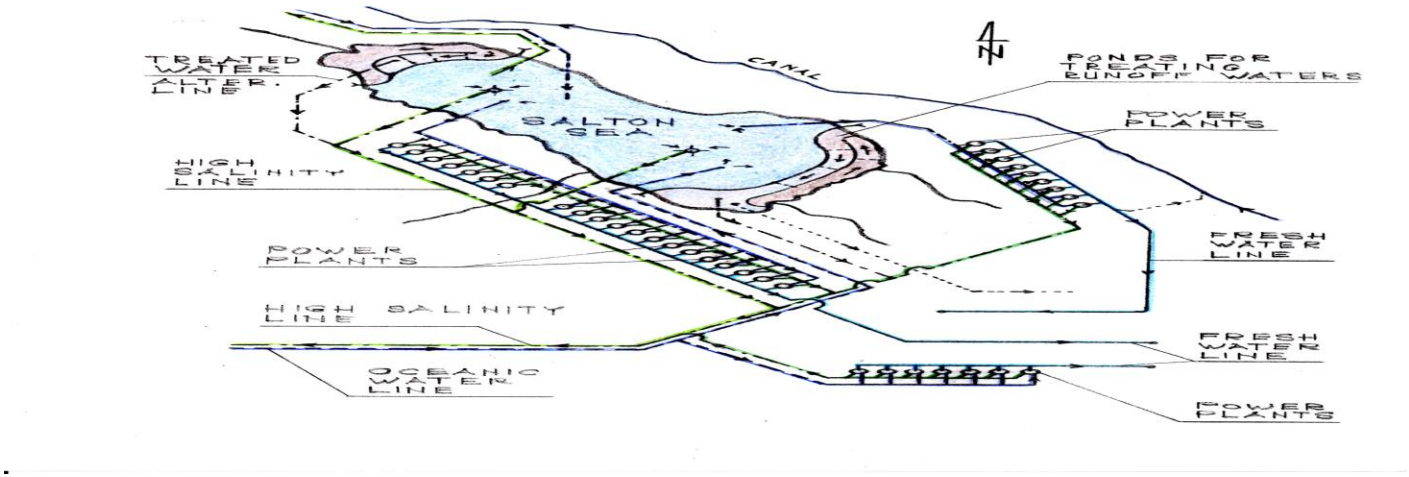
Proposal for Restoration of the Salton Sea
"Scientific Geothermal Technology"

– Power Point Presentation –

SMU – Power Plays Conference, Dallas, TX - May 18-20, 2015



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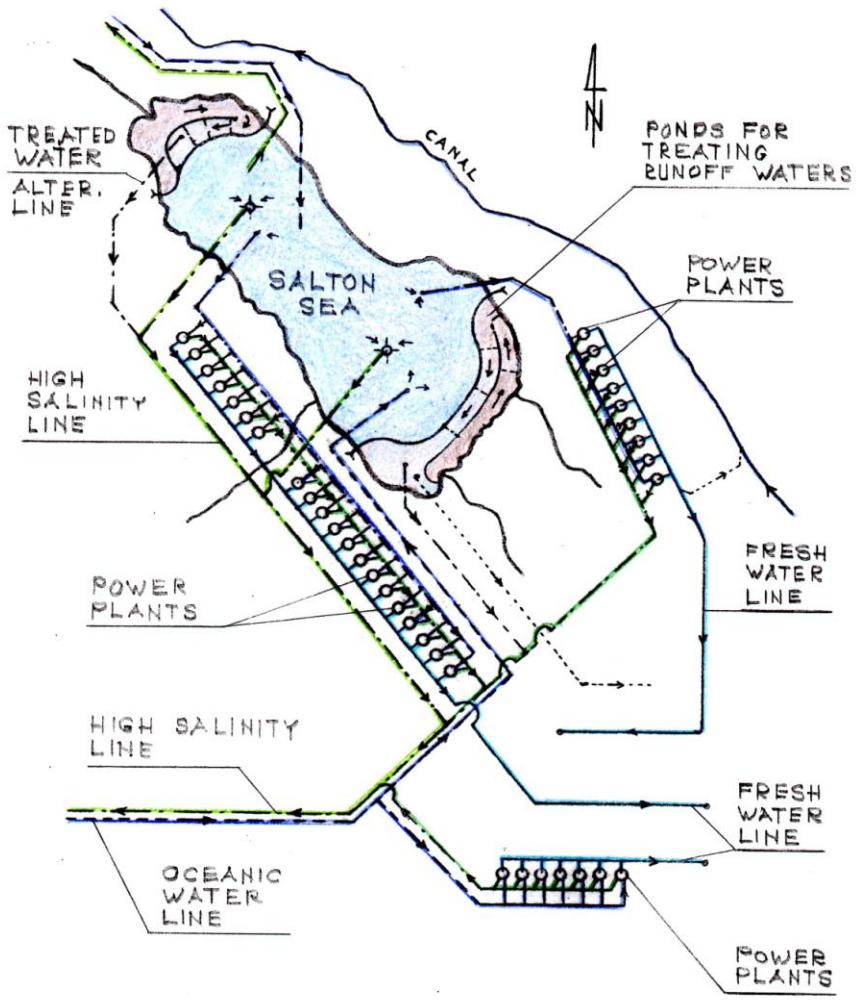
Summary of the Proposal for Restoration of the Salton Sea



- **Phase I**: **Connecting the Salton Sea with Pacific Ocean** with pipelines for controlling waterline level of the lake and exchanging waters **and providing conditions for tourism.**
- **Phase II: Production of two sets of dikes –** one in northern and one in southern part of the Salton Sea forming ponds for **treatment of farmland runoff water and providing wildlife sanctuary, and separating (now) oceanic water in the central part of the lake.**
- **Phase III: Production of the first Power Plant with SCI-GHE system using geothermal sources for production of electricity and fresh water.**
- **Phase IV: Production of two additional power plants on two additional sectors.**
- **Phase V: Continued buildup of subsequent Power Plants at each sector.**

The "Self Contained In-Ground Heat Exchanger" (SCI-GHE system)

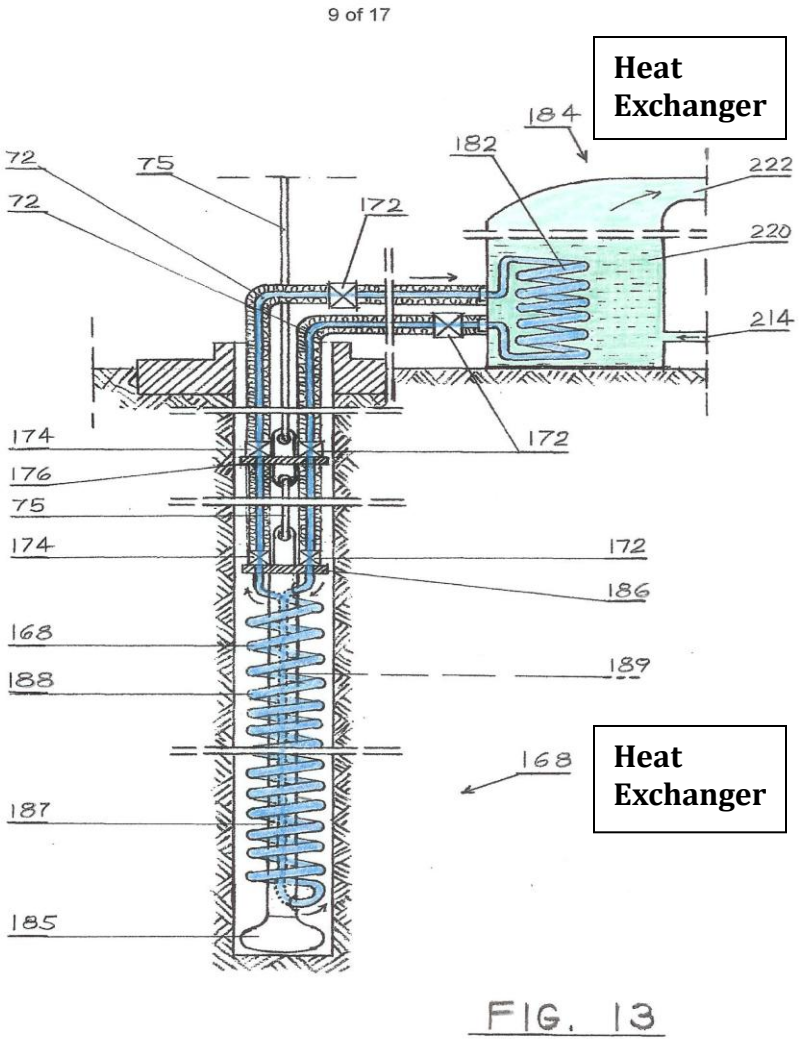


FIG. 13

- The (SCI-GHE) apparatus is an integral part of the "Self Contained In-Ground Geothermal Generator" (SCI-GGG system) and is used separately as an independent Heat Exchanger apparatus.
- The (SCI-GHE) apparatus consist of: two coils (Heat Exchangers); a closed loop of thermally insulated pipes/houses 72; at least one In-Line Pump 172; and a Binary Power Unit 184.
- The first coil (Heat Exchanger) 168 of the first closed loop systems is located at the bottom of the well at heat source and the second coil (Heat Exchanger) 182 is coupled into boiler of the Binary Power Unit on the ground surface which operates as a second closed loop system - the Organic Rankine Cycle (ORC) – which generates electricity.
- Alternatively, the (SCI-GHE) and/or (SCI-GHE) apparatus can be scaled to be used for extracting heat from abandon and marginal wells.
- The first coil (HE) at the bottom of well bore is structurally sound and can support its weight.

Cross-sectional view of the “In-Line Pump” taken along line 22-22’ of FIG. 23

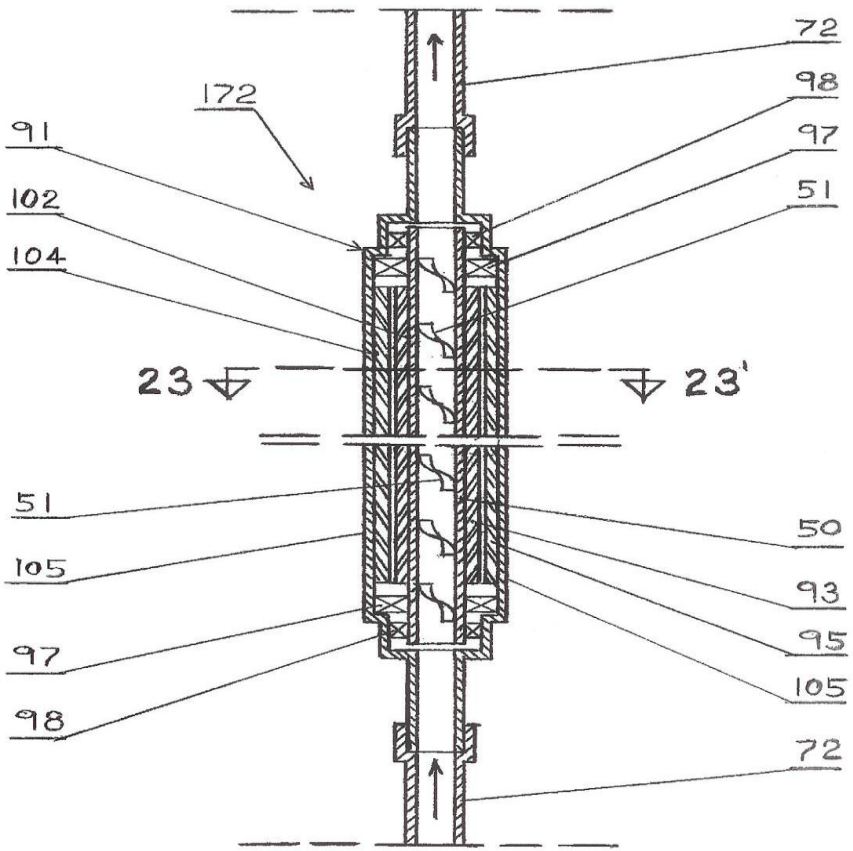


FIG. 22

- **The In-Line-Pump 172 is an integral part of both SCI-GGG and SCI-GHE systems, circulating fluids through closed loop systems.**
- **The In-Line-Pump 172 is an electromotor cylindrical shape and is inserted as a repetitive segment in pipeline.**
- **It has a hollow cylinder shaft of the rotor with spiral blades inside hollow shaft.**
- **Yields maximum flow rate with limited diameter.**

Cross-sectional view of the In-Line Pump taken along line 23-23' of FIG. 22

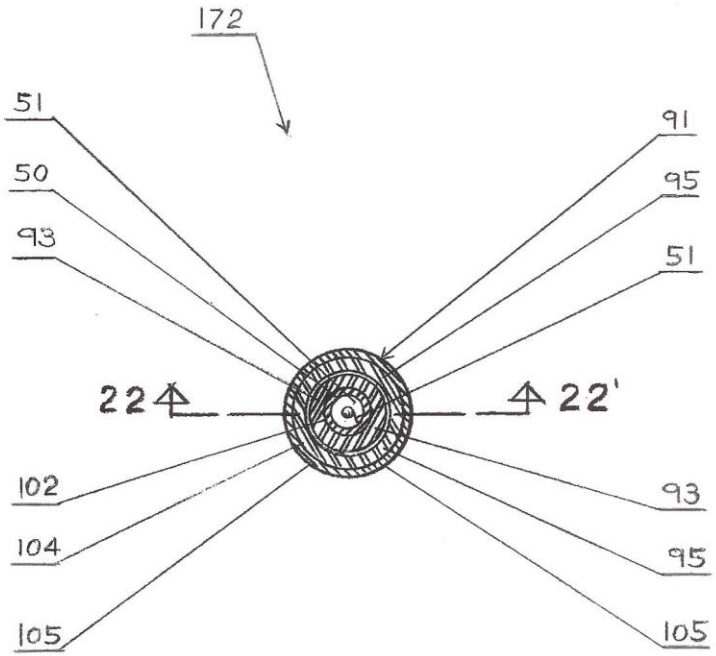


FIG. 23

- **Alternatively, the In-Line-Pump 172 can be inserted as a repetitive segment of a raiser pipe for pumping fluids up to the ground surface from reservoirs in which geo-pressure is low.**
- **Also, the In-Line-Pump 172 can be used in cross-country pipeline for oil, gas, water, etc., as a repetitive segment.**
- **In downhill route it function as a generator and generates electricity, which can be used to supplement In-Line-Pumps 172 in horizontal and uphill route.**

Schematic Cross-Sectional Diagram of an Universal Heat Exchange System 210

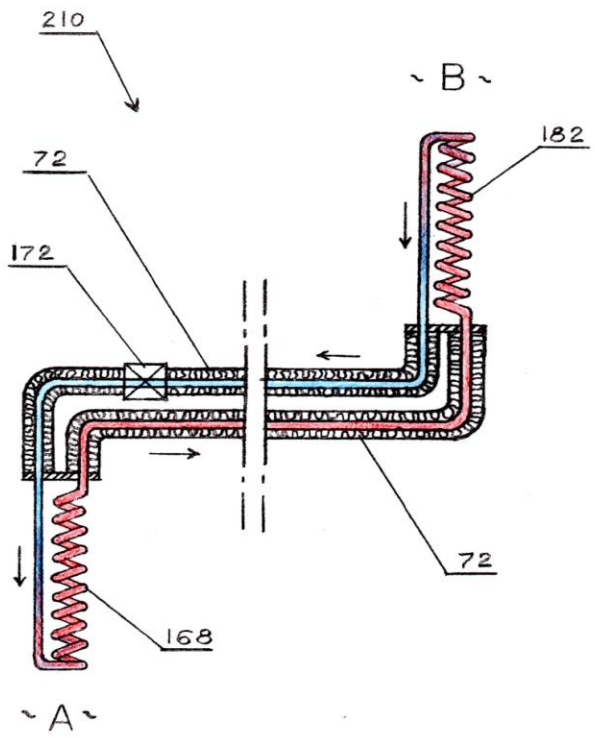


FIG. 24

FIG. 24 illustrate an schematic cross sectional diagram of an universal heat exchange system 210 with main segments including:

- **A thermally insulated close loop line 72 with an in-line pump 172;**
- **A first heat exchanger 168 positioned in heat source environment “A”; and**
- **A second heat exchanger 182 positioned in preferred environment “B”;**
- **Heat is extracted from heat source through the first heat exchanger 168 and transferred through thermally insulated line 72 to the second heat exchanger 182 for external use including production of electricity.**
- **The universal heat exchange system 210 is a portable unite and can be used in many applications.**

Schematic Plan View of a Power Plant for Production of Electricity in locations such as Hawaii by using SCI-GHE System

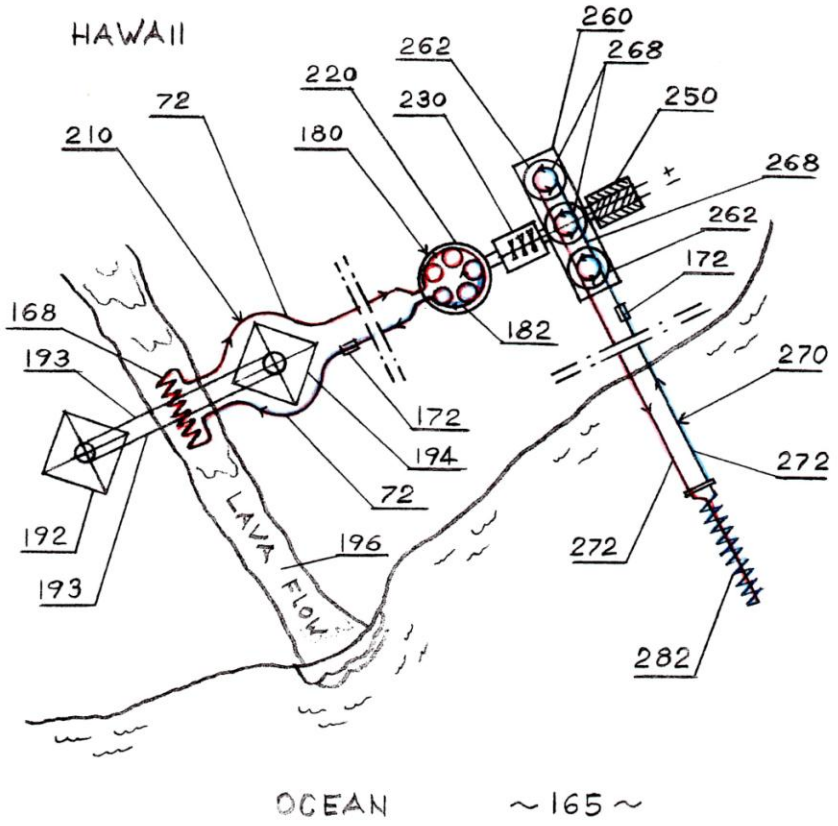


FIG. 26

- **Two posts/towers 192 and 194 erected on either side of established lava flow/tube 196 with cable 193 suspended between them.**
- **The first heat exchanger 168 is lowered at safe distance, close to lava flow 196, and the second heat exchanger 182 is coupled into boiler/evaporator 220 of the binary power unit 180.**
- **Heat exchangers 168 and 182 are connected with thermally insulated closed loop system 210.**
- **Power unit 180 consist of a boiler 220 a turbine 230, a generator 250, and a condenser 260.**
- **Cooling system for the condenser 260 consisting of additional closed loop system 270 with heat exchanger 282 submerged into Ocean 165.**

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Cross-sectional view of a Power Plant for Production of Electricity from heat source such as Oil Well Flare Stacks by using SCI-GHE System

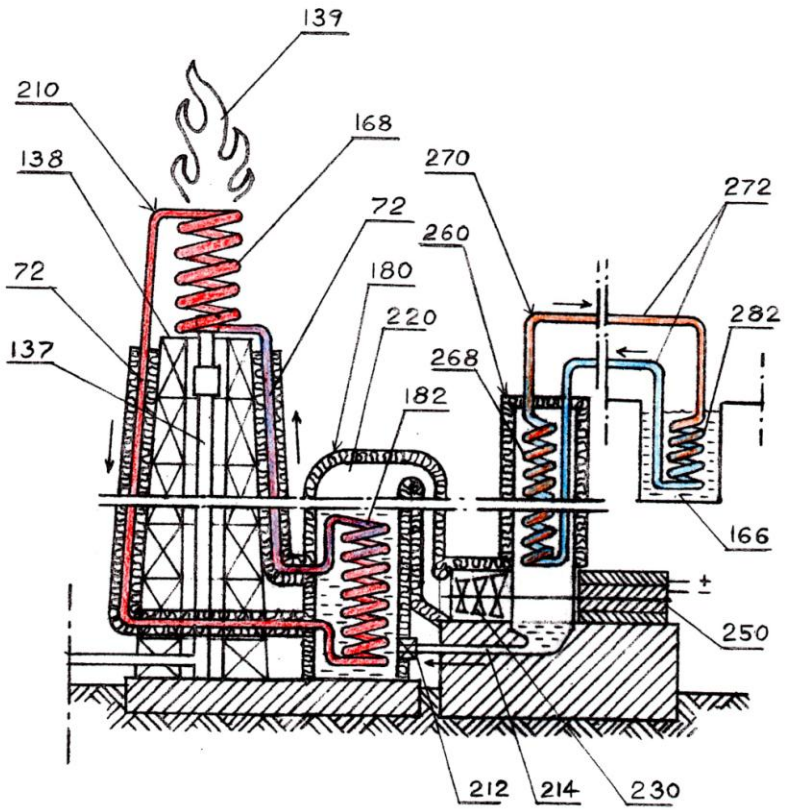

FIG. 27

- **Flare stack 137 has support structure 138.**
- **The heat exchange system 210 with the first heat exchanger 168 positioned on top of the supporting structure 138 and the second heat exchanger 182 coupled into boiler/evaporator 220 of the binary power unit 180.**
- **Heat from flame 139 is extracted through the first heat exchanger 168 and transferred through thermally insulated line 72 to the second heat exchanger 182.**
- **Binary power unit 180, has a boiler 220, turbines 230, a generator 250, and condenser 260.**
- **Condenser 260 is cooled with additional closed loop system 270 consisting of the first heat exchanger 268, closed loop line 272 and the second heat exchanger 282 which can be submerged into nearby source of cold water.**

Power Plant

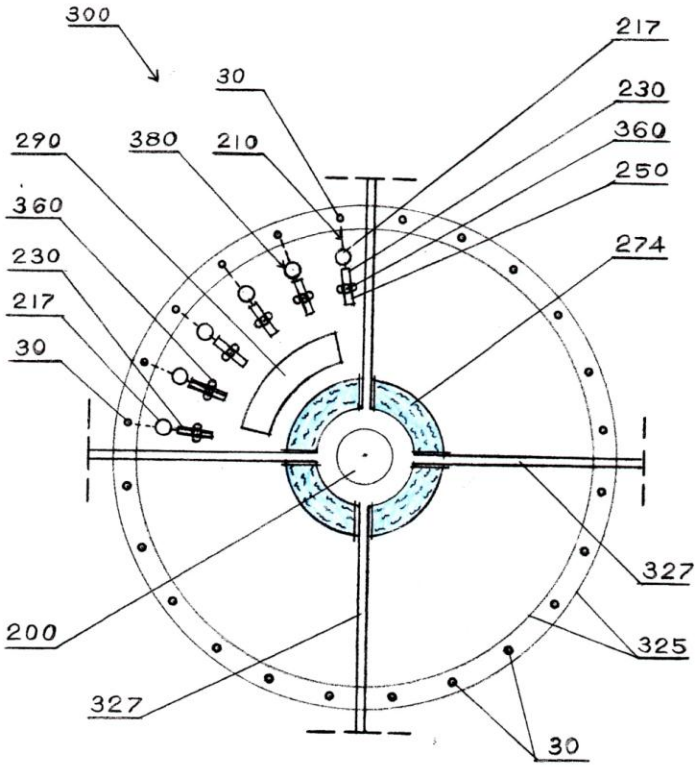

FIG. 41

- **300 – Power Plant.**
- **30 – Wells.**
- **380 – Power Units.**
- **200 – Control Center.**
- **290 – Processing Building.**
- **274 – Fresh water pond.**
- **210 – Heat Exchange system.**
- **325 – Railroad track for maintenance derrick.**

Cross-Sectional view of one Power Unit – SCI-GHE System

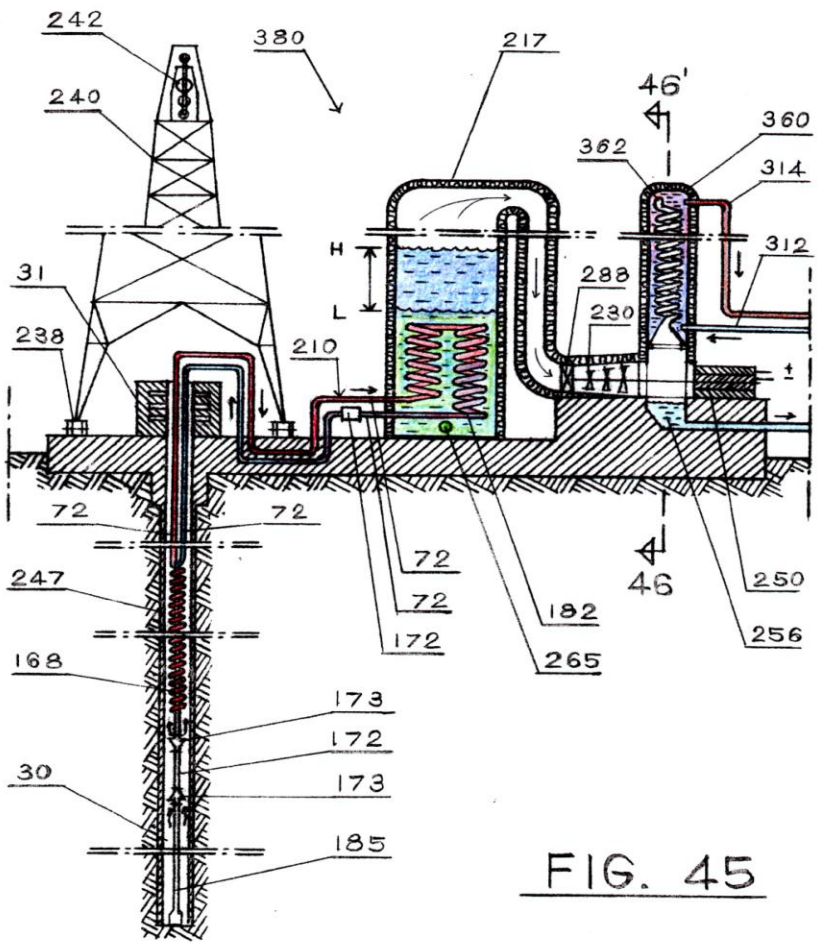

FIG. 45

- **30 - Well.**
- **240 - Derrick.**
- **380 - Power Units.**
- **210 - Heat Exchange system.**
- **217 - Boiler / Distiller.**
- **230 - Turbine.**
- **360 - Condenser.**
- **250 - Generator.**
- **312 - Inflow cooling line – water from canal.**
- **314 - Outflow cooling line.**
- **256 - Condensed fresh water line.**