

Simple motor



Constructed by
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Abstract:

This documentation will teach you how to make a simple electric motor. You'll be using the electrical energy from a power supply to produce mechanical energy that turns a coil. This is a very simplified version of motors, and many of the other devices that make your life easier. You will use simple tools and equipments to build this motor.

Safety:

You have to concern the safety issue and you have to be careful that nothing harms you while building this motor. Keep everything organized and put away sharp tools when you finish using them. Clean the working place or surface right after each step of building this motor to avoid any kind of distraction.

Material list:

- 1- Plastic tube.
- 2- 2 m Copper wire.
- 3- Pen.
- 4- Ruler.
- 5- Masking tape.
- 6- Two electrical leads with clips on each end.
- 7- Wire strippers
- 8- Soldering pen and soldering wire.
- 9- Knife.
- 10-Pliers
- 11-Block of wood large enough to make the magnet holder.
- 12-Magnet (round shape)
- 13-Small tube enough to make the rotor holder.
- 14- Copper plate (10x20cm)
- 15-2 copper plate (3x10cm)

Work process:

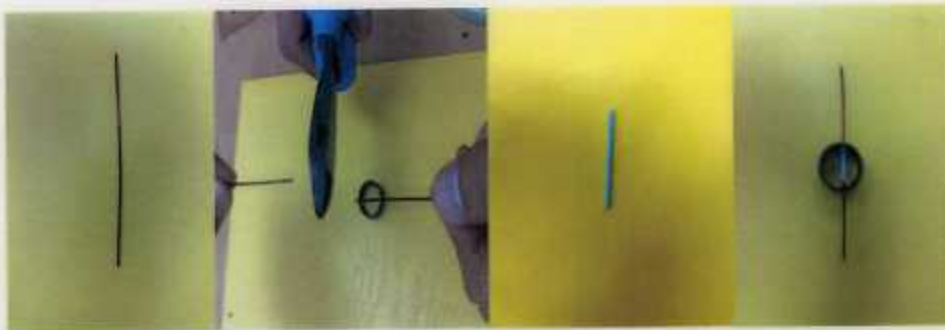
- 1- Take the plastic tube and make two holes from the center, use pen and ruler to mark and measure the center of the tube.



2- Make the holes by using the soldering pen (just a small hole from both sides to let the wire through)



3- Take 10 cm copper wire and cut it in two halves equally. Insert them into the hole from both sides and plug the inside ends into the small tube (this tube holds the wire when they are disconnected, make sure they don't touch each other from the inside end)



4- Take the soldering pen and by the tip of the pen melt the plastic on the wire to make them stay from each side.

5- Make a coil by winding the copper wire 55 times, creating loops that are about 1 inch in diameter.



6- Strip the insulation off the ends of the 2 inches of wire sticking out from each side of the coil. Scrape away only the top direction of the weir in the plastic tube by using knife and attach each end of the coil to each side of the stator by soldering them. This is an important step because it allows the magnetic field to turn off for half of a spin on every turn of the coil. Inertia carries the rotating coil through the half turn past the point, allowing the current to resume in the same direction as it was flowing.



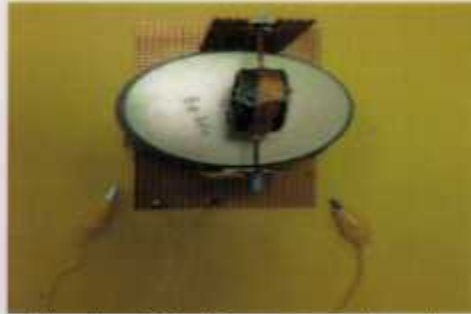
7- Take the large copper plate and solder the two other small plates vertically each on in each side of the plate.



8- At the top center of each small plate make a curve this curve will hold the rotary part.



9- Insert the rotary part in the supporting plate.



10- Take Two electrical leads with clips on each end and solder each one individually. Each one should be connected only to one side of the small supporting plate.



11- Take around magnet and place it under the rotary part .make sure there is enough distance between the rotary and the magnet .



12- Take these tow lead and connect them to the power supply . adjust the power supply to 12v .



Figure 1



Figure 2



Figure 3



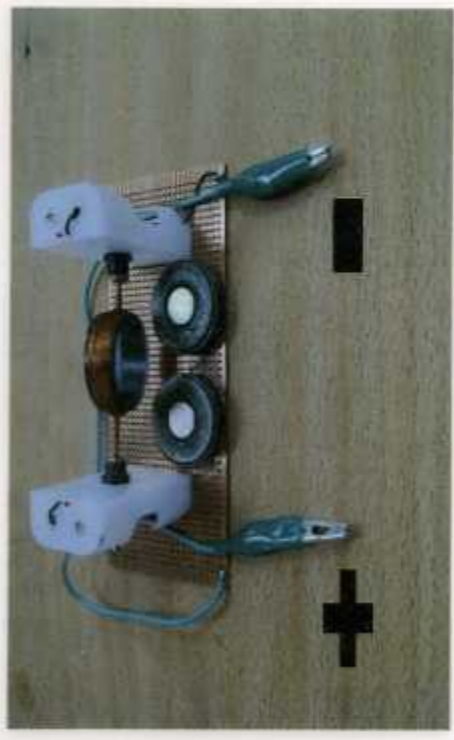
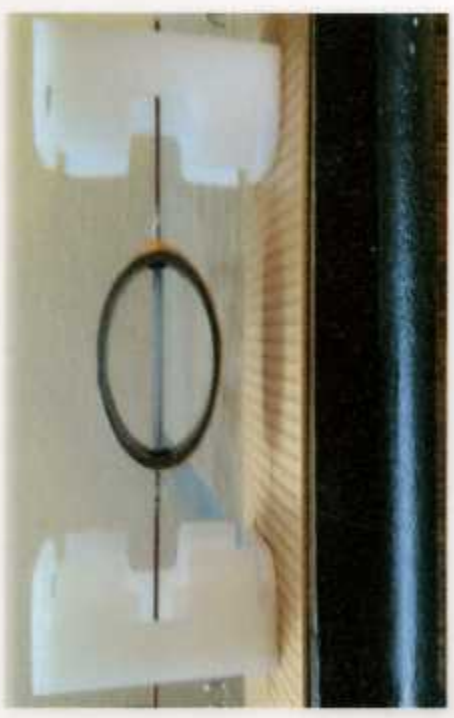
Figure 4



Figure 5



Figure 6



How can you make a small Motor?

طريقة صنع المحرك

Materials

Action

Steps

Design the rotor	<ul style="list-style-type: none"> -knife-cutter - soldering machine -Piece of plastic (circle shape) 	<p>Make two holes in the plastic shape in axis line (make sure in straight line).</p>	<p>تصميم العضو الدوار : تعمل قثنتين في القطعة البلاستيكية وتكون القثنتين بمحور واحد (محور اقي) وتأكد من ان الخططين مستقيمين</p>
Make the axis line	<ul style="list-style-type: none"> -Wire size : 1.25 mm -length:4cm -knife-cutter- soldering machine -Super glue. 	<p>Cut two wires length4cm size1.25mm after that fix one wire in the hole (step1)and fix the another wire to the second hole (make sure the two wires don't touch each other in center)</p>	<p>تقطع سلكين طول 1.25ملم مقاس 4سم وبعد ذلك تثبت السلك الاول في القثنه الاولى (الخطوة الاولى) وتثبت السلك الاخر بالقثنه الثانية (وتأكد من ان السلكين لا تلمس بعض في الوسط)</p>
Windings	<ul style="list-style-type: none"> -Wire size : 0.2mm -Length:100 times -knife-cutter 	<p>Wind the wire 96 to 100 times around the plastic shape .letting the ends of the wire 3 cm.</p>	<p>تلف السلك على القطعة البلاستيكية من 97 مرة الى 100 مرة .وتد مسافة 3 سنتيمتر للنهايات السلك .</p>
Fix the wire to axis line.	<ul style="list-style-type: none"> -Knife - soldering machine 	<p>Remove the insulation of the end of wire. Remove the insulation of the axis line from the one hole for 0.5 cm .soldering the end of wire to the removed insulation area in axis line. Make the same action on the other end of the wire.</p>	<p>تعري نهاية السلك . بعد ذلك تعري سلك المحور المثبت بالقثنه البلاستيكية من جهة القثنه مسافة نصف سنتيمتر . ثم تقوم بتلحيم السلك المعري الى المحور الذي تم تعريته . نفس الخطوة تقوم بها على النهاية الاخرى .</p>
Design the stator	<ul style="list-style-type: none"> Knife – soldering machine –cutter -Two plastic stands5.9cm *3.5cm -small board 6.4cm *14.5cm 	<p>Make a hole in center of two stands in the same line. After that fix two stands to the board.(the stands should be face to face).Also make a connection point from the two holes.</p>	<p>تصميم العضو الثابت : عمل قثنه في منتصف القاعدتين في نفس الخط . بعد ذلك نقوم بتثبيت القاعدتين في اللوحه . (ضع القاعدتين متقابلتين) .ايضا" عمل نقطة توصيل من القثنتين لتوصيل الكهرباء الى المحرك .</p>
Assembling	<ul style="list-style-type: none"> -Soldering machine -two lead wires. 	<p>Insert the rotor inside the two stands. Soldering the two lead wires to the connection points in two holes.</p>	<p>ادخال العضو الدوار داخل القاعدتين . وتقوم بتلحيم سلكين التوصيل في نقاط التوصيل المعموله بقثحات القواعد .</p>
Connection to the power supply.	<ul style="list-style-type: none"> -Power supply 12 VDC. -magnet 	<p>Connect power to the two lead wires in stands. and fix the magnet in a good position to help the rotor to move (under the rotor)</p>	<p>توصيل الكهرباء إلى سلكين التوصيل المثبتة بالقواعد . بعد ذلك وضع المغناطيس في مكان يساعد العضو الدوار على الحركة (اسفل العضو الدوار)</p>
Start –up the motor			