OMEGA

A COMPANY OF THE SWATCH GROUP

CALIBRE

551

27.90 RA SC PC AM Bulletin 24p

11 1/2''' ø 27.90 mm	
Height of rotor	4.50 mm
Power-reserve Jewel number Frequency	50 h 24 19'800 A/h

This caliber, utterly modern in design and measuring but 4.5 millimeters in height, will prove especially suitable for extremely thin watches. Thanks to its tapering outline, it has been possible to devise attractive cases of supreme elegance.

Exceptionally long running is secured through the automatic winding of the mainspring, actuated by a rotor operating in both directions.

Measurements

Total diameter 28.40 mm

Casing blank diameter 27.90 mm

Height of rotor 4.5 mm

Tapping diameter of winding stem 0.90 mm

Number of vibrations 19,800 per hour

Movement blank

It comprises

1 bridge for barrel and center wheel

1 bridge for third wheel, fourth wheel and escape wheel

1 pallet bridge

1 cock (balance bridge)

2 bridges for automatic device constituting a block independent of the movement

Jewelling

24 jewels, including 19 olive-hole jewels for gear-train, escapement, also for upper and lower bridges of automatic device

2 cap-jewels for balance

2 pallet-stones and the roller jewel

1 beryllium-bronze bushing at upper pivoting point of arbor in barrel bridge

Movement finish

Rosy gilt with large waves, diamond polished bevels

Mainspring

The mainspring, to which is soldered a brake spring, is made of stainless alloy; it is unbreakable and does not warp. Thanks to its 7 turns of development, it will secure a duration of running over 50 hours from the moment when the watch is (fully) wound up.

Gear train

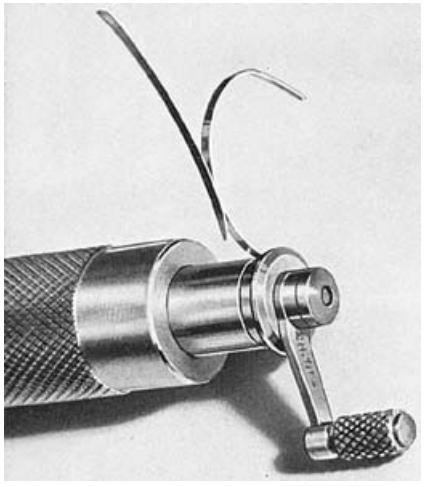
The third wheel, while revolving over the center wheel, is made to mesh with the seconds pinion on the one side and with the center pinion on the other side; so there is no driving wheel over third wheel.

Escapement

The escape wheel and pallet are made of steel whereas the roller is in rosy gilt brass.

Shock-protecting device

Incabloc



Balance-hairspring

The non-magnetic assembly comprises a compensating flat hairspring and a beryllium-bronze screwless balance the advantages of which have been described in the Technical Guide No. 12.

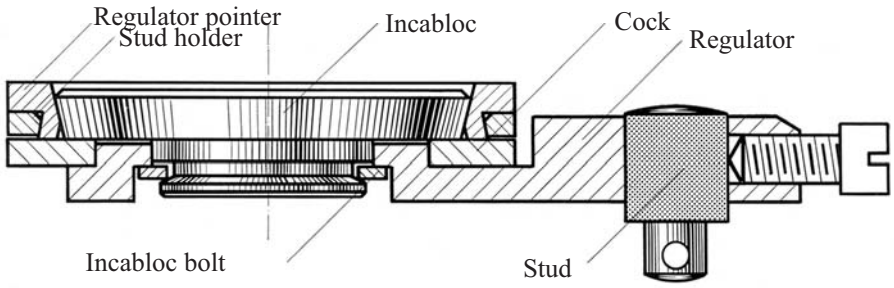
Regulating device

The regulator is of the two-piece type so as to permit wide displacements of the key-holder on adjusting. The gateway for hairspring head is split like a screw; when turned, it allows easy release of the hairspring before disassembling the balance-cock. The regulator spring enhances the design of the caliber, so as to give it the appearance of a chronometer, and permits very close touching up of the adjustment.

Movable stud holder

This organ, which we happen to use for the first time in one of our calibers, allows of quickly and most accurately setting the balance to "beat-point". This horological term means that the balance and hairspring being at a standstill, the roller jewel should be exactly positioned on a straight line from the center of pallet to the center of balance, which considerably facilitates adjusting in the various timing positions.

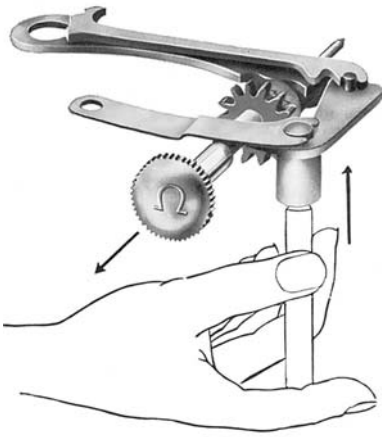
Said movable stud holder, made of brass and freely fitted into the cock, receives, in central hole thereof, the Incabloc shock resistant device, the fitting of which is also free. The Incabloc bolt, operating just like a friction spring, secures, on the one side, the Incabloc device on the face of cock and, on the other side, the movable stud holder against the lower portion of said face.



When adjusting the watch, first set the balance to "beat-point" then only afterwards, move the regulator. By means of the vibrograph and without interfering in any way with the balance, the "setting of beat-point" is performed by rotating the stud holder in either direction until the two straight dotted lines on the paper chart are made to touch or superpose each other. (See figure opposite.)

Uncasing the movement

The setting screw has been superseded by an axle cast integral with the setting lever itself; a spring blade named pressure spring for setting lever, keeps it down on the plate. The disposition facilitates uncasing the movement: as a matter of fact, a mere pressure under the setting lever axle, by means of a pointed tool, will release the winding stem.

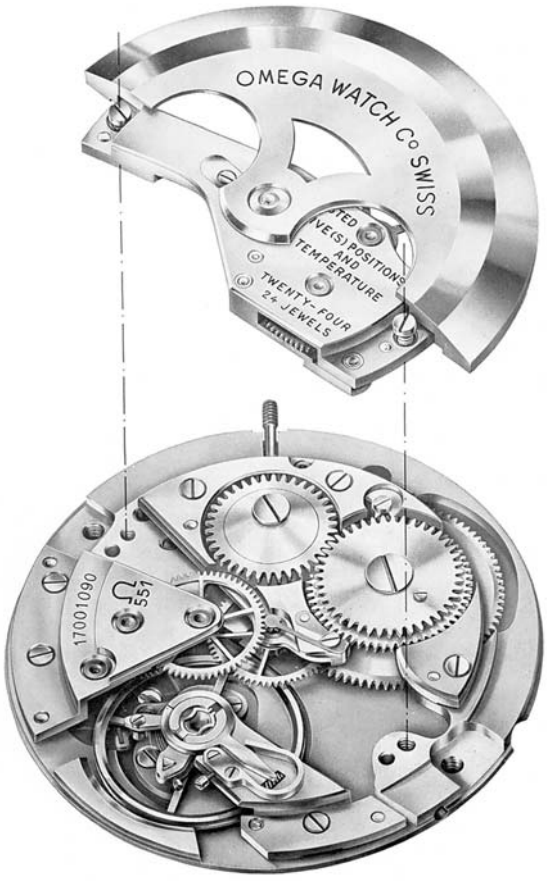


Automatic winding device

The self-winding mechanism is housed within a block independent of the watch movement and fitted thereon by two screws. Thanks to this arrangement, it is possible to turn out simultaneously the movement and the winding mechanism. Furthermore, it is most propitious for keeping all parts absolutely clean throughout the manufacture of the watch movement. So the watchmaker will find within easy reach the various organs of which he will have to check the running.

As the automatic block is interchangeable, the watch-repairer can easily replace it, in case of need, by another block taken from a stock that will be constituted in the material department of all our Agents.

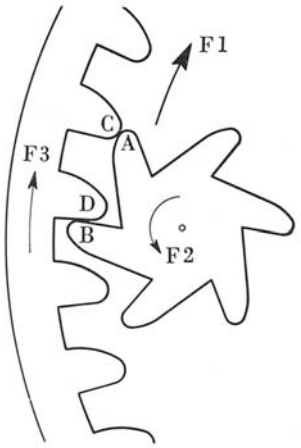
The rotor is made to swing either clockwise or counterclockwise through the slightest gestures of the wrist; in both cases it secures ample winding of the watch.

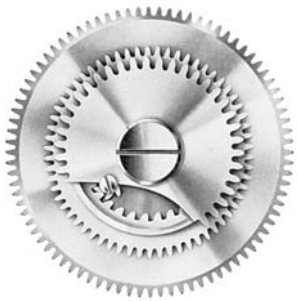


MANUAL WINDING

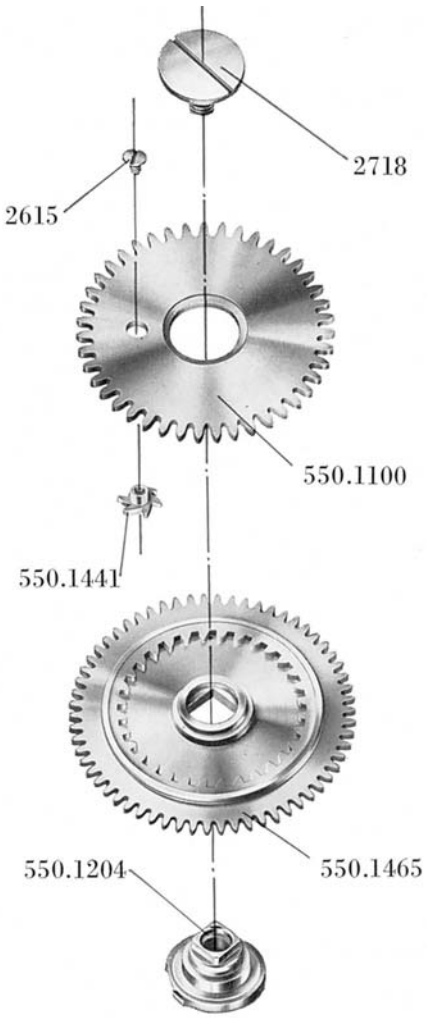
When winding the watch by means of the manual - winding mechanism, the latter actuates a first ratchet No. 550.1100 called main ratchet wheel which is freely fitted on the inner drop of a second ratchet, squareholed, No. 550.1465 called automatic ratchet wheel fixed on the barrel arbor by means of screw No. 2718.

The automatic ratchet wheel is driven by the main ratchet wheel through a satellite pinion No. 550.1441, in mesh with the inner teeth of the automatic ratchet wheel.



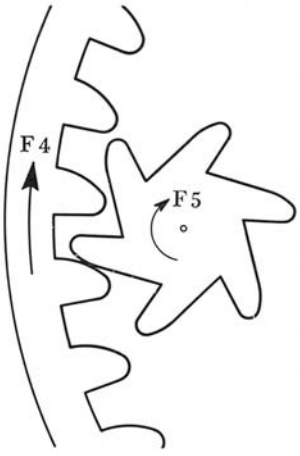


Ratchet wheels assembled on barrel-arbor



On winding, the main ratchet wheel revolves in the direction shown by arrow F1; it drives the satellite pinion which, being in contact with the inner teeth of the automatic ratchet wheel, starts revolving in the direction shown by arrow F2. At once, leaf A is made to lean against tooth C, which causes the satellite pinion to be blocked up and, through leaf B thereof, then in contact with tooth D, to drive the automatic ratchet wheel in the direction of arrow F3, thus operating the winding of mainspring.

When the automatic device is functioning, the automatic ratchet wheel revolves in the direction shown by arrow F4, its inner teeth then drive the satellite pinion in the direction of arrow F5 and makes it turn freely, from that moment, the satellite pinion having no longer any action upon the main ratchet wheel, the latter remains at a standstill.



THE AUTOMATIC WINDING DEVICE includes the following parts

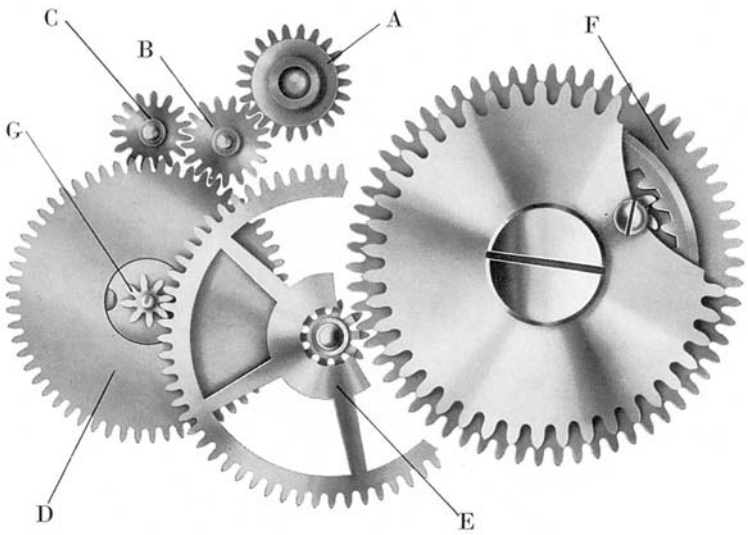
A rotor fitted with its pinion A (No. 550.1026),

a large wheel for winding wheel B (No. 550.1453),

a small wheel for winding wheel C (No. 550.1454),

a winding gear D (No. 550.1464),

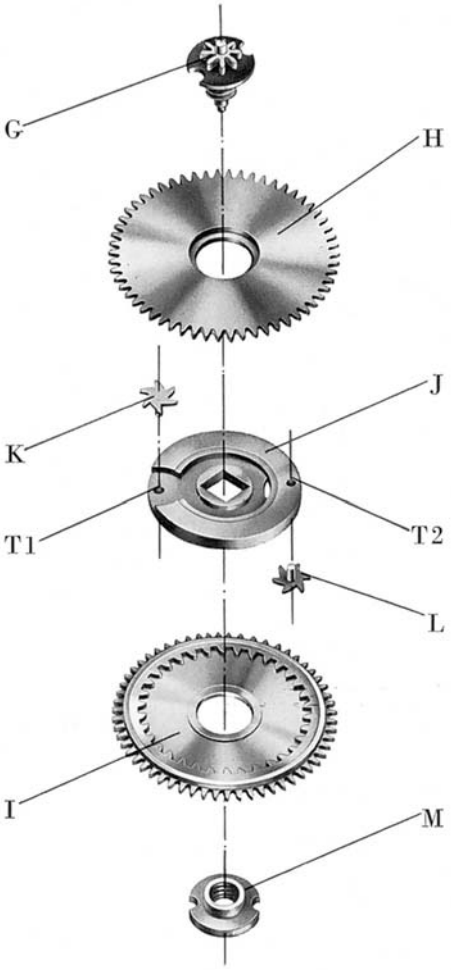
a driving gear for ratchet wheel E (No. 550.1437) the pinion whereof meshes With the automatic ratchet wheel F (No. 550.1465).



WINDING GEAR D comprises the following parts

Winding pinion G, whereon is driven a threaded nut with square, the superior winding wheel H, the inferior winding wheel I, the winding wheel core J,

the superior satellite pinion K along with inferior satellite pinion L, both pivoting respectively within holes T1 and T2 of winding wheel core J.



AUTOMATIC WINDING

FUNCTIONAL DESCRIPTION OF THE MECHANISM WHEN THE ROTOR REVOLVES CLOCKWISE (see figure 1).

The rotor pinion A while moving in the direction of arrow F1 drives the large wheel of winding wheel B which, in its turn, causes the superior winding wheel DS to revolve in the direction shown by arrow F2, through pinion G, the superior winding wheel DS actuates the driving wheel for ratchet wheel E, and the pinion thereof will communicate its motion to automatic ratchet wheel F in the direction of arrow F3, thus winding the mainspring.

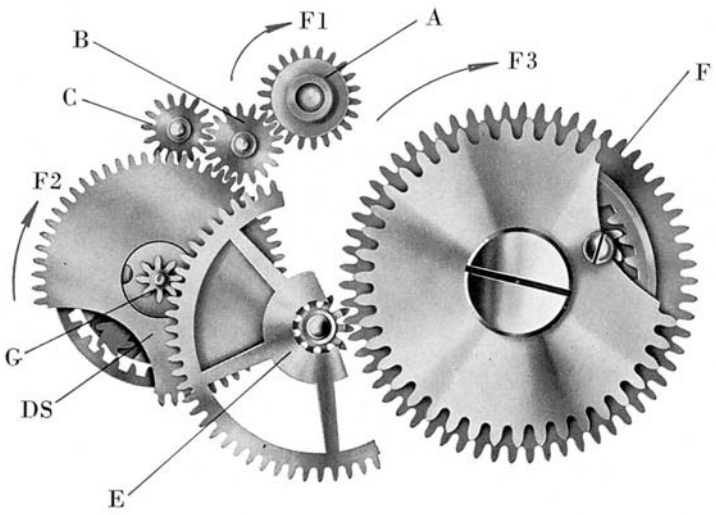


Figure 1

FUNCTIONAL DESCRIPTION OF THE MECHANISM WHEN THE ROTOR REVOLVES COUNTER-CLOCKWISE (see figure 2).

When the rotor pinion A moves in the direction of arrow F4 it successively drives the wheels of winding wheel B and C. The small wheel C, meshing with inferior winding wheel DI, makes the latter revolve in the direction of arrow F2. Through its pinion G, said inferior winding wheel actuates the driving wheel for ratchet wheel E, and the pinion thereof will communicate its motion to automatic ratchet wheel F in the direction of arrow F3, thus winding the watch.

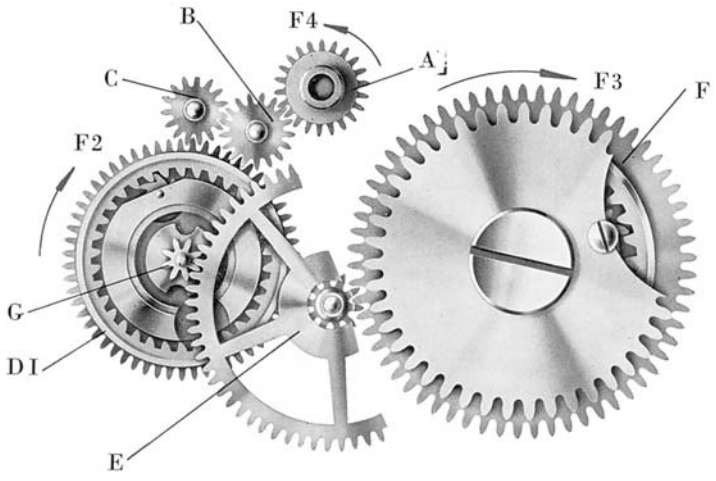


Figure 2

HOW THE SUPERIOR AND INFERIOR WINDING WHEELS OPERATE ON WINDING (see figures 1, 3 and 4).

When the rotor turns clockwise the large wheel for winding wheel B causes the superior winding wheel DS to revolve in the direction of arrow F2; the tooth O of its inner teeth N, when coming into contact with leaf R of superior satellite pinion K, drives the latter in the direction shown by arrow F5. Thereupon, leaf S of satellite pinion, made to lean against tooth P of the winding wheel, blocks up the pinion which, through its pivot, drives the winding wheel core J in the direction shown by arrow F6.

The winding pinion G fitted through its square on the winding wheel core, then transmits the motion to the driving gear for ratchet wheel E.

When the rotor turns counter-clockwise, the small wheel for winding wheel C drives the inferior winding wheel DI; these organs perform their duty in the same manner as for the superior winding wheel DS, but through the inferior satellite pinion (see figures 2 and 4).

Let us mention that when one of the winding wheels is operating, the other winding wheel turns idle, but in the opposite direction.

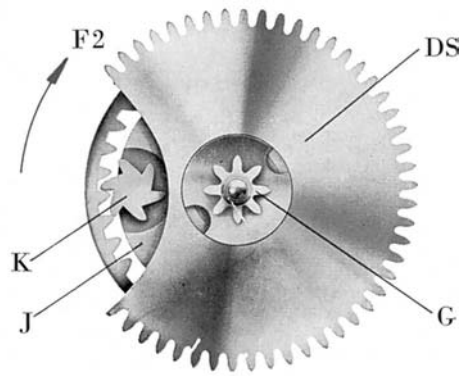


Figure 3

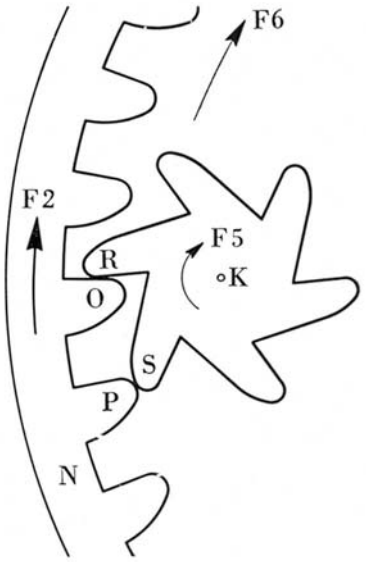


Figure 4

Figure 5

On manual winding, the driving wheel for ratchet wheel E actuates the pinion of winding wheel G, fitted to the winding wheel core J, in the direction of arrow F 7; the satellite pinion K driven by the inner teeth N of winding wheel then revolves freely in the direction of arrow F8 (see figure 5).

CONSTITUENT PARTS OF THE AUTOMATIC BLOCK

Inserted between a lower bridge and an upper bridge, the mechanism of the automatic block is composed of the following parts:

The gib of rotor 550.1451, fixed by its screw 2631 to upper bridge 551.1031, securing the rotor on axle thereof.

The 2 screws 2044 used for fixing the automatic block on to the plate.

The rotor axle 550.1400 fitted to the upper bridge by 3 screws 2631.

Driving gear for ratchet wheel 550.1437.

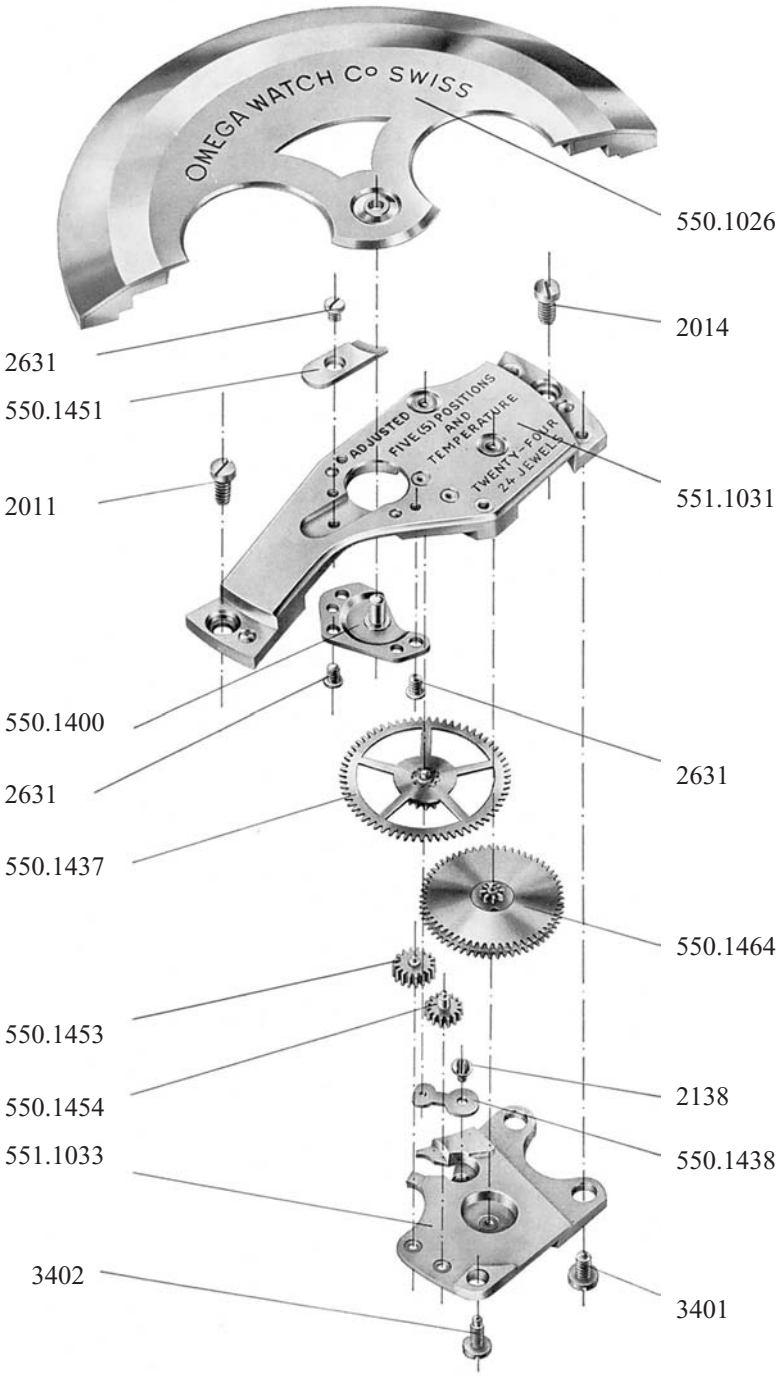
Winding gear 550.1464.

Large wheel of winding wheel 550.1453.

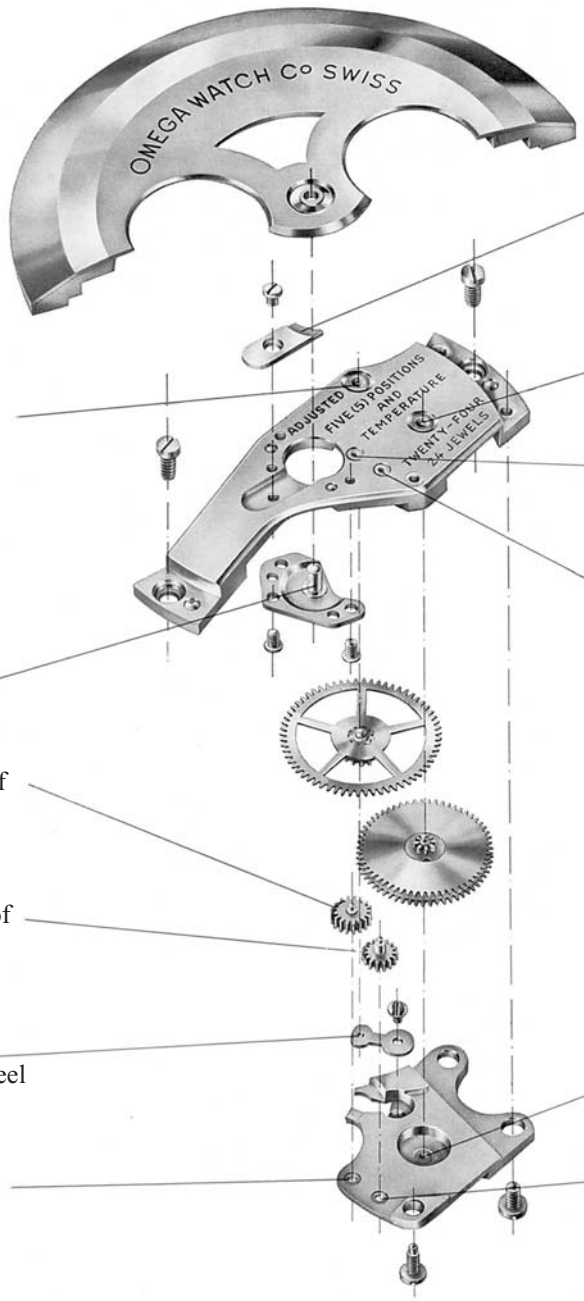
Small wheel of winding wheel 550.1454.

Bearing for driving gear for ratchet wheel 550.1438 fixed to lower bridge by its screw 2138.

Both screws 3401 and 3402 that fix lower bridge 550.1033 to upper bridge 551.1031.



OILING OF THE AUTOMATIC BLOCK



Dip the gib of rotor in a piece of elder-pith moistened with oil

Jewel for winding wheel

Jewel for driving gear of ratchet wheel

Jewel for large wheel of winding wheel

Jewel for small wheel of winding wheel

Rotor axle pivot

Teeth of the large wheel of winding wheel

Teeth of the small wheel of winding wheel

Pivoting center for driving gear of ratchet wheel

Jewel for winding wheel

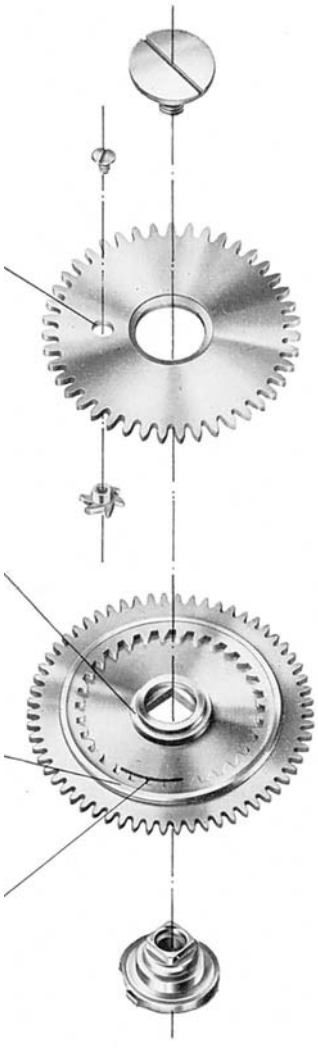
Jewel for large wheel of winding wheel

Jewel for small wheel of winding wheel

Use Synta-visco-lube oil

OILING

Assembled ratchet wheels



Hole of pivoting center of satellite pinion of ratchet wheel

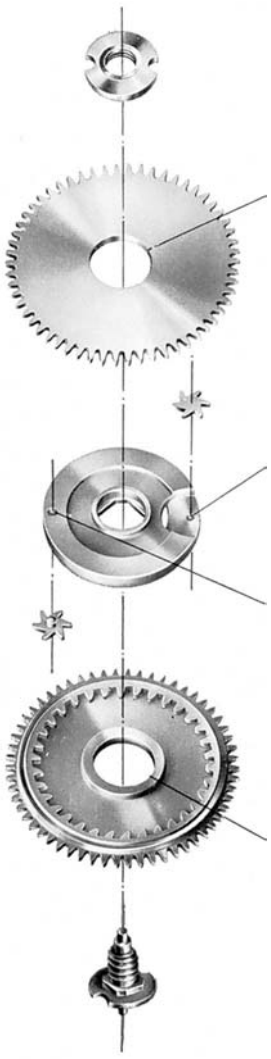
Pivoting place of hand ratchet wheel to the automatic ratchet wheel

Scat of hand ratchet wheel to the automatic ratchet wheel

Inner teeth of automatic ratchet wheel

Use Synta-visco-lube oil

Winding gear



Hole of the inferior winding wheel

Hole of pivoting center of inferior satellite pinion

Hole of pivoting center of superior satellite pinion

Hole of the superior winding wheel

Use Synta-visco-lube oil

DISASSEMBLING THE WINDING GEAR

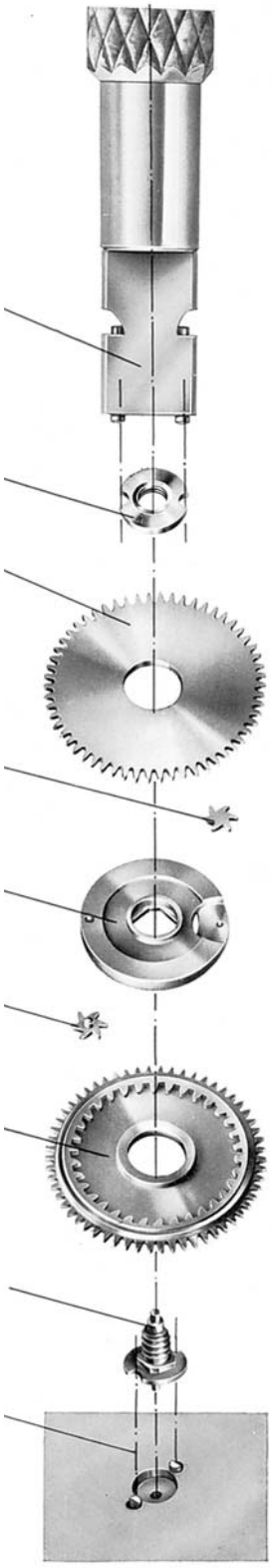
To disassemble and reassemble said gear it is necessary to utilize the fitting and the nut wrench devised for that purpose.

When disassembling, proceed as follows:

Place the gear through the 2 notches of pinion, upon the fitting, then screw off the nut counter-clockwise by means of the nut-wrench.

To reassemble the gear, first place the pinion upon the fitting, then locate successively the other parts on the pinion, while carefully oiling, as indicated hereon, and screw the nut with the wrench.

We keep these tool-sets at your disposal.



THE OMEGA STYLING

The styling of the OMEGA models which for many years will have to suit the ever finer taste of the public is a matter of constantly renewed work.

The originality and imagination of the designers have of necessity to adapt themselves to the size and shape of the caliber, and this goes very often against the requirements of beauty or elegance.

Thanks to its special profile and to its reduced height, caliber 551 (27.90 RA SC PC AM Bulletin 24 jewels) can be fitted into thinner cases.

The new "Constellation" CK 14381 shown here is a perfect example thereof. To its many well known qualities has been added that of a streamlined appearance which will be appreciated everywhere.