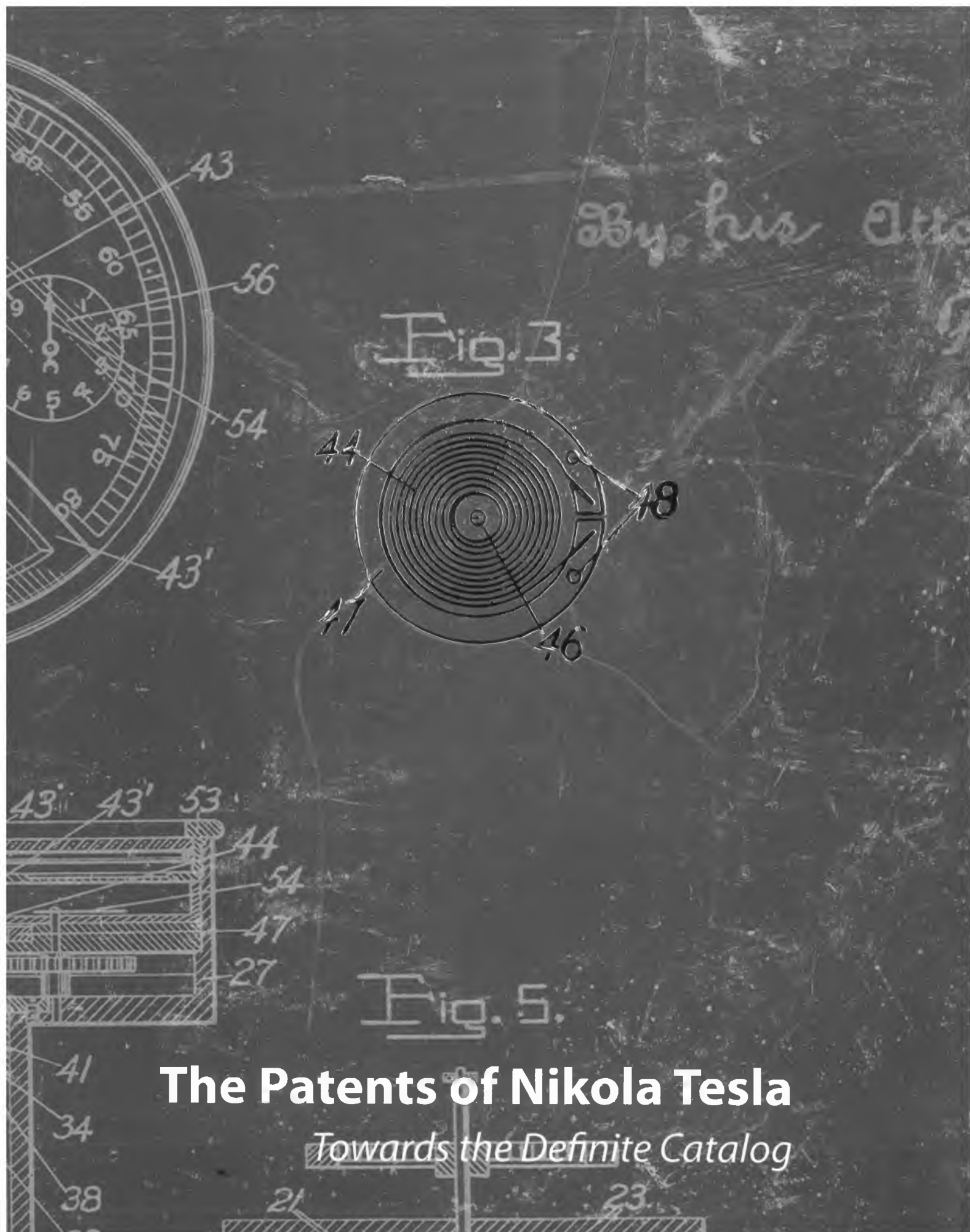






SPE
APPLICATION

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Fig.

Snežana Šarboh, M.Sc.

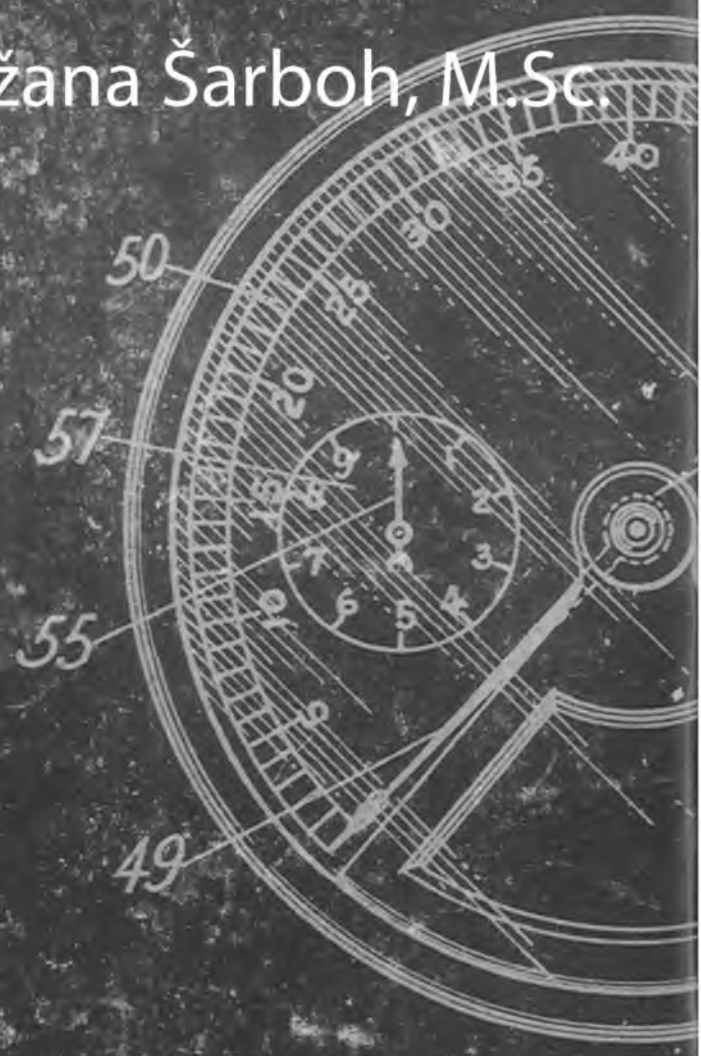


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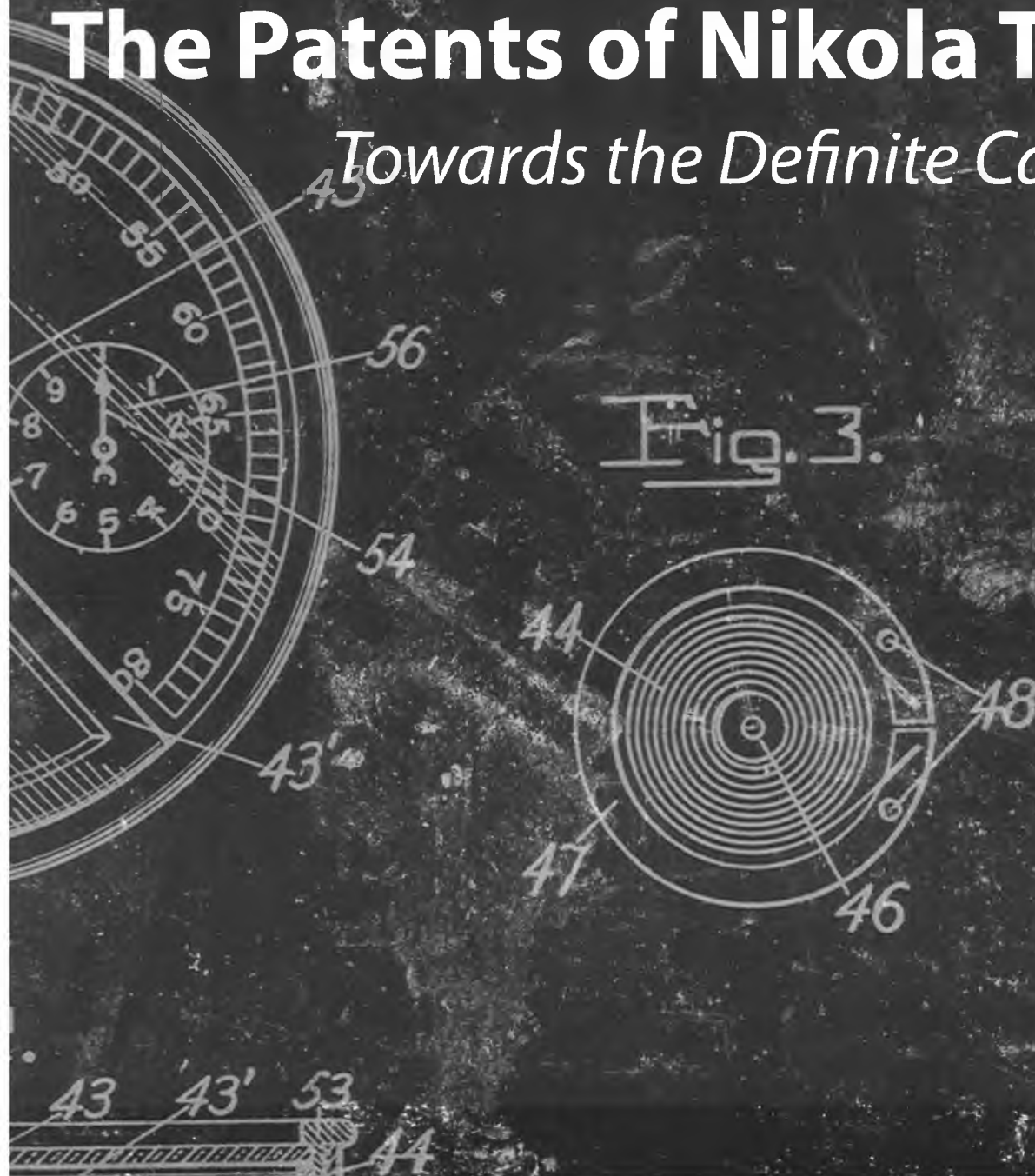
49 55 52 46

TESLA.
INDICATOR.
FILED DEC. 18, 1916.

Patented Aug. 6, 1918.

The Patents of Nikola Tesla

Towards the Definite Catalog



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Fig. 2.

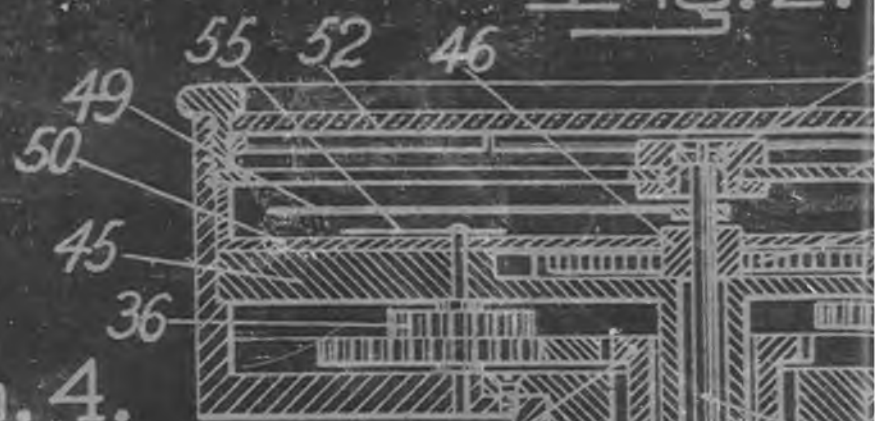
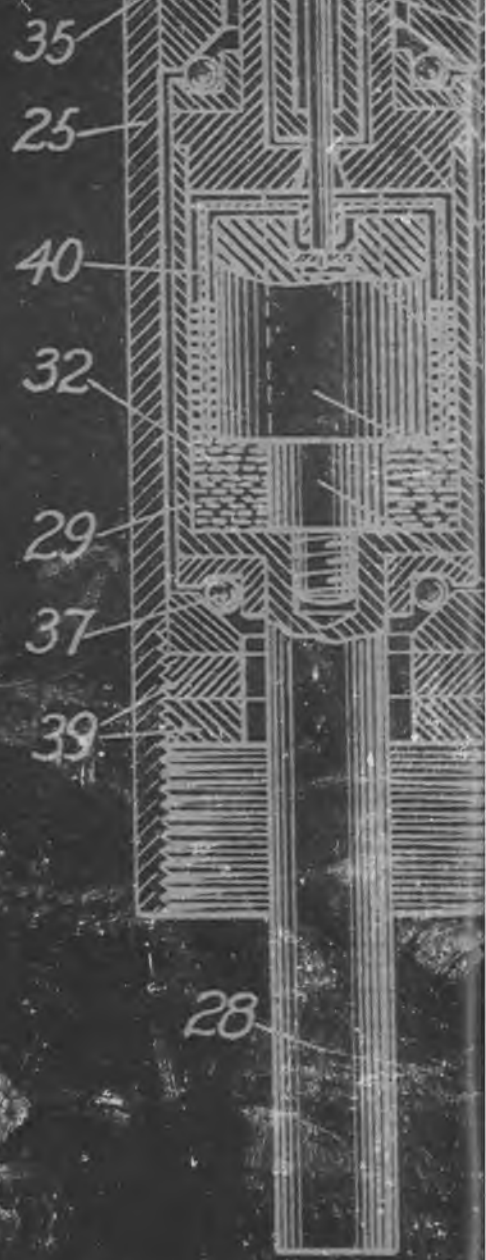
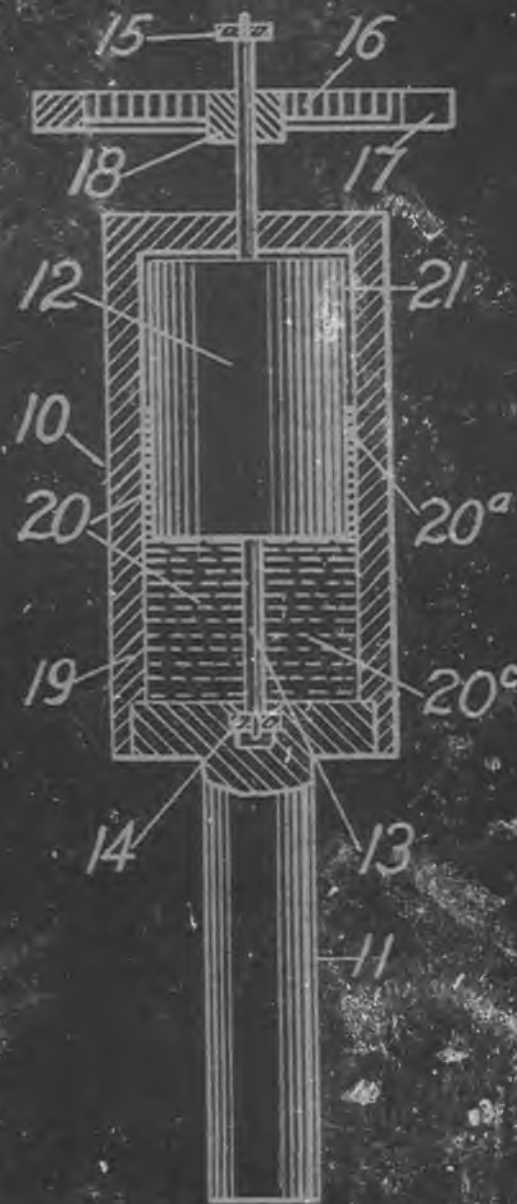


Fig. 4.



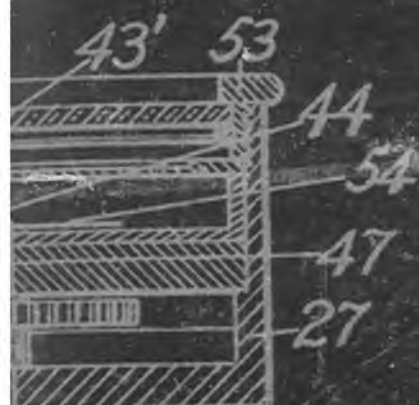
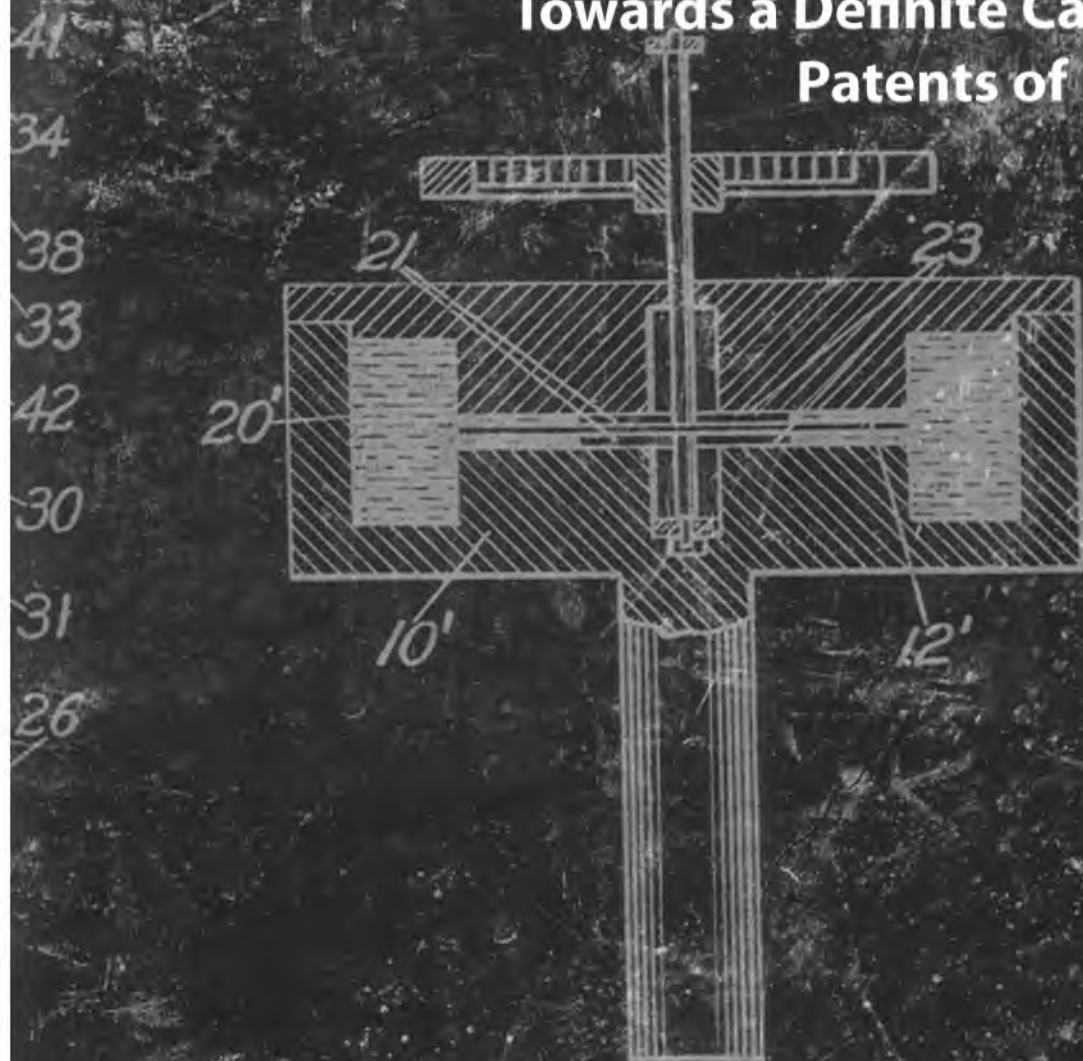


Fig. 5.

Towards a Definite Catalog of the
Patents of Nikola Tesla



Inventor

Nikola Tesla

By his Attorney

Forer, Bain & May

In contrast to the renowned Serbian scientists and Tesla's contemporaries Milutin Milanković and Mihajlo Pupin, who had typical scientific careers, and whose innovative opus was contained in their research papers and monographs, Tesla's most important achievements were his inventions, and their specifications and drawings were presented in his patents. However, even on the 150th anniversary of his birth, there is still no definite list of all of his patents.

Although Tesla's life and work were the subject of many comprehensive researches, only a small number of them covered his patents. Several books on the subject published abroad have covered primarily Tesla's patents in the U.S., and some of them published the complete patent documentation for all of Tesla's 112 U.S. patents. However, they contain practically no information about Tesla's patents in other countries, outside the U.S.

Published at the end of the 1980s, The Catalogue of Tesla's Patents (*"Katalog Teslinih patenata"*, publication of the Nikola Tesla Museum, the Federal Patent Institute and *"Pronalazastvo"*, Belgrade, and *"Centar za radničko stvaralaštvo"* (*"Center for Workers' Creativity"*), Rijeka, 1987), in addition to the list of Tesla's 112 U.S. patents, which somewhat differs from the ones published abroad, also contains a list of 109 patents he obtained in countries other than the U.S. However, already at the time of its publishing, there were some indications that this number is not definite. For that reason, at the beginning of the 1990s, the Nikola Tesla Museum entered into cooperation with the Federal Patent Institute (today the Institute for Intellectual Property), in order to, through them, obtain copies of all patent documentation at the disposal of the European Patent Institute. However, the processing of this material largely required the participation of patent engineers, which the Museum did not have at its disposal. Therefore, the cooperation of the Museum and the Federal Patent Institute continued, with the goal of establishing the exact number of Tesla's registered patents, both in the U.S. and in other countries.

During 1992 and 1993, a group of patent engineers visited the Nikola Tesla Museum to study and analyze the archive materials kept at the Museum in the effort to complete a list of all of Tesla's patents, establish whether there were any submitted patent applications for which patents were not granted, and, finally, whether there were any prepared patent applications that were never submitted by Tesla.

This comparative analysis of patent documentation from the European Patent Institute and the archives of the Museum yielded an extremely large volume of material, which was never systematized or published. Still, it was a foundation for the report that this group submitted to the Director of the Federal Patent Institute. This Report was the first document to point out the fact that Tesla sought patent protection for some of his inventions in countries outside the U.S. without obtaining the corresponding U.S. patents.

This Report also served as a foundation for the selection of Tesla's patents published in the edition *The Selected Works of Nikola Tesla (Izabrana dela Nikole Tesle)*, released on the occasion of the 140th anniversary of Tesla's birth, in the volumes four to seven, named Patents I, Patents II, Patents III, and Patents IV (*"Patenti I"*, *"Patenti II"*, *"Patenti III"*, and *"Patenti IV"*, published by the Institute for Textbooks and Teaching Aids (*Zavod za udžbenike i nastavna sredstva*), Belgrade, 1996). This edition, published in both Serbian and English, contains 112 of Tesla's U.S. patents, but also the 6 recently discovered British patents. This was a significant step forward compared to previous publications dedicated to Nikola Tesla's patents.

After the celebration of this anniversary in 1996, all institutional activities concerning the research of Tesla's patents ceased. The working material from the Nikola Tesla Museum remained at the Federal Patent Institute, but was not studied any further - until 1999, when Snežana Šarboh, M.Sc., continued the research on her own accord. Being aware of the importance of the performed research, since it was the first time that Nikola Tesla's legacy was analyzed by industrial property experts, and the need to establish a complete and accurate list of the patents of Nikola Tesla, and being one of the direct participants in this research at the Nikola Tesla Museum, she took upon herself the task to process the collected material and make the obtained results available to experts, as well the general public.

Based on the analysis and processing of the obtained material, Snežana Šarboh wrote several papers covering the patents of Nikola Tesla, which were published successively from 1999 in the Intellectual Property Gazette (*"Glasnik intelektualne svojine"*) of the Intellectual Property Institute, Belgrade. In the article "The Patents of Nikola Tesla Registered in Countries Outside the U.S." (*"Patenti Nikole Tesle registrovani u drugim zemljama osim SAD"*), published in August 2003, she presented a list of Nikola Tesla's patents containing 141 patents from 26 different countries. Although this list, compared to the already mentioned ones, presented the information about 32 additional, previously unknown Tesla's patents, already at the time of its publishing there were indications that even that list is not final. The further work on the list resulted in complete bibliographic information about patent documentation for additional 25 Tesla's patents, with the exception of bibliographic information about the German patents No. 47012 and No. 47885, for which the source was the book *The Works of Nikola Tesla*, by Slavko Bokšan.

Snežana Šarboh's prolonged research contributed to the endeavor towards a definite catalog a list of 116 original patents, out of which 109 are from the US and 7 are British, and which Tesla used to protect 125 of his inventions. In addition, it established that Tesla had 164 analogues of these patents, which means that he received a total of 280 patents in 26 countries around the world.

Perhaps the results of this research will be a disappointment for some who believed the long-standing claims about the existence of between 700 and 800 of Tesla's patents. Regardless of the exact number, the essence of Tesla's discoveries, inventions, and patents has never been their quantity, but his ingenious solutions, their universal application, and the numerous scientific and technological breakthroughs they have set in motion throughout the world.

The possibility of discovering some currently unknown patents of Nikola Tesla in countries outside the U.S. certainly still exists. However, their number is in all likelihood proportionally small, and it can be assumed with great certainty that these patents cover only the already known inventions of Nikola Tesla. However, it is still worth the effort to find these patents and join them with the ones that are known, in order to obtain a definite catalog of all of Tesla's patents. This important research paper, published for the first time by the Nikola Tesla Museum in the year of the 150th anniversary of Tesla's birth, is definitely an excellent foundation for any further research.



Vladimir Jelenković

Director of the Nikola Tesla Museum

1. Introduction

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Although more than sixty years have passed since Nikola Tesla's death in New York City on January 7th, 1943, his life and work are still drawing considerable attention, and are the subject of a variety of academic and professional research, which are yielding a large volume of reference material. Despite this attention to the inventor and scientist, very few of these works have dealt with patent protection of his inventions and his activities in the field of industrial property.

From the books published on the territory of former Yugoslavia, the book "Delo Nikole Tesle" (*The Works of Nikola Tesla*), by Slavko Boksan, published by the Serbian Academy of Arts and Sciences in Belgrade in 1950, should be highlighted. The first part of this book contains the translations of 35 of Tesla's U.S. patents covering polyphase systems, while the second part of the book details the lawsuit and court decision related to the annulment of two of Tesla's patents in Germany.

Another significant book that deals with Tesla's patents is "Nikola Tesla - Lectures, Patents, Articles," which consists of the material that was edited and prepared for publication by Vojin Popović, Radoslav Horvat and Nikola Nikolić (first published by Nolit, 1956). In addition to other archive materials, it contains 99 of Tesla's U.S. patents.

Another important paper covering Tesla's activities related to the protection of his inventions is "Katalog Teslinih patenata" (*The Catalogue of Tesla's Patents*, published by the Nikola Tesla Museum, the Federal Patent Office, and "Pronalazaštvo", Belgrade, and "Centar za radničko stvaralaštvo" ("Center for Workers' Creativity"), Rijeka, 1987). The book presents the list of 112 Tesla's U.S. patents, as well as a list of 109 patents that he obtained in other countries. Radmila Dugić and Branimir Jovanović compiled these lists, which contain a total of 221 patents. In the introduction, titled 'Patenti Nikole Tesle' (*Nikola Tesla's Patents*), Aleksandar Marinčić, PhD claims that, according to the records of the Nikola Tesla Museum, the total number of patents Nikola Tesla obtained in the U.S. is 112. However, it is also noted that the list mentioned above contains the patent No. 613,819, which was granted for the invention named "Filings Tube", despite the fact that there was no reliable information that it was granted to Nikola Tesla.

Several books focusing on the Tesla's U.S. patents have been published in other countries, and some of them contained the complete patent documentation for his patents. *Dr. Nikola Tesla Complete Patents* (published by the Tesla Book Company, Millbrae, USA, 1983, edited by John T. Ratzloff), presents a list of 112 patents. A similar list was also published in the book *The Complete Patents of Nikola Tesla* by Jim Glenn (Barnes & Noble Books, New York, USA, 1994).

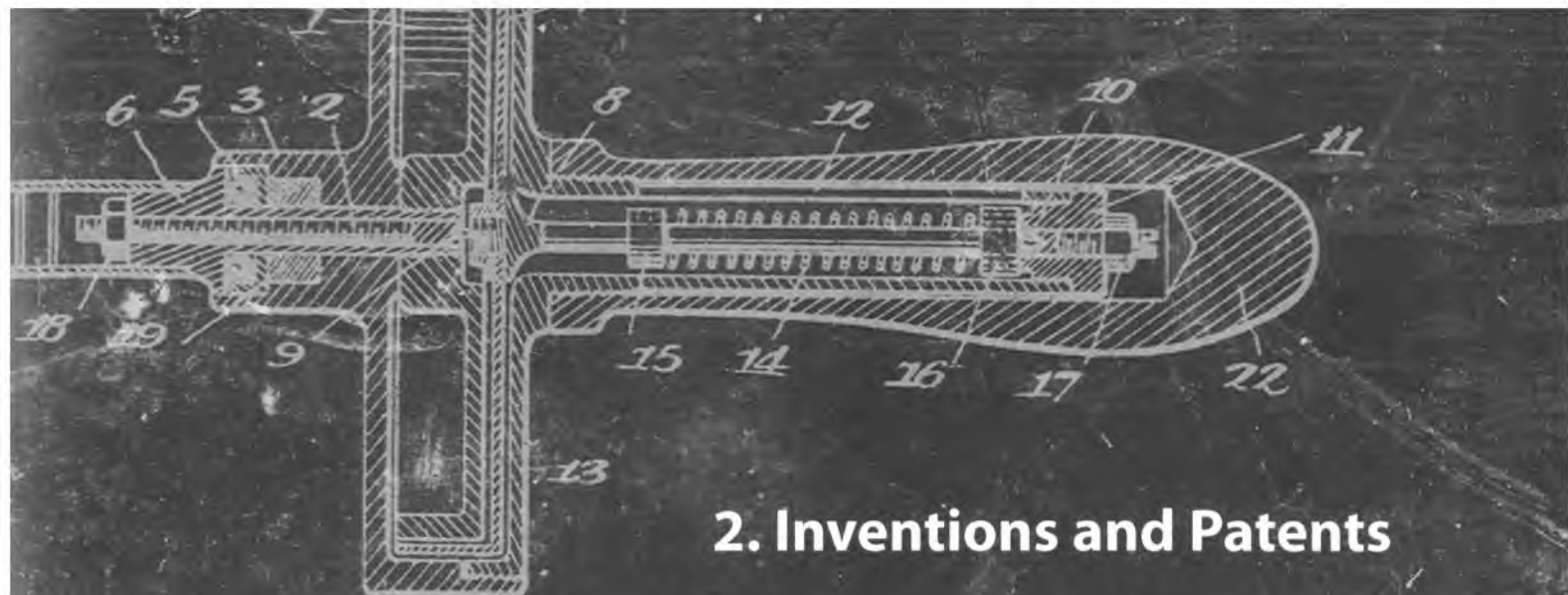
On the other hand, Tesla's patents that were registered in countries other than the U.S. have not attracted that much attention, and therefore the data in existence is incomplete, inaccurate and unreliable. Even today, the official web site of the Nikola Tesla Museum, www.tesla-museum.org, only states that Nikola Tesla had several hundred patents in many countries around the world. On the Internet it can also be found that Tesla had more than 700 patents (from the web page http://en.wikipedia.org/wiki/List_of_Tesla_patents), which stands in serious disproportion to the figure of Tesla's 221 patents, specified in the 'Katalog Teslinih patenata' (*The Catalogue of Tesla's Patents*), although there were indications already at the time of its publishing that the contained list is not complete.

For that reason, at the beginning of the 1990s, Aleksandar Marinčić, PhD, the Director of the Nikola Tesla Museum, contacted the Federal Patent Office (today the Intellectual Property Office) in Belgrade, and received copies of all documentation related to the patents of Nikola Tesla in possession of the European Patent Office (EPO). However, this material had to be processed by specific experts - patent engineers - who were not available to the Nikola Tesla Museum, and therefore the cooperation between the museum and the Federal Patent Office continued. As agreed, in order to determine the exact number of Tesla's patents registered in the U.S., as well as in other countries, a team of experts was visiting the Nikola Tesla Museum in 1992 and 1993. Their goal was to study and analyze the archive materials kept there, and, based on that, to compile a list of all of Tesla's patents, as well as to determine whether Tesla had submitted any patent applications for which the patents have not been granted, and to check whether Tesla had prepared any patent applications for submission, but never did submit them. Members of that team included Ivan Župunski, PhD, Snežana Šarboh, M.Sc., Bogdan Todorov, M.Sc., Ljiljana Kovačević, Jovan Perić and Slobodan Stojković, who spent more than six months at the Nikola Tesla Museum. In addition, the Federal Patent Office requested from the European Patent Office (EPO) the copies of all of Tesla's patents that were available to them, and EPO obliged. The received patent documentation was analyzed in parallel to the archive materials at the Museum, resulting in an exceptionally large volume of working material. However, due to the circumstances, this material was neither systematized nor published, except for one report prepared and submitted by the expert team to the director of the Federal Patent Office. The importance of this report is that it confirms, for the first time, the existence of specific Tesla's patents in other countries, protecting Tesla's inventions for which he had no corresponding U.S. patents. In particular, this concerns 6 of Tesla's patents from Great Britain, belonging specifically to the latest period of Tesla's work.

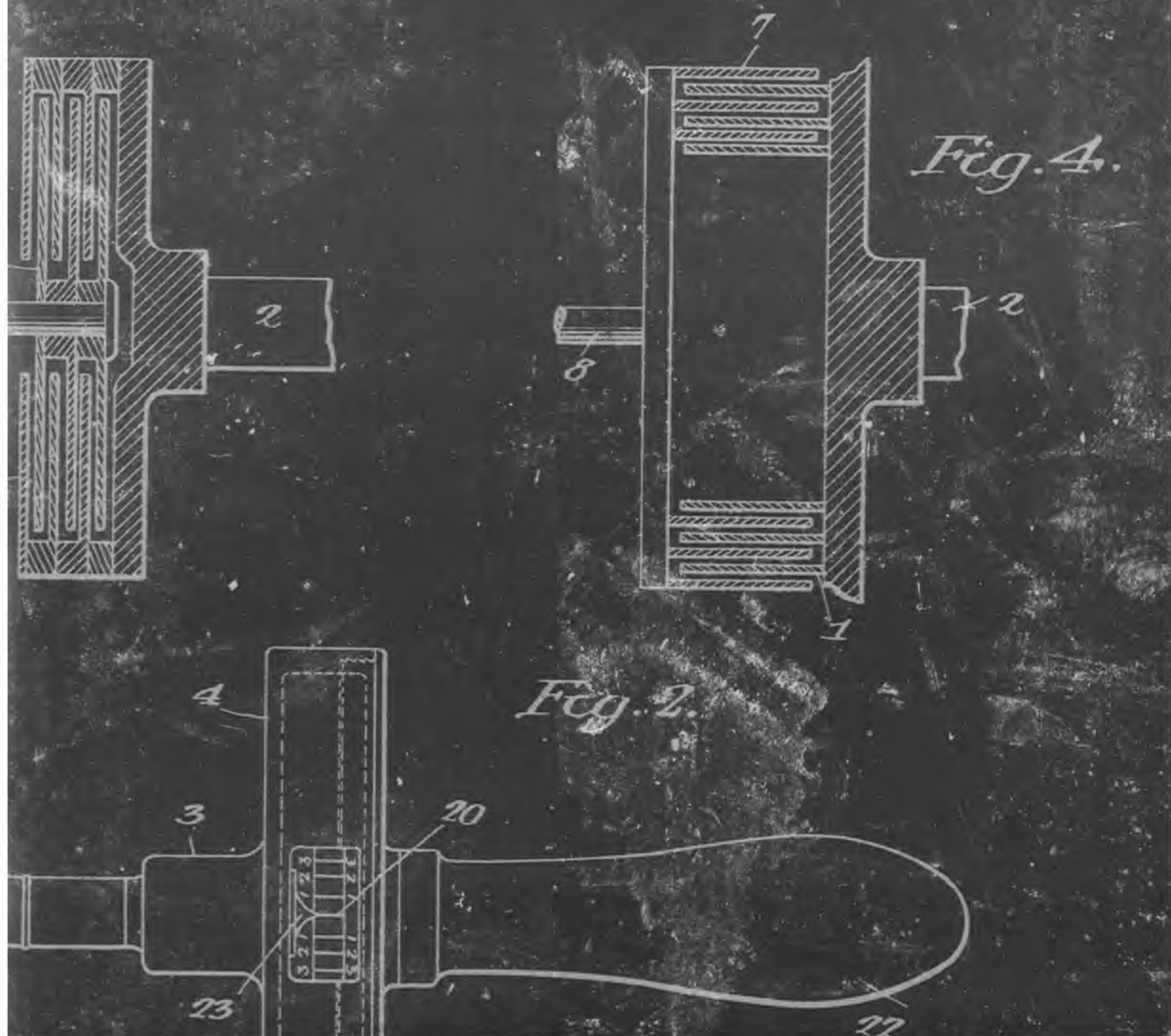
The report mentioned above served as a basis for a selection of Tesla's patents published in the edition "Izabrana dela Nikole Tesle" (*"The Selected Works of Nikola Tesla"*), volumes four to seven, titled "Patenti I" (*"Patents I"*), "Patenti II" (*"Patents II"*), "Patenti III" (*"Patents III"*) and "Patenti IV" (*"Patents IV"*) (published by Zavod za udžbenike i nastavna sredstva (Institute for Textbooks and Teaching Aids), Belgrade, 1996). These four books contained 112 of Tesla's U.S. patents, as well as the 6 patents from Great Britain, in both Serbian and English, which was a significant step forward compared to earlier works covering Tesla's patents.

Bearing in mind the importance of the performed research, because it was the first time that Tesla's legacy was analyzed by industrial property experts, and the need to establish a complete and accurate list of the patents of Nikola Tesla, and being that I was one of the direct participants of this research, I took upon myself the challenge to process the collected material and make the obtained results available to experts as well the general public. The processing and study of this material brought about a number of papers about Nikola Tesla's patents that were published successively, starting from 1999, in the *'Glasnik intelektualne svojine'* (*the Intellectual Property Gazette*). The joining of these papers, together with the presentation of the new results that have been obtained in the meantime, resulted in the paper that will be presented in the following section.

Since the author is a patent engineer, the introduction contains a brief description of the basic concepts of patent law, to facilitate proper comprehension of the presented material.



2. Inventions and Patents



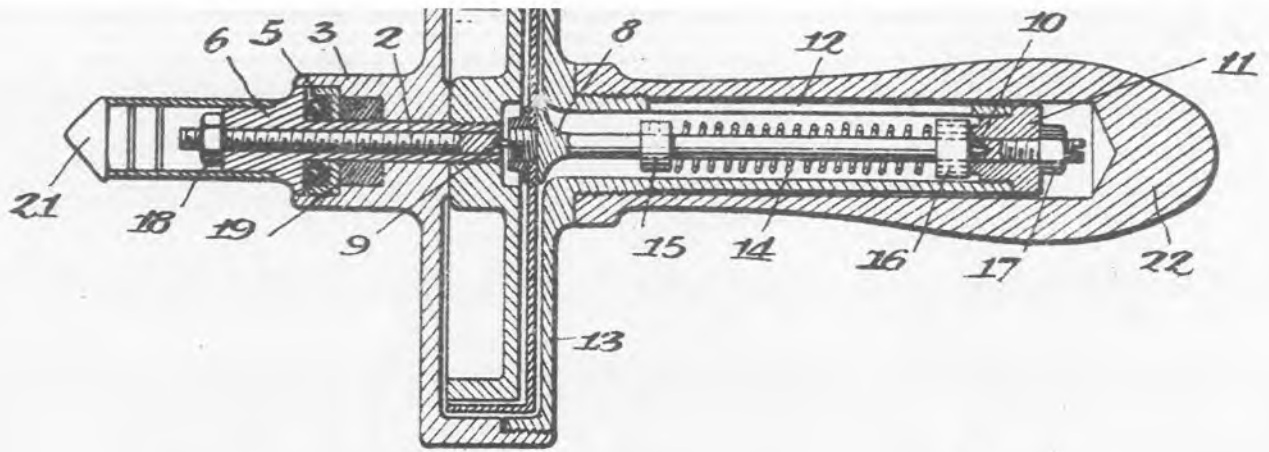


Fig. 3.

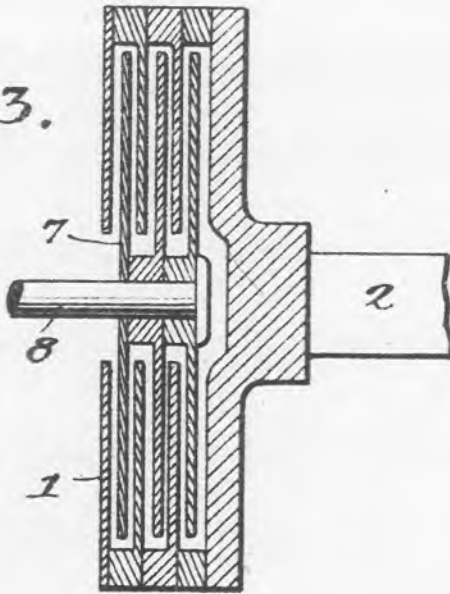


Fig. 4.

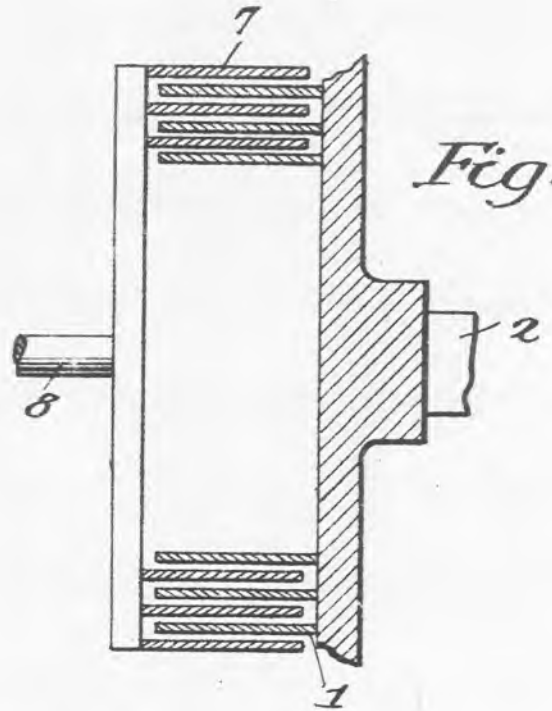
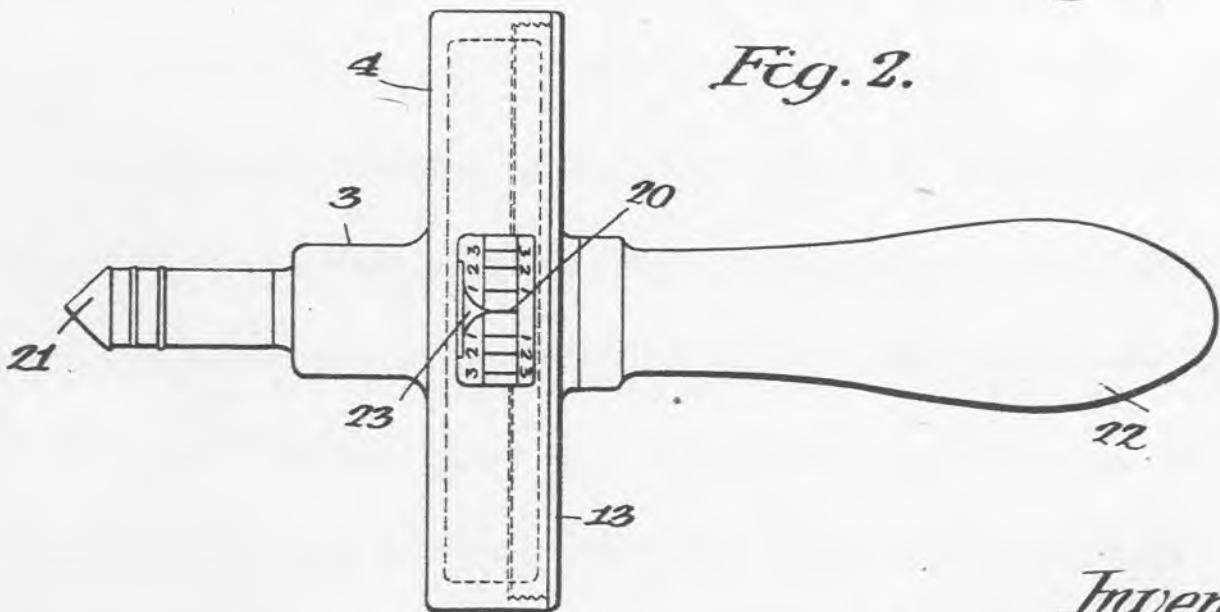


Fig. 2.



Inventor:
Nikola Tesla
Forie Rainclunay
Attorney

In general conversation, the expressions “invention” and “patent” are often interchangeable. However, although these expressions are well known to all of us, their true meanings are very specific. The term “invention” should be defined first. In patent law, an invention is the solution of a particular technical problem. The essence of this definition lies in the fact that an invention has to be of a technical nature and should belong to a technical field, whereas other products of the human intellect, like aesthetic creations, on one side, or discoveries, scientific theories, mathematical methods, plans, rules and procedures for performing intellectual work, for playing games or doing business, computer software and the like, on the other side, are not considered to be of technical nature as such, and therefore are not inventions within the meaning of patent law.

On the other hand, the expression “patent” has two accepted meanings in most countries. One of them refers to the rights acquired by the patent owner, while the other refers to the document by which these rights are conferred to him/her. A patent is not obtained automatically, by merely creating an invention or by announcing it to the public, but only after the stipulated administrative procedure has been completed, which is initiated by filing a patent application with the competent authority.

The purpose of a patent is to protect an invention. This protection gives exclusive rights to the patent holder, i.e. the property rights to manufacture, use and sell the protected invention. Furthermore, the patentee has the right to prevent any third party to do the same without his/her consent. In addition to the rights on the part of patent owner, there are rights conferred to the inventor as well, which are known as moral rights and refer to the right to be known as the creator of the invention.

A patent is granted only when the invention satisfies the conditions for patentability as stipulated by law. To qualify for patent protection, the invention has to be novel; it has to be the result of a creative process, and must be industrially applicable. In certain countries, the U.S. for example, an invention is required to be useful rather than industrially applicable. Regarding the novelty of invention, it means that it is required that the invention is not identical to any inventions that were known or available to the public prior to the filing of the patent application. Furthermore, the invention is a result of a creative process only if such a solution is not obvious to an expert in the appropriate technical field, as would be the case, for example, when the invention is a simple combination of two or more already existing inventions, or, on the other hand, if it is the result of omitting or simply replacing individual elements of known inventions with other elements. Finally, an invention meets the conditions for industrial application if it can be manufactured or used, which can often be determined at first sight. However, in certain cases, the industrial applicability of an invention is not obvious, for example in the case of a chemical compound, thus requiring the patent applicant to specify its use (i.e. as a drug, herbicide, etc.). In still other cases, the invention can be determined to have no application at all, for instance if it is in a direct violation of the laws of physics, as it is the case with any perpetual mobile, which claims to produce effective work without the input of energy.

A patent can protect a product or a process, and the term product can have a very broad definition, and can include a device, tool, machine, substance, composition of matter, or other.

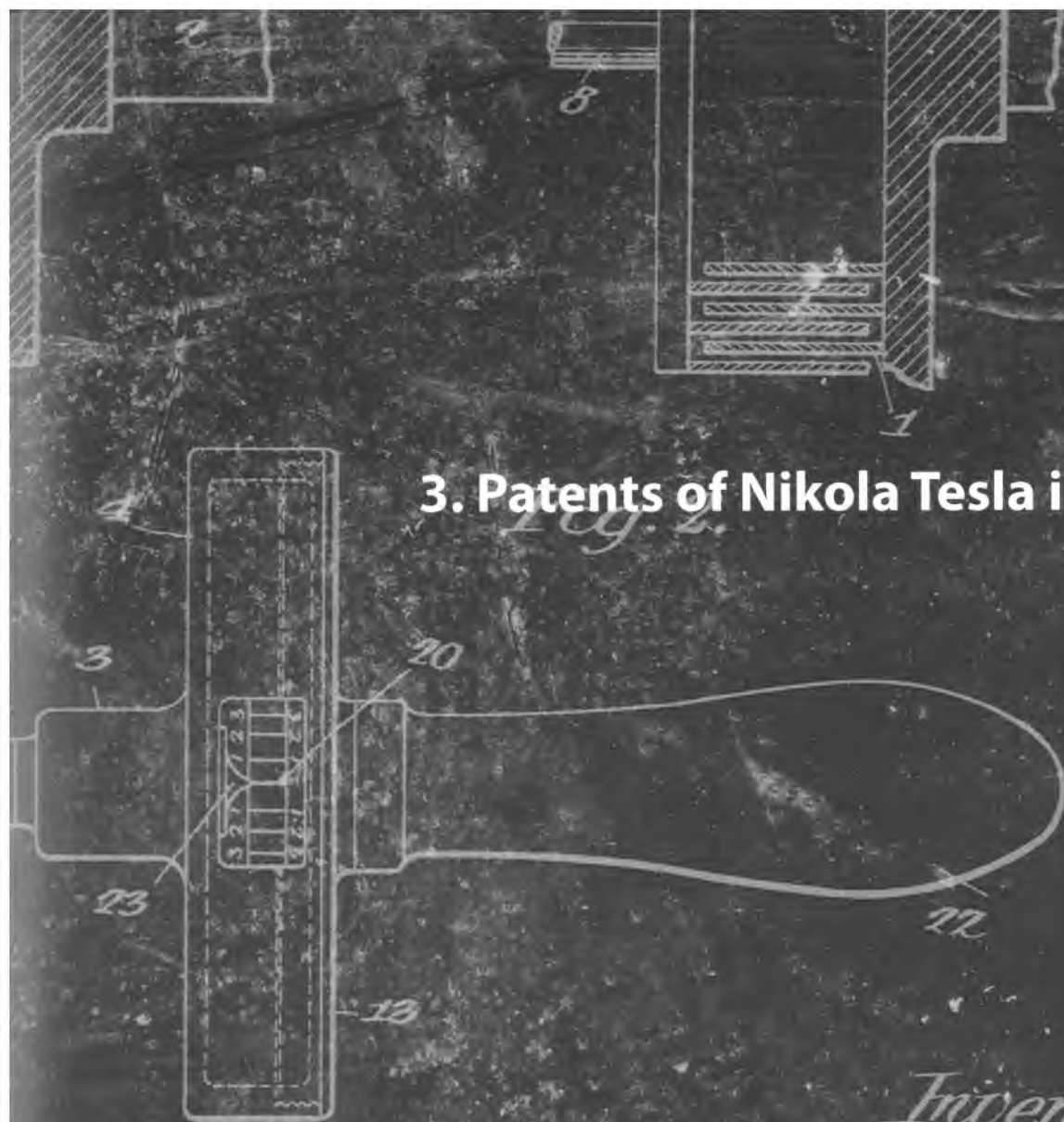
The validity of patent rights is time limited, and in most countries it is 20 years from the filing date of the patent application. Upon the expiration of this time period, the invention is open to the general public and anyone may freely use it. Of possible greater significance is that the validity of a patent is territorially limited, i.e. it is valid only in the country in which the competent authority granted the corresponding patent, while in the rest of the world, in all other countries, where the invention has not been protected by a patent, the invention may be freely used.

If the patent applicant or patent owner improves his/her invention, he/she may file an additional application for that improvement and acquire a patent of addition, which is bound to the patent application previously filed for that invention or to the granted patent, i.e. the basic patent application or basic patent. However, this is possible only in some countries. In the U.S., a patent of addition essentially corresponds to the "continuation in the part", which is a separate type of patent for improvements in an invention. In U.S. patent law, there are also reissued patents, which are intended for cases when the patent owner believes that the patent specification should be corrected in order to define the scope of protection of the invention described in the patent claim more precisely, or to eliminate shortcomings in the specification or drawings of the invention, thus resulting in a request for the reissuing of an already granted patent, with these corrections. Additionally, in the U.S., in cases when the procedure following the patent application is suspended, for instance due to unpaid fees, the applicant can request its renewal within a certain period of time. This renewed application is given a new number, but retains the filing date of the original patent application.

In general, a separate patent application should be submitted for each invention, but if several inventions are related in such a manner as to form a single general concept of invention, it is possible to file only one patent application for all of them, based on the unity of invention. The criteria for unity of invention are not the same everywhere, and may vary from country to country to a certain degree. If the unity of invention is determined not to exist, the applicant may request a division of the application - the initial application - into one or more patent applications to be based on the initial one, with the resulting subset called divisional applications. The divisional applications retain the filing date of the initial application, but are given new numbers.

Because of the different legislative solutions throughout the world, and the unequal status of locals and foreigners, the Paris Convention for the Protection of Industrial Property was signed in 1883 with the goal of leveling the field. One of the 11 founding countries was the Kingdom of Serbia. The Paris Convention defines the matter of industrial property and explicitly lists patents, designs, trademarks for goods and services, indications of origin, as well as the prevention of unfair competition, as such, and also prescribes the minimum rights that the signatory countries are obliged to incorporate into their legislature. One of the most important ones is the right to international priority, i.e. the priority given to an applicant, based on which a patent application filed in any of the signatory countries, called the first or the earliest filed patent application, grants the applicant the right of priority, over all other applications for the same patent in all other countries, to file a corresponding patent application in that country within one year of the original patent application that the right of priority is based upon. When invoking priority, the applicant should name the country, the number and the filing date of the first duly submitted patent application, as well as submit a certified copy thereof.

3. Patents of Nikola Tesla in the U.S.



Inventor:
Nikola Tesla
Forie Rainoluan
attorney



Although it is known that Nikola Tesla started his work as an inventor in early 1880s, in the period around 1881-1882, while he was working at the Central Telegraph Office in Budapest, there is no information whether he tried to acquire patents for any of his inventions at that time.

The situation changed at the beginning of 1884, after Tesla arrived to the United States and started working at Thomas Edison's Edison Machine Works. Thomas Edison was not only a great inventor, but also a smart businessman, who deftly led the company he founded and was able to use the patent system efficiently, acquiring more than one thousand U.S. patents in the process, and reaping their benefits to establish a monopolistic market position as well to promote his work. On the other hand, a great number of his patents were not entirely original, because they were just protecting his improvements of inventions made by other inventors. Edison also had no qualms with registering the inventions that were developed by his employees to his own name, which often led to conflicts with them and was causing their subsequent departure from Edison's companies.

At the time when he was employed in Edison's company, Tesla was working on the development and improvement of dynamo-electric machines, and probably the electric arc lamps as well. However, in this case, Edison most likely usurped the results of another person's work and protected these inventions under his own name. Therefore, the public today is left without any information about Tesla's first inventions that were protected by patents. Looking at the list of Edison's patents from this period, one can only speculate which ones of these patented inventions were developed by Tesla, and which ones by other Edison's employees. This kind of attitude from Edison was one of the reasons for the conflict between the two, but it can be assumed that it was during this period that Tesla learned about the significance of protecting his inventions and submitting timely patent applications.

This is also confirmed by the fact that, immediately after leaving Edison's company and starting his own company, "Tesla Electric Light & Manufacturing", Nikola Tesla filed his first patent application in the U.S., for the Electric-Arc Lamp (patent application No. 160,574 dated March 30, 1885, for which he obtained the patent No. 335,786). Before the end of that year, Tesla filed four additional patent applications, one of which was also related to electric arc lamps, while the other three covered dynamo-electric machines and their regulators.

The following year, in 1886, Tesla filed only three patent applications, out of which two were again related to dynamo-electric machines and their regulators, and the third one covered the thermo-magnetic motor. On the other hand, the U.S. Patent Office granted Tesla's first six patents, the first of them being the patent No. 334,823 for the Commutator for Dynamo-Electric Machines, although he filed this application on May 6, 1885, more than month after he filed his first U.S. patent application mentioned above.

In 1887, Tesla submitted six new patent applications. In addition to the first two applications, one for the Regulator for Dynamo-Electric Machines and the other for the Pyromagneto-Electric Generator, the other applications were already in the field of polyphase alternating currents, and were related to motors and generators based on them.

However, three of the applications mentioned above had to be divided at the request of the U.S. Patent Office, because they believed that the patent claim did not meet the conditions for unity of invention, and Tesla was forced to divide one additional patent application from each of the following three initial patent applications: No. 252,132 submitted on October 12, No. 256,652 submitted on November 30, and No. 258,787 submitted on December 23. Therefore, the total number of Tesla's patents that year amounted to nine.

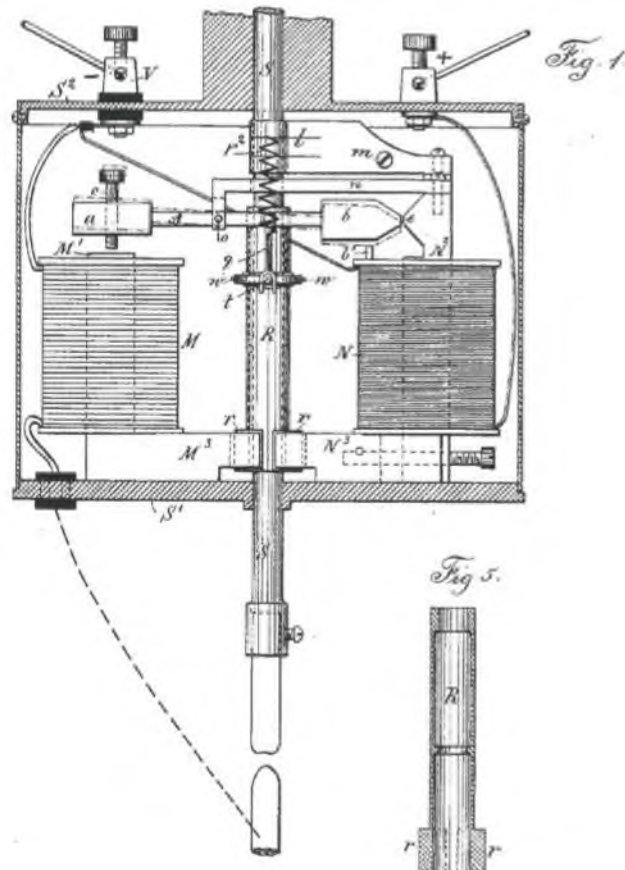
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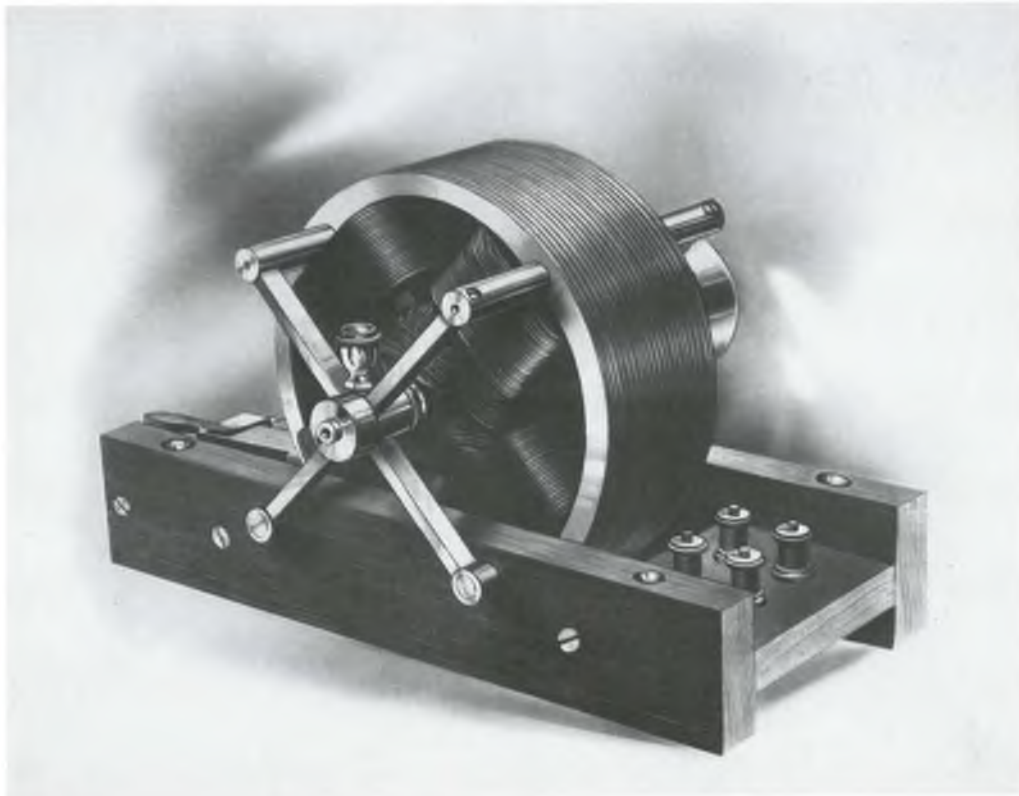
Patented Feb. 9, 1886.



Witnesses:
I. Stait
Chas. H. Smith

Inventor:
Nikola Tesla
per Lemuel W. Correll

BY PETTER, Patent Attorneys, Washington, D. C.



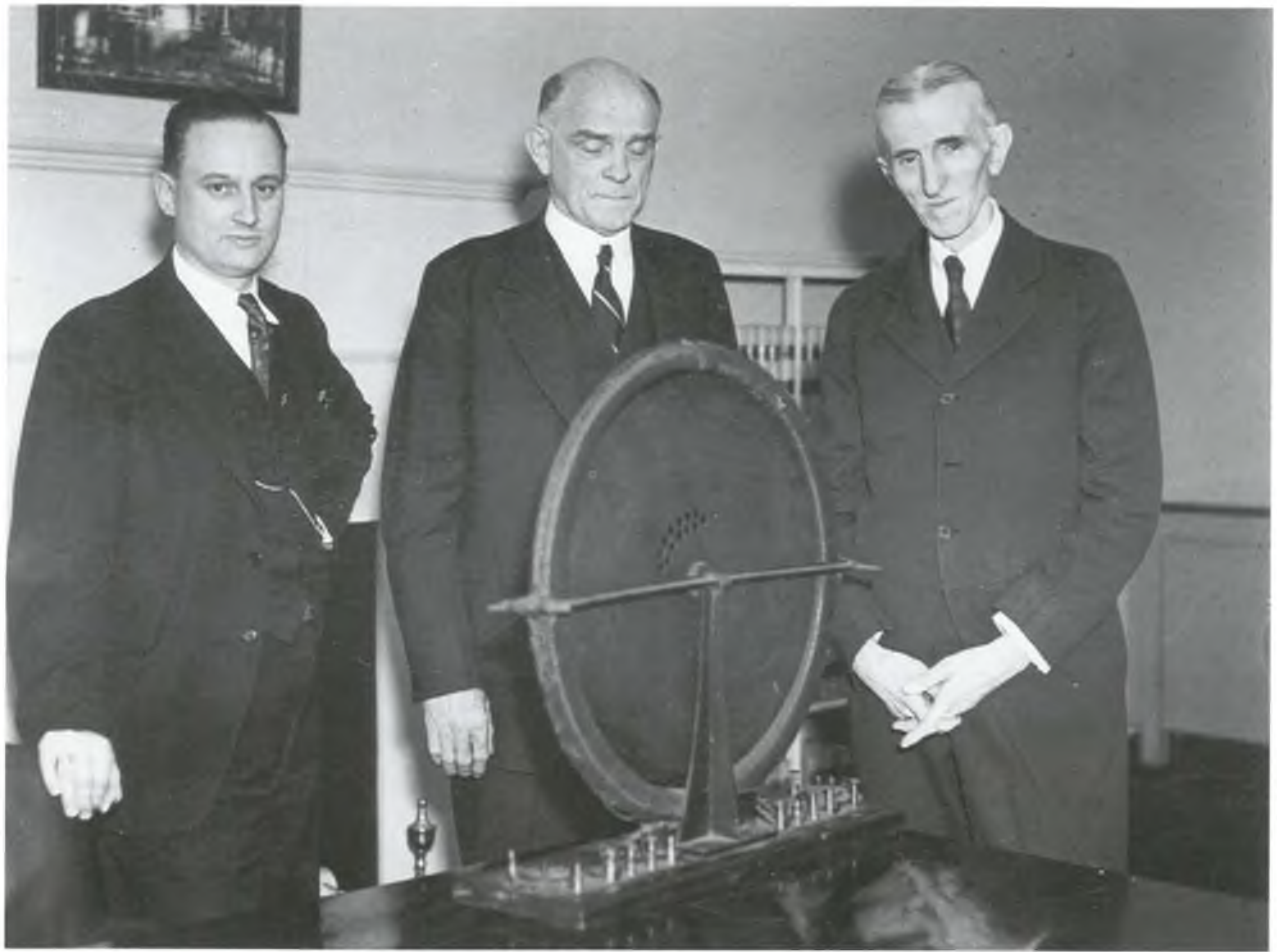
However, even this figure is not final. Namely, after the inspection of the archive materials kept at the Nikola Tesla Museum, it was established that, in addition to the mentioned patent applications that the U.S. Patent Office granted the patents for, Tesla had also filed a number of applications that have not been accepted, for various reasons. An example is Tesla's patent application No. 239,481, submitted on May 26, 1887, from which Tesla separated a divisional patent application on May 15, 1889, under No. 312,069, and obtained the patent No. 428,057, for the invention named the Pyromagneto-Electric Generator. However, after the examination of the list of Tesla's U.S. patents, it is obvious that he did not receive a patent for the initial patent application No. 239,481. Based on the existing information, it ensues that this patent application was rejected.

This means that the number of patent applications filed by Tesla, in some years, was higher than the number listed here, because this list contains only the patent applications for which Tesla obtained the corresponding patents.

Tesla's activity on filing patent applications increased in the two following years. In 1888, he filed ten patent applications, one of which had to be divided later, which brings the final number of Tesla's patent applications to eleven that year. The following year, in 1889, Tesla filed fifteen patent applications, which remained the largest number of patent applications he filed in a single year in his entire career. The following year, 1890, the number of patent applications filed was significantly lower, only six.

The inventions that Tesla requested protection for in patent applications over these three years were primarily in the field of polyphase alternating currents.

In 1891, Tesla submitted seven, in the following year only three, and in 1893 another six patent applications. These patent applications were still mostly covering the field of polyphase currents and their application, for instance for lighting, electric railways, etc. It is interesting to note that in this period, Tesla also

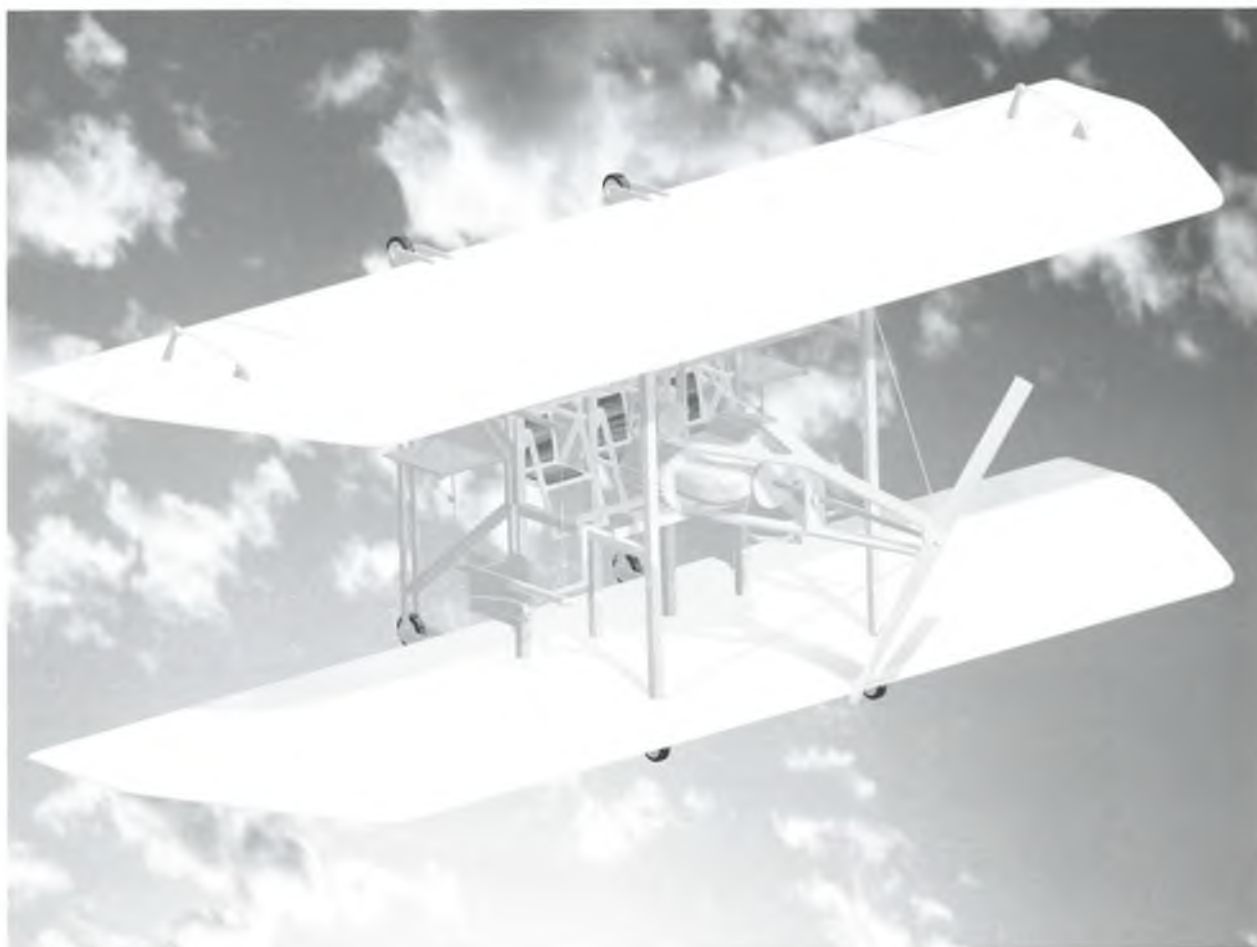


received his first two patents in the field of machine engineering, for the Reciprocating Engine and the Steam Engine.

At that time, the focus of Tesla's work had shifted towards high frequency alternating currents. This caused a two year gap in his patent applications, followed by the period when Tesla was filing larger numbers of applications per year again, namely nine in 1896, six in 1897, with another divisional application, and six additional patent applications in 1898. In the next two years, Tesla filed a smaller number of applications, but the U.S. Patent Office insisted on having them divided, so that the number of applications in 1899 increased from two to four, and in 1900 from four to six. In 1901 Tesla filed two patent applications, and in 1902 only one.

The majority of patent applications filed in this period covered at first the field of high frequency alternating currents, as well as electric circuit controllers, and Tesla later focused on radio and remote control, as well as the transmission of energy through natural media. This set of patents ended the activities of Nikola Tesla related to patent applications in the field of electro-technology.

Tesla filed his next patent application in the U.S. only in 1909, in the field of machine engineering, and it had to be divided, at the request of the U.S. Patent Office, into two separate applications - one for Tesla's pump, and the other for Tesla's turbine. After another pause, in 1913 and 1914, Tesla submitted the patent application for the Speed-Indicator, and another for his fountain. A sharp increase in the number of patent applications followed in 1916, when he submitted a total of six applications - for inventions including the Lightning Protector, the Valvular Conduit, the Flow Meter, etc.



In 1921 and 1927, Tesla filed the last two patent applications for which he was received patents, the first being a basic application and the other an addition, and they covered the Method and the Apparatus for Aerial Transportation.

In this list, the following bibliographical data is given for each patent: the original name of the invention, the filing date and the number of the corresponding patent application, information about the procedural modifications after the submission, with the modification type, date and number depending on whether it was a divisional, renewed or additional patent application or a reissued patent, as well as the registration date and number of the patent. In cases where the name of invention as specified in the patent application is different from the one in the registered patent, the name of the invention is listed as it is stated in the registered patent. The presented list has the patents ordered by the date of submission, which should logically be the closest to the creation date of invention that had to be protected, and not by the patent registration date or number, because they depended to a large extent on the course of the procedure before the competent authority, in this case the U.S. Patent Office (today the U.S. Patent and Trademark Office). Although this institution is well known for its speed, there are also examples of the opposite. For instance, Tesla received the patent No. 1,655,113, for the invention named the Method of Aerial Transportation, more than six years after the corresponding patent application.

List of Nikola Tesla's Patents Registered in the U.S

No.	Name of Invention	Patent Application Filing Date D/M/Y	Patent Application Number	Modifications in the Course of the Patent Procedure			Date of Patent Registration D/M/Y	Patent Registration Number
				Type of Modification	Date of Modification D/M/Y	Number of the Modified Application		
1.	Electric-Arc Lamp	30.03.1885	160,574				09.02.1886	335,786
2.	Commutator for Dynamo-Electric Machines	06.05.1885	164,534				26.01.1886	334,823
3.	Regulator for Dynamo-Electric Machines	18.05.1885	165,793				02.03.1886	336,961
4.	Regulator for Dynamo-Electric Machines	01.06.1885	167,136				02.03.1886	336,962
5.	Electric-Arc Lamp	13.07.1885	171,416				09.02.1886	335,787
6.	Dynamo-Electric Machine	14.01.1886	188,538 188,540	Renewed Application	01.12.1886	220,370	22.03.1887	359,748
7.	Regulator for Dynamo-Electric Machines	14.01.1886	188,539				19.10.1886	350,954
8.	Thermo-Magnetic Motor	30.03.1886	197,115				15.01.1889	396,121
9.	Commutator for Dynamo-Electric Machines	30.04.1887	236,711				15.05.1888	382,845
10.	Pyromagneto-Electric Generator	26.05.1887	239,481	Divisional Application	25.05.1889	312,069	13.05.1890	428,057
11.	Electro-Magnetic Motor	12.10.1887	252,132				01.05.1888	381,968
12.	Electrical Transmission of Power	12.10.1887	252,132	Divisional Application	09.03.1888	266,755	01.05.1888	382,280
13.	Electro-Magnetic Motor	30.11.1887	256,561				01.05.1888	382,279
14.	Electro-Magnetic Motor	30.11.1887	256,562				01.05.1888	381,969
15.	Electrical Transmission of Power	30.11.1887	256,562	Divisional Application	09.03.1888	266,756	01.05.1888	382,281
16.	System of Electrical Distribution	23.12.1887	258,787				01.05.1888	381,970
17.	Method of Converting and Distributing Electric Currents	23.12.1887	258,787	Divisional Application	09.03.1888	266,757	01.05.1888	382,282
18.	System of Electrical Distribution	10.04.1888	270,187				02.10.1888	390,413
19.	Dynamo-Electric Machine	23.04.1888	271,626				02.10.1888	390,414
20.	Regulator for Alternate-Current Motors	24.04.1888	271,682				09.10.1888	390,820
21.	Dynamo-Electric Machine	28.04.1888	272,153				09.10.1888	390,721
22.	System of Electrical Transmission of Power	15.05.1888	273,992				13.12.1892	487,796
23.	Alternating Motor	15.05.1888	273,993				25.02.1896	555,190
24.	Electrical Transmission of Power	15.05.1888	273,993	Divisional Application	03.12.1888	292,475	02.01.1894	511,915
25.	Dynamo-Electric Machine or Motor	15.05.1888	273,994				02.10.1888	390,415
26.	Electro-Magnetic Motor	20.10.1888	288,677				14.08.1894	524,426
27.	Electrical Transmission of Power	08.12.1888	293,051				26.12.1893	511,559
28.	System of Electrical Power Transmission	08.12.1888	293,052				26.12.1893	511,560

29.	Electro-Magnetic Motor	08.01.1889	295,745				25.06.1889	405,858
30.	Method of Operating Electro-Magnetic Motors	18.02.1889	300,220				16.04.1889	401,520
31.	Method of Electrical Power Transmission	14.03.1889	303,251				25.06.1889	405,859
32.	Dynamo-Electric Machine	23.03.1889	304,498				16.07.1889	406,968
33.	Electro-Magnetic Motor	06.04.1889	306,165				22.09.1891	459,772
34.	Electro-Magnetic Motor	20.05.1889	311,413				03.12.1889	416,191
35.	Method of Operating Electro-Magnetic Motors	20.05.1889	311,414				03.12.1889	416,192
36.	Electro-Magnetic Motor	20.05.1889	311,415				03.12.1889	416,193
37.	Electro-Magnetic Motor	20.05.1889	311,416				25.03.1890	424,036
38.	Electro-Magnetic Motor	20.05.1889	311,417				27.01.1891	445,207
39.	Electric Motor	20.05.1889	311,418				03.12.1889	416,194
40.	Electro-Magnetic Motor	20.05.1889	311,419				03.12.1889	416,195
41.	Electro-Magnetic Motor	20.05.1889	311,420				31.12.1889	418,248
42.	Method of Obtaining Direct from Alternating Currents	12.06.1889	314,069				22.10.1889	413,353
43.	Armature for Electric Machines	28.06.1889	315,937				24.12.1889	417,794
44.	Alternating-Current Electro-Magnetic Motor	26.03.1890	345,388				05.08.1890	433,700
45.	Alternating-Current Motor	26.03.1890	345,389				05.08.1890	433,701
46.	Electrical Transformer or Induction Device	26.03.1890	345,390				05.08.1890	433,702
47.	Electro-Magnetic Motor	04.04.1890	346,603				05.08.1890	433,703
48.	Method of Operating Arc Lamps	01.10.1890	366,734				10.03.1891	447,920
49.	Alternating-Electric-Current Generator	15.11.1890	371,554				10.03.1891	447,921
50.	Electro-Magnetic Motor	27.01.1891	379,251				30.06.1891	455,067
51.	Method of and Apparatus for Electrical Conversion and Distribution	04.02.1891	380,182				03.11.1891	462,418
52.	Electrical Meter	27.03.1891	386,666				30.06.1891	455,068
53.	System of Electric Lightning	26.04.1891	390,414				23.06.1891	454,622
54.	Electric Incandescent Lamp	14.05.1891	392,669				30.06.1891	455,069
55.	Electro-Magnetic Motor	13.07.1891	399,312				08.12.1891	464,666
56.	Electrical Condenser	01.08.1891	401,356				08.12.1891	464,667
57.	Incandescent Electric Light	02.01.1892	416,772	Renewed Application	15.12.1893	493,776	06.02.1894	514,170
58.	Electrical Conductor	02.01.1892	416,773				06.02.1894	514,167
59.	Electric Railway Systems	02.01.1892	416,774				20.02.1894	514,972
60.	Coil for Electro-Magnets	07.07.1893	479,804				09.01.1894	512,340
61.	Means for Generating Electric Currents	02.08.1893	482,194				06.02.1894	514,168
62.	Electric Generator	19.08.1893	483,562				02.01.1894	511,916
63.	Reciprocating Engine	19.08.1893	483,563				06.02.1894	514,169
64.	Electrical Meter	15.12.1893	493,739				20.02.1894	514,973
65.	Steam Engine	29.12.1893	495,079				10.04.1894	517,900
66.	Apparatus for Producing Electric Currents of High Frequency and Potential	22.04.1896	588,534				22.09.1896	568,176
67.	Apparatus for Producing Ozone	17.06.1896	595,927				22.09.1896	568,177
68.	Electrical Condenser	17.06.1896	595,928				15.09.1896	567,818
69.	Method of Regulating Apparatus for Producing Currents of High Frequency	20.06.1896	596,262				22.09.1896	568,178

70.	Method of and Apparatus for Producing Currents of High Frequency	06.07.1896	598,130				22.09.1896	568,179
71.	Apparatus for Producing Electrical Currents of High Frequency	09.07.1896	598,552				22.09.1896	568,180
72.	Apparatus for Producing Electric Currents of High Frequency	03.09.1896	604,723				23.02.1897	577,670
73.	Apparatus for Producing Currents of High Frequency	19.10.1896	609,292				08.06.1897	583,953
74.	Manufacture of Electrical Condensers, Coils etc.	05.11.1896	611,126				23.02.1897	577,671
75.	Electrical Igniter for Gas-Engines	17.02.1897	623,832	Renewed Application	15.06.1898	683,524	16.08.1898	609,250
76.	Electrical Transformer	20.03.1897	628,453				02.11.1897	593,138
77.	Electric-Circuit Controller	03.06.1897	639,227	Renewed Application	15.06.1898	683,525	16.08.1898	609,251
78.	System of Transmission of Electrical Energy	02.09.1897	650,343				20.03.1900	645,576
79.	Apparatus for Transmission of Electrical Energy	02.09.1897	650,343	Divisional Application	19.02.1900	5,780	15.05.1900	649,621
80.	Electrical-Circuit Controller	02.12.1897	660,518				16.08.1898	609,245
81.	Electrical-Circuit Controller	10.12.1897	661,403				04.10.1898	611,719
82.	Electrical-Circuit Controller	28.02.1898	671,897				16.08.1898	609,246
83.	Electric-Circuit Controller	12.03.1898	673,558				16.08.1898	609,247
84.	Electric-Circuit Controller	12.03.1898	673,559				16.08.1898	609,248
85.	Electric-Circuit Controller	12.03.1898	673,560				16.08.1898	609,249
86.	Electric-Circuit Controller	19.04.1898	678,127				08.11.1898	613,735
87.	Method of and Apparatus for Controlling the Mechanism of Moving Vessels or Vehicles	01.07.1898	684,934				08.11.1898	613,809
88.	Method of Intensifying and Utilizing Effects Transmitted through Natural Media	24.06.1899	721,790	Renewed Application	29.05.1901	62,315	05.11.1901	685,953
89.	Apparatus for Utilizing Effects Transmitted from a Distance to a Receiving Device through Natural Media	24.06.1899	721,790	Divisional Application Renewed Application	08.09.1899 29.05.1901	729,812 62,317	05.11.1901	685,955
90.	Method of Utilizing Effects Transmitted through the Natural Media	01.08.1899	725,749	Renewed Application	29.05.1901	62,316	05.11.1901	685,954
91.	Apparatus for Utilizing Effects Transmitted through Natural Media	01.08.1899	725,749	Divisional Application Renewed Application	02.11.1899 29.05.1901	735,573 62,318	05.11.1901	685,956
92.	Means for Increasing the Intensity of Electrical Oscillations	21.03.1900	9,501	Renewed Application	03.07.1901		22.10.1901	685,012
93.	Art of Transmitting Electrical Energy through the Natural Mediums	16.05.1900	16,889	Renewed Application	17.06.1902	112,034	18.04.1905	787,412
94.	Methods of Insulating Electric Conductors	15.06.1900	20,405				14.08.1900	655,838
95.	System of Signaling	16.07.1900	23,847				14.04.1903	725,605
96.	Method of Signaling	16.07.1900	23,847	Divisional Application	14.06.1901	64,522	17.03.1903	723,188
97.	Method of Insulating Electric Conductors	14.08.1900	655,838	Reissued Patent	21.09.1900	30,722	23.10.1900	11,865
98.	Apparatus for Utilization of Radiant Energy	21.03.1901	52,153				05.11.1901	685,957

99.	Method of Utilizing Radiant Energy	21.03.1901	52,154				05.11.1901	685,958
100.	Apparatus for Transmitting Electrical Energy	18.01.1902	90,245	Renewed Application	04.05.1907	371,817	01.12.1914	1,119,732
101.	Fluid Propulsion	21.10.1909	523,832				06.05.1913	1,061,142
102.	Turbine	21.10.1909	523,832	Divisional Application	17.01.1911	603,049	06.05.1913	1,061,206
103.	Fountain	28.10.1913	797,718				13.10.1914	1,113,716
104.	Speed-Indicator	29.05.1914	841,726				19.12.1916	1,209,359
105.	Valvular Conduit	21.02.1916	79,703	Renewed Application	08.07.1919	309,482	03.02.1920	1,329,559
106.	Lightning Protector	06.05.1916	95,830				14.05.1918	1,266,175
107.	Flow Meter	18.12.1916	137,688				11.01.1921	1,365,547
108.	Frequency Meter	18.12.1916	137,689				03.01.1922	1,402,025
109.	Ship's Log	18.12.1916	137,690				02.09.1919	1,314,718
110.	Speed-Indicator	18.12.1916	137,691				06.08.1918	1,274,816
111.	Method of Aerial Transportation	09.09.1921	499,519				03.01.1928	1,655,113
112.	Apparatus for Aerial Transportation	04.10.1927	223,915	Continuation in the Part for Basic Application	09.09.1921	499,518	03.01.1928	1,655,114

As it can be observed from the list above, Tesla had 112 registered U.S. patents. Based on the comparison of this list with other available sources, it can be assumed that this is the definitive number of U.S. patents held by Tesla. The list no longer includes the patent No. 613,819, which used to be attributed to Tesla by some sources. Namely, the Federal Patent Office was able to acquire a copy of the that patent in 1995, and, by examining the patent documentation, it was established that this patent refers to an invention named "Illuminating Torch", by inventor George Kelly from Mineral Point, Wisconsin.

Some corrections have been made compared to the list published in *The Catalogue of Tesla's Patents*, mostly concerning numbers and dates of patent applications. The reason for this lies in the fact that one application could have its number changed more than once: in case of a divisional applications derived from an initial application, and in case of renewed applications or reissued patents, as described previously. This list contains all numbers under which an application has been registered in the course of the procedure.

This list also contains all relevant information about Tesla's U.S. patents, except the number under which Tesla filed the patent application for the Dynamo-Electric Machine on January 14, 1886, for which he later acquired the patent No. 359,748. Since Tesla filed another patent application, for the Regulator for Dynamo-Electric Machines, on the same very day, with No. 188,539, it can be assumed that the missing application number is either 188,538 or 188,540, but that can be confirmed only by checking with the appropriate registry of patent applications at the U.S. Patent Office.

The following table presents an overview of Tesla's activities on filing patent applications in the U.S., presenting the number of applications for each year, starting with 1885, where the first figure represents the number of applications directly filed by Tesla, while the number in brackets is the total number of applications after the divisions requested by the U.S. Patent Office. It should be stressed once more that these figures apply only to applications that resulted in original patents.

Overview of Nikola Tesla's Patent Applications in the U.S., According to the Year the Application was Filed

Year	Number of Filed Patent Applications	Number of Granted Patents
1885	5	-
1886	3	6
1887	6 (9)	1
1888	10 (11)	13
1889	15	13
1890	6	6
1891	7	11
1892	3	1
1893	6	2
1894	-	11
1895	-	-
1896	9	7
1897	6 (7)	4
1898	6	10
1899	2 (4)	-
1900	4 (6)	4
1901	2	7
1902	1	-
1903	-	2
1904	-	-
1905	-	1
...	-	-
1909	1 (2)	-
...	-	-
1913	1	2
1914	1	2
1915	-	-
1916	6	1
1917	-	-
1918	-	2
1919	-	1
1920	-	1
1921	1	1
1922	-	1
...	-	-
1927	1	-
1928	-	2

Considering inventions protected by Tesla's American patents, they can be divided into five basic groups. To the first group belongs patents relating to the field of direct currents, electric-arc lightning and dynamo-electric machines and regulators therefore, and it consists of 8 patents:

334,823;	335,786;	335,787;	336,961;	336,962;
350,954;	359,748;	382,845.		

To the second group belong Tesla's patents for the inventions in the field of alternating currents, such as motors, generators, transformers, transmission of electrical power and its utilizations, and it contains 42 patents:

381,968;	381,969;	381,970;	382,279;	382,280;
382,281;	382,282;	390,413;	390,414;	390,415;
390,721;	390,820;	401,520;	405,858;	405,859;
406,968;	413,353;	416,191;	416,192;	416,193;
416,194;	416,195;	417,794;	418,248;	424,036;
433,700;	433,701;	433,702;	433,703;	445,207;
447,920;	447,921;	455,067;	459,772;	464,666;
487,796;	511,559;	511,560;	511,915;	511,916;
524,426;	555,190.			

The third group involves patents relating to high-frequency currents and high voltages, and it contains 23 patents:

447,920;	447,921;	454,622;	455,069;	462,418;
464,667;	511,916;	514,167;	514,168;	514,170;
567,818;	568,176;	568,177;	568,178;	568,179;
568,180;	577,670;	577,671;	583,953;	609,245;
609,246;	609,247;	609,248;	609,249;	609,250;
609,251;	611,719;	613,735.		

The fourth group involves patents relating to the field of wireless transmission and it involves 14 patents:

613,809;	645,576;	649,621;	685,012;	685,953;
685,954;	685,955;	685,956;	685,957;	685,958;
723,188;	725,605;	787,412;	1,119,732.	

To the fifth group belongs patents relating to the various fields of technology, the most of them are relating to mechanical engineering, such as pump, turbine, speed-indicators or airplane, but some of them are relating to the field of electrical engineering, such as thermo-magnetic motor, electric lightning and isolation, and there are 25 such patents:

11,865;	396,121;	428,057;	455,068;	455,069;
514,169;	514,170;	514,972;	514,973;	517,900;
577,671;	609,250;	655,838;	1,061,142;	1,061,206;
1,113,716;	1,209,359;	1,266,175;	1,274,816;	1,314,718;
1,329,559;	1,365,547;	1,402,025;	1,655,113;	1,655,114.

4. Patents of Nikola Tesla Registered in Countries Other than the U.S.

Fig. 10.

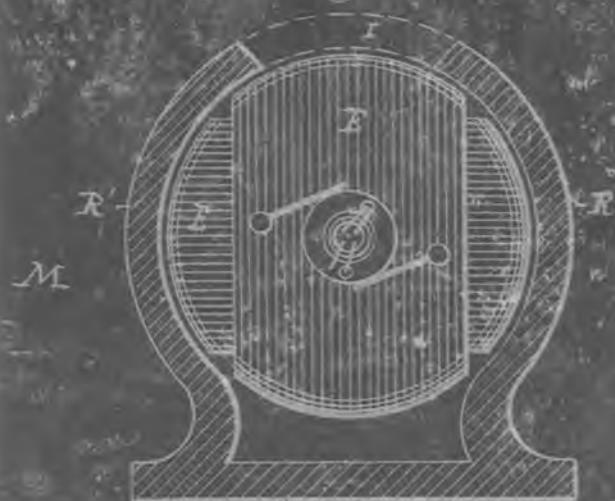
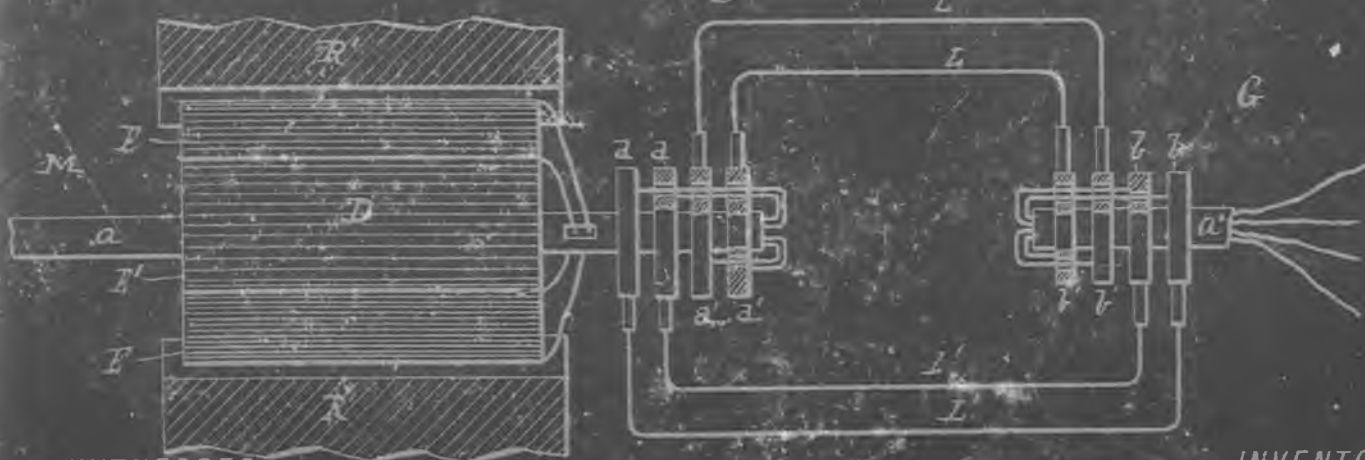


Fig. 11.



Fig. 12.

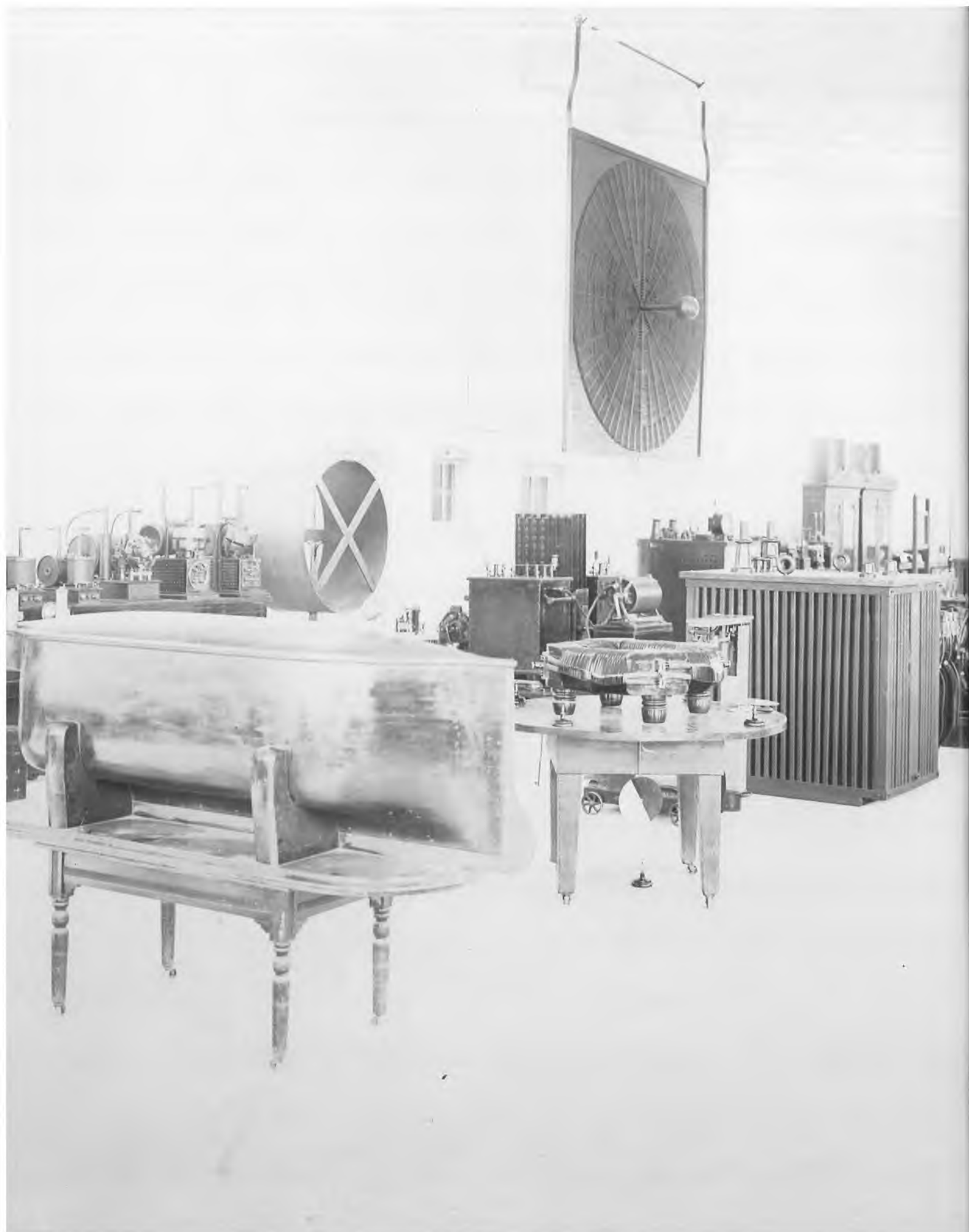


WITNESSES:

INVENTOR

Frank E. Hartley
and B. Murphy

Nikola Tesla
BY
Duncan, Curtis & Hagg



In addition to his U.S. patents, Nikola Tesla also protected his inventions in other countries of the world. Unlike the above list, which contains 112 Tesla's patents in the U.S. and for which it can be claimed with a high degree of certainty that it is definite, the work on establishing a corresponding list of Tesla's patents in countries other than the U.S. has not yet been completed.

The list of patents given in *The Catalogue of Tesla's Patents*, published in 1987, containing the 109 patents that Tesla had acquired in 25 different countries, has already been mentioned above.

Also, it has already been said that during 1992 and 1993, a team of experts from the Federal Intellectual Property Office visited the Nikola Tesla Museum in order to study and analyze its archive materials. It has also already been mentioned that the Federal Patent Office received copies of Tesla's patents that were available to the European Patent Office. Based on these sources, at the end of August 2003, in the journal "Glasnik intelektualne svojine", I have published the article "Nikola Tesla's patents in countries other than the United States" with a list of Nikola Tesla's patents, which included 141 patents from 26 countries. Although this list contained 32 additional patents when compared to the previously published list, and which were completely unknown until then, at the moment of its publication there were already some indications that even that list was not final. Namely, this list was accompanied by an additional list of fifteen patents, for which the available information was not complete, or for which no specifications existed.

The work on further compilation was subsequently continued based on my own and the efforts of Mr. Slobodan Stojković, resulting in the complete bibliographical information and patent documentation for another 25 of Tesla's patents, with the exception of a part of bibliographical information concerning the German patents No. 47012 and 47885, mentioned in the book 'Delo Nikole Tesle' (*The Works of Nikola Tesla*) by Slavko Bokšan. The results of this research have been included in the list of Tesla's patents registered in countries other than the U.S., which is presented in the following section. The current list contains bibliographical information about 168 patents from 26 different countries. Compared to the previously published list, this one includes bibliographical information about additional three patents from Belgium, nine from Great Britain, one from Italy, five from Canada, four from Germany, two from Spain, and three from France, which were all previously unknown.

In this list, the following bibliographical data is given for each patent: country of registration, original name of invention, date and number under which the application was filed, and the date and number of patent registration. In cases where the name of invention specified in the patent application was different from its name in the registered patent, the latter was included in the list. If the patent documentation contained information concerning priority, then they are included in the column titled "Priority". If the patent documentation contained information about a corresponding analogue, it is included in the column "Remarks" in the table, where standard two-letter codes US, GB, IT and ES were used for USA, Great Britain, Italy and Spain, respectively. Similar annotations have been made if one of the patents was a patent of addition, which is also stated in the column "Remarks". Furthermore, it should also be noted that in Italy, when the validity of a patent is extended, the patent is given a new number. These new numbers are listed in the table, with the corresponding dates in brackets. It should also be noted that the overview of patents from New South Wales and Victoria is given separately from Australia, since these two British colonies became part of Australia only in 1901.

List of Tesla's Patents in Countries Other than the U.S

No.	Country	Name of Invention	Application Filing Date D/M/Y	Date the Patent was Granted D/M/Y	Patent Number	Priority	Remarks
1.	Argentina	Mejoras en medios de propulsión por fluido	15.03.1912		9089		
2.	(Commonwealth of) Australia	Improvement in Fluid Propulsion and Fluid Propelled Mechanism	15.12.1910	23.05.1911	20,211		
3.	Austria	Verfahren zur Isolierung elektrischer Leiter	14.08.1900	01.08.1902	9098		
4.	Austria	Einrichtung zur Übertragung elektrischer Energie	11.07.1901	02.07.1903	13115		
5.	Austria	Einrichtung zur Übertragung elektrischer Energie	26.07.1901	21.04.1904	16480		
6.	Austria	Kraftmaschine oder Pumpe mit mehreren, in einem geschlossenen Gehäuse auf einer Zentralwelle in Abständen voneinander angeordneten, parallelen, kreisenden Scheiben	21.10.1910	31.05.1913	60332	US 21.10.1909	
7.	Belgium	Perfectionnements dans le mode de fonctionnement des moteurs électromagnétiques à l'aide de courants alternatifs	16.04.1889	30.04.1889	85866		
8.	Belgium	Perfectionnements dans les moteurs électro-magnétiques à courants alternatifs	03.10.1889	16.10.1889	88701		
9.	Belgium	Perfectionnements dans la construction et le mode de fonctionnement des moteurs à courants alternatifs	03.10.1889	16.10.1889	88702		
10.	Belgium	Procédé et appareil perfectionnés pour produire de la force électrique et l'utiliser pour l'éclairage	19.05.1891	30.05.1891	94940		
11.	Belgium	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	17.02.1894	28.02.1894	108594	US 19.08.1893	
12.	Belgium	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	17.02.1894	28.02.1894	108595	US 19.08.1893	
13.	Belgium	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	22.09.1896	15.10.1896	123665		
14.	Belgium	Perfectionnements dans les systèmes de transmission de l'énergie électrique et dans les appareils employés à cet effet	26.10.1897	15.11.1897	131524		
15.	Belgium	Perfectionnements aux contrôleurs de circuits électriques	04.07.1898	15.07.1898	136606		

16.	Belgium	Perfectionnements dans le procédé et les appareils de réglage pour les mécanismes des bâtiments flottants ou des véhicules en marche	30.01.1899	15.02.1899	140489	US 01.07.1898	
17.	Belgium	Perfectionnements à l'isolement des conducteurs électriques	14.08.1900	31.08.1900	151563		
18.	Belgium	Perfectionnement à la transmission de l'énergie électrique	17.07.1901	31.07.1901	157668		
19.	Belgium	Perfectionnements à la transmission de l'énergie électrique	08.08.1901	31.08.1901	158088		
20.	Belgium	Perfectionnements concernant la propulsion fluide	19.10.1910	31.10.1910	229701	US 21.10.1909	
21.	Belgium	Perfectionnements aux fontaines	22.05.1920	16.06.1920	286983	US 28.10.1913	
22.	Belgium	Perfectionnements aux paratonnerres	03.09.1921	30.12.1921	298511	US 06.05.1916	Analogue of US 1,266,175
23.	Belgium	Conduit faisant fonction de valve	03.09.1921	30.12.1921	298512	US 21.02.1916	Analogue of US 1,329,559
24.	Belgium	Perfectionnements aux turbines actionnées par la vapeur ou des gaz	23.03.1922	15.04.1922	302317	GB 24.03.1921	
25.	Belgium	Procédé et appareil pour la production d'un vide élevé	23.03.1922	15.04.1922	302318	GB 24.03.1921	
26.	Belgium	Procédé et appareil pour l'utilisation de la vapeur comme force motrice	23.03.1922	15.04.1922	302319	GB 24.03.1921	
27.	Belgium	Procédé et appareil pour économique de l'énergie de la vapeur au moyen de turbines	23.03.1922	15.04.1922	302320	GB 24.03.1921	
28.	Belgium	Perfectionnements aux procédés et machines pour obtention de force motrice par les turbines à fluides élastiques	31.03.1922	15.04.1922	302321	GB 01.04.1921	
29.	Belgium	Procédé et appareil pour transports aériens	03.04.1922	15.05.1922	302824	GB 04.04.1921	
30.	Belgium	Procédé et appareil pour équilibrer les pièces tournantes des machines	02.09.1922	16.10.1922	305851	GB 02.09.1921	
31.	Brasil	Methodo e apparetho para mecanismos de regular navios ou vehiculos em movimento	14.08.1899	25.08.1900	2882		
32.	Brasil	Aperfeiçoamentos em propulsao por meio de fluido	20.10.1910	08.03.1911	6435		
33.	Canada	Dynamo Electric Machines	27.04.1886	10.05.1886	24033		
34.	Canada	System of Electrical Transmission of Power	01.05.1888	17.07.1888	29537		
35.	Canada	System of Electrical Conversion and Distribution	01.05.1888		30172		
36.	Canada	Method and Apparatus for Converting Alternating into Direct Current	19.12.1889		33317		
37.	Canada	Art of Transmitting Electrical Energy Through the Natural Mediums	17.04.1906	13.08.1912.	142352		
38.	Canada	Fluid Propulsion	22/24.11. 1910	22.04.1911	135174		

39.	Cuba	Mejoras en medios de propulsión por fluido	30.11.1910	24.11.1911	1433		
40.	Danmark	Fremgangsmaade til ved Hjaelp af Afkøling at isolere elektriske Ledninger	14.08.1900	22.07.1901	4094		
41.	Danmark	Fremgangsmaade og Apparat til Omdannelse af Varmeenergi til mekanisk Energi	31.03.1922	08.05.1923	31737	GB 01.04.1921	
42.	Danmark	Flyvemaskine	03.04.1922	24.04.1923	31663	GB 04.04.1921	
43.	France	Perfectionnements dans les procédés et appareils pour transformer et distribuer les courants électriques	01.05.1888	05.07.1888	190,332		
44.	France	Perfectionnements dans le mode de transmission de la force par l'électricité	01.05.1888	05.07.1888	190,333		
45.	France	Perfectionnements du mode de fonctionnement des moteurs électromagnétiques à l'aide de courants alternatifs	16.04.1889	17.06.1889	197,532		
46.	France	Perfectionnements aux moteurs électro-magnétiques à courants alternatifs	03.10.1889	11.02.1890	202,372		
47.	France	Perfectionnements à la construction et au mode de fonctionnement des moteurs à courants alternatifs	03.10.1889	11.02.1890	202,373		
48.	France	Procédé et appareil perfectionnés pour produire de la force électrique et l'utiliser pour l'éclairage	19.05.1891	12.09.1891	213,556		
49.	France	Perfectionnements dans les moteurs électromagnétiques à courants alternatifs	07.07.1891	30.08.1891	214,718		
50.	France	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	17.02.1894	08.05.1894	236,356		
51.	France	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	17.02.1894	08.05.1894	236,357		
52.	France	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	22.09.1896	11.01.1897	259,940		
53.	France	Perfectionnements dans les systèmes de transmission de l'énergie électrique et dans les appareils employés à cet effet	29.10.1897	07.02.1898	271,641		
54.	France	Perfectionnements aux contrôleurs de circuits électriques	01.07.1898	18.10.1898	279,362		
55.	France	Perfectionnements dans le procédé et les appareils de réglage pour les mécanismes des bâtiments flottants ou des véhicules en marche	24.12.1898	30.03.1899	284,352		
56.	France	Perfectionnements à l'isolement des conducteurs électriques	14.08.1900	20.11.1900	303,025		

57.	France	Perfectionnements à l'utilisation des variations ou chargements d'état électriques ou d'ordres vibratoires similaires transmis à travers les milieux naturels, et appareils pour leur mise à exécution	10.06.1901	26.09.1901	311,629		
58.	France	Perfectionnements à la transmission de l'énergie électrique	17.07.1901	13.11.1901	312,783		
59.	France	Perfectionnements à la transmission de l'énergie électrique	02.08.1901	23.11.1901	313,188		
60.	France	Perfectionnements à la transmission de l'énergie électrique	18.08.1905	08.08.1905	354,791		
61.	France	Procédé et appareils pour la production et l'utilisation de la force motrice au moyen de fluides	17.10.1910	24.12.1910	421,543		
62.	France	Perfectionnements aux fontaines	11.05.1920	25.11.1920	515,388	US 28.10.1913	
63.	France	Conduite faisant fonction de valve	03.09.1921	20.04.1922	540,616	US 21.02.1916	
64.	France	Perfectionnements aux paratonnerres	03.09.1921	20.04.1922	540,617	US 06.05.1922	
65.	France	Perfectionnements aux turbines actionnées par la vapeur ou des gaz	15.09.1921	27.04.1922	541,112	GB 24.03.1921	
66.	France	Procédé et appareil pour équilibrer les pièces tournantes des machines	15.09.1921	27.04.1922	541,113	GB 02.09.1921	
67.	France	Procédé et appareil pour économique de l'énergie de la vapeur au moyen de turbines	23.03.1922	14.11.1922	549,259	GB 24.03.1921	
68.	France	Procédé et appareil pour l'utilisation de la vapeur comme force motrice	23.03.1922	14.11.1922	549,260	GB 24.03.1921	
69.	France	Procédé et appareil pour la production d'un élève	23.03.1922	14.11.1922	549,261	GB 24.03.1921	
70.	France	Perfectionnements aux procédés et machines pour obtention de force motrice par les turbines à fluides élastiques	30.03.1922	22.11.1922	549,516	GB 01.04.1921	
71.	France	Procédé et appareil pour transports aériens	01.04.1922	24.11.1922	549,628	GB 04.04.1921	
72.	Germany	Schaltung eines Transformators und des zugehörigen Elektrizitätserzeugers.	30.04.1888	10.05.1889	47012		
73.	Germany	Verbindung der Drahtspulen bei Elektrizitätserzeugern mit denen von Motoren.	30.04.1888	17.07.1889	47885		
74.	Germany	Feldmagnetanordnung für Wechselstromkraftmaschine.	02.12.1889	15.09.1891	58774		
75.	Germany	Wechselstromtreibmaschine mit auf eine in sich geschlossene Ankerwicklung wirkenden Haupt- und Hilfs-Feldmagneten.	02.12.1889	26.01.1893	66802		
76.	Germany	Verfahren zur Erzeugung elektrischen Lichtes	19.05.1891	22.01.1894	73080		
77.	Germany	Durch Dampf oder Druckluft betriebenes, geradlinig schwingendes Pendel	28.08.1893	03.12.1895	84335		

78.	Germany	Vorrichtung zur Erzeugung elektrischer Ströme von gleichbleibender Schwingungszahl	28.08.1893	25.06.1896	87269		
79.	Germany	Stromkreisregler für die Umwandlung von Strömen geringer Wechselzahl in solche von hoher Wechselzahl mittels Kondensatorentladungen	21.09.1896	20.08.1897	93255		
80.	Germany	Einrichtung zur Erzielung von Strömen hoher Frequenz aus Gleichströmen durch Kondensatorentladungen	21.09.1896	28.09.1898	99173		
81.	Germany	Stromunterbrecher mit flüssigem Leiter	18.06.1898	19.04.1900	109865		
82.	Germany	Stromunterbrecher mit flüssigem Leiter	18.06.1898	21.04.1900	110049		
83.	Germany	Stromunterbrecher mit flüssigem Leiter	18.06.1898	20.04.1900	110050		
84.	Germany	Vorrichtung zur Fernsteuerung von Wasserfahrzeugen mittels elektrischer Wellen	07.11.1898	01.08.1903	142842		
85.	Germany	Verfahren und Vorrichtung zur Nutzbarmachung von aus der Ferne durch den Äther oder die Erde oder beide gesandten elektrischen Impulsen oder Schwingungen	19.06.1901	27.03.1903	139464		
86.	Germany	Verfahren und Vorrichtung zur Nutzbarmachung von aus der Ferne durch den Äther oder die Erde oder beide gesandten Impulsen oder Schwingungen	19.06.1901	27.03.1903	139465		
87.	Germany	Verfahren zur Nutzbarmachung von aus der ferne durch den Äther gesandten Einwirkungen	19.06.1901	27.03.1903	139466		
88.	Germany	Verfahren zur Erzeugung elektrischer Schwingungen	09.07.1901	10.12.1902	136841		
89.	Germany	Verfahren und Vorrichtung zur sicheren Übertragung einer Nachricht auf einem bestimmten Empfänger mittels elektrischer Impulse oder Schwingungen verschiedener Beschaffenheit	22.07.1901	12.08.1903	143453		
90.	Great Britain	Improvements in Electric Lamps	09.02.1886	16.09.1886	1,877		
91.	Great Britain	Improvements in Dynamo Electric Machines	02.03.1886	01.02.1887	2,975		
92.	Great Britain	Improvements relating to Electrical Transmission of Power and to Apparatus therefor	01.05.1888	01.06.1888	6,481		
93.	Great Britain	Improvements relating to the Generation and Distribution of Electric Currents and to Apparatus therefor	01.05.1888	01.06.1888	6,502		
94.	Great Britain	Improvements relating to Electromotors	16.04.1889	18.05.1889	6,527		
95.	Great Britain	Improvements relating to the Conversion of Alternating into Direct Electric Currents	22.10.1889	07.12.1889	16,709		

96.	Great Britain	Improvements in Alternating Current Electro-magnetic Motors	03.12.1889	11.01.1890	19,420		
97.	Great Britain	Improvements in Construction and Mode of Operating Alternating Current Motors	03.12.1889	11.01.1890	19,426		
98.	Great Britain	Improved Methods of and Apparatus for Generating and Utilizing Electric Energy for Lighting Purposes	19.05.1891	20.06.1891	8,575		
99.	Great Britain	Improvements in Alternating Current Electro-magnetic Motors	06.07.1891	22.08.1891	11,473		
100.	Great Britain	Improvements in Methods of and Apparatus for the Generation of Electric Currents of Defined Period	08.02.1894	10.03.1894	2,812	US 19.08.1893	
101.	Great Britain	Improvements in Reciprocating Engines and Means for Regulating the Period of the same	08.02.1894	14.04.1894	2,801	US 19.08.1893	
102.	Great Britain	Improvements Relating to the Production, Regulation and Utilization of Electric Currents of High Frequency and to Apparatus therefor	22.09.1896	21.11.1896	20,981		
103.	Great Britain	Improvements in Systems for the Transmission of Electrical Energy and Apparatus for Use therein	21.10.1897	26.03.1898	24,421		
104.	Great Britain	Improvements in Electrical Circuit Controllers	08.06.1898	27.08.1898	12,866		
105.	Great Britain	Improvements in the Method of and Apparatus for Controlling the Mechanism of Floating Vessels or Moving Vehicles	13.12.1898	09.12.1899	26,371	US 01.07.1898	
106.	Great Britain	Improvements Relating to the Insulation of Electric Conductors	14.08.1900	12.01.1901	14,550		
107.	Great Britain	Improvements Relating to the Utilization of Electromagnetic, Light or other like Radiations Effects or Disturbances Transmitted through the Natural Media and to Apparatus therefor	01.06.1901	02.11.1901	11,293		
108.	Great Britain	Improvements in, and relating to, the Transmission of Electrical Energy	03.07.1901	09.11.1901	13,563		
109.	Great Britain	Improvements in, and relating to, the Transmission of Electrical Energy	17.07.1901	24.04.1902	14,579		
110.	Great Britain	Improvements relating to the Transmission of Electrical Energy	17.04.1905	17.04.1906	8,200		
111.	Great Britain	Improved Method of Imparting Energy to or Deriving Energy from a Fluid and Apparatus for use therein	17.10.1910	06.07.1911	24,001	US 21.10.1909	
112.	Great Britain	Improved Process of and Apparatus for Production of High Vacua	24.03.1921	04.05.1922	179,043		
113.	Great Britain	Improvements in the Construction of Steam and Gas Turbines	24.03.1921	25.09.1922	186,082		
114.	Great Britain	Improved Method of and Apparatus for the Economic Transformation of the Energy of Steam by Turbines	24.03.1921	25.09.1922	186,083		

115.	Great Britain	Improved Method of and Apparatus for Deriving Motive Power from Steam	24.03.1921	25.09.1922	186,084		
116.	Great Britain	Improvements in Methods of and Apparatus for the Generation of Power by Elastic Fluid Turbines	01.04.1921	02.02.1922	174,544		
117.	Great Britain	Method of and Apparatus for Aerial Transportation	04.04.1921	04.09.1922	185,446		
118.	Great Britain	Process of, and Apparatus for Balancing Rotating Machine Parts	02.09.1921	12.10.1922	186,799		
119.	Hungary	Eljárás és berendezés elektromos energia átvitelére	27.10.1897	01.04.1898	11230		
120.	Hungary	Berendezés áramköröknek gyors egymásutánban való megszakítására és zárására	27.06.1898	30.05.1899	15067		
121.	Hungary	Eljárás és berendezés járműveknek távolról való hajtására és kormányzására	07.11.1898	01.06.1902	24842		
122.	Hungary	Eljárás elektromos vezetékek szigetelésére	14.08.1900	20.02.1901	20897		
123.	Hungary	Újtás az elektromos energia távközlésére szolgáló eljárások és berendezésen	13.07.1901	12.03.1902	24076		
124.	Hungary	Újtások villamos energia távközlésében	23.07.1901	02.10.1902	25869		
125.	Hungary	Eljárás és gép energiának folyadékokra való átvitelére és azokról való levételére	20.10.1910	31.10.1911	54937	US 21.10.1909.	
126.	India	Improvements in fluid propulsion	08.12.1910	27.03.1911	640		
127.	Italy	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	02.03.1894	22.03.1894 (02.05.1900) (12.05.1903)	35836 (54660) (66600)		
128.	Italy	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	02.03.1894	22.03.1894 (12.05.1900) (14.05.1903)	35837 (54661) (66601)		
129.	Italy	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	22.09.1896	21.10.1896 (14.02.1903)	42615 (65173)		
130.	Italy	Perfezionamenti nei sistemi di trasmissione dell'energia elettrica e relativi apparecchi	28.02.1898	18.04.1898	47334		
131.	Italy	Perfezionamenti nei regolatori del circuito elettrico	18.06.1898	17.09.1898	48461		
132.	Italy	Perfectionnements dans le procédé et les appareils de réglage pour les mécanismes des bâtiments flottants ou des véhicules en marche	17.01.1899	13.04.1899	50371		
133.	Italy	Perfectionnements à l'isolement des conducteurs électriques	14.08.1900	29.11.1900	56676		
134.	Italy	Perfectionnements à l'isolement des conducteurs électriques	18.10.1900	29.01.1901	57312		Patent of Addition for IT 56676
135.	Italy	Perfectionnements à la transmission de l'énergie électrique	08.08.1901	12.12.1901	60679		

136.	Italy	Perfectionnement a la transmis- sion de l'energie electrique	18.04.1905	24.05.1905	76685		
137.	Italy	Perfezionamenti nella propulsione a fluido	20.10.1910	19.05.1911	112767		
138.	Italy	Perfectionnements aux procede et machines pour obtention de force motrice par les turbines a fluides elastiques	31.03.1922	31.03.1922	208594	GB 01.04.1921	
139.	Japan	Fluid Propulsion	26.03.1912	28.12.1912	21883		
140.	Mexico	Una maquina que puede ser empleada como bomba, turbina ó compresora	18.10.1910	25.10.1910	11079		
141.	New South Wales	Improvements in Methods of and Apparatus for Producing, Regulat- ing and Utilizing Electric Currents of High Frequency	16.10.1896	02.07.1897	6972		
142.	New South Wales	Improvements in systems for the transmission of electrical energy and apparatus for use therein	26.11.1897	05.03.1898	8019		
143.	New Zealand	Improvements in fluid propulsion	08.12.1910	23.05.1911	28853		
144.	Norway	Isolation af elektriske ledere	14.08.1900	26.08.1901	9847		
145.	Norway	Fremgangsmaate og apparat til utvikling og overføring av energi ved hjælp av væske - eller gasfor- mige drivmedier	25.11.1910	21.10.1912	22669		Analogue of Application US 523,832
146.	Norway	Fremgangsmaate og apparat til frembringelse av mekanisk ved hjálp av turbiner for elastisk fluidum	01.04.1922	26.11.1923	38426	GB 01.04.1921	
147.	Rhodesia	Improvements in fluid propulsion	15.12.1910	28.08.1911	651		
148.	Russia	Трансформаторъ, служащато для передачи электрическихъ токовъ очень высокаго напряжения черезъ верхние разрѣженные слои атмосферы	18.10.1897	30.12.1900	4656		
149.	Russia	Приспособленія для управленія дѣйствіемъ пловучихъ судовъ или иныхъ движущихся пловчей при помощи электрическихъ волнъ	26.10.1898	30.06.1905	10188		
150.	Russia	Способъ приданія изолирующихъ свойствъ материалу, окружающему электрический проводъ или прилегающему къ нему	01.08.1900	31.03.1903	7692		
151.	Russia	Способъ передачи электрической энергии безъ проводовъ	16.07.1901	30.01.1907	11535		
152.	Spain	Mejoras en el sistema de gobierno del mecanismo de recipientes ó barcos flotantes ó vehiculos moviles por medio de los aparatos que se describen	31.01.1899	09.03.1899	23742		
153.	Spain	Mejoras en el aislamiento de conductores electricos	14.08.1900	07.12.1900	26430		
154.	Spain	Mejoras en el aislamiento de conductores electricos	06.11.1900	08.02.1901	26801		Patent of Addition for ES 26430

155.	Spain	Mejoras introducidas en los motores, actuados por fluido	21.10.1910	12.12.1910	49122		
156.	Spain	Un procedimiento, con su aparato correspondiente para la obtención de fuerza motriz por medio de turbinas de fluidos elásticos	31.03.1922	26.05.1922	81244		
157.	Spain	Un método, con su aparato correspondiente para transportes aéreos	03.04.1922	27.05.1922	81253		
158.	Sweden	Sätt att isolera elektriska konduktorer	14.08.1900	22.08.1901	12969		
159.	Sweden	Rotationsmaskin	23.11.1910	04.03.1915	38545		
160.	Sweden	Sätt och apparat för att utbalansera roterande maskindelar	01.09.1922	23.02.1926	60297	GB 02.09.1921	
161.	Sweden	Anordning vid turbinaggregat med anordning för backgang	31.03.1922	23.03.1926	60428	GB 01.04.1921	
162.	Switzerland	Installation pour la transmission d'énergie électrique	26.10.1897	22.09.1900	15542		
163.	Switzerland	Installation pour commander la marche des machines d'un véhicule automobile d'un point éloigné du véhicule	20.01.1899	19.12.1901	18652		
164.	Switzerland	Installation d'isolation de conducteurs électriques	14.08.1900	31.12.1901	22213		
165.	Switzerland	Machine rotative pouvant travailler comme pompe, ventilateur, moteur, etc.	15.11.1910	17.05.1912	54375		Analogue of Application US 523,832
166.	Transvaal	Improvements in Fluid Propulsion	02.12.1910		593		
167.	Victoria	An improved method of and apparatus for producing and regulating electric currents of high frequency	15.10.1896		13596		
168.	Victoria	Improvements in methods and systems for the transmission of electrical energy and apparatus for use therein	25.11.1897		14798		

In this list, the German patent No. 199580 has finally been removed from the list of Tesla's patents in countries other than the U.S. Namely, there is a copy of a drawing for this patent in the archives of the Nikola Tesla Museum, but other parts of the documentation are missing. However, after the analysis of the corresponding patent documentation at the web site of the German Patent Office, it was established that the holder of this patent has been Paul Lupa, for the invention named *Spülversatzleitung mit inneren Querrippen zur Erzeugung einer zusammenhängenden, schützenden Kruste aus dem Versatzgut* in German. The document probably came into Tesla's possession because the German Imperial Patent Office in Berlin used it to challenge Tesla's patent application for the Valvular Conduit, protected by the U.S. patent No. 1,329,559.

The following table gives an overview of the number of Tesla's patents according to countries where they were registered:

Overview of Tesla's Patents, According to Country (Outside the U.S.)

Number	Country	Number of Approved Patents
1.	Argentina	1
2.	Australia	1
3.	Austria	4
4.	Belgium	24
5.	Brasil	2
6.	Canada	6
7.	Cuba	1
8.	Denmark	3
9.	France	29
10.	Germany	18
11.	Great Britain	29
12.	Hungary	7
13.	India	1
14.	Italy	12
15.	Japan	1
16.	Mexico	1
17.	New South Wales	2
18.	New Zealand	1
19.	Norway	3
20.	Rhodesia	1
21.	Russia	4
22.	Spain	6
23.	Sweden	4
24.	Switzerland	4
25.	Transvaal	1
26.	Victoria	2

The above table shows that Tesla had the largest number of approved patents in Great Britain and France - 29 in each of them; the fact that he had 24 patents registered to his name in Belgium is a little surprising, while 18 patents were granted to him in Germany and 12 in Italy. Tesla had a significantly lower number of approved patents in other countries, ranging from one to seven.

As it was written in the text "Nikola Tesla's Patents" in the already mentioned *"The Catalogue of Tesla's Patents"*, it was a general opinion up to the present day that the list of Tesla's patents approved in countries other than the U.S. "does not contain any patents in the field of power systems, and that the first patents are related to Tesla's arc oscillator in 1891". However, analyzing the above list of patents Tesla registered in countries other than the U.S., it is obvious that the situation are fundamentally different. Tesla began to submit patent applications in other countries already one year after he filed his first patent applications in the United States. He submitted his first patent application outside the U.S. in Great Britain, on February 9, 1886, for Improvements in Electric Lamps, and he received the patent No. 1,877. The same year, in Great Britain, he also submitted the patent application for Improvements in Dynamo Electric Machines, and, shortly thereafter,

submitted another patent application for the same invention in Canada. In 1888, he endeavored to protect his inventions in the field of polyphase alternating currents, which are covering the corresponding motors and generators, in Germany and France, and also in Belgium the following year. These facts are completely reversing all the knowledge related to the beginnings of Tesla's activities on the protection of his inventions outside the U.S., and are showing that these activities began five years earlier than it was previously thought. Also surprising is the scope of his activities. Namely, between 1886 and 1890, Tesla filed applications in the above-mentioned countries and received a total of 24 patents. The following table presents a summary of his patent applications in countries other than the U.S., giving the number of applications for each year, starting with 1886. It should again be emphasized that these figures refer only to applications that resulted in original patents.

A.D. 1886, 9th FEBRUARY. N° 1877.

PROVISIONAL SPECIFICATION.

Improvements in Electric Lamps.

I NIKOLA TESLA, formerly of Smiljan Lika, border Country of Austro-Hungary, but now of Main Street, Rahway, State of New Jersey, United States of America Electrician do hereby declare the nature of this invention to be as follows:—

In these improvements I make use of two helices, one in a shunt and the other in the main circuit that includes the carbons.

An armature lever swings between the upper ends of the cores of these helices and at the other ends of the cores are pole pieces between which is an armature that is connected to a tubular clamp around the upper carbon holder, and this tubular clamp is suspended from the aforesaid armature lever. The cores and pole pieces of said helices, the swinging armature lever and the armature of the clamp, form a compound magnet.

The electric current passes from the + binding post through the shunt helix of high resistance to the — binding post, also from the + binding post the current passes through the carbon holders and carbons to the main line helix, and a branch from this helix goes to the — binding post and the end of said helix is connected to one of the pole pieces of the shunt magnet and is insulated. When the energy of the shunt core is increased by the increased resistance of the arc, the clamp is moved to allow the carbons to feed, and when the current through the shunt is abnormally strong, the armature of the clamp coming into contact with the pole of the shunt magnet, closes a branch circuit, that allows the electric current to pass through the clamp and the branch and a part of the main helix to the negative binding post, so that the continuity of the circuit is preserved and the shunt magnet is not injured, and as soon as the carbons come into contact and a path for the current is re-established through them, the carbons are separated to form the arc.

The ends of the swinging armature lever are curved, so also are the adjacent pole pieces of the respective cores and the poles at the other ends of the cores converge to the faces that act upon the armature at the bottom of the tubular clamp, and there is a spring that tends to swing the armature clamp away from the aforesaid insulated pole pieces.

Dated this 9th day of February 1886.

BREWER & SON,
For the Applicant.

First Page from the Patent Specification for the First of Tesla's Patents Approved in a Country Other than the U.S. - the British Patent No. 1,877

Overview of Tesla's Patents in Countries Other than the U.S., According to the Year of Filing

47

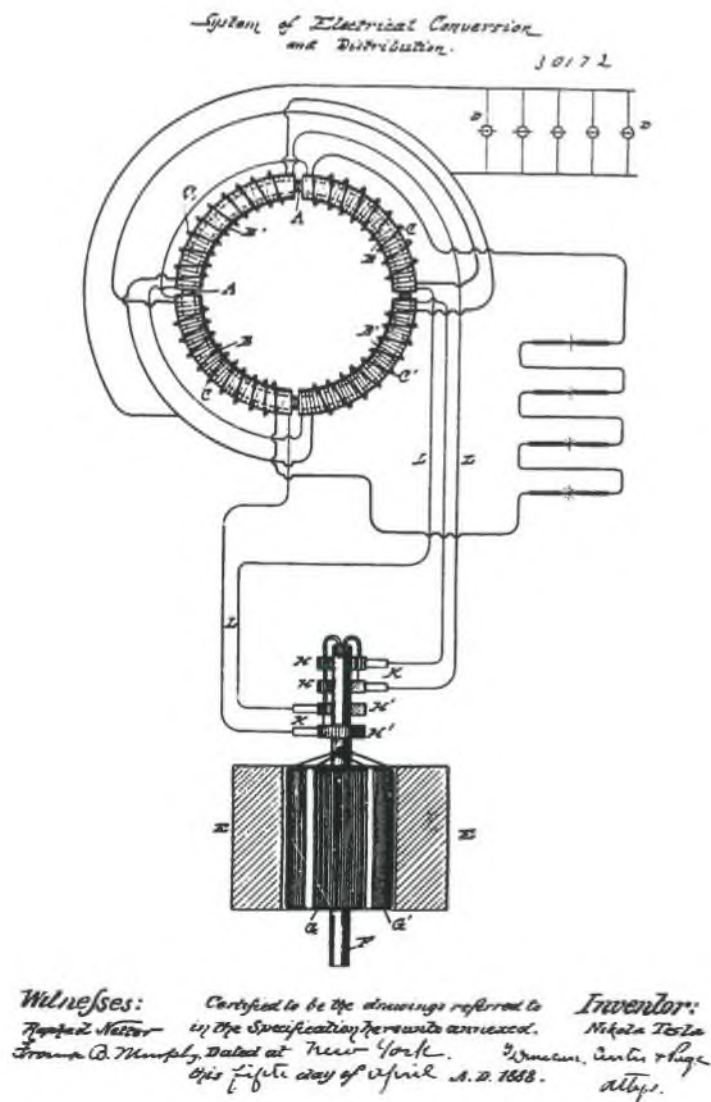
Year	Number of Filed Patent Applications
1886	3
1887	-
1888	8
1889	13
1890	-
1891	6
1892	-
1893	2
1894	8
1895	-
1896	8
1897	8
1898	14
1899	5
1900	14
1901	19
...	-
1905	3
1906	1
...	-
1910	19
1911	-
1912	2
...	-
1920	2
1921	13
1922	20

It is obvious from this table that Tesla's activities on the protection of his inventions in countries other than the U.S. spanned the period from 1886 to 1922, which means that they lasted 36 years, i.e. 7 years less than in the U.S. It is also obvious that there are big differences in the number of submitted patent applications from year to year, with several years having exceptionally large numbers of submitted applications: 1889, 1898, 1900, 1901, 1910, 1921 and 1922. Tesla filed more than 10 patent applications in each of these years.

The next question related to Tesla's patent applications in countries other than the U.S. concerns the inventions that he intended to protect with them - are any of them new, previously unknown inventions? However, there are no major surprises here, except some minor exceptions, which will be covered later. The content of these patents is dictated by the fact that each patent is territorially limited, i.e. it is valid only

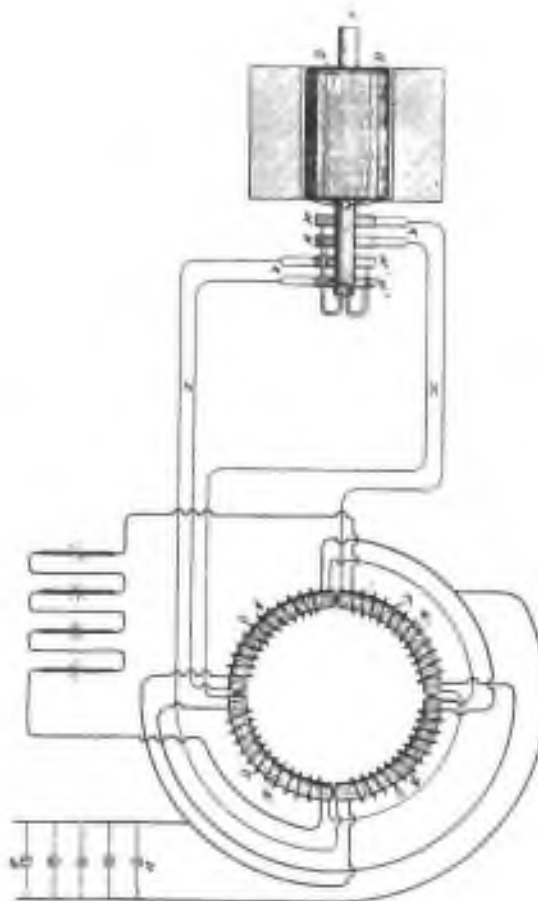


for the country of registration, which is the reason why Tesla had to submit separate applications in each country in which he wanted to protect his inventions. This is the reason for so many patents for the same inventions in different countries. A set of patents that is protecting the same invention in different countries is called a patent family, while the patents constituting a patent family are called analogues. Of all the patents constituting a patent family, the first application, i.e. the earliest, is the most important, for many reasons. First of all, the date of this application is the closest to the true date of creation of the invention. Second, that, initial patent application and/or the corresponding patent is often the first published, thus becoming a part of the body of technical knowledge, which prevents other parties from protecting the same invention. Third, it is an indication the country that the inventor is most interested in, because it is quite natural that it is there where he/she would submit the first patent application. In our literature, there is no appropriate expression for a patent that was approved based on the first submitted application, because the term "basic patent", which would otherwise be adequate, is already being used for a patent that has an additional application or a patent of addition. Therefore, the expression "original patent" is used in the following text.



Example of the Analogues: the Canadian Patent No. 30172

A.D. 1888. Mar 1. N^o 6502.
LAKES COMPLETE SPECIFICATION.

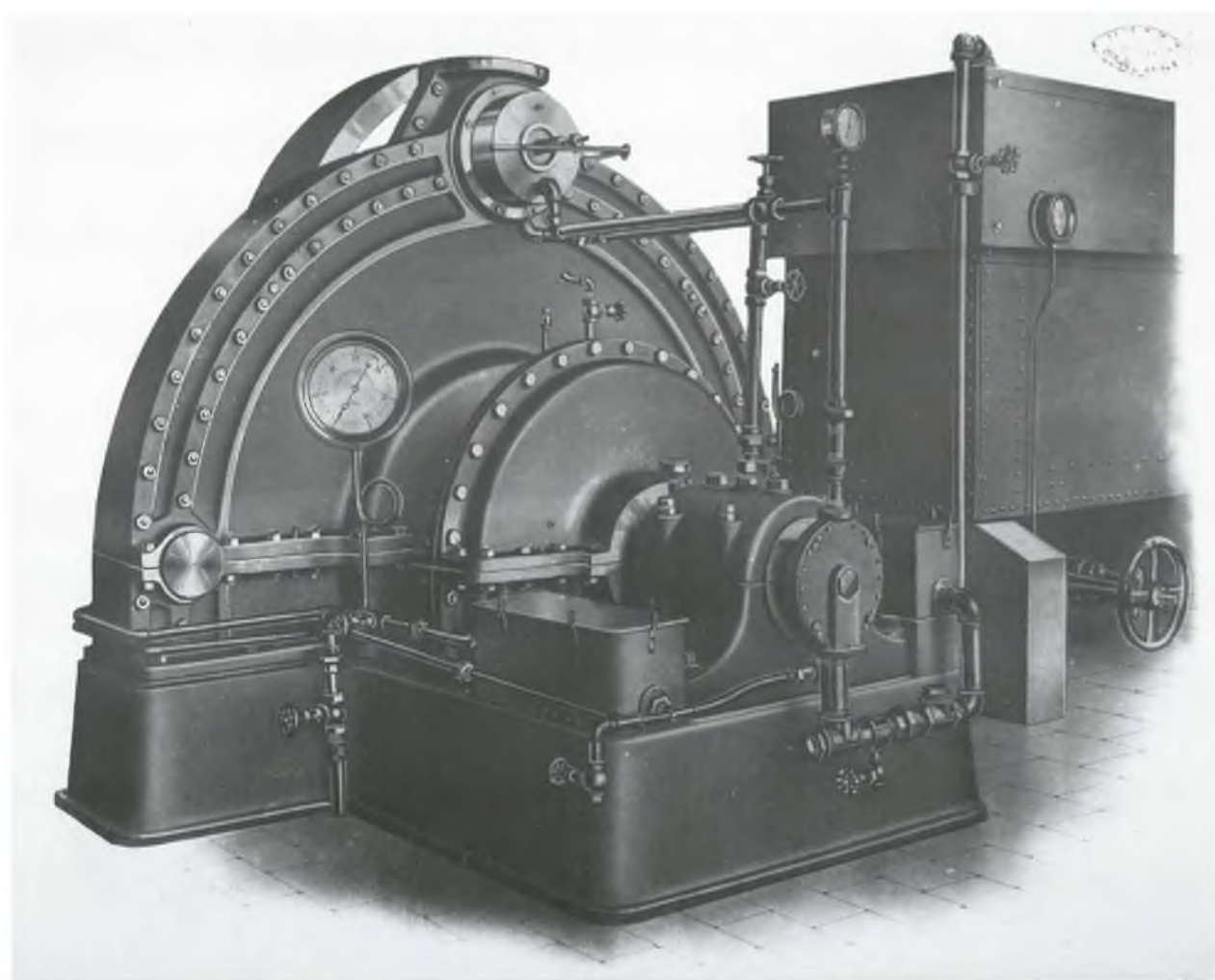


Example of the Analogues: the British Patent No. 6,502

On the other hand, patents that constitute a patent family do not always have identical content. There are many factors, two of which are the most significant. The first is that different countries have different legislation, and the competent authorities have different practices, which influences the content of granted patents. The second factor is that obtaining a patent in any country is associated with the payment of appropriate fees and expenses, as well as services of patent representatives in that country, which, when a patent is protected in many different countries, can become very costly for the applicant. That is the reason why applicants are allowed to join multiple patent applications from the country where they were first filed into a single patent application that he/she is filing in another country or in other countries, and even that patent applications joined in such an application do not have to be complete, but that the application may contain just some segments thereof. As already mentioned above, in general, a separate patent application should be submitted for each invention. However, if some of the inventions are related and constitute a single general concept, then it is possible to submit a single patent application for them, based on the unity of invention. The criteria for unity of invention are not unique and differ to some extent from country to country. There are many

such cases among Tesla's patents from countries other than the U.S., for example Belgian patent No. 123665, which includes five patent applications that resulted in U.S. patents 568,176, 568,177, 568,178, 568,179 and 568,180. In the period when Tesla protected his inventions, in addition to the U.S. Patent Office, which was the harshest, the Imperial Patent Office (Kaiserliches Patentamt) in Germany was also very restrictive concerning the unity of invention. Other countries interpreted the unity of invention much more freely, which resulted in a larger number of patents covering more than one invention. A typical example is Tesla's patent application No. 523,832, submitted in the U.S. on October 21, 1909, for which only the U.S. Patent Office requested that it should be divided into two patent applications, based on which Tesla received two patents, Nos. 1,061,142 and 1,061,206, for Fluid Propulsion and for the Turbine, while he received only one patent for both inventions in all other countries where he submitted the same patent application.

The patenting procedure was also different in each country, and remained so until today. Some countries applied a registration system without any examination of the filed claim. Under this system, the applicant would file a specification of the invention, together with drawings and corresponding patent application, and would receive the patent document very shortly thereafter. This system was applied, for example, in Argentina. A somewhat different system was applied in non-independent countries that had a



colonial or similar type of status. In these countries, a patent issued in the colonial motherland would simply be re-registered. Examples included Rhodesia, Transvaal, India and other British colonies. Other countries applied various methods of examination of the filed application, but there are generally two systems: the first consisted of only a formal examination of whether the application was duly submitted, i.e. whether it includes all the required documentation and a comprehensive specification of the invention, after which the patent was granted. In the second type of procedure, formal examination of the application is followed by a fundamental examination of the claim, which should establish whether the invention fulfills all the previously mentioned requirements for patentability, and if it is the case, a patent is granted. Examples of the second system of patent examination procedure would be the U.S. and Germany. The main feature of these systems is the procedure that lasts longer from the filing date to the granted patent, but, on the other hand, the obtained rights are more precisely defined and offer a higher degree of legal protection.

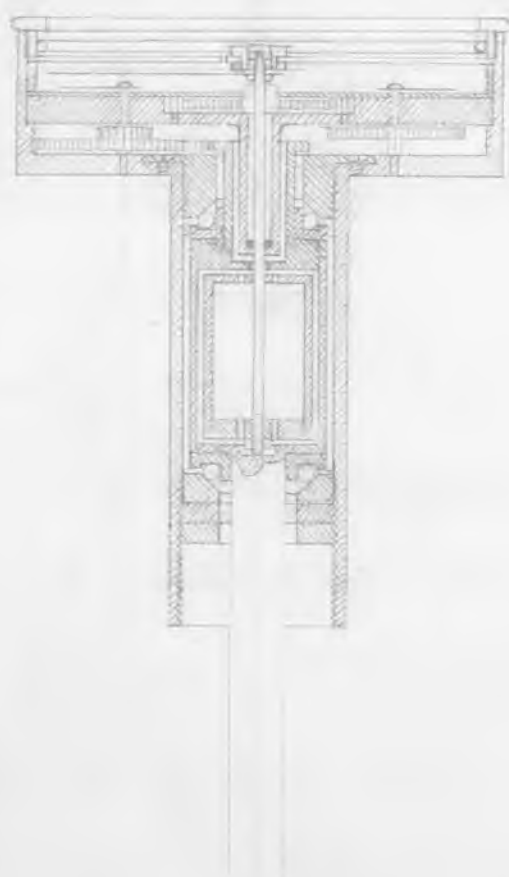
However, there are exceptions to this rule. In his book, *"The Works of Nikola Tesla"*, Slavko Bokšan states that the State Court in Berlin annulled the German patents Nos. 47012 and 47885 on November 26, 1898, following the legal action of German electrical engineering companies (primarily AEG). In addition, the patent documentation for the two following German patents, Nos. 58774 and 66802, indicates that these patents were also annulled. The reasons for annulment of Tesla's German patents in the field of polyphase alternating currents, covering the corresponding motors and generators, lie outside the patent law, and are based on the efforts of German electrical engineering companies to use Tesla's major inventions without paying any remuneration.

**Analogue Patents of Nikola Tesla in
Countries other than the United States
Patent Families of Tesla's
and Nikola Tesla's Original**

Cap to hold jewel bearing
Hub fastened to shaft to hold

Technical drawing of a mechanical assembly, likely a pump or engine component, showing a cross-section. The drawing includes numerous dimensions in inches, such as $2\frac{1}{4}"$, $2\frac{5}{32}"$, $2\frac{3}{32}"$, $3\frac{1}{6}"$, $3\frac{1}{8}"$, $3\frac{1}{4}"$, $3\frac{1}{2}"$, $3\frac{3}{4}"$, $4\frac{1}{2}"$, $4\frac{3}{4}"$, $5\frac{1}{4}"$, $5\frac{3}{4}"$, $6\frac{1}{4}"$, $6\frac{3}{4}"$, $7\frac{1}{4}"$, $7\frac{3}{4}"$, $8\frac{1}{4}"$, $8\frac{3}{4}"$, $9\frac{1}{4}"$, $9\frac{3}{4}"$, $10\frac{1}{4}"$, $10\frac{3}{4}"$, $11\frac{1}{4}"$, $11\frac{3}{4}"$, $12\frac{1}{4}"$, $12\frac{3}{4}"$, $13\frac{1}{4}"$, $13\frac{3}{4}"$, $14\frac{1}{4}"$, $14\frac{3}{4}"$, $15\frac{1}{4}"$, $15\frac{3}{4}"$, $16\frac{1}{4}"$, $16\frac{3}{4}"$, $17\frac{1}{4}"$, $17\frac{3}{4}"$, $18\frac{1}{4}"$, $18\frac{3}{4}"$, $19\frac{1}{4}"$, $19\frac{3}{4}"$, $20\frac{1}{4}"$, $20\frac{3}{4}"$, $21\frac{1}{4}"$, $21\frac{3}{4}"$, $22\frac{1}{4}"$, $22\frac{3}{4}"$, $23\frac{1}{4}"$, $23\frac{3}{4}"$, $24\frac{1}{4}"$, $24\frac{3}{4}"$, $25\frac{1}{4}"$, $25\frac{3}{4}"$, $26\frac{1}{4}"$, $26\frac{3}{4}"$, $27\frac{1}{4}"$, $27\frac{3}{4}"$, $28\frac{1}{4}"$, $28\frac{3}{4}"$, $29\frac{1}{4}"$, $29\frac{3}{4}"$, $30\frac{1}{4}"$, $30\frac{3}{4}"$, $31\frac{1}{4}"$, $31\frac{3}{4}"$, $32\frac{1}{4}"$, $32\frac{3}{4}"$, $33\frac{1}{4}"$, $33\frac{3}{4}"$, $34\frac{1}{4}"$, $34\frac{3}{4}"$, $35\frac{1}{4}"$, $35\frac{3}{4}"$, $36\frac{1}{4}"$, $36\frac{3}{4}"$, $37\frac{1}{4}"$, $37\frac{3}{4}"$, $38\frac{1}{4}"$, $38\frac{3}{4}"$, $39\frac{1}{4}"$, $39\frac{3}{4}"$, $40\frac{1}{4}"$, $40\frac{3}{4}"$, $41\frac{1}{4}"$, $41\frac{3}{4}"$, $42\frac{1}{4}"$, $42\frac{3}{4}"$, $43\frac{1}{4}"$, $43\frac{3}{4}"$, $44\frac{1}{4}"$, $44\frac{3}{4}"$, $45\frac{1}{4}"$, $45\frac{3}{4}"$, $46\frac{1}{4}"$, $46\frac{3}{4}"$, $47\frac{1}{4}"$, $47\frac{3}{4}"$, $48\frac{1}{4}"$, $48\frac{3}{4}"$, $49\frac{1}{4}"$, $49\frac{3}{4}"$, $50\frac{1}{4}"$, $50\frac{3}{4}"$, $51\frac{1}{4}"$, $51\frac{3}{4}"$, $52\frac{1}{4}"$, $52\frac{3}{4}"$, $53\frac{1}{4}"$, $53\frac{3}{4}"$, $54\frac{1}{4}"$, $54\frac{3}{4}"$, $55\frac{1}{4}"$, $55\frac{3}{4}"$, $56\frac{1}{4}"$, $56\frac{3}{4}"$, $57\frac{1}{4}"$, $57\frac{3}{4}"$, $58\frac{1}{4}"$, $58\frac{3}{4}"$, $59\frac{1}{4}"$, $59\frac{3}{4}"$, $60\frac{1}{4}"$, $60\frac{3}{4}"$, $61\frac{1}{4}"$, $61\frac{3}{4}"$, $62\frac{1}{4}"$, $62\frac{3}{4}"$, $63\frac{1}{4}"$, $63\frac{3}{4}"$, $64\frac{1}{4}"$, $64\frac{3}{4}"$, $65\frac{1}{4}"$, $65\frac{3}{4}"$, $66\frac{1}{4}"$, $66\frac{3}{4}"$, $67\frac{1}{4}"$, $67\frac{3}{4}"$, $68\frac{1}{4}"$, $68\frac{3}{4}"$, $69\frac{1}{4}"$, $69\frac{3}{4}"$, $70\frac{1}{4}"$, $70\frac{3}{4}"$, $71\frac{1}{4}"$, $71\frac{3}{4}"$, $72\frac{1}{4}"$, $72\frac{3}{4}"$, $73\frac{1}{4}"$, $73\frac{3}{4}"$, $74\frac{1}{4}"$, $74\frac{3}{4}"$, $75\frac{1}{4}"$, $75\frac{3}{4}"$, $76\frac{1}{4}"$, $76\frac{3}{4}"$, $77\frac{1}{4}"$, $77\frac{3}{4}"$, $78\frac{1}{4}"$, $78\frac{3}{4}"$, $79\frac{1}{4}"$, $79\frac{3}{4}"$, $80\frac{1}{4}"$, $80\frac{3}{4}"$, $81\frac{1}{4}"$, $81\frac{3}{4}"$, $82\frac{1}{4}"$, $82\frac{3}{4}"$, $83\frac{1}{4}"$, $83\frac{3}{4}"$, $84\frac{1}{4}"$, $84\frac{3}{4}"$, $85\frac{1}{4}"$, $85\frac{3}{4}"$, $86\frac{1}{4}"$, $86\frac{3}{4}"$, $87\frac{1}{4}"$, $87\frac{3}{4}"$, $88\frac{1}{4}"$, $88\frac{3}{4}"$, $89\frac{1}{4}"$, $89\frac{3}{4}"$, $90\frac{1}{4}"$, $90\frac{3}{4}"$, $91\frac{1}{4}"$, $91\frac{3}{4}"$, $92\frac{1}{4}"$, $92\frac{3}{4}"$, $93\frac{1}{4}"$, $93\frac{3}{4}"$, $94\frac{1}{4}"$, $94\frac{3}{4}"$, $95\frac{1}{4}"$, $95\frac{3}{4}"$, $96\frac{1}{4}"$, $96\frac{3}{4}"$, $97\frac{1}{4}"$, $97\frac{3}{4}"$, $98\frac{1}{4}"$, $98\frac{3}{4}"$, $99\frac{1}{4}"$, $99\frac{3}{4}"$, $100\frac{1}{4}"$, $100\frac{3}{4}"$. The drawing also includes labels such as "in jewel bearings" and "steel races".

MUZEO
NIKOLE TESLE



Starting from the assumption that Tesla was submitting patent applications for his inventions first in the U.S., and only thereafter in other countries, it had to be determined which patents from countries other than the U.S. corresponded to which U.S. patents, i.e. which U.S. patents they were analogues of. The corresponding analogues were established as follows: in cases where the complete patent documentation was available, including the specification of the invention with appropriate drawings and patent applications, it was determined which invention(s) it covered, and then an attempt was made to find the corresponding U.S. patent(s). In cases where no corresponding U.S. patents had been found, or the filing date of the corresponding patent application in the U.S. was later than the patent(s) considered, all patents covering the same invention were extracted, and then it was determined which one of them has the earliest filing date. In cases when the complete patent documentation was not available, but only part of it or just the patent certificate, the name of invention was used to establish the invention that it covered, as it was the case, for example, with the Belgian patent No. 229701, for an invention named *Perfectionnements concernant la propulsion fluide*, which corresponds to the translation of the name of the invention *Perfezionamenti nella propulsione a fluido* from the Italian patent No. 112767, for which the complete patent specification is preserved, and for which it has been established that it is the analogue for U.S. patents Nos. 1,061,142 and 1,061,206.

In the process of establishing the analogues, special attention had to be dedicated to the content of the specification and the drawings of the invention, and particularly to specific embodiments of the invention, as described and presented in them. The reason is that at the time when Tesla was protecting his inventions, the form and content of patent applications varied significantly from country to country, and in some countries the patent claims were not even an obligatory segment of the patent documentation. In some cases, this task was made even more difficult by the fact that the patent specifications were written by hand, primarily for the earliest Belgian and French patents, but also for the Spanish patents at the beginning of the twentieth century.

Based on all of the above, we have established the list of patents held by Nikola Tesla in countries other than the U.S. as analogues. In this list, the following bibliographical information is given with each patent: country of registration; name of the invention; filing date of the corresponding patent application; number of the registered patent; country and number of the corresponding patent granted based on the earliest application, i.e. the original patent, as well as the date of submission of the earliest patent application.

85866

Mémoire descriptif

à l'appui d'une demande de

Brevet d'Invention de Le Gouv

Belge

Perfectionnements dans le mode de fonctionnement des moteurs électro-magnétiques à l'aide de courants alternatifs

Par

M. Nikola Tesla

Electricien à New-York (Etats-Unis d'Amérique)

— On sait que certains systèmes de machines à courant alternatif ont la propriété, lorsqu'elles sont reliées en circuit avec un générateur de courant alternatif, de marcher comme un moteur synchrone. Mais bien que le courant alternatif force marcher le moteur après qu'il a atteint un degré de vitesse synchrone avec celui du générateur, il ne le maintient pas en marche. En conséquence, dans tous les cas qui se sont présentés jusqu'ici, on l'on faisait marcher ces machines synchrones, comme on les appelle, en les adaptant à une machine pour amener les moteurs en synchronisme avec le générateur ou à l'aide d'un autre moyen qu'on applique le courant alternatif du générateur pour les actionner. En certains cas, on a utilisé un effet des dispositifs mécaniques. Dans d'autres, on a constitué des systèmes de moteurs synchrones en combinaison. Cette invention consiste en un moyen ou procédé beaucoup plus simple pour faire fonctionner les moteurs synchrones, et qui ne nécessite pratiquement aucune action appréciable sur le courant lui-même. En d'autres termes, pour

Analogue Patents of Nikola Tesla in Countries other than the U.S.

57

No.	Country	Name of invention	Application Filing Date D/M/Y	Patent Number	Country of Registration of the Original Patent	Number of the Original Patent	Filing Date of the Original Patent D/M/Y
1.	Argentina	Mejoras en medios de propulsión por fluido	15.03.1912	9089	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
2.	Australia	Improvement in Fluid Propulsion and Fluid Propelled Mechanism	15.12.1910	20,211	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
3.	Austria	Verfahren zur Isolierung elektrischer Leiter	14.08.1900	9098	USA	655,838	15.06.1900
4.	Austria	Einrichtung zur Übertragung elektrischer Energie	11.07.1901	13115	USA	685,012	21.03.1900
5.	Austria	Einrichtung zur Übertragung elektrischer Energie	26.07.1901	16480	USA USA	725,605 723,188	16.07.1900 16.07.1900
6.	Austria	Kraftmaschine oder Pumpe mit mehreren, in einem geschlossenen Gehäuse auf einer Zentralwelle in Abständen voneinander angeordneten, parallelen, kreisenden Scheiben	21.10.1910	60332	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
7.	Belgium	Perfectionnements dans le mode de fonctionnement des moteurs électromagnétiques à l'aide de courants alternatifs	16.04.1889	85866	USA USA	401,520 405,859	18.02.1889 14.03.1889
8.	Belgium	Perfectionnements dans les moteurs électro-magnétiques à courants alternatifs	03.10.1889	88701	USA	416,195	20.05.1889
9.	Belgium	Perfectionnements dans la construction et le mode de fonctionnement des moteurs à courants alternatifs	03.10.1889	88702	USA USA USA	416,191 416,192 416,193	20.05.1889 20.05.1889 20.05.1889
10.	Belgium	Procédé et appareil perfectionnés pour produire de la force électrique et l'utiliser pour l'éclairage	19.05.1891	94940	USA USA	454,622 455,069	26.04.1891 14.05.1891
11.	Belgium	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	17.02.1894	108594	USA	514,169	19.08.1893
12.	Belgium	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	17.02.1894	108595	USA	511,916	19.08.1893
13.	Belgium	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	22.09.1896	123665	USA USA USA USA USA	568,176 568,177 568,178 568,179 568,180	22.04.1896 17.06.1896 20.06.1896 06.07.1896 09.07.1896
14.	Belgium	Perfectionnements dans les systèmes de transmission de l'énergie électrique et dans les appareils employés à cet effet	26.10.1897	131524	USA USA	645,576 649,621	02.09.1897 02.09.1897
15.	Belgium	Perfectionnements aux contrôleurs de circuits électriques	04.07.1898	136606	USA USA USA USA USA USA USA	609,245 611,719 609,246 609,247 609,248 609,249 613,735	02.12.1897 10.12.1897 28.02.1898 12.03.1898 12.03.1898 12.03.1898 19.04.1898

16.	Belgium	Perfectionnements dans le procede et les appareils de reglage pour les mecanismes des batiments flottants ou des vehicules en marche	30.01.1899	140489	USA	613,809	01.07.1898
17.	Belgium	Perfectionnements a l'isolement des conducteurs electriques	14.08.1900	151563	USA	655,838	15.06.1900
18.	Belgium	Perfectionnement a la transmission de l'energie electrique	17.07.1901	157668	USA	685,012	21.03.1900
19.	Belgium	Perfectionnements a la transmission de l'energie electrique	08.08.1901	158088	USA USA	725,605 723,188	16.07.1900 16.07.1900
20.	Belgium	Perfectionnements concernant la propulsion fluide	19.10.1910	229701	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
21.	Belgium	Perfectionnements aux fontaines	22.05.1920	286983	USA	1,113,716	28.10.1913
22.	Belgium	Perfectionnements aux paratonnerres	03.09.1921	298511	USA	1,266,175	06.05.1916
23.	Belgium	Conduit faisant fonction de valve	03.09.1921	298512	USA	1,329,559	21.02.1916
24.	Belgium	Perfectionnements aux turbines actionnees par la vapeur ou des gaz	23.03.1922	302317	Great Britain	186,082	24.03.1921
25.	Belgium	Procede et appareil pour la production d'un vide eleve	23.03.1922	302318	Great Britain	179,043	24.03.1921
26.	Belgium	Procede et appareil pour l'utilisation de la vapeur comme force motrice	23.03.1922	302319	Great Britain	186,084	24.03.1921
27.	Belgium	Procede et appareil pour economie de l'energie de la vapeur au moyen de turbines	23.03.1922	302320	Great Britain	186,083	24.03.1921
28.	Belgium	Perfectionnements aux procedes et machines pour obtention de force motrice par les turbines a fluides elastiques	31.03.1922	302321	Great Britain	174,544	01.04.1921
29.	Belgium	Procede et appareil pour transports aeriens	03.04.1922	302824	Great Britain	185,446	04.04.1921
30.	Belgium	Procede et appareil pour equilibrer les pieces tournantes des machines	02.09.1922	305851	Great Britain	186,799	02.09.1921
31.	Brasil	Methodo e apparetho para mecanismos de regular navios ou vehiculos em movimento	14.08.1899	2882	USA	613,809	01.07.1898
32.	Brasil	Aperfeiçoamentos em propulsão por meio de fluido	20.10.1910	6435	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
33.	Canada	Dynamo Electric Machines	27.04.1886	24033	USA USA	336,961 336,962	18.05.1885 01.06.1885
34.	Canada	System of Electrical Transmission of Power	01.05.1888	29537	USA USA USA	381,968 382,280 382,279	12.10.1887 12.10.1887 30.11.1887
35.	Canada	System of Electrical Conversion and Distribution	01.05.1888	30172	USA USA	381,970 382,282	23.12.1887 23.12.1887
36.	Canada	Method and Apparatus for Converting Alternating into Direct Current	19.12.1889	33317	USA	413,353	12.06.1889
37.	Canada	Art of Transmitting Electrical Energy Through the Natural Mediums	17.04.1906	142352	USA	787,412	16.05.1900
38.	Canada	Fluid Propulsion	22/24.11.1910	135174	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
39.	Cuba	Mejoras en medios de propulsion por fluido	30.11.1910	1433	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
40.	Danmark	Fremgangsmaade til ved Hjaelp af Afkøling at isolere elektriske Ledninger	14.08.1900	4094	USA	655,838	15.06.1900
41.	Danmark	Fremgangsmaade og Apparat til Omdannelse af Varmeenergi til mekanisk Energi	31.03.1922	31737	Great Britain	174,544	01.04.1921

42.	Danmark	Flyvemaskine	03.04.1922	31663	Great Britain	185,446	04.04.1921
43.	France	Perfectionnements dans les procédés et appareils pour transformer et distribuer les courants électriques	01.05.1888	190,332	USA USA	381,970 382,282	23.12.1887 23.12.1887
44.	France	Perfectionnements dans le mode de transmission de la force par l'électricité	01.05.1888	190,333	USA USA USA	381,968 382,280 382,279	12.10.1887 12.10.1887 30.11.1887
45.	France	Perfectionnements du mode de fonctionnement des moteurs électromagnétiques à l'aide de courants alternatifs	16.04.1889	197,532	USA USA	401,520 405,859	18.02.1889 14.03.1889
46.	France	Perfectionnements aux moteurs électro-magnétiques à courants alternatifs	03.10.1889	202,372	USA	416,195	20.05.1889
47.	France	Perfectionnements à la construction et au mode de fonctionnement des moteurs à courants alternatifs	03.10.1889	202,373	USA USA USA	416,191 416,192 416,193	20.05.1889 20.05.1889 20.05.1889
48.	France	Procédé et appareil perfectionnés pour produire de la force électrique et l'utiliser pour l'éclairage	19.05.1891	213,556	USA USA	454,622 455,069	26.04.1891 14.05.1891
49.	France	Perfectionnements dans les moteurs électromagnétiques à courants alternatifs	07.07.1891	214,718	USA	455,067	27.01.1891
50.	France	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	17.02.1894	236,356	USA	514,169	19.08.1893
51.	France	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	17.02.1894	236,357	USA	511,916	19.08.1893
52.	France	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	22.09.1896	259,940	USA USA USA USA USA	568,176 568,177 568,178 568,179 568,180	22.04.1896 17.06.1896 20.06.1896 06.07.1896 09.07.1896
53.	France	Perfectionnements dans les systèmes de transmission de l'énergie électrique et dans les appareils employés à cet effet	29.10.1897	271,641	USA USA	645,576 649,621	02.09.1897 02.09.1897
54.	France	Perfectionnements aux contrôleurs de circuits électriques	01.07.1898	279,362	USA USA USA USA USA USA USA	609,245 611,719 609,246 609,247 609,248 609,249 613,735	02.12.1897 10.12.1897 28.02.1898 12.03.1898 12.03.1898 12.03.1898 19.04.1898
55.	France	Perfectionnements dans le procédé et les appareils de réglage pour les mécanismes des bâtiments flottants ou des véhicules en marche	24.12.1898	284,352	USA	613,809	01.07.1898
56.	France	Perfectionnements à l'isolement des conducteurs électriques	14.08.1900	303,025	USA	655,838	15.06.1900
57.	France	Perfectionnements à l'utilisation des variations ou chargements d'état électriques ou d'ordres vibratoires similaires transmis à travers les milieux naturels, et appareils pour leur mise à exécution	10.06.1901	311,629	USA USA USA USA USA USA	685,953 685,955 685,954 685,956 685,957 685,958	24.06.1899 24.06.1899 01.08.1899 01.08.1899 21.03.1901 21.03.1901
58.	France	Perfectionnements à la transmission de l'énergie électrique	17.07.1901	312,783	USA	685,012	21.03.1900

59.	France	Perfectionnements a la transmission de l'énergie électrique	02.08.1901	313,188	USA USA	725,605 723,188	16.07.1900 16.07.1900
60.	France	Perfectionnements a la transmission de l'énergie électrique	16.08.1905	354,791	USA	787,412	16.05.1900
61.	France	Procédé et appareils pour la production et l'utilisation de la force motrice au moyen de fluides	17.10.1910	421,543	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
62.	France	Perfectionnements aux fontaines	11.05.1920	515,388	USA	1,113,716	28.10.1913
63.	France	Conduite faisant fonction de valve	03.09.1921	540,616	USA	1,329,559	21.02.1916
64.	France	Perfectionnements aux paratonnerres	03.09.1921	540,617	USA	1,266,175	06.05.1916
65.	France	Perfectionnements aux turbines actionnées par la vapeur ou des gaz	15.09.1921	541,112	Great Britain	186,082	24.03.1921
66.	France	Procédé et appareil pour équilibrer les pièces tournantes des machines	15.09.1921	541,113	Great Britain	186,799	02.09.1921
67.	France	Procédé et appareil pour économie de l'énergie de la vapeur au moyen de turbines	23.03.1922	549,259	Great Britain	186,083	24.03.1921
68.	France	Procédé et appareil pour l'utilisation de la vapeur comme force motrice	23.03.1922	549,260	Great Britain	186,084	24.03.1921
69.	France	Procédé et appareil pour la production d'un élève	23.03.1922	549,261	Great Britain	179,043	24.03.1921
70.	France	Perfectionnements aux procédés et machines pour obtention de force motrice par les turbines à fluides élastiques	30.03.1922	549,516	Great Britain	174,544	01.04.1921
71.	France	Procédé et appareil pour transports aériens	01.04.1922	549,628	Great Britain	185,446	04.04.1921
72.	Germany	Schaltung eines Transformators und des zugehörigen Elektrizitätserzeugers.	30.04.1888	47012	USA USA	381,970 382,282	23.12.1887 23.12.1887
73.	Germany	Verbindung der Drahtspulen bei Elektrizitätserzeugern mit denen von Motoren.	30.04.1888	47885	USA USA USA	381,968 382,280 382,279	12.10.1887 12.10.1887 30.11.1887
74.	Germany	Feldmagnetanordnung für Wechselstromkraftmaschine.	02.12.1889	58774	USA	416,193	20.05.1889
75.	Germany	Wechselstromtreibmaschine mit auf eine in sich geschlossene Ankerwicklung wirkenden Haupt- und Hilfsfeldmagneten.	02.12.1889	66802	USA	416,195	20.05.1889
76.	Germany	Verfahren zur Erzeugung elektrischen Lichtes	19.05.1891	73080	USA	454,622	26.04.1891
77.	Germany	Durch Dampf oder Druckluft betriebenes, geradlinig schwingendes Pendel	28.08.1893	84335	USA	514,169	19.08.1893
78.	Germany	Vorrichtung zur Erzeugung elektrischer Ströme von gleichbleibender Schwingungszahl	28.08.1893	87269	USA	511,916	19.08.1893
79.	Germany	Stromkreisregler für die Umwandlung von Strömen geringer Wechselzahl in solche von hoher Wechselzahl mittels Kondensatorentladungen	21.09.1896	93255	USA USA	566,179 566,180	06.07.1896 09.07.1896
80.	Germany	Einrichtung zur Erzielung von Strömen hoher Frequenz aus Gleichströmen durch Kondensatorentladungen	21.09.1896	99173	USA USA	568,176 568,178	22.04.1896 20.06.1896
81.	Germany	Stromunterbrecher mit flüssigem Leiter	18.06.1898	109865	USA USA USA USA USA	609,245 609,246 609,247 609,248 609,249 613,735	02.12.1897 28.02.1898 12.03.1898 12.03.1898 12.03.1898 19.04.1898

82.	Germany	Stromunterbrecher mit flüssigem Leiter	18.06.1898	110049	USA	611,719	10.12.1897
83.	Germany	Stromunterbrecher mit flüssigem Leiter	18.06.1898	110050	USA	613,735	19.04.1898
84.	Germany	Vorrichtung zur Fernsteuerung von Wasserfahrzeugen mittels elektrischer Wellen	07.11.1898	142842	USA	613,809	01.07.1898
85.	Germany	Verfahren und Vorrichtung zur Nutzbarmachung von aus der Ferne durch den Äther oder die Erde oder beide gesandten elektrischen Impulsen oder Schwingungen	19.06.1901	139464	USA USA	685,953 685,955	24.06.1899 24.06.1899
86.	Germany	Verfahren und Vorrichtung zur Nutzbarmachung von aus der Ferne durch den Äther oder die Erde oder beide gesandten Impulsen oder Schwingungen	19.06.1901	139465	USA USA	685,954 685,956	01.08.1899 01.08.1899
87.	Germany	Verfahren zur Nutzbarmachung von aus der ferne durch den Äther gesandten Einwirkungen	19.06.1901	139466	USA	685,958	21.03.1901
88.	Germany	Verfahren zur Erzeugung elektrischer Schwingungen	09.07.1901	136841	USA	685,012	21.03.1900
89.	Germany	Verfahren und Vorrichtung zur sicheren Übertragung einer Nachricht auf einem bestimmten Empfänger mittels elektrischer Impulse oder Schwingungen verschiedener Beschaffenheit	22.07.1901	143453	USA USA	725,605 723,188	16.07.1900 16.07.1900
90.	Great Britain	Improvements in Electric Lamps	09.02.1886	1,877	USA	335,787	13.07.1885
91.	Great Britain	Improvements in Dynamo Electric Machines	02.03.1886	2,975	USA USA	336,961 336,962	18.05.1885 01.06.1885
92.	Great Britain	Improvements relating to Electrical Transmission of Power and to Apparatus therefor	01.05.1888	6,481	USA USA USA	381,968 382,280 382,279	12.10.1887 12.10.1887 30.11.1887
93.	Great Britain	Improvements relating to the Generation and Distribution of Electric Currents and to Apparatus therefor	01.05.1888	6,502	USA USA	381,970 382,282	23.12.1887 23.12.1887
94.	Great Britain	Improvements relating to Electro-motors	16.04.1889	6,527	USA USA	401,520 405,859	18.02.1889 14.03.1889
95.	Great Britain	Improvements relating to the Conversion of Alternating into Direct Electric Currents	22.10.1889	16,709	USA	413,353	12.06.1889
96.	Great Britain	Improvements in Alternating Current Electro-magnetic Motors	03.12.1889	19,420	USA	416,195	20.05.1889
97.	Great Britain	Improvements in Construction and Mode of Operating Alternating Current Motors	03.12.1889	19,426	USA USA USA	416,191 416,192 416,193	20.05.1889 20.05.1889 20.05.1889
98.	Great Britain	Improved Methods of and Apparatus for Generating and Utilizing Electric Energy for Lighting Purposes	19.05.1891	8,575	USA USA	454,622 455,069	26.04.1891 14.05.1891
99.	Great Britain	Improvements in Alternating Current Electro-magnetic Motors	06.07.1891	11,473	USA	455,067	27.01.1891
100.	Great Britain	Improvements in Methods of and Apparatus for the Generation of Electric Currents of Defined Period	08.02.1894	2,812	USA	511,916	19.08.1893
101.	Great Britain	Improvements in Reciprocating Engines and Means for Regulating the Period of the same	08.02.1894	2,801	USA	514,169	19.08.1893
102.	Great Britain	Improvements Relating to the Production, Regulation and Utilization of Electric Currents of High Frequency and to Apparatus therefor	22.09.1896	20,981	USA USA USA USA USA	568,176 568,177 568,178 568,179 568,180	22.04.1896 17.06.1896 20.06.1896 06.07.1896 09.07.1896

103.	Great Britain	Improvements in Systems for the Transmission of Electrical Energy and Apparatus for Use therein	21.10.1897	24,421	USA USA	645,576 649,621	02.09.1897 02.09.1897
104.	Great Britain	Improvements in Electrical Circuit Controllers	08.06.1898	12,866	USA USA USA USA USA USA USA	609,245 611,719 609,246 609,247 609,248 609,249 613,735	02.12.1897 10.12.1897 28.02.1898 12.03.1898 12.03.1898 12.03.1898 19.04.1898
105.	Great Britain	Improvements in the Method of and Apparatus for Controlling the Mechanism of Floating Vessels or Moving Vehicles	13.12.1898	26,371	USA	613,809	01.07.1898
106.	Great Britain	Improvements Relating to the Insulation of Electric Conductors	14.08.1900	14,550	USA	655,838	15.06.1900
107.	Great Britain	Improvements Relating to the Utilization of Electromagnetic, Light or other like Radiations Effects or Disturbances Transmitted through the Natural Media and to Apparatus therefor	01.06.1901	11,293	USA USA USA USA USA USA	685,953 685,955 685,954 685,956 685,957 685,958	24.06.1899 24.06.1899 01.08.1899 01.08.1899 21.03.1901 21.03.1901
108.	Great Britain	Improvements in, and relating to, the Transmission of Electrical Energy	03.07.1901	13,563	USA	685,012	21.03.1900
109.	Great Britain	Improvements in, and relating to, the Transmission of Electrical Energy	17.07.1901	14,579	USA USA	725,605 723,188	16.07.1900 16.07.1900
110.	Great Britain	Improvements relating to the Transmission of Electrical Energy	17.04.1905	8,200	USA	787,412	16.05.1900
111.	Great Britain	Improved Method of Imparting Energy to or Deriving Energy from a Fluid and Apparatus for use therein	17.10.1910	24,001	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
112.	Great Britain	Improved Process of and Apparatus for Production of High Vacua	24.03.1921	179,043		Original Patent	
113.	Great Britain	Improvements in the Construction of Steam and Gas Turbines	24.03.1921	186,082		Original Patent	
114.	Great Britain	Improved Method of and Apparatus for the Economic Transformation of the Energy of Steam by Turbines	24.03.1921	186,083		Original Patent	
115.	Great Britain	Improved Method of and Apparatus for Deriving Motive Power from Steam	24.03.1921	186,084		Original Patent	
116.	Great Britain	Improvements in Methods of and Apparatus for the Generation of Power by Elastic Fluid Turbines	01.04.1921	174,544		Original Patent	
117.	Great Britain	Method of and Apparatus for Aerial Transportation	04.04.1921	185,446		Original Patent	
118.	Great Britain	Process of, and Apparatus for Balancing Rotating Machine Parts	02.09.1921	186,799		Original Patent	
119.	Hungary	Eljárás és berendezés elektromos energia átvitelére	27.10.1897	11230	USA USA	645,576 649,621	02.09.1897 02.09.1897
120.	Hungary	Berendezés áramköröknek gyors egymásutánban való megszakítására és zárására	27.06.1898	15067	USA USA USA USA USA USA USA	609,245 611,719 609,246 609,247 609,248 609,249 613,735	02.12.1897 10.12.1897 28.02.1898 12.03.1898 12.03.1898 12.03.1898 19.04.1898
121.	Hungary	Eljárás és berendezés járműveknek távolról való hajtására és kormányzására	07.11.1898	24842	USA	613,809	01.07.1898

122.	Hungary	Eljárás elektromos vezetékek szigetelésére	14.08.1900	20897	USA	655,838	15.06.1900
123.	Hungary	Újítás az elektromos energia távközlésére szolgáló eljárásen és berendezésen	13.07.1901	24076	USA	685,012	21.03.1900
124.	Hungary	Újítások villamos energia távközlésében	23.07.1901	25869	USA USA	725,605 723,188	16.07.1900 16.07.1900
125.	Hungary	Eljárás és gép energiának folyadékokra való átvitelére és azokról való levételére	20.10.1910	54937	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
126.	India	Improvements in fluid propulsion	08.12.1910	640	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
127.	Italy	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	02.03.1894	35836 (54660) (66600)	USA	514,169	19.08.1893
128.	Italy	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	02.03.1894	35837 (54661) (66601)	USA	511,916	19.08.1893
129.	Italy	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	22.09.1896	42615 (65173)	USA USA USA USA USA	568,176 568,177 568,178 568,179 568,180	22.04.1896 17.06.1896 20.06.1896 06.07.1896 09.07.1896
130.	Italy	Perfezionamenti nei sistemi di trasmissione dell'energia elettrica e relativi apparecchi	28.02.1898	47334	USA USA	645,576 649,621	02.09.1897 02.09.1897
131.	Italy	Perfezionamenti nei regolatori del circuito elettrico	18.06.1898	48461	USA USA USA USA USA USA USA	609,245 611,719 609,246 609,247 609,248 609,249 613,735	02.12.1897 10.12.1897 28.02.1898 12.03.1898 12.03.1898 12.03.1898 19.04.1898
132.	Italy	Perfectionnements dans le procédé et les appareils de réglage pour les mécanismes des bâtiments flottants ou des véhicules en marche	17.01.1899	50371	USA	613,809	01.07.1898
133.	Italy	Perfectionnements à l'isolement des conducteurs électriques	14.08.1900	56676	USA	655,838	15.06.1900
134.	Italy	Perfectionnements à l'isolement des conducteurs électriques	18.10.1900	57312	USA	655,838	15.06.1900
135.	Italy	Perfectionnements à la transmission de l'énergie électrique	08.08.1901	60679	USA USA	725,605 723,188	16.07.1900 16.07.1900
136.	Italy	Perfectionnement à la transmission de l'énergie électrique	18.04.1905	76685	USA	787,412	16.05.1900
137.	Italy	Perfezionamenti nella propulsione a fluido	20.10.1910	112767	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
138.	Italy	Perfectionnements aux procédé et machines pour obtention de force motrice par les turbines à fluides élastiques	31.03.1922	208594	Great Britain	174,544	01.04.1921
139.	Japan	Fluid Propulsion	26.03.1912	21883	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
140.	Mexico	Una maquina que puede ser empleada como bomba, turbina ó compresora	18.10.1910	11079	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
141.	New South Wales	Improvements in Methods of and Apparatus for Producing, Regulating and Utilizing Electric Currents of High Frequency	16.10.1896	6972	USA USA USA USA USA	568,176 568,177 568,178 568,179 568,180	22.04.1896 17.06.1896 20.06.1896 06.07.1896 09.07.1896

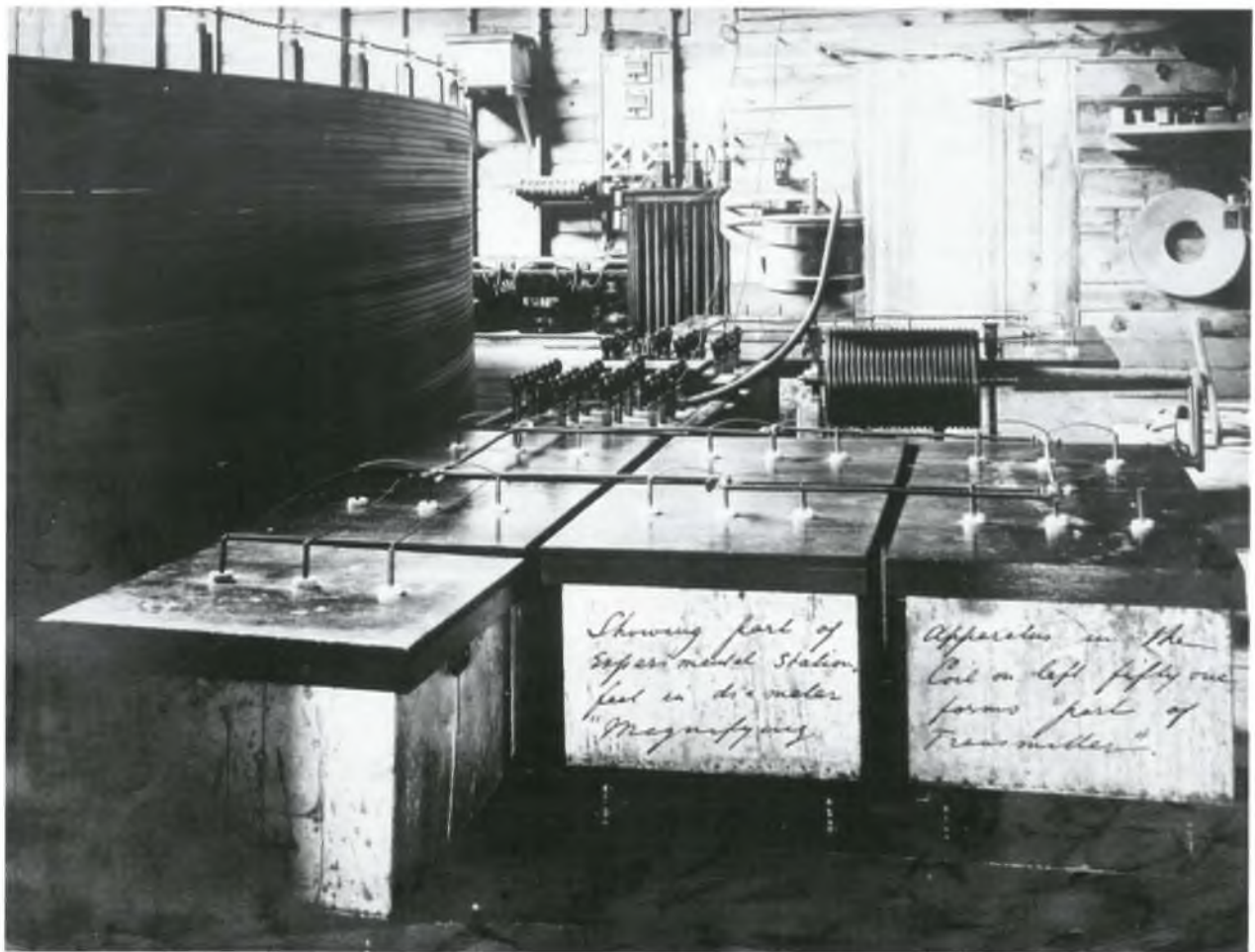
142.	New South Wales	Improvements in systems for the transmission of electrical energy and apparatus for use therein	26.11.1897	8019	USA USA	645,576 649,621	02.09.1897 02.09.1897
143.	New Zealand	Improvements in fluid propulsion	08.12.1910	28853	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
144.	Norway	Isolation af elektriske ledere	14.08.1900	9847	USA	655,838	15.06.1900
145.	Norway	Fremgangsmaate og apparat til utvikling og overføring av energi ved hjelp av væske - eller gasformige drivmedier	25.11.1910	22689	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
146.	Norway	Fremgangsmaate og apparat til frembringelse av mekanisk ved hjelp av turbiner for elastisk fluidum	01.04.1922	38426	Great Britain	174,544	01.04.1921
147.	Rhodesia	Improvements in fluid propulsion	15.12.1910	651	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
148.	Russia	Трансформаторъ, служащаго для передачи электрическихъ токовъ очень высокаго напряженія черезъ верхніе разряженные слои атмосферы	18.10.1897	4656	USA USA	645,576 649,621	02.09.1897 02.09.1897
149.	Russia	Приспособленія для управленія дѣйствіемъ пловучихъ судовъ или иныхъ движущихся помѣщей при помощи электрическихъ волнъ	26.10.1898	10188	USA	613,809	01.07.1898
150.	Russia	Способъ приданія изолирующихъ свойствъ матеріалу, окружающему электрический проводъ или прилегающему къ нему	01.08.1900	7692	USA	655,838	15.06.1900
151.	Russia	Способъ передачи электрической энергіи безъ проводовъ	16.07.1901	11535	USA USA	725,605 723,188	16.07.1900 16.07.1900
152.	Spain	Mejoras en el sistema de gobierno del mecanismo de recipientes ó barcos flotantes ó vehículos móviles por medio de los aparatos que se describen	31.01.1899	23742	USA	613,809	01.07.1898
153.	Spain	Mejoras en el aislamiento de conductores eléctricos	14.08.1900	26430	USA	655,838	15.06.1900
154.	Spain	Mejoras en el aislamiento de conductores eléctricos	06.11.1900	26801	USA	655,838	15.06.1900
155.	Spain	Mejoras introducidas en los motores, actuados por fluido	21.10.1910	49122	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
156.	Spain	Un procedimiento, con su aparato correspondiente para la obtención de fuerza motriz por medio de turbinas de fluidos elásticos	31.03.1922	81244	Great Britain	174,544	01.04.1921
157.	Spain	Un método, con su aparato correspondiente para transportes aéreos	03.04.1922	81253	Great Britain	185,446	04.04.1921
158.	Sweden	Sätt att isolera elektriska konduktorer	14.08.1900	12969	USA	655,838	15.06.1900
159.	Sweden	Rotationsmaskin	23.11.1910	38545	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
160.	Sweden	Sätt och apparat för att utbalansera roterande maskindelar	01.09.1922	60297	Great Britain	186,799	02.09.1921
161.	Sweden	Anordning vid turbinaggregat med anordning för backgang	31.03.1922	60428	Great Britain	174,544	01.04.1921
162.	Switzerland	Installation pour la transmission d'énergie électrique	26.10.1897	15542	USA USA	645,576 649,621	02.09.1897 02.09.1897
163.	Switzerland	Installation pour commander la marche des machines d'un véhicule automobile d'un point éloigné du véhicule	20.01.1899	18652	USA	613,809	01.07.1898

164.	Switzerland	Installation d'isolation de conducteurs électriques	14.08.1900	22213	USA	655,838	15.06.1900
165.	Switzerland	Machine rotative pouvant travailler comme pompe, ventilateur, moteur, etc.	15.11.1910	54375	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
166.	Transvaal	Improvements in Fluid Propulsion	02.12.1910	593	USA USA	1,061,142 1,061,206	21.10.1909 21.10.1909
167.	Victoria	An improved method of and apparatus for producing and regulating electric currents of high frequency	15.10.1896	13596	USA USA USA USA USA	568,176 568,177 568,178 568,179 568,180	22.04.1896 17.06.1896 20.06.1896 06.07.1896 09.07.1896
168.	Victoria	Improvements in methods and systems for the transmission of electrical energy and apparatus for use therein	25.11.1897	14798	USA USA	645,576 649,621	02.09.1897 02.09.1897

Based on data from the above table, it is obvious that Tesla frequently joined several of his U.S. patent applications into a single patent application for filing in another country or countries, in order to reduce the expenses of patent protection. Moreover, several patent applications were joined together as complete, as it is the case, for example, with patent applications for which he received the U.S. patent Nos. 336,961 and 336,962, covering the Regulators for Dynamo-Electric Machines, while other joint patent applications included only segments of original applications, as is the case with applications referring to U.S. patents Nos. 685,953, 685,954 685,955 685,956, 685,957 and 685,958, covering Methods and Apparatuses for Intensifying and Utilizing Effects Transmitted through the Natural Media.

The largest number of patent applications that Tesla joined into a single application was seven - all covering Electrical-Circuit Controllers, and this patent application consisted of U.S. applications which resulted in patents Nos. 609,245, 611,719, 609,246, 609,247, 609,248, 609,249 and 613,735. Tesla filed this patent application in Belgium, Great Britain, Italy, France and Hungary, and in each case he received a single national patent. However, he received three patents based on this application in Germany, Nos. 109865, 110049 and 110050, mainly due to the Imperial Patent Office's restrictive interpretation of provisions covering unity of invention. Generally, the content of Tesla's patents approved outside the U.S. is essentially identical, with the exception of individual German patents, where the content is different to a certain extent from the patents in other countries, i.e. is reduced and/or limited compared to other patents.

The analysis of Tesla's patents in countries other than the U.S. revealed two surprising facts. The first one is that not all U.S. patents held by Nikola Tesla are the earliest submitted analogues, i.e. the original patents. Namely, Tesla filed the patent application for the Method and Apparatus for Aerial Transportation first in Great Britain, on April 4, 1921, and only five months later, on September 9, 1921, he filed the same application in the U.S., which means that the British patent application was the first submitted, and therefore the British patent No. 185,446 is the original patent, and not the U.S. patent No. 1,655,113. The second one is that there are no corresponding U.S. patents for six other British patents from that period, either because Tesla did not file any patent applications for them, or because the U.S. Patent Office rejected his applications. It is interesting to note that these British patents covered Tesla's inventions in the field of mechanical engineering, the first being for the Improvements in the Construction of Steam and Gas Turbines (No. 186,082), the second for the Improved Process of and Apparatus for Production of High Vacuum (No. 179,043), the third for the Improved Method of and Apparatus for the Economic Transformation of the Energy of Steam by Turbines (No. 186,083), Improved Method of and Apparatus for Deriving Motive Power from Steam (No. 186,084), the fifth for the Improvements in Methods of and Apparatus for the Generation of Power by Elastic Fluid Turbines (No. 179,544), and the sixth for the Process of, and Apparatus for Balancing Rotating Machine Parts (No. 186,799).



Based on all of the above, the following list of patent families of Nikola Tesla's patents was established. In this list, the following bibliographical data is given for each patent: the country where the patent was registered, the name of invention as listed in the patent, filing date of the corresponding patent application and the patent registration number, while the column "Remarks" contains specific information about that patent, such as whether the corresponding patent application was divided from the application that was originally submitted, and whether the approved patent is a patent of addition to the basic patent in this country, which means that when the list of patent families was formed, patents of addition and reissued patents were included with the analogues. The gray-shaded rows contain original patents, while the rows beneath them, which are not shaded, contain the corresponding analogues. Each patent family has one or more original patents, because some of them are the result of division from the initial patent application, which was the case in the U.S. on a number of occasions. The ordinal number of the patent family stands only before the first of the specified original patents, in cases when the patent family has multiple original patents.

It should also be noted that individual analogues are listed as members of several patent families, which is the consequence of joint patent applications from several original patent applications for submission in other countries, as previously described.

Patent Families of Nikola Tesla's Patents

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No.	Name of Invention in Patent	Country	Original Patent Application Filing date D/M/Y	Patent Number	Remarks
1.	Electric-Arc Lamp	USA	30.03.1885	335,786	
2.	Commutator for Dynamo-Electric Machines	USA	06.05.1885	334,823	
3.	Regulator for Dynamo-Electric Machines	USA	18.05.1885	336,961	
	Improvements in Dynamo Electric Machines	Great Britain	02.03.1886	2,975	
	Dynamo Electric Machines	Canada	27.04.1886	24033	
4.	Regulator for Dynamo-Electric Machines	USA	01.06.1885	336,962	
	Improvements in Dynamo Electric Machines	Great Britain	02.03.1886	2,975	
	Dynamo Electric Machines	Canada	27.04.1886	24033	
5.	Electric-Arc Lamp	USA	13.07.1885	335,787	
	Improvements in Electric Lamps	Great Britain	09.02.1886	1,877	
6.	Dynamo-Electric Machine	USA	14.01.1886	359,748	
7.	Regulator for Dynamo-Electric Machines	USA	14.01.1886	350,954	
8.	Thermo-Magnetic Motor	USA	30.03.1886	396,121	
9.	Commutator for Dynamo-Electric Machines	USA	30.04.1887	382,845	
10.	Pyromagneto-Electric Generator	USA	26.05.1887	428,057	
11.	Electro-Magnetic Motor	USA	12.10.1887	381,968	Divisional Application
	Electrical Transmission of Power	USA	12.10.1887	382,280	
	Verbindung der Drahtspulen bei Elektrizitätserzeugern mit denen von Motoren.	Germany	30.04.1888	47885	
	Improvements relating to Electrical Transmission of Power and to Apparatus therefor	Great Britain	01.05.1888	6,481	
	System of Electrical Transmission of Power	Canada	01.05.1888	29537	
	Perfectionnements dans le mode de transmission de la force par l'électricité	France	01.05.1888	190,333	
12.	Electro-Magnetic Motor	USA	30.11.1887	382,279	
	Verbindung der Drahtspulen bei Elektrizitätserzeugern mit denen von Motoren.	Germany	30.04.1888	47885	
	Improvements relating to Electrical Transmission of Power and to Apparatus therefor	Great Britain	01.05.1888	6,481	
	System of Electrical Transmission of Power	Canada	01.05.1888	29537	

	Perfectionnements dans le mode de transmission de la force par l'électricité	France	01.05.1888	190,333	
13.	Electro-Magnetic Motor	USA	30.11.1887	381,969	Divisional Application
	Electrical Transmission of Power	USA	30.11.1887	382,281	
14.	System of Electrical Distribution	USA	23.12.1887	381,970	Divisional Application
	Method of Converting and Distributing Electric Currents	USA	23.12.1887	382,282	
	Schaltung eines Transformators und des zugehörigen Elektrizitätserzeugers	Germany	30.04.1888	47012	
	Improvements relating to the Generation and Distribution of Electric Currents and to Apparatus therefor	Great Britain	01.05.1888	6,502	
	System of Electrical Conversion and Distribution	Canada	01.05.1888	30172	
	Perfectionnements dans les procédés et appareils pour transformer et distribuer les courants électriques	France	01.05.1888	190,332	
15.	System of Electrical Distribution	USA	10.04.1888	390,413	
16.	Dynamo-Electric Machine	USA	23.04.1888	390,414	
17.	Regulator for Alternate-Current Motors	USA	24.04.1888	390,820	
18.	Dynamo-Electric Machine	USA	28.04.1888	390,721	
19.	System of Electrical Transmission of Power	USA	15.05.1888	487,796	
20.	Alternating Motor	USA	15.05.1888	555,190	Divisional Application
	Electrical Transmission of Power	USA	15.05.1888	511,915	
21.	Dynamo-Electric Machine or Motor	USA	15.05.1888	390,415	
22.	Electro-Magnetic Motor	USA	20.10.1888	524,426	
23.	Electrical Transmission of Power	USA	08.12.1888	511,559	
24.	System of Electrical Power Transmission	USA	08.12.1888	511,560	
25.	Electro-Magnetic Motor	USA	08.01.1889	405,858	
26.	Method of Operating Electro-Magnetic Motors	USA	18.02.1889	401,520	
	Perfectionnements dans le mode de fonctionnement des moteurs électromagnétiques à l'aide de courants alternatifs	Belgium	16.04.1889	85866	
	Improvements relating to Electro-motors	Great Britain	16.04.1889	6,527	
	Perfectionnements du mode de fonctionnement des moteurs électromagnétiques à l'aide de courants alternatifs	France	16.04.1889	197,532	

27.	Method of Electrical Power Transmission	USA	14.03.1889	405,859	
	Perfectionnements dans le mode de fonctionnement des moteurs électromagnétiques à l'aide de courants alternatifs	Belgium	16.04.1889	85866	
	Improvements relating to Electro-motors	Great Britain	16.04.1889	6,527	
	Perfectionnements du mode de fonctionnement des moteurs électromagnétiques à l'aide de courants alternatifs	France	16.04.1889	197,532	
28.	Dynamo-Electric Machine	USA	23.03.1889	406,968	
29.	Electro-Magnetic Motor	USA	06.04.1889	459,772	
30.	Electro-Magnetic Motor	USA	20.05.1889	416,191	
	Perfectionnements dans la construction et le mode de fonctionnement des moteurs à courants alternatifs	Belgium	03.10.1889	88702	
	Perfectionnements à la construction et au mode de fonctionnement des moteurs à courants alternatifs	France	03.10.1889	202,373	
	Improvements in Construction and Mode of Operating Alternating Current Motors	Great Britain	03.12.1889	19,426	
31.	Method of Operating Electro-Magnetic Motors	USA	20.05.1889	416,192	
	Perfectionnements dans la construction et le mode de fonctionnement des moteurs à courants alternatifs	Belgium	03.10.1889	88702	
	Perfectionnements à la construction et au mode de fonctionnement des moteurs à courants alternatifs	France	03.10.1889	202,373	
	Improvements in Construction and Mode of Operating Alternating Current Motors	Great Britain	03.12.1889	19,426	
32.	Electro-Magnetic Motor	USA	20.05.1889	416,193	
	Perfectionnements dans la construction et le mode de fonctionnement des moteurs à courants alternatifs	Belgium	03.10.1889	88702	
	Perfectionnements à la construction et au mode de fonctionnement des moteurs à courants alternatifs	France	03.10.1889	202,373	
	Feldmagnetanordnung für Wechselstromkraftmaschine.	Germany	02.12.1889	58774	
	Improvements in Construction and Mode of Operating Alternating Current Motors	Great Britain	03.12.1889	19,426	
33.	Electro-Magnetic Motor	USA	20.05.1889	424,036	
34.	Electro-Magnetic Motor	USA	20.05.1889	445,207	
35.	Electric Motor	USA	20.05.1889	416,194	
36.	Electro-Magnetic Motor	USA	20.05.1889	416,195	
	Perfectionnements dans les moteurs électro-magnétiques à courants alternatifs	Belgium	03.10.1889	88701	

	Perfectionnements aux moteurs électro-magnétiques à courants alternatifs	France	03.10.1889	202,372	
	Wechselstromtreibmaschine mit auf eine in sich geschlossene Ankerwicklung wirkenden Haupt- und Hilfs-Feldmagneten.	Germany	02.12.1889	66802	
	Improvements in Alternating Current Electro-magnetic Motors	Great Britain	03.12.1889	19,420	
37.	Electro-Magnetic Motor	USA	20.05.1889	418,248	
38.	Method of Obtaining Direct From Alternating Currents	USA	12.06.1889	413,353	
	Improvements relating to the Conversion of Alternating into Direct Electric Currents	Great Britain	22.10.1889	16,709	
	Method and Apparatus for Converting Alternating into Direct Current	Canada	19.12.1889	33317	
39.	Armature for Electric Machines	USA	28.06.1889	417,794	
40.	Alternating-Current Electro-Magnetic Motor	USA	26.03.1890	433,700	
41.	Alternating-Current Motor	USA	26.03.1890	433,701	
42.	Electrical Transformer or Induction Device	USA	26.03.1890	433,702	
43.	Electro-Magnetic Motor	USA	04.04.1890	433,703	
44.	Method of Operating Arc Lamps	USA	01.10.1890	447,920	
45.	Alternating-Electric-Current Generator	USA	15.11.1890	447,921	
46.	Electro-Magnetic Motor	USA	27.01.1891	455,067	
	Improvements in Alternating Current Electro-magnetic Motors	Great Britain	06.07.1891	11,473	
	Perfectionnements dans les moteurs électromagnétiques à courants alternatifs	France	07.07.1891	214,718	
47.	Method of and Apparatus for Electrical Conversion and Distribution	USA	04.02.1891	462,418	
48.	Electrical Meter	USA	27.03.1891	455,068	
49.	System of Electric Lightning	USA	26.04.1891	454,622	
	Procédé et appareil perfectionnés pour produire de la force électrique et l'utiliser pour l'éclairage	Belgium	19.05.1891	94040	
	Improved Methods of and Apparatus for Generating and Utilizing Electric Energy for Lighting Purposes	Great Britain	19.05.1891	8,575	
	Verfahren zur Erzeugung elektrischen Lichtes	Germany	19.05.1891	73080	
	Procédé et appareil perfectionnés pour produire de la force électrique et l'utiliser pour l'éclairage	France	19.05.1891	213.556	
50.	Electric Incandescent Lamp	USA	14.05.1891	455,069	

	Procédé et appareil perfectionnés pour produire de la force électrique et l'utiliser pour l'éclairage	Belgium	19.05.1891	94040	
	Improved Methods of and Apparatus for Generating and Utilizing Electric Energy for Lighting Purposes	Great Britain	19.05.1891	8,575	
	Procédé et appareil perfectionnés pour produire de la force électrique et l'utiliser pour l'éclairage	France	19.05.1891	213,556	
51.	Electro-Magnetic Motor	USA	13.07.1891	464,666	
52.	Electrical Condenser	USA	01.08.1891	464,667	
53.	Incandescent Electric Light	USA	02.01.1892	514,170	
54.	Electrical Conductor	USA	02.01.1892	514,167	
55.	Electric Railway Systems	USA	02.01.1892	514,972	
56.	Coil for Electro-Magnets	USA	07.07.1893	512,340	
57.	Means for Generating Electric Currents	USA	02.08.1893	514,168	
58.	Electric Generator	USA	19.08.1893	511,916	
	Vorrichtung zur Erzeugung elektrischer Ströme von gleichbleibender Schwingungszahl	Germany	28.08.1893	87269	
	Improvements in Methods of and Apparatus for the Generation of Electric Currents of Defined Period	Great Britain	08.02.1894	2,812	
	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	Belgium	17.02.1894	108595	
	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	France	17.02.1894	236,357	
	Perfectionnements dans les moyens et appareils propres à produire des courants électriques de période déterminée	Italy	02.03.1894	35837 (54661) (66601)	
59.	Reciprocating Engine	USA	19.08.1893	514,169	
	Durch Dampf oder Druckluft betriebenes, geradlinig schwingendes Pendel	Germany	28.08.1893	84335	
	Improvements in Reciprocating Engines and Means for Regulating the Period of the same	Great Britain	08.02.1894	2,801	
	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	Belgium	17.02.1894	108594	
	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	France	17.02.1894	236,356	
	Perfectionnements dans les machines à mouvement de va-et-vient et dans mécanismes ou dispositifs destinés à en régler la période	Italy	02.03.1894	35836 (54660) (66600)	
60.	Electrical Meter	USA	15.12.1893	514,973	
61.	Steam Engine	USA	29.12.1893	517,900	

62.	Apparatus for Producing Electric Currents of High Frequency and Potential	USA	22.04.1896	568,176	
	Einrichtung zur Erzielung von Strömen hoher Frequenz aus Gleichströmen durch Kondensatorentladungen	Germany	21.09.1896	99173	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Belgium	22.09.1896	123665	
	Improvements Relating to the Production, Regulation and Utilization of Electric Currents of High Frequency and to Apparatus therefor	Great Britain	22.09.1896	20,981	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Italy	22.09.1896	42615 (65173)	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	France	22.09.1896	259,940	
	An improved method of and apparatus for producing and regulating electric currents of high frequency	Victoria	15.10.1896	13596	
	Improvements in Methods of and Apparatus for Producing, Regulating and Utilizing Electric Currents of High Frequency	New South Wales	16.10.1896	6972	
63.	Apparatus for Producing Ozone	USA	17.06.1896	568,177	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Belgium	22.09.1896	123665	
	Improvements Relating to the Production, Regulation and Utilization of Electric Currents of High Frequency and to Apparatus therefor	Great Britain	22.09.1896	20,981	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Italy	22.09.1896	42615 (65173)	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	France	22.09.1896	259,940	
	An improved method of and apparatus for producing and regulating electric currents of high frequency	Victoria	15.10.1896	13596	
	Improvements in Methods of and Apparatus for Producing, Regulating and Utilizing Electric Currents of High Frequency	New South Wales	16.10.1896	6972	

64.	Electrical Condenser	USA	17.06.1896	567,818	
65.	Method of Regulating Apparatus for Producing Currents of High Frequency	USA	20.06.1896	568,178	
	Einrichtung zur Erzielung von Strömen hoher Frequenz aus Gleichströmen durch Kondensatorentladungen	Germany	21.09.1896	99173	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Belgium	22.09.1896	123665	
	Improvements Relating to the Production, Regulation and Utilization of Electric Currents of High Frequency and to Apparatus therefor	Great Britain	22.09.1896	20,981	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Italy	22.09.1896	42615 (65173)	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	France	22.09.1896	259,940	
	An improved method of and apparatus for producing and regulating electric currents of high frequency	Victoria	15.10.1896	13596	
	Improvements in Methods of and Apparatus for Producing, Regulating and Utilizing Electric Currents of High Frequency	New South Wales	16.10.1896	6972	
66.	Method of and Apparatus for Producing Currents of High Frequency	USA	06.07.1896	568,179	
	Stromkreisregler für die Umwandlung von Strömen geringer Wechselzahl in solche von hoher Wechselzahl mittels Kondensatorentladungen	Germany	21.09.1896	93255	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Belgium	22.09.1896	123665	
	Improvements Relating to the Production, Regulation and Utilization of Electric Currents of High Frequency and to Apparatus therefor	Great Britain	22.09.1896	20,981	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Italy	22.09.1896	42615 (65173)	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	France	22.09.1896	259,940	

	An improved method of and apparatus for producing and regulating electric currents of high frequency	Victoria	15.10.1896	13596	
	Improvements in Methods of and Apparatus for Producing, Regulating and Utilizing Electric Currents of High Frequency	New South Wales	16.10.1896	6972	
67.	Apparatus for Producing Electrical Currents of High Frequency	USA	09.07.1896	568,180	
	Stromkreisregler für die Umwandlung von Strömen geringer Wechselzahl in solche von hoher Wechselzahl mittels Kondensatorentladungen	Germany	21.09.1896	93255	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Belgium	22.09.1896	123665	
	Improvements Relating to the Production, Regulation and Utilization of Electric Currents of High Frequency and to Apparatus therefor	Great Britain	22.09.1896	20,981	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	Italy	22.09.1896	42615 (65173)	
	Perfectionnements relatifs à la production, au réglage et à l'utilisation des courants électriques de grande fréquence et aux appareils employés à cet effet	France	22.09.1896	259,940	
	An improved method of and apparatus for producing and regulating electric currents of high frequency	Victoria	15.10.1896	13596	
	Improvements in Methods of and Apparatus for Producing, Regulating and Utilizing Electric Currents of High Frequency	New South Wales	16.10.1896	6972	
68.	Apparatus for Producing Electric Currents of High Frequency	USA	03.09.1896	577,670	
69.	Apparatus for Producing Currents of High Frequency	USA	19.10.1896	583,953	
70.	Manufacture of Electrical Condensers, Coils Etc.	USA	05.11.1896	577,671	
71.	Electrical Igniter for Gas-Engines	USA	17.02.1897	609,250	
72.	Electrical Transformer	USA	20.03.1897	593,138	
73.	Electric-Circuit Controller	USA	03.06.1897	609,251	
74.	System of Transmission of Electrical Energy	USA	02.09.1897	645,576	
	Apparatus for Transmission of Electrical Energy	USA	02.09.1897	649,621	Divisional Application

	Трансформаторъ, служаго для передачи электрическихъ токовъ очень высокаго напряженія черезъ верхніе разряженные слои атмосферы	Russia	18.10.1897	4656	
	Improvements in Systems for the Transmission of Electrical Energy and Apparatus for Use therein	Great Britain	21.10.1897	24,421	
	Perfectionnements dans les systèmes de transmission de l'énergie électrique et dans les appareils employés à cet effet	Belgium	26.10.1897	131524	
	Installation pour la transmission d'énergie électrique	Switzerland	26.10.1897	15542	
	Eljárás és berendezés elektromos energia átvitelére	Hungary	27.10.1897	11230	
	Perfectionnements dans les systèmes de transmission de l'énergie électrique et dans les appareils employés à cet effet	France	29.10.1897	271,641	
	Improvements in methods and systems for the transmission of electrical energy and apparatus for use therein	Victoria	25.11.1897	14798	
	Improvements in systems for the transmission of electrical energy and apparatus for use therein	New South Wales	26.11.1897	8019	
	Perfezionamenti nei sistemi di trasmissione dell'energia elettrica e relativi apparecchi	Italy	28.02.1898	47334	
75.	Electrical-Circuit Controller	USA	02.12.1897	609,245	
	Improvements in Electrical Circuit Controllers	Great Britain	08.06.1898	12,866	
	Perfezionamenti nei regolatori del circuito elettrico	Italy	18.06.1898	48461	
	Stromunterbrecher mit flüssigem Leiter	Germany	18.06.1898	109865	
	Berendezés áramköröknek gyors egymasutánbáb való megszakítására és zárására	Hungary	27.06.1898	15067	
	Perfectionnements aux contrôleurs de circuits électriques	France	01.07.1898	279,362	
	Perfectionnements aux contrôleurs de circuits électriques	Belgium	04.07.1898	136606	
76.	Electrical-Circuit Controller	USA	10.12.1897	611,719	
	Improvements in Electrical Circuit Controllers	Great Britain	08.06.1898	12,866	
	Perfezionamenti nei regolatori del circuito elettrico	Italy	18.06.1898	48461	
	Stromunterbrecher mit flüssigem Leiter	Germany	18.06.1898	110049	
	Berendezés áramköröknek gyors egymasutánbáb való megszakítására és zárására	Hungary	27.06.1898	15067	
	Perfectionnements aux contrôleurs de circuits électriques	France	01.07.1898	279,362	
	Perfectionnements aux contrôleurs de circuits électriques	Belgium	04.07.1898	136606	

77.	Electrical-Circuit Controller	USA	28.02.1898	609,246	
	Improvements in Electrical Circuit Controllers	Great Britain	08.06.1898	12,866	
	Perfezionamenti nei regolatori del circuito elettrico	Italy	18.06.1898	48461	
	Stromunterbrecher mit flüssigem Leiter	Germany	18.06.1898	109865	
	Berendezés áramköröknek gyors egymásutánban való megszakítására és zárására	Hungary	27.06.1898	15067	
	Perfectionnements aux contrôleurs de circuits électriques	France	01.07.1898	279,362	
	Perfectionnements aux contrôleurs de circuits électriques	Belgium	04.07.1898	136606	
78.	Electric-Circuit Controller	USA	12.03.1898	609,247	
	Improvements in Electrical Circuit Controllers	Great Britain	08.06.1898	12,866	
	Perfezionamenti nei regolatori del circuito elettrico	Italy	18.06.1898	48461	
	Stromunterbrecher mit flüssigem Leiter	Germany	18.06.1898	109865	
	Berendezés áramköröknek gyors egymásutánban való megszakítására és zárására	Hungary	27.06.1898	15067	
	Perfectionnements aux contrôleurs de circuits électriques	France	01.07.1898	279,362	
	Perfectionnements aux contrôleurs de circuits électriques	Belgium	04.07.1898	136606	
79.	Electric-Circuit Controller	USA	12.03.1898	609,248	
	Improvements in Electrical Circuit Controllers	Great Britain	08.06.1898	12,866	
	Perfezionamenti nei regolatori del circuito elettrico	Italy	18.06.1898	48461	
	Stromunterbrecher mit flüssigem Leiter	Germany	18.06.1898	109865	
	Berendezés áramköröknek gyors egymásutánban való megszakítására és zárására	Hungary	27.06.1898	15067	
	Perfectionnements aux contrôleurs de circuits électriques	France	01.07.1898	279,362	
	Perfectionnements aux contrôleurs de circuits électriques	Belgium	04.07.1898	136606	
80.	Electric-Circuit Controller	USA	12.03.1898	609,249	
	Improvements in Electrical Circuit Controllers	Great Britain	08.06.1898	12,866	
	Perfezionamenti nei regolatori del circuito elettrico	Italy	18.06.1898	48461	
	Stromunterbrecher mit flüssigem Leiter	Germany	18.06.1898	109865	
	Berendezés áramköröknek gyors egymásutánban való megszakítására és zárására	Hungary	27.06.1898	15067	
	Perfectionnements aux contrôleurs de circuits électriques	France	01.07.1898	279,362	
	Perfectionnements aux contrôleurs de circuits électriques				

	Perfectionnements aux contrôleurs de circuits électriques	Belgium	04.07.1898	136606	
81.	Electric-Circuit Controller	USA	19.04.1898	613,735	
	Improvements in Electrical Circuit Controllers	Great Britain	08.06.1898	12,866	
	Perfezionamenti nei regolatori del circuito elettrico	Italy	18.06.1898	48461	
	Stromunterbrecher mit flüssigem Leiter	Germany	18.06.1898	109865	
	Stromunterbrecher mit flüssigem Leiter	Germany	18.06.1898	110050	
	Berendezés áramköröknek gyors egymásutánban való megszakítására és zárására	Hungary	27.06.1898	15067	
	Perfectionnements aux contrôleurs de circuits électriques	France	01.07.1898	279,362	
	Perfectionnements aux contrôleurs de circuits électriques	Belgium	04.07.1898	136606	
82.	Method of and Apparatus for Controlling the Mechanism of Moving Vessels or Vehicles	USA	01.07.1898	613,809	
	Приспособления для управления действием пловучих судов или иных движущихся помпей при помощи электрических волн	Russia	26.10.1898	10188	
	Eljárás és berendezés járműveknek távolról való hajtására és kormányzására	Hungary	07.11.1898	24842	
	Vorrichtung zur Fernsteuerung von Wasserfahrzeugen mittels elektrischer Wellen	Germany	07.11.1898	142842	
	Improvements in the Method of and Apparatus for Controlling the Mechanism of Floating Vessels or Moving Vehicles	Great Britain	13.12.1898	26,371	
	Perfectionnements dans le procédé et les appareils de réglage pour les mécanismes des bâtiments flottants ou des véhicules en marche	France	24.12.1898	284,352	
	Perfectionnements dans le procédé et les appareils de réglage pour les mécanismes des bâtiments flottants ou des véhicules en marche	Italy	17.01.1899	50371	
	Installation pour commander la marche des machines d'un véhicule automobile d'un point éloigné du véhicule	Switzerland	20.01.1899	18652	
	Perfectionnements dans le procédé et les appareils de réglage pour les mécanismes des bâtiments flottants ou des véhicules en marche	Belgium	30.01.1899	140489	
	Mejoras en el sistema de gobierno del mecanismo de recipientes ó barcos flotantes ó vehiculos móviles por medio de los aparatos que se describen	Spain	31.01.1899	23742	
	Methodo e apparetho para mecanismos de regular navios ou vehiculos em movimento	Brasil	14.08.1899	2882	

83.	Method of Intensifying and Utilizing Effects Transmitted through Natural Media	USA	24.06.1899	685,953	Divisional Application
	Apparatus for Utilizing Effects Transmitted From a Distance to a Receiving Device through Natural Media	USA	24.06.1899	685,955	
	Improvements Relating to the Utilization of Electromagnetic, Light or other like Radiations Effects or Disturbances Transmitted through the Natural Media and to Apparatus therefor	Great Britain	01.06.1901	11,293	
	Perfectionnements à l'utilisation des variations ou chargements d'état électriques ou d'ordres vibratoires similaires transmis à travers les milieux naturels, et appareils pour leur mise à exécution	France	10.06.1901	311,629	
	Verfahren und Vorrichtung zur Nutzbarmachung von aus der Ferne durch den Äther oder die Erde oder beide gesandten elektrischen Impulsen oder Schwingungen	Germany	19.06.1901	139464	
84.	Method of Utilizing Effects Transmitted through the Natural Media	USA	01.08.1899	685,954	Divisional Application
	Apparatus for Utilizing Effects Transmitted through Natural Media	USA	01.08.1899	685,956	
	Improvements Relating to the Utilization of Electromagnetic, Light or other like Radiations Effects or Disturbances Transmitted through the Natural Media and to Apparatus therefor	Great Britain	01.06.1901	11,293	
	Perfectionnements à l'utilisation des variations ou chargements d'état électriques ou d'ordres vibratoires similaires transmis à travers les milieux naturels, et appareils pour leur mise à exécution	France	10.06.1901	311,629	
	Verfahren und Vorrichtung zur Nutzbarmachung von aus der Ferne durch den Äther oder die Erde oder beide gesandten Impulsen oder Schwingungen	Germany	19.06.1901	139465	
85.	Means for Increasing the Intensity of Electrical Oscillations	USA	21.03.1900	685,012	
	Improvements in, and relating to, the Transmission of Electrical Energy	Great Britain	03.07.1901	13,563	
	Verfahren zur Erzeugung elektrischer Schwingungen	Germany	09.07.1901	136841	
	Einrichtung zur Übertragung elektrischer Energie	Austria	11.07.1901	13115	
	Újítás az elektromos energia távközlésére szolgáló eljárás és berendezésén	Hungary	13.07.1901	24076	
	Perfectionnement à la transmission de l'énergie électrique	Belgium	17.07.1901	157668	
	Perfectionnements à la transmission de l'énergie électrique	France	17.07.1901	312,783	

86.	Art of Transmitting Electrical Energy through the Natural Mediums	USA	16.05.1900	787,412	
	Improvements relating to the Transmission of Electrical Energy	Great Britain	17.04.1905	8,200	
	Perfectionnement à la transmission de l'énergie électrique	Italy	18.04.1905	76685	
	Perfectionnements à la transmission de l'énergie électrique	France	18.08.1905	354,791	
	Art of Transmitting Electrical Energy through the Natural Mediums	Canada	17.04.1906	142352	
87.	Method of Insulating Electric Conductors	USA	15.06.1900	655,838	Reissued Patent
	Способъ приданія изолирующихъ свойствъ матеріалу, окружающему электрический проводъ или прилежащему къ нему	Russia	01.08.1900	7692	
	Verfahren zur Isolierung elektrischer Leiter	Austria	14.08.1900	9098	
	Perfectionnements à l'isolement des conducteurs électriques	Belgium	14.08.1900	151563	
	Improvements Relating to the Insulation of Electric Conductors	Great Britain	14.08.1900	14,550	
	Fremgangsmaade til ved Hjaelp af Afkøling at isolere elektriske Ledninger	Danmark	14.08.1900	4094	
	Perfectionnements à l'isolement des conducteurs électriques	Italy	14.08.1900	56676	
	Eljárás elektromos vezetékek szigetelésére	Hungary	14.08.1900	20897	
	Isolation af elektriske ledere	Norway	14.08.1900	9847	
	Method of Insulating Electric Conductors	USA	14.08.1900	11,865	
	Perfectionnements à l'isolement des conducteurs électriques	France	14.08.1900	303,025	
	Installation d'isolation de conducteurs électriques	Switzerland	14.08.1900	22213	
	Sätt att isolera elektriska konduktorer	Sweden	14.08.1900	12969	
	Mejoras en el aislamiento de conductores eléctricos	Spain	14.08.1900	26430	
	Perfectionnements à l'isolement des conducteurs électriques	Italy	18.10.1900	57312	Patent of Addition
	Mejoras en el aislamiento de conductores eléctricos	Spain	06.11.1900	26801	Patent of Addition
88.	System of Signaling	USA	16.07.1900	725,605	Divisional Application
	Method of Signaling	USA	16.07.1900	723,188	
	Способъ передачи электрической энергии безъ проводовъ	Russia	16.07.1901	11535	
	Improvements in, and relating to, the Transmission of Electrical Energy	Great Britain	17.07.1901	14,579	
	Verfahren und Vorrichtung zur sicheren Übertragung einer Nachricht auf einem bestimmten Empfänger mittels elektrischer Impulse oder Schwingungen verschiedener Beschaffenheit	Germany	22.07.1901	143453	

	Újítások villamos energia távközlésében	Hungary	23.07.1901	25869	
	Einrichtung zur Übertragung elektrischer Energie	Austria	26.07.1901	16480	
	Perfectionnements à la transmission de l'énergie électrique	France	02.08.1901	313,188	
	Perfectionnements à la transmission de l'énergie électrique	Belgium	08.08.1901	158088	
	Perfectionnements à la transmission de l'énergie électrique	Italy	08.08.1901	60679	
89.	Apparatus for Utilization of Radiant Energy	USA	21.03.1901	685,957	
	Improvements Relating to the Utilization of Electromagnetic, Light or other like Radiations Effects or Disturbances Transmitted through the Natural Media and to Apparatus therefor	Great Britain	01.06.1901	11,293	
	Perfectionnements à l'utilisation des variations ou chargements d'état électriques ou d'ordres vibratoires similaires transmis à travers les milieux naturels, et appareils pour leur mise à exécution	France	10.06.1901	311,629	
90.	Method of Utilizing Radiant Energy	USA	21.03.1901	685,958	
	Improvements Relating to the Utilization of Electromagnetic, Light or other like Radiations Effects or Disturbances Transmitted through the Natural Media and to Apparatus therefor	Great Britain	01.06.1901	11,293	
	Perfectionnements à l'utilisation des variations ou chargements d'état électriques ou d'ordres vibratoires similaires transmis à travers les milieux naturels, et appareils pour leur mise à exécution	France	10.06.1901	311,629	
	Verfahren zur Nutzbarmachung von aus der ferne durch den Aether gesandten Einwirkungen	Germany	19.06.1901	139466	
91.	Apparatus for Transmitting Electrical Energy	USA	18.01.1902	1,119,732	
92.	Fluid Propulsion	USA	21.10.1909	1,061,142	Divisional Application
	Turbine	USA	21.10.1909	1,061,206	
	Improved Method of Imparting Energy to or Deriving Energy from a Fluid and Apparatus for use therein	Great Britain	17.10.1910	24,001	
	Procédé et appareils pour la production et l'utilisation de la force motrice au moyen de fluides	France	17.10.1910	421,543	
	Una maquina que puede ser empleada como bomba, turbina ó compresora	Mexico	18.10.1910	11079	
	Perfectionnements concernant la propulsion fluide	Belgium	19.10.1910	229701	
	Perfezionamenti nella propulsione a fluido	Italy	20.10.1910	112767	
	Eljárás és gép energiának folyadékra való átvitelére és azokról való levételére	Hungary	20.10.1910	54937	

	Kraftmaschine oder Pumpe mit mehreren, in einem geschlossenen Gehäuse auf einer Zentralwelle in Abständen voneinander angeordneten, parallelen, kreisenden Scheiben	Austria	21.10.1910	60332	
	Mejoras introducidas en los motores, actuados por fluido	Spain	21.10.1910	49122	
	Machine rotative pouvant travailler comme pompe, ventilateur, moteur, etc.	Switzerland	15.11.1910	54375	
	Fluid Propulsion	Canada	22/24.11. 1910	135174	
	Rotationsmaskin	Sweden	23.11.1910	38545	
	Fremgangsmaate og apparat til utvikling og overføring av energi ved hjelp av væske - eller gasformige drivmedier	Norway	25.11.1910	22689	
	Mejoras en medios de propulsión por fluido	Cuba	30.11.1910	1433	
	Improvements in Fluid Propulsion	Transvaal	02.12.1910	593	
	Improvements in fluid propulsion	India	08.12.1910	640	
	Improvements in fluid propulsion	New Zealand	08.12.1910	28853	
	Improvement in Fluid Propulsion and Fluid Propelled Mechanism	Australia	15.12.1910	20,211	
	Improvements in fluid propulsion	Rhodesia	15.12.1910	651	
	Mejoras en medios de propulsión por fluido	Argentina	15.03.1912	9.089	
	Fluid Propulsion	Japan	26.03.1912	21883	
93.	Fountain	USA	28.10.1913	1,113,716	
	Perfectionnements aux fontaines	France	11.05.1920	515,388	
	Perfectionnements aux fontaines	Belgium	22.05.1920	286983	
94.	Speed-Indicator	USA	29.05.1914	1,209,359	
95.	Valvular Conduit	USA	21.02.1916	1,329,559	
	Conduit faisant fonction de valve	Belgium	03.09.1921	298512	
	Conduite faisant fonction de valve	France	03.09.1921	540,616	
96.	Lightning Protector	USA	06.05.1916	1,266,175	
	Perfectionnements aux paratonnerres	Belgium	03.09.1921	298511	
	Perfectionnements aux paratonnerres	France	03.09.1921	540,617	
97.	Flow Meter	USA	18.12.1916	1,365,547	
98.	Frequency Meter	USA	18.12.1916	1,402,025	
99.	Ship's Log	USA	18.12.1916	1,314,718	
100.	Speed-Indicator	USA	18.12.1916	1,274,816	
101.	Improved Process of and Apparatus for Production of High Vacua	Great Britain	24.03.1921	179,043	
	Procédé et appareil pour la production d'un vide élevé	Belgium	23.03.1922	302318	
	Procédé et appareil pour la production d'un élevé	France	23.03.1922	549,261	
102.	Improvements in the Construction of Steam and Gas Turbines	Great Britain	24.03.1921	186,082	

	Perfectionnements aux turbines actionées par la vapeur ou des gaz	Belgium	23.03.1922	302317	
	Perfectionnements aux turbines actionées par la vapeur ou des gaz	France	15.09.1921	541,112	
103.	Improved Method of and Apparatus for the Economic Transformation of the Energy of Steam by Turbines	Great Britain	24.03.1921	186,083	
	Procédé et appareil pour économique de l'énergie de la vapeur au moyen de turbines	Belgium	23.03.1922	302320	
	Procédé et appareil pour économique de l'énergie de la vapeur au moyen de turbines	France	23.03.1922	549,259	
104.	Improved Method of and Apparatus for Deriving Motive Power from Steam	Great Britain	24.03.1921	186,084	
	Procédé et appareil pour l'utilisation de la vapeur comme force motrice	Belgium	23.03.1922	302319	
	Procédé et appareil pour l'utilisation de la vapeur comme force motrice	France	23.03.1922	549,260	
105.	Improvements in Methods of and Apparatus for the Generation of Power by Elastic Fluid Turbines	Great Britain	01.04.1921	174,544	
	Perfectionnements aux procédés et machines pour obtention de force motrice par les turbines à fluides élastiques	France	30.03.1922	549,516	
	Perfectionnements aux procédés et machines pour obtention de force motrice par les turbines à fluides élastiques	Belgium	31.03.1922	302321	
	Fremgangsmaade og Apparat til Omdannelse af Varmeennergi til mekanisk Energi	Denmark	31.03.1922	31737	
	Perfectionnements aux procédé et machines pour obtention de force motrice par les turbines à fluides élastiques	Italy	31.03.1922	208594	
	Anordning vid turbinaggregat med anordning för backgang	Sweden	31.03.1922	60428	
	Un procedimiento, con su aparato correspondiente para la obtención de fuerza motriz por medio de turbinas de fluidos elásticos	Spain	31.03.1922	81244	
	Fremgangsmaade og apparat til frembringelse av mekanisk ved hjælp av turbiner for elastisk fluidum	Norway	01.04.1922	38426	
106.	Method of and Apparatus for Aerial Transportation	Great Britain	04.04.1921	185,446	
	Method of Aerial Transportation	USA	09.09.1921	1,655,113	
	Procédé et appareil pour la production d'un vide élève	Belgium	23.03.1922	302318	
	Procédé et appareil pour transports aériens	France	01.04.1922	549,628	
	Flyvemaskine	Denmark	03.04.1922	31663	

	Un método, con su aparato correspondiente para transportes aéreos Apparatus for Aerial Transportation	Spain	03.04.1922	81253	Continuation in the Part
		USA	04.10.1927	1,655,114	
107.	Process of, and Apparatus for Balancing Rotating Machine Parts	Great Britain	02.09.1921	186,799	
	Procédé et appareil pour équilibrer les pièces tournantes des machines	France	15.09.1921	541,113	
	Sätt och apparat för att utbalansera roterande maskindelar	Sweden	01.09.1922	60297	
	Procédé et appareil pour équilibrer les pièces tournantes des machines	Belgium	02.09.1922	305851	

The following table contains systematized information about each of the patent families listed in the previous table. For each patent family is given: first, the name of the invention or inventions protected by the original patents, followed by the number of original patents in each patent family, the total number of patent family members including original patents and analogues, and finally, the number of inventions protected by original patents.

The number of inventions protected by original patents was determined as follows: the total number of original patents within a patent family was established first, and then it was analyzed whether unity of invention exists in any of the original patents, and/or whether any of the original patents protected multiple inventions.

Analysis of Patent Families of Nikola Tesla's Patents

No.	Patent Family - Names of Invention(s) Protected by Original Patents	Number of Original Patents in the Patent Family	Total Number of Members of the Patent Family	Total Number of Inventions Protected by Original Patents
1.	Electric-Arc Lamp	1	1	1
2.	Commutator for Dynamo-Electric Machines	1	1	1
3.	Regulator for Dynamo-Electric Machines	1	3	1
4.	Regulator for Dynamo-Electric Machines	1	3	1
5.	Electric-Arc Lamp	1	2	1
6.	Dynamo-Electric Machine	1	1	1
7.	Regulator for Dynamo-Electric Machines	1	1	1
8.	Thermo-Magnetic Motor	1	1	1
9.	Commutator for Dynamo-Electric Machines	1	1	1
10.	Pyromagneto-Electric Generator	1	1	1
11.	Electro-Magnetic Motor Electrical Transmission of Power	2	6	2
12.	Electro-Magnetic Motor	1	5	1
13.	Electro-Magnetic Motor Electrical Transmission of Power	2	2	2
14.	System of Electrical Distribution Method of Converting and Distributing Electric Currents	2	6	2

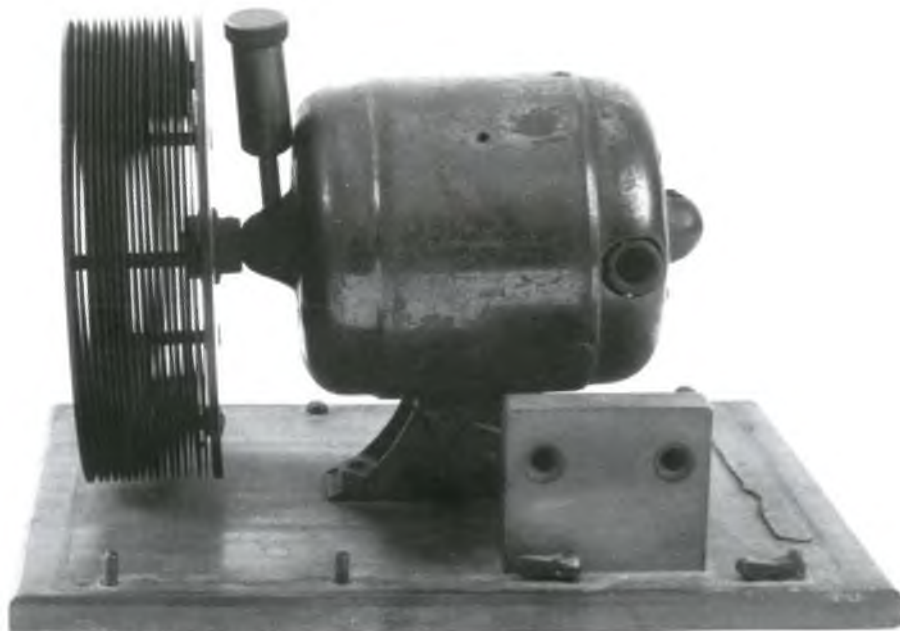
15.	System of Electrical Distribution	1	1	1
16.	Dynamo-Electric Machine	1	1	1
17.	Regulator for Alternate-Current Motors	1	1	1
18.	Dynamo-Electric Machine	1	1	1
19.	System of Electrical Transmission of Power	1	1	1
20.	Alternating Motor Electrical Transmission of Power	2	2	2
21.	Dynamo-Electric Machine or Motor	1	1	1
22.	Electro-Magnetic Motor	1	1	1
23.	Electrical Transmission of Power	1	1	1
24.	System of Electrical Power Transmission	1	1	1
25.	Electro-Magnetic Motor	1	1	1
26.	Method of Operating Electro-Magnetic Motors	1	4	1
27.	Method of Electrical Power Transmission	1	4	1
28.	Dynamo-Electric Machine	1	1	1
29.	Electro-Magnetic Motor	1	1	1
30.	Electro-Magnetic Motor	1	4	1
31.	Method of Operating Electro-Magnetic Motors	1	4	1
32.	Electro-Magnetic Motor	1	5	1
33.	Electro-Magnetic Motor	1	1	1
34.	Electro-Magnetic Motor	1	1	1
35.	Electric Motor	1	1	1
36.	Electro-Magnetic Motor	1	5	1
37.	Electro-Magnetic Motor	1	1	1
38.	Method of Obtaining Direct From Alternating Currents	1	3	1
39.	Armature for Electric Machines	1	1	1
40.	Alternating-Current Electro-Magnetic Motor	1	1	1
41.	Alternating-Current Motor	1	1	1
42.	Electrical Transformer or Induction Device	1	1	1
43.	Electro-Magnetic Motor	1	1	1
44.	Method of Operating Arc Lamps	1	1	1
45.	Alternating-Electric-Current Generator	1	1	1
46.	Electro-Magnetic Motor	1	3	1
47.	Method of and Apparatus for Electrical Conversion and Distribution	1	1	2
48.	Electrical Meter	1	1	1
49.	System of Electric Lightning	1	5	1
50.	Electric Incandescent Lamp	1	4	1
51.	Electro-Magnetic Motor	1	1	1
52.	Electrical Condenser	1	1	1
53.	Incandescent Electric Light	1	1	1
54.	Electrical Conductor	1	1	1
55.	Electric Railway Systems	1	1	1
56.	Coil for Electro-Magnets	1	1	1
57.	Means for Generating Electric Currents	1	1	1
58.	Electric Generator	1	6	1
59.	Reciprocating Engine	1	6	1
60.	Electrical Meter	1	1	1

61.	Steam Engine	1	1	1
62.	Apparatus for Producing Electric Currents of High Frequency and Potential	1	8	1
63.	Apparatus for Producing Ozone	1	7	1
64.	Electrical Condenser	1	1	1
65.	Method of Regulating Apparatus for Producing Currents of High Frequency	1	8	1
66.	Method of and Apparatus for Producing Currents of High Frequency	1	8	2
67.	Apparatus for Producing Electrical Currents of High Frequency	1	8	1
68.	Apparatus for Producing Electric Currents of High Frequency	1	1	1
69.	Apparatus for Producing Currents of High Frequency	1	1	1
70.	Manufacture of Electrical Condensers, Coils Etc.	1	1	1
71.	Electrical Igniter for Gas-Engines	1	1	1
72.	Electrical Transformer	1	1	1
73.	Electric-Circuit Controller	1	1	1
74.	System of Transmission of Electrical Energy Apparatus for Transmission of Electrical Energy	2	11	2
75.	Electric-Circuit Controller	1	7	1
76.	Electric-Circuit Controller	1	7	1
77.	Electric-Circuit Controller	1	7	1
78.	Electric-Circuit Controller	1	7	1
79.	Electric-Circuit Controller	1	7	1
80.	Electric-Circuit Controller	1	7	1
81.	Electric-Circuit Controller	1	8	1
82.	Method of and Apparatus for Controlling the Mechanism of Moving Vessels or Vehicles	1	11	2
83.	Method of Intensifying and Utilizing Effects Transmitted through Natural Media Apparatus for Utilizing Effects Transmitted From a Distance to a Receiving Device through Natural Media	2	5	2
84.	Method of Utilizing Effects Transmitted through the Natural Media Apparatus for Utilizing Effects Transmitted through Natural Media	2	5	2
85.	Means for Increasing the Intensity of Electrical Oscillations	1	7	1
86.	Art of Transmitting Electrical Energy through Natural Mediums	1	5	1
87.	Method of Insulating Electric Conductors	1	16	1
88.	System of Signaling Method of Signaling	2	10	2
89.	Apparatus for Utilization of Radiant Energy	1	3	1
90.	Method of Utilizing Radiant Energy	1	4	1
91.	Apparatus for Transmitting Electrical Energy	1	1	1
92.	Fluid Propulsion Turbine	2	22	2
93.	Fountain	1	3	1
94.	Speed-Indicator	1	1	1
95.	Valvular Conduit	1	3	1
96.	Lightning Protector	1	3	1
97.	Flow Meter	1	1	1
98.	Frequency Meter	1	1	1
99.	Ship's Log	1	1	1
100.	Speed-Indicator	1	1	1
101.	Improved Process of and Apparatus for Production of High Vacuum	1	3	2

102.	Improvements in the Construction of Steam and Gas Turbines	1	3	1
103.	Improved Method of and Apparatus for the Economic Transformation of the Energy of Steam by Turbines	1	3	2
104.	Improved Method of and Apparatus for Deriving Motive Power from Steam	1	3	2
105.	Improvements in Methods of and Apparatus for the Generation of Power by Elastic Fluid Turbines	1	8	2
106.	Method of and Apparatus for Aerial Transportation	1	7	2
107.	Process of, and Apparatus for Balancing Rotating Machine Parts	1	4	2

The analysis of the presented data established that Nikola Tesla had 116 original patents, out of which 109 were U.S. patents, and seven were British. These 116 patents protected a total of 125 different Tesla's inventions.

The inventions that Tesla protected in the largest number of countries are his pump and turbine (U.S. patent Nos. 1,061,142 and 1,061,206). Tesla received a total of 22 patents in 21 different countries for these inventions.



The invention with the second highest number of granted patents is for the Methods of Insulating Electric Conductors (U.S. patent No. 655,838, which was reissued under No. 11,865) and for which he received 16 patents in 13 different countries.

Tesla received 11 patents for the Method of and Apparatus for Controlling the Mechanism of Moving Vessels or Vehicles (U.S. patent No. 613,809) in 11 different countries. Also, he obtained 11 patents for the System of Transmission of Electrical Energy and the Apparatus for Transmission of Electrical Energy (U.S. patent Nos. 645,576 and 649,621) in 10 different countries.

For the System of Signaling and the Method of Signaling (U.S. patents No. 725,605 and 723,188), Tesla obtained 10 patents in 9 different countries.

From the tables above, it can be determined that there are 107 patent families of Tesla's patents, while the number of members of individual patent families ranges from one, which is the case when the original patent has no analogue, to 22 patents. More information about the sizes of the individual patent families is displayed in the table below, which contains the number of patent family members, and the number of patent families with that number of members.



Sizes of Patent families of Nikola Tesla's Patents

No.	Members of Patent Family - Total	Number of Patent Families Having that Number of Members
1.	1	54
2.	2	3
3.	3	12
4.	4	7
5.	5	7
6.	6	4
7.	7	9
8.	8	6
9.	10	1
10.	11	2
11.	16	1
12.	22	1

The average number of members per patent family of Tesla's patents is 2.67. This means that one original patent was on the average accompanied by more than one analogue in other countries.

On the other hand, 54 of Tesla's original patents do not have analogues in other countries, and it should be noted that all of them are U.S. patents.

The systematization of the data presented above yielded the following list of Nikola Tesla's original patents, and, as already stated, there are 116 of them, out of which 109 are U.S. patents and 7 are British patents. This list contains the following bibliographical information for each patent: the country of registration of the original patent, name of invention in the original patent, filing date of the corresponding patent application and the application number of the original patent, and, finally, the registration number of the patent itself.

This list is followed by the list of inventions that Nikola Tesla protected with original patents, containing 125 inventions that are covered by original patents. This list is different from the previous one in a way that in cases where the unity of invention existed and one patent protected several inventions, these inventions are listed separately, while the columns in the list are identical, i.e. it contains the following bibliographical information: the country of registration of the original patent, name of invention in the original patent, filing date of the corresponding patent application and the application number of the original patent, and, finally, the registration number of the patent itself.

List of Nikola Tesla's Original Patents

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No.	Name(s) of Invention(s) Covered by the Original Patent	Country	Application Filing date of the Original Patent D/M/Y	Application Number of the Original Patent	Registration Number of the Original Patent
1.	Electric-Arc Lamp	USA	30.03.1885	160,574	335,786
2.	Commutator for Dynamo-Electric Machines	USA	06.05.1885	164,534	334,823
3.	Regulator for Dynamo-Electric Machines	USA	18.05.1885	165,793	336,961
4.	Regulator for Dynamo-Electric Machines	USA	01.06.1885	167,136	336,962
5.	Electric-Arc Lamp	USA	13.07.1885	171,416	335,787
6.	Dynamo-Electric Machine	USA	14.01.1886	188,538/ 188,540	359,748
7.	Regulator for Dynamo-Electric Machines	USA	14.01.1886	188,539	350,954
8.	Thermo-Magnetic Motor	USA	30.03.1886	197,115	396,121
9.	Commutator for Dynamo-Electric Machines	USA	30.04.1887	236,711	382,845
10.	Pyromagneto-Electric Generator	USA	26.05.1887	239,481	428,057
11.	Electro-Magnetic Motor	USA	12.10.1887	252,132	381,968
12.	Electrical Transmission of Power	USA	12.10.1887	252,132	382,280
13.	Electro-Magnetic Motor	USA	30.11.1887	256,561	382,279
14.	Electro-Magnetic Motor	USA	30.11.1887	256,562	381,969
15.	Electrical Transmission of Power	USA	30.11.1887	256,562	382,281
16.	System of Electrical Distribution	USA	23.12.1887	258,787	381,970
17.	Method of Converting and Distributing Electric Currents	USA	23.12.1887	258,787	382,282
18.	System of Electrical Distribution	USA	10.04.1888	270,187	390,413
19.	Dynamo-Electric Machine	USA	23.04.1888	271,626	390,414
20.	Regulator for Alternate-Current Motors	USA	24.04.1888	271,682	390,820
21.	Dynamo-Electric Machine	USA	28.04.1888	272,153	390,721
22.	System of Electrical Transmission of Power	USA	15.05.1888	273,992	487,796
23.	Alternating Motor	USA	15.05.1888	273,993	555,190
24.	Electrical Transmission of Power	USA	15.05.1888	273,993	511,915
25.	Dynamo-Electric Machine or Motor	USA	15.05.1888	273,994	390,415
26.	Electro-Magnetic Motor	USA	20.10.1888	288,677	524,426
27.	Electrical Transmission of Power	USA	08.12.1888	293,051	511,559
28.	System of Electrical Power Transmission	USA	08.12.1888	293,052	511,560
29.	Electro-Magnetic Motor	USA	08.01.1889	295,745	405,858
30.	Method of Operating Electro-Magnetic Motors	USA	18.02.1889	300,220	401,520

31.	Method of Electrical Power Transmission	USA	14.03.1889	303,251	405,859
32.	Dynamo-Electric Machine	USA	23.03.1889	304,498	406,968
33.	Electro-Magnetic Motor	USA	06.04.1889	306,165	459,772
34.	Electro-Magnetic Motor	USA	20.05.1889	311,413	416,191
35.	Method of Operating Electro-Magnetic Motors	USA	20.05.1889	311,414	416,192
36.	Electro-Magnetic Motor	USA	20.05.1889	311,415	416,193
37.	Electro-Magnetic Motor	USA	20.05.1889	311,416	424,036
38.	Electro-Magnetic Motor	USA	20.05.1889	311,417	445,207
39.	Electric Motor	USA	20.05.1889	311,418	416,194
40.	Electro-Magnetic Motor	USA	20.05.1889	311,419	416,195
41.	Electro-Magnetic Motor	USA	20.05.1889	311,420	418,248
42.	Method of Obtaining Direct From Alternating Currents	USA	12.06.1889	314,069	413,353
43.	Armature for Electric Machines	USA	28.06.1889	315,937	417,794
44.	Alternating-Current Electro-Magnetic Motor	USA	26.03.1890	345,388	433,700
45.	Alternating-Current Motor	USA	26.03.1890	345,389	433,701
46.	Electrical Transformer or Induction Device	USA	26.03.1890	345,390	433,702
47.	Electro-Magnetic Motor	USA	04.04.1890	346,603	433,703
48.	Method of Operating Arc Lamps	USA	01.10.1890	366,734	447,920
49.	Alternating-Electric-Current Generator	USA	15.11.1890	371,554	447,921
50.	Electro-Magnetic Motor	USA	27.01.1891	379,251	455,067
51.	Method of and Apparatus for Electrical Conversion and Distribution	USA	04.02.1891	380,182	462,418
52.	Electrical Meter	USA	27.03.1891	386,666	455,068
53.	System of Electric Lightning	USA	26.04.1891	390,414	454,622
54.	Electric Incandescent Lamp	USA	14.05.1891	392,669	455,069
55.	Electro-Magnetic Motor	USA	13.07.1891	399,312	464,666
56.	Electrical Condenser	USA	01.08.1891	401,356	464,667
57.	Incandescent Electric Light	USA	02.01.1892	416,772	514,170
58.	Electrical Conductor	USA	02.01.1892	416,773	514,167
59.	Electric Railway Systems	USA	02.01.1892	416,774	514,972
60.	Coil for Electro-Magnets	USA	07.07.1893	479,804	512,340
61.	Means for Generating Electric Currents	USA	02.08.1893	482,194	514,168
62.	Electric Generator	USA	19.08.1893	483,562	511,916
63.	Reciprocating Engine	USA	19.08.1893	483,563	514,169
64.	Electrical Meter	USA	15.12.1893	493,739	514,973
65.	Steam Engine	USA	29.12.1893	495,079	517,900
66.	Apparatus for Producing Electric Currents of High Frequency and Potential	USA	22.04.1896	588,534	568,176
67.	Apparatus for Producing Ozone	USA	17.06.1896	595,927	568,177
68.	Electrical Condenser	USA	17.06.1896	595,928	567,818

69.	Method of Regulating Apparatus for Producing Currents of High Frequency	USA	20.06.1896	596,262	568,178
70.	Method of and Apparatus for Producing Currents of High Frequency	USA	06.07.1896	598,130	568,179
71.	Apparatus for Producing Electrical Currents of High Frequency	USA	09.07.1896	598,552	568,180
72.	Apparatus for Producing Electric Currents of High Frequency	USA	03.09.1896	604,723	577,670
73.	Apparatus for Producing Currents of High Frequency	USA	19.10.1896	609,292	583,953
74.	Manufacture of Electrical Condensers, Coils Etc.	USA	05.11.1896	611,126	577,671
75.	Electrical Igniter for Gas-Engines	USA	17.02.1897	623,832	609,250
76.	Electrical Transformer	USA	20.03.1897	628,453	593,138
77.	Electric-Circuit Controller	USA	03.06.1897	639,227	609,251
78.	System of Transmission of Electrical Energy	USA	02.09.1897	650,343	645,576
79.	Apparatus for Transmission of Electrical Energy	USA	02.09.1897	650,343	649,621
80.	Electrical-Circuit Controller	USA	02.12.1897	660,518	609,245
81.	Electrical-Circuit Controller	USA	10.12.1897	661,403	611,719
82.	Electrical-Circuit Controller	USA	28.02.1898	671,897	609,246
83.	Electric-Circuit Controller	USA	12.03.1898	673,558	609,247
84.	Electric-Circuit Controller	USA	12.03.1898	673,559	609,248
85.	Electric-Circuit Controller	USA	12.03.1898	673,560	609,249
86.	Electric-Circuit Controller	USA	19.04.1898	678,127	613,735
87.	Method of and Apparatus for Controlling the Mechanism of Moving Vessels or Vehicles	USA	01.07.1898	684,934	613,809
88.	Method of Intensifying and Utilizing Effects Transmitted through Natural Media	USA	24.06.1899	721,790	685,953
89.	Apparatus for Utilizing Effects Transmitted From a Distance to a Receiving Device through Natural Media	USA	24.06.1899	721,790	685,955
90.	Method of Utilizing Effects Transmitted through the Natural Media	USA	01.08.1899	725,749	685,954
91.	Apparatus for Utilizing Effects Transmitted through Natural Media	USA	01.08.1899	725,749	685,956
92.	Means for Increasing the Intensity of Electrical Oscillations	USA	21.03.1900	9,501	685,012
93.	Art of Transmitting Electrical Energy through the Natural Mediums	USA	16.05.1900	16,889	787,412
94.	Method of Insulating Electric Conductors	USA	15.06.1900	20,405	655,838
95.	System of Signaling	USA	16.07.1900	23,847	725,605
96.	Method of Signaling	USA	16.07.1900	23,847	723,188

97.	Apparatus for Utilization of Radiant Energy	USA	21.03.1901	52,153	685,957
98.	Method of Utilizing Radiant Energy	USA	21.03.1901	52,154	685,958
99.	Apparatus for Transmitting Electrical Energy	USA	18.01.1902	90,245	1,119,732
100.	Fluid Propulsion	USA	21.10.1909	523,832	1,061,142
101.	Turbine	USA	21.10.1909	523,832	1,061,206
102.	Fountain	USA	28.10.1913	797,718	1,113,716
103.	Speed-Indicator	USA	29.05.1914	841,726	1,209,359
104.	Valvular Conduit	USA	21.02.1916	79,703	1,329,559
105.	Lightning Protector	USA	06.05.1916	95,830	1,266,175
106.	Flow Meter	USA	18.12.1916	137,688	1,365,547
107.	Frequency Meter	USA	18.12.1916	137,689	1,402,025
108.	Ship's Log	USA	18.12.1916	137,690	1,314,718
109.	Speed-Indicator	USA	18.12.1916	137,691	1,274,816
110.	Improved Process of and Apparatus for Production of High Vacua	Great Britain	24.03.1921		179,043
111.	Improvements in the Construction of Steam and Gas Turbines	Great Britain	24.03.1921		186,082
112.	Improved Method of and Apparatus for the Economic Transformation of the Energy of Steam by Turbines	Great Britain	24.03.1921		186,083
113.	Improved Method of and Apparatus for Deriving Motive Power from Steam	Great Britain	24.03.1921		186,084
114.	Improvements in Methods of and Apparatus for the Generation of Power by Elastic Fluid Turbines	Great Britain	01.04.1921		174,544
115.	Method of and Apparatus for Aerial Transportation	Great Britain	04.04.1921		185,446
116.	Process of, and Apparatus for Balancing Rotating Machine Parts	Great Britain	02.09.1921		186,799

List of Nikola Tesla's Inventions Protected by Original Patents

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No.	Name of Invention in the Original Patent	Country	Application Filing Date of the Original Patent D/M/Y	Application Number of the Original Patent	Registration Number of the Original Patent
1.	Electric-Arc Lamp	USA	30.03.1885	160,574	335,786
2.	Commutator for Dynamo-Electric Machines	USA	06.05.1885	164,534	334,823
3.	Regulator for Dynamo-Electric Machines	USA	18.05.1885	165,793	336,961
4.	Regulator for Dynamo-Electric Machines	USA	01.06.1885	167,136	336,962
5.	Electric-Arc Lamp	USA	13.07.1885	171,416	335,787
6.	Dynamo-Electric Machine	USA	14.01.1886	188,538/ 188,540	359,748
7.	Regulator for Dynamo-Electric Machines	USA	14.01.1886	188,539	350,954
8.	Thermo-Magnetic Motor	USA	30.03.1886	197,115	396,121
9.	Commutator for Dynamo-Electric Machines	USA	30.04.1887	236,711	382,845
10.	Pyromagneto-Electric Generator	USA	26.05.1887	239,481	428,057
11.	Electro-Magnetic Motor	USA	12.10.1887	252,132	381,968
12.	Electrical Transmission of Power	USA	12.10.1887	252,132	382,280
13.	Electro-Magnetic Motor	USA	30.11.1887	256,561	382,279
14.	Electro-Magnetic Motor	USA	30.11.1887	256,562	381,969
15.	Electrical Transmission of Power	USA	30.11.1887	256,562	382,281
16.	System of Electrical Distribution	USA	23.12.1887	258,787	381,970
17.	Method of Converting and Distributing Electric Currents	USA	23.12.1887	258,787	382,282
18.	System of Electrical Distribution	USA	10.04.1888	270,187	390,413
19.	Dynamo-Electric Machine	USA	23.04.1888	271,626	390,414
20.	Regulator for Alternate-Current Motors	USA	24.04.1888	271,682	390,820
21.	Dynamo-Electric Machine	USA	28.04.1888	272,153	390,721
22.	System of Electrical Transmission of Power	USA	15.05.1888	273,992	487,796
23.	Alternating Motor	USA	15.05.1888	273,993	555,190
24.	Electrical Transmission of Power	USA	15.05.1888	273,993	511,915
25.	Dynamo-Electric Machine or Motor	USA	15.05.1888	273,994	390,415
26.	Electro-Magnetic Motor	USA	20.10.1888	288,677	524,426
27.	Electrical Transmission of Power	USA	08.12.1888	293,051	511,559
28.	System of Electrical Power Transmission	USA	08.12.1888	293,052	511,560
29.	Electro-Magnetic Motor	USA	08.01.1889	295,745	405,858
30.	Method of Operating Electro-Magnetic Motors	USA	18.02.1889	300,220	401,520
31.	Method of Electrical Power Transmission	USA	14.03.1889	303,251	405,859

32.	Dynamo-Electric Machine	USA	23.03.1889	304,498	406,968
33.	Electro-Magnetic Motor	USA	06.04.1889	306,165	459,772
34.	Electro-Magnetic Motor	USA	20.05.1889	311,413	416,191
35.	Method of Operating Electro-Magnetic Motors	USA	20.05.1889	311,414	416,192
36.	Electro-Magnetic Motor	USA	20.05.1889	311,415	416,193
37.	Electro-Magnetic Motor	USA	20.05.1889	311,416	424,036
38.	Electro-Magnetic Motor	USA	20.05.1889	311,417	445,207
39.	Electric Motor	USA	20.05.1889	311,418	416,194
40.	Electro-Magnetic Motor	USA	20.05.1889	311,419	416,195
41.	Electro-Magnetic Motor	USA	20.05.1889	311,420	418,248
42.	Method of Obtaining Direct From Alternating Currents	USA	12.06.1889	314,069	413,353
43.	Armature for Electric Machines	USA	28.06.1889	315,937	417,794
44.	Alternating-Current Electro-Magnetic Motor	USA	26.03.1890	345,388	433,700
45.	Alternating-Current Motor	USA	26.03.1890	345,389	433,701
46.	Electrical Transformer or Induction Device	USA	26.03.1890	345,390	433,702
47.	Electro-Magnetic Motor	USA	04.04.1890	346,603	433,703
48.	Method of Operating Arc Lamps	USA	01.10.1890	366,734	447,920
49.	Alternating-Electric-Current Generator	USA	15.11.1890	371,554	447,921
50.	Electro-Magnetic Motor	USA	27.01.1891	379,251	455,067
51.	Method of and Apparatus for Electrical Conversion and Distribution	USA	04.02.1891	380,182	462,418
52.	Method of and Apparatus for Electrical Conversion and Distribution	USA	04.02.1891	380,182	462,418
53.	Electrical Meter	USA	27.03.1891	386,666	455,068
54.	System of Electric Lightning	USA	26.04.1891	390,414	454,622
55.	Electric Incandescent Lamp	USA	14.05.1891	392,669	455,069
56.	Electro-Magnetic Motor	USA	13.07.1891	399,312	464,666
57.	Electrical Condenser	USA	01.08.1891	401,356	464,667
58.	Incandescent Electric Light	USA	02.01.1892	416,772	514,170
59.	Electrical Conductor	USA	02.01.1892	416,773	514,167
60.	Electric Railway Systems	USA	02.01.1892	416,774	514,972
61.	Coil for Electro-Magnets	USA	07.07.1893	479,804	512,340
62.	Means for Generating Electric Currents	USA	02.08.1893	482,194	514,168
63.	Electric Generator	USA	19.08.1893	483,562	511,916
64.	Reciprocating Engine	USA	19.08.1893	483,563	514,169
65.	Electrical Meter	USA	15.12.1893	493,739	514,973
66.	Steam Engine	USA	29.12.1893	495,079	517,900
67.	Apparatus for Producing Electric Currents of High Frequency and Potential	USA	22.04.1896	588,534	568,176
68.	Apparatus for Producing Ozone	USA	17.06.1896	595,927	568,177

69.	Electrical Condenser	USA	17.06.1896	595,928	567,818
70.	Method of Regulating Apparatus for Producing Currents of High Frequency	USA	20.06.1896	596,262	568,178
71.	Method of and Apparatus for Producing Currents of High Frequency	USA	06.07.1896	598,130	568,179
72.	Method of and Apparatus for Producing Currents of High Frequency	USA	06.07.1896	598,130	568,179
73.	Apparatus for Producing Electrical Currents of High Frequency	USA	09.07.1896	598,552	568,180
74.	Apparatus for Producing Electric Currents of High Frequency	USA	03.09.1896	604,723	577,670
75.	Apparatus for Producing Currents of High Frequency	USA	19.10.1896	609,292	583,953
76.	Manufacture of Electrical Condensers, Coils Etc.	USA	05.11.1896	611,126	577,671
77.	Electrical Igniter for Gas-Engines	USA	17.02.1897	623,832	609,250
78.	Electrical Transformer	USA	20.03.1897	628,453	593,138
79.	Electric-Circuit Controller	USA	03.06.1897	639,227	609,251
80.	System of Transmission of Electrical Energy	USA	02.09.1897	650,343	645,576
81.	Apparatus for Transmission of Electrical Energy	USA	02.09.1897	650,343	649,621
82.	Electrical-Circuit Controller	USA	02.12.1897	660,518	609,245
83.	Electrical-Circuit Controller	USA	10.12.1897	661,403	611,719
84.	Electrical-Circuit Controller	USA	28.02.1898	671,897	609,246
85.	Electric-Circuit Controller	USA	12.03.1898	673,558	609,247
86.	Electric-Circuit Controller	USA	12.03.1898	673,559	609,248
87.	Electric-Circuit Controller	USA	12.03.1898	673,560	609,249
88.	Electric-Circuit Controller	USA	19.04.1898	678,127	613,735
89.	Method of and Apparatus for Controlling the Mechanism of Moving Vessels or Vehicles	USA	01.07.1898	684,934	613,809
90.	Method of and Apparatus for Controlling the Mechanism of Moving Vessels or Vehicles	USA	01.07.1898	684,934	613,809
91.	Method of Intensifying and Utilizing Effects Transmitted through Natural Media	USA	24.06.1899	721,790	685,953
92.	Apparatus for Utilizing Effects Transmitted From a Distance to a Receiving Device through Natural Media	USA	24.06.1899	721,790	685,955
93.	Method of Utilizing Effects Transmitted through the Natural Media	USA	01.08.1899	725,749	685,954
94.	Apparatus for Utilizing Effects Transmitted through Natural Media	USA	01.08.1899	725,749	685,956
95.	Means for Increasing the Intensity of Electrical Oscillations	USA	21.03.1900	9,501	685,012

96.	Art of Transmitting Electrical Energy through the Natural Mediums	USA	16.05.1900	16,889	787,412
97.	Method of Insulating Electric Conductors	USA	15.06.1900	20,405	655,838
98.	System of Signaling	USA	16.07.1900	23,847	725,605
99.	Method of Signaling	USA	16.07.1900	23,847	723,188
100.	Apparatus for Utilization of Radiant Energy	USA	21.03.1901	52,153	685,957
101.	Method of Utilizing Radiant Energy	USA	21.03.1901	52,154	685,958
102.	Apparatus for Transmitting Electrical Energy	USA	18.01.1902	90,245	1,119,732
103.	Fluid Propulsion	USA	21.10.1909	523,832	1,061,142
104.	Turbine	USA	21.10.1909	523,832	1,061,206
105.	Fountain	USA	28.10.1913	797,718	1,113,716
106.	Speed-Indicator	USA	29.05.1914	841,726	1,209,359
107.	Valvular Conduit	USA	21.02.1916	79,703	1,329,559
108.	Lightning Protector	USA	06.05.1916	95,830	1,266,175
109.	Flow Meter	USA	18.12.1916	137,688	1,365,547
110.	Frequency Meter	USA	18.12.1916	137,689	1,402,025
111.	Ship's Log	USA	18.12.1916	137,690	1,314,718
112.	Speed-Indicator	USA	18.12.1916	137,691	1,274,816
113.	Improved Process of and Apparatus for Production of High Vacua	Great Britain	24.03.1921		179,043
114.	Improved Process of and Apparatus for Production of High Vacua	Great Britain	24.03.1921		179,043
115.	Improvements in the Construction of Steam and Gas Turbines	Great Britain	24.03.1921		186,082
116.	Improved Method of and Apparatus for the Economic Transformation of the Energy of Steam by Turbines	Great Britain	24.03.1921		186,083
117.	Improved Method of and Apparatus for the Economic Transformation of the Energy of Steam by Turbines	Great Britain	24.03.1921		186,083
118.	Improved Method of and Apparatus for Deriving Motive Power from Steam	Great Britain	24.03.1921		186,084
119.	Improved Method of and Apparatus for Deriving Motive Power from Steam	Great Britain	24.03.1921		186,084
120.	Improvements in Methods of and Apparatus for the Generation of Power by Elastic Fluid Turbines	Great Britain	01.04.1921		174,544
121.	Improvements in Methods of and Apparatus for the Generation of Power by Elastic Fluid Turbines	Great Britain	01.04.1921		174,544
122.	Method of and Apparatus for Aerial Transportation	Great Britain	04.04.1921		185,446

123.	Method of and Apparatus for Aerial Transportation	Great Britain	04.04.1921		185,446
124.	Process of, and Apparatus for Balancing Rotating Machine Parts	Great Britain	02.09.1921		186,799
125.	Process of, and Apparatus for Balancing Rotating Machine Parts	Great Britain	02.09.1921		186,799

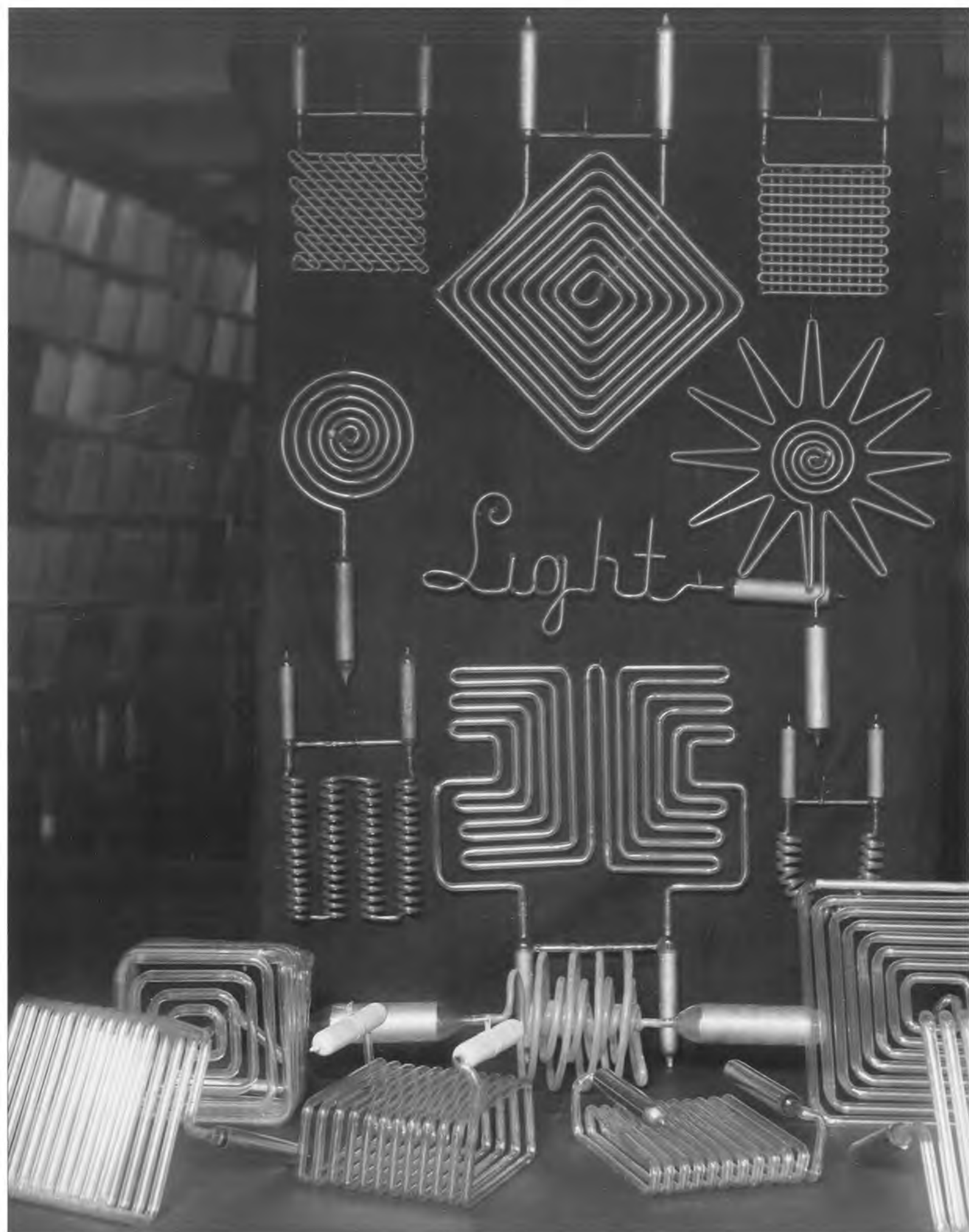
Bearing in mind all the available information, it can be claimed with considerable certainty that the list of Tesla's original patents is definite, as is the list of inventions that Tesla's protected with original patents.

However, as far as the corresponding analogues are concerned, the situation is different, and there is still a possibility that some currently unknown Tesla's patents can be discovered in some countries. For example, it was established that Tesla had 29 patents each in Great Britain and France, which generally covered the same inventions. On the other hand, when comparing these patents, it is evident that they did not always cover the same inventions, and therefore, for now, it has not been established whether Tesla protected his inventions of the Fountain, Lightning Protector and Valvular Conduit in Great Britain, for which he held patents in France. There is also a possibility that Tesla protected some of his first inventions, such as the electric-arc lamps and the regulators for dynamo-electric machines in France and probably in Belgium, which leaves room for further research. There is also an open possibility of another German patent, because some lists published on the Internet, such as on the Internet site www.wikipedia.org, maintain that Tesla had 19 German patents, unless they are erroneously counting in the German patent No. 199580, which was mentioned previously. The number of these patents is in all probability proportionally small, but is in any case worth the effort to locate these patents and add them to the available data.

Therefore, based on all of the above, it can be said that Tesla had 116 original patents, 109 in the U.S. and 7 in Great Britain, which protected 125 of his inventions. It was also established that Tesla had 164 analogues of these patents, including the patents of addition and reissued patents, which means that he, in total, received 280 patents in 27 different countries.



**6. Patent Applications of Nikola Tesla for
which the Patents were not Granted**



In addition to the large number of patent applications for which he received patents, the archive material of Nikola Tesla Museum also contains information about inventions that Tesla submitted patent applications for, but did not obtain the corresponding patents. The following list of Nikola Tesla's patent applications which were not approved was created based on the processing of data collected during the research done by the team from the Federal Patent Office in 1992 and 1993. This list contains only information about the patent applications submitted to the U.S. Patent Office, although the archives do contain some information about patent applications from other countries, such as Germany and France. However, the available data was too scarce to be included in the following list.

Some patent applications from the archives of the Nikola Tesla Museum have complete specifications of the invention with drawings, while for other inventions only the segments of specification, or some drawings, exist, and in some cases, there are only remarks about a submitted patent application, without any accompanying material. The following list contains only the patent applications for which the information about the application number and the date of submission to the U.S. Patent Office existed, irrespective of the fact whether the name of the invention, or the corresponding specification and drawings have been preserved.

The following list contains the following bibliographical information for each patent application: the name of the invention as given in the patent application, filing date and number of the patent application, available information about the outcome of the patent claim examination procedure, and remarks referring either to the corresponding analogues of the inventions covered by these applications, or other relevant information.

List of Patent Applications of Nikola Tesla for which the Patents were not Granted

No.	Name of Invention in Patent Application	Application Filing date D/M/Y	Application Number	Outcome of the Examination Procedure	Remarks
1.	Method of and Apparatus for Generating Electric Current	26.05.1887	239,481	Claim rejected	
2.	Electric Generators	06.10.1887	251,660		
3.	Apparatus for Increasing Traction of Car Wheels	08.12.1888	293,058	Claim rejected	
4.	Electrical Meters	06.04.1891	387,722	Patent granted, but fee not paid	
5.	Electric Lighting Devices	18.07.1891	399,948		
6.	Armatures	07.08.1893	482,630	Claim rejected	
7.		13.08.1893	483,653		
8.	Armatures for Alternating Current Motors	19.09.1893	485,865		
9.	Reciprocating Engines	03.01.1894	495,347		
10.	Reciprocating Engines	21.02.1894	501,008		

11.	Method of Removing Gaseous Matter from Closed Receptacles	15.02.1896	579,448		
12.	Industrial Utilization of Water for Heating Purposes	23.05.1900	17,612		
13.	Art of Transmitting Electrical Energy Through the Natural Media	15.01.1901	43,368		
14.	Production and Application of Electric Force	17.06.1904	213,055		
15.	Apparatus for Transmission of Electrical Energy	17.04.1905	256,022		
16.	Fluid Propulsion	21.10.1909	735,914		Divided from the patent application US 523,832
17.	Method of Deriving Energy from Fluids	20.02.1912	678,817	Claim rejected	
18.	Transmission of Electrical Energy Through the Natural Media/ Methods and Systems of Transmitting Electrical Energy to a Distance through Natural Media	03.03.1916	81,768		
19.	System of Wireless Transmission	17.04.1916	91,679		
20.	Transmission of Electrical Energy through Natural Media	16.02.1919	277,130		
21.	Construction of Steam and Gas Turbines	09.09.1921	499,520		Analogue of GB 182,082
22.	Method of and Apparatus for Thermo-Dynamic Transformation of Energy	02.02.1922	533,524	Application rejected	
23.	Method and Apparatus for Fluid Propulsion	02.02.1922	533,525	Claim rejected	
24.	Method of and Apparatus for Balancing Rotating Machine Parts	23.03.1922	546,037	Claim rejected	Analogue of GB 186,799
25.		23.03.1922	546,038		Probably analogue of GB 179,043
26.	Method of and Apparatus for Deriving Motive Power From Steam	23.03.1922	546,039		Analogue of GB 186,084
27.	Method of and Apparatus for Economic Transformation of the Energy of Steam by Turbines	24.03.1922	546,308		Analogue of GB 186,083
28.	Apparatus for the Generation of Power by Elastic Fluid Turbines	30.03.1922	548,233		Analogue of GB 174,544
29.	Methods of Generating of Power by Elastic Fluid Turbines	30.03.1922	548,234		Analogue of GB 174,544
30.	Process of Treating and Transporting Sulfur	15.06.1923	645,568		
31.	Apparatus for Treating and Transporting Sulfur	15.06.1923	645,569	Patent granted, but fee not paid	
32.	Economic Method of Operating Automobiles and the Like	03.01.1928	244,345		
33.	Apparatus for Operating Automobiles and the Like	03.01.1928	244,346		

Inventions that were covered by the 33 listed patent applications are from the fields of electrical engineering, machine engineering, and even technology. Tesla did patent several of these inventions in other countries, including the inventions that are covered by seven original British patents, Nos. 179,043, 186,082, 186,083, 186,084, 174,544 and 186,799. However, for these inventions, Tesla did not receive U.S. patents, although he filed the corresponding patent applications, Nos. 499,520, 546,037, 546,038, 546,039, 546,308, 548,233 and 548,234, but only after filing the same applications in Great Britain.

In addition to these six patent applications, Tesla filed another 12 applications for inventions in machine engineering, which a casual observer would probably not associate with Tesla's name, such as the Apparatus for Increasing Traction of Car Wheels, Reciprocating Engines, Industrial Utilization of Water for Heating Purposes, Economic Method and Apparatus for Operating Automobiles and the Like, and so forth. In addition, several Tesla's patent applications in the field machine engineering are covering the improvements of Tesla's pump and turbine. Taking into account all of these patent applications from the field of machine engineering, their total number amounts to 18.

There are also 12 patent applications in the field of electrical engineering, which primarily cover the field of polyphase currents, but also the wireless transmission.

For one application, there is no other available information except the number and the filing date.

Among the most interesting patent applications for which Tesla did not receive patents are two from the field of technology, covering the Process of, and Apparatus for Treating and Transporting Sulfur, filed in 1923. Tesla was granted the patent for this apparatus, but because he never paid the prescribed fee, he never received the patent certificate and the patent documentation was never printed.

Since unity of invention exists in at least 6 of the listed patent applications, because they simultaneously sought protection for both the method and the corresponding apparatus, it ensues that in these applications Tesla sought protection for at least 39 inventions. However, when the 11 inventions covered by the six original British patents are counted out, it ensues that Tesla did not manage to protect at least 28 of his inventions.

Unfortunately, for the majority of these patent applications there is no information about the outcome of the examination procedure. Still, for six patents from this list the information exists that they were rejected. It means that after examination, the U.S. Patent Office assessed that the claims do not satisfy one or more of the three previously described basic requirements for patentability, and therefore rejected these applications.

For one patent application from this list the information that exists is that the application was rejected, meaning that the U.S. Patent Office assessed that the application contains errors, and thus, without examining whether the invention covered by the claim fulfills the requirements for patentability, suspended the proceedings.

In addition to the aforementioned patent application for the Apparatus for Treating and Transporting Sulfur, Tesla also received a patent for the Electrical Meters, but he also did not pay the prescribed fee, and therefore neither received the corresponding patent certificate, nor was the patent documentation printed.

The following table shows the number of Nikola Tesla's patent applications for which the patents were not granted, according to the year of filing.

Overview of Nikola Tesla's Patent Applications for which the Patents were not Granted, According to the Year of Filing

Year	Filed Patent Applications
1887	2
1888	1
1891	2
1893	3
1894	2

1896	1
1900	1
1901	1
1904	1
1905	1
1909	1
1912	1
1916	2
1919	1
1921	1
1922	8
1923	2
1928	2

It seems that Tesla's activities related to patenting of his inventions ended in early 1928, as there is no information about later applications. This means that Tesla's activities in the field of patent protection lasted for a total of 43 years. Tesla's last activity related to the protection of industrial property took part in 1938, when he filed the only known trademark application, which was registered the following year.

Nikola Tesla's Trademarks Registered in the U.S.

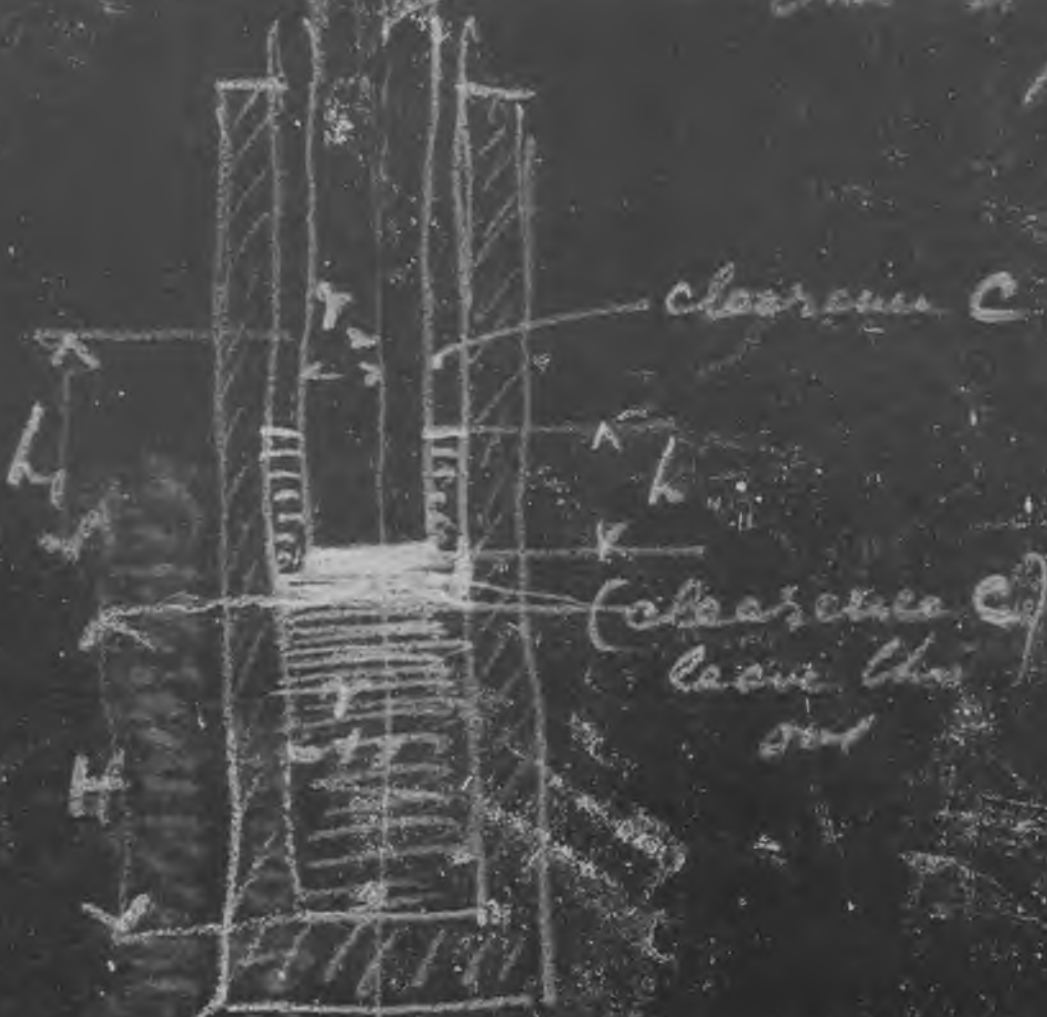
No.	Trademark	Application Filing Date D/M/Y	Application number	Trademark Registration Date D/M/Y	Trademark Registration Number
1.	FACTOR AUCTUS	23.06.1938	407,826	21.11.1939	372,906

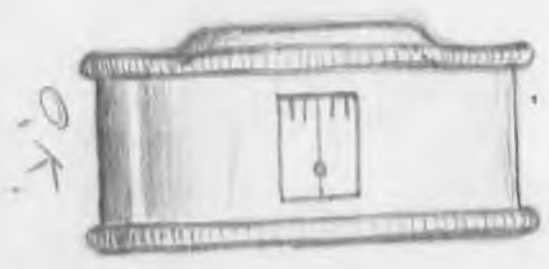
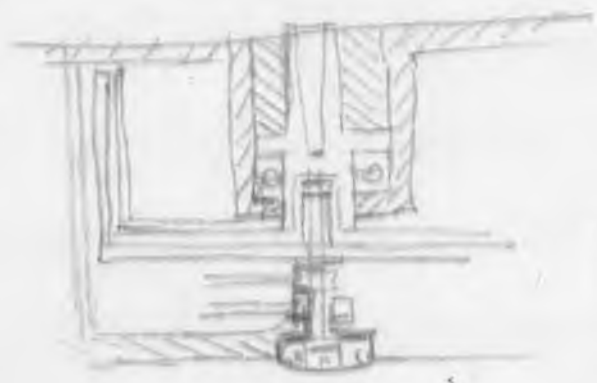
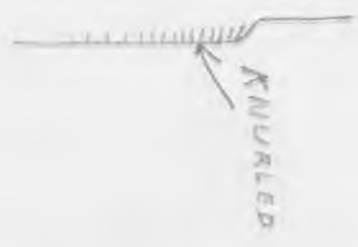
The expression FACTOR AUCTUS, which appears in this trademark, means "growth factor" in Latin. It was found that Tesla had planned to use this trademark for a special type of bird feed, but there is no information whether he ever realized that project.



Tesla's U.S. Trademark No. 372,906

7. Tesla's Path from an Idea to the Patent and its Commercialization





As all great inventors, Nikola Tesla also had his own specific development path from an idea to the patent. What differentiated him from the other inventors was his phenomenal ability to visualize, his talent to see the objects in his mind formed as if in real life. Tesla himself claimed that he constructed his inventions in his spirit, as well as that he could monitor their operation, find their defects and correct them, picture different variants based on the same principle, and also that he could precisely define the type of material and the dimensions of the parts for his devices. This ability was so pronounced that he sometimes did not have the need to make technical drawings of his inventions, but could immediately start building a model or prototype. Also, Tesla could retain the images he visualized in this manner in his memory for a long time, and access them later to improve and develop them.

Such a method of work, which led to his epochal achievements and which flatly contradicted the customary method of trial and error used by the majority of inventors, including Edison, is original, and, as far as it is known, solely his, especially while in his youth.

The results that Tesla achieved with this method are exceptional, but on the other hand, the consequence is that it is often difficult to reconstruct the development from the idea to the patent for many of Tesla's inventions. However, Tesla's legacy still contains a large number of sketches of his inventions. Tesla has drawn these sketches in pencil on various types and sizes of paper, often on memorandums of the hotels that he resided in. Some of them are just rough sketches, while others contain much more detail. Since the sketches contained in Tesla's mind perished forever with his death, only the sketches that remain can shed some light on the process Tesla used to realize his inventions, develop them, and, finally, prepare the appropriate patent application. In addition to these sketches, the archives of the Nikola Tesla Museum contain a large number of photographs of models and prototypes of his inventions, as well as the technical documentation with technical drawings for many of them, but also the data on their placement. Based on this material, the development from the idea to the patent, and further, to commercialization, will be presented for three of Tesla's inventions: the Electro-Magnetic Motor, the Valvular Conduit, and the Speed Indicator.

The first of these inventions is Tesla's alternating-current electro-magnetic motor. An important element of Tesla's polyphase system, it was based on his discovery of the rotating magnetic field, in 1882. Although Tesla made the first prototype of this motor in 1883 in Strasbourg, and continued to improve its construction later on, his sketches from that period have unfortunately not been preserved, if there were any at all, bearing in mind his method of work. He started submitting the patent applications for the motors of this type in October 1887, and began receiving the corresponding patents from May 1888. The next two pictures show the electro-magnetic motor from U.S. patent No. 381,968.

(No Model.)

N. TESLA.

4 Sheets—Sheet 1.

ELECTRO MAGNETIC MOTOR.

No. 381,968.

Patented May 1, 1888.

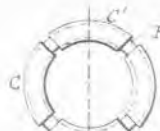
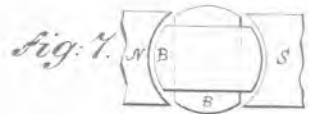
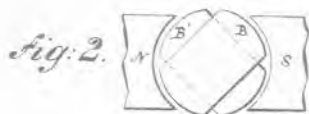
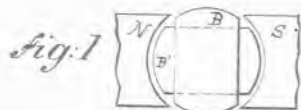


Fig. 1^a

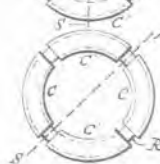


Fig. 2^a



Fig. 3^a



Fig. 4^a

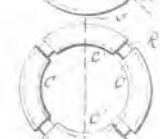


Fig. 5^a



Fig. 6^a

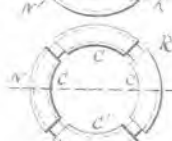


Fig. 7^a



Fig. 8^a

WITNESSES

Frank E. Hartley
Frank A. Murphy

INVENTOR

Nikola Tesla
BY
Duncan, Curtis & Page
ATTORNEYS.

(No Model.)

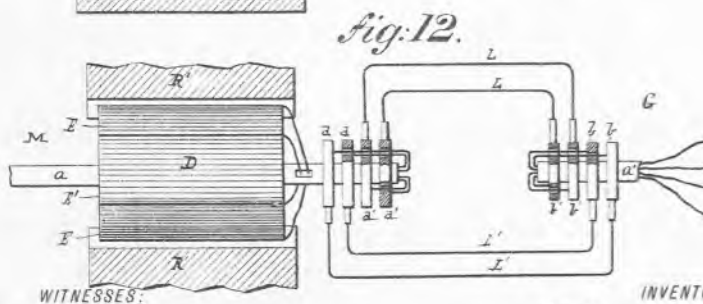
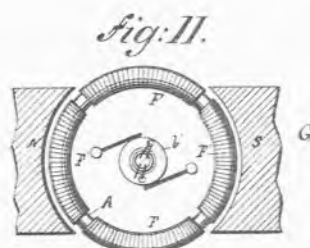
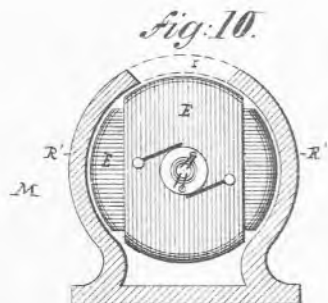
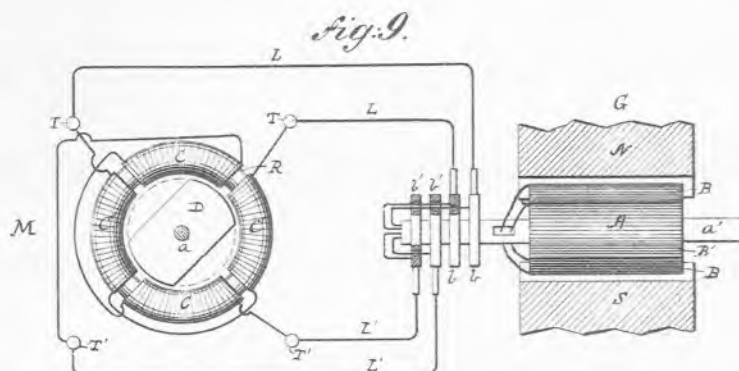
4 Sheets—Sheet 2.

N. TESLA.

ELECTRO MAGNETIC MOTOR.

No. 381,968.

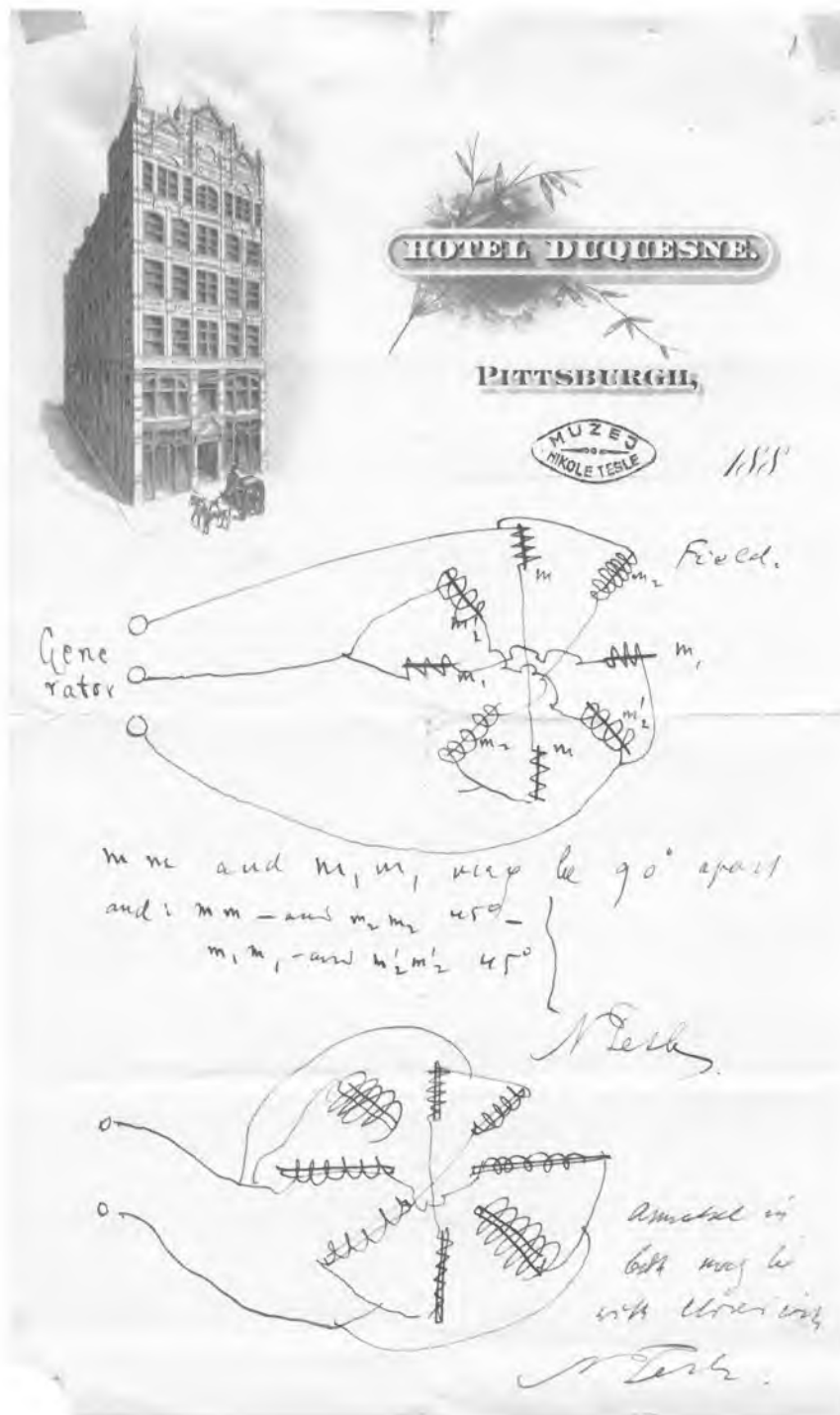
Patented May 1, 1888.



WITNESSES:
 Frank E. Hartley,
 Frank B. Murphy.

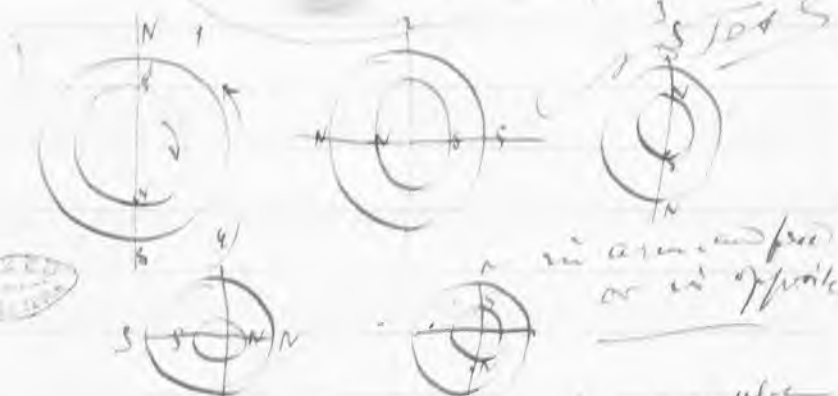
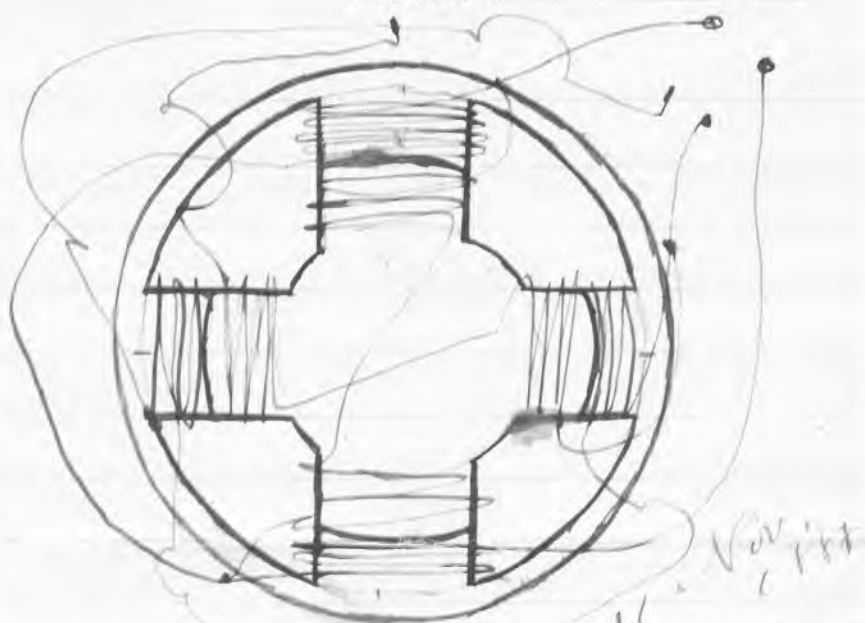
INVENTOR.
 Nikola Tesla,
 BY
 Duncan, Curtis & Hage
 ATTORNEYS.

The next year, in mid-1888, he signed a contract with Westinghouse and moved to Pittsburgh to work for him, where he spent the next year. The next two sketches are from the period Tesla spent there, done by hand, developing some construction details of the motor. One sketch contains the date of its origin - November 11, 1888.



HOTEL ANDERSON, MCKINNIE & BEAN.

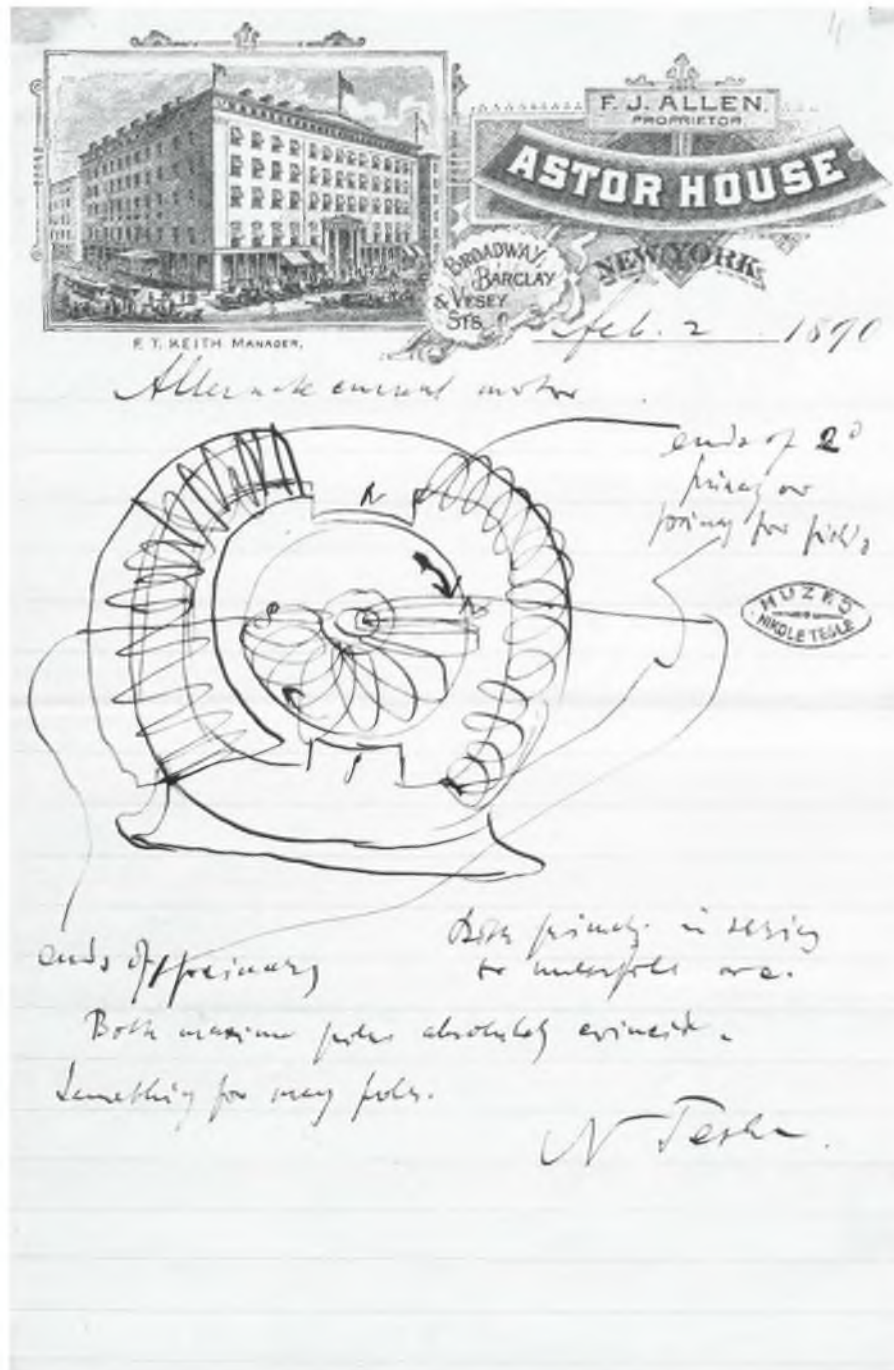
PITTSBURGH, PA. 188



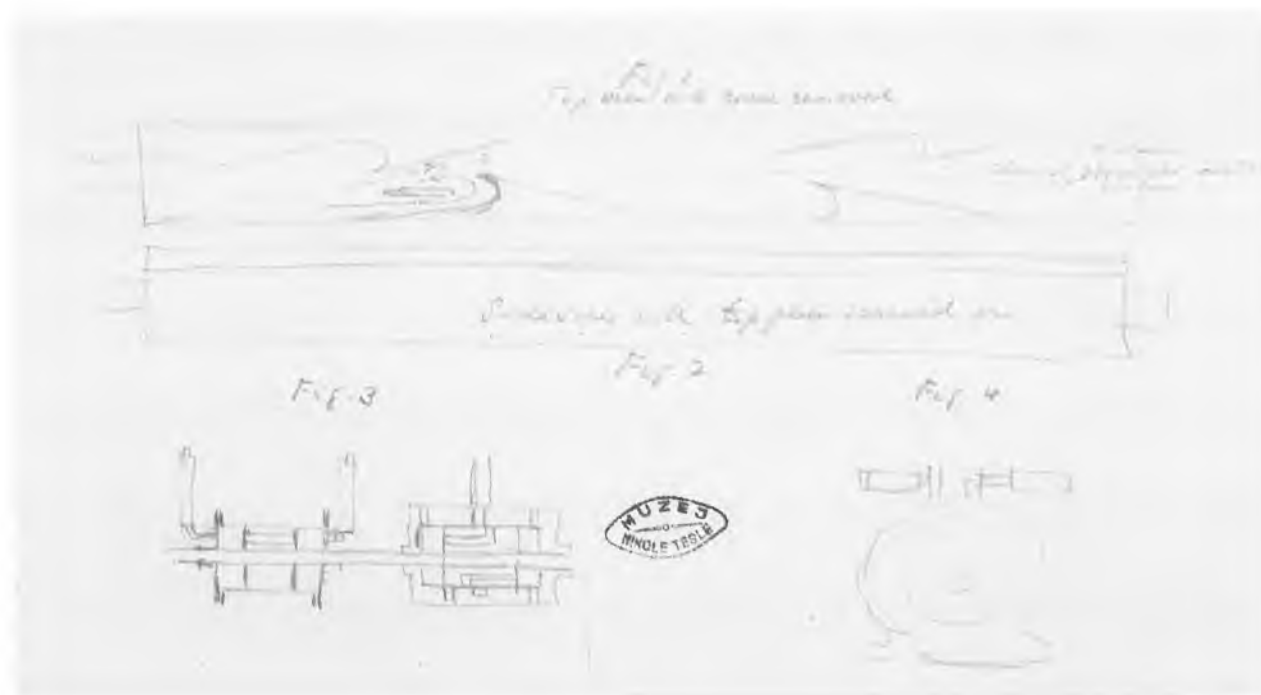
apparatus for increasing number
of alternations
and decreasing
shifting of poles by alternately
currents in one direction

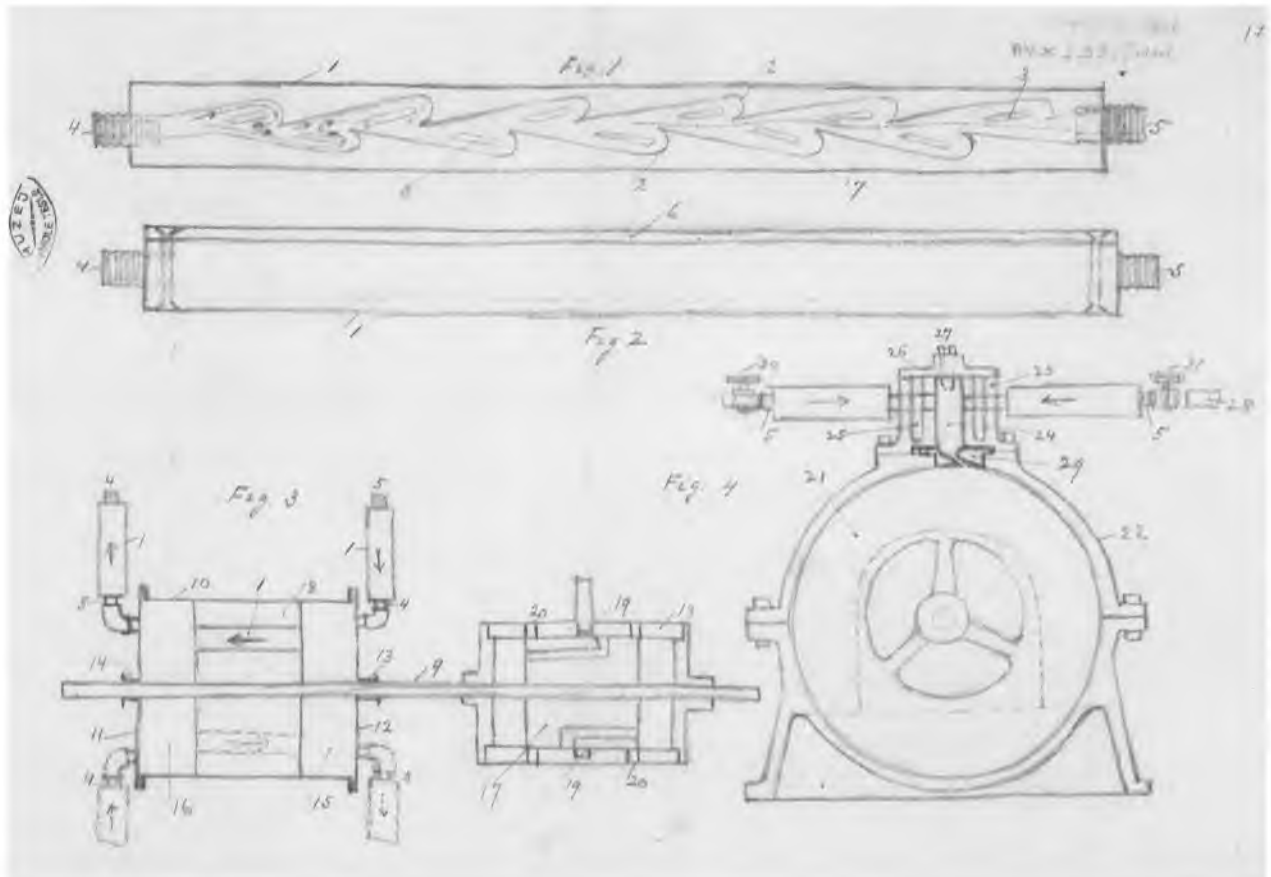
In addition to these two sketches, there is another one dated February 2, 1890, when Tesla had already returned to New York.

As it can be seen from the presented material, it is not possible to precisely reconstruct the development of the electro-magnetic motor.



However, more archive materials exist for the second listed invention - the valvular conduit. The initial sketches for this invention have also not been preserved, if they existed at all, though the first sketches for the corresponding patent application exist, as well as their corrected version.



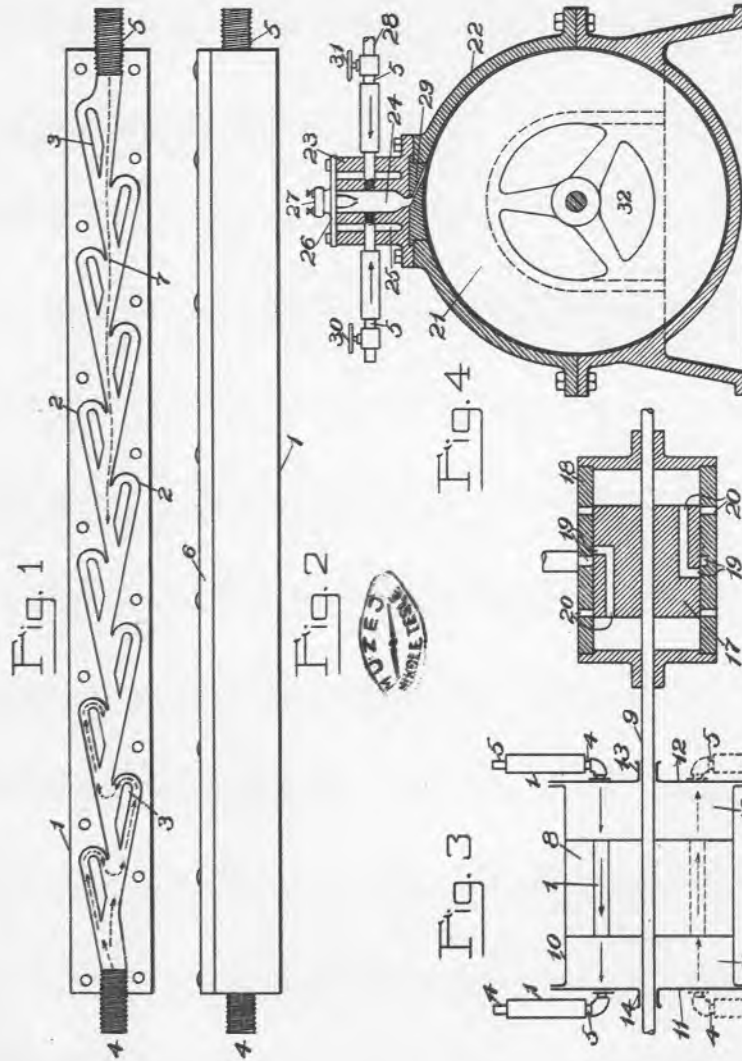


N. TESLA.
VALVULAR CONDUIT.

APPLICATION FILED FEB. 21, 1916. RENEWED JULY 8, 1919.

1,329,559.

Patented Feb. 3, 1920.



INVENTOR

Nikola Tesla

BY

Sten, Page, Cooper & Hayward
ATTORNEYS.

Tesla continued his work on the valvular conduit during the patent grant procedure, as well as after it. He performed various calculations related to its dimensions and parameters, as shown on the first of the

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Sept. 4, 1921 ~~85~~
89

MUSEUM
NIOLETES

Valvular Conduit

Assume loss of head 2 percent per cycle
and 100 cycles. Then—

$\left(\frac{98}{100}\right)^{100}$ will give ratio of loss of head to
total head.

$100 \log 98 = 100 \times 1.98122012 = 198.122012$
Remainder 1.3262×10^{199}

$100 \log 100 = 200$
Remainder 10^{200}

$\frac{1.3262}{10} = 0.13262$ will be value

$\frac{h_p}{h} = 0.13262$ $h_p = 0.13262 h$

for 200 cycles

$200 \log 98 = 396.24422$
Remainder 1.7588×10^{398}

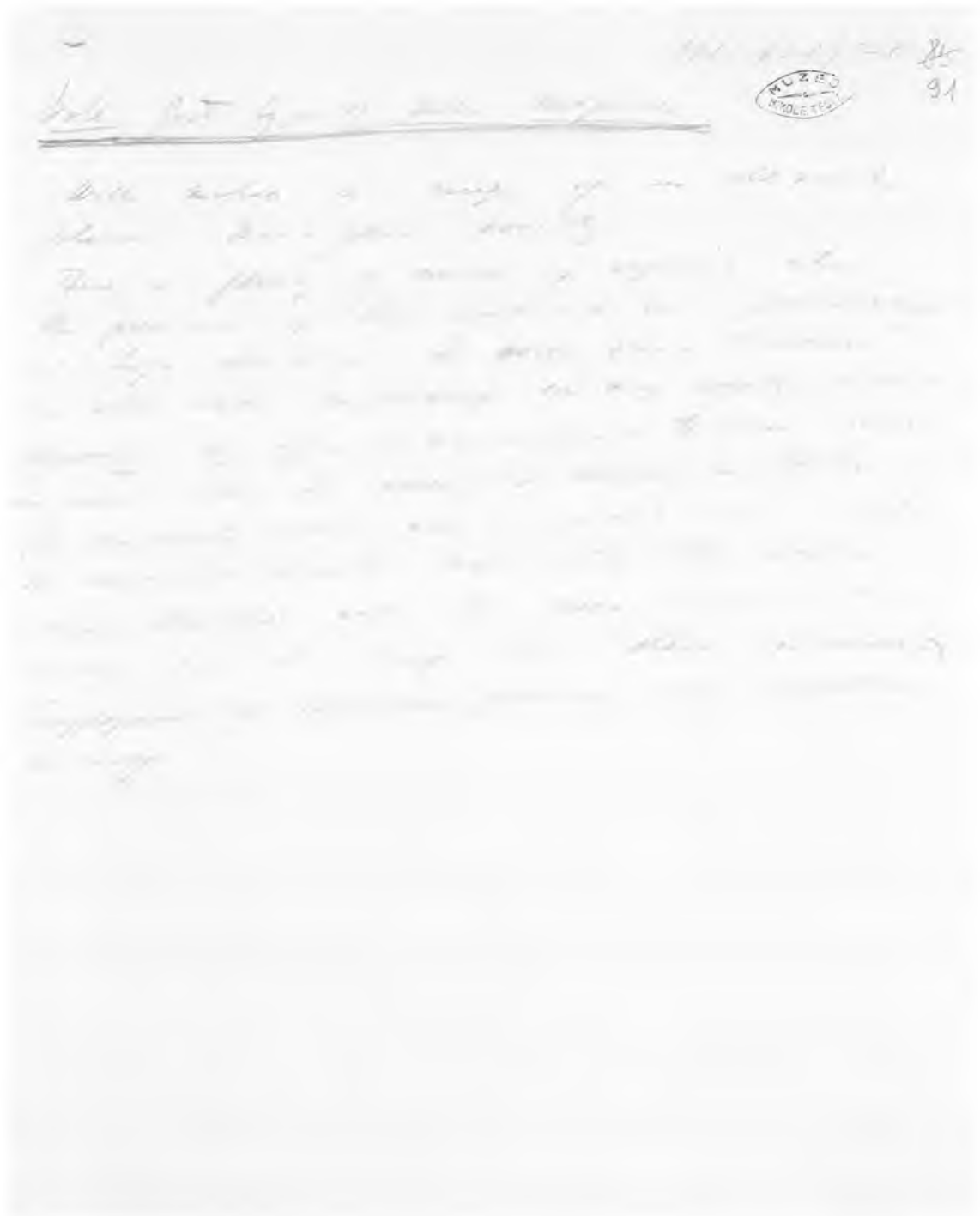
$200 \log 100 = 400$
Remainder 10^{400}

Loss ratio $\frac{1.7588}{100} = 0.017588$

" $h_p' = 0.017588 h$

Conclusion: With loss of head of 2% in cycle
for 200 cycles and the
ratio of the valvular conduit will be very
small as given in a sketch of valvular conduit.
But the conduit should be a total valvular
conduit rather than valvular of valvular character. The conduit should be

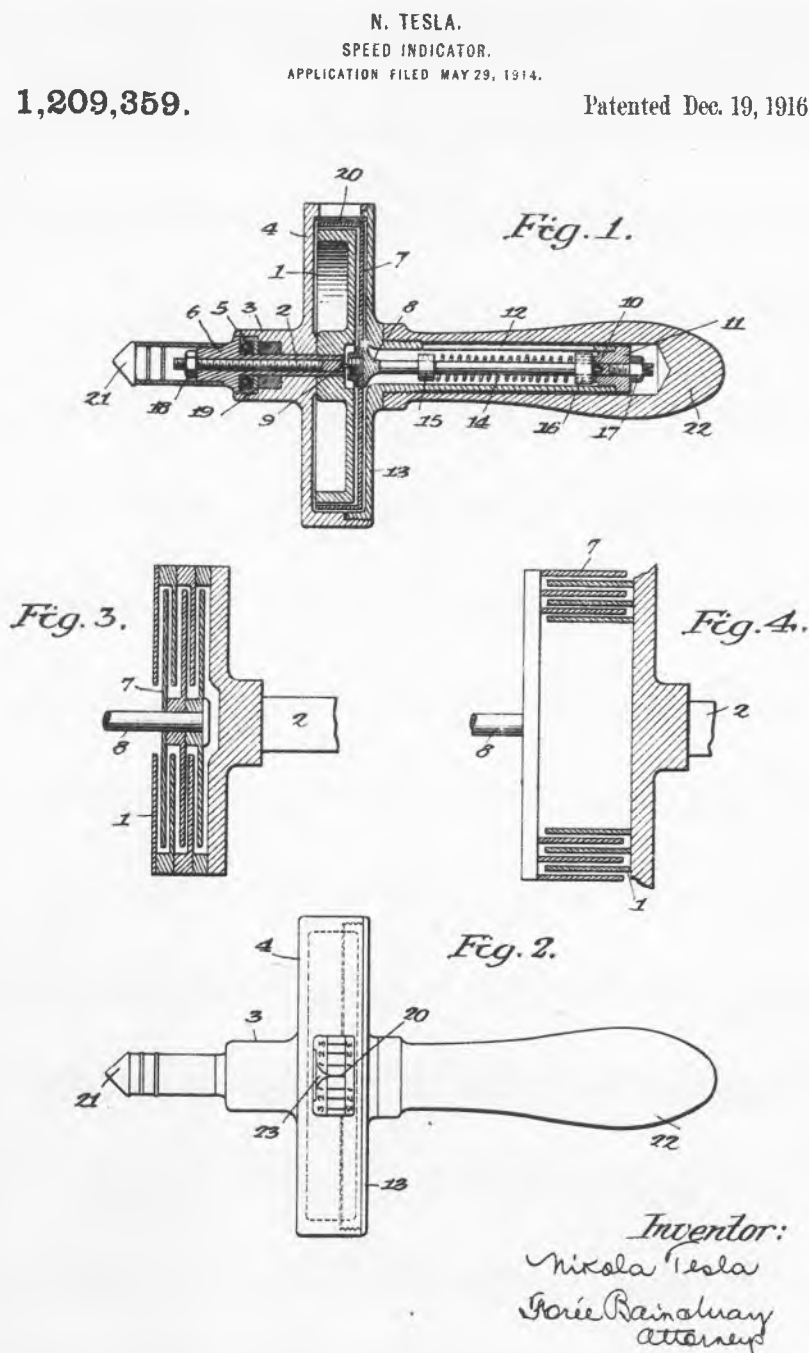
following pictures, as well as investigated its application within the installations on his pumps and turbines, as shown in the second of these pictures.



The speed indicator is one of Tesla's inventions that achieved large commercial success during the 1920s, and solved Tesla's financial problems for a period of time. The basic concept that this work is based on is the same one used in Tesla's pump and turbine, just in a different area of application - the measurement of speed using a new method. Tesla submitted the patent application for the first version of the speed indicator, with air as the working fluid, on May 29, 1914, and obtained the patent No. 1,209,359 on December 19, 1916.

1,209,359.

Patented Dec. 19, 1916.

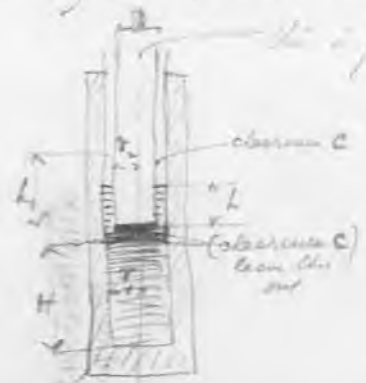


In the meantime, since he was dissatisfied with some parameters of the speed indicator, primarily with its behavior when measuring low speeds, Tesla worked on its improvement. He found the solution in the use of mercury as the working fluid, instead of air. At the same time, he was working on the improvement of construction details, as well as the calculations related to the principal dimensions of this speed indicator, some of which were preserved, as shown on the next pictures from October and November 1915.

Oct. 31. 1915 215

Mem. to Tesla

It is found that average variation of viscosity of the change range of 50°C is approximately 1.9 times the exposure of η for corresponding range of temperature. Hence in order to have uniformity of viscosity and standard dimensions of torque components for and under the influence and around for all temperatures within the limits the diameter of η and annular rings should be so calculated that volume area is increased in same ratio as viscosity is decreased. The η is varied in proportion as indicated:



the lower part of system isolated

the provided system to provide resistance

It is to have total volume of η

$$V = \frac{\pi}{4} r_1^2 H + \frac{\pi}{4} (r_1^2 - r_2^2) h$$

Mercury should rise as it is heated to a height h , not the h_1 the

1.9 times the volume of the

ratio $\frac{\mu}{\mu_1}$ μ viscosity at low temperature μ_1 " at high "

the H increase in many times greater as volume the annular active space is very small. And volume of large

chamber 1.9 times the volume of annular space that is

$$\frac{\pi}{4} r_1^2 \times H = \frac{\pi}{4} (r_1^2 - r_2^2) h \quad \text{Hence } r_3^2 = r_1^2 - r_2^2$$


Note to architect meter

Nov. 3, 1915 2H

In case of boots res. for the sale we have 100 typ. n
per second =

Quantity of air per second passing through section can
be found as follows:

$$\text{I assume speed velocity is: } \frac{5}{2} \times \frac{2.75}{12} \times 100 = \frac{8.64 \times 100}{24} \\ = 37 \text{ feet per second.}$$

In side open effective speed will be 0.75 the
velocity that is $0.75 \times 37 = 28$ feet - And it
is not convenient to reduce area assuming same
speed through the whole of it. The area effective
is $\frac{2}{100} \times \frac{7}{10} \times 1.375 = 0.01925$. The area of corner

$$\text{space is } \frac{7}{16} \times \frac{2}{100} = 0.4375 \times \frac{2}{100} = 0.004375$$

$$\text{Hence the } \begin{array}{r} 0.004375 \\ 0.01925 \\ \hline 0.023625 \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \text{ total } 0.024 \text{ sq. inch.}$$

The air moves through this section with a speed of
37 feet per second hence

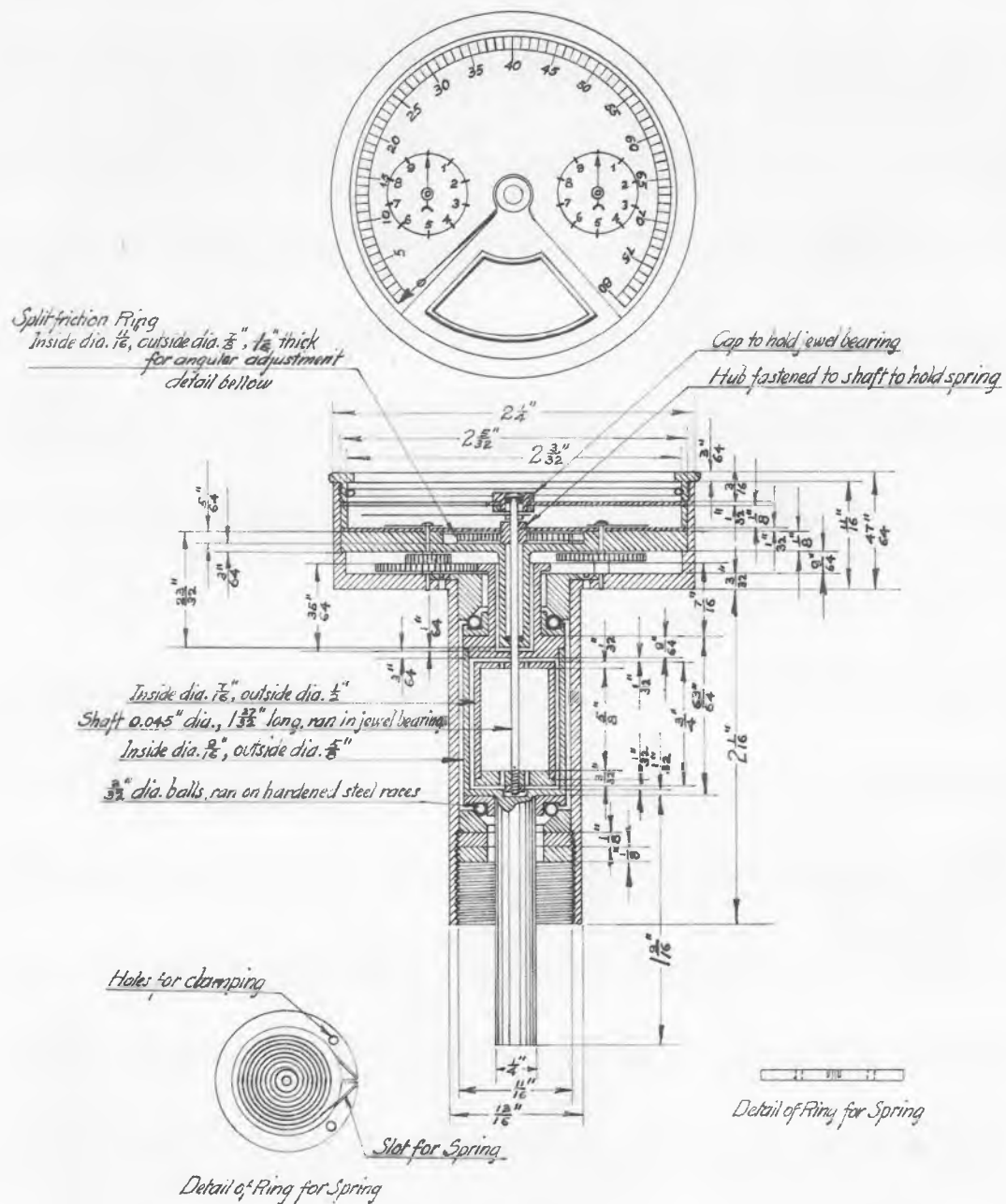
$$0.024 \times \frac{1}{144} \times 37 = 0.062 \text{ cub feet of air per second pass through section.}$$

Note we should really take effective speed into calculation. This means that $\frac{62}{1000}$ cub feet per second are well known & brought up to speed $74 \times \frac{7}{10} = 51.8$ sq
52 feet per sec.

$$\text{Finally we have } \frac{1}{2} A V^2 = P s \quad \frac{1}{2} \times \frac{1}{32} \times \frac{62}{1000 \times 12.6} \times 52^2 = P \times 37$$

$$P = \frac{167.65}{64 \times 12.6 \times 37} = \frac{16765}{2923680} = \frac{6}{1000} \text{ lbs. } \frac{96}{1000} \text{ sq } \frac{1}{10} \text{ ounce.}$$

Tesla's work resulted in a new, improved construction of the speed indicator, with better characteristics than the previous one. The corresponding technical drawing with all technical data necessary for the construction of this speed indicator is dated February 9, 1916.



Therefore, at that very moment, Tesla already had a developed desired final product; however, he submitted the patent application only in December of that year, and was awarded with the patent No. 1,274,816 in August 1918.

N. TESLA.
SPEED INDICATOR.
APPLICATION FILED DEC. 18, 1916.

1,274,816.

Patented Aug. 6, 1918.

Fig. 1.

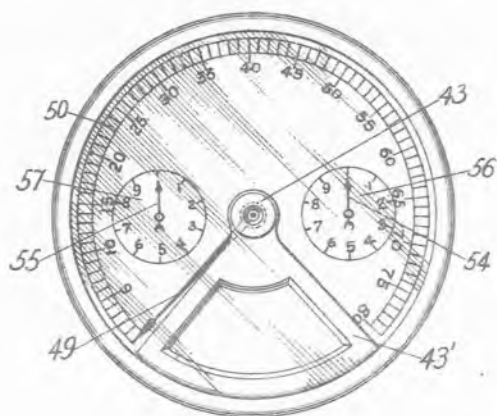


Fig. 3.

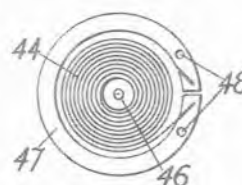


Fig. 2.

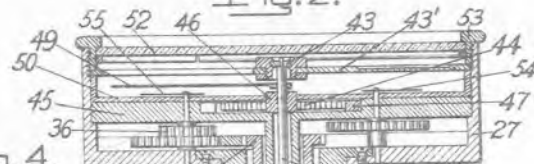


Fig. 4.

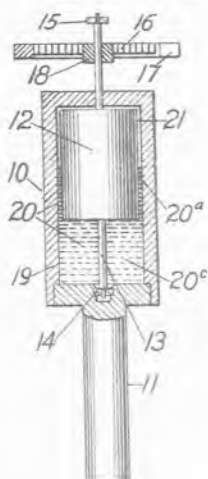
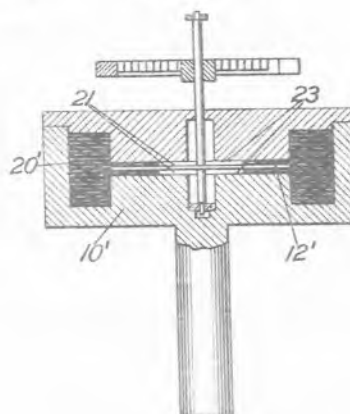
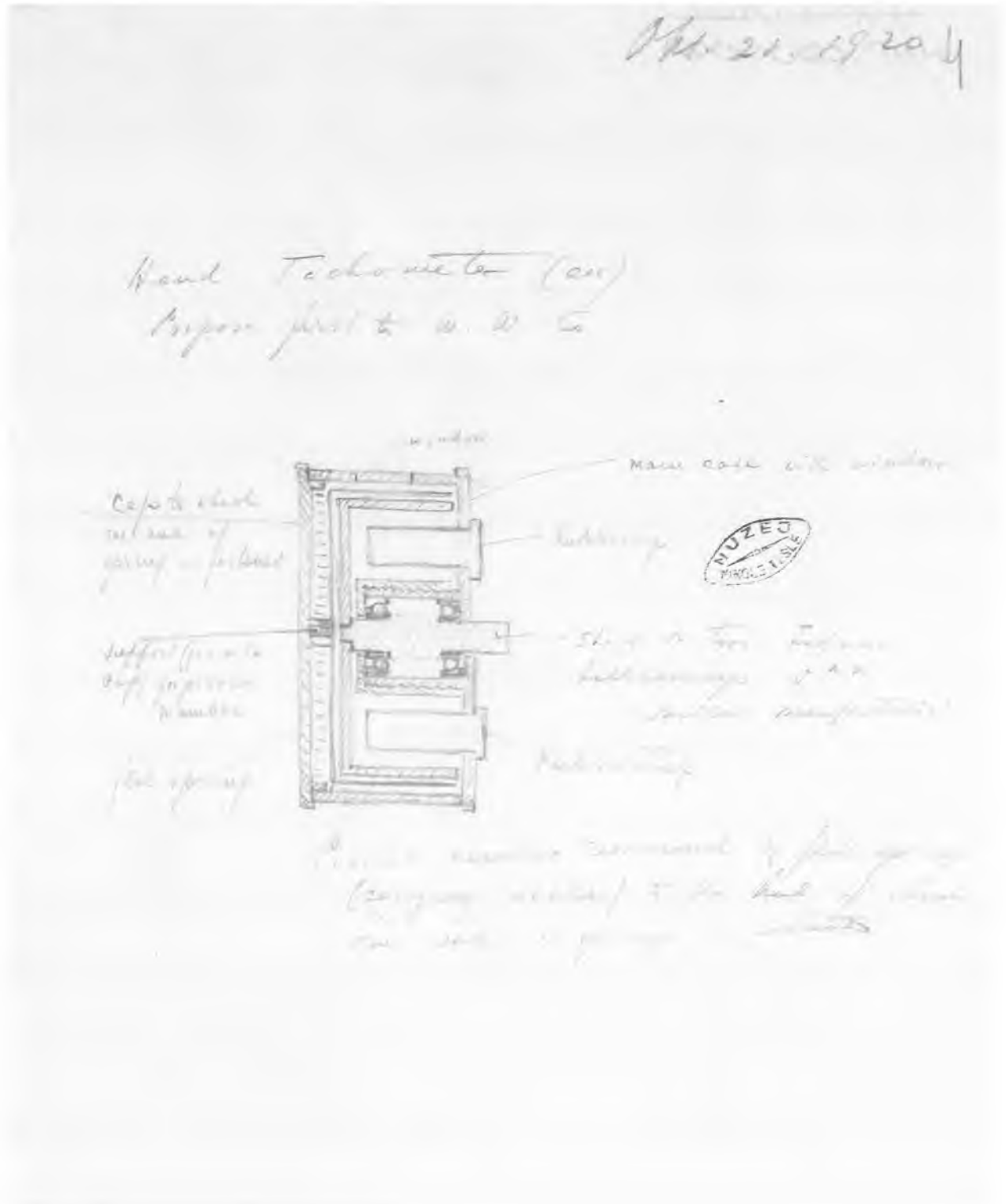


Fig. 5.



Inventor
Nikola Tesla
By his Attorneys
Foré Bain & May

Tesla continued working on his speed indicator after receiving the patent, as it can be seen from the following sketch dated May 21, 1920.



Finally, Tesla managed to sign license contracts for both of his patents with the Waltham Watch Company, under very favorable financial conditions, which provided him with relative financial security in that period of

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A G R E E M E N T.

THIS AGREEMENT, made and entered into at Waltham in the Commonwealth of Massachusetts, this ~~22nd~~ ^{23rd} day of November, 1921, by and between WALTHAM WATCH COMPANY, a corporation duly organized and existing under the laws of the Commonwealth of Massachusetts and having its principal place of business at Waltham in said Commonwealth, hereinafter termed the Licensor; and TESLA COMPANY, INC., a corporation duly organized and existing under the laws of the State of New York and having a regular and established place of business in the City of New York in said State of New York, hereinafter termed the Licensee; witnesseth,-



WHEREAS, the Licensor is the owner of Letters Patent of the United States No. 1,209,359, granted December 19, 1916, for "Speed-Indicators"; and

WHEREAS, the Licensee is desirous of acquiring the license and privilege of manufacturing, using and selling certain hereinafter-specified forms of Speed-Indicators embodying the inventions and improvements set forth and claimed in said Letters Patent;

NOW, THEREFORE, in consideration of the sum of One dollar and other valuable considerations paid unto the Licensor by the Licensee, the receipt whereof is hereby acknowledged, the parties hereto have agreed and by these presents do agree as follows:

(1) The Licensor has given and by these presents does give unto the Licensee, its successors and assigns, the exclusive right, license and privilege of manufacturing and selling for use and resale certain herein-identified forms of Speed-Indicators embodying the inventions and improvements

his life. The speed indicator, presented in the next picture, was a successful product on the market, and found application in various fields.



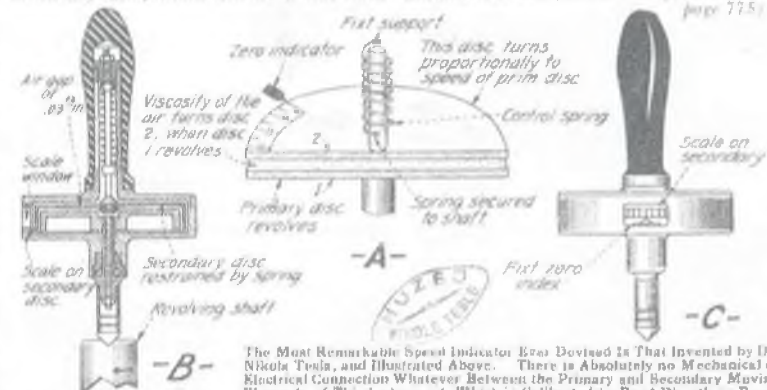
This invention by Tesla was also very favorably described in professional literature, and one of these articles, published in the magazine Science and Invention in December 1921, is preserved.

Tesla Air-Friction Speed Indicator

ONE of the latest wonders of applied science perhaps is the new Tesla speed indicator put out by the well known Waltham watch concern. Contrary to all previous designs and schemes employed in producing a direct-reading speed indicator or tachometer, as the engineers call it, Dr. Nikola Tesla, the famous electrical and radio expert, has here shown us a new trick in the physics of gases and liquids.

As becomes clear from the accompanying illustrations, this direct-reading speed indicator is supplied and calibrated to read in revolutions per minute, or in miles per hour, et cetera, according to the use to which the instrument is to be put; there is no direct mechanical connection between the driving and driven members of the instrument. In a few words what happens is this: When the first cup or disk secured to the driving spindle is rapidly rotated, by having its pointed end placed in contact with the engine or motor-shaft for example, the thin layer of air, about .03" thick, between it and the secondary disk or cup acts by virtue

of its viscosity or friction to drag around the secondary disk, which carries a dial from which the speed is read off by means of a fixed zero index or pointer. (Continued on page 775)



The Most Remarkable Speed Indicator Ever Devised Is That Invented by Dr. Nikola Tesla, and Illustrated Above. There is Absolutely No Mechanical or Electrical Connection Whatever Between the Primary and Secondary Moving Elements of This Instrument, Which is Calibrated to Read Directly in Revolutions per Minute, or Miles per Hour. Air Friction or Viscosity of the Air Accounts for the Drag Which Turns the Indicator Disk.

Science & Invention. December 1921.

In a later patent Dr. Tesla covers a scheme for using mercury instead of air between the cups or disks, in order to give a more pronounced and reliable scale reading or deflection of the pivoted secondary member, when the instrument is to be calibrated or low speeds. One of the remarkable outstanding features of the new Tesla speed indicator is the fact that the scale divisions are all of equal size, thus making the instrument much easier to read and also much simpler in its calibration. In calibrating, it is simply necessary to adjust the correcting or biasing spring, until the needle just reaches the upper part of the dial when the upper limit of speed to which the instrument is to be adapted is reached; it is then a simple matter to divide up the scale into equal divisions and to evaluate each division or group of divisions. The action of the apparatus is almost uncanny to the uninitiated, but the fact that the instrument has now been brought out commercially proves that it will do the work claimed for it, and that Dr. Tesla's theory and ideas as explained in his patents covering the device are correct.

A comprehensive laboratory test has proved that air friction is not influenced by heat, cold, or changes in altitude up to 10,000 feet. The makers of this instrument, which is being fitted on many of the leading high grade American motor cars this season, further state that by using this Tesla principle, a uniform scale of calibration is possible without oscillation or swinging of the needle, and the instrument further indicates immediately any speed-change.

Unfortunately, the succeeding inventions from Tesla did not achieve this level of success, which led to financial problems for the rest of his life. Although Tesla had a large number of patents, out of which some were very financially viable, the fact remains that he did not utilize his intellectual property properly, although its value could certainly compare to Edison's. Unlike the development process from the idea to the patent, which he mastered brilliantly, the other part - from the patent to its commercialization - often presented an insurmountable obstacle for Tesla, and the reason for that deserves an extensive analysis. However, the fact that Tesla's ability to commercialize his inventions has been significantly behind his inventing genius does not diminish his greatness in any way.



Fig. 2^a



Fig. 3^a

8. Conclusion



Fig. 4^a



Fig. 5^a



Fig. 6^a



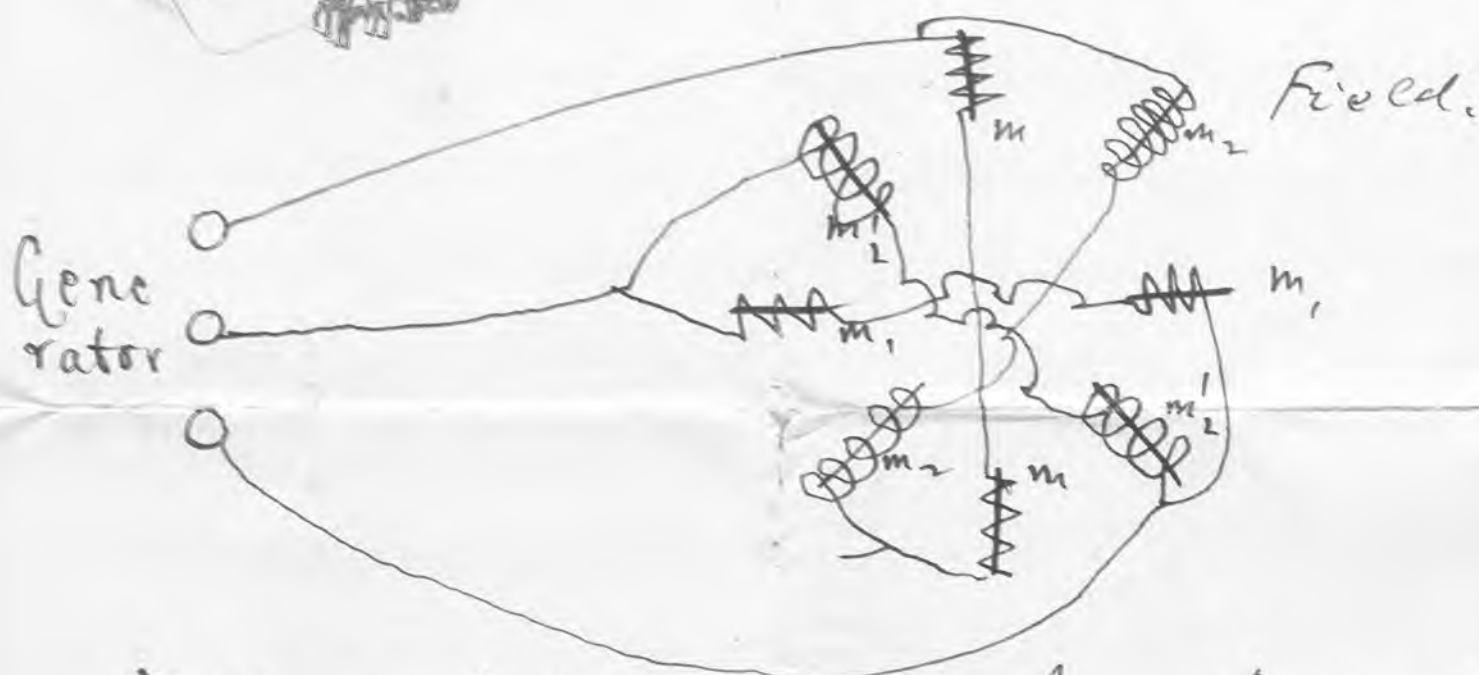
Fig. 7^a



PITTSBURGH,



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$m_1 m_2$ and $m_1' m_2'$ keep be 90° apart
 and $i m_1 m_2$ - and $m_1' m_2'$ are -
 $m_1 m_2$ - and $m_1' m_2'$ are 45°

Based on the analysis and systematization of the available literature, the data collected during the work at the Nikola Tesla Museum, as well as the patents obtained in the subsequent period, we have created the list of Nikola Tesla's U.S. patents, the list of Tesla's patents in countries outside the U.S., as well as the list of original patents of Nikola Tesla, which contains 116 patents, out of which 109 are U.S. patents, and 7 are British. The list of Nikola Tesla's inventions protected by original patents contains a total of 125 inventions, subject to protection with original patents.

It was also established that Tesla had 164 analogs of original patents, including the additional and re-issued patents, which means that Tesla obtained a total of 280 patents for his inventions, in 27 different countries of the world.

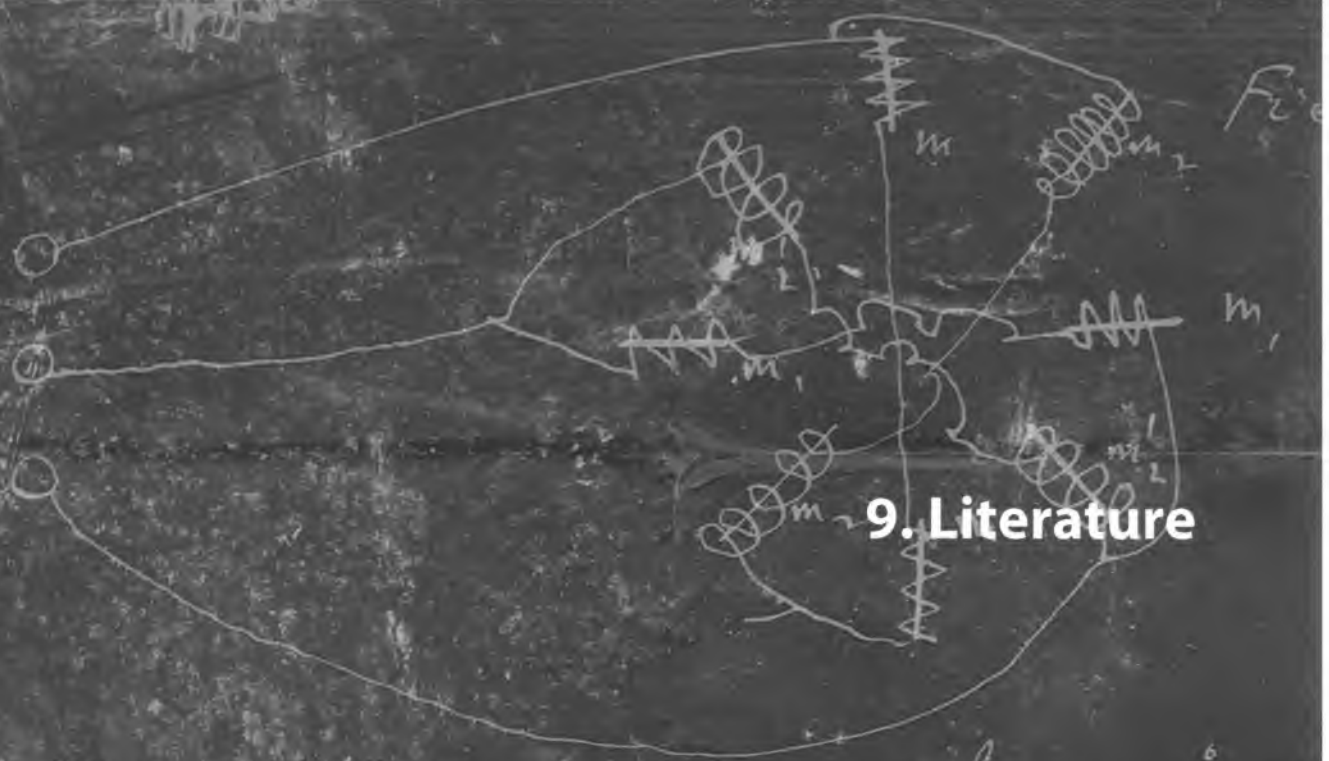
Unlike the list of original patents, which is probably complete, the list of analogs is still not complete, because there are indications of the existence of a certain number of analogs unknown to date.

Additionally, the documentation from Tesla's 33 U.S. patent applications that the U.S. Patent Office failed to issue patents for is also presented. These applications sought protection for at least 39 inventions, out of which Tesla did not succeed to protect at least 28 inventions in any other country.

Tesla also had one registered US trademark, which he intended to use for a special type of bird feed.

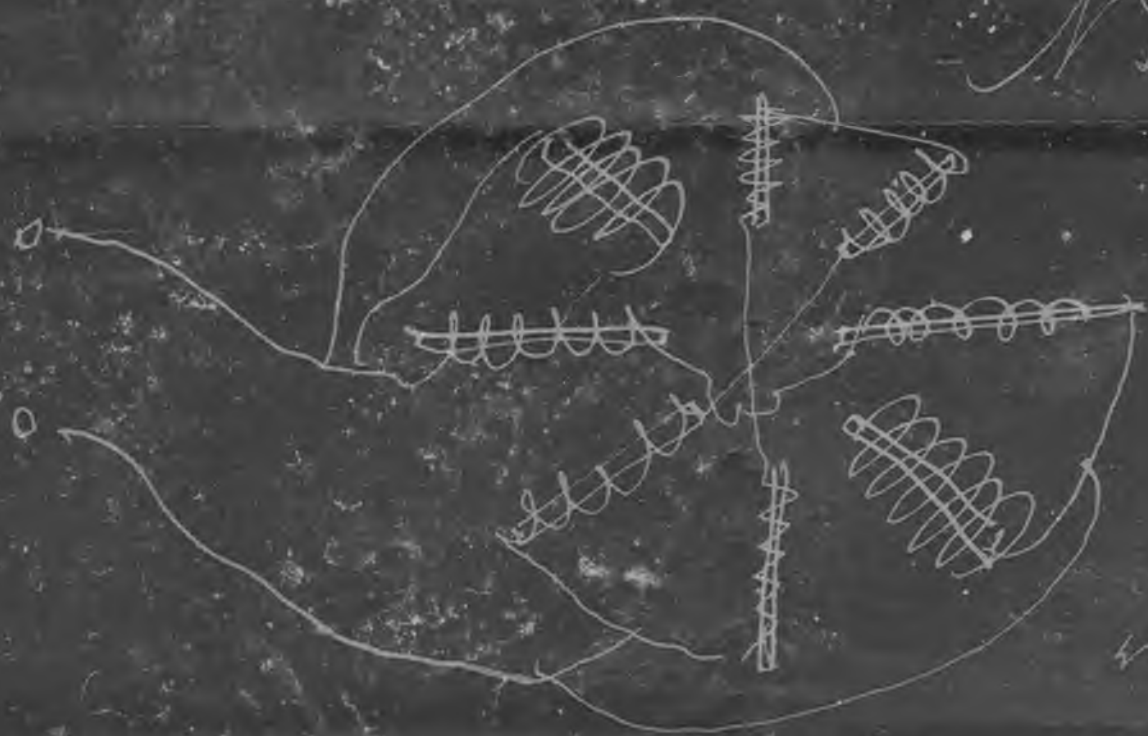
The archives of the Nikola Tesla Museum also contain information about patent applications that Tesla prepared for submission, but failed to submit. In addition, Tesla created a considerable number of inventions that he never attempted to protect, such as, for instance, application of high-frequency currents for medical purposes, and glowing vacuum tubes. For that reason, it remains practically impossible to establish the exact number of Tesla's inventions.

Gene
rator



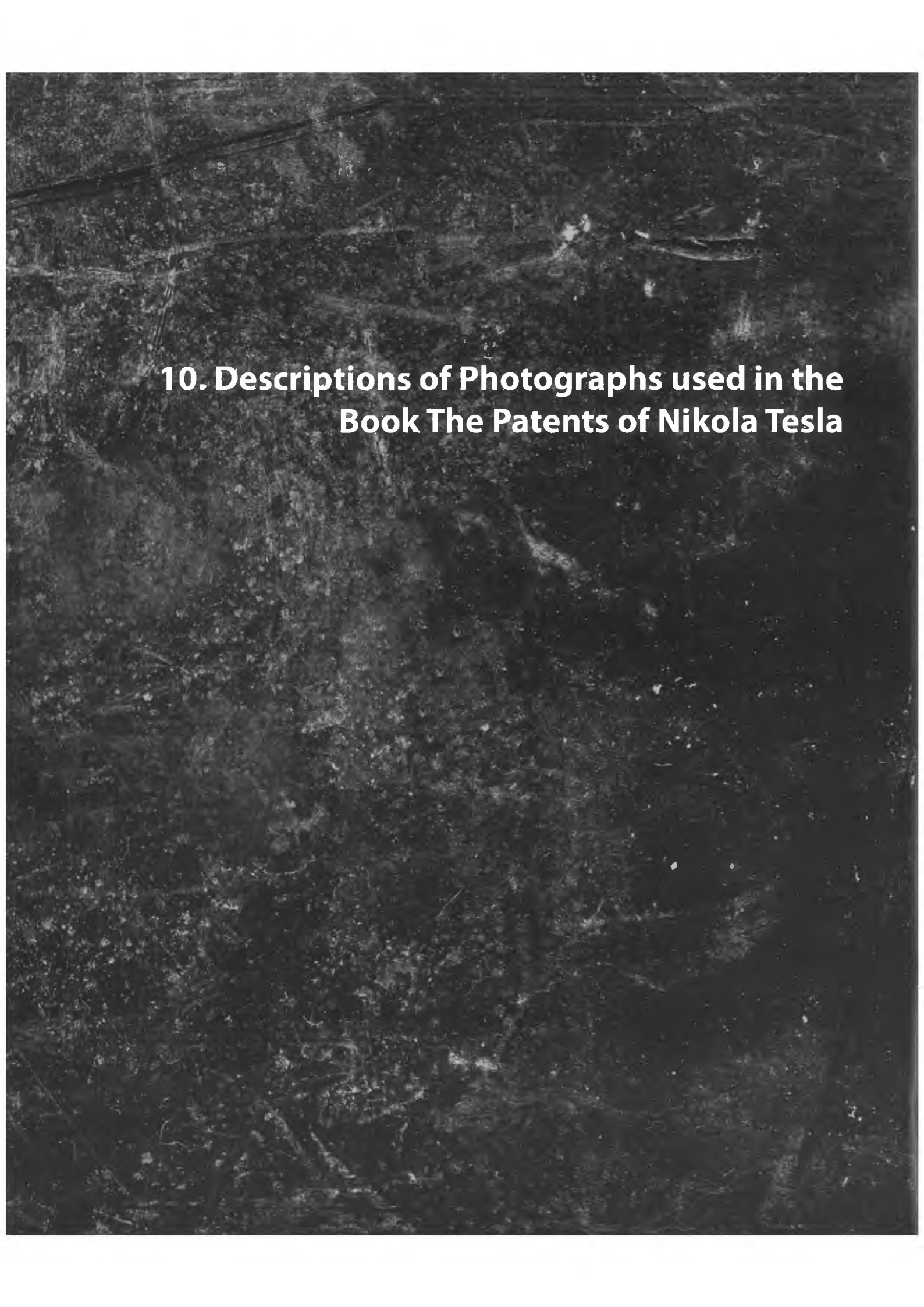
9. Literature

m_1 and m_2 keep be 90° ap
and i to m_1 — and m_2 keep
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Amos
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with all

1. Slavko Bokšan, **Delo Nikole Tesle**, (The Works of Nikola Tesla), SAN, Belgrade, 1950
2. **Nikola Tesla - Lectures, Patents, Articles**, edited by Vojin Popović, Radoslav Horvat and Nikola Nikolić, Nolit, 1956
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4. **Dr. Nikola Tesla Complete Patents**, Tesla Book Co., Millbrae, USA, 1983
5. **Izabrana dela Nikole Tesle: Patenti I**, (The Selected Works of Nikola Tesla: Patents I), Zavod za udžbenike i nastavna sredstva (The Institute for Textbooks and Teaching Aids), Belgrade, 1996
6. **Izabrana dela Nikole Tesle: Patenti II**, (The Selected Works of Nikola Tesla: Patents II), Zavod za udžbenike i nastavna sredstva (The Institute for Textbooks and Teaching Aids), Belgrade, 1996
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8. **Izabrana dela Nikole Tesle: Patenti IV**, (The Selected Works of Nikola Tesla: Patents IV), Zavod za udžbenike i nastavna sredstva (The Institute for Textbooks and Teaching Aids), Belgrade, 1996
9. S.D. Šarboh, **Američki patenti Nikole Tesle**, (The U.S. Patents of Nikola Tesla), "Glasnik intelektualne svojine" ("The Intellectual Property Gazette") No. 4/99, pg.813-819, Belgrade, 1999
10. S.D. Šarboh, **Patenti Nikole Tesle registrovani u drugim zemljama osim SAD**, (Nikola Tesla's Patents Registered in Countries other than the United States), "Glasnik intelektualne svojine" ("The Intellectual Property Gazette") No. 4/03, pg.437-449, Belgrade, 2003
11. S.D. Šarboh, **Dopuna liste patenata Nikole Tesle registrovanih u drugim zemljama osim SAD**, (Addition to the List of Nikola Tesla's Patents Registered in Countries other than the United States), "Glasnik intelektualne svojine" ("The Intellectual Property Gazette") No. 3/04, pg. 695-698, Belgrade, 2004
12. S.D. Šarboh, **Patenti Nikole Tesle**, (The Patents of Nikola Tesla), a study published on the web site of the Intellectual Property Office: www.yupat.sv.gov.yu in April 2004
13. S.D. Šarboh, **Belgijski patenti Nikole Tesle**, (The Belgian Patents of Nikola Tesla), "Glasnik intelektualne svojine" ("The Intellectual Property Gazette") No. 1/05, pg. 167-168, Belgrade, 2005
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17. Web site of the Nikola Tesla Museum: www.tesla-museum.org
18. Wikipedia web site www.wikipedia.org
19. Web site of the U.S. Patent and Trademark Office: www.uspto.gov
20. Web site of the European Patent Office: www.european-patent-office.org
21. Web site of the German Patent and Trademark Office: <http://depatisnet.dpma.de>

The background of the entire page is a dark, heavily textured surface, possibly a book cover or a piece of old paper. It features a complex pattern of light and dark spots, scratches, and fibers, giving it a mottled, aged appearance. The lighting is uneven, with some areas appearing slightly brighter than others, emphasizing the texture.

10. Descriptions of Photographs used in the Book The Patents of Nikola Tesla

SIGNATURE	PAGE	DESCRIPTION
MNT, VI/V, 14	12	Nikola Tesla with the book by Rudjer Boskovic, "Theoria Philosophiae Naturalis," in front of the spiral secondary of the high-frequency transformer in his laboratory at 46 East Houston Street, New York. Photographer: George Grantham Bain.
MNT, VI/IV, 30	20	Transmission tower with the power station and laboratory for the "World System," in construction, Wardencllyffe, Long Island, near New York.
MNT, VI/I, 61	23	One of Tesla's motors, presented at the lecture held on May 16, 1888 at Columbia University for the American Institute of Electrical Engineers.
MNT, VI/V, 53	24	Tesla with the representatives of the Westinghouse Company in 1938, at the celebration of 50 years of the invention of the induction motor. The motor on the photograph was made at the Westinghouse Company factory in Pittsburgh, and corresponds to the first induction motor that Tesla constructed in Strasbourg in 1883.
	25	3D computer model of Tesla's aircraft with vertical take-off and landing.
MNT, VI/IV, 52	34	The inside of the Long Island Laboratory, arranged as an exhibition of Tesla's numerous inventions.
MNT, VI/IV, 48	48	Tesla's laboratory on 46 East Houston Street, New York, illuminated with artificial daylight - his vacuum tubes.
MNT, VI/III, 90	51	Tesla's turbo pump installed at Bridgeport, March 14, 1916.
MNT, VI/IV, 46	66	Interior of the Colorado Springs laboratory, showing condensers, break motor and regulating coil in primary of oscillator. Westinghouse high tension transformer, supply transformers, and arresters in background.
T: 23.1	86	Prototype of Tesla's pump.
MNT, VI/II, 201	87	The remote-controlled boat that Tesla presented at his lecture in Chicago in 1899. The apparatus was improved compared to the boat he presented to the public in 1898 so it was also capable of diving.
MNT, VI/II, 184	100	Glowing vacuum tubes that Tesla exhibited at the Chicago World's Fair in 1893. At the exhibition, he experimented with high-voltage and high frequency currents by letting them flow through his body and using them to light up vacuum tubes.

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001.894 Тесла Н.

ŠARBOH, Snežana

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Belgrade : Nikola Tesla Museum, 2007
(Belgrade : Dexin). - 135 str. : ilustr.
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а) Тесла, Никола (1856-1943) - Патенти

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