

**April 18, 1961**

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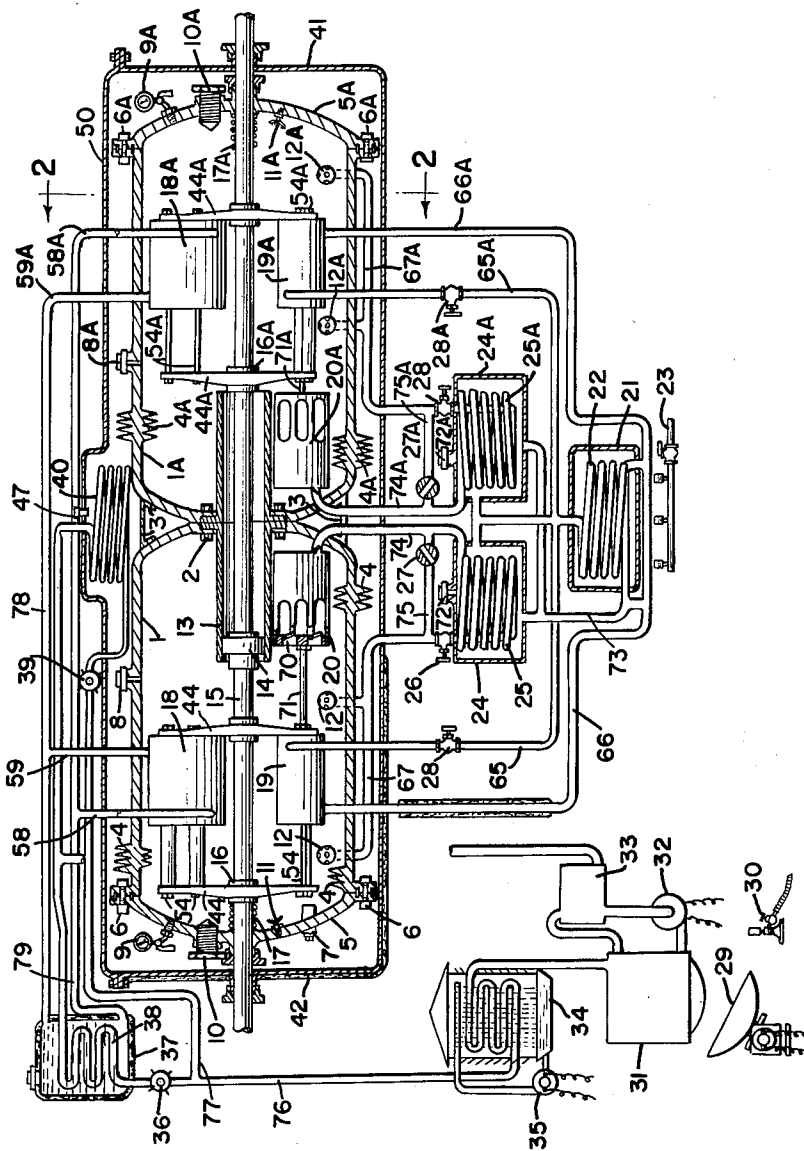
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## POWER GENERATING DEVICE

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2 Sheets-Sheet 1

**Fig. 1.**



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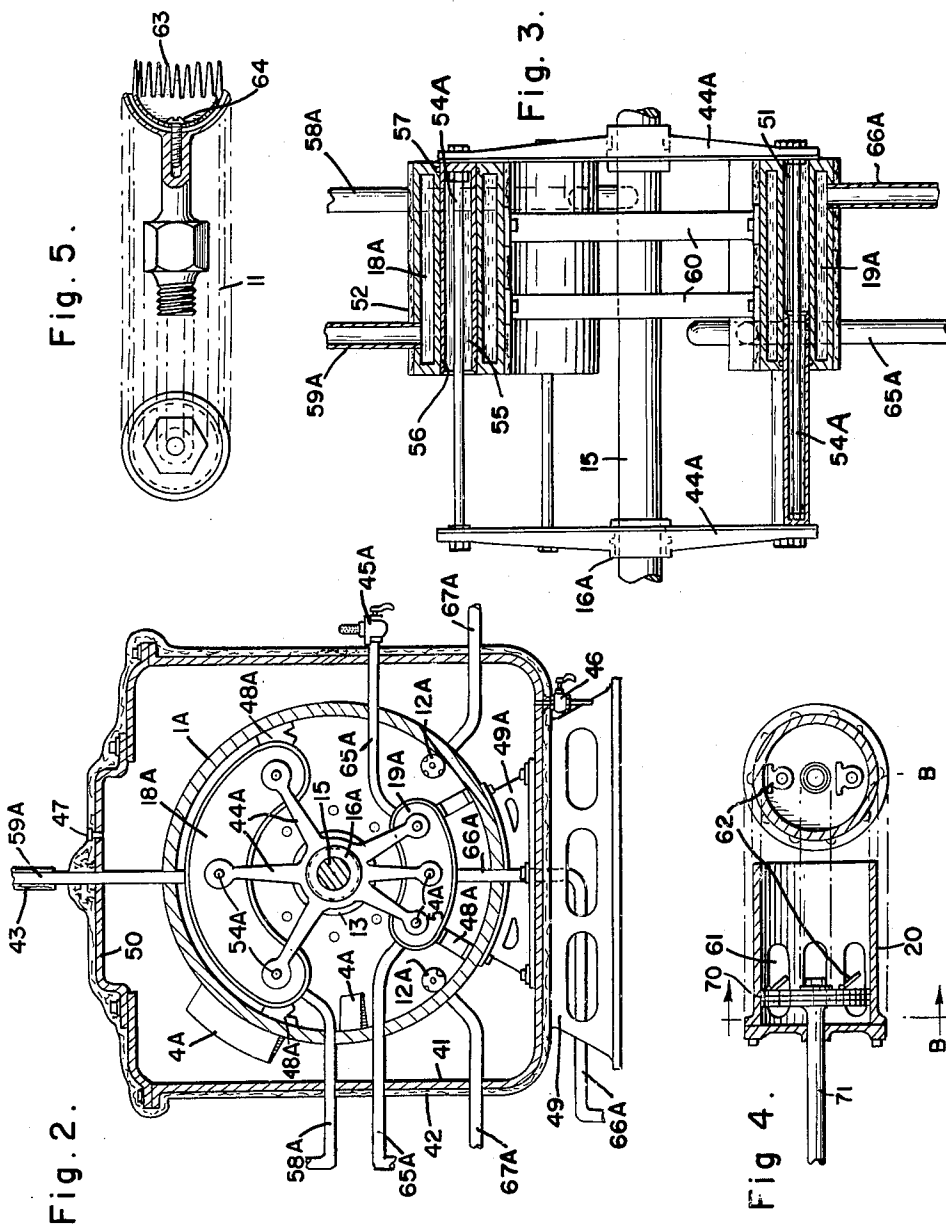
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## POWER GENERATING DEVICE

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This invention relates to a method of and means of generating power. The principal object of this invention is to provide a method of controlling the expansion of liquids at below the fusion point in such a manner as to transmit the expansive force of the liquid at that temperature into controlled mechanical movement under conditions which will prevent solidification of the liquid.

Another object of this invention is to provide a machine which will hold liquid within a sufficiently compressed area so as to prevent its freezing within the machine, and which will allow the expansive forces of the liquid to operate a piston and will provide means of sequentially changing the temperature within the machine so as to vary the volume of the liquid while it is still in a liquid state at a point below its fusion temperature.

Another object of this invention is to provide a method of utilizing the highly expansive character of liquids which are present when the liquids reach a temperature below the temperature of fusion, and are held by compression in the liquid state.

Another object of this invention is to provide a machine which will employ the tremendous mechanical forces produced by a new modification of water which is found when water held under high pressure is attempting to solidify at temperatures below its fusion temperature.

Another object of this invention is to provide a power generating device which derives the force of its power stroke from a reduction rather than an increase of temperature within the device.

Another object of this invention is to provide a novel two-cycle machine wherein the power stroke thereof is accomplished by the withdrawal of heat to a temperature below zero degrees centigrade, and the compression stroke thereof is accomplished by the application of heat so as to increase the temperature slightly to a point still below zero degrees centigrade.

Figure 1 is a vertical central sectional view through the power generating device.

Figure 2 is a vertical sectional view taken on lines 2—2 of Figure 1.

Figure 3 is a vertical sectional view through interior heat exchangers 18A—19A of Figures 1 and 2.

Figure 4 is a sectional view of the interior pumps 20—20A showing piston taken on line B.

Figure 5 is a sectional view of the steel points holders 11 and 11A of Figure 1.

It has been well understood in the art that water when brought below zero degrees centigrade undergoes great expansion as it changes from a liquid to a solid state. This force has notoriously demonstrated itself in the bursting of pipes.

It is also well known that if a sufficient structure is employed to resist the force of the expanding liquid at below normal freezing temperature that the liquid will not freeze, i.e., turn into a solid. The subject invention concerns itself with the application of this principle to a method and machine for utilizing the force of a liquid which has been reduced in temperature below the tem-

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perature at which the liquid would normally solidify but in which the liquid is prevented from solidifying by confining the area of the liquid to such an extent that solidification is impossible. By the use of this energy tremendous expansive forces can be generated by fluctuating the temperature of the liquid within very limited temperature ranges.

For example assume a short length of sturdy steel tube, strong enough to hold internal pressure to five thousand pounds per inch, threaded on both ends for secure sealing, coated with hot wax and filled full with pure water, is securely sealed on both ends and submerged in a cold salt brine bath at a temperature of approximately  $-3^{\circ}$  C. The contained water, in time (if not disturbed) is super-cooled. The water giving up its heat of fusion and enough sensible heat to the cold brine is reduced in temperature to approximately  $-3^{\circ}$  C. The steel tube is then disturbed, by striking sharply, with a metal rod. A small, but violent explosion takes place. The unstable water develops great pressure in an effort to complete a change of state to the crystalline form, ruptures the steel tube and flash freezes to the solid state, instantly, upon release of pressure. At the instant it is disturbed, the confined super-cooled water at approximately  $-3^{\circ}$  C. temperature, is further reduced in temperature approximately  $1^{\circ}$  C. by the internal pressure. Approximately  $1^{\circ}$  C. of sensible heat becomes latent during the instant of pressure increase. At approximately minus  $4^{\circ}$  C. temperature, internal pressure instantly mounts to eight thousand pounds per inch and ruptures the tube.

The super-cooled, unstable, temperature sensitive, seeded water, described in the above experiment is the working substance employed in this motor. It makes available the great force of crystallization for power generation. The new working substance is never allowed the expansion necessary for a change of state. Ice having a definite volume, is wholly melted, if reduced by pressure slightly below this needed volume. The working substance is always held below the needed volume for ice, by the absence of the needed space in the motor cylinder for the change of state to occur.

Water, disturbed and properly seeded with crystallization centers of ice and under high pressure can be lowered to temperatures below approximately  $0^{\circ}$  C. without solidifying into ice. Under such pressure and temperature, the water takes on physical characteristics considerably different from those of water above  $0^{\circ}$  C. temperature and atmospheric pressure.

Such seeded and disturbed water, when enclosed in a restrictive pressure chamber and cooled to approximately  $1^{\circ}$  C. exerts a pressure of two thousand pounds per square inch in its effort to expand and complete its change of state to ice. With the withdrawal of one more degree of heat (to approximately  $-2^{\circ}$  C.) the pressure rises to four thousand pounds per square inch.

Since the seeded water in the motor is under sufficient self generated pressure, due to the restricting pressure chamber and piston, to prevent the water molecules from arranging themselves on the classically-conceived three-dimensional ice lattice, the water will remain in a fluid state despite the low temperature.

The working substance is a new modification of water never before employed to accomplish useful work.

It is found only in nature under favorable conditions of temperature and pressure, as under glaciers, at edges where it flashes immediately from liquid to ice upon the release of pressure.

The working substance is capable of considerably greater expansion and compression than is "normal" water at standard temperature and pressure.

This pressure-temperature-modified water exists and is

functional only within the volumetric range between the volume of regular water and a mass slightly less than that which would result if a given volume of water were changed to ice.

The working substance contains no heat of fusion and cannot exist at 0° C. or above temperature. Neither can it exist at ordinary atmospheric pressures.

The possible expansion or compression of the working substance mentioned under paragraph 5 above, is approximately 10%. It has the peculiar ability of suddenly building up great and constant pressures through its expansion range at slight temperature reductions.

In this motor, the working substance is always under sufficient pressure to prevent regelation. Thereafter, it always remains a mobile liquid although it contains the nuclei of crystallization centers of ice, which are attempting to cause a flash change of state to solid, if pressure were removed.

The motor primed and the working substance created, there is no further need of applying or withdrawing, the great quantity of heat of fusion, during operation of motor. The working substance remains liquid at -0° C. due to restrictive area of chambers and cylinder and the pressure. Each B.t.u. applied to the working substance results in an increase in temperature and decreases in pressure, or each B.t.u. withdrawn from the working substance results in a decrease in temperature and an increase in pressure. Refrigeration coils, expansion valves and other control equipment which is fully explained hereinafter are used to maintain cooling tank and interior heat exchanger temperature as low as possible with proper performance. Fail-proof safeguards are incorporated to prevent over heating or cooling.

Referring to Fig. 1 of the drawings:

The numeral 41 designates an enclosure tank having insulation 42.

The enclosure tank 41 is provided with a removable cover 50 having filter hole and plug 47.

Within the enclosure tank 41 are a pair of high pressure metal containers 1-1A each having an open end where said metal containers 1-1A are joined and held together by the bolts 2 and the brackets 3. Interconnecting the chambers of and affixed within the metal containers 1-1A is a main cylinder 13. The main cylinder 13 extends through the open end of each of the metal containers 1-1A an equal distance into the chamber of each. Slidably mounted within the main cylinder 13 is a piston 14 which is concentrically affixed to the piston rod 15 which extends through the longitudinal axis of the main cylinder 13, the metal containers 1-1A and enclosure tank 41.

In the following description those components bearing the designation "A" relate to metal container 1A.

Extending internally and externally from the wall of the metal containers 1 and 1A are fins 4 and 4A.

Each metal container 1 and 1A has a removable cover 5 and 5A sealing the closed end thereof. These removable covers 5 and 5A are secured to their respective metal containers 1 and 1A by the bolts 6 and 6A and stay bolts 7 and 7A, the latter extending the length of the chamber of the metal container and through the open-end thereof. The numerals 8 and 8A designate removable plugs extending into the chambers of the metal containers 1 and 1A. The numerals 9 and 9A indicate pressure gauges fixed to and extending through the removable covers 5 and 5A. The numerals 10 and 10A are capacity adjustment screws also extending through the covers 5 and 5A. The numerals 11 and 11A show cups having steel points affixed to the inner surface of the covers 5 and 5A so that the steel points protrude toward the interior of the metal containers 1 and 1A. A plurality of spray heads 12 and 12A positioned and secured within the metal containers 1 and 1A.

The numerals 17 and 17A show bumper coil springs

surrounding the piston rod 15 and abutting the inner surface of the covers 5 and 5A.

The numerals 18 and 18A designate a heat exchanger (hereinafter each being called the internal upper heat exchanger) and the numerals 19 and 19A show internal lower heat exchangers which are smaller than the internal upper heat exchangers 18 and 18A. Each of said heat exchangers 18, 18A, 19 and 19A are equipped with tie rods 54-54A and are secured within the chambers of metal containers 1 and 1A.

The numerals 44 and 44A indicate metal spiders, the body of which loosely surrounds piston rod 15. The numerals 16 and 16A indicate collars. These collars 16 and 16A are concentrically fixed to the piston rod 15. The arms of the metal spiders are connected to each end of the tie rods 54 and 54A which pass through the heat exchangers 18, 18A, 19 and 19A.

The numerals 20 and 20A designate circulating pumps which are positioned and fixed within the metal containers 1 and 1A. Said pumps are equipped with pistons 70 and 70A and piston rods 71 and 71A, the latter being fixed to an arm of the metal spiders 44 and 44A.

The numeral 21 designates a heat collector situated outside the enclosure tank 41 and containing the coil 22. The heat collector 21 is positioned adjacent to a gas burner 23.

The numeral 24 designates a heat exchanger containing a coil 25, and 24A shows a companion heat exchanger containing coil 25A. Each of said heat exchangers is equipped with a filler hole and plug, 72 and 72A.

The pipes interconnecting the apparatus as shown in Fig. 1 are as follows:

65 is a pipe interconnecting the coil 22 and the internal lower heat exchanger 19, said pipe having along its length a flow control valve 28. 65A shows the counterpart of 65 interconnecting coil 22 with internal lower heat exchanger 19A, it having along its length flow control valve 28A.

66 is a pipe positioned adjacent to gas burner 23 and extending into internal lower heat exchanger 19 with 66A, an extension of pipe 66 extending into internal lower heat exchanger 19A.

73 interconnects pipe 66 and the chambers of heat exchangers 24 and 24A.

Pipe 67 interconnects coil 25 and spray heads 12, said pipe 67 being separated from coil 25 by a flow control valve 26. Pipe 67A connects coil 25A with spray heads 12A, it also being separated from coil 25A by flow control valve 26A.

The numerals 74 and 74A show pipes interconnecting the coils 25 and 25A with circulating pumps 20 and 20A.

75 is a pipe interconnecting pipe 67 and pipe 74, said pipe 75 having along its length by-pass valve 27; 75A interconnects pipes 67A and 74A, it having by-pass valve 27A.

Continuing in Figure 1, the numeral 31 depicts an absorption ice machine generator which is positioned adjacent to a parabolic mirror 29 in the proximity of a gas burner 30. 33 is an absorber interconnected with the generator 31. 32 is a recirculating pump which is interconnected with generator 31 and absorber 33.

The numeral 34 indicates a condenser interconnected with generator 31 and having a recirculating pump 35.

The numeral 37 is a heat exchanger containing expansion coil 38. The pipe 76 having an expansion valve 36 along its length, interconnects expansion coil 38 and the coil of condenser 34.

The numeral 40 indicates a second expansion coil positioned within enclosure tank 41. 77 is a pipe which interconnects expansion coil 40 with pipe 76, the point of connection being between condenser 34 and expansion valve 36. 39 is an expansion valve along the length of pipe 77. Pipes 59 and 59A enter the internal upper heat exchangers 18 and 18A respectively. These pipes 59 and 59A are connected to heat exchanger 37 by pipe 78.

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Pipes 58 and 58A enter the internal upper heat exchangers 18 and 18A also and they are connected to heat exchanger 37 by pipe 79.

Referring to Figure 2 of the drawings:

Numeral 41 indicates the enclosure tank having insulation 42 and a removable cover 50. Enclosure tank 41 is mounted on stand 49. Numeral 47 is a filler hole and plug in the removable cover 50. The enclosure tank 41 is equipped with a drain cock 46.

Numeral 1A shows the metal container which is mounted within enclosure tank 41 upon stand 49A. 4A are fins extending from the outer and inner surface of metal container 1A. The main cylinder 13 is shown fixed within the metal container 1A.

The numeral 15 indicates the piston rod extending from the main cylinder 13 and being surrounded by the attached collar 16A which abuts the body of metal spider 44A.

Numeral 18A is the internal upper heat exchanger with its tie rods 54A secured to the upper arms of the metal spider 44A. 19A is the internal lower heat exchanger having its tie rods 54A secured to the lower arms of the metal spider 44A. Both of said heat exchangers are held in position within metal container 1A by the supports 48A.

The numeral 45A indicates an air vent extending from the lower heat exchanger 45A.

Pipes 67A are shown entering metal container 1A to supply spray heads 12A.

58A is a pipe entering the internal upper heat exchanger 18A and 59A is a pipe leaving said heat exchanger. 65A is a pipe entering and 66A is a pipe leaving the internal lower heat exchanger 19A.

All pipes are heat insulated as indicated at 43.

Referring to Fig. 3 of the drawings, a sectional view of the upper and lower internal heat exchangers of metal container 1A:

The internal upper and lower heat exchangers 18A and 19A are supported by the frame members 60. Tie rods 54A are shown passing through the cylinders 51 of the heat exchangers, the ends of the tie rods 54A being connected to the arms of the metal spiders 44A. Surrounding and secured to a portion of each of the tie rods 54A are pistons 56 which have an oak wood core 55 and frost scrapper rings 57.

As shown the piston 56 of the lower heat exchanger 19A is positioned on the tie rod 54A so as to cause said piston to be partially withdrawn from cylinder 51 when piston 56 of the upper heat exchanger 18A is fully within its cylinder 51.

Referring to Figure 4 of the drawings:

The numeral 70 designates the piston of the circulating pump 20, with the piston rod 71. Numeral 61 shows the cut-out ports in the pump's cylinder wall and 62 indicates check valves hinged over ports extending through the face of the piston 70.

Referring to Figure 5 of the drawings showing the cup 11 having the sharp steel points 63 protruding from its surface said points 63 are fastened to the base of cup 11 by screw 64.

The power generating device which is the subject of my invention is operated in the following manner:

The piston 14 is manually brought to either end of the main cylinder 13. The metal container 1 or 1A then containing the piston 14 is filled with pure water through its filler opening (8 or 8A), which is then sealed. The piston 14 is then manually moved to the opposite end of the main cylinder 13, creating a partial vacuum in the metal container (1 or 1A) from which the piston 14 is moved. This partial vacuum comprises about 10% of the total volume of the container (1 or 1A) from which the piston is moved and the cylinder 13. The empty metal container (1 or 1A) is then filled to capacity with pure water through its filler hole 8 or 8A which is then sealed. The manual force holding piston 14 at the end

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of the main cylinder 13 is then removed and the vacuum created as described above causes piston 14 to retract to a central position in cylinder 13. With the piston 14 in a central position as described, a 5% partial vacuum is created in metal containers 1 and 1A and cylinder 13.

Tank 41 is then filled to capacity with salt brine or Prestone solution through filler hole 47 which is then sealed.

When metal containers 1 and 1A are filled as described, water flows by gravity through spray heads 12—12A, through pipes 67—67A, through valves 26—26A, thus filling coils 25—25A. When the coils 25—25A are filled, water is then forced up filling by-pass valves 27—27A, pipes 75—75A, pipes 74—74A, and circulating pumps 20—20A.

The tank of heat exchanger 37 is then filled to capacity with salt brine or Prestone solution. This will cause pipes 59—59A, internal upper heat exchangers 18—18A and pipes 58—58A to fill with said solution by gravity.

Through their air vents 45A (Fig. 2) the internal lower heat exchangers 19—19A are then filled to capacity with salt brine or Prestone solution. This will in turn cause said solution to flow by gravity and fill pipes 65—65A, 66—66A and coil 22 of heat collector 21. After coil 22 is filled, the solution will flow up and fill the tanks of heat exchangers 24 and 24A.

The salt brine or Prestone solution used as described is sufficiently concentrated to remain in a liquid state at minus 10° C.

The pure water contained in metal containers 1—1A is then cooled as follows:

The absorption ice machine, 31, 32, 33, 34, 35, 36 and 38, is activated by the sun rays reflected from mirror 29 upon generator 31, or in the alternative, heat may be supplied to generator 31 by gas burner 30. The temperature of the solution contained in the tank of heat exchanger 37 is reduced to minus 10° C. by the boiling refrigerant within the expansion coil 38. Hence, by conduction, the solution contained in the tank of heat exchanger 37 as well as the solution contained in the internal upper heat exchangers 18 and 18A is cooled to minus 10° C.

Simultaneously with the above described cooling process, the salt brine or Prestone solution contained in the enclosure tank 41 is cooled to minus 3° C. by expansion coil 40; said temperature is maintained by expansion valve 39.

By conduction, through the walls of metal containers 1 and 1A, and the fins 4 and 4A, the temperature of the pure water contained in metal containers 1 and 1A is reduced to 0° C. Further reduction of the temperature of the pure water contained in metal containers 1 and 1A will result in a withdrawal of the heat of fusion thereof.

Thus by continuing the withdrawal of heat by conduction from the pure water in metal containers 1 and 1A, the heat of fusion is withdrawn from the pure water. The steel points of cups 11 and 11A will start to cause the freezing process to begin with respect to the pure water. When one half of the heat of fusion is so withdrawn, one half of the pure water in metal containers 1 and 1A is changed in state to ice and ice crystals. This results in an expansion within metal containers 1 and 1A filling the existing 5% vacuum and leaving no further room for free expansion therein.

At this point, withdrawal of the balance of the heat of fusion from the pure water will cause a rapid increase in pressure within metal containers 1 and 1A. When the remaining heat of fusion is withdrawn, together with enough sensible heat to reduce the temperature of the pure water to minus 2° C., the pressure within metal containers 1 and 1A will reach approximately 4,000 pounds per square inch. At this pressure, the ice formed within metal containers 1 and 1A will re-melt to the liquid state. The resulting contents of metal containers 1 and 1A is an unstable, seeded liquid which is the working

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substance of my invention. The power generating device having 4,000 pounds pressure in metal containers 1 and 1A is now primed and ready for operation.

By raising the temperature in metal container 1 or 1A 1° centigrade, the pressure is reduced approximately 2,000 pounds per square inch in the container so heated. By heating the working substance in one of the metal containers, the main piston 14 will be forced toward the container having the warmer working substance. The additional heat is supplied to one or the other container 1 or 1A, by the heat collector 21. Coil 22 of heat collector 21 heats the brine or Prestone within the coil 22 which flows into the internal lower heat exchangers 19 and 19A through pipes 65, 65A, 66 and 66A. The amount of heat thus transmitted to said heat exchangers is controlled by flow valves 28 and 28A.

When the main piston 14 is forced into the warmer container 1 or 1A, the piston 56 of the internal upper heat exchanger 18 or 18A of the said warmer container is moved to the open position; conversely, the piston of the internal lower heat exchanger 19 or 19A found in the warmer container (1 or 1A) will move to the closed position. When the piston 14 has so moved to the end of cylinder 13, it is stopped by the collar 16 or 16A abutting the bumper spring 17 or 17A.

Hence, as the main piston 14 approaches the end of the stroke, the internal lower heat exchanger 19 or 19A distant from the piston will open and commence warming the surrounding working substance, thus reducing the pressure therein to bring about a return stroke of the piston 14. When the main piston 14 has reached the end of the stroke, the internal upper heat exchanger 18 or 18A will open and commence cooling the working substance of the then warmer container (1 or 1A), thus increasing the pressure therein to bring about a return stroke of the piston 14.

As the main piston 14 moves toward the warmer container (1 or 1A), the pump piston 70 or 70A moving in the same direction as the main piston 14 causes the check valves 62 on the face of the pump piston 70 or 70A to close thereby forcing a portion of the cooler working substance into pipe 74 or 74A as the case may be, thus forcing preheated working substance in coil 25 or 25A through flow valve 26 or 26A and out through spray heads 12 or 12A. This heated spray of working substance acts to heat the cooler working substance instantly to a degree necessary to create the needed differential in pressure between the metal containers.

Conversely, as the main piston proceeds toward the warmer container (1 or 1A), the check valves 62 of the pump piston 70 or 70A found in the warmer container 1 or 1A open, allowing the working substance therein to enter the interior of said pump in preparation for the return stroke.

In addition, the pump ports 61 in cylinder wall serve to churn and mix the working substance in the metal containers when the pump piston 70 or 70A is forced in or out of the pump cylinder.

Although an exemplary type and method of application of the new principles involved in the present invention have been illustrated by means of the drawings and specifically described in the accompanying specification, it is understood that it is not desired to limit the invention to said exact description but to embody such features as may readily be adapted for the utilization of heat energy from any source to produce useful mechanical power through the medium of a new engine motivated by the energy of a new modification of water. The molecules in the new modification of water developing great force in their effort to arrange themselves to crystals and a change in state, at temperatures below fusion temperature thereof.

I claim:

1. A power generating device comprising: a body forming two adjacent chambers; a cylindrical member in-

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tercommunicating with said chambers; a piston slidably mounted within said cylindrical member; a shaft connected to said piston and extending exteriorly of said body; fluid sealing means forming a completely liquid tight seal for said chambers; and heat exchanger means in each said chamber operably connected to said shaft to operate alternately inversely of each other; said heat exchanger means having a cooling member to reduce the temperature within said chambers to a point substantially below 0° C. and heat means to raise the temperature within said chambers to a point below 0° C. and above the temperature effected by said cooling member for actuating said piston; said heat exchanger means relatively synchronized so as to always create fluid force in each chamber against the cylindrical member of sufficient intensity to prevent the expansion of the area within the opposite chamber to the area sufficient to allow freezing of water therein.

2. A power generating device comprising: a pair of adjacent chambers having fluid therein; a cylinder positioned between said chambers and extending into each; piston means slidably positioned within said cylinder to prevent fluid communication between said adjacent chambers; an output shaft connected to said piston and extending exteriorly through said chambers to a point of use; heating means for each said chamber; cooling means for each said chamber; and control means within each chamber and connected to said shaft whereby the heating and cooling means are actuated alternatively to provide alternate raising and lowering of the temperature of the fluid in said chambers for actuating said piston.

3. A power generating device comprising: a body forming a pair of adjacent chambers; a cylinder joining said chambers; a piston slidably mounted in said cylinder to prevent fluid communication from one chamber to the other; each said chamber being completely filled with water; heating and cooling means for each said chamber for actuating said piston; and means connected to said piston to regulate said heating and cooling means to cause the water in each said chamber to exert sufficient pressure against said piston to limit the physical displacement of water within the other chamber sufficiently to prevent freezing of the water therein when the temperature of the water in both chambers is substantially below zero degrees centigrade.

4. A power generating device comprising: a pair of adjacent chambers; a cylinder connecting said chambers; a piston slidably mounted within said cylinder; liquid completely filling each said chamber for actuating said piston; a shaft extending exteriorly of said chambers connected to said piston; heating means in each said chamber; cooling means in each said chamber; heating and cooling control means operably connected to said piston to reduce the temperature in one said chamber and raise the temperature in the opposite chamber when the piston has reached a predetermined limit of travel; said limit being such that the maximum cubic displacement allowable within each said chamber is sufficiently diminutive to prevent freezing of the liquid at temperatures which would solidify the liquid at atmospheric pressure.

5. A device according to claim 3 comprising at least one crystallization center creating means mounted within each said chamber.

6. A method of generating power comprising the steps of: confining liquid within a limited volume; reducing the temperature of the liquid to below its fusion temperature while restraining the expansion of the liquid with sufficient force to prevent it from solidifying; reducing the restraining force to permit expansion of the liquid by its attempting to solidify; and transmitting and utilizing the expansional force exerted by the liquid in its attempt to solidify.

7. A method of generating power comprising the steps

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of: confining liquid within a limited volume; reducing the temperature of the liquid to below its fusion temperature so as to create at least one crystalline center in the liquid while restraining the expansion of the liquid with sufficient force to prevent it from solidifying; reducing the restraining force to permit expansion of the liquid by its attempting to solidify; and transmitting and utilizing the expansional force exerted by the liquid in its attempt to solidify.

8. A method of generating power comprising the steps of: confining liquid within a limited volume; reducing the temperature of the water to below its fusion temperature while restraining the expansion of the liquid with sufficient force to prevent it from solidifying; alternately increasing and reducing the temperature of the liquid while controlling its volume sufficiently to prevent solidification of the liquid; and transmitting and utilizing the expansional force exerted by the water in its attempt to solidify.

9. A method of generating power comprising the steps of: confining water within a limited volume; reducing the temperature of the water to below its fusion temperature while restraining the expansion of the water by

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its attempting to solidify; alternately increasing and reducing the temperature of the water within a range below its fusion temperature while controlling the volume of the water sufficiently to prevent it from solidifying; and transmitting and utilizing the expansional force exerted by the water in its attempt to solidify.

10. A method of generating power comprising the steps of: confining two bodies of water, each within a limited volume, the bodies of water being interconnected by a movable member; reducing the temperature of the two bodies of water to below their fusion temperature while restraining the expansion of the water with sufficient force to prevent it from solidifying; causing alternating differentials in pressure between the two bodies of water by alternately and inversely increasing and reducing the temperature of the water within a range below fusion temperature, thus causing the movable member to move to and from each body of water.

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