Carr Technology

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2021, 30 January

ABSTRACT: This article aims to demonstrate that Otis Carr developed a complete craft with autonomous energy and propulsion systems. His experiments on rotating mercury devices like Utron and magnetic fields gave him the knowledge to build a functioning craft with these technologies. The base of all his technology is the rotation of metallic parts to produce magnetic fields. It will be developed a first mathematical approach to quantify his "Amusement Device", that is a model for a flying saucer.

KEYWORDS: Utron device, biconic device, regenerating accumulator, capacitor plates, rotating platform, flying saucer, inertial mass, artificial gravity.

Contents

1 Introduction

Over a period of three years, Otis T. Carr had the opportunity to talk to Nikola Tesla about various discoveries, during the period of seclusion at a hotel where Tesla lived in New York. From this knowledge and his understanding of the simple principles of Nature, he began his investigations in 1937, which culminated with the invention of an energy generator called Utron and a levitating device capable of overcoming the planet's gravitational force.

In 1938, Carr and his team actively made models and in 1942 reached the basic principles. In 1947 Carr finished his research on the flying saucer and tried to arouse interest from various governments and universities, but all in vain because there was more interest, at that time, in atomic fission. So, he decided to patent his invention as if it were an educational and recreational device,

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and in 1959 he registered US patent No. 2,912,244 – Amusement Device. This patent accurately describes the proportions and design of his anti-gravity vehicle.

In May 1995, FATE Magazine published on its page 17 the following news title: "Gravity Machine?". Such news referred to the statements of Otis T. Carr, president of OTC Enterprises, Inc., about his model of circular motion device that was the principle of a "free energy circular blade" spacecraft that he could build, if someone raised the resources.

According to Carr, the device could be adapted to machines of any size to produce continuous energy absolutely free of dissipation. Its immediate application would be on a spaceship and its associates claimed that their discoveries were based on the simplest practical applications of natural laws and discoveries in science and mathematics.

He claimed that the same free energy that causes the Earth to rotate on its axis and its translation around the Sun would move a device that he described as being biconic – two cones joined in their circular bases. This was the central component of Carr's disk; it was called Utron and consisted of bicones that turned in high rotation, having a hollow interior with a spherical shape, as each cone contains a semi-spherical hollow space. Its shape is unusual: seen from the side, it is shaped like a square, seen from above or below, it is shaped like a circumference. In the technical specifications it was called "regenerating accumulator". Mounted on a circular base, when the rotation of such a base reached a certain speed relative to the Earth's orbital speed, the equipment would take flight, that is, when the speed of the external circumference of the model rotated at a speed greater than the speed of the Earth in the equator.

Figure 1: Utron device shape.

Carr also claimed that the central part of his spaceship would be a huge battery that would rotate at the ship's external speed and that it would be recharged by its movement. The principle by which such a circular motion machine would operate was that "any vehicle accelerated to an axial rotation relative to its mass of inertial attraction (the Earth), would immediately become activated by the free energy of space and act as an independent force".

In August 1995, FATE Magazine published on its page 32 the following news: "The Saucer that didn't Fly" by W. E. Du Soir. This news refers to a public launch scheduled in April of the same year for a flying saucer prototype, the O.T.C. X1 with six feet (1.8 m) in diameter, working with Utron energy. But the launch would have been delayed due to technical difficulties. Publicly, there has never been such a launch.

According to Raph Ring [1], a technician who worked with Carr, he built some flying saucers that worked… before his experiments were forcibly terminated by government agents. Carr built several working prototypes with varying size, from experimental models of a few feet in diameter to a 45-foot (13.5 m) diameter and 30-tonne disk, where Ring with two others was a co-pilot, and pass through a distance of 10 miles (16 km) instantly. It was a dramatically successful experience. Carr was seriously interested in taking his ship to the moon. However, two weeks after the dramatic experiment, his laboratory was forcibly closed by government officials and all files and documents were confiscated. In early 1961, his laboratory was robbed and destroyed, the group of engineers was forced to disband, cease contact with each other and the project was never completed.

"You must always work with Mother Nature. Force is never necessary. The laws of the physical universe are really very simple." He described when the disk models were powered and reached a particular rotation speed "…the metal turned to Jell-o. You could push your finger right into it. It ceased to be solid. It turned into another form of matter, as if it was not entirely here in this reality. That's the only way I can attempt to describe it. It was uncanny, one of the weirdest sensations I've ever felt."
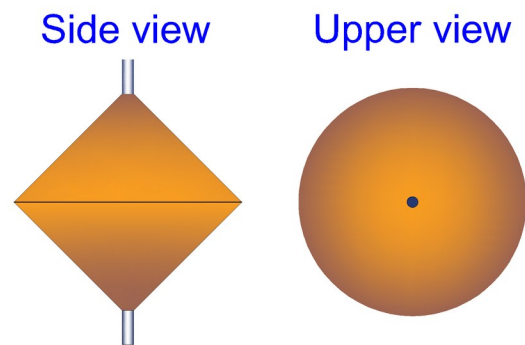
Ring described his "flight" in the Utron craft saying that: [1]

Fly is not the right word. It traversed distance. It seemed to take no time. I was with two other engineers when we piloted the 45' craft about ten miles. I thought it hadn't moved – I thought it had failed. I was completely astonished when we realized that we had returned with samples of rocks and plants from our destination. It was a dramatic success. It was more like a kind of teleportation.

What's more, time was distorted somehow. We felt we were in the craft about fifteen or twenty minutes. We were told afterwards that we'd been carefully timed as having been in the craft no longer than three or four minutes. I still have no complete idea how it worked. We just built it exactly according to Carr's instructions. Everything had to be perfect … it all had to be just so, or it he said it would not work: a kind of symbiotic state between man and machine.

The Utron was the key to it all. Carr said it accumulated energy because of its shape, and focused it, and also responded to our conscious intentions. When we operated the machine, we didn't work any controls. We went into a kind of meditative state and all three of us focused our intentions on the effect we wanted to achieve. It sounds ridiculous, I know. But that's what we did, and that's what worked. Carr had tapped into some principle which is not understood, in which consciousness melds with engineering to create an effect. You can't write that into equations. I have no idea how he knew it would work. But it did.

Figure 2: OTC-X1 model.

2   Description of the "Amusement Device"

Basically, Otis Carr's craft consists of three parts:

1. Device composed of a platform that rotates in direct rotation (clockwise) together with the central battery (under the cabin) where the six capacitor plates are equally spaced and interspersed with the six regenerating accumulators (Utron devices) that rotate in counter rotation (counterclockwise).

2. Device composed of a platform fixed to the outer hull of the disc, which rotates in counter rotation (counterclockwise) together with twelve electromagnets equally spaced and distributed in the external perimeter.

3. Stationary device composed of the central cabin where the crew members are housed, fixed to the central axis of the ship where the lower support in the form of a tripod is attached and by which, through bearings, it forms a single set with the first two parts.
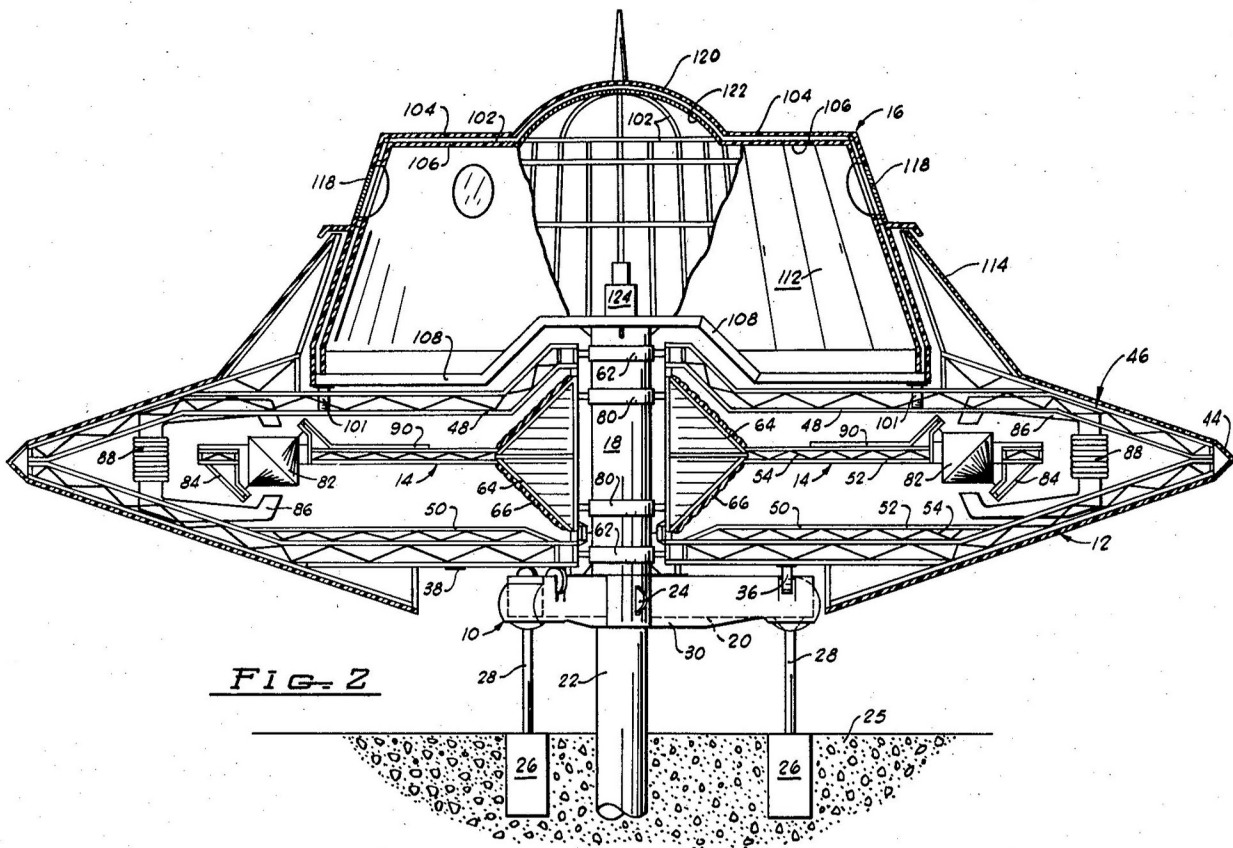

Figure 3:Design of the amusement device from Carr's patent.

While the internal platform, which has the six Utron regenerating accumulators, the central accumulator and the six capacitor plates, rotates in one direction, the external platform, which has the twelve electromagnets, rotates in the opposite rotation. The cabin, located at the top and center of the rotating mechanism, remains stationary due to the various coupling bearings, as stated by Carr: [2]

> We have this cabin as the center of the craft and the battery below the cabin and the electromagnets are the total outside of the circular foil. The shaft of the accumulator goes through the cabin and there is a bearing. Now, just as this stays stationary when this is rotated, so will the

cabin because there are two rotating forces. You have the clockwise rotation of the accumulator, the capacitor plates, the generative coils, you have a counter-rotation of the entire circular area of the craft, the larger diameter which houses the electromagnets; therefore, when you have rotation in both directions, the cabin itself is like a bearing and extension of the shaft. We've built models and proved this is correct.

To start the rotation movement of the motor, it is necessary to create a flow of electric current through the set of coils distributed on the periphery of the craft, as stated by Carr: [2]

… We have a tremendous spin here. An electric motor operates the same way. You set up an electromotive force inside a magnetic field and you get rotation. So what we actually have here is an improved electrical motor which in itself is a circular device, and we say we make energy out of the air, from another dimension.

To clear your analogy up also, we would like to demonstrate the fact that this earth itself is literally a space craft demonstrating what we're talking about; it's rotating and orbiting at a certain constant speed with a magnetic field and it is in itself a spacecraft.

…

They (the coils) individually operate by circuit breakers and the first motion begins to start a repetition. The same we have in a motor that has the opposite of a commutator, which is an accumulation of contact points where each coil is energized as the current flows through this coil. Then this starts the motion, the repetition of this motion brings the whole motor into phase in the same sense our accumulator and magnets become speeded up and the circuits are made and broken as they rotate.
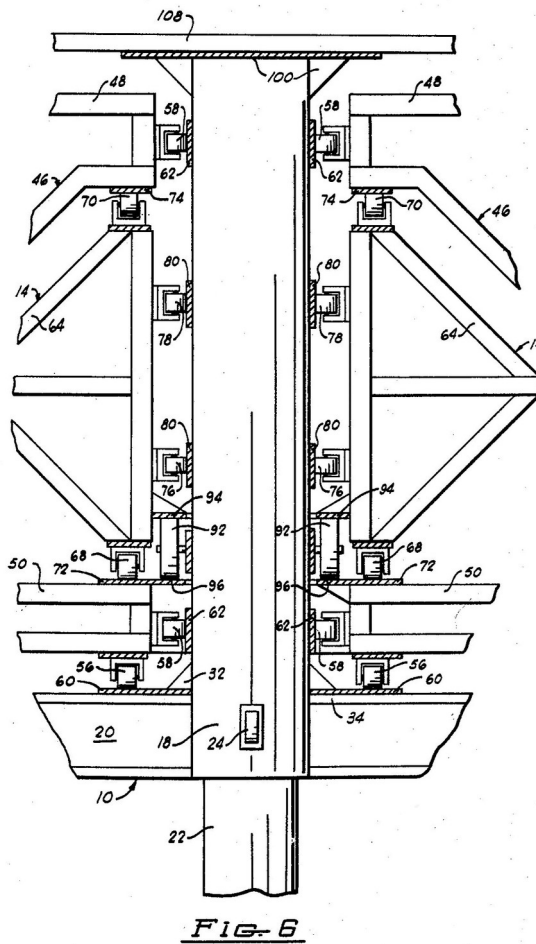

Figure 4: Central axis bearing system.

When asked if the central battery set activates the electromagnets in the outer perimeter, and it is recharged by them, Carr replied: [2]

This is true. We do this by contacting this lead wire from the positive and negative poles of these batteries to the electromagnets and then we have circuit breakers from these electromagnets and we have counter-rotation. These electromagnets will rotate counter-clockwise while the internal area is rotating clockwise.

…

The coils of wire inside the ring (ferromagnetic core) are regenerative coils; they are electromotive force coils and they assist in regenerating the battery, because they are loops of wire brought through a magnetic field which sets up an electromotive force. These others are capacitor

plates and these are also activated by the central power core, but these plates, which can accept a very high charge in neutral conductance also through the process of ionization utilize atmospheric electricity.

The central cabin is coupled to the two moving plataforms, which rotate in direct rotation and in opposite rotation, through bearings mounted on the central axis of the cabin. These allow free movement of the moving parts while the central cabin remains stationary.

The central battery pack rotates in direct rotation just below the cabin and is coupled by bearings mounted on the central axis. On its circular platform, the six Utron devices that rotate in counter rotation are mounted on bearings.
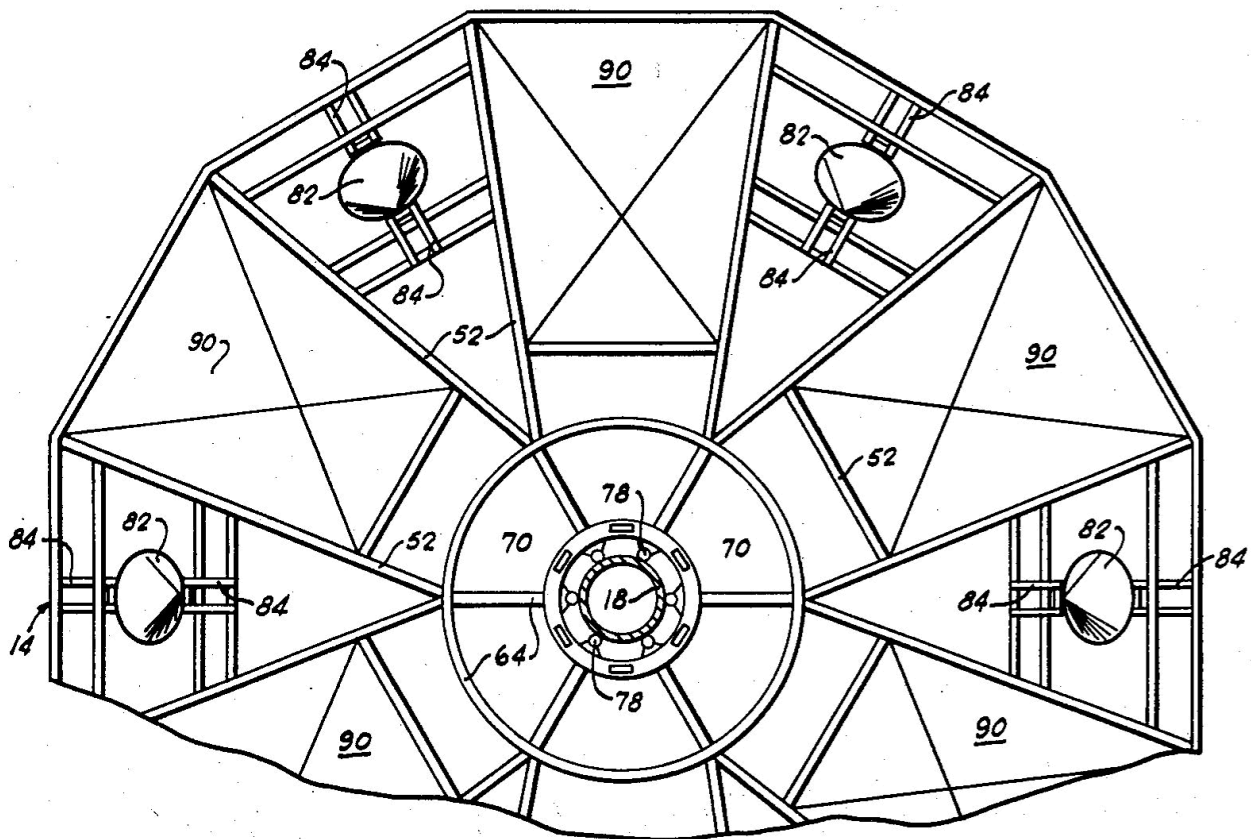

Figure 5: Platform with capacitor plates and Utron regenerating accumulators.

Utron devices that rotate in counter rotation have fins that force their rotation like a turbine. This occurs when the central battery is put to spin, therefore, after a certain rotation, they work as energy generators by the same principle as the Faraday disk. They have a coil of enameled copper wire on their outer surface which produce a magnetic field that interacts with the electromagnets that rotate together with the hull of the craft in counter rotation.

Initially, the electromagnets are powered by the central battery to rotate the battery platform as a motor in direct rotation. After a certain speed, the six Utrons produce enough magnetic energy to feed the central battery through its passage inside the air gap of the electromagnets.

3   How the Craft Works

According to Carr, when two electrically charged bodies rotate in opposite directions on the same axis, the effect is to create a gravitational center that makes the craft independent of external gravitational forces: [2]

"Any vehicle accelerated to an axis rotation relative to its attractive inertial mass, immediately becomes activated by free-space-energy and acts as an independent force… We have shown that a charged body, accelerated to an axis rotation relative to this attractive inertial mass, indicates polarity in a given direction. The dip-needle points, say, up toward the top of the body. But mount this while rotating body, with its spindle, on another platform and rotate this platform on a spindle, then if the counter-rotation is greater than the inertial forward rotation of the body, a dip-needle on the second platform will point down while the first dip-needle points up, indicating complete relativity of polarity. When the exact counter-rotation matches the forward rotation the body loses its polarity entirely and immediately becomes activated by free-energy (tensor stresses in space) and acts as an independent force… The above-described assembly of counter-rotating charged masses becomes weightless and will escape the immediate attraction of gravitational forces…"

Carr uses an internal platform rotating in direct rotation and places several devices in counter-rotation with its axes fixed by bearings on this first platform. There are six counter-rotating devices, equally spaced along the perimeter of the internal platform and are called Utron regenerative accumulators. There is another external platform that rotates in counter-rotation, as opposed to the first platform, with twelve electromagnets that produce electrical energy during the passage of the Utrons in their air gaps, when the system works as a regenerative generator.

This second external platform rotating in counter-rotation aims to compensate for the rotation of the first internal platform and keep the central cabin stationary. The fact is that the internal platform works like a rotor, while the external platform works like a stator (armature). In another statement by Carr, we can confirm that to create an artificial gravity inside the craft, as well as to keep the central cabin stationary, it is necessary to rotate two systems in opposite rotation: [2]

Yes, this is the beginning of an answer to your question: we have capacitor plates and electromagnets as a part of this system. Now, this is counter-rotating; the electromagnets rotate in one direction, and the batteries rotate in another. The capacitor plates rotate in conjunction with the battery so that we have a clockwise and counterclockwise rotation. Now the third system is the cabin that keeps the crew. This does not rotate; it is fixed due to the fact that the two bodies are rotating clockwise and counterclockwise. Therefore the system causes the craft to escape from the gravity pull. The craft itself due to this system still has internal gravity because it still has the same weight that it had in the beginning.

As we can see, one of the functions of Utron devices and electromagnets is to make the system work like a motor, where the rotor and stator (armature) rotate in opposite rotation freely, which keeps the cabin stationary in the center. The switching of the electromagnets is done in a similar way to the present brushed motors and the supply of this "motor" is done by the central battery. However, switching the electromagnets also allows the energy regeneration of the batteries, when the system reaches a minimum rotation that allows the rotor (where the Utron accumulators are) and the stator (where the electromagnets are) to function as a generator. We can describe the central Utron as an energized rotor or, in other words, as a rotor that contains its own battery in motion and that is also capable of continually re-energizing itself.

Otis Carr knew that bodies in high rotation create a gravitational field in the direction of the angular velocity vector, parallel to the spin axis. This principle was demonstrated in the chapter

Gravitational Neutralization of the article Inertial Field [3], by analogy to the balance of forces that keeps a satellite in orbit around the planet. This gravitational neutralization was further studied in the section Gravitational Potential Neutralization in the article EM-GI Propulsion Systems [4]. We saw that when an object is in high rotation, it is possible to overcome the planet's gravitational field force, and we performed calculations that allow quantifying this phenomenon, known as the gyroscopic effect. This effect explains why, when asked about the square shape of the Utrons, Carr replied: [2]

> Dimensionally it is; it is square in these dimensions and when this rotation starts and builds up to a certain velocity, this form is very important because we have the total equation of action and reaction. Now this is done by a system of coil winding wherein we start at a point, expand to an equator, and continue our winding down to a point. With this physical expansion and contraction, is an electromagnetic field. Gravity enters the picture in the form of this relative rotation. When the relative rotation – inertial effective mass –, it's a matter of dimension. So that is the earth, say, is 8,000 miles in diameter, we know its fixed rotation is 1 in 24 hours. If we were 1 mile in diameter its rotation would be 8,000 in 24 hours. And by the same system, our 45-foot craft has a rotation of 580 rpm and when it reaches this rotation it is totally independent of its inertial attractive mass, in an electromagnetic field.
> …
> This model was spun at 40,000 rpm and when it did it set a pressure pattern of 1,000 tons; the horsepower reading was a little over 700. Six engineers checked this out. Now the relative rotation of this model would be about 68,000 rpm, and when it reaches this rotation, it would immediately take off.

To overcome the gravitational pull of planet Earth, the relative rotation speed of the platform would be equal to the rotation speed of the Earth at the equator, that is, around 580 RPM. As the rotation of the electromagnets would be 580 RPM and the rotation of the central battery would also be 580 RPM, however, in the opposite direction, the total rotation, in relation to the other, would be 1,160 RPM. Mr. Colton, in an interview continues: [2]

> We're not giving it for a certain rotation for the sake of rotation but for the sake of relativity to the attractive mass. The earth at 8,000 miles diameter rotating once in 24 hours is relatively equal to a 45-foot craft rotating at 580 rpm, and 580 rpm would calculate to be the approximate rotational speed of an automobile tire on a car moving at about 25-30 mph.

The rotation at which the 45-foot disc would be independent of its inertial attractive mass presented by Mr. Colton in the interview is not correct. The approximate correct value is 660 RPM:

Diameter	Turns	Time
8,000 miles (12,800 km)	1	24 h (24*60 = 1,440 min)
1 mile (1,600 m)	8,000	24 h (24*60 = 1,440 min)
45 foot (13.5 m)	658.4 ≈ 660	1 min

The six capacitor plates that rotate in direct rotation create a magnetic field on the central axis of the system in the same way as seen in the chapter Magnetic Propulsion Through Mass Rotation of the article EM-GI Propulsion Systems [4]. This central rotating magnetic field collects the ions from the atmosphere, as seen in the section Electric Charge Gathering by Magnetic Vortex of the article Power from Electrostatic Charges [5], and projects the negatively charged particles to the craft's periphery. Capacitor plates are bombarded by these negative electrostatic charges because

they are on their path to the periphery and absorb them becoming superconducting due to the structural change in their atoms. The same occurs with the hull surface that is in the projection direction of these particles. This structural change is commented as being similar to jelly, that is, the metal becomes soft. The superconducting characteristic of these plates increases the central magnetic field by more than a thousand times and the projection of particles also multiplies. In this way, the central magnetic field is amplified and allows the disk to float magnetically in the vertical component of the Earth's magnetic field.

Carr's craft used several propulsion systems that, taken together, produced a gravitational center that moved the entire craft together, without the effects of inertia. In addition to the central electrical system, which provides electrical energy to the disk, we can identify the magnetic system of capacitor plates, which provides magnetic levitation, the peripheral magnetic system, which works as a motor and generator, and the gyroscopic system of gravitational propulsion.

There are two other systems that may be explored based on the electrostatic charges projection to the periphery, that we will not describe again in here. The first is the gathering of these charges to get free energy, because it was widely described in the article Power from Electrostatic Charges [5]. The second is the magnetic propulsion system caused by the circulation of these charges in the periphery of the disk. This creates a repulsion between this magnetic field and the vertical component of the terrestrial magnetic field, but it was widely described in the article EM-GI Propulsion Systems [4].

In addition to these systems, there is a secondary effect of producing etheric particles that provides an increase in the mental capacity of the crew. This allows control of the craft's direction according to the will and controlled imagination of its crew. We will not discuss this phenomenon.

4   Central Electric System

According to Carr, the set of batteries that feeds the entire electrical system of the craft consists of the electrical connection of countless electrical cells of any known type (lead-acid, nickel-cadmium, metal hydride, etc.), which form an accumulator of large capacity, mounted inside a device in the form of double overlapping cones (central Utron). [2]

> We could use any of the kinds you mentioned; what we have here is tremendous power size in comparison to other batteries; therefore, it's very easy to put 1,000 2-volt cells inside this one unit as you see it. It has functioned very well. In our 45-foot craft we plant to have 12,000-volt batteries which will extend an electromotive force which will energize the electromagnets and the capacitor plates. The generative coils will put back into the batteries in this system the same amount of volts going out until there is a breakdown of electro-chemicals or wear-out of equipment. But it could last as long as average storage batteries in automobiles.

As described above, the battery pack provides an electrical potential of 2,000 Volts DC for the prototype, but the 45-foot craft will have a battery pack that will provide 12,000 Volts DC for the production of the magnetic fields of the Utrons and electromagnets from the periphery. In order to function as a motor/generator, the Utrons and peripheral electromagnets are powered by synchronized pulses. For electromagnets, which have a ferromagnetic core, the pulsating current is calculated to not saturate the core, but in the case of Utrons, which do not have a ferromagnetic core, the pulsating current must be calculated to provide a minimum magnetic field sufficient to separate a large part, if not all, the electrical charges of mercury (its electrons in the conduction layer). This means that these current pulses can reach 1,000 A or more for the prototype, and 10,000 A or more for the 45-foot craft.

During operation, when the platform (which contains the six Utron regenerative accumulators and the six capacitor plates) rotates in the opposite direction to the external structure

(which contains the electromagnets), an intense magnetic field is formed in the center of the disk, all powered by the central battery bank. [2]

> Our system utilizes gravity, electromagnetism, and electromotive force and a relative field to get its functional operation. We use an electrified sender. It's a sensor power core. Now this is what we call an accumulator… It is a storage cell, an accumulation of storage cells which provide an electromotive force in the same manner that any known battery produces an electromotive force.

In operation, the central battery pack releases electromotive force to power the entire ship and, at the same time, is recharged by the energy collected in the coils of the electromagnets that rotate in counter rotation on the external platform. It is the central energy system for the space vehicle. As Carr describes: [2]

> This starts out electrochemically the same as other batteries, but we do have a regenerating system that is very unique. We are able here, for the first time to our knowledge, to use atmospheric electricity as a recharging system. This is done as part of the operational principle of the craft.
> …
> We have electrochemical systems to provide us with all the energy that we need and have a regenerating system in the manner of a regenerative coil that recharges this battery in the same manner that the storage battery in the automobile is recharged now, by a generator.

5 Utron Electric Regenerative Accumulator

The Utron regenerative accumulator is described as a device composed of an electrically isolating or conductor material with a biconic geometric shape that rotates inside a magnetic field. If it is made with a metal, must resist to mercury dissolution and don't make amalgam. Its interior is hollow with a spherical shape, where the electrolyte is stored, so it is also called a battery, according to the text: [2]

> This [the Utron] is a dimensional product. It was designed with the dimensions of space itself. We say it is truly the geometric form of space, because it is completely round and completely square. It has been proven in scientific laboratories that the very smallest unit of mass matter ever photographed in the electron microscope are square in shape… We have applied this principle into an electrified system, which is the power core of our space vehicle. Now what makes this unique and novel from a battery is the fact that this is a piece of moving machinery that rotates. Our average storage battery is an inanimate object set in an inertial spot and then the electromotive force is conducted by wires from this battery to animate some object.
> …
> The battery rotates in this magnetic field. The average armature today in any electrical system is usually the permeability, iron wound with copper, then through a magnetic field acts as a motor, or it becomes a generator, depending upon the lead. The great novelty here in the area in which an armature is normally used, we have a power unit, and this is a battery, and this is a moving power unit.

Seen from the side, it is shaped like a square, seen from above or below, it is shaped like a circle. Furthermore, it has fins, similar to a conical drill, which are reactive channels that make the accumulator to spin in counter-rotation like a turbine, when the platform rotates in direct rotation.

Carr confirms this when he answers a question on a number of ridges looking like gears would fit in: [2]

> No, those are in a sense turbine; they are reactive channels and where there is atmosphere a flow of air there aids in rotation.
>
> …
>
> This is right. This is a storage cell for electrical energy. In operation it generates electricity at the same time it puts out electromotive force. This is the central power system for our spacecraft.
>
> …
>
> It is a sphere, yes. And each unit is a hemisphere. We call the center of this large dimension the equator and of course it contracts and expands to a point on each side. It's the union of two presto-conical sections; that is what it is, two right angle sections, and we say it is the dimensions of space and we have shown how this comes about…

The blades are fixed on the surface of each cone through spacers to be over the coil, which is wound directly on the assembled bicone, and follow a line in straight or spiral form, as showed in the figure bellow. The spiral line offers better performance because the area offering air resistance is larger. The sectional shape of the blades is triangular, with straight or curved lines, so that the air is not deflected on one side of the bicone when the platform rotates, and creates a torque force that makes the Utron turns in high rotation.
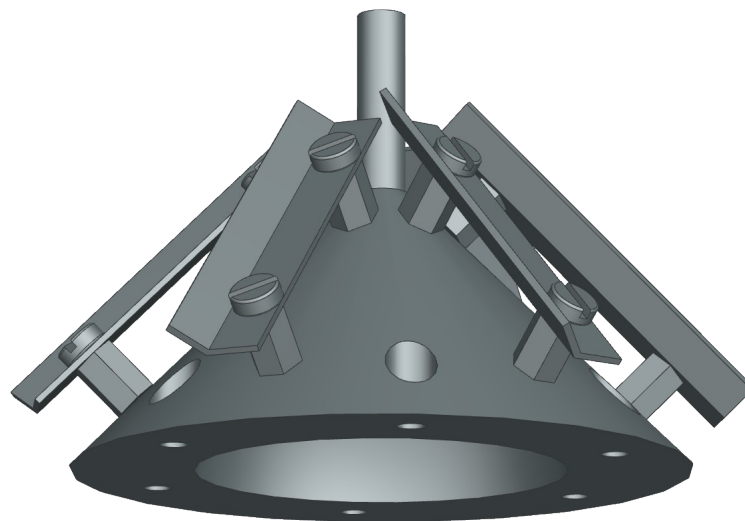

Figure 6: Cone model with spacers and blades.

The battery of the Utron (bicone with metallic electrolyte) is surrounded by a magnetic field produced by a biconical shaped coil. However, as the coil rotates with the bicone, it must be energized through brushes placed at the apex of the upper and lower cones. When the platform rotates, the air pressure on the bicone blades sets it in free rotation within the magnetic field and, due to its circular movement, generates electricity. As Carr describes: [2]

> All energy comes from these two cones [Utron]. This in vernacular is a battery. The big novelty is that we have put a battery in motion. We have designed it within the accepted knowledge of total dimensions of space-matter and we have activated it electrochemically [electrolyte in the hollow center] and used the force through chemical activation to activate the entire craft, after which we have motion as the feature of this accumulator.

Another option is to mount the biconical coil fixed on the platform and far enough away from the bicone that it rotates without touching it, with the blades fixed directly on the bicone. This assembly has the drawback that the air speed is reduced due to the coil, so it must be wound in an intricate way, to present numerous "holes" that allow the free flow of air.

The coil can also be wound with a smaller amount of turns but with a copper tube, in which case it is necessary to use high electric current. In both situations, the set (bicone with its blades and coil) must be dimensioned properly so that it passes freely in the air gap of the electromagnets that are in the external perimeter.

The coil is energized by the disc's central battery bank with pulsating DC current, and must be sized to produce a pulsating magnetic field of at least 1 Tesla. However, as there is no ferromagnetic core that saturates, this field can be increased several times, ensuring the proper functioning of the separation of electrical charges in the electrolyte, as well as guaranteeing the repulsion/induction of potential in the peripheral electromagnets.

Carr and his team found that the Utron obtains energy from the outside, that is, from the atmosphere, indicating that the spatial rotation cycle of a magnetized object is related to the production of electrical energy, as he explains: [2]

> This is due to its circular motion. Electrical forces are motions where they manifest. Now we have cycles in alternating current; AC gives you 60 cycles per second; we have discovered in our experiments that there is a space cycle related to electricity, and if we join the cycle we get energy from it.

In 1958, Otis Carr published the plans of the OTC-X1 spacecraft with drawings and descriptions of the various parts that comprise it as a way of publicizing his works, to encourage public interest in his discoveries. The specifications for the Utron electric accumulators are described on the page entitled "The Geometry of Space in Fourth Dimensional Physical Form with the Revolutionary Utron Electrical Accumulator". The following statements stand out from the text:

> … One such characteristic which is basic in novel concept, and important as new and profound translation of natural physical phenomena, is one manner in which the Utron may be coil-wound to act as an armature in an activated magnetic field: The winding is begun at the Utron's conical apex, spiraled to and across its equator, and terminated at the opposite apex… As contrasted to the common conventional techniques employing looped rotating circuits, the Utron uses the full potential of the eddy currents set up at its equator on an elliptical angle of 45 degrees, thus uniting the straight lines of magnetic pressure force with motion to develop a fourth-dimensional space-time energy pattern which becomes uni-polarized in the inertial attraction of the affected mass and is actively repelled by the mass. When the equation becomes relative it is entirely released from such attraction and becomes an independent force in a universal field.

Here it is the same as in the Faraday unipolar generator, where the magnetic field acts on a rotating electrical conductive material producing electrical energy. The expression "uniting the straight lines of magnetic pressure force with motion" means that the vector of the magnetic field is perpendicular to the vector of the linear speed (tangent) of the bicone. The "eddy currents" mentioned are produced by the Lorentz force when the bicone rotates within this magnetic field, that is, the electrons in the electrolyte (metallic mercury) conduction layer are displaced to the periphery and the rotation of the device produces an electric current. The expression "uni-polarized" refers to the unipolar magnetic field, different from the multipolar motors/generators referred to in "looped rotating circuits". The expression "actively repelled by the mass" is due to the phenomenon of the Lorentz force that pushes electric charges towards the bicone equator.

The initial magnetic field is produced by the winding with biconical shape that starts at the apex of one cone and ends at the apex of the other. When the Utron is in rotation, a difference in electric potential is produced between the center and the periphery (equator) of the bicone due to the electric charges separation. The electric current, produced by the rotation of these charges, reinforces the initial magnetic field, so the fins of the bicones must be fixed such that the rotation produces a magnetic field in the right direction (defined by the right hand rule), that reinforces the original magnetic field. If the rotation is sufficient, the device enters positive feedback.

For the purposes proposed for the Utron, the electrolyte used in the hollow spherical interior of the bicone is metallic mercury (Hg), precisely used by Faraday in his first unipolar engine experiment in 1821. There are also references to a spherical Marconi dynamo based on the rotation (vortex) of metallic mercury and, as Marconi was a student of Nikola Tesla, it is to be expected that he obtained his information from the same source as Otis Carr, namely Tesla. In this way, Marconi's dynamo and Carr's Utron would have the same operating principle, as well as Dr. Korovyakov's unipolar electric motor with fluid mercury rotor.

Marconi developed the dynamo after his association with Tesla in the 1920s. It was an electric dynamo that had a hollow spherical stator, with coils wrapped around the outer surface. The sphere was partially filled with metallic mercury, which performed the function of a fluid rotor, rotating around a vertical axis (or any other).

5.1 Utron Mathematical Model

There are some principles involved in the rotation of metallic masses that have already been developed mathematically and that allow to establish the conditions that satisfy the production of energy and propulsion:

1. Gravitational field induction in the direction of the angular velocity vector, that is, its axis of rotation, described in the chapter Gravitational Potential Neutralization of the article EM-GI Propulsion Systems [4]. This subject will be discussed in the section Gravitoinercial Propulsion System below.
2. Separation of electric charges from the electrolyte when the centrifugal potential energy exceeds the energy of the first ionization potential of the atoms that make up the material, described in the chapter Separation of Electrical Charges Through Mass Rotation of the article EM-GI Propulsion Systems [4].
3. Separation of electric charges from the electrolyte when the rotating mass is subjected to a magnetic field, as a result of the Lorentz force $\vec{F} = q_E(\vec{v} \times \vec{B})$.
4. Gathering and projection of electrostatic charges from the atmosphere that flow to the magnetic vortex produced by the rotation of the magnetic field of the Utron, described in the chapter Electric Charge Gathering by Magnetic Vortex of the article Power from Electrostatic Charges [5].

5.1.1 Coil for the Utron

The coil used to produce the initial magnetic field on the Utron's bicone, and which is also used to move the ship's platforms as a motor/generator when passing through the air gap of the peripheral electromagnets, does not have a ferromagnetic core, however the surface density of the magnetic charge $B = \mu_0 H$ must be sufficient to separate the electrons from the conducting layer of the metallic mercury inside the bicone. This means that the pulsating electric current applied to the coils must be calculated for an air core coil.

Initially, we can consider the generation of a surface density of magnetic charge equivalent to a neodymium magnet (B = 1.25 T), that is, the magnetic field is approximately 1 MA/m (10^6 A/m).

The biconical shape of the coil creates difficulties in the calculation, so as an approximation, we will use the equation for calculating the magnetic field for a cylindrical coil, without introducing magnetic material:

$$NI_E = Hl \quad \Rightarrow \quad I_E = \frac{Hl}{N} = \frac{Bl}{\mu_0 N} \quad .$$

With:

N = Number of turns;
I_E = Electric current [A];
H = Magnetic field [A m^{-1}];
B = Surface density of magnetic charge [Wb m^{-2}] [T];
μ_0 = Magnetic permeability of free space = 1.2566*10^{-6} Wb A^{-1} m^{-1};
l = Coil length [m].

Example:

Biconical coil made of copper tube with 100 turns and 30 cm high.

$$I_E = \frac{Hl}{N} = \frac{10^6 * 0.3}{100} = 3,000\,A \quad .$$

With:

I_E = Electric current [A];
H = 10^6 A m^{-1};
l = 0.3 m;
N = 100.

We see that it is a very high current, which can be decreased by increasing the number of turns. The switching circuit for these coils must be properly dimensioned.

5.1.2 Separation of Electric Charges from the Electrolyte

The second and third principles of electric charges separation allow the mercury vortex to behave like an electric current loop. The high rotation of Utron, subjecting metallic mercury to the magnetic field generated by energizing the coil around the bicone, produces an electric current that reinforces the original magnetic field. The higher the rotation, the more intense the magnetic field that will induce, in the passage through the air gap of the electromagnets fixed on the external platform, an electric potential that will recharge the central battery bank.

The electric current that circulates inside the regenerative accumulators is calculated by knowing the amount of electric charges (free electrons) in the volume of liquid mercury that circulates per second in the internal vortex of the bicone. In the condition of maximum separation, when all electrons of the last electronic layer of the electrolyte atoms are rotating at the edge of the bicone equator, we will have the maximum electrical current that can be produced by Utron. Applying the equivalent electric charge formula, we have:

$$q_E = n_e\,e\,S\,l = n_e\,e\,V \quad .$$

With:

q_E = Electric charge [C];
n_e = Volumetric density of electric charges [electron m^{-3}];
e = Electric charge of electron = 1.602*10^{-19} C;
V = Volume of mercury = 4/3*πr^3 [m^3].

Applying the equivalent electric current formula, we have:

$$I_E = q_E f = n_e e V f \quad .$$

With:

   I_E = Electric current [A];
   q_E = Electric charge [C];
   f = Frequency of the rotation = $v_{RPM}/60$ [cycle s^{-1}] [Hz].

The central area of the accumulators will be subjected to 100% of the magnetic field and the outermost areas will have a magnetic field proportional to the electric currents that are inside their diameters. Applying the formula of the magnetic field without the introduction of magnetic material, we have:

$$H = \frac{I_E}{2r} \quad \Rightarrow \quad B = \mu_0 H \quad .$$

With:

   H = Magnetic field [A m^{-1}];
   B = Surface density of magnetic charge [Wb m^{-2}] [T];
   μ_0 = Magnetic permeability of free space = 1.2566*10^{-6} Wb A^{-1} m^{-1};
   I_E = Electric current [A];
   r = Average internal radius (of the electrolyte) [m].

The concentration of ions n_e (which in the case of mercury is equal to the concentration of free electrons, since each atom contributes an electron), can be computed from the density of mercury ρ_{Hg} = 13.58 g/cm^3 and its atomic mass M_{Hg} = 200.59 g/mol. Atomic mass is the mass of one mole of atoms, and with the number of Avogadro N_A = 6.022×10^{23} atom/mol, we have:

$$n_e = \rho_{Hg} \frac{N_A}{M_{Hg}} = 13.58 \frac{6.022*10^{23}}{200.59} = 4.077*10^{28} \, electron \, m^{-3} \quad .$$

Example 1:
   Utron accumulator made with electrical insulating material (nylon, celeron, bakelite etc.) with 25 cm in diameter and 25 cm in height, it has a hollow spherical center of 20 cm in diameter where metallic mercury is deposited until it fills its volume. The accumulator spin at 12,000 RPM.

Applying the equivalent electric charge formula, we have:

$$q_E = n_e e V = 4.077*10^{28} * 1.602*10^{-19} * 4.189*10^{-3} = 2.736*10^7 A$$

With:

   I_E = Electric current [A];
   n_e = 4.077*10^{28} electron m^{-3};
   e = 1.602*10^{-19} C;
   V = 4/3*πr^3 = 4/3*$\pi(0.1)^3$ = 4.189*10^{-3} m^3.

Applying the equivalent electric current formula, we have:

$$I_E = q_E f = 2.736*10^7 * 200 = 5.472*10^8 A$$

With:

   I_E = Electric current [A];
   q_E = 2.736*10^7 C;

$$f = v_{RPM}/60 = 12,000/60 = 200 \text{ Hz.}$$

Applying the formula of the magnetic field without the introduction of magnetic material, we have:

$$H = \frac{I_E}{2r} = \frac{5.472 * 10^8}{2 * 0.05} = 5.472 * 10^9 \, A\,m^{-1} \quad .$$

With:

   H = Magnetic field [A m^{-1}];
   $I_E = 5.472*10^8$ A;
   r = 0.05 m.

$$B = \mu_0 H = 1.2566 * 10^{-6} * 5.472 * 10^9 = 6.876 * 10^3 \, T \quad .$$

With:

   B = Surface density of magnetic charge [Wb m^{-2}] [T];
   $\mu_0 = 1.2566*10^{-6}$ Wb A^{-1} m^{-1};
   H = $5.472*10^9$ A m^{-1}.

In the real condition, only part of this separation will be achieved, which depends on the Lorentz's Force $\vec{F} = q_E(\vec{v} \times \vec{B})$ produced by the rotation of the electrolyte within the magnetic field of the coil. The separation of electric charges produces an electric field $\vec{E} = \vec{v} \times \vec{B}$ that can be used to calculate the amount of electric charges separated from the electrolyte, a phenomenon also known as the Hall effect. The electric field is created by a distribution of electric charges, as with capacitors, so we can determine the amount of electric charges and the electric current as a function of the rotation of the electrolyte.

The separation of electric charges in the electrolyte occurs in the direction perpendicular to the applied magnetic field and to the rotation of the bicone, therefore the charges will be displaced to the edge of the bicone equator creating a radial electric field perpendicular to the axis of rotation. In this situation, the distribution of electric charges can be approximated by that of a capacitor, whose average surface is determined by height (half the diameter of the sphere) and length (perimeter of the sphere in half the radius). The unfolding of the equations below shows this approximation:

$$\vec{D} = \varepsilon \vec{E} \quad \Rightarrow \quad D = \frac{q_E}{S} = \varepsilon E = \varepsilon \frac{V_E}{l} \quad \Rightarrow \quad q_E = \varepsilon S E = \varepsilon \frac{S}{l} V_E = C_E V_E \quad ;$$

$$\vec{E} = \vec{v} \times \vec{B} \quad \Rightarrow \quad q_E = \varepsilon S E = \varepsilon S v B \quad .$$

With:

   q_E = Electric charge [C];
   D = Surface density of electric charge [C m^{-2}];
   ε = Electric permittivity [C V^{-1} m^{-1}] [F m^{-1}];
   E = Electric field [V m^{-1}];
   V_E = Electric potential [V];
   C_E = Electric capacitance [F];
   B = Surface density of magnetic charge [Wb m^{-2}];
   v = Average linear velocity of electrolyte = $2\pi r/2 * f = \pi r \, v_{RPM}/60$ [m s^{-1}];
   S = Average surface of capacitor = r * $2\pi r/2 = \pi r^2$ [m^2];
   l = Distance [m].

The electric current is determined by the amount of electric charges calculated above and by the frequency of rotation of the electrolyte:

$$I_E = q_E f = \varepsilon S v B f \quad .$$

With:

        I_E = Electric current [A];

        q_E = Electric charge [C];

        f = Frequency of rotation = $v_{RPM}/60$ [cycle s^{-1}] [Hz].

Example 2:

        Utron accumulator made with electrical insulating material (nylon, celeron, bakelite etc.) with 25 cm in diameter and 25 cm in height, it has a hollow spherical center of 20 cm in diameter where metallic mercury is deposited until it fills its volume. The accumulator spin at 12,000 RPM and the applied magnetic is 1 MA/m (1.25 T).

        Applying the equivalent electric charge formula, we have:

$$q_E = \varepsilon S v B = 1.2566*10^{-6}*3.1416*10^{-2}*6.2832*10^{1}*1.25 = 3.100*10^{-6} C \quad .$$

With:

        q_E = Electric charge [C];

        ε = 1.2566*10^{-6} C V^{-1} m^{-1} [F m^{-1}];

        B = 1,25 Wb m^{-2};

        v = πr $v_{RPM}/60$ = 6.2832*10^{1} m s^{-1};

        S = πr^2 = 3.1416*10^{-2} m^2.

        We see that the amount of electric charge separated in the electrolyte is very small, compared to the condition of total charge separation. Applying the equivalent electric current formula, we have:

$$I_E = q_E f = 3.100*10^{-6}*200 = 6.200*10^{-4} A \quad .$$

With:

        I_E = Electric current [A];

        q_E = 3.100*10^{-6} C;

        f = $v_{RPM}/60$ = 200 cycle s^{-1} [Hz].

        It is a very small electric current, even multiplying the magnetic field and the rotation by a factor of 10, it would still fall short of the needs in relation to an increase in the initial magnetic field. There are two possibilities, the first is that the operation of the Utron does not depend on this separation of charges from the electrolyte, the second is that the coil is generating a magnetic field much more intense than that calculated to effectively separate a much larger amount of electrical charges from the electrolyte.

5.1.3 Gathering of Electrostatic Charges from the Atmosphere

        The rotating magnetic fields of the Utron displace electrostatic charges from the atmosphere and project them around the periphery, producing an electric current that also reinforces the original magnetic field. In the vicinity of Utron, the density of electrostatic charge decreases because the magnetic field always projects these charges to the periphery, but more charges from the atmosphere move to maintain density, and the cycle remains as long as the Utron rotates.

        The magnetic vortex of each of the six Utrons distributed on the internal platform collects and projects the electrostatic charges from the atmosphere directly onto the capacitor plates. The

biconic shape of the Utron causes these charges to be projected by their equator and reach the upper part of the capacitor plate on the right and the lower part of the capacitor plate on the left of each Utron. Thus, all capacitor plates receive the same amount of electrostatic charges (called Carr of neutral conductance) which, when accumulated in large quantities, ionize the plates. They also produce a high electric current with the rotation of the platform and, therefore, a high magnetic field in the spin center of the platforms.

        In addition, the rotating movement of the inner platform where the Utrons are located displaces their magnetic fields around the spin center and also displaces a very large amount of electrostatic charges from the atmosphere around the disk that, as commented by technician Ring, makes the hull of the ship to behave like jelly (by absorbing these charges and altering its atomic structure).

        The mathematical development for calculating the gathering and projection of electrostatic charges is already carried out in the chapter Electric Charge Gathering by Magnetic Vortex of the article Power from Electrostatic Charges [5]. In the example below we will use the equations already demonstrated.

Example:
        Utron accumulator with 25 cm in diameter and 25 cm high, has an initial magnetic field H = 1 MA/m applied by its coil. The accumulator spin speed is 12,000 RPM.

        The approximate amount of electrostatic charge that is under the influence of the magnetic field will be estimated by the volume of the cylinder minus the volume of the bicone:

$$q_E = n_e\, e\, V = 4*10^{25}*1.602*10^{-19}*8.181*10^{-3} = 5.243*10^4\, C \quad .$$

With:

        q_E = Electric charge [C];
        n_e = Volumetric density of electric charge of the atmosphere = $4*10^{25}$ electron m^{-3};
        e = $1.602*10^{-19}$ C;
        V = Volume = $2/3*\pi r^2*h = 2/3*\pi*0.125^2*0.25 = 8.181*10^{-3}$ m^3.

        The initial surface density of magnetic charge is:

$$B = \mu_0 H = 1.2566*10^{-6}*10^6 = 1.2566\, T \quad .$$

With:

        B = Surface density of magnetic charge [Wb m^{-2}] [T];
        μ_0 = $1.2566*10^{-6}$ Wb A^{-1} m^{-1};
        H = 10^6 A m^{-1}.

        The average linear speed of the bicone rotation is taken at the average radius and it will be considered the velocity of atmospheric air inside the magnetic field of the Utron coil:

$$\omega = \frac{2\pi}{60}v_{RPM} \quad \Rightarrow \quad \bar{v} = \omega\frac{r}{2} = \frac{2\pi}{60}v_{RPM}\frac{r}{2} = \frac{\pi}{60}v_{RPM}r = \frac{\pi}{60}12{,}000*0.125 = 78.54\, m\, s^{-1} \quad .$$

With:

        $\bar{v}$ = Average velocity [m s^{-1}];
        v_{RPM} = Spin velocity = 12,000 RPM;
        r = bicone radius = 0.125 m.

        The force on the electrostatic charge is:

$$F = e\,v\,B = 1.602 * 10^{-19} * 78.54 * 1.2566 = 1.579 * 10^{-17} N \quad .$$

With:

        F = Force [N];
        e = $1.602 * 10^{-19}$ C;
        v = 78.54 m s^{-1};
        B = 1.2566 T.

The acceleration of charges is defined as a function of its mass:

$$a = \frac{F}{m_e} = \frac{1.579 * 10^{-17}}{9.109 * 10^{-31}} = 1.733 * 10^{13} m\,s^{-2} \quad .$$

With:

        a = Acceleration [m s^{-2}];
        F = $1.579 * 10^{-17}$ N;
        m_e = Mass of electron = $9.109 * 10^{-31}$ kg.

$$t_1 = \sqrt{\frac{l_m}{a}} = \sqrt{\frac{0.0625}{1.733 * 10^{13}}} = 6.01 * 10^{-8} s \quad .$$

With:

        t_1 = Acceleration time [s];
        l_m = Magnetic field length (half radius) = 0.0625 m;
        a = $1.733 * 10^{13}$ m s^{-1}.

Charges velocity after acceleration:

$$v_o = \sqrt{a\,l_m} = \sqrt{1.733 * 10^{13} * 0.0625} = 1.04 * 10^{6} m\,s^{-1} \quad .$$

$$t_2 = \frac{d_2}{v_o} = \frac{0.5}{1.04 * 10^{6}} = 4.81 * 10^{-7} s \quad .$$

With:

        t_2 = Constant velocity time [m s^{-1}];
        d_2 = Distance between Utron and capacitor plate $\approx$ 0.5 m;
        v_o = $1.04 * 10^{6}$ m s^{-1}.

The average time of the charge path from the center of the magnetic field to the capacitor plates is:

$$t = t_1 + t_2 = 6.01 * 10^{-8} + 4.81 * 10^{-7} = 5.41 * 10^{-7} s \quad .$$

The amount of electric charges that each capacitor plate receives per second is:

$$I_E = \frac{q_E}{t} = \frac{5.243 * 10^{4}}{5.41 * 10^{-7}} = 9.69 * 10^{10} C\,s^{-1} \quad .$$

This is just an estimate of the amount of electric charges projected by a small Utron unit that has an initial magnetic field corresponding to a common magnet. It is clearly defined why the name of the plates is "capacitor plates", because these plates accumulate lots of electric charges. In operation, this magnetic field is greatly amplified, which makes this device very suitable as an energy generator.

6 Peripheral Magnetic System

The peripheral magnetic system consists of two parts:
1. A set of six Utron regenerative accumulators that rotate in counter-rotation with their axis of rotation at 45° from the vertical, distributed 60° from each other around the perimeter of the internal platform, that rotates in direct rotation;
2. A set of twelve electromagnets distributed at 30° from each other around the perimeter of the external structure of the disc that rotates in counter-rotation near the ship's hull.

The shape of the twelve electromagnets fixed on the external structure of the hull is similar to a horseshoe, or also, like the "C" cores of transformers. A coil of enameled copper wire is wound around the central leg of each core and the Utron accumulators pass through the core air gap, which, because of their magnetic fields, induce an electric potential in the electromagnetic coils. Of the twelve electromagnets, only six are energized at a time in the passage of the six accumulators, therefore, we have two circuits lagged by 30°. In the beginning, the system works as a motor but, after a certain rotation, it function as a self-sustaining generator, supplying energy to recharge the central battery.

A consequence of the shape of the Utron accumulators is that, when the system works as a generator, only a fraction of the magnetic field produced by them is transferred to the core of the electromagnets in the periphery. This is necessary because its magnetic fields become very intense and could saturate the core.
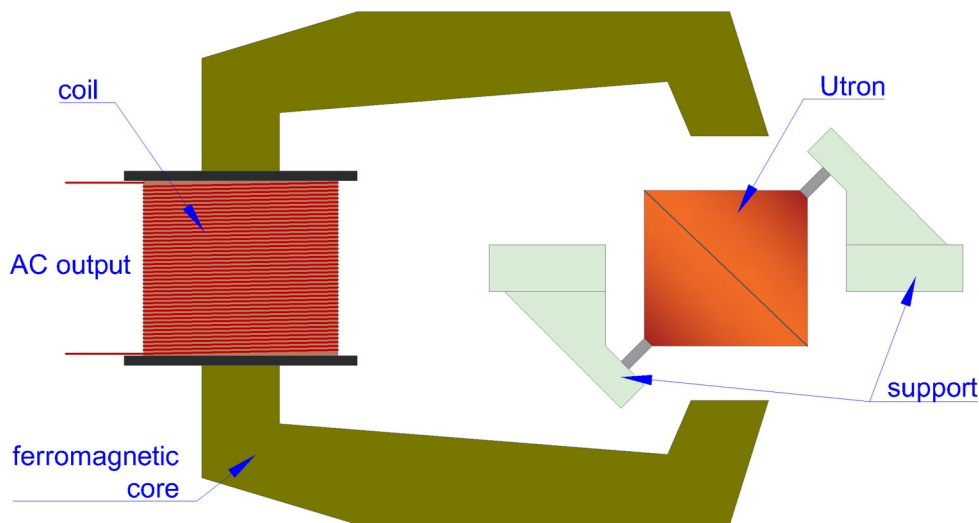

Figure 7: Utron device inside transformer air gap.

When the Utron accumulator pass in the air gap of the core, there is a sinusoidal variation in the surface density of the magnetic charge of the core that induces an electric potential inversely proportional to the time of this variation (magnetic induction). The electric potential induced in each coil will be proportional to the number of coil turns:

$$f = 1/t \quad , \quad q_M = B S \quad \Rightarrow \quad V_E = -N \frac{dq_M}{dt} = -N S \frac{dB}{dt} = -N S B f \quad .$$

With:

V_E = Electric potential [V];
N = Number of coil turns;

q_M = Magnetic charge [Wb];
B = Surface density of magnetic charge [Wb m^{-2}] [T];
S = Core section area [m^2];
t = Time of senoidal wave [s];
f = Frequency of senoidal wave [cycles s^{-1}] [Hz].

Each accumulator that passes through the air gap of the ferromagnetic core induces an electric potential in the coil, so the frequency of the sine wave will be multiplied by the number of accumulators that pass through the core:

$$f = N_r \frac{v_{RPM}}{60} \quad .$$

With:

f = Frequency of induced sinusoidal electrical potential [Hz];
N_r = Number of accumulators;
v_{RPM} = Translation speed of rollers around the plate [RPM].

As an example, in each coil, with 6 accumulators surrounding the platform, it will be induced a sine wave of frequency equivalent to:

$$f = 6 * \frac{v_{RPM}}{60} = \frac{v_{RPM}}{10} \, Hz \quad .$$

The energy that can be extracted depends on the magnetic energy density of each accumulator and their magnetic volume, and corresponds to the energy of the magnetic field:

$$U = \frac{1}{2} B H S d = \frac{1}{2} \frac{B^2}{\mu} S d \quad .$$

With:

U = Energy [J];
B = Surface density of magnetic charge of the accumulator [Wb m^{-2}] [T];
H = Magnetic field intensity of the accumulator [A m^{-1}];
μ = Magnetic permeability of the accumulator [Wb A^{-1} m^{-1}] [H m^{-1}];
S = Magnetic surface of the accumulator [m^2];
d = High of the accumulator [m].

The passage of each accumulator through the peripheral coils determines a frequency that defines the electrical power that can be extracted from the set of accumulators in one coil:

$$P = U f = \frac{1}{2} \frac{B^2}{\mu} S d f \quad .$$

With:

P = Power [W];
U = Energy [J];
f = Frequency of induced sinusoidal electrical potential [Hz].

If the device has 12 coils, we will have 12 times this power. The calculation of each coil follows the conventional procedure for calculating transformers. The classic formula for calculating transformers is:

$$N = \frac{V_E}{4,44 \, B_{MAX} \, S f} \quad .$$

With:

      N = Number of coil turns;

      V_E = Electric potential (RMS) applied to coil [V];

      B_{MAX} = Maximum surface density of magnetic charge of ferromagnetic core [Wb m^{-2}] [T];

      S = Core section area [m^2];

      f = Operating frequency [Hz].

Example:

      Six Utron accumulators made with electrical insulating material (nylon, celeron, bakelite, etc.) with a diameter of 1 m and a height of 1 m, have a hollow spherical center of 0.8 m in diameter where metallic mercury is deposited until filling its volume. An intricate coil of enameled copper wire is wound on the outer surface starting at the apex of one cone and ending at the apex of the other cone. The final rotation of each accumulator is 12,000 RPM.

      In the outer perimeter, 12 electromagnets in "C" shape are made of ferromagnetic material (silicon steel sheets) with a relative magnetic permeability of 4,000, withstand a surface density of magnetic charge (magnetic induction) of 1.2 T [Wb/m^2]. Their air gaps have a height of 1 m and a square section of 20 x 20 cm. In this condition, when the accumulators pass through the air gap, there will be spaces of 15 cm above and below.

      The relative rotation between the internal platform (where the accumulators are) and the external platform (where the electromagnets are) is 24,000 RPM. The output voltage of each coil is 12,000 Volts and only six electromagnets are energized at a time in the passage of the six accumulators, therefore, we have two 30° lagged circuits, which are used as a motor and, after reaching self-sustained speed, work as generator. The coils are connected in parallel to supply the central battery of the disc.

      The electric current that circulates inside the regenerative accumulators is calculated by the amount of electric charges (free electrons) of the volume of liquid mercury that circulates per second. The mathematical development to calculate this field was done in the section Rotation of Volumetrically Charged Masses of the article EM-GI Propulsion Systems [4]. Applying the equivalent electric current formula, we have:

$$I_E = n_e \, e \, V f = 4.077 * 10^{28} * 1.602 * 10^{-19} * 8.533 * 10^{-2} * 200 = 1.115 * 10^{11} \, A$$

With:

      I_E = Electric current [A];

      n_e = Volumetric density of electric charge = $4.077*10^{28}$ electron m^{-3};

      e = Electric charge of electron = $1.602*10^{-19}$ C;

      V = Volume of mercury = $4/3*\pi r^3 = 4/3*\pi(0.4)^3 = 8.533*10^{-2}$ m^3;

      f = Frequency of rotation = $v_{RPM}/60$ = 12,000/60 = 200 Hz.

      The central area of the accumulators will be subjected to 100% of the magnetic field and the outermost areas will have a magnetic field proportional to the electric currents that are within their diameters. Applying the formula of the magnetic field without the introduction of magnetic material, we have:

$$H = \frac{I_E}{2r} = \frac{1.115 * 10^{11}}{2 * 0.5} = 1.115 * 10^{11} \, A m^{-1} \quad .$$

With:

      H = Magnetic field [A m^{-1}];

$I_E = 1.115*10^{11}$ A;

r = Internal radius = 0.5 m.

$$B = \mu_0 H = 1.2566*10^{-6}*1.115*10^{11} = 1.401*10^5\,T \quad .$$

With:

B = Surface density of magnetic charge [Wb m^{-2}] [T];

$\mu_0 = 1.2566*10^{-6}$ Wb A^{-1} m^{-1};

H = $1.115*10^{11}$ A m^{-1}.

The frequency of the electric potential induced by the passage of six accumulators is calculated by:

$$f = 6\,\frac{v_{RPM}}{60} = 6\,\frac{24,000}{60} = 2,400\,Hz \quad .$$

With:

f = Frequency of sinusoidal wave [Hz];

v_{RPM} = 24,000 RPM.

Only a fraction of the calculated magnetic field will induce electric potential in the electromagnetic coils and the 15 + 15 cm air gap ensures that the core material does not saturate, so we will consider that the value of B does not exceed the maximum value allowed by the ferromagnetic cores. Coil calculation:

$$N = \frac{V_{RMS}}{4.44\,B_{MAX}\,S f} = \frac{12,000}{4.44*1.2*4*10^{-2}*2,400} = 23.46 \approx 24\,turns$$

With:

N = Number of coil turns;

V_{RMS} = 12,000 V;

B_{MAX} = 1.2 T;

S = 400 cm^2 = $4*10^{-2}$ m^2;

f = 2,400 Hz.

The electrical power delivered by the external magnetic system (Utron accumulators + electromagnets) can be evaluated by the magnetic energy produced by the Utron accumulators. The amount of magnetic field that induces electric potential in the electromagnetic coils is proportional to the area of the core section relative to the area of the circumference of the accumulators. As the current turns in the liquid metal are at varying distances from the axis of rotation of the accumulators, the magnetic field tends to be larger on the axis than on the periphery. Therefore, if the accumulators pass through the air gap in an average position between the axis and the periphery, we will have an average magnetic field smaller than the calculated total. The list of areas is:

1. Core section area = $4*10^{-2}$ m^2;
2. Accumulator circumference area = $\pi r^2 = \pi(0.5)^2 = 5.854*10^{-1}$ m^2.

Considering that the difference in the areas is approximately 20 times and that the magnetic field is smaller than calculated, we will approximate the reduction of the field to 100. The amount of energy in the magnetic field that passes through the air gaps is given by:

$$U = \frac{1}{2}\mu_0 H^2 V = \frac{1}{2}1.2566*10^{-6}*(1.115*10^9)^2*2.8*10^{-2} = 2.187*10^{10}\,J \quad .$$

With:

U = Energy [J];
μ_0 = 1.2566*10^{-6} Wb A^{-1} m^{-1};
H = 1.115*10^9 A m^{-1};
V = Magnetic field volume = A*l = 4*10^{-2} * 0.7 = 2.8*10^{-2} m^3.

The available electrical power of the magnetic field that can be extracted from each coil in the passage of the six accumulators is:

$$P = U f = 2.187 * 10^{10} * 2,400 = 5.249 * 10^{13} W \quad .$$

With:

P = Electrical power [W];
U = 2.187*10^{10} J;
f = 6*24,000/60 = 2,400 Hz.

All this power will not be available on electromagnets because there are limitations related to the materials used, however, it is an available power that can be used when magnetic materials with very high permeability are developed.

7　Magnetic Propulsion System of Capacitor Plates

The capacitor plate system has the purpose of storing a high amount of electrical particles (called neutral conductance by Carr) using so-called atmospheric electricity. In working condition, the plates become ionized and have a corona-like effect with a very soft bluish-green luminescence, as stated by Carr when asked if the disk gets warm because its high rotation: [2]

> No, it won't because it has its own protection field which is its electromagnetic actuation. We described it as a self-contained unit. This ionization of the capacitor plates sets up a glow brilliantly with a very soft luminescent light.
> …
> It would be in the nature of blue-green or very similar to the electric arc you see in welding. This is the field we are testing. It does not have a heat barrier in forward velocity at all. This electromagnetic field is being tested out now in conventional aircraft and proved very efficient.

The luminescence observed is due to the projection of electrostatic charges and ions to the periphery of the craft, which ionizes the atmospheric air and, due to the low pressure of the ionized air, presents the corona effect, similar to that observed in evacuated tubes.

We saw above that the capacitor plates are charged by atmospheric electricity, so that they absorb and accumulate the electrostatic charges deflected by the equipment. The accumulation of charges makes the plates superconducting and multiplies the intensity of the magnetic field created on the central axis of the craft, as we saw in the chapter Magnetic Propulsion Through Mass Rotation of the article EM-GI Propulsion Systems [4]. There are two ways of absorbing electrostatic charges:

1. Each of the six rotating Utron generators produces a 45° inclined magnetic field that deflects the electrostatic charges from the atmosphere and rotates them around their circumference, so these charges collide with the adjacent capacitor plates;
2. The central magnetic field produced in the form of a vortex deflects the electrostatic charges from the atmosphere and projects them from the center to the periphery of the craft. In this path, the charges collide with the capacitor plates.

In this way, the capacitor plates in high rotation speed, having excess electric charges, behave like a high-intensity electric current, sufficient to create an intense vertical magnetic field on the craft axis that repulses the vertical component of the terrestrial magnetic field and allows the craft to float magnetically in the atmosphere.

Example:

Internal platform with a diameter of 15 m, central battery diameter of 3 m, with six metal capacitor plates folded in "C" format, so that their surface doubles. The capacitor plates have a length of 5 m, an external width of 3 m and an internal width of 2 m. The thickness of these plates is 10 mm and the material is copper. The platform rotates at 12,000 RPM. We will consider that the capacitor plates absorb an additional electrostatic charge that multiplies the free electrons density of copper by 1,000, that is, the plates become superconducting.

Applying the equivalent electric current formula, we have:

$$I_E = n_e e \, S l f = 8.46 * 10^{31} * 1.602 * 10^{-19} * 150 * 10^{-2} * 200 = 4.066 * 10^{15} A \quad .$$

With:

I_E = Electric current [A];
n_e = Volumetric density of electric charge = $8.4538 * 10^{31}$ electron m^{-3};
e = Electric charge of electron = $1.602 * 10^{-19}$ C;
S = Area of plates = 6 * 2 (5 * 2.5) = 150 m^2;
l = Plate thickness = 10^{-2} m;
f = Rotation frequency = $v_{RPM}/60$ = 12,000/60 = 200 Hz.

The central area of 5 m radius will be subjected to 100% of the magnetic field and the outermost areas will have a magnetic field proportional to the electric currents that are within their diameters. Applying the formula of the magnetic field without the introduction of magnetic material, we have:

$$H = \frac{I_E}{2r} = \frac{4.066 * 10^{15}}{2 * 2.5} = 8.132 * 10^{14} \, A \, m^{-1} \quad .$$

With:

H = Magnetic field [A m^{-1}];
I_E = Electric current = $4.066 * 10^{15}$ A;
r = Internal radius = 2.55 m.

$$B = \mu_0 H = 1.2566 * 10^{-6} * 8.132 * 10^{14} = 1.022 * 10^9 T \quad .$$

With:

B = Surface density of magnetic charge or magnetic induction [Wb m^{-2}] [T];
μ_0 = Magnetic permeability of atmosphere = $1.2566 * 10^{-6}$ Wb A^{-1} m^{-1};
H = $8.132 * 10^{14}$ A m^{-1}.

The repulsion force between the magnetic field created in the center of the ship and the vertical component of the terrestrial magnetic field is:

$$F = q_M H = B S H = 10^{-9} * 19.635 * 8.132 * 10^{14} = 1.597 * 10^7 N \quad .$$

With:

F = Repulsion force [N];
B = Vertical component of terrestrial surface density of magnetic charge = 10^{-9} T;
S = Area submitted to the magnetic field = $\pi r^2 = \pi(2.5)^2$ = 19.635 m^2;

$H = 8.132*10^{14}$ A m^{-1}.

The amount of gravitational charge (mass) that can be levitated with this force is:

$$q_G = \frac{F}{G} = \frac{1.597*10^7}{9.80665} = 1.628*10^6 \, kg \quad .$$

With:

q_G = Gravitational charge (mass) [kg];
F = 1.597*10^7 N;
G = Terrestrial gravitational field [N kg^{-1}] = g = gravitational acceleration = 9.80665 m s^{-2}.

8   Gravitoinertial Propulsion System

The theoretical development that allows to neutralize the gravitational attraction in function of the speed of an object was made in the chapter Gravitational Neutralization of the article Inertial Field [3], by analogy to the balance of forces that keeps a satellite in orbit on the planet. This gravitational neutralization was further studied in the section Gravitational Potential Neutralization in the article EM-GI Propulsion Systems [4]. We saw that when an object is in high rotation, it is possible to overcome the planet's gravitational force, and we performed calculations that allow quantifying this phenomenon, known as the gyroscopic effect.

If the external platform rotates at high speed, it can help neutralize the weight of the discoid craft considering that the inertial current is the square of the speed and this induces a gravitational potential. The equations are:

$$I_I = v^2 = \omega^2 r^2 = \frac{\omega^2}{2}\left(r_2^2 - r_1^2\right) = V_G \quad \Rightarrow \quad \omega = \sqrt{\frac{2V_G}{r_2^2 - r_1^2}} \quad .$$

With:

I_I = Inertial current [m^2 s^{-2}];
ω = Angular speed of object [rad s^{-1}];
r_1 = Internal radius of object [m];
r_2 = External radius of object [m];
V_G = Gravitational potential [m^2 s^{-2}].

The gravitational potential on the planet's equatorial surface is:

$$V_G = k_g \frac{Q_G}{R} = 6.6739*10^{-11}\frac{5.976*10^{24}}{6.378*10^6} = 6.253*10^7 \, m^2 s^{-2} \quad .$$

With:

V_G = Gravitational potential [N m kg^{-1}] [m^2 s^{-2}];
k_g = Universal gravitational constant = 6.6739*10^{-11} N m^2 kg^{-2} [m^3 kg^{-1} s^{-2}];
Q_G = Gravitational charge (mass) of the Earth = 5.976*10^{24} kg;
R = Equatorial radius of Earth = 6.378*10^6 m.

In the case of a discoid craft, in which the total weight is greater than the weight of the rotating mass, we must calculate the additional gravitational potential by matching the inertial energy of the amount of rotating gravitational charge with the gravitational energy of the total gravitational charge of the device:

$$U = q_{G1} V_{G1} = q_{G1} I_I = q_{G1} \frac{\omega^2}{2} (r_2^2 - r_1^2) = q_{G2} V_G \quad \Rightarrow \quad \omega = \sqrt{\frac{2V_G}{r_2^2 - r_1^2} \frac{q_{G2}}{q_{G1}}} = \sqrt{\frac{2k_g}{(r_2^2 - r_1^2) R} \frac{Q_G q_{G2}}{q_{G1}}} \quad .$$

With:

       U = Energy [J];

       q_{G1} = Rotating gravitational charge [kg];

       q_{G2} = Total Gravitational charge [kg];

       V_{G1} = Gravitational potential of the rotating object [m^2 s^{-2}];

       V_G = Gravitational potential of the planet [m^2 s^{-2}];

       I_I = Inertial current of the rotating object [m^2 s^{-2}];

       ω = Angular speed of the object [rad s^{-1}];

       r_1 = Internal radius of platform [m];

       r_2 = External radius of platform [m].

Example:

       A discoid flying saucer is constructed with an external platform 15 m in diameter with 25,000 kg of total mass. The mass of the external platform that turns in counter-rotation, due to the weight of the electromagnets, is 6,000 kg, distributed in the last meter of the ship's radius. Calculate the speeds to cancel 30% and 100% of the total weight.

       In the case of eliminating 30% of the weight we have:

$$\omega = \sqrt{\frac{2k_g}{(r_2^2 - r_1^2) R} \frac{Q_G q_{G2}}{q_{G1}}} = \sqrt{\frac{2*6.674*10^{-11}}{(15^2 - 14^2) 6.378*10^6} 0.3 \frac{5.976*10^{24}*25,000}{6,000}} = 2.322*10^3 \, rad \, s^{-1} \quad .$$

$$v_{RPM} = \frac{60}{2\pi} \omega = \frac{60}{2\pi} 2.322*10^3 = 2.22*10^4 \, RPM \quad .$$

With:

       v_{RPM} = Rotation speed [RPM];

       q_{G1} = Rotating gravitational charge = 6,000 kg;

       q_{G2} = Total Gravitational charge = 25,000 kg;

       r_1 = Internal radius of platform = 14 m;

       r_2 = External radius of platform = 15 m;

       k_g = Universal gravitational constant = 6.6739*10^{-11} N m^2 kg^{-2} [m^3 kg^{-1} s^{-2}];

       Q_G = Gravitational charge (mass) of the Earth = 5.976*10^{24} kg;

       R = Equatorial radius of Earth = 6.378*10^6 m.

       In the case of eliminating 100% of the weight we have:

$$\omega = \sqrt{\frac{2k_g}{(r_2^2 - r_1^2) R} \frac{Q_G q_{G2}}{q_{G1}}} = \sqrt{\frac{2*6.674*10^{-11}}{(15^2 - 14^2) 6.378*10^6} \frac{5.976*10^{24}*25,000}{6,000}} = 4.239*10^3 \, rad \, s^{-1} \quad .$$

$$v_{RPM} = \frac{60}{2\pi} \omega = \frac{60}{2\pi} 4.239*10^4 = 4.05*10^4 \, RPM \quad .$$

9 Artificial Gravity System

       We know that the counter rotation of the internal and external platforms maintain the cabin stationary. But there is the counter rotation of the Utrons devices mounted on the direct rotation

internal platform, so we have two masses at opposite rotations. In the chapter Gravitational Potential Neutralization of the article EM-GI propulsion Systems [4], we developed a mathematical approach for the induction of a gravitational potential with the rotation of masses, so with two masses at opposite rotations we have, at the meeting point of these two gravitational fields, an artificial gravitational center.

On the internal platform that rotates in direct rotation, in addition to the capacitor plates, there are six Utron accumulators that rotate in counter rotation. These opposite rotations allow the formation, in the axis of rotation of the platform and the Utrons, a center of gravitational attraction to which the ship and everything under the influence of this gravitational field will be pushed. In the axis of rotation of the internal and external platforms that rotate in opposite rotations, a gravitational center of less intensity also forms. It is what we can call artificial gravity.

The gravitational center is proportional to the amount of inertial energy of the same amount for opposite rotations, that is, the amount of inertial energy that one platform has more than the other will result in a gravitational force in that direction.

The gravitational potential associated with this gravitational center is calculated from the same equations already seen:

$$I_I = v^2 = \omega^2 r^2 = \frac{\omega^2}{2}\left(r_2^2 - r_1^2\right) = V_G \quad \Rightarrow \quad U = q_G V_G = q_G I_I = q_G \frac{\omega^2}{2}\left(r_2^2 - r_1^2\right) \quad .$$

With:

I_I = Inertial current [m^2 s^{-2}];
ω = Angular velocity of object [rad s^{-1}];
r = Distance from object to spin center [m];
r_1 = Internal radius of platform [m];
r_2 = External radius of platform [m];
V_G = Gravitational potential [m^2 s^{-2}];
U = Energy [J];
q_G = Rotating gravitational charge [kg].

On the other hand, considering what was exposed in the article Gravitational Charge [6], the energy associated with a gravitational field may be expressed by:

$$u = \frac{1}{2}\gamma_0 G^2 \quad \Rightarrow \quad U = \frac{1}{2}\gamma_0 G^2 V \quad .$$

With:

u = Volumetric density of energy [J m^{-3}];
U = Energy [J];
γ_0 = Gravitational permeability of vacuum = 1.19230*10^9 [kg^2 N^{-1} m^{-2}];
G = Gravitational field [N kg^{-1}] = acceleration [m s^{-2}];
V = Volume of the gravitational field [m^3].

Matching the two energies, we can estimate the value of the artificial gravitational field produced by the rotation of a quantity of gravitational charge (mass):

$$U = q_G(\omega r)^2 = q_G \frac{\omega^2}{2}\left(r_2^2 - r_1^2\right) = \frac{1}{2}\gamma_0 G^2 V \quad \Rightarrow \quad G = \sqrt{\frac{2U}{\gamma_0 V}} = \sqrt{\frac{2q_G}{\gamma_0 V}(\omega r)^2} = \sqrt{\frac{q_G}{\gamma_0 V}\omega^2\left(r_2^2 - r_1^2\right)} \quad .$$

Example:

A flying saucer is built with an internal platform of 12 m in diameter with six Utrons evenly distributed at 60° from each other around the circumference. According to the original design, the

Utrons are mounted at an angle of 45° in relation to the central axis of the craft. Their centers are 4 m away from the axis and each Utron has a mass of 200 kg with a diameter and height of 50 cm. Its counter-rotation is such that it balances the direct rotation of the platform, which is 24,000 RPM.

The inertial energy of the set is given by:

$$U = q_G(\omega r)^2 = 1,200 * (2.513 * 10^3 * 4)^2 = 1.2125 * 10^{11} J \quad .$$

With:

U = Energy [J];
q_G = 6*200 = 1,200 kg;
$\omega = 2\pi/60 \ v_{RPM} = 2\pi/60 * 24.000 = 2.513 * 10^3$ rad s^{-1};
r = 4 m.

To simplify the calculations, we will estimate that the volume occupied by the gravitational field projected at 45° is given by the sum of six cylinders with the same diameter and height as the Utrons.

$$G = \sqrt{\frac{2U}{\gamma_0 V}} = \sqrt{\frac{2 * 1.2125 * 10^{11}}{1.19230 * 10^9 * 9.817 * 10^{-2}}} = 45.517 \, N \, kg^{-1} = 45.517 \, m \, s^{-2} \quad .$$

With:

G = Gravitational field [N kg^{-1}] = acceleration [m s^{-2}];
U = 1.2125*10^{11} J;
γ_0 = 1.19230*10^9 [kg^2 N^{-1} m^{-2}];
V = 6*πr^2*h = 6*π(0.25)^2*0.5 = 9.817*10^{-2} m^3.

This gravitational field value occurs within the volume occupied by both opposite fields, which is formed 4 meters above the platform. The above value is sufficient to overcome the strength of the Earth's gravitational field and transport everything inside the ship without the effects of inertia.

A gravitational field is also formed inside the ship centered on the axis of rotation of the two platforms that rotate in opposite directions. The volume occupied by the opposite gravitational fields is determined by the height of the craft (here estimated in 3 meters) and the area of the circumference whose radius is the distance from the Utrons to the center of rotation (4 meters in this example).

$$G = \sqrt{\frac{2U}{\gamma_0 V}} = \sqrt{\frac{2 * 1.2125 * 10^{11}}{1.19230 * 10^9 * 1.508 * 10^2}} = 1.161 \, N \, kg^{-1} = 1.161 \, m \, s^{-2}$$

With:

G = Gravitational field [N kg^{-1}] = acceleration [m s^{-2}];
U = 1.2125*10^{11} J;
γ_0 = 1.19230*10^9 [kg^2 N^{-1} m^{-2}];
V = πr^2*h = π(4)^2*3 = 1.508*10^2 m^3.

10 Conclusion

We see that the "Amusement Device" patented by Otis Carr is a description of the complete schematic and parts for a flying saucer based on rotating devices. Its fundamental Utron device is an application for the Faraday's disc, geometrically adapted to function as an energy generator and magnetic propulsion device. There is a lot of genius in this project.

The central energy of the project, that starts the opposed rotation of two platforms, is a set of batteries housed inside an Utron device that function as a generator and produces an intense magnetic field in the center of the craft. Initial calculations with modest dimensions for this field gave B = 10^6 T, more than sufficient to recharge the central set of batteries.

The peripheral magnetic system, composed of six Utron devices that pass through the air gap of the external electromagnetic coils, can work as motor or generator. Each Utron device is a unipolar generator with rotating metallic mercury inside it. Its dimensions, for a craft, can release an excess of energy of 10^{10} J and, depending on rotation, a power of 10^{13} W, with first approximations, although only part of this is necessary to power up the entire craft electrical systems.

The metallic capacitor plates distributed in the perimeter of the internal platform accumulate electrostatic charges projected radially and change its atomic structure to become a superconductor. This makes it possible the magnetic buoyancy with the created magnetic field and the terrestrial magnetic field. First calculations shows that it is possible to neutralize the weight of 10^6 kg.

The mass of the external platform in rotation may be used to give gyroscopic propulsion, and simple calculations with a 15 m in diameter craft gave the possibility to neutralize the weight of its 25 tons with $4*10^5$ RPM. This is a good result for simple mass rotation.

The possibility to create an artificial gravitational center considering the opposed rotation of two masses showed that the Carr's craft used this method as a gravitational shield, to overcome any external gravitational field, turning the craft as a little planet with its own gravity center.

It was demonstrated that the technology developed by Otis Carr is complete, that is, it is able to produce energy and propulsion for flying saucers with actual and already established technology. There is no need for any type of fuel other than what nature itself freely gives.

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