PATENT AGREEMENT

Dec. 22nd , 19 43

In consideration of and as an inducement to the Metallurgical Laboratory of the University of Chicago to employ me, and in recognition of the fact that the Metallurgical Laboratory is engaged exclusively in the performance of a contract with the Government of the United States, I hereby agree:

- 1. That the services for which I am employed and paid include the improvement of the processes, apparatus, machines, and appliances which the Metallurgical Laboratory is utilizing in the course of its work and all researches related thereto.
- 2. That every invention or improvement developed by me during the course of such employment pertaining to the work now or hereafter carried on by the Metallurgical Laboratory, shall become the property of the Government of the United States.
- 3. To disclose promptly and fully all information concerning all such inventions or improvements to the Director of the Laboratory or such employee of the Laboratory as he may designate, and to assist the Metallurgical Laboratory and its officers and agents designated for that purpose in every possible way to obtain for the Government of the United States patents on any and all such inventions or improvements in the United States and in any and all foreign countries.
- 4. To assign by effective written instruments in such forms as may be determined by the Metallurgical Laboratory of the University of Chicago my entire right, title, and interest in and to each, every, and all such inventions and improvements to become the property of the Government of the United States and to be and remain its property whether patented or not.
- 5. To grant the Government of the United States full and exclusive power and right to prosecute at its expense by its attorney or attorneys any and all such applications for patents made by me pursuant to this agreement, and any and all proceedings in connection therewith, and to give such assistance and information and to execute all such applications for letters patent and other papers necessary or desirable to carry this agreement into effect.
- L.S. J. C. S. It is understood and agreed that the above patent release is 12-22-43 effective as of May 1, 1943.

Subs	er:	ibed	and	sworn	to
befo	re	me,	this	221	nd
					, 1943

(Signed) Leo Szilard

Lucartha P. Sullivan (Signed) Notary Public What is claimed is:

- 1. A power plant comprising a neutronic reactor, a tube extending into said reactor, a neutron absorbing liquid in said tube, and means for changing the amount of the liquid in said tube to control said reactor.
- 2. A power plant comprising a neutronic reactor, a tube extending in a vertical direction into said reactor, a neutron absorbing liquid in said tube and means for changing the level of the liquid in said tube to control said reactor.
- 3. A power plant comprising a neutronic reactor, a tube extending in a vertical direction into said reactor, a liquid metal in said tube and means for changing the level of the liquid metal in said tube to control said reactor.
- 4. A power plant comprising a neutronic reactor, a tube extending in a vertical direction into said reactor, a liquid metal containing bismuth in said tube and means for changing the level of the liquid metal in said tube to control said reactor.
- 5. A power plant comprising a neutronic reactor, a tube extending in a vertical direction into said reactor, a liquid bismuth containing a strong neutron absorber in said tube, and means for changing the level of the liquid bismuth in said tube to control said reactor.
- 6. A power plant comprising a neutronic reactor, a tube extending into said reactor, a neutron absorbing liquid in said tube, means for changing the amount of the liquid in said tube to control said reactor, and means for cooling the liquid.

- 7. A power plant comprising a neutronic reactor, a tube extending in a vertical direction into said reactor, a neutron absorbing liquid in said tube, means for changing the level of the liquid in said tube to control said reactor, and means for cooling the liquid.
- 8. A power plant comprising a neutronic reactor, a tube extending in a vertical direction into said reactor, a liquid metal in said tube, means for changing the level of the liquid metal in said tube to control said reactor, and means for cooling the liquid metal.
- 9. A power plant comprising a neutronic reactor, a tube extending in a vertical direction into said reactor, a liquid metal containing bismuth in said tube, means for changing the level of the liquid metal in said tube to control said reactor, and means for cooling the bismuth.
- 10. A power plant comprising a neutronic reactor, a tube extending in a vertical direction into said reactor, a neutron absorbing liquid in said tube, an exterior tank connected to the bottom of said tube and also containing said liquid to establish a liquid level common to said tube and tank, and means for moving said liquid into and out of said tank to vary the liquid level in said tube.
- 11. Apparatus in accordance with Claim 10 where the normal liquid level is such as to stop the operation of said reactor.
- 12. A power plant comprising a neutronic reactor, a system adapted to conduct a metal normally solid at ambient temperatures through said reactor, means for heating said reactor and said system to liquify said metal, and means for circulating said liquid metal through said reactor.
- 13. In combination, a neutronic reactor having uranium bodies dispersed in a neutron moderator, and a liquid metal comprising bismuth in said reactor in an amount between about one-half of the weight to the total weight of the uranium in the reactor not substantially greater than the weight of the uranium in said reactor.

- 14. The method of cooling a neutronic reactor having discrete bodies containing uranium disposed in a moderator comprising passing a liquid metal coolant through said reactor in contact with said bodies.
- 15. The method of cooling a neutronic reactor having discrete bodies containing uranium disposed in a moderator comprising passing a liquid metal coolant through said reactor in contact with the interior of said bodies.
- 16. The method of cooling a neutronic reactor having discrete bodies containing uranium disposed in a moderator comprising passing a liquid metal coolant through said reactor in contact with the exterior of said bodies.
- 17. The method of cooling a neutronic reactor having discrete bodies containing uranium disposed in a moderator comprising passing a liquid metal containing bismuth through said reactor in contact with said bodies.
- 18. The method of cooling a neutronic reactor having discrete bodies containing uranium disposed in a moderator comprising passing a liquid metal containing bismuth through said reactor in contact with the interior of said bodies.
- 19. The method of cooling a neutronic reactor having discrete bodies containing uranium disposed in a moderator comprising passing a liquid metal containing bismuth through said reactor in contact with the exterior of said bodies.
- 20. The method of cooling a reactor comprising passing a liquid bismuth through said reactor to remove the heat of reactor operation, shutting down the reactor, continuing the passage of said liquid bismuth and reducing the melting point of said bismuth by adding lead thereto.
- 21. A device for producing heat energy for power comprising bodies containing uranium geometrically arranged in an efficient, low neutron-absorbing, neutron slowing-down material, passages through said bodies, a fluid, means passing the fluid through the passages in the uranium bodies so as to extract heat from the walls of said passages, means extracting

the heat from the fluid, and means circulating the fluid in said heat exchange relationship at a sufficient rate to stabilize the temperature in said devide.

- 22. The method of extracting heat from a self-sustaining neutron chain reacting system employing a fissionable material and an efficient neutron slowing material capable of slowing fast neutrons to thermal energy comprising passing a fluid having a danger coefficient less than one in heat exchange relationship with the fissionable material, and then removing the fluid from the system.
- 23. For use in a neutron chain reacting system, a uranium body having a passage therethrough for circulation of a coolant therethrough.
- 24. For use in a neutron chain reacting system, a fissionable material in the form of a body having a passage therethrough for circulation of a coolant therethrough.
- 25. For use in a neutron chain reacting system, a fissionable material in the form of a body cylindrical in form and having a passage therethrough for circulation of a coolant therethrough.
- 26. A neutronic reactor comprising a moderator having channels therein, masses comprising uranium and smaller in diameter than said channels
 positioned along the channels, said channels being adapted to conduct a
 coolant into contact with the masses.
- 27. A neutronic reactor comprising a moderator having channels therein, masses comprising fissionable material and smaller in diameter than said channels positioned along the channels, and means passing a coolant through the channels in contact with the masses.
- 28. In a neutronic chain reacting system, a neutron moderator having channels therein, means for passing a fluid coolant through said channels, and a plurality of uranium rods positioned in said channels.

- 29. In a chain neutron reacting system operating by virtue of nuclear fission of a fissionable material, means for abstracting the heat of fission comprising a body of fluid in heat exchange relationship with the fissionable material in the system.
- 30. The method of cooling a neutronic reactor having a moderator and uranium bodies dispersed therein comprising passing a liquid metal containing bismuth in heat exchange relation to said uranium.
- 31. The method of cooling a neutronic reactor having a moderator and uranium bodies dispersed therein comprising passing a liquid metal containing bismuth through the interior of said bodies.
- 32. The method of cooling a neutronic reactor having a moderator and uranium bodies dispersed therein comprising passing a liquid metal containing bismuth in heat exchange relation with the exterior of said bodies.
- 33. The method of operating a neutronic reactor comprising passing a coolant through said reactor, and removing from said coolant a radioactive element formed by neutron absorption by said coolant.
- 34. The method of operating a neutronic reactor comprising passing bismuth through said reactor and removing from the reactor polonium formed by neutron absorption by said bismuth.
- 35. The method of transmitting elements comprising repeatedly passing said elements through a neutronic reactor, removing heat from said elements between passes, and thereafter recovering from said elements different elements formed by neutron absorption during said passes.
- 36. A neutronic reactor comprising a moderator, uranium bodies dispersed in said moderator, coolant tubes positioned in heat exchange relation to said uranium bodies, and a liquid metal coolant in said coolant tubes.

- 37. A neutronic reactor comprising a moderator, uranium bodies dispersed in said moderator, coolant tubes positioned in heat exchange relation to said uranium bodies, and a liquid metal comprising bismuth in said coolant tubes.
- 38. A neutronic reactor comprising a moderator, uranium bodies dispersed in said moderator, coolant tubes positioned in heat exchange relation to said uranium bodies, and a liquid metal of low neutron capture crosssection in said coolant tubes.
- 39. A neutronic reactor comprising a moderator, uranium bodies dispersed in said moderator, coolant tubes positioned in heat exchange relation to said uranium bodies, and a liquid metal bismuth alloy in said coolant tubes.
- 40. A neutronic reactor comprising a moderator, uranium bodies in said moderator, and means for conducting a liquid metal coolant in heat exchange relation with said uranium bodies.
- 41. A neutronic reactor comprising a moderator, uranium bodies in said moderator, and means for conducting a liquid metal coolant through the interior of said bodies.
- 42. A neutronic reactor comprising a moderator, uranium bodies in said moderator and means for conducting a liquid metal coolant over the exterior surface of said bodies.
- 43. A neutronic reactor comprising a moderator, uranium bodies in said moderator, and means for conducting a liquid metal coolant between said bodies and said moderator.

- 44. A neutronic reactor comprising a liquid moderator, uranium bodies dispersed in said moderator, means for conducting a liquid coolant through said moderator, means for conducting a liquid coolant through said bodies at a temperature higher than the boiling point of said moderator, and means providing heat insulation between said bodies and said moderator.
- 45. A neutronic reactor comprising a liquid moderator, uranium bodies dispersed in said moderator, means for conducting a liquid coolant through said bodies at a temperature higher than the boiling point of said moderator, and means providing a heat insulating space between said bodies and said moderator.
- 46. A neutronic reactor comprising a liquid moderator, uranium bodies dispersed in said moderator, means for conducting a liquid coolant through said bodies at a temperature higher than the boiling point of said moderator, and means providing a gaseous barrier between said bodies and said moderator.
- 47. A neutronic reactor comprising a liquid moderator, uranium bodies dispersed in said moderator, means for conducting a liquid coolant through said bodies at a temperature higher than the boiling point of said moderator, and means providing a space filled with helium between said bodies and said moderator.
- 48. A neutronic reactor system comprising a neutronic reactor, and a primary circulating system operating to cool and recirculate a coolant through said reactor to be made radioactive thereby.
- 49. The method of operating a neutronic reactor having discrete uranium bodies disposed in a neutron moderator comprising maintaining the uranium at a lower temperature than that prevailing in the moderator.

- 50. The method of operating a neutronic reactor having discrete uranium bodies disposed in a neutron moderator comprising cooling the uranium to a lower temperature than that prevailing in the moderator.
 - 51. The features of novelty herein shown and/or described.

PATENT AGREEMENT

Whereas, Columbia University has entered into a contract or contracts with the Director, Office of Scientific Research and Development in the Office for Emergency Management, Executive Office of the President, as contracting officer for the United States of America, for conducting certain studies and experimental investigations in connection with the development of methods and equipment of use in national defense;

and Whereas, under the terms of the said contract or contracts it is understood and agreed that whenever any patentable discovery or invention is made by the Contractor or its employees in the course of the work under this contract or these contracts, the Director, Office of Scientific Research and Development, shall have the sole power to determine whether or not a patent application shall be filed, and to determine the disposition of the title to and the rights under any application or patent that may result; and it is further understood and agreed that the judgment of the Director, Office of Scientific Research and Development, on such matters shall be accepted as final, and the Contractor, for itself and for its employees, agrees that the inventor or inventors will execute all documents and do all things necessary or proper to carry out the judgment of the Director, Office of Scientific Research and Development; and the Contractor agrees that it will include the provisions of this paragraph in all contracts of employment with persons who do any part of the work, investigations, and developments called for in the contract or contracts;

and whereas, the undersigned has accepted employment by Columbia University to assist the University in carrying out the terms of the said contract or contracts,

the undersigned agrees that he will promptly report and communicate to the Director, National Defense Laboratories of Columbia University, or to such other individuals as the University may from time to time designate, any and all inventions relating to or arising from the work on which he is employed or which he may make from the time of entering the employment of Columbia University to assist in carrying out the said contract or contracts until he leaves said employment,

and that he will, under the direction of the Director of the Columbia University-National Defense Laboratories or such other individuals as the University may from time to time designate, do whatever is necessary to take out patents on these inventions or discoveries in all or any countries as and when requested before or after leaving its employment, and will assign the inventions and all patents and applications relating to them to Columbia University as and when requested before or after leaving its employment, it being understood that the necessary cost and expense of making such assignments and procuring such Letters Patent shall be paid by others than the inventor,

and further that the undersigned recognizes that the making of such inventions and transferring them to Columbia University is an important part of the work under the contract or contracts with the United States of America under which he is employed by Columbia University,

and further that the undersigned understands and agrees that if and when he makes any patentable discovery or invention in the course of this employment, the Director, Office of Scientific Research and Development, shall, in accordance with the said contract or contracts, have the sole power to determine whether or not Columbia University shall require the undersigned to file a patent application, and that under the contract or contracts the Director, Office of Scientific Research and Development, shall have the sole and final power to determine the disposition of the title to and the rights under any application or patent that may result,

and the undersigned further agrees that he will execute all documents and do all things necessary or proper to carry out the judgment of the Director, Office of Scientific Research and Development.

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Note: If the oath is taken before a Notary Public the date of expiration of his commission should be shown.

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STATE OF NEW YORK)

COUNTY OF NEW YORK)

IEO SZILARD, being duly sworn, deposes and says:

The only bank account which I have in the United States is the one with the Chase National Bank. The present balance in this bank account, as of August 30, 1943, is \$1,042.87.

I may have another banka ccount in England. If so, the balance would be less than \$500.00, but I have no received any statements from England for years.

Of securities I bought 3000 shares Eldorado Gold Mine Ltd. in Canada in 1939. I gave orders kest Monday to sell these shares. I believe the value of these shares is less than \$1500.00.

Some time ago I bought \$400. war bonds, but on September 3, 1943 I sent them back to the Federal Reserve Bank for a refund. I have no other stocks or bonds.

I have not applied for any patents since March 20, 1939, when I applied for the patent which was abandoned.

Sworn to before me this 9th day of September, 1943. Adam 8 191

STATE. OF NEW YORK) SS:

IEO SELLARD, being duly saoru, deposes and says:

The only dant account without mave in the present balance
is the one with the Chase National Bank. The present balance
in this bank account, as of August 50, 1945, is \$1,042.87.

I may have another bank account in England. If so, the balance
would be less than \$500.00, but I have no received any statements from England for years.

Of securities I bought 5000 shares Eldoredo Gold Min Ltd. in Canada in 1939. I gave orders hat Monday to sell these shares. I believe the value of these shares is less than \$1500.00.

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METHOD OF OR ABSENCE OF ADVERTISING

(Sec. 3709 of the Revised Statutes)

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proper authority without written agreement in any form. In case of a written agreement (formal contract, proposal, and acceptance, or less formal agreement) Standard Form No. 1036—Revised should be used for abstracting the method of or absence of advertising and award of contract. (See General Regulations No. 51, Supplement No. 6, General Accounting Office, Aug. 20, 1930.)

THIS DOCUMENT HAS BEEN
TAKEN FROM A FILE OF THE
ARGONNE NATIONAL LABORATORY
AND WAS TURNED OVER TO DR. LEO SZILARD ON Danen C. Johnson

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METHOD OF OR ABSENCE OF ADVERTISING

(Section 3709 of the Revised Statutes)

1.	After	adv	vertising	in	newspapers.
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- 2. (a) After advertising by circular letters sent to ____ dealers.
 - (b) And by notices posted in public places.

(If notices were not posted in addition to advertising by circular letters sent to dealers, explanation of such omission must be made. The notation on the certificate on the face of the voucher must be "2(a)(b)" or "2(a)", depending on whether or not notices were posted.)

- 3. Without advertising, under an exigency of the service which existed prior to the order and would not admit of the delay incident to advertising.
 - 4. Without advertising in accordance with
 - 5. Without advertising, it being impracticable to secure competition because of _____

(Here state in detail the nature of the exigency or circumstances under which the securing of competition was impracticable under 3 and 4)

Note.—The above form "Method of or Absence of Advertising" is to be used when purchases are made or services secured under proper authority without written agreement in any form. In case of a written agreement (formal contract, proposal, and acceptance, or less formal agreement) Standard Form No. 1036—Revised should be used for abstracting the method of or absence of advertising and award of contract. (See General Regulations No. 51, Supplement No. 6, General Accounting Office, Aug. 20, 1930.)

16-22900-1

I further certify that the amount of this voucher is accepted as full and complete payment of the consideration set forth in the contract, and waive claim to any additional right of compensation arising from the contract.

THIS DOCUMENT HAS BEEN TAKEN FROM A FILE OF THE ARGONNE NATIONAL LABORATORY AND WAS TURNED OVER TO DR. LEO SZILARD ON

Daven C. Johnson

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METHOD OF OR ABSENCE OF ADVERTISING (Section 3709 of the Revised Statutes)

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MEMORANDUM OF AGREEMENT THE OF THE OF

WHEREAS, Szilard, as joint inventor, has invented certain new and useful improvements in Methods for Testing Materials, for which he is about to file an application for U. S. Letters Patent, identified as S-1/501, and believes that he now owns the hereinafter granted rights, privileges, and interests relative thereto, and

WHEREAS, Szilard believes that he is the sole or joint inventor of certain inventions, discoveries and improvements in the field of Nuclear Physics made prior to 1 November 1940; and

WHEREAS, Szilard believes that he is now the owner of the entire right, title and interest in and to all of the hereinafter granted inventions, discoveries and improvements made by him in the field of Nuclear Physics prior to 1 November 1940 and that he is now the owner of an undivided right, title and interest in and to any and all of the hereinafter granted inventions, discoveries and improvements jointly made by him with others in the field of Nuclear Physics prior to 1 November 1940; and

WHEREAS, Szilard believes that he is the sole or joint inventor of certain inventions, discoveries and improvements in the field of Nuclear Physics made after 1 November 1940, and alone or jointly has conceived and developed methods, apparatus, devices and compositions in said field after 1 November 1940, all while in the employ of the Trustees of



Columbia University in the City of New York and/or the University of Chicago starting 1 November 1940, pursuant to certain employment agreements with said Universities, respectively, and believes that be now owns the hereinafter granted rights, privileges, and interests relative thereto, and admits that he is obligated to do whatever is necessary to take out patents on any and all inventions, discoveries, and improvements in any and all countries made by him during the periods of his said employments as and when requested by the Trustees of Columbia University in the City of New York and/or The University of Chicago and to assign upon request of the Trustees of Columbia University in the City of New York and/or The University of Chicago all rights, title and interest in and to any and all sole or joint inventions, discoveries and improvements thereon, as well as any and all patents and applications therefor to the Trustees of Columbia University in the City of New York and/ or The University of Chicago or to other assignees designated by the Trustees of Columbia University in the City of New York and/or The University of Chicago; and

WHEREAS, the Government is desirous of acquiring the rights, privileges and interests hereinafter granted and believed to be at the present time owned by Szilard in and to said applications to be filed and identified as S-1/501, for Method of Testing Materials and in and to the inventions, discoveries and improvements disclosed therein; and the entire right, title and interest of Szilard in and to any and all sole or joint inventions, discoveries and improvements in the field of Nuclear Physics made prior to 1 November 1940 and now believed to be owned by Szilard with the exception of United States Letters Patent No. 2161,985

SECRET

issued to Szilard 3 June 1939 and entitled Process of OT 9300 British Patent No. 440023, and Secret British Patent assigned to the British Government in 1936, or the inventions covered by said patents, or any of them; and

WHEREAS, the Government is desirous of acquiring Szilard's entire right, title and interest in and to any and all sole or joint inventions, discoveries and improvements made by Szilard while employed by the Trustees of Columbia University in the City of New York and/or the University of Chicago on behalf of the Government;

NOW THEREFORE to all whom it may concern, be it known that for and in consideration of the sum of Fifteen Thousand Four Hundred Seventeen Dollars and Sixty Cents (\$15,417.60) to Szilard, in hand paid by the Government and for other good and valuable considerations, the receipt of which is hereby acknowledged:

- l. Szilard has sold, assigned, and transferred, and by these presents does sell, assign and transfer unto the Government as represented for the purpose hereof, by the Director of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President and/or his assigns, his entire right, title and interest that he now owns as joint inventor in the United States Patent Application, to be filed and identified as S-1/501, for the Method of Testing Materials and in and to the inventions, discoveries and improvements disclosed in said United States Patent application to be filed.
- 2. Szilerd has sold, assigned and transferred and by these presents does sell, assign and transfer unto the Government as represented for the purpose hereof by the Director of the Office of Scientific Research and Development,



SECRET

THIS DOCUMENT HAS BEEN OF THE President and/or his assigns, his entire right, title and interest in and to any and all inventions, discoveries and improvements in the field of Nuclear Physics made by him alone or jointly with others prior to 1 November 1940 and in and to any and all Letters Patent wherever they may be granted thereon as well as reissues and extensions of said Letters Patent, together with any and all of his inventions covered by applications filed by him and subsequently abandoned, the same to be held and enjoyed by the said Government to the full end of the term or terms for which Letters Patent are or may be granted, reissued or extended, as fully and entirely as the same would have been held or enjoyed by him had this assignment not been made, except however the assignment made in this paragraph two does not extend to nor does the present agreement concern in any manner United States Letters Patent No. 2161,985 issued to Szilard 3 June 1939 and entitled "Process of Producing Radioactive Elements," British Patent No. 440023, and Secret British Patent assigned to the British Government in 1936, or the inventions covered by said patents, or any of them.

these presents does sell, assign and transfer unto the Government as represented for the purpose hereof by the Director of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President and/or his assigns his entire right, title and interest in and to any and all inventions, discoveries and improvements made by him alone or jointly with others while employed by the Trustees of Columbia University in the City



of New York and/or The University of Chicago, of behalf of the Government of the United States of The read gradent in this paragraph three is made the Szilard in accordance with and at the request of the Trustees of Columbia University in the City of New York and/or The University of Chicago, which is hereby made by the affixing hereto of the signature of a duly authorized person, acting for and on behalf of each respective University.

4. Szilard agrees to make, execute, and deliver unto the Government or to the Director of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President and/or his assigns any and all papers, documents, affidavits, renewal, divisional and reissue applications, statements, or other instruments in such usual or other form, terms and contents as may be required by the Government or the Director of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President or his assigns in or incident to the filing, prosecution or conduct of any and all applications, before as well as after the issuance of any Letters Patent thereon, or in the adjustment or settlement of any interferences or other actions or proceedings that said applications may encounter or in which they may become involved, and Szilard agrees that he will aid and assist the Government of the United States in every way in protecting the inventions as may be requested by the Government or the Director of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President or his assigns, except that any expenses incurred in connection with such assistance shall be paid by the Government under proper arrangements to be made by the Government with Szilard for

that purpose and in case the savvices workstlard are required involving loss of time and income by Szilard, Szilard shall be paid by the Government at the prevailing rate for the type of services rendered by proper arrangements to be made by the Government with Szilard for that purpose.

- 5. Szilerd understands and agrees that with respect to any patentable discovery or invention coming under this agreement, the Contracting Officer of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President and/or the Contracting Officer of the United States Engineers, Manhattan District, War Department, or their duly appointed representative, shall have the sole power to determine whether or not a patent application shall be filed covering any and all of said inventions, discoveries and improvements made by Ssilard.
- have the irrevocable and exclusive right to prosecute all patent applications, wherever filed, covering inventions made by him and Szilard hereby grants to the Government the full power of substitution and revocation to make alterations and amendments to any and all said patent applications, to receive all Letters Patent and to transact all business in any Patent Office in connection with any applications, and to prosecute, conduct and make adjustments and settlements of any interferences or other acts or proceedings that any and all inventions and/or said applications and patents may encounter or in which they may become involved.

THIS DOCUMENT HAS BEEN IN TESTIMONY WHEREOF, FRANCE AGREEMENT HAS BEEN EXECUTED DAYNOP A December THIS 31st Witness: GOVERNMENT OF THE UNITED STATES By K. D. NICHODS, Colonel, Contracting Officer United States Engineers Manhattan District War Department Assented to and Trustees of Columbia University approved by: in the City of New York Assistant Treasurer Assented to and Board of Trustees of approved by: The University of Chicago Harrell, Business Manager STATE OF ILLINOIS) SS. COUNTY OF C O O K) Public in and for the County and State aforesaid, do hereby certify that LEO SZILARD, personally known to me to be the same person whose name is subscribed to the foregoing instrument, appeared before me this day in person and acknowledged that he signed, sealed and delivered the said instrument as his free and voluntary act and deed for the uses and purposes therein set forth. Given under my hand and Notarial Seal this thing day of pecember, 1943.

MY COMMISSION EXPIRES JANUARY 28, 1946

Corrected Draft to

MEMORANDUM OF AGREEMENT made this

1943 between Leo Szilard of Chicago, Illinois

(hereinafter referred to as Szilard) and the Government of the United States (hereinafter referred to as the Contracting Official Government) represented for the purpose hereof by the of the United States (hereinafter referred to as the United States Engineers, Manhattan District, War Department.

WHEREAS, Szilard, as joint inventor, Thas invented certain new and useful improvements MiniMethods for Testing Materials, for which he is about to file an application for U. S. Letters Patent, identified as S-1/501, and believes that he now owns, certain rights, privileges, and interests relative the hereinafter granted, and

WHEREAS; Szilard believes that he is the sole or joint inventor of certain inventions, discoveries and improvements in the field of Nuclear Physics made prior to 1 November 1940; and

WHEREAS, Szilard believes that he is now the owner of the entire right, title and interest in and to all inventions, discoveries and improvements made by him in the field of Nuclear Physics prior to 1 November 1940 and of the hereinafter granted) and that he now is the owner of an undivided right, title and interest in and to any and all Ainventions, discoveries and improvements jointly made by him with others in the field of Nuclear Physics prior to 1 November 1940 and hereinafter granted; and

> WHEREAS, Szilard believes that he is the sole or joint inventor of certain inventions, discoveries and improvements in the field of Nuclear Physics made after 1 November 1940, and alone or jointly has conceived and developed methods, apparatus, devices and compositions

granted wights privilege, that he now owns the heremaje.

of the Trustees of Columbia University in the City of New
York and/or The University of Chicago starting 1 November
1940, pursuant to certain employment agreements with said
Universities, respectively, and admits no to obligated to
do whatever is necessary to take out patents on any and all
inventions, discoveries and improvements the any and all
countries made by him during the periods of said employments
as and when requested by eltiprof said universities to the
case may be to said Universities or to other assignees
designated by either of them, and assign all rights, title Chicago
and interest in any and all sole or joint inventions, discoveries and improvements (to any and all patents and apto the University of Chicago, or to other assignees
plications thereof; and designated by the University of Lincology;
WHEREAS, the Government is desirous of acquiring

the rights, privileges and interests hereinafter granted with the believed to be filed and identified as S-1/501, for Method of Testing Materials and in and to the inventions, discoveries and improvements disclosed therein; and the entire right, title and interest of Szilard in and to any and all sole or joint inventions, discoveries and improvements in the field of Nuclear Physics made prior to 1 November 1940 and now believed to be owned by Szilard; and

Spilands WHEREAS, the Government is desirous of acquiring his entire right, title and interest in and to any and all sole or joint inventions, discoveries and improvements (heretofere (preparent) made by Szilard while employed by the Trustees of Columbia University in the City of New York and/or the University of Chicago on behalf of the Government;

NOW THEREFORE to all whom it may concern, be it known that for and in consideration of the sum of to Szilard, in hand paid

In Change

by the Government and for other good and valuable considerations, the receipt of which is hereby acknowledged:

- l. Szilard has sold, assigned, and transferred, and by these presents does sell, assign and transfer unto the Government as represented for the purpose hereof, by the Director of the Office of Scientific Research and Development, Office for Emergency Management, executive Office of the President and/or his assigns, his entire right, title and interest that he now owns as joint inventor in the United States Patent Application, to be filed and identified as S-1/502, for the Method of Testing Materials and in and to the inventions, discoveries, and improvements disclosed in said United States Patent Application to be filed.
- 2. Szilard has sold, assigned and transferred and by these presents does sell, assign and transfer unto the Government as represented for the purpose hereof by the Director of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President and/or his assigns, his entire right, title and interest in and to any and all inventions, discoveries and improvements in the field of Nuclear Physics made by him alone or jointly with others prior to 1 November 1940 and in and to any and all Betters Patent wherever they may be granted thereon as well as reissues and extensions of said Letters Patent, together with any and all of his inventions covered by applications filed by him and subsequently abandoned, the same to be held and enjoyed by the said Government to the full end of the term or terms for which Letters Patent are or may be granted, reissued or extended, as fully and entirely as the same would have been held or enjoyed by him had this assignment not been made, excepting from this provision United States Letters Patent No. 2161,985 made

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roducing Radioactive Flements", British Patent No. ______,
and Secret British Patent assigned to the British Admiralty
in 1936, or the unventures covered by Mande patents, or any of them.

and by these presents does sell wissign and transfer unto
the Government as represent to the purpose hereof by the
Director of the Office of Scientific Research and Development,
Office for Emergency Management, Executive Office of the
President and/or his assigns his entire right, title and
interest in and to any and all inventions, discoveries and
improvements heretofore and hereinafter made by him alone
or jointly with others while employed by the Trastees of
Columbia University in the City of New York and/or the
University of Chicago, on behalf of the Government of the
The assignment of the Government of the
United States, in accordance with requests made by said
Universities.

Universities.

4. Szilard agrees to make, execute, and deliver the affilm; The signature unto the Government or to the Director of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President and/or his assigns any and all papers, documents, affidavits, renewal, divisional and reissue applications, statements, or other instruments in such usual or other form, terms, and contents as may be required by the Government or the Director of the Office of Scientific Research and Development, Office for Emergency Management, Frecutive Office of the President or his assigns in or incident to the filing, prosecution or conduct of any and all applications, before as well as after the issuance of any Letters Patent thereon, or in the adjustment or settlement of any interferences or other actions or proceedings that said applications may encounter

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or in which they may become involved, and Szilard agrees
that he will aid and assist the Government Jos the Whited 21HT
States in every way in protecting the interest of Management and protecting the interest of Management and Grand G

- 5. Szilard understands and agrees that with respect to any patentable discovery or invention coming under this agreement, the Contracting Officer of the Office of Scientific Research and Development, Office for Emergency Management, Executive Office of the President and/or the Contracting Officer of the United States Engineers, Manhattan District, War Department, or their duly appointed representative, shall have the sole power to determine whether or not a patent application shall be filed covering any and all of said inventions, discoveries and improvements made by Szilard.
- shall have the irrevocable and exclusive right to prosecute all patent applications, wherever filed, covering inventions made by him and Szilard hereby grants to the Government the full power of substitution and revocation, to make alterations and amendments to any and all said patent applications, to receive all Letters Patent and to transact all business in



any Patent Office in connection with any applications, and to prosecute, conduct and make adjustments and settlements of any interferences or other acts or proceedings that any and all said fiventions and patents may encounter or in while they weak become involved.

IN TESTIMONY WHEREOF, THIS AGRIFFMENT THAS BEEN

EXECUTED THIS

DAY OF

Leo Szilard

GOVERNMENT OF THE UNITED STATES

By
Contracting Officer
United States Engineers
Manhattan District
War Department

SECTION

STATE OF ILLINOIS) COUNTY OF COOK

MESS 2AH THEMUSOR 21HTM

SHOW AND AND AND HEAT NOT AN OUT AND HEAT NOT AND HEAT Given under my hand and Notarial Seal this day of , 1943. Notary Public Assented to and Trustees of Columbia University in the City of New York approved by: By Assented to and approved by: Board of Trustees of the University of Chicago

