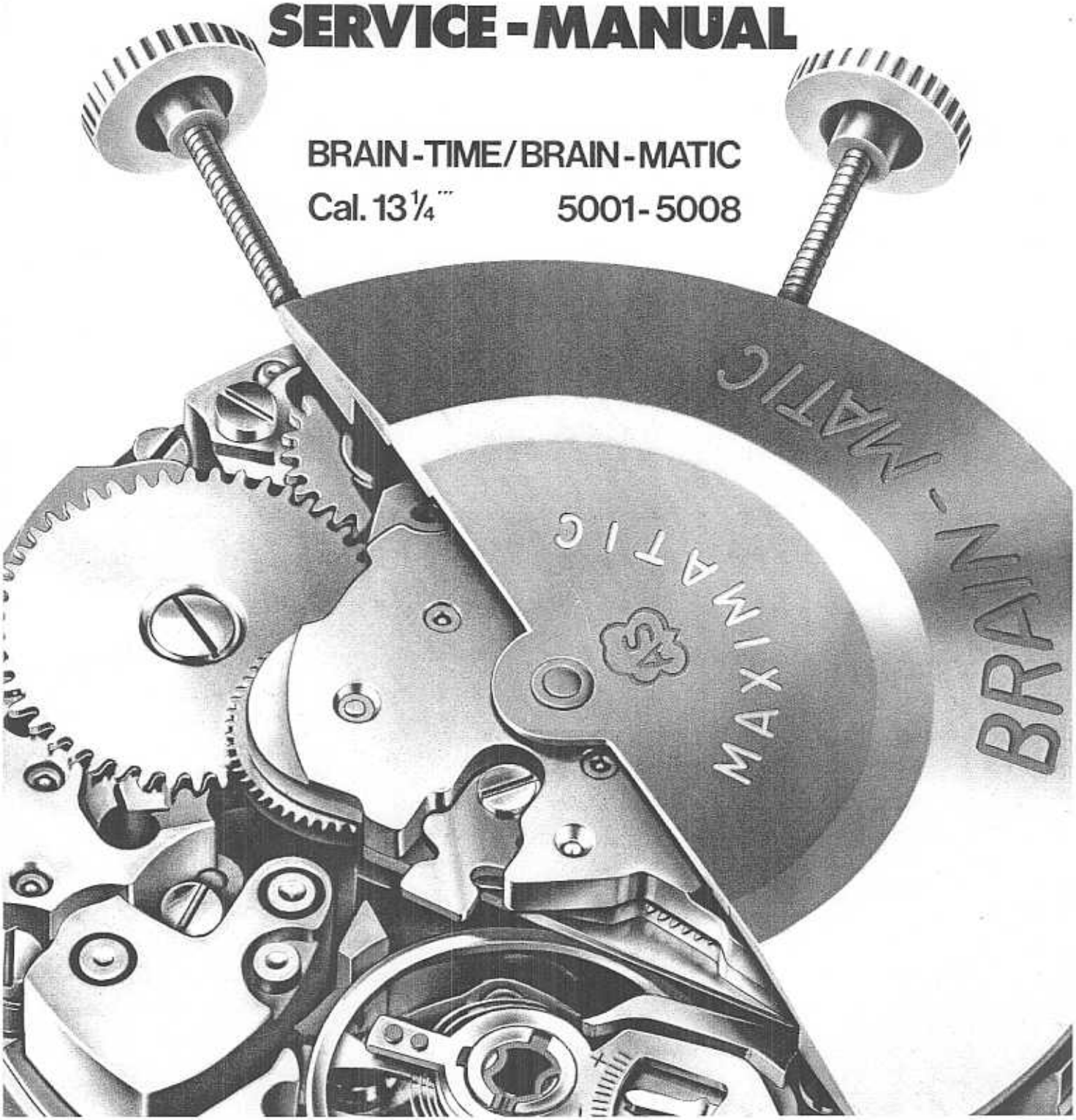
A. Schild S.A.
Fabrique d'ébauches, 2540 Grenchen/Switzerland

Periscope

SERVICE-MANUAL

BRAIN-TIME/BRAIN-MATIC
Cal. 13¼‴ 5001-5008



Periscope AS A. Schild S.A.
Fabrique d'ébauches, 2540 Grenchen/Switzerland

3 30 3

SUMMARY

Periscope AS A. Schild S.A.
Fabrique d'ébauches, 2540 Grenchen/Switzerland

1. Introduction

A. Schild, Inc., one of the world's largest movement-blank factories, has pleasure in presenting a "S E R V I C E M A N U A L" which will certainly prove to be a most useful aid to work for all users of the "Brain-Time" and "Brain-Matic" family of calibers for alarm wristwatches.

This documentation may be regarded as a self-contained whole or, if the cover is simply removed, as a complement to the existing "Periscope" articles which deal with these products.

Our object in bringing out this documentation is to try to answer every possible question that may be asked in connection with the automatic alarm wristwatch. It will no doubt be a valuable help to your after-sales service organization and be welcomed as a useful guide by watch-repairers in general.

Grenchen, February, 1974

Periscope AS A. Schild S.A.
Fabrique d'ébauches, 2540 Grenchen/Switzerland

3 30 3

Alarm·wristwatch family AS
BRAIN·TIME+BRAIN·MATIC

2. CALIBER PROGRAM

The family of calibres consists of 5 versions:

- 1 caliber with hand winding BRAIN-TIME : cal. 5001
- 4 calibres with automatic winding BRAIN-MATIC : cal. 5004, 5005, 5007, 5008

Designation of caliber		Diameter in Ligne	Height in mm	Frequency	Winding Mechanism		Calendar			Alarm	Stop-second device	AS 3 fine-regulating device
Name	Caliber number				Movement	Alarm	Day	Date	Corrector			
BRAIN-TIME	5001	13¼	5,25	4 HZ 28'800A/h	hand	hand		12	1	bell	STOP	
BRAIN-MATIC	5004	13¼	7,60	4 HZ 28'800A/h	auto	hand		12	1	bell	STOP	
	5005	13¼	7,60	4 HZ 28'800A/h	auto	hand	DAY	12	2	bell	STOP	
	5007	13¼	7,60	4 HZ 28'800A/h	auto	auto		12	1	bell	STOP	
	5008	13¼	7,60	4 HZ 28'800A/h	auto	auto	DAY	12	2	bell	STOP	

1 Date corrector by rotation of winding-stem

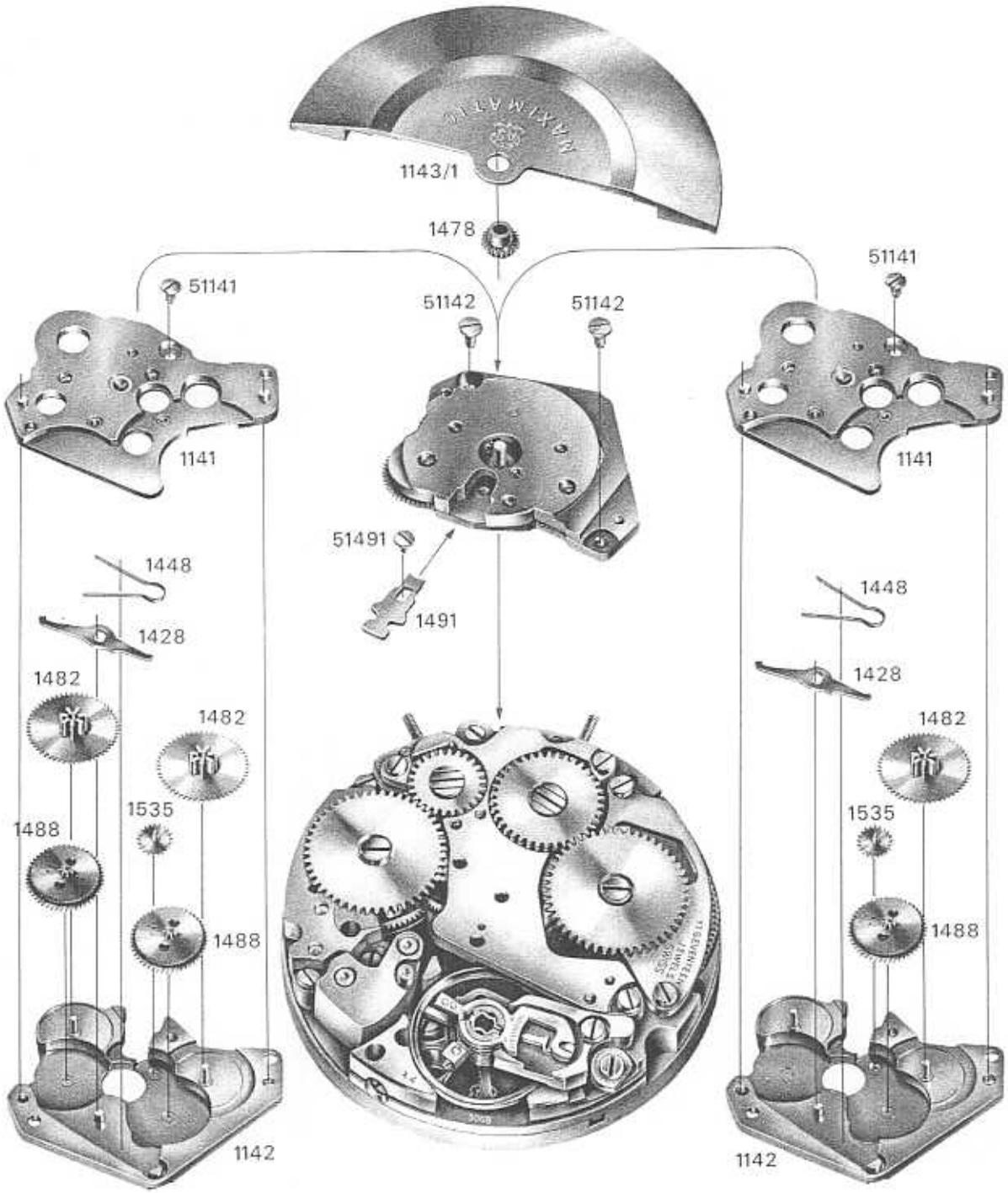
2 Day and Date corrector by rotation of winding-stem

Automatic winding

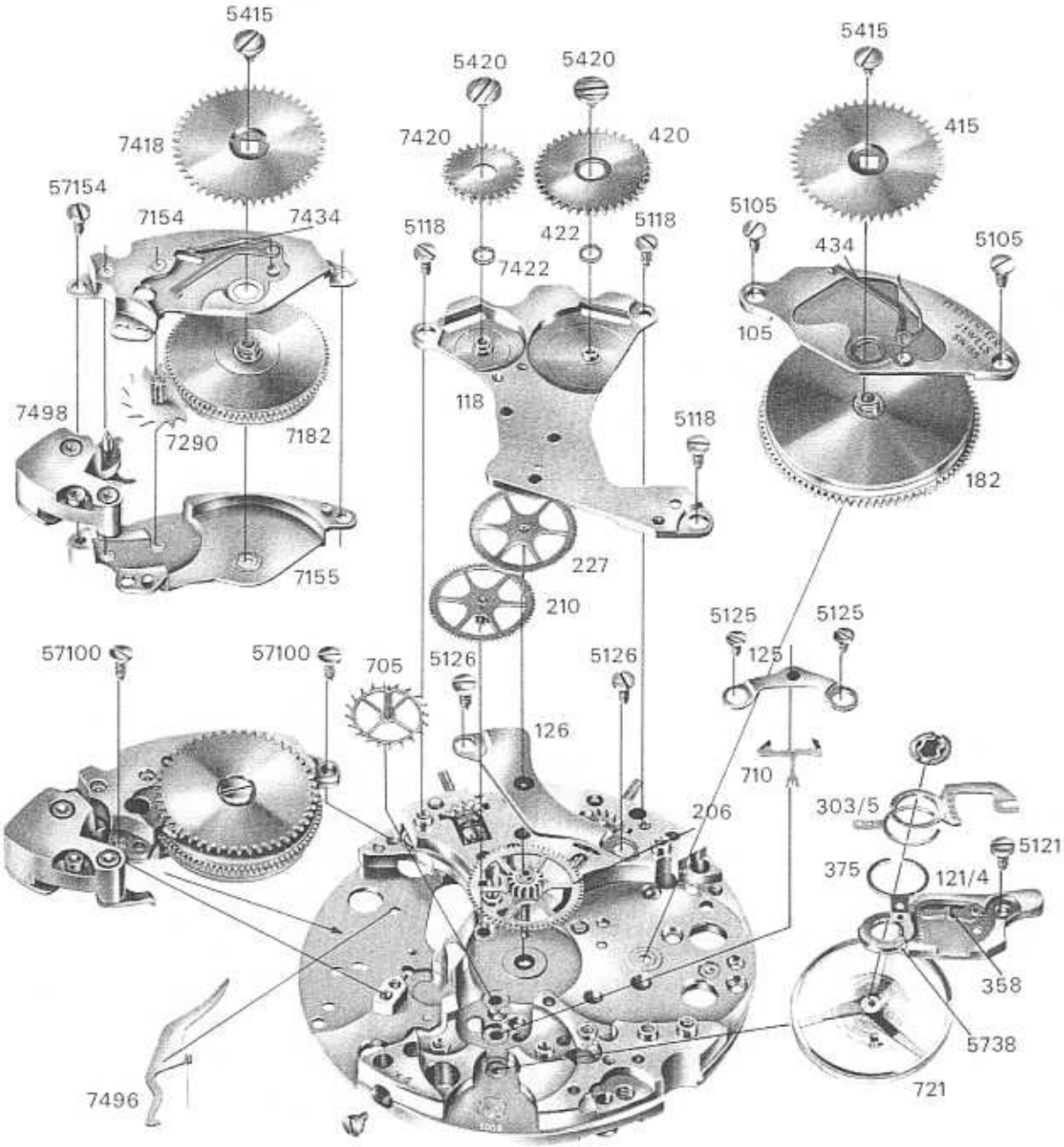
Hand winding

Movement mounted with automatic device in exploded view, cal. 5004-5008

A

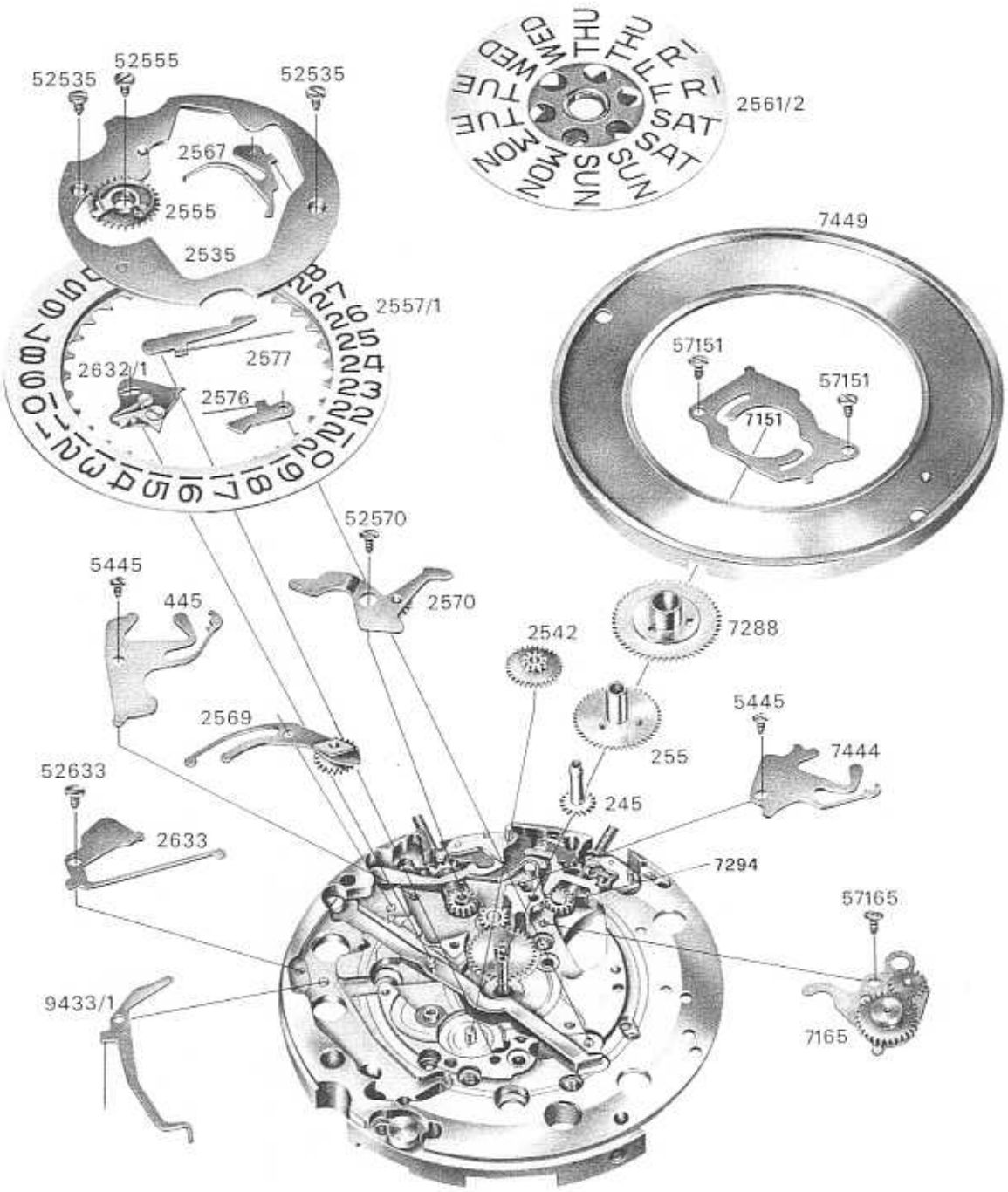


Movement bridge side in exploded view, cal. 5001-5008 B



C

Movement dial side in exploded view, cal. 5005, 5008



4. Removing the case

4.1. Open the back of the case.

4.2. Using a pointed tool (tweezers, screwdriver), press the setting-lever pivots at point A and extract the winding-stems by pulling the crowns. Both the stems must be removed.

4.3. Loosen or, if necessary, take out the case screws.

4.4. Remove the casing-ring, if any.

4.5. Take the movement out of the case.

4.6. Remove the hands and dial.

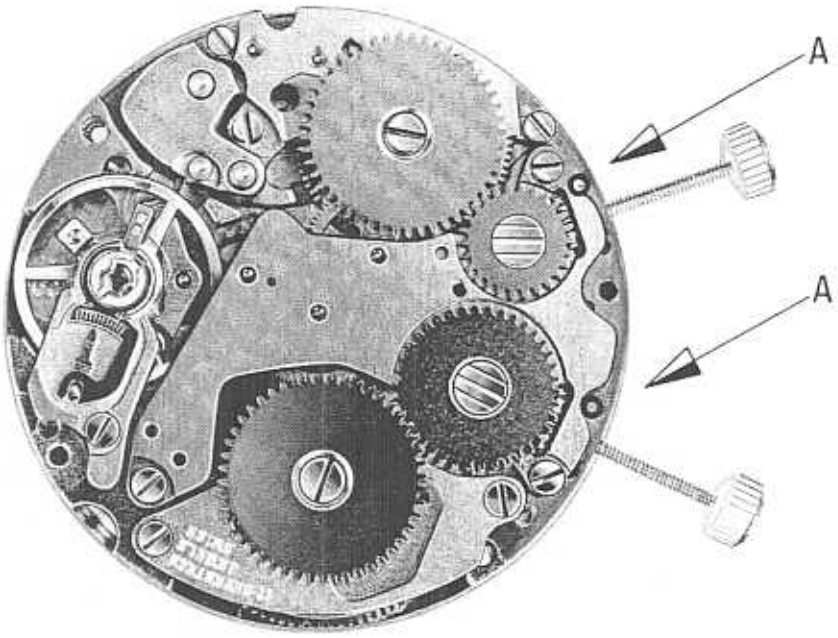


Fig. 1

5. Dismantling

5.1. Lifting off and dismantling the automatic-winding assembly

See exploded view A, page 2

5.1.1. Having loosened its screw No. 51491, pull back the oscillating-weight bolt No. 1491.

5.1.2. Lift off the oscillating weight No. 1143/1.

5.1.3. Take out the two screws No. 51142 securing the automatic-winding assembly.

5.1.4. Lift off the automatic-winding assembly.

5.1.5. Having taken out its screw No. 51141, remove the lower bridge No. 1141 of the automatic-winding assembly.

5.1.6. Remove the remaining components.

5.2. Removing and dismantling the alarm assembly

See exploded view B, page 3

5.2.1. Let down the alarm mainspring.

5.2.2. Take out the two screws No. 57100 securing the alarm assembly and remove the assembly itself.

5.2.3. Remove the alarm bolt No. 7496.

5.2.4. Unscrew and remove the alarm ratchet wheel No. 7418 and the alarm spring-click No. 7434.

5.2.5. Take out the screw No. 75154 and lift off the bridge of the alarm assembly.

5.2.6. Remove the remaining components.

5.3. Dismantling the watch movement

See exploded view B, page 3

5.3.1. Let down the mainspring of the watch movement.

5.3.2. Unscrew and disengage the balance cock No. 121/4; turn the movement over on the bench and allow the balance and its cock to drop out.

5.3.3. Unscrew and remove the pallet cock No. 125 and the pallets No. 711.

5.3.4. Unscrew and remove the ratchet wheel No. 415 and the spring-click No. 434.

5.3.5. Unscrew and remove the barrel bridge No. 105 and the barrel No. 182.

5.3.6. Unscrew and disengage the combined bridge No. 118; turn the movement over on the bench and allow the combined bridge, the escape wheel No. 705, the sweep-second wheel No. 227 and the third wheel No. 210 to drop out.

5.3.7. Unscrew and remove the center-wheel cock No. 126 and the center wheel No. 206.

5.3.8. Unscrew and remove the two crown wheels Nos. 420 and 7420 on the combined bridge. Take away the crown-wheel rings Nos. 422 and 7422.

5.4. Dismantling the alarm assembly on the dial side and the instantaneous Calday calendar work

See exploded view C, page 4

5.4.1. Lift off the day disk, No. 2561/2.

5.4.2. Unscrew and remove the calendar driving-wheel, No. 2555.

5.4.3. Unscrew and remove the date-indicator guard No. 2535.

5.4.4.	Remove:	the day-corrector	No. 2567
		the day jumper	No. 2577
		the date jumper	No. 2576
		the unlocking yoke for the date-indicator	No. 2632/1
		the date-setting wheel	No. 2542
		the date-indicator	No. 2557/1

5.4.5. Lift off the gong No. 7449 by gently turning a screwdriver after having inserted it into the space between the gong and the plate, at point B.

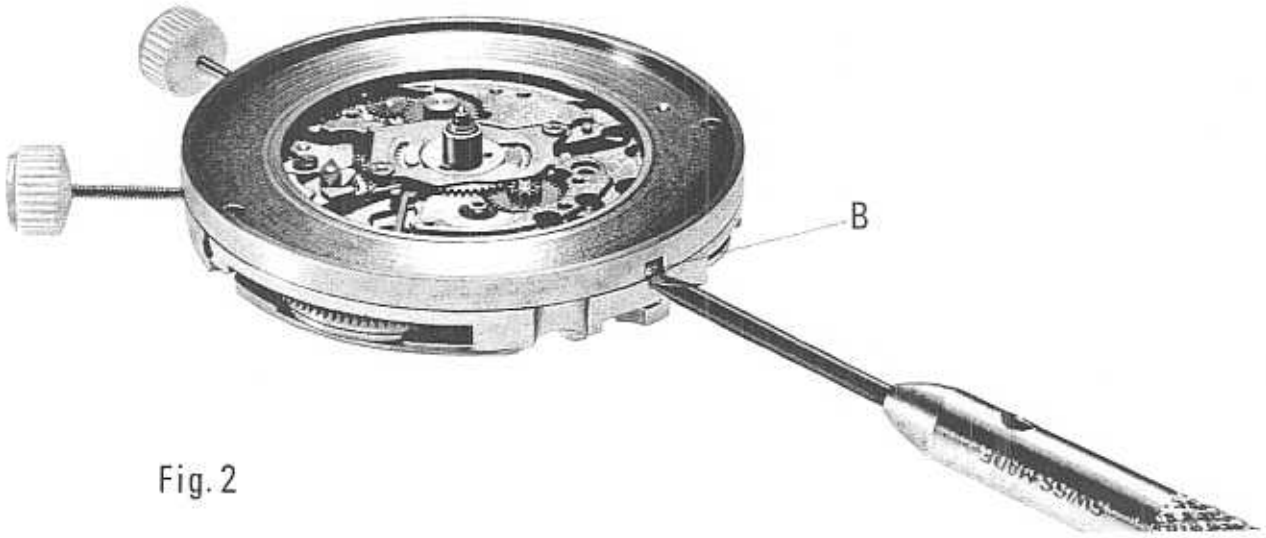


Fig. 2

5.4.6. Unscrew and remove the unlocking-wheel holder No. 7151.

5.4.7. Remove:

the unlocking-wheel	No. 7288
the hour wheel	No. 255
the cannon pinion with clam notch	No. 245

5.5. Dismantling the winding- and setting-mechanism, the stop-second device and the corrector system

See exploded view C, page 4

5.5.1. Unscrew and remove the alarm-setting device No. 7165

5.5.2. Remove:

the minute wheel	No. 260
the alarm-setting connection wheel	No. 7294

5.5.3. Unscrew and remove the alarm setting-lever spring No. 7444.

5.5.4. Remove:

the yoke spring	No. 440
the alarm yoke	No. 7435
the alarm setting-lever	No. 7443
the alarm winding-stem	No. 7401
the alarm winding-pinion	No. 7410
the alarm clutch wheel	No. 7407

5.5.5. Unscrew and remove the release-lever spring No. 2633. Remove the stop lever No. 9433/1.

5.5.6. Unscrew and remove the operating-lever No. 2570 of the double corrector.

5.5.7. Remove:

the double corrector	No. 2569
the intermediate setting-wheel	No. 453
the setting-wheel	No. 450

5.5.8. Unscrew and remove the setting-lever spring No. 445.

5.5.9.	Remove:	the yoke	No. 435
		the setting-lever	No. 443
		the winding-stem	No. 401
		the winding-pinion	No. 410
		the clutch wheel	No. 407

5.5.10. Unscrew and remove the disconnector No. 7459.

6. Cleaning and demagnetizing

6.1. Cleaning

6.1.1. With the exception of those referred to under 6.1.2, all the components may be cleaned in the usual way, in the fluids which are available on the market.

6.1.2. Exceptions: not to be dipped into cleaning-fluids

- date-indicator	No. 2557/1
- day star with disk	No. 2561/2
- assembled barrels for going movement and alarm work	No. 182 and 7182
- escape wheel and pignon	No. 705
- jeweled pallet fork and staff	No. 710
- dial and hands	

6.1.3. Important!

The escape wheel No. 705 should be cleaned only if it is very dirty. The nature of the lubrication of the escapement should be ascertained beforehand. After cleaning, the lubrication should be renewed as indicated under 7.3.4.

6.1.4. The pallets No. 710 should be cleaned in pure benzine.

6.1.5. If, for any particular reason, it is necessary to dismantle and clean the barrel for automatic winding or to replace it, the inner wall of the drum should be freshly lubricated before the mainspring is fitted.

Lubricant: Chronogrease P or an equivalent preparation.

6.2. Demagnetizing

If necessary, all the components may be demagnetized without risk.
The movement as a whole can also be demagnetized. It is advisable to use, if possible, the Magno-Matic (Greiner) or the Magna-Flux (Bergeon) apparatus. Both these appliances, which are readily available on the market, ensure optimum demagnetization.

6.3. Replacing faulty or damaged components

Before the movement is reassembled, it is necessary to check the condition of the components and to replace any that are faulty or damaged.
It is important to use only genuine components that have been supplied to the material-dealers by the Spare-Parts Service of Ebauches S.A., Neuchâtel, Switzerland.

6.4. Replacing to mainspring

6.4.1. Only mainsprings of good-quality alloy should be used. The dimensions and torques will be found on the technical specification sheet for the caliber concerned.

6.4.2. Before it is fitted with a new mainspring, the barrel should be thoroughly cleaned. In the case of barrels for automatic winding, the inner wall of the drum must then be carefully lubricated.

Lubricant: Chronogrease P or an equivalent preparation.

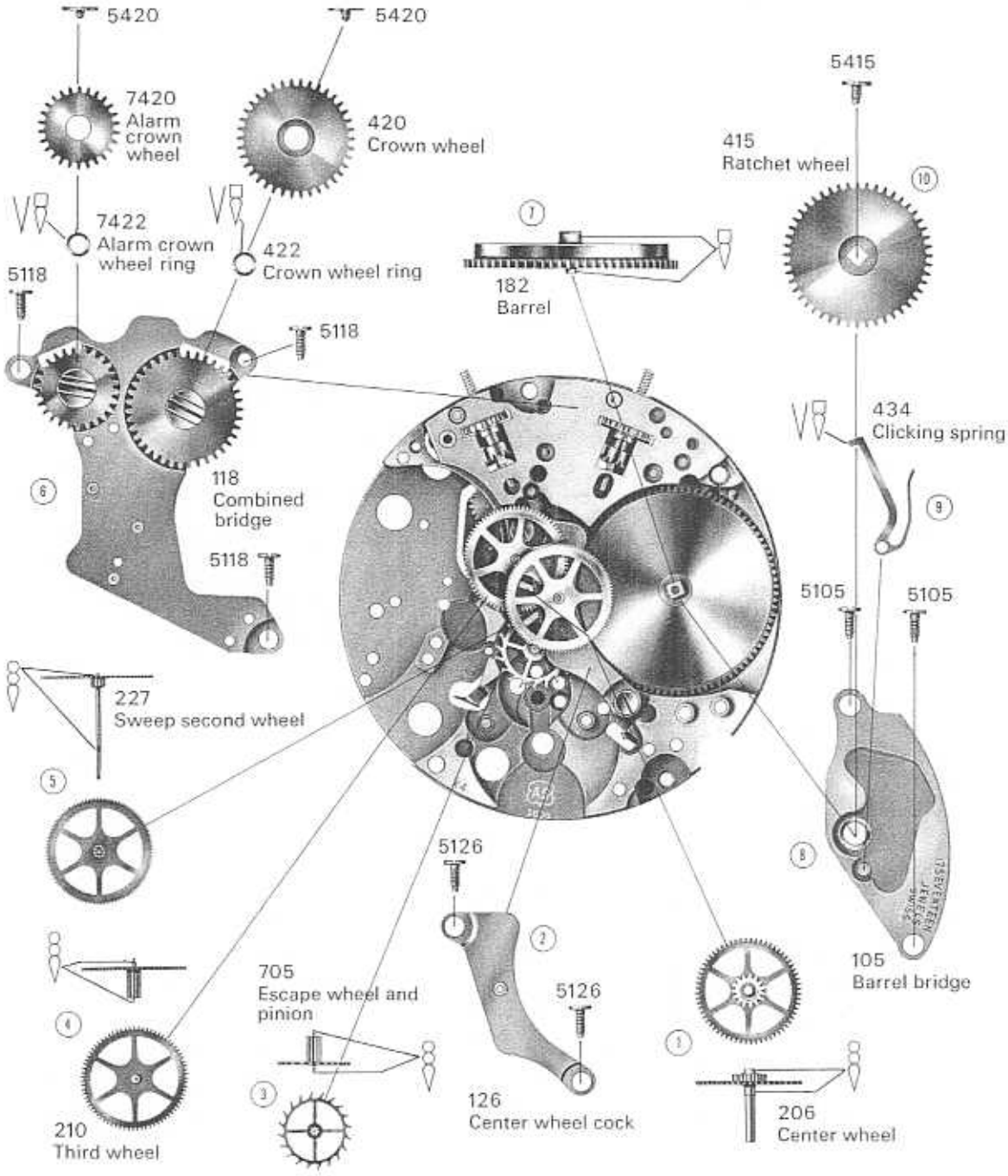
6.4.3. After closing the barrel, check the number of turns as far as the point at which the brake spring slips.

Values (for guidance only):

Going barrel:	8	revolutions
Alarm barrel:	5,7	revolutions

2

Assembly of train and barrel, cal. 5001-5008



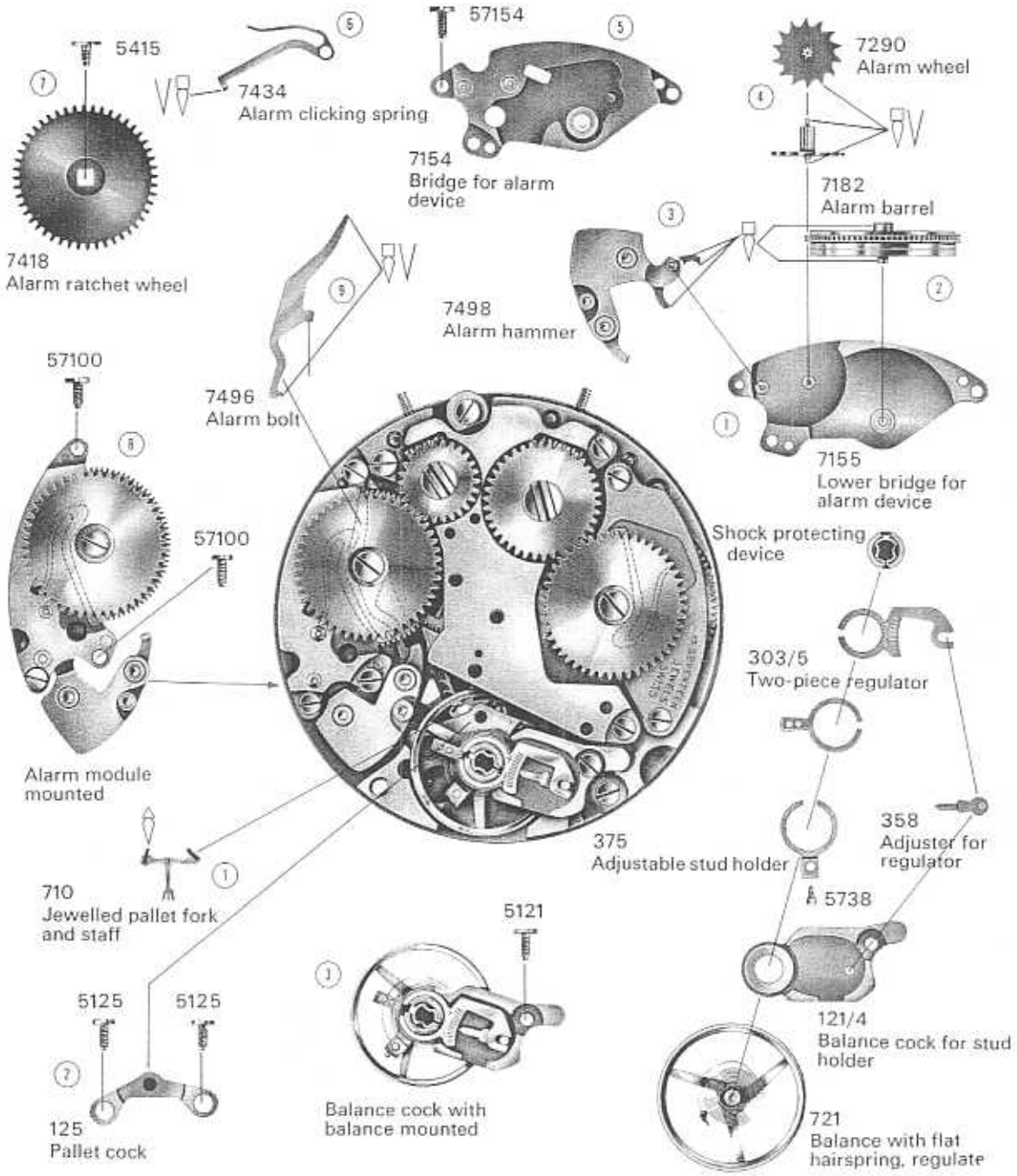
Grease (Moebius 8200)
Thick oil (Moebius 9020)
Fine oil (Moebius 9010)
Oil for levers (Moebius 941)
Prelubrication possible

Figures in circle = how t
due order.

Periscope AS A. Schild S.A.
Fabrique d'ébauches, 2540 Grenchen/Switzerland
3 30 3

Assembly of pallets and balance — Assembly and fitting of alarm module, cal. 5001-5008

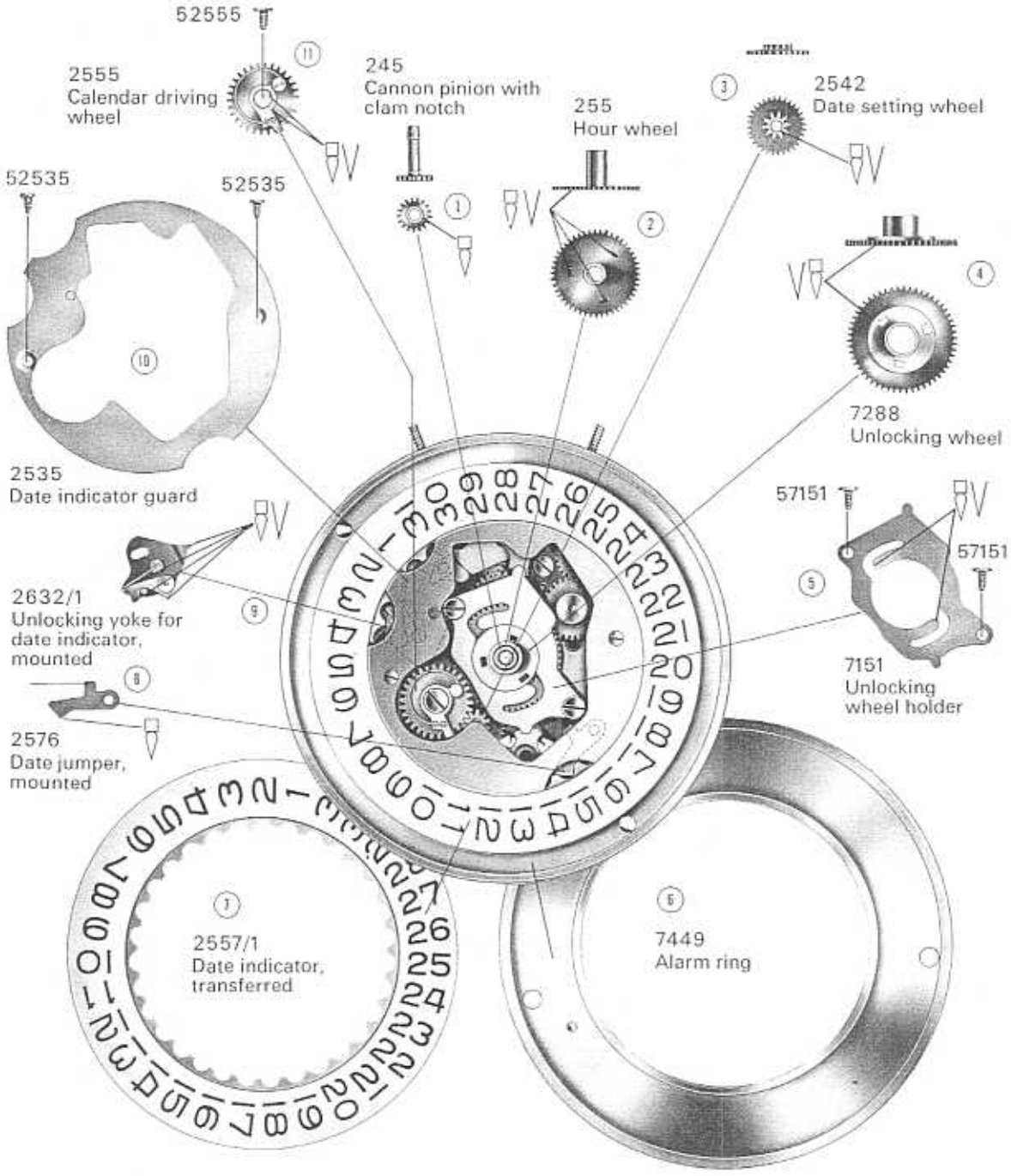
3



Grease (Moebius 8200)
Thick oil (Moebius 9020)
Fine oil (Moebius 9010)
Oil for levers (Moebius 941)
Prelubrication possible

Assembly of alarm portion on dial side and of simple instantaneous calendar, cal. 5001, 5004, 5007

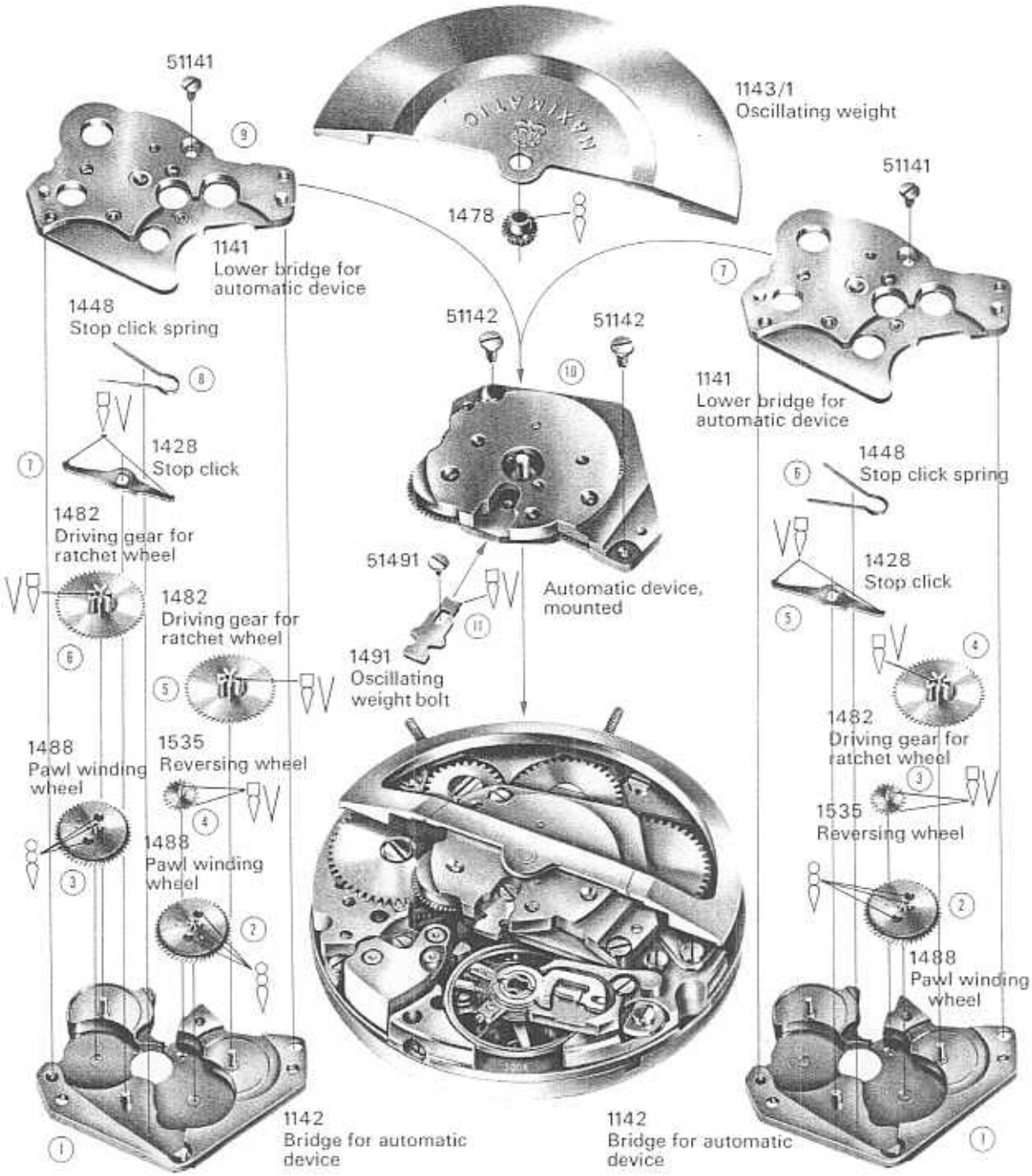
4



Grease (Moebius 8200)
Thick oil (Moebius 9020)
Fine oil (Moebius 9010)
Oil for levers (Moebius 941)
Prelubrication possible

Assembly of automatic winding-device and fitting of oscillating weight, cal. 5004-5008

6



Grease (Moebius 8200)
Thick oil (Moebius 9020)
Fine oil (Moebius 9010)
Oil for levers (Moebius 941)
Prelubrication possible

Assembly of the automatic winding system is made easier by use of a special plate, available through AS.

7. Assembly, lubrication and operational tests

7.1. Assembling the winding- and setting-mechanism, the stop-second device and the corrector system

See assembly sheet 1, page 13

7.1.1. Instructions for lubrication are given on the same sheet.

7.1.2. The following parts can be pregreased by machine before they are fitted:

winding-pinion	No. 410, 7410
clutch wheel	No. 407, 7407
setting-lever	No. 443, 7443
yoke	No. 435, 7435
double corrector	No. 2569
lever for double corrector	No. 2570
intermediate wheels	No. 450, 453, 7294
minute wheel	No. 260
alarm-setting device	No. 7165

7.1.3. Checking:

- All the intermediate wheels, the minute wheel and the wheels of the alarm-setting device should turn freely.
- The corrector No. 2569, the operating-lever No. 2570 and the stop lever No. 9433/1 should be freely movable.
- Check the functions by acutuating the winding-stems. For the functions of the crowns, see pages 30-32.

7.2. Assembling the train and barrel

See assembly sheet 2, page 14

7.2.1. Instructions for lubrication are given on the same sheet.

7.2.2. The following parts can be pregreased by machine before they are fitted: 

barrel arbor	No. 195
crown-wheel ring	No. 422, 7422
clicking spring	No. 434

7.2.3. Checking:

- The train must turn freely.
- The wheels should have an average endshake of 0.03 mm.
- The crown wheels must turn freely.
- Check the running of the train with the mainspring slightly wound.

Important! The pivots should be oiled beforehand.

7.3. Assembling the pallets and balance

Assembling and fitting the alarm work

See assembly sheet 3, page 15

7.3.1. Instructions for lubrication are given on the same sheet.

7.3.2. Fit the pallets No. 710.
Check the endshake (average value 0,03 mm).
Check the functions of the escapement.

7.3.3. Set the balance on its cock and fit the assembly into the movement.
Check the centering of the hairspring and its truth in the flat. Make sure that the hairspring beats between the bon pins when the balance swings.

7.3.4. Lubricating the escapement: recommendation

In principal, there are three possible methods:

a) Lubrication with molybdenum bisulphide (FAR system). If the escapement has been cleaned, a fresh layer of molybdenum bisulphide should be applied. Observe the data and instructions issued by FAR, Le Locle, Switzerland.

b) Stop-Oil treatment (Seitz system). The escape wheel and the pallets are subjected to a special surface treatment by Seitz SA. After the hairspring has been checked, the escapement should be lubricated sparingly in the usal way.
Recommended lubricant: Moebius 941.
For the rest, observe the data and instructions issued by Seitz S.A., Les Brenets, Switzerland.

c) Lubrication by immersion in Miracle Plastic. Only the escape wheel is treated in this way. It is advisable to study the special instructions issued by Bergeon & Cie., Le Locle, Switzerland.

7.3.5. Regulating the watch movement

- Adjust the beat on a timing-machine, by means of the stud-holder No. 375.
- Adjust the daily rate by means of the regulator No. 303/5. Move only the front part with the boot.
- The pointer of the AS 3 fine-regulation device should be in the middle. It is used for correcting slight errors of rate.
- Check the balance amplitude.

Values (for guidance only):

M_O	DU	280° ∢
	PL	250° ∢
M_{24}	DU	250° ∢
	PL	220° ∢

7.3.6. The alarm work is preassembled independently of the watch movement.
For assembling in series, a special workplate is available (see tools for assembling, page 28).

7.3.7. The following parts can be pregreased by machine before they are fitted:

alarm barrel arbor	No. 7196
alarm wheel	No. 7290
alarm spring-click	No. 7434
alarm bolt	No. 7496

7.3.8. Check the endshake of the alarm hammer No. 7498 and the alarm wheel No. 7290.

7.3.9. Check the working of the alarm assembly by turning the barrel.

7.3.10. Fit and screw on the alarm bolt No. 7496 and the alarm assembly.

7.3.11. Check the functions of the alarm assembly by actuating the winding-stem.

7.4. Assembling the alarm work on the dial side and the simple instantaneous calendar work

See assembly sheet 4, page 16

7.4.1. Instructions for lubrication are given on the same sheet.

7.4.2. The following parts can be pregreased by machine before they are fitted: 

- unlocking-wheel	No. 7288
- unlocking-wheel holder	No. 7151
- date-setting wheel	No. 2542
- unlocking-yoke for date-indicator	No. 2632/1
- calendar driving-wheel	No. 2555

7.4.3. Checking:

- Check the working of the date-corrector over a whole revolution of the date-indicator, with the winding-crown in its intermediate position.

- Check the instantaneous changing of the date indication by turning the hands, with the winding-crown in its fully-extended position.

- Check the unlocking of the alarm work by turning the hands and the unlocking-wheel.
  Also check the functions on the crown side.

7.5. Assembling the alarm work on the dial side and the instantaneous Calday calendar work

See assembly sheet 5, page 17

7.5.1. Instructions for lubrication are given on the same sheet.

7.5.2. The following parts can be pregreased by machine before they are fitted: 

- unlocking-wheel	No. 7288
- unlocking-wheel holder	No. 7151
- date-setting wheel	No. 2542
- unlocking-yoke for date-indicator	No. 2632/1
- calendar driving-wheel	No. 2555

7.5.3. Checking

- Check the working of the date- and day-corrector over a whole revolution of the date- and day-indicators, with the winding-crown in its intermediate position.

- Check the instantaneous changing of the date and day indications by turning the hands, with the winding-crown in its fully-extended position. The date- and day-indicators should jump forward simultaneously.

7.6. Assembling the automatic-winding mechanism and fitting the oscillating weight

See assembly sheet 6, page 18

7.6.1. Instructions for lubrication are given on the same sheet.

7.6.2. The following parts can be pregreased by machine before they are fitted: 

- driving-gear for ratchet wheel	No. 1482
- reversing-wheel	No. 1535
- stop click	No. 1428

7.6.3. The pawl winding-wheels No. 1488 must be lubricated

For this purpose, each wheel hat two holes on its upper side. The lubricant should be applied through these holes.

Recommended lubricants: Moebius 9020
Synta-Visco-Lube

7.6.4. The automatic winding-mechanism is assembled independently of the watch movement. A special workplate is available for this purpose (see assembling-tools, page 28).

7.6.5. Checking

- Endshake:
  - driving-gear for ratchet wheel — No. 1482
  - reversing-wheel — No. 1535
  - pawl winding-wheel — No. 1488
- Value (for guidance only): 0.03 to 0.04 mm.

7.6.6. Place the automatic winding-assembly upon the movement and screw it tight.

7.6.7. Grease the oscillating-weight axle.
Recommended lubricants: Moebius 9020
Synta-Visco-Lube

Fit the oscillating weight and bolt it tight.

7.6.8. Checking

- Check the endshake and sideshake.
- Check the automatic winding function.

Cal. 5004 and 5005:
- Turn the oscillating weight clockwise; this will wind the movement by way of the ratchet wheel.
- Turning counter-clockwise has no effect.