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Energy and created atoms and molecules as a result of electrical discharges in N_2 gas or air.

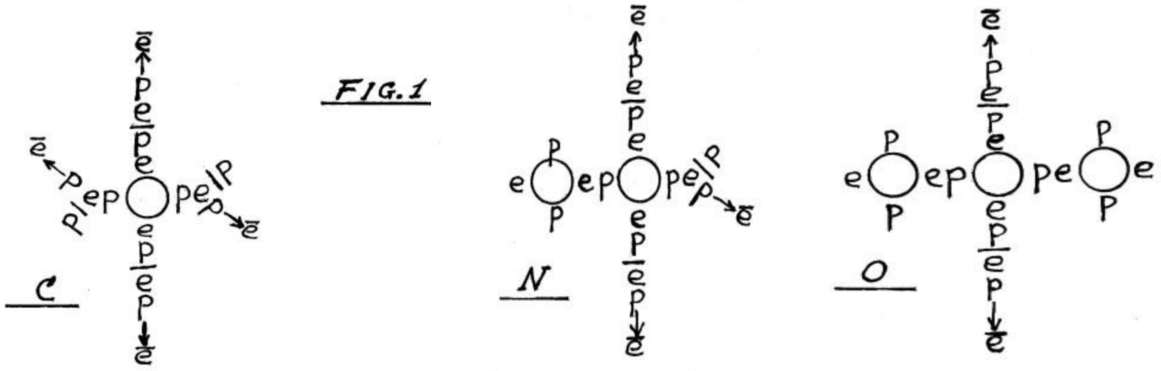
Topic
A Method and Apparatus derived from that, have been found to yield net energy, as well as by fusion created new atoms and molecules 10 due to electron discharges by nitrogen, N_2 gas or air or plasma thereof.

Summary
Since the year 2000, due to research by the inventor, it is evident that by means of electron discharge in gases and plasmas thereof, especially in the presence of other elements, which are in the said gases and plasmas thereof, are inserted, which for example can be done by incorporate those mentioned elements into the compositions of cathodes and anodes, between said electron-discharges take place, new elements, or isotopes, and/or new molecules are formed, as a result of fusion between the elements and the elementary particles which are taking part of such processes. Such fusion-reactions can be exothermic or endothermic. In most cases, these processes are exothermic, which enables generation and useful utilisation of the net yield possible.

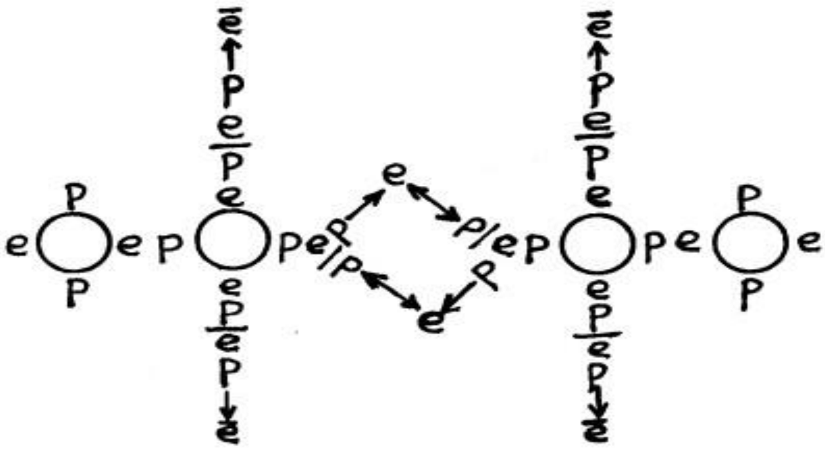
Introduction
It has been found that, for successful process liners in virtually all investigated fusion process, it was/is extremely important that in the rooms in which said fusion-processes take place: vortex formation and continuous existence thereof, is allowed.
Further factors of importance are: the pressure of gases and/or plasmas, the frequency of the electron discharges, the wave-characteristic thereof, and whether there half- or full wave rectification occurs .
The photon-energy which is released is almost always composed of a number of wavelengths, which mostly lie between infrared and extreme ultra-violet.
Said radiation-composition varies from process to process. At Most of the investigated processes, a net yield of energy is observed with respect to the consumption of electrical energy it spends, which is a result of mass-defects occurring. In some process-liners 'net yield / consumption' ratios are observed of 6/1 through 10/1.
Mentioned observations have become acknowledged by independent laboratories.

Description
a) Theory (Fluid-Mechanical Analysis)
In the following, analyses are included of core-structures and mechanisms of nuclear reactions, which are in conformity with the 'Aether-Physica'.
These Physica is developed in the 'Continuum Fluidum Universalis' book series and in 'Primary-Physics'; the author being the inventor hereto.
The assumption that the atomic nucleus is being held together by the so-called 'Strong Force' is totally erroneous.
The consistency is due to the structure of the neutrons: the fact that neutrons both exhibit positive - and negative charge at a distance, (Refs: R.Hofstadter, (1961); report by L.Pauling and P. Pauling in 'chemistry', publisher: W.H. Freeman & Co, (1975), page 683).
Also, protons exhibit two ether outlets / 'jets'; each proton therefore can keep two neutrons attracted.
By means of this physical mechanism, as well as the structure of the neutrons, nuclei are being held

together and also nuclear fusion is possible.
The proton has two ether outlets (positive charge); The Electron has two ether inlets (negative charge).
The nitrogen-atom N, shows when compared with the carbon-atom C as well as in comparison with the oxygen-atom O a unique a-symmetry in its nucleus.
Concerning the perfect symmetry over the X, Y and Z axes of the C-atomcore, (the total amount of protons, neutrons and electrons, shows a spherical disposition), the core of the N-atom shows a bulge due to an additional attached helium-core at the point wherein at a C-core a neutron, proton and valence-electron' are located, which entails a spatial asymmetry.
This spatial disposition causes the N-atom-core to have a relatively high energy.
The core of the O-atom is symmetrical about the X and Y -axes, while the Z -axis has a different length.
The total of the protons, neutrons, and electrons in the O-core, has an ellipsoidal contour.



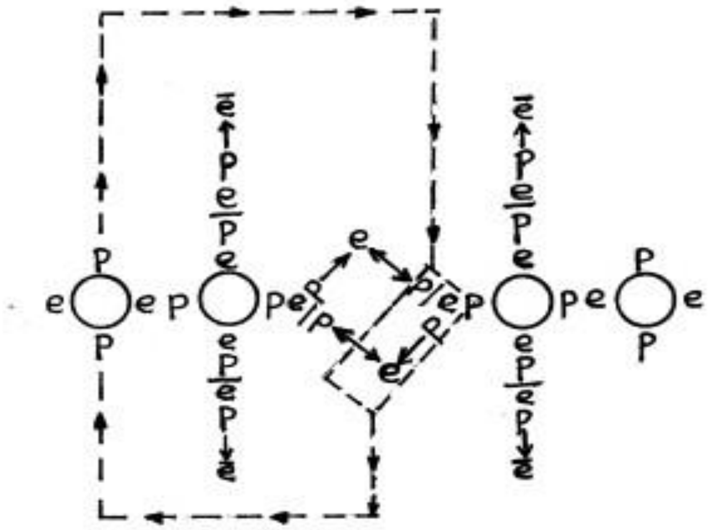
Figures 1a, 1b and 1c show the fluid-mechanical dispositions in the ether of the elementary particles and the structure of the atomic nuclei respectively of C, N and O.
Said dispositions are, in reality, three-dimensional, but in the Figures they are projected in the 'flat plane'.



N_2

Figure 2 shows the molecule N_2 ; notice that the valence electrons of both N-atoms are attracted by

proton ends of neutrons of both N-atoms.
The physical mechanism of the conversion of N_2 -> CO works as follows:
When there is sufficient vibration, due to temperature, but more importantly because of the frequency of said vibration, which can/has to be near or at a resonance value, a Helium-core portion of an N-atom can shift to the location of the 'neutron, proton, valence-electron' group at the other N-atom, while this group is then moved to wherever the Helium-core was located at the first said N-atom.
The result is that the first said N-atom is converted to an O-atom.



N_2

Figure 3 shows the change of place of respectively the helium-core and 'neutron, proton, valence-

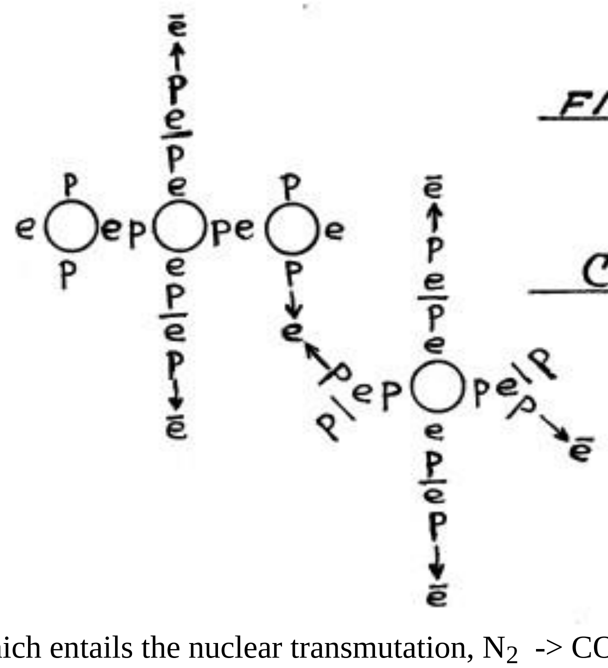


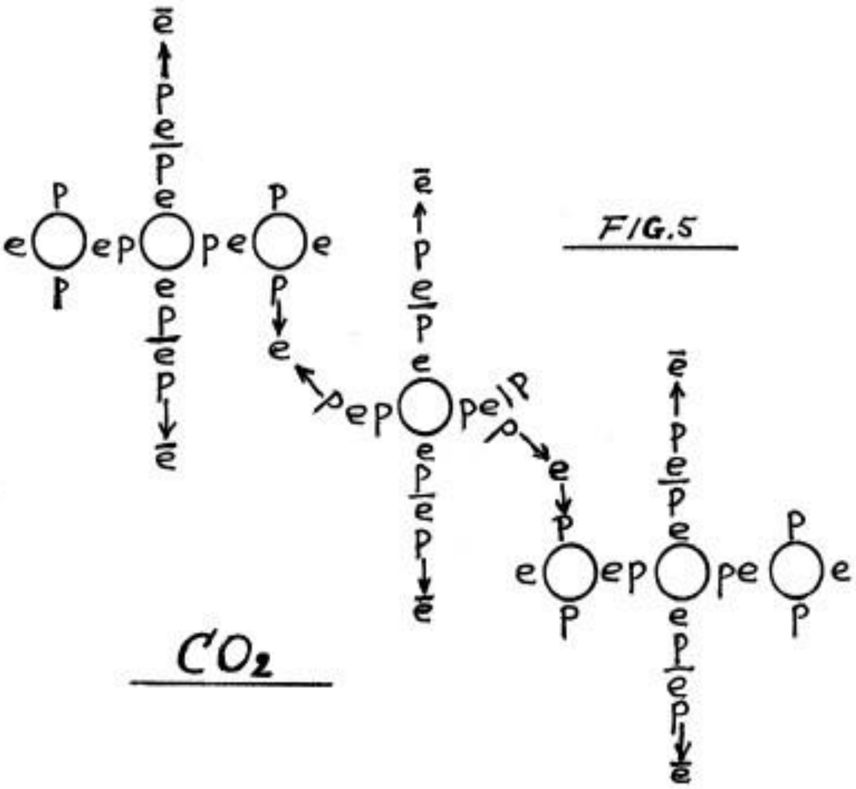
FIG. 4

CO

electron' group, which entails the nuclear transmutation, N_2 -> CO.

Figure 4 shows the structure of carbon.

In practical applications, the CO will be burned with air to CO_2.



In Figure 5, the structure of CO_2 is shown.
Transmutation, N_2 -> CO has a mass defect.
According to the 'chart of the nuclides' of the U.S. Atomic Energy Commission, mass of N_2 can be safely set to 2 x 14.0067 = 28.0134 (the little N15, 0.37%, that in addition to N14, 99.63% is present, is also converted in accordance with the above-mentioned transmutation).
Products of nuclear fusion processes are unlike products of 'fission'/degradation processes always very clean.
The mass of the formed CO can be set at 12.000000 + 15.994915 = 27.9949..; so the mass defect per mol N_2 = 0.185 gram.massa, which is extremely interesting, as the costs of nitrogen in the air is nothing.
It has been found in laboratory tests with equipment, as will be described here, that the electrical energy required to have the transmutation take place is less than the photon energy produced

Calculation of the energy yield:
in connection with the binding energy of CO, (see point P in Figure 4) the mass-defect will be set at 0.160 gram.massa / mol N_2.
According to $E = \Delta mc^2$, we obtain $E = 0.16 \times 10^{-3} \times (3 \times 10^8)^2 = 1.44 \times 10^{12}$ kg.m².sec⁻² = 1.44×10^9 kJoule/mol N_2
Volume of a gram.mol = 22.4 litres (at normal atmospheric pressure and temp).
Air is 79% N_2. We can say that 100/79 x 22.4 = 28.35 litres of air can produce 1.44×10^9 kJoule of energy.
The caloric equivalent is: 3.43×10^8 kCal. This allows us to bring 3.43×10^6 litres = 3430 Ton!!! of water at 0°C to 100°C
with only 28.35 litres of air!!

The burning of CO with O_2 in air, in accordance to $2CO + O_2 \rightarrow 2CO_2$ provides additional, 67.6 kcal/mol, which is very low in
comparison with the energy yield of the transmutation said .
The deduction in the form of the required amount of electric energy can be adjusted to about 40%, and the heat losses up to 10%.
With a free fuel, this nuclear transmutation process provides an excellent solution for sustainable clean energy supply .

Technology

The above-mentioned nuclear transmutation is rather easily achieved within a fully or partially enclosed space, in which a cathode and an anode situated at a distance from one another and between which a pulsed full- or half rectified voltage is provided, which results in electron transport from anode to cathode, wherein in the plasma which is formed, always a vortex is formed.
Transmutations and fusions occur almost always in the 'oogwal' (= translated eyewall??!!) region of said vortex.
The speed of the plasma is high and so there is also the kinetic energy of the dragged along and moving along particles.
If same-charged particles at high speed in parallel jobs move in the same direction in PLASMA, then there is the Lorenz attraction, which will encourage the fusion among these particles.
(Analogy: DC in the same direction in two parallel wires).
However, in the process of this invention, the amplitude of the vibration/pulsation plays a larger role .
If the vibration-deflection of the to the nucleus attached helium-core of an atom in the N_2 molecule large enough is to come loose, an immediate rotation of said helium-core, as well as to the said "neutron, proton and valence-electron'-group, will be the result .
This is due to the fact that physical affinities strive to come toward lower, more stable energy positions.

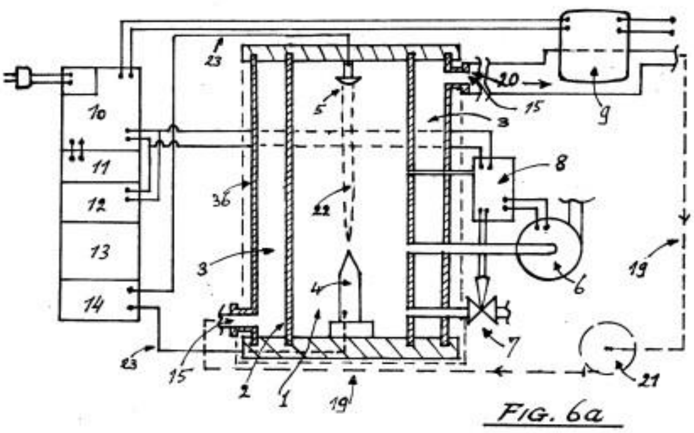


FIG. 6a

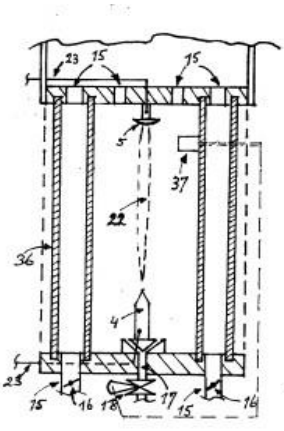


FIG. 6b

Figures 6a and 6b show reactors, wherein the cathode and anode are vertically arranged, and wherein the cathode occupies the low position.
(Horizontal reactor tubes and plasma vortexes, which will take a bow-shape, are undesirable because almost all the heat released will only go into the upper portion of the reactor; vertical plasma-vortexes give uniform heat distribution on the reactor wall).
Also the cylinder shape is important, as other shapes will cause disturbances/'eddy'-effects to the perimeter of the 'potential'/ir-rotational flow, there prevailing in the plasma at diameters greater than those of the 'oogwal' (= translated eyewall??!!).
The process liners can be done, in general, in two ways:
a) closed-tube reactor, in which there is a reduced pressure; heat is removed through the reactor

wall; intermittently (for example, every hour) must new N_2/air be let in, which then needs to be sucked away somewhat (5 sec) to the "operation' pressure.
During the "operation" the pressure does not increase; the formed CO at the same temperature and pressure, does not take in a larger volume, in comparison to N_2/air.

Advantages of this system: Long plasma-vortex and relatively low pulse-voltage .
Cycle-duration is determined by the quantity of present N_2, which is determined by the reactor-volume and the operational pressure .
b) Reactor-tube has small holes (with control valve at the bottom), and works atmospheric and continuously; heat is removed by the reactor wall, as well as also due to the low volume flow which passes through the reactor.
The advantage of this system: Continuity of the operation. Disadvantages: Shorter plasma-vortex and much higher pulse-voltage required.
(b) has somewhat higher power consumption as compared to (a), while the cost of (a) are slightly higher than that of (b).
The material of the cathode is of great importance; some metals provide a catalytic influence; for example, Al, Ti and Ag provide better Process liners.
Cathodes preferably have a sharp point, which greatly increases the voltage-concentration and achieves tight vortex formation.
The metals boil off of the cathode-points and if for example Al is the cathode material, it fuses Al with itself, according to 2Al -> Fe.
This resultant iron is very pure and falls back to the reactor bottom in the form of "needles.
Very pure iron has a high value, which gives an additional advantage. concerning the full- or half-rectified electrical voltage:
it must show a steep onset/time, so that a great shock is given to the attached He-core portion of a N atom in the N_2 molecule, at which it overcomes its ionization-voltage and can move to the position of the 'neutron, proton, valence-electron'-group of the other N atom in the N_2 molecule, thereby de facto resulting CO is formed.
Of the utmost importance is that the frequency is set to the level of 'molecular-resonance'.
This last factor is the key to easy, fast, relatively low energy consuming Process-lining.

In Figure 7 a system is schematically illustrated connected with a standard type of Stirling engine.
The hot air, which is produced by the reactor, heats therein, the head of the displacer-cyclinder-housing of the Stirling engine-generator.

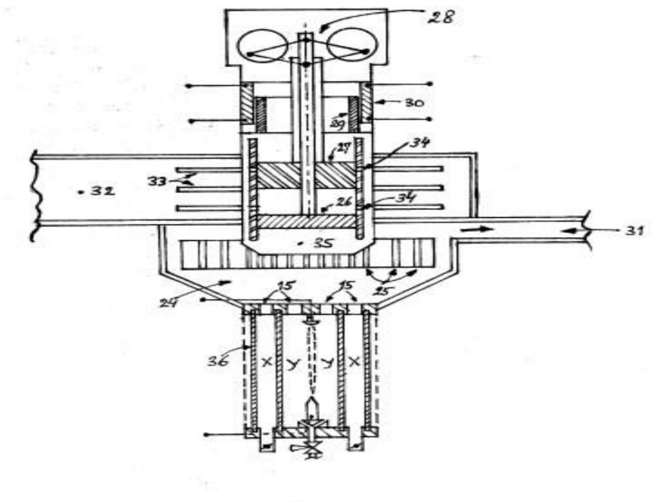


FIG.7

Description of the figures .
In the 'fluid-mechanical' dispositions of atoms, C, N and O, and molecules N_2, C0 and CO_2 in the Figures 1, 2, 3, 4 and 5 are as follows: p is Proton, e is Electron, **e** is Valence Electron, p/e is the Neutron and

e
p O p is the helium core.
e

The dashed line in Figure 3 shows schematically the position-change of the Helium core with the 'neutron, proton, valence-electron'- group.
In Figures 6a and 6b are: (1) reactor, (2) reactor wall, (3) enclosing heat collecting space, in which flowing air is heated, (4) cathode, (5) an anode, (6) evacuation pump, (7) air-inlet valve, (8) Instrument which operates (6) and (7) in response to measured pressure and amperage by reactor, (9) the device to be heated, e.g., a Stirling-motor-generator (10) battery, (which for the first time starting a 'charger' has attached, (11) digital waveform and frequency structure, (12) amplifier (13) up-transformer (14) whole- or half-wave rectification, (15) flow openings: in Figure 6a disposed tangentially to (3), in Figure 6b with control valves (16) therein , Fig. 6b (17) inlet for process- N2, or air, (18) instrumented control-valve (19), re-circulation channel, through which air, which after heating of the 'useful Device' still a certain amount of heat energy contributes, is redirected to the inlet of (3), which gives a higher temperature at the outlet (20) thereof to the 'useful device', (21) circulation fan (19). The plasma vortex is indicated by (22). Wiring to the cathode and anode (23). Fig. 6b does not show the electrical excitation parts and also not the appliance to heat; these are identical to, and as shown in Fig. 6a.
Fig. 7 shows as an example the reactor embodiment of Fig. 6b. The heated air (x) and the very hot air (low flow rate) (y), come out of through-flow openings (15) in space (24), Which surrounds the "head" (heater) of a Stirling-engine (25) flow-through holes in order to increase the heat-exchange surface in the 'head', (26), is the displacer, (27) is the piston, (28) is the 'rhombic' driving gear that determines the mutual movements (29) permanent magnets which move with the piston (30) wire coils (induction therein) fixed against inner wall. (31) Exhaust of mainly CO_2, (32) cooling air channel, (33) fins (34) openings in cylindrical wall, which are necessary for the communication of the gas-medium, eg He, the gas-mediun is indicated with (35). Insulation against heat loss is indicated by (36). The CO concentration sensor is indicated by (37).
Inventor hereto expects that the reader is familiar with Stirling-engine thermo-

dynamics and operation and will not give any further description of this, there it does not form part of this patent application.

Conclusions

1. A Method, to give a yield of energy by means of electron discharge process that takes place in N_2 or air, or plasma thereof, in or a closed, or in a not fully closed reactor with continuous flow there through, wherein the nuclear transmutation N_2 -> C0 takes place, followed by further oxidation to $C0_2$.

2. A method, as in (1), wherein said electron-discharges take place in a closed reactor room, with a lower than atmospheric operating pressure

3. A Method, as in (1), wherein said electron-discharges take place in a not completely closed reactor room, where the operating pressure atmospheric is.

4. A method, as in (2), or as defined in (3), where said discharges of electrons are of the half- or full rectified AC type.

5 . A method as in (2) and (4), or as defined in (3) and (4), wherein the voltage-time characteristic of said electron discharge steep start gradients exhibits .

6. A method, as in any of the preceding claims, wherein the frequency of said electron-discharges higher is than 50, or 60 Hz.

7. A Method, as in (6), wherein the frequency of said electron-discharges on or near the natural 'resonant' frequency of the N2-molecule lies.

8. A method , as in any of the preceding claims, wherein said electron discharges take place from a cathode, at which this one creates a plasma-vortex between said cathode and a spaced anode.

9. A method, as in any of the preceding claims, wherein said electron-discharges take place between a number of cathodes and anodes, which are arranged in a pattern like shape against the ends of said reactor-space.

10. A method, as in any of the preceding claims, wherein the cathode (s) show a sharp point or a sharp edge, in order to increase the voltage-concentration(s) therein.

11.A method, as set out in any of the preceding claims, wherein said cathode(s) are placed vertically below said anode(s).

12. A method, as in any of the preceding claims, wherein the material of the cathode(s) a catalyst working has (to promote nuclear transmutation).

13. A method, as in any of the preceding claims, wherein more than one

material in the cathode(s) is included, at where between the cathode materials a nuclear transmutation takes place (as a result and simultaneously with said electron-discharge pulses), which transmutation additional energy provides to facilitate the nuclear transmutation N_2 -> C0.

14. A Method, as in (12), wherein the cathode(s) consist(s) of B, C, Al, Ti, Fe or Ag.

15. A Method, as in (12), (13) and (14), wherein said additionally added cathode material Li, Be, Mg, or In is.

16. A method, as in any of the preceding claims, wherein the high-voltage-pulses, which are needed for said electron-discharge, or in a electronically way with inverter, or digital 'wave function' build up, takes place, with associated 'signal amplification'.

17. A method, as in any of the preceding claims, wherein a housing is arranged around said reactor-space in which through-flowing air, or by free convection or by forced convection is heated due to heat exchange with the reactor wall and wherein the hot flow-through air is communicated through duct work to an object to be heated, eg a Stirling engine generator.

18. A method, as in any of the preceding claims, wherein a control-valve is attached at said reactor-space, regulating the supply of new N_2 gas or air, after the former 'charge' has been used due to the nuclear transmutation that had taken place.

19. A method, as in any of the preceding claims, wherein means for the reduction of the pressure in said reactor-space thereby are connected, what resources are intermittently being activated, after adding new N_2 gas or air.

20. A Method as defined in (1) through (17) in which an air inlet control valve is attached to the lower part of said reactor, with the aim of continuous feeding with a small flow rate of N_2 or air, in accordance with the consumption thereof per unit of time by the present nuclear transmutation process.

21. A Method as defined in (1) through (17) and (20), at where outlet openings are provided in the upper portion of said reactor so that the produced gases: C0 and $C0_2$, and some N_2, and/or air to be continuously elated .

22. Equipment, in which, and with which methods, as in any of the preceding claims, may be put into effect, consisting of:
(a.1) A reactor-space, which is completely sealed, with means to obtain a reduced pressure and with means, by which intermittent N_2 or air can be let in, or:
(a.2) A reactor-space, which is not completely sealed, but that has a small adjustable inlet and exhausts, which makes it possible to let N_2 or air flow, at a low-flow rate, in accordance with the consumption by the mentioned nuclear transmutation process.

(b) One or more cathode(s) and one or more anode(s), which are arranged to the inside of the end pieces of said reactor space, which are connected to:
(c) Means of effecting high-voltage pulses of certain specific frequency and waveform between said cathode(s) and anode(s).
(d) housing around said reactor space, in which through-flowing air is heated by the process-heat of said reactor.
(e) If necessary channels for re-circulation of heat bearing air to (d).

23. Equipment, as in (22), wherein said means for obtaining lower pressure, is an evacuation pump.

24. Equipment, as in (22), to which said intermittent N_2 or air inlet means, is a control valve, together with a pressure and current measurement instrument, which both control said control valve and said evacuation pump.

25. Equipment, as in (22), concerning the reactor implementation of continuous flow and which operates at atmospheric pressure, wherein said inlet control valve is operated by an instrument which is continuously measures the CO concentration in the produced gas mixture.

26. Equipment, as in (22) through (25), where said cathode(s) show a sharp point or sharp edge, there where the electrons are repelled.

27. Equipment, as in (22) through (26), wherein the cathode(s) mainly consists/consist of one or more of the following elements: B, C, Al, Ti, Fe and/or Ag.

28. Equipment, as in (22) through (27), wherein additionally one of the following elements is added, Li, Be, Mg, or In, for additional transmutation(s), which promote the N_2 -> CO transmutation.

29. Equipment, as in (22) through (28), wherein said means to achieve high-voltage pulses, consists of: a battery (which possible can be charge from the outside), and digital waveform and frequency generator, amplifier using power transistor(s), up-transformer and full- or half-wave rectification.

30. Equipment, as in (29), wherein instead of digital waveform and frequency generator, an inverter, with possible modifications is being applied.

3l. Equipment, as in (22) through (30), where said housing which encloses said reactor, has tangential inlets and outlets to promote the heat exchange by means of the spiral-shaped flow at the reactor wall.

32. Equipment, as in (22) through (31), where said ribs are attached to the reactor wall, in order to increase the heat-exchange surface .

33. Equipment, as in (22) through (32) , wherein channels are provided with possible a fan therein, in order to re-circulate the still useful heat carrying air, after it has left the object to be heated, for example, a Stirling engine generator.