# Jens Olsen's astronomical clock (II)

## Jens Olsen's life and influences

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(https://jens-olsen.github.io)

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Before describing Olsen's astronomical clock, I want to give a sketch of Olsen's life and explain what led him to construct such a complex clock. Much of what follows is drawn either from Johannessen's brochure [3], or from Mortensen's book [7].

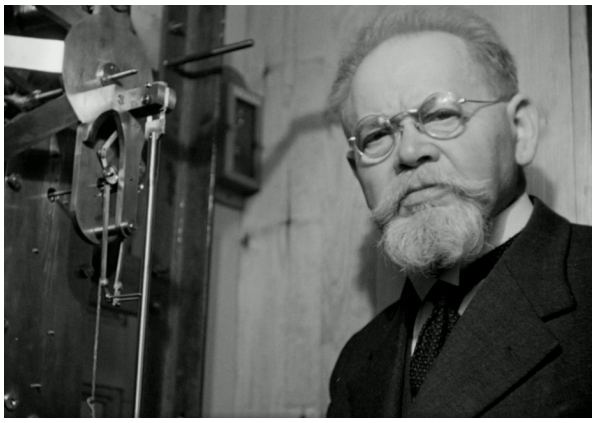

Figure 1: Jens Olsen and the gravity escapement of his clock (excerpt of https://www.danmarkpaafilm.dk/film/jens-olsens-verdensur).

Jens Olsen was born in Ribe, a small town southwest of the Jutland peninsula in Denmark, on July 27, 1872. He was the fifth of eight children. His father was the weaver Niels Olsen (1825-1903) and his mother Mette Krøldrup (1833-1890). The family was poor but it was a happy family. According to Johannessen, one evening Jens' sister Christine read from the book "A polish family" (1839) from the Danish poet Carsten Hauch (1790-1872). There a broken clock was described. This clock had a moving eagle, but no one could repair it. It is said that the young Jens Olsen didn't understand how that could be, that a clock could be built but not repaired, and that decided him to become a clockmaker.

Jens Olsen was an excellent pupil in mathematics and physics, although he was only average in other fields. He kept wanting to become a clockmaker, but his father put him as an apprentice to a locksmith. He then became a good mechanician, but he also read all he could find on mechanics, clocks and astronomy. He then became a journeyman and worked among other places in Ålborg.

In 1897, he started his "journeyman

Figure 2: Jens Olsen observing the work for the equations (excerpt of https://www.danmarkpaafilm.dk/film/jens-olsens-verdensur).

years." Around 1900, he saw the astronomical clock in the Strasbourg cathedral, and this clock greatly impressed him. The current mechanisms of the Strasbourg clock were built by Jean-Baptiste Schwilgué (1776-1856) between 1838 and 1843 and this clock has a number of very advanced features for its time. It does in particular determine the date of Easter semiautomatically (it still needs to be rewound and some parts need to be set beforehand), and it has a very accurate display of the motions of the moon and the sun, a prerequisite for a display of the eclipses. No other known clock had such features and this certainly got Olsen very interested.

Jens Olsen supposedly hid inside the Strasbourg cathedral in order to be able to study the clock, because the normal visiting hours were not sufficient for him. He also is said to have spent 11 days in Strasbourg studying the clock. It is possible that he did that, but I do not believe that Olsen was inside the clock by himself, as there is, and was, a lock. Instead, the access to the clock was controlled either by the cathedral employees, or by the Ungerer clock company. In fact, according to Alfred Ungerer's son Charles, Olsen had met Alfred Ungerer in Strasbourg, and Ungerer showed him the inside of the clock. Whether this is true or not, I do not know, especially since Charles Ungerer (born in 1895) was very young at that time and probably didn't experience it firsthand, but it is also a possibility that cannot be discarded.

In any case, Olsen also spent some time in Basel, Switzerland, and he then had the idea of constructing an even more complex clock than the clock in Strasbourg. He also spent a year and a half in Paris during the 1900 Paris Exposition, as well as several months in London. During all these years, Olsen continued to study for his clock project.

It is possible that Olsen was also influenced by the work of the French clockmaker Antide Janvier (1751-1835) who built several astronomical clocks, and himself influenced Schwilgué. In his 1802 masterpiece, Janvier has for instance a dial for the representation of the eclipses, and this dial shares many features with the corresponding dial on Olsen's astronomical clock. And while in London, Olsen may have become familiar with the gravity escapement that he used in his astronomical clock. He may even have seen the great Westminster clock.

After five years of travelling, Olsen eventually returned to Denmark and opened a clock workshop. He also then

worked for four years at the Cornelius Knudsen manufacture of scientific instruments in Copenhagen. He called himself an "astromechanician."


Figure 3: Jens Olsen's grave in Bispebjerg cemetery in Copenhagen (Toxophilus, 2015, Wikimedia Commons).

Olsen constructed a number of clocks, including tower clocks, some of which do still exist. He got married in 1905 to Anna Sofie Krøldrup who was eight years his senior. Olsen spent many years from 1900 until 1920 designing his astronomical clock. At the beginning of the 1920s, he obtained a positive support from the leading Danish astronomer Elis Strömgren. It is also with Stömgren that he took a patent for a watch showing both mean and sidereal time (patent 22822 of February 11, 1918).

In 1934, the clockworkers' guild created a committee in order to raise money for the construction of Olsen's clock.

In 1943, 100000 Danish Kroner were given by the Employers' Union for the construction of the clock, and later money was raised among craftsmen. The clock became a national project. Olsen and the engineer Axel Flint made drawings of all the parts of the clock, collaborators were hired and the Technological Institute provided a workshop for the construction.

In 1944, Olsen's only son Martin died from a stray German bullet. In March 1945, his wife died.

In 1945, 11 of the 12 mechanisms of the astronomical clock had been completed when Olsen had to go through surgery and died on November 17. The clockworker Otto Mortensen (1900-1973) then took over the direction of the project.

The case of the clock was designed by one of Denmark's great architects, Gunnar Biilmann Petersen (1897-1968).

Finally, in 1955, all the 15448 elements of the clock were assembled. The clock was started on December 15, 1955, by King Frederik IX and Olsen's granddaughter Birgit Olsen.