**LOGICAL ONE**

**A** **paragon of elegant, high-precision, fine Swiss watchmaking**

Romain Gauthier’s award-winning timepiece, Logical One, features a revolutionary, friction-minimising ruby-link chain, together with snail cam and sapphire-lined mainspring barrel to offer nearly two days of constant force – the holy grail of precision watchmaking.

Its beautifully hand-finished, multi-patented in-house movement can be appreciated dial side and through the display back, and is wound using an ergonomic winding pusher integrated into the caseband. Hours, minutes, small seconds and a 46-hour power reserve indicator on the back make up the displays of this timepiece – a paragon of elegant, high-precision, fine Swiss watchmaking.

*“When I designed Logical One, I worked from the premise that for a precision watch to be truly precise, it should have constant energy,”* says Romain Gauthier*. “However, I didn’t want to create a constant-force movement that remained hidden. I wanted this mechanism to be part of the dial, on show, in all its glory.”*

Logical One’s pioneering in-house movement features Romain Gauthier’s 21st-century reinterpretation of a traditional chain-and-fusee style constant force mechanism, on display to the left of the hour-minute subdial.

Gauthier’s invention contains an innovative snail cam connected to the mainspring barrel by a ruby-link chain. With the snail cam and mainspring barrel configured so they are ‘flat’ – i.e. on the same plane – force is transmitted in a straight line for an ultra-efficient transfer of energy. The relatively short length of the chain allows it to contain strong, generously sized links in steel featuring rollers made from low-friction, hard-wearing synthetic rubies. The chain is joined together via a smart snap-clip system.

To eliminate potential uneven friction within the mainspring barrel, Gauthier has placed the mainspring between synthetic sapphire plates. Sapphire has a low coefficient of friction with steel making it the ideal material to use.

Winding Logical One is a veritable tactile pleasure thanks to Romain Gauthier’s innovative push button winding system, with the pusher set into the caseband at 9 o’clock. Another demonstration of Gauthier’s clever engineering, the pusher efficiently transmits force to the barrel on the same plane. That the pusher protrudes just slightly from the caseband and follows the curve of the case is an aesthetic tour de force.

Virtually every component of the movement bears Romain Gauthier's distinctive touch: The highly visible balance wheel with curved arms and calibrated eccentric weights; the curvaceous balance bridge; bespoke gear wheels with graceful circular arms for maximum strength; hand-decorated bridges; high-efficiency profiles of the gear teeth; polished screw heads with s-slot for more length; and Romain Gauthier-invented triangular pallet lever for maximum rigidity. All these elements can be admired dial side.

More of the movement can be viewed through the display back. Bridges feature polished, rounded bevels that have been meticulously created by hand as well as hand-polished jewel countersinks. As many as 90 hours have been devoted to decorating the movement – even those components that are not on show.

So accomplished is it that Logical One was awarded the prize for Best Men’s Complication watch by the jury of the 2013 Grand Prix d'Horlogerie de Genève – the Oscars of watchmaking.

**LOGICAL ONE IN DETAIL**

**Constant force – the holy grail of precision watchmaking**

The majority of machines run on constant force: Cars and planes don’t start running more slowly as fuel runs low and machines receive the same voltage no matter how much electricity is produced. Yet, the power that runs and regulates most high-precision mechanical timepieces varies greatly according to the state of wind of the mainspring. Constant force, or constant torque, is one of the holy grails of horology and with Logical One, Romain Gauthier has reinvented the chain-and-fusee − one of the oldest methods of supplying constant force to a horological movement − making it more reliable, more effective… and more constant.

**Traditional chain-and-fusee**

A fusee is a cone-shaped pulley wound with a cord or chain that is attached to the mainspring barrel. Fusees have been used since the 15th century to improve timekeeping by compensating for the diminishing torque/power of the mainspring as it runs down. The first fusees used fine cord but as technology enabled the manufacture of ever-smaller chains, chains replaced cords because they transmit power more efficiently. Yet, the traditional chain-and-fusee suffers from 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 they are quite weak. 2. The chain is often inefficiently transmitting force between the fusee and mainspring barrel at an angle.

**Romain Gauthier’s 21st century interpretation of the chain-and-fusee**

Romain Gauthier has solved these problems by replacing the fusee with a slowly rotating snail cam, placed to the left of Logical One’s hour-minute subdial. With the snail cam and mainspring barrel on the same level, the force is transmitted in a straight line. Since only a short line of chain is needed, Gauthier has made the links bigger and stronger than the chain found in a traditional chain-and-fusee.

**Friction-minimising ruby rollers and snap-clip chain system**

To further improve efficiency, Gauthier has made the chain rollers out of low-friction, hard-wearing synthetic rubies. The time-honoured method of joining chain links is by placing a thin sheet of paper between the links and connecting plates, riveting them together and burning the paper away to create a fine, though imprecise, tolerance. Romain Gauthier has bettered this method by inventing a snap-clip system of links in steel that offers precision, reliability and ease of servicing.

**Ergonomic winding pusher**

A traditional crown is quite small with a fine, relatively fragile stem that has to transmit the force 90° from the crown to the mainspring barrel. Logical One’s pusher, on the other hand, efficiently transmits force to the barrel on the same plane. It also feels great to use and aesthetically complements the curves of the case.

**Mainspring barrel with sapphire lining**

As the mainspring unwinds in a traditional brass barrel, the metal of the spring scratches the metal of the barrel, even when freshly greased. Over time, grease clots, scratches get rougher and the barrel sticks to the spring, meaning it no longer rotates smoothly. To eliminate this potential source of uneven friction, Romain Gauthier has placed the mainspring of Logical One between synthetic sapphire plates. Sapphire has the ideal properties of having a low coefficient of friction with steel and is highly scratch resistant.

**In-house developed movement and superlative hand finishing**

Logical One’s movement was conceived, developed, produced, decorated, assembled and regulated at Manufacture Romain Gauthier. The spectacular decoration includes hand-created and hand-polished bevels, hand-frosting, snailing, straight-graining, circular-graining as well as hand-polished jewel countersinks.

**LOGICAL ONE BY ROMAIN GAUTHIER: WHITE GOLD – RED GOLD – PLATINUM**

**Technical Specifications**

**Editions**

18k white gold case with 4.5N rose gold-treated movement

18k red gold case with NAC-treated movement – 20-piece limited edition

950 platinum case with palladium-treated movement – 20-piece limited edition

**Features and indications**

Hours, minutes, small seconds; 46-hour power reserve indicator; push-button winding; innovative chain-and-fusee style constant force system featuring snail cam and ruby-link chain

**Dial and hands**

Oven-fired white enamel dial on an 18k gold base complemented by flame-blued steel hands, or

Oven-fired black enamel dial on an 18k gold base complemented by 18k gold hands, or

Blackened brass dial featuring clous de Paris guilloche complemented by 18k gold hands

**Movement and finishing**

Dimensions: 35.5mm x 10.5mm

Power reserve: 46 hours

Number of jewels: 63 in total, including 26 for the constant-force chain

Number of components: 359

Balance frequency: 28,800 vph / 4Hz

Movement components in: steel, stainless steel, beryllium copper, brass, titanium and German silver

4 patents: The specific composition and construction of the chain; the constant force system; the push-button winding system; and the high-efficiency profiles of the gear teeth

Finishing: Highest-level *haute horlogerie* finishing

**Case**

Dimensions: 43mm x 14.2mm

Water resistance: 30m/3atm/100ft

Sapphire crystal with interior anti-reflection coating, front and display back

Crown for time setting at 2 o’clock

Push button for winding at 9 o’clock

**Strap and buckle**

Alligator leather strap hand-stitched in Switzerland with red gold pin buckle where case is red gold, and white gold pin buckle where case is white gold or platinum