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(54) IMPROVEMENTS IN STREAKING
 NUCLEAR REACTORS

(71) I, ARTHUR PAUL PEDRICK, a British subject, 77 Hillfield Road, Selsey, Sussex, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is concerned with improvements in "nuclear streaking reactors". As will become clear, this title for the nuclear reactor of the kind concerned in the present invention, is particularly appropriate as it depends upon a process of stripping atomic nuclei of their electron shells by heating to a very high temperature plasma, and passing them, at high speed, through a chamber in which they are forced into contact with a wall formed by a uni-directional stream of photons from continuous emission laser beams. It will be understood that the "streaking reactor" has a somewhat common character or form of operation to the present craze for "streaking" whereby, for reasons that are not clear even to psychiatrists, people suddenly take off all their clothing and dash naked down a public highway, usually pursued by the police.

The present concept is also appropriate to my position as self-elected Chairman of the R.S.P.C.S.A., or the Royal Society for the Prevention of Cruelty to the "Splittable Atom".

It is well known that nuclear reactors in current use for producing electricity are fission reactors whereby the nucleus of the Atom is split into two or sometimes three, usually not quite equal, fragments with an emission of neutrons sufficient to sustain a chain reaction.

The only other nuclear reaction for releasing large amounts of nuclear energy is the fusion reaction which between deuterium and tritium takes place in the H bomb but which so far as is known, has not yet been used in any controlled manner in a reactor leading to a utilisable output of electricity in a reactor.

The "Atom" has complained to me that it does not like either being broken up into

bits, as in a fission reactor, or made to hit another nucleus at high speed as in a fusion reaction, so in the present concept, I have devised a method of a somewhat gentler "brushing" of the nucleus, devoid of its electron shells, against an intense radiation wall in the form of a high density stream of photons from laser beams, by which it should be possible to brush off from the surface of nuclei numbers of nucleons i.e. protons and neutrons, with release of their binding energy, so that the energy produced is capable of a much more gentler control than takes place with a chain reaction, or fusion process requiring extremely high temperatures.

Furthermore if the present concept can be applied successfully to elements of high Atomic number, which are normally regarded as stable and unfissionable, a vast new source of nuclear energy release will have been made available to meet the so called "World Energy Shortage". which is a ridiculous expression considering the vast great amounts of material in nuclear weapon stocks, which could be turned into useful energy using Einstein's equation $E=mc^2$, the current energy "crunch" being a shortage of electricity generating plant and fuel for transportation purposes, not of "energy", per se.

The method of operation of the "Streaking Nuclear Reactor" is, therefore, more kindly to the "Splittable Atom" since it is intended to just "knock bits off it", rather than fission or fuse it, but it is just possible that an atomic nuclei might be spun sufficiently in a "Streaking nuclear reactor" to disintegrate a nucleus completely into nucleons by simple centrifugal action with a great release of binding energy.

The invention is made clear with reference to the accompanying drawings wherein

Figures 1 to 5 illustrate certain (experimental) facts concerning the nature of the light photon which are made use of in the "Streaking Nuclear Reactor".

Figure 6 illustrates a nucleus of the "Splittable Atom" and how the "repulsive" forces around it may be explained and

Figure 7 shows how a nucleus, such as that shown in Figure 7, in "streaked" condition, without its electron shells by being heated in a plasma, may be subjected to a violent spin, or pulling forces by unidirectional streams of photons in laser beams.

Figure 8 illustrates the kind of process that, it is believed, is going on during proton-neutron interchange in the nucleus of the "Splittable Atom".

Figures 9—11, show an elevation and cross-sectional view and various design details in a "Streaking Nuclear Reactor" plant.

Figures 12—14 show alternative ways of creating the "photon Wall" in a "streaking nuclear reactor".

The "Nuclear Streaking Reactor" depends upon the fact that experimentally, it can be proved that light photons *pull* upon the surface of any body they fall on, as well as exerting a measurable pressure on it, as is well known,

Proof of this "pulling" effect of light, can be obtained by sensitive instruments, whereby it can be observed that a light, or laser beam, falls upon a flat liquid surface as shown in Figure 1, the water, or other liquid, jumps up to meet it a bit.

Also this "pulling effect" of light, can be observed without the help of instruments with the help of a Crookes radiometer as pictured in Figures 2(A) and (B).

It is described in most physics books, how light, or some other form of radiant energy, by falling on the black sides of rotor plates of a Crookes radiometer, drives it round in the anti-clockwise sense, as in Figure 2(A), it being generally presumed that the warm black sides of the rotor plates, acts upon the small number of molecules of nitrogen and oxygen atoms left in the bulb, which is not completely evacuated.

However "the physics books" do not refer to the fact, as illustrated in Figure 2(B), that if the rotor is stopped and a pencil beam of light is directed only at the silvered or mirror side, of the rotor, it starts rotating in the same sense, as in Figure 2(A), but less rapidly.

From this effect it must be presumed that light photons *pull* at a mirror surface both before, and after they reach it as a confirmation of the effect in Figure 1.

Now consider Figures 3(A) and (B). If a ball *B* strikes a flat plate *P*, it usually rebounds, as in (B), giving the plate *P* a force to the left as indicated. We say that some energy has been passed from the ball *B* to the plate *P*, and assume, rightly, that the ball *B* has lost this much energy, so that its speed now $V - \Delta v$ will be less than its original speed *V*.

Now consider a series of light photons p_1 to p_5 directed at a mirror surface *M* so as to return (along) the same line of action, although in Figure 4 the return photons are

shown to move along a parallel path to make the figure clear.

First of all if the light photons, p_1 — p_5 were in exactly the same line of action perpendicular to the mirror surface, we would expect the reflected photons to hit, or deflect the photons which have not reached the mirror surface, so that the picture presented by the mirror to an observer, would be distorted and the mirror would be useless, or inefficient, but this is not so in practice.

However ignoring the fact that this does not happen the photons p_1 — p_5 , ought not to lose any energy by reflection since it is the whole basis of quantum theory that a light photon is a discrete, indivisible, quantum of radiant energy, which is emitted from an Atom when an electron jumps from one electron shell, or "standing wave", to another, and it should not be possible to "knock bits off such photon quantum energies", when a light photon is reflected, and if no energy is lost by the photons p_1 — p_2 there should be no force transmitted to the mirror surface *M* but, experimentally, as shown in Figure 2(B), we find that the light pulls at the mirror faces to rotate the rotor as shown.

Experimentally, however, we find that there is a force which makes the mirror move to the right, and therefore energy must have been given up by the photons p_1 — p_2 etc., but how do we explain this.

It is postulated that the photon cannot be an "indivisible wave packet", as believed, but must consist of even smaller parts or "entities", by which it can be split up into smaller fractional bits of the "wave-packet".

It is postulated, as shown in Figure 5, that each photon is a limited length group of spinning pairs of tiny particles or "gravitons", or "true atoms" *m* which move along to trace out a double helix sinusoidal track as pictured in Figure 5.

It is maintained that the energy transmitted to the mirror face to make it move must be obtained by retaining in the material of the mirror surface, at least a number of the graviton particles, in the photons p_6 — p_8 , shown in Figure 5, so that the photon 6 has less gravitons in it that the photons p_7 and 8, which have not yet reached the mirror *M*.

However, whether we regard the photon as a "wave-packet" or a "particle-packet", Figures 1 and 2(B) prove, experimentally that light *pulls* a little bit at any surface on which it falls and it is the purpose of the invention to use this effect to pull bits off the surface of the nucleus of an Atom, and therefore it is important to consider the structure of such nuclei, one of which is represented in Figure 6 with the well known structure, of usually, about twice as many neutrons, black, as protons, white.

Although in Figure 6, the neutrons and protons are pictured as being quite separate

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"entities", it is generally agreed that the nucleus of the Atom is in a constant state of "flux", with protons turning into neutrons and back again all the time.

5 Considering Figure 6, it is well known that the nucleus of the Atom presents an "enigma" in Physics, because if, as is believed, the protons all carry a positive electrostatic charge which matches the negative charge on an equal number of electrons, not shown in Figure 6, why does not every nucleus of every Atom in the Universe break up by electrostatic "repulsion" between the Protons.

15 There are various theories about what holds the nucleus together, and the meson particle, originally postulated by Yukawa of Japan, is generally regarded as the "nuclear glue" holding the nucleons together. It is also known that around the nucleus, there is a short range strong repulsive force, the reason for which is not fully understood at all.

20 Thus, although there are currently in operation, a substantial number of nuclear power stations using nuclear fission to turn nuclear energy into heat and through steam into electricity, and large stocks of nuclear bombs are in existence in land and sea based rockets, which if fired off, could kill millions of people who have probably never heard of Einstein's equation, $E=mc^2$, it must be true to say that none of the physicists, who have helped to build these "nuclear energy devices" knows

- 35 (1) Why the protons in the nucleus don't fly apart due to electrostatic repulsion?
 (2) How the repulsive zone around the nucleus is produced? or
 (3) Why the neutron and proton always have masses of about 1838 and 1836× the electron rest mass?

40 to all of which, relatively simple, questions there ought to be a rational answer or logical reason.

45 So far as is known, just no-one has publicly suggested the "impossible thought". Is it not possible that "the Worlds Physics books", are incorrect and there is *no repulsion* between two like electrostatically charged bodies, there is *no reason why* the protons should repulse each other, and the situation in the nucleus is *completely normal*, with gravitational attraction between the protons, balanced against some centripetal force due to some normal rotation of the nucleus as a whole?

55 When we put a charge on two suspended pith balls and they move apart, we at once say they are "repulsing each other" but which may be quite untrue if we put in the "lines of force" it is seen that the lines between the balls are distorted to leave a neutral point, and it is just as likely the balls are being *Pulled Apart* by streams of particles i.e. gravitons in the "lines of force" leaving their unadjacent sides.

65 If we think about this, we find we can apply it as an explanation for all the phenomena described in a "Physics book", in which there is shown to be an apparent "repulsive" force between like electrostatically charged bodies, and, indeed, if we see also, in our imagination, streams of gravitons moving along each magnetic "line of force", in a magnetic field, we can understand that the repulsion between like magnetic poles of magnets may also be an illusion and caused by greater Pulls at the unadjacent ends.

70 But then we wonder, can we not also explain away, the only other "repulsive" force in the "physical world", i.e. around the nucleus, as in Figure 6.

80 The "repulsive" zone around the nucleus is quite different from that between electrostatic charges, which obeys the Inverse square law, so we must look for a very different explanation, and indeed there is one too.

85 Let the nucleus have a mass big M in Figure 6, and imagine a neutron, mass m , orbiting around the nucleus at a distance d from its centre with gravitational attraction equated to centripetal force.

90 Thus we have

$$GmM/d^2 = mV^2/d$$

or

$$d = GM/V^2$$

95 which is the well known equation applying to orbiting bodies, in a gravitational field, and applies to Earth satellites in space.

100 But, if Relativity Theory tells us that no particle can move faster than the Speed of light C , the minimum value of d will be given by $d = GM/C^2$.

105 If d should exceed the radius of the physical surface of the nucleus, as in Figure 6, marked as radius R , then there will be a zone between d and R within which no body, or particle, can go into orbit without exceeding the Speed of light C .

110 Thus we can regard the radius d as defining a sort of "Speed of light barrier", around every nucleus, within which it is impossible for any particle, like a neutron, to stay although the neutron may pass right through the barrier and Split the nucleus, as we know it can do.

115 Thus we see that the "repulsive" force around each nucleus may also be "illusory", but for a quite different reason, to that for the illusions of electro-static or magnetic "repulsion".

120 Returning now to matters more applicable to the present invention, it is proposed to pull bits off the surface of Atomic nuclei stripped of their electron clouds, or shells, as in Figure 7, by directing nuclei at the crossing point of concentrations of photons, in two or more laser beams as shown.

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- By such a system, we may expect to give nuclei a violent spin, which will cause nucleons in the surface to be thrown off by both the pulling effect of the photons and centripetal force. Thus binding energy may be released in a manner, using the equation $E=mc^2$, which does not need a chain reaction, as in a fission reactor, or the enormous temperatures in a fusion reaction.
- Also if the process of Figure 7, can be applied to the nuclei of the Atoms, or elements, of high Atomic number, which are normally quite stable, a vast new source of nuclear energy releasing material will have been provided and the control of the release of such energy ought to be amenable to much more sensitive control than takes place in a fission reactor with "critical masses" being involved.
- Considering Figure 8, there is here schematically illustrated what is believed to be the kind of process that takes place all the time in the nucleus of the "Splittable Atom".
- Since the nucleus only has a size of about $x \times 10^{-13}$ cm it will probably be impossible for us ever to have an instrument which will reveal the true State of Affairs in the nucleus, but this is what I believe is happening.
- A proton has an internal structure consisting of millions of spinning pairs of gravitons or "true atoms" so that it has immense density. This results in the fact that if the equation $d=gm/c^2$ is also applied to a proton, when such proton has a mass m of about $1836 \times$ the electron rest mass, d moves outside the physical dimensions of the proton body, and form a "Speed of light barrier" around it, similar to that around the nucleus as a whole.
- Gravitons from the surrounding "Dynamic ether sea", collect around the protons just outside the "Speed of Light barrier" at radius d , and thus form a sort of spherical halo, or "meson cloud" around it, which for some reason not clear, stabilises to give the proton, plus ring or cloud, as at the top of Figure 8, which constitutes a neutron, with a mass of about $1838 \times$ the electron rest mass.
- It is postulated that what is happening in the nucleus is that this "halo" or "meson cloud", is all the time being interchanged between the protons like a sort of game of high-speed basket ball, which gives a physical picture of the nuclear reactions.
- Neutron=Proton, plus electron, plus anti-neutrino and
Proton plus electron plus neutrino=Neutron which are well known.
- At (1) at the top of Figure 8, a neutron comprises a proton A with a meson cloud C around it. A proton B passes close to cloud C around A , and pulls it away gravitationally as at (3).
- At (4) the cloud breaks away behind A to emit an anti-neutrino An , which flies away at the speed of light C . The proton A carries on alone, as at (6), while the meson cloud C closes round proton B and is completed by its ends being joined up by a neutrino An .
- The proton A passes close to the meson cloud E around a proton D , as at (8), and at (9) pulls it away gravitationally, so that it breaks in two behind D with emission of an anti-neutrino An .
- At (10) and (11) the meson cloud E closes round proton A and is closed up, as at (11) by a neutrino.
- This is a picture of the sort of process which must take place in the nucleus all the time with continuous interchange of the "meson cloud", like a game of basket ball.
- However the complete Atom always has an equal number of protons and electrons, so there must be a correspondence between the state of affairs in the nucleus, with the electrons in the various shells, so that it is presumed, in the process of interchange, from one proton to another the meson cloud expands right out to form the "orbital" of an electron, but it is not really clear why there should be electron shells at only certain quantised energy levels, in accordance with the structure according to the late Neils Bohr.
- Figure 8 does indicate, however, that it is by no means impossible to explain neutron-proton interchange in the nucleus, in a manner which will explain why the proton and neutron should have masses of about 1836 and $1838 \times$ the electron rest mass, in a process which is basically of a gravitational character and derived from true atoms or miniscule "graviton" particles.
- Figure 9 shows a typical vertical centre line plane cross section through a "Streaking Nuclear Reactor".
- Nuclei stripped of their electron clouds in a plasma are fed into the reactor through a pipe 1 in the base, and are passed out of central body 2 through radial ducts 3 which point directly at the cross over points of as shown in Figure 11, four uni-directional streams of photons 4 in continuous emission laser beams 5.
- The plasma flow with its energy increased by the binding energy released is then passed through the centre of the reactor shell 6 within the confinement of the proton wall 7 and its flow modulated by the field of a coil 9 which receives a feed back of current from a transformer 11 receiving a primary input from the modulated plasma flow interacting with the primary coil field 10, and output of electricity from an output coil being taken from the transformers as described in UK Patent No. 1,207,698.
- Figures 12 to 14 show 3 other ways of producing the photon wall 7 from laser beams

reflecting from the high polish bore of a "Streaking Reactor Shell".

In Figure 14 it will be observed that the nuclei can be directed at the cross over points of 3 separate laser beams.

My co-pending Applications 11942/74 (Serial No. 1,421,521) and 13492/74 (Serial No. 1,421,712) describe and claim similar apparatus.

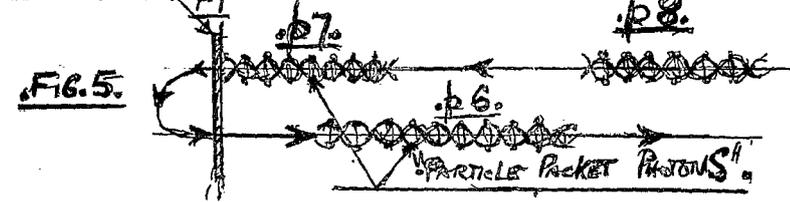
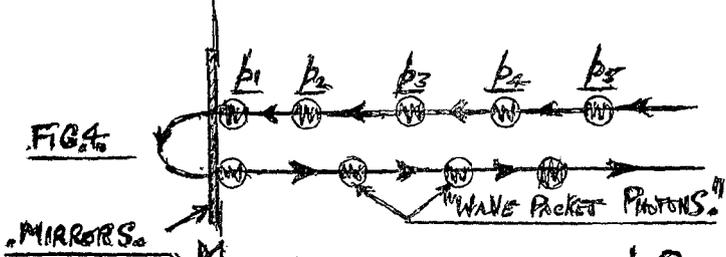
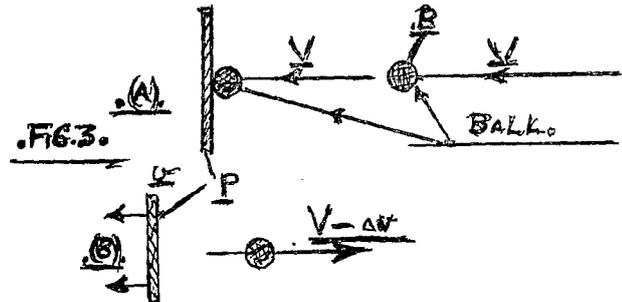
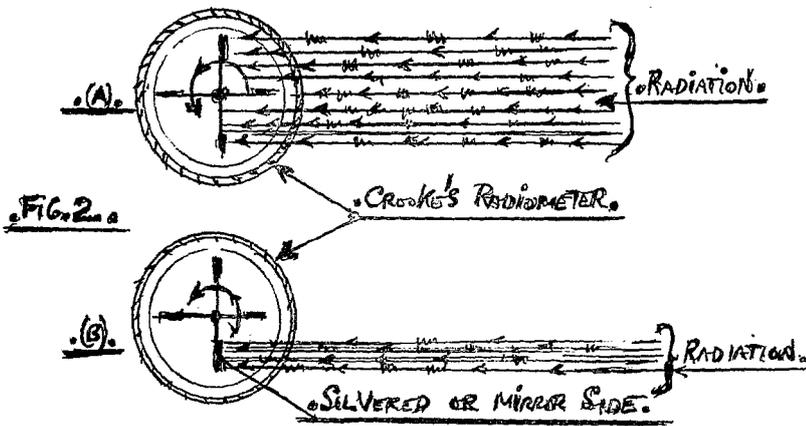
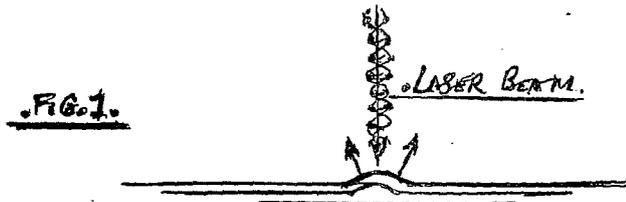
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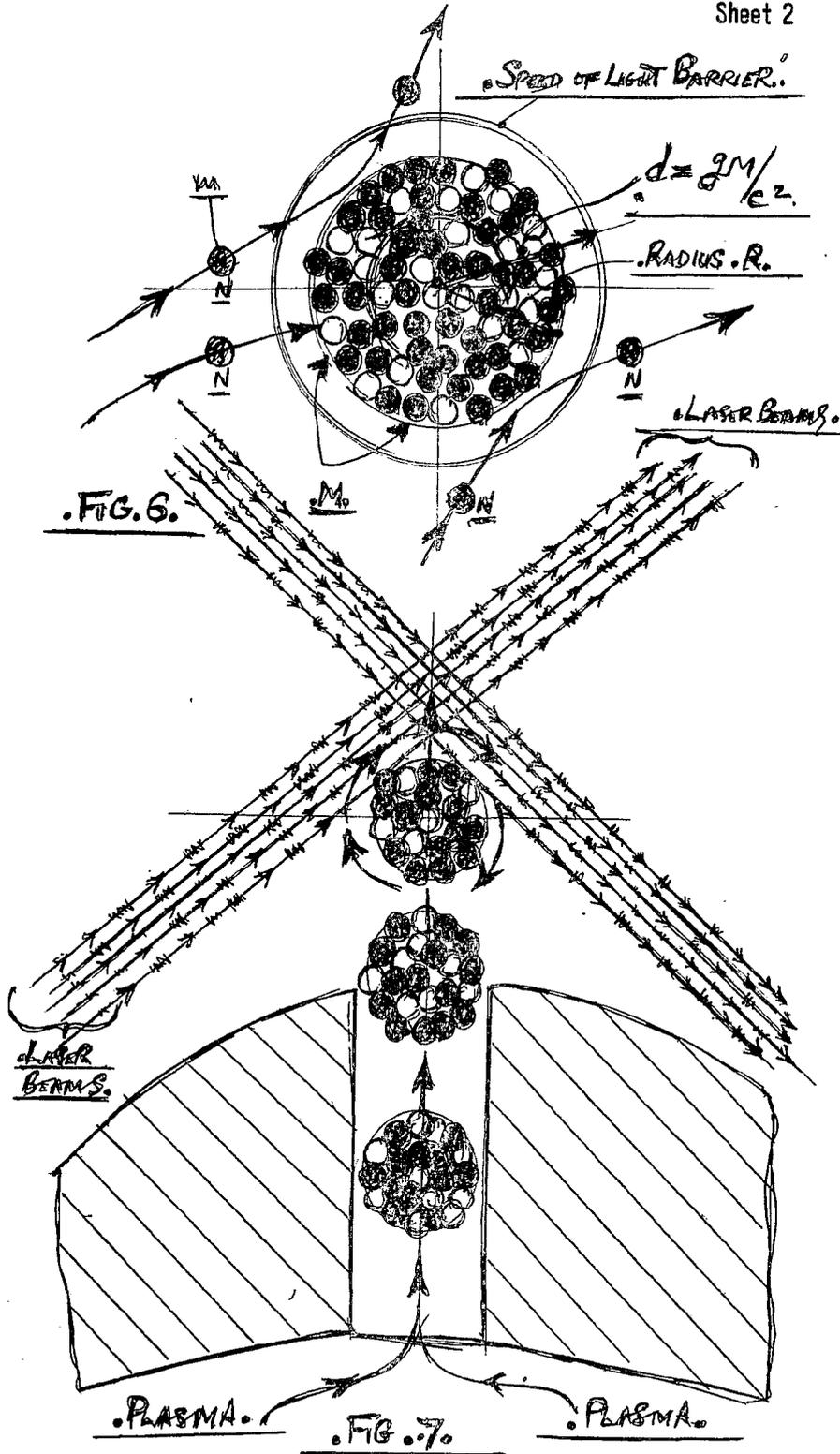
A nuclear reactor comprising means for producing atomic nuclei which have been

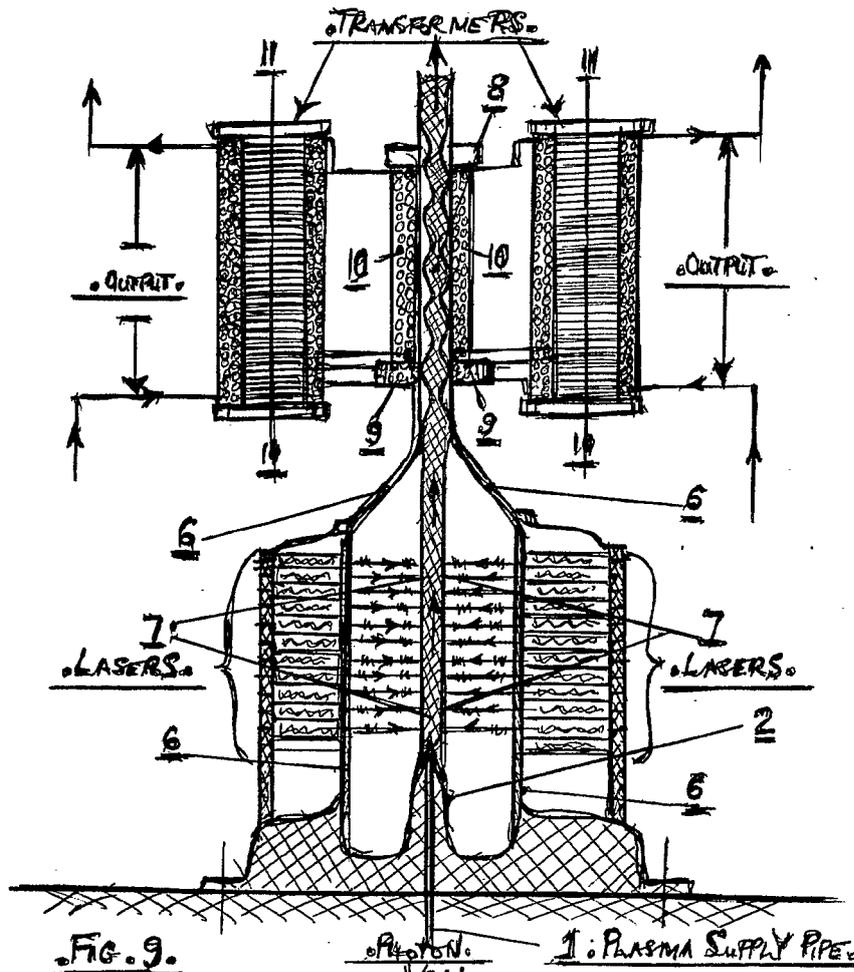
stripped of their electron clouds by being heated to a temperature sufficient to convert the atoms, as a whole, into a plasma, a central body having radial ducts through which, in use, the nuclei are passed out of the central body, and a plurality of lasers, or other light sources, whose beams are so arranged, that the nuclei are discharged radially at the cross-over point of two or more laser or other radiant beams, which form a corner at the junction of two or more photon walls.

A. P. PEDRICK.

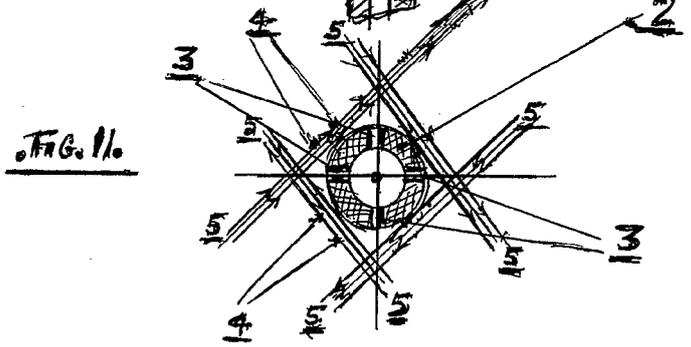
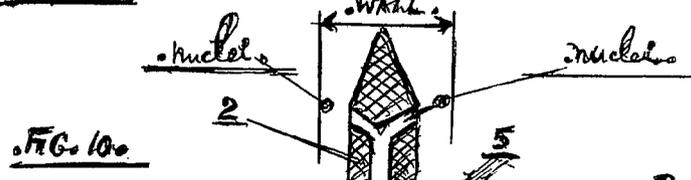
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1: PLASMA SUPPLY PIPE



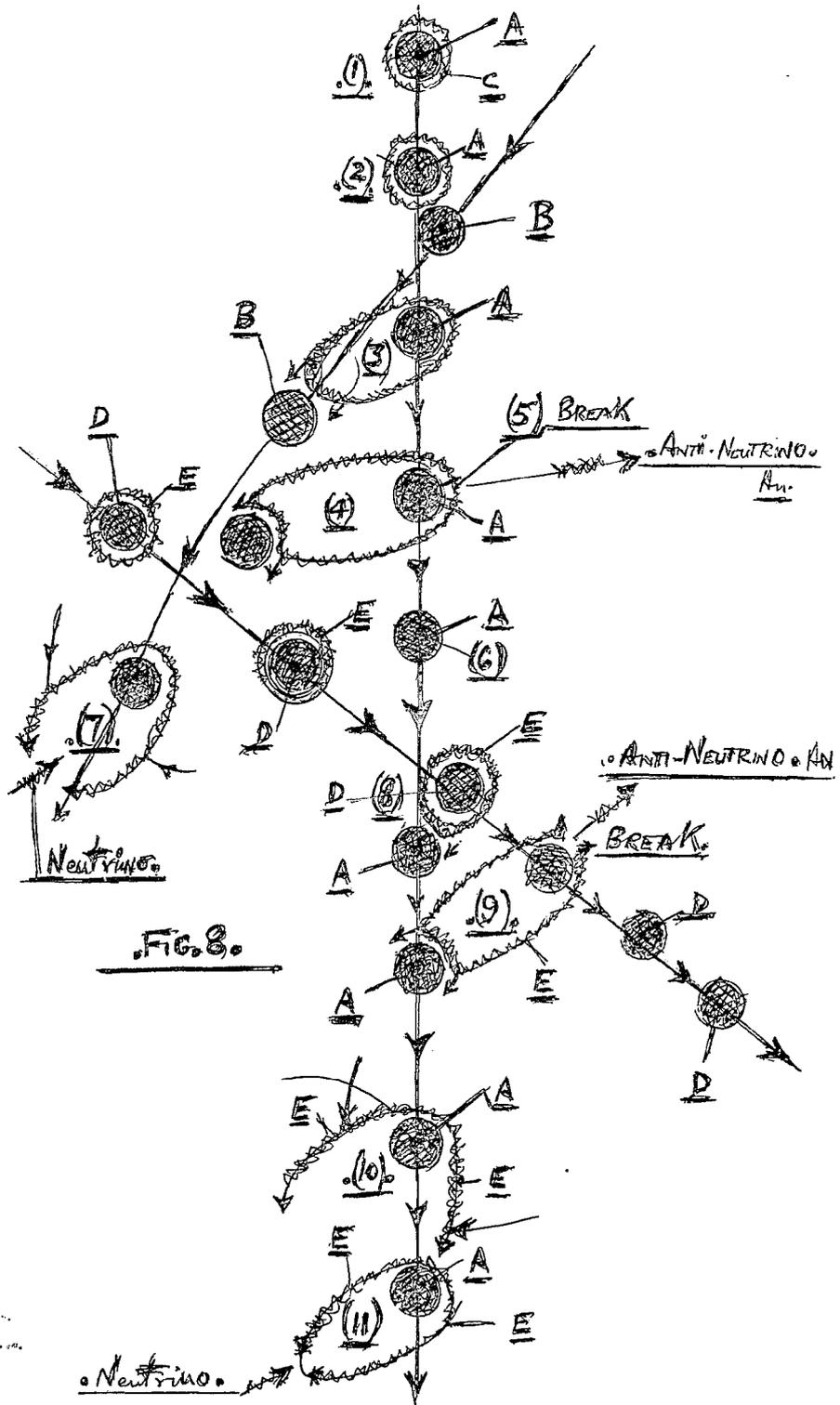


FIG. 8.

