

EBAUCHES S. A.

NEUCHÂTEL

SWITZERLAND

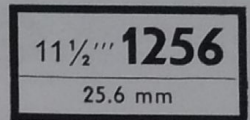
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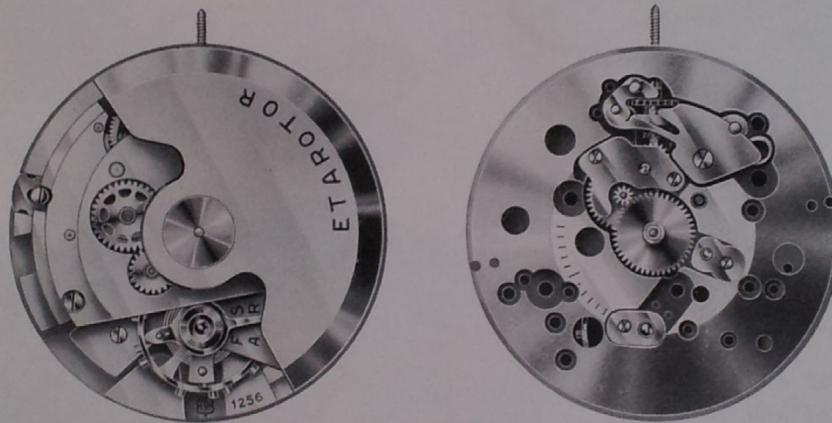
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ETA S. A., GRENCHEN



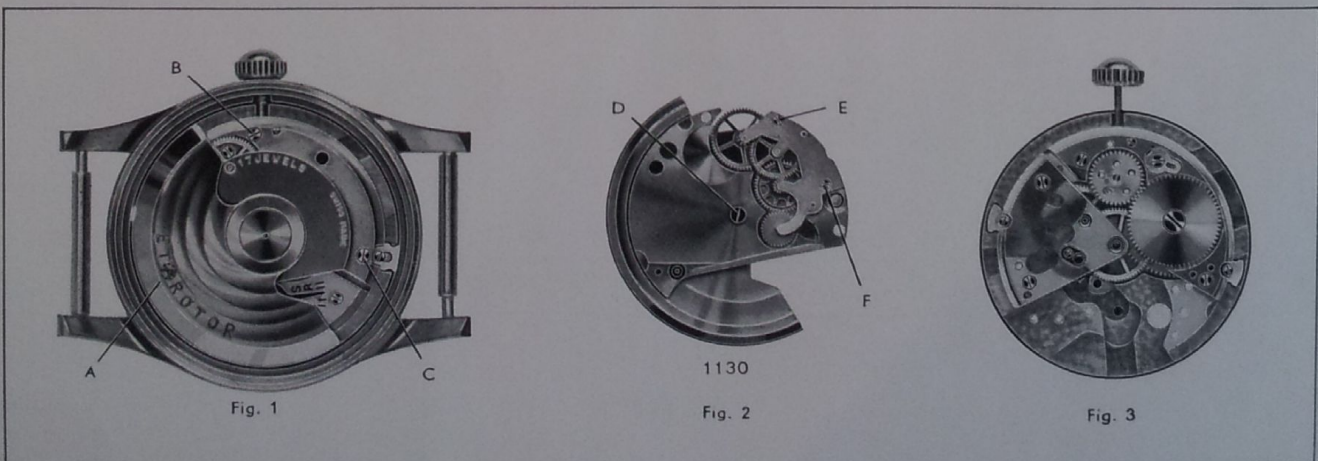
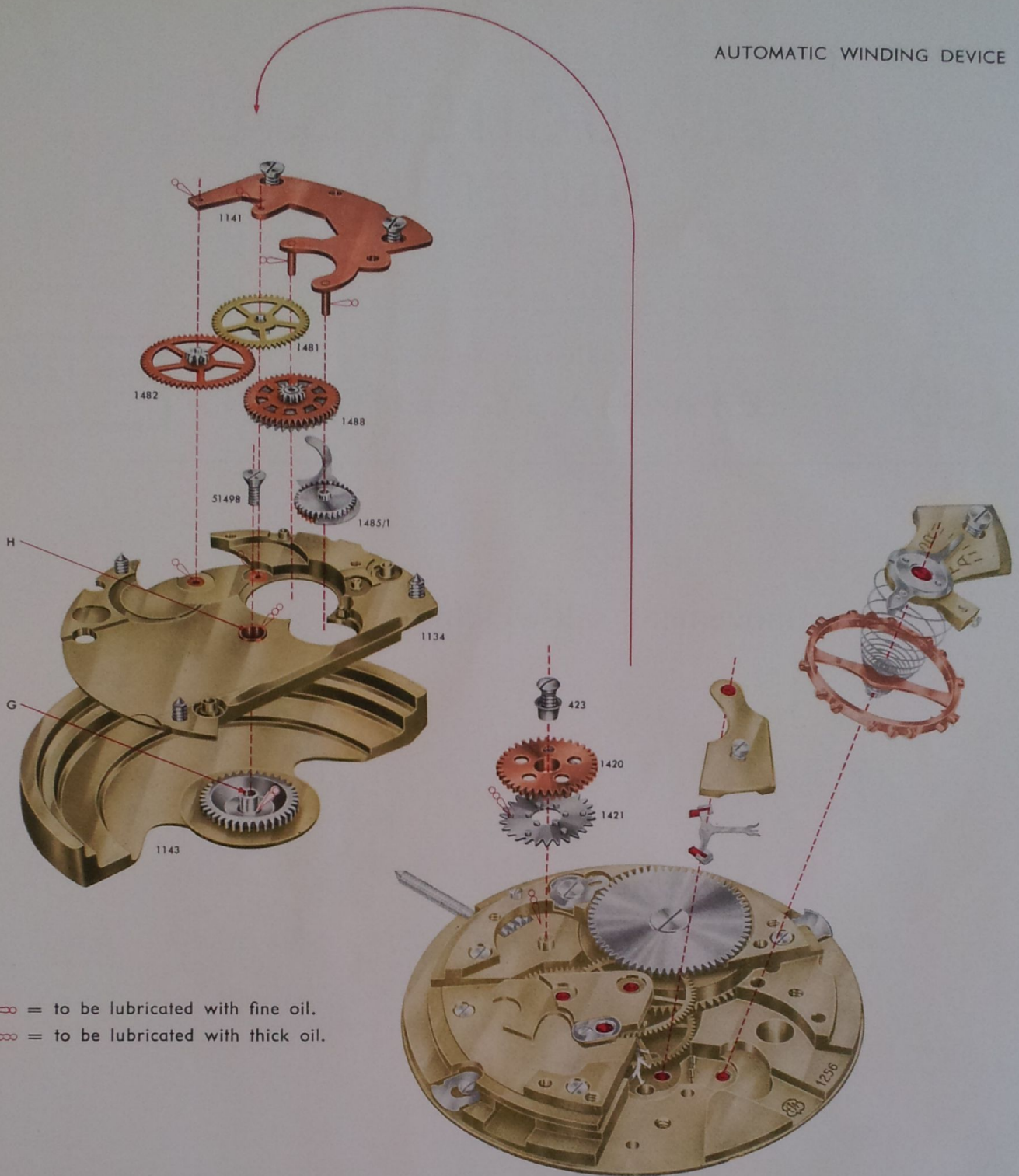
Lever movement, self-winding, with sweep second



Enlarged movement

TECHNICAL AND PRACTICAL COMMUNICATION FOR THE GUIDANCE OF WATCH REPAIRERS

AUTOMATIC WINDING DEVICE



THE REPAIR OF THIS MOVEMENT IS SIMPLIFIED BY THE FACT THAT THE AUTOMATIC WINDING DEVICE IS ENTIRELY INDEPENDENT OF THE WATCH MOVEMENT PROPER

DISASSEMBLING AND ASSEMBLING THE WATCH MOVEMENT PROPER :

1. Open case (see under CASING).
2. Remove mounted automatic device 1130 from the watch movement by unscrewing the 3 screws A, B and C of framework 1134 (fig. 1 and 2).
3. Remove winding stem ; then, if the proposed repair makes it necessary, take the movement out of the case ; remove hands and dial, then replace winding stem.
4. If it is necessary to disassemble the movement completely, remove balance wheel and pallet fork, then disassemble the watch movement and clean all its parts in the ordinary way ; check cleanness and wear of parts, oil all pivot holes and friction points, then reassemble the movement, including pallet fork and balance wheel. The mainspring may be replaced without disassembling the movement proper (fig. 3).

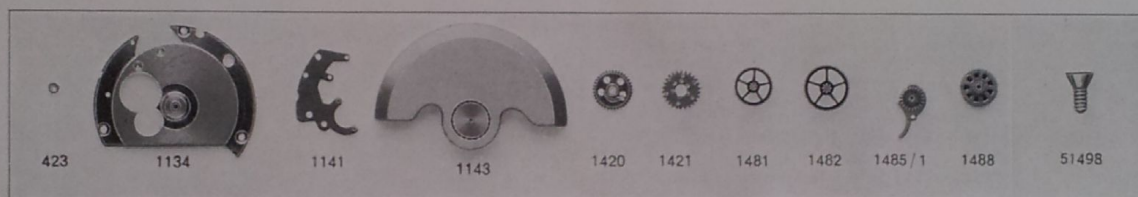
Mainspring : If the mainspring and brake spring are working normally, they should not be removed from the barrel (the brake spring should not slip until the mainspring has been wound 5-6 turns). On the other hand, if the mainspring or brake spring is damaged, it should be replaced by a spring of good quality and of the prescribed dimensions, viz.

Mainspring: breadth 1.48 mm. - thickness 0.10 mm. - length 260 mm.

Brake spring: breadth 1.34 mm. - thickness 0.165 mm. - length 30.8 mm.

Grease the entire inner circumference of the barrel. Fit brake spring, bending it as little as possible, then fit mainspring, oiling it in the ordinary way (remember to check the slipping of the brake spring).

Crown wheel : The crown wheel consists of 2 distinct wheels: lower crown wheel 1421 (to be fitted first, with its lever pins upwards) and upper crown wheel 1420 (to be fitted on top of lower crown wheel, with the click between its rows of lever pins). Then fit crown wheel core 423 and its screw (left-hand thread). The 2 wheels should turn freely and independently of each other ; when turned in the direction of winding, however, the lower wheel will drive the upper wheel through the action of the click. The friction surfaces, the click and the lower surface of the lower crown wheel should be lubricated with thick oil.



DISASSEMBLING THE AUTOMATIC DEVICE :

1. Remove oscillating weight 1143 (fig. 2) from mounted framework 1134/1, by taking out screw D (screw 51498 for bearing wheel of oscillating weight). The bearing wheel should only be removed from the oscillating weight if it has to be replaced.
2. Remove : lower bridge 1141 of automatic device (by unscrewing the 2 screws E and F, fig. 2), reduction gear 1481, driving gear 1482 of crown wheel, and then, simultaneously, mounted pawl winding wheel 1488 and mounted reverser 1485/1. Check cleanness and wear of all these parts.

ASSEMBLING THE AUTOMATIC DEVICE :

1. Place framework 1134 of automatic device on a holder, with its inner side upwards; then fit mounted reverser 1485/1 into its countersink, the arm being located by a pin.
2. Fit complete pawl winding wheel 1488, with its pinion upwards, from the side, so that the arm of mounted reverser 1485/1 lies between the 2 wheels; then fit driving gear 1482 of crown wheel (large), with its pinion upwards, and reduction gear 1481 (small), with its pinion downwards.
3. Place in position lower bridge 1141 of automatic device by fitting its 2 pins into the holes in mounted reverser 1485/1 and pawl winding wheel 1488, then tighten the 2 screws E and F.

Lubrication : Use fine oil to lubricate upper and lower pivot holes of reduction gear 1481 and driving gear 1482 of crown wheel, as well as the 2 pins on lower bridge 1141 of automatic device, which act as pivots for mounted reverser 1485/1 and complete pawl winding wheel 1488.

4. Place mounted framework 1134/1 on oscillating weight 1143 fitted with its bearing wheel 1498 (fig. 2); then tighten screw 51498 (conical head) of bearing wheel of oscillating weight.

To correct end-shake of oscillating weight, proceed as follows: to reduce end-shake, adjust inner cone of hub of bearing wheel 1498 (see arrow G on colored plate opposite). To increase end-shake, adjust inner cone of tube of framework 1134 (see arrow H on colored plate opposite). To fraise the cones, use a 60° conical fraise held in an ordinary chuck. When end-shake has been corrected, the 2 cones should be lubricated with good-quality fine oil, and bearing wheel screw 51498 should be screwed home.

5. Fit dial and hands, and place movement in case. Fit mounted automatic device 1130 on to the watch movement by means of the 3 screws A, B and C. Before tightening the screws, slightly turn the winding stem to cause driving gear 1482 of crown wheel to mesh with upper crown wheel 1420; then drive the 3 screws home.

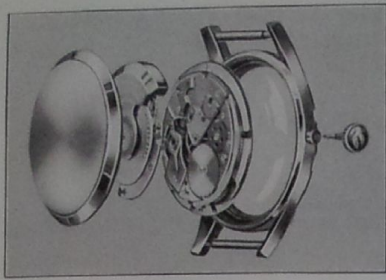


Fig. 4

Casing : Ordinary 3-piece cases give no trouble, but there are many different kinds of **waterproof cases**, of which those illustrated are among the most popular.

Fig. 4 shows a type of waterproof case of which the back opens to enable the movement to be taken out.

Fig. 5 shows a type of which the bezel is snapped on and is opened by a knife-blade inserted at the point indicated by the arrow; when the crown (with 2-piece winding stem) has been removed, the movement is taken out from the dial side.

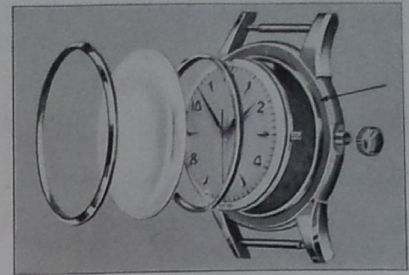


Fig. 5

This movement may be fitted with special casing clamps; the positions of these are shown in the diagram below.

Position for ordinary case.



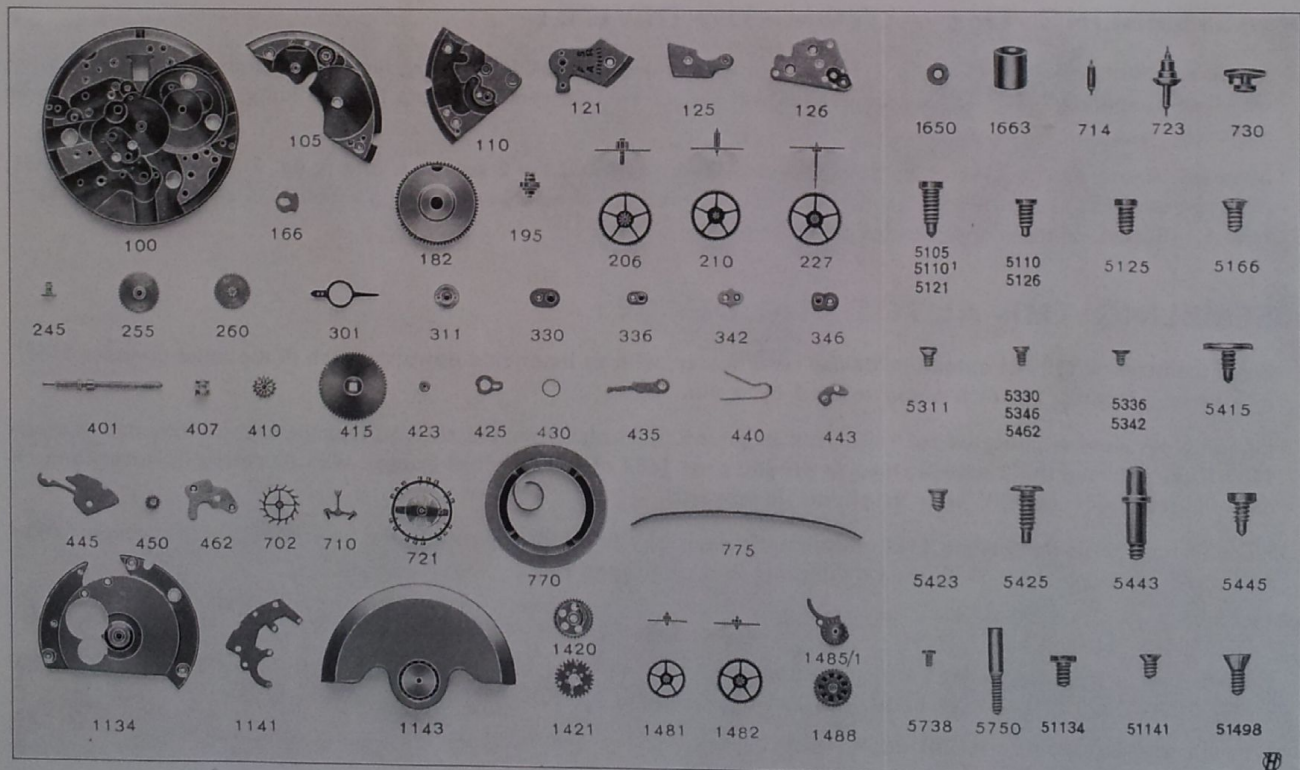
Position for waterproof case.

When fitting a movement into a waterproof case, it is essential, in order to avoid excessive friction, to center the winding stem correctly in the tube.

Description and numbering of spare parts according to the "Technological Dictionary of Watch Parts", 2nd edition.

- | | | |
|---|--|---|
| 100 Plate | 336 Upper cap jewel, with end-piece, for escape wheel | 710 Jewelled pallet fork and staff |
| 105 Barrel bridge | 342 Bearing plate for sweep second wheel | 714 Pallet staff |
| 110 Train wheel bridge | 346 Lower cap jewel, with end-piece, for escape wheel | 721 Balance with flat hairspring, regulated |
| 121 Balance cock for flat hairspring | 401 Winding stem | 723 Balance staff, pivoted |
| 125 Pallet cock | 407 Clutch wheel | 730 Roller |
| 126 Center wheel cock | 410 Winding pinion | 770 Mainspring |
| 166 Casing clamp | 415 Ratchet wheel | 775 Brake spring |
| 182 Barrel and cover (without arbor) | 423 Crown wheel core | 1134 Framework for automatic device |
| 195 Barrel arbor | 425 Click | 1141 Lower bridge for automatic device |
| 206 Center wheel and pinion (without cannon pinion) | 430 Click spring | 1143 Oscillating weight |
| 210 Third wheel and pinion | 435 Yoke (clutch lever) | 1420 Upper crown wheel |
| 227 Sweep second wheel and pinion | 440 Yoke spring (set spring) | 1421 Lower crown wheel |
| 245 Cannon pinion with clam notch | 443 Setting lever (detent) | 1481 Reduction gear |
| 255 Hour wheel | 445 Setting lever spring (set bridge) | 1482 Driving gear for crown wheel |
| 260 Minute wheel | 450 Setting wheel | 1485/1 Reverser, mounted |
| 301 Regulator for flat hairspring | 462 Minute work cock | 1488 Pawl winding wheel, complete |
| 311 Upper cap jewel, with end-piece, for balance | 702 Escape wheel and pinion, pivoted, for 2 end-pieces | 1650 Bushing for automatic device |
| 330 Lower cap jewel, with end-piece, for balance | | 1663 Bushing for oscillating weight, lower |

5105 Barrel bridge screw - 5110 Train wheel bridge screw, low head - 5110¹ Train wheel bridge screw, high head - 5121 Balance cock screw - 5125 Pallet cock screw - 5126 Center wheel cock screw - 5166 Casing clamp screw - 5311 Screw for upper end-piece of balance - 5330 Screw for lower end-piece of balance - 5336 Screw for upper end-piece of escape wheel - 5342 Screw for bearing plate of sweep second wheel - 5346 Screw for lower end-piece of escape wheel - 5415 Ratchet wheel screw - 5423 Crown wheel core screw - 5425 Click screw - 5443 Setting lever screw - 5445 Screw for setting lever spring - 5462 Minute work cock screw - 5738 Hairspring stud screw - 5750 Dial screw - 51134 Screw for framework of automatic device - 51141 Screw for lower bridge of automatic device - 51498 Screw for bearing wheel of oscillating weight.



When ordering parts for a shock-protecting device, make certain to specify its exact type. For further details of the description and numbering of spare parts, see the "Technological Dictionary of Watch Parts", 2nd edition, published by Ebauches S. A.

Order repair parts through your jobber, giving the numbers and designations, thus insuring prompt and efficient deliveries.