

# ITALIAN CONTRIBUTION TO CSP WITH FLAT REFLECTORS

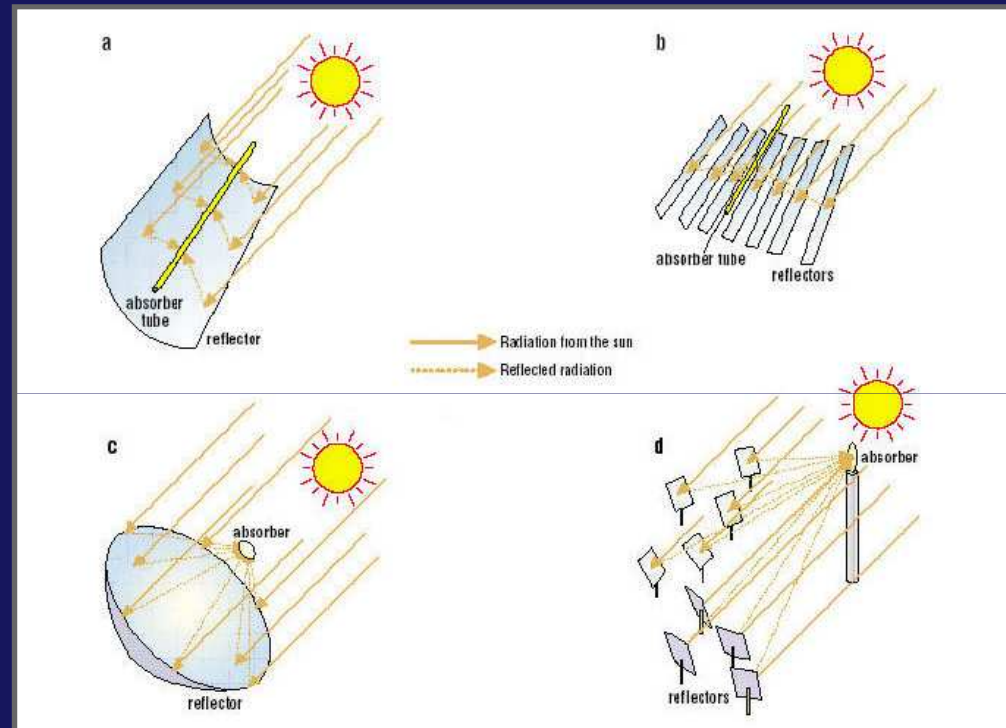
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ISES Solar World Congress  
Kassel Germany, 28 Aug. - 02 Sept. 2011

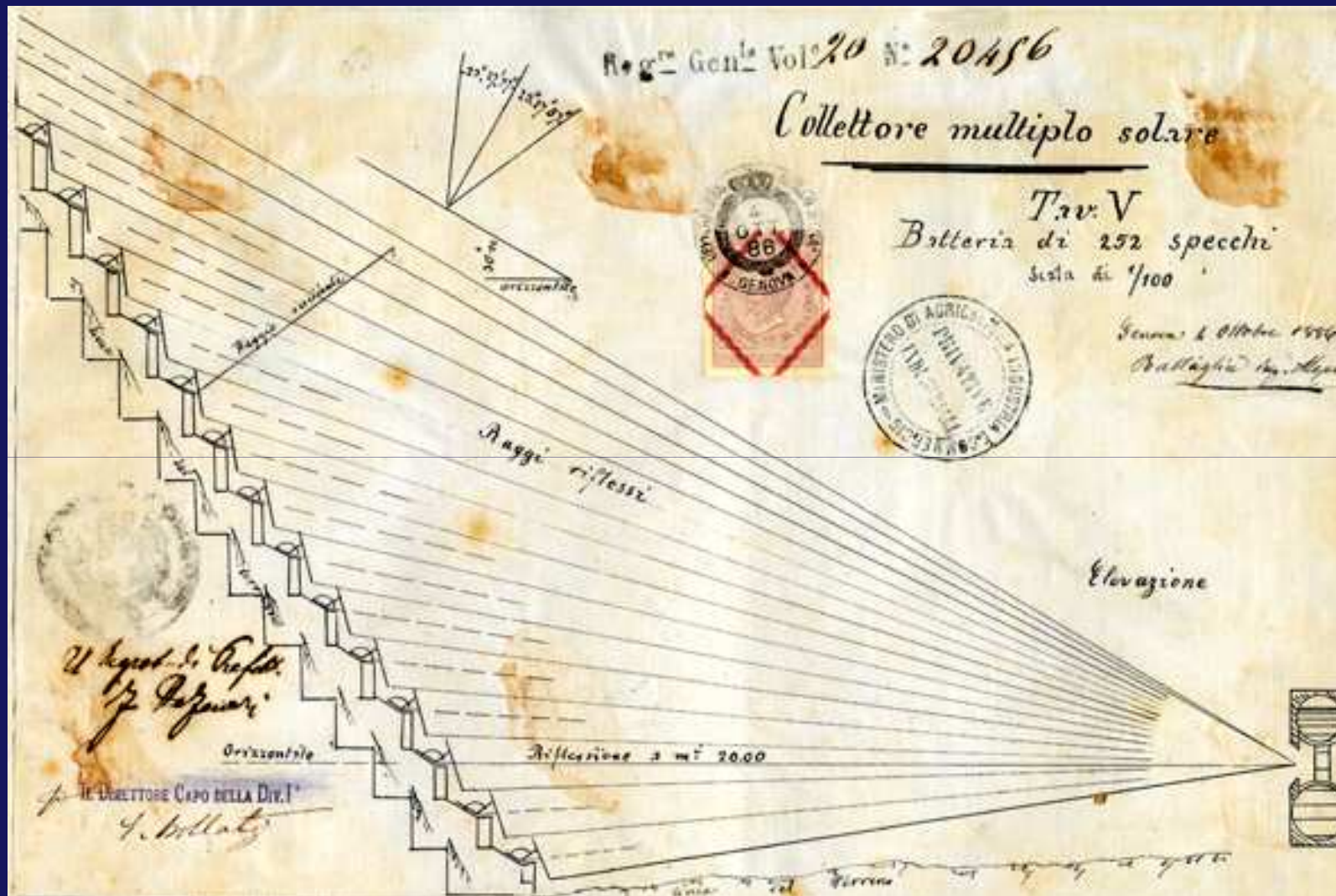


# Concentrating Solar Thermal Power (CSP): curved or flat reflectors?



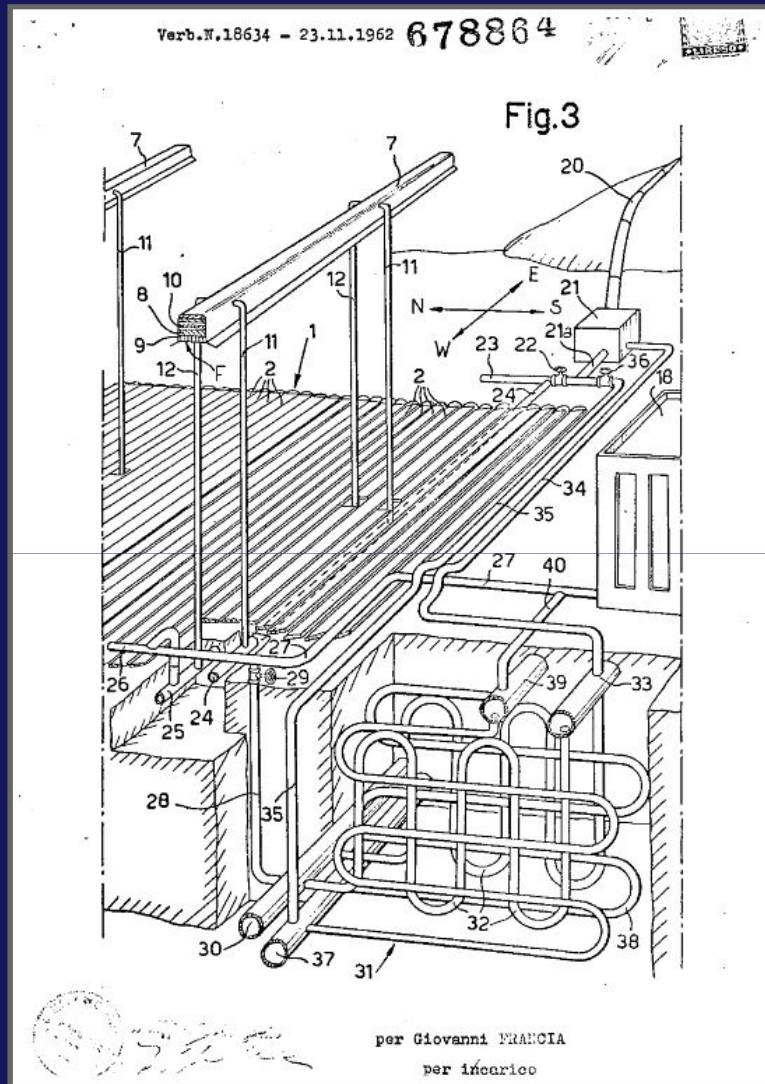
Flat reflectors: this was the answer of  
Alessandro Battaglia in 1884  
and Giovanni Francia in 1961/1965

# Battaglia's "Multiple Solar Collector" patent, 1886

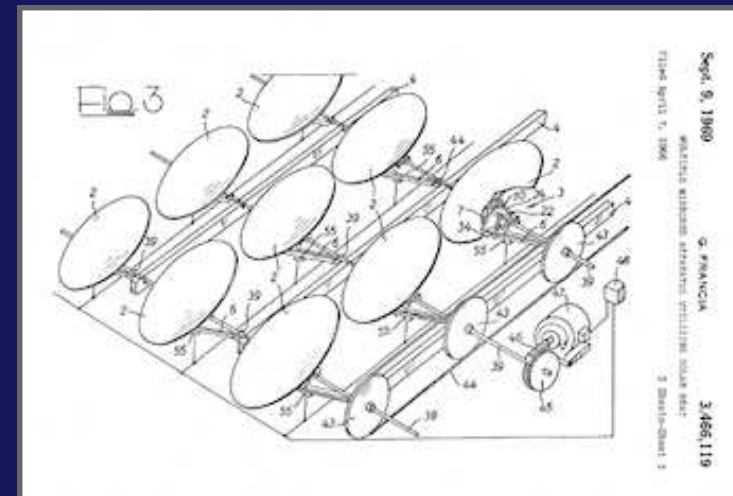
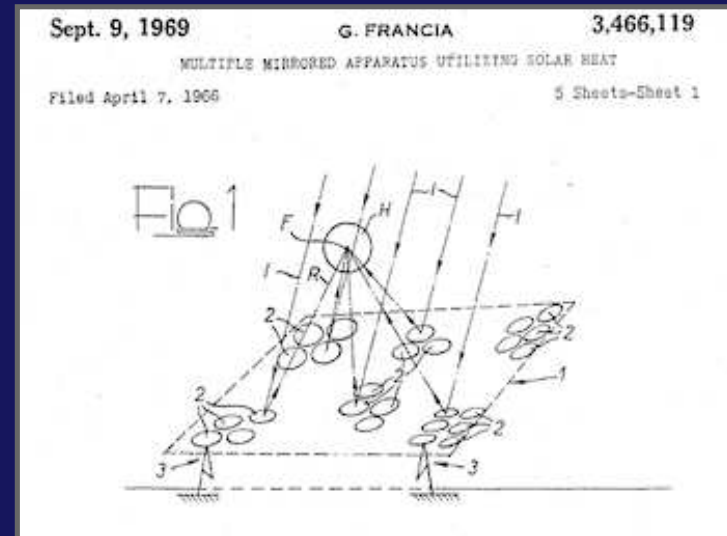


*Separating the reflector field from the boiler*

# Francia's patents on Fresnel reflectors



Linear (Italy, 1962)

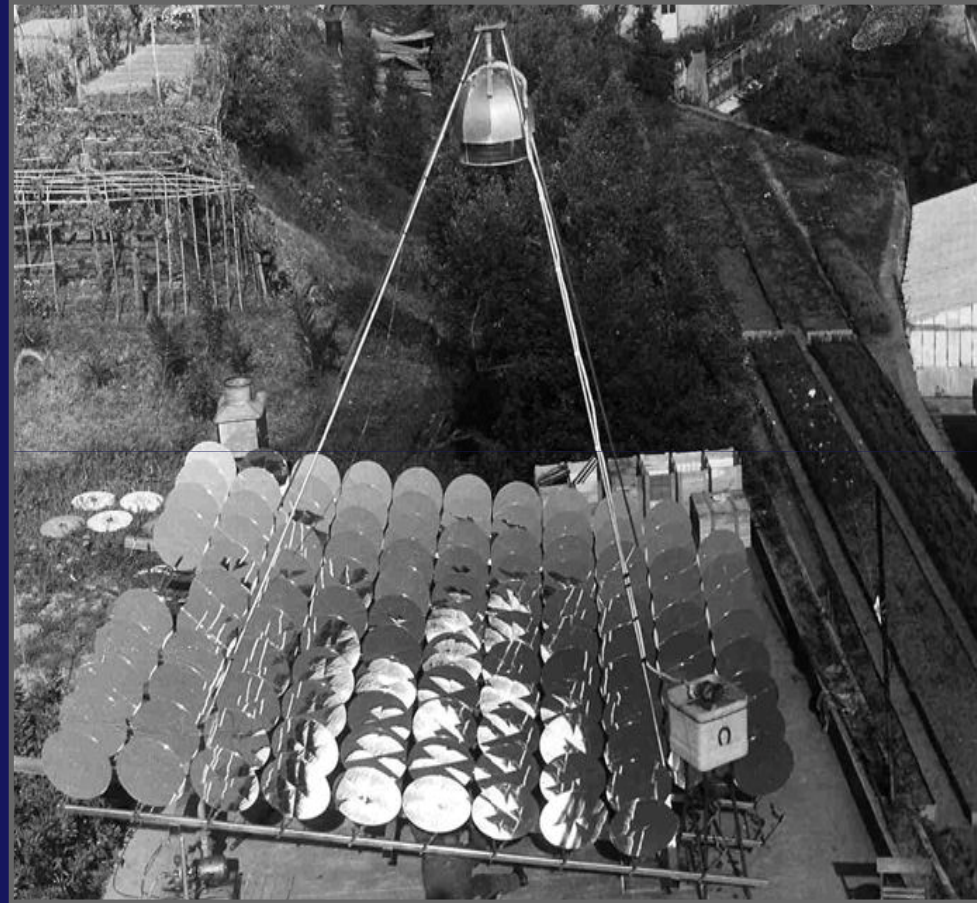


Point focus (US, 1969)

# Francia's prototypes for Fresnel reflectors: *First in the world*

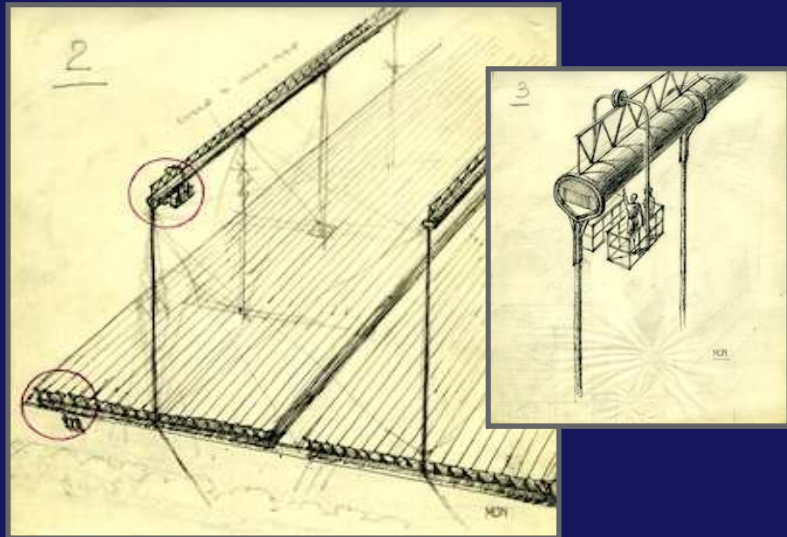


Linear (1961/1964)



Point focus (1965)

## Pioneering work...



Francia's vision, 1965

## Applied today



Ausra, 2009



Eurelios, Sicily, 1981



BrightSource Energy, 2011

# Images and photos courtesy

Solar Paces

Italian State Central Archive

Giovanni Francia's Heirs

Museo dell'Industria e del Lavoro di Brescia

Ausra

BrightSource Energy