

## Written Evidence Submitted by Warwick Seymour-Hamilton



(HNZ0004)

### **Smoke free Chimney Installation.**

Fossil fuels, wood, biomass, etc., produce much smoke and polluting chemicals when burnt for energy to such an extent that coal for example has been phased out for electricity production and other energy needs.

The purpose of this invention is to burn the smoke and polluting chemicals which are produced by incomplete combustion in the chimney leaving almost 100% carbon dioxide and nitrogen. If wood or biomass - green fuels are used then the carbon dioxide is green if trees are planted for example to replace those that have been burnt. There is an enormous energy gap left by the loss of fossil fuels and at the moment there is no alternative. With this method wood can fill this gap without recreating a new polluted black country. If each of the 60 000 000 people in this country plant one sapling now and plant one sapling to replace the adult tree burnt this energy gap would disappear in 5 years or so depending on the species of tree.

To produce heat carbon fuels are burnt in an enclosed area mostly a firebox and the superheated exhaust gases after passing over water filled tubes create steam at high pressure to drive turbines, reciprocating steam engines etc., which produce electricity, or motive power for transport, or any

chemical method requiring heat or superheated steam. Coking ovens produce coke and gas from coal and can be replaced by wood to produce charcoal and wood gas for heating and lighting. All methods require an exit for the gases of combustion.

This chimney can be used by all methods of burning carbon fuels that produce excessive smoke freeing their use for energy, in this case wood - a green fuel. The by products of charcoaling wood are the same as coal, tar for roads, creosote to preserve wood, the last two can be burnt in the above furnaces or alcohol and volatile oils can be distilled from them for use in internal combustion engines. An all round winner.

The design of the chimney in size would depend on the use and size of the furnace. Just above the chimney inlet from the firebox, gaps can be created in the chimney which can be enlarged or reduced at will by sliding doors to allow air, air and oxygen or pure oxygen to be drawn by a venturi effect into the exhaust gases in the chimney or a closed system with oxidizing gasses under pressure forced into the base of the chimney. Adjustments to the pressure of the incoming oxidising gasses allow a fine control of the amount introduced. Oxygen and oxygen / air instantly ignites the hot carbon particles and incompletely burnt products of combustion leaving a clean exhaust. Oxygen is used initially and as the furnace reaches its maximum temperature air / oxygen or air alone is sufficient.

The method of spraying the smoke with oxidising gases varies according to the use of the firebox but with a square or round chimney two slits or holes can be made in the chimney at opposite sides at the base of the chimney just above the inlet to the chimney from the firebox, to allow the oxidising gases to be sucked into the smoke. The size of the slits or holes depends on the size of the chimney and firebox but must be large enough to allow sufficient air or air/oxygen or oxygen to be applied to the smoke to allow complete burning. The size of the slits or holes can be varied with a sliding door controlling the rate of oxidizing gas admission. Oxygen alone under pressure can be flowed into the slits holes or sprayed into the enclosed chimney without slits or holes creating an impressive burn. The method of introducing the oxidizing gases at the base of the chimney can vary and include all methods in this application. Air, air/oxygen, oxygen under pressure if introduced into a chimney without slits or holes but in the same position can be independently controlled and manually altered to the state of fuel combustion to a finer degree.

In the case of steam production the pollution free hot gasses from the chimney can be led into the boiler and then allowed to enter the atmosphere or used as bellow before entering the atmosphere. Or the exhaust gases can be burnt as above after leaving the boiler. Under normal conditions the venturi effect sucking in air through slits in the base of the chimney where the inlet size can be varied with a sliding door is sufficient to burn the incomplete products of combustion when the furnace is at working temperature.

The rate of burn of the smoke can be judged by a heat proof window in the chimney and by observing the issue of smoke from the top of the chimney. The rate of smoke production varies according to the type of fuel, its dryness and the amount of fuel loaded into the furnace, and the stage of fuel burn. On firing up the furnace more smoke is produced due to incomplete burning which is coped with by altering the size of the slits or adjusting the pressure of applied air, oxygen or air / oxygen mixture.

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