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Water Purification Off The Grid, Phase II

This solar boiler was designed to boil water and capture the steam to produce pure water using a Fresnel lens. In this phase, it was redesigned to use a two axes solar tracker. A Fresnel lens focuses the sun's energy onto a copper heat sink which is submerged in water in order to boil it. A 12 volt DC battery is wired to the solar tracker to provide power. The two axes tracker is wired to the gear motor and controls the east/west movement and the up/down movement depending on its position relative to the sun. Tests to compare the conductivity of copper to aluminum showed that the copper had a higher rate of change, while the aluminum had a lower rate of change in degrees per minute. The salinity test on ocean water showed that before boiling it had 21,000 PPM of salt and afterwards 4 PPM of salt. The bacteria test showed that before it had coli form bacteria and afterwards it was free of bacteria. Nitrates, copper and alkali were also removed. This year's results determined that I could successfully wire a 2 axes tracker to both a linear actuator and a 50 inch pound gear motor and have it track the sun automatically. The copper heat sink did perform better than the aluminum heat sink. The center of gravity of the boiler was lowered, significantly increasing stability. The processed water test results indicate that the solar boiler can successfully produce safe drinking water.