

Perfectly simple and simply perfect

Anthony Roberts and Norman Heckenberg rediscover Thomas Murday.

British horologist, Thomas Murday arrived with his family in Sydney, Australia, on the White Star Line steam ship, *Afric*, on 22 July 1911, to begin a new career.

Background

The authors of this article have been researching electric clock systems in Australia, particularly Synchronome clocks, for the past 15 years. The results of our research have been published in the book *Synchronome Brisbane*¹ and the *Horological Journal*².

As a result of the Horological Journal articles we were contacted by a collector with several questions about an unusual Synchronome master clock he owned, similar to that shown in **Figure 1**. As explained in *Synchronome Brisbane*, the Synchronome Electrical Co of Australasia in Brisbane purchased the rights to Synchronome patents from Frank Hope-Jones in the UK around 1903, and soon began independently to produce considerable numbers of master clocks. However, although this clock had a Synchronome flavour, it was different in many ways from those made

in either Brisbane or London.

Subsequent research has led us to believe that this clock was designed by the well-known British horologist and electrical engineer, Thomas Murday, and manufactured by Prouds Ltd in Sydney. Prouds, as well as being established jewellery retailers, had a 'works', Prouds Ltd Clock and Scientific Instrument Makers, which commenced electric clock manufacture in 1912.

The late Lawrence Taprell, who served his apprenticeship at Prouds Ltd from 1939 to 1945, has written:

'Electric clock making began in Sydney about 1909 [sic] with the arrival from England of the well known British horologist Thomas Murday who became manager of a clock company set up by W.J. Proud Esq. This company had a very close association with the Synchronome Company of London and Brisbane. Many well known clockmakers were employed by Prouds Ltd. during these early days: names like George Gough, A.L. Franklin and C.R.O Gross who was the manager for thirty two years.'

In this article we would like to concentrate on some of Thomas Murday's activities while employed by Prouds. We will briefly explore the correlation between his British patents and the design of shelf clocks, and master and slave clock systems, manufactured, sold and installed by

Prouds in the early 20th century.

Murday migrates to Australia

Thomas John Murday was a British electrical engineer who arrived in Australia in 1911 at age 46 with his wife and two children. He was resident in Sydney, Australia, till his death on Saturday 19 February 1938. Exactly what Murday's reasons were for emigrating, we do not know, but demand for electric clock systems was expanding rapidly in Australia at the time, so someone with his experience would have been very welcome. In one of Prouds' brochures from about 1913 it is stated that 'Mr T.J. Murday is in charge of the electric clock and scientific instrument workshop', which we believe is shown in **Figure 2**. Before coming to Australia, Murday was granted several British patents, perhaps the best known being for his horizontal balance-wheel clock (GB1910/1326). This clock, shown in **Figure 3**, is eagerly sought after by collectors.

As far as we can tell, Prouds commenced their clock business in 1912 at 336 Kent St, Sydney, and one brochure showing this address is known to us. This brochure shows Murday's horizontal balance-wheel clock and several case variants of a half-second pendulum electromagnetic shelf-clock. **Figure 4** shows an illustration of the latter from the brochure, which is clearly based on an almost identical brochure



Figure 1: Unusual master clock with many Synchronome characteristics, of the type which triggered this research.



Figure 2: A photograph of a workshop preserved by Lawrence Taprell. The dials in the background are marked 'SYNCHRONOME ELECTRIC SYDNEY'.

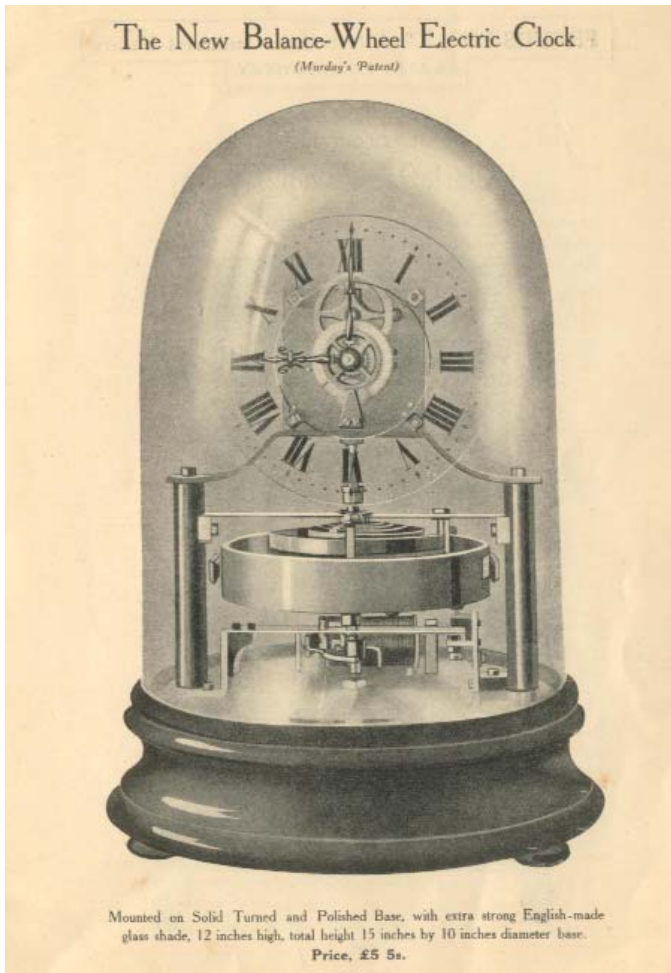


Figure 3: Murday patent horizontal balance-wheel clock shown in Prouds brochure c1913.

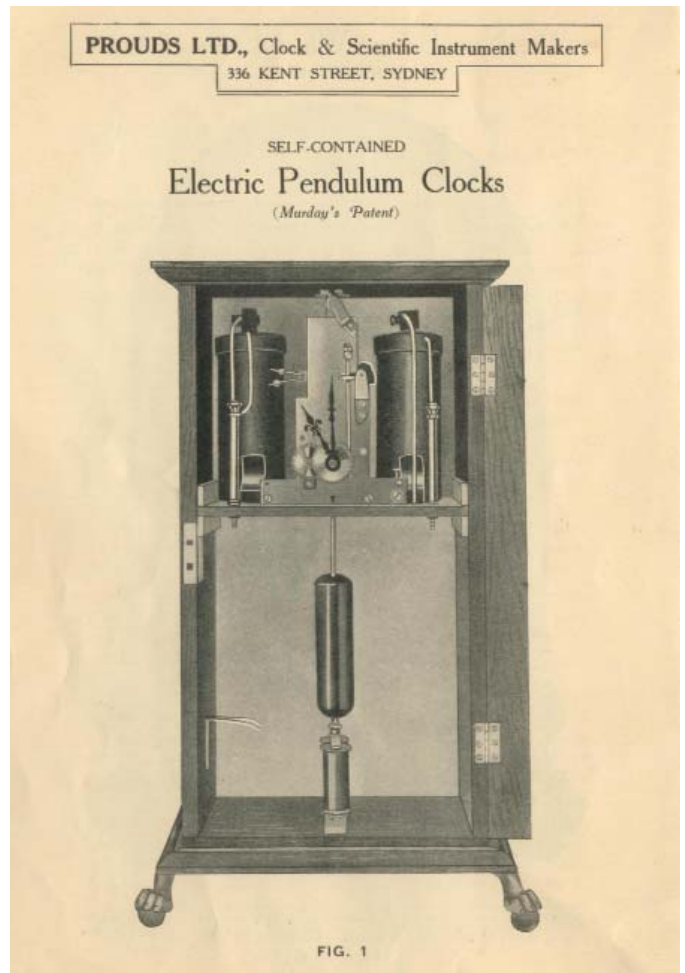


Figure 4: Half-second pendulum clock shown in Prouds brochure c1913.

from the Reason Manufacturing Co. in Brighton in England, a firm with which Murday had previously been associated.

It seems reasonable to assume that both the above clocks were made by the Reason Manufacturing Company and sold by Prouds. Both clocks employ what we now know as the 'Hipp toggle' principle of pendulum impulse. Although Matthaus Hipp invented this type of pendulum impulse system in the mid 1800s, Thomas Murday, A.W. Staveley and I.H. Parsons (of Gents') were granted a British patent for the same device in 1897 (GB1897/6212).

Murday's influence

Thomas Murday employed a unique system to 'drive wheel work for the purpose of indicating time' on the balance-wheel and half-second pendulum clocks as well as others we will discuss shortly. It is a ratchet wheel with two clicks or pawls as shown in **Figure 5**, which advances the wheel twice per oscillation of the pendulum. The use of worm gears as in the half-second pendulum clock is another characteristic of Murday's designs, as is a great simplicity of construction and finish.

Information about the above clocks was published in the Horological Journal of December 1910.

A clearer picture of Prouds' clock manufacturing is formed by looking at brochures from their next address, Lawson House, 49 Clarence St, Sydney. These brochures show a number of different master and slave clock movements, two with a Hipp toggle and the countwheel with two pawls, plus an unusual method of impulsing the pendulum, whereby, as can be seen in **Figures 6 and 7**, an electromagnet pulls up an armature attached to a pivoted arm carrying a roller which then acts downward on an impulse pallet like that on a Synchronome master clock. The brochures depict standard master clocks, tower clocks and slaves, the last being very similar to Synchronome dial movements.

Murday Synchronome

Another (undated) brochure depicts the unusual Synchronome master clock movement, shown in **Figure 1**, which triggered our research into Prouds. This master clock, although basically Synchronome in nature, shows the influence of a Thomas Murday patent of

A.D. 1908. Oct. 27. N.º 22,819.
MURDAY'S PROVISIONAL SPECIFICATION.

(1 SHEET)

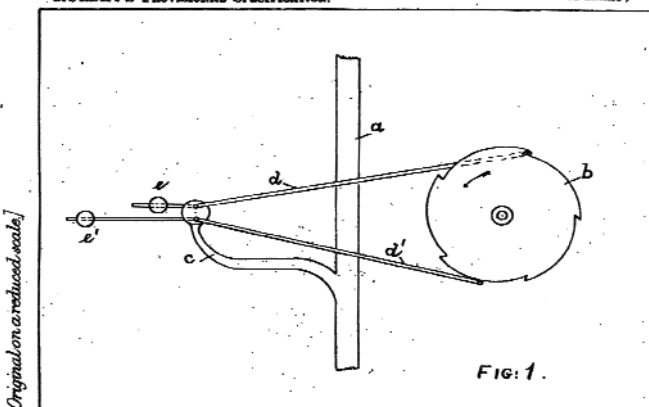


Figure 5: Patent drawing showing the countwheel with two pawls used by Murday in several of his clock designs.(patent GB 1908/22819)



Figure 6 (above): 'Murday type' master in unrestored condition.

THE MURDAY TYPE CONTROLLING CLOCK

CONSISTS essentially of an electrically operated pendulum, automatically controlling its supply of energy, and maintaining a constant arc independent of variation in the strength of the driving battery. This constancy of arc (unobtainable in any other type of electric pendulum, or weight driven Regulator), coupled with accurate compensation for temperature, produces a timekeeper of the highest degree of excellence and reliability.

This pendulum drives mechanically, a simple train of wheels forming a centre seconds movement, and indicating time, second by second, on a twelve-inch diameter dial. Electric Contacts are also fitted to operate a circuit of secondary dials every half-minute.

Contacts can also be arranged to give impulses, or signals, every second, or at any other period required. The Pendulum Bob is brass cased, and weighs twenty-five pounds; the rod is of "Invar" Steel. The case is made of well-seasoned oak, with glass panelled door fitting dust tight. The approximate dimensions are, five feet high by eighteen inches wide and seven inches deep.

The mechanism of this clock can be mounted in any design of case, Grandfather or otherwise, to meet personal requirements, or to harmonise with existing fittings.

Fulllest information and Prices furnished on application.
Call and see our Clocks or telephone City 6993.

Figure 7 (right): From a Prouds brochure c. 1917 entitled 'Uniform Electric Time Service'.

1901, in which a drawing, reproduced in **Figure 8**, depicts the temperature compensation principle, using a plain steel rod for the pendulum and a zinc compensating rod with a lever and curb on the suspension spring. It is worth noting that although this arrangement is described in great detail in the specification, it does not feature in the actual claims of the patent, possibly because the principle had already been

widely used. Murday had used this system in an 'electrical regulator' while working for the Standard Time Company, and described it in the *Horological Journal* in November 1901. Another old photograph provided to us by the family of Lawrence Taprell shows the Prouds Synchronome master clock movement, **Figure 9**. Note the badge marked 'Synchronome Patents'. We don't understand Murday's relationship with the Synchronome Electrical Co of Australasia in Brisbane which had purchased exclusive rights to the patents. It is not unlikely that Murday was acquainted with Hope-Jones and we do know that A.G. Jackson in

A.D. 1901. Aug. 2. N° 15,664.
MURDAY & others' PROVISIONAL SPECIFICATION.

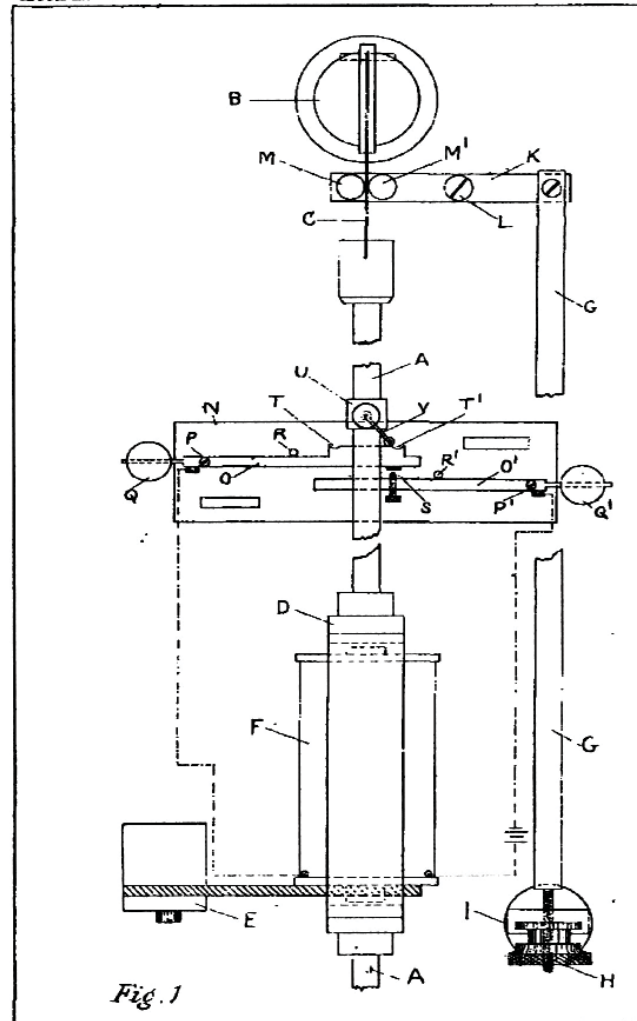


Figure 8. Drawing from GB1901/15664 showing the zinc rod (G), lever (K) and curb (MM') temperature compensation.

Brisbane was keen to sell on rights to the Synchronome patents, but we have not been able to find any record of an agreement. Business directories show a Synchronome Electrical Co. of NSW still in existence in 1915. The records of the Brisbane firm show a single sale of three No.3 dial movements to Prouds in 1913, and then no further sales to Sydney until 1951.

We are not aware of any examples of this 'Murday Synchronome' surviving in original state, but have been fortunate enough to acquire an almost complete mechanism that we have now restored to working order. The zinc compensation rod is about 30 cm in length. Given that the coefficient of thermal expansion of zinc is roughly three times that of steel, and that the lever system has a ratio of 3/2, and accounting for the expansion of the cast iron backplate supporting the zinc rod, we estimate that the curb pins descend 10.3 μ micrometre/C, which is close to, but less than, the expected length increase of a metre length of steel. If we account for the fact that the

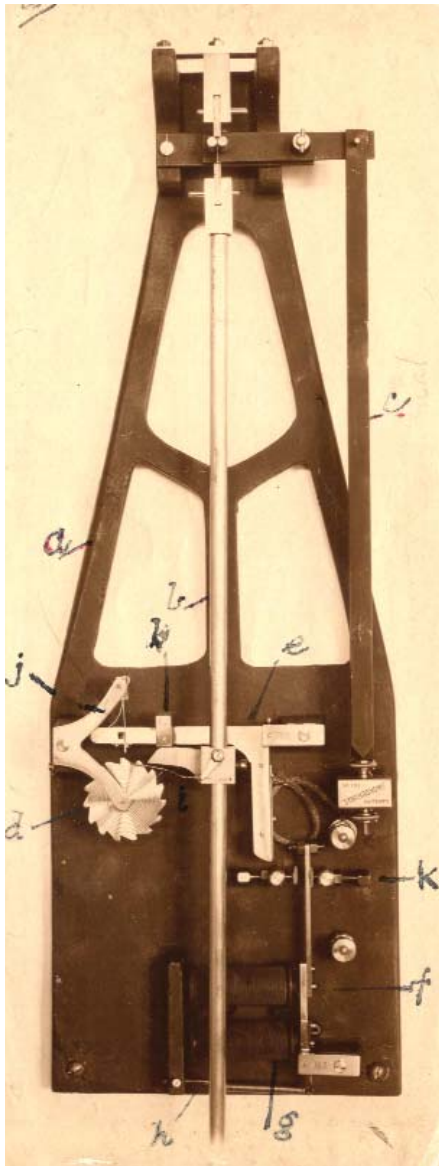


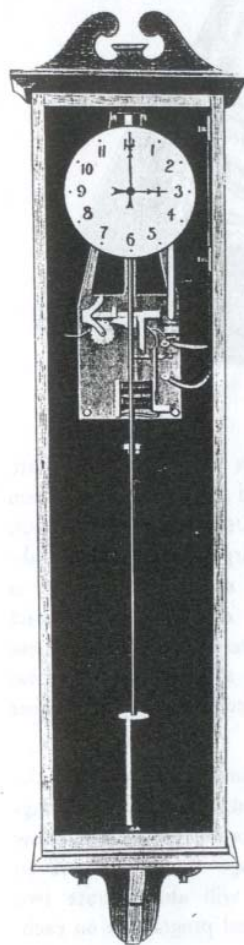
Figure 9. Contemporary photograph of Murday Synchronome. Note simplified construction and SYNCHRONOME badge. The countwheel backstop is missing in this photograph.

pendulum bob is supported at its base rather than at its centre, we find that the system would be over-compensated for a lead bob, but very close for a solid brass bob. Unfortunately we do not know if the bob we have is original. Some preliminary tests suggest that the system only partially compensates for temperature effects, some of which may stem from the variation of elasticity of the suspension spring, but we have had difficulties achieving steady enough rates for definitive results.

It seems likely that production of this type of master clock did not continue for very long as we have seen only two and have only one brochure showing the clock, which describes it as being 'perfectly simple and simply perfect' **Figure 10**, a phrase also used by Synchronome in London.

THE SYNCHRONOME TYPE CONTROLLING CLOCK

PERFECTLY SIMPLE. AND SIMPLY PERFECT



THE Synchronome Master Clock, as herewith illustrated, is manufactured in our Workshops, 49 CLARENCE STREET, SYDNEY, in accordance with the latest patents of the well known Synchronome Co. Ltd., London, and is absolutely the last word in simplicity of construction combined with certainty of action.

In this movement there is only one wheel. The pendulum receives its impulse once every half minute from a falling lever. This lever is reset electro magnetically, and the same current which resets it passes on to the various step dials included in the circuit, moving them forward half a minute. The pendulum is seconds length, and fitted with the latest method of zinc-steel compensation.

The movement is fitted in polished oak case, approximately five feet high, fifteen inches wide and seven inches deep, with glass panelled dustproof door. Time is indicated on an eight inch diameter enamelled dial, in half minutes, synchronous with the other dials included in the circuit. These Secondary Dials may be had in sizes ranging from four inches to four feet, mounted in wood or metal casings, or to match special fittings as required.

PRICES ON APPLICATION TO

PROUDS LIMITED, MANUFACTURERS,
49 CLARENCE STREET, SYDNEY

Figure 10. Murday version of Synchronome master clock from an undated Prouds leaflet, entitled 'Electric Time Circuits'. Note the simplified construction and the zinc rod temperature compensation on the right hand side.

Prouds clock systems

From the brochures we have obtained and the later master clocks we have seen, it appears that Prouds settled for a somewhat different standard clock by 1925, a Hipp toggle type clearly based on the 'Murday Type Controller' of **Figures 6 and 7**, which continued in production up to some time in the 1940s. But gone is the two click/pawl system, replaced by a single click/pawl acting on a 15-tooth countwheel with 30 seconds electrical contacts, which could control internal or external slave dials.

As the years went by, Prouds recorded hundreds of installations, mainly in New South Wales, but extending to Tasmania, Queensland, South and Western Australia, even to Madras, India, and Suva, Fiji. With the withdrawal of Prouds from electric clock production some time

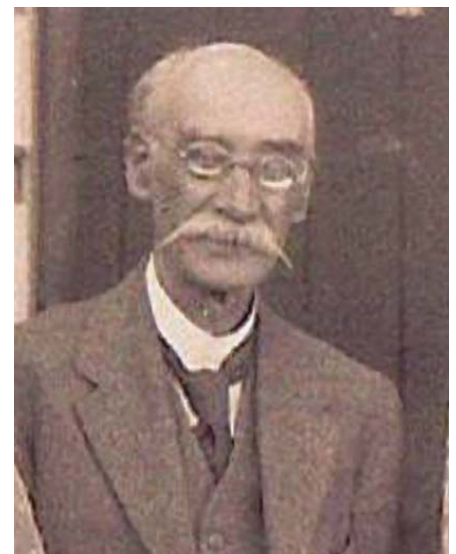


Figure 11. Thomas John Murday, from a family group photograph taken in 1931.



Figure 12. Murday style 'silent' slave movement (rear view).

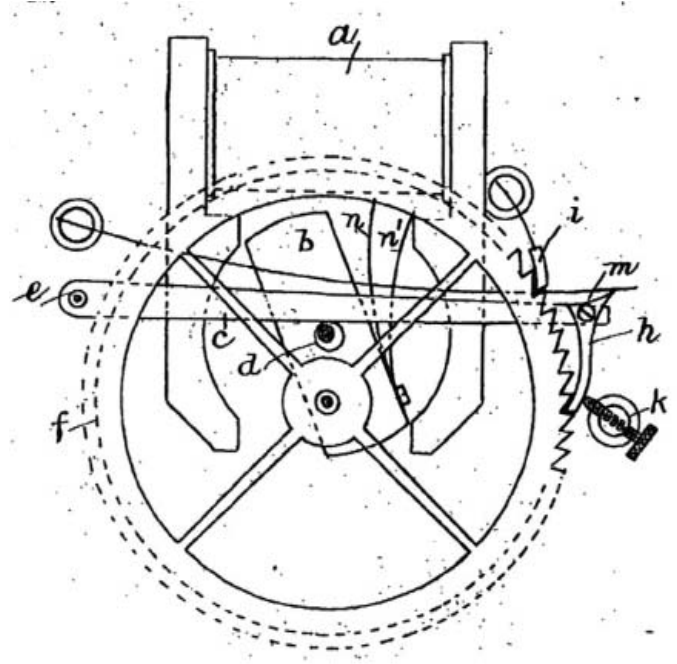


Figure 13. Drawing from GB patent 1908/26239. (front view) It is claimed to 'produce...an almost total absence of noise.'

in the 1940s, several former employees continued building and installing similar systems, notably Scientific Clocks founded by Lawrence Taprell and Cecil Gross in 1947.

Murday applied for an Australian patent in 1913 (10,747) for 'an electrical device for timing, controlling and indicating the duration of boxing contests and the like'. Such an 'Athletograph' with four 4-minute dials, a round counter and bells, driven by a Murday type controller, was installed in Sydney and several other stadiums. The same sort of controller was used in 'Murday's Thread Recording Electrical Micro-Barometer' and in a 'Self-contained Watchman's Telltale' manufactured by Prouds Ltd. Both were based on the thread recorder principle rather than his own recorder patents. Murday also applied for a patent associated with 'Telegraphy, Telephony and Fire and Police Signalling' in conjunction with Amalgamated Wireless (Australasia) (AWA), but both applications lapsed. We have not been able to find any patents for any of the other Prouds clock systems.

Murday was granted his last British patent in 1927, for 'a method of controlling automatically the recharging of accumulator batteries from the supply mains, applicable to electric clock circuits and the like'. This would seem to indicate that he was still deeply involved in electrical horology at that time, although Frank Rozzoli, apprenticed to Prouds in 1928, remembered accompanying Murday to the port to

collect ships' chronometers for service and calibration³.

Thomas Murday was also responsible for producing a type of slave clock. We have seen one example, **Figure 12**, and this closely follows his 1908 patent (**Figure 13**, note that the patent drawing shows a view from the front as if the plate were transparent). It was offered in an early Prouds brochure as a silent alternative to a Synchronome style slave. In the patent it is claimed to 'produce... an almost total absence of noise.' Although the patent drawing shows ratchet style teeth, the surviving example has a wheel with normal wheel teeth.

Until we commenced this research, although we had heard of Thomas Murday and knew of his connection with the horizontal balance-wheel clock, we had no idea of his migration to Australia, his connection with Prouds, his other patents and the great influence he had on the design of hundreds of master clock systems in Sydney and Australia in general.

Thanks to the preservation of historical material by the late Lawrence Taprell, and the generosity of his family, we have been able to learn something about his activities and the clocks subsequently produced by Prouds. We are also grateful to Ross Garnsey for information about Murday's family, and to Julian Holland, Ron Rozzoli and Bob Mills for their assistance. We believe that there is still much more to learn.

Notes

1. G. Bianchi, J. Gardner, N. Heckenberg, A. Roberts and J. Woolrych. "Synchronome Brisbane 1903-1991", NAWCC Chapter 104, 1998
2. Norman Heckenberg and Tony Roberts, 'The Synchronomes at the End of the World'. Part 1, *Horological Journal*, October 2006, 383-385; Part 2, *Horological Journal*, November 2006, 415-417.
3. as recounted to his son, Ron Rozzoli.