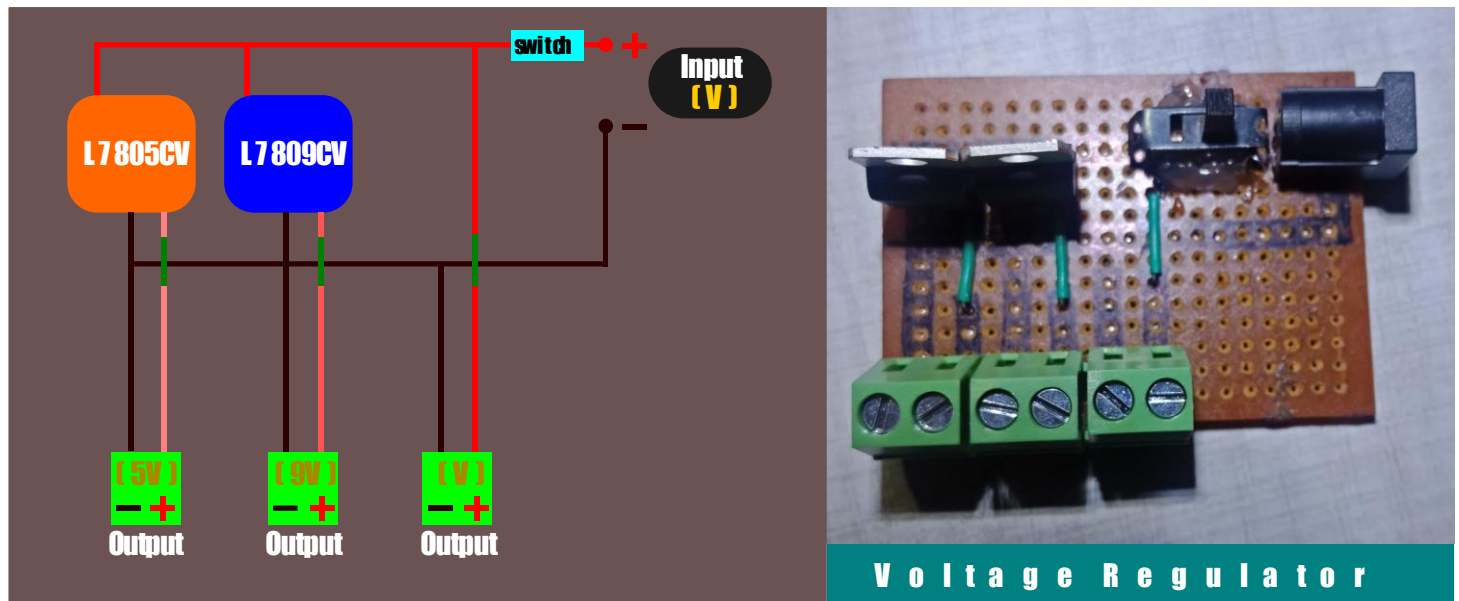


5 simple steps to create 2 in 1 Voltage-Regulator



Disclaimer:

"Necessity is the mother of all Inventions", This voltage regulator circuit was a necessity in one of my projects(I will make sure to add the same project on completion, the need was to use a 12.6v battery to supply power to microcontroller(9v-DC), Motor-Driver(~equal to battery voltage),Motor-driver-logic(5v) and some extra components(5v)).It is the most basic possible circuit, and can still be improved to a very good extent as per the user's needs(consider the datasheet attached for improvement possibilities).I do hope to improve the circuit further ahead and will surely update the content, as and when I improve it. The datasheet and other references added are taken from internet, I have just attached it as a reference for the reader. They are neither created nor owned by me.

Datasheet Reference: <https://www.alldatasheet.com/datasheet-pdf/pdf/22676/STMICROELECTRONICS/7805CV.html>

The tips are added to help the reader. I hope my idea, helps the reader.

Knowledge share=(knowledge)^2.

Suggestions, Critics as well as Complements are welcomed at mailtovigyannveshi@gmail.com

Requirements:

Tools:



**Pencil pointed-tip/
Fine-tip Soldering Iron**



Flat-tip Soldering Iron



Digital Multimeter



Solder



Soldering-flux



Safety-goggles



Glue-gun

Tip 1: As a beginner it is always better to use fine tip soldering-iron. I personally use the one as shown above(fine-tip), moreover there is better temperature control in it. It comes within INR (500), prices may vary according to market inflations. Initially I had purchased the (flat-tip), and it was quite difficult to solder in cases of fine-soldering. For soldering this circuit, preferably use the fine solder.

Tip 2: As a beginner, a simple digital multimeter is sufficient, which comes around INR (180) in local market, prices may vary according to market inflations. It will be an essential tool for testing.

Tip 3: Safety first, before starting the soldering process, please use the goggles (no specialised goggles needed any clear safety goggles will do). It is needed because, there are risks of solder spitting out. While soldering use either use an exhaust fan or solder at places where there is an excellent ventilation of air. It is necessary because the direct exposure to fumes is hazardous. I often use a cloth mask while soldering.

Tip 4: Preferable use a lead free solder, although it needs a slightly higher temperature to melt but it is safe. You can read more about it at reference:

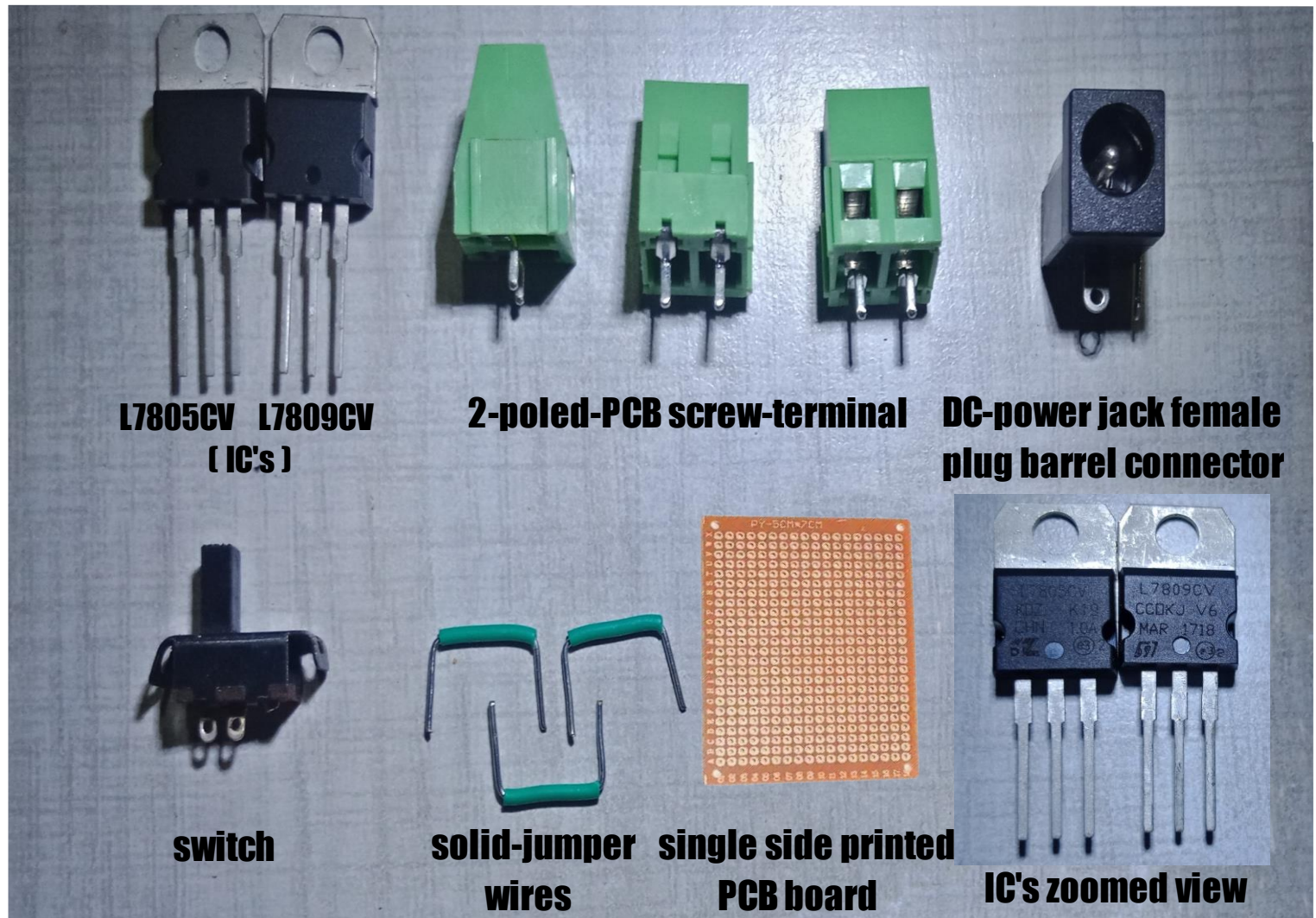
<https://blog.matric.com/lead-vs-lead-free-solder-in-pcb-manufacturing>

Tip 5: After completing the soldering wash your hands thoroughly with water and soap.

You can read the soldering safety guidelines

Reference: https://safety.eng.cam.ac.uk/safe-working/copy_of_soldering-safety

Components:



Tip 6: While purchasing the IC's naming them as number '7809' itself is sufficient to be specified to the retailer. In case of need of specific variations reference: <https://forum.allaboutcircuits.com/threads/whats-the-difference-between-lm7805-and-lm7805cv.25673/>

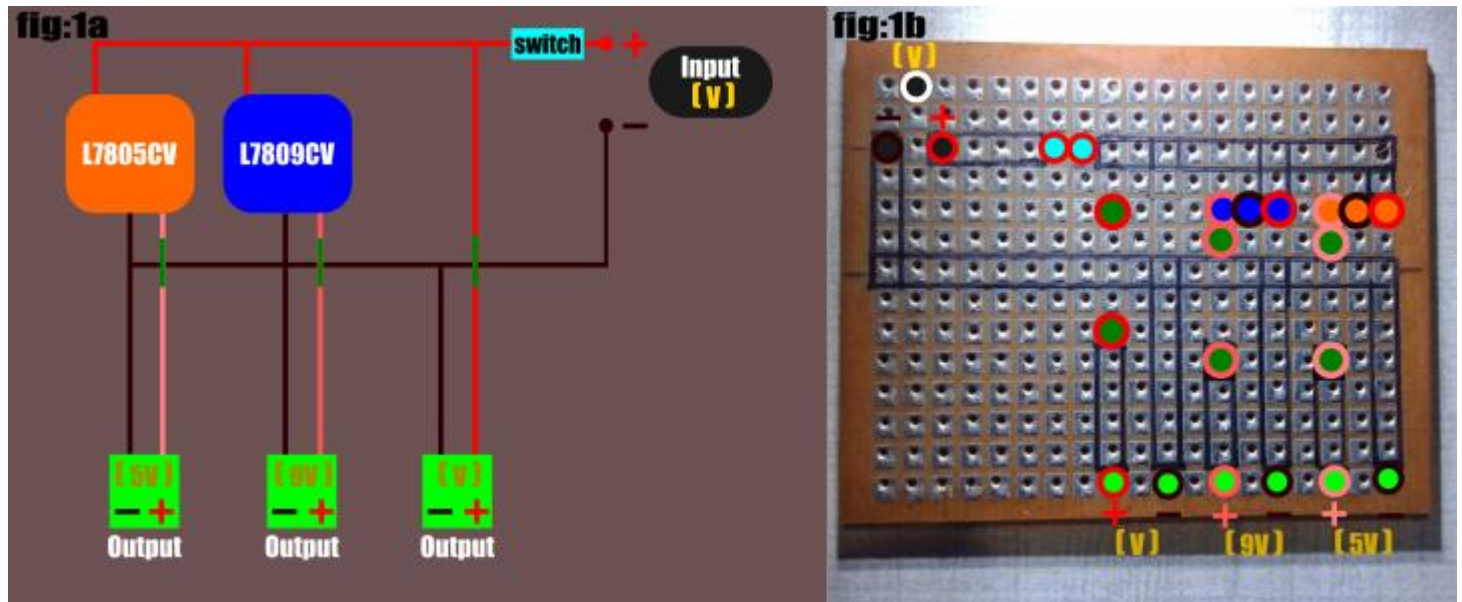
Tip 7: DC-power jack female plug barrel connector(2.1mm inner radius and 5.5mm outer radius) is used to give input to circuit. I have used it as per my necessities. Instead of this component, you may use another 2-Poled PCB screw-terminal, or header pins or just solder wires directly to input.

Tip 8: The switch shown actually had 3 pins. I have removed a pin, excluding the common and another pin from any side as per convenience to solder it to PCB.

Tip 9: The solid jumper wires used were a part of a set of breadboard solid jumper. They are necessary to jump over the ground rail of solder. You may use normal wires instead of these.

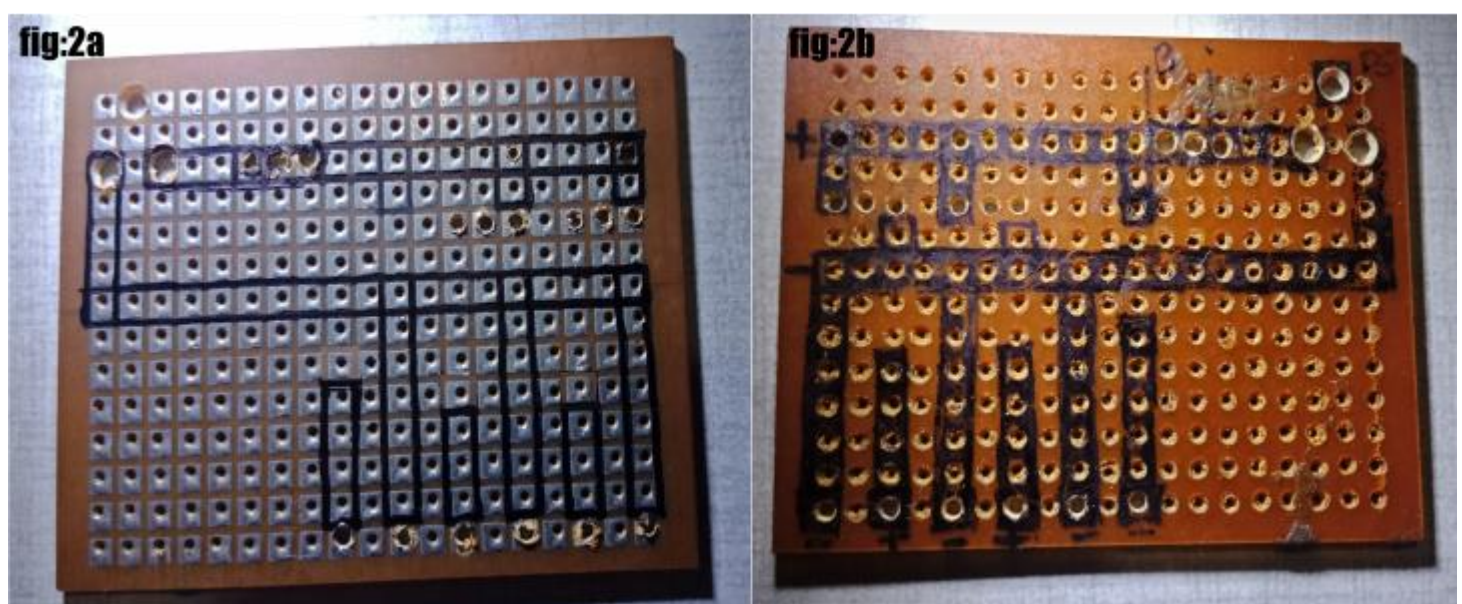
Procedure:

Step 1:



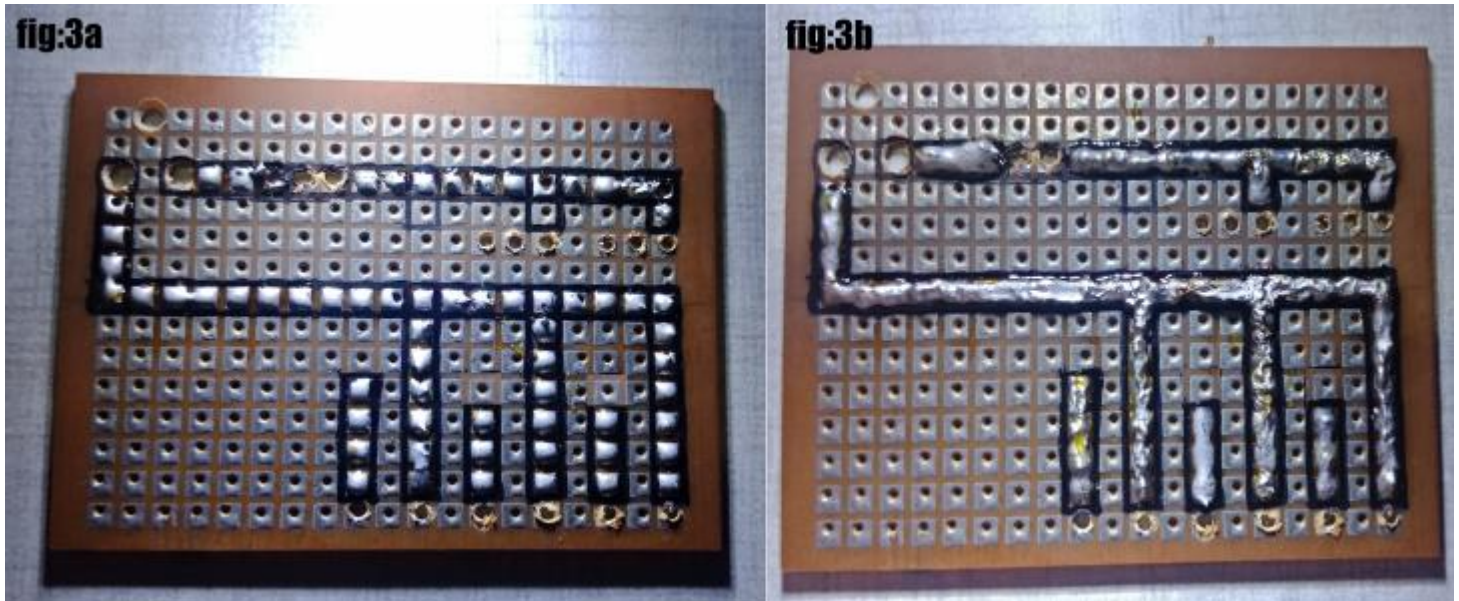
Refer fig: 1a for circuit diagram, Mark lines with a black marker on the PCB Board where you will be needing to bridge rails with solder for connection as seen fig: 1b. The circle - marked region depicts the positioning of the components, wherein the outer circle colour depicts voltage of the component and inner colour depicts the component itself. You need not mark the circles, they are shown to avoid soldering around this region

Step 2:



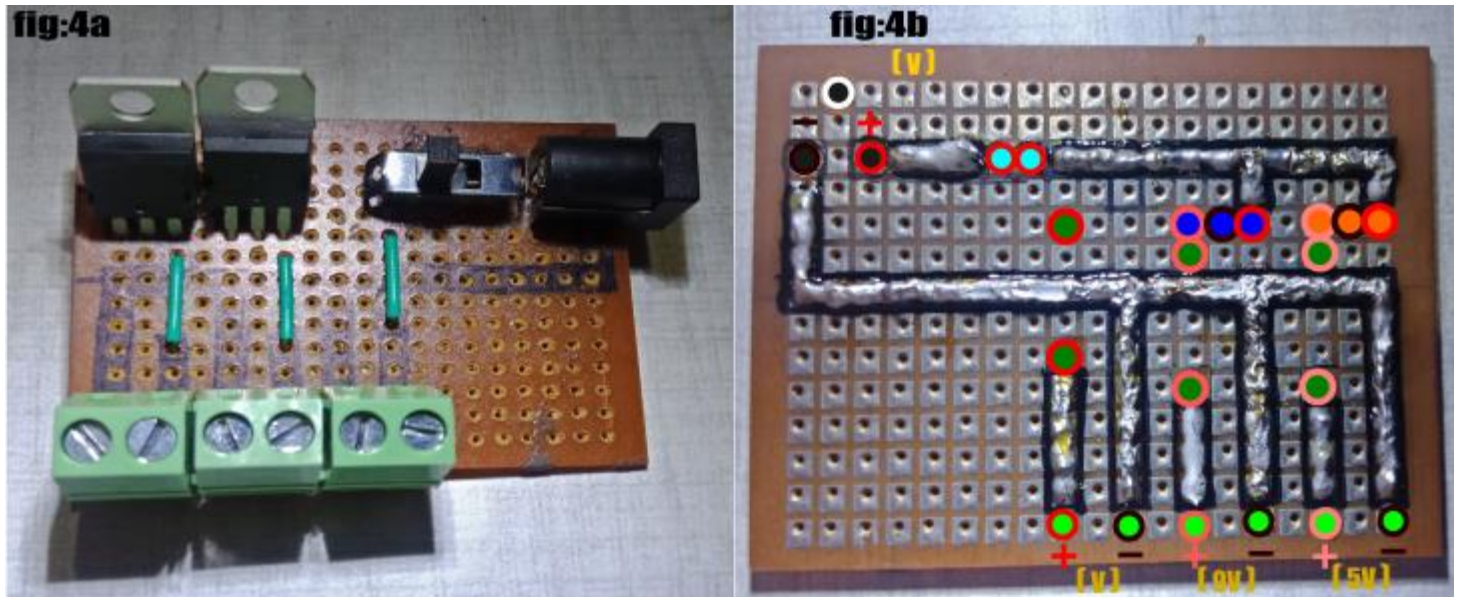
Now mark lines with marker on opposite face [Non printed side] also, as seen in fig: 2b, and increase the hole size such that the components can easily fit into the holes. We also need to increase the size of holes on [Printed side] as seen in fig: 2a.

Step 3:



In order to create a solder rail, first fill the holes with solder as seen in fig: 3a, then after completing it, join in between two squares until you connect them together, i.e., solder in between as shown in fig: 3b.

Step 4:



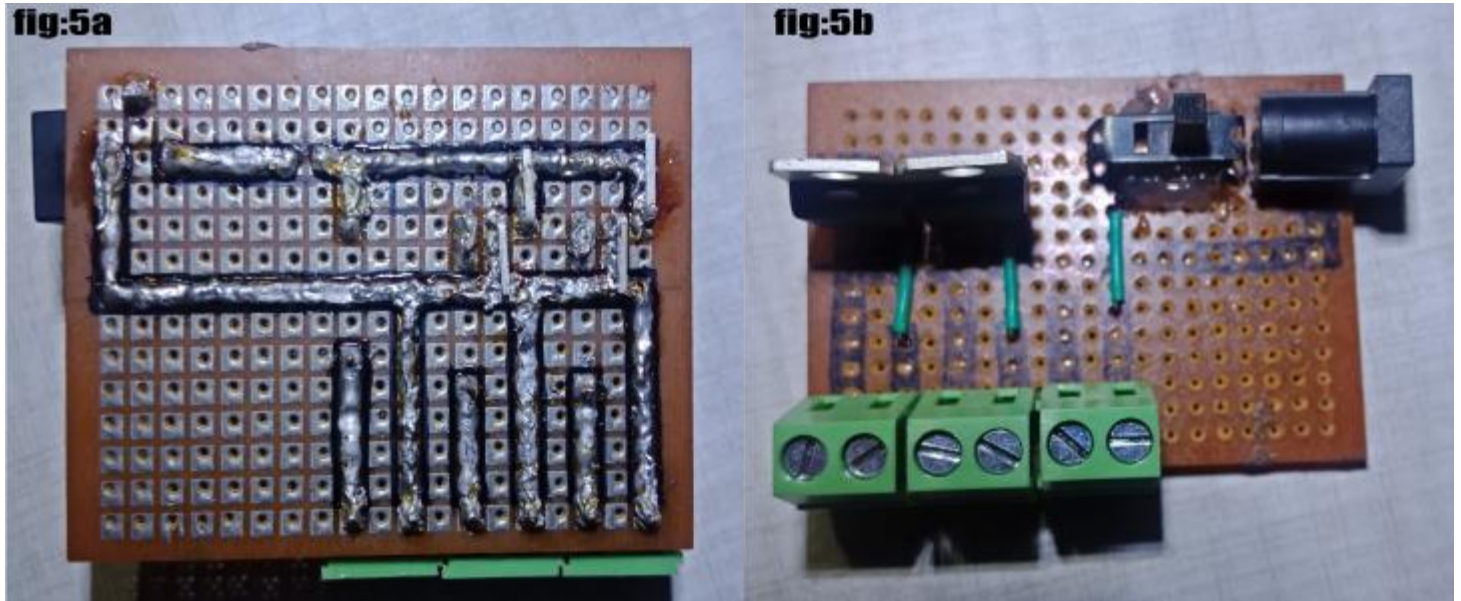
Place the components on the PCB and solder them one by one referring fig: 4a and fig: 4b

Tip 10: The IC's polarity is in order "input, ground, output", considering the written-side facing towards you. Here in fig: 4a, the green jumper wire is used for output of IC.

Tip 11: In case you use the DC-power jack female plug barrel connector, to find the polarity, supply a DC input to it and use a multimeter, such that connection yields a positive multimeter voltage. The terminal connected via positive probe of multimeter is the positive terminal, and one connected to negative probe is the negative terminal.

Tip 12: Take care that you don't mis-solder, in case of minute gaps between the two soldering areas.

Step 5:



After soldering the components, bend or cut any extra protrudings as seen in fig: 5a. Now firmly fix the switch, 2-poled-PCB screw-terminal and the DC-power jack female plug barrel connector if they still wobble even after soldering, using the glue gun. The circuit is ready. You can provide an input ($\sim 12\text{v}$) to the circuit and check its output using multimeter.

Tip 13: While adding hot glue make sure it doesn't adhere any moving parts such as the switch or the screws or the input of DC-power jack female plug barrel connector.

Tip 14: Your creativity is always appreciated, I haven't used the capacitors in the circuit, still the circuit works quite fine in my case. If you desire to add capacitors refer the data sheet referenced above.

I hope that I have something new for the reader, you can add your doubts or queries to me via gmail at mailtovigyannveshi@gmail.com. Till then "Seek Science behind Substances to get Simplified Solution".