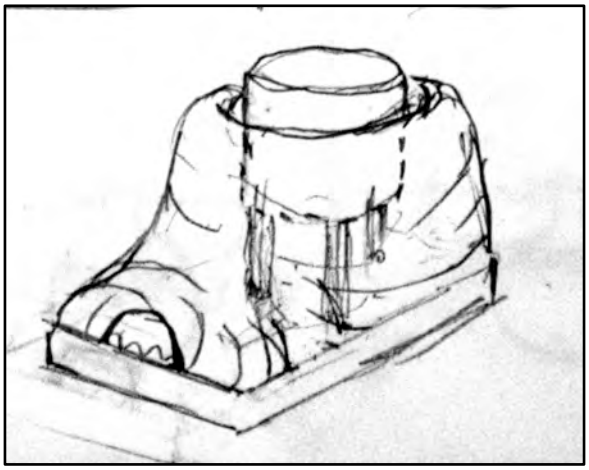
Rocket Stoves

History

Dr. Larry Winiarski began to develop the rocket stove in 1980 and invented the basic principles in 1982. Another well-known developer of rocket stoves is the American Ianto Ewans.



A rocket stove is a very simple furnace, which can be used for cooking, heating and water heating. It uses less wood than traditional open fire, can burn small pieces of wood, produce less pollution and can be easily constructed from cheap materials.

The main components of a rocket stove are:

- Fuel Stack: For the firewood entering the combustion chamber.
- Combustion chamber: The end of the fuel stack, where the firewood is burned.
- Chimney: The vertical portion of the combustion chamber providing draft to maintain the fire.
- Heat exchanger: The heat is transferred to the pot or other surfaces.

Four techniques to boil water faster:

1. Create a large enough fire in the combustion chamber.
2. Force the gases to flow against the bottom and sides of the pot in narrow channels.
3. Make sure the gases are as hot as possible.
4. Increase the speed of the hot gases flowing over the surface of the pot.

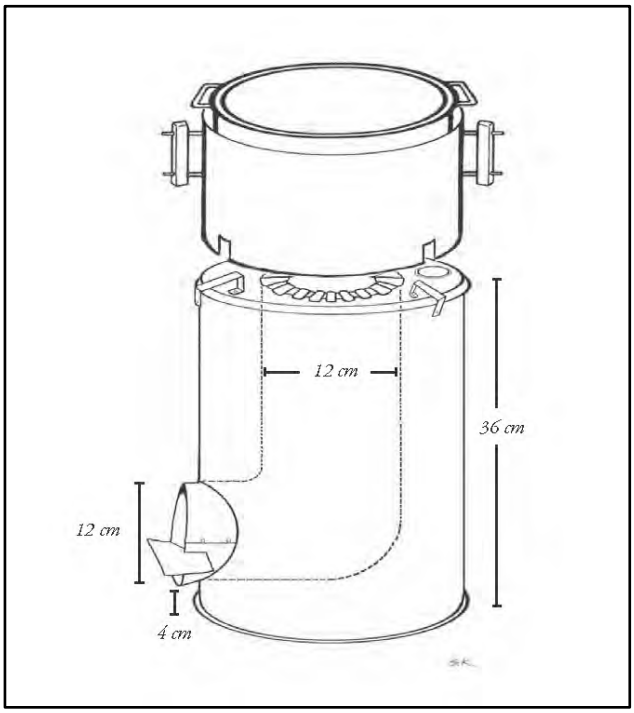
The three T's

Carbon monoxide and particulate matter always form when fuel and air do not completely mix, and complete mixing does not occur in stoves with natural draft. The orange colour of a flame comes from the radiation of particulate matter (soot) within the flame. Blue flame results from the reaction of carbon monoxide to produce carbon dioxide. So, coloured flames indicate that PM and CO are reacting.

Emissions of these harmful pollutants can be reduced by burning them before the exhaust cools.

Wood stove designers know that this burnout requires the three T's: time, temperature and turbulence.

1. Time indicates that the longer the exhaust gas stays hot, the longer pollutants have to burn.



2. Temperature indicates that the gas needs to stay as hot as possible; the reactions stop when the gas gets too cool.
3. Turbulence is an engineering term for rough flow. If the air is turbulent, pollutants have a greater chance of coming into contact with oxygen so they can burn out.