Higher institute for engineering and technology – kafr el sheikh

Power supply with simple home security system.

Techno team

151

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زياد ايمن الريحان	٣
ذكى حمدى فتحى عرب	٣
خالد واصف هليل على	٢
بسملة جلال محمد	٢
بسملة طه محمد	٢
جنى جمال الدين احمد	٢
دعاء خالد محمد	٢
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سهيلة السيد طلعت الهجين	٣
رحمة عبدالواحد ادريس	٣
اميمة فكرى قنديل	٢

Contents:

- # Power supply:

  A power supply is an electrical device that supplies electric power to an electrical load. The main purpose of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load. As a result, power supplies are sometimes referred to as electric power converters.

  - Types of power supply:
    1- DC power supplies
    2- Linear power supply
    3- Switched-mode power supply
    4- Capacitive (transformerless) power supply
    5- Linear regulator
    6- AC power supplies
    7- AC adapter
    8- Programmable power supply
    9- Uninterruptible power supply
    10- High-voltage power supply
    11- Bipolar power supply

- Our Power supply:

  It is consider variable voltage and fixed voltage variable voltage between 0 to 32v and fixed voltage 5V, -5V, 9V, -9V, 12V and -12V. and maximum current 3A.

  - Component:

    1. Fixed resistors
    2. Variable resistors
    3. Transformer 12V – 0 – 12V 3A
    4. Digital panel counter
    5. Buck converter
    6. Switch
    7. 2 pin power cord
    8. Bridge rectifier
    9. 4700µF capacitor
    10. Socket
    11. Wires
    12. Voltage regulator
    13. Box of aluminum

Fixed resistor

variable resistor

transformer

Digital panel counter

Buck converter

Switch

2 pin power cord

Bridge rectifier

4700µF capacitor

socket

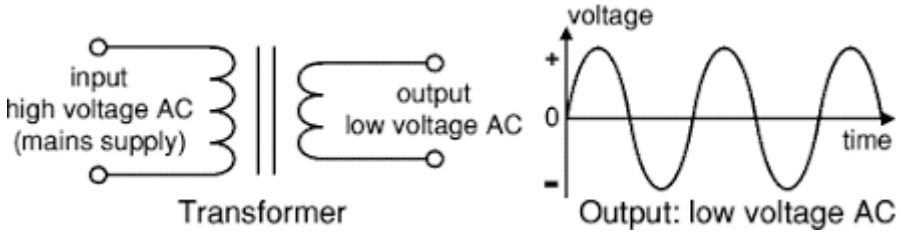
wires

Voltage regulator

- The function of each of the components:
  - Resistor:

    Controlling the current and voltage to be output from the power supply through some pulleys.
  - Transformer:

    It converts the input voltage from 220V to 12V and generates a current of 3A.



  - Digital banal counter:

    Used to display the value of the output current and voltage.
  - Buck converter:

    The buck converter is a ubiquitous DC-DC converter that efficiently converts a high voltage to a low voltage efficiently. Efficient power conversion extends battery life, reduces heat.
  - Switch:

    It is used to lock and turn on the power supply.
  - 2 pin power cord:

    It is used to transfer voltage from the socket to the power supply.
  - Bridge rectifier:

    The purpose of the Bridge Rectifier is to convert the AC power into DC power.

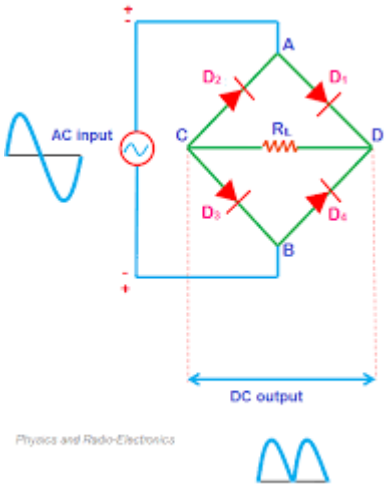
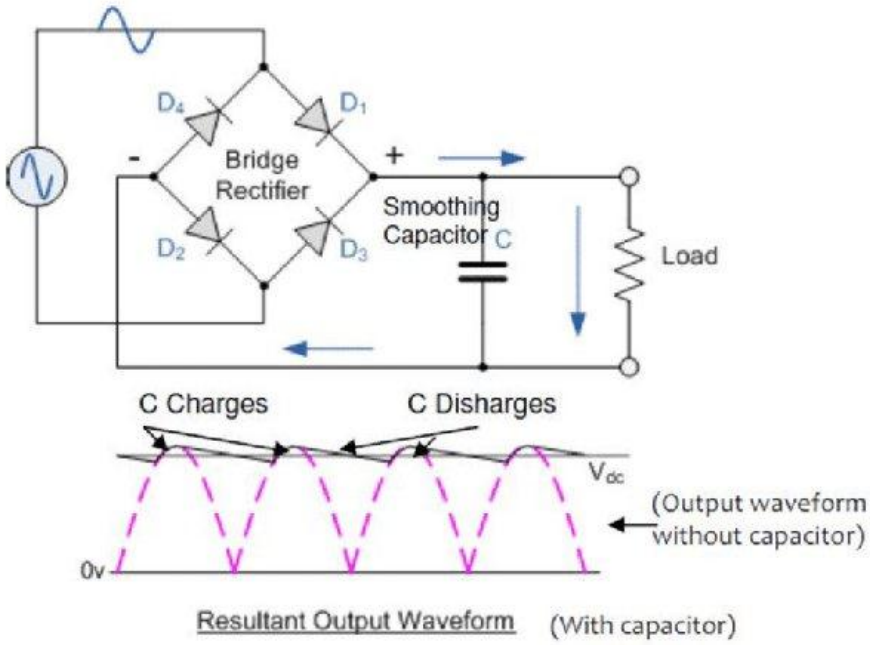


Fig: Bridge Rectifier

- 4700µF capacitor:

  filter out AC noise, suppress rapid voltage changes, and improve feedback loop characteristics.



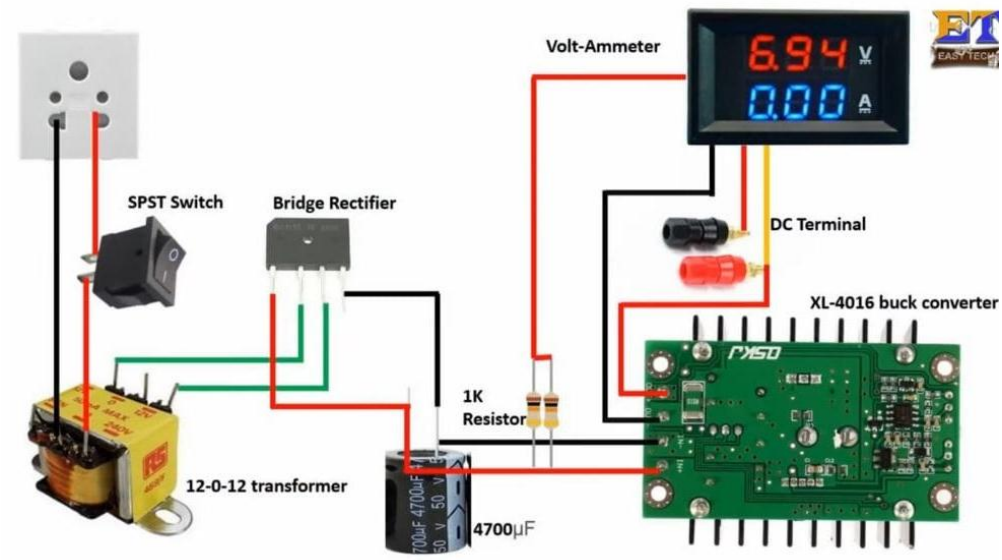
- Socket:

  It is considered a station for transferring voltage and currents from the power supply to the load.

- Voltage regulator:

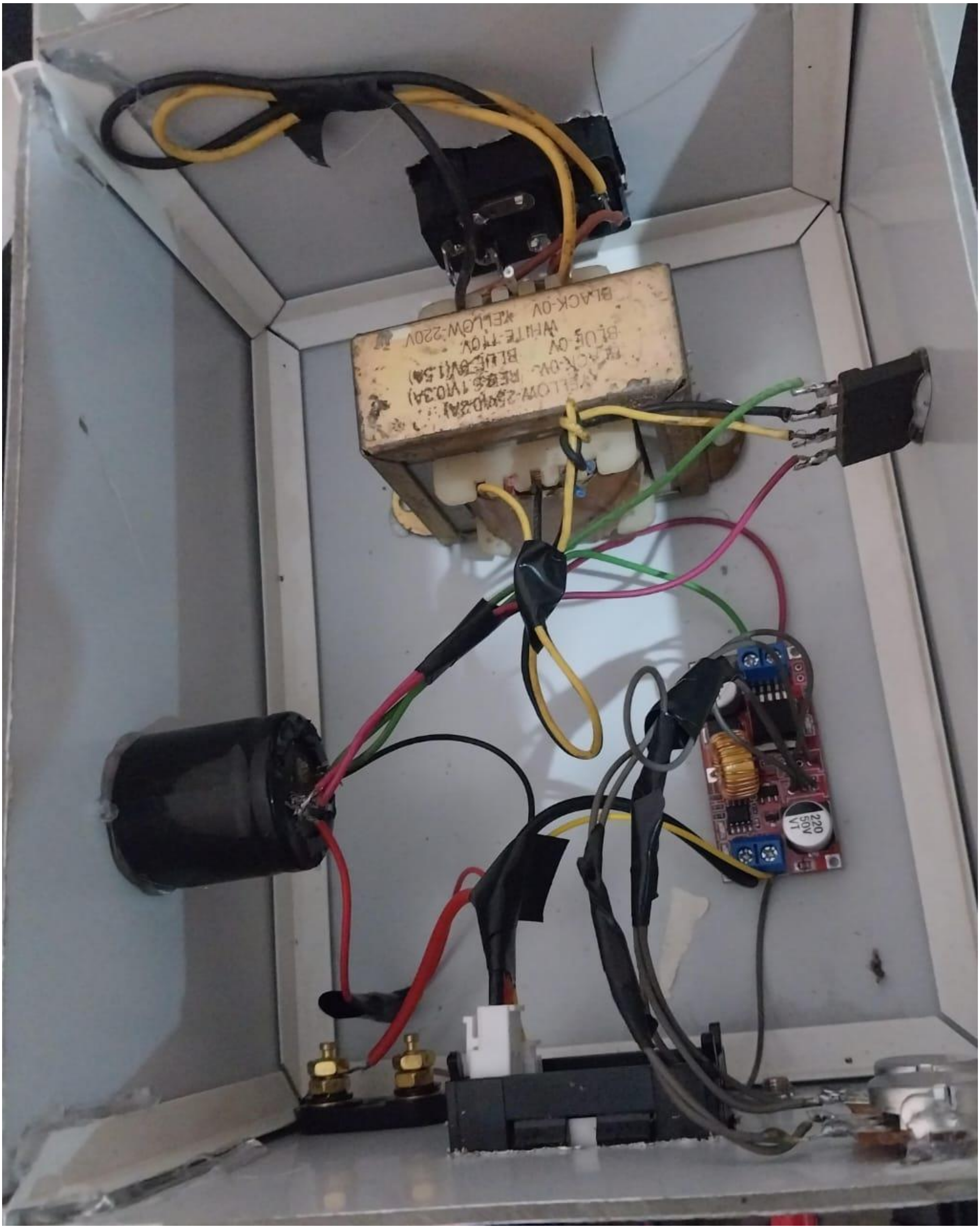
  creates and maintains a fixed output voltage, irrespective of changes to the input voltage or load conditions.

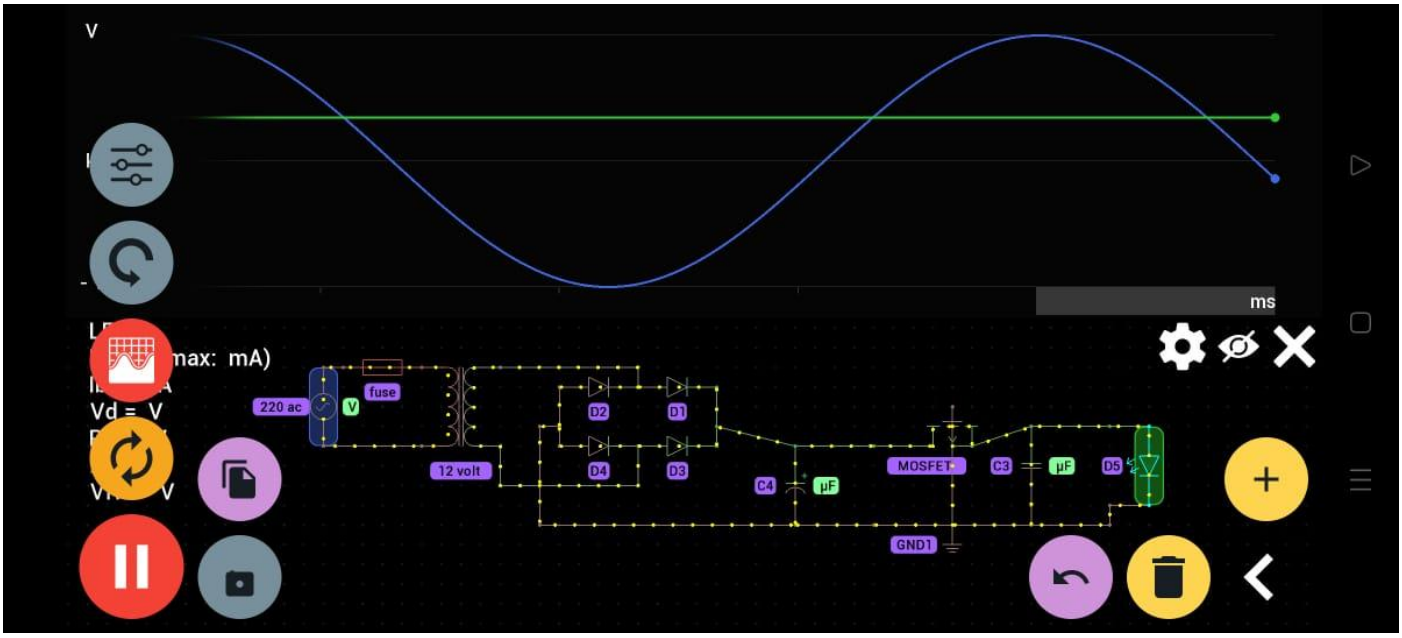
- connection and installation:
  - variable bower supply:



The first We connected the voltage source to the transformer, and in the middle of them is a switch to control the opening and closing of the switch.

Then we connect the transformer output to the bridge rectifier to convert the AC power into DC power.
And then we connect the bridge rectifier output to the capacitor to smooth the signal.
And then we connect the capacitor to buck converter to control current and voltage.
And then we connect the buck converter output to DC terminal to get the voltage out and connect to digital banal counter to display current and voltage.


BLACK-0V
YELLOW-220V
WHITE-110V
BLUE-0V
220
50V



- fixed power supply:

  we use three voltage regulator

  1- voltage regulator 7809 => 9V

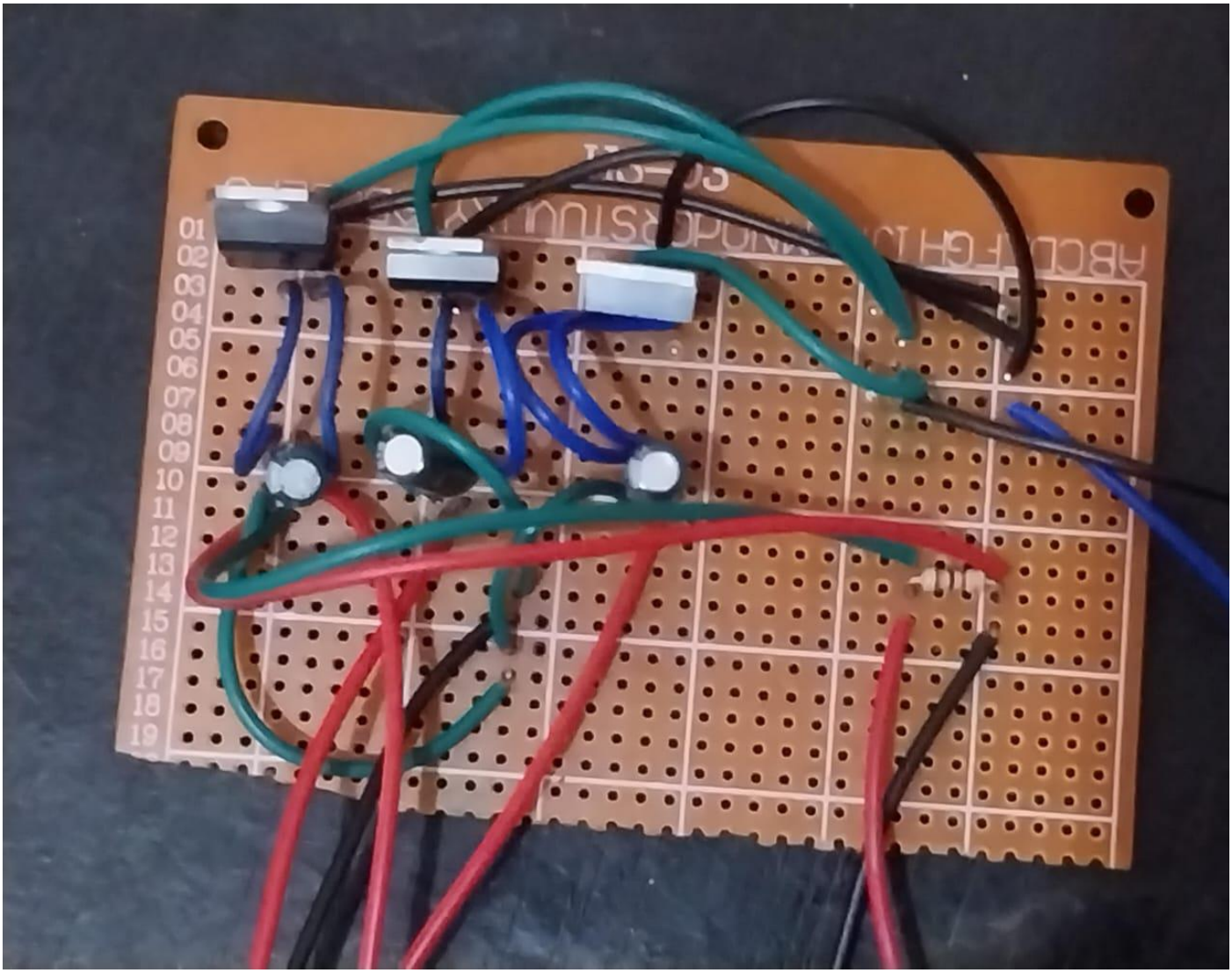
  2- Voltage regulator 7805 => 5V

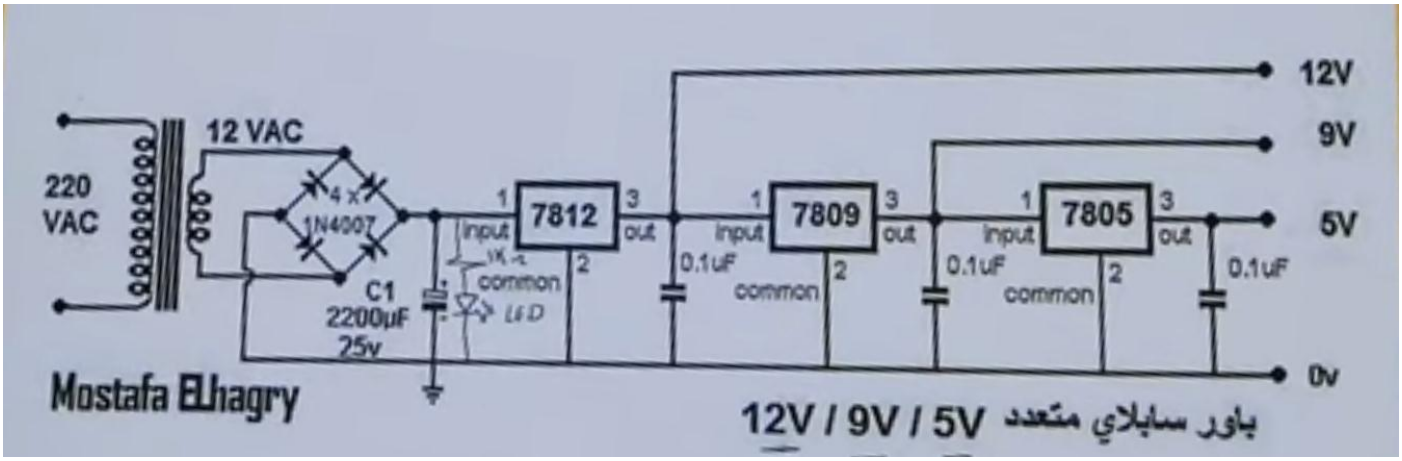
  3- Voltage regulator 78012 => 12V

  And 3 capacitor 1µF

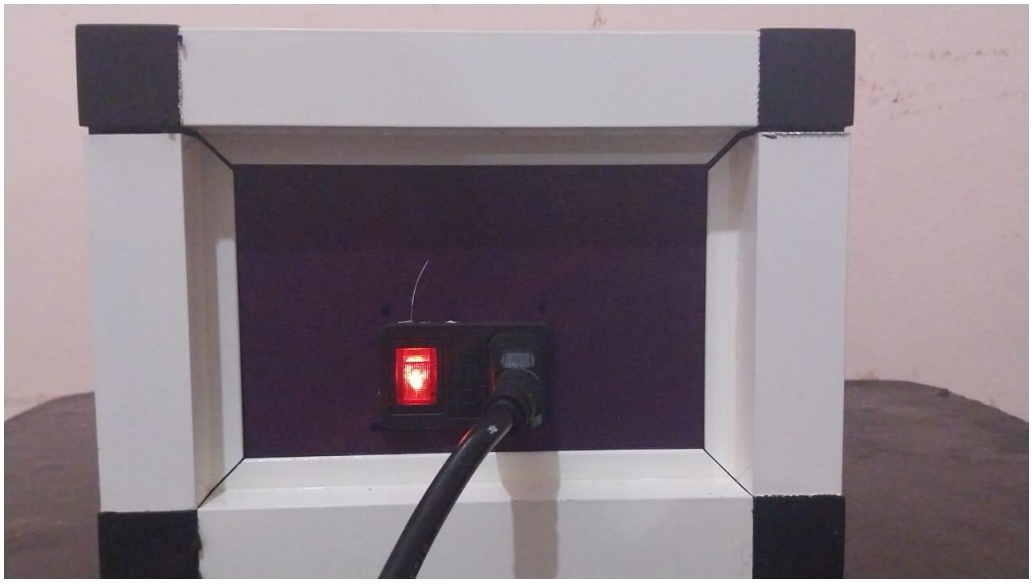
  We took out 3 values for voltage 9V, 5V and 12V and We shortened the negative voltage to one point.

  Then we took a connection from the capacitor with a variable voltage on 3 voltage regulator to output the values of the required voltage.

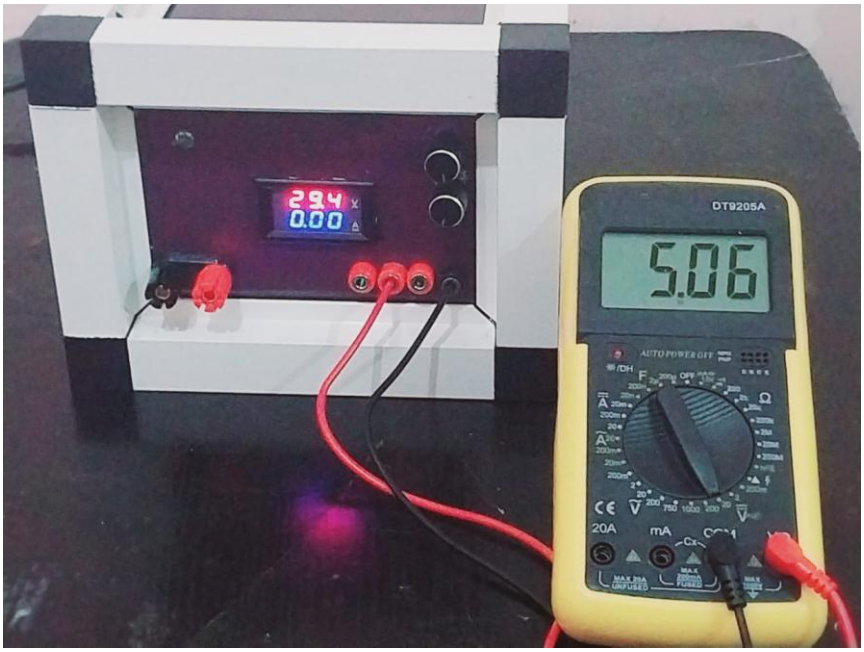


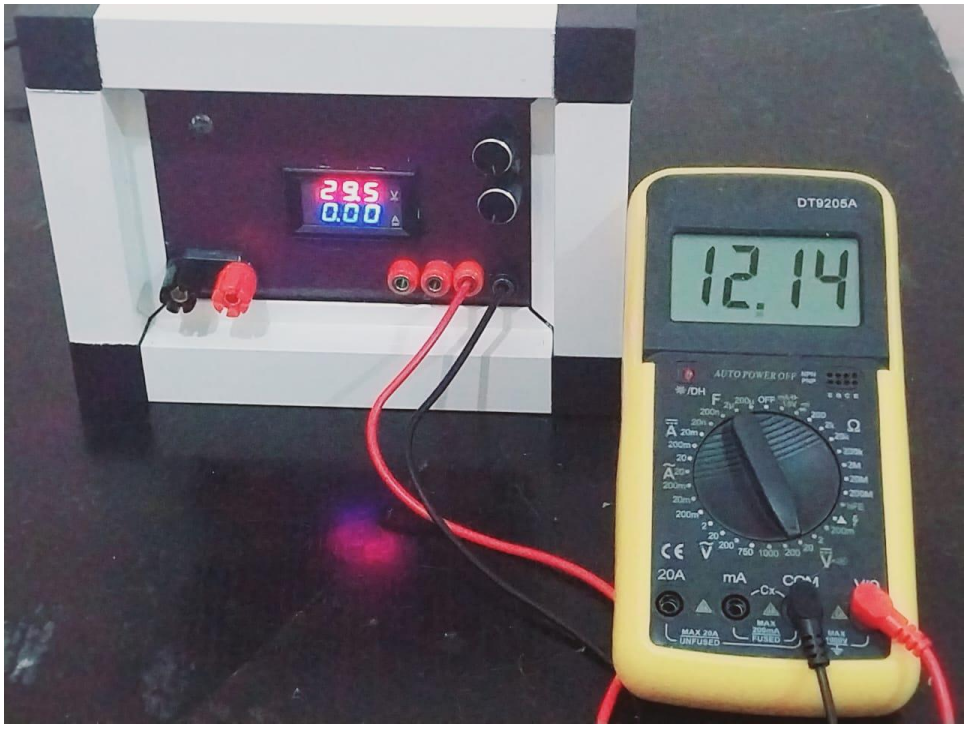

12V
9V
5V
0v
12 VAC
220
VAC
4 x
1N4007
C1
2200µF
25v
7812
7809
7805
input
out
common
0.1uF
LED
Mostafa Elhagry
12V / 9V / 5V
باور سابلاي متعدد

Some picture:




29.4
0.00
DT9205A
9.16
AUTO POWER OFF
20A
mA


29.4
0.00
DT9205A
5.06
AUTO POWER OFF
20A
mA


29.5
0.00
DT9205A
12.14
AUTO POWER OFF
20A
mA

• Security system home:

Consisting of:

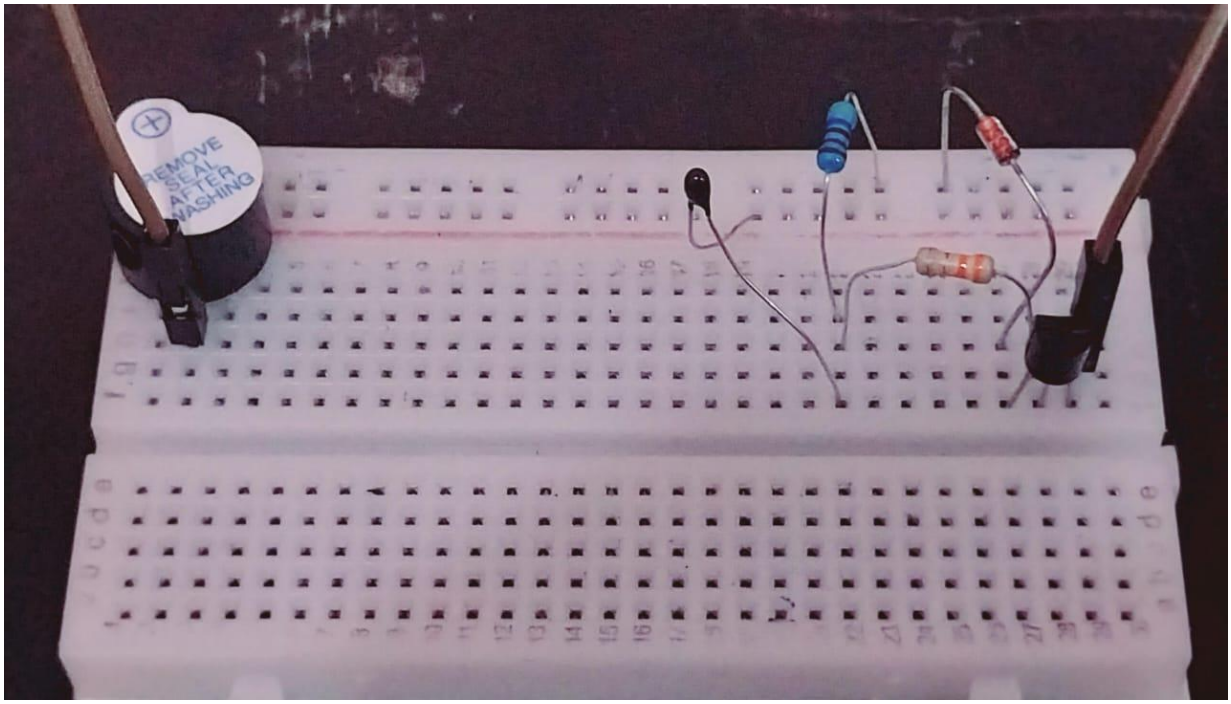
- Fire detection alarm:

The number of fire incidents in Egypt reached 49,341 incidents in 2022, with a percentage of 34.5% residential fires. Therefore, the alarm will help in early detection of fires using the IR sensor and will alert residents using the buzzer.

- Component:

1- Resistors
2- Buzzer
3- Wires
4- IR sensor
5- 5V source
6- Transistor

- Connection:



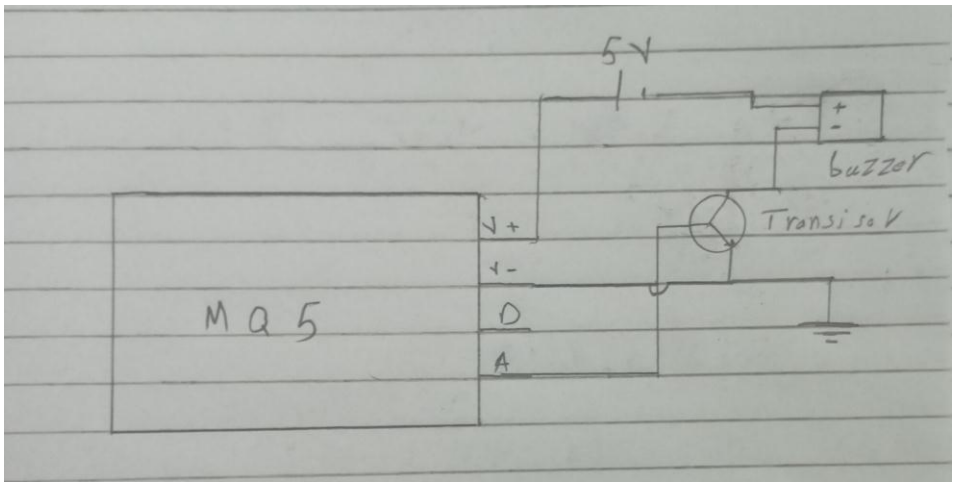
- gas detection alarm:

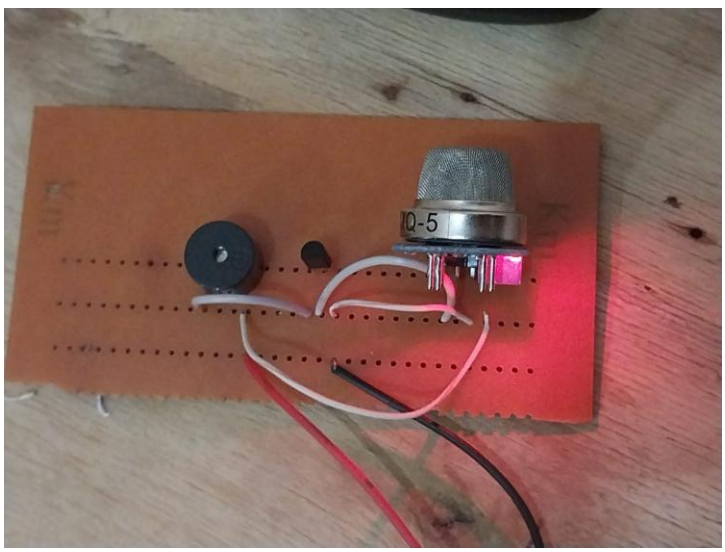
One of the most dangerous residential fires is gas leakage fires, because they are like an instantaneous destructive explosion, and a simple action, such as turning off the lights, may ignite the gas spreading in the air, which prompted adding a smell to the gas to help detect it, but when the smell arrives, the gas may be spread throughout the house, so the speed of setting off the alarm is important.

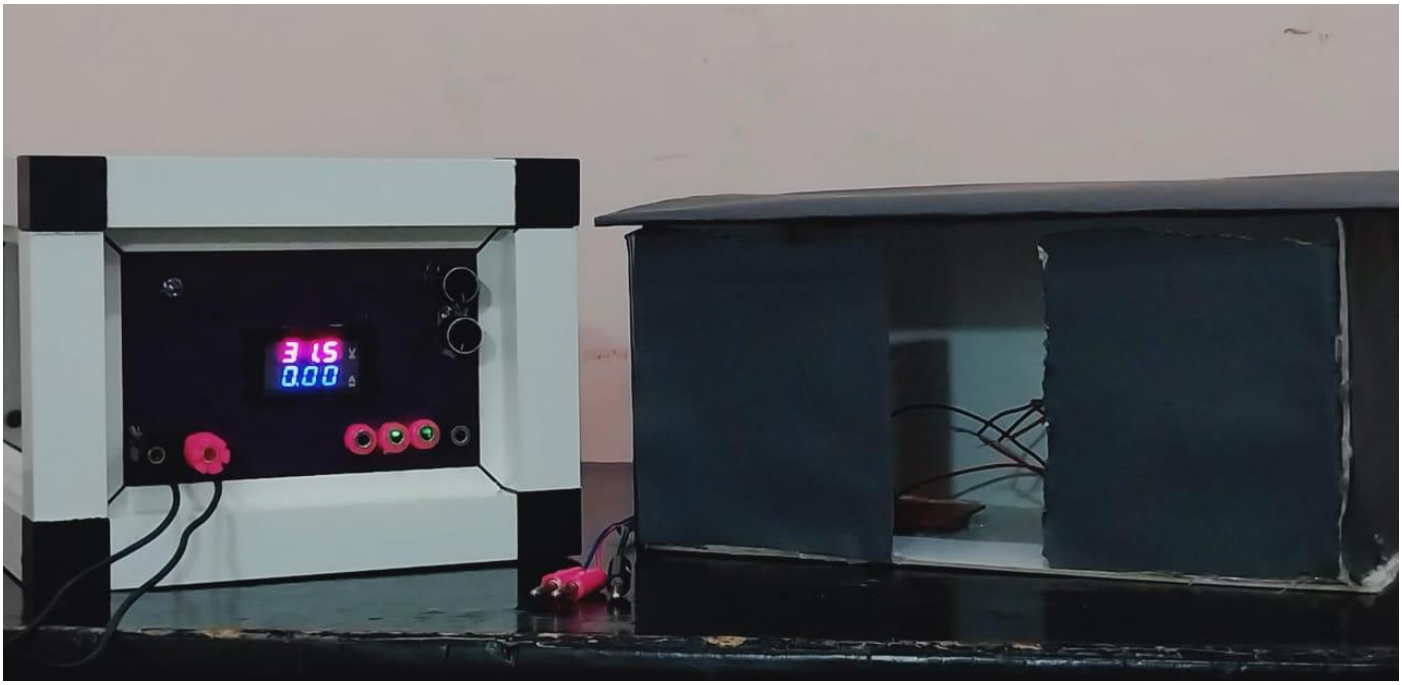
- Component:

1. Sensor of gas MQ5
2. Buzzer 5V
3. Transistor NBN BC547
4. Wires
5. 5V source

- Connection:







The final form

- Conclusion:

  Attached for you is a report on our project, in which we present the basic idea of the project and its main components. We also presented the sub-components of the project. Below we will present to you the division of the team:

Power supply	Variable	خالد جلال فوزى الرامخ	بسملة جلال محمد
		رحمة عبدالواحد ادريس	سهيلة السيد طلعت
	fixed	9V	اية عيد موسى
		12V	دعاء عبدالحميد إبراهيم
		5V	جنى جمال الدين احمد

- Fire detection alarm:

بسملة طه محمد

اميمة فكرى قنديل

دعاء خالد

- gas detection alarm:

ذكى حمدى فتحى – زياد ايمن الريحان – خالد واصف هليل

"والله ولى التوفيق"