

## 1. Presentation

The Falkirk Wheel is a rotating boat lift located in Scotland, UK, connecting the Forth and Clyde Canal with the Union Canal, opened in 2002. It is named after the nearby town of Falkirk which is in central Scotland. The two canals were previously connected by a series of 11 locks, but by the 1930s these had fallen into disuse, were filled in and the land built upon. The two sides are completely balanced due to Archimedes Principle, therefore it only takes 1.5 kWh to turn the wheel.



## Falkirk Wheel: Eliminating locks

Once connected by a flight of 11 locks that stepped down a distance of a mile (1.5 km), the Falkirk Wheel, using Archimedes principle of mass displacement, now connects the Forth and Clyde Canal which lays 115 ft. (35 m) below the Union Canal. The world's only rotating boat lift is a big attraction for many people sailing the British canals.

### Connecting two canals

Scotland  
UK  
London

Forth & Clyde Canal  
Union Canal

Gondolas connected to rotating wheels

To Union Canal

78 ft. lift (24 m)

To Forth & Clyde Canal

Boat

Visitor center

• Wheel shape Celtic-inspired, double-headed axe

• Wheel diameter 35 m (110 ft.)

• Opened May 24, 2002

• Cost \$167 million

### Archimedes principle of mass displacement

- The mass of a boat sailing into a Falkirk Wheel gondola will displace an exactly proportional volume of water so that the final combination of boat plus water balances the original total mass
- Boats remain level because gondolas remain horizontal thanks to small wheels connected to the inner edge of the large rotating wheels

Boats enter gondola

Wheel rotates

Boats exit

© 2008 MCT  
Source: www.thefalkirkwheel.co.uk  
Graphic: Morten Lyhne

## 2. Falkirk Wheel in video



[Falkirk Wheel](#)

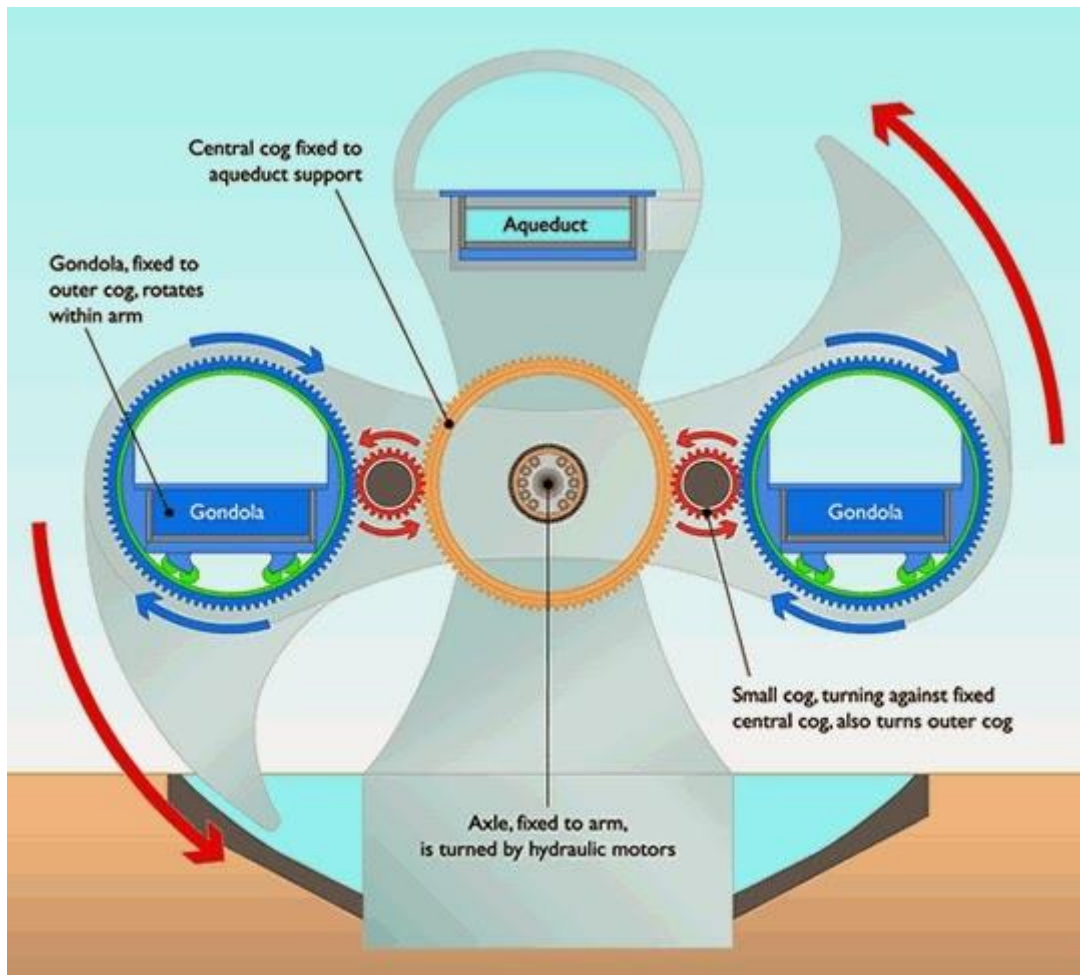


[Timelapse of the wheel rotation](#)



[Timelapse from inside a boat](#)

## 3. The wheel



## 4. Question

Present the Falkirk Wheel and explain how it works.