

“Bonne Maman” engine

For years I intended to build a pop-pop engine using for diaphragm the lid of a jam jar. A lid of the type “the pop when opening is your guaranty”. When we press a finger on the lid it emits a pop, and so it does when we release it. Therefore it must be able to emit a pop-pop sound. Lid made of steel 18/100mm.



Apart of that, for 5 or 6 years I had stored the gas controller of an old water heater, the body of which was made of bronze (the rest was made of plastic) and had good shape and dimensions to fit various diaphragms of large diameter (75mm). It remained to build a ring to connect the pieces together. A piece of duralumin taken on the rudder head of a 420 was suitable. The joint of an old preserve pot for tightness and some screws...



And to test the sound of this music box I mounted it on a big engine of proven design. Tube of inner diameter 18.1mm.

1st test. We hear the sound of water inside the engine but the Bonne Maman lid doesn't move. I'm not surprised. On one hand the volume of the chamber is enormous. On the other hand, due to the prestressing of the lid, it is by low pressure that the first pop is to be activated. But we know that the low pressure is approximately twice less than the high pressure.

2nd test. Lid mounted upside down. The gurgling of water is more loud, but the lid doesn't move. Slight deception. Dismantling. I discover that I had tightened too much the screws. The lid has been deformed and is now too rigid.

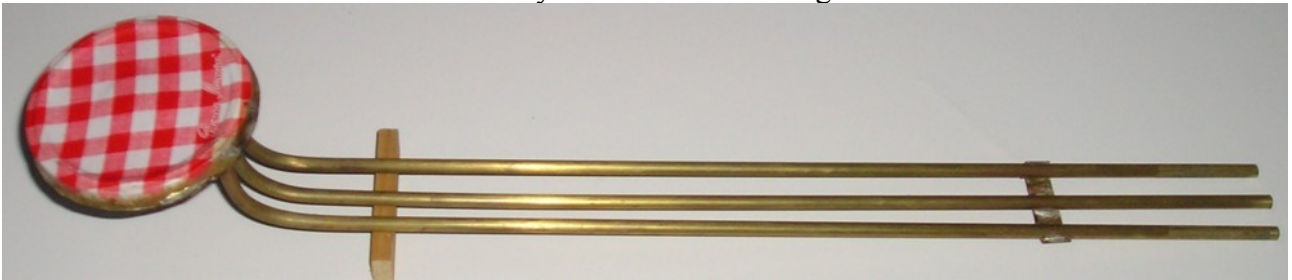
3rd test. Diaphragm made of thin brass. 5/100mm. A proven material. Clap-clop, clap-clop,... Big deformation of the diaphragm. Very regular sound. Frequency: 0.98Hz.

4th test. Prestressed diaphragm made of aluminum 25 to 30/100mm thick. Lid a can of powder milk for babies. Super sound. Due to the prestressing of the diaphragm this one is deformed in two steps. The audible result is something as cli-pe-ti-clap, cli-pe-ti-clap... Frequency: 1.10Hz.



After these tests, a new lid took place on my work bench. I just decided to end up with it. This time, instead of adapting the lid on an existing engine, I built a new engine. Big evaporator (diameter 86mm) and 3 tubes of inner diameter 5mm. It works!

Here is my “Bonne Maman” engine.



The engine pulses well. But I must confess that the audio aspect is not what I expected. When I push with a finger on the center of the lid and when I release my finger I hear clearly the typical sound of such a lid. But when working on the engine the sound level is reduced. To build a loud pop-pop engine, a thin diaphragm is to be preferred.

Disappointed? No. All that was just for fun.