

Nikola Tesla

QEG SYSTEM DESCRIPTION 概論

The Quantum Electric Generator system (QEG) is an adaptation of one of Nikola Tesla's many patented electrical generator / dynamo / alternator designs. The particular patent referenced is No. 511,916, titled simply "Electric Generator", and dated January 2, 1894 (see back of this manual). The adaptation is a conversion from a linear system, to a rotary system.

量子エネルギー発電システム(QEG)は、ニコラ・テスラの多くの特許が取られた電氣的なジェネレーター/発電機/交流発電機設計のうちの1つの改良品です。

参考文献として載せられた特別の特許は 511,916 番です、単に「起電機」とタイトルづけられた 1894 年 1 月 2 日の特許、(このマニュアルに後を参照)です。

その改良点は線形運動系から回転運動方式への転換です。

The QEG prototype is scaled to produce electrical power in the range of 10-15 kW (kilowatts) continuously, and can be set up to provide either 120 Volt or 230-240 Volt single phase output. We are also planning future designs to provide 3-phase power.

QEG 試作品プロトタイプは 10-15kW(キロワット)の範囲の電力を連続的に生産するために大きさに設計されていて、120 ボルトあるいは 230-240 ボルトの単相出力を出す様に組み上げることができる。

我々は、さらに、3 相発電機の将来設計を計画している。

Service life of the device is limited only by certain replaceable components, such as bearings, v-belts, and capacitors. The basic machine should operate trouble-free (with minimal maintenance) for as long as any good quality electro-mechanical appliance, such as a quality washing machine or refrigerator. Heavy-duty mechanical components are used throughout for reliability.

装置の耐用年数は、ベアリング、v-ベルトおよびコンデンサーのようなある代替可能なコンポーネントによってのみ制限されています。

基礎的な機械は、普通の品質の良い電気機械的な器具同様に、例えば洗濯機か冷蔵庫のように、ある程度良質の間はトラブルなしに(最小のメンテナンスで)動作しなければならない。

丈夫な機械的部品が、信頼度を上げる為、随所に使用されています。

The QEG is not a complicated device, as it is designed (like Tesla's other 'discoveries'), to work in harmony with natural laws, rather than with the power-wasting symmetric motor and generator designs used in today's mainstream industry.

QEG は、今日の主流産業で使われるパワーを無駄遣いする対称形のモータやジェネレーターの設計を備えるだけではなく自然の法則と調和して働く様に設計されている為(テスラの他の「発明」と同様に)、複雑な装置ではありません。

An effective way to understand the operating principle of the QEG is to think of it as a high-powered, self-resonant oscillator (a power tank circuit), which generates high-voltage AC (15 to 25kV). These HV oscillations are then transformed into line voltage AC output, at current levels up to approximately 85 A. In today's alternative energy terminology, it would be called a type of resonance machine.

QEG の動作原理を理解する有効な方法は、それを高出力の、自己共振するオシレーター(パワー・タンク

回路)と見なすことである。

それは高電圧 AC(15〜25kV)を生成する。

これらの高電圧発振出力は、その後でおよそ 85A までの電流レベル以内で、線間電圧 AC 電源出力に転換される。

今日の代替エネルギー用語では、それは一種の共振機械と呼ばれるだろう。

The circuitry that develops high power in this device is really based on an existing but under-utilized power oscillator configuration, however, the 'quantum' part of the design has to do with how the generator output is tuned for maximum power. Conventional alternators (AC generators) consume more input power than the output power they provide. For example, one brand of power take off (PTO) alternator uses 18,000 watts (24 horsepower) to develop 13,000 watts of output power. In the QEG, input power is used only to maintain resonance in the core, which uses a small fraction of the output power (under 1000 watts to produce 10,000 watts), and once running, the QEG provides this power to its own 1 horsepower motor. This is known as over-unity. Once the machine builds up to the resonant frequency, it powers itself (self-running).

この装置中の高パワーを生み出す回路構成は、実際に既存であるが十分に利用されなかったパワー・オシレーター構成に基づきます。しかし、この設計の「量的」部分は発電機出力が最大のパワーのためにどのように調整されるかと関係します。

従来のオルターネイター(交流発電機)は、それらが供給する出力電力より多くの入力パワーを消費します。例えば、動力発生装置(PTO)交流発電機の 1 つのブランド品は、13,000 ワットの出力電力を出すために 18,000 ワット(24 馬力)を使用します。

QEG では、入力パワーは単に磁心中での共振を維持するために使用されます。(それは出力電力のごく一部分を使用する(10,000 ワット生み出すのに 1000 ワット未満))、そして一度動作状態に入れば、QEG はそれ自身の 1 馬力のモータにこの力を供給します。

これは過剰単一性として知られています。

一旦機械が共振周波数まで立ち上がれば、それは自分自身(自立動作)に動力を供給します。

In the QEG, the exciter coil is used to provide a conduction path through the quantum field (zero point) into the generator core. This has the effect of polarizing the core, which increases power output over time.

James M. Robitaille

QEG では、励磁コイルは量子場(ゼロ点)を通してジェネレーター鉄心への伝導経路を提供するために使用されます。

これは、鉄心を分極させる効果があります。それはパワー出力を時間と共に増加させます。

James M. Robitaille

NOTICE 注意

TO BE READ AND UNDERSTOOD BY ALL QEG PROJECT CREWS

すべての QEG プロジェクト乗組員によって読まれ理解されること

Fix the World (FTW) is not responsible for the actions of others. We can only tell you our experience. We have discovered it is essential that those wishing to build a QEG use careful thinking, patience, and consideration for the greater good.

Fix the World(FTW)は、他の人達の行動に責任を負いません。

私たちは単にあなた方に私達の経験を伝えることができます。

私たちは、それが不可欠であることを発見しました、QEG 実用化への望み、より偉大な善のための注意深い思考、忍耐および考察。

The inhabitants of planet Earth are entering into a new paradigm and a new way of doing business. In honor of Nikola Tesla, the QEG is a gift freely given to the world, and FTW's involvement is strictly altruistic.

地球の住民は新しいパラダイムおよびビジネスの新しいやり方への道へ入っています。

ニコラ・テスラに敬意を表して、QEG は世界に無償で提供された贈り物です。また、FTW の関与は厳密に利他主義です。

The QEG is an electromechanical device and as such, safety for the individual and end user should always be of prime concern. It is therefore essential that persons assembling the device are experienced in the field of electro-mechanical assembly. A considerable level of knowledge in quantum physics is also required.

QEG は電気機械装置です。また、そういうものとして、個人及びエンドユーザに対する安全性は常に最重要事柄であるべきです。

したがって、装置を組み立てる人が電気機械組み立ての分野で経験を積んだことが必要です。

量子物理学の相当なレベルの知識も必要です。

IF YOU ARE TRAINED IN TRADITIONAL PHYSICS, AND HAVE NOT BEEN DOING THIS WORK FOR MANY YEARS, YOU MUST FIRST DO YOUR RESEARCH ON BASIC QUANTUM ENERGY DEVICES AND HOW THEY WORK (e.g. resonance and tuning).

もしあなたが伝統的な物理学での経験を積んでいて、この仕事を長年遣って来ていないならば、あなたはまず基本的な量子エネルギー装置とそれがどのように動作するかに関する調査をしなければなりません。(例えば共振とチューニング)。

Electrical / Mechanical devices are inherently dangerous. Electrical shock hazards can cause serious injury and in some cases death. Mechanical hazards can result in dismemberment and in some cases death.

電氣的/機械的な装置は本質的に危険です。

感電危険は大怪我を引き起こす場合があります、死に至る場合も有ります。

機械的な危険は分解破損で、死に至る場合もあります。

Due diligence has been applied to ensure that the QEG instructions are complete and correct. All local and country-specific electrical and mechanical code implications, by which a QEG might be installed and operated, cannot possibly be known. Nor is it conceivable that any and all possible hazards and/or results of each procedure or method have been accounted for.

相当な努力が QEG の説明書が完全で正確であることを保証するために払われた。

すべての地域そして各国ごとの電氣的・機械的な電気工事の規定(QEG がそれによって設置され動作させられるかもしれない)は、どうしても知ることができません。

また、全ての可能性のある危険、あるいは各々の処理や手法の結果が考慮されたとは考えられない。

It is for these reasons that the QEG must be either directly installed or supervised by an experienced electromechanical engineer to ensure the installation is done safely and in accordance with local electrical code, however, the QEG is installed the same way as any commercial generator and does not violate any electrical codes. Anyone who uses the QEG installation instructions (including but not limited to any procedure or method of installation) must first satisfy themselves that neither their safety, nor the safety of the end user, will be endangered over the course of the installation and operation of the QEG.

これらの理由から、設置が安全に且つ地域の電気工事規定に従って行われることを保証するため、経験を積んだ電気機械のエンジニアが直接 QEG を設置するか監督するかしなければなりません。しかしながら QEG は、任意の商用発電機と同じ方法で設置されているし、またどんな電気工事規定も破っていません。QEG の設置説明書(設置に関するすべての処理あるいは方法を含むが、これらに限定されない)を使用する人は誰でも、最初にかれら自身の安全を満たさなければなりません。さもなくばエンドユーザの安全も、QEG の設置およびオペレーションの間に危険にさらされるでしょう。

It is imperative to understand YOU NEED PROFESSIONALS AND EXPERT ADVICE to build a QEG.

QEG を組み立てるには専門家及び専門家のアドバイスが必要で有る事を理解することは避けられません。

The installation instructions are designed to show how we have found the building of the device to be accomplished, and any negative outcomes that result are completely the responsibility of the person/company building it; FTW provides no guarantee for the successful installation of the QEG.

設置説明書は、私たちがいかに装置の組み上げに成功したかのケース、或いはそれは完全に組み上げた人/会社の信頼性の結果であるが、あらゆるネガティブな結果のケースを示す事を目指しています。

FTW は、QEG 設置の成功の保証を提供しません。

This notice serves the purpose of communicating the serious nature of building a quantum machine, as we are well aware that there have been severe restrictive agencies involved with their suppression. Quantum free energy isn't taught at University and most designers have heretofore been unsuccessful at mass distribution. It is YOUR RESPONSIBILITY therefore to make certain you are building the QEG with positive intentions for humanity, and lashing out legally or otherwise to FTW, HopeGirl

and/or the designer and his family, is a violation of goodwill and will in no way be attended to. We know of no other way to do this but to go back to the “HONOR SYSTEM.”

この通知は、量子機械組み立てと言う重大な自然現象について議論するという目的に役立ちます。と言うのも私たちがそれらの抑制に関連した厳しい限定的な機関があることによく気づいているからです。

量子フリーエネルギーは大学で教えられません。また、ほとんどのデザイナーは大量流通で以前失敗しました。

したがってあなたが人間性に対する肯定的な意図を持って QEG を作り上げており、FTW、HopeGirl および設計者とかれの家族の評判が貶められ、最早社会に参加できない状況で有る事に対して法律上あるいは他の方法で強く非難していることを示すことはあなたの責任です。

私たちは、「道義心のシステム」に戻る以外、これをなす他の方法を知りません。

In reading this notice I agree that:

この通知を読む際に、私はそれに同意します:

1) I WILL NOT ATTEMPT TO BUILD A QEG UNLESS I DO SO APPROPRIATELY WITH AN ELECTROMECHANICAL ENGINEERING PROFESSIONAL.

1) 私は、もし電気機械エンジニアリング専門家と一緒に適切に行わなければ、QEGを組み立てることをしません。

2) I WILL NOT COMMISSION (TURN ON) OR INSTALL THE QEG WITHOUT AN ELECTROMECHANICAL ENGINEERING PROFESSIONAL.

2) 私は電気機械エンジニアリング専門家がいなければ、QEGを動作させたり設置したりしない。

3) UNDER THE ABOVE CONDITIONS, I MAY USE THE QEG INSTALLATION INSTRUCTIONS FOR PERSONAL USE, AND UNDERSTAND THE NEED FOR IMPECCABLE COMMITMENT TO THE BETTERMENT OF HUMANITY. IN THE BEST INTEREST OF THE PEOPLE OF PLANET EARTH, I WILL NOT ATTEMPT TO MISUSE OR MONOPOLIZE THE QEG INSTALLATION INSTRUCTIONS IN ANY CAPACITY, NOR WILL I ATTEMPT TO MAKE A HUGE PROFIT AT THE EXPENSE OF ANOTHER HUMAN BEING.

3) 上記の条件の下で、私はQEG設置説明書を個人的利用に使用し、人間性の向上に対する無欠宣言の必要を理解する。

地球上の人々の最大利益に於いて、私は、いかなる可能性に於いてもQEG設置説明書の誤用や独占することを試みません。また、私は、他の人類を犠牲にして巨大な利益を得ることを試みません。

IMPORTANT - Please make certain that persons who are to use this equipment thoroughly read and understand these instructions and any additional instructions prior to construction, installation and operation. In addition, we require you to read this notice again when you are ready to assemble the core.

重要—この設備を使用する人は、組立、設置および作動に先立ってこれらの説明書およびすべての追加説明を徹底的に読み理解していることを確認してください。

さらに、私たちは、あなたが鉄心を組み立てる準備ができた時に、再びこの注意書を読むことを要求します。

Letter from the Editor 編集者からの手紙

Dear Builder,

It is no easy task to build the QEG, and we want to encourage you by offering a short treatise on the importance of ‘consciousness’ in this endeavor. Many are becoming more familiar with Nikola Tesla, his desire for all people to have access to free energy, and his failed attempt to expose this technology to the world. Many have followed him with the same aspirations and, similar to Tesla’s plight, have also been prevented by powers beyond their control. The “free” energy movement is rife with horror stories ranging from government theft of patents, to reputations destroyed, to the murder of untold numbers of brilliant scientists/inventors.

拝啓、製造者

QEGを作るのは容易な仕事ではありません。私たちは、この努力に於いて「意識」の重要性に関する短い物語を提示する事により、あなた方を激励したい。

多くの人達が、ニコラ・テスラ、すべての人々がフリーエネルギーを手に入れると言う彼の望み、および世界にこの技術を公開すると言う彼の失敗した試み、をより一般的に知る様に成り始めた。

多くの人達が同じ大望を持って彼に続きました、そして、テスラの苦境と同様に、またもやかれらのコントロールを超えた力によって阻止されました。

「フリー」エネルギーの運動には、優れた科学者/発明者の話されていない人数の殺人、悪評による人格破壊、特許の政府窃盗、などホラー物語が蔓延している。

We must all consciously and constantly rise above these tyrannical infringements, and create an environment for ourselves and our neighbors, and rediscover Nature’s Laws to be able to live and thrive. We must leave off responding in incredulity to what was “done to us” when we were told and believed we couldn’t create free energy. We are now awake to the point that we know they were lying. Who’s they? The elite for starters – follow the money (watch THRIVE); J.P. Morgan couldn’t put a meter on an energy plan for the world, and so destroyed any chance of that happening through several vicious attacks on Tesla’s reputation and livelihood – basically got Tesla’s ideas out of the way for his own profit and power – and maliciously destroyed the man (youtube: Tesla’s Autobiography). While the electric companies have told the people theirs is the only way to get electricity, and we are dependent on them, the truth is that we have been deprived of this alternative (quantum) energy source for close to 130 years. Morgan’s grip on the energy supply has not loosened one bit in all that time, in fact, you are probably paying more for electricity than ever before, all things being equal.

私達は皆、意識的に且つ絶える事無くこれらの専制的な侵犯を克服し、我々自身と我々の隣人のための環境を築き、生きて繁栄することができるよう自然法則を再発見しなければならない。

私達は、フリーエネルギーを作る事はできないと言われそれを信じた時に私たちに何が行われたかに関する不審に対し応酬することを止めなければ成りません。

私たちは、今や彼らが嘘をついていた事、そして彼ら（まず第一はエリート）?が誰であるかも知っている時点まで、目覚めています。 お金を追え(THRIVEを参照);

J.P.モーガンは世界のためのエネルギー計画にメーターを付けることができなかった、だからテスラの評判

および生計上に対する何度かの攻撃を通してその事が成就するすべての機会を潰しました？

根本的に自分の利益および力の為にテスラのアイデアを邪魔に成らないようにした。

そして、悪意を持ってその人(youtube: テスラの自叙伝を参照)を殺してしまいました。

電気会社がそれらが電気を得るただ一つの方法であると人々言い続けた間、私たちがそれらに依存する一方、真実は、130 年近くの間この代替(量子)エネルギー源を私たちが奪われてきたということです。

エネルギー供給に対するモーガンの独占はこの間ずっと幾らかも揺ぎ有りません、実際たぶんあなた方は以前よりもっと電気代を払っていると思います。

全ての物と同様に。

So how do we effect our future now, and free ourselves and the generations to come after us completely from energy tyranny? Building the QEG is one way. It is a journey that requires you think deeply about processes that will, in turn, expand your senses to enable you to receive information from the quantum field of consciousness, or God if you prefer this reference. We believe we had Divine inspiration and help, which began with a burning desire to “get off the grid” and also do something significant for humanity. The timing is wonderful because, as of the writing of this, the entire planet is in turmoil as never before, and people will need to not only be self-sufficient, we will all need to live according to what is good for all (Ubuntu), and help each other for our continued evolution as species/planet.

Valerie Robitaille

だから我々は今どのように我々の未来を意図するか。そしてどのようにエネルギーの暴政から完全に我々自身と後世の人達を解放するのか。

QEG の構築は一つの方法である。

これはあなたがプロセスに関して深く考える事を要求し、それは順番に、意識の量子場からあるいはもしあなたがこの参照表現を好むなら神から情報を得ることを可能にするあなたの感覚を発達させる旅である。我々は、神のインスピレーションおよび支援(それは「グリッドを取り外し」、さらに人類にとって意義ある重要な事を成し遂げたいと言う、燃える望みから始まった)を持ったと信じる。

これを書いている時点において、タイミングとしては絶好です。

なぜなら惑星全体がかつてないほど混乱しており、人々が単に利己主義であることを要求していない事、我々は皆、全て(他者への思いやり)取って良い事に従って生きて行く事を要求している。そして人類/惑星として継続的な進化のためにお互いに助け合う事を望んでいる。

It is with great love that the QEG is offered to the world, and as you take on the task of building one, it is hoped that this becomes your path also: the mission of free energy for all! The next step we ask you to take on your journey, before and during building,

is to listen to the discussion

<http://www.youtube.com/watch?v=3FqzTW7qh2U&feature=youtu.be> with HopeGirl, Ralph and Marsha Ring, Fernando Vossa and the 3D Global Network.

QEG が世界へ提示されるのは大きな愛です。そして、あなたが 1 つを組み上げる仕事を引き受けると

もに、さらにすべて人にフリーエネルギーをと言う使命! : へのあなたの道に成る事が望みます。
あなたの旅を引き受けるために私たちがあなたに要求する次のステップは、組み上げる前にもその最中にも、下記に議論する為に問い合わせる事です。

<http://www.youtube.com/watch?v=3FqzTW7qh2U&feature=youtu.be>、HopeGirl Ralph and Marsha Ring, Fernando Vossa and the 3D Global Network

I am, in service to Gaia and its inhabitants, deeply grateful for this technology, and the opportunity to share it!

私は、この技術に深く感謝し、ガイアおよびその住民に対する貢献とそれを共有する機会に恵まれています!

IMPORTANT ADDITIONAL INFORMATION 重要な追加情報

We are not professional writers or photographers and didn't always have opportunities to document or photograph every step of development. Therefore, please take the level of engineer/electrical experience required to build a QEG very seriously as we are giving these to you under this premise. You will discover the advanced level of knowledge of mechanical/electrical processes needed quickly enough. The correct construction of the QEG requires patience and careful thought. We made several mistakes in development and have given here the steps that were successful. You will probably still make mistakes – and these will be your greatest learning opportunities as you gain more knowledge about this type of energy.

我々は職業作家または写真家でなく、開発の毎ステップを文書化するか撮影する機会が必ずしもあったとは限らなかった。

したがって、QEG を構築するのに必要とされるエンジニア/電気的な経験のレベルを持って下さい。我々は非常に真剣にこの前提の下であなたにこれらを与えている。

あなた方は、十分に早く必要とされる機械的/電気的なプロセスについてより高レベルの知識を発見するだろう。

QEG の正確な構築には忍耐および注意考察を必要とする。

我々は、開発で何度か失敗し、ここで成功した段階を得た。

あなた方は、恐らくまだ誤りを犯すだろう。

これらはあなた方がこの種のエネルギーに関するより多くの知識を獲得する大きな学習する機会に成るだろう。

Before beginning to build, consider how much you would like to outsource to one of the cottage industry community units (CICUs) near you! In the US we recommend Polaris for the steel stator/rotor construction, and Torelco for toroidal winding. As FTW continues to roll out the distribution plan, and more connections across the world are made, we think CICUs will be commonplace and hence, QEG parts accessible (many people will be making them!)

組み立てる前に、あなたの近くの家内工業コミュニティ・ユニット(CICU)のうちの 1 つにどれ位外部委

託したいか考えてください!

私たちは米国では、鋼製のロータ/ステータの組み立てに Polaris を推薦し、環状巻線工程は Torelco を推薦します。

FTW は装置配布計画の展開を続け、世界中でより多くのコネクションができると共に、私たちは、CICU は普通になり、従って、QEG のパーツは入手が容易に成と思います。(多くの人々がそれらを作るでしょう!)

When website URLs were available we provided links for the person reading this online. You may certainly use your own sources for materials but it is imperative you do not alter the instructions/parts herein if you are building a QEG. (We know with increased knowledge you will discover many applications for this technology.) When photographs can be shown to help you visualize a process, they are provided. Please remember, we are not professional manual writers. What we offer you here is free of charge and our gift to humanity – but it comes with great responsibility. Learn as much as you can, use discernment and wisdom, share freely, and you will be privileged to know the secrets of energy creation from the quantum field.

ウェブサイト URL が利用可能だった時、私たちはこれをオンラインで読む人にリンクを供給しました。

あなた方は、材料に関し明らかにあなた方自身の資源を使用しても構いません。もしあなたが QEG を組立中ならば、あなた方がこの中の説明書/部品を変更しない事はさけられません。

(私たちは、あなた方がこの技術を通して多くの応用製品を見つけるだろう事を更に増えた知識で知っています。)

写真が、あなた方がプロセスを視覚化するのを助けるとハッキリわかる場合、それらが提供されます。

思い出してください。私たちは専門のマニュアル作製家では有りません。

私たちがここであなた方に提供するものは無料で、人類への私たちの贈り物です。

しかし、それは大きな責任を伴います。

できるだけ多くを学び、識別力と知恵を使用し、自由に共有し、そうすれば、量子場からのエネルギー生成の秘密を知る特権を与えられるでしょう。

We would like to dedicate the success we've experienced to our first teacher, Sir Timothy Thrapp, and WITTS Ministries, without whose guidance none of this would be available so soon. We acknowledge and honor the work WITTS has done for over 200 years bringing technology forward, and hope that you will consider making a donation to the ministry for their great work.

我々は、最初の教師である Sir Timothy Thrapp および WITTS 省に経験した成功を奉げたい(その援助なしではこのどれもがこんなに早く利用可能に成らなかったで有ろう)。

我々は、WITTS が、200 年以上に渡り携えていた技術を前面に出した仕事を認め尊敬し、あなた方がそれらの偉業に対し WITTS 省への寄付を考慮する事を望む。

We would also like to thank our greatest teacher and fellow humanitarian, Nikola Tesla. It is our most gratifying honor to present modern plans for a quantum energy generator to the world, based on Tesla's discoveries, especially at a time when we the people are being manipulated and controlled by a

corrupt energy economy. Tesla wanted everyone on the planet to have energy. We continue to carry out his vision.

さらに、私たちは最も偉大な教師および人道主義者仲間(ニコラ・テスラ)に感謝したい。

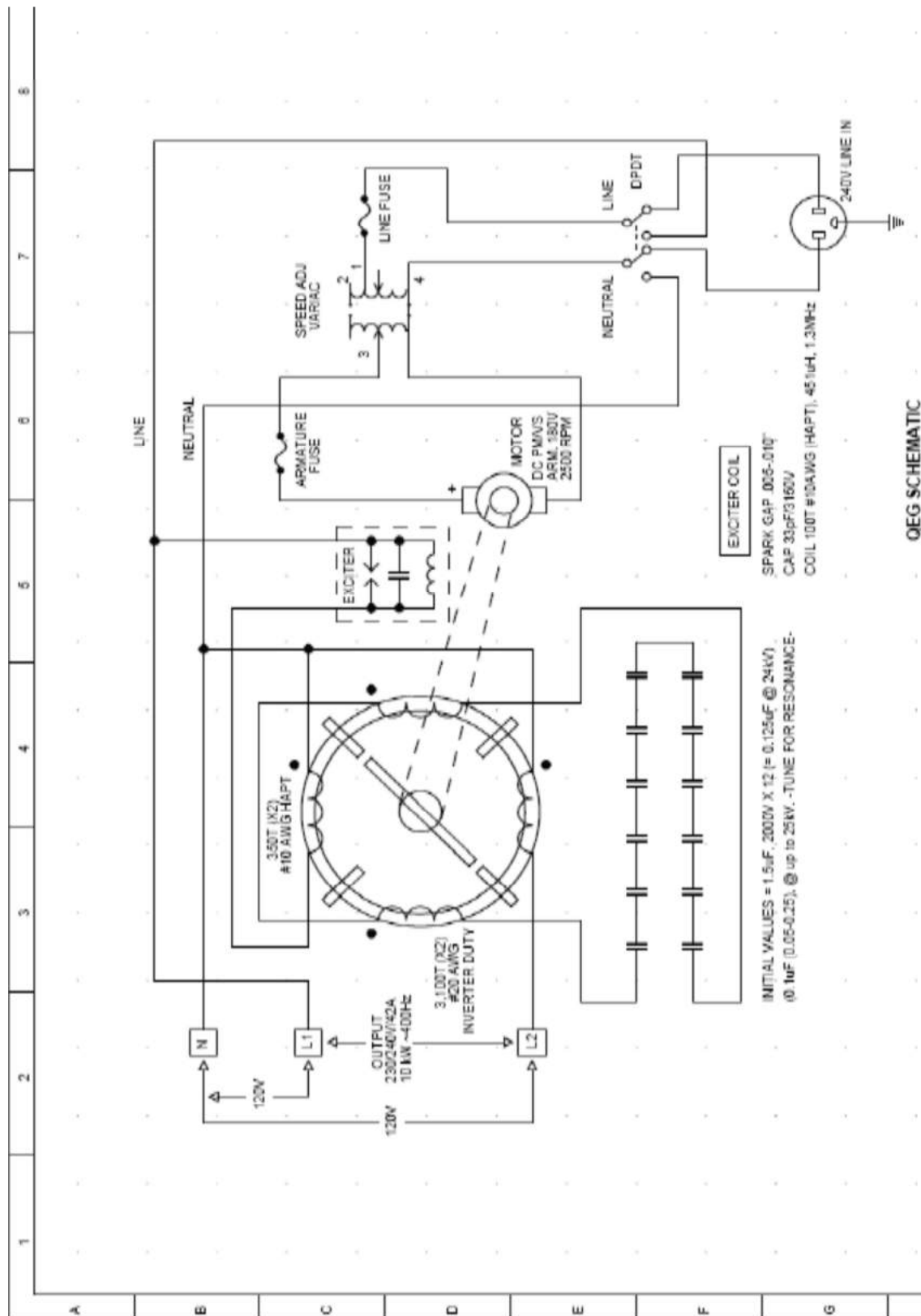
特に私たち一般人が汚れたエネルギー経済によって操作されコントロールされている時に、

テスラの発見に基づいて、量子エネルギー・ジェネレーターを世界へ届ける最新の計画を表明する事は、私たちの最も嬉しい名誉です。

テスラは、惑星上の皆がエネルギーを持つことを望みました。

私たちは彼のビジョンを実行し続けます。

回路図



Parts List 部品表

Part	Type, Model # or MFG PN	Quantity
Capacitors		
Ceramic Disc Capacitors	15pF 3150volts	2
Film Capacitors	2.5uF 2000V	12
End Plates and Shrouds		
Fiberglass reinforced epoxy laminate (for 2 end plates)	G10/FR4	(1) sheet ½ inch thick by 3 feet by 4 feet
Fiberglass reinforced epoxy laminate (shrouds)	G10/FR4	(2) 1/8" x 5.875" diameter
Exciter Coil		
Clear Cast Acrylic Tube	4-3/4" OD x 4-1/2" ID, 1' Length	1
#10 Magnet wire (see generator core)		
V-Belts and Pulleys		
Goodyear 4L430 V-Belt	GDYR_4L430	1
1 Groove, 3" x 7/8" bore, type A Pulley (Motor)	AK30 x 7/8	1
1 Groove 2.50" Pulley 7/8" bore type A (Generator)	AK25X7/8	1
Drive Motor		
	DC PM Variable Speed, 2500 RPM, 180V armature, 7/8" shaft, with base	1
Generator Core		
Spacer Blocks 1-1/2" x 1-1/2" x 4-1/2"	Aluminum 6061-T6	16
Mica Tape 1.00" x 50YD	MICA77956X1X50	1
Bonder for shaft/rotor	LOCTITE 648	1
7387 Activator (use with bonder)	1.75oz	
Mica Plate NEMA 6	36" x 36" x .030	1
7/8" Three Bolt Flange	SATRD205-14G	2
Bearings		
Magnet Wire #10 Round HPT or HAPT	~620'	
Magnet Wire #20 Round Pulse Shield	HTAIHSD 6" SPL/060-Heavy MW35, 73, 36	~5200'

Teflon tubing	TFT20019 NA005 (Alpha Wire)	8 pieces (12" each)
Fiberglass sleeving w/PVC for #10 HAPT wire (tubing)	PF1308	8 pieces (12" each)
Tape, white, 1" fiberglass, hi-temp (outer wrap)	RG48 (Intertape)	2 rolls
Tape, black, 1" reinforced, high-strength	60020719 (Von Roll)	2 rolls
Nomex Corner Insulation	Torelco	16
Shafting 7/8" dia. x 11.0" long w/standard 3/16" x 3/32" keyway	C1045 TGP Trukey	7/8" dia. x 11"
8 inch Bolts, 1/4 - 28 thread, Grade 8	1050095555 (Instock Fasteners)	8

Electrical Terminals

Assorted ring, spade, and quick connect terminals

Additional Parts

Variac, 120/240V in, 0-280V out, 9.5 Amps	Type 1520 (STACO)	1
Console Box w/panel	1456FG4BKBU (Hammond Mfg.)	1
Plexiglass sheet for mounting 2.5uF capacitors	1/4 inch thick by 12 inches sq.	1
Electrical box	4" x 4"	1
50 amp plug	1	
50 amp receptacle	1	
Switch, start/run	DPDT center off, 15 amp, 240V	1
Bridge Rectifier	600 volt, 25 Amp., quick connect terminals	1
Nuts	1/4 - 28 Grade 8	8
Washers	1/4 " flat	16

Frame and Base

Angle aluminum	1 1/2" x 1 1/2" x 4 feet. 1/8" thk.	1
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Suppliers and Parts/Service List 部品/サービス提供業者リスト

POLARIS LASER LAMINATIONS – Generator Core; Rotor

TORELCO – Toroidal winding service and complete core processing ready to ship

FASTENAL – Retaining (bonding) compound (Loctite 648: bonds rotor to shaft) with activator

EIS – Mica tape; 20 gauge Magnet wire

S & W – 10 gauge Magnet wire

INDUSTRIAL SENSORS AND CONTROLS (ebay) – Motor controller KBIC-240D variable speed DC motor controller; Resistor

MOUSER – Capacitors, Enclosures, Variac, Rectifiers, Start/Run switch

JDS (ebay) – V belt; pulleys

EMCO PLASTICS – End plates

ASHEVILLE-SCHOONMAKER MICA – Mica plates

DISCOUNT STEEL – Aluminum squares (spacers)

BRIGHTON BEST – 8 in. bolts

MCMMASTER-CARR – Clear acrylic tube for exciter coil

LAKE CITY ELECTRIC (ebay) – Variable speed DC Motor (1 hp)

THE BIG BEARING STORE – 7/8” Three Bolt Flange Bearing w/set screws

Additional Parts 追加部品

High-temperature fiberglass tape (outer wrap)

4” x 4” electrical box

50 amp plug

50 amp receptacle

Black fiberglass sleeving (pvc-coated)

Black mylar insulating tape

Wood or welded steel tubular frame for base

12 - TPC Thomson / AVX Medium Power Film Capacitors

Angle aluminum

Start/run switch

MAJOR GENERATOR COMPONENTS 主要発電機部品

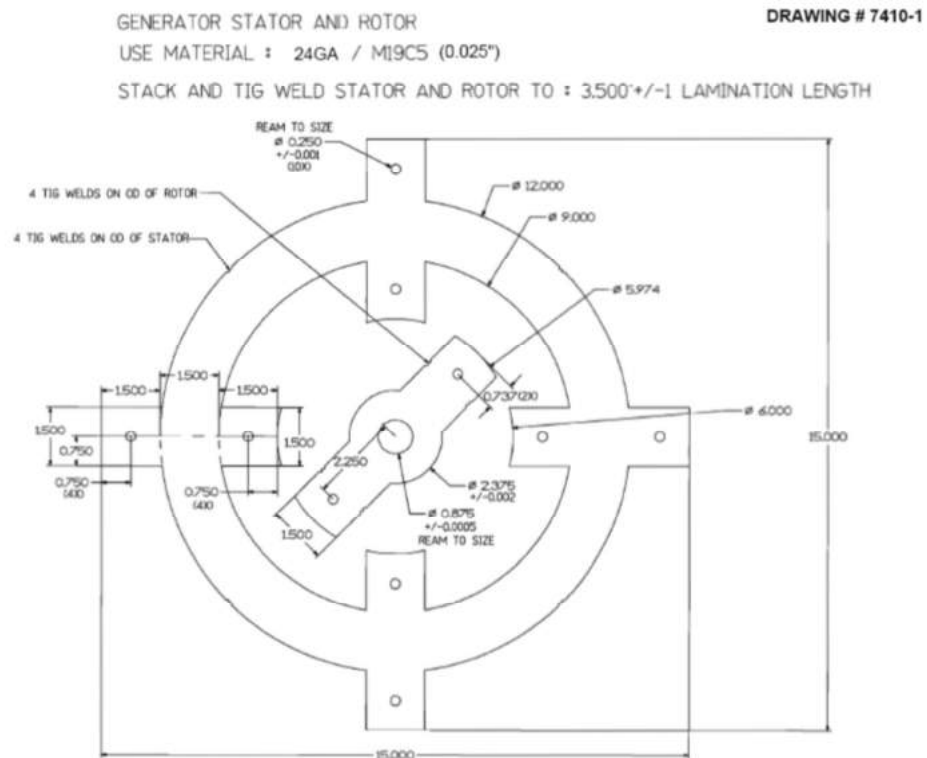
- Stator
- Rotor
- Bearings
- V belts
- Capacitors
- External exciter coil
- End panels/plates
- Magnet wire
- Drive motor
- Control box
- Frame and packaging
- Variac
- Inverter
- Pulleys

THE STATOR, or generator core, is made using 140 laminations of 24 gauge M19 C5 electrical steel forming a stack of 3 - ½ inches, with a 4 pole configuration. Corresponding **ROTOR** with 2 poles. Both STATOR and ROTOR are tig welded in 4 places.

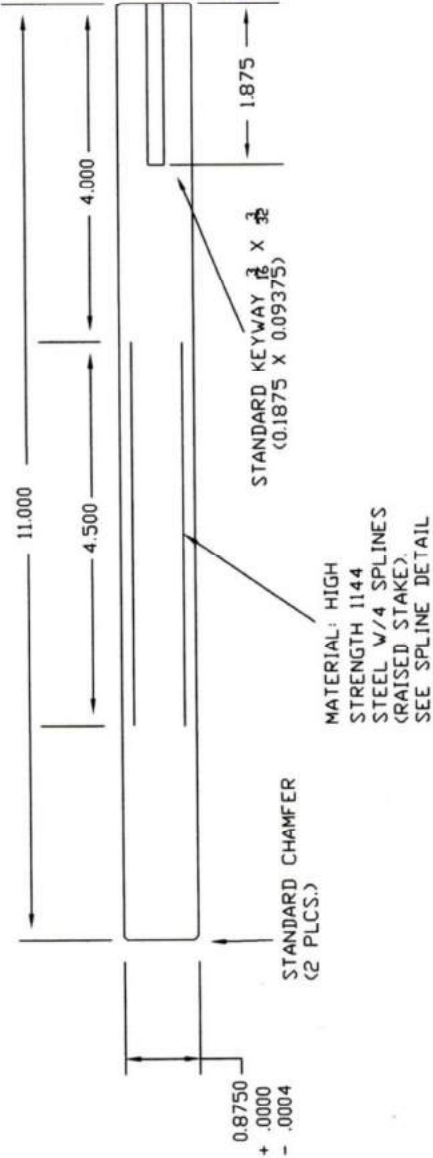
ステーター（発電機の鉄心）は、24 規格 M19 C5 の 140 個の薄層構造電磁鋼板を使用し 3 - ½ インチの堆積物にした物で極数は 4 極である。

対応するローターは 2 極です。

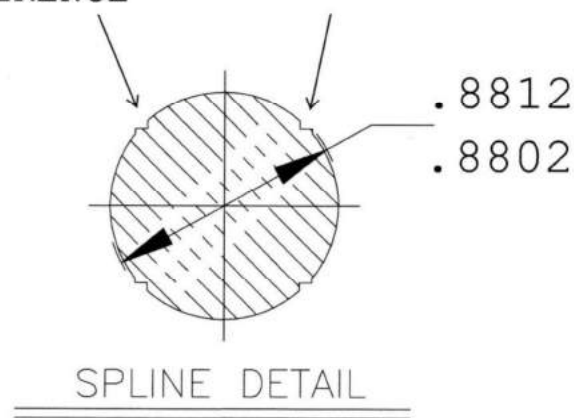
ステーター、ローター共に 4 か所で溶接されている。



Shaft シャフト



4 SPLINES (RAISED STAKE)
EQUIDISTANT AROUND SHAFT
CIRCUMFERENCE



* We didn't use the splines, rather, we used Loctite 648 retaining compound to bond the rotor to the shaft. This technique works very well with a close slip fit between the parts.

* 私たちはローターをシャフトに接合する為にスプライン「キー溝」を使用しませんでした、もっと正確に言えば、私たちは、ロックタイト 648 接着剤を使用しました。

このテクニックは、部品間が極わずかなズレで勘合し非常に上手く行った。

End Plates 外装側板

Fiberglass reinforced epoxy laminate (FR-4/G10) is used for end plate construction. End plates must be constructed of insulating material, but must also be structurally strong as they support all generator components, including bearings, shaft, rotor and stator. FR4 is the same material used to make circuit boards and is very strong, machinable, and dimensionally stable. Dimensions: End Plates: .500" Thk. G10/FR-4 15" X 16.5" with 15" radius and 2.450" center hole.

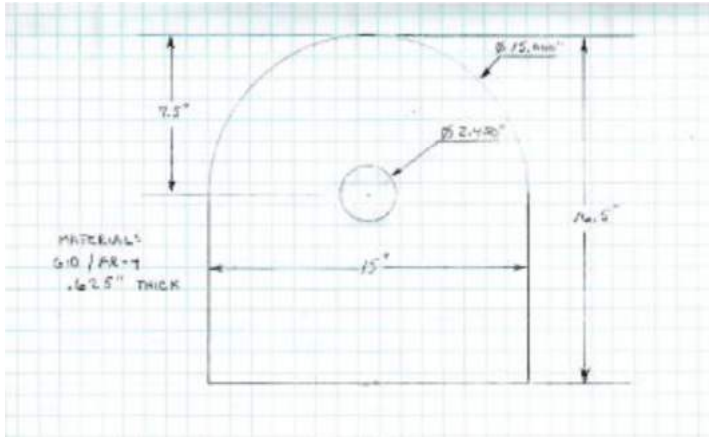
エポキシ樹脂で積層し強化したガラス繊維 (FR-4/G10)が、外装側板に使用されます。

外装側板は絶縁材料で造らなければ成りません、それらがベアリング、軸、シャフトおよびステーターを含むジェネレーター・コンポーネントをすべて支援するので、さらに、構造上強くなければ成りません。

FR4 は回路基板を作製する為に使用されるのと同じ材料で、非常に強く、切削可能で、寸法的に安定しています。

寸法: 端板:厚さ 0.5 インチ、15 インチ×16.5 インチ角の G10/FR-4。

15 インチの半径と 2.450 インチのセンター穴を有する



Bearings ベアリング

The bearings should have a narrow inner ring with set screws for attaching to the shaft. Housing is cast iron with a grease zerk for re-lubing the bearing. We used a 3-bolt flange type mount, but 2-hole or 4-hole can also be used. Bearings are mounted on the *inside* of the end plates toward the rotor.

ベアリングは、軸に付ける為のセットビスを付ける狭いインナー・リングを持っていなければ成らない。

外装は、ベアリングに油を給油するためのグリースザークを持つ鋳鉄である。

我々は 3 本のボルト・フランジ形台を使用した。しかし、2 つまたは 4 つ穴の物も使用することができる。

ベアリングはローター用に外装側板の内側に組み込まれる。

Capacitors コンデンサー

The capacitors are a critical part of the system. The initial configuration on our prototype uses 12 caps, 2.5uF (microfarad) each. Each cap is rated for 2000V. These capacitors are wired in series in order to be able to withstand up to 25,000V in the primary circuit. The value and quantity of these capacitors will be adjusted to tune the frequency of the generator.

コンデンサーはこのシステムにとって厳密な重要部品です。

私たちの試作の初期構成は 12 個のコンデンサー、各々 2.5uF(マイクロファラド)です。

各々のコンデンサーは 2000V 定格です。

これらのコンデンサーは一次回路の中で 25,000V まで耐えることができる様に直列に結線されています。

これらのコンデンサーの値と数量は発電機の周波数を合わせる為に調節される。

Variac スライダック変圧器

The variac is used to control the drive motor speed which effectively controls the system power. It's used during construction/tuning, and prior to self-running set-up when it can be replaced with the

smaller, lighter electronic motor drive circuit board.

バリアックはシステムの電源出力を効果的にコントロールする駆動モーターの速度をコントロールするために使用される。

それは、組立/調整の間、および自立作動へのセット・アップに先立って使用されます。

自立後は、より小さくより軽いモータードライバー基板に変更できる。

Drive motor control circuit board モータードライブ制御基板

The drive motor control circuit board is an industry standard SCR type DC motor drive manufactured by KB Electronics. The control board can be mounted in the console box we have included in the parts list, and is provided with a speed control potentiometer for adjusting motor speed.

駆動モーター制御基板は、KBエレクトロニクス製の業界標準的なSCRタイプDCモータードライブです。制御基板は、私たちが部品表に入れたコンソール・ボックスにマウントすることができ、モーター速度制御用可変抵抗器が付いています。

End Plate Layout 外装側板の配置

We used the bare core as a template to drill all the core mounting holes in the proper locations on the end plates. After end plates are cut and finished, place one on a flat work surface that will support 100 lbs. Place the bare core over end plate, aligning the center bore of the core with the center hole in the end plate. Make sure the pole pieces are right to the edge of the radius at the top of the end plate. We used an extra long drill bit to drill the 8 mounting holes. Repeat this process for the other end plate. Alternately, a long pin could be used as a center punch to mark hole locations and drill the holes using a drill press. If using the core as a template be sure to make assembly marks on the core and the end plate so that final assembly will have all the parts in the same orientation and the mounting bolts will go through without binding. Be sure to mark the in-facing and out-facing sides of each panel.

側板の適切な位置にすべての鉄心にマウント用の穴を開けるために、我々はテンプレートとして裸の鉄心を使用した。

側板をカットし完成させた後、それを 100 ポンドの重さに耐える平らな作業台の上に置く。

裸鉄心の中心穴と側板の中心穴を整列させる。

磁極部がちょうど側板の半径の端、一番上にあることを確かめてください。

我々は、8つの取り付け穴を開けるために特別長いドリル・ビットを使用した。

別の側板もこのプロセスを繰り返してください。

代替として、穴位置をマークするセンターポンチとして長いピンを使用することができ、立て型ボール盤を使用して、穴を開けることができた。

もしテンプレートとして鉄心を使用する場合、鉄心と側板に組立用の印を必ず付ける事。

最終組み立てですべての部品が同じ方向で、組立用のボルトが、縛ることなく通るように。

必ず各パネルの内面、外面に印を付けてください。

CORE ASSEMBLY コアアッセンブル品

This is the time to review the NOTICE and section on consciousness at the beginning.

We highly recommend ordering your generator set (stator and rotor) from an experienced professional lamination house. When your stator/rotor is welded and drilled, you are ready to bolt down the 8 spacers and wrap the core with 2 types of tape: Wrap 2 layers mica tape around the steel core (round part) followed by 1 layer of 1" reinforced, high-strength black tape. These 3 layers will bring the thickness needed for insulation to 17 mil (be very mindful at the corners of the pole pieces making certain there is no opening in the insulation for the wire to fall down into contact with the steel. If this happens, the coil will be short-circuited).

これは、再度注意を見直す時間であり、初めの自覚の為のセクションです。

私たちは経験を積んだ積層の専門家にあなたの発電セット(スターターとステーター)を注文することを強く推奨します。

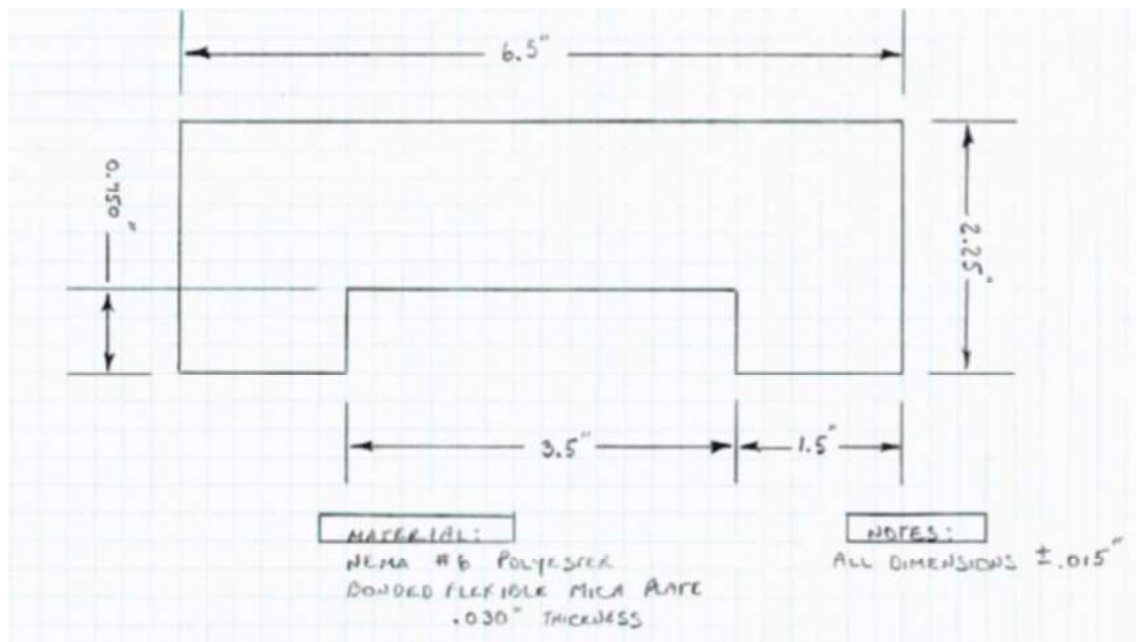
あなたのスターターとステーターが溶接され、穴が空けられるのなら、あなたは8つのスペーサーをボルトで締め、かつ2種類のテープで鉄心を包む準備ができています:

鋼鉄心(周りの部分)のまわりをマイカテープで2層(高強度のブラック・テープ)包んでください。

1層巻いた後、1インチの強化黒テープを巻く。

これらの3層は、絶縁に必要とされる17ミリ厚さをもたらす。(ワイヤーが鋼との接触まで倒れ絶縁に於ける穴がないことを確かめる様に磁極部の角は非常に注意する。これが起これば、コイルは短絡する。

Mica Plate Cuts (16 pieces) マイカ板カット品 16枚



Installing Mica Plates マイカ板の組み立て工程

After you've cut 16 c-shaped mica plates, install them on the top and bottom of each pole piece (front and back). We used a small amount of contact cement to hold them in place for the rest of the processing, but they can also be taped in place with the reinforced black mylar tape. These are installed after core taping and before winding.

Cの形をしたマイカ板を 16 枚カットした後、それらを各磁極部のトップ&ボトム(前部と後部)に組立てる。私達は、残りの工程処理でそれらをその場所に保持する為、少量のコンタクトセメントを使用した。しかし、それらは、黒い強化マイラーテープで保持することもできる。これらはコアのテーピング後で巻線する前に組み立てる。

Wiring 巻線工程

You will need to commission a toroidal winding service. They might agree to process the entire core if you supply the materials (mica tapes and plates, corner insulation, aluminum spacers, bolts, outer taping, etc.). Proper winding is critical.

Teflon sleeving is installed on the first complete turn of each winding of the #20 wire, and fiberglass/PVC sleeving on the #10 wire. Two coils of 3100 turns each of #20 wire are wound on opposing sides (left and right), and 2 coils of 350 turns each of #10 wire on the other sides (top and bottom). Leave about 3 feet of wire at the start of each winding and also at the finish for lead wires. Use enough sleeving to make sure the lead wires are completely insulated where they come through the back end panel. Be sure to secure the finish leads of each coil so that they don't unravel during handling.

あなた方は環状巻線サービスを外部に委任する必要があるでしょう。

彼らは、あなた方が材料(マイカテープおよびプレート、角用絶縁物、アルミニウム・スペーサー、ボルト、外装テープ)を供給すれば、鉄心部全体を処理することに合意するかもしれません。

適切な巻線は不可欠です。

#20 ワイヤーの各巻線の最初の一回転にテフロンのスリーブを付ける。

そして#10 ワイヤーに PVC ガラス繊維のスリーブを付ける。

2 個の#20 ワイヤー3100 ターンのコイルを反対側(左、右)に曲げる、および 2 個の#10 ワイヤー350 のコイルを反対側(トップ、ボトム)に曲げる。

リードワイヤーとして各巻線の最初と最後に約 3 フィートのワイヤーを残す。

後部パネルを通す所でリードワイヤーが完全に絶縁される様に、十分なスリーブを施す事。

取り扱いの間に解けないように、必ず各コイルの完成リード線を確保する事。

Outer Wrap Taping テーピングにより表面を包む工程

Wrap a single layer of 1" white fiberglass tape tightly and securely around each coil making sure that all wire is covered and tape is butted up against the 4 pole pieces.

ワイヤーすべてカバーされ、テープは 4 つの磁極部に密着している事を確信しながら、個々のコイルの周

りを 1 インチの白いガラス繊維・テープの単層でしっかりと安全に包む。

Generator Assembly Steps 発電機アッセンブル工程

Rotor/Shaft/Shroud Assembly ローター/シャフト/側板アッセンブル

Drawings are provided for the shaft showing an optional spline operation that can be used to mount the rotor to the shaft, if desired. We used Loctite 648 industrial adhesive (with activator), which is effective with close fitting parts.

Drill a 7/8" center hole, and two 1/4" mounting holes into the shroud disks (mounting holes are lined up with the holes in the rotor). Slide one disk onto the shaft on each side of the rotor. Bolt both shrouds to the rotor using two 4" or 4-1/4" long 1/4 - 28 through-bolts and nuts. These bolts should not be any longer than necessary or a rotor imbalance can occur. Shrouds are used to quiet the windage noise generated by the spinning rotor.

もし望まれるならという事で、この図面は、ローターをシャフトに取り付けるのに使用できるオプションとしてスプラインを採用したケースを提供しています。

私たちはロックタイト 648 産業用接着剤(活性剤付)を使用しました、(それは勘合部品に有効である)。

7/8"のセンター穴と 1/4"の組み付け用の穴を外装板に空ける。

(組み付け用の穴は、ローターの穴と整列される)

シュラウド・ディスクの中への取り付け穴。

ローターの両サイドのシャフト上に 1 枚のディスクを滑らせる。

シュラウド・ディスクとローターは 2 本のサイズ 4"または 1/4 インチ太めの 4-1/4" 長さ 28 インチの貫通ボルト及びナットを使用して締める。

これらのボルトは必要以上に長くは無い。でなければ、ローターのインバランスが生じる。

シュラウドはローターが回る事によって発生する風切音を静めるために使用される。

Bearings

Mount bearings to the *inside* of the front and rear end plates. Center each bearing on the 2.450" hole in the center of the plate. Drill the holes oversize for the mounting bolts. This is done to provide adjustability in the position of the shaft at final assembly. The bearings will have to be moved slightly to center the rotor in the bore of the generator. The gap between rotor and stator is very small (.010") and the rotor will need to be positioned so it does not rub on the stator bore. Only tighten finger tight at this time.

We opted to bring the leads from the coils out directly through holes drilled in the rear end plate. You may decide to bring the leads out a different way. Here are the steps for our method:

正面と後部のプレートの内部へのベアリングを組み付ける。

各々のベアリングをプレートの中心に有る 2.450"の穴に合わせる。

組み付けボルト用に大き目の穴を空ける。

これは最終組み立てでシャフトの位置を調整可能にする為です。

ベアリングはジェネレーターの穴にローターを中心合わせする為、わずかだが移動されなければならないだろう。

ローターとステーター間のギャップは非常に小さい(.010")。また、ローターはステーター内径にこすれないように配置する必要がある。この位置で強く締める。

私たちは、後部プレートに空けた穴を通してコイルから直接リード線を持ってくる事を選んだ。

あなた方は、異なる方法を取ってもよい。

これは、私たちの方法の各ステップです:

1) Insert all 8 bolts into the rear end plate, then lay the plate down on a flat work surface with the bolts pointing up. The work surface should have a hole under the center hole in the end plate to provide clearance when the rotor is inserted. About 1 ½ inches of clearance is needed below the plate.

1) 後部プレートに8本のボルトをすべて挿入し、次に、立ち上がったボルトと一緒に平らな作業台に置く。作業台は、ローターが挿入された時にクリアランスを提供するために、後部プレートのセンター穴の下に穴が必要です。

約 1-1/2 インチのクリアランスがプレートの下に必要です。

2) With an assistant or two, place the fully processed core (about 90 lbs.) down onto the bolts. Slide the core all the way down into contact with the end plate.

2) 1 人か 2 人の助手と共に、ボルトの上に完全に処理された鉄心(約 90 ポンド)を置く。

鉄心を後部プレートとの接触するまで下へ滑り込ませる。

3) Insert the short end of the rotor/shaft/shroud assembly through the stator bore and into the rear bearing. Let the rotor assembly drop gently to the bottom and place the front end plate with bearing over the bolts and shaft end. Tap into place with rubber mallet if necessary. Once plate is in contact with stator assembly, install washers and nuts and tighten securely.

3) ローター/シャフト/シュラウド組立品の短い側をステーターの内径を通して、後部ベアリングへ挿入する。

ローター組立品を底まで優しく落とし、ベアリング付の前面プレートをボルトおよびシャフト端面の上に置く。

必要ならばゴム製の槌で叩き込む。

一旦プレートがステータ組立品に接したなら、ワッシャとナットを入れてしっかりと締める。

4) With assistance, place the assembly upright onto the raised portion of the base. We used 5 lag bolts across the bottom of the end plates on each side to mount the assembly to the wood base/frame. Other methods could be employed.

4) 組立品を助手と一緒に基礎の高くした部分の上に立てて置く。

我々は組立品を木製のベースフレームへ組み上げるために、エンドプレートの底の両サイドで対向させて

5つのラグボルトを使用した。

他の方法を使用することができるかもしれない。

5) Mount the drive motor to the base/frame. We mounted the shaft end of the motor onto the aluminum angle on the front of the base with one bolt to provide adjustability for belt tightening. We built a sliding mount for the rear of the motor using sheet metal parts, but sliding motor bases are commercially available that provide adjustability for proper belt tensioning.

5) ベースフレームへの駆動モーターをマウントする。

私たちは、モータ軸端をベースの正面に置いたアルミニウム製アングル上にベルトの張りを調整できるように1本のボルトでマウントした。

私たちは板金部品を使用してモータの後部に向かってスライド構造を作った。

しかし適切な張力に調整できる市販のモータ台が入手可能である。

6) When the motor is mounted to the base, install 3" pulley on motor shaft using set screws.

6) モータをベースへ組み込む時、3"の滑車をモータ軸にセットビスを使って取り付ける。

7) At this point the rotor position should be adjusted so that it spins freely inside the core without rubbing. This is where you may need to adjust the bearing positions repeatedly until the rotor spins freely. (The gap between the rotor and stator is .010" making this step a little delicate.) however, once the rotor is tightened in position it does not tend to move. Place the 2 ½" pulley on the generator shaft at this time; it can be used to turn the rotor by hand while adjusting its position.

7) ローターは、この時点で摩擦なしに鉄心内部で軽く回るように、位置を調節する。

ここでは、ローターが自由に回るまで、ベアリング位置を繰り返し調節する必要があるかもしれない。

(ローターとステーター間のギャップは.010"で、この調整を少し微妙にしている)

しかしながら、一度ローターをその位置で締めてしまえば、それは動く傾向は無い。

この時点で2½"のプーリー滑車を発電機のシャフトに取り付ける。

それは位置調節する時に手によってローターを回すため使用することができます。

8) Place the V-belt over both pulleys and position pulleys as close to the motor and the generator as possible. Both pulleys should be positioned an equal distance from the faces of the motor and generator to assure that the belt runs true.

8) V ベルトを両 滑車に取り付け、滑車をできるだけモータとジェネレーターの近くに置く。

両方の滑車は、ベルトが上手く動作する様にモータ面とジェネレーター面の等しい距離に配置する。

9) The variac can be mounted on the base at this time. We used two 1/4 – 20 x 1" bolts with nuts to mount the variac to the aluminum angle. After all the components are mounted on the base, wiring

and testing will be performed using the variac. (After set-up and testing is completed, the variac can be replaced with the electronic motor control circuit board for less bulk and weight. The console box in the parts list can be used as an enclosure/control panel for the motor speed control board, and for mounting the DPDT start/run switch.)

9) バリアック変圧器は、この時点でベースに取り付けることができる。

私たちは 2 1/4 を使用しました？

変圧器をアルミニウムアングルへ取り付けするために、2 本の 1/4" 長さ 20" とナットを使った。。

コンポーネントをすべてベースに取り付けた後、配線と試験は変圧器を使用して行う。

(セット・アップと試験が完成した後、変圧器は、より小さくて軽い電子モーター制御基板と取り替えることができる。部品表中のコンソール・ボックスは筐体兼コントロール・パネルとしてモーター速度制御ボードおよびスタート/実行切り替え用 DPDT スイッチの組み込みに使用することができる。)

10) With all components mounted on the base, wiring can begin. Please follow the schematic to make connections. We mounted a 4" x 4" electrical box on the base to support a large (50 Amp) receptacle to bring the power out of the generator.

10) ベースにすべてのコンポーネントを組み込んだ状態で、配線を始める。

接続をするために回路図を見てください。

私たちはベースにジェネレーター出力用の大きな 50 アンペアコンセントを保持する為 4"×4"角の電気ケースを取り付けた。

Wiring Notes: The generator output can be wired in series (220, 230-240V), or parallel (110, 115, 120V). For the series connection shown on the schematic, the start leads from each coil are connected together. This connection provides the highest voltage output from the windings. If using a parallel connection for lower voltage/higher current, be careful to connect the four leads with polarity opposed (start lead of one coil connected to finish lead of other coil).

The variac we used can be wired for 120 or 240 volt input, and provides 0-280 volts output, at up to 9.5 amps. This is a versatile variac and can be used with either a 120 or 240 volt system. The output of the variac is connected to a 600 volt, 25 Amp full-wave bridge rectifier to power the variable speed DC drive motor.

配線の注意:

発電機の出力は、シリーズ接続(220 および 230-240V)、並列接続(110、115 および 120V)が可能です。

回路図にある直列接続については、各コイルからのスタートリード線どうしを接続する。

この接続は、巻線からの高電圧出力を提供する。

並列接続を低電圧/高電流で使用する場合は、4 つのリード線の極性を反対に成る様(1 個のコイルのスタートリード線を他のコイルの終了リード線に接続) 注意して接続する。

私たちが使用した変圧器は 120 又は 240 ボルト入力で使用でき、0~280V、9.5A の出力が取り出せる。

これは用途の広い変圧器で、120 又は 240 ボルトのシステムどちらでも使用できる。

変圧器出力は、可変速駆動 DC モーターに動力を供給する為、600 ボルト 25 アンペアの全波整流器に接続される。

Set-up and testing セットアップとテスト

Starting with the wiring setup as shown in the schematic, disconnect the primary coils from the series capacitor string on one end (disconnect capacitors). This will prevent resonance momentarily.

Connect input power to the variac. We started with a full 240 volt series wired system, but parallel 120 volt wiring can also be used.

回路図に示している配線セットアップから始めて、直列接続されたコンデンサをその一端で一次コイルから切り離す(コンデンサーを分離する)。

これは一時的に共振を止める。

変圧器に電源を接続する。

私たちは 240 ボルトフル電圧のシリーズ配線システムで始めた。しかし、並列の 120 ボルトの配線も使用できる。

Test mechanical assembly by spinning up the motor/rotor/belt and observing operation. Adjust variac voltage from zero to about $\frac{3}{4}$ through its range. The active rpm range is under 2500 rpm, so we don't need to spin very fast. Assure there is no stack rub (rotor scrubbing on stator), or other mechanical issues that need to be corrected for smooth operation.

モータ/ローター/ベルトの回転を上げて動作を観察することにより組み立て状態をテストする。

変圧器電圧を 0 から電圧レンジのおよそ $\frac{3}{4}$ に調節する。

動作回転数の範囲は 2500rpm 未満です。

したがって、非常に速く回す必要はありません。

擦りが無い事(ローターのステータとの擦り)を確認する。滑らかな動作をする為に修正される必要のある他の機械的な不具合がないか確認する。

When proper mechanical operation is assured, re-connect the series capacitor bank. The initial configuration of 12 (twelve) 2.5 uF, 2000 volt capacitors gives us .208uF, that will withstand up to 24,000 volts. This initial value should be in the range to produce resonance.

適切な機械的動作が保証されるたら、再度直列のコンデンサ群を接続する。

初期設定の 2.5 uF、2000V コンデンサー12 個の構成は、.208uF、24,000 V 耐圧となる。

この初期値は共振を生み出すレンジの範囲に入っていなければ成らない。

As the machine spins up to resonance, the sound will change, and the rotor speed will lock into the resonant frequency. At this point any further increase of the motor speed control will change the speed only slightly, but the additional mechanical power (horsepower) will drive the core deeper into resonance, thereby increasing the power output. With a single control, the voltage and current (power) can be increased or decreased.

機械が共振まで回転上昇すると、音は変わる。

また、ローター速度は共鳴周波数へロックする。

この時点では、モーター速度制御での更なる過速はほんのわずかしかな効かない。

しかし、追加した機械力(馬力)は鉄心をより深く共振へドライブし、それによって、出力パワーを増加させる。

単一の制御で、電圧と電流(電力)を増減できる。

As previously mentioned, the exciter coil is used to provide a conduction path through the quantum field (zero point) into the generator core. This has the effect of polarizing the core, which increases power output over time. After the QEG is first built, the spark gap on the exciter coil should be adjusted (with power off) to between .005" and .010". Start the generator and let it spark for 2-3 seconds, and repeat this 4 or 5 times. Do this whenever starting the generator for the first few weeks of operation.

以前に言及したように、励磁コイルはジェネレーター鉄心への量子場(ゼロポイント)からの導電経路を形成するために使用される。

これは、鉄心を分極化する効果がある。それは出力を時間共に増加させる。

QEG を最初に組み立てた後、励磁コイル上の放電ギャップは、電源を落とした状態で .005"から.010"の間に調節されなければ成らない。

ジェネレーターをスタートし、それを 2-3 秒間スパークさせて、これを 4 あるいは 5 回繰り返す。

これをオペレーションの最初の数週間の間、ジェネレーターをスタートさせる時に常に行う事。



BEARINGS



SHROUDS



CAPACITORS



WOUND CORE



ACRYLIC TUBING & PLATE



MICA TAPING



MOTOR



EXCITER COIL



ASSEMBLY MARKS



MICA PLATING TOP



MICA PLATING BOTTOM



FIBERGLASS SLEEVING



MOTOR CONTROL BOX

ASSEMBLY MARKS



SHAFT



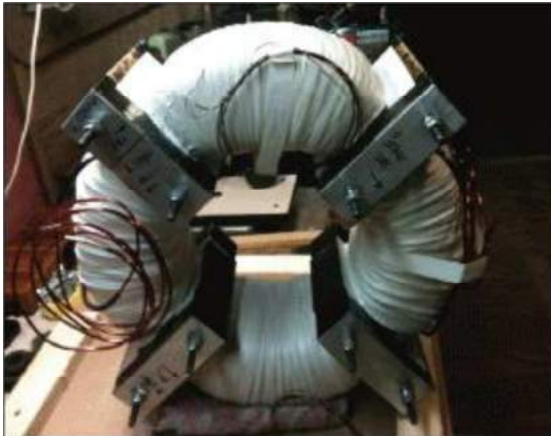
ROTOR & SHAFT



CAPACITORS



VARIAC



FULLY WRAPPED CORE



END PANEL FRONT



END PANEL REAR



OUTER WRAP



TOROIDAL WINDER



STATOR



ELECTRICAL BOX



END PLATES



WOOD FRAME



WRAPPED CORE/END PLATES



STATOR/ROTOR/SHAFT



WIRED CORE



WOOD FRAME



MOTOR CONTROLLER



20 GAUGE MAGNET WIRE



10 GAUGE MAGNET WIRE



SPACER BLOCKS

UNITED STATES PATENT OFFICE.

NIKOLA TESLA, OF NEW YORK, N. Y.

ELECTRIC GENERATOR.

SPECIFICATION forming part of Letters Patent No. 511,918, dated January 2, 1894.

Application filed August 19, 1893. Serial No. 493,562. (No model.)

To all whom it may concern:

Be it known that I, NIKOLA TESLA, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Generators, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

In an application of even date herewith, Serial No. 493,563, I have shown and described a form of engine invented by me, which, under the influence of an applied force such as the elastic tension of steam or a gas under pressure, yields an oscillation of constant period.

In order that my present invention may be more readily understood I will explain the conditions which are to be observed in order to secure this result.

It is a well known mechanical principle that if a spring possessing a sensible inertia be brought under tension, as by being stretched, and then freed, it will perform vibrations which are isochronous, and as to period, in the main, dependent upon the rigidity of the spring, and its own inertia or that of the system of which it may form an immediate part. This is known to be true in all cases where the force which tends to bring the spring or movable system into a given position is proportionate to the displacement.

In the construction of my engine above referred to I have followed and applied this principle, that is to say, I employ a cylinder and a piston which in any suitable manner I maintain in reciprocation by steam or gas under pressure. To the moving piston or to the cylinder, in case the latter reciprocate and the piston remain stationary, a spring is connected so as to be maintained in vibration thereby, and whatever may be the inertia of the piston or of the moving system and the rigidity of the spring relatively to each other, provided, the practical limits within which the law holds true that the forces which tend to bring the moving system to a given position are proportionate to the displacement, are not exceeded, the impulses of the power impelled piston and the natural vibrations of the spring will always correspond in direction and coincide in time. In the case of the engine referred

to, the ports are so arranged that the movement of the piston within the cylinder in either direction ceases when the force tending to impel it and the momentum which it has acquired are counterbalanced by the increasing pressure of the steam or compressed air in that end of the cylinder toward which it is moving, and as in its movement the piston has shut off at a given point, the pressure that impelled it and established the pressure that tends to return it, it is then impelled in the opposite direction, and this action is continued as long as the requisite pressure is applied. The length of the stroke will vary with the pressure, but the rate or period of reciprocation is no more dependent upon the pressure applied to drive the piston, than would be the period of oscillation of a pendulum permanently maintained in vibration, upon the force which periodically impels it, the effect of variations in such force being merely to produce corresponding variations in the length of stroke or amplitude of vibration respectively.

In practice I have found that the best results are secured by the employment of an air spring, that is, a body of confined air or gas which is compressed and rarefied by the movements of the piston, and in order to secure a spring of constant rigidity I prefer to employ a separate chamber or cylinder containing air at the normal atmospheric pressure, although it might be at any other pressure, and in which works a plunger connected with or carried by the piston rod. The main reason why no engine heretofore has been capable of producing results of this nature is that it has been customary to connect with the reciprocating parts a heavy fly-wheel or some equivalent rotary system of relatively very great inertia, or in other cases where no rotary system was employed, as in certain reciprocating engines or tools, no regard has been paid to the obtainment of the conditions essential to the end which I have in view, nor would the pressure of such conditions in said devices appear to result in any special advantage.

Such an engine as I have described affords a means for accomplishing a result heretofore unattained, the continued production of electric currents of constant period, by imparting the movements of the piston to a core or

coil in a magnetic field. It should be stated however, that in applying the engine for this purpose certain conditions are encountered which should be taken into consideration in order to satisfactorily secure the desired result. When a conductor is moved in a magnetic field and a current caused to circulate therein, the electro-magnetic reaction between it and the field, might disturb the mechanical oscillation to such an extent as to throw it out of isochronism. This, for instance, might occur when the electro-magnetic reaction is very great in comparison to the power of the engine, and there is a retardation of the current so that the electro-magnetic reaction might have an effect similar to that which would result from a variation of the tension of the spring, but if the circuit of the generator be so adjusted that the phases of the electromotive force and current coincide in time, that is to say, when the current is not retarded, then the generator driven by the engine acts merely as a frictional resistance and will not, as a rule, alter the period of the mechanical vibration, although it may vary its amplitude. This condition may be readily secured by properly proportioning the self induction and capacity of the circuit including the generator. I have, however, observed the further fact in connection with the use of such engines as a means for running a generator, that it is advantageous that the period of the engine and the natural period of electrical vibration of the generator should be the same, as in such case the best conditions for electrical resonance are established and the possibility of disturbing the period of mechanical vibrations is reduced to a minimum. I have found that even if the theoretical conditions necessary for maintaining a constant period in the engine itself are not exactly maintained, still the engine and generator combined will vibrate at a constant period. For example, if instead of using in the engine an independent cylinder and plunger, as an air spring of practically constant rigidity, I cause the piston to impinge upon air cushions at the ends of its own cylinder, although the rigidity of such cushions or springs might be considerably affected and varied by the variations of pressure within the cylinder, still by combining with such an engine a generator which has a period of its own approximately that of the engine, constant vibration may be maintained even through a considerable range of varying pressure, owing to the controlling action of the electro-magnetic system. I have even found that under certain conditions the influence of the electro-magnetic system may be made so great as to entirely control the period of the mechanical vibration within wide limits of varying pressure. This is likely to occur in those instances where the power of the engine while fully capable of maintaining a vibration once started, is not sufficient to change its rate. So, for the sake of illustration, if a pendulum is started in vibration,

and a small force applied periodically in the proper direction to maintain it in motion, this force would have no substantial control over the period of the oscillation, unless the inertia of the pendulum be small in comparison to the impelling force, and this would be true no matter through what fraction of the period the force may be applied. In the case under consideration the engine is merely an agent for maintaining the vibration once started, although it will be understood that this does not preclude the performance of useful work which would simply result in a shortening of the stroke. My invention, therefore, involves the combination of a piston free to reciprocate under the influence of steam or a gas under pressure and the movable element of an electric generator which is in direct mechanical connection with the piston, and it is more especially the object of my invention to secure from such combination electric currents of a constant period. In the attainment of this object I have found it preferable to construct the engine so that it of itself controls the period, but as I have stated before, I may so modify the elements of the combination that the electro-magnetic system may exert a partial or even complete control of the period.

In illustration of the manner in which the invention is carried out I now refer to the accompanying drawings.

Figure 1 is a central sectional view of an engine and generator embodying the invention. Fig. 2 is a modification of the same.

Referring to Fig. 1 A is the main cylinder in which works a piston B. Inlet ports C C pass through the sides of the cylinder opening at the middle portion thereof and on opposite sides. Exhaust ports D D extend through the walls of the cylinder and are formed with branches that open into the interior of the cylinder on each side of the inlet ports and on opposite sides of the cylinder. The piston B is formed with two circumferential grooves E F which communicate through openings G in the piston with the cylinder on opposite sides of said piston respectively.

The particular construction of the cylinder, the piston and the ports controlling it may be very much varied, and is not in itself material, except that in the special case now under consideration it is desirable that all the ports, and more especially the exhaust ports should be made very much larger than is usually the case so that no force due to the action of the steam or compressed air will tend to retard or affect the return of the piston in either direction. The piston B is secured to a piston rod H which works in suitable stuffing boxes in the heads of the cylinder A. This rod is prolonged on one side and extends through bearings V in a cylinder I suitably mounted or supported in line with the first, and within which is a disk or plunger J carried by the rod H. The cylinder I is without ports of any kind and is air-tight except as a

small leakage may occur through the bearings V, which experience has shown need not be fitted with any very considerable accuracy. The cylinder I is surrounded by a jacket K which leaves an open space or chamber around it. The bearings V in the cylinder I, extend through the jacket K to the outside air and the chamber between the cylinder and jacket is made steam or air-tight as by a suitable packing. The main supply pipe L for steam or compressed air leads into this chamber, and the two pipes that lead to the cylinder A run from the said chamber, oil cups M being conveniently arranged to deliver oil into the said pipes for lubricating the piston. In the particular form of engine shown, the jacket K which contains the cylinder I is provided with a flange N by which it is screwed to the end of the cylinder A. A small chamber O is thus formed which has air vents P in its sides and drip pipes Q leading out from it through which the oil which collects in it is carried off.

To explain now the operation of the engine described, in the position of the parts shown, or when the piston is at the middle point of its stroke, the plunger J is at the center of the cylinder I and the air on both sides of the same is at the normal pressure of the outside atmosphere. If a source of steam or compressed air be then connected to the inlet ports O O of the cylinder A and a movement be imparted to the piston as by a sudden blow, the latter is caused to reciprocate in a manner well understood. The movements of the piston compress and rarefy the air in the cylinder I at opposite ends of the same alternately. A forward stroke compresses the air ahead of the plunger J which acts as a spring to return it. Similarly on the back stroke the air is compressed on the opposite side of the plunger J and tends to drive it forward. The compressions of the air in the cylinder I and the consequent loss of energy due mainly to the imperfect elasticity of the air, give rise to a very considerable amount of heat. This heat I utilize by conducting the steam or compressed air to the engine cylinder through the chamber formed by the jacket surrounding the air-spring cylinder. The heat thus taken up and used to raise the temperature of the steam or air acting upon the piston is availed of to increase the efficiency of the engine. In any given engine of this kind the normal pressure will produce a stroke of determined length, and this will be increased or diminished according to the increase of pressure above or the reduction of pressure below the normal.

In constructing the apparatus proper allowance is made for a variation in the length of stroke by giving to the confining cylinder I of the air spring properly determined dimensions. The greater the pressure upon the piston, the higher the degree of compression of the air-spring, and the consequent counteracting force upon the plunger. The rate

or period of reciprocation of the piston, however, is mainly determined as described above by the rigidity of the air spring and the inertia of the moving system, and any period of oscillation within very wide limits may be secured by properly portioning these factors, as by varying the dimensions of the air chamber which is equivalent to varying the rigidity of the spring, or by adjusting the weight of the moving parts. These conditions are all readily determinable, and an engine constructed as herein described may be made to follow the principle of operation above stated and maintain a perfectly uniform period through very wide limits of pressure.

The pressure of the air confined in the cylinder when the plunger I is in its central position will always be practically that of the surrounding atmosphere, for while the cylinder is so constructed as not to permit such sudden escape of air as to sensibly impair or modify the action of the air spring there will still be a slow leakage of air into or out of it around the piston rod according to the pressure therein, so that the pressure of the air on opposite sides of the plunger will always tend to remain at that of the outside atmosphere.

To the piston rod H is secured a conductor or coil of wire D' which by the movements of the piston is oscillated in the magnetic field produced by two magnets B' B' which may be permanent magnets or energized by coils C' C' connected with a source of continuous currents E'. The movement of the coil D' across the lines of force established by the magnets gives rise to alternating currents in the coil. These currents, if the period of mechanical oscillation be constant will be of constant period, and may be utilized for any purpose desired.

In the case under consideration it is assumed as a necessary condition that the inertia of the movable element of the generator and the electro-magnetic reaction which it exerts will not be of such character as to materially disturb the action of the engine.

Fig. 2 is an example of a combination in which the engine is not of itself capable of determining entirely the period of oscillation, but in which the generator contributes to this end. In this figure the engine is the same as in Fig. 1. The exterior air spring is however omitted and the air spaces at the ends of the cylinder A relied on for accomplishing the same purpose. As the pressure in these spaces is liable to variations from variations in the steam or gas used in impelling the piston they might affect the period of oscillation, and the conditions are not as stable and certain as in the case of an engine constructed as in Fig. 1. But if the natural period of vibration of the elastic system be made to approximately accord with the average period of the engine such tendencies to variation are very largely overcome and the engine will preserve its period even through a considerable range of variations of pressure. The

generator in this case is composed of a magnetic casing *E'* in which a laminated core *G'* is secured to the piston rod *H* is caused to vibrate. Surrounding the plunger are two exciting coils *C' C'*, and one or more induced coils *D' D'*. The coils *C' C'* are connected with a generator of continuous currents *E'* and are wound to produce consequent poles in the core *G'*. Any movement of the latter will therefore shift the lines of force through coils *D' D'* and produce currents therein.

In the circuit of coils *D'* is shown a condenser *H'*. It need only be said that by the use of a proper condenser the self induction of this circuit may be neutralized. Such a circuit will have a certain natural period of vibration, that is to say that when the electricity therein is disturbed in any way an electrical or electro-magnetic vibration of a certain period takes place, and as this depends upon the capacity and self induction, such period may be varied to approximately accord with the period of the engine.

In case the power of the engine be comparatively small, as when the pressure is applied through a very small fraction of the total stroke, the electrical vibration will tend to control the period, and it is clear that if the character of such vibration be not very widely different from the average period of vibration of the engine under ordinary working conditions such control may be entirely adequate to produce the desired results.

Having now described my invention, what I claim is—

1. The combination with the piston or equivalent element of an engine which is free to reciprocate under the action thereon of steam or a gas under pressure, of the moving conductor or element of an electric generator in direct mechanical connection therewith.

2. The combination with the piston or equivalent element of an engine which is free to reciprocate under the action of steam or a gas

under pressure, of the moving conductor or element of an electric generator in direct mechanical connection therewith, the engine and generator being adapted by their relative adjustment with respect to period to produce currents of constant period, as set forth.

3. The combination with an engine comprising a piston which is free to reciprocate under the action of steam or a gas under pressure, and an electric generator having inducing and induced elements one of which is capable of oscillation in the field of force, the said movable element being carried by the piston rod of the engine, as set forth.

4. The combination with an engine operated by steam or a gas under pressure and having a constant period of reciprocation, of an electric generator, the moving element of which is carried by the reciprocating part of the engine, the generator and its circuit being so related to the engine with respect to the period of electrical vibration as not to disturb the period of the engine, as set forth.

5. The combination with a cylinder and a piston reciprocated by steam or a gas under pressure of a spring maintained in vibration by the movement of the piston, and an electric generator, the movable conductor or element of which is connected with the piston, these elements being constructed and adapted in the manner set forth for producing a current of constant period.

6. The method of producing electric currents of constant period herein described which consists in imparting the oscillations of an engine to the moving element of an electric generator and regulating the period of mechanical oscillation by an adjustment of the reaction of the electric generator, as herein set forth.

NIKOLA TESLA.

Witnesses:

PARKER W. PAGE,
R. F. GAYLORD.

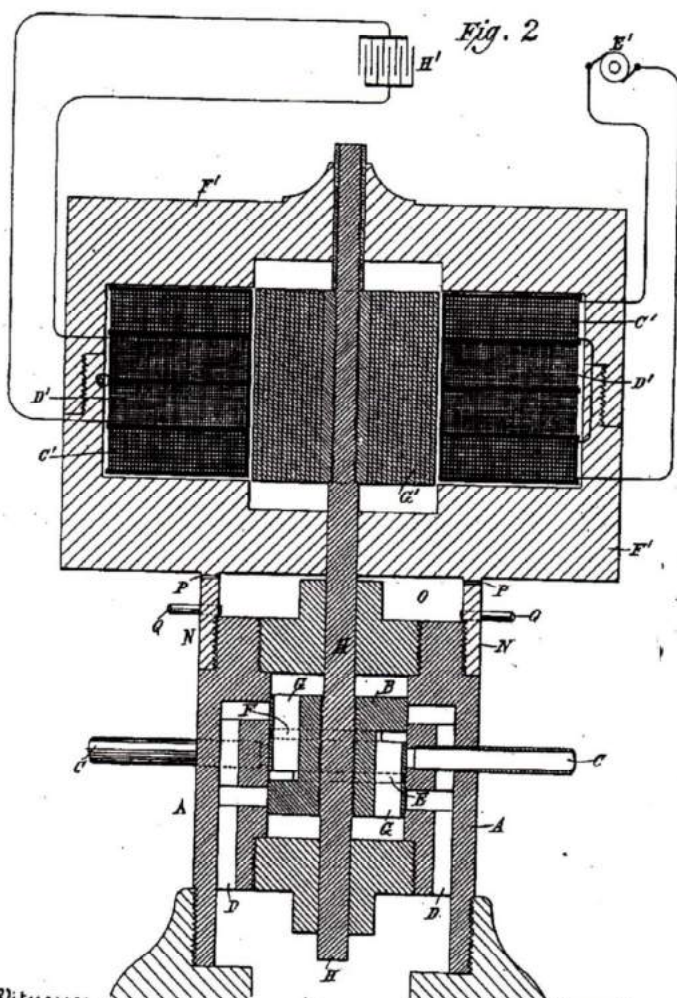
(No Model.)

2 Sheets—Sheet 2.

N. TESLA.
ELECTRIC GENERATOR.

No. 511,916.

Patented Jan. 2, 1894.



Witnesses
Raphael Kitter
R. F. Faylond

Inventor
Nikola Tesla
By his Attorneys
Duncan & Page.

Frequently Asked Questions 良くある質問

- Where is the energy this device is using coming from ?

この装置が使っているエネルギーはどこから来るのですか？

The quantum field

量子場からです。

- How much overall power does the QEG produce?

QEGはどの位パワーを出せますか？

10 KW (same design scaled up can produce 40 KW)

10 KWです。（同じデザインで大きさを大きくして40 KW出せます）

- If 'free' energy devices work, why aren't the electric companies using them?

もしフリーエネルギー装置が動作するなら何故電力会社はそれを使用しないのか？

This should be obvious but in case you need a reference, please see: <http://hopegirl2012.wordpress.com/>

これは明白ですが、必要ならば右のホームページを参照、<http://hopegirl2012.wordpress.com/>

- How is the QEG started up if it doesn't require fuel?

燃料を必要としないなら、QEGはどのようにスタートしますか？

All that's needed is to spin the machine up to resonance. At that point it will run itself. It can be started using existing electrical power if available, or a crank mechanism, or a battery powered motor-start system. A battery start system could also keep its own batteries fully charged, by tapping some power from the generator.

必要なのは共振までの機械を回すことです。

その時点では、それは自立運転します。

利用可能な場合、既存の電力を使用するか、クランク・メカニズム、あるいは、バッテリー動作のモーター・スタート・システムでスタートさせる。

バッテリー・スタート・システムは、ジェネレーターから取り出した僅かなパワーでバッテリーをフル充電しておくことができた。

- How long will the QEG run?

QEGの寿命はどの位？

Indefinitely (or until parts wear out)

無期限（あるいは部品がすり減るまで）

- How did the QEG improve upon Tesla's work?

QEGは特斯拉の機械からどのように改良したか？

This design adapts the linear, reciprocating element of the Patent, to a rotating element, and some electronics are employed for added stability; controlled amount of power and correct frequency range.

この設計は、特許中の線形の往復運動要素を回転運動要素に適合させた。またいくつかの電気回路を更なる安定性のために採用した：出力と正確な周波数範囲のコントロール

- Does the QEG slow down when more of a load is added?

QEGは負荷が重くなると回転が落ちるのか？

No – it's not that type of energy.

いいえ—そのようなタイプのエネルギーでは無い

- Does the QEG emit radiation?

QEGは不要輻射が有るのか？

No – it's not that type of energy.

いいえ—そのようなタイプのエネルギーでは無い

- What form of energy does QEG use?

QEGはどのようなエネルギー形態の物を利用しているのか？

Electromagnetic and atmospheric charge

電磁気および大気充電