Colloidal gold generator.

1.Introduction

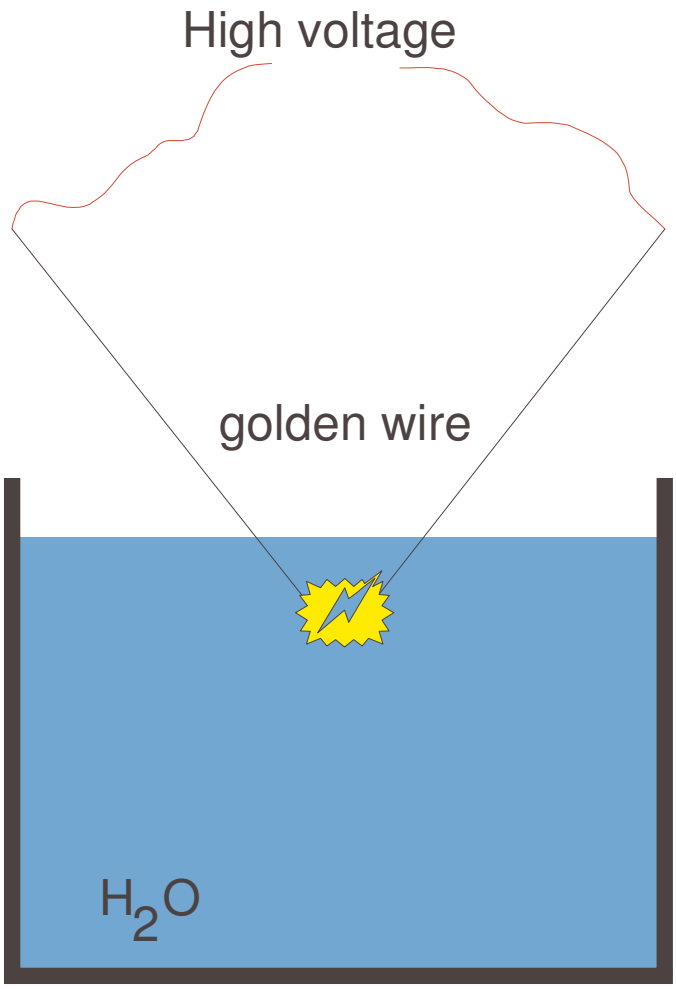
This document describes how to make colloidal gold with the high voltage method.

This is a way to create a working system. There are probably dozens of other ways. Most ideas and tips came from Yahoo cg_exchange.

The goal is to create an arc between two gold wires submersed in distilled water.

So you create a suspension (or colloid) of sub-micrometre-sized particles of gold; These little particles are in a continues movement. The liquid is usually an intense red colour (for particles less than 100 nm)

The construction consists of two parts, an electrical and a mechanical part.



2. The high voltage

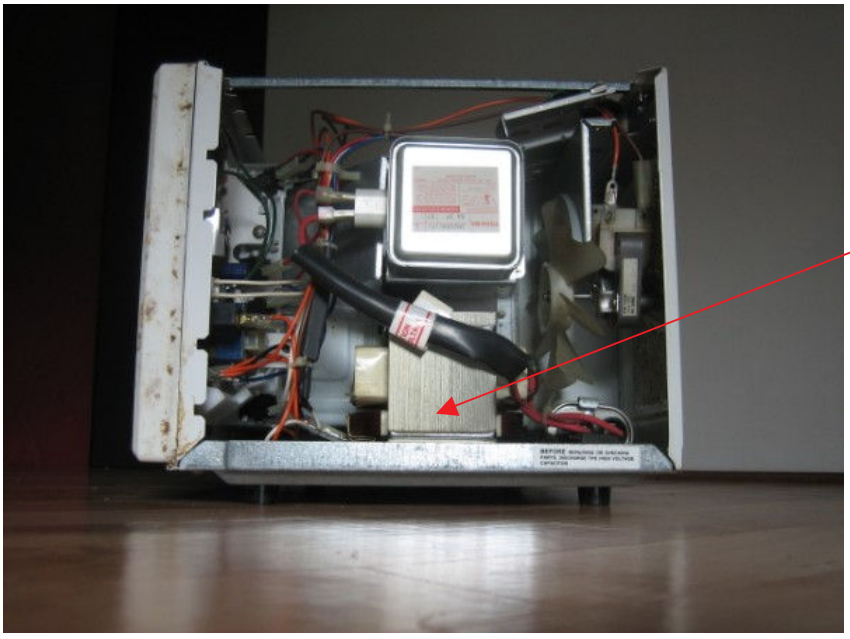
Be careful ! You are going to work with high voltages. This means very dangerous currents and tensions. These can kill you. If you don't know ohms low, you better stop here. You need to know the meaning of resistance, current, voltage, power and wattage. Take all precautions to work save and clean. No children in the neighborhood.

What do you need?

The most important part is the MOT. This is a Microwave Oven Transformer.

How to get it? Find a defective Microwave oven. In a recycling park they have tons of it. So it doesn't has to cost anything.

Even if the microwave oven stopped working it can be used. Usually it is the diode that has died. The transformer is practically never defective, and that's the only part you need.

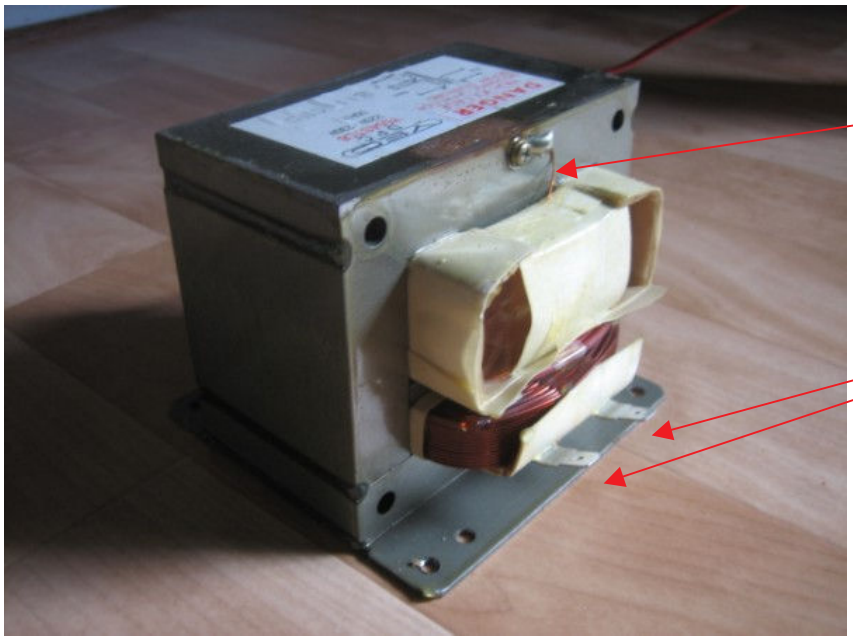


Cut off the power cord and open the microwave oven.

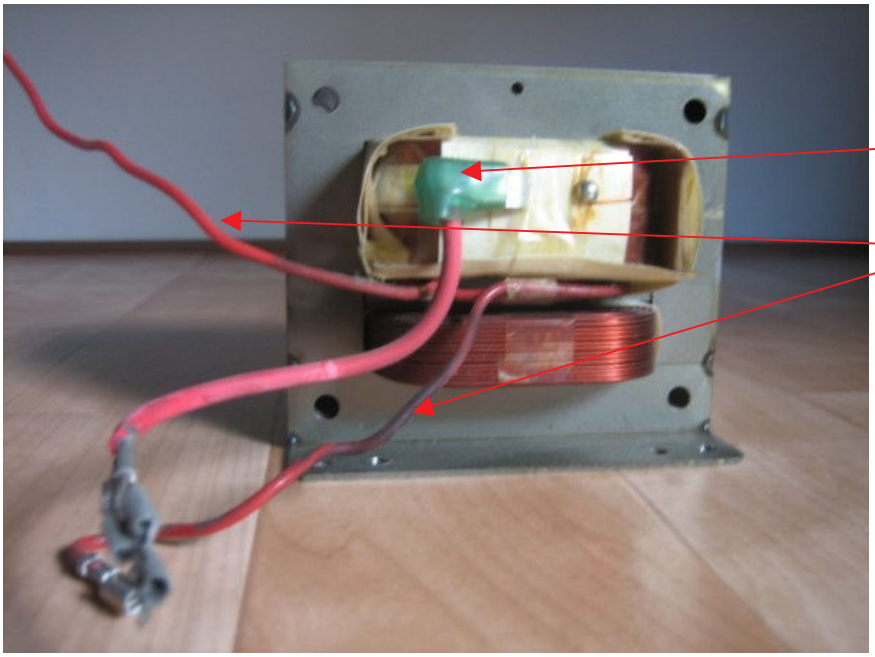
The transformer is the biggest and heaviest part of the oven.

Pay attention: there is also a big capacitor. This can be charged to dangerous high voltage and needs to be discharged by shorting it with a big screwdriver. Do this several times until you are sure there are no sparks anymore.

It is now save to remove the transformer.



A MOT has normally 3 windings. One primary and two secondary. The primary coil has a lot of windings of thick wire, and normally two male fast-on connectors. The first secondary winding has only a few turns of very thick wire. You can practically count them. Just cut them off and isolate them.



The second secondary coil is the high voltage winding. You can recognize it by the extra isolation. There are a lot of windings of thin wire. One side is riveted or welded to the chassis. (ground) The other side is usually equipped with a female fast-on connector.

The other part you need is a variac.



There are a lot of different models. 3Ampere is enough but 5 ampere gives you a little more room for experimenting. The price difference is so small that you can better buy a 5 ampere model. Price proximally 100 euro's.

You can replace the variac by a normal transformer. For example 225VA primary 230V secondary 2x36V. This will cost you only 40 euro's;

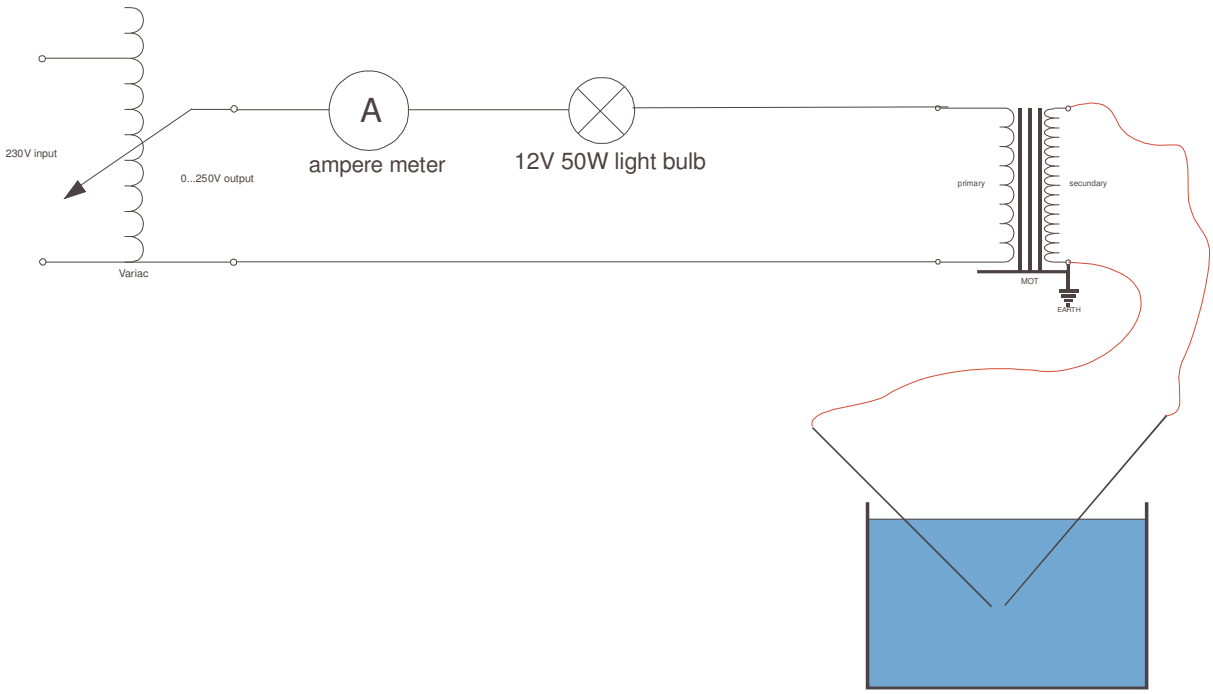
Other little parts:

Halogen light bulb 12V 50W with lamp socket.
Banana plug and wires to wire up you system.

You also need an ampere meter and an universal meter.

All descriptions are made with 230 Volt mains power!

The schematic:



A few measurements on the transformer:

Weight 4.7Kg

Primary winding: 2 ohm
Secondary winding: 85 ohm

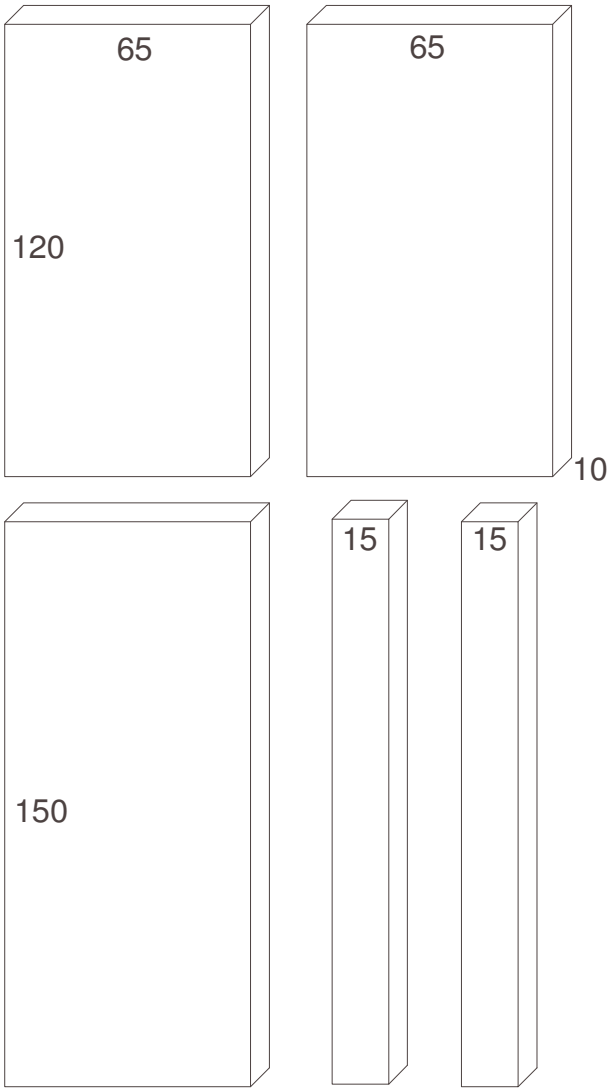
Primary 30Volt in → secondary 270Volt out unloaded
Primary 60Volt in → secondary 540Volt out unloaded

Primary 1Ampere in → secondary 110mA shorted with amp meter
Primary 4Ampere in → secondary 440mA shorted with amp meter

Primary 75 Volt 2,85Amp secondary 1Kohm 300Volt 300mA

2. The electrode holder

You start with 5 PVC blocks

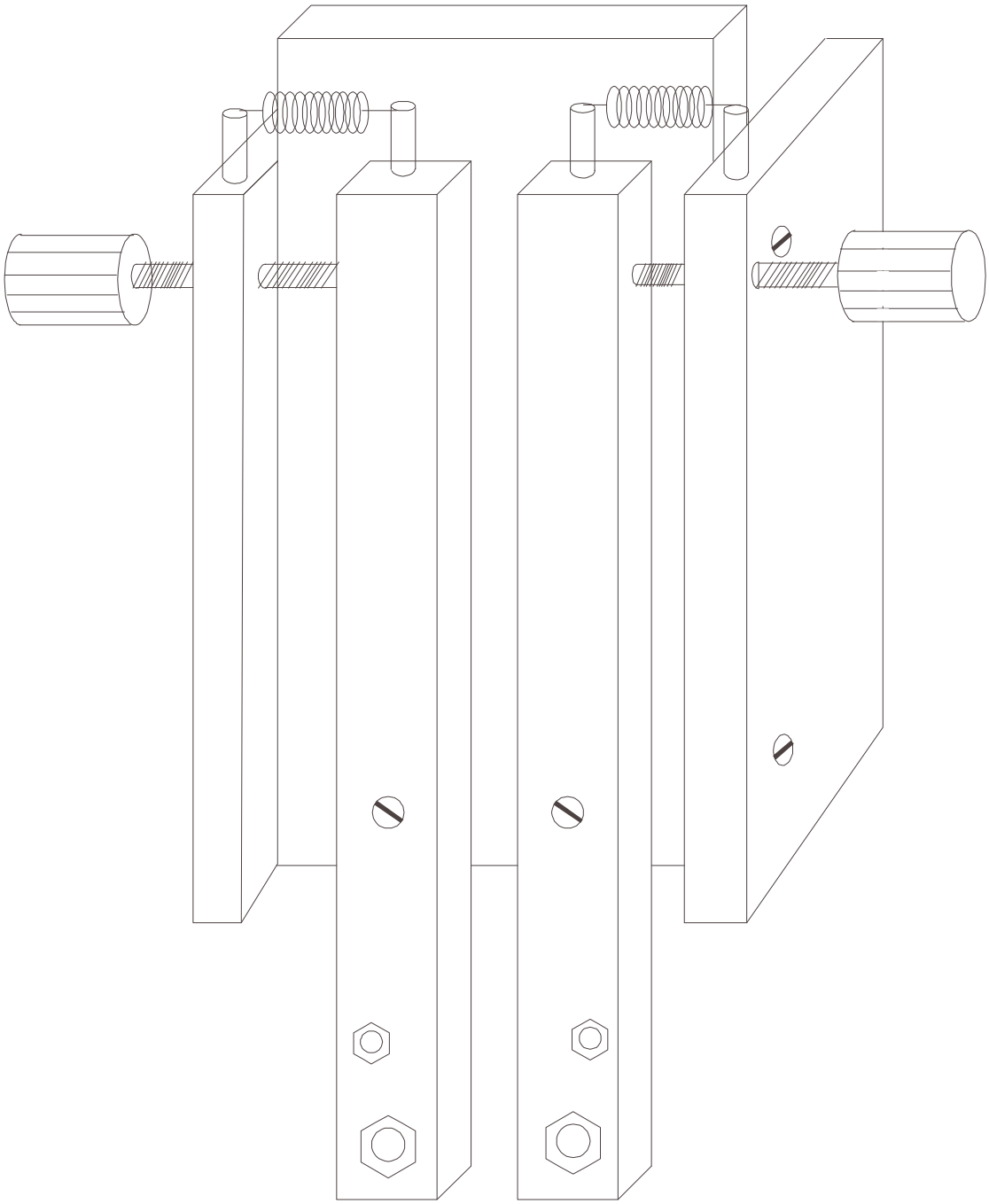


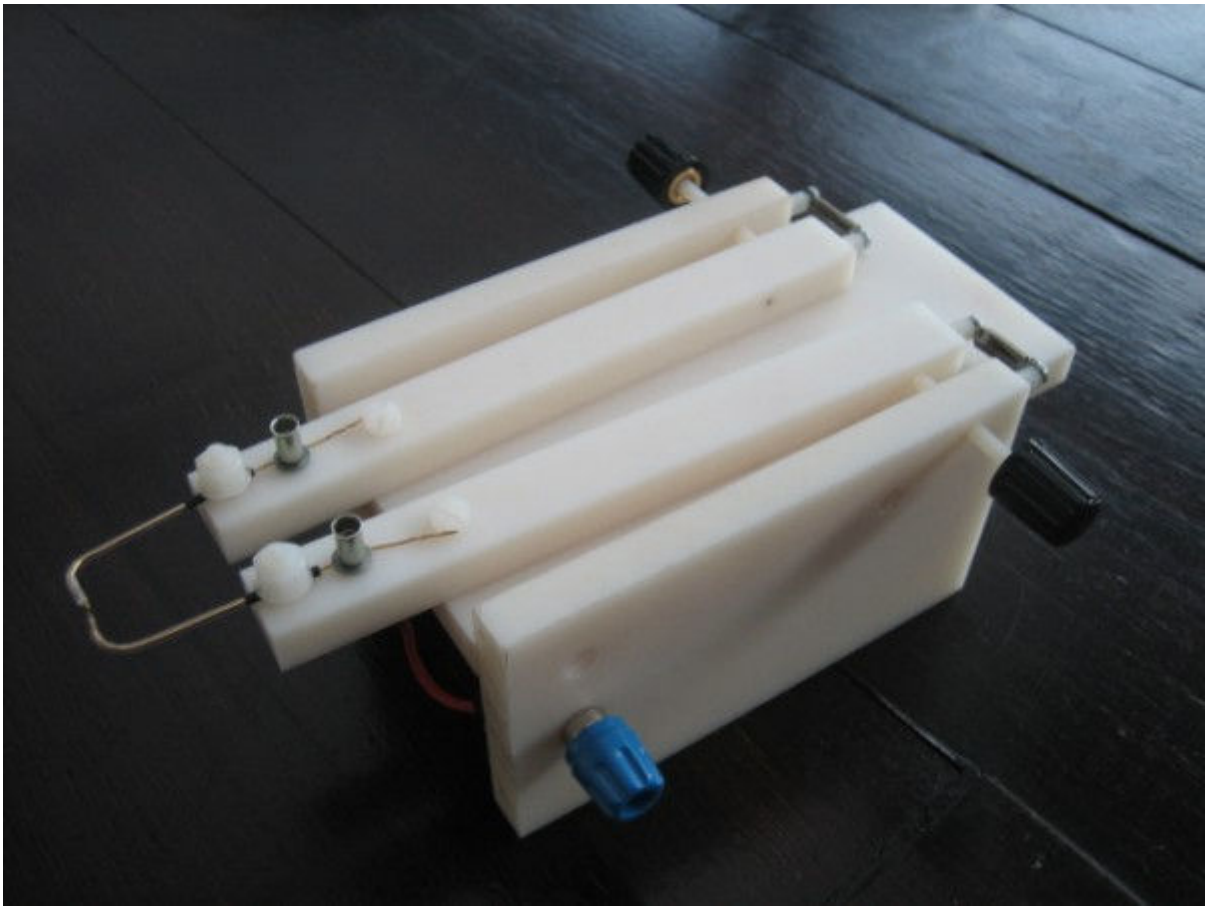
4 nylon scews M3 x 25 countersunk head
2 nylon screws M4 x 25 cheese head + nuts
2 nylon screws M5or M6 x 25 cheese head + nuts
(drill a transversal hole in it for the glass tubes, see photo's)

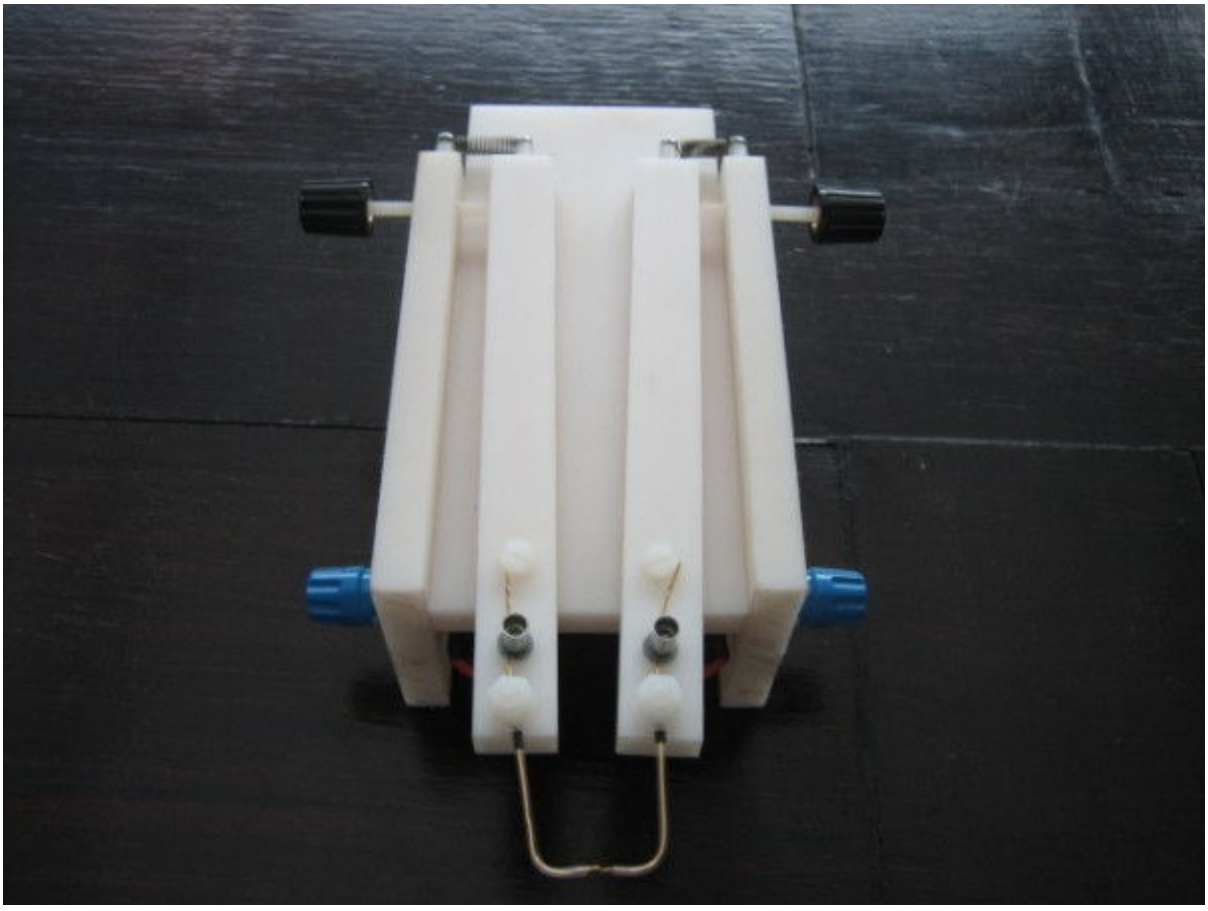
2 metal screws M3 or M4 x 20 cheese head + nuts + washer

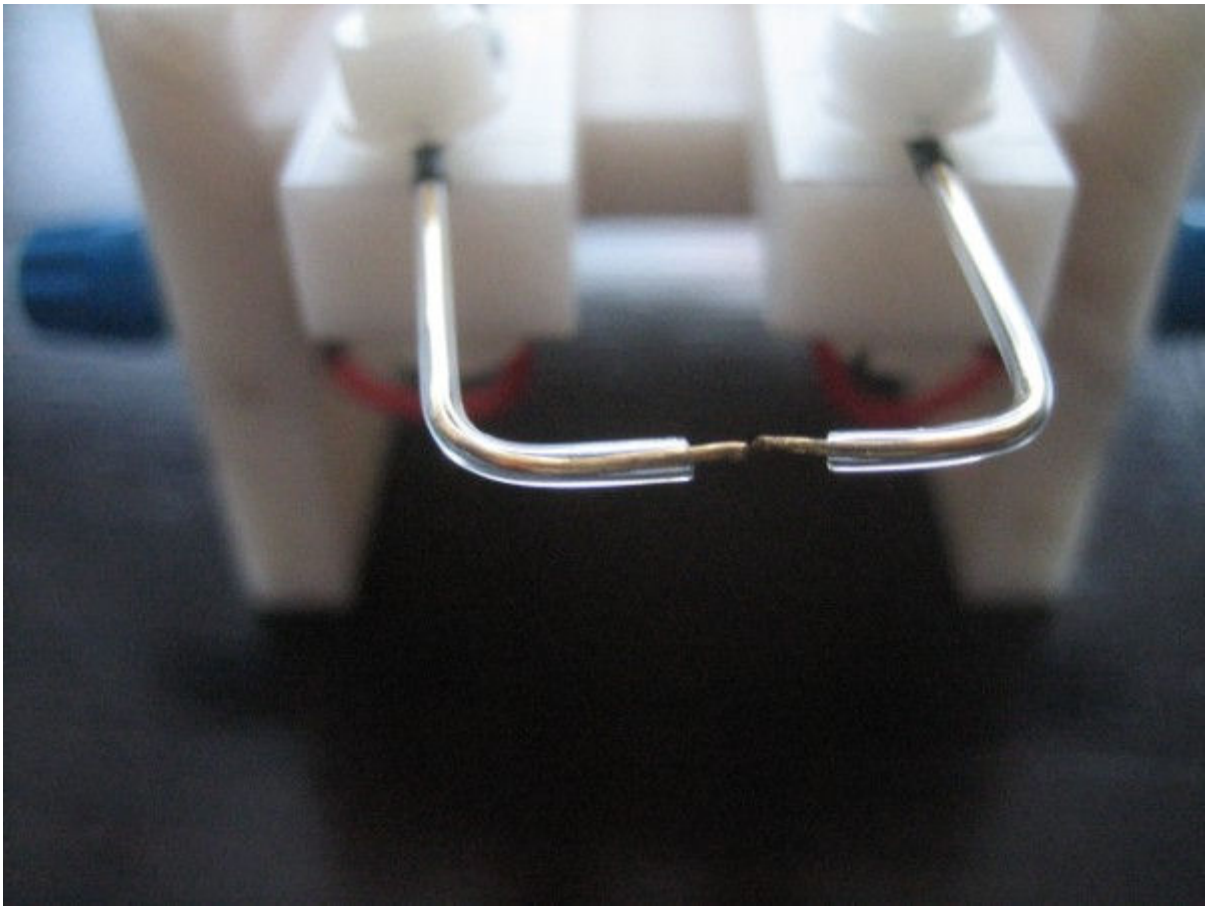
springs, knops spacers and other small parts that every hobbyist has
1,5 or 3mm glass tubes, you can bent them in a flame
golden wire (pure 24K gold NOT 18K)

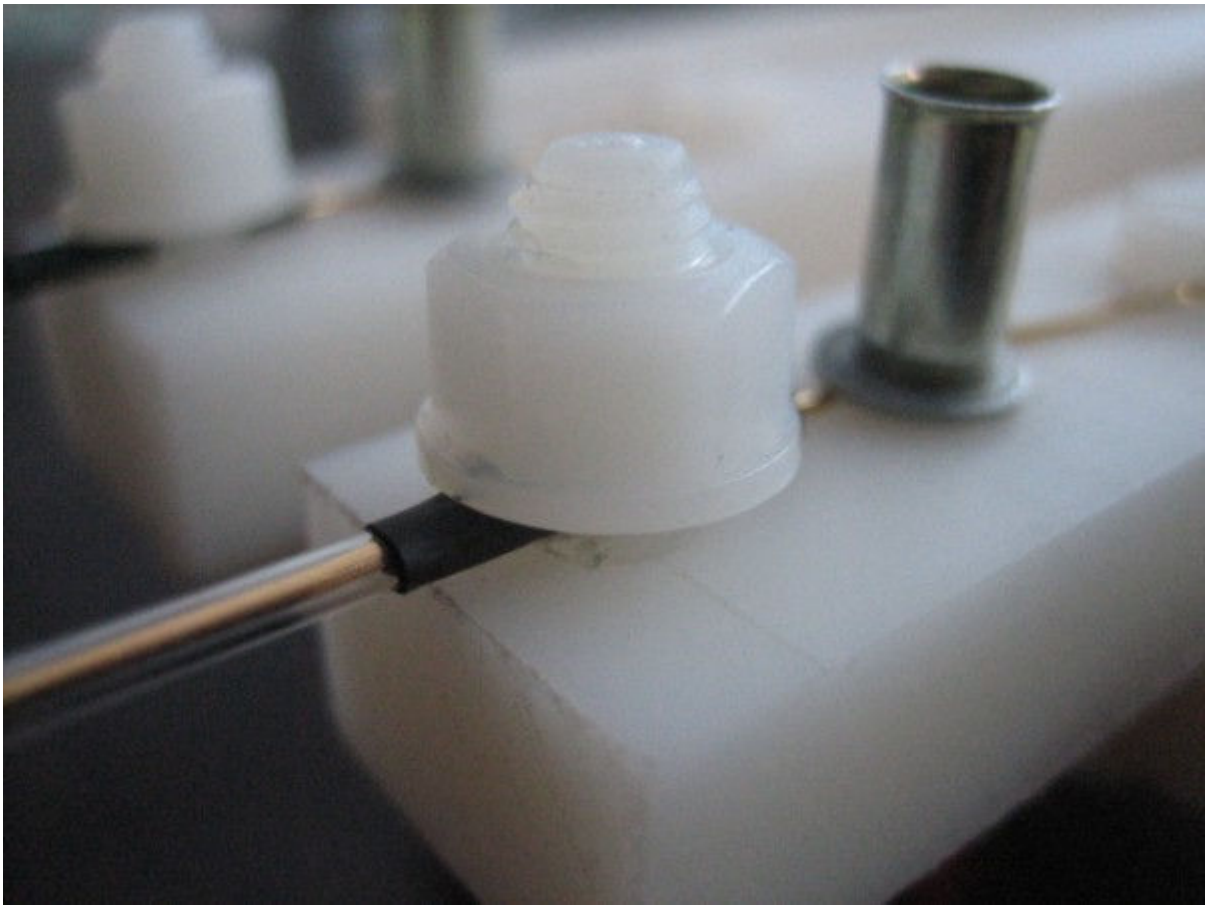
Screw it together like this:

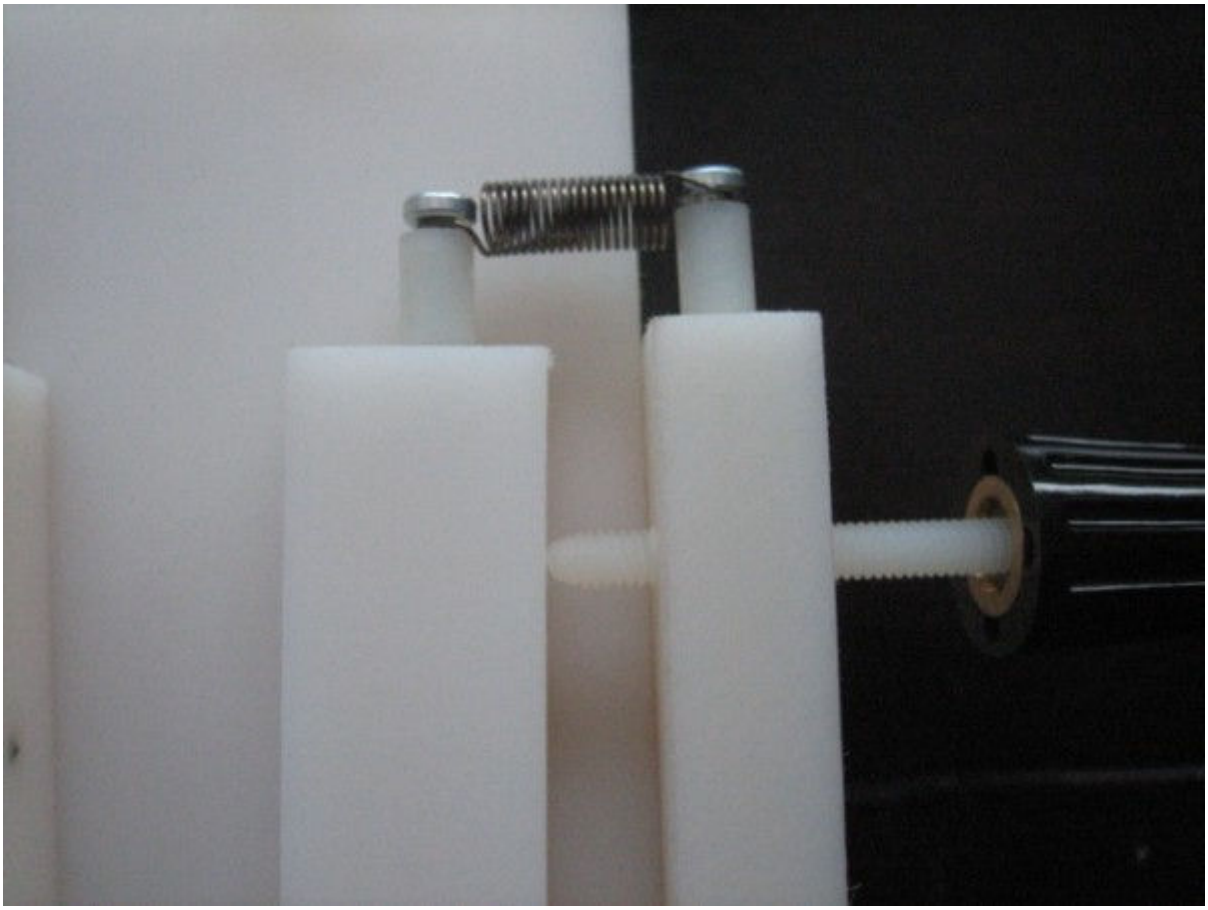


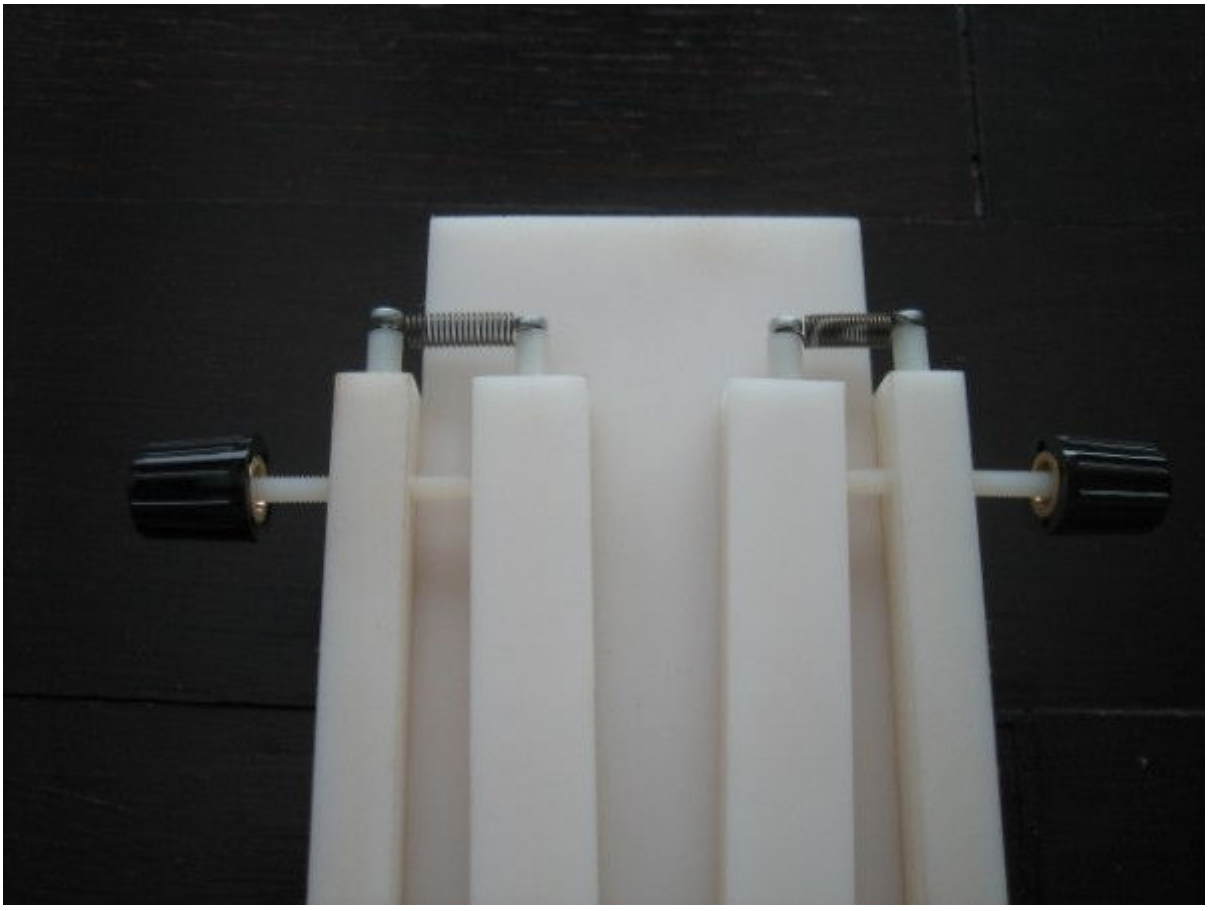


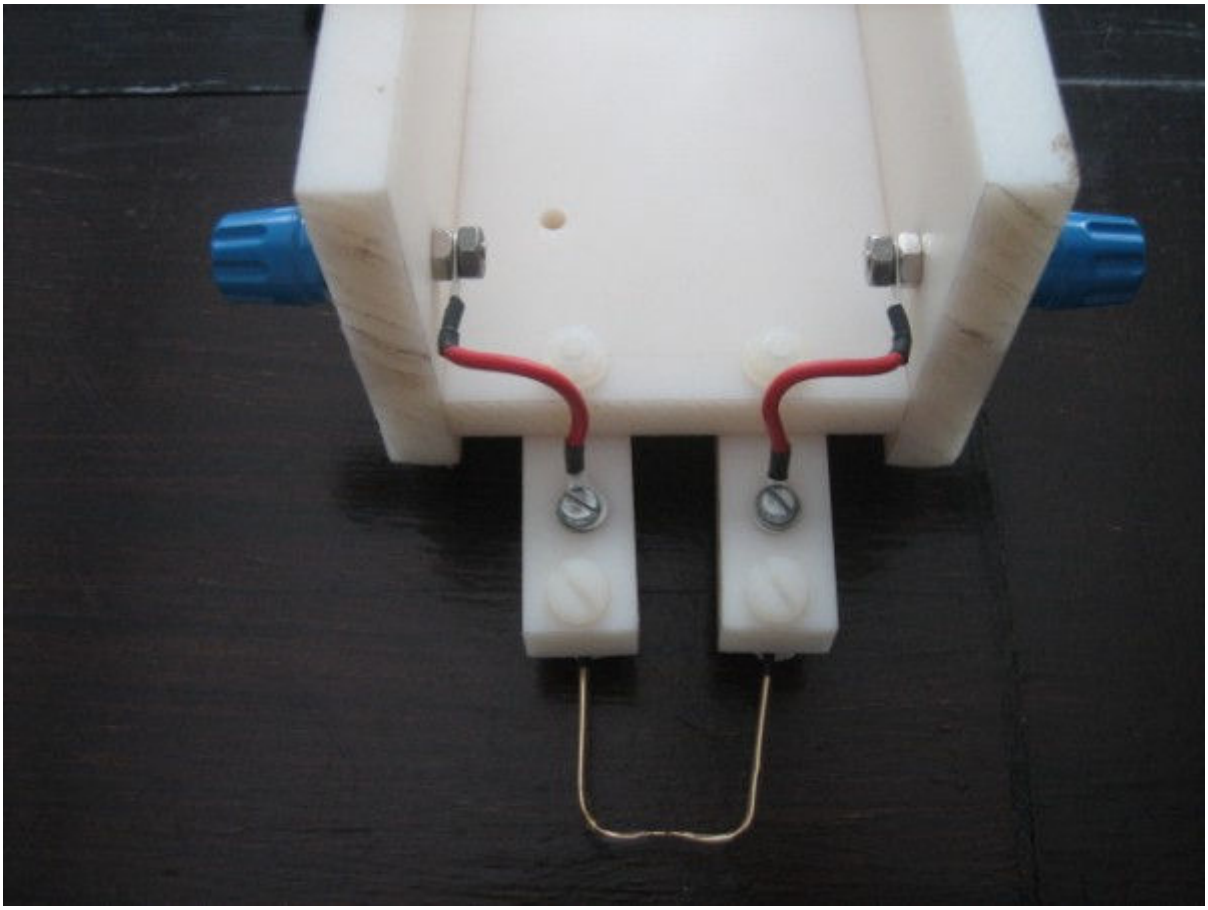


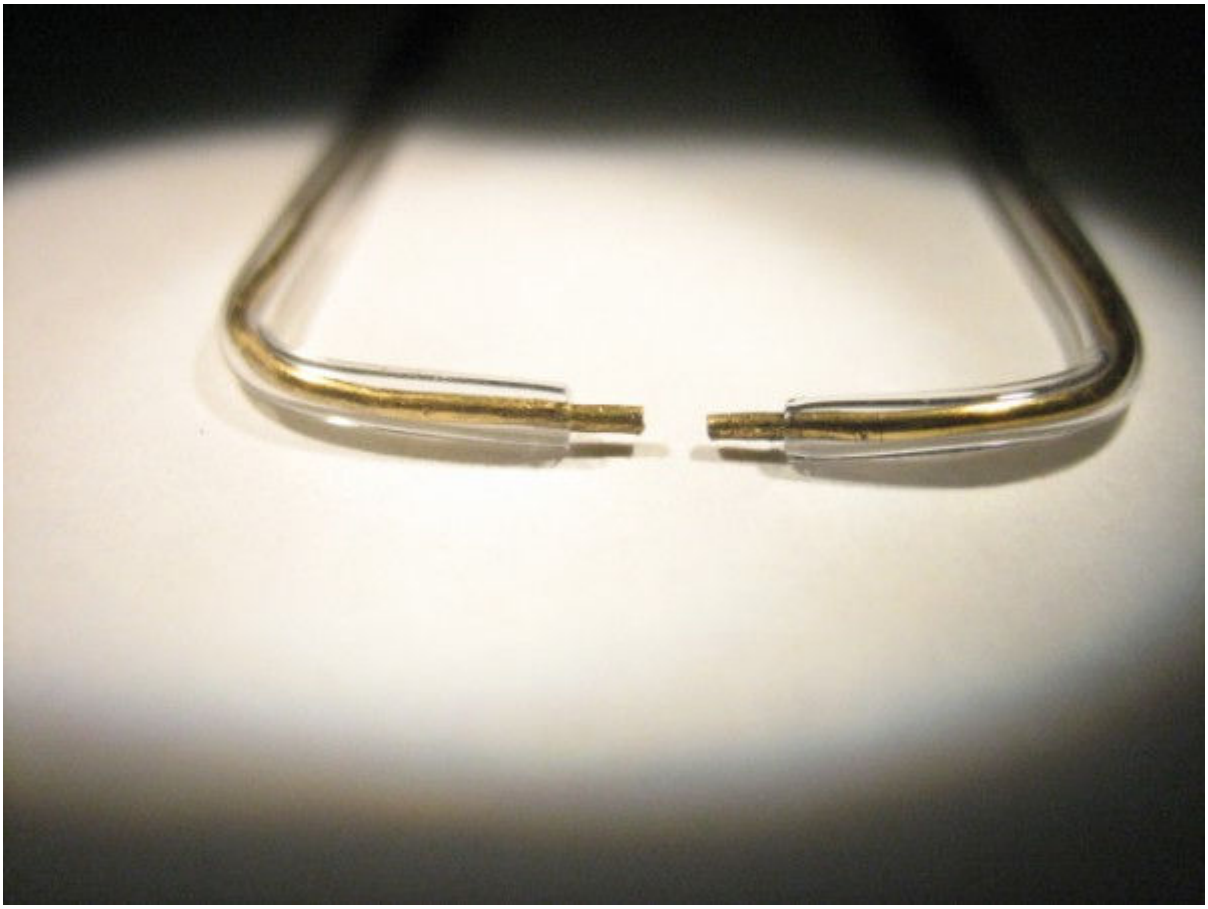




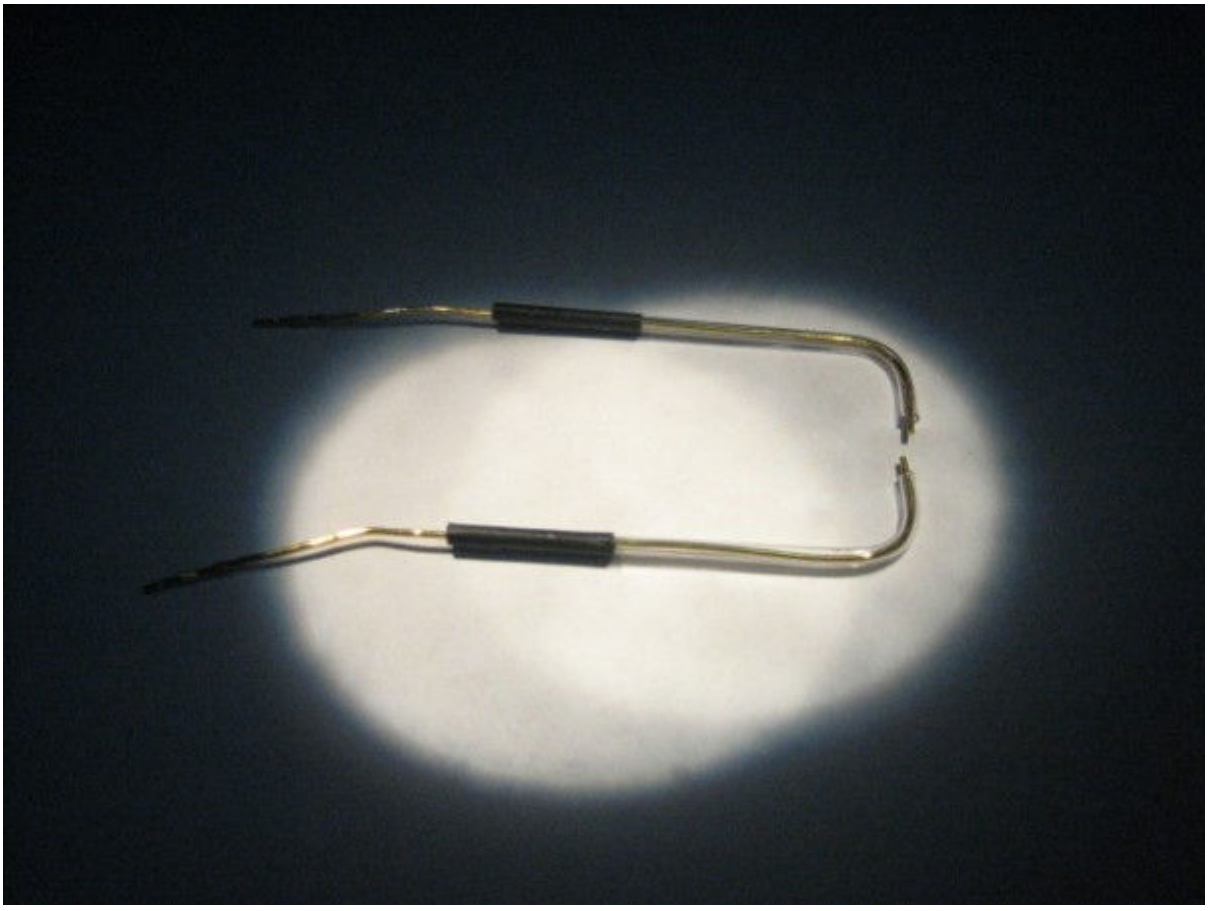














A little bit of additional information

Before you start weight the electrodes. When you are finished weight them again. So you know haw much mg gold you used.

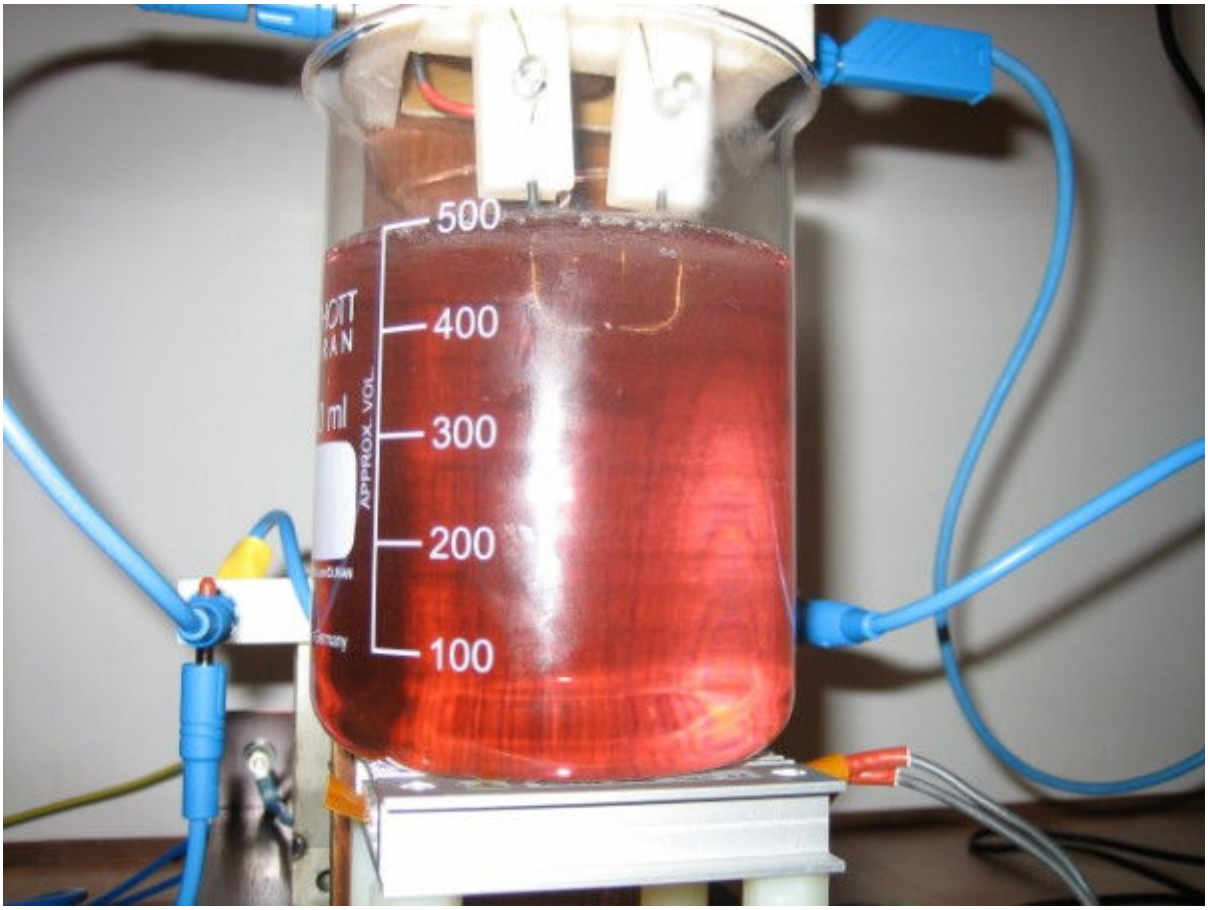
Heat 475ml distilled H2O in an measuring cup on a hot plate until 45°C. Ad 20ml 3% food grade H2O2. You can ad a stirring device for better results.

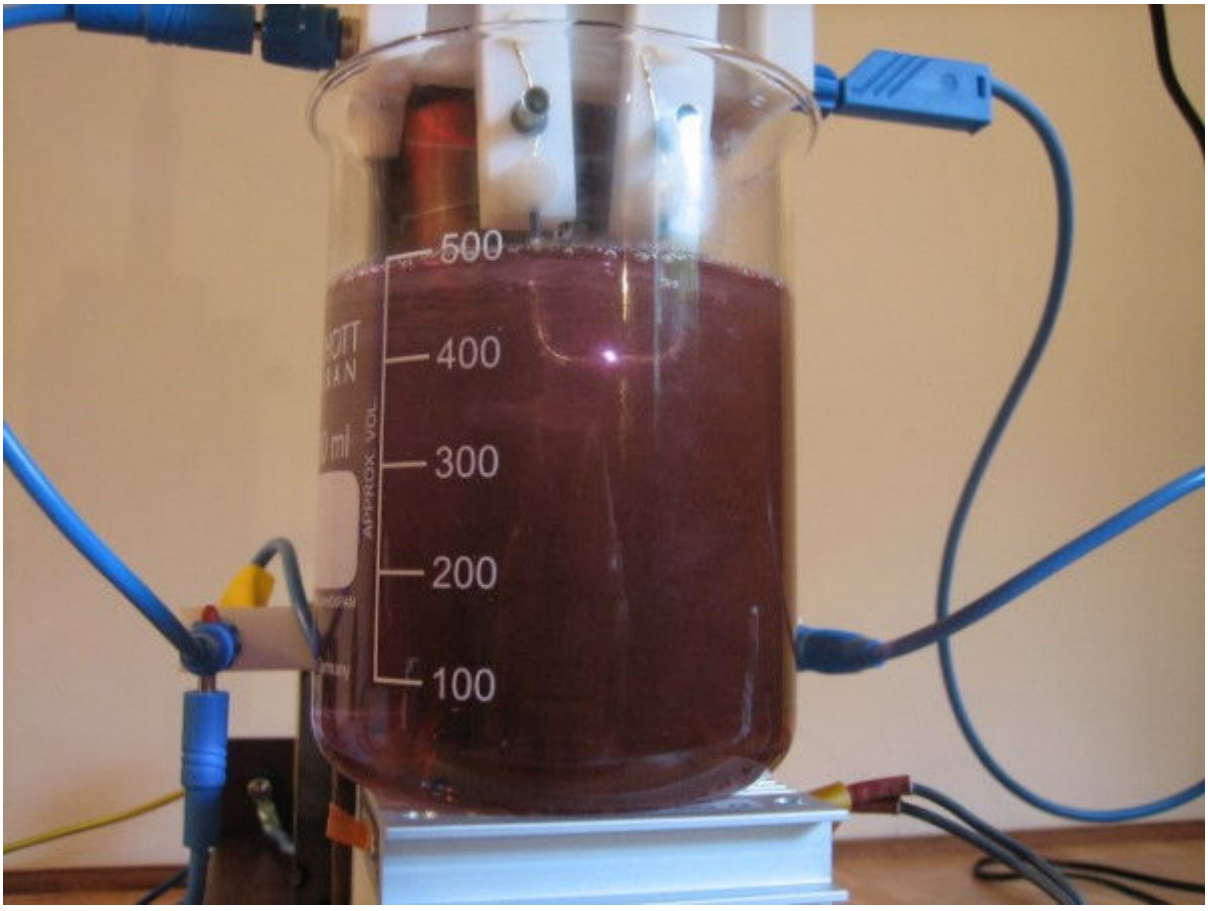
Adjust the side screws with the handle until you have a nice good spark. The golden wires may not touch each other. When they do the lamp bulb will glow at full power and there will be no spark.

In the beginning you need to adjust a lot . After the first minute the spark will stabilize and you just have to keep it going by very slowly adjusting one screw every few minutes. When its good you have approximately 2 amp in the primary winding and the lamp glows at half power.

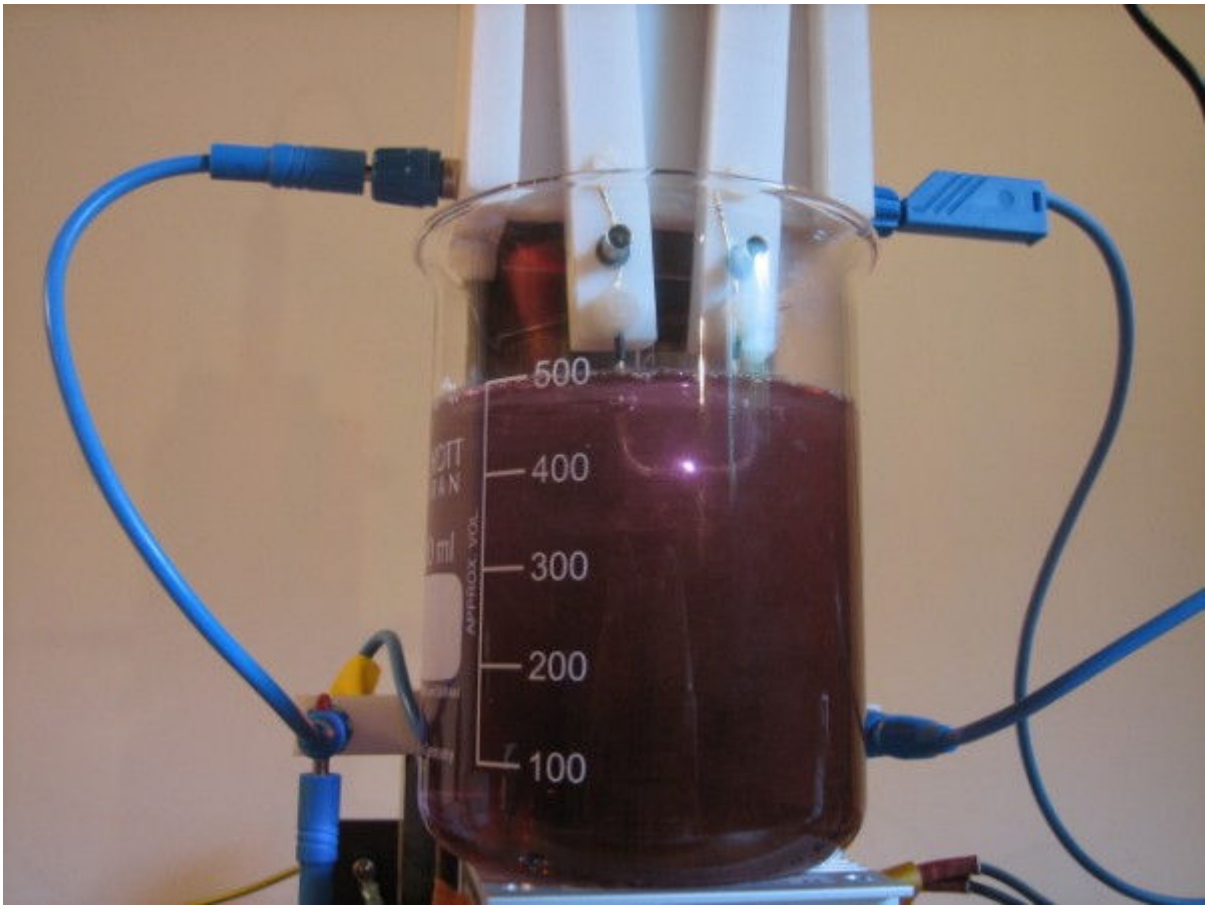
Very soon you get a nice red color. After 30 minutes its much darker after 45 minutes nearly purple.

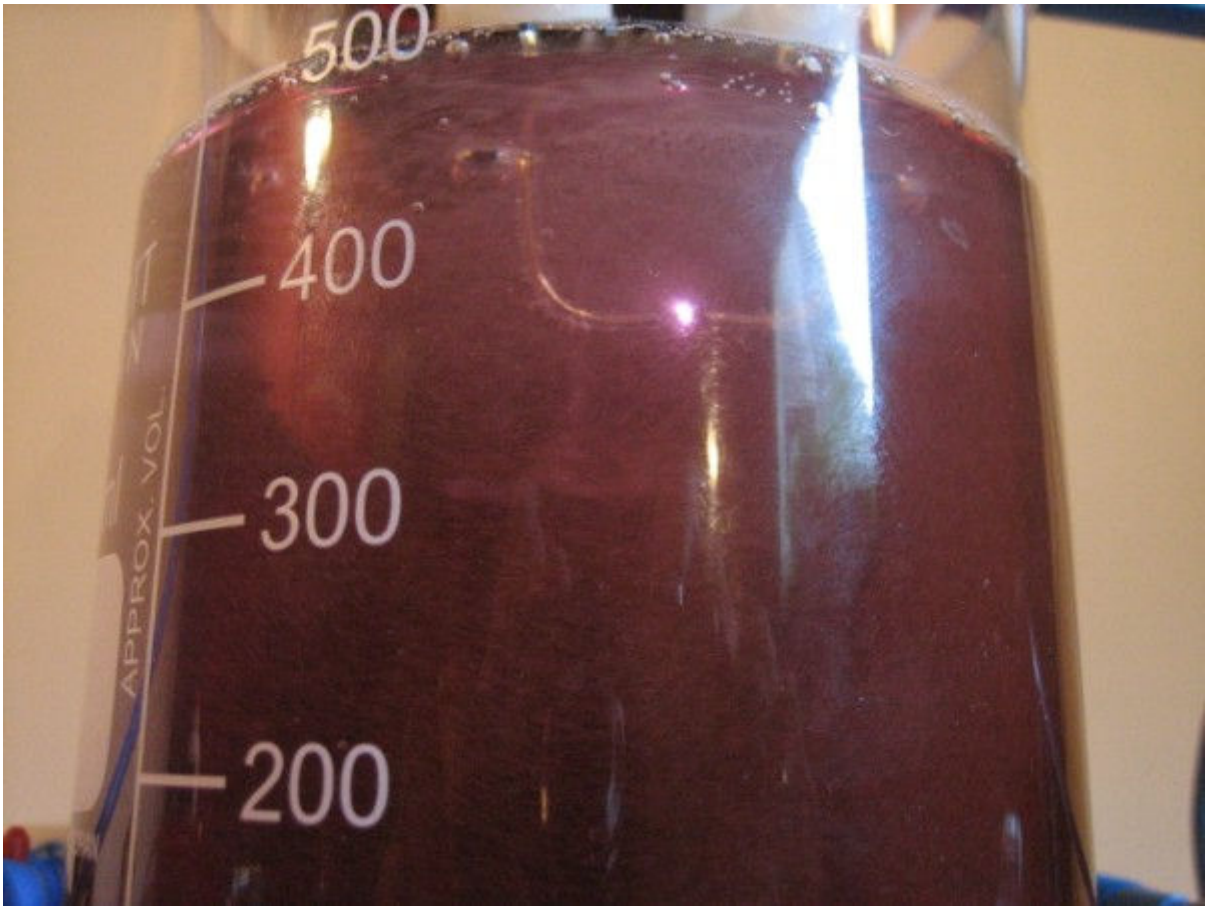
With this setup I had 14 mg gold in 500ml distilled H2O that's equals 28 ppm in 30 minutes.


500
400
300
200
100
APPROX. VOL


500
400
300
200
100
APPROX. VOL


A
2
0
V
150
100
50
0


500
400
300
200
100


500
400
300
200
APPROX. VOL

