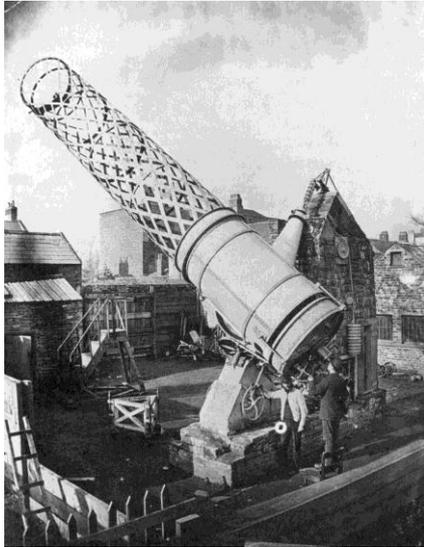


The Great Melbourne Telescope Project

A Joint Venture by Museum Victoria, The Royal Botanic Gardens and the Astronomical Society of Victoria

3. The Great Melbourne Telescope's Mechanical Innovations Part -2

The GMT designed and built by Thomas and Howard Grubb of Dublin incorporated many technical innovations. One of these was the friction reduction system for the bearings.

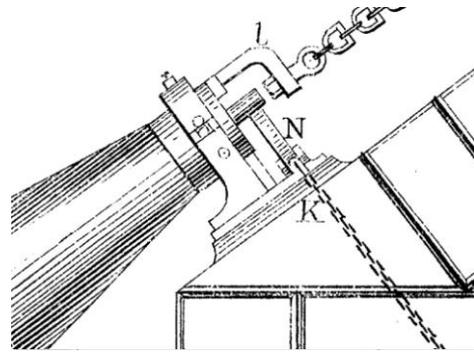


The GMT being tested at the Grubb works in Dublin Ireland.

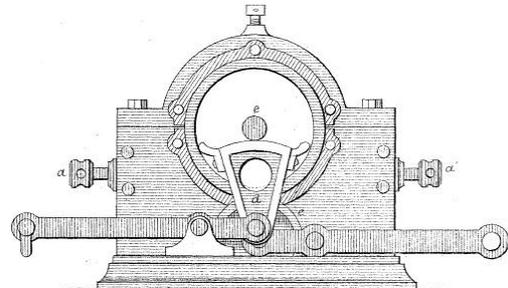
Friction Reduction

Telescopes have to be aimed at various areas of the sky. Once the object of interest has been centred in the field of view the telescope has to be moved slowly to compensate for Earth's rotation. Large 19th century reflecting telescopes such as Rosse's 72-inch aperture "Leviathan" and the 48-inch aperture instruments of William Herschel and Lassell required labourers working hard to move the telescopes with blocks and tackle, windlasses, levers and geared handwheels. This is because there were no ball bearings at the time, just plain bearings, and the great mass of these large instruments loaded the bearings sufficiently to require a mechanical advantage in order for muscular force to be multiplied enough to overcome the friction. For the GMT, Grubb made an art form of the friction reduction mechanisms fitted to both axes. In comparison with its large reflector predecessors, the GMT's equatorial mounting was a spectacular success in terms of its full sky access, ease of manoeuvring and accuracy of tracking.

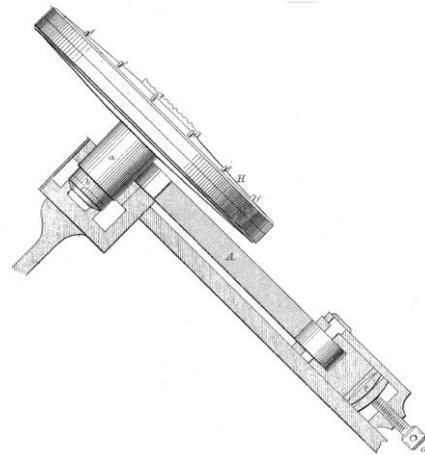
The GMT has three specific friction reduced bearings on the polar axis; The upper pivot of the polar axis, the lower pivot of the polar axis and end pressure of the lower pivot of the polar axis.



Located at the upper pivot of the polar axis are bearing relief mechanisms controlled by counterweights suspended over the side and the front of the south pier.



The upper pivot bearing showing the relief mechanism. The central bar is lifted by the cantilevers pulled by suspended weights.



The lower pivot bearing showing the bearing relief mechanism. The adjusting screw at the bottom right lifts the axis off the bearing surface.

The Great Melbourne Telescope Project Information Fact Sheet

This fact sheet is one of a series providing information on the GMT historical background, technical details of the instrument and the efforts to reconstruct this magnificent telescope for use by the public.