Mechanical Electrical Discharge Machining… but why?

It all started with the need to solve an old headache.
Many years ago, I made a small vise for my drill press—a vise much more precise than the usual ones found at hardware stores. At the time, I was working in a sugar factory, and during night shifts, there were times when I had a little bit of downtime between interventions (electrical work, in my case).
To keep myself awake and alert, I would sometimes move from the electrical department to the machine shop next door. With leftover metal scraps, I enjoyed making small projects on the lathe and milling machine.
It was on that old milling machine from the ’50s that my precious vise was born.
Everything went smoothly… perfect measurements, everything fit together, everything ran smoothly.
But then, at the very end, in the last operation—which was tapping the fixing holes for the jaw with an MA6 tap… crack! The tap broke clean off, completely stuck inside 14 mm of solid steel.
All attempts to remove it failed.
So, I decided to use the vise as it was, with the jaw fixed using only one screw.
Functionally, it was great, but I never got over that imperfection. Years went by (over twenty!) until one day I thought: am I really the only one this ever happened to?
Maybe someone else found a solution…
So I started searching online and discovered that, as usual, everything has already been invented: it’s called Electrical Discharge Machining (EDM). And down the rabbit hole I went!
There are solutions to suit all tastes and all budgets, even for less than €300.
But why buy something, spending €250–300 for a device that, once you understand how it works, you can build yourself for just a few tens of Euros?
Especially since building it is half the fun… after all, we’re makers!

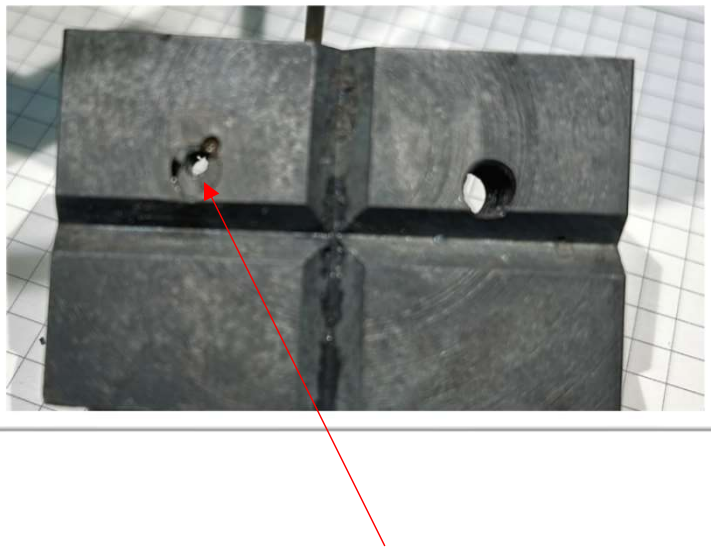
That’s how this little and fun project was born.
What I’m sharing here simply aims to show the working principle and leave it to the interested maker to decide how to implement it.

So all that’s left is to wish you good luck and lots of creativity!

Cheers!

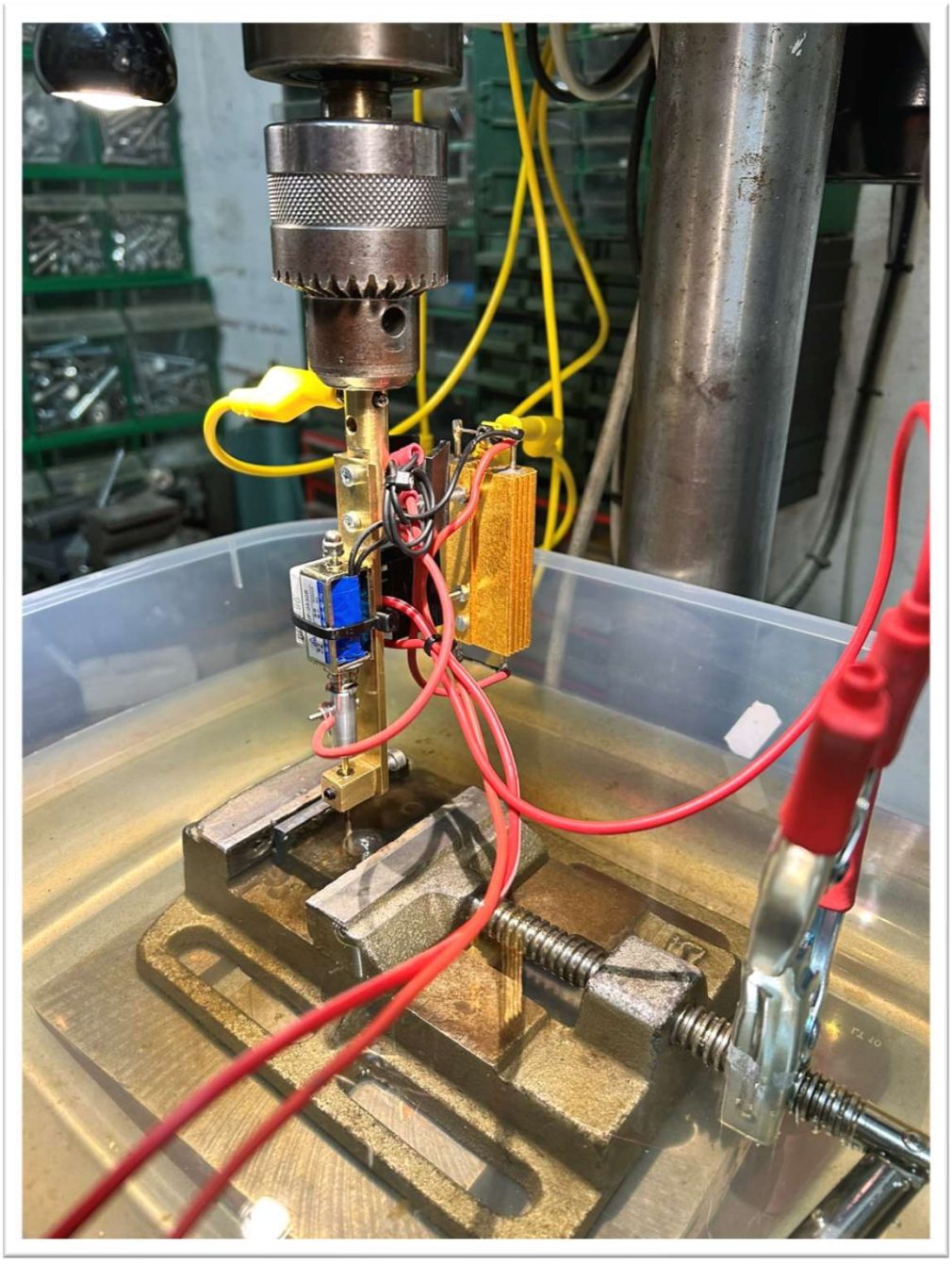
Marcello Caselli

La mini morsa



The broken tap inside the hole.
Note the small 2 mm hole in the center of the tap, drilled using electrical discharge machining.

A second drilling finally allowed me to break the tap with a few strikes of a punch and remove it in pieces.



Mechanical EDM working