Joe Flynn's Parallel Path Magnetic Technology

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Inventor Joe Flynn's parallel path magnetic technology works not by defying the laws of physics but by extracting magnetic flux energy.

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There is a common opinion that some kind of exotic new physics will be required in order to significantly improve the efficiency of electrical motors, while many doubt such a thing is even scientifically possible.

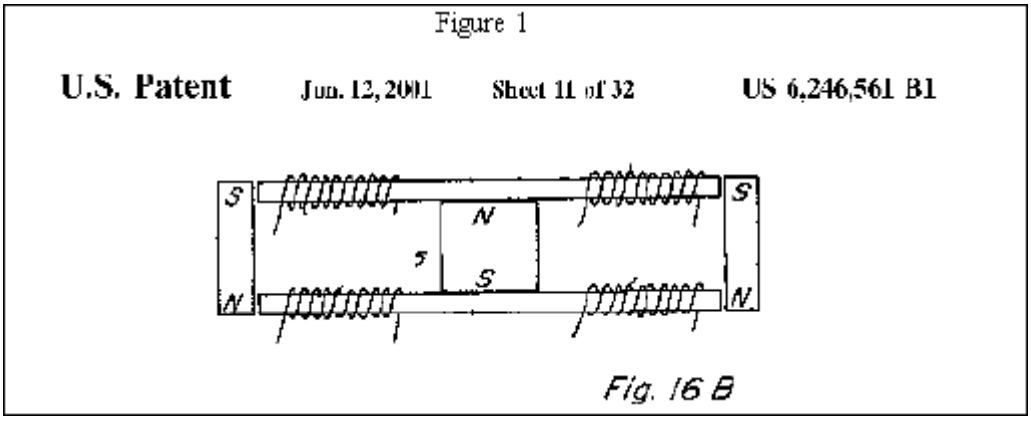
However exciting new principals for the manipulation of magnetic force, provide the basis for development of a new generation of high performance electrical motors.

The credit for this ground breaking research goes to Joe Flynn, who has been engaged in magnetic flux research for over 25 years now. His work is long standing, comprehensive, and in later years, well funded. It is reported $7m has been spent to date, with over $lm alone developing a revolutionary high performance magnetic motor. His equipment is validated and apparently already in mass production for select customers.

Since many lines of research have been formulated and explored by Joe Flynn, the following article presents only a brief summary of some of his best apparatus, but is nonetheless sufficient to convey the basic ideas, and provide a framework within which one can undertake experiments.

Principles of Operation

Figure 1



1.75 times more force is delivered to the legs of the core

than is provuded bt the electrical input to the control coils

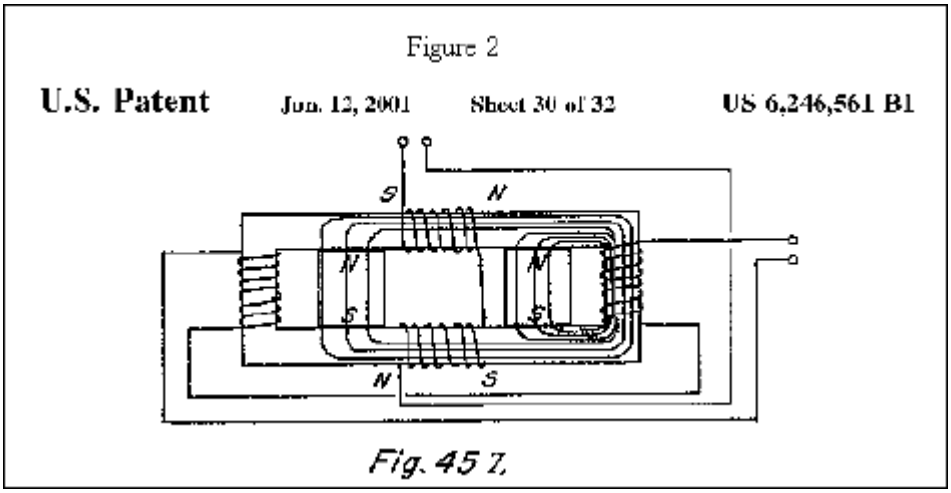
Figure 1 is taken from Joe Flynn's US patent **6,246,561** awarded on June 12, 2001 and filed on July 31, 1998. It explains a simple magnetic force multiplication experiment, which forms the basis for the Flynn magnetic art. If the windings on either side of the central magnet, which are normally connected in series, are properly pulsed, the field of the permanent magnet in the center, will be diverted to the opposite side of the core flux path provided. Or in alternative language, the side of the core that is pulsed, is demagnetized, relative to the field of the permanent magnet used in the apparatus. This is elementary textbook physics anyone can understand.

So what is surprising about this apparently simple apparatus, is that the armature on the side of the flux core, will contain 1.75 times more units of magnetic force, than could be manifested by the electrical input to the apparatus alone. Since the ability to arbitrarily move force from one point to another is the basis for motion or work, however simplistic, we therefore have a basis for a system that can be developed for practical technological purposes.

Expressed in alternative language, we also have the capability to engineer a time varying magnetic field, without the need for moving parts, which will allow development of systems that output electrical energy. Both capabilities are highly desirable, and offer substantial opportunity for technical development.

Expanding upon this basic experiment, there is a second simple and logical improvement in layout illustrated in Figure 2, which should be obvious, but has been shown not to be the case. In this instance, the pulse is centrally located and a dual flux field layout employed, which both demagnetizes the core relative to one magnet, and magnetizes it relative to the other. Since the two actions are complementary, the input required to manifest the flux switching effect is halved, therefore doubling efficiency.'

Figure 2



3.47 times more force is delivered to the legs of the core

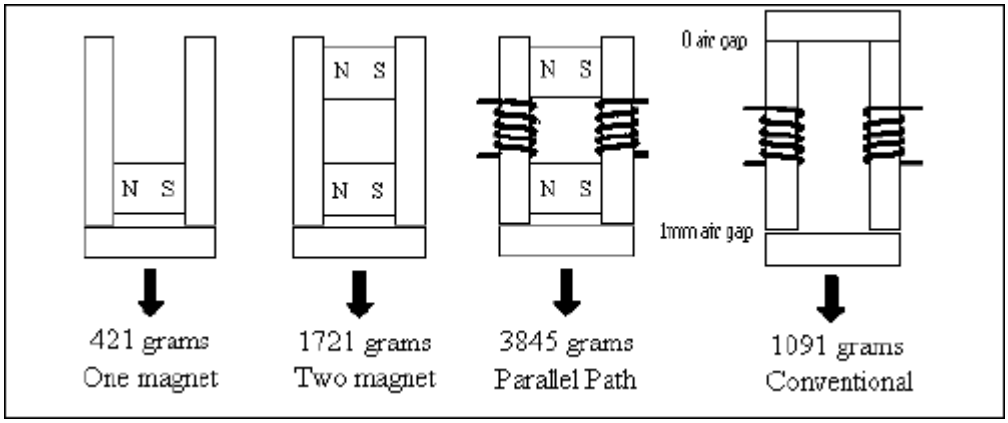
Than is provided by the electrical input to the control coils

It should be noted thatwhile the efficiency is doubled, the absolute output may not be significantly improved. This is because the major weakness of this effect and technology is flux saturation of the core, with values depending upon the specific properties of the B-H curve of the core material employed, limiting absolute output of both layouts the same.

The previous statements are not required to be taken on trust, and simple experiments have been proposed by Joe Flynn, such that anyone can validate this ef&d for themselves. Figure 3 is a simple experiment taken from the Flynn website, that can be used to validate the principals put forward in this article.

Figure 3

Simple Magnetic Force Multiplication Experiments

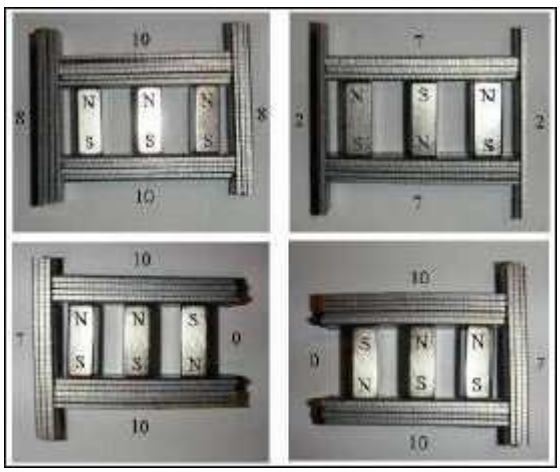


An even simpler non electrical flux experiment was proposed by GM in the Parallel Path egroup. My apparatus is illustrated in Figure 4. It is no more than magnets and steel staple strips, bought from a local hardware store for a total of under $20. The Parallel Path effect can be replicated with identical apparatus, at only a slight increase in cost and complexity, with the addition of a simple 12v polarity reversible power supply, such as those commonly sold to power computer speakers, among other household applications.

Figure 4

In PP Egroup GM proposed a simple experiment to illustrate how small changes in layout can alter magnetic force in cores.

Experiment done with $20 of parts from local hardware stores.



Conservation of Energy Field Potential

One of the aspects of the Flyrm technology people find most difficult to understand, is how you can have a device that delivers 3.47 times more units of magnetic force than is electrically inputted, yet not violate accepted principals of text book physics.I feel this apparent puzzle can not be better explained than by reference to Joe Flynn's own analysis of the experiment presented in Figure 3.

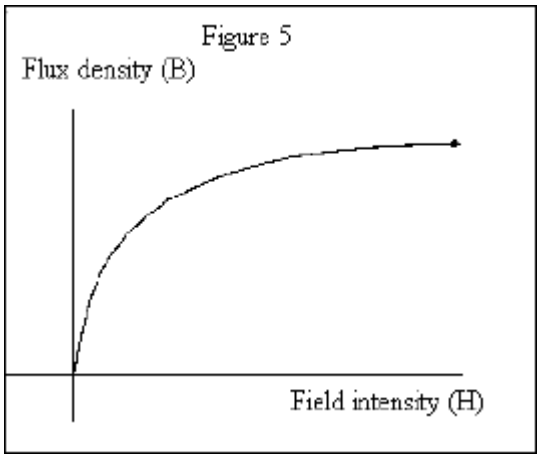
Since the Parallel Path System produced 3.47 times more force than the conventional system, with the same electrical input, it appears to violate conservation this is only true when observed from a tradional view point.

The system contains three flux producing sources (2 magnets and an electronmgnet) which together are capable of producing a far greater force than is actually produced. All of the flux sources together can produce a force of 13.11 units, therefore in the physical sense a loss of 1- (9.01/13.11)= 31% is realized.

So the system is 347 % efficient, in terms of delivered magnetic force compared to net electrical input, yet still conforms to the accepted physical principals of field conversation, by being only 69 % efficient, in terms of the fields present in the system. However surprising this result may appear, the analysis presented is in outline correct with the difference between fields present in the system, and net electrical input, being the important concept presented.

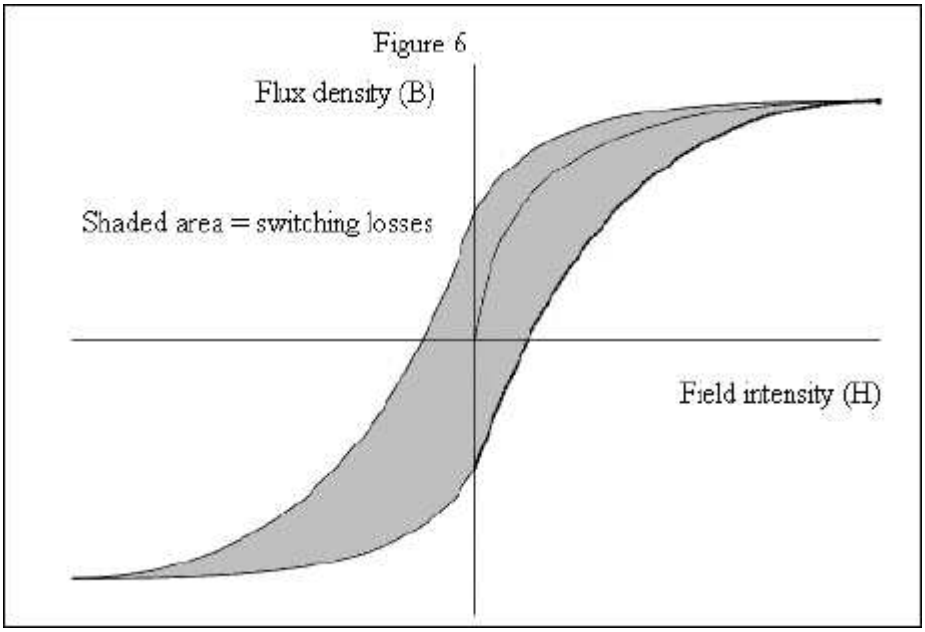
Losses in the System

In order to optimise flux cores, an appreciation of the physics that underlies the transfer of flux within a core is required. The normal magnetization curve, or B -H curve, is a mathematical relationship between applied field intensity H, and resultant flux density manifested in the core B. It varies according to core material, and the curve will shift, if there is a starting magnetism within the core, such as that provided by the field of a permanent magnet. If the start magnetism is excessive, the core is saturated, and will not properly respond to the applied force H. A simple B-H curve is illustrated in Figure 5.



Hysteresis is a delay between applied magnetic force H, and resultant flux density B, that again varies according to material type. It also manifests as a delay between the termination of force H, and the manifestation of flux density B. So, the system will not turn on instantly, and will not turn off instantly, in simple terms. This is because the magnetic memory of the core, mean s a flux vector remains within it, even when the application of magnetic force H has been terminated. If we apply a reversed force H to the core, the basic B-H curve is now expanded as in Figure 6, with the memory effect also illustrated.

Figure 6

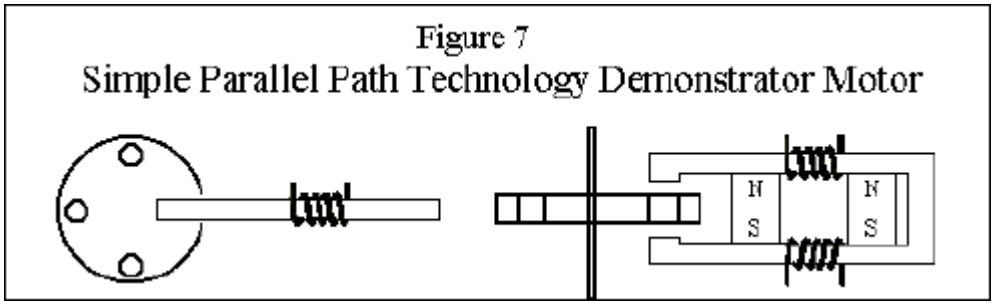


In order to return to the initial switched state, the remnance magnetism must now be overcome, hence input once in operation, will be greater than that required for the very first pulse. The area within the hysteresis curve gives a rough estimate for the amount of wasted energy, and along with other conventional sources of losses resultant in flux transfer within a core, is what reduces the efficiency of flux cores from maximum values of 2, or 4, down to values such as 1.75 or 3.47 typically.

Motor Apparatus

Although numerous practical applications abound for this effect electric motor design remains the most outstanding opportunity. To this extent, again a few simple images, should be sufficient to explain how the basic flux switching apparatus, can be turned into a highly efficient electrical motor.

The first motor shown in Figure 7 is one I have proposed to validate the flux switching effect at a most basic level. It illustrates the point made in the Flynn patent, that the annature of the core can be removed and replaced with a motor flux path. This first motor is not claimed to be highly ewicient but it helps one to understand how the transition from simple flux core to motor takes place.



Designed to demonstrate core principals, not provide over-unity 4 magnetically permeable cores placed on rotor section Flux is switched through

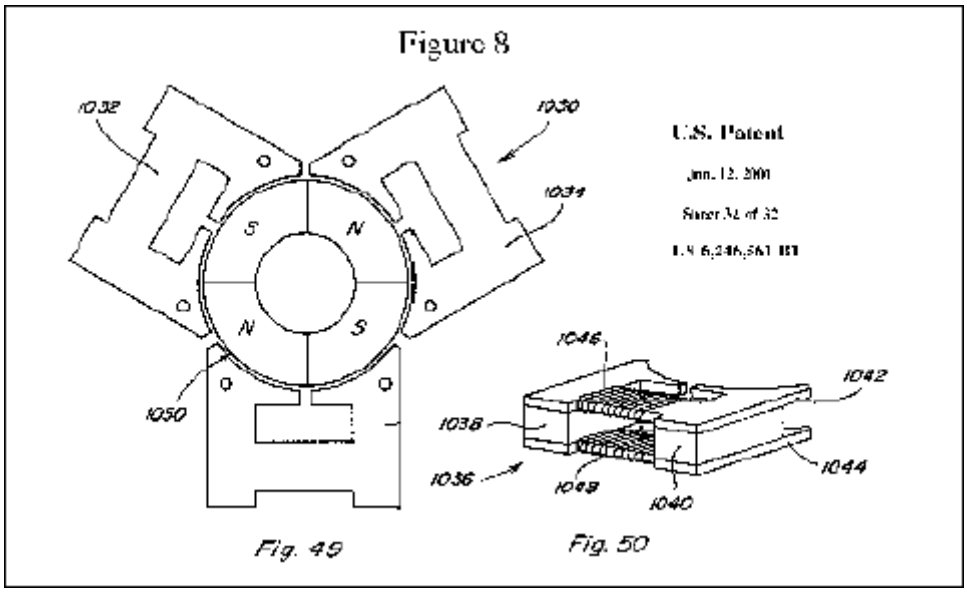
core section on approach to armature section When armature section is in register with rotor cores

Flux is switched back, and rotor core free wheels away from register

The next motor shown in Figure 8 is again taken directly from the Flynn patent, and illustrates the next intermediate step to motor design. The fields of the permanent mapets are alternatively switched from one side of the surrounding flux cores to the

other, alternately interacting with N and S poles on the rotor, imparting motion to the central rotor shaft.

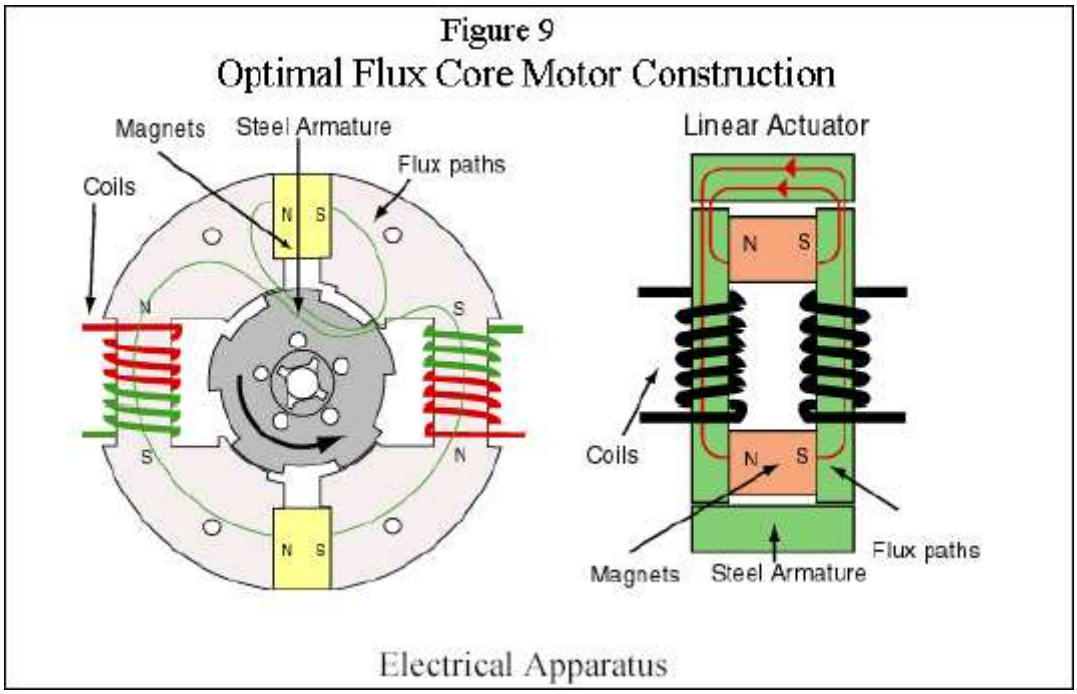
Figure 8



With proper financial support, and the facilities to have Metglas(r) cores custom moulded, Joe Flynn was able to develop improved motor apparatus, shown in Figure 9. No detailed performance numbers have been released for this motor, whose precise characteristics remain proprietary to Joe Flynn at this time. But the optimisation is so advanced, it is stated to posses exotic performance properties, such as cool ambient operation and reduced current draw.

Figure 9

Optimal Flux Core Motor Construction



The geometrical layouts depicted in Figures 1 and 2 can be adapted for electrical output as is clearly stated in the 'Power Conversion' section of the Flynn patent:

The construction shown in FIG. 45X utilizes four control coils and a single

permanent magnet and the construction shown in FIG 45X uses two control coils and two permanent magnets. The flux that would normally be supplied by a primary winding is supplied by the static flux of the permanent magnet or magnets and the control coils convert this static flux into a time varying flux in a novel way. Both arrangements use

two secondary coils, the secondary coils are placed in the region of the continuous flux path that would be occuped by an armature or rotor in the linear or rotary arrangements The regions of the flux paths that perform work are the same in all cases.

By alternating the polarity of the control coils during one cycle, one working region experiences an increasing flux and the opposite region experiences a decreasing flux and during the next cycle the opposite occurs

This results in the induction of a voltage in the secondary coils that is decided by the magnitude of the change in flux in the working region and the time in which this change occurs

The novelty of this discovery is that the primary flux inducing the voltage in the secondary coils is supplied by the permanent magnet or magnets and is far greater than the flux supplied by the control coils.

As regards switching, it is necessary for the input and output circuits to be closed in series. The reason for this circuitry requirement is obvious enough, with only a little analysis.

If the output circuit is closed when the input circuit is activated, then the input energy simply leaks into the output circuit, as in an ordinary transformer. So no flux switching effect is manifested, and the field of the permanent magnet is static in time.

Thus you have an ordinary transformer, with reduced efficiency, because of the core flux saturation effect provided by the permanent magnet.

This is one of the most important points to make about the Flynn apparatus. If you approach it as if it is a normal piece of scientific equipment then proper optimisation is not greatly problernatic. For example more turns on the output coils, simply means more voltage and less current, exactly as standard textbook equations predict. Increased input voltage enables faster switching speeds, a consequent greater rate of change of magnetic flux, resulting in higher absolute output, but only up to the flux saturation limit of the core material.

Summary of Flux Core Physics

There has been a certain amount of confusion about the flux core technology Joe Flynn pioneered. The exceptional performance of these systems as set by conventional expectations, led many people to believe, the physics was more exotic than was in fact demonstrated to be the case.

Furthermore, this technology is optimally implemented to multiply the application of magnetic force, with particular regard to the design and implementation of high performance electric motors. Inevitably, the obscure electrical effect is limited by the flux saturation point of the core material employed, ensff ing absolute output is always relatively low.

While making predictions about future adoption of technology is always difficult, it seems reasonable to expect flux core motors will eventually replace conventional designs across a broad range of applications. With high torque, relatively low manufacturing cost, and performance ahnost beyond belief, there appears to be little to stop commercial acceptance of this remarkable technology.