

Australian inventions for sustainable farming



What is the name of the invention or new knowledge ?

**The Alston Gearless Windmill –
a windmill that didn't need to be looked after so much**



What did it look like ?

There is a drawing of it in an advertisement at the Museum Victoria website <http://museumvictoria.com.au/collections/items/1500514/advertisement-james-alston-sons-pty-ltd-new-invention-alston-s-gearless-windmills-1917>

When was it known ?

1917

(date of advertisement for its sale to the public)

Who was the scientist?

James Alston
engineer

agricultural implement maker and blacksmith at Warrnambool, manufacturer of windmills from 1886

For more details about Alston's life and work, see Australian Dictionary of Biography website, for the James Alston page by George Parsons at www.adb.anu.edu.au/biography/alston-james-5008



What need was there for this?

Windmills with working parts were open to the weather. They needed frequent attention to stop them from rusting and seizing. That meant regular checks and oilings. Farmers, and graziers, had to spend lots of time going out to visit isolated windmills to make sure they were still working and their stock had water.

Soldiers were returning from WWI and Soldier Settlement Land was being opened for farming further inland than before. Water resources were scarcer here on the surface and windmills were needed for underground water for feeding stock. So windmills were in demand at this time.



What was the discovery that led to this invention?

How to enclose the gear case so that the weather didn't get in and the oil didn't get out.



How does it work ?

Note first, that Alston had been making windmills for 35 years when he came up with his gearless modification. His windmill designs already had:

- a simple governing device to stop racing in high winds
- a sensitive ball-bearing turntable to start with the slightest wind

The gearless invention was to stop the three moving parts from rubbing against themselves, and thus reduce wear and noise. To do this he:

- put them in a sealed case
- and surrounded them with an oil bath
- and made from steel ball-bearings

There are diagrams and named parts of this Gearless Windmill Head at <http://www.geocities.ws/ozwindmills/gearless.html>

There is a colour photo close-up of the 8 ft gearless windmill head and a full description of how it works by the Morowa District Historical Society, from Western Australia, a

www.members.westnet.com.au/caladenia/AlstonGL.html




What shows its importance as an Australian discovery/invention ?

Alston dominated the windmill market– he made 50,000 windmills. Windmills spread across Australia in the 1900-1920s.

Business set up on it	Alston was already a big manufacturer of windmills in Australia. The gearless one kept his business at the forefront.
Where used on farm	in paddocks for water for stock at a dam or trough, or for water to the home
Changes it made to farming	by the 1930s the maintenance workload for windmills had been reduced to infrequent checking for oiling – about once a year, from monthly.
contribution to sustainability	farmers could rely on their stock having water without having to spend so much time and money checking the windmill was working - ie made the farming enterprise more efficient
How quickly it was adopted for use	Windmills spread with the development of Soldier Settlements into drier lands.
The places it spread to	across Australia
Changes made to it for today	



Still being used today	windmills were used under the channel system of bringing water to farm dams in the Wimmera to pump the water from the dam to where it was needed.
How we use it today in the Wimmera	In the last 5 years, the Wimmera- Mallee pipeline has replaced the channel system and farm dams and farmers do not need to use windmills now for home and farm use.
Led to new knowledge or invention	There were other windmill makers, eg Southern Cross, in Australia in this era, each providing their own design.  Windmill at Wimmera Mallee Pioneer Museum, Jeparit, photos © J. Clark 2013

*Australian Windmill manufacturers A-B, at Morova District Historical Society and Museum website at www.members.westnet.com.au/caladenia/ManuA~B.html
Walsh, Gerald *Pioneering days- People and innovations in Australia's Rural Past* 1993 St Leonards: Allen and Unwin, p. 177*



Shape Sleuths Link – An exercise for the 2013 Maths of Planet Earth

1 Draw the simple shapes that make up :

- *The windmill as shown in Alston's 1917 advertisement*
- *Windmill head from the diagram of it*
- *Windmill shapes from the Southern Cross windmill photo above*

2 Name the shapes that are found in your drawings above.

3 Can you see any difference in the shapes of the Alston and the Southern Cross windmills? If so, name them.

4 If you have a chance to see a windmill in reality,

- *makes some measurements of its dimensions and find out how much water it draws up per day and convert that to a rate of litres per hour.*

For further information :

In Museum

Clark, Jeanie, photo of Southern Cross Windmill at the Wimmera Mallee Pioneer Museum, Jeparit, 2013.



Books

Walsh, Gerald *Pioneering days- People and innovations in Australia's Rural Past* 1993 St Leonards: Allen and Unwin, pp. 172-177

Websites

Advertisement James Alston and Sons at Museum Victoria website

<http://museumvictoria.com.au/collections/items/1500514/advertisement-james-alston-sons-pty-ltd-new-invention-alston-s-gearless-windmills-1917>

Alston gearless windmill 8ft at Morowa District Historical Society WA website at

www.members.westnet.com.au/caladenia/AlstonGL.html

Australian Windmill manufacturers A-B, at Morowa District Historical Society and Museum website at

www.members.westnet.com.au/caladenia/ManuA~B.html

James Alston and Sons at Alston windmills website at

<http://www.geocities.ws/ozwindmills/gearless.html>

Parsons, George, James Alston at Australian Dictionary of Biography website

www.adb.anu.edu.au/biography/alston-james-5008



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