

## Watts on - May 2020 - Master Clocks by Scientific Clocks Sydney

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**Australia** had many prominent makers of electromechanical master clocks from the early 20<sup>th</sup> century through to the 1960's when they were superseded by synchronous and eventually quartz clocks. In Brisbane 1903 the Jackson family purchased the rights to Synchronome name and patents from Frank Hope-Jones of London.

Master clocks were used in railways, factories and public buildings, connected to slave clocks exhibiting the same time throughout the premises. Alexander Bain a Scottish inventor patented the first one in 1842.

In addition to Jacksons were Prouds, Acelec and Scientific Clocks manufacturing and refining their designs, the latter two coming into existence when Prouds decided to exit this market after WWII.

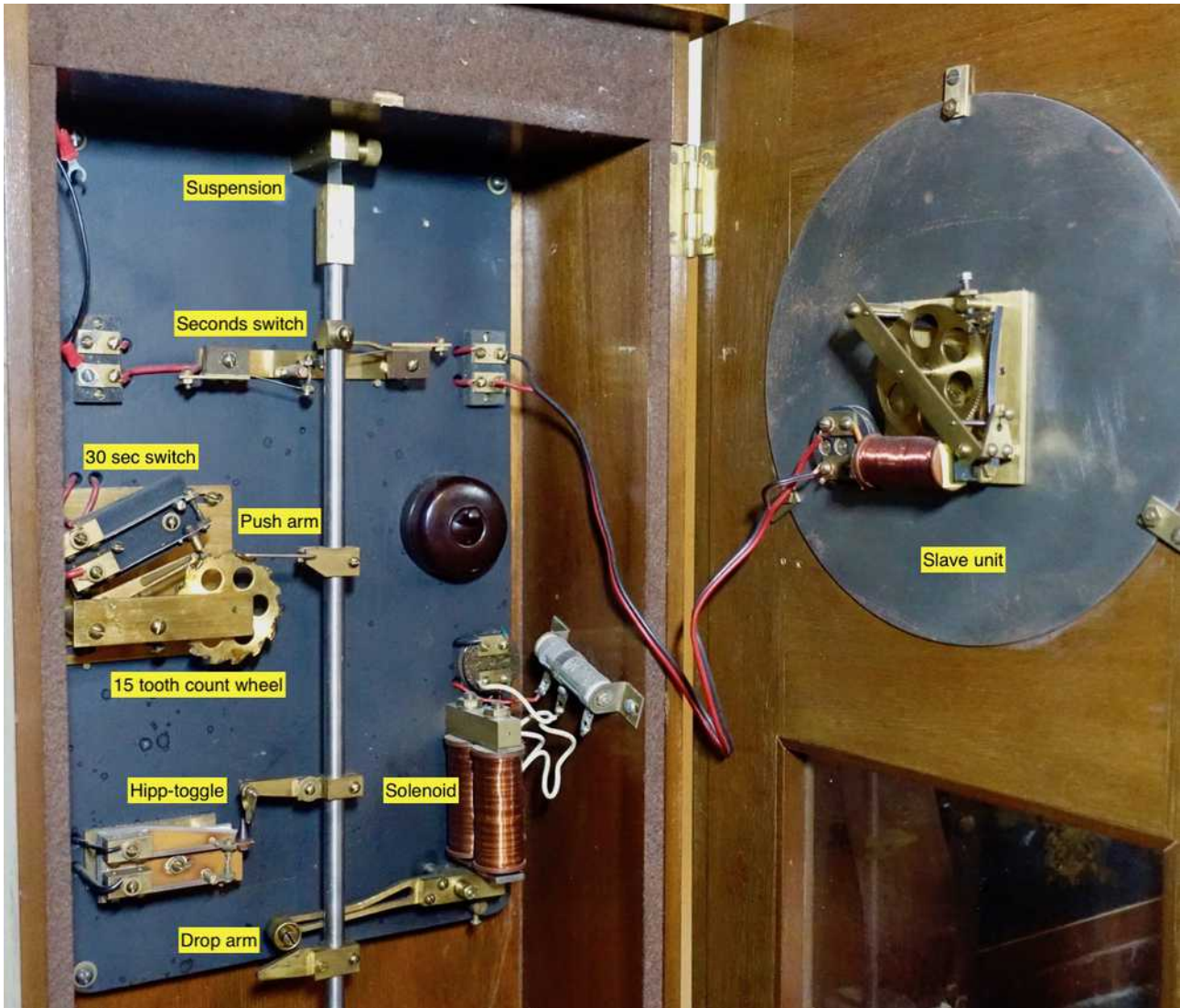
Becoming obsolete, many master clocks landed up in the tip. I rescued the example shown found on Gumtree ex a certain Council building being demolished. The council building caretaker put it in his shed. When he died a mate of his landed up with it and was going to get it going sometime. It just took up room and he had to move it along and it landed up with me for \$200. He obviously had no idea about these clocks as he had attached a 240v plug which would have resulted in a big bang or his electrocution! These clocks run on low DC voltage, typically 3 D cells at 4 ½ volts which is great for the non-electrician enthusiast.

Scientific Clocks Sydney was set up by Laurie Taprell and Cecil Gross in 1947.



One of their clocks provided the seconds pulse for the Sydney Observatory time signal, check out this link <https://collection.maas.museum/object/230571#ixzz1bAN1ylwq>

This picture of my clock shows the movement components attached to a solid cast iron block, in turn screwed to the back of the case. Of necessity, these clocks are very solid, designed to be securely attached to a wall for stability of performance.

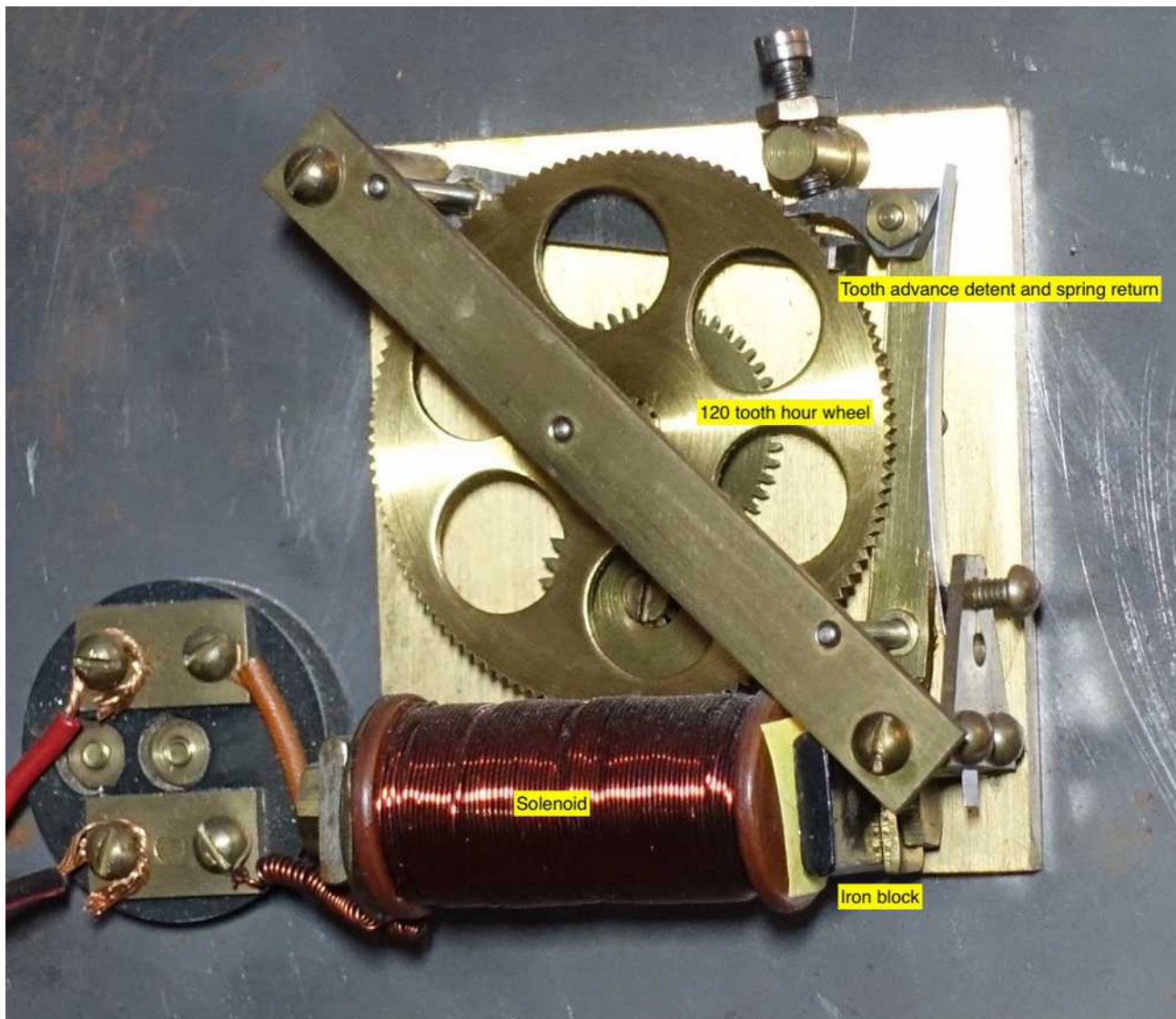


Essentially there are 2 electric circuits:

- One to operate the pendulum which is the driving force ie “the motor” to mechanically operate the single 15 tooth “count” wheel
- The other to send a pulse to the slave movement in the door every 30 seconds.

The pendulum is impulsed by a drop arm activated by a double barrelled electromagnet (bottom right). This is switched by a Hipp-toggle device invented in the 1840's by Matthaus Hipp [https://en.wikipedia.org/wiki/Matthäus\\_Hipp](https://en.wikipedia.org/wiki/Matthäus_Hipp) designed to impulse the pendulum when the amplitude drops and not every pendulum (full)swing as in the Synchronome for example; Energy saving.

The pendulum takes two seconds for a full swing backwards and forwards, rotating the 15 tooth count wheel every 30 seconds. One high tooth closes the 30 sec switch. This sends a pulse to the slave movement solenoid.



This pulls the iron block towards it and advances the 120 tooth hour wheel a notch and drive the motion work for the clock. You can now understand why the clock minute hand only “ticks over” every half minute. To advance the clock, the seconds switch can be engaged to pulse the slave every second. I suppose to retard this clock it would have to be stopped?

The story of Australian built master clocks is slowly being uncovered. Norman Heckenberg and Tony Roberts have done much to trace the account of Synchronome Brisbane, the history of Prouds and others. An online international collection of electric clocks has their work on the Prouds master clocks, <https://clockdoc.org/default.aspx?aid=6286>