

Romain Gauthier

THE EVOLUTION OF TRADITION

LOGICAL ONE by ROMAIN GAUTHIER

Constant force for the 21st century



Logical One features a triple patent-pending Romain Gauthier flat chain-and-fusee style constant force system with ruby chain links, ergonomic push button winding system, dial-side visible balance, mainspring barrel with sapphire inserts, plus a 60-hour power reserve indicator.

'Coming from an engineering background, it appeared strange to have a high precision machine forced to run at varying power levels. So I started with the premise that it would be better to have constant energy.' Romain Gauthier

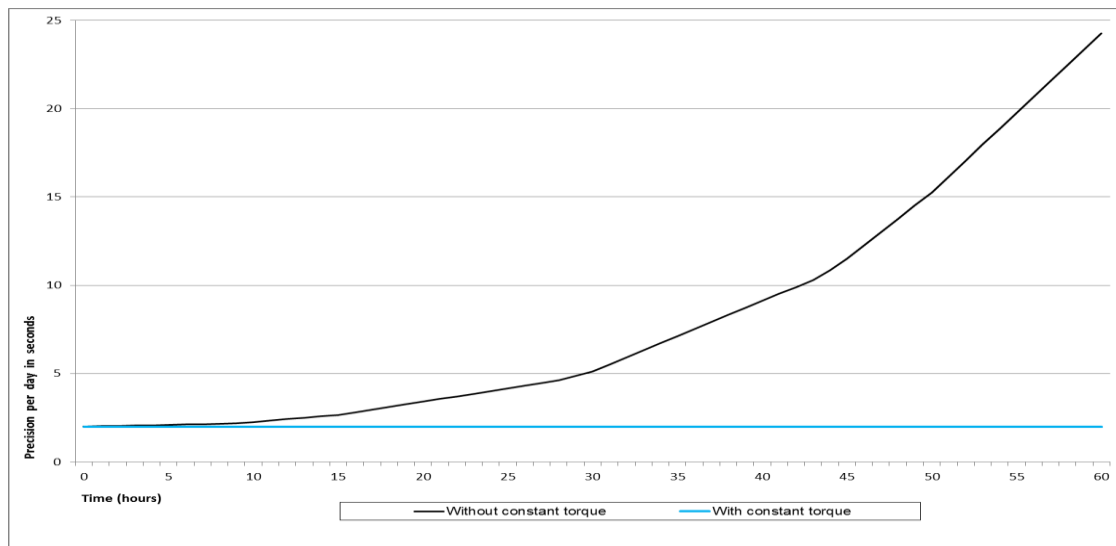
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Constant force

The vast majority of machines run on constant force: Cars and planes don't start running slower as fuel runs low and machines receive the same voltage no matter how much electricity is produced.



Both lines on the graph above represent a 60-hour power reserve

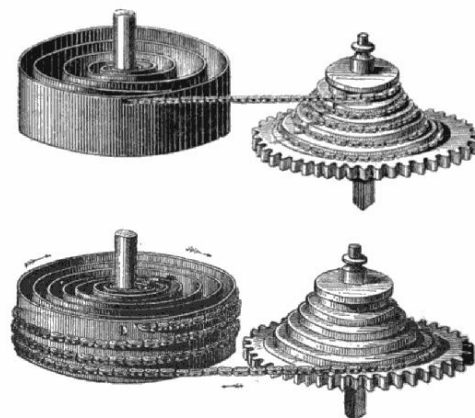
Yet the power that runs and regulates the vast majority of high precision mechanical timepieces varies greatly according to the state of wind of the mainspring.

Constant force is one of the holy grails of horology and with Logical One, Romain Gauthier has reinvented the chain-and-fusee – one of the oldest and most traditional methods of supplying constant force to a watch/clock movement – making it both more reliable, more effective ... and more constant.

Traditional chain and fusee

A fusee ('fusée' is French for cone) is a cone-shaped pulley wound with a cord or chain that is attached to the mainspring barrel.

Fusees have been used since 15th century to improve timekeeping by compensating for the diminishing torque/power of the mainspring as it ran down.



Fusee (the cone-shaped pulley on right) with chain

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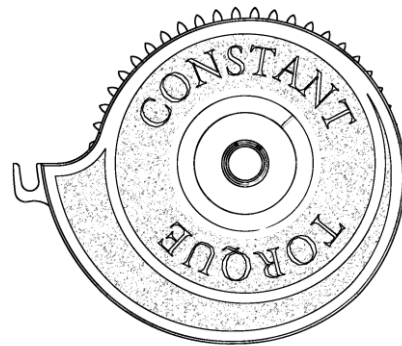
The first fusees used fine cord; however, as technology enabled the manufacture of ever-smaller chains, these replaced cords because chains transmit power more efficiently. But the traditional chain and fusee has two inherent problems:

1. The multiple layers of chain (often eight turns) on the fusee mean that the individual links have to be small, which means that they are relatively weak.
2. The chain is often transmitting force between the fusee and mainspring barrel at an angle, which is both inefficient and adds stress.

Replacing the fusee with a snail cam

Romain Gauthier solved both problems by replacing the fusee with a slowly rotating snail cam, which is situated at 10 o'clock to the left of the hour/minutes dial.

As the snail cam and mainspring barrel are on the same level, the force is always transmitted in a straight line and, as only one short line of chain is needed, the links can be bigger and stronger.



Ruby chain (patent pending)

To further improve efficiency, Romain Gauthier has taken full advantage of the larger chain links by making the links in low-friction hard-wearing synthetic rubies.

And there is yet another innovation in the construction of the chain itself.

Romain Gauthier has replaced the traditional method of joining chain links, by placing a fine sheet of paper between the links and connecting plates, riveting them together and burning the paper away to create a fine (though imprecise) tolerance, with a snap clip system that offers high-precision, simplicity, reliability and consistency.



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Winding with ergonomic pusher

Winding Logical One is a pleasure thanks to Romain Gauthier's innovative push button winding system, with the pusher set neatly into the left caseband.

While the push-to-wind system is a pleasure to use, its advantages are not only ergonomic and aesthetic, but based on sound engineering principles.

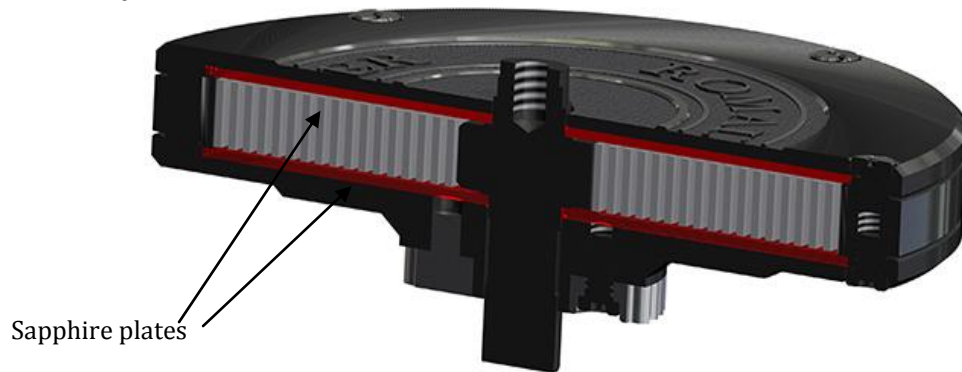
A traditional crown is relative small with a fine (relatively fragile) stem that has to transmit the force 90° between the crown to the mainspring barrel. The pusher to wind Logical One transmits force to the barrel on the same plane.

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Mainspring barrel with sapphire lining

As the mainspring unwinds in a traditional brass barrel, the metal of the spring scratches the metal, even when freshly greased. Over time, grease clots, scratches get rougher, the barrel sticks to the spring and does not rotate smoothly.



To eliminate this potential source of uneven friction, Romain Gauthier has placed mainspring of Logical One between synthetic sapphire plates. Sapphire has the ideal properties of having a low coefficient of friction with steel – why watch movements have ruby bearings – and is highly scratch resistant – why it is used for watch crystals.



A world of details

- Bespoke gear wheels with graceful circular arms for maximum rigidity
- Special power-process hand frosted bridges
- High efficiency gear teeth profile (patent pending)
- Polished screw heads with distinctive S-slot for more length/less slip
- Balance wheel with curved arms and calibrated eccentric weights
- Triangular pallet lever (Romain Gauthier invention) for improved rigidity.

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Movement & finishing

The movement for Logical One was entirely conceived, developed, designed, produced, decorated, assembled and regulated by Manufacture Romain Gauthier.

Highly polished sharp internal bevelled angles in the movement plates and bridges are the hallmark of superlative hand finishing because, to date, machines are not capable of milling and polishing sharp internal bevels. With Logical One, Romain Gauthier has gone a step further still in creating double-angle bevels with sharp internal angles, which give the effect of border.



This distinctive eye-catching hand finish, created by using a two parallel bevels, has a similar effect to that of a frame around a beautiful painting, in that the frame highlights the artwork within.

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Logical One Technical Specifications

Features: hours, minutes, small seconds, 3-day power reserve, push-button winding and innovative chain-and-fusee style constant force system

Case and strap

Case materials: red gold or platinum

Movement plates and bridges: titanium, stainless steel, brasst

Dimensions: 43mm x 14.2mm

Water resistance: 50m / 5 atm / 150'

Sapphire crystal with anti-reflection coat front and display back

Winding by push button at 9 o'clock

Time-setting crown with sapphire cabochon at 2 o'clock

Strap and buckle: alligator leather hand-stitched in Switzerland with pin buckle in metal to match the case.

Movement

In-house manufacture movement calibre

Dimensions: 35.5mm x 10.5mm

Power reserve: 60-hours

Number of jewels: 30 in movement, 34 for chain

Number of components: 333

Balance frequency: 28,800 bph / 4Hz

Highest level *haute horlogerie* finishing, including hand polished screws and jewel countersinks; hand bevelled and polished bridges and plates.

Three patents pending

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Romain Gauthier profile

Romain Gauthier was born in 1975 in Le Sentier, in the picturesque Vallée de Joux, at the heart of fine Swiss watchmaking. It was there that he developed a passion for traditional haute horlogerie blended with clean, contemporary design and innovative micro-engineering. After studying precision-mechanics, Romain gained a diploma as a constructor of precision machinery. In 1997, he started his first job as machine programmer/operator and over the following years, Romain managed and grew the department into one of the best - equipped and most efficient production facilities in Europe.

Determined to create his own watch brand, Romain completed an MBA in 2002. His final thesis – passed with distinction – was the business plan for Montres Romain Gauthier. He then began work on the timepieces themselves. *"I knew that a good movement was the basis of everything I planned to build, so I started with that."* In 2005, after three years of working in secret, Romain launched his brand in Baselworld 2007 with the Prestige HM, featuring his own in-house manufacture movement. The Prestige HMS followed in 2010 and Logical One in 2013.

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