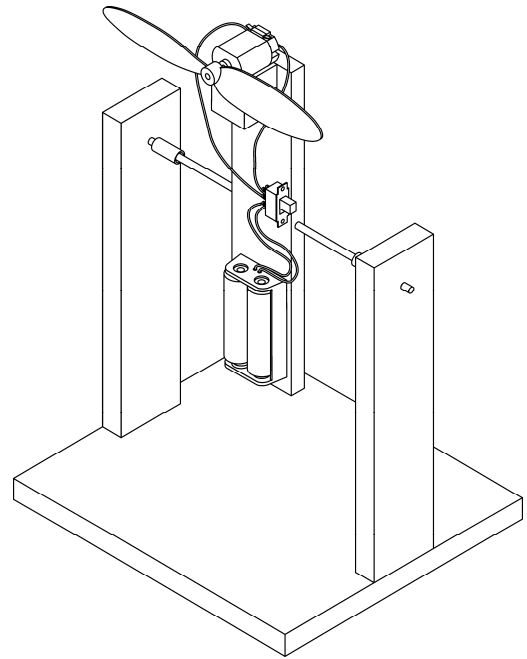


FERRIS WHEEL

DESCRIPTION

This model represents a *FERRIS WHEEL* in its most simple form, consisting of a single rotating beam. This beam has an electric motor with a propeller, mounted at one end. A battery holder is on the other end of the beam and counter-balances them. The beam is mounted on an “axle” (shaft) at the beams’ centre of gravity.

When the *FERRIS WHEEL* is switched on, the motor spins the propeller, thus rotating the beam around its axle.



THE PROJECT

The major aspects of this project are the planning, design, construction and assembly stages of the device.

1. COMPONENTS REQUIRED

1.1 COMPONENTS SUPPLIED

The following components are supplied in a plastic bag :

- | | |
|-------------------------------|---------------------------------------|
| 1x Electric Motor 3.0V (flat) | 1x Propeller 151 mm long |
| 1x Sliding switch (small) | 1x Steel shaft 2.5mm dia x 200mm long |
| 1x 2x AA Battery holder | 1x20 mm Rubber tubing (orange) |

Note: it is suggested that, before you commence construction, you check the components in your kit.

1.2 ADDITIONAL REQUIREMENTS

- 1.2.1 Available from us are AA batteries, and need to be ordered separately.
- 1.2.2 The additional requirements are: Material for the stand and beam, and fine electric wire.

2. DESIGN

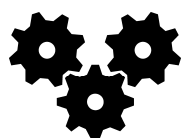
2.1 GENERAL

The drawing in this unit shows the basic construction of the *FERRIS WHEEL*.

NOTE: the designer should look at the design of the *FERRIS WHEEL* as a complete unit – not just a collection of components.

2.2 THE ROTATING BEAM

- The rotating beam can be made from wood, balsa or plastic.
- The weight of the beam will affect the acceleration.
- The beam needs to be large enough not to flex.
- The width of the beam needs to be sufficient for all components to be securely mounted.
- The beam should be assembled and balanced before making the stand’s side supports.



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2.3 OTHER POINTS TO CONSIDER:

- The supports need to be long enough and far enough apart to allow the beam to rotate, and the propeller to spin, without hitting anything.
- The base and two side supports can be made from any kind of (scrap) timber.
- The base should be large enough so that the *FERRIS WHEEL* doesn't fall over when the beam rotates.
- The beam is located centrally, along the axle, by the use of two tubes.
- An on/off switch is located on the beam (in the middle for ease of operation).

3 ASSEMBLY OF THE COMPONENTS TO THE BEAM

- Press the propeller on to the motor's shaft.

Hint: Place the gear on the bench, insert the motor shaft into the pulley's hole and gently tap the end of the shaft (where it exits the motor) with a small hammer.

WARNING: Don't just push the motor down as this can push the motor armature out of its bearings and jam the motor.

- Attach the motor/propeller, the switch and the battery holder to the beam using hot glue or double sided foam tape. Note: to aid adhesion, roughen the surfaces to be glued with sandpaper.
- Determine the assembled beam's equilibrium point (centre of balance). The centre of balance is not at the geometric centre, because of the different weights at each end. This needs to be carried out with the batteries fitted.
- The simplest way to determine the centre of balance is by balancing the fully assembled beam on a "knife edge", rule or something similar.
- Drill a 3.0 mm diameter hole through the beam at this equilibrium point.
- If after drilling the hole the beam does not balance, place some blue tack or plasticene on the light end until it balances.

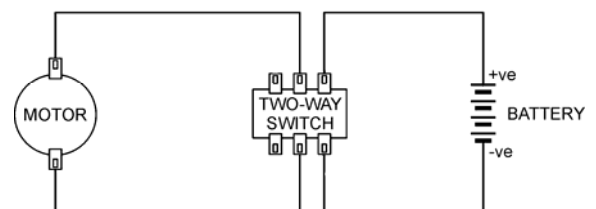
4. ASSEMBLING THE *FERRIS WHEEL*

- The two sides of the stand can be made from any timber – dowelling or square. If dowelling is used, appropriate holes may be drilled in the base. 3 mm diameter holes are drilled in the side supports for the pivot shaft.
- Assemble the rotating beam, stand and pivot shaft.
- The rubber tube is cut to size and installed on the axle, on each side of the beam.

5. WIRING

The Switch should be wired as shown in the "Wiring Schematic"

- Solder both the battery holder's wires to both of the terminals at one end of the switch. Solder two wires to the switch's middle terminals.
- Connect the other ends of those two wires to the motor's terminals. If the propeller turns in the correct direction, solder the wires to the terminals. If the propeller spins in the wrong direction, swap the wires & then solder them.



WIRING SCHEMATIC

CONGRATULATIONS! YOU HAVE BUILT YOUR OWN *FERRIS WHEEL*!