Some Remarks on the Howard Johnson Magnetic Motors.

(www.rexresearch.com/johnson/1johnson.htm)

There is no doubt that these motors run without any input of electricity or external energy. The process is demonstrable in several working models and does not violate the Noether Theorem. Linear and rotating models have been constructed in this way and theory and computer simulation formulated by Harrison. The latter postulates a force of the type:

$$F = \frac{m_1 m_2}{\mu_0 r^2} \quad \text{--- (1)}$$

where m_1 and m_2 are magnetic monopoles and where μ_0 is the S.I. magnetic permeability. Here r is the distance between the two magnetic monopoles. Harrison then proceeds to carry out computer simulations of the magnetic motors of Howard Johnson. These computer simulations appear to be well carried out.

2) In Maxwell Heaviside ~~theory~~ the magnetic monopoles do not exist:

$$m_1 = m_2 = 0 \quad (?) \quad (MH) \quad -(2)$$

so the force in eq. (1) does not exist. In ECE ~~theory~~, the homogeneous field equation is:

$$d \wedge F = \mu_0 j \quad -(3)$$

in the indexless notation used to reveal the structure of the equation. In a more complete notation:

$$d \wedge F^a = \mu_0 j^a \quad -(4)$$

where a is a polarization index. There exists a magnetic charge-current density defined by:

$$j^a = \frac{A^{(0)}}{\mu_0} \left(R^a{}_b \wedge q^b - \omega^a{}_b \wedge T^b \right) \quad -(5)$$

The detailed structure of j^a has ~~been~~ been given in the monographs. Its time-like part is the origin of m_1 and m_2 in

3) Harrison's eq. (1). Therefore, if:

$$R^a{}_b \wedge q^b \neq \omega^a{}_b \wedge T^b \quad -(6)$$

the monopoles m_1 and m_2 may be non-zero.

In tensor notation eq. (4) is:

$$\partial_\mu F^a_{\nu\rho} + \partial_\rho F^a_{\mu\nu} + \partial_\nu F^a_{\rho\mu} = \mu_0 \left(j^a_{\mu\nu\rho} + j^a_{\rho\mu\nu} + j^a_{\nu\rho\mu} \right) \quad -(7)$$

i.e.: $$\partial_\mu \tilde{F}^{a\mu\nu} = \mu_0 \tilde{j}^{a\nu} \quad -(8)$$

where: $$\tilde{F}^{a\mu\nu} = \frac{1}{2} |g|^{1/2} \epsilon^{\mu\nu\rho\sigma} F^a_{\rho\sigma} \quad -(9)$$

is the Hodge dual tensor of $F^a_{\nu\rho}$. The Hodge dual current is:

$$\tilde{j}^{a\sigma} := 3 \left(\frac{1}{6} |g|^{1/2} \epsilon^{\mu\nu\rho\sigma} j^a_{\mu\nu\rho} \right) -(10)$$

The magnetic monopole is defined by:

$$\nu = 0 \quad -(11)$$

in Eq. (8), so the Gauss Law of magnetism becomes

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$$\underline{\nabla} \cdot \underline{B}^a = \mu_0 \tilde{j}^{a0} \quad -(12)$$

where $\tilde{j}^{a0}$ is the magnetic monopole.

The current term in general is defined by:

$$\tilde{j}^{a\nu} = \frac{A^{(0)}}{\mu_0}\left(\tilde{R}^{a\ \mu\nu}_{\ \mu} - \omega^a_{\ \mu b}\tilde{T}^{b\mu\nu}\right) \quad -(13)$$

$$= \left(\tilde{j}^{a0}, \underline{\tilde{j}}^a\right) \quad -(14)$$

so:

$$\tilde{j}^{a0} = \frac{A^{(0)}}{\mu_0}\left(\tilde{R}^{a\ \mu 0}_{\ \mu} - \omega^a_{\ \mu b}\tilde{T}^{b\mu 0}\right) -(15)$$

Therefore:

$$\boxed{\underline{\nabla} \cdot \underline{B}^a = A^{(0)}\left(\tilde{R}^{a\ \mu 0}_{\ \mu} - \omega^a_{\ \mu b}\tilde{T}^{b\mu 0}\right)} -(16)$$

<u>Units Check</u>

$$cA^{(0)} = \text{volts}, \quad A^{(0)} = \text{metres} \times |\underline{B}^a|$$

so $\quad m^{-1} = m\,(m^{-2} - m^{-1}m^{-1})$ ✓

Summation is implied over the repeated μ and b indices in eq. (16).

) The S.I. units of the magnetic monopole used by Harrison are:

$$m = (F\mu_0)^{1/2} r \quad -(17)$$

from eq. (1). Here:

$$F = \text{newtons} = \text{kgm m s}^{-2}$$

$$\mu_0 = J s^2 C^{-2} m^{-1}$$

$$= \text{kgm m}^2 s^{-2} s^2 C^{-2} m^{-1}$$

So:

$$m = (\text{kgm}^2 m^2 C^{-2} s^{-2})^{1/2} m$$

$$\boxed{m = \text{kgm m}^2 C^{-1} s^{-1}} \boxed{= J s C^{-1}}$$

The units of magnetic flux density are:

$$\underline{B} = \text{tesla} = J s C^{-1} m^{-2} = W m^{-2}$$

Therefore:

$$\underline{\nabla} \cdot \underline{B} = J s C^{-1} m^{-3}$$

Therefore the units of the magnetic monopole are weber, the same as magnetic flux. So:

$$\boxed{\underline{\nabla} \cdot \underline{B}^a = \frac{m^a}{V}} \quad -(18)$$

So from eqs. (16) and (18):

$$\boxed{m^a = V A^{(0)} \left(\tilde{R}^{a\ \mu 0}_{\ \mu} - \omega^a_{\ \mu b} \tilde{T}^{b \mu 0} \right)} \quad -(19)$$

6) The magnetic charge density is therefore:

$$\frac{m^a}{V} = A^{(0)}\left(\tilde{R}^{a\ \mu 0}_{\ \mu} - \omega^a_{\ \mu b}\tilde{T}^{b\mu 0}\right). \quad -(20)$$

and the force between the magnetic charge m is given by Harrison's equation (1).

The condition for the existence of m^a is

$$\tilde{R}^{a\ \mu 0}_{\ \mu} \neq \omega^a_{\ \mu b}\tilde{T}^{b\mu 0} \quad -(21)$$

If this geometrical condition is satisfied in the design used by Johnson, ~~then~~ the analysis by Harrison applies.

Spin Connection Resonance

In eq. (3):

$$F = d \wedge A + \omega \wedge A \quad -(22)$$

so:

$$d \wedge (d \wedge A + \omega \wedge A) = \mu_0 j \quad -(23)$$

giving the possibility of resonance. Even a very small j can give rise to large effects.