

## A History of Time

Two months ago, we asked independent watchmaker **Roger Smith** to contribute to our series of articles on horological icons and, unsurprisingly, he chose George Daniels' Co-axial pocket watch. As this issue of QP goes to press, we have just learnt the sad news of Daniels' death on 21 October. Rather than alter the original copy, we have decided to run the article as it was written, as a tribute to one of the greatest watchmakers of our time.

Roger Smith



## The first Co-axial pocket watch of Dr George Daniels CBE



There have been some very interesting articles in this particular series and when I received the call from QP, while *en route* to Bordeaux with my wife for a long weekend break, it gave me plenty to ponder while standing in the tedious airport security queues. I must admit that it did not take me long to make my decision. Mudge, in my view, has to be at the top of the charts of Britain's historical horological greats, but he has already been expertly covered and, therefore, there seemed little option but to write about Dr George Daniels CBE, and his first Co-axial pocket watch.

Having studied and worked with Daniels for many years, we are now collaborating together on his new wristwatch project. You may groan at the predictability of my decision, but ultimately it is generally accepted that Daniels is the greatest living watchmaker, whose philosophy and watches have influenced the entire horological industry and the lives of many watchmakers, as well as being an inspiration to any inventor. Daniels and his work simply have to be included in this series of articles.

### The man, the legend

In order to fully understand a watch and escapement that is both a technical innovation and a supreme mastery of one's chosen art, you have to fully understand the man who made it. Daniels is a man who has spent his whole life challenging the system. Having been born into a large family and experiencing a difficult home life, he discovered horology when he was five-years-old. It was then that Daniels opened up the back of a watch and discovered "a whole new world" in which he immersed himself with single-minded enthusiasm.

After a spell in the army, several years in the watch trade restoring watches and several more working as an expert for Sotheby's, Daniels began to realise that the innovation and art that had always been the pride of the English watch industry was fast



Dr George Daniels



disappearing. He eventually came to the conclusion that he had to build a watch himself to avoid the extinction of the mechanical watch that he so admired.

In 1968 Daniels began to make his first masterpiece – a gold and silver cased, one-minute, pivoted-detent chronometer tourbillon pocket watch. An extraordinary watch, made to exquisite proportions and boasting supreme technical mastery, this watch defies further belief when you realise that there was no watch industry left in England to support him with the supply of vital movement, case or dial components. Unperturbed, Daniels set about learning and perfecting the 30 or so trades that once supported the mighty English watch industry. In fact, when describing his working process, it is often easier to state that the only components Daniels did not make in his watches were the balance springs, mainsprings and some of the jewels and screws. Of further note is that Daniels is the first man in history to have ever made a watch using these methods and even since the completion of the piece in 1969 you can count on one hand the number of people who have achieved the same, with this number being further slashed when you bring technicality, quality and artistic achievement into the frame.

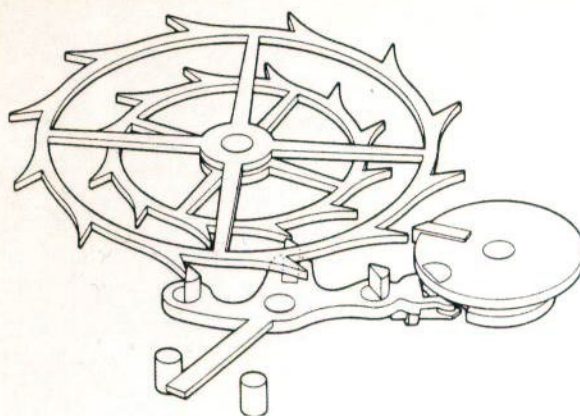
#### Refusal to compromise

Daniels continued making watches in this same vein – completing approximately one unique piece per year – with progressive stylistic and technical issues being tackled and perfected on each piece. The area that particularly fascinated Daniels was escapements and in the 1970s, with the growing threat from the increasingly popular quartz watch, he began to formulate ideas for the improvement of mechanical timekeeping. For almost a century the lever escapement had been used in various forms but Daniels knew that the lever had a major weakness – the oil that lubricates it.

After two years of work, the new Daniels independent double-wheel escapement was completed. It was an impressive start and with it he managed to deliver clean impulse directly to the balance (not through a lever) in both the anti and clockwise vibration with almost no sliding friction. The breakthrough of this escapement was that it did not require lubrication or, if applied, it was impervious to deterioration, which gave the benefit of an extended degree of accuracy and a longer service interval.

For Daniels and his pioneering escapement work to be more generally accepted he was aware that the ultimate test would be to fit one of his escapements into a modern mechanical wristwatch. However, because the independent double-wheel escapement requires two trains

Daniels Co-axial escapement



of wheels to drive it he realised that the industry would not accept this costly and space-stealing method of improving the accuracy of the mechanical watch. Eventually, waking in the early hours of one morning, he conceived three tiny parts, which have made horological history – the Daniels Co-axial escapement.

#### The masterpiece

Work began on the building of a watch to test his new idea and in 1976 he completed the piece that I credit with the accolade of my iconic timepiece. The watch in question has the movement made of gilt brass construction with two going-barrels engaging a common, offset centre pinion. The Daniels Co-axial escapement is mounted in a polished steel one-minute tourbillon carriage under a polished steel balance cock and the watch has a mono-metallic, stainless steel, four arm balance with gold adjusting weights and Daniels auxiliary compensation with free-sprung over coil balance spring. There is a differential screw mechanism for reserve of winding. On completion and testing the watch performed spectacularly well with no deviation in rate being noted when held in a fixed position and just 1.6 seconds variation between positions. In 1980 the Worshipful Company of Clockmakers awarded Daniels with the Tompion Gold Medal for this outstanding achievement.

The Daniels Co-axial escapement was the culmination of 25 years work and, after trialling in several branded wristwatches, it was accepted by Omega who could see the benefit of a new, compact escapement technology that is impervious to the deterioration of an applied lubricant with the added benefit of improved long term timekeeping and an increased service interval.

The last watch to have been created with such an impressive horological clout was the pocket watch made by Thomas Mudge for Queen Charlotte 250 years ago in 1754, which housed the first Lever escapement – the genesis of the escapement now termed the Swiss lever escapement. When we look back at Daniels' pocket watch after the same time has elapsed, I am quite sure that it will have proved itself to be of equal historical importance. In short I believe that history already shows that the Daniels co-axial escapement is and will continue to be used by makers within the industry who have a passion and appreciation for the long term future of the mechanical timekeeper and that Daniels' work has inspired a new generation of watchmakers who flourish outside of the monotony of the mainstream watch industry.

Further information: [www.danielslondon.com](http://www.danielslondon.com)