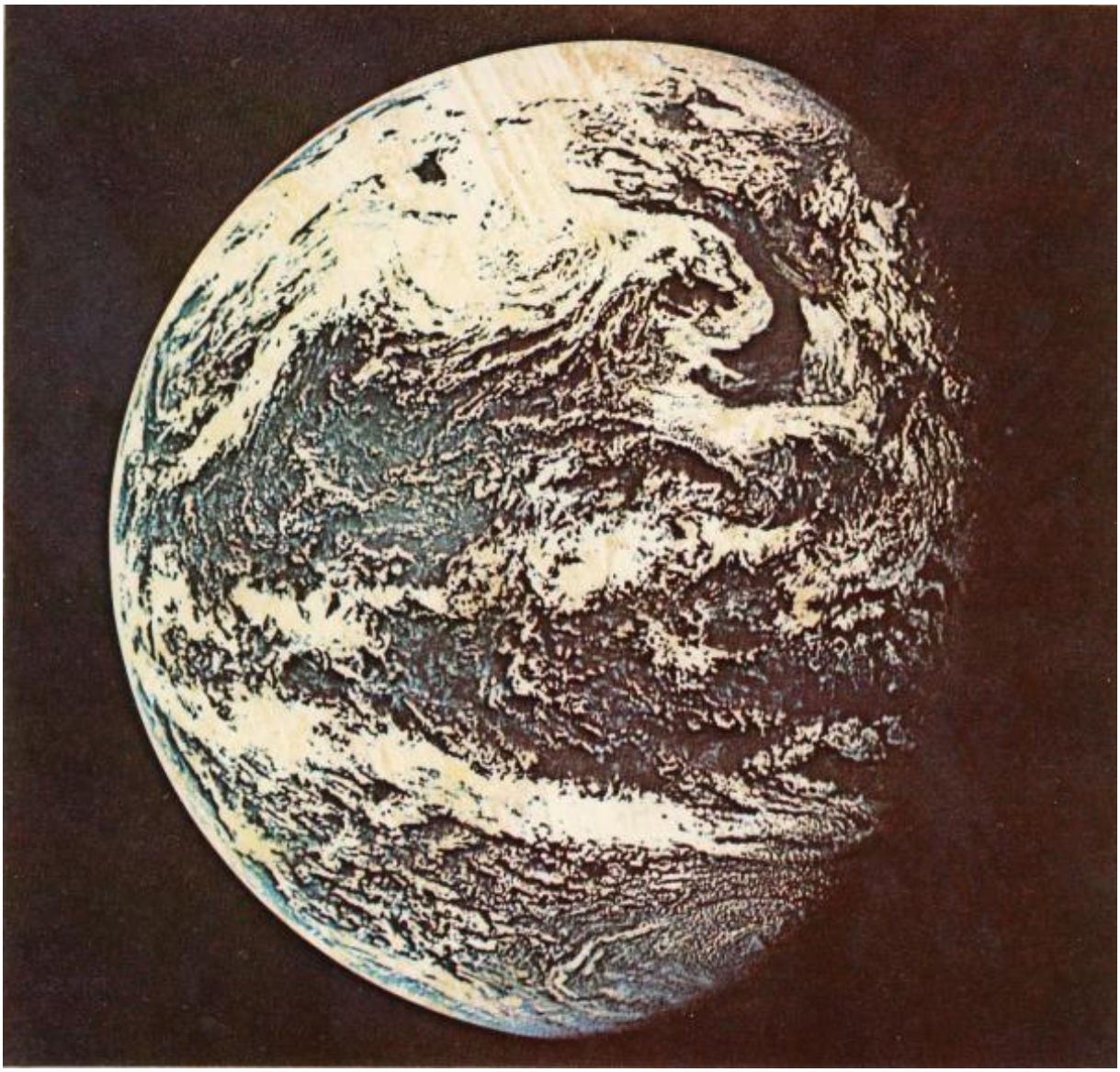
Macro

It is now time to activate the epochal transition from the thriftless dispersion of permanently depletable elemental resources toward the employment of infinitely regenerative energy sources-those that may be purposefully manipulated for specific needs yet whose final product and destination is that of the original source/s. It is now time to activate energy conversion methods which utilize, via harmonization, the relatively perpetual motions that are resultants of sun/earth/moon gravitational and climatic relationships. All interactive energy resultants are ultimately derived from tremendous forces of attractable gyrations coupled with effects of the sun's heat and light. These motions generate subsequent synergetic re/actions evidenced by flows of temperature and pressure, wind and water, and the array of chemical intertransformations.

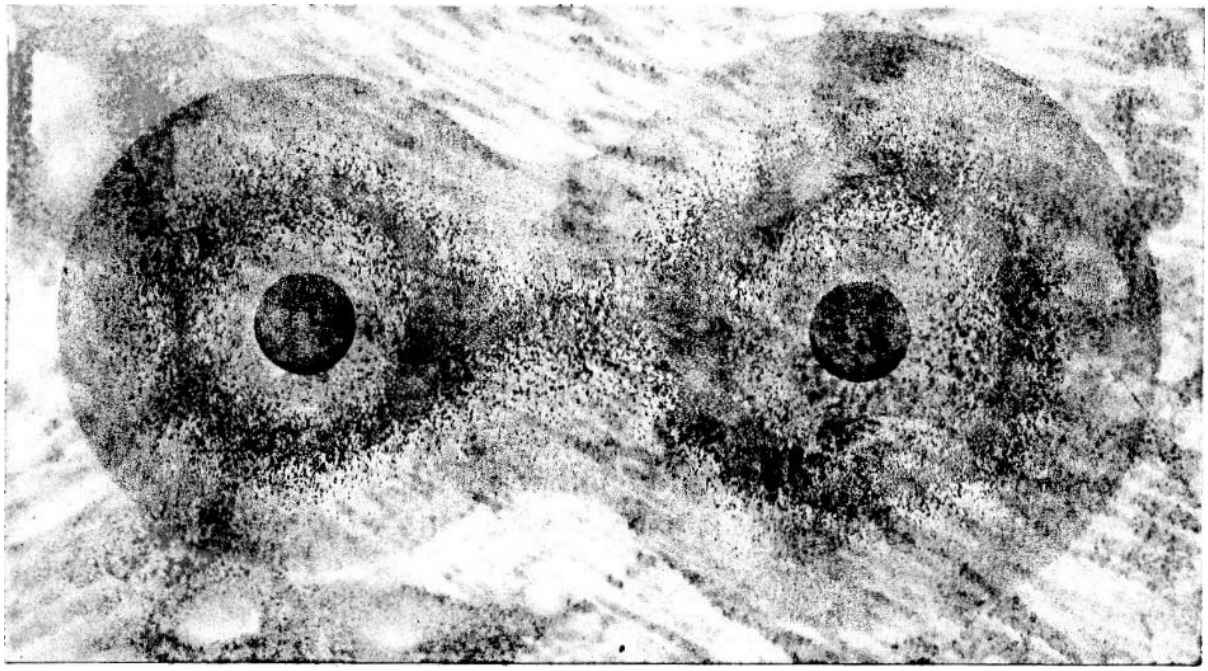


Three quarters of Earth's surface is comprised of water (139,400,000 "square" miles) with an average depth of 2.4 miles, a fraction of Earth's 3,957 mile radius. The hydrosphere, so delicately balanced between precipitation and evaporation, maintains flux by virtue of the continual circulation of winds, thermal gradients, seismic activity, and the asymmetric rotations of the heavenly bodies. The hydrosphere churns in direct response to these impingements forever seeking the calm of equilibrium. It throws its waters about in currents and eddies causing tertiary movements that combine or cancel to generate surface disturbances within a wide range of amplitude-from the smallest ripple to the largest tsunami.

Micro

In its purest form, water is a compound of hydrogen and oxygen atoms. These atoms are attracted to one another because their union nearly satisfies an otherwise insatiable desire for molecular stabilization. Each to themselves is a lonely hunter- oxygen has only six electrons in its outer orbit but desires eight electrons. Hydrogen has but one electron.

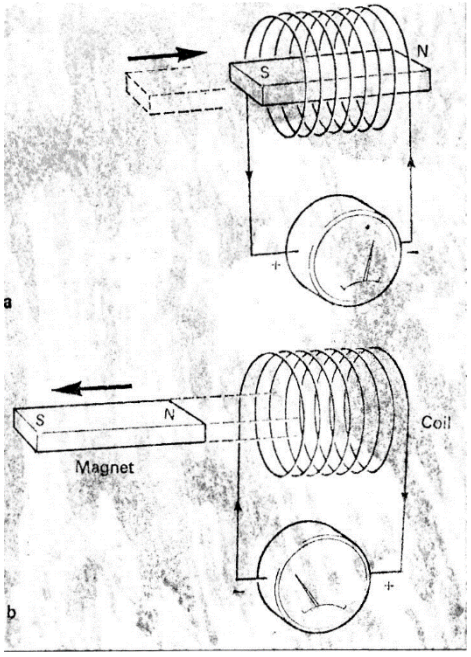
Therefore, by cooperatively overlapping its electron orbits with those of two hydrogen atoms, the oxygen atom approaches stabilization. However, stabilization will not occur due to the need for two additional electrons above and beyond what hydrogen supplies- for these electrons still "belong" to the hydrogen atom. What ensues is a dancing interaction of electrons like the cogs of meshing gears. Both hydrogen and oxygen attempt to "short-change" one another, but each is as much a failure in this quest as it is a success. Thus water remains a delicately balanced, though turbulent liquid- neither gas nor solid.



Interaction of electron clouds of two atoms. This interaction occurs only when the atoms come close enough to each other to allow overlapping of their electron clouds.

However, if a constant flow of additional electrons from an external source is introduced to the hydrogen-oxygen bond, it will annul their hungry attraction for each other. The two gases, satisfied, will separate from one another to take company among their own ranks. Division will occur as long as additional electrons are provided. An accumulation of the gases will formulate if they are isolated from one another as might be accomplished with separate storage vessels.

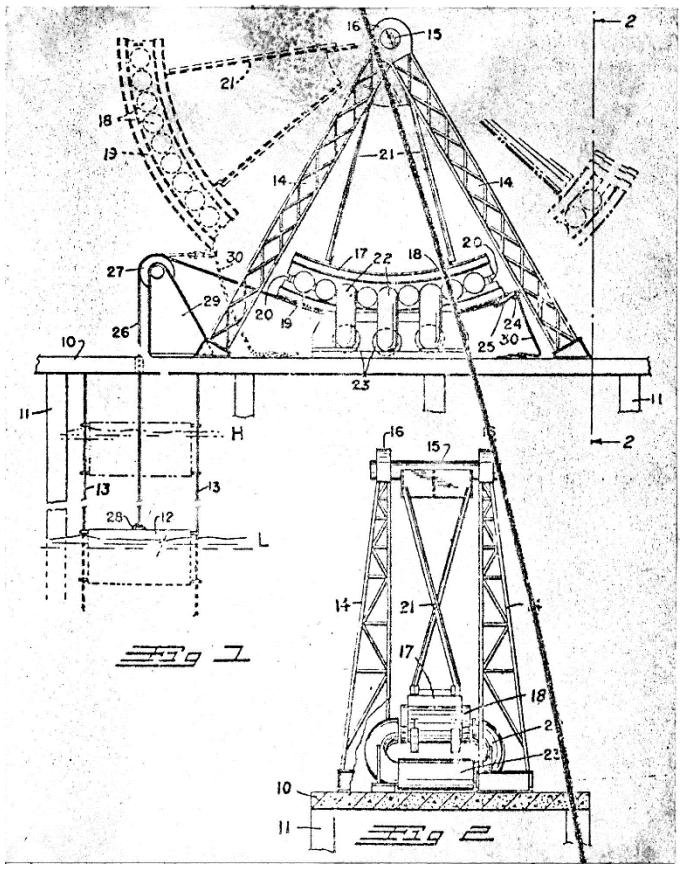
This method of water splitting is called electrolysis. To operate successfully, it requires that a direct and unceasing current of electricity permeate a solution of acid and water called an electrolyte. One method of generating the electricity required for electrolysis is by inducing a flow of electrons in a conducting medium such as copper wire. This flow (electromotive force) may be induced by the relative movement of a permanent magnet from a position within a coil of wire to a position outside the coil. A cycle is completed as the magnet returns to its initial position.



Therefore, given properly located electrical and support apparatus, all that is needed for the steady generation of electricity is a continually operative source of fluctuating energy levels. As should be readily apparent, a most suitable form of fluctuating energy is to be found within the aforementioned hydrosphere. The churning passage of ocean wave troughs and crests over a fixed ocean point offers the consistent changes in vertical distance that are required to push-pull a magnet (or series) through inductive wire. Electricity may be generated as long as motion is offered.

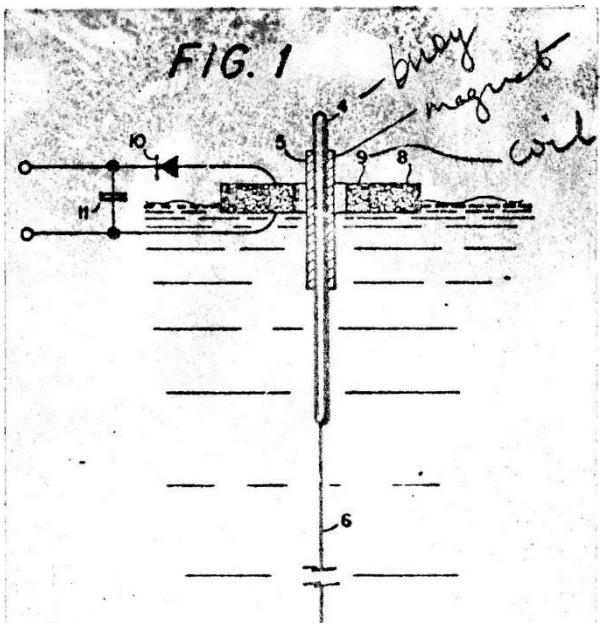
Because ocean wave generation will cease only as a result of hell freezing over, it becomes feasible to consider this energy as relatively perpetual. Any device that effectively translates these energies may be deemed perpetual for as long a time as its apparatus is operative. A distinction must be assumed between alleged perpetual motion machines (unto themselves) and perpetual motion systems (in harmony with the powers that be). Systems are comprised of interchangeable components. If any one component fails, it may be replaced with negligible effects to the overall operation of the other parts. Thus, diminutive friction may take its special case tolls without toil to the comprehensive, modulated package.

There have been a number of prior proposals to utilize the gestic motions of wave energy but each suffers inefficiencies in terms of maximal potential use of available materials. Some devices lay claim to redundant over-structuring while others provide scanty frameworks, thus becoming passive pansies in relation to ocean wave energies. Let us compare and contrast the following U.S. Patents. These are inventions within Class 60, sub-classes 497, 498, 499, 500 and Class 290, sub-classes 42, 53. Five previous patents have been issued for inventions in these classes and all are quite interestingly different from each other.



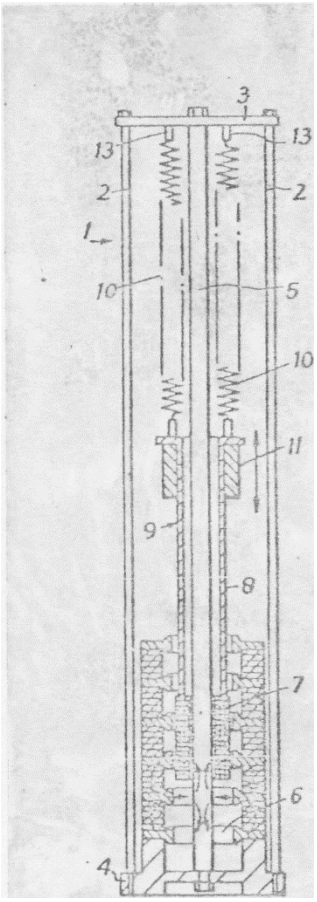
U.S. Patent #3,011,062 to Goldsmith

This configuration of elements primarily utilizes changes in mean levels of water generated by tides to raise and lower a weighted float which is attached by tensile cable to a moveable armature that directly responds to the level changes of the float. As the tide rises, the float follows and is held in suspension until the tide recedes. The float is then released to travel through air until it meets the water's surface again. The armature's attachment to the float forces it to move in reaction to the dropping of the float, thereby generating a sudden spurt of electricity in a stationary coil of wire located on a platform above mean water level. In essence, electrical energy is obtained once every 14 hours due to the rhythms of tides. This device is limited to coastal areas because it relies on substantial ground connection to maintain the armature above the float/water level.



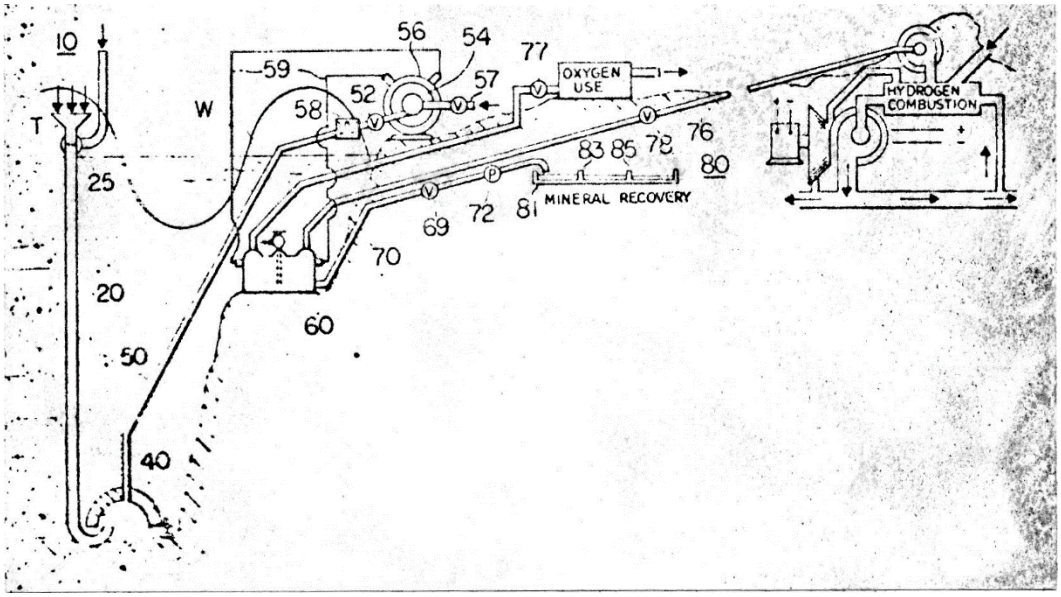
U.S. Patent #3,546,473 to Rich

This device is a definite improvement over prior art because it drastically reduces the amount of hardware required to achieve the same results. While it still relies on ground connection to operate, the connection is obtained by means of an anchored tensile cable, a more slender solution than prior art. It is also a wave energy converter rather than tide- this readily homogenizes output due to the shorter period between waves. But this device falls short of achieving maximum results because the horizontal component of a wave will push the armature/float/cable to its maximum distance away from anchorage and keep it there. Thus, very little effective change in distance will be obtained because of the relative co-motive cooperation of coil/armature. In other words, both coil and armature will move in synchronization with each other, drastically reducing the effective change in distance between the two that is required to generate electricity. In essence, this configuration will wallow about, serving as a man-made indicator of ocean wave properties. It will passively submit to wave forces instead of providing a stationary constant from which relative movement may be gauged.



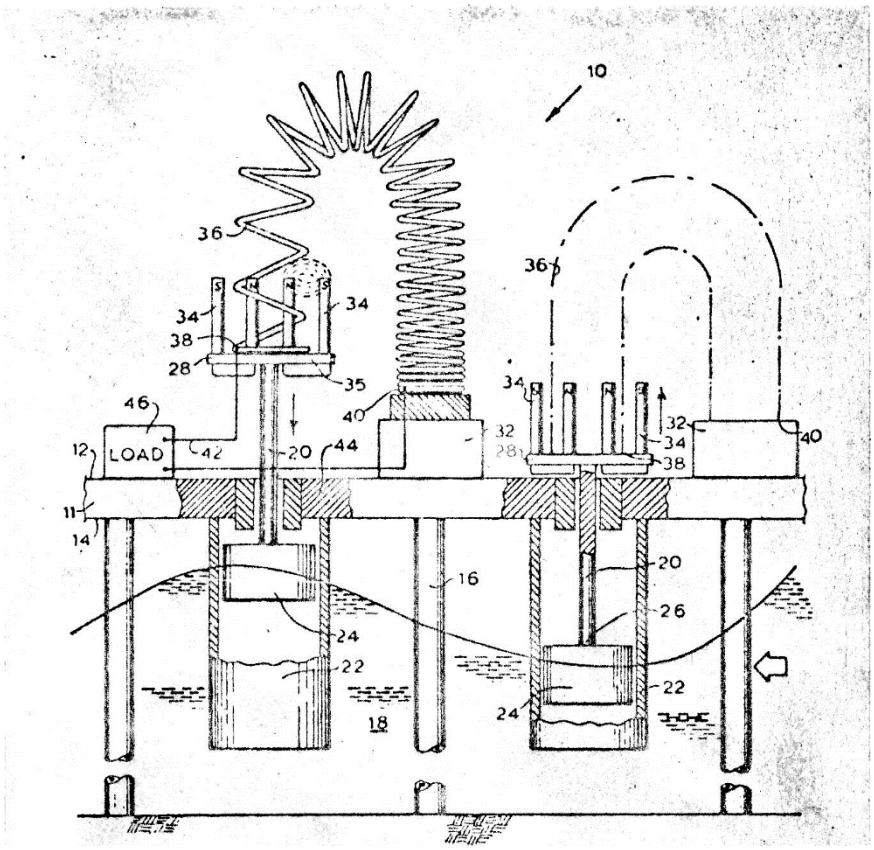
U.S. Patent #3,696,251 to Last et al

This is a Yankee Magazine "whatsit", a guaranteed gillhickie that serves 1001 useful purposes. It is a device that may be fixedly secured to a variety of moving elements- from horses legs to navigational buoys. Last et al have fully employed the God-given phenomenon of motion relative to lack thereof to produce electricity. In a sense, they have patented a motion rather than a motor.



U.S. Patent #3,754,147 to Hancock et al

Back to ocean waves. This device traps air and places it under compression to drive prime movers for the generation of electricity. As is evident from the drawing, it is limited to coastal areas, and in fact, totally relies on the contour of the shore of a body of water to operate successfully. All elements are firmly embedded to earth, and without this natural foundation, an expensive man-made reiteration would be necessary. This escalates construction costs beyond practical feasibility and otherwise limits potential deployment sites.

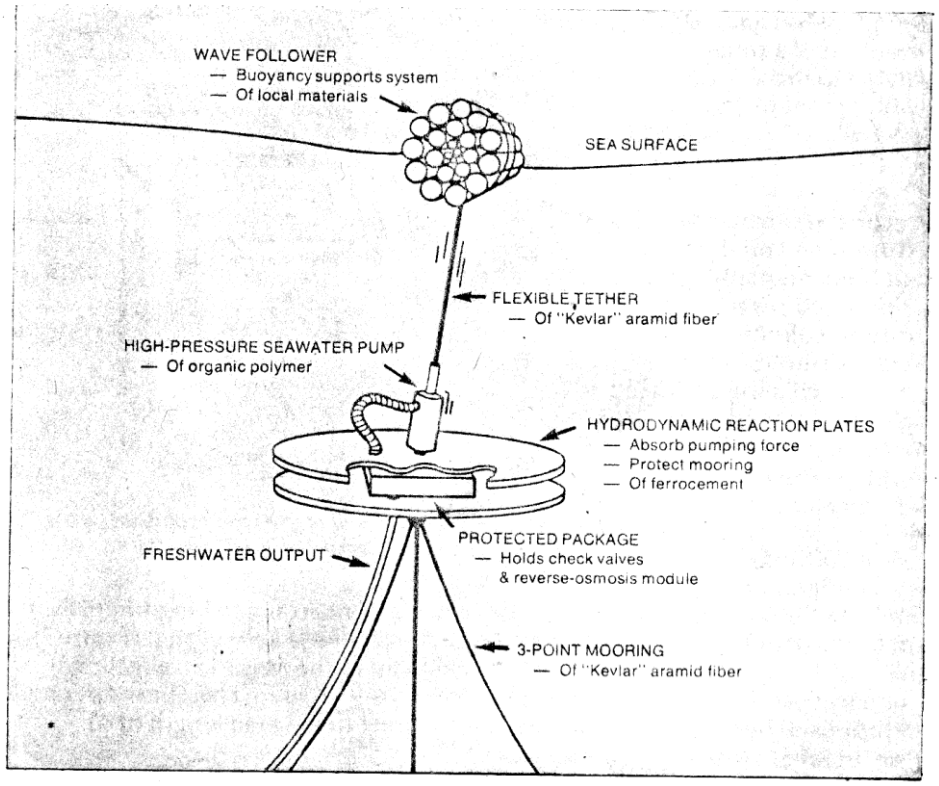


U.S. Patent #3,783,302 to Woodbridge

As was evidenced in #3,011,062 and #3,754,147, this device also depends heavily on ground connection for successful operation. Massive piers must be constructed to the ocean floor to maintain the electrical apparatus well above mean water level. Its efficiency is further mitigated by the size of the magnets in relation to the coil, and also the lack of means of coil alignment in relation to the magnets.

Geometrically, this is a roundabout solution. The piers go up farther than is necessary, then come down in the form of flotation devices to finally encounter the energy source to be used. This is an incredible waste of hardware.

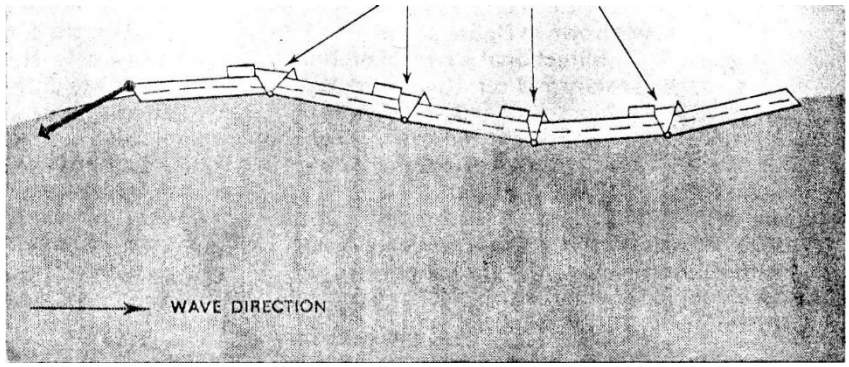
In addition to the preceding patents, there are three wave energy converters that have periodically appeared in various journals.



Wave Energy Pump for Water Desalination by Pleass

This device utilizes wave motion to drive a high pressure pump which forces seawater through a reverse osmotic membrane. Apparently, the membrane desalinates ocean water, thus rendering it potable for consumption in areas where fresh water is not readily available. For successful operation, it must be assumed that the "aramid fiber" is fully retractable, not unlike a rubber band- for if it is not, then the tether will remain in its fully extended position, thus curtailing meaningful pumping action.

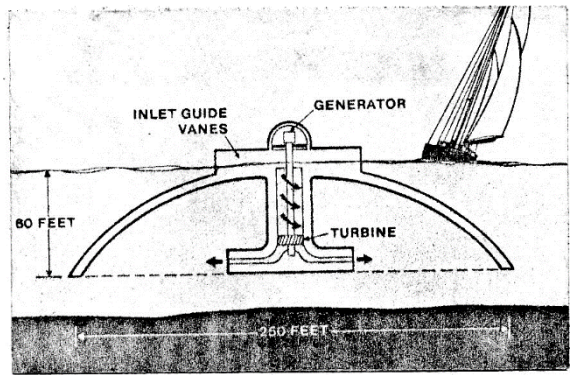
Otherwise, this device appears relatively efficient from the standpoint of cost effectiveness. However, as is evidenced in most of the prior devices, it relies on ground connection for stabilization and there is no consideration for the benefits of modulation.



Wave Contouring Raft by Cockerell

We may finally rest our eyes on a wave energy converter that is conceived as a module, thus part of a system. This is a prime consideration that must be extensively incorporated if any meaningful amount of wave energy is to be translated to electrical energy, for the oceans are a realm that does not tolerate isolated, exclusive non-systems.

Unfortunately, this system is merely one dimensional. The rafts may certainly be attached along a line, one in front or behind the other- but if they are interconnected as part of a two axis, planar grid (so that one unit is surrounded by eight), energy may only be collected if the direction of wave passage is absolutely perpendicular to the hinged joints and their associated power mechanisms. Otherwise, a plurality of units will move en masse, allowing no hinging action.

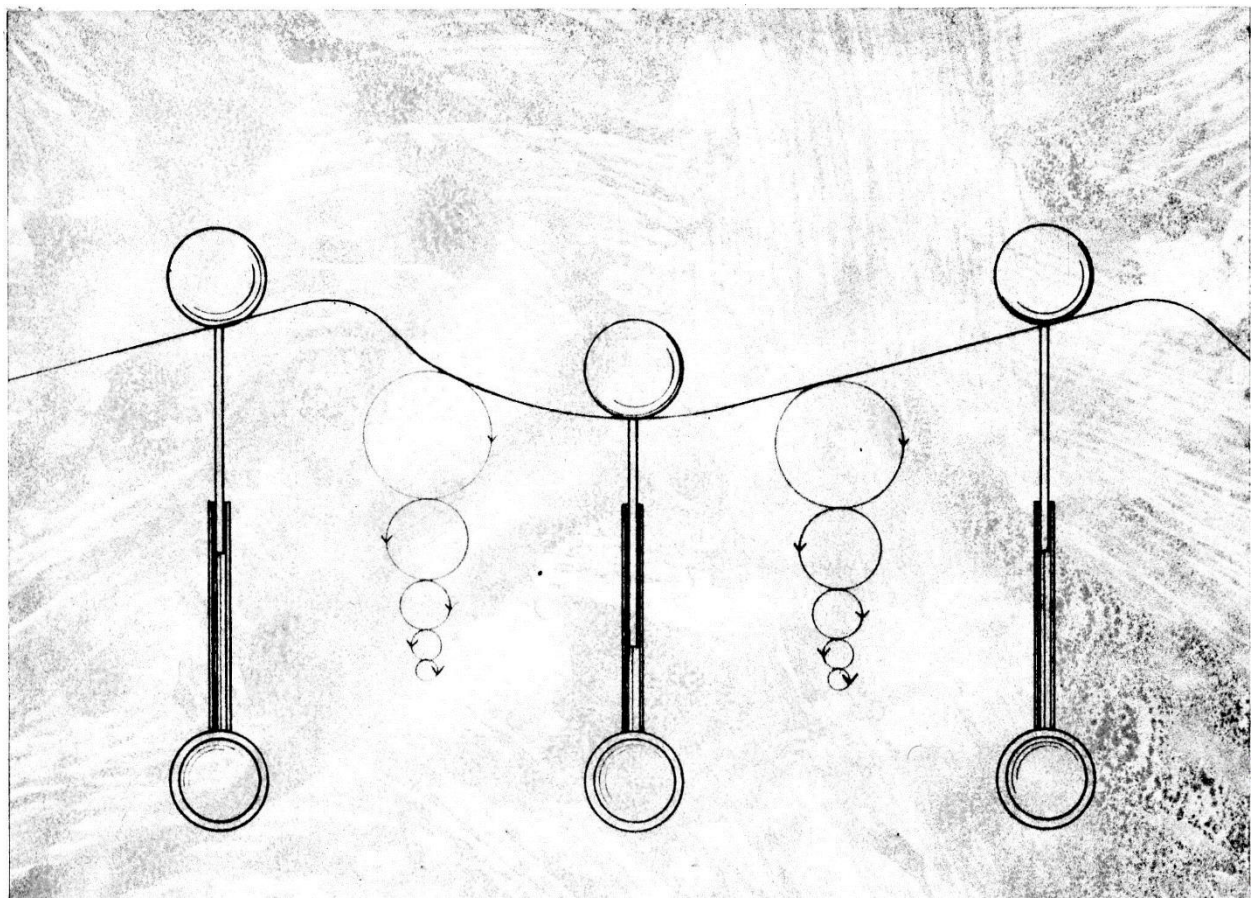


Lockheed Dam- Atoll

This device represents the culmination of a six year research effort by Lockheed engineers. It is a massive artificial atoll, 250' by 60', that forces a wave train to concentrate its energies toward a set of guide vanes. The water then enters a central core to spiral down and out, subsequently rotating a turbine that generates electrical energy.

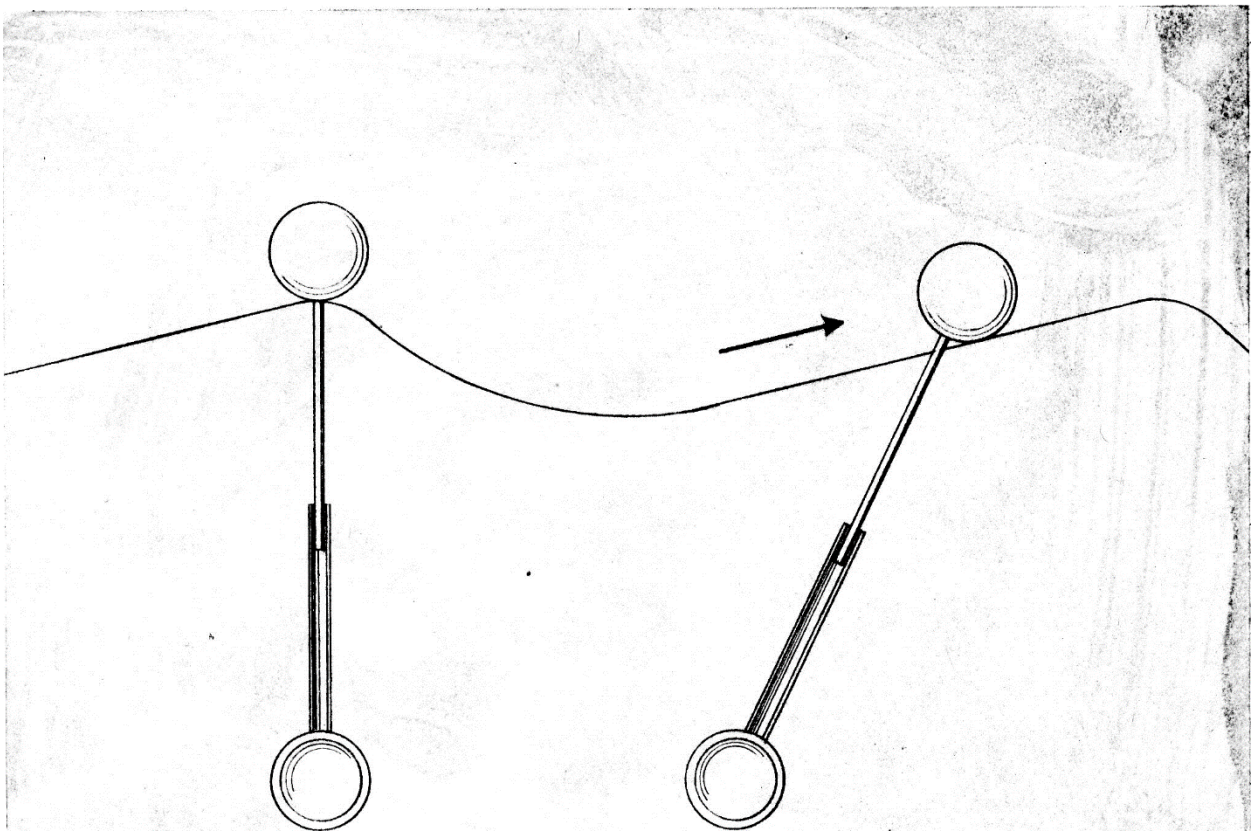
For this device to be deemed efficient, it must be assumed that all of the wave energy within the 49,000 square foot area that the dam- atoll occupies is used to rotate the turbine. Otherwise, the massiveness of this proposal does not warrant its realization. It appears that much of the wave energy is not concentrated for use, but instead, allowed to proceed by the configuration unaffected by its geometry.

As was evidenced with all prior devices, there is no consideration for unit to unit connections. Without "buddy system" modulation, ocean wave energy will never be effectively harnessed.

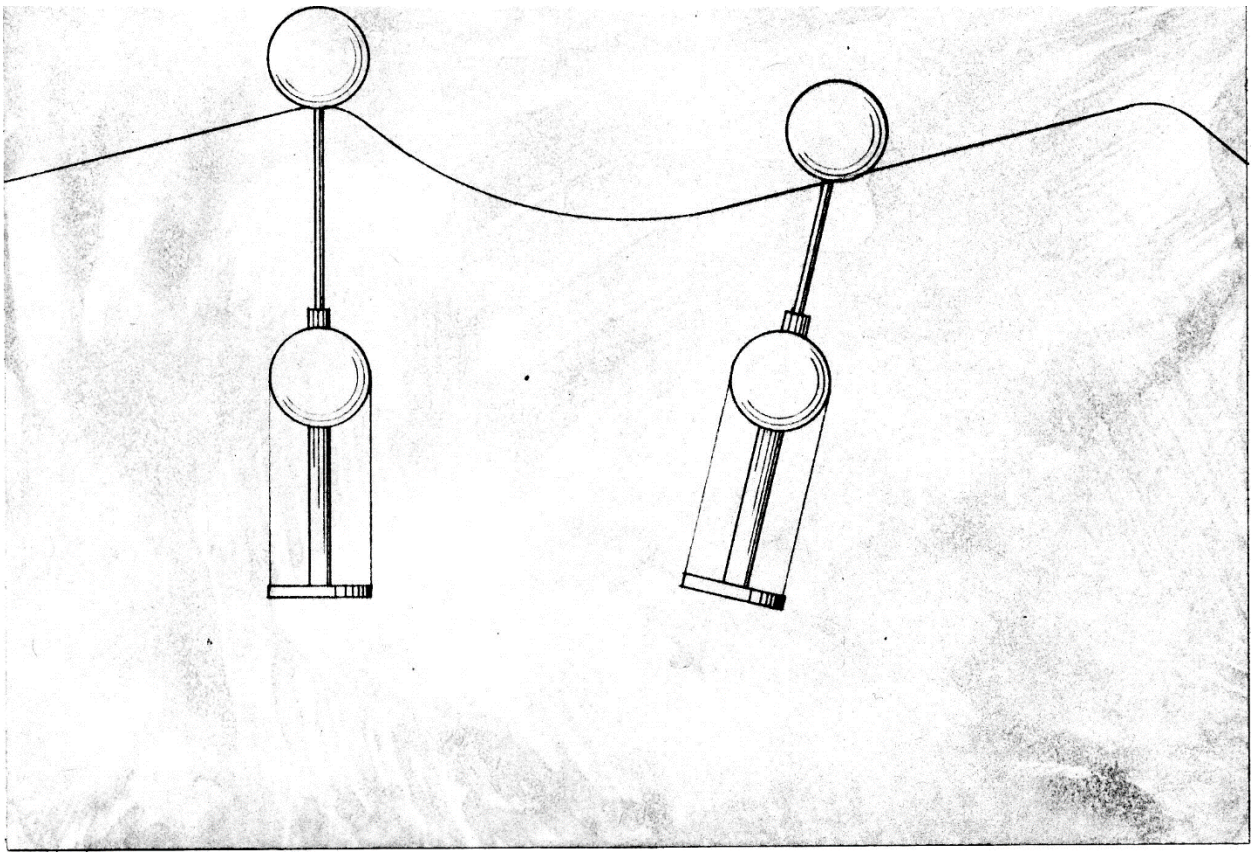


Ocean waves move horizontally across a plane. Their movement causes vertical turbulence in substrata to a depth dependent on the size and period of the wave. Below that depth, turbulence falls off due to viscous shear.

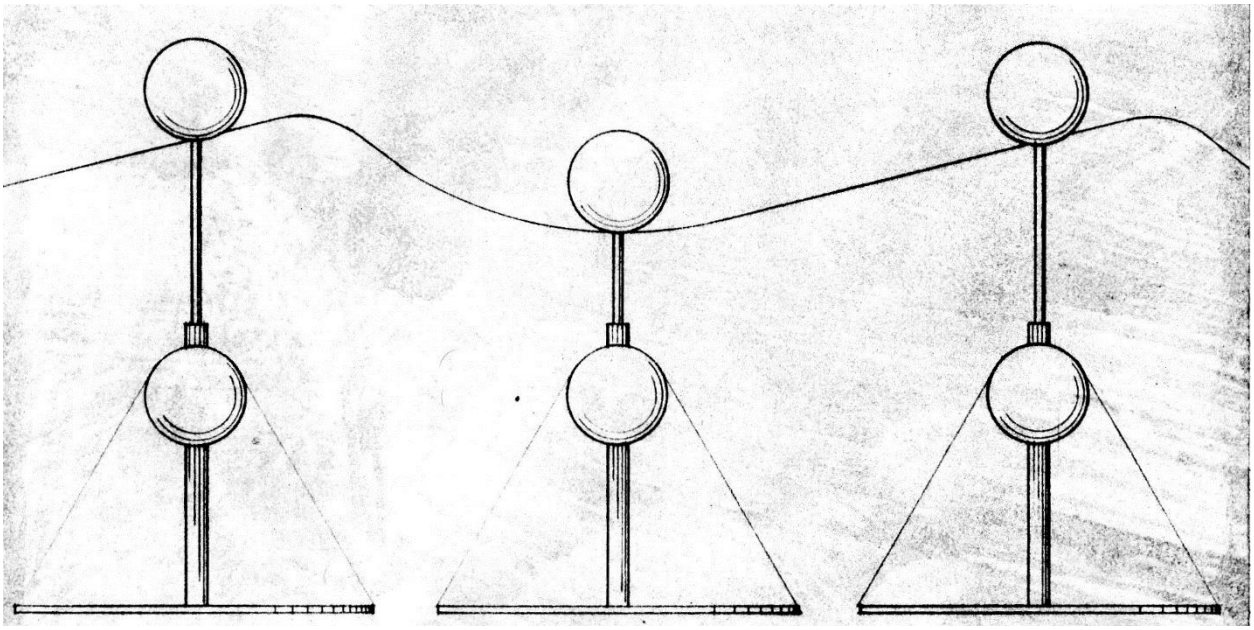
Consider one sphere, with a rod attached to it, resting on the ocean surface. Consider another sphere, with a tube attached to it, submerged at the undisturbed depth by an air to weight ratio- the volume of air contained to the weight of its container plus the attached tube. With the rod inside the tube, a meaningful change in distance will occur between the two spheres as a result of ocean wave troughing and cresting.



However, with said vertically oriented configuration, the primarily horizontal force of an ocean wave will permanently push the buoyant sphere away from the submerged sphere because the buoyant sphere cannot readily return to its initial position.



If another rod, with a weighted mass secured on one end, is attached to the bottom of the submerged sphere (and the weight of the mass subtracted from the original weight of the sphere), a more stable air to weight configuration will be obtained, but it is still tenuous.



A much improved configuration is obtained if the width of the mass is greater than that of the submerged sphere. Simply, this relationship is conical- not unlike the rotated stance of a defensive boxer preparing to receive a punch.