

# Thomas Tompion and English watchmaking

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**T**homas Tompion was born in 1639 in Bedfordshire. Both his father and his grandfather were blacksmiths. At that time, most clocks were made of iron for churches, and they were made by blacksmiths. These clocks were not very accurate, and needed to be reset from a sundial at noon quite frequently. Typically, they only had hour hands because they were so inaccurate.

The English clockmakers, most of whom were immigrants, obtained a charter for the Clockmakers Company in 1631. The industry was transformed by the application of the pendulum to regulate a clock by Huygens in Holland in 1656. This changed the clock from an indifferent timekeeper to a fairly accurate timepiece. This development was successfully exploited by English makers from 1658.

Tompion probably started work as a blacksmith, and possibly made one or two iron clocks. In 1664 he became an apprentice to a London clockmaker. Little is known of his early career in London; the first reference is in 1670 when he was recorded in Water Lane (now Whitefriars Street) off Fleet Street. Tompion became known as the “Father of English watchmaking” because of his important innovations. In 1695 he took an apprentice, George Graham, and the address was recorded as the “Dial and 3 Crowns, Corner Water Lane, Fleet Street. Graham too made some important innovations.

The first watches were nothing like the watches we know today – they were more like small portable clocks, squat and dumpy, which could be carried round, often supported on a string round the neck. The growing fashion for waistcoats prompted a demand for a slimmer watch which could be slipped into the waistcoat pocket but it wasn't easy to see how this could be done.

In 1658, Robert Hooke, an English polymath who was active as a brilliant experimental scientist, natural philosopher and architect described a spring-regulated mechanism for watches, but he never got round to building one, until a parallel invention by Huygens on the Continent prompted him to start a collaboration with Thomas Tompion.

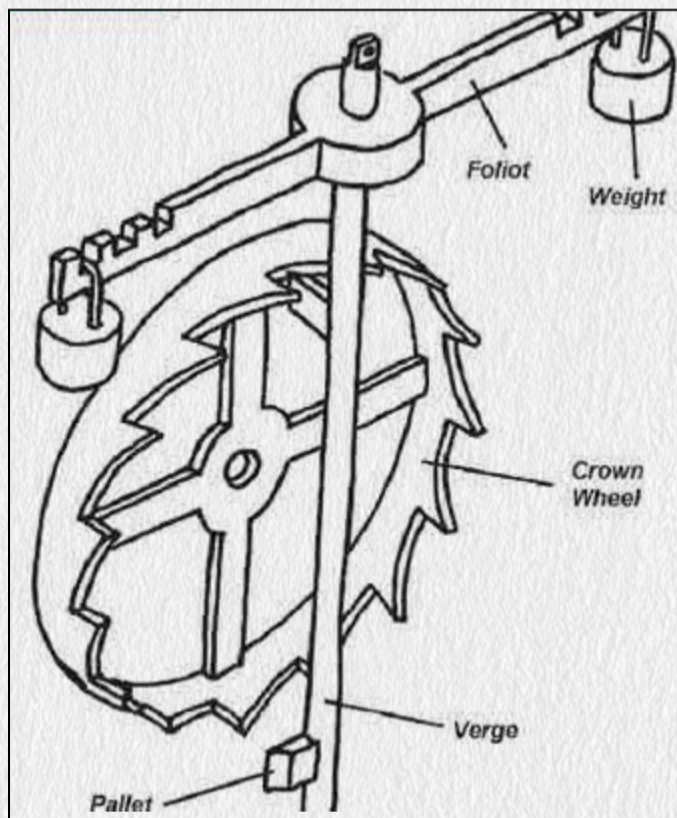
They built the first balance-regulated spring-driven watch and presented it to King Charles II, inscribed “Hooke Invenit 1658 Tompion fecit 1675”, This improvement greatly increased accuracy of the watch. Hooke became interested in pendulum clocks, and worked out that a pendulum with a heavy weight and a long swing over small amplitude with an anchor escapement would be an improvement on the short swing and wide amplitude regulated by a verge escapement.

Tompion's excellence and unrivalled reputation was based on the sound design of his products, the high quality of the materials used, and the outstanding skills of the workmen he employed, many of which were of French or Dutch Huguenot origin. Sir William Petty, when he noted one visit to Tompion's workshop, highlighted the very early example of the division of labour ..., and the effect on cost: ‘if one man should make the wheels, another the spring, another shall engrave the dial-plate and another shall make the cases, then the watch will be better and cheaper, than if the whole work be put upon any one man’.

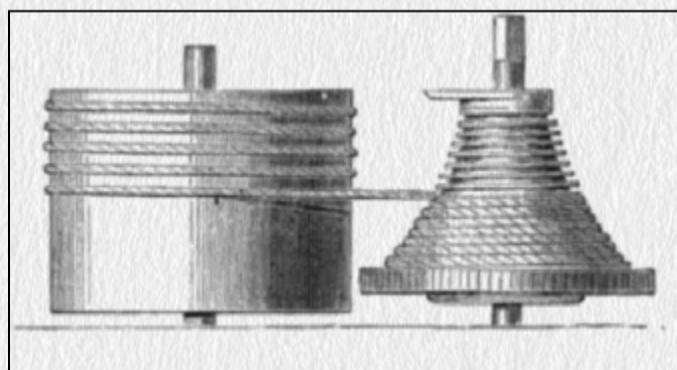
The torque provided by a spring decreases linearly as the spring unwinds, and, as it does so, the watch goes slightly more slowly. English clockmakers compensated for this by the use of a cone shaped spindle wound with a helical groove, called the fusee. A cord or chain is wound round the fusee, and attached to the barrel of the mainspring. This perfectly compensates for the declining torque of the mainspring. Fusees had the disadvantage of introducing another bulky component into the watch, and damage could be caused if the cord or chain broke, but they had the considerable advantage of improving the accuracy of the watch. For this reason, the fusee was widely used by clockmakers in England, though not on the Continent, thus adding to the reputation of English-made watches. The use of the fusee was known, but not so widely used, by continental makers

The last twenty years of Tompion's life included successive improvements to escapements to improve the accuracy of watches. The cylinder escapement introduced by George Graham in the 1720s built on all this work.

Thomas Tompion died in 1713, and George Graham continued the business, which moved in 1720 to the “Dial and 1 Crown” near Fleet Bridge. Both were fellows of the Royal Society, and both are buried in Westminster Abbey.



*The River Fleet*



*Mainspring barrel and fusee*



# Thomas Tompion and English watchmaking Additional notes

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Prepared by: Piers Nicholson, 2023 with generous advice from a past curator of the Clock Museum (now located in the Science Museum, London.)

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**Sources:** Wikipedia pages on Thomas Tompion, Escapement, Mechanical escapements. Balance spring Fusee (horology) Website British watch making in the 17th and 18th centuries (anordain.org) and Leo Hollis, Mechanical Philosophy, Hooke, Tompion... IEEE Magazine 14(4), 45-51 article by Michael Lombardi

**Further reading:** Jeremy Evans Thomas Tompion at the Dial & Three Crowns (Antiquarian Horological Society, Ticehurst 2006)

Jeremy Evans, Jonathan Carter & Ben Wright Thomas Tompion 300 Years (Water Lane Publishing, Stroud Gloucestershire 2013)  
There are a number of YouTube animated videos which are also very informative, such as “Explanation - how cylinder escapement works (Horloger de la Croix Rousse)