

# EBAUCHES S.A.

## NEUCHÂTEL

SWITZERLAND

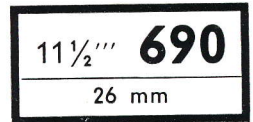
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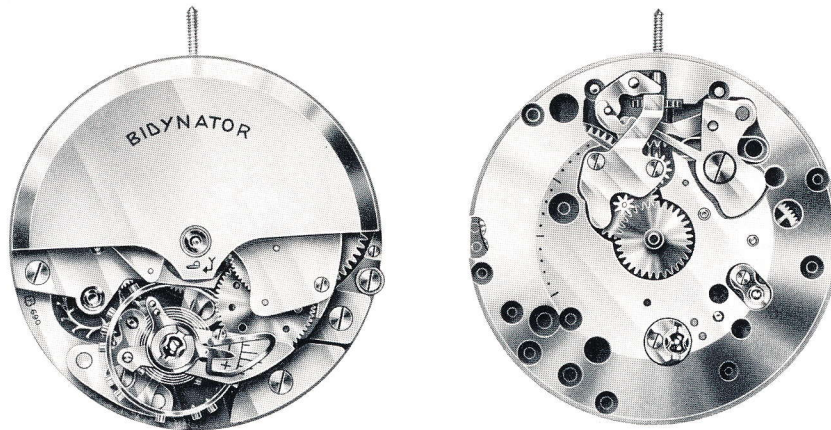
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FABRIQUE D'EBAUCHES  
**FELSA S.A., GRENCHEN**



Lever movement, self-winding, with sweep second







Enlarged movement

TECHNICAL AND PRACTICAL COMMUNICATION FOR THE GUIDANCE OF WATCH REPAIRERS

# AUTOMATIC WINDING DEVICE



-  = to be lubricated with fine oil.
-  = to be lubricated with thick oil.
-  = to be lubricated with fine oil, underneath the part.
-  = to be lubricated with thick oil, underneath the part.

THE REPAIR OF THIS MOVEMENT IS SIMPLIFIED BY THE FACT THAT THE OSCILLATING WEIGHT CAN BE REMOVED BY MEANS OF A SIMPLE BOLT

## DISASSEMBLING :

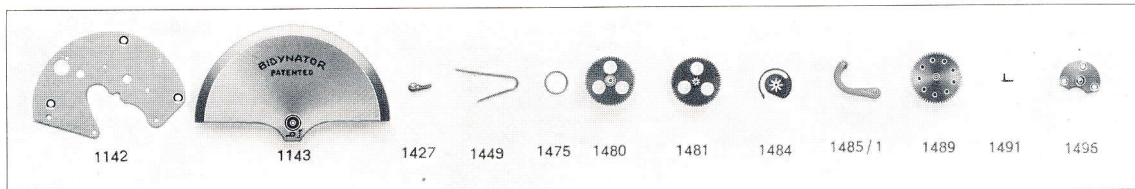
1. Open case (see under CASING).
2. Move bolt 1491 in direction of arrow (fig. 1), then turn the movement to allow oscillating weight 1143 to drop; if necessary, remove bolt 1491 and its spring 1475.
3. Remove winding stem, take the movement out of the case, and remove hands and dial. Then replace winding stem.
4. If necessary, release mainspring as follows (fig. 2) : with winding stem in hand-setting position, draw back click B (it will stay in this position), then tension click 1427 at the point indicated by arrow C. Remove balance wheel and pallet fork.  
To gain direct access to the barrel (fig. 3), it is only necessary to take out the 4 screws D, E, F and G (fig. 2) in order to remove the train wheel bridge with the automatic winding device in position.
5. Remove upper bridge 1142 of automatic device (fig. 2), after taking out the 3 screws H, I and K.
6. Remove (fig. 4) : mounted reverser 1485/1, tension click spring 1449 and its click 1427, winding-up wheel 1480 (without pinion), reduction gear 1481 and complete pawl winding wheel 1488. Then separate pinion 1484 with spring click from pawl winding wheel 1489 and, if necessary, unscrew oscillating weight axle 1496.
7. Disassemble the watch movement proper 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, check its running and remove balance wheel and pallet fork.

**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 1.45 mm., thickness 0.1075 mm., total length 320 mm., length of riveted hook 3.80 mm. from rivet.

Brake spring : breadth 1.35 mm., thickness 0.1575 mm., length 35 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. The winding may be checked by placing the barrel in the movement, but it is simpler to use an F 690 ratchet wheel winder.



## ASSEMBLING :

**Lubrication A :** Use fine oil to lubricate lower pivot holes of winding-up wheel 1480, reduction gear 1481 and pawl winding wheel 1489, lower pivot holes of tension click 1427 and mounted reverser 1485/1, pinion spindle of mounted reverser 1485/1, and lower spindle of pawl winding wheel 1489. Use thick oil, however, to lubricate the countersink of pawl winding wheel 1489.

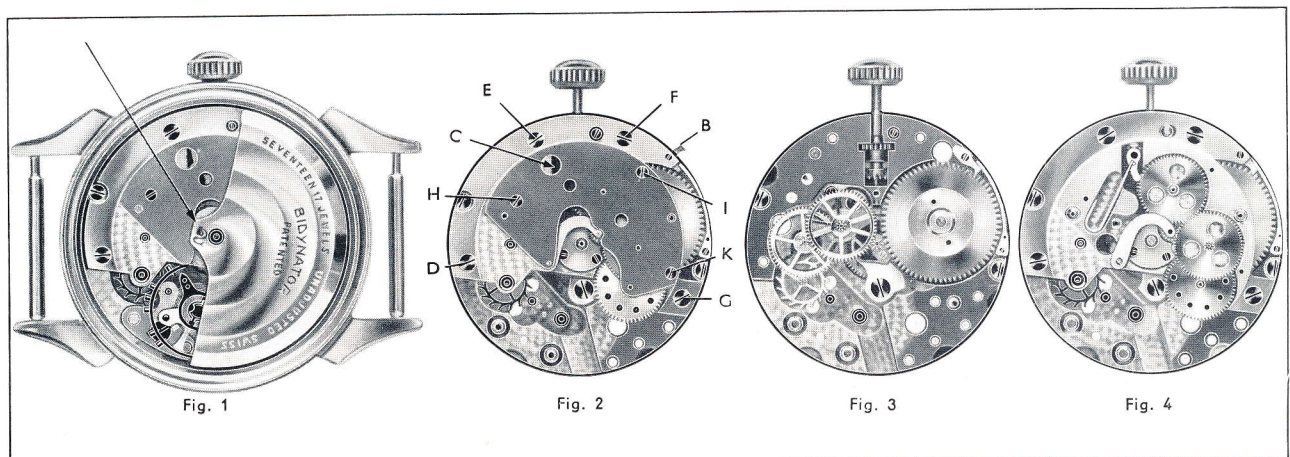
1. Fit complete pawl winding wheel 1488 with its pinion downwards (1488=1489+1484), reduction gear 1481 with its pinion downwards, winding-up wheel 1480 with its seat upwards, mounted reverser 1485/1, tension click 1427 and its spring 1449.

2. Fit upper bridge 1142 of automatic device by means of the 3 screws H, I and K. Replace pallet fork and balance wheel.

**Lubrication B :** Use fine oil to lubricate the 5 upper pivot holes of the automatic device, oscillating weight axle 1496 at its end and base; its groove should be lubricated with thick oil.

**To correct end-shake of oscillating weight,** raise or lower its upper jewel (small hole), as required.

3. Fit dial and hands, and place movement in case.
4. Move bolt 1491 in direction of arrow, replace oscillating weight 1143 and push back the bolt.



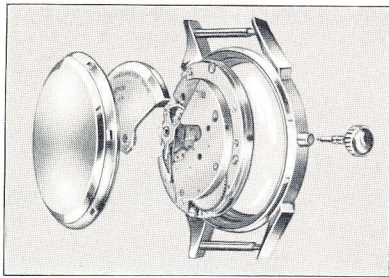


Fig. 5

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

Fig. 6 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.

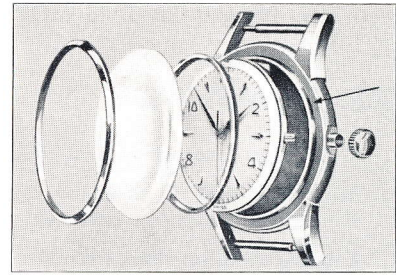


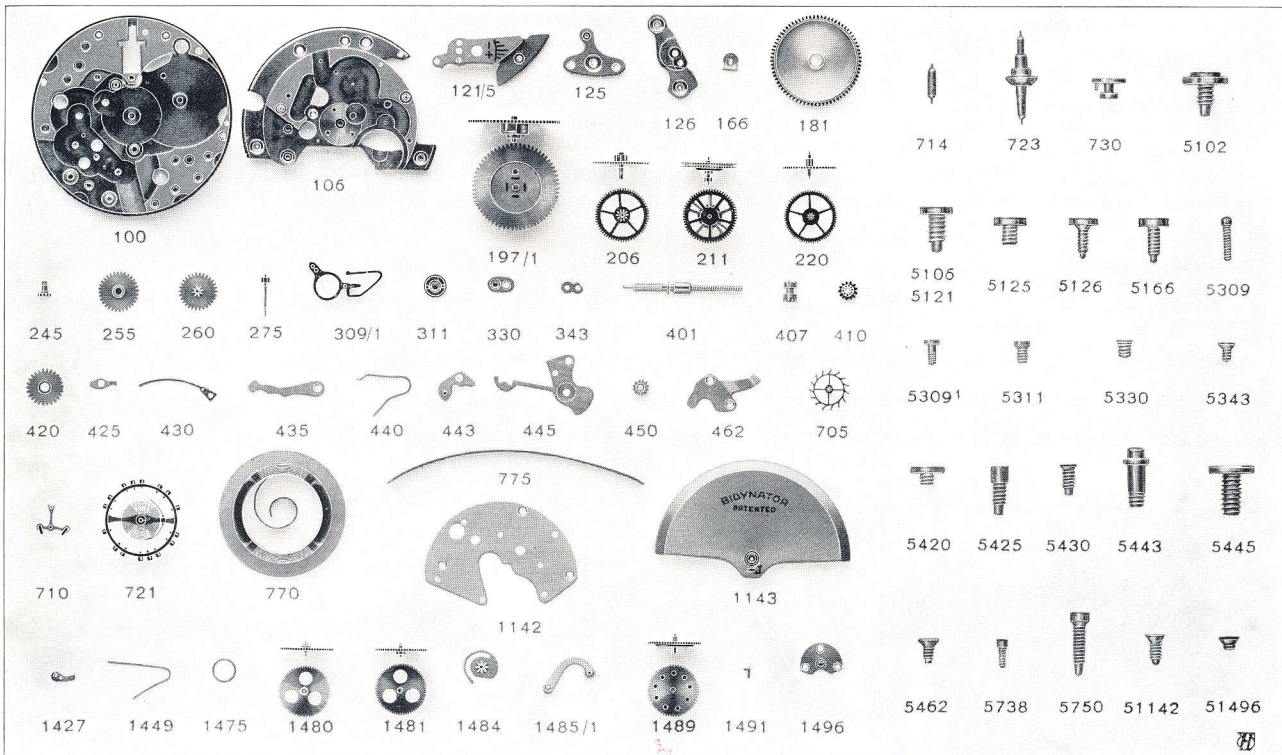
Fig. 6

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  | 311 Upper cap jewel, with end-piece, for balance         | 714 Pallet staff                            |
| 106 Barrel and train wheel bridge                          | 330 Lower cap jewel, with end-piece, for balance         | 721 Balance with flat hairspring, regulated |
| 121/5 Cock for regulating device, flat hairspring          | 343 Bearing plate, non-jewelled, for sweep second pinion | 723 Balance staff, pivoted                  |
| 125 Pallet cock  | 401 Winding stem   | 730 Roller                                  |
| 126 Center wheel cock                                      | 407 Clutch wheel   | 770 Mainspring                              |
| 166 Casing clamp   | 410 Winding pinion                                       | 775 Brake spring                            |
| 181 Barrel for drilled core                                | 420 Crown wheel  | 1142 Upper bridge for automatic device      |
| 197/1 Core, axle and ratchet wheel, mounted                | 425 Click  | 1143 Oscillating weight                     |
| 206 Center wheel and pinion (without cannon pinion)        | 430 Click spring   | 1427 Tension click                          |
| 211 Double third wheel and pinion                          | 435 Yoke (clutch lever)                                  | 1449 Tension click spring                   |
| 220 Fourth wheel and pinion                                | 440 Yoke spring (set spring)                             | 1475 Bolt spring                            |
| 245 Cannon pinion with clam notch                          | 443 Setting lever (detent)                               | 1480 Winding-up wheel                       |
| 255 Hour wheel   | 445 Setting lever spring (set bridge)                    | 1481 Reduction gear                         |
| 260 Minute wheel   | 450 Setting wheel  | 1484 Pinion with spring click               |
| 275 Sweep second pinion                                    | 462 Minute work cock                                     | 1485/1 Reverser, mounted                    |
| 309/1 Regulator with adjusting device, for flat hairspring | 705 Escape wheel and pinion with straight pivots         | 1489 Pawl winding wheel                     |
|  | 710 Jewelled pallet fork and staff                       | 1491 Bolt                                   |
|  |  | 1496 Oscillating weight axle                |

5102 Case screw, special - 5106 Screw for barrel and train wheel bridge - 5151 Balance cock screw - 5125 Pallet cock screw - 5126 Center wheel cock screw - 5166 Casing clamp screw - 5309 Adjusting screw for regulator - 5309<sup>1</sup> Banking screw for regulator - 5311 Upper end-piece screw - 5330 Lower end-piece screw - 5343 Screw for bearing plate of sweep second pinion - 5420 Crown wheel screw - 5425 Click screw - 5430 Screw for click spring - 5443 Setting lever screw - 5445 Screw for setting lever spring - 5462 Minute work cock screw - 5738 Hairspring stud screw - 5750 Dial screw - 51142 Screw for upper bridge of automatic device - 51496 Screw for oscillating weight axle.



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.