SONNERIE SOUVERAINE

OWNER'S MANUAL

F.P.JOURNE
Invenit et Fecit

Preface

THE SONNERIE SOUVERAINE GRAND-STRIKE CLOCKWATCH AND MINUTE-REPEATER

Full grand-strike functionality and operational safety protected by 10 patents

The grand-strike clockwatch is the most complex of horological creations. The greatest difficulty in its construction is to achieve full clockwatch capability from the limited energy in a wristwatch, without compromising on the sound and reliability of the chime.

In your watch, a single mainspring provides enough energy for 24 hours of grand strike (96 full chimes in passing), for the minute-repeater, and to keep the movement going for 48 hours. The chiming functions alone use up almost 60% of the mainspring's energy, and without the chime, the movement will run for five days.

Constructing this movement has been an exercise in minimising energy use by maximising mechanical efficiency. The result is a low-tension movement with gentle mechanisms that have to be very finely adjusted to ensure unfailing chimes 35,040 times a year.

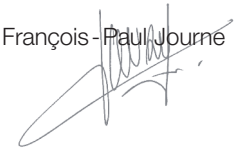
Operating a chiming watch has always been risky. If you do the slightest thing wrong, like setting the time while the chimes are ringing, you damage expensive mechanisms.

Thus, the first entry in my specification book for your watch was: "make it safe to use by an eight-year-old child." You will forgive me if you knew that the eight-year-old set me the toughest assignment of my career. To meet the demands, I had to construct a movement on new mechanical principles. In this piece, 10 patents underwrite the "invenit" of my watchmaking. "Fecit" took me five years.

I'd like your watch to make you feel you possess time itself, and therefore invite you discover how the illusion was created by exploring your new domain in this manual.

By naming your watch, you gave it a purpose, an identity and a soul. Thank you for being its guardian.

François-Paul Journe



Instructions

Crown

1 To wind and set your watch, first unscrew the crown. Wind the watch by turning the crown forwards until you feel resistance. The movement and the chimes, driven from a single spring, are wound together.

2 To set the time, pull the crown to position 2 and turn it to bring the hands to the right time. The chime is blocked while you set the time.

3 Note: the crown must be screwed in for the watch to work.

Repeater button – at 2 o'clock.

Activate the minute-repeater by pressing the button right down and releasing it. The repeater will chime the hours, quarters and minutes.

Strike select button – at 4 o'clock.

Select grand strike, small strike or silent by pressing the button.

G = Grand strike: chimes the hours on the hour and with each quarter.

S = Silent: the chime is stopped.

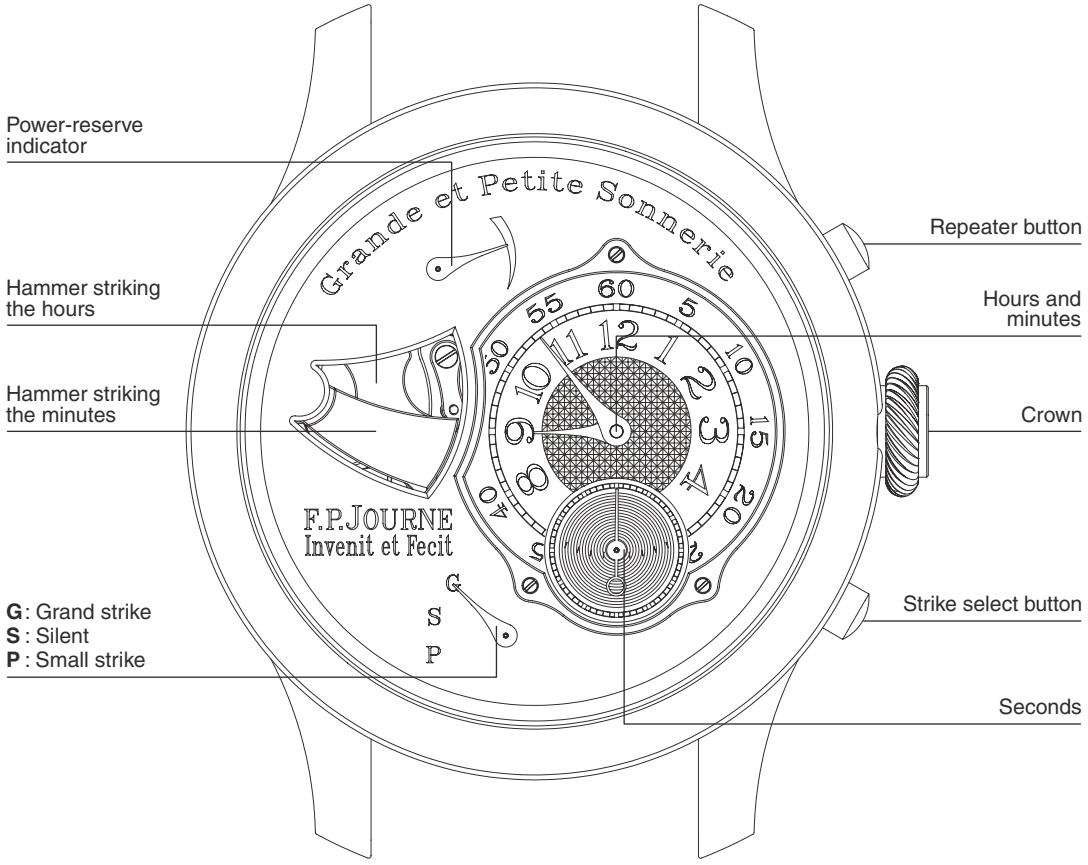
P = Small strike (petite sonnerie): omits chiming the hours with each quarter.

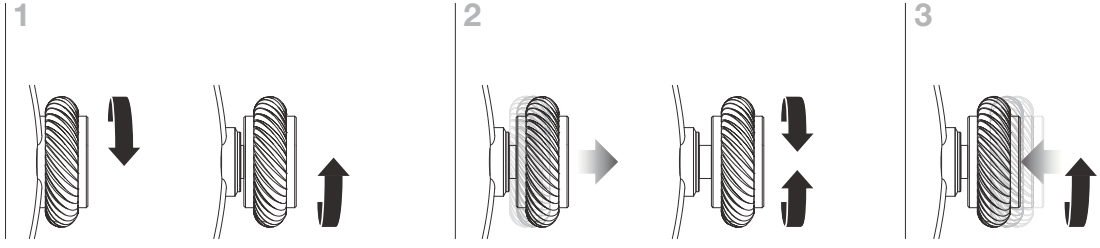
Power-reserve indicator

– This shows the total amount of energy available for the movement, the chime in passing and the minute-repeater. To prevent the chimes using all the energy and stopping the watch, they are blocked to reserve the last 24 hours of power for the movement alone.

– If the chimes are silenced, the fully wound watch will keep going for 120 hours.

INDICATORS AND CONTROLS





Specifications

MOVEMENT_		
	Calibre 1505	
	Manually wound	
	Gold baseplate and bridges	
	40 jewels	

MOVEMENT DIMENSIONS_		
	Overall diameter:	35.80mm
	Casing diameter:	35.00mm
	Frame height:	6.25mm
	Overall height:	7.80mm
	Height of stem axis:	3.41mm
	Stem-thread diameter:	S1.20mm

BALANCE_		
	Free-sprung	
	4 adjustment weights	
	Flat Anachron balance-spring	
	Fixed stud-holder	
	Pinned stud	
	Spring pinned to the collet	
	Frequency:	21,600 v/h (3Hz)
	Inertia:	11.00 mg/cm^2
	Angle of lift:	52°
	Amplitude:	Dial up, fully wound: > 340° Dial up, 24 hours: > 300°

ESCAPEMENT_	
	Linear escapement
	15-tooth escape-wheel

VISUAL INDICATIONS_	
Hours and minutes, off-centre	
Small seconds at 6 o'clock	
Power reserve	
Strike mode selection	
Striking hammers	

SOUND INDICATIONS_	
Grand strike, small strike on the quarters in passing	
Strike silent	
Minute-repeater on demand	

AUTONOMY_	
120 hours without chime	
Approx. 48 hours with grand strike	
Approx. 24 hours after strike runs down	

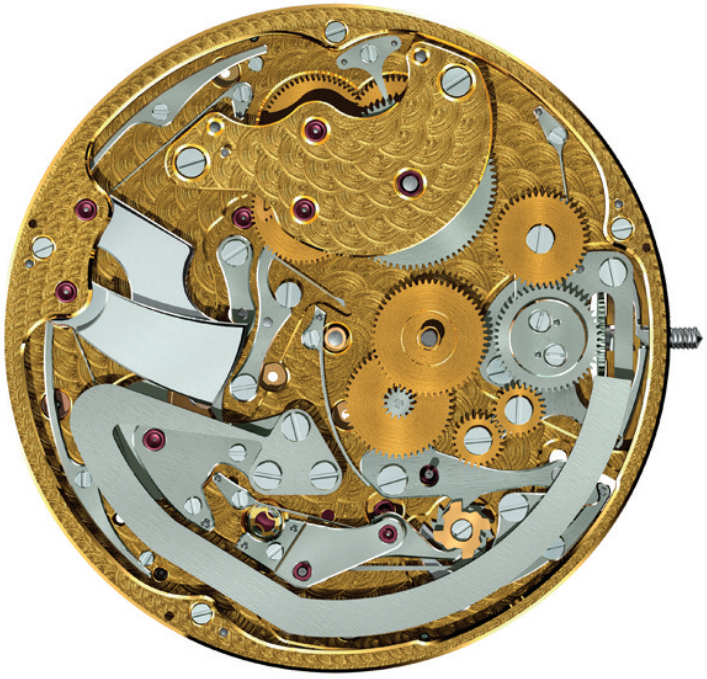
FINISH_	
Circular grained baseplates	
Circular ribbing on the bridges	
Polished and bevelled screws	
Pegs with rounded, polished ends	
Steelwork decorated by hand	
3D engraving	

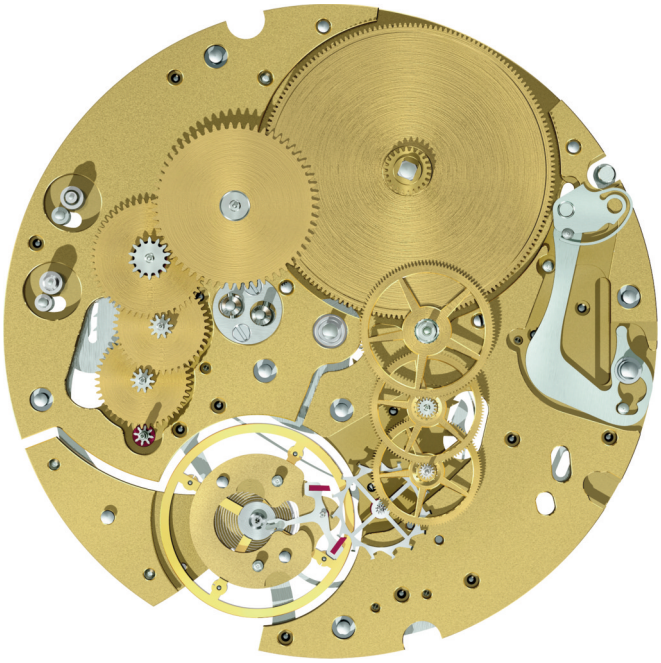
CASE_	
Steel	
Diameter:	42.00mm
Overall height:	12.25mm

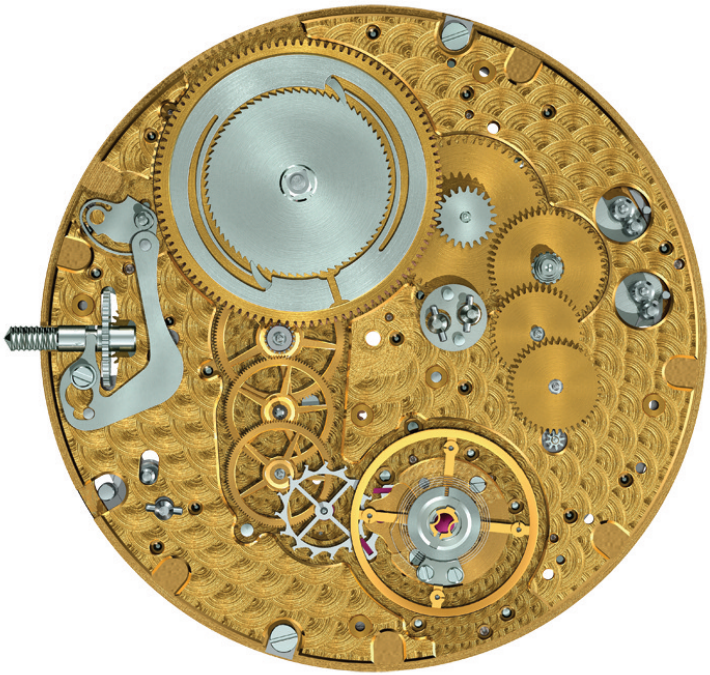
CONTROLS_	
Two position winding and setting crown	
Pushbutton to release the minute-repeater at 2 o'clock	
Pushbutton to select the strike mode at 4 o'clock	

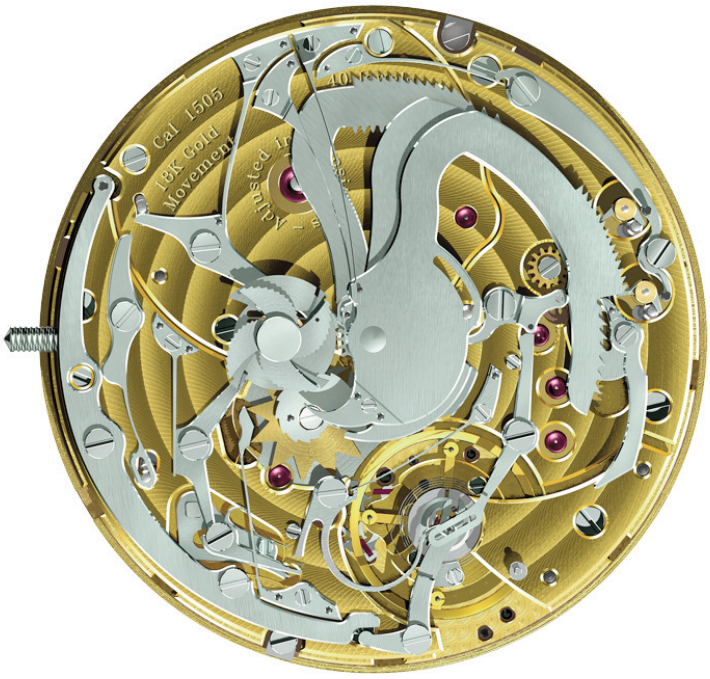
NUMBER OF PIECES_	
Movements without dial	408
Cased-up, on leather	441
Cased-up, steel bracelet	558


Grande et Petite Sonnerie
F.P.JOURNE
Invenit et Fecit
G
S
P

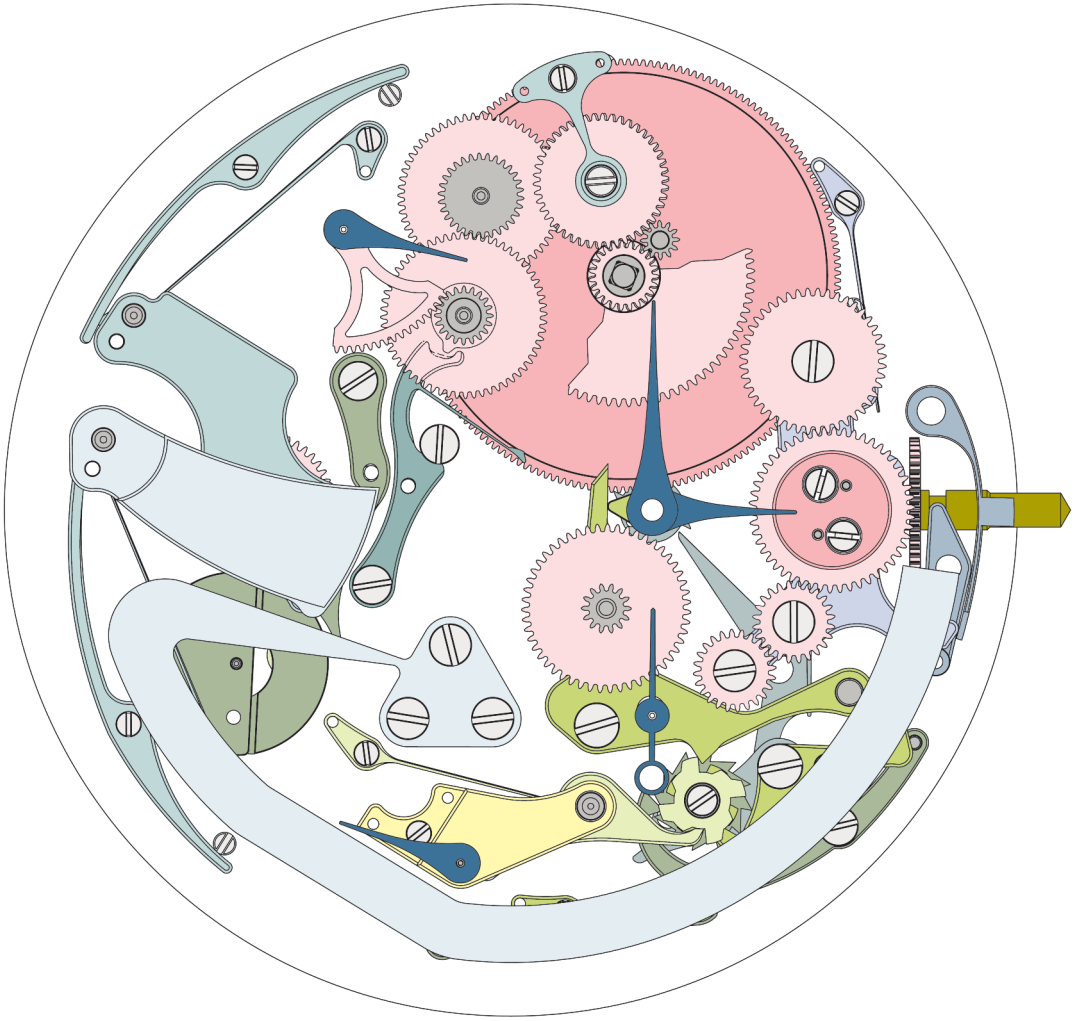




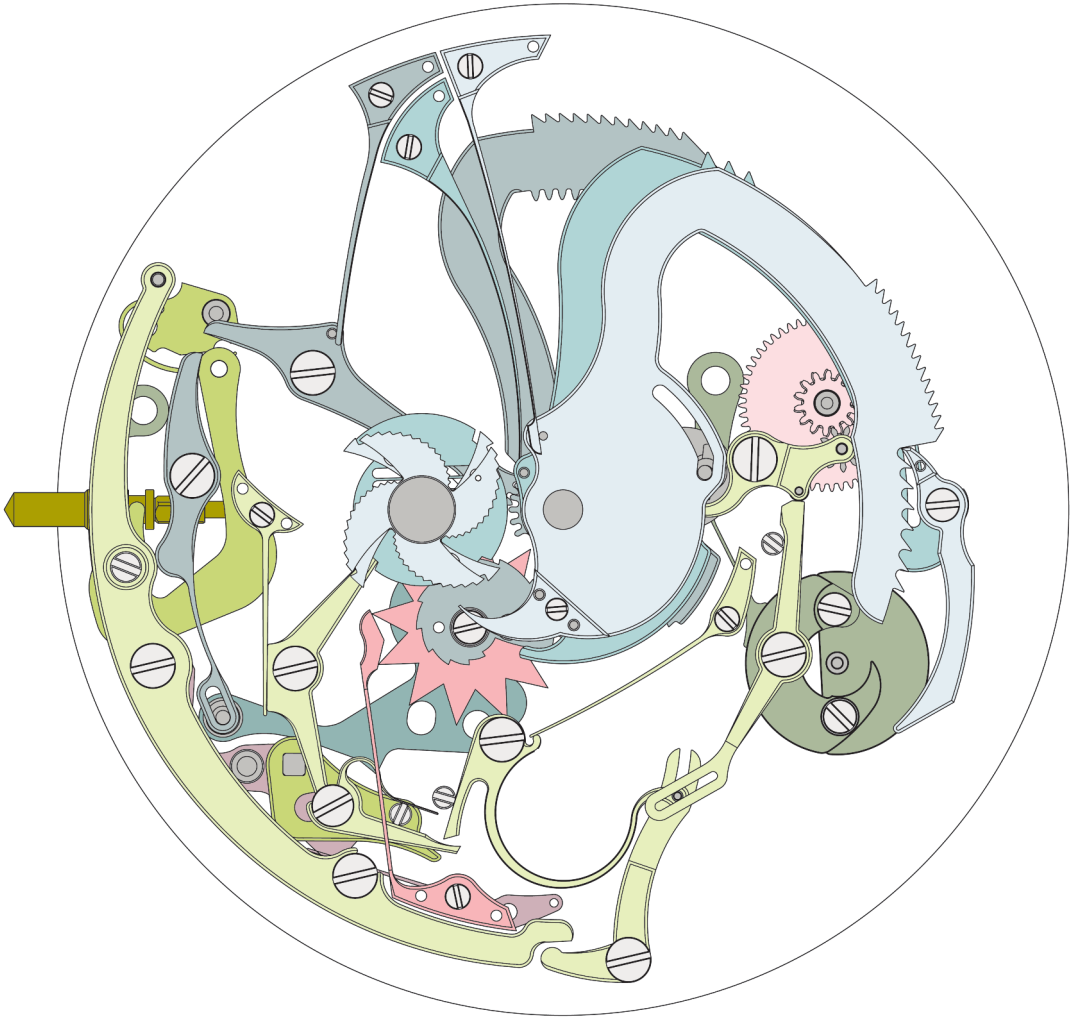



Cal 1505
18K Gold
Movement

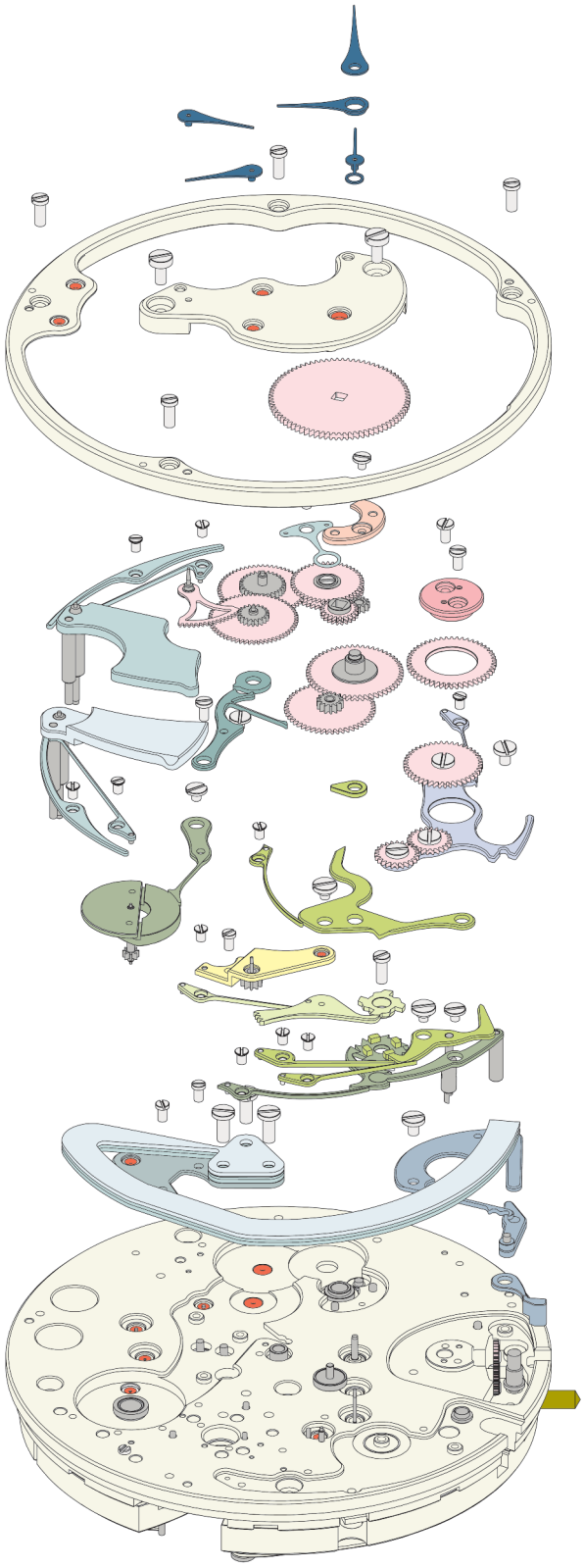

Grande Sonnerie R.minutes
Cal. 1505
18K Gold
Movement
F.P.JOURNE Inv. Fecit

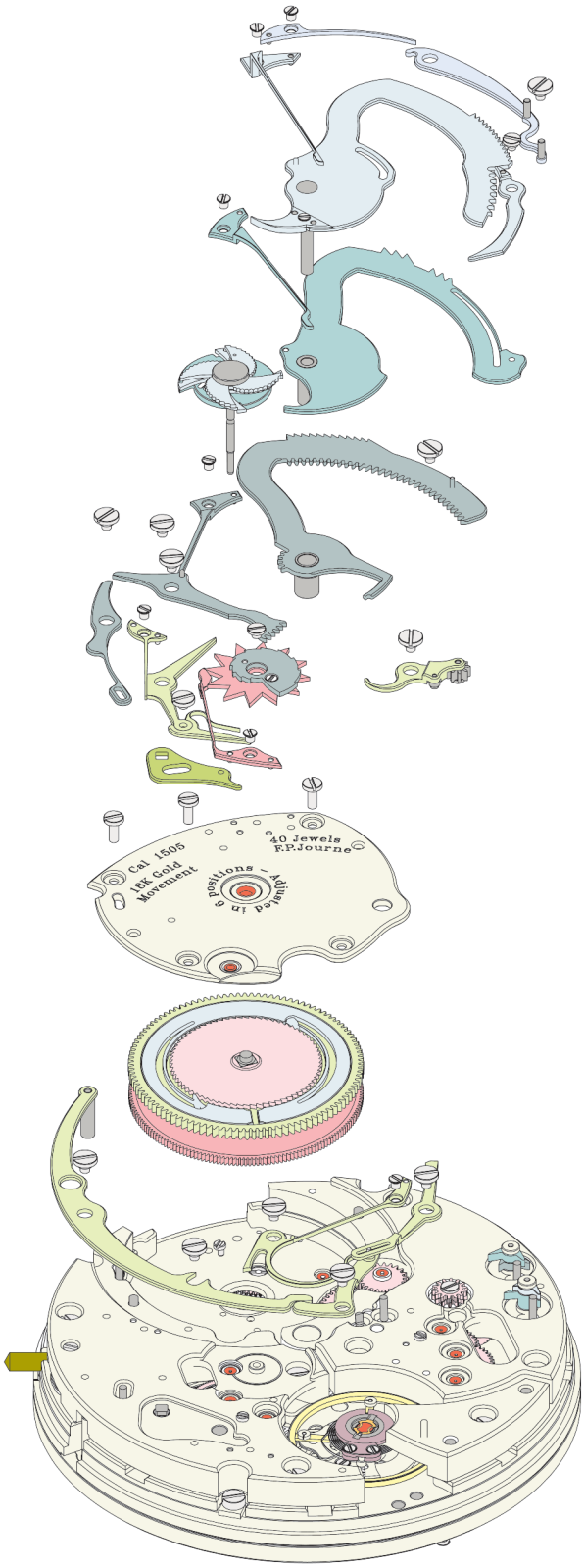


UNDER-DIAL VIEW



BRIDGES - SIDE VIEW



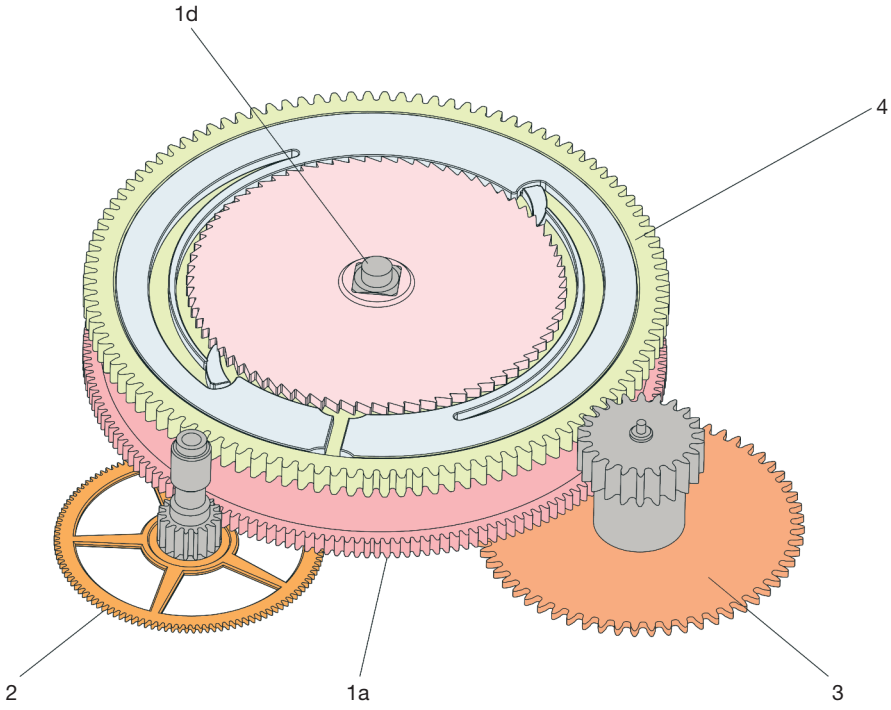

Cal 1505
18K Gold
Movement
5 positions
Adjusted in
40 Jewels
F.P.Journe

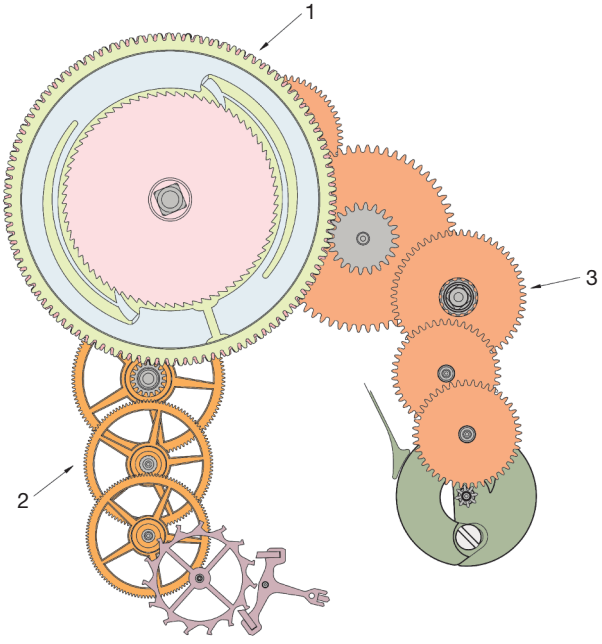
Patent
Barrel

EP 1 760 548 A1

A single barrel (1) drives both the going-train (2) and the strike-train (3) from each end of the mainspring.

The barrel's drum, fixed to the outer end of the mainspring coil, has a toothed edge (1a) to drive the going-train (2). The barrel's arbor (1d), fixed to the inner end of the mainspring, turns a toothed wheel (4) that drives the strike-train (3) through unidirectional gearing.


1d
4
2
1a
3


1
3
2

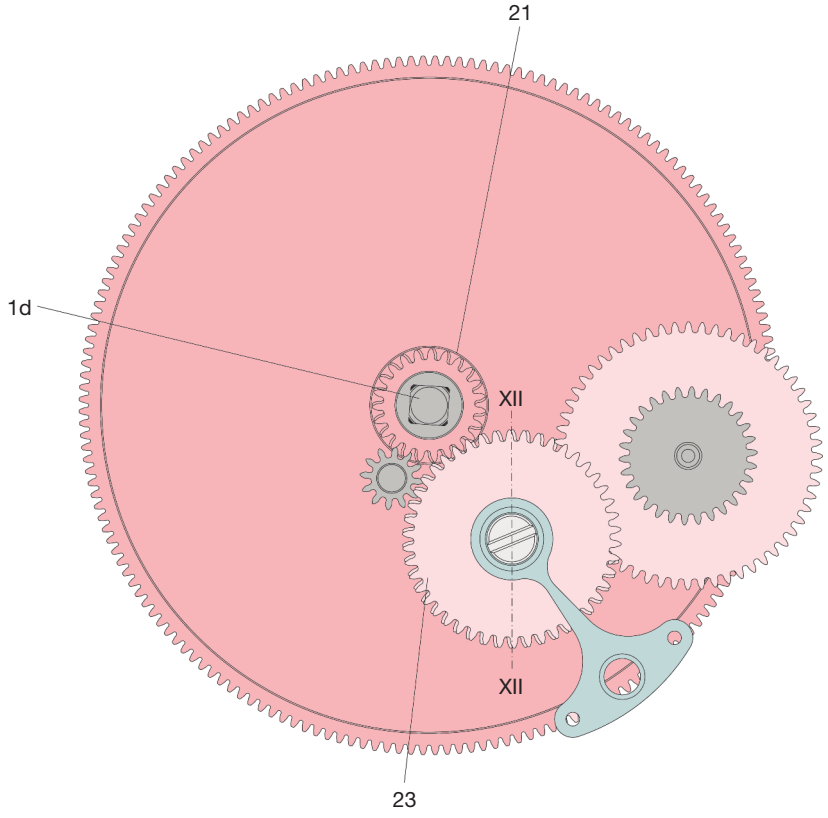
Patent

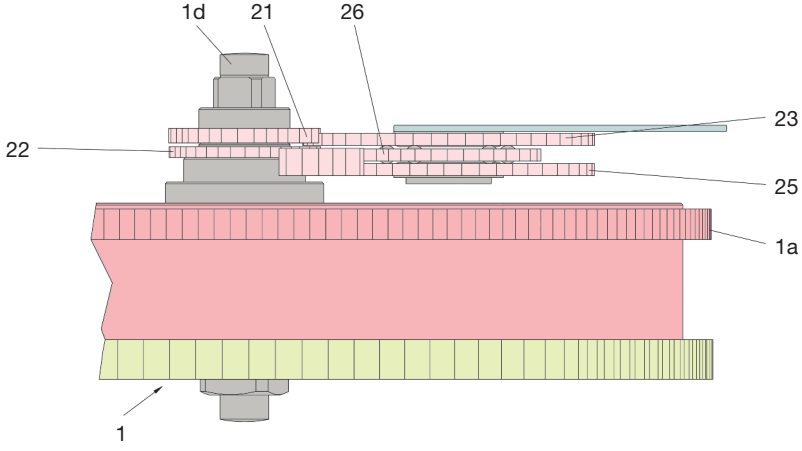
Power-reserve indicator

EP 1 760 544 A1

A mainspring that unwinds both through the barrel (1a) and the arbor (1d) requires a sophisticated power-reserve indicator.

The power-reserve indicator has three coaxial differentials. The top differential (23) forms the link between the arbor (22) and the barrel (21).The lower differential (25) moves according to the winding or unwinding of the arbor. A third differential (26) forms the link between the first two differentials to show the mean power-reserve of the mainspring.


21
1d
XII
XII
23


1d
21
26
23
22
25
1a
1

Patent

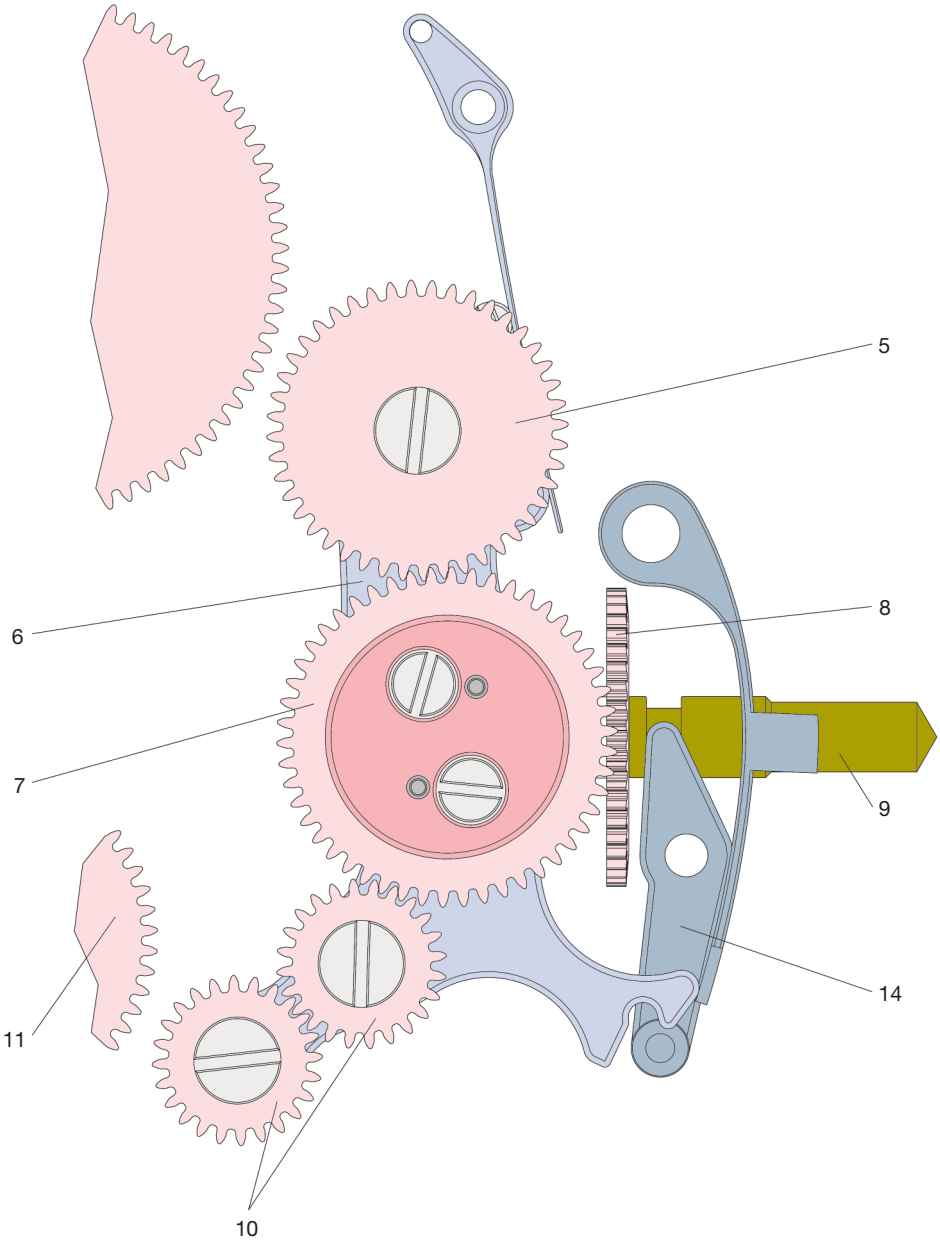
Winding and setting system

EP 1 760 555 A1

The compact winding and setting system does away with the long stem and sliding-pinion, and finds its place under the dial.

In this system, the crown-wheel (8) is permanently meshed with the transmission-wheel (7) mounted coaxially on a rocking arm (6). The winding-stem (9) slides through a square in the centre of the crown-wheel (8). The transmission-wheel (7) drives intermediate-wheels for winding (5) and for setting the time (10), mounted at either end of the rocking arm (6). Pulling out the winding-stem (9) makes the pullout piece (14) pivot the arm (6) to mesh the intermediate-wheels (10) with the minute-wheel (11) for setting the hands.

With the stem (9) in the winding position, the torque produced by the winding action on the transmission wheel (7), swings the rocking arm (6) to mesh intermediate wheel (5) with the winding ratchet.


5
6
8
7
9
14
11
10

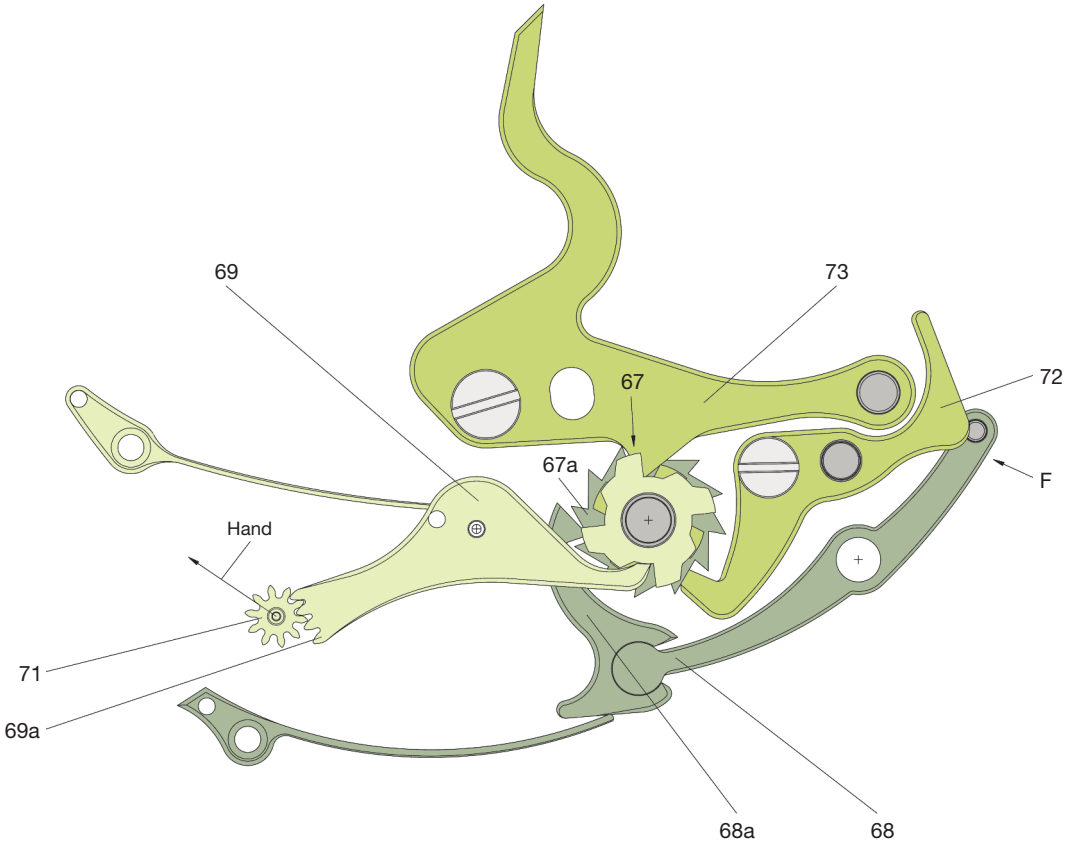
Patent
Strike selection

EP 1 760 550 A1

Controlled by a column wheel, the mechanism to select and indicate the strike mode performs its duties with the minimum of parts.

The rotating column-wheel (67) acts on three levers: the lever to select grand strike or small strike (73), the lever to select silence (72) and the sprung rocking-arm (69) that indicates the selected strike mode on the dial via a rack and pinion (69a, 71).

Pressing the strike-select button (F) makes rocking-arm (68) lift the sprung pawl (68a). The pawl pulls the 12-toothed wheel (67a) step by step to rotate the column-wheel through consecutive cycles of actions.

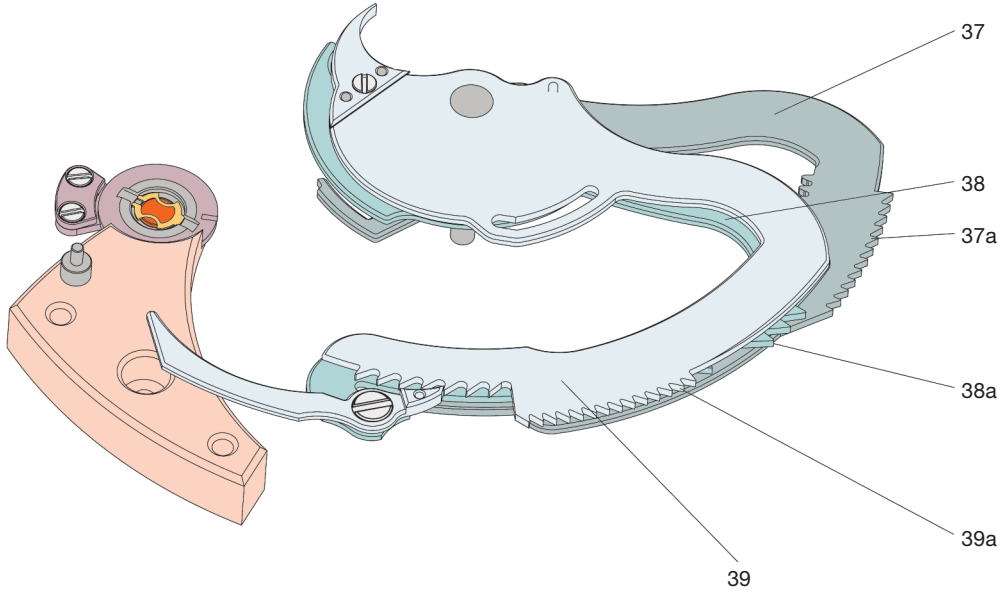

69
73
72
67
67a
F
Hand
71
69a
68a
68

Patent
The striking racks

EP 1 760 554 A1

The construction of the movement, with the hours and minutes off-centre, allows the striking-racks to be mounted in the centre of the movement. This in turn makes possible outsize racks for greater precision and control.

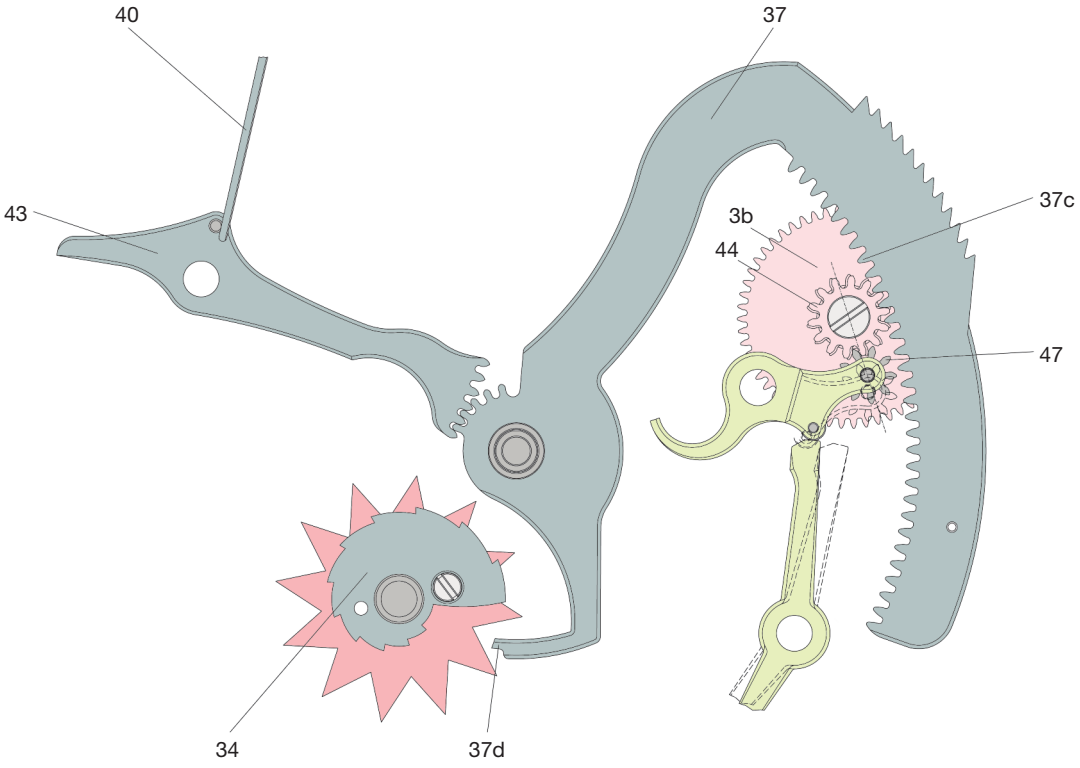
The strike is governed by three coaxially mounted racks: for the hours (37), for the quarters (38) and for the minutes (39). Each has ratchet toothing (37a - 38a - 39a) to activate the hammers. When the strike is released, the racks drop on their respective cams. They are then immediately engaged by the strike-train and lifted to the end of their travel. As the racks lift, their outer teeth (37a - 38a - 39a) engage the gathering-pallets to strike the gongs. The distance each rack is lifted, thus number of teeth presented to activate the strike, depends on its starting point on its cam.


37
38
37a
38a
39a
39

EP 1 760 553 A1

The hours-rack (37) has a toothed sector (37c) where it is engaged by the strike-train. The teeth (37c) are permanently meshed with a free pinion (44), rotating coaxially on the fixed pinion of the strike-train (3b). To lift the rack, the rocking clutch-pinion (47) engages the free and fixed pinions (44), locking them together, and transferring the drive from the strike-train to the rack.

When the clutch-pinion (47) disengages, the sprung-rack (40, 43) brings the rack's finger (37d) down on the cam (34).

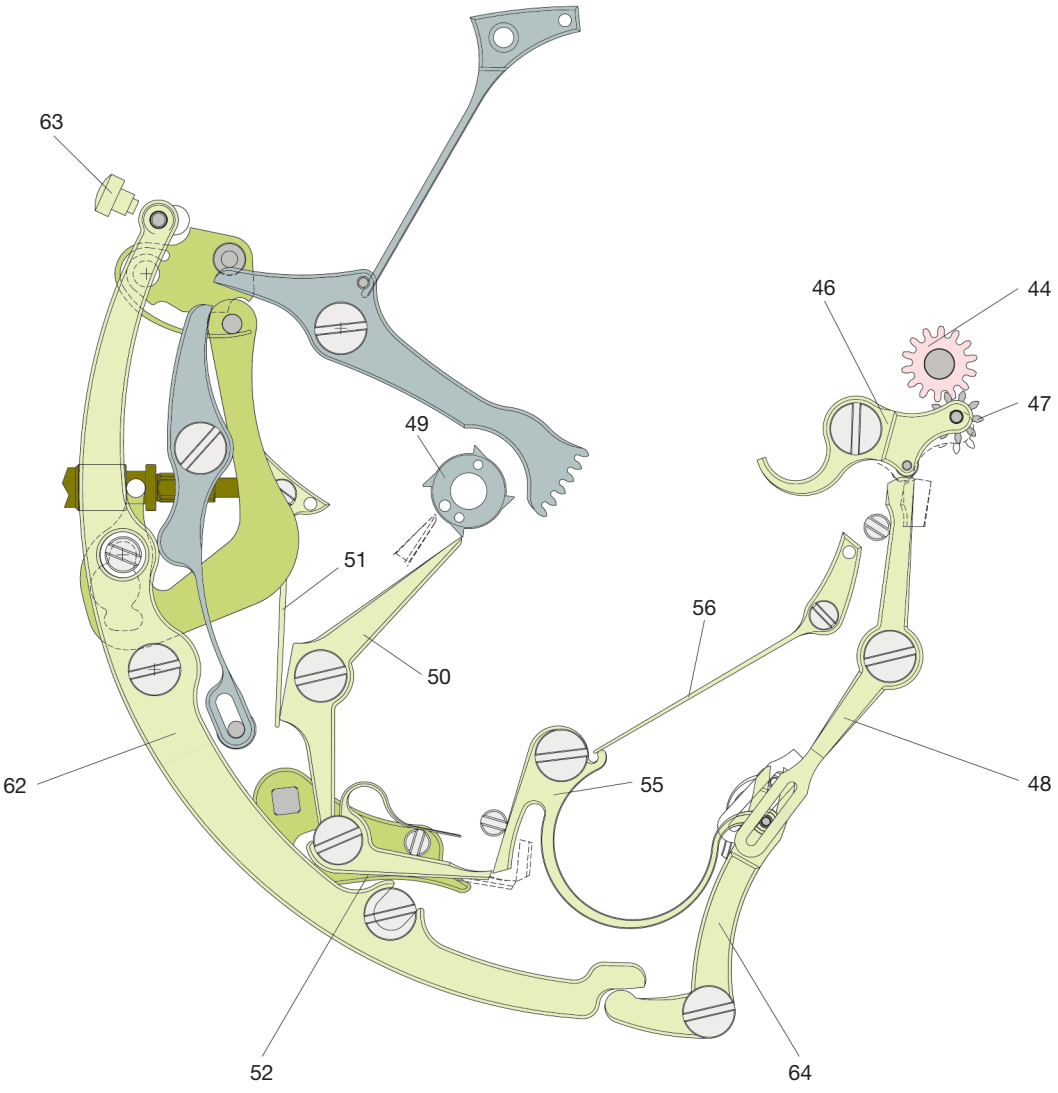

40
37
43
3b
44
37c
47
34
37d

Patent
Strike release

EP 1 760 552 A1

Every quarter hour, a tooth on the star-wheel (49) pivots the trigger (50) against its spring (51) to set in motion the chime in passing. The trigger (50) acts through sprung levers (52 & 55) to disengage the rocking arm (48) from the pivoting clutch (46, 47). This frees the pinion (44) to allow the racks to fall on their cams. The spring (56) then returns the rocking arm (48) against the pivoting clutch (46) to re-engage pinion (44) to lift the racks.

The minute-repeating strike is released by pressing button (63). The pivoting levers (62, 64) act on the rocking arm (48) to disengage the clutch (47) and allow the racks to fall.

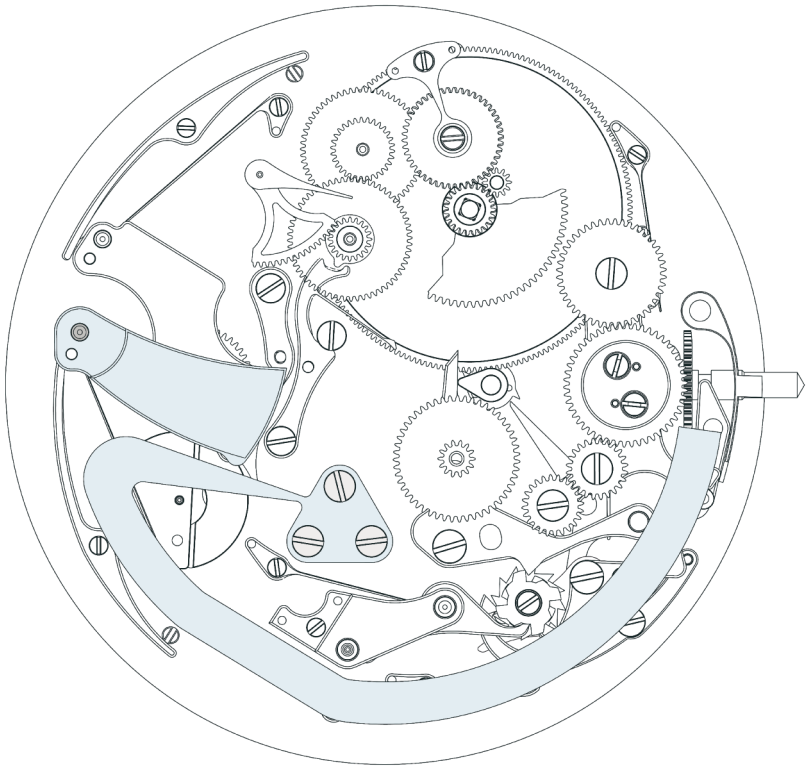

63
46
44
47
49
51
56
50
62
55
48
52
64

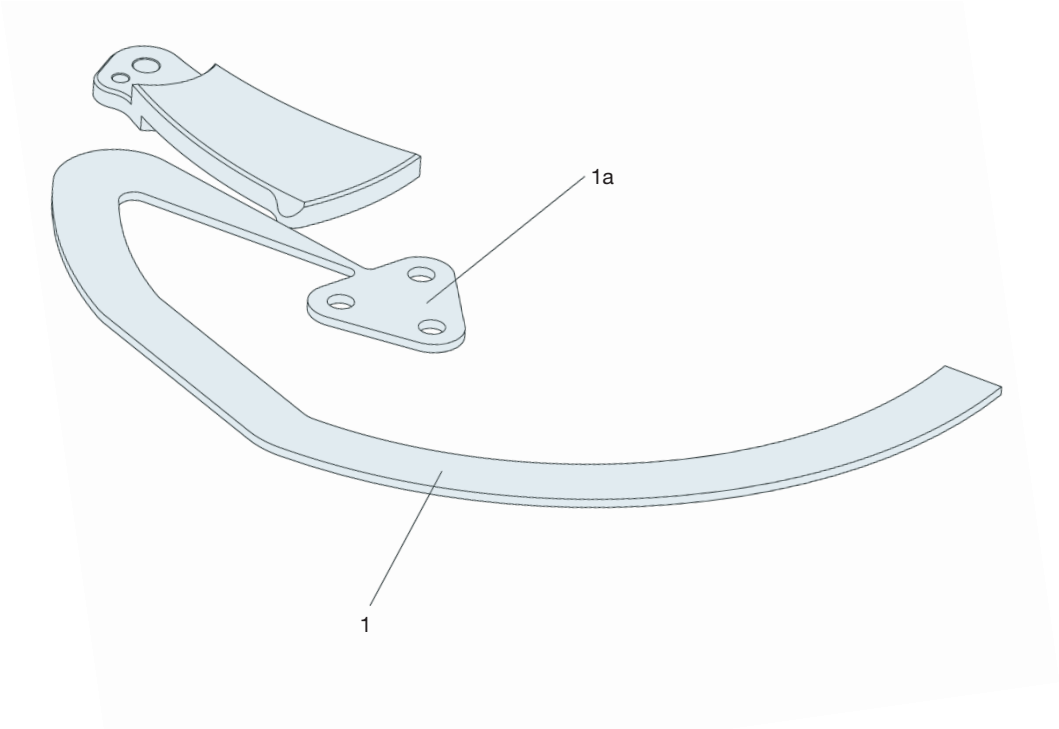
Patent
Chimings gongs

EP 1 760 549 A1

This new design produces a louder, clearer sound from gongs that are just three-tenths of a millimetre thick. Mounting the gongs on the movement instead of around it increases the diameter of the movement.

The gongs for a chiming mechanism consist of a flat blade (1) one end of which (1a) can be fastened to the structure of the watch. The free part of the blade is shaped so that its natural frequency is audible when its edge is struck.




1a
1

Patent

Blocking the strike automatically

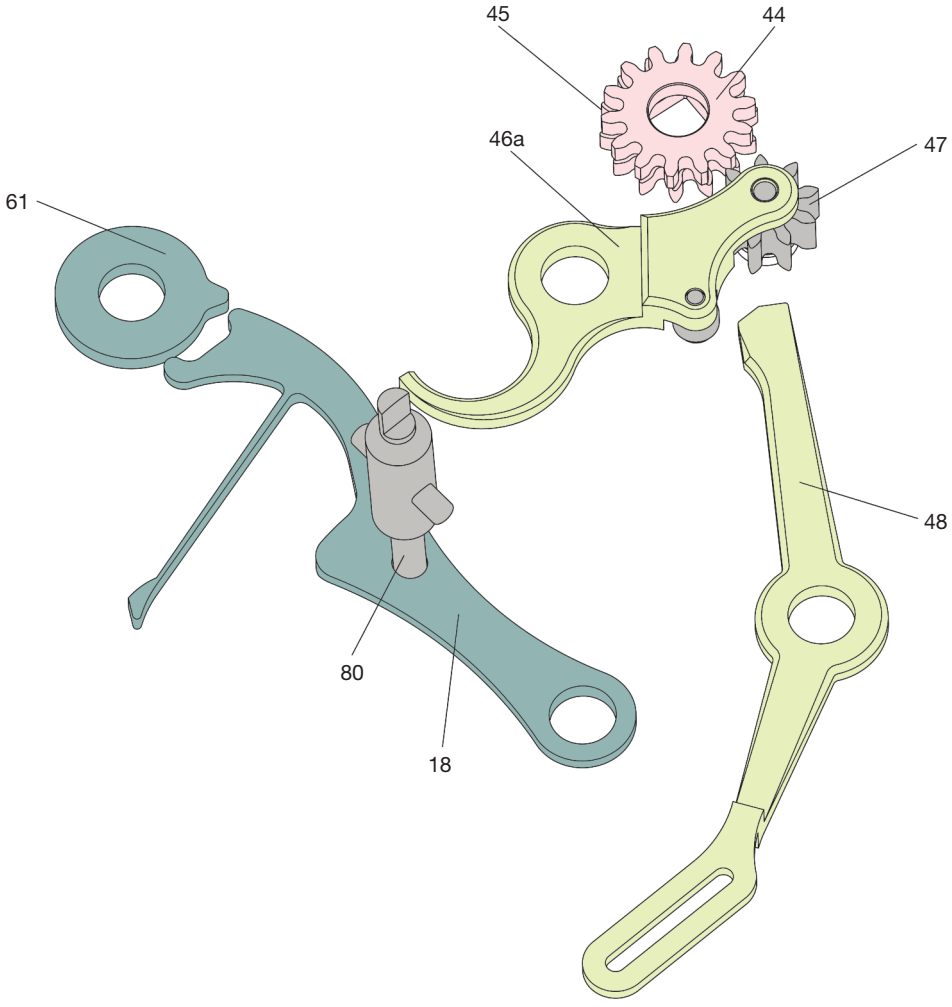
EP 1 760 545 A1

The chimes are automatically blocked to reserve the last 24 hours of the mainspring's energy to the movement.

A cam (61), working off the power-reserve differential, switches the pivoting lever (18) when the power reserve falls to 24 hours. The blocking device (80) keeps the clutch-pinion (47) meshed with the driving pinions of the rack (44, 45), thus preventing the racks from falling to start the chime.

When the power-reserve exceeds 24 hours, the cam releases the blocking mechanism (80), returning the pivoting clutch (46, 47) to the control of the rocking arm (48).

41



Patent

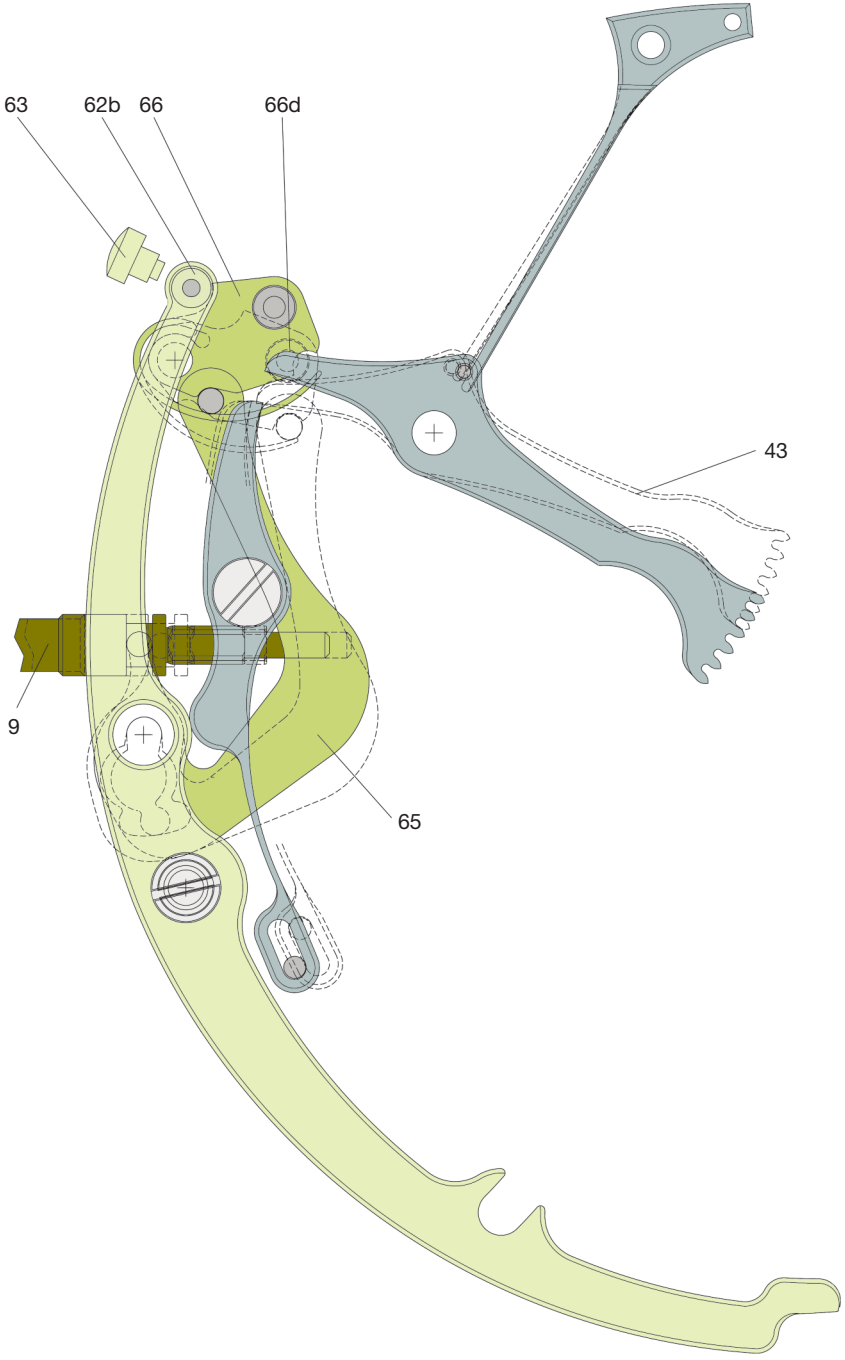
Blocking the strike and the winding stem

EP 1 760 551 A1

This safety system prevents the winding-stem from being pulled out when the strike is operating, and it blocks the strike when the stem is pulled out.

A locking-cam (66) can be pivoted in two positions: one to block the manual strike-release button (63); the other to lock the winding-stem (9) by acting on (66d). Pulling the winding stem out pushes the lever (65) to the left, pivoting the locking-cam (66) so that it blocks the manual strike-release (62b).

The locking cam is also switched by a pivoting sprung arm (43) connected to the hours-rack. As soon as the rack moves to begin the strike, the arm (43) pivots the cam (66) so that it engages the stem-blocking device (66d) and prevents the stem from being pulled out to set the time.


63
62b
66
66d
43
9
65