Dec. 19, 1961 BONNIE SMITH, JR 3,013,384
NOW BY JUDICIAL CHANGE OF NAME
BONNE SMITH, JR
JET ATOMIC SYSTEM

Filed July 15, 1955 3 Sheets-Sheet 1

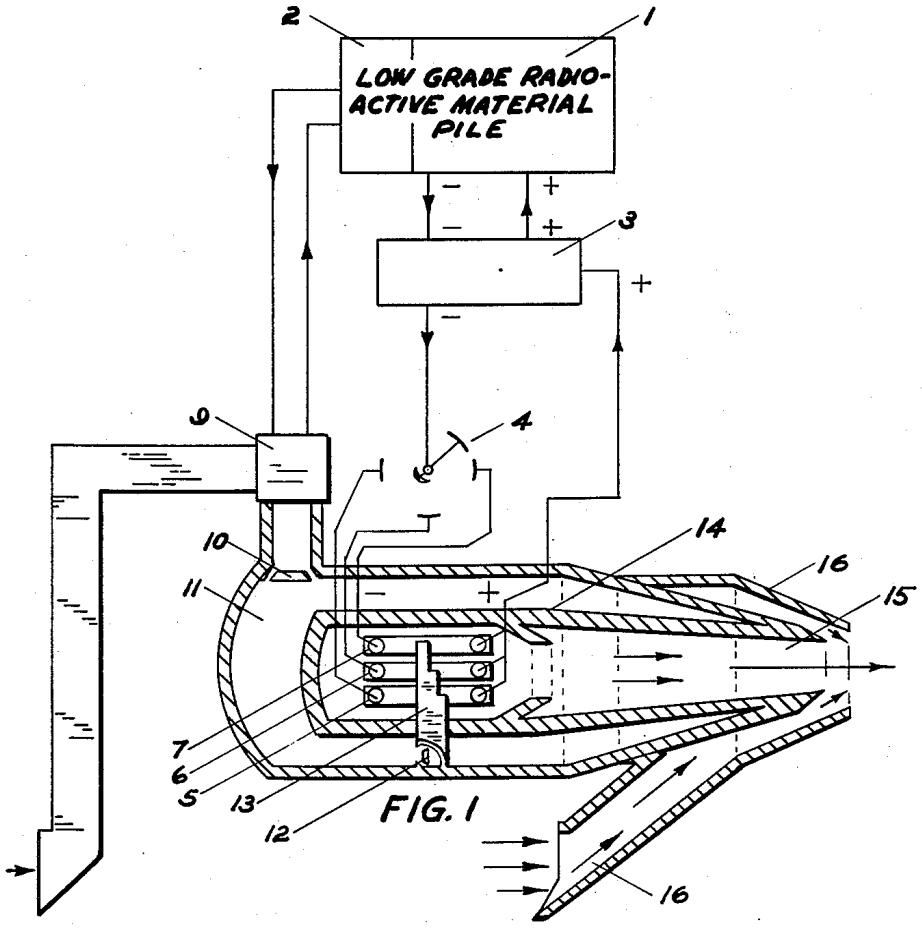

FIG. 1

INVENTOR, Bonnie Smith Jr

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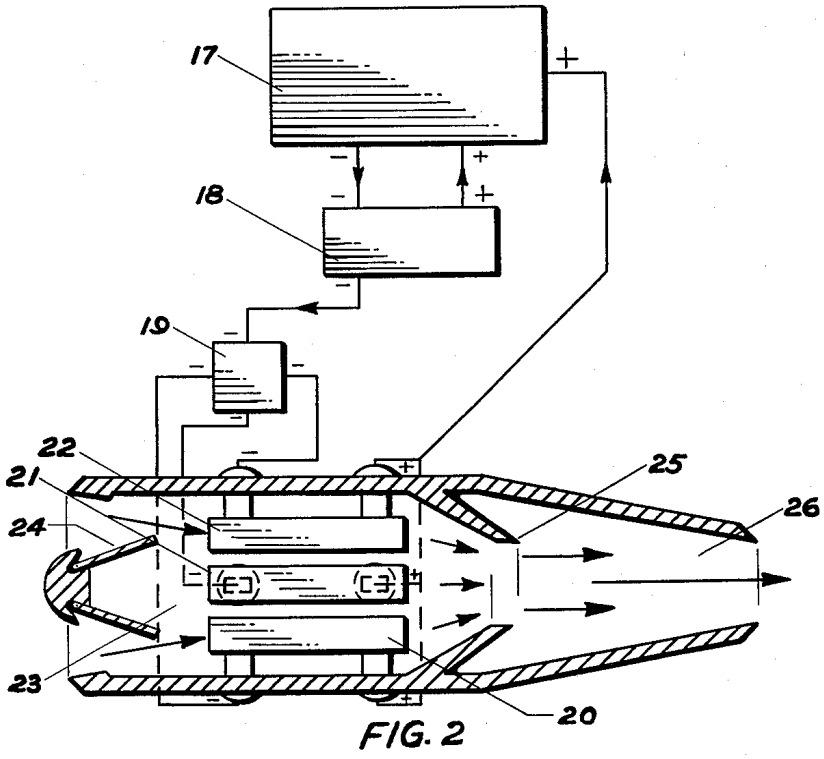

FIG. 2

INVENTOR, Bonnie Smith Jr.

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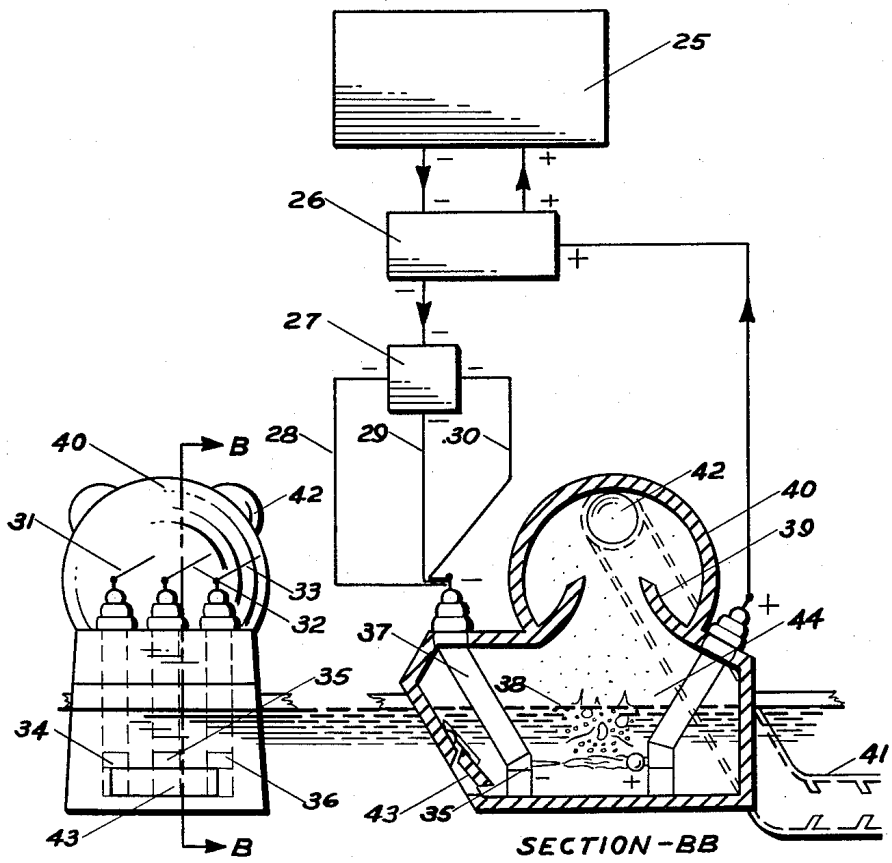

FIG. 3

INVENTOR, Bonnie Smith Jr.

United States Patent Office 3,013,384 Patented Dec. 19, 1961

3,013,384
JET ATOMIC SYSTEM

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Filed July 15, 1955, Ser. No. 522,315
2 Claims. (Cl. 60—35.5)

The invention relates generally to a basic system of electrically driven jet engine wherein pulsed electric arc heated and driven gaseous compression-expansion chambers are used in the production of gaseous jet streams of high velocity and thrust. In accordance with the invention, it is contemplated that any jet engine may be converted into a jet atomic engine of the invention by replacing its conventional fuel burning chambers and ignition means with pulsed electric arc heated compression-expansion chambers constructed and designed to withstand high or very high temperatures without damage thereto, and which receive the necessary pulsed electrical drive power from electrical systems of the type herein shown and described.

This invention relates to a system hook-up for jet atomic engines operating in or with a water medium. This water jet engine is believed to be the first to utilize low grade radioactive waste material as the power source. The system uses water or hydraulical substances as the expansion propulsion medium, the cooling medium and the shielding medium without water contamination. The use of low grade radioactive materials as the power source for water engines is much more economical than the presently used high grade or purified nuclear materials which are converted to heat energy and then to mechanical energy by turbines.

The present invention may be used in a water or air medium, which medium is the compression-expansion material used in the compression-expansion chambers. Of course, the source of electrical drive power may be obtained from sunlight by the use of light-to-electrical energy conversion means, or from low grade or waste radioactive material or the like, housed in a light-weight pile surrounded and shielded with a couple of inches of water, for example.

The present system invention is especially adapted for and exceedingly useful in a water medium. Such systems may be stationary and used as pumping stations or they may be mobile thereby producing thrust for various kinds of high speed water craft.

Generally, the present jet atomic system utilizes pulsed electrical power for the production of gaseous jet streams of high velocity and thrust by means of a thermo-gaseous reaction within the engine chambers of the invention.

The system hook-up provides means whereby atomic electric power is used directly to produce a unidirectional water jet stream of high velocity and thrust by thermo-hydraulic action and reaction.

It an object of the invention to provide system means whereby a jet engine may operate without the use of inflammable fuels.

It is an object of the invention to provide an atomic means for deriving electrical energy for propelling such vessels as lighter-than-air ships by the compression-expansion of liquifiable media which are gasified by a pulsed electric arc heating means in a compression-expansion chamber, which such vessel is used at high or low altitudes.

Another object of the invention is to provide means for propelling water craft by using either sunlight as a source of electrical power to expand a liquifiable material in the production of gaseous jet streams, or radioactive material or piles shielded by water, or the like, for producing thermo-gaseous jet streams of high velocity and thrust by the use of water as the expansion material.

Another object of the invention is to provide a system whereby stationary power plants may use an energy source such as sunlight or radioactive material in combination with compression-expansion means for air or water in the production of high levels of mechanical power.

It is one object of the invention to provide means for propelling water craft at high speed by using water as the expansion material in the production of unidirectional jet streams.

Another object of the invention is to provide an engine system for water craft which uses water as the expansion medium, cooling agent and nuclear shielding medium.

Still another object of the invention is to provide means whereby stationary power plants and/or pumping stations may utilize low grade radioactive waste material as the power source without hazard.

Still further new and useful objects of the invention, which it is believed have never been achieved before in engines, will become apparent to persons skilled in the field of jet propulsion.

The primary purpose of the invention is to provide a jet engine which will operate on naturally and very abundantly occurring sources of energy which have for the most part gone unused in the past.

The present invention distinguishes over known devices or means of producing mechanical energy in that it enables a jet engine to produce gaseous jet streams of high velocity and thrust by the use of low grade radioactive waste material producing electrical energy for expanding a liquifiable medium such as water.

It should be understood, however, that the specific apparatus herein illustrated and described are intended to be representative only, as many changes may be made therein without departing from the clear teachings of the invention.

Two preferred and proven forms of the jet atomic system for water jet engines are described in the detailed description and illustrated in the drawings in which:

FIG. 1 is an electrical system block diagram showing means whereby low grade radioactive waste material is used to produce arc heating and expansion of a water medium thereby forming a unidirectional water jet of high velocity and thrust.

FIG. 2 shows an electrical system similar to that of FIG. 1 wherein a gaseous generation-expansion chamber of multiple electrodes or arc units may be used, and wherein the arc units and chamber are constructed from heat resistant cermetallic materials such as hafnium and/or tantalum carbides.

Referring to the block diagram and characters of reference, there is shown in drawing FIG. 1, a basic electrical system for jet atomic engines using a water medium, with blocks 1 and 2 representing low grade radioactive material piles for the production of electrical power.

Direction of flow of electrical energy is indicated in the circuit by arrow head pointers. As an example of operation, in drawing FIG. 1, blocks 1 and 2 represent electrical power sources such as low grade radioactive waste material piles shielded by water. Electrical energy flows from unit block 1 to block 3 which is an inductive-capacitive type storage unit for electrical power. As the electrical power level builds up in storage unit 3, electrical power discharges through distribution switch 4 and flows to water expansion chamber or group of chambers 5 where an interior arc of high power and concentration generates momentarily, high levels of heat causing thermal expansion within chambers 5 and 14. Since all chambers and chamber elements are water cooled in this particular engine, no significant cooling time is required for hydraulic expansion chambers 5, 6, 7 . . . , and the frequency of arcing may be high enough to be judged by

the human eye with protective measures, as continuous in all chambers simultaneously. The ratio of cooling time to firing time of any electric arc heated hydraulic expansion chamber in the system will naturally be determined by the combined action of charging-storage unit 3 and switching unit 4. The engine and electrical system shown in drawing FIG. 1 was designed to be used near an abundant source of water such as on a water craft. As shown in the drawing, water is initially drawn in through strainer scoop 8 by the action of electrically driven impeller unit 9 which is driven by electric power source 2, said water flows through one-way valve 10 and fills storage tank 11 which surrounds jet forming chamber 14 and keeps it below its characteristic temperature damage level; water in tank 11 flows through one-way valve 12 into pipe 13 by which means it is injected in a continuous spray-like projection into electric arc heated water expansion chambers 5, 6, 7 . . . , thereby cooling interior electrodes and elements to well below their temperature damage level, and at the same time acting as the expansion material. All heat critical parts are made of heat resistant cermetallic materials of high tensile strength. Scoop intake and tail pipe water chamber 16 operate on the ram-jet principle. The directional flow of water through this chamber assembly is shown by arrowhead pointers. Cool water is scooped into chamber 16 from which it escapes and reacts with the heated and expanded jet stream of high velocity 15, thereby increasing the overall thrust of the engine.

Operation of the system shown in drawing FIG. 3 is as follows, water enters chamber 44 through one-way valve 43. Nuclear electric power applied to water submerged arc units 35 causes concentrated arcing between the units 35 thereby expanding the water medium in the form of steam which passes through vent 39 into pressure accumulating chamber 40 from which it escapes in the form of a high thrust jet stream. The pressure of this jet stream is applied through vented tail pipe 41 to form a water jet of high thrust. All basic interior elements of this engine are shown in drawing section BB. All necessary electrical drive power is provided by unit 25 which is preferably a small water shielded pile using low grade radioactive material in the production of electrical power. Direction of electrical energy flow in the system is shown by arrowhead pointers. Electrical energy generated in pile 25 flows into electrical power charging storage unit 26, from which high levels of electrical energy travel through switching means 27 and are fed sequentially into leads 28, 29, 30 which are connected respectively through insulator connections 31, 32 and 33 to water expansion chamber arc units 34, 35, 36 by way of sealed insulated lead pipes 37. 42 is the elbow connection of pipe 41.

Reasonably high levels of electrical energy flow from unit 25 to electrical storage unit 26 which accumulates electrical energy, allowing the power of said energy to raise to a much higher momentary pulsing level, which is sufficient to arc between the electrodes of water expansion units 34, 35, 36 . . . , thereby generating super heated steam by thermal reaction. It will be readily understood by persons skilled in electronic circuitry, that the charging time constant of charging, storage and pulsing unit 26 is determined by the storage capacity of said unit and the electrical output of unit 25. Arc duration or firing duration within units 34, 35, 36 is determined by the discharge time of storage pulse line unit 26, all of the characteristics will naturally be determined by design.

Regarding the use of low grade radioactive waste material such as strontium 90 as the power source, in a protective water shielded pile, energy levels up to and exceeding one million electron volts of electrical energy may be obtained from this kind of source and utilized in electrical systems for jet producing engines. This energy when converted into horsepower, provides a very practical and usable source of work energy. Means of tapping out electrical energy from radioactive piles of strontium 90 have been previously developed and are available at the present time.

The present application for patent is the parent application of the inventor's copending continuation-in-part application Serial No. 8,558, filed February 15, 1960, for "Electro-Plasmic Jet Forming Hardware and Circuitry."

Additional embodiments of the invention in this specification will occur to others and therefore it is intended that the scope of the invention be limited only by the appended claims and not by the embodiments described hereinabove.

That which I believe to be new and useful, and wish to secure by Letters Patent is:

1. A jet atomic system in combination with water jet forming means comprising a low grade radioactive pile producing an electrical current, an inductive-capacitive charging storage network having its input coupled to said radioactive pile, a jet forming chamber having a nozzle configured exit opening and having a plurality of electric arc expansion chambers disposed within said jet forming chamber, a multiple output power distribution switch connecting the storage network to respective electric arc expansion chambers for intermittent and sequential firing of said chambers, a water storage tank substantially encapsulating the surface of said jet forming chamber for receiving water through an electrically driven impeller unit electrically connected to said radioactive pile for energization thereof, a one-way valve for retaining water in the water storage tank received through the electrically driven impeller unit, and a second one-way valve to intermittently inject water from the said water storage tank into the jet forming chamber to replenish the water consumed by the last previous firing and cool said electric arc expansion chambers.

2. A jet atomic system in combination with water jet forming means comprising a low grade radioactive pile producing an electrical current, an inductive-capacitive charging storage network having its input coupled to said radioactive pile, a jet forming chamber having a nozzle configured exit opening and having a plurality of electric arc expansion chambers disposed within said jet forming chamber, a multiple output power distribution switch connecting the storage network to respective electric arc expansion chambers for intermittent and sequential firing of said chambers, a water storage tank substantially encapsulating the surface of said jet forming chamber for receiving water through an electrically driven impeller unit electrically connected to said radioactive pile for energization thereof, a one-way valve for retaining water in the water storage tank received through the electrically driven impeller unit, a second one-way valve to intermittently inject water from the said water storage tank into the jet forming chamber to replenish the water consumed by the last previous firing and cool said electric arc expansion chambers, and an additional water receiving means mounted about the nozzle configured exit opening of said jet forming chamber for inducting water into the jet produced thereby, said additional water receiving means having a scoop to receive water into said receiving means.

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