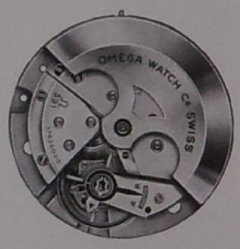
OMEGA Ω

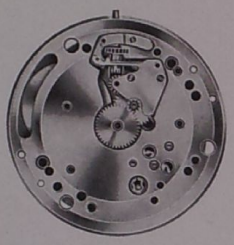
TECHNICAL GUIDE

N° 21 1960

AUTOMATIC CALIBRE WITH ROTOR

591 (27.80 RA SC PC AM 20 Jewels)





This new medium height calibre has been designed for large scale manufacture, bearing in mind ease of maintenance and repair. It gives an excellent performance and is most reliable in every respect. Furthermore, the extent to which the movement is bevelled facilitates the use of slim and elegant cases.

CHARACTERISTICS

Dimensions

Total diameter 28.30 mm
Casing diameter 27.80 mm
Height including rotor 5.35 mm
Diameter of winding stem thread 0.90 mm

Train

19800

Ebauche

Comprises:
1 bridge for barrel and centre wheel
1 bridge for third, fourth and escape wheel
1 pallet bridge
1 balance bridge
2 bridges for automatic work forming one unit independent of the movement

Jewelling

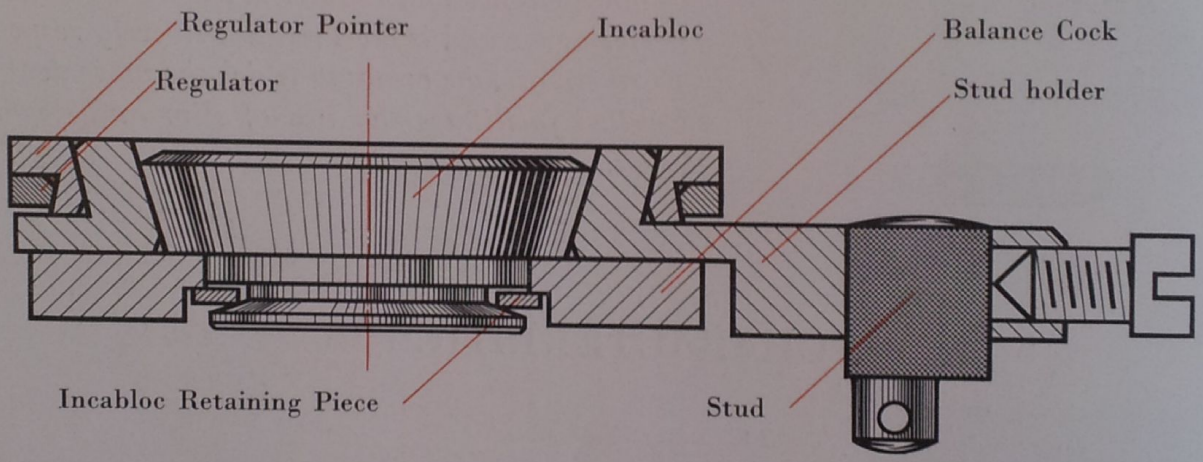
20 jewels including 8 olive holes for train and escapement
2 balance jewels and endstones
2 pallet stones
1 roller jewel
3 jewels for upper bridge for automatic work
2 ruby rollers for automatic winding wheels
1 beryllium bronze bushing for upper pivot of centre wheel
3 beryllium bronze bushings for lower bridge of automatic work

Finish

Rose gilt with large wave effects diamond polished rotor bevel.

Mainspring

This allows development of seven turns giving a running time of 48 hours. It has an attached brace, is of a stainless alloy unbreakable and non-distorting.



Movable Stud Holder

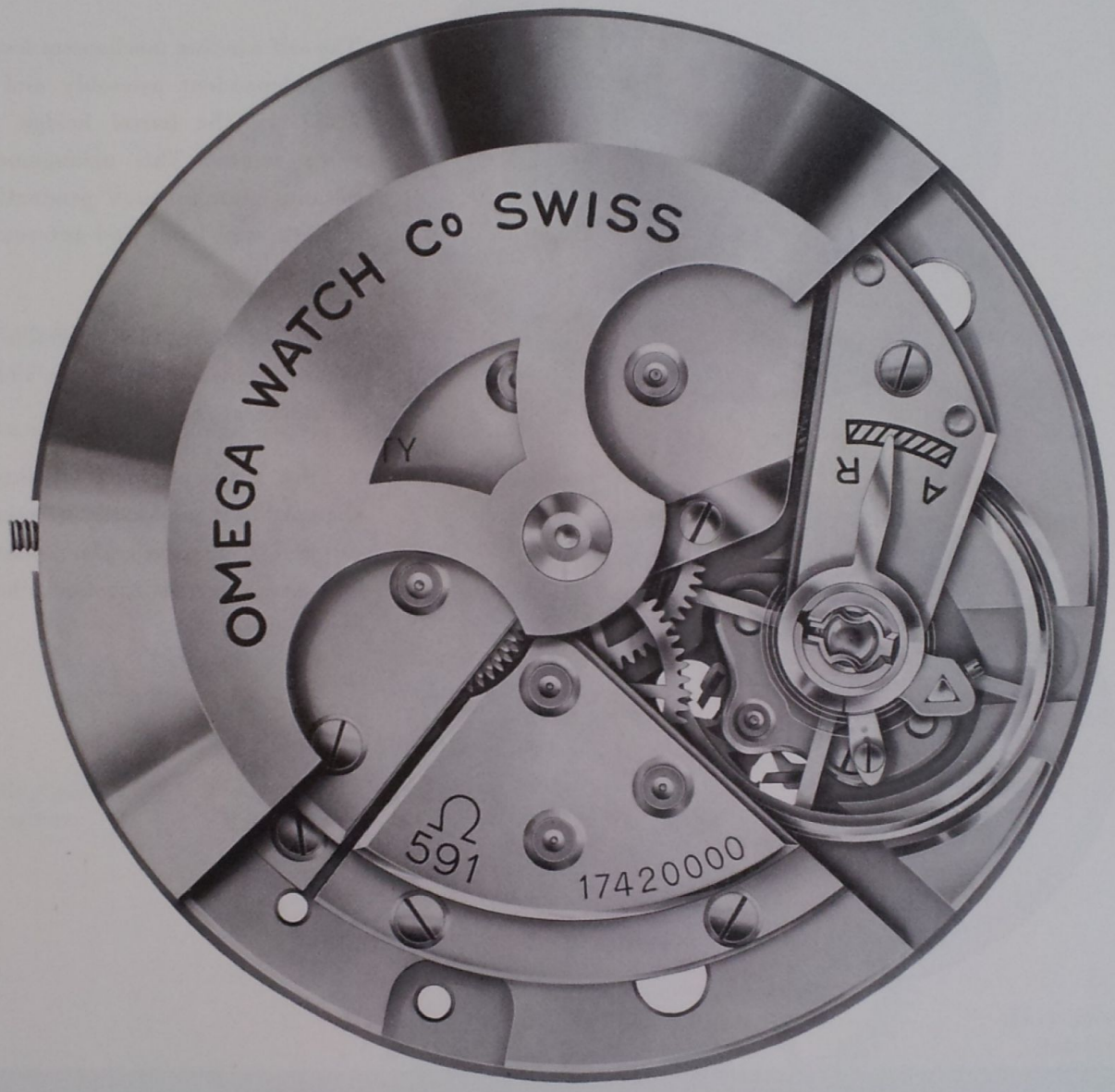
The movable stud holder, the advantages of which are described in technical guide No. 13, is fitted with a two piece regulator. This is fitted with two curb pins between which the balance spring will pass, as well as a boot, the function of which is to retain the balance spring in position.

Shock Protection

Incabloc. The lower assembly being pressure set in the plate as opposed to the normal method of fixing.

Wheel Train

The train is so designed that the third wheel runs over the centre wheel and barrel bridge meshing simultaneously with both fourth wheel and centre second pinion thus dispensing with normal top third wheel.



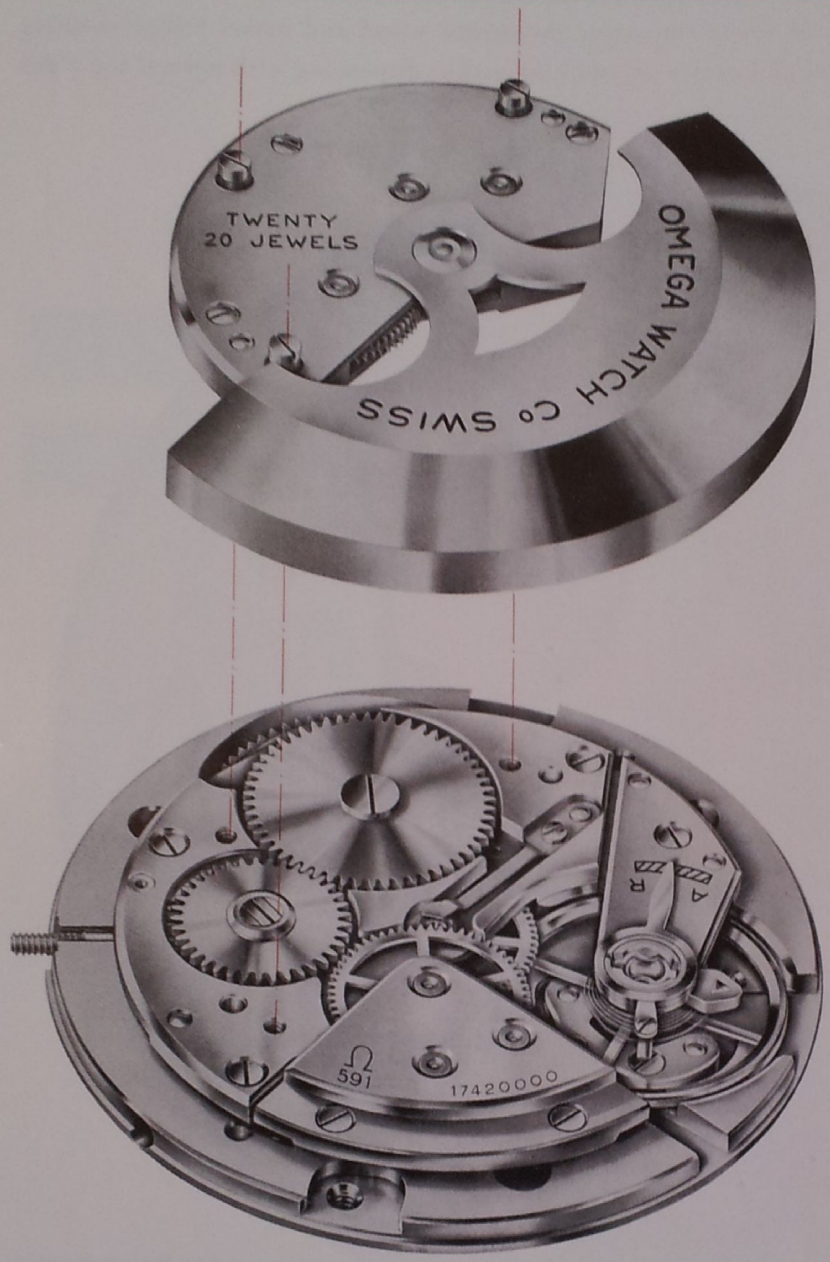
Escapement

The escape wheel, pallets and roller are of steel, the latter being nickel plated.

Balance and Spring

This is a screwless non-magnetic assembly in beryllium bronze.

AUTOMATIC WINDING



The self winding mechanism forms an independent assembly and is fitted on the barrel bridge by three screws. This arrangement permits simultaneous production of both movement and automatic assembly.

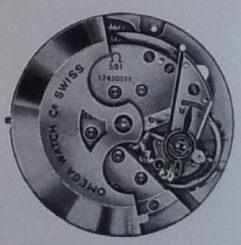
It also facilitates the inspection of these parts when wishing to check their correct functioning.

As the automatic unit is interchangeable it may easily be removed and if the need arises replaced by a new one from the stocks held by our agents.

NUMBERING OF MOVEMENTS

Movements the numbers of which range from 17420000 to 17439999 bear the sign Ω, the number of the calibre (591) and that of the movement engraved on the upper bridge of the automatic assembly as shown in illustration opposite.

From 17640000 the sign Ω, the number of the calibre (591) and the number of the movement will be engraved on the train bridge.



AUTOMATIC WINDING

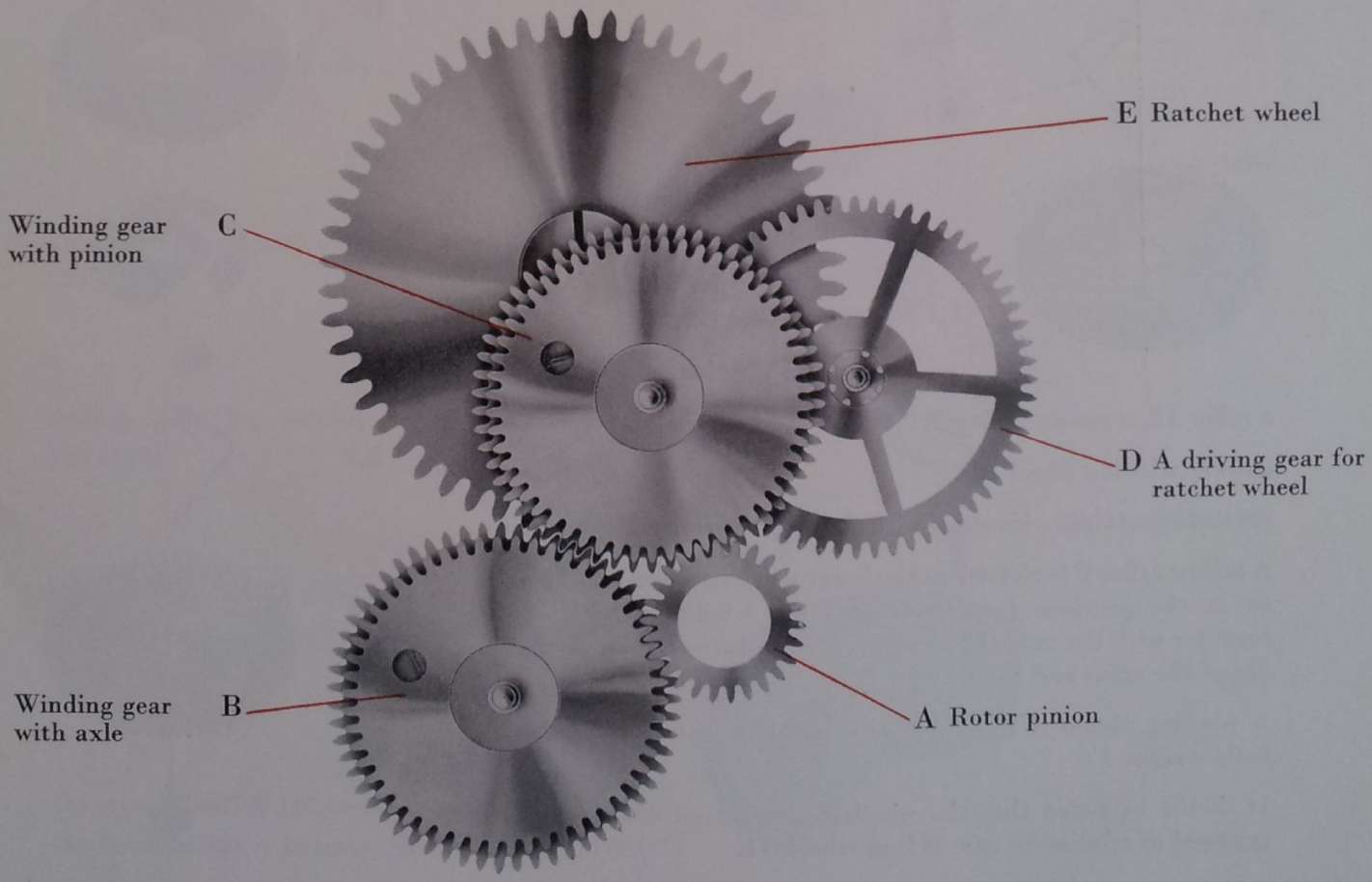
In this calibre automatic winding is achieved by the rotor winding in both directions.

It comprises:

a rotor with pinion	A
a winding gear with axle	B
a winding gear with pinion	C
a driving gear for ratchet wheel	D

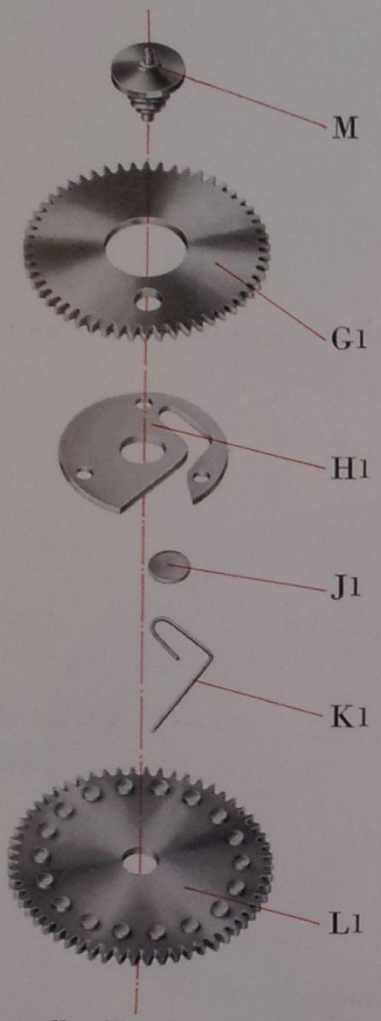
There is no provision made for disconnecting the manual from automatic winding. Hence the crown wheel and winding pinion will rotate with any movement of the rotor.

The winding assemblies cannot be dismantled.



WINDING ASSEMBLIES

WINDING GEAR with AXLE



The winding gear with axle comprises: an upper winding wheel G1 having 54 teeth and 3 studs on the under-side,

a winding cam H1 which is riveted on the studs of winding wheel G1,

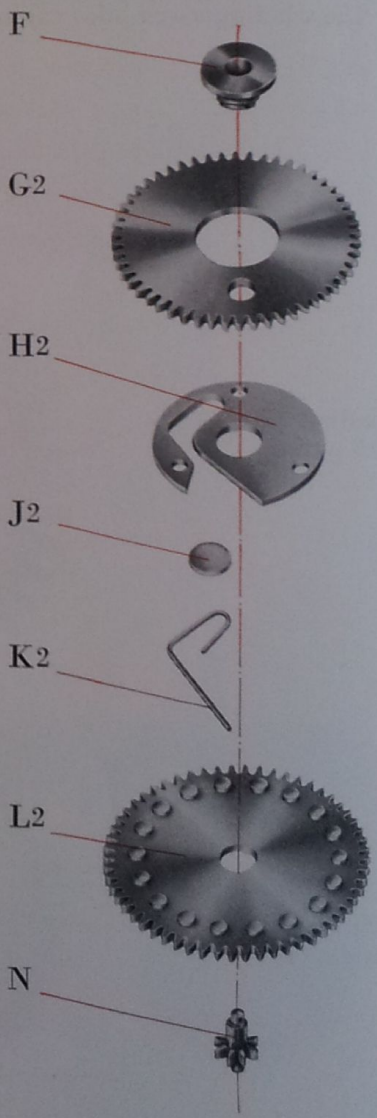
a ruby roller J1 with return spring K1,

a lower winding wheel L1 having 58 teeth and 18 pillars,

the winding wheel arbor M is riveted on the lower winding wheel L1,

When assembled the upper winding wheel G1 on which is riveted cam H1 is free to rotate between the upper shoulder of the arbor M and the lower winding wheel L1.

WINDING GEAR with PINION



The winding gear with pinion comprises:

an upper winding wheel G2,

a winding cam H2,

a roller J2, a return spring K2,

a lower winding wheel L2.

All these parts being identical with those on winding assembly B.

A hollow arbor F is riveted on the lower winding wheel L2. This as in the previous instance allows the winding wheel G2 together with the cam H2 to revolve freely between the shoulder of the arbor and the wheel L2.

A winding pinion N the arbor of which is a driven fit in the hollow arbor F.

It should be noted that the winding cam H2 on wheel G2 is reversed in relation to cam H1 on wheel G1.

DISMANTLING THE AUTOMATIC ASSEMBLY

Located between an upper and lower bridge the automatic assembly comprises the following parts:

the three screws 2632 by which the upper bridge 591.1031 is held to the lower bridge 590.1033;

the rotor gib 590.1451 held by its screw 2632 to lower bridge 590.1033 positions and retains the rotor on its arbor;

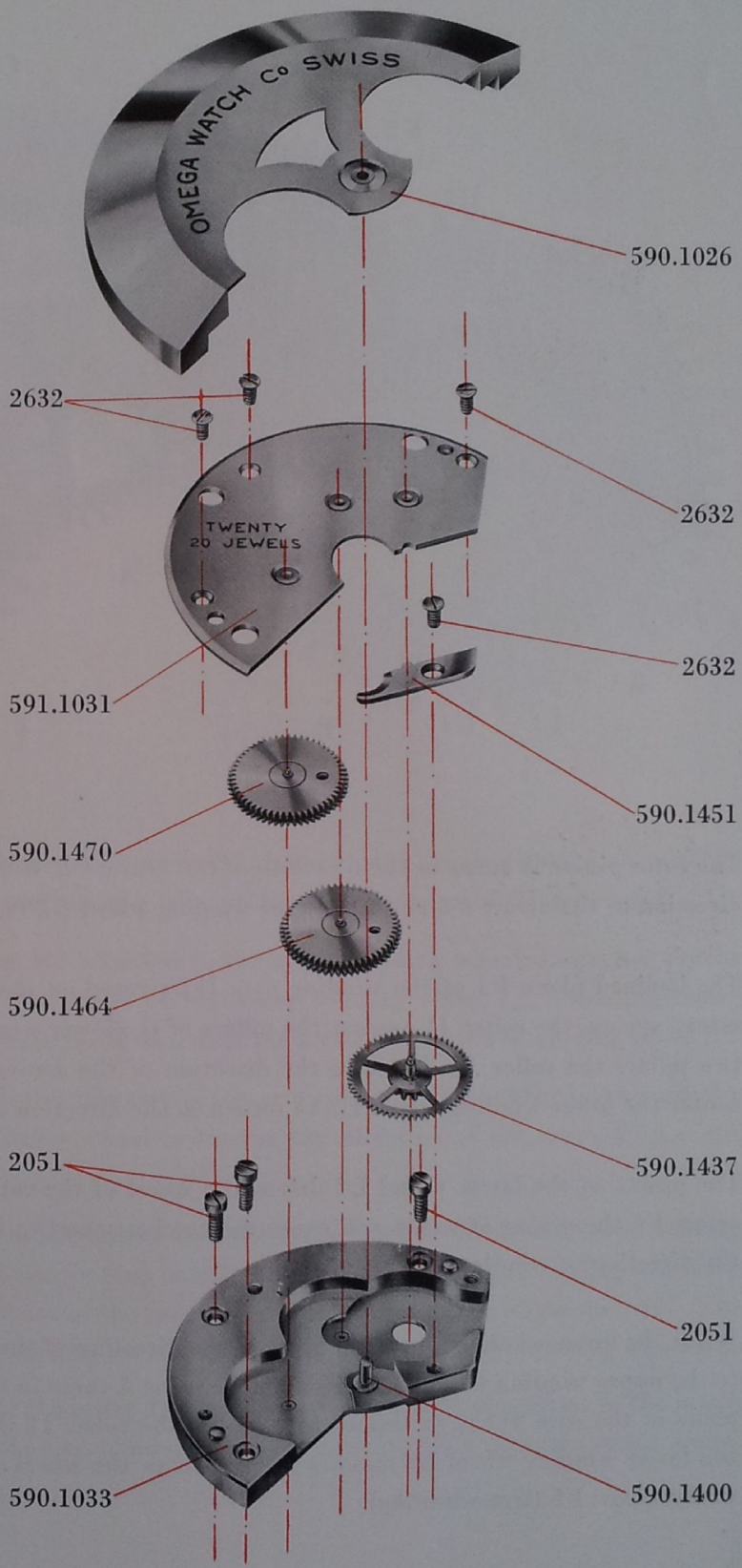
the winding gear with axle 590.1470;

the winding gear with pinion 590.1464;

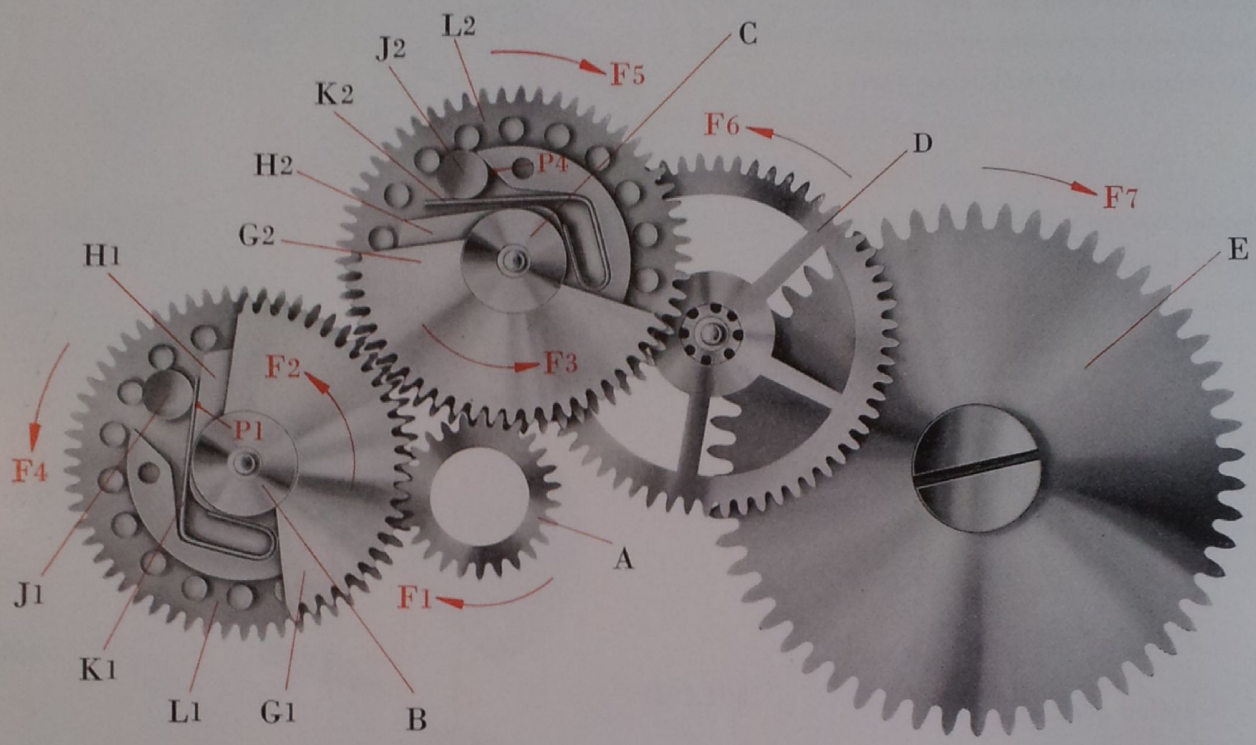
driving gear for ratchet wheel 590.1437;

the three screws 2051 for holding the automatic assembly on the barrel bridge;

the rotor arbor 590.1400 riveted on the lower bridge is irremovable.



Functional Description of Automatic Work when the Rotor turns in a clockwise direction (as observed from above the movement)



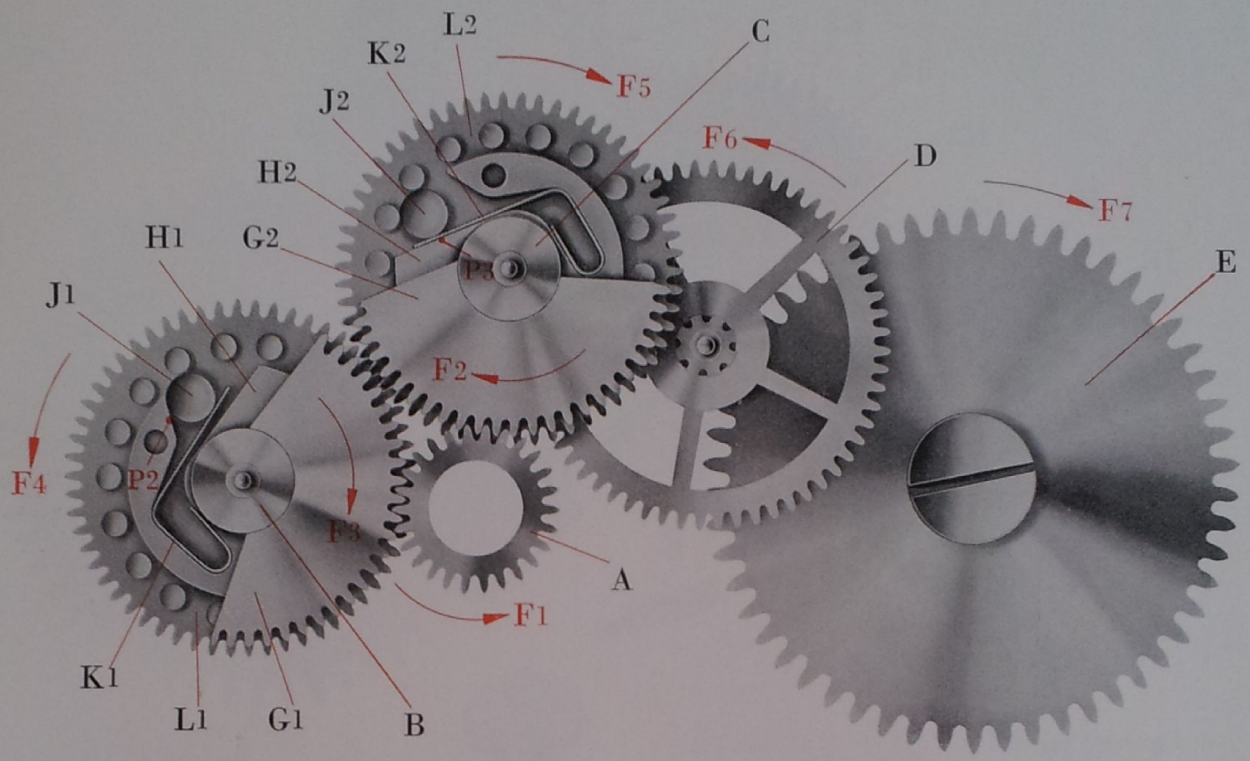
The rotor pinion A turns in the direction of the arrow F1; it drives the upper winding wheel G1 in the direction of the arrow F2 and the upper winding wheel G2 in the direction of the arrow F3.

The inclined plane P1 of the winding cam H1 riveted on the upper winding wheel G1 pushes via its return spring, the roller J1 against the pillars of the lower winding wheel L1. Once positioned between two pillars the roller J1 drives in the direction of the arrow F4 the lower winding wheel L1 which causes the lower winding wheel L2 to return in the direction of the arrow F5.

The pinion of the latter wheel L2 drives the wheel of the ratchet driving gear in the direction of the arrow F6 the pinion of which will cause the ratchet wheel to turn in the direction of the arrow F7 i.e. the direction of winding.

While the lower winding wheel L2 turns in the direction of the arrow F5 the winding cam H2 attached to the upper winding wheel G2 driven by the rotor A turns in the direction of the arrow F3; the locking plane of the cam H2 is so shaped as to allow the roller J2 to move radially away from the pillars of the lower winding wheel L2 moving to and fro as the wheel and pillars move past it in the direction of the arrow F5 (free-wheeling).

Functional Description of Automatic Work when the Rotor turns in the anti-clockwise direction (as observed from above the movement)



The rotor pinion A revolves in the direction of the arrow F1; it drives the upper winding wheel G2 in the direction of the arrow F2 and the upper winding wheel G1 in the direction of the arrow F3.

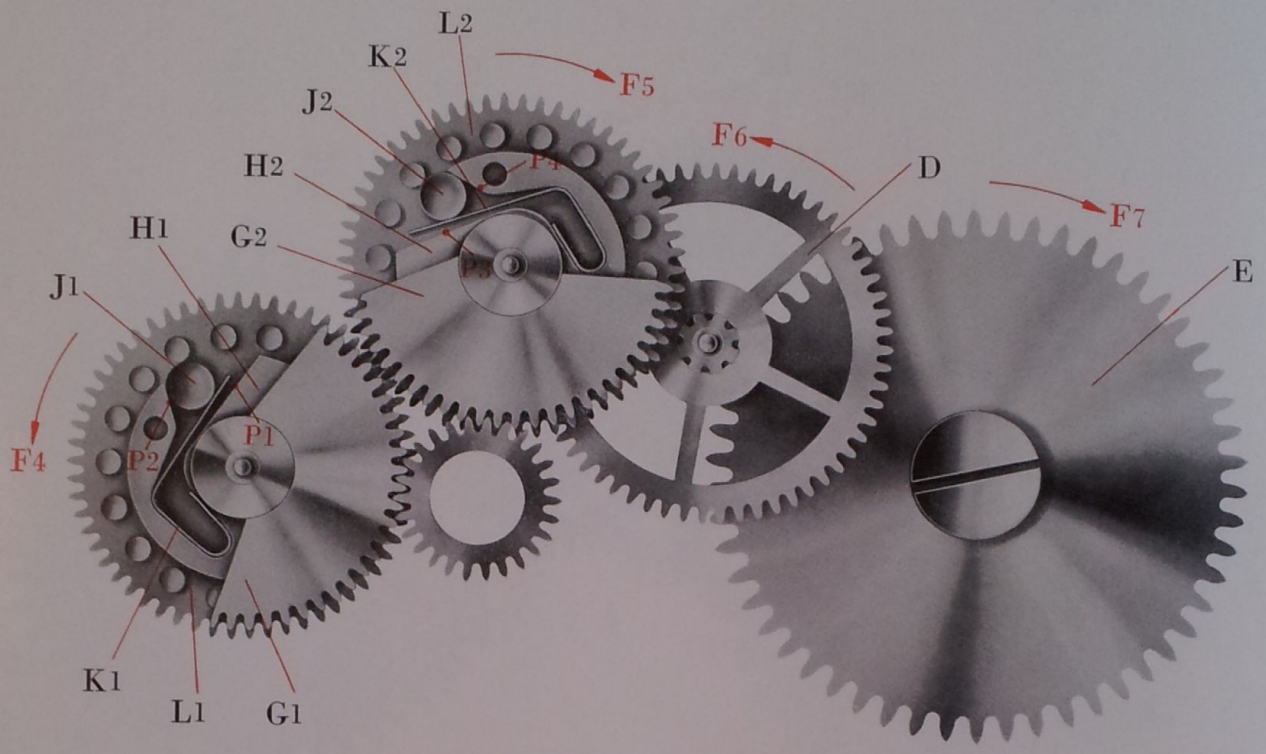
The inclined plane P3 of the winding cam H2 attached to the upper winding wheel G2 pushes via the return spring K2 the roller J2 against the pillars of the lower winding wheel L2. Once positioned between the two pillars, the roller J2 drives in the direction of the arrow F5 the lower winding wheel L2.

The pinion of the latter wheel L2 drives in the direction of the arrow F6 the wheel of the ratchet driving gear D the pinion of which causes the ratchet wheel to turn in the direction of the arrow F7 i.e. the direction of winding.

While the lower winding wheel L2 turns in the direction of the arrow F5 and drives the lower winding wheel L1 in the direction of the arrow F4 the winding cam H1 mounted on the upper winding wheel G1 driven by the rotor A, turns in the direction of the arrow F3. The locking plane of the cam H1 is so shaped as to allow the roller J1 to move radially away from the pillars of the lower winding wheel L1.

Under the action of the return spring K1, the roller J1 remains in contact with the pillars of the lower winding wheel L1 moving to and fro as the wheel and pillars move past it in the direction of the arrow F4 (free-wheeling).

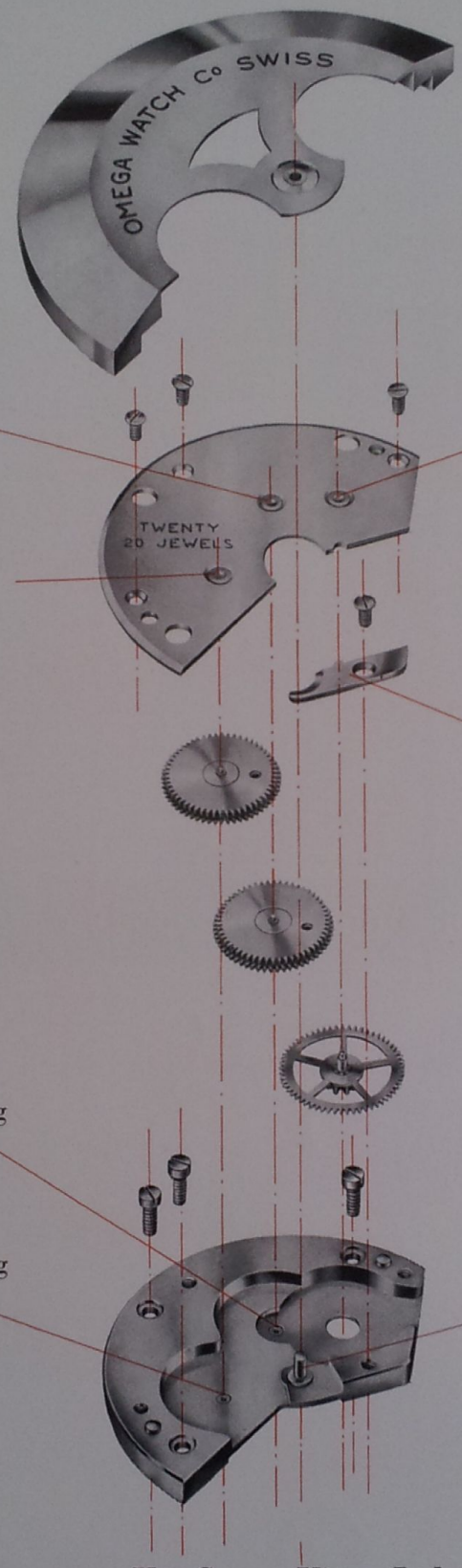
HAND WINDING



On winding the watch by hand the ratchet wheel E turns in the direction of the arrow F7 and drives through its pinion the ratchet wheel driving gear D in the direction of the arrow F6. This wheel meshing with the pinion of the lower winding wheel L2 causes it to turn in the direction of the arrow F5 which in turn drives the winding wheel L1 in the direction of the arrow F4.

Under these conditions the rollers J1 and J2 bear against the locking planes P2 and P4 of the winding cams H1 and H2 respectively. As they are only held in position by their return springs K1 and K2 and are not in contact with the locking planes P1 and P3 no drive is imparted to the upper winding wheels G1 and G2. Thus no motion is transferred to the rotor when the watch is hand wound.

OILING THE AUTOMATIC WORK



Jewel for winding gear with pinion

Jewel for winding gear with axle

Jewel for driving gear of ratchet wheel

Plunge rotor gib into oil-soaked pith

Bushing for winding gear with pinion

Bushing for winding gear with axle

Rotor axle pivot

Use Synta-Visco-Lube oil

OILING THE MOVEMENT

Mainspring Pivoting Points of barrel on arbor	Moebius lubricant
Pivoting Points of barrel arbor and centre wheel in bridge and plate Sweep seconds pinion pivots and friction spring	Moebius oil for Chronometers No. 1
Cannon Pinion Pallet Stones	Synta-A-Lube oil
Winding and hand setting mechanism Minute wheel stud Intermediate wheel stud Bushings for driving gear of ratchet wheel	Synta-Visco-Lube oil

Oiling of Automatic assemblies

The Automatic assemblies should be washed in Petrol/Benzine then dried in air not saw-dust as it is extremely important that they should be absolutely free from dust.

The periphery of the winding rollers should be lightly oiled with Synt-A-Lube oil. To carry this out proceed as follows:

1. Rotate the winding wheel such that the roller and return spring can be seen through the observation hole in the upper winding wheel.

2. By means of an oiler place a very small quantity of oil where the periphery of the roller meets the blade of the return spring.

Ω

Printed in Switzerland