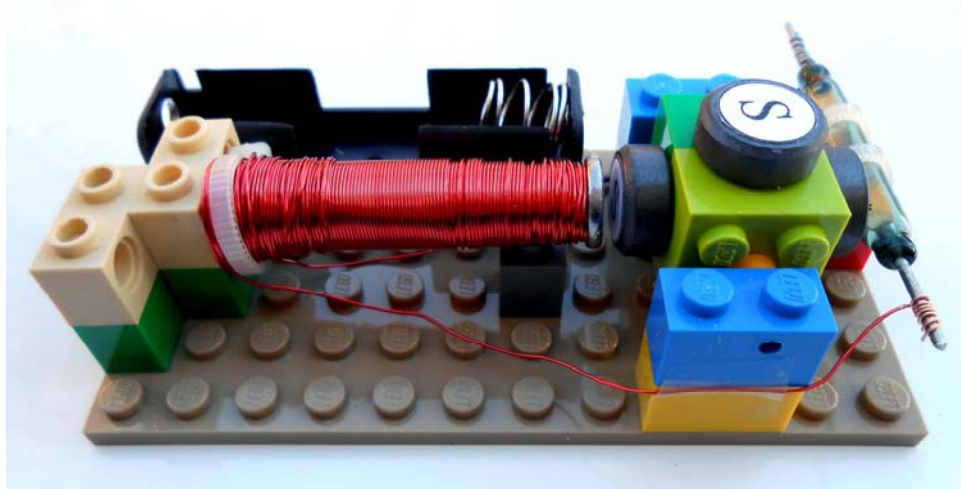
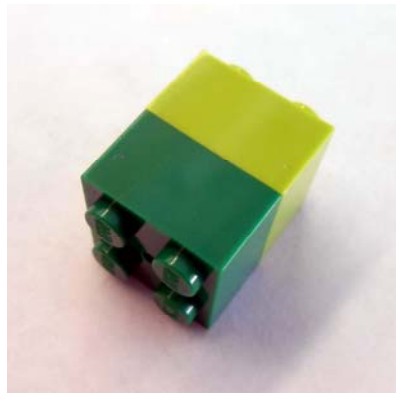


# Assembly Instructions: Kit #11

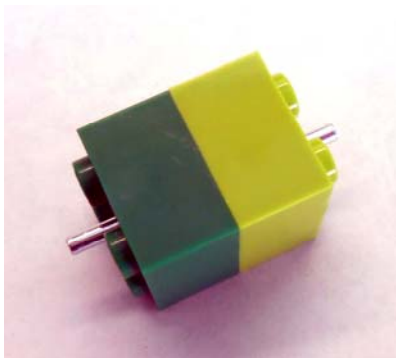
## Basic QuikLock Reed Switch Motor



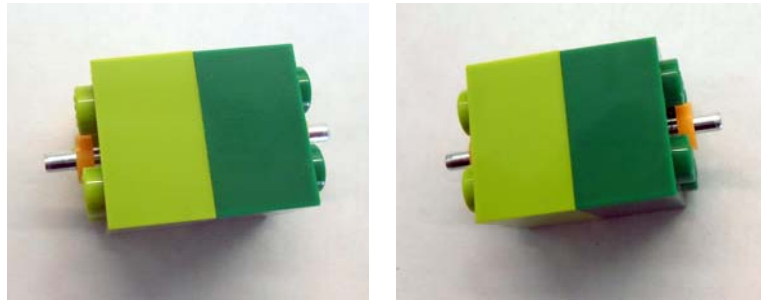
1. Glue together two 2x2 rotor pieces as shown\*. Pay attention to their alignment.



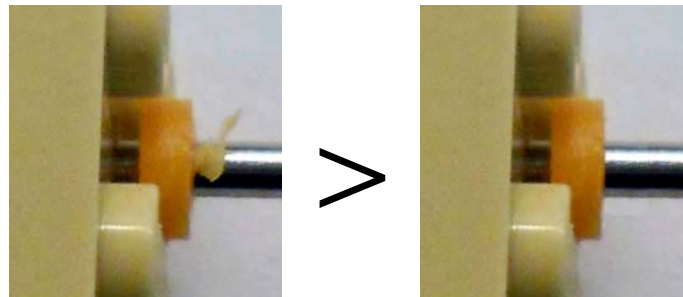
2. Insert the motor shaft through the holes and center it.



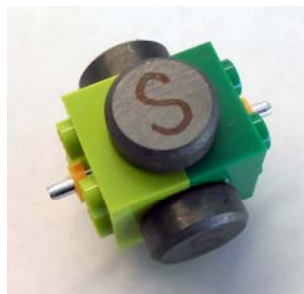
3. Add plastic sleeves (washers) to both ends of the shaft. They fit tightly and require some effort. You may put the sleeve on the table and push the shaft in with the negative end of the battery. Leave a small gap so the sleeves are slightly above the surface of the knobs.



If you notice burrs on the plastic sleeves remove them with a sharp knife.



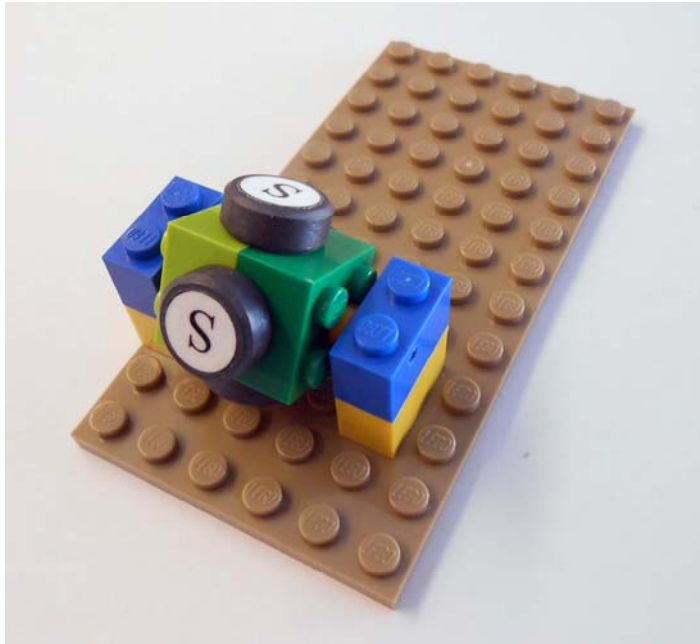
4. Glue magnets to the rotor with the letter 'S' facing outside. If you want to try 2 magnets first, glue them to the opposite sides.



5. If you want your rotor look better you may cut out the white glossy round labels that are provided and paste them to the magnets. It is recommended to use regular white glue or a glue stick on the labels for better results. This step is optional and may be done after you finish your motor.



6. Assemble rotor on the base plate. Try to spin it by hand. If it does not spin freely you might need to squeeze blue bricks slightly together to push plastic shaft sleeves in. There should be a tiny gap between sleeves and inner sides of the bricks with holes.



We strongly recommend lubricating the shaft ends. It allows the motor to run smoother and faster. You may use a drop of oil from your car dipstick, WD-40, or even vegetable oil.

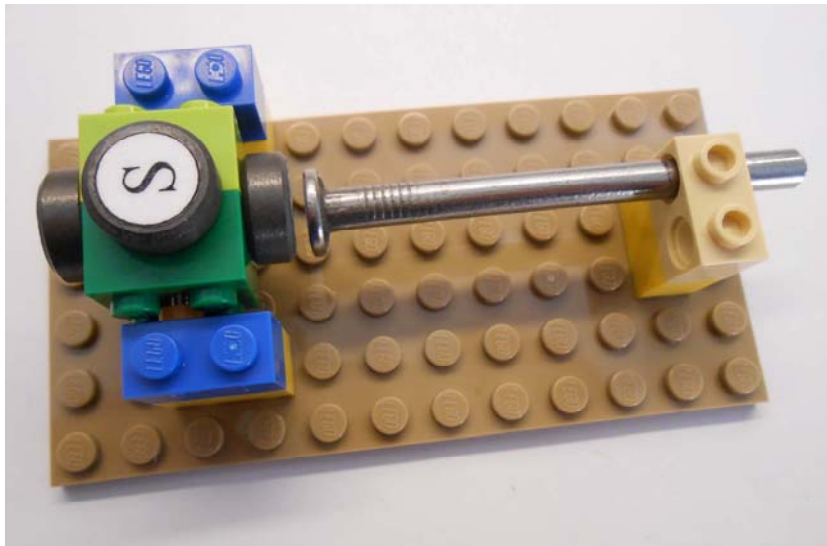
7. Slide the 1x2 brick with two holes on the electromagnet core to the mark as shown.



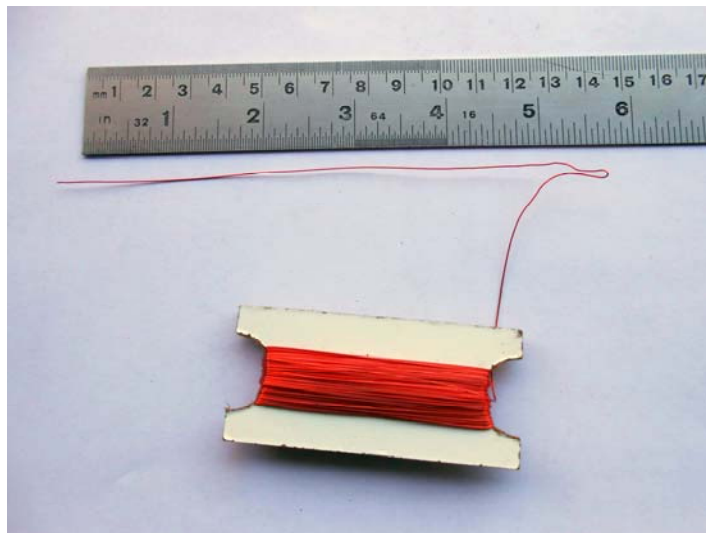
If the brick is loose you may use super glue to prevent it from sliding while making the electromagnet.

The position of the brick is important. It defines the length of the electromagnet. If it is too long it will not fit; if it is too short the motor will be less powerful or will not work at all. Mark on the core should be OK but you may find more precise position by checking it on the board as shown below.

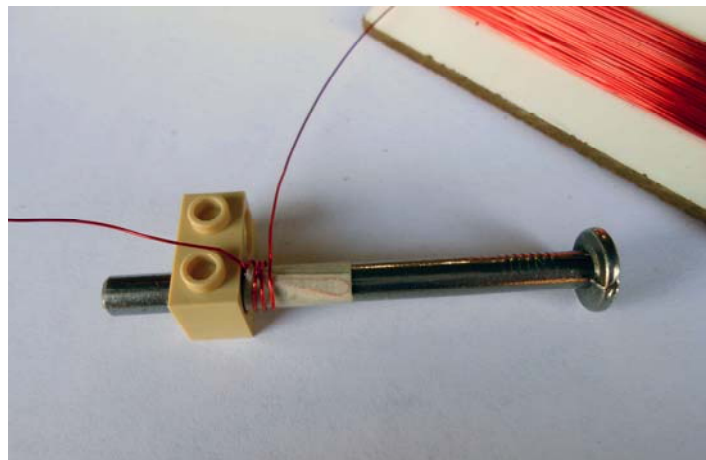
**Spin the rotor and make sure that none of the magnets hits the electromagnet!**



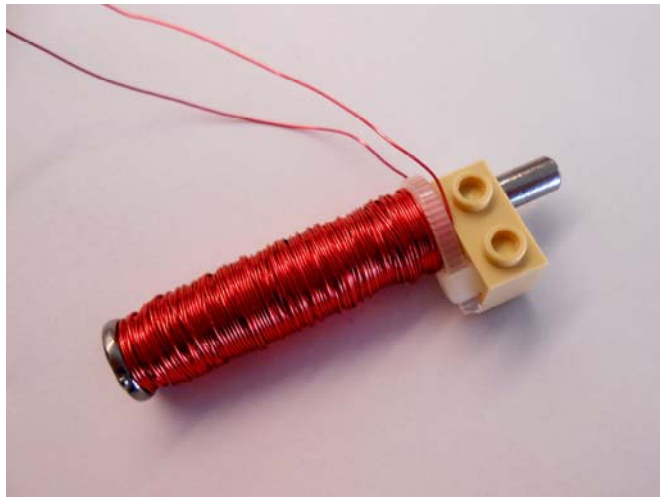
8. Measure at least 5" (13 cm) of the wire and fold it.



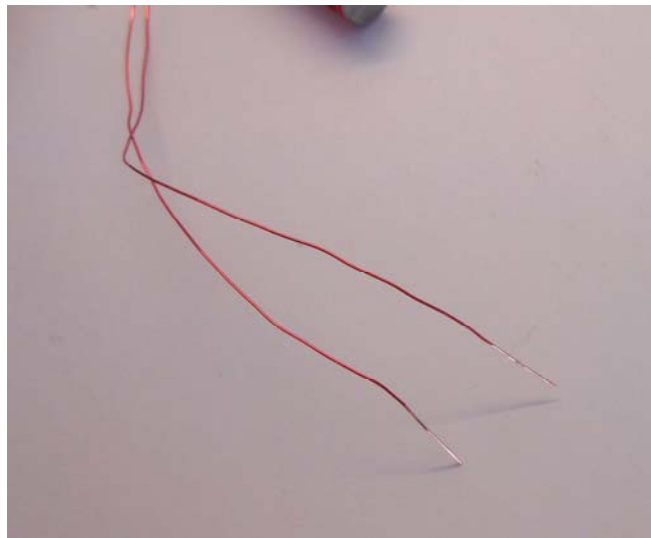
9. Tape the folded end and wind all the wire in one rotational direction (either clockwise or counterclockwise) moving back and forth along the core. All spool wire should be used.



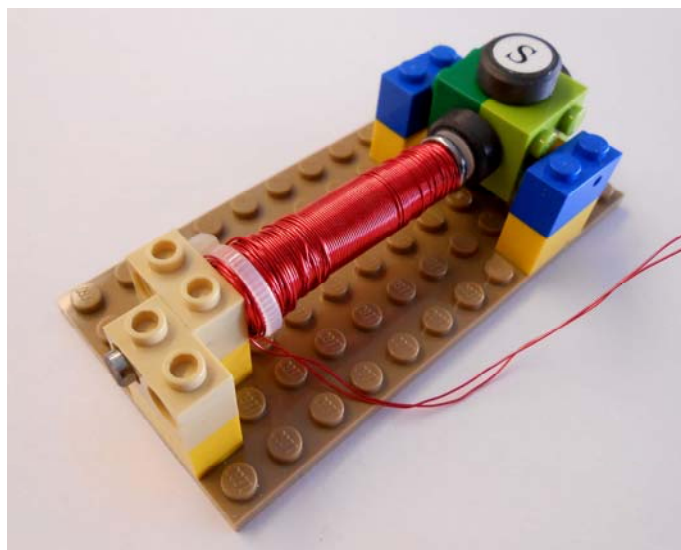
10. When there is about 5" (13 cm) of wire left, secure it with a cable tie.



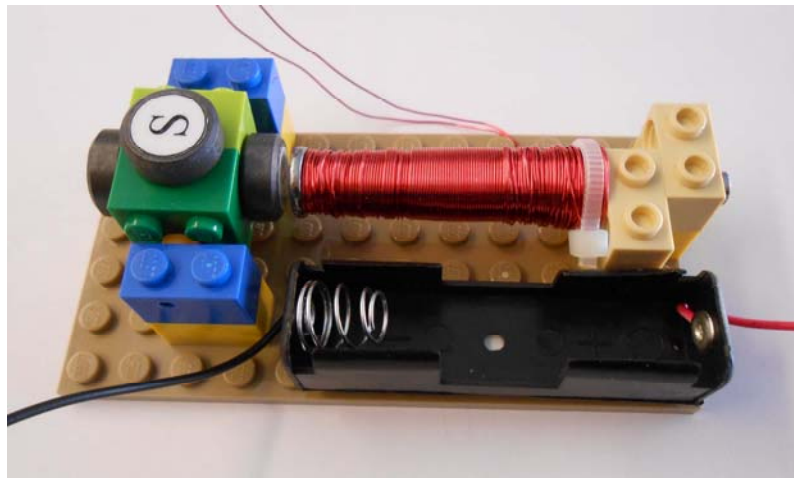
11. Remove the insulation from the wire tips with fine sandpaper (included) or a sharp knife.



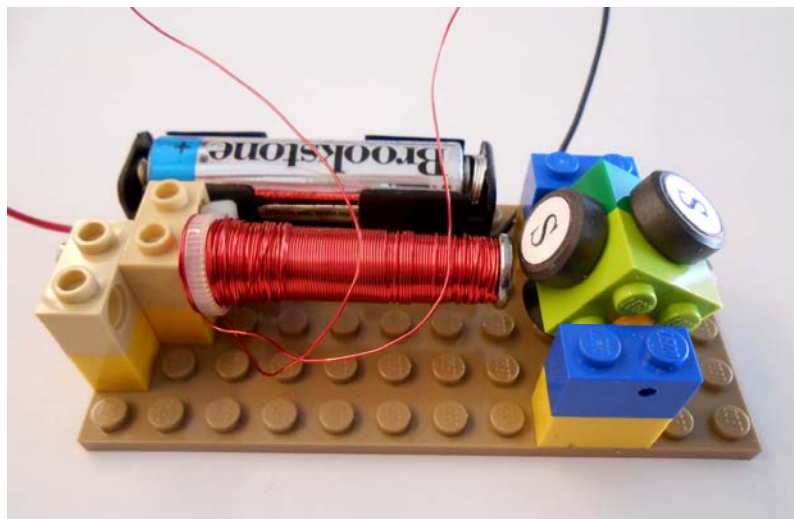
12. Assemble electromagnet on the base plate.



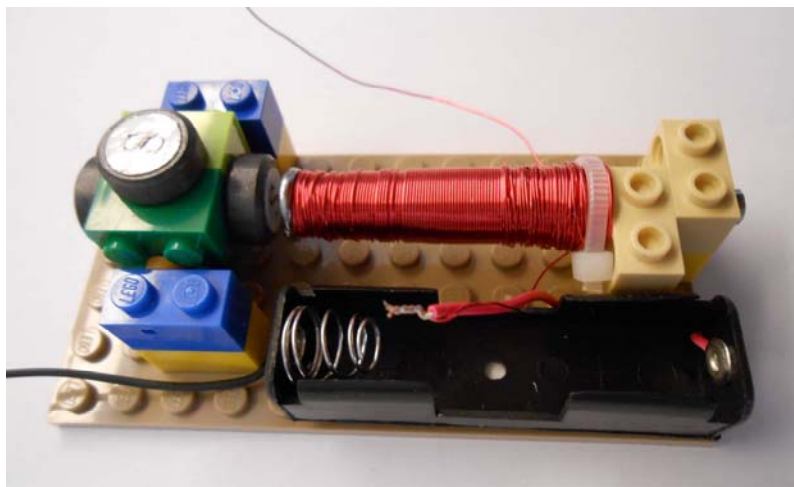
13. Attach the battery holder to the base plate.



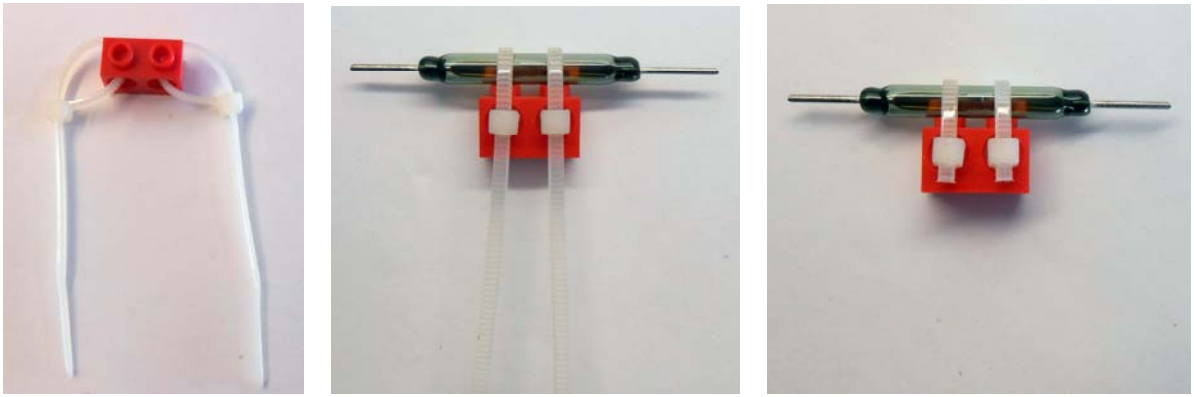
14. Insert the battery and briefly connect electromagnet wires to the battery. If nothing happens switch the wires. With the correct connection electromagnet repels the permanent magnets and the rotor stops in the position shown.



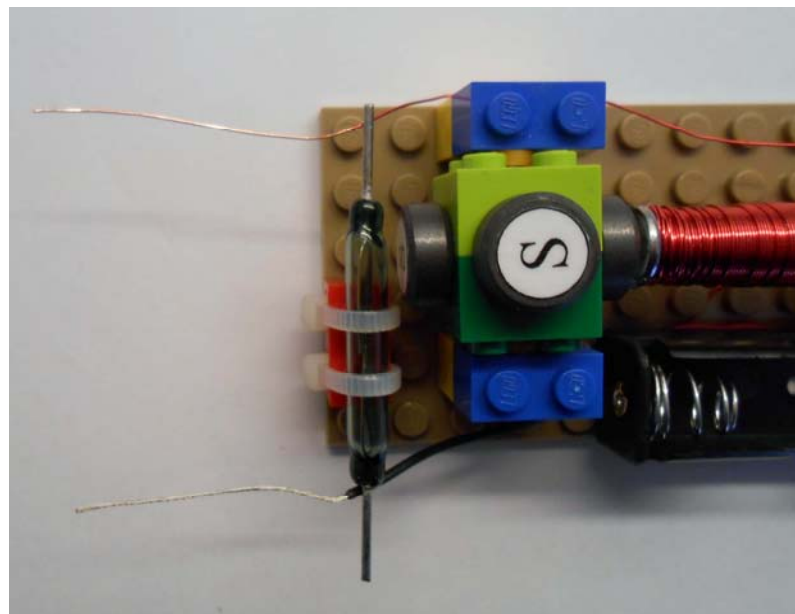
15. After you found the correct connection trim red (positive) wire from the battery holder and corresponding electromagnet wire. Remove the insulation from the wire tips and twist them together. You may tack this connection under the battery holder.



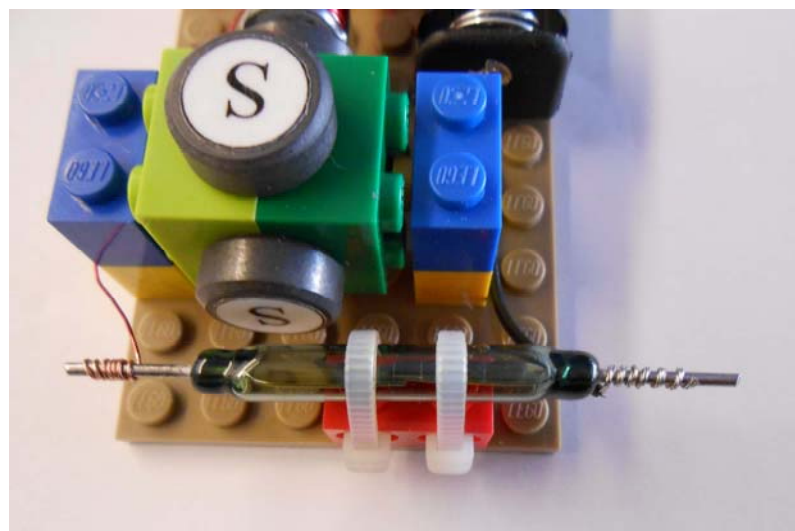
16. Fasten the reed switch to 1x2 brick with side holes using cable ties. Trim them with scissors.



17. Assemble the reed switch on the base plate. Trim the wires as necessary and remove at least 1" (2.5 cm) of insulation.

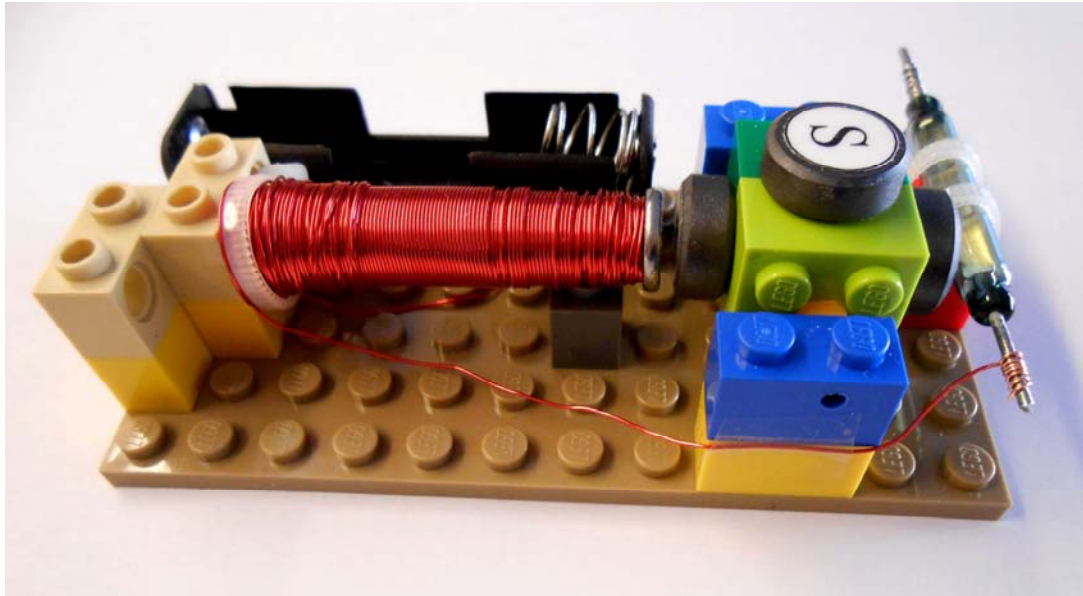


18. Wind bare wire ends tightly around the reed switch contacts.



19. If the head of the electromagnet is lower than the rotor axle you may add small 1x1 brick as shown to have a better alignment. It also provides additional support for the electromagnet.

You may tape the electromagnet wire that is connected to the reed switch to the side of the rotor stand (clear tape is shown).



Spin the rotor by hand. Make sure it does not hit the electromagnet, reed switch or wires. You should hear the click every time the magnet passes the reed switch.

Your motor is ready! If it does not start on its own you may need to give it a slight push. Generally if your battery is fresh it should start rotating without the push if you find the correct position of the electromagnet and the magnets on the rotor sides are centered.

You may glue bricks together and to the plate if you do not plan to disassemble it.

Visit our site at [www.simplemotor.com](http://www.simplemotor.com) for principles of this motor operation, troubleshooting, speed measurement, and other related questions.

Enjoy your motor! We hope you had fun building it.

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\* Colors of the parts may vary.