



British Horology Times

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What Lubrication?

*By Dennis Radage*FNAWCC, CA*

Most good horological restorers will do a thorough job of lubricating just about any clock or timepiece that comes in for servicing. As we know, correct lubrication is an essential part of any servicing program. Most of us have seen a very wide selection of pieces, some very old and some more modern.

Serious collectors will bring their clocks in for examination and lubrication on a regular basis typically every five or six years. Other owners with one or two mantle cocks, and often an inherited tall case clock will bring their clocks in, or call for service, only when their clock stops. Spring clocks are usually fully wound in effort to persuade the clock to run believing that the issue is with the winding. The explanation for tall case clocks often describes numerous attempts to start the clock by repeatedly swinging the pendulum, only to report that the swing slowly comes to a halt while not hearing any 'tick-tock'.

Sometimes the clock has been moved while redecorating the room, the cause possibly a now out-of-beat scenario - this requires a different educational article!

No matter what the scenario, the question should always be asked: When was the clock last serviced? Sometimes it was just a few years ago but often it is unknown or possibly decades earlier. One client proudly stated that the clock has been in his possession for fifty years and never needed servicing, Figure 1. When the question of lubrication came up, the response was: What lubrication?



Figure 1 - An obvious problem. Dried and gummed up lubrication on the barrel pivot.

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Chapter 159

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An Interesting Watch Paper map of Bath, England & surrounding area, circa 1800. No GPS needed!



President's Message:

When I last wrote a message for the British Horological Times the state of affairs in the world was unprecedented. Over the summer things seem to have become even more unstable and concerning. We were unable to meet with friends and family let alone with our Chapter associates and other NAWCC members. The NAWCC has decided to go ahead with planning for in-person events, including Regional meetings as well as the National Convention. It is my fondest hope that these events will occur and we will be able to have our usual Chapter meetings in 2021. The National Convention will be in Hampton, Virginia and I'm pleased to announce that British Horology is a co-host for the event. If you are planning to attend and have time to volunteer, we would definitely appreciate some help. In addition, the Convention Committee is planning to have a large exhibit on chronometers and a second exhibit on 17th and 18th century pocket watches. If you have items in your personal collection that you would be willing to contribute to the exhibit at the National, please get in touch with us.

To this end, our Chapter meeting in Florida will be an exciting affair as the time and periods of social withdrawal have provided opportunities. New acquisitions have been made and quite a number of fine restorations have been carried out. A significant component of our meeting will be a "show and tell" session where you will have the opportunity to share with us your watches and clocks. In addition, we will have a program which, I am sure will be of interest to all Chapter members.

In this issue, there are not one, but two, articles by Dennis Radage. Dennis is a superb artisan and historian and both articles are illustrated extremely well. Thank you, Dennis, for your support and enthusiasm, but most of all for sharing your knowledge and experience with us.

From time to time, we receive emails like the following:

"I have been unable to find a competent resource for servicing my fusee watches. I have resorted to sending them to the UK when needed as a result. My one attempt using the NAWCC resource page resulted in a charge for over \$400 and the watch was returned in worse condition than when it left. Any recommendations fellow members of this chapter might have would be deeply appreciated".

We are reluctant to make recommendations but we can set up a Mart area to our British Horology Times where members could make their requests known, advertise their services and even offer timepieces for sale and wanted. If you desire to be included in this section of the BHT please email us at britishhorology@gmail.com.

I close on a rather sad note. We have learned that long time member and my personal friend, Roger Gendron has passed away. Roger was extremely supportive of the Chapter and may be remembered for often providing the sherry that accompanies our meetings. I extend my condolences and the condolences of our Chapter to Judith and the family.

Once again, I hope that we can meet in person soon and until then keep well.

Cheerio

Bob

No one ever said that the clock needs lubrication!

These situations do not usually offer the most pleasant or rewarding service work. There is likely serious damage and generally the movement is quite dirty with lots of dust, darkened brass work, blackened pivots and ultimately, a somewhat higher repair bill to negotiate, Figure 2.

The latest owner was just such a case, his clock had not been serviced for decades. He had no knowledge of how to manage or care for his clock. The owner had tried over several weeks to force the clock to run, but it was stubborn, the pendulum just would not keep swinging. Sure enough, the clock would not run, the hood was removed exposing lots of dust and of course blackened pivots, Figure 3.



Figure 2 - Dismantling the movement exposes the dried and caked lubrication.



Figure 3 - Barrel and great wheel pivot, blackened lubrication.

I taped down the lines, then removed the weights. I explained what ‘end shake’ was, then tried it. Fortunately, the strike side was quite free, although there was a lot of ‘slop’ on the line barrel great wheel side (back) pivot. Same was true for the time side great wheel pivot. However, the second wheel pinion-end pivot was frozen. No ‘end shake’ at all. Sorry Sir, but this movement must go back to my workshop for examination.

While this is not a unique scenario, and certainly not the first time I have experienced this problem, it is unpleasant. While the great wheel pivots were in reasonable condition, the rear plate pivot holes were quite elliptical, Figure 4. Two new bushes needed here.

The time side second wheel pinion-end pivot was indeed frozen, Figure 5. The wheel needed a strong pull to remove it from the plate. Totally dried and caked up lubrication, this makes a really efficient grinding paste. The pivot was badly worn. This requires a new pivot and re-bushing of the plate.

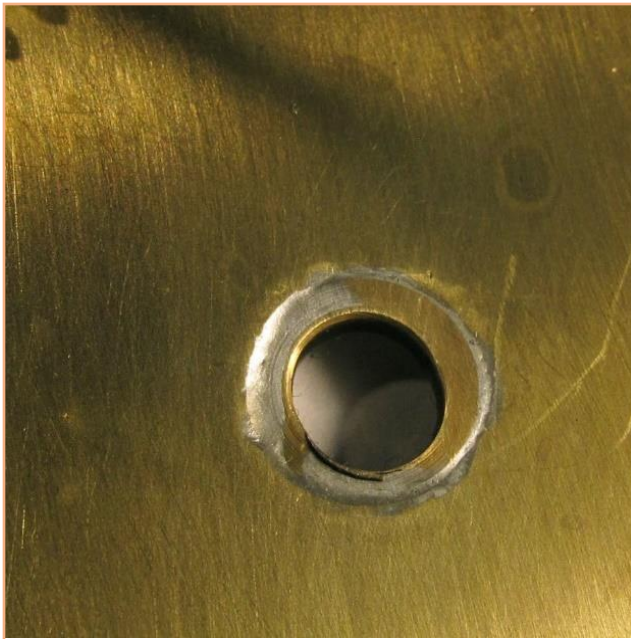


Figure 4 - The result of not lubricating. The great wheel pivot hole now worn quite elliptical. Obviously not the first time this has happened.



Figure 5 - Dried lubrication on second wheel pivot.

Forcing the clock to continue running without lubrication will certainly cause problems. The second wheel pinion-end is under considerable force from the great wheel. Both the great wheel and the second wheel pivots will sustain damage, Figures 6 and 7.



Figure 6 - Second wheel plate pivot hole wheel forced out.



Figure 7 - Second wheel pinion-end pivot. Totally dried and caked lubrication.

The question is, can these be ground and polished, albeit substantially reducing the diameter of the pivot, thus strength, or should the arbor be drilled and a larger pivot inserted, Figures 9 and 10? The latter will certainly have a longer life with such owners. The decision often rests with the potential repair bill. I usually inform the owner that their clock should be freshly lubricated about every six or so years then dismantled and cleaned about every twelve or so years – often dependent upon the location and environment where the clock is located.

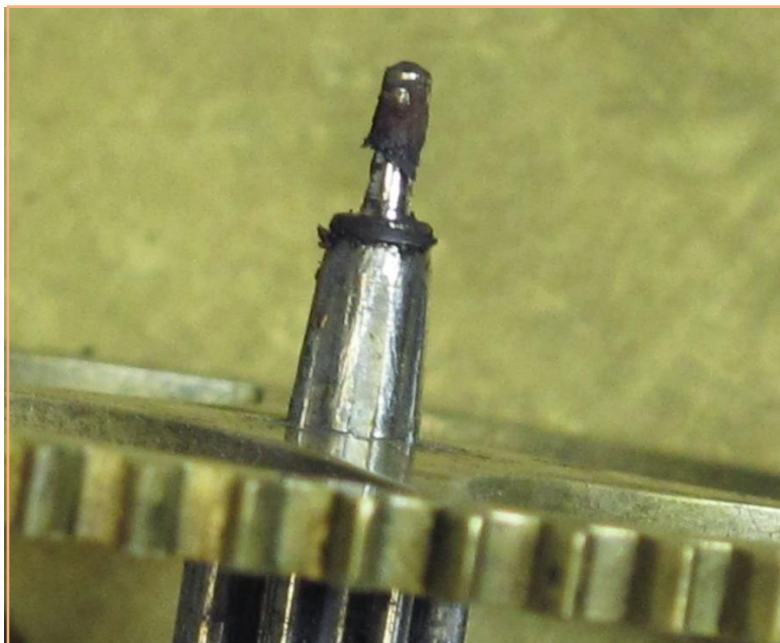


Figure 8 - Another example of a second wheel pivot with dried and caked lubrication.

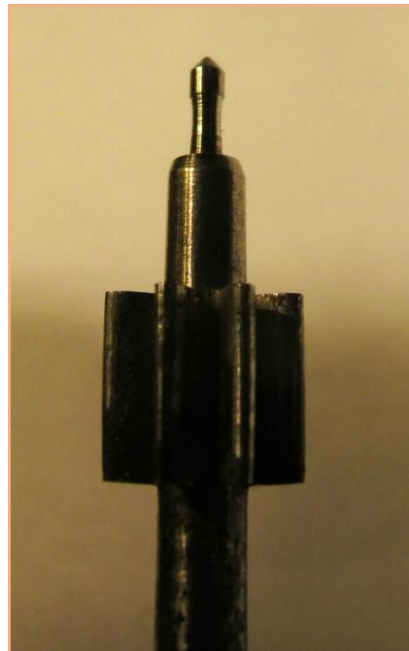


Figure 9 - The damage is done. Forcing the clock to run with dried lubrication ground much of the pivot away.

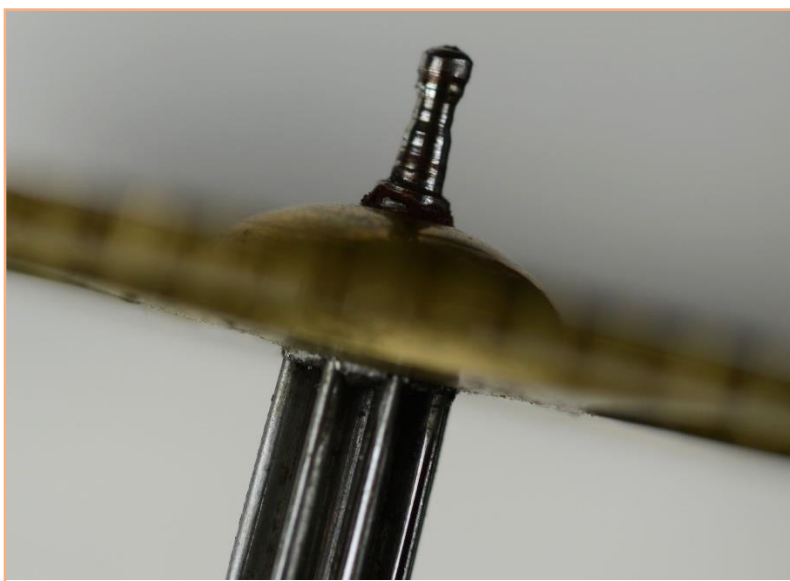


Figure 10 - Another example of the damage caused to the second wheel pivot when running with dried lubrication.

This service project was not very unusual, but certainly a wake-up call. Now, when did I last lubricate my own collection? Sometimes restorers can be the worst at servicing their own clocks.

I simply went around and stopped those clocks which I thought were due for fresh lubrication. Over the next few months therefore, one by one, I will dismantle, clean and lubricate them.

Obviously, it's time to re-bond with some of my own clocks. This last service call illustrated very clearly what happens when precious clocks are neglected. Unfortunately, this will not be the last time that I get a call because the owner's clock has stopped.

Dating an Arnold Spring Clock

By Dennis Radage *FNAWCC, CA
With some brief maker notes and more

Recently I was asked for information about an Arnold spring clock, specifically what period is it from and when was it made? The clock is in a walnut drum-style case with an oak leaf and acorn carved bezel above a double-waisted body and on four bun feet, Figure 1.



Figure 1. The walnut clock.



Figure 2. The gilt dial signed Arnold.

The dial is signed *Arnold*, Figure 2. This Arnold naturally refers to John Roger Arnold (JR) whose workshop was at 84 Strand, London. JR was the son and earlier partner to his father John Arnold, the renowned chronometer maker. This clock has a gilt dial with Roman hour numbers and blued steel spade-and-pointer hands.

The clock is superbly made, it has 6 ¾” heavy circular plates, twin fusees with chain line to the spring barrels and a large English lever platform escapement positioned across the top of the plates, Figure 3. The balance is temperature compensated.

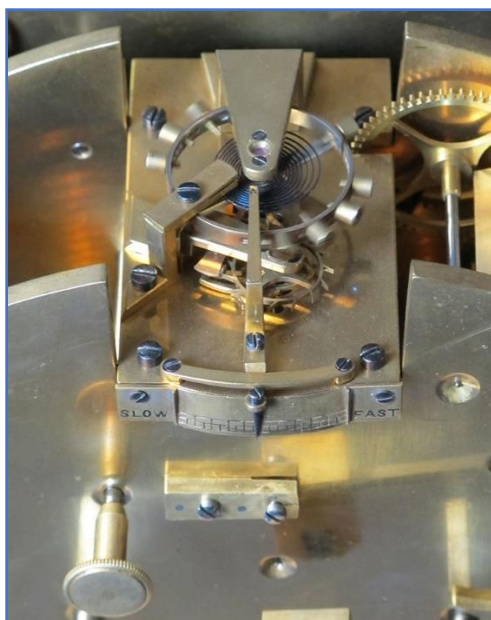


Figure 3. The huge platform escapement mounted across the top of the plates.



Figure 4. The Arnold signature and number 766 engraved on the back plate.

The 8-day movement is wound from the rear, similar to carriage clocks, and strikes the hours on a large blued steel coiled gong. The rear plate is signed *Arnold, 84 Strand, London*, and is numbered 766, Figure 4. The rear door is fitted with fretwork allowing the cathedral-like striking to be easily heard.

John Arnold and John Roger Arnold

John Arnold, the father (b1736 – d1799) was a very distinguished watchmaker and inventor who is credited as being the first to design production watches that were accurate, therefore useful timepieces. He created precision timekeepers so bringing the term ‘chronometer’ into general use. John Arnold’s work enabled quantity watch and chronometer production for their use at sea. Arnold introduced improvements to precision timekeepers that included many forms of temperature compensation, the helical balance spring and the detent escapement amongst them.

Arnold’s chronometers were used on Captain Cook’s second voyage to the Pacific in 1772 and on Captain George Vancouver’s voyage to the Pacific North West in 1792. Arnold’s No. 176 was one of Captain Vancouver’s marine chronometers that is now owned and on display at the Vancouver Maritime Museum. The Board of Longitude commissioned this chronometer in 1791 for use by Captain George Vancouver on board

HMS Discovery. This chronometer uses Arnold's spring detent escapement and an undersprung gold alloy helical spring of 5 ¾ turns. The balance is Arnold's 'Z' type, Figure 5. A second view, between the plates, can be seen in Figure 6.

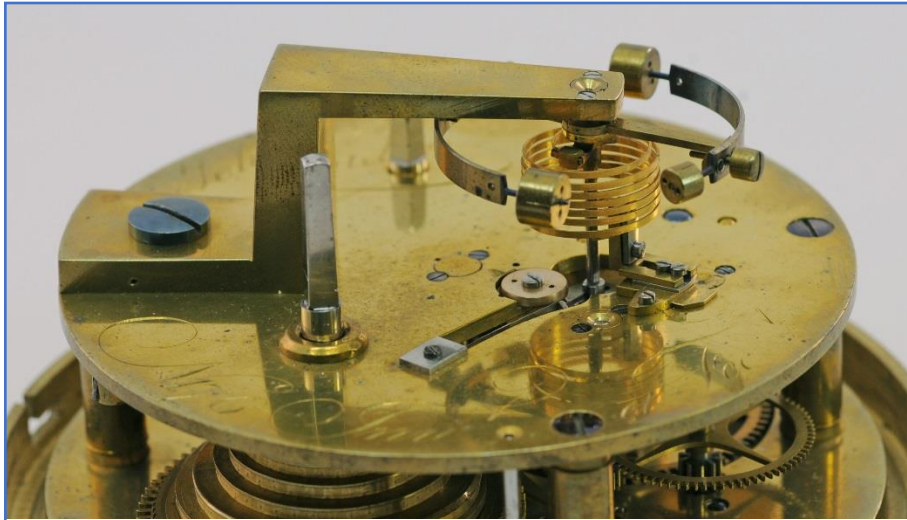


Figure 5. Arnold No. 176 'Z' balance.

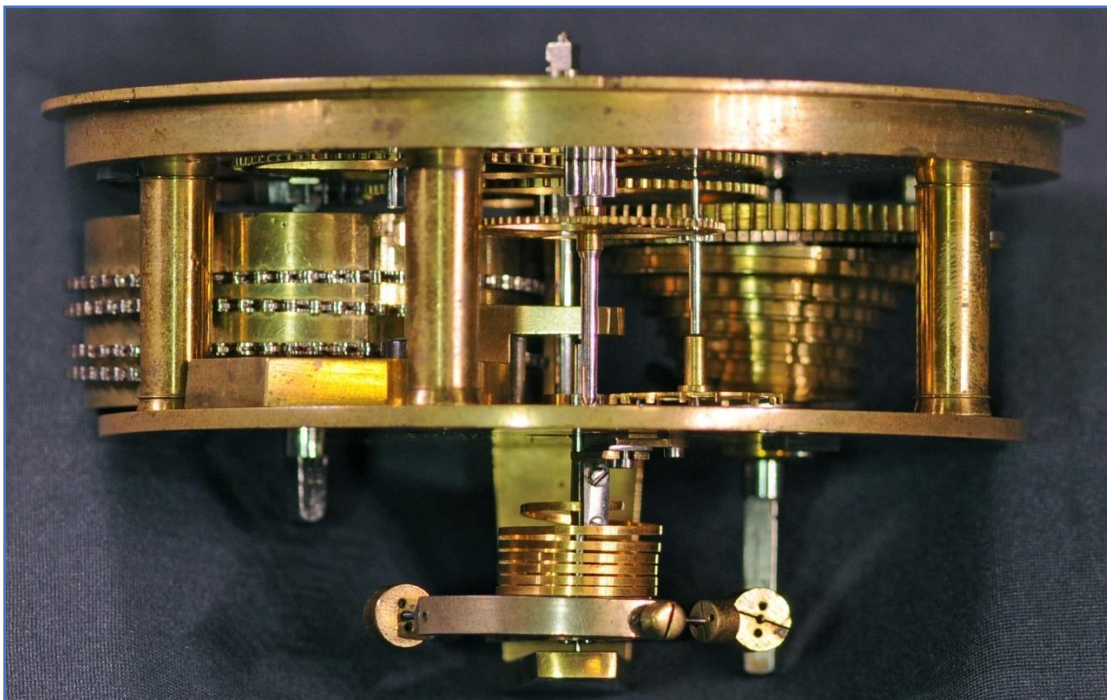


Figure 6. View between the plates, also showing the compensated balance.

John Roger Arnold (b1769 – d1843) was apprenticed to his father in 1783 for seven years. John Arnold took his son into partnership in 1787, three years before the end of his apprenticeship. John Arnold was a good friend of Abraham-Louis Breguet and sent his son (JR) to work with Breguet for two years from 1792. The Arnolds and Breguet exchanged many ideas.

Figure 7 and Figure 8 show pocket chronometer No. 224 that was originally signed *John Arnold, London Inv et Fecit*. However, added by a different hand and in a different script is *& Son*. This watch has the date letter 'I' for 1787, which is the year that Arnold and Son first entered their partnership. This is obviously one of the first chronometers to come out of this partnership and employs Arnold's OZ compensating balance.



Figure 7. Arnold and Son, pocket chronometer No. 224.

John Roger Arnold became a freeman of the Worshipful Company of Clockmakers in 1796 then he became Master of the Company in 1817.

John Arnold died in 1799 leaving his son to carry on the business of producing precision timekeepers including both pocket and marine chronometers.

From 1799 JR owned and rented several business premises in London until he finally purchased 84 Strand in 1821. In 1830 JR brought Edward John Dent into the business, continuing to produce precision timekeepers and chronometers. The Arnold and Dent business continued until 1840 when Dent left to start his own business just two doors away at 82 Strand.

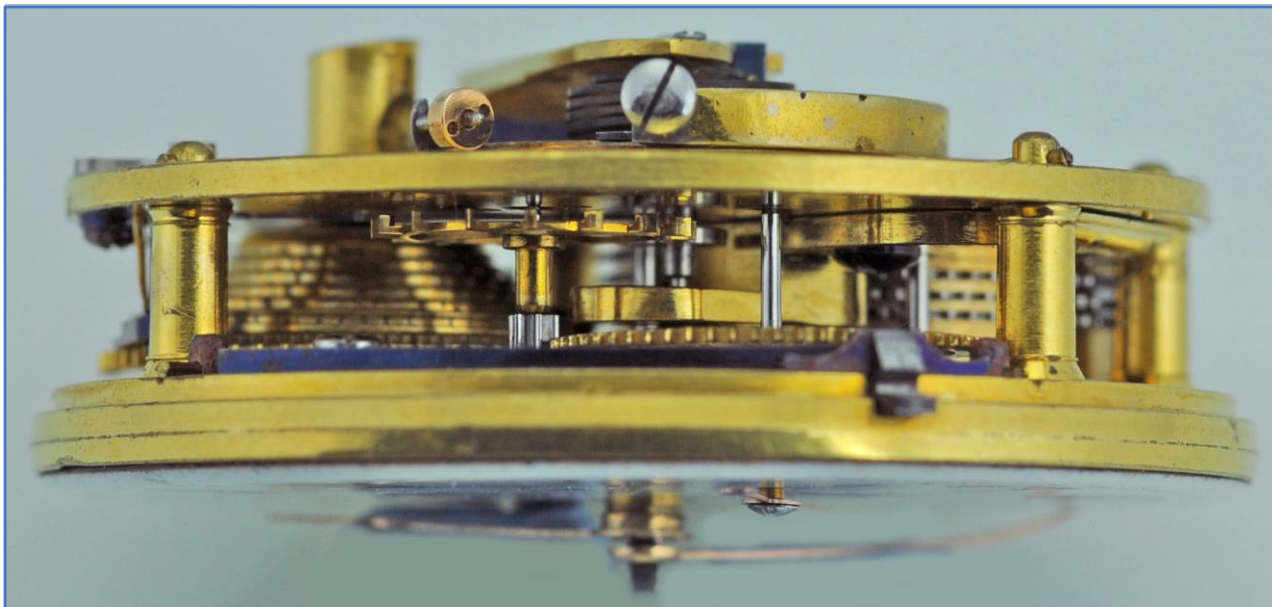


Figure 8. View between the plates of No. 224 showing the balance and escape wheel.

Arnold continued his successful precision timepiece business at 84 Strand until he died in 1843.

Soon after JR's death, Charles Frodsham purchased the Arnold business and moved into 84 Strand under the business name 'Arnold & Frodsham'. It is interesting that in addition to chronometers and precision timekeepers, this firm also produced and sold domestic clocks, some signed just 'Arnold'.

By 1857 the Arnold name was discontinued, and the firm continued as 'Frodsham, 84 Strand'. Frodsham continued to produce precision timekeepers, chronometers and domestic clocks. Frodsham also acquired the goodwill of the Vulliamy business after he died in 1854.

The clock we are dating here is signed just 'Arnold'. JR worked at 84 Strand from 1821 until 1830, but these dates are too early for this clock and JR's focus would have been on chronometers. From 1830 until 1840 the business operated as 'Arnold & Dent'. I have not found records that suggest Arnold would have signed alone during this period. However, after Frodsham acquired the Arnold business, from 1844, it is recorded that Frodsham purposely capitalized on the continued use of the renowned Arnold name, producing some clocks signed just 'Arnold'. Frodsham dropped the Arnold name by 1857. Note that we are now into the Victorian period.

There is an Arnold & Frodsham domestic clock number 655 that is signed simply 'Arnold' that dates to circa 1845. This is just over one hundred numbered clocks less than the clock in question, numbered 766, therefore offering evidence of date and maker. (Refer to Plate 212 P.180 *John Arnold & Son* by Vaudrey Mercer). Another clock numbered 1136 is dated 1865 as informed by the current Frodsham company.

Conclusion:

This clock therefore dates to the late 1840s, in the Victorian period, but made by the company 'Arnold & Frodsham', 84 Strand. Even though signed just *Arnold*, JR had died several years before the clock was made.

Footnote:

This clock was recently serviced, fully dismantled and cleaned. On dismantling the fusees, an inscription was found on the inside of the fusee great wheel. This turned out to be a tribute to a fallen soldier. It read: *Bert - surname is obscure, Killed in action – France - July 14th 1916.*



Figure 9. The tribute to a fallen soldier inscribed on the inner face of the fusee great wheel.

Unfortunately, the surname could not be determined. The inscription must have been added during a complete service when the clock was fully dismantled, obviously by a specialist who knew the family history. Who was this service specialist? One also wonders who was Bert and was there a family or other relationship? Was this a tribute to a friend or for the widow, now owner of her late husband's clock? This tribute is for a soldier who died more than one hundred years ago. It is unlikely we will ever know, but it does bring a very personal connection to the clock.

The clock is signed 'Arnold' and has a huge platform escapement that indicates that it was obviously not an inexpensive clock in its time. The owners must have been quite wealthy. What a fine hidden tribute that is only to be seen by various generations of professional clock restorers.

Credits:

All photos by author.

Arnold clock – Author

Arnold pocket chronometer No. 224 – Author

Arnold marine chronometer No. 176 – Courtesy Vancouver Maritime Museum.

Reference and further reading:

John Arnold & Son, Vaudrey Mercer, AHS 1972

The Frodshams, Vaudrey Mercer, AHS 1981

Wikipedia, various searches