

Fig 1.18 Solar heated primary school

The worlds first active solar heated school building , Rose Elementary School, Tucson, Arizona 1948.

In 1948 an Arizona architect, Arthur Brown designed a unique, low cost school building warmed almost entirely by solar heat. What is remarkable about this building is that it was built with a bare bones budget so as not to antagonise the rate payers who funded the project. Tucson enjoys mild winters and because school hours were only between 9am and 3 pm, the sunniest part of the day, no elaborate heat storage was required which reduced costs. Furthermore, the roof itself, which was constructed of aluminium channels with lids on top to form parallel airways, served as the solar collector.

system served the school well but when it came for expansion, the new administration decided to replace it with a gas furnace. Fossil fuels had become so unsustainably cheap by the late 1950's due to government policies that nobody cared about saving energy anymore. The wartime conservation ethic had quickly evaporated and for now so had the interest in solar architecture.

Gas and oil production was booming and massive fortunes were being made. Nobody wanted to know about *Cinderella Solar*, her two ugly sisters made sure of that !

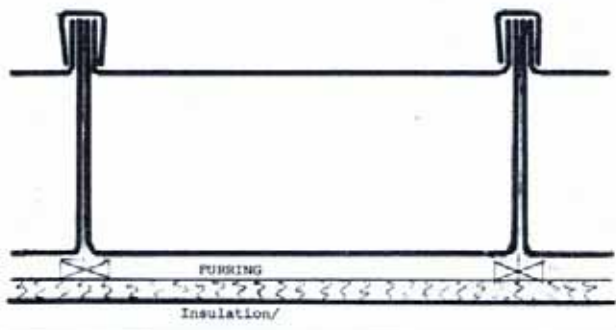


Fig 1.19 Cross section of solar collector

Aluminium troughs served as roof supports and ducting for the solar heated air.

During the winter, fans drew solar heated air into the classrooms through the roof channels. During summer the fans reversed direction and expelled warm classroom air out through the roof channels, cooling the roof down simultaneously. For ten years Browns

Fortunately for us all, *Prince Charming* was born in 1954 disguised as a silicon solar cell. His father, Bell Telephone Laboratories had stumbled across him whilst investigating the properties of silicon for making diodes. By May, Bell scientists Fuller, Chaplin and Pearson had produced a mono-crystal silicon solar cell with a sunlight conversion efficiency of 6 %, ten times better than selenium cells. By 1956 the first solar power panels were being manufactured for use in telephone repeater stations. Cost was extremely high at over \$2000 per watt of generating capacity which severely limited their initial development. Their saviour was the space program which by the early 1960's had kick started an entire solar cell industry. The sun shines continuously in outer space, and with no moving parts solar cells were proving to be the most reliable and lightweight power source