

# HOW WORKS AN ELECTRIC COOLER: CELL PELTIER



We pack a cooler for the curious

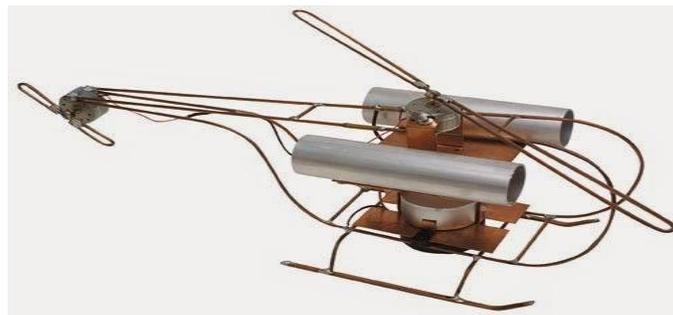
Well, after a temporadilla almost no entries, I think this summer will not you going to complain;.)**We'll start with this entry, in which he disarmed a cooler** of those that plug into the car (or home if you adapt one transformer least 5 amps and 12 volts), **to discover another fascinating use of semiconductors (thermoelectric effect) and electricity: The Peltier cells .**



Long time **coming looking at how to adapt a cooler** and make the most durable cold on long trips **adding a pair of Peltier cells** (about 5 € each) and a pair of

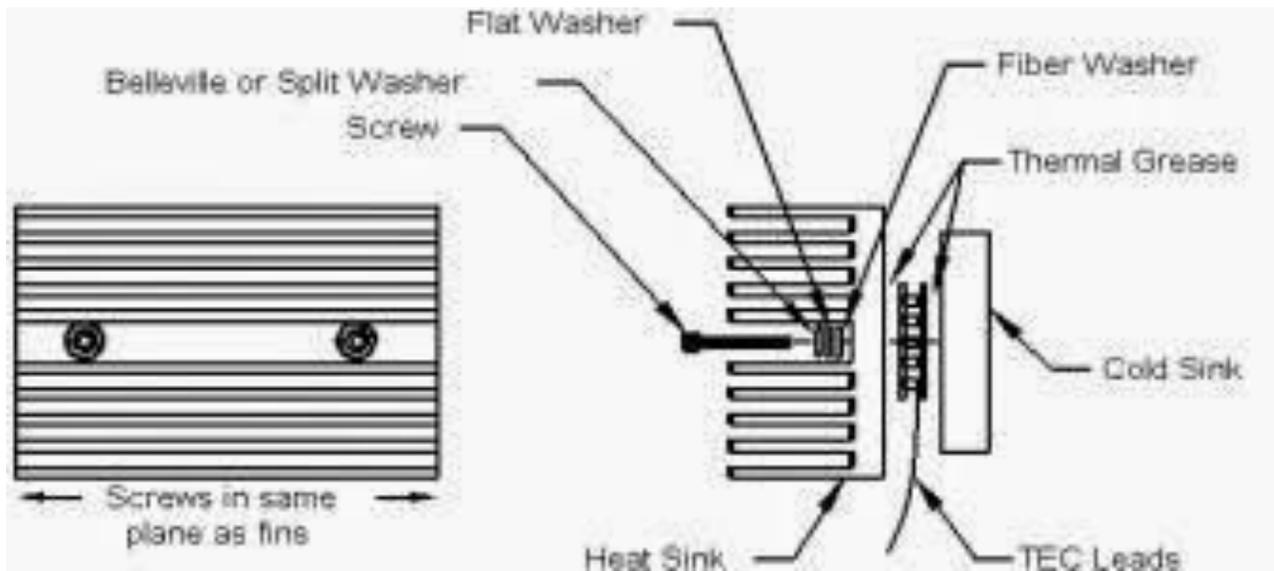
sinks computer (the cool side can take a heatsink smaller), but **seen the prices of refrigerators (44 €** which I acquired in the Eroski), I have not much complicated, time is scarce (if I will ride my own later, but we'll see, there are other priorities .) Shortly after buying the cheap refrigerator, and work pretty well plugged in making additional lighter side of the boot (can not ask for much in the fridge for that price), I realized that sinks moved slightly, **something had loosened so I have disarmed to fix them better** and incidentally show you how it works;).

**The Peltier cells are very useful if you have imagination** ; you can from cool whatever you want (drinks, picnic boxes) to build some animated by a candle heating the side, like a curious helicopter to leverage also works the other adornment; **if we cause differences in temperature (heating the hot side and cooling cold), produce a small stream** that small and efficient engines (such as mobile vibrator) can produce a curious effect.



Curious helicopter powered by a candle and cell peltier

## Peltier cells Features:



- **They are inefficient** cooling; consuming for frigorie.
- **Capable of generating electricity** when one side cold and the other stays warm.
- **No vibrates or is noisy** when running (except the fans need).
- **Long life** ; its semiconductor, working in a safe range, lasting many years.
- **They take up little space** ; Ideal for cooling small appliances.
- They usually work between 5V and 15V DC; **a higher voltage and more power consumption, but less efficient** and shorter; resistance between 5Ω and 1.3, depending on the cell.

## Disarming the fridge

It has a **screw on the lid** ; four little on the sides and 10 hidden beneath the gum rubber sealant withdraw carefully. The cover protects the cooling part and directs air from the fan to sink the cold side, which is fixed with plastic tabs.



**We loose the screws holding the heatsink** to access the Peltier cell:



We can lift, and at the bottom we see the heat sink; peltier cell medium set with white heat conductive paste, then a billet aluminum to overcome the isolation of styrofoam to the other side, which is attached cooler cools the portion smaller.

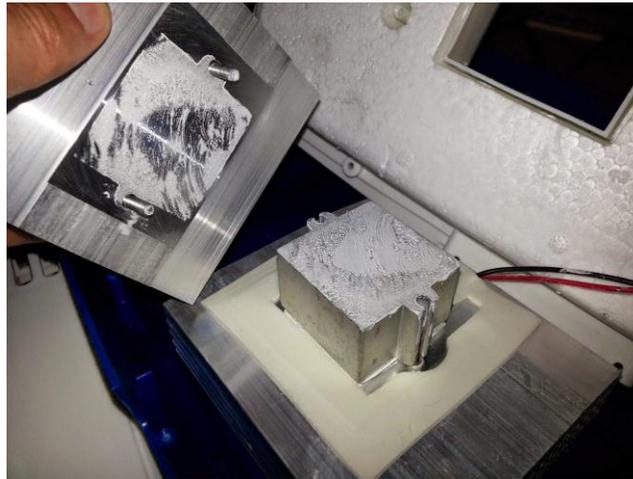


The operation could not be easier; carries no power control ; it's just a switch that directly feeds the two small fan motors and peltier cell, plus a small diode with a resistor to lower the voltage.



**Being underpowered, there is little danger of frost forms** , and after several hours of use are maintained as a 5 to 10 ° C less difference with the outside.

You have to see **how it would behave as if we put a pack of two stacked cells** (hot cold side of the other) thereby increasing the effect and still getting more temperature difference.



Detail of the conductive paste to improve contact

**To better tie sinks, I used the handy silicone** on the side of expanded polystyrene, which holds very well low and high temperatures (-60 to 200, I speak from memory).



**Now we only go in reverse and mount it as it was** , being careful that the screws are firmly fixed sinks, because if the cell does not make proper contact with the heatsink, it would spoil quickly and cool down very little.

Source: <http://crecimiento-sostenible.blogspot.in/2015/02/how-works-electric-cooler-cell-peltier.html>