F.P.JOURNE
Invenit et Fecit

User manual - Tourbillon Souverain

A unique design, based on an exclusive mechanism

English

Tourbillon Souverain
The Quest for precision_

"From ancient times, humankind has constantly attempted to measure time by dividing it into equal fractions and inventing the notion of isochronism! Only with the arrival of the first mechanical clocks did specialists begin to seek a means of equalising the force reaching the escapement. The balance-spring did not yet exist and the so-called "foliot" balance had an irregular beat due to the arrival of a force varying because of the imperfections of the gearing. At the time, clocks were equipped with just one hand which completed a revolution once every 12 hours, since their degree of imprecision did not permit the measurement of minutes. After the invention of the mainspring, which would enable the construction of table-clocks, 15th century watchmaker Jobst Bürgi had the idea of adding an extra gear representing an independent system wound in short spurts by the mainspring. The escapement thus ensured a more constant flow and enabled an autonomy of several months: this was the first remontoir or constant-force device!

Later, 17th century Dutch watchmaker Christiaan Huygens invented the balance-spring and the pendulum. These innovations would give both clocks and watches an unprecedented degree of precision timekeeping: the minute hand became widespread and the constant-force device fell into oblivion for around a century. With the arrival of the 18th century, known as the Age of Enlightenment, the high requirements relating to astronomical observations and calculations of longitude for maritime navigation called for ever higher levels of precision. As new technical solutions were found, the seconds hand became a common feature on watches of the period. In England, Thomas Mudge invented a constant-force device for his marine chronometers, while famous French watchmaker Robert Robin "Watchmaker to the King" also invented one for his precision regulators. Paradoxically, it was in the 19th century that the constant-force device became widely used in the construction of clocks intended for buildings not to remedy any flaws in the springs (since all these clocks ran by driving-weights), but to isolate the time mechanism from the outside hands. This was because the latter were exposed to strong winds and might disturb the mechanism.

Nonetheless, making a constant-force device was a complex and tedious task, causing it to be almost entirely abandoned in the 20th century, apart from a few rare exceptions: English watchmaker George Daniels used it in a tourbillon pocket-watch; his contemporary Anthony Randall built it into a table-clock based on the principle of John Harrison's H4; and I myself have incorporated it into three tourbillon pocket-watches, a so-called "sympathique" clock and more recently for the very first time in wristwatch form with the first model in the F.P.Journe "Invenit et Fecit" collection, the Tourbillon Souverain.

What is fascinating in the principle of the constant-force device is that each watchmaker who has set out to build one has his own personal interpretation: only the basic idea remains the same."

Dead beat second or the art of stopping time

Towards the late 17th century, as clocks were becoming increasingly accurate, watchmakers added a hand to measure the seconds. These clocks (horloges in French) which became known as pendulum clocks (pendules), thanks to the invention of the pendulum balance by Dutch watchmaker Huygens, were almost naturally equipped with a 1-metre long balance, with a period of 1 second. The dial was divided up into 60 subdivisions to enable the hand to jump from one second to the next.

When the first watches indicating the seconds were made, a few 18th century watchmakers wanted to create the same visual effect as on pendulum clocks. To achieve this, they invented systems that extended the period of the balances: the best-known are the crown-wheel escapement with pendulum or the very large balance created by Mr.Pouzait. Nonetheless, these systems were quickly abandoned, since they were detrimental to precision. Thus, without any additional system, the hand began to beat half-seconds, the frequency most commonly used at the time. The extremely easy read-off of time provided by a hand beating off the second, and which did not move during this second, gave watchmakers new ideas in the 19th century.

Three so-called “dead beat seconds” systems became widely used:

_**The first:** composed of a small additional gear-train activated by a spring that was wound at the same time as the main spring and carrying the seconds hand, was released each second by the watch escapement. This system, referred to as “independent seconds” offered the advantage of not disturbing the precision of the watch and could be stopped at will by the user.

_**The second:** composed of an additional gear-train connecting the escape-wheel to an additional fourth wheel (for the seconds) equipped with 60 teeth held by a spring, which was very rudimentary, had extremely adverse effects on precision.

_**The third:** an escapement known as a “single-beat escapement” waited for the balance to complete two oscillations before moving the escape-wheel forward every second. These escapements were commonly used in watches made for China, since in terms of Chinese philosophy, this corresponded to stopping time, meaning that the latter no longer had any power on the wearer, and was thus mastered….

Finally, today, the Tourbillon Souverain is fitted with a natural dead beat seconds system, which is mounted on one of the wheels of the remontoir or constant-force device, and can thus in no way affect the precision of my watch.

The first tourbillon wristwatch with constant force device and dead beat second

The Tourbillon Souverain à seconde morte is the worthy heir to my very first passion for a watchmaking complication: the tourbillon. It was while I was an apprentice watchmaker working for my uncle that I became fascinated by this complication, at a time when it was far from being well-known and commercialised among the public at large! I dreamed of owning a specimen but could not afford one and so decided to… make one. I was twenty years old at the time and spent all my free time creating this first pocket-watch with tourbillon and constant-force device. It was completed in 1982.

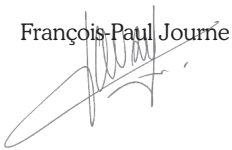
It is important to resituate this approach in a period when quartz watches had gained supremacy over mechanical watches. One might legitimately consider that only a dozen or so clients worldwide were potentially interested in buying a tourbillon. Indeed, Englishman George Daniels was one of the only watchmakers to actually make tourbillon models at the time.

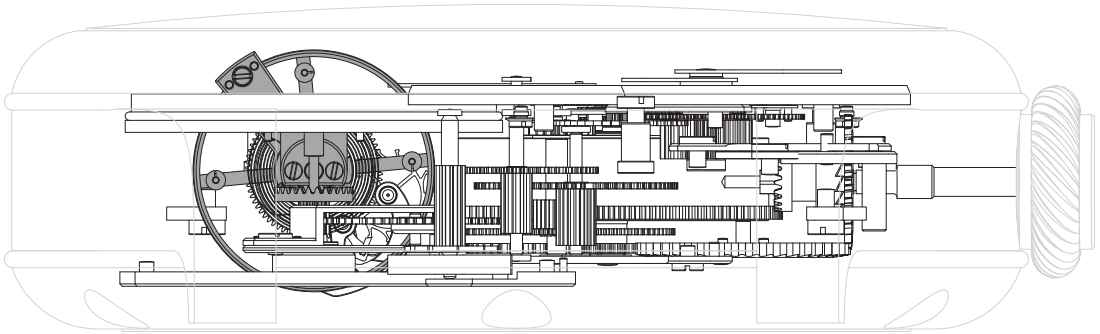
In the Tourbillon Souverain workshops, the watchmakers' intense concentration imposes absolute silence. Assembling and entirely dismantling the mechanism before achieving the desired result is a daily exercise. Since the tourbillon is already made up of over 60 parts, each gesture calls for extreme dexterity and tireless perseverance.

In 1991, I presented my first watch to the public bearing the signature F.P. Journe, it was featuring a tourbillon with remontoir d'égalité (constant-force device). When eight years later in 1999, I launched my own brand F.P. Journe "Invenit et Fecit" with a first collection of wrist chronometers, the first model had to be a Tourbillon. Representing the first model in the Souveraine collection, the Tourbillon Souverain offered the exclusivity of a wristwatch with remontoir d'égalité (constant-force device). Although it had become a bestseller for F.P. Journe, I decided to stop producing it in 2003 in order to offers my clients the luxury of rarity. I presented a new and even more sophisticated version of the Tourbillon Souverain, the Tourbillon Souverain à seconde morte, a model embodying the quintessence of a watchmaker's maturity.

This new model features all the characteristics and technical demands inherent to a watch by F.P. Journe: It improves the general running of the watch; its mechanism revives the definition of the tourbillon patented in the 18th century by Abraham-Louis Breguet, (†1823). I combined it with a constant-force device capable of supplying the tourbillon with the same energy for a full 42 hours so as to ensure that the frequency of the balance remains isochronous; and it is also equipped with a patented deadbeat seconds system. This unique complication within a wristwatch ensures a more precise read-off of time. The expression "deadbeat seconds" stems from the fact that the hand remains motionless (as if dead) so long as the second has not elapsed.

François-Paul Journe





A New Tourbillon Souverain to Celebrate the 20th Anniversary of the Tourbillon Souverain

The innovative and revolutionary horological creator François-Paul Journe has inspired a generation of contemporary watchmakers with the originality of his creations, his quest for precision, his timeless and immediately recognisable style, and his respect for horological ethics and traditions.

Fascinated by the tourbillon since his youth, François-Paul Journe began to make his first watch when he was 20 - entirely by hand. It was a tourbillon pocket watch. In 1991, he created his first tourbillon wristwatch, selling the very small number of examples to a handful of knowledgeable collectors. In 1999, he launched the first Tourbillon Souverain with remontoir d'égalité in wristwatch form. It was sold by subscription and was much sought-after by collectors who rival with each other to get on the short list of 20 examples.

The year 2003 saw the birth of the new generation of Tourbillon Souverain, to which François-Paul Journe added natural deadbeat second. Then, to make the watches even more desirable, he produced his haute horlogerie movements in 18k rose Gold, a first in the world of modern mechanical watchmaking.

To celebrate the 20th anniversary of this emblematic wristwatch, F.P.Journe has developed a tourbillon whose cage is vertical, rather than the traditional horizontal cage. "I designed this vertical tourbillon so that the tourbillon's functions remain constant whether the watch lies flat or is placed on its side, and the amplitude is consequently the same, whether the watch has a deployant clasp and lies on its side or an ardillon buckle and lies flat".

This vertical tourbillon with remontoir d'égalité and deadbeat second makes one revolution every 30 seconds. This is faster than the usual time of one minute, making the technical prowess even more visually astonishing. Surrounding the cage, a cone-shaped mirror-polished ring concentrates light, reflecting the tourbillon cage. A second reflector was created on the movement side to provide light around the tourbillon cage. The 4N rose Gold bridges that form the dial are decorated with "Clous de Paris" guilloche with, for the first time, an enamel hour dial at 3 o'clock. The Tourbillon Souverain also features an 80-hour power reserve at 12 o'clock and small seconds at 6 o'clock; the remontoir d'égalité is placed at 7 o'clock. The 42 mm case is available in platinum or in 18k 6N Gold.

Crown_

Winding:
Keep the crown on position **1** and turn forwards until it stops.

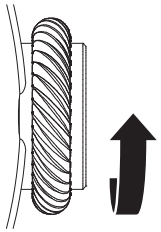
The Tourbillon Souverain has a power reserve of 42 hours. During this time, the remontoire mechanism supplies constant force to the tourbillon escapement. The Tourbillon Souverain may nevertheless continue working longer than 42 hours, but in this case, the constant force is not considered as effective. **That is why a full winding is imperative, until the crown stops, to recover the spring's total force**.

As in antique marine chronometers, the power reserve indicator shows the number of hours elapsed since the watch was last wound.

Setting the time:
Pull the crown out to position **2** and turn towards you to set the correct time.
It is strongly recommended not to turn the hands anti-clock wise.

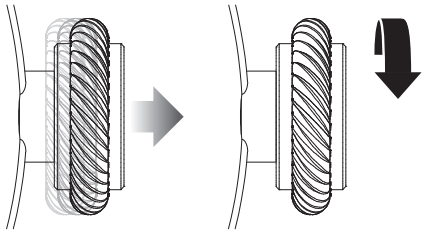
Please note!
Push the crown back to position **1** for the watch to work.

1

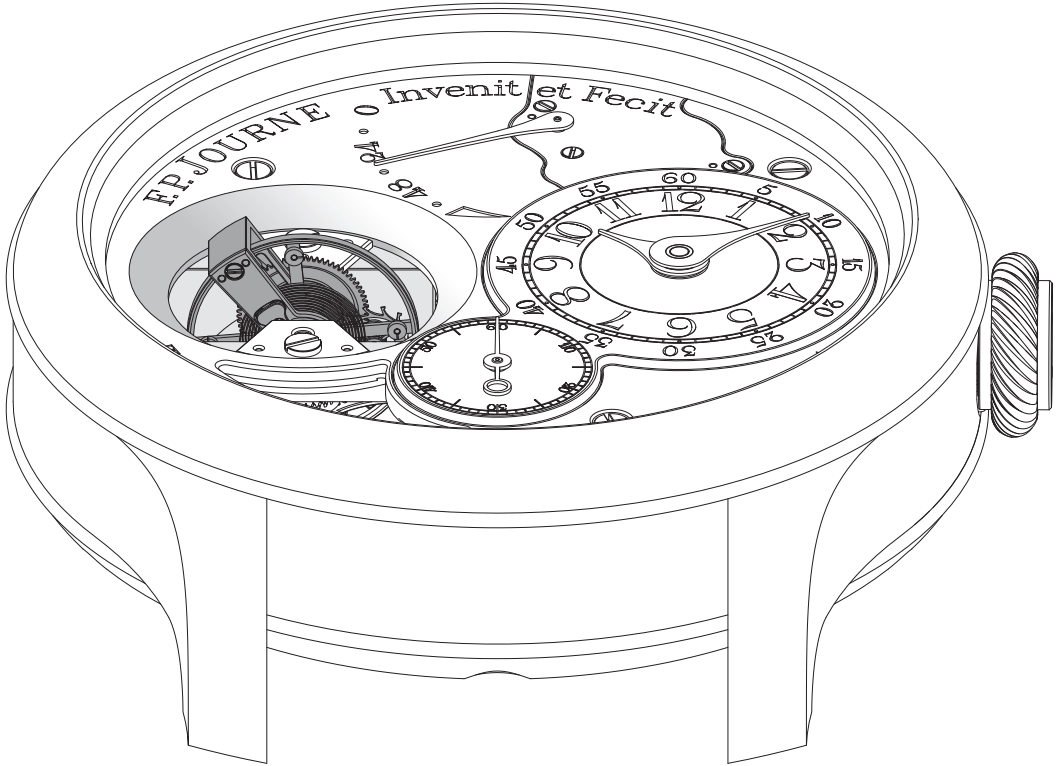


Position
Winding

2



Position
Time setting


F.P.JOURNE
Invenit et Fecit

Tourbillon Souverain

_Unique patented constant force device mechanism

Two key technical developments have enabled F.P. Journe to construct the Tourbillon Souverain.

_Constant Force Device

Making a constant-force device was a complex and tedious task, causing it to be almost entirely abandoned in the 20th century, apart from a few rare exceptions. F.P. Journe has incorporated it into three tourbillon pocket-watches, a so-called “sympathique” clock and today for the very first time in a wristwatch form with the first model in the F.P. Journe “Invenit et Fecit” collection, the Tourbillon Souverain.

_Dead Beat second

The Tourbillon Souverain is fitted with a natural dead beat seconds system, which is mounted on one of the wheels of the remontoire or constant-force device, and can thus in no way affect the precision of the watch.

_Movement

The movement is manually wound, with base-plates and bridges in 18K rose gold. The free-sprung balance, with variable inertia adjustment on four opposing weights, oscillates at 21’600 v/h.

Tourbillon with constant force mechanism

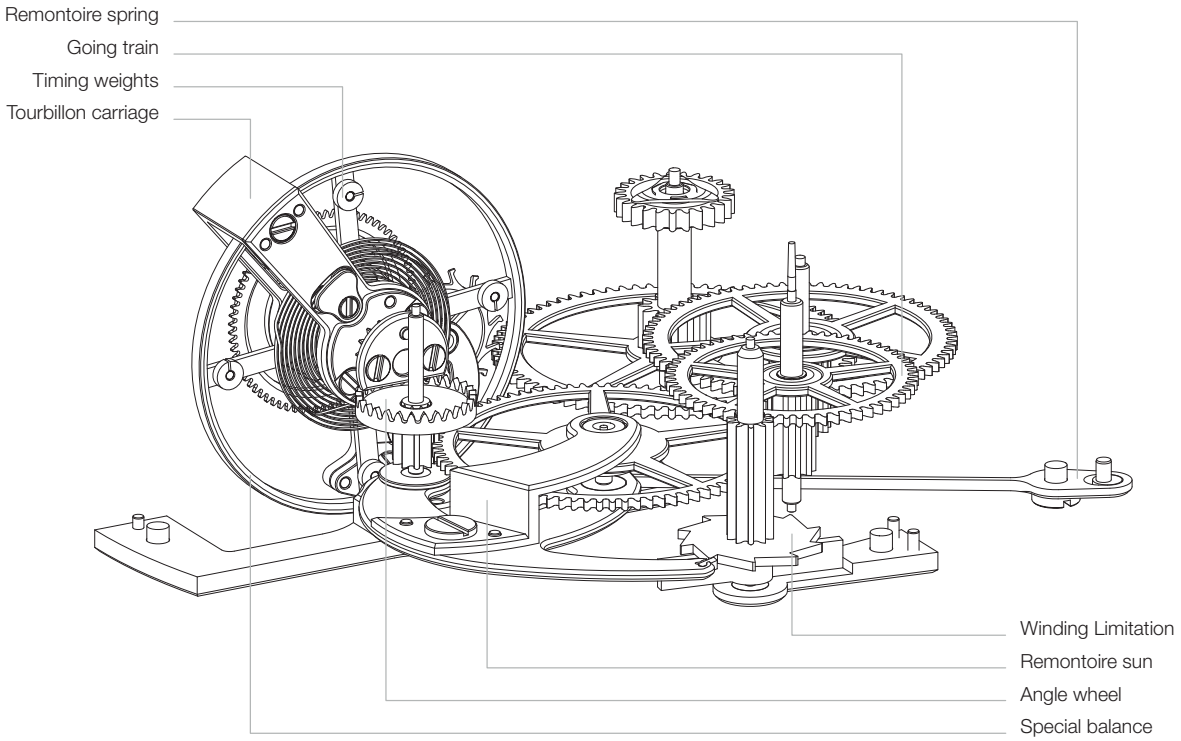
Patented system_

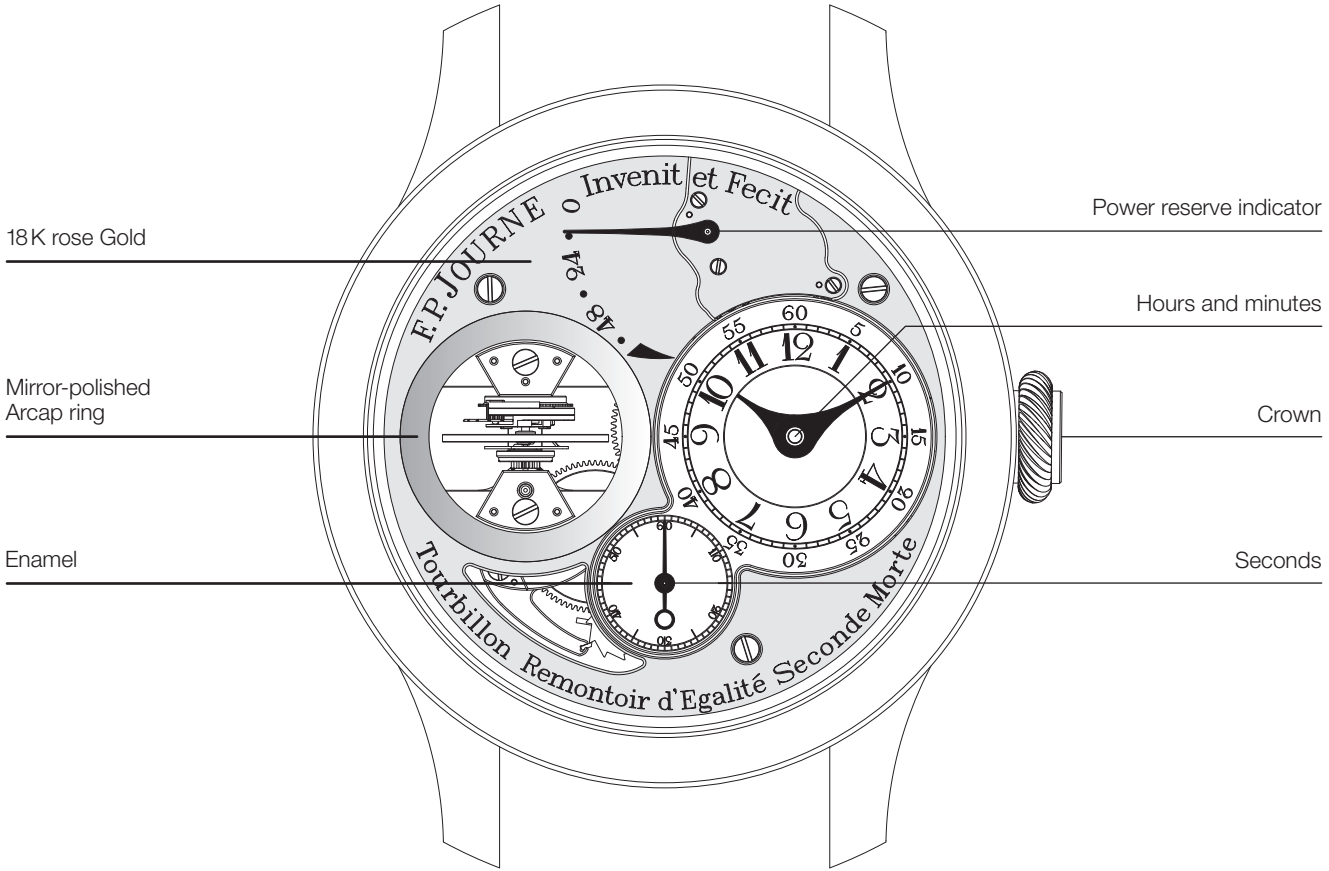
Remontoir mechanism_

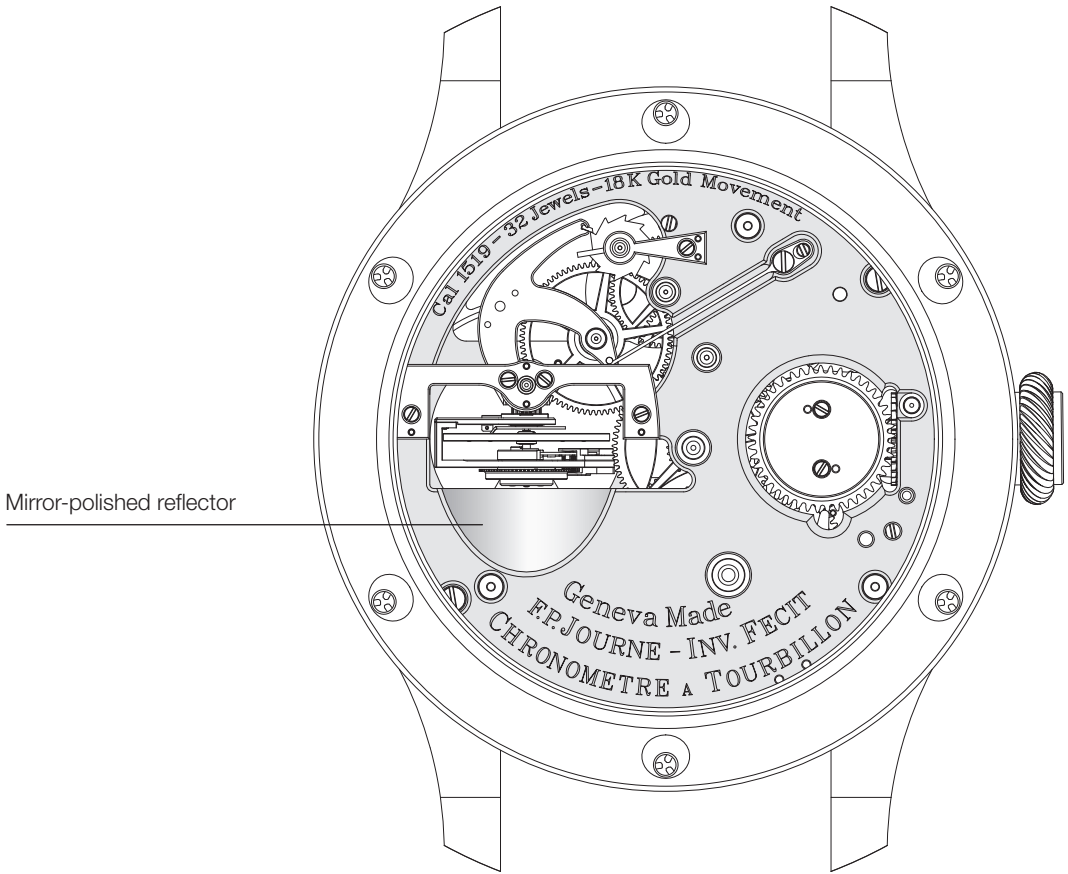
The coaxially pivoted remontoire sun and planet gearing is controlled by the remontoire spring, itself rewound once every second by the main spring. The remontoire ensures the isochronism of the Tourbillon's escapement for 42 hours.

The Tourbillon Souverain has a special four-arm balance fitted with timing weights for fast/slow adjustement. It has been carefully timed in our workshops to beat with a frequency of 21600 alt/hour. The concentric development of the spiral is given by a "Philips" type terminal curve.

This meticulous setting is done exclusively in our workshops and cannot be modified by a third person.


Remontoire spring
Going train
Timing weights
Tourbillon carriage
Winding Limitation
Remontoire sun
Angle wheel
Special balance


18 K rose Gold
Mirror-polished Arcap ring
Enamel
Power reserve indicator
Hours and minutes
Crown
Seconds
F.P. JOURNE
Invenit et Fecit
Tourbillon Remontoir d'Egalité Seconde Morte


Cal. 1519 – 32 Jewels – 18K Gold Movement
Geneva Made
F.P. JOURNE – INV. FECIT
CHRONOMETRE A TOURBILLON
Mirror-polished reflector

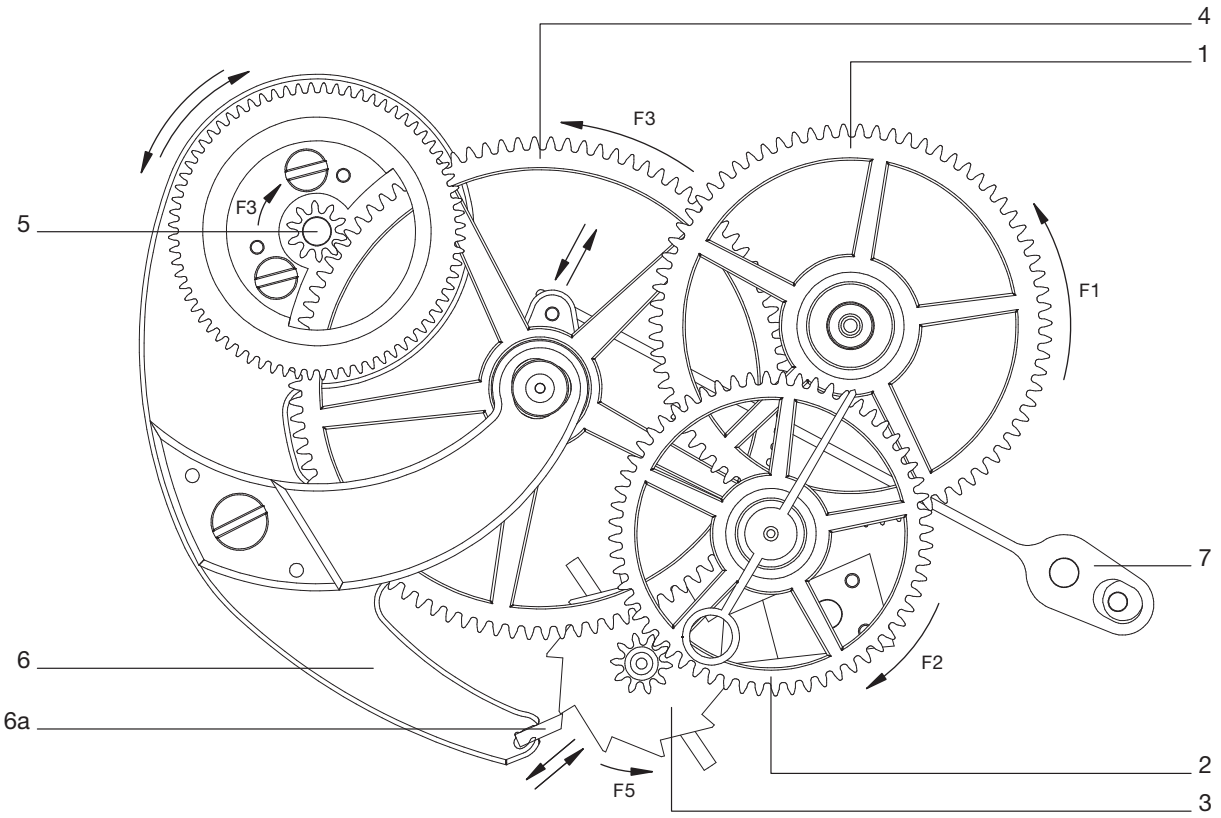
Movement_	Calibre 1519 Manual winding / 29 turns of crown 18K rose Gold	
Dimensions of the movement_	Overall diameter: Cased-up diameter: Overhall height: Height of winding stem: Diameter of stem thread:	34.60 mm 34.20 mm 10.86 mm 3.66 mm S1.20 mm
Balance_	4 inertia weights Flat Anachron balance spring with Philips overcoil Pinned stud Free-sprung Spring pinned to collet Pinned GE stud Frequency: Inertia: Angle of lift: Amplitude:	 21,600 V/H (3Hz) 11.00 mg/cm^2 52° 0h dial up: > 260° 24h vertical: > 260°
Main Characteristics_	30 seconds vertical tourbillon with constant force and dead second. Time adjustment by crown in position 2.	
Escapement_	15 tooth escape wheel 90° Anchor fork	

Indications_	Hours and minutes at 3h00 Small second at 6h00 Power reserve at 12h00 Vertical Tourbillon at 9h00	
Power reserve_	80 ± 2 hours	
Dial_	Movement in 18 K 4N rose Gold with hour dial in enamel on white Gold.	
Finishing_	High quality. Guilloche Clous de Paris on bridges. Circular Geneva Waves on base plate. Screw heads polished and bevelled. Pegs with polished rounded ends.	
Case_	Platinum PT 950 or 18K 6N Gold Diameter : Height :	 42 mm 13.60 mm
Number of parts_	Movement without dial : Cased on leather strap : Jewels :	230 260 32

1 **European patent** — EP 1 760 544 A1
Power reserve indicator device

2 **European patent** — EP 1 528 443 A1
Remontoir and deadbeat seconds

A storage device comprises a first second wheel (2), engaging with a mainspring, and a second seconds wheel (5), a setting wheel (4) for connecting the two seconds wheels (2, 5), a yoke (6) on which said setting wheel (4) is pivotably mounted, the pivot axis of this yoke (6) and that of the second seconds wheel (5) being coaxial, a stop wheel (3) kinematically linked with said first seconds wheel (2), a finger (6a) fixedly connected to said yoke (6), a storage spring (7) for exerting upon said yoke (6) a force tending to separate said finger (6a) from said stop wheel (3), whereas the force exerted upon said setting wheel (4) by said mainspring serves to press said finger (6a) against said stop wheel (3), so that the latter is wound to the point where a tooth of said stop wheel (3) abuts against said finger (6a).


4
1
F3
5
F3
F1
7
6
F2
6a
2
F5
3

Maintenance_

Your wristwatch should be thoroughly cleaned once **every 4 years** to maintain its precision!

Important_
Keep carefully the original warranty card supplied with your wristwatch. Your authorized **F.P. JOURNE** retailer will need this identity card for any after sales servicing. For all maintenance or repair, your wristwatch must be entrusted to an appointed **F.P. JOURNE** agent.

Warranty_

Your **F.P.Journe - Invenit et Fecit** watch is covered by a warranty against any manufacturing flaws for a period of **2 years** as of the date of purchase appearing on the back of the warranty card or certificate. The warranty is valid only on presentation of the original card or certificate, duly filled out by the authorised retailer (serial number, date of purchase, retailer's stamp). The warranty does not cover normal wear or damage resulting from abnormal use of the watch, accidents or alterations.

Warranty extension_
If your **F.P.Journe - Invenit et Fecit** watch was purchased at an **F.P.Journe Boutique**, your watch is automatically covered for a period of **3 years** as of the date of purchase appearing on the back of the warranty card or certificate. If your watch was purchased at an **authorized retailer**, we kindly invite you to register on **https://customerservice.fpjourne.com/en/guarantee** during the 30 days following the initial date of purchase to benefit from **an additional year of warranty**.