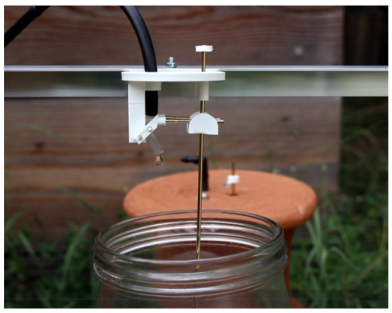

instructables DIY Low Cost Floating Valve for Low Tech Irrigation Automation With Ollas Instruction Manual

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DIY Low-Cost Floating Valve for Low Tech Irrigation Automation With Ollas Instruction Manual

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DIY Low-Cost Floating Valve for Low Tech Irrigation Automation With Ollas

 by lmu34

If you do not want to be on the headlines for wasting water (**https://www.latimes.com/california/story/2022-08-22/kimkardashian-kevin-hart-california-drought-water-waste**)
it might be a good time to install or improve your garden irrigation system.

This instructable shows how to make a low-cost, low-tech dating valve.

- It works well in a low-pressure environment (i.e. water coming from a rainwater tank)
- It would not be able to handle pressure (like water coming from a domestic water network). See step 6 if you only have access to such water distribution.

I wanted to improve a bit the ollas system with low-tech automation in order to auto ll the ollas with a rainwater tank.
I started this work with this instructable: low-tech greenhouse automation, this is an update of the watering part.
Although I got good results with the low-tech watering automation setup in my greenhouse, there were several points I wanted to improve :
The underground interconnection of the pots: it works well but makes it difficult to reorganize the pots or perform maintenance, there is also a risk of leaking over time.
The ower pots themselves: they are not as optimized as true ollas can be (the maximum radius of the pot is close to the ground surface while for ollas this is the minimum radius, as a result, the maximum water diffusion takes place underground with ollas).
So I wanted to use true ollas that are not interconnected underground. A simple solution is to have a coating valve installed in each olla, unfortunately, I could not and any commercially available coating valve that would t in an olla (due to its small radius)….let's make one then…
I have tested many different setups…even tried a motorbike carburetor oat pin.. but what I describe in this inscrutable is what worked…all my other attempts did not give good results (immediately or over time).
You have two parts in this instructable, from steps 2 to 5 is how to make the coating valve using a 3D printer, and from steps 7 to 12 if you do not have a 3D printer.

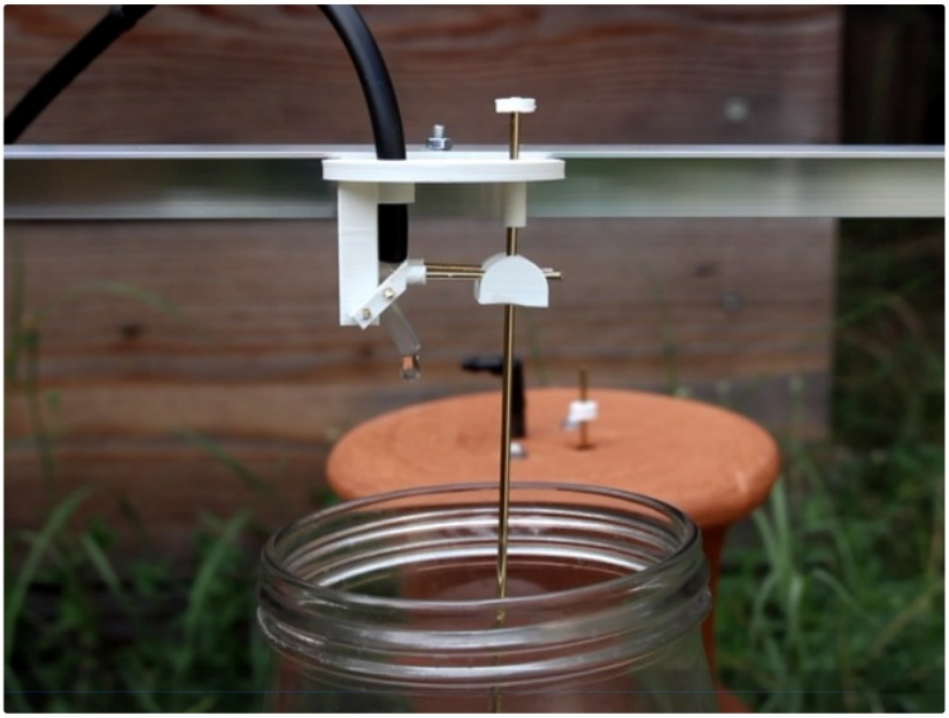
Supplies:

- A few ollas with their cover…I have no idea how easy it is to nd ollas in your own country…if not easy it might be a good opportunity to develop your own ollas business…
- polystyrene balls or eggs (7cm diameter)… need to be big enough to push the valve, and small enough to be inserted into the ollas
- 2mm brass rod (I found mine sold as brass brazing rod)
- thin-walled silicon tube (4 mm outside diameter, 3mm inside diameter)
- standard micro drip irrigation water hose (what is sold locally here is 4 mm inside diameter, 6mm outside diameter) connectors for this micro water hose
- 2 x 3mm screws, nuts, and washers
- PLA lament for the 3D printed parts

For the non-3D printed version same as above but PLA is replaced by :

- L-shaped aluminum (10x20mm 50mm length)
- at shaped aluminum (10 mm wide, 2 pieces 40 mm long, 2 pieces 50 mm long)
- square aluminum tube (8x8mm 60mm long)

- two small pop rivets (could be replaced by screws if you do not have a pop rivet gun)



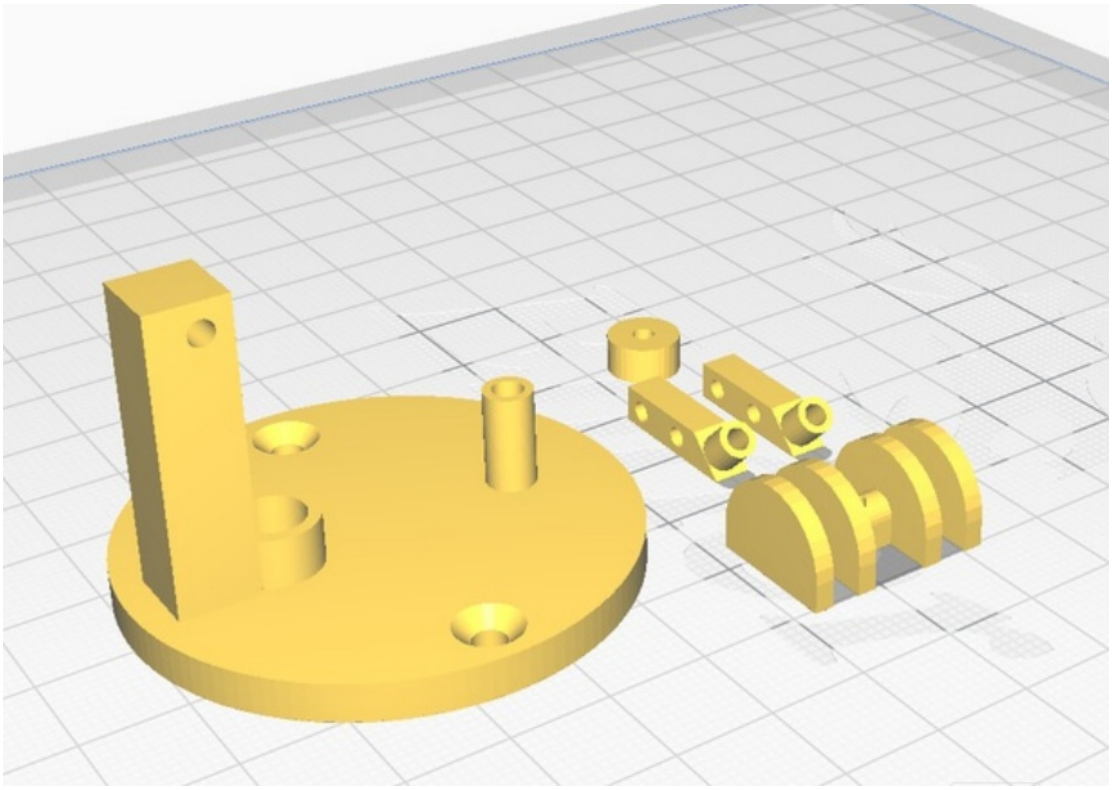
Step 1: Let’s See It Working First…

This small video is accelerated by 8 to illustrate the coating valve in action.

https://youtu.be/G7mDQn0UjcE

Step 2: Print the Parts

I designed my parts to be used with 2mm rods and a 6mm water hose…you may have to adjust the hole sizes based on what you have available.
I used PLA which is water-resistant and easy to print.



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Step 3: Parts Assembly

Assembly is simple, insert the brass rod and cut to the desired size (allow enough clearance between parts, do not tight them together, the mechanism must operate smoothly)
I found it convenient to use a power drill to insert the brass stick into the polystyrene ball. Since this ball will push the whole mechanism, it should not slide easily along the brass stick. Once assembled, you can adjust the desired water level in the ollas by moving up or down the water. Make sure the brass stick is shorter than the depth of the ollas or it could maintain the valve in a closed position.
The small piece of silicon tube is just inserted in the black hose, to ease the insertion, and humidify it first.
You will notice that the mechanism gently pinches the silicone tube even in the open position.a

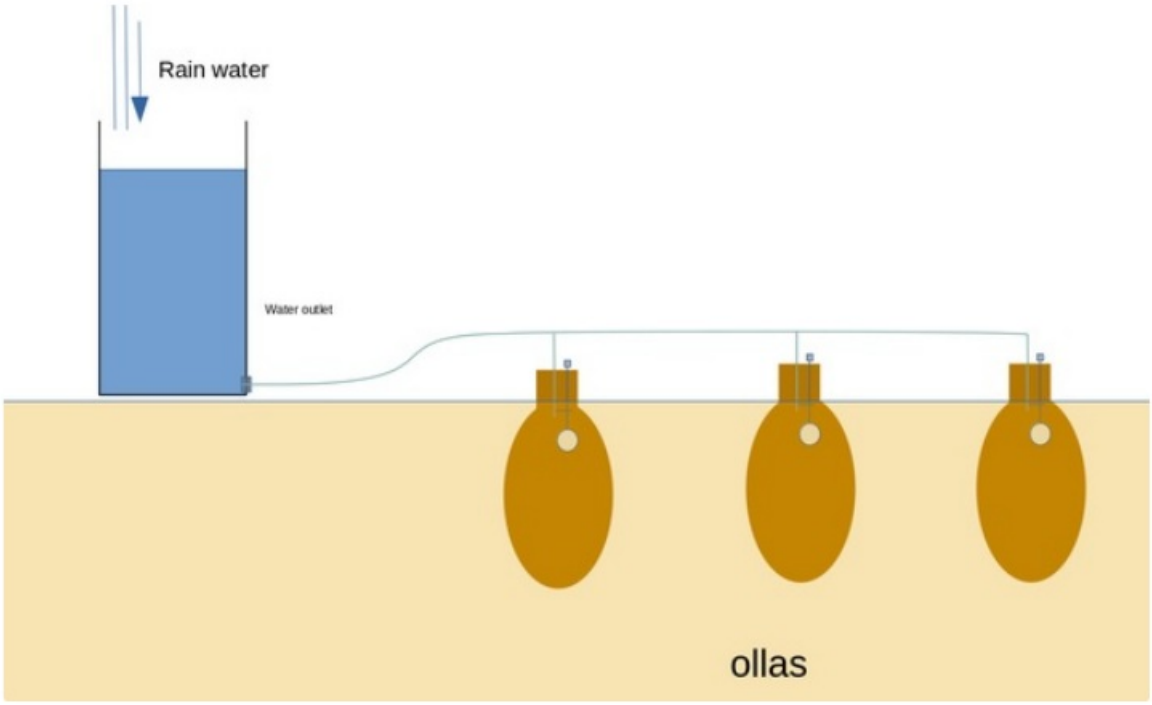
https://youtu.be/bc2hZvAJMb8

Step 4: Modify the Ollas Lid

- use the printed plate to mark the 4 needed holes
- drill: the two holes that will be used to secure the plate on the lid are drilled with 4mm drill bit. The two others (one to let the brass rod move freely and one to let the water hose go in) are drilled with a 6mm drill bit. I used masonry drill bits (for concrete) it does a nice job on clay.
- secure the plate with two screws and reinstall the brass rod with its polystyrene ball into the mechanism.

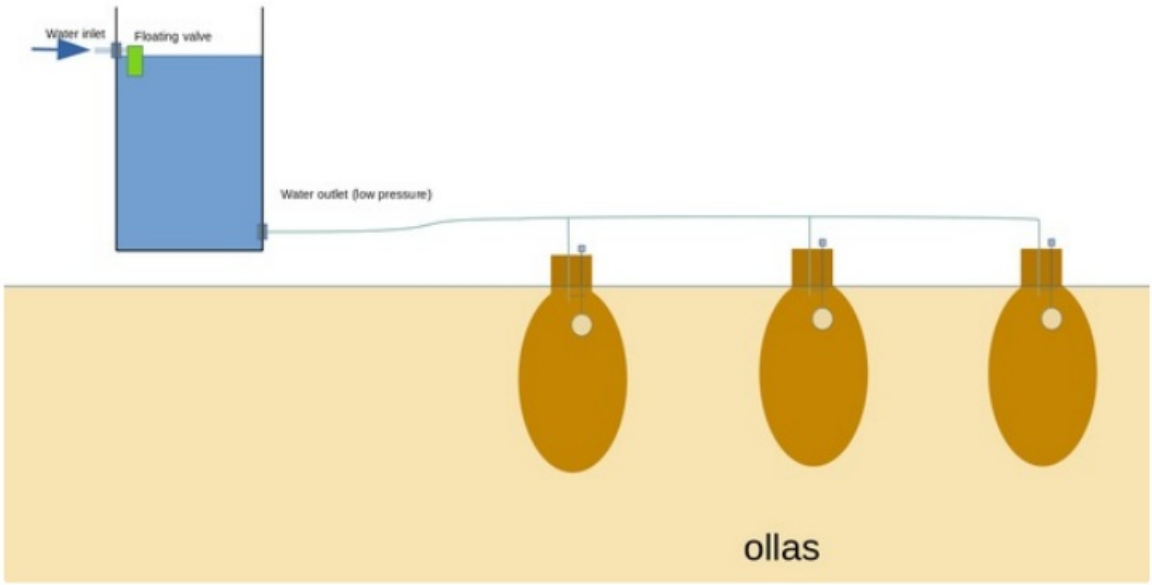
Step 5: Test and Install Your New Irrigation System!

The photo shows two ollas under test.
They will be buried in their nal location.



Step 6: What If I Do Not Have a Rain Water Barrel?

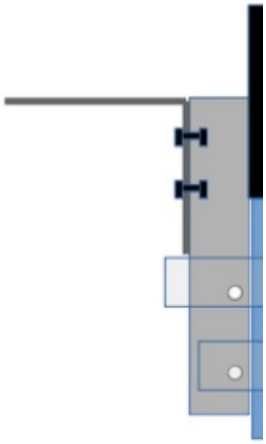
Well, install one **https://www.instructables.com/DIY-Rain-Barrel/**
As another option, you could just create a small buer tank between the water distribution and the ollas you want to auto feed, it will “break” the pressure of the distributed water (as mentioned earlier this coating valve cannot handle water pressure from the public network or a pump).
This beer tank would be auto-filled with a “strong” rating valve (like the ones we have in our toilets, cheap and easy to nd as spare parts). The tank does not need to be big but just high enough (higher than the highest ollas since we use gravity to ll the ollas).



Step 7: I Do Not Have a 3D Printer

3D printing such parts is really the easy way especially if you want to make several valves, however, if you do not have a 3D printed or do not have easy access to one you can make a valve using parts found in DIY stores (aluminum proles)
I am suggesting a slightly different design here, the brass rod does not need to go through the ollas lid (it can be seen as an advantage, however, we do not see anymore if the ollas are empty or not from the outside anymore,

which is convenient I think). This design could be of course adapted for 3D printing.



https://youtu.be/t2lLnvhmWvc

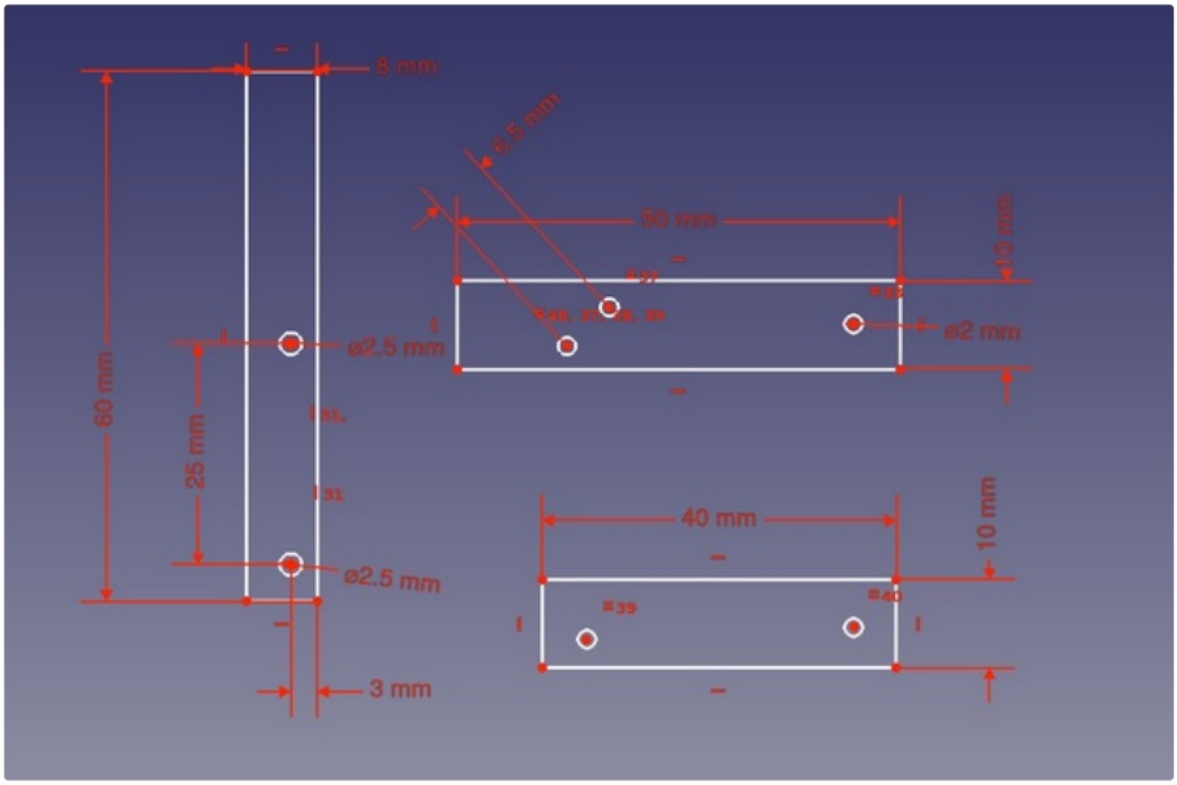
Step 8: Cut the Aluminum Profiles

- square prole: 60mm long

- at bar : 2x 40 mm and 2x 50mm long
- L shaped: 50 mm long

Step 9: Drill the Aluminum Parts

This is the most important part. The quality of the drills will impact the quality of the whole mechanism (good parallelism will allow smooth operation).
I think it would be hard to achieve something good enough without a drill press.
The most important point is to have the holes in the aluminum arms perfectly aligned. To achieve this I suggest you start drilling the hole on one of the arms (one of the longest ones with three holes) and then use this one as a template to drill the three remaining arms.
Use a center punch to accurately place your hole marks before drilling.



Step 10: Cut a Cork

one last piece is missing, it links the oater axis to the mechanism. I used a piece of cork bottle :

- cut a 5mm wide slice of a cork (in its length)
- drill two holes 25mm apart on one face
- drill one deep hole to insert the oater axis

Step 11: Assemble the Parts With the Brass Axis

We have ve axis to insert, I added some end stops made from slices of hot glue stick drilled in their center.
The mechanism photo in step 6 should be enough to understand what has to be done.

Step 12: Install on an Ollas Lid

This design requires only 3 holes: 2 (4mm) to secure the L-shaped prole with two screws, and one (6mm) to insert the micro drip watering hose, it needs to be as close as possible to the square bar.

Step 13: Thanks

Thanks to https://www.terra-idria.fr/ who provided me with two ollas for my tests.
Thanks to Poterie Jamet with whom I exchanged while designing this coating valve and who will provide me with a few ollas to present this project at Maker Faire Lille (France) 2022


Very well done! and I’m sure people will appreciate the fact you went the extra mile to add a nonprinted version! Thanks for sharing

Documents / Resources

	instructables DIY Low Cost Floating Valve for Low Tech Irrigation Automation With Ollas [pdf] Instruction Manual DIY Low Cost Floating Valve for Low Tech Irrigation Automation With Ollas

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