Faroun Lenz v2 Vertical Axis Wind Turbine

by faroun on July 10, 2008

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intro: Faroun Lenz v2 Vertical Axis Wind Turbine

http://www.vawt.tk

keep in mind that this one is easier to build than my Savonius.

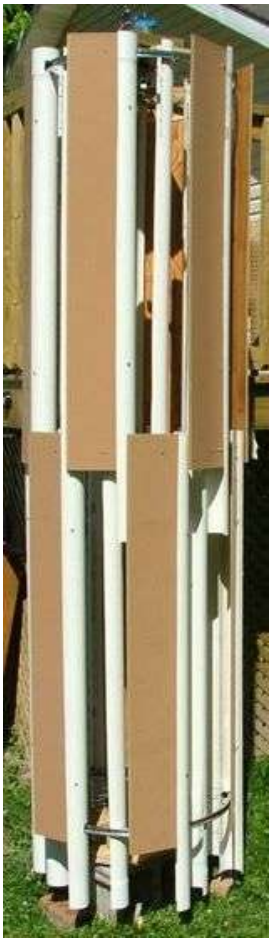
i kept it very basic.

to build the turbine, you need the following material:
-3 bicycle 29" wheels $5.00
-12 lamminate flooring $20.00 (.25"x8"x4'.4") <----only for testing.
-Various sizes of screws $7.00
-3" PVC cut in 2 $50.00 or (cardboard tubing for start) <------only for testing
-wood or metal straping for the inside of rims to keep it from twisting apart. $10.00
- mider saw, band saw,...etc "$$alot of money for the tools$$"

THis Turbine is only to present a diffrent idea on how to build one of these turbines
-I have included 2 movies that shows it in cartboard and pvc tubing.

use proper material for builing it permenently.

science & tech , wind, turbine, generator, science, experiment, renewable, energy, savonius, power, pm, SAVONIUS ROTOR, Vertical Savonius rotors, windmill, Darrieus, vertical axis wind , vawt, hawt, windy, magnets



step 1: the wheel

i got the wheel from garage sale a dollar a wheel.

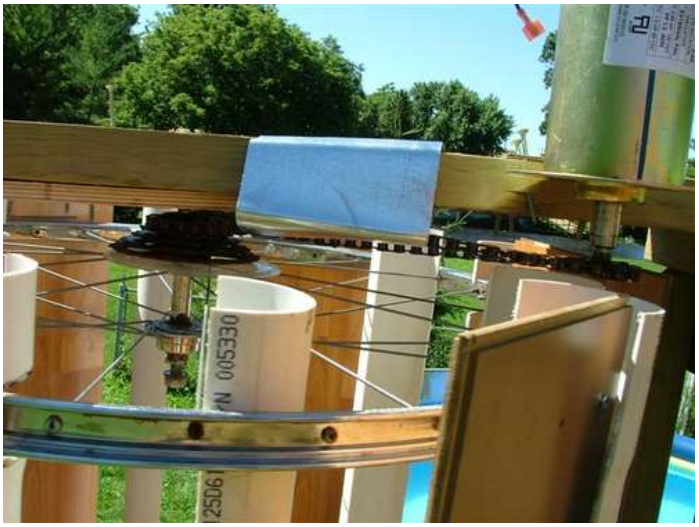
the size is 29" diamater and 1" thick with 36 spoks
the wheel is 5.5lbs.

i am not sure if i am going to use the gear for the generator so lets not make a special placment for that reason.

so all 3 wheel should be the same size and 45.5" in between them.
the top and bottom wheels you need to remove 2 spoks every other 4 spoks
but the middle you need to remove 4spoks and leave 1 and so on.
that is it for the wheels for now, maybe later i need more work on them to brace 3 wheels together.

make sure you grease or oil them for better result.

faroun



step 2: The Wing

the wing is made of 2 parts, the wing surface and the wing leading edge.

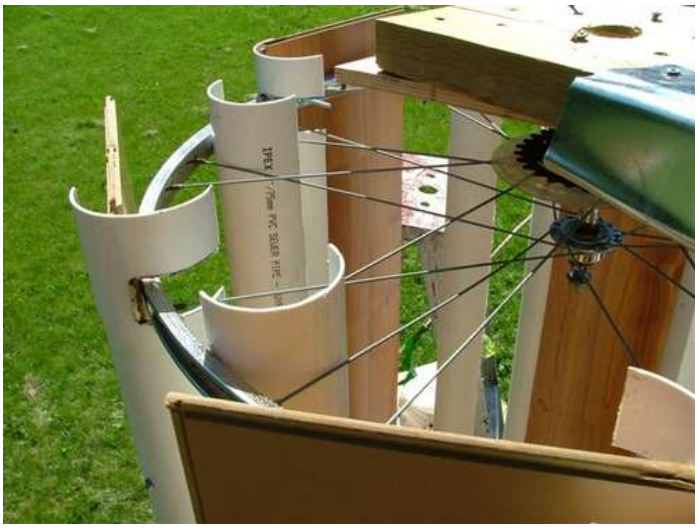
the surface I used
floor lamminate' 4.4" long .25" thick, 8.25" wide and it is 4.5lbs

the leading edge is PVC tubing
3" PVC cut in 2 and 5' long 2.1lbs

i started by screwing the lamminat to the wheel first.

when the screwing was done, i then placed the pvc as the leading edge, i notched the pvc to fit through the wheel rim.
at this point i have screwed the PVC in place using few screws only, for further testing. i did try diffrent layout but the best so far is the 2/3 leading edge on the inside and a 1/3 to the outside of the lamminate board.

regards
faroun



step 3: the inner PVC

this step simply came with the testing i did.
I relized that if i placed more Half cut PVC i Get More push but the need to be placed 60 degree the the wing surface and not parallel or 90degree.

at this point my plan is to figure out the best layout before permamnetaly fastin all parts.

next step will be the gen part, it may take me some time.

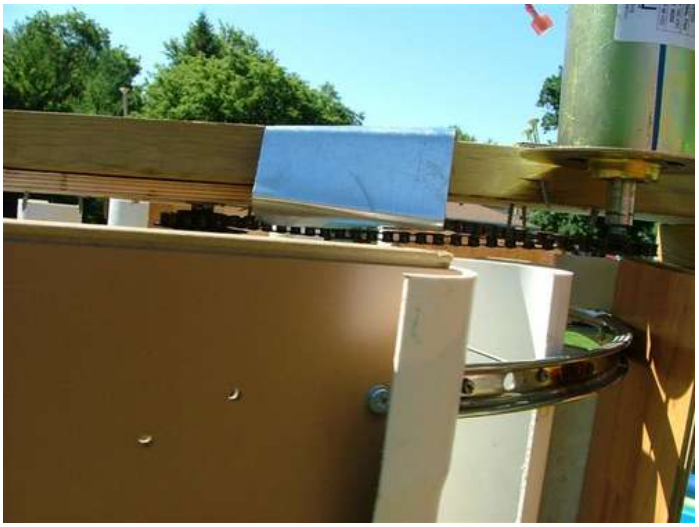
Note: this sucker spins like crazy with so little wind.

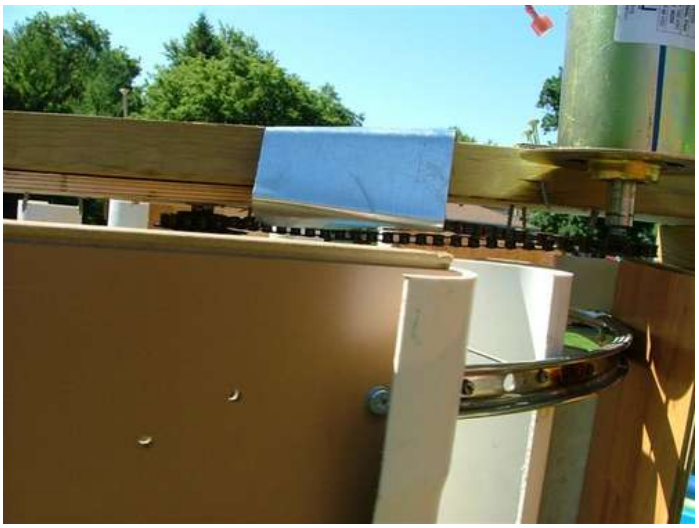
in total it weigh 125pound.

please review the movie and see how it preforms

regards

Faroun





step 4: The Generator #1

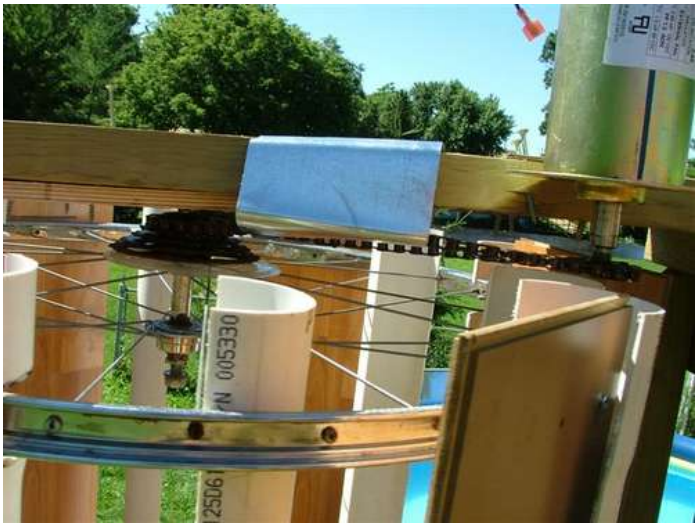
in this little step I simply macguyvered the bicycle sprockets to fit on a pm generator(crapy one) anyway it is there to show the idea, connected the 2 with a common chain and you can tell from the pics that I made a small latter for the chain not to come off....lol...

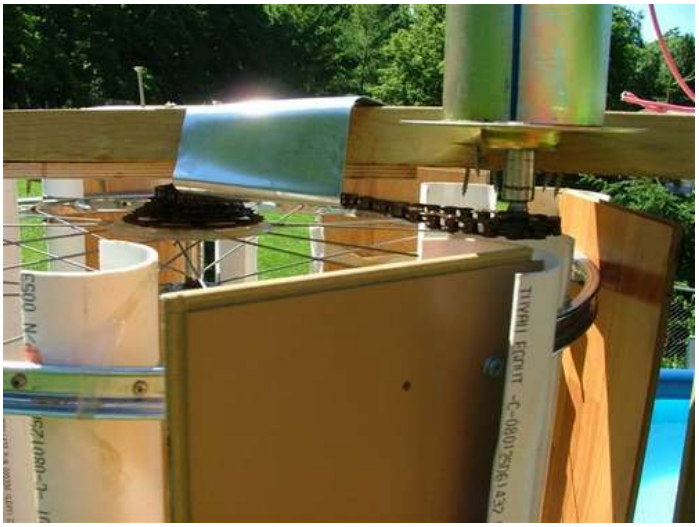
I think the idea is there, there are many way to improve on it.

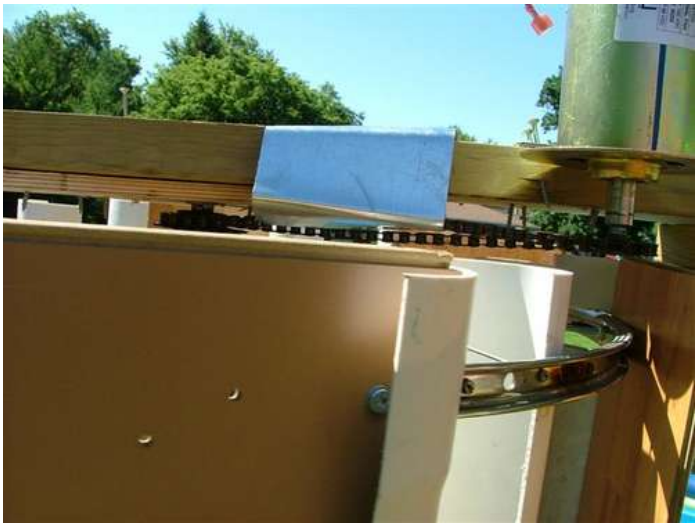
next step I am hoping to build an custom Pm generator
axial flux style

regards

Faroun







step 5: Turbine wings added

this step is to show you how easy it is to add extra blade area, i know the more wieght the more stress on the barring, will deal with it later.

soon i will be mounting the ametek 38 vdc on it, no specific way yet but i want it simple, i have few ideas.

step 6: Generator #2

hi guys,
all i have here is my old custom 3 phase gen that i used on my previous Savonius vertical axis.

i simply placed leds on each pahse sepretaly, as you will see in the movie how the phases flow, also you will notic that one of them is off by a bit or producing a bit less voltage, it could be due to the layout of the coils.

i live in a vally with hardly any wind, i am doing this for the fun of it, most likely i will end up with solar.

anyway enjoy the movie.

my next Generator will be geaared up Ametek 38.

later

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Comments

10 comments **Add Comment**

bhunter736 says: Sep 22, 2008. 2:21 PM **REPLY**

I like what you have done! :) You are getting a meaningful amount of power from very little air movement too. That is very significant. I like the view of the yard too, it makes the VAWT look as much like an aesthetic addition as a resource.

faroun says: Sep 22, 2008. 7:54 PM **REPLY**

thanks man, i have been building them like crazy, few i have not posted because the output is not so great, I reliZed that the blades away from centre Vawt need geaaring or custom build alternator that is why i am testing with the narrow and tall the blade area is greater and the rpm add the inertia factor to the mix.

i hope you are doing good. why dont you start some other VAWT?

regards

faroun

watkinsbl says: Aug 10, 2008. 9:51 PM **REPLY**

This is great! Congrats! Several questions.
How did you figure out the the number of wings, their length, and the size of the leading edge?
How did you make the base - secure the bottom wheel?
Have you ended up generating power from this? How did you hook it up and to what?
Thanks
Brad

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faroun says: Aug 11, 2008. 3:51 PM **REPLY**

the number of wings and sizes was trial and error basses, i used 3 wings, 4, 5 but the best config was 6 baldes for that diameter 24.5" at the beginig i used sheet metal but it was to flex and did not work for me so the material has to be firm and not to flex, you can use 1/8" steel but it will be to havy for the barrings, the aluminum is a better choice but more money. remember that the wing size was trial and error to come up with the size and wieght is key.
-the leading edge is the most critical, if you notice at first i used cartboard tubes and they where from 1.5" to 6" and the best size was 3" and the layout is key, i had the best result when the leading adge was 1/3 on one side and 2/3 on the other.

i tried bigger diameter but i needed more robust frame to hold it and that caused drag and the size was not excceptable and i wanted it to go up and not wide.
i simply bolted the bottom wheel axil to a firm surface (i later changed the bottom to ply wood screwed to the wheel rim.
i did and do get power from it, as low as 5mph, at that speed i may get 25watt, i know it sounds low but look at what i am working with, i am hoping for 250watt at 25mph. i used my custom generator, soon i will be mounting a 38 volts Ametek on it.

i hope i am making sense.

please share and learn but alwyas give credit where is due..

regards

faroun

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watkinsbl says: Aug 11, 2008. 10:30 PM **REPLY**

wow! 25watts @ only 5mph, that seems way above what others have reported, especially given its ground level location. You did 6 wings on the top and 6 on the bottom, right? How did you cut the PVC pipe in half lengthwise (that seems like a major feat to me). Why an Ametek; they seem pricey? Thanks for both of your inspiring Instructables!
Brad

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faroun says: Aug 12, 2008. 4:59 PM **REPLY**

here is my latest movie, dont laugh at my beer belly...lol

http://www.instructables.com/files/orig/FBD/XG4Z/FJHG7LYG/FBDXG4ZFJHG7LYG.mov

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faroun says: Aug 12, 2008. 4:53 PM **REPLY**

i have 6wings+6wings+6wings stacked, not 2 times.
i used bandsaw to cyt them. accually Ametek seems to be the value for the buck and it will be best balance for my turbine power VS blade area.

i konw that my instructables are not the best written but i am doing my best.

regards

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mred2 says: Mar 29, 2009. 5:39 PM **REPLY**

"i konw that my instructables are not the best written but i am doing my best."

are you kidding me! You have tons of pictures and closeups of things and they are not blurry!

I see alot of things that should have more angles of shots of a project, but they don't....so keep up the good work!

Although I am curious of the brand of pm generator, and did you buy it, or scrap it out of something? If so, what'd you rip it out of or cost if purchased?

The 3 phase motor. What does it look like? How did you make it custom and same question for this motor as above.

Thanks and keep us updated.

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faroun says: Mar 30, 2009. 8:53 AM **REPLY**

thanks very much for the encouragement.
I pulled the pm I am using from a treadmill machine, I went to a junk yard close by and voila, I got it for 10 dollars and he though he got a great deal.

Go to my site at vawt.tk and click on the download link, in there you will find a load of how to custom pm generators

Regards

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sam dekok says:
Nice VAWT.

http://www.instructables.com/id/Build-your-own-Savonius-VAWT-Vertical-Axis-Wind-T/

Jul 20, 2008. 6:17 AM **REPLY**