International Journal of Engineering Science Invention (IJESI)
ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726
www.ijesi.org ||Volume 7 Issue 1|| January 2018 || PP. 37-39

If The Rechargeable Battery Has Run out, Recharge It with A 12V 1.5 A Charger.

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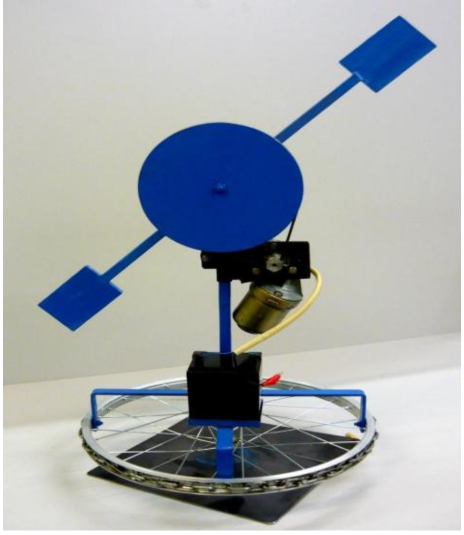
Date of Submission: 12-01-2018 Date of acceptance: 24-01-2018

Bölcsföldi-Footstool
The Demonstration of the Conservation of The Amount of Rotation
Motto: The presence of humans in the universe is temporary. Nevertheless, the laws of the universe are eternal.
The law of conservation of the amount of rotation
If the sum of torques of external forces that are applied to the axis of rotation equals zero, then $N=\theta.\omega$ is constant, where θ is the moment of inertia of the rotating system, ω is the angular speed of rotation, and N is theamount of rotation of the system.

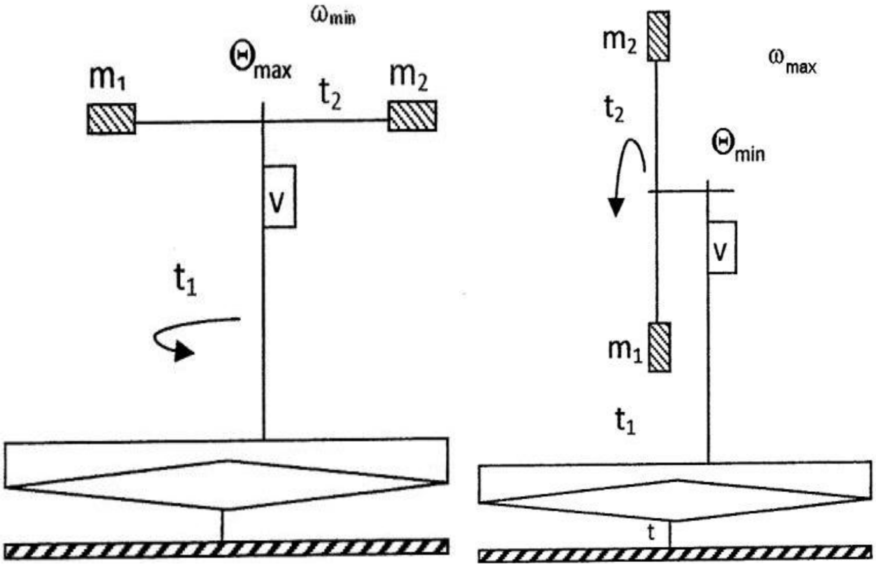
Traditional demonstration

A human is standing or sitting on a rotating footstool. If he moves the masses in his hand towards the axis of rotation, the moment of inertia of the system will decrease, as the moment of inertia of a mass point is proportional to $m.r^2$, and the angular speed of rotation will increase. If the human his arms stretched out moves the masses away from the axis of rotation, the moment of inertia of the system will increase, and the angular speed of rotation will decrease. This demonstration is justifiable, as both the living human and the lifeless footstool obey the law of conservation of the amount of rotation. The presence of humans in the universe is nevertheless temporary. Before the appearance of mankind every rotating movement – for instance rotation of planets, stars etc. – took place over millions of years (and takes place even today) strictly according to the law of conservation of the amount of rotation. If, for example, the fusion fuel of a star runs out, and consequently, the outward fusion pressure ceases, the star collapses as a result of gravity.

If the size of a star decreases to the ten-thousandth part in case of such a collapse, the angular speed of rotation will increase hundred-million times (white dwarfs, neutron stars, black holes). Consequently, there must be a device which demonstrates the law of conservation of the amount of rotation without human involvement.
Bölcsföldi-footstool: Demonstration of the conservation of the amount of rotation entirely eliminating human involvement.



a) **b)**



Parts of the demonstration device

Static pedestal, which can be, for example, an iron plate.

Rotating footstool, which rotates around the vertical axis of rotation (t_1) with a minimal friction. (That can be e. g. the front wheel of a children's bicycle.) The endpoint of the axis of the wheel is attached to the centre of the pedestal.

Internal rotating subsystem: It consists of masses m_1 and m_2, and the thin rod connecting them. It is installed to the rotating part of the footstool so that it is able to rotate around the horizontal axis of rotation (t_2). $m_1=m_2$.

Electric motor [V] functioning with a 12 volt rechargeable battery: It rotates the internal rotating subsystem around the horizontal axis of rotation (t_2) evenly.

Functioning of the system

The mass of the whole system is constant.

The moment of inertia related to the axis t_1 consists of a constant and a variable part. The constant part of the moment of inertia is due to the axis t_1 related moments of inertia of the electric motor, battery, supporting pillar and bicycle parts.

The variable part of the moment of inertia is due to the axis t_1 related moments of inertia of the internal rotating subsystem, which evenly rotates around the horizontal axis t_2. If the variable part of the moment of inertia of the whole system is significantly bigger than the constant part of the moment of inertia of the system, the whole system will rotate in a discontinuous way around axis t_1.

If the variable part of the moment of inertia of the whole system is significantly smaller than the constant part of the moment of inertia, the small variable moment of inertia cannot modify the moment of inertia of the whole system to the required extent. Therefore, the change of the angular speed cannot possibly be perceived either. The proper balance can be achieved through the change of the masses m_1 and m_2, and as a result through the change of the axis t_1 related moment of inertia of the whole system. The electric motor is switched on. The torque achieved by the motor (internal torque) slowly rotates the internal rotating subsystem around axis t_2 with a speed of 5 rpm. The footstool will be rotated around axis t_1 with a small speed (external torque), and thereafter the system will be left alone.

If the rod holding the masses m_1 and m_2 is in a horizontal position (illustration „a"), the whole system rotates around axis t_1 with a maximum of moment of inertia and a minimum of angular speed. If the rod holding the masses m_1 and m_2 is in a vertical position (illustration „b"), the whole system rotates with a minimum of moment of inertia and a maximum of angular speed. Between these two limits both the axis t_1 related moment of inertia (θ) and the angular speed (ω) change continuously and periodically while the axis t_1 related amount of rotation θω is constant.

It is not expedient to rotate the whole system with a high speed because the arising strong centrifuging effect moves the rod holding the masses m_1 and m_2 into an almost horizontal position, and in this case the motor is not able to rotate the internal rotating subsystem.

The maintenance of the device

Bölcsföldi József. "If The Rechargeable Battery Has Run Out, Recharge It With A 12V 1.5 A Charger." International Journal of Engineering Science Invention(IJESI), vol. 07, no. 01, 2018, pp. 37–39.