Bluff Body Burner

The bluff body/concentrator burner widens and narrows the flame gas path. The local pressures are lower as the gas accelerates around the bluff bodies, increasing the pressure difference with the secondary air. This increased pressure difference at the lower bluff body pushes the gasses together, and rapidly mixes the air into the wood gas for very rapid mixing. Directly above this the concentrator concentrates the heat from this rapid flame to crack the tars into flammable gasses. The upper bluff body burner burns the newly cracked flammable gasses. The result is a very clean burning of the wood gas, even at very high-power levels. The burner works for a small cooking stove, but could also work for larger scale applications. Below is a cross-sectional drawing of the burner.

Higher velocity gasses separate from the bluff body exposing more gas/air surface contact.

Fuel reactor chamber

Lower velocity gasses hug the bluff body exposing less gas/air surface contact. A larger bluff body increases the surface contact for improved mixing. Too large a bluff body creates excessive flow resistance, hindering performance.

Alignment