Patents

Method and device (variants) for generating electrical energy by partially separating the magnetic field of a ferromagnetic substance from a magnetization coil

Abstract

The invention relates to means of generating electrical energy. A method for generating electrical energy is based on converting energy during the magnetization and demagnetization of a core, and drawing off additional energy using an additional detachable secondary winding. The additional energy in the invention can be obtained during demagnetization of a core which has been premagnetized using a coil. A device (and variants thereof) comprises magnetization coils and cores, the number and position of which may differ in different embodiments of the device. The technical result is the possibility of obtaining an additional amount of electrical energy without additionally expending electrical energy on the working of the device.

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Description

A method and apparatus (variants) generating electricity by means of partial separation of the magnetic field on the magnetization of the ferromagnet coil.

TECHNICAL FIELD

Electrical engineering, energy, converting equipment. Background of the Invention: analogues and the prototype there.

BACKGROUND ART

Analogs and prototypes were found.

SUMMARY OF THE iNVENTION

A method for generating electricity by separating the magnetic field from the ferromagnetic magnetizing coil is to create magnetic fields and converting non-inductively with a coil (coils) magnetization. The formation of these magnetic fields is achieved by a special design and topology itself magnetic field device when magnetizing the coil is engaged only a part of the magnetic flux and the magnetic core of energy (cores) of ferromagnetic material. The second step is the transformation of the energy of the magnetic field and the magnetization coil and ferromagnetic core of demagnetizing (in reverse motion) into electrical energy. Generation and is achieved by converting the entire magnetic energy in the core power. When demagnetizing the magnetic energy of the ferromagnetic core is not connected with the magnetizing coil is converted into additional power is not related to the cost of the magnetization. The simplest embodiment of this device the topology implements a method of generating this current, coil wires, circuit, or magnetizing coil located just next to the volume of the ferromagnetic core. Magnetizing coil located, for example, opposite end of the ferromagnetic core. A significant or even most of the energy of the magnetic field of the ferromagnetic core generally does not inductively linked with the magnetizing coil, and is closed around the core, passing the magnetizing coil. The energy of the magnetic field is proportional to the square of the magnetic induction and, therefore, almost all the magnetic energy is closed in most near-field space around the core. The magnetic field is closed all around the core and the shape of the magnetic field depends on the shape of the core of ferromagnetic material that can be used to construct the devices.

In the traditional classical conventional electrical winding magnetization always cover all or almost all of the magnetic field of the core. Dividing partially magnetic field from the coil core magnetization, we get the magnetic field of the ferromagnet, which does not have influence on the establishment of a current in the coil

magnetization. The principle of separation of the magnetic field volume of the ferromagnetic core of the magnetization coil itself is achieved by special topology of devices is the main feature of the invention. generation process is achieved by the fact that the distance from the magnetizing wires to the surface of the core of ferromagnetic material and is sufficiently large enough that significant circuit would formed ferromagnetic magnetic flux without covering the coils with the current and without forming an inductive coupling with the magnetising coil. The magnetizing coil unit is not attached to the core itself, but as if the charge side, for example, to end at a certain distance from it. The magnitude of this distance envy and the diameter of the coil core is determined by the desired thickness and size of the magnetic coupling. The simplest version of the apparatus and system topology is just a piece, the volume of ferromagnetic material adjacent to the current-carrying wire. This forms a significant part of the magnetic field does not cover the wire and not associated with the inductive coupling wire. Cores can be arranged in and around the wire, but have to be separated by gaps for partial or strong magnetic fields of their separation from each other. If the current-carrying wire forms a coil, the circuit and core may be within the contour (but at a distance from the wire) is as a plane contour and the next, and in general the outside contour of the current loop.

In another case (embodiment) has a magnetization coil in several (or many times) larger diameter section than the cross section of the core and partially or almost completely enters the core on a plane. It's kind of remote magnetization of ferromagnetic volume, and it provides a magnetic field of the volume of the ferromagnet has no way connected inductive (magnetic) with a coil magnetization. It is important that the device may be used only one core, the coil magnetization and itself without a core.

Operation of the current source (electric power consumption) when the magnetization is always equal to the magnetic energy in the coil plus a loss of magnetization. Operation of the current source, the electric power expended magnetization is always equal (ignoring losses) of the magnetic energy and only ferromagnetic volume that is associated with the magnetic induction coil magnetization. But all of the energy of the magnetic field of the ferromagnet is thus always a lot more than that part of the energy of the magnetic field of a ferromagnet that is inductively coupled with the coil. As a result, the total energy of the magnetic field of the ferromagnet is greater than the cost of its distance (a distance) magnetization. And do electricity consumption for the magnetization will always be equal only to the energy of the magnetic field that is inductively coupled with the coil magnetization. But then the total energy of the magnetic field of the ferromagnetic core will always be more than a part of the core energy of the field associated with the coil magnetization. Part is always less than the whole. This allows the magnetic field energy of the ferromagnet core longer than the actual power consumption for the magnetization in the magnetization coil. Electricity costs are always magnetized only one and only the magnetic energy is directly connected inductively with a coil magnetizing the magnetic flux and direct inductive coupling. But with the coil magnetizing inductance (due to the topology of the devices and fields) is connected, only a small part of the energy of the magnetic field of the ferromagnetic material volume, and the total energy of the magnetic core will always be greater than the energy of the magnetic field associated with the ferromagnetic magnetizing coil. But that would be at the demagnetization (on the return stroke) to convert into electricity has all the energy of the magnetic field of the ferromagnet volume need a special removable additional secondary winding. This removable secondary winding is not active (current blocking diode or controlled rectifier) during magnetization and demagnetization only works when phase. In the case of a pulsed flyback converter secondary winding only works in current interruption phase (or recession) transistor or thyristor in the primary coil magnetization.

flyback mode allows you to get rid of the current reaction in the secondary coil during the magnetization, but does not prevent convert magnetic energy in ferromagnetic demagnetization. It should be noted that the energy in a ferromagnetic material stored in the form of magnetic domains Elastic interaction energy, and this quantity depends on the initial induction and an external constant magnetic field. When the magnetization of the core permanent magnets (or currents) and can work on a cycle not magnetize and demagnetize the core has to zero or all of the core of magnetization reversal in the opposite direction. But the principle of the reverse here is, is the accumulation of magnetic energy in the elastic ferromagnet and then return magnetic induction to the primary state. The core is magnetized permanent magnet may be demagnetized by a magnetic field and current even

remagnetized in the opposite direction to the magnetic field of the magnets. This can significantly increase the maximum amplitude of the magnetic flux density in the core of ferromagnetic material, nearly twice (maximum) than on a cycle of magnetization from zero induction. Also, the presence of permanent magnet demagnetizing field reduces a magnetic induction decay to zero when the magnetizing current is switched off and reduce the residual induction in the core. Magnets may be arranged as a series from the ends of the core and parallel to it.

It is very important and the very form of the ferromagnetic cores. This core may be a simple straight shape or have end projections to reduce the demagnetizing factor and create a certain shape W

magnetic field around the core. For example, a ferrite core can have a dumbbell shape to form a particular magnetic field topology and reducing demagnetization end portions. Dumbbell shape and end projections may be as in the whole of the core (or entire batch of sheets), and or in the form of individual pads reproach butt end. Such inlaid core made of ferromagnetic material consists of three parts have a central core and two side cores in the form of pads on the ends. May use a conventional serial or special core of ferrite in the form of a dumbbell shape or any close or similar shape (and in one projection). The core lamination is made in the form of a pack of sheets of the transformer or electrical (steel dynamos) have straight or special shape or consist of multiple packs of steel. The direction of the magnetic fields laminated core scattering along and across the direction of the charge will vary considerably and this must be taken into account when designing the device. The greatest magnetic leakage will charge along the plane of the sheet, rather than across, the sheet, due to eddy currents in the steel sheets. Ends laths arranged transverse end and allow the core to direct the magnetic fields sideways of the scattering from the end of the core and reduce magnetic coupling with coils magnetization. End plate essentially as a magnetic shunt rotates the magnetic fluxes in the core sides.

The devices operate on the principle of creation, accumulation of the magnetic energy and its transformation during demagnetization and disconnecting current. Demagnetizing currents as in the conventional transformer when magnetized not arise because blocked or controlled rectifier diodes of the transistors or thyristors. This so-called reverse mode. The current in the secondary winding is only shutdown phase and current in the coil magnetization decay.

reverse principle can be implemented in a pulse-converting opening magnetizing current in the primary circuit of the coil by means of a transistor, relay, the lockable or brush collector thyristor. As well as any other type of key-type vacuum tubes, gas discharge and other methods. The apparatus may simply be fed pulsating voltage and current on any special external power supply. The voltage and current may be variable, but with the constant component, or any other form of current rise and fall. When an alternating current of any shape, too, have a current phase of growth, and the current recession phase, which can be used to implement flyback principle. Converters flyback pulse in the converter equipment may be of different schemes, for example, booster, or inverting chopper converters and any other schemes. One can use any scheme for embodiments of the method and device of generation. Magnetizing coil and secondary windings can be operated independently (for different load), or run in parallel on the total capacitance (condenser) Voltage adder. As well they can work together and consistently to a common load. In the phase during demagnetization and magnetization current decreases, the magnetizing coil itself and a removable secondary winding on the core connected in series to a common load. In this case, their emf voltage and magnetic energy are added together cumulatively, transformed into electricity in the total load. Series connection can be used directly with the coil winding and with different voltages and EMF for one load. The adder of the capacitors in this case is not needed.

The principle of separation of the magnetic fields and ferromagnetic realized due to the special layout of the device. Separation of the magnetic field from a ferromagnetic current arises just when the volume is adjacent to the ferromagnetic conductor with a current or next to the windings of the coil inside contour with current, and with its outer side. Thus a significant part of the energy of the magnetic field of the core, the volume of the

ferromagnetic closed without current coverage and no inductive coupling with the magnetization current. This part of the energy of the magnetic field of the system, which does not "see" the current source in the magnetization and the magnetic field energy of the ferromagnet current source does not waste energy. But this component of the magnetic field of a ferromagnet (not related to the magnetizing current) can be converted to the return stroke by means of an auxiliary winding in additional electricity. Displacement ferromagnet can thus simply be near the current as a direct wire, for example, or as a coil. Ferromagnet may be located within the large loop (or coil current) whose diameter is several or many times larger than the core section and its length. Ferromagnet can be and generally is loop or coil turns, but next to it, for example. magnetizing coil may be flat in the form of a coil current. Length magnetizing coil can be much less than the length of the core and the core may be partially or fully come inside the coil volume or in its plane. When this magnetization is still applied to the entire core of the ferromagnet due to the magnetic interaction domains. magnetizing coil may be flat as a coil, which itself reduces the amount of magnetic energy and costs for magnetization. Magnetic energy not only depends on the square of the magnetic field, but also from the scope of the magnetic field. This determines the power consumption for the magnetization. For magnetizing frequently and local (in space) of a strong magnetic field in the core portion of the ferromagnet. This significantly (several times) to reduce the electricity consumption for the magnetization and have a strong enough magnetic induction in a ferromagnetic material. Magnetization is distributed over the entire volume of the ferromagnet. Coil length can be thus considerably less than the length of the core (cores) of ferromagnetic material. magnetizing coil can be either solid or consist of separate sections, spaced to a uniform magnetization of the core. magnetizing coil may operate on two or three cores (or more). The optimum embodiment of this use of multiple cores, as this gives more ferromagnetic magnetic energy. For example, a magnetizing coil runs on two of the core and its plane is disposed between or adjacent to the ends of cores separated by an air gap. This core can be represented as a first one-piece core, but then, as it were sawn in half and spread apart to a certain gap between the ends. sectional dimensions or diameter of the magnetizing coil can be several times and many times be greater than the dimensions of the cross section or diameter of the core (cores). This increases the effect of the magnetic field of the magnetization coil by a distance along the length of the core and reduce the magnetic coupling of the coil to magnetize the magnetic field cores themselves. magnetizing coil at the same time as it covers the gap between the cores, which also reduces the magnetic coupling with them. Cores ends as mutually slightly magnetize each other through the gap to enhance induction. But the main role in the magnetization of the ferromagnetic cores of the magnetic field itself plays a magnetizing current in the coil along the core.

The apparatus may also be of the three cores of ferromagnetic material and separated by large gaps for separation .ih strong magnetic fields. In this case, the coil magnetization also do better in a few or many times greater than the cross-section dimensions of the sides of the cores themselves. magnetizing coil can cover the volume, only one central core or partially or fully come on at the two side planes of the core. Length magnetizing coil can be much less than the length of the central core with a relatively large diameter enlarged to reduce the magnetic field due to the core. To reduce magnetic coupling between the magnetization and the cost of the central core can be several times smaller than the sectional area of the side cores and have a relatively small length. sectional area (sectional shape itself) of the central core can be the same or nearly specifically several times smaller than the sectional area of the side cores. Wherein the central core is used as an auxiliary for increasing mutual magnetization through the gaps. This all can reduce the cost of magnetization (and the coil size) and increase the magnetic fluxes are not connected to the coil. Useful energy of the magnetic field is removed from all three cores of ferromagnetic demagnetizing. The device of the three cores is one of the easiest and most technologically advanced on the device. As already described the magnetizing coil (device with cores is magnetizing coils) can have (as an option) and a small your inner (central) kind of a supporting core of ferromagnetic material, but it is not a prerequisite. When this is used to generate all three core. The apparatus may integrally comprise any number of magnetizing coils (coils sections) and any number of ferromagnetic cores of different shapes and cross-sectional area to reduce cost and increase the magnetization of the magnetic field energy of the ferromagnet is the magnetizing coils.

The apparatus can operate even when only one core of ferromagnetic material. Any one-piece core and can be represented as the integral sum successive cores with small, small gaps. An important difference from the

options magnetization with a special core inductor coil magnetization in that additional energy is removed from all of the cores of the system. A very simple embodiment of the apparatus may be only on one core of ferromagnetic material and a magnetizing coil. The core is partially or completely inserted in magnetizing coil near or adjacent to its plane. Magnetizing coil itself can be a single homogeneous in turns density or inhomogeneous, or in general as to consist of several individual sections separated by spaced a certain distance. This allows a more uniform along the induction core due to its stronger local magnetization of its end portions and increase the overall uniform longitudinal magnetization. Section (two) can be shifted closer to the ends of the core to reduce the magnetic field due to the core. This is due to the fact that the magnetic equator core will always be the maximum magnetic flux linkage. It's better than the location of a single coil magnetization near the center of the core, as it reduces the magnetic coupling and the cost of the magnetization with a stronger local magnetization of the end parts of the core. To reduce magnetic coupling between the core and is also used increase (at times) the diameter or cross section of the coil sides magnetization circular, rectangular and so on. Any shape. To reduce the demagnetizing factor of a single core can be replaced by a bundle of separate parallel and cores in the form of rods or plates, but separated by gaps of dielectric material for reducing the mutual demagnetization. Such a core may be considered as a number of separate cores or a core inlaid of separate parts in the form of a bundle or stack. Each core pack can also have its own separate detachable coil for the transformation of the magnetic field of the core. Winding all together in parallel and in series to a common load or drive. The pack can operate as a single inlaid core. At the same total useful area of the cross section and the magnetization of the magnetic induction of the core typesetting rods or plates will be greater. This is due to the fact that more elongated relative to the width of the cores have a much lower coefficient of demagnetization. This original new technical solution is practically used in conventional electrical engineering, but useful for increasing the magnetization of unclosed cores. Importantly which itself sectional shape in the core at the same cross-sectional area circular shape core always will have a much larger demagnetizing factor than the core rectangular elongated circular or elongated section or almost flat sectional core. This cross section shape can be used for construction of the device to reduce the demagnetizing factor. When this magnetization coil must be also rectangular elongated shape in the right section and have a sufficient distance from the surface of the core that would have formed a magnetic leakage flux inside the coil. This elongated rectangular section of the form must also take into account that the magnetic leakage flux mostly closed more elongated along the side of the rectangular cross-section. This factor must be considered when choosing the direction of the charge in the laminated core plates of steel. In this direction and made the parameters of the magnetization coil size. This cross-sectional shape allows the device more compact in installation in modules than just coils circular cross-section. Elongated rectangular or rounded (without sharp corners) shape of the core and coil wires magnetization consumption increases, but the cross-sectional shape more convenient and more efficient at the same operating square section. To reduce the demagnetizing factor of the core lamination plates of steel may have an increased thickness of dielectric insulating spacers between the plates or sheets or steel core itself has periodically arranged dielectric gaps, which seemed to divide into separate parallel core pack. These are all design options, wherein the core is located either near the magnetizing coil, or in general inside the magnetizing coil. This topology can be integrally combined in a closed magnetic torus type chain or rectangular (with gaps) of many coils and cores. This integral magnetic fields by coils partially overlap and are summarized, reinforce each other, and the cores are magnetized mutually to each other through the gaps. The apparatus can also include a common magnetizing coil and any large number of small micro-cores (with windings) or cores of ferromagnetic particles and arranged in series and parallel. Each core has its detachable coil.

The degree of magnetic coupling and the magnetic coupling between them may be different, but all distances between the cores must be chosen so that always be formed significant stray magnetic fields confined only around the cores in the proximal space area. These all magnetic stray fields and this magnetic energy inductively has nothing to do with the magnetizing coil. The magnetization current is fed only in one common outer magnetizing coil, but the demagnetizing magnetic energy has to be removed and the coil magnetization and from all cores, micro or cores ferromagnetic particles (dielectric) disposed inside the magnetizing coil. In this case, additional energy is transformed and the entire magnetic energy of all inner (relative to the coil) magnetic fields dissipate all cores, micro cores or ferromagnetic particles. All windings of cores (particles) of ferromagnetic material are combined together for parallel groups and (or) or sequentially at different overall

load or a common drive in the form of electricity or battery block capacitors. Such a magnetic system may be direct (open magnetically at the ends) in the form of a solenoid coil type (with cores) or a more complex closed magnetic torus type system or rectangular magnetic circuit for closing the magnetic field within the total system. This leads to a partial magnetic isolation of the external environment.

However, the cores may be located just next to or around the straight wire (s) or a coil with a current at a tangent to the magnetic field current. The magnetic field is direct or nearly direct current coil and the other forms a concentric closed magnetic path around the current-carrying wire. This embodiment also allows the topology to use a large number of cores, a large total magnetic flux and the total energy of the magnetic field at a coil circuit, the magnetizing coil. Each core also has a detachable coil, which is needed to convert the entire magnetic energy of the core and including one that is not inductively linked with the magnetize coil.

Ferromagnetic and may in the form of a torus, which covers the current, but this torus should be large gaps divided into separate segments for the partial separation of their magnetic fields. We can say that it is just a few or many cores located on a tangent to the magnetic field current. Such cores are magnetized tangentially field current and also a little mutually magnetize each other through large gaps, forming a magnetic circuit. Such magnetic circuit of the segments like cover and a wire current. But because of the large gap magnetic field cores closed mostly right around them in the near field, and does not form a magnetic circuit. This also arise magnetic field segments not associated with induction coils, or the coil current. This kind of almost closed magnetic circuit is obtained, and it can be in the form of a torus or rectangular shape of the segments with gaps and consist of any number of ferromagnet segments. Each such separate segment of a ferromagnetic torus should have its removable secondary winding (section) for converting the total magnetic field ferromagnet segments. The magnitude of the gaps between the segments of the magnetic circuit is chosen such as to obtain substantial separation of magnetic fields segments (and their energies) greater than the formation of the common magnetic flux. This allows for significant segments of magnetic energy and convert it into additional electricity. One straight wire carrying a current to the coil or coils may be many such strung magnetic circuits in the form of a torus or rectangular shape and any shape. Cores, to be exact volumes of ferromagnetic and can simply be disposed adjacent to a current loop or the coil as is the current contour and outside contour is plane or volume of the magnetizing coil. The core is either out of the plane of the current loop, but next to it or is displaced in any direction relative to the contour axis. The core (core) can be positioned and is generally only magnetizing coil at its ends or even be, as it were beside the side, but the magnetization is not very effective. If the coil has a diameter or sectional size (cross-section can be any shape) is several times more than a relatively short section of the core, the core may be located anywhere within the coil and in the center or near the periphery. The magnetic field of the core part inside the closed circuit directly and without inductive coupling with it. The magnetization of a ferromagnet with the most effective, but the device must have a magnetization coil of large diameter section. The main thing is that a significant portion of the magnetic field energy of the core (cores) is closed inside the coil, but without an inductive coupling with the coil windings themselves. According to the physical effect is the same circuit as a magnetic field outside the plane of the magnetizing coils. But when this is achieved the maximum magnetization by arranging a ferromagnetic core in the magnetizing circuit. A decrease in the magnetic field due to the coil core is due to increase of the coil diameter or simply due to the displacement of the core bit relative to the plane magnetization coil. It is important, and the distance from the core wire to the coil and the magnetization direction of the magnetic flux itself lines coil and magnetic core flux.

It is important to clearly understand what is important is not the formal presence of flux, and the real effective magnetization and effective magnetic flux linkage. The presence of something, such as a single coil (or more) of the magnetization coil on the core (with a full flux) does not mean that the cost of the magnetization associated with the entire field of the ferromagnetic core. When you attempt to work around my patent for the invention may be used, and the fact that the location of a number of turns (for example, when a hundred other turns of the coil) magnetizing coils formally as it violates the formula that has a magnetic field is not associated with the induction coil magnetization. The situation is also complicated, and if there is no counter included flights and sections, and must take into account the contribution to the magnetization and the cost of electricity

has magnetization of each turn. The individual windings spaced magnetizing coil can in principle be thus all linked with the magnetic field of the core, but it is not related to the effective magnetization. It is important not formal linkage of the individual coils and core of fields, and very effective magnetization and effective magnetic flux linkage itself fields and coils. The magnetic flux linkage of the individual coils with the field magnetizing coil core of ferromagnetic material and can be, but it may be unrelated to the real effective magnetization of the core or the contribution to the effect of magnetization just small and insignificant. There are generally any partial flux linkage Part of turns of the coil magnetic field and the magnetization of the ferromagnetic cores, but it must always be considered effective only (and not the formal) magnetization and flux linkage fields and the associated power consumption for magnetisation itself.

Itself formed Quantum ferromagnetic magnetic electron currents moments (spins) and has an inductive impedance resistance. In this case a ferromagnetic carrier is independent of the magnetic field energy. To magnetize ferromagnetic and formation of its magnetic energy is not needed as the current and voltage in the coil of wire, for example, and only the external magnetic field originating in the external current conductors. To generate a need only partially inductively separate the intrinsic magnetic field of the coil itself of the ferromagnet magnetization. It's kind of remote magnetization at a specific distance from the coil magnetizing wires. This device and method for generating additional energy allows to obtain magnetic fields ferromagnet volume without electric power supply costs. A demagnetizing (on the return stroke) and all this extra magnetic field energy of the ferromagnet volume can easily be converted into electricity by means of a special removable secondary winding which is disposed on the core and the magnetic field covers all of the core. The inventive method consists in the generation and the magnetization of the ferromagnet, the formation of the magnetic field energy is magnetizing coil and then converting all magnetic field energy of the ferromagnet (demagnetizing) through a special removable additional secondary winding on the core. Secondary winding works only on the return stroke in the demagnetization phase. flyback mode allows you to obtain and effectively convert the magnetic energy of the core without the effect of demagnetization as in conventional transformers. Device (and the method) operate in the accumulation phase of the magnetic energy of the ferromagnet and to its phase transformation. In phase coil magnetization and demagnetization of the secondary coil can be connected together in series or in parallel to a common load or work on various loads or one adder through a common voltage of the capacitors.

Device for implementation of the simplest form of this method is easy magnetizing coil located near the end of a simple direct ferromagnet core as a rod or bar. magnetizing coil may have a cross section less than, equal, or close a larger cross section than the cross section of the core (or one of its sections). magnetizing coil may be the diameter and the cross section of a few and many times greater than the cross section of the core and partially in the plane come to an end portion of the core or be spaced from the plane of the end face of the core. Magnetizing coil of larger diameter provide a stronger magnetic field at the same distance from the plane of section smaller than the diameter or cross section of the coil. For stronger magnetizing two coils can be positioned on both sides of each end of the core opposite to magnetization from two sides. Another simple embodiment of the apparatus is a closed core with a large air gap, which houses the magnetizing coil. In this device, a magnetization coil in the gap magnetizes the immediately have two ends closed core in a rectangular or circular magnetic circuit. The gap is especially large and the magnetic field of the core is substantially closed through the gap, and the air around the entire core, as in a straight core rod. A magnetizing coil magnetizes the immediately two ends of the core is almost closed. A magnetic circuit can be rectangular or in the form of a torus, simple or branched. The magnetic circuit may be one piece or composed of individual segments of a ferromagnet. The segments of the magnetic circuit can be further separated by small air gaps for partial separation of the magnetic fields of these segments. This increases the total magnetic flux of the cores at the same cross-sectional area segments. The magnetic circuit may have two or more magnetizing coils between segments for a larger total magnetic flux in the device. But the easiest version of the device is one core (direct or almost closed) and one coil magnetization. The device Direct core is better to make two magnetizing coil to magnetize the core from two ends. The two coils can be represented simply and as two spaced apart one coil magnetization section. In the case of a closed or almost closed core precisely with a gap of one coil and sufficient magnetization which acts directly on the two ends of the core. This kind of closed (half-closed)

version of the device structure and the magnet system and its counterpart is a straight rod with a magnetizing coil near the end of the core. These are the easiest options for devices with only one core. In these devices, the magnetic field of the ferromagnetic core is closed like the side, away from the magnetizing coil itself. But the magnetizing coil especially large diameter, which is several or many times larger than the cross section of the core may even come partially (in its plane) on the end portion of the core (cores) for a stronger magnetization. The core may be located entirely inside the magnetizing coil diameter of which is several or many times larger than the cross section of the core and approximately (plus-minus) comparable with the length of the core of ferromagnetic material.

The core of ferromagnetic certain length and can be located directly inside the coil magnetization whose diameter is several times, many times greater than the core section. The distance from the wire coil to magnetize the core surface sufficient to complete the closure of much of the energy of the magnetic field inside the ferromagnetic magnetizing coil without flux and without inductive coupling with the coil magnetization. You can close a magnetic field in the core principle either side (side) of the magnetizing coil either directly inside the magnetizing coil. For this purpose, the core itself need not be long, and the magnetizing coil must be comparable diameter approximately the length of the core of ferromagnetic material. The magnitude of the magnetic coupling katushka- core can vary widely technically in the desired limit due to different sized cross sections, the diameter of the magnetizing coil, and the length and thickness of the core cross section of ferromagnet. magnetizing coil diameter or cross-section (rectangular, for example) must in this case be a few or many times greater than the cross section of the core. A core length should not significantly exceed the diameter or cross section of the magnetizing coil. It is better to use shorter cores. The core may be located either in the center of (preferably) or arbitrarily large magnetizing coil diameter. The distance from the wire coil to magnetize the core surface should be sufficient to ensure that would be space for a large part of energy-circuit the magnetic field inside the core and without magnetizing coil with inductive coupling coil.

The magnetic field and the magnetic energy of the core is closed in substantially inside the magnetizing coil. For conversion into electric energy entire magnetic core thereon is detachable special secondary winding which operates only on the return stroke when demagnetization. This secondary winding may be connected in parallel or in series for the total load with the magnetizing coil, or on a separate work load. A plurality of large diameter coils with cores (arranged in series and mutually magnetizing each other through clearances) may form an overall total, integrated system. Magnetic chain may be a straight or a closed magnetic circuit including a magnetic branched chain. The individual magnetization coil can be represented as separate sections common magnetizing coil. An apparatus of this type is a magnetizing coil (whole or as individual sections) and dial-up core in the form of successive cores through the gaps. The magnitude of the gaps may be different for different devices, from the small gap to the cases when the core of the weak interaction through the large gaps. Such total core can be represented as a kind of common typesetting core, but as a set of all individual cores arranged in series through the gaps.

To reduce the demagnetizing factor of the ferromagnetic core itself can not be made solid, and inlaid in a stack of parallel circular rods or flat or rectangular plates separated by spacers of non-magnetic dielectric. Such a narrow rods or plates more easily magnetized and have a smaller demagnetizing factor. This gives a stronger induction of magnetization.

The laminated core of transformer plates or the electrical steel can significantly increase the insulation between the plates due to spacers made of plastic, cardboard and so forth. The thickness of dielectric plates may be comparable to the thickness of the plates themselves or steel sheets and even exceed it. This dramatically reduces the demagnetizing factor and increases the magnetic field induction at the same length and a thickness of typesetting core of ferromagnetic material. In principle, the device can not be simply monolithic core (solid) and a number of separate cores disposed parallel to and spaced from the dielectric to reduce mutual demagnetization. Such a core can be regarded as a kind of core in the form of dial-bundle of rods or plates, but also as a set of parallel arranged individual cores in the form of rods or plates. Thus, each bundle in the core may have its own removable secondary winding.

Also, the core may be in the form of type-setting consecutive segments separated by air gaps (dielectric) to effect partial separation of their magnetic fields. Is formed around each of the core and its magnetic field due to the gaps. Summary of the magnetic flux of the inlaid core segments may be much larger than that of a whole cross-sectional area of the core. This device with a large number of cores. magnetizing coil can be surrounded by all the cores of ferromagnetic material on all sides and be as if inserted into a window or the whole typesetting, simple or branched magnetic circuit. This may be a rectangular magnetic circuit, wherein the window is simply inserted magnetizing coil (air core). The core formed two opposing magnetic flux, and the magnetic branched chain and more. Magnetizing coil flat shape (short and wide) can be filled and all outside and inside of the ferromagnetic cores, but that would be a place for closing the magnetic fields of the cores that do not cover (or partially cover) the magnetizing coil wires. Any device of any complex shape can be easily technically represented as the integral sum of the individual cores and one or more magnetizing coils. Any topology of the magnetic circuit can be assembled from individual coils of the magnetizing cores of various shapes of modular solid or in the form of segments. The cores may be joined with the segments for the separation of large gaps or magnetic fields with minimal clearances for receiving a desired shape of the core. The sectional shape magnetizing coil may be of various shapes, cool, rectangular or round. magnetizing coil can be flat, short, cylindrical or in the form of individual spaced-apart sections. To improve the efficiency of the magnetization can be used, and two magnetizing coils located on either side of the ends of the core. Thus a core of ferromagnetic material is magnetized from two sides and magnetic field coils are formed, which increases the efficiency and uniformity of magnetization. A magnetizing coil can be disposed between the two cores of ferromagnetic material, being located in the gap between the cores. In this case one coil magnetizes the immediately two core. magnetizing coil may partially enter the plane of the ends of the cores with the proviso that the diameter of the coil section is many times greater than the cross section of the core. But the easiest version of the device is a device with only one core of ferromagnetic material. But possible embodiments of devices and any large number of cores. Any device with a large number of cores and the magnetizing coil sections can be represented simply as the total integral execution of the individual elements with a core. Magnetizing coil of large diameter and can partly enter (along the plane of the coil ends) at the ends or at any part of either of the cores themselves. Various smooth variation of magnetic coupling of the coil and any ratio of length and the length of the core (cores) of ferromagnetic material. This relates to different devices and with any number of cores. The magnetic coupling of individual cores and coils magnetization can generally be different in one apparatus with a large number of cores. The magnetic fields act on the coil core on the axis (on the plane) of the coil increases with its diameter, and it can be used in devices for more efficient remote magnetization in the region. This allows better magnetize the cores at a smaller reverse magnetic coupling with the magnetising coil.

The apparatus may consist, for example, from the magnetizing coil of relatively large diameter or cross section (and rectangular, for example), and three cores. When this magnetization coil (large diameter) on the plane can cover the end portions of the central core or only partially come to the side cores or only to partially or gaps themselves and two side two cores. There may be a variety of smooth variation of the topology and the mutual arrangement of the magnetic coupling, but they have no fundamental significance. magnetizing coil can be as small as the length of the central core and to be approximately equal to it (taking into account gaps) or be greater than the length of the central core. magnetizing coil can enter edges (along the planes of the ends of) the side cores to different degrees in different variations mutual inductive magnetic coupling. Due to this, and is governed by the magnetic coupling with the core. Form cores may be conventional in form of rods or rectangular or rounded cross section in plates of ferromagnetic material (ferrite, etc.). But there may be used a special form cores. For example, cores in a frame shape (or a shape like a bobbin thread to) a rectangular or circular cross section, such as those that are used to throttle the inductance of the ferrite. This special form of ferrite is also called as a dumbbell. Ferrite form a dumbbell-like shapes Babin for cables or wires. Sectional shape of parts may be round or rectangular. To increase the magnetization of the core may have separate toothed lateral projections at the ends. The magnetic stray field of the end parts thus always very highly concentrated at these projections, ledges and the teeth of the ends of the side projections presence (y end) of the core of ferromagnetic material considerably changes the topology of the magnetic field, since the magnetic fluxes are concentrated at various projections. Lateral protrusions ferromagnet like concentrated and directed

magnetic flows laterally from the ends of the core, which reduces the length of the power lines of induction and improve the closure of the magnetic energy in the near area of the core. Lateral projections can be made from a solid core or made as separate plates on the transverse end portions. The cores of a special shape with lateral projections in particular to dramatically reduce the overall magnetic coupling with the magnetising coil with the same distances, and size of gaps. The profile of such a core has a H-shape. Lateral projections also significantly reduce the demagnetizing factor in the core of ferromagnetic material at the same longitudinal length of the core. The apparatus may be in the form of a ferrite core as a skeleton for magnetizing coil of thread and the diameter of which is several times greater than the core cross section and is comparable with the length of the core. The magnetic energy in the core significant, largely closed inside a magnetizing coil, and its formation has not spent current electric power source. But in a special core is removable secondary winding for converting all the energy of the magnetic field of the ferromagnetic core. This is one of two basic principles topology separation of magnetic fields. The magnetic field can be closed out of the coil plane (side view), or partially or completely right in the very plane of the coil due to the size of the magnetization coil, which is several times or many times larger than the cross section of the core. It is important to take into account at the same time and the length of the core of ferromagnetic material. The core is shorter better closes the magnetic near field space than the core length. Inlaid core of many short successive cores (via the large clearances) can significantly reduce the width of the cross section, the diameter of the magnetizing coil. This typesetting core with gaps around each core is formed shorter its magnetic stray field, which space is closed in the proximal zone. This inlaid core significantly reduces the diameter size, magnetization of the coil section. Apparatus represents magnetization coil and core (solid or dial-up) inside the secondary winding. The diameter or cross-section of the magnetizing coils of several or many times greater than the cross section of the core. It is necessary for the closure part of the energy of the magnetic field inside the core magnetizing coil. When the load is connected to the demagnetization of the magnetization coil and the secondary coil. Each core inlaid core must be positioned has its own section of the secondary winding, which covers all the intrinsic magnetic field scattering of each core.

magnetizing coil can be simply inserted into the air gap closed (nearly closed) then the magnetic circuit and one magnetizing coil is working directly on two ends of the core. The magnetic circuit with the gap may be rectangular or in the form of a torus and also be simple or branched, including a volume of three, four or more branches. A simple magnetic circuit must have a clearance for arranging coil magnetizing section which compares roughly with the ends of the magnetic circuit section. Biasing the two ends directly magnetizes the entire core torus-shaped or rectangular magnetic circuit. In fact it is almost a closed core and a coil magnetization, which works directly on the two ends of the core. The magnetic circuit device can be simple or branched in three (of the central and two side branches), four or five branches. Most of the magnetic field of the core to form a magnetic circuit with the gap is not connected to the inductive coil magnetization.

The magnetic circuit may be as many segments with large gaps to separate magnetic fields of the cores, but instead merely magnetizing coil straight wire (or turns of the coil) in a magnetic circuit such as a window typesetting core (as current transformers). The magnetic circuit may be rectangular or in the form of a torus or rounded. Magnetizing coil in such a device can be made in the form of a straight wire (or large coil windings) in the middle of this magnetic circuit or in separate sections arranged in different sectors. A significant part of the energy of the magnetic field of the segments of the magnetic circuit due to the large gap is closed around each segment only and is not associated with the wires and the turns of the coil (coil sections) magnetization. The magnetic leakage field as the individual segments are closed in the outer regions of the space around the magnetic circuit, and in that the stacked box magnetic circuit, the magnetic circuit if the window is sufficiently great. The window of the magnetic circuit can be specifically increased to increase the scattering of the magnetic field and the number of segments. To increase the efficiency of generation is also advantageous to use a magnetic branched chain (with three, four, five branches) of the segments, since one and the same magnetizing coil can be magnetized to several times the number of magnetic and branches of ferromagnet segments.

On each such segment of the magnetic circuit should be located its removable section secondary coil for converting all the energy of the magnetic field magnetizing coil. The magnetization current is supplied directly

conductive in the magnetic circuit section of the window or the magnetizing coil, and demagnetizing the magnetic energy of the stray fields of the cores segments through the secondary winding is converted into additional energy. This type of relatively closed magnetic circuit and the magnetic system. But unlike all conventional magnetic circuits in classical electrical here specially created stray magnetic fields around each core (segment) which is not associated with induction magnetizing coils do not form a common magnetic field. This kind of multiplier effect of the magnetic field due to the clearances and a special section of the magnetizing current. Cores in a partially closed magnetic system slightly mutually magnetize each other through the gaps, but the magnitude of this interaction, and may be different depending on the size of the gaps. Magnetization segments and exerts a large effect of the magnetic field magnetizing current, the magnetic field intensity and the current in the coil as a local field and a magnetic field along the contour (total current law). In devices of this type can be used immediately much cores and mutual magnetization through gaps greatly reduces the demagnetizing factor of the ferromagnetic cores. But fundamentally the physics of the process and on the principle of generation is no different from the most simple devices with a single core.

The devices can be operated in pulsed mode, the flyback converter, when the primary current is interrupted by a transistor, a thyristor or other lockable key type brush collector or lamp. Operation is possible simply by a special external source of pulsating current and voltage. It will be a kind of reinforcing DC-DC Converter DC-DC converter with an efficiency much more than 100%. Such devices can be used for amplifying charge or recharge the battery capacitor blocks in an uninterruptible power supply or autonomous systems. Magnetizing coil and the secondary winding included in the charging mode and boost converter circuit and operate to charge the battery or capacitor. When accumulating magnetic energy from the DC power source is only the magnetization coil and the demagnetizing coil in series with a magnetization (and constant current source) turns on the secondary winding and the energy goes into the second DC drive. Converting all magnetic field energy of the ferromagnet secondary winding induces additional power, which is also fed to a second constant voltage drive. Thus one battery or capacitor (ionistor or straight.) Is discharged, while the other is charging, but the second is charged at a higher energy than first discharged. The total energy of the two batteries is increasing, that allows you to create an uninterrupted DC power source and without any external recharging. In such devices, due to the DC-DC converter with an efficiency greater than 100% can be recharged batteries or capacitors without an external voltage source. It allows you to create completely autonomous power supply DC power for any electronics, household appliances, communication technology and navigation, toys and so on. Electronics and appliances.

Energy conversion of the booster circuit pulse converter can dramatically improve the power factor during operation for charging the capacitor battery or battery pack, which would overcome the tension already created on the battery or capacitor. In this case the primary voltage source, the magnetization coil and the secondary winding (by opening switch) in series for charging a capacitor or a secondary battery. This permits to recharge the second constant current source (battery, capacitor) greater energy than the first discharged. In sum, this system drives DC never discharged and may even increase the stored charge. There's also an independent or parallel operation of coils and windings on different drives or load switching for a variety of schemes.

Magnetizing coil and the secondary coil can operate sequentially on the overall load on the step-up circuit voltage (boost) converter and in parallel on different load or a common special adder capacitive voltage of the capacitors. The capacitance capacitor voltage adder individual capacitors charged in parallel and independently, and then be included together in series and discharged to a common load. Additional energy generates a secondary winding due to the transformation of the magnetic field in the ferromagnetic core of additional electricity.

It is also possible to work directly from the AC mains AC or pulsed (square of the inverter) or a sinusoidal voltage, including the commercial frequency. When current rise phase (and magnetization) operates only magnetizing coil only, and works and the secondary winding which is connected in series with the primary phase with the overall load current decay and demagnetization. Thus, switching of the winding in the desired phase can immediately receive gain direct AC power anyone, including the commercial frequency. Such

amplifiers AC can be used for self-excitation LC- oscillatory circuit and the current consumption from the mains cut-off or simply direct power amplifying common network or AC power generator to auxiliary power. Energy conversion through the secondary winding provides additional energy to the circuit when a recession, the current decreases and enables undamped oscillations AC even under load. In the growth phase current running in the circuit is only enabled magnetizing coil, while decreasing phase current, the current decay is switched in series with it, and a secondary winding for generating additional reactive power AC. This allows amplify and pulsating current and AC voltage of any shape, including power frequency sinusoidal alternating current, both single phase and three-phase current (three units for each phase). Apparatus AC amplifier can operate immediately directly to alternating current and the ripple current of only one polarity, but it will then need two devices (push tyani-) per AC phase. For three-phase circuit will have six devices. Device for amplification AC can operate with a pulsating voltage and current switched on and the driver circuit of the AC circuit as in the three point oscillator.

The concept of the magnetization and demagnetization is conditional, because the energy stored in a ferromagnet in a magnetic elastic energy ferromagnetic domains. When the magnetization of the core permanent magnets can be run on a cycle of magnetization and magnetization reversal of the magnetic induction in the opposite direction. Remagnetization of the core in the opposite direction increases almost twice the total amplitude of the magnetic induction EMF which increases useful capacity and devices. Magnetization of the core permanent magnet itself sharply increases the total magnetic interaction with ferromagnetic domains field magnetizing current and weak and strong magnetic fields. Using the core of magnetization reversal magnetized permanent magnet also allows to sharply increase the amplitude of the magnetic induction in the electromotive force and to increase the total capacity of the device. The core of the permanent magnet external magnetic field current can be magnetized, demagnetized to zero or even remagnetized in the opposite direction to increase the voltage amplitude.

It is also important to realize that there are important and effective magnetization and formally even multiple (and even more) magnetising coil turns on the core of ferromagnetic material (in order to circumvent the patent, for example) do not change the essence of the magnetic process and to work the magnetization. It is only important that the overall operation of magnetization determined by the balance of ampere-turns of the magnetizing coil and the device topology.

Devices start with the most simple embodiment on the same core when magnetizing coil is adjacent to one end of the core, or greater-diameter coil (cross section) partially comes to a bit end of the coil plane. The simplest embodiment is one magnetizing coil, just adjacent to the end of one straight core (simple or special shapes). The second option is to have two coils on both sides, on both ends of the core and which work in pairs to mutual reinforcement, and the core is magnetized from two sides. This embodiment can be considered simply as a certain two spaced apart two sections of a common magnetizing but which work together on a single core. Magnetizing coil may either abut the end faces of the core or partially enter them in the plane, but the coil must be significantly or in some times be greater than the cross section of the core. The core does not abut tightly to the wire coil magnetizing large diameter, which is desirable, but not required. A better when the core is located closer to the axis (and parallel to it) the magnetizing coil. To reduce magnetic coupling between the coil and the core used in either a different distance from the coil to the core or the increase of the diameter of the magnetizing coil section several times greater than the cross section of the core. The distance from the coil to the core wire is chosen so that the least significant magnetic field formed core not connected with the magnetizing coil. There may be any smooth transitions relative position and magnetic coupling between the coil and the core (cores) of ferromagnetic material. The number of individual parallel or successive cores (via gaps) in the coil can be any two, three, four or more. The degree of magnetic coupling coil (or its separate sections) with separate cores chain may be different and vary smoothly in different ranges. magnetizing coil may be shorter than the core (or a segment), to be approximately equal length or have a length greater than the length of the core. magnetizing coil may fully or only partially cover the individual cores or cores of the chain is separated by gaps. magnetizing coil can ends along planes (and length) to enter and cover only part of one or successive cores separated by gaps.

The apparatus may be a single magnetizing coil, which is disposed between the cores in the area of the gap therebetween and runs directly to the two cores. Coil relative diameters (several times larger than the cross section than the cores themselves) may partially cover the end faces of the cores in the plane. The coil does not abut tightly against the cores (preferred), and the core is located towards the middle of the magnetizing coil. Location coil in gaps greatly reduces the magnetic coupling with the core and is applicable to devices of any number of elements. For example, a magnetizing coil is disposed between the ends (or covering the air gap) by two simple straight core or cores special T-shaped or E-shaped (to reduce the demagnetizing factor). The cores may be of any special more effectively magnetizing and demagnetizing factor reduction. Between the two U-shaped cores or in the region of the gap may be two and the magnetizing coil, and between the two E-shaped cores and three magnetizing coil. Cores E-shaped part it may be branched magnetic circuit.

Core itself may be a one-piece and consist of several segments separated by gaps. To increase the scattering of the magnetic core itself may have non-uniform cross section and have, for example, broadening sectional area in the central part of the core. Sectional area of the end parts, adjacent to the magnetizing coils may be several times smaller than the sectional area of the central portion of the core. The magnetic effect on the coil decreases and the magnetic energy of the core is increased. This broadening of the core cross-sectional area in the central part can be both smooth and with rectangular ledges that perform additional scattering function. This special shape of the core (to increase the magnetic scattering) is a unique part of the invention and is applicable to almost all other embodiments of the devices, especially for increasing the operational efficiency. In the conventional electrical cores such forms are not necessary and do not apply in principle. Cores special form a special part of the invention, as it applies to almost all embodiments of devices. There is also a special forms cores include cores of segments separated by gaps for partial separation of the core of magnetic fields. Cores with side protrusions (projections and creating overlays) also belong to a special form cores and are applicable to various embodiments of the devices. The cores may be of ferrite or laminations of sheets of the transformer, magnetic steel or any other ferromagnetic material. Another embodiment is one magnetizing coil (one or more sections) which is inserted into the large gap of the magnetic circuit and operates directly on the magnetization of the two ends of the ferromagnetic core. Size or diameter of the cross section of the coil can be approximately equal to, or less than several times larger than the cross section of the end face of the core. magnetizing coil or adjacent to the ends of the core at a certain distance or partly covers both end portions (in the plane) of the core under the condition that the magnetization coil is a few times wider than the core itself. One coil magnetizing works directly on the magnetization of the two ends of one of the ferromagnetic core. This type of magnetic system could also be comprised of any number of cores and the coils or between the magnetization in the gaps between the cores. The magnetic system can be open or closed contour with a circular or rectangular magnetic circuit.

Core itself can have a nonuniform cross section and have a wider cross-sectional area in the magnetic equator and the ends have to be smaller sectional area. This reduces the magnetic interaction with the coils, but at times increases very useful effective core sectional area itself magnetic scattering. The core may also have a wider central part and the cross-sectional area of the end portions is several times less than the central portion. The core may be either one-piece or consist of individual segments separated by gaps (for partial separation of magnetic fields) for a large magnetic flux. Secondary detachable coil is located closer to the equator of the magnetic core to the line between the magnetic poles and which is closed around the magnetic core stream. For core segments need to dispose of the removable winding (or coil sections total) has on each segment separately to convert all eigenvalues and magnetic fields of each core. This applies generally to all typesetting cores of individual segments (with gaps) in all embodiments of devices.

Another type of magnetic cores when the system is located directly inside the magnetizing coil of relatively large diameter coil magnetizing magnetic field and separation occurs due to the closure of much of the magnetic field energy directly inside the magnetizing coil. This is achieved in that the coil diameter or cross-section (rectangular for example) in several or many times larger than the cross section of the core, and the length and width of the core has a certain relation to the width of the cross section of the reel itself magnetization. The simplest embodiment of the device is a device with a simple straight core of ferrite, steel or any other

ferromagnetic material. The core may be circular or rectangular cross-section or specially shaped with lateral projections on the end portions. The core may be solid or dial-up (with or without gaps) and generally any special shape to increase the efficiency of the magnetization and the magnetic scattering. The core may be in the form of parallel bundle of individual cores separated by a narrow gap of non-magnetic dielectric or air. The core may be inlaid in the form of successively bred cores separated by gaps for partial separation of the magnetic fields of the cores. Each such core must have its winding removable section or a separate common secondary winding for converting the entire magnetic energy of each core.

The core is inlaid in the form of parallel bundle cores can have their individual removable windings on each core. Various devices may be combined in a common closed magnetic circuit part (with gaps) for a small magnetization and mutual cooperation. The device may be, for example, in the form of a closed magnetic circuit in the form of a torus or a rectangular magnetic circuit (with gaps) of a plurality of individual segments. magnetizing coil may be in the form of generally straight wire (or wire coil) in the window of the magnetic circuit or in separate sections of coils spaced on the sectors of the magnetic circuit. Most of the intrinsic magnetic field segments (due to large gaps) of ferromagnetic material of the magnetic circuit generally has nothing to do with inductive coil (or wire) magnetization. This property is the magnetic energy of the cores is not included in the cost of the magnetization, but it can be converted into electricity by means of detachable secondary windings on each segment. It is such a kind of flyback converter, but with a more complex topology of the magnetic field.

Inside the magnetizing coil may be several such stacks composing cores. A separate type of device is the magnetizing coil, inside which there is a lot of small or micro cores or particles of ferromagnetic material separated by a dielectric. The core may be in the form of a kind of the magnetic dielectric, wherein the small micro or cores or cores of ferromagnetic microparticles generally rasplozhen (or embedded in a dielectric) within a common magnetizing coil. The degree of mutual magnetic action such micro cores may be any, as well as the gaps between them. But gaps (dielectric) between the cores and the particles of ferromagnetic material must be sufficiently high and allow the closure of all internal stray fields. Around each core or particles of ferromagnetic material formed in its magnetic field near most of the space area. This internal magnetic field of the cores and the ferromagnetic particles have nothing to do with the common inductive magnetizing coil. And the formation of the internal magnetic energy micro cores energy in the outer coil magnetization is not wasted. But it can be converted into additional useful energy in the demagnetization phase through the secondary winding. The magnetization current is fed only into the outer most coil and the magnetic energy is already removed from it, and with each individual core or ferromagnetic particles. For this purpose, each particle or micro core of ferromagnetic material should have a removable secondary winding (secondary winding or section) that covers all of the magnetic field of each core. When demagnetizing the magnetic energy is converted to magnetic energy is already all of the cores or particles of ferromagnetic material. This internal magnetic energy of all cores can be many times, many dozens or even hundreds of times greater than the energy that was spent on the magnetization in the overall big coil magnetization. The device should work to reverse course and produce additional electricity. The device may be of different shape and different magnetizing coil form micro or cores of ferromagnetic particles. Cores and chains can be bridged by magnetic shunts through the gaps for better mutual gain of magnetization and field circuit. Cores can also be a special U-shaped or U-shaped around the magnetizing coil, both inside and outside of the coil at any angle to the plane of the coil and in any quantity. Such cores is shaped similar to the cores with lateral projections. A special form of circuit improves the magnetic field and increases the effective length and the magnetization of cores because a longer better core is magnetized. There may be any form cores and the cores embodiments magnetizing coil positioned relative to the straight portion or wire (s) with a current.

Devices varying magnetic field topology and shape of the cores (and their amounts) in common is that when magnetization occurs in the space ferromagnetic magnetic energy field is not associated with induction magnetizing coil. But the magnetizing coil and spends only as much energy as the magnetization associated with the induction coil magnetization. This means that the energy of the magnetic field associated with the ferromagnetic not magnetize coil already formed free without any additional electricity costs. But technically it

can be easily converted into additional electricity (over cost) when demagnetization with a special removable additional secondary windings on the core. Secondary winding covers and converts all the energy has a magnetic field in the core in excess of additional electricity costs magnetization. The device may have only one core, but also have several cores, tens, hundreds, or more micro cores of ferromagnetic material and microparticles. But the principle is the same generation of process physics and engineering for the energy conversion of the magnetic field. The devices differ only in the shape, topology entire common magnetic system and magnetic fields, as well as by the number of elements, - the coils and the magnetization of the ferromagnetic cores themselves. Shape of the core and a ferromagnetic material may be different or be the same in different devices. Cores may be specially shaped for the magnetic scattering and magnetization or simple geometric shapes. In these devices, there is no special magnetizing core with dense winding and the additional energy can be removed from all of the cores of the magnetic system.

The magnetic system of any shape and complexity can be expressed as the integral sum of individual elements of the coils and cores. Totaling individual coils can be represented simply as separate sections common magnetizing coil and core like a common dial-up core of the individual segments. The individual elements and coils and cores in mutually different degrees further magnetize each other, and the magnitude of this interaction depends on the gap between the cores. Reducing the magnetic coupling coils and the cores achieved a certain distance from the core end faces or increasing section sizes magnetizing coils themselves relatively sectional width and length of the core. This gives the greatest efficiency of the magnetization, but requires increased coil size. Also it increases the air (vacuum) component of the magnetic energy of the current that is not associated with a ferromagnet, is not involved in the magnetization, but loads the magnetizing coil. It is important that the magnetic interaction itself cores may not be significant, and the magnetization occurs almost exclusively on the magnetic field of the current in the magnetizing coil wires. Cores in the form of a chain of shorter cores (separated by gaps) are arranged axially or coaxially in a coil or just inside the magnetizing coil is relatively large, but that would be a considerable part of fields of the cores are not covered wires magnetizing coil. It basically does not differ from the embodiment with a single core, but shorter cores serve to reduce the diameter or sectional size (may be rectangular or any other cross-sectional shapes coil) magnetizing coil. Also, the magnetic effect of the cores themselves (two, three or more) through the gaps reduces the demagnetizing factor for short and cores increase their induction. But the principle of separation of magnetic fields makes it one of volume and mass of the ferromagnet core receive greater magnetic flux and magnetic energy. Short cores can no longer store the magnetic elastic energy than the core length. Therefore, such patterned cores in the form of sequentially arranged a short chain through the gaps longer cores can store magnetic energy. But the presence of large gaps between the cores and requires increasing the ampere-turns in the coil magnetization to overcome the reluctance. The simplest version of the apparatus is only one core (of a certain length) coaxially disposed about or just inside the cross section considerably greater magnetising coil wide. The core part may include an end portion on the plane of the coil, or even not to enter into the very large plane magnetization coil, but the magnetic field of the coil will due to its size almost also act on the core. magnetizing coil can be short, nearly flat (as the coil shape) and significantly shorter in height than the core of ferromagnetic material. The apparatus may have many cores are arranged on all sides around the coil and around a straight or curved wires magnetizing coil wires and that form multiple magnetic circuits (with gaps) as it threaded on currents. This allows you to use all the surrounding currents magnetizing the magnetic field (or direct current, the coil current and the magnetizing coils) closed around them on all sides.

The core may be, as if split into many parallel individual narrower cores spaced to reduce and increase the demagnetizing factor of the magnetic scattering. The cores can each have their own removable secondary winding.

The method and device of generation may be used to generate electricity in small devices for the equipment and the power devices and for the industrial production of electricity at any power. For high-power devices can be used or reverse mode at a constant pulse or pulsed current on powerful Lockable thyristors or generation right away on alternating current. The devices can be used to recharge the battery or batteries and capacitors create uninterrupted autonomous power sources. For optimal use of the so-called step-up voltage booster-type

conversion as the serial battery inclusions magnetizing coil and the secondary winding (on the return stroke) to charge another battery or bank of capacitors. The transformation of the so-called a booster circuit is on the return stroke, and when the magnetization is connected to the power supply only magnetising coil. There may be different embodiments of switching circuits and windings art. The energy of the magnetic field of ferromagnetic materials (non-magnetizing coil) through the secondary winding is converted into additional energy used to charge another battery or capacitor. This allows you to recharge the batteries and capacitors with current-gain voltage and the charge and create a fully autonomous energy sources that do not require external charging source. Such converters can be operated and connected in parallel windings on different batteries or via a common capacitive voltage adder (condenser) to the total load in the end. Switching circuits and conversion may be different. When charging the capacitors and batteries can be used as the switching capacitor for charging a full charge and reduce distortion of the peak pulse mode. Wherein the first capacitor has not much to smooth the pulse peak and for this its capacitance should not be too great, and at least one charging capacitor it is deactivated and activated one of greater capacity. Such capacitive drive already consists of several (two or three or more) accumulation capacitor stages are switched on as charging pulse for complete conversion of the falling current in the drive charge. This allows you to use and transform the condenser almost all the accumulated magnetic energy. The capacitor may have a first stage and a non-zero initial charge to increase the equivalent resistance (and reduce, limit the first current pulse) and the effect of smoothing the pulse mode operation. This increases the power ratio of the capacitance of the capacitor of the rectifier and accumulator allows to keep the speed of the magnetic induction decay fronts and efficiency in a pulsed mode.

Claims

CLAIM

1. A method for power generation due to the partial separation of the magnetic field from the coil magnetization ferromagnetic consist in the fact that a significant portion of the magnetic field energy of the ferromagnetic core (one or several cores) is closed during magnetization magnetizing coil is achieved by the fact that the wire or magnetization coil does not encompass dense core or removed from its surface (and in this portion of the magnetic field generation source current does not waste electric power when in agnichivanii), while demagnetization has all the energy of the magnetic field of the core is converted into additional electricity with a special removable additional secondary windings on the core.
2. A device for the partial separation of the magnetic field on the magnetization of the ferromagnet electricity generating coil consists of a coil magnetizing which either just adjacent to the end face of a ferromagnetic core (with the secondary winding) at a predetermined distance or disposed adjacent to the end face of the core (any angle) or slightly It covers the core end; wherein the core may partially go into the plane of the coil and the amount of magnetization relatively much larger diameter section, and the distance from the coil to the core wire allows the magnetic flux to withdraw a large core with no flux linkage with the coil magnetization.
3. generating device consists of a magnetizing coil of large diameter (or cross section) which is several or many times larger than the cross section of the core, and the coil magnetizing plane partially or fully enters the end itself or a core of ferromagnetic material of such a length that most of the magnetic field energy of the ferromagnetic core is closed within and without inductive coupling with the magnetising coil wires; wherein the core is partially or completely in the volume of the magnetizing coil, and its magnetic field within the current loop is closed (current) without a flux magnetizing coil.
4. The apparatus consists of a coil generating magnetization sectional size which is several or many times larger than the cross section of the core (or bundle or band of many parallel cores) and in which most of the energy of the magnetic field within the magnetizing coil is closed without inductive coupling therewith; wherein a core of ferromagnetic material may be positioned anywhere within the coil, and at any angle to its plane.
5. The device consists of a coil generating a magnetization which is inserted into a large air gap of the closed core (simple or branched magnetic circuit) and magnetizes a coil in the gap immediately at two ends of one of the closed core of ferromagnetic material; wherein the core may be adjacent to the ends or even go part ends in a plane (volumes) magnetizing coil if its diameter or cross section considerably greater cross section of the core ends.

6. The apparatus consists of generating two coils (coils or two sections) of magnetization which are arranged on both sides of the core near its ends and according to magnetize the core (or cores parallel stack) of ferromagnetic material from two sides; wherein the core can be any simple or any special shape or have end protrusions have thickened cross-sectional area in the central part and a narrowing cross-sectional area to the ends.
7. generation device comprises one of a relatively large cross section of the coil and the magnetization of the individual chains contiguous cores of ferromagnetic material (direct or any special shape) separated by gaps for partial separation of magnetic fields and forming a large total magnetic flux; wherein the cores are arranged approximately along the coil axis, and the magnetization coil may itself along the length of cover all or only a part of the cores of the serial chain.
8. generation device consists of a coil and the magnetization of the core special typesetting ferromagnet in a stack of parallel flat plates or bars (separated by non-magnetic gaps) for reducing the demagnetizing factor and the increase of the magnetization of the cores; and wherein the laminated core of sheet steel has a too large thickness of dielectric spacers between the plates of transformer sheets, the electrical steel.
9. The apparatus consists of a coil generation of magnetization and a large number of small micro cores or cores of ferromagnetic particles in a dielectric (each with its detachable coil) arranged randomly or many parallel chains and separated by gaps within this one large common magnetizing coil; wherein the distance between the cores sufficient to form a high internal magnetic energy (around each ferromagnetic volume) and which demagnetizing removed is converted from all cores and the ferromagnetic particles.
10. The apparatus consists of generating simple or branched chain of closed segments of ferromagnetic cores (separated by large gaps) and magnetizing coils or in the form of a straight wire windings or wires in window (s) of the magnetic circuit or the coil sections in the form of different individual sectors a magnetic circuit; wherein a substantial portion of the energy of the magnetic field of the cores is not connected with the magnetizing coil windings by removing the coils from the surface of the ferromagnetic cores.
11. The apparatus consists of a generating straight line (or closed) of the magnetic circuit core and the magnetization coil (circular or rectangular) in a chain of any number of cores of ferromagnetic material (separated by large gaps) inside the coil located closest to the axis; wherein the diameter or cross section windings (or sections) of the coil in several or many times larger than the cross section of the cores themselves in the chain and due to this magnetic field cores weakly inductively coupled to the windings of the magnetizing coils.
12. The generating device consists of a magnetizing coil a relatively large cross-section and three cores of ferromagnetic material (separated by gaps), and the magnetizing coil length is less than or equal to or slightly greater than the length of the central core and a magnetizing coil covers the central core, but does not include lateral or partially (or only at the ends of the plane) and the side covers two cores.
13. The apparatus consists of generating any large amount of magnetizing coils (or sections of one coil) and any of a large number of cores of ferromagnetic material, forming a straight or a closed magnetic circuit; wherein a magnetizing coil arranged between the end faces of the cores themselves or around gaps between the cores and the ends of the core may partially go into the plane, the volume of the magnetizing coils and coil magnetizing relatively bigger than the cores themselves.
14. The generating device consists of many successive and magnetically connected flat coils (large section) with a core at the axis, and which together form a common line or system with a closed magnetic mutual magnetizing elements; wherein the individual coils or sections magnetizing coil cores and integrally form a common magnetic system.
15. The apparatus consists of generating two cores (separated by a gap) straight, T-shaped (or E-shaped and other special forms) and magnetizing coils located either in the gap between the two end faces of the two cores, or in the gaps (partially covering the ends of cores); wherein one magnetizing coil runs directly on the two cores, and the cores of the magnetic coupling coil magnetizing fields in the minimum clearance is obtained.
16. The generating unit with magnetization of the core permanent magnets or current, and wherein there is either an additional magnetization of the core, or its complete demagnetization or magnetization reversal in the opposite direction, and the magnetization is used to increase magnetic interaction with the core of the current field and to increase the amplitude of the magnetic induction.

17. An apparatus for generating a charge-enhancing battery recharge batteries or capacitors, wherein a magnetization power source is connected only to the coil magnetization and demagnetization under a second battery or a capacitor in series (so-called booster circuit for converting) the first battery is connected, the magnetizing coil and the secondary winding to increase the voltage and charging efficiency.
18. The generating unit with parallel independent switching magnetization coil and the secondary winding (on the return stroke) in the total capacitance (capacitor) voltage adder operating on a common load; thus it can be used as the switching capacitor to a more complete charging of the adder and reduce distortion pulse mode ..
19. An apparatus for generating an alternating current (sinusoidal or rectangular) wherein when the phase of the current rise and is connected to the magnetizing coil magnetizing circuit only, and with decreasing current and the demagnetizing coil to its secondary is connected in series (to convert the magnetic field all of the core) for voltage amplification and the power of single-phase or three-phase AC power, including the power frequency.
20. The apparatus consists of generating the magnetizing coil of relatively large diameter and the whole or typesetting core (with gaps) of ferromagnetic materials in which only the magnetization coil operates at the source of DC power and magnetizing and demagnetizing (on the return stroke) to a load connected in series and magnetizing coil and a secondary winding for voltage gain and power.
21. generating apparatus, wherein for reducing the size of the cross section of the coil and increase the resultant magnetic flux ferromagnetic core is inlaid of shorter individual cores separated by small or large gaps and each having a removable secondary winding; wherein the inlaid core is disposed coaxially in the coil magnetising sectional size of several or many times larger than the size sectional cores themselves.
22. The apparatus of generation, wherein in order to reduce the demagnetizing factor and a short circuit of the magnetic fields of the ferromagnetic core itself is made of special shape with lateral projections at the ends or in a form like a carcass of cylindrical ferrite choke (such as a spool for thread) with projecting annular the projections at the end face; wherein the core is disposed coaxially with or just inside the coil is much larger diameter or sectional size.
23. generating apparatus in which many individual cores (micro or cores) of ferromagnetic material and arranged inside and outside a large, flat (short) or the magnetizing coil only around the outside of the magnetizing coil (at any angle to the plane of the coil) with all the parties for full utilization magnetizing magnetic field magnetizing coil.
24. generating apparatus, wherein the magnetization coil (no core or a small core) is inserted into the window or the entire lamella (segment) simple or branched magnetic circuit (or covered on all sides by a number of U-shaped core or a U-shape which are arranged partially or completely outside the plane of the magnetizing coils); wherein the coil is surrounded by a magnetization of the ferromagnetic cores, and the magnetic field of the coil is shorted.
25. generating apparatus, wherein the cores are positioned within or outside and around the top and bottom (around) from the wire or flat plane magnetization coils (and any angle), and have a common core or each their separate secondary winding; wherein all the cores are separated by gaps and form strung on a conductive or semi-branched simple magnetic circuit, and most of the magnetic fields of the cores are not covered wires magnetizing coil.

Patent Citations (2)

Publication number Priority date Publication date Assignee Title
Family To Family Citations
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Priority And Related Applications

Priority Applications (2)

Application Priority date Filing date Title
RU2016121712A 2016-06-01 2016-06-01 A method and apparatus (variants) generating electricity by means of partial separation of the magnetic field from the magnetizing coil ferromagnet
RU2016121712 2016-06-01

Legal Events

Date Code Title Description
2018-12-05 121 Ep: the epo has been informed by wipo that ep was designated in this application

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Kind code of ref document: A2