

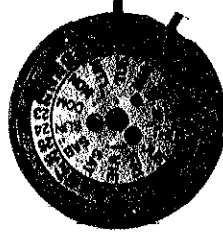
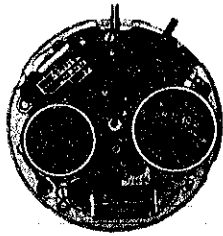
**SEIKO**

**QUARTZ**

**Cal. 7223A**

**PARTS LIST**

# Cal. 7223A



125 001



139 006



196 001



231 036



241 066



259 001



261 016



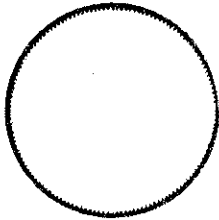
269 001



270 036



271 072



274 001



282 021



353 006



353 011



354 060



356 002



383 072



384 021



388 016



391 021



426 006



☆470 181



491 260



556 016



560 006



603 001



610 001



☆611 001

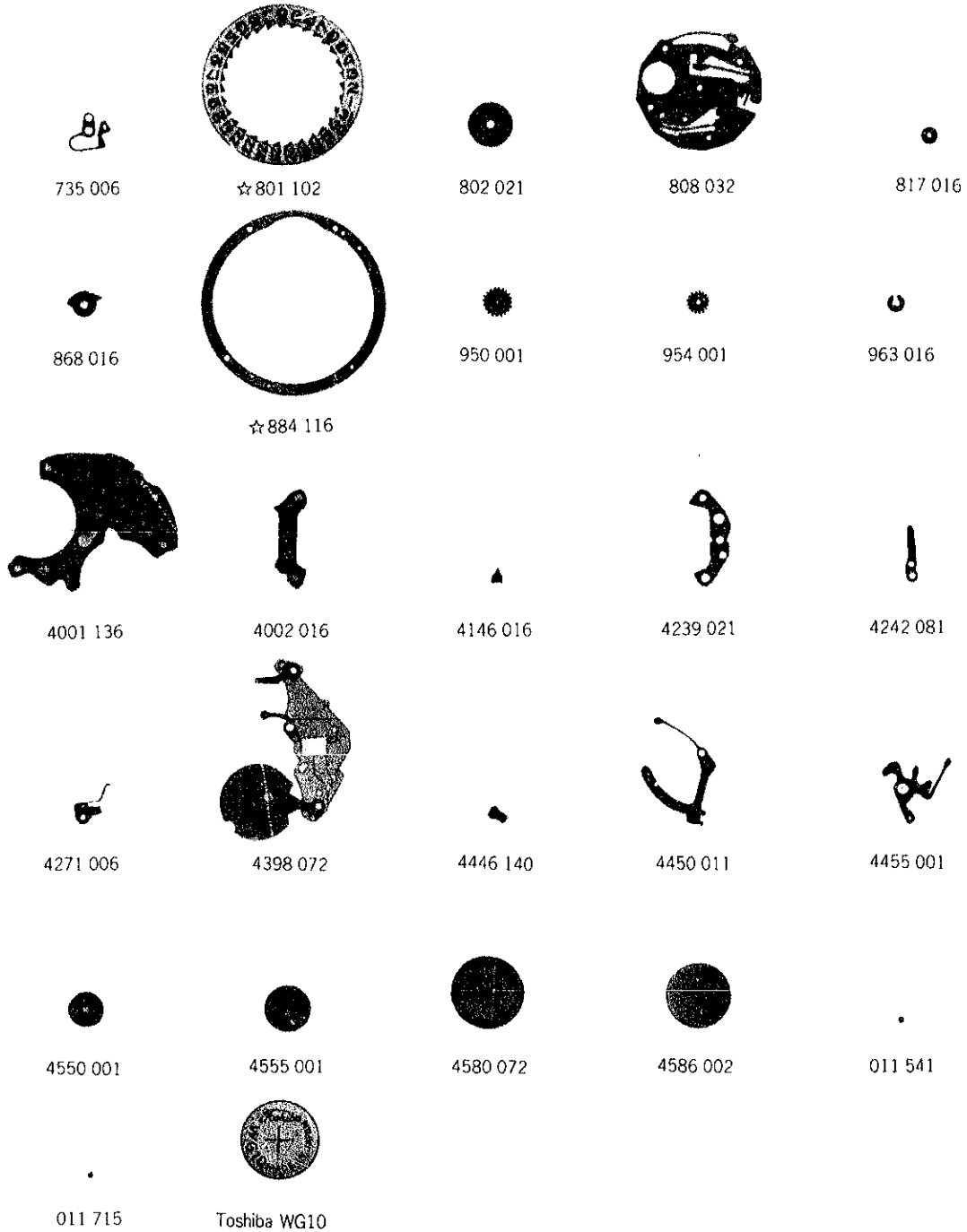


701 016



706 016

# Cal. 7223A



012 162	012 164	012 165	012 308	012 703	013 975	017 176	017 177	017 178	017 179	
017 180	017 181	017 182	017 183	017 184	017 185	017 186	017 187	017 188	017 189	017 894 2/1

☆⇒ Please see remarks on the next reverse page.

# Cal. 7223A

## Characteristics

Casing diameter:  $\phi$  28.1 mm  
 Maximum height: 3.9 mm without battery  
 Jewels: 2j  
 Frequency of quartz crystal oscillator: 32,768 Hz (Hz = Hertz . . . . Cycles per second)  
 Driving system: Step motor system (2 poles)  
 Regulation system: Trimmer condenser  
 Second setting device  
 Calendar (Day & Date)  
 Alarm mechanism: The alarm time can be set at every five minute intervals  
 Instant setting device for day & date calendar  
 Bilingual change-over system for day of the week  
 Battery life indicator: Second hand moves in two-second interval.

PART NO.	PART NAME	PART NO.	PART NAME
125 001	Train wheel bridge	4001 136	Circuit block
139 006	Lower bridge for third wheel	4002 016	Coil block
196 001	Intermediate alarm setting wheel cover	4146 016	Step rotor
231 036	Third wheel & pinion	4239 021	Rotor stator
241 066	Fourth wheel & pinion	4242 081	Speaker connection (+)
259 001	Alarm sliding pinion	4271 006	Battery connection (+)
261 016	Minute wheel	4398 072	Battery guard
269 001	Alarm winding pinion	4446 140	Crystal unit cushion
270 036	Center minute wheel	4450 011	Alarm switch lever
271 072	Hour wheel	4455 001	Reset lever
274 001	Alarm setting wheel	4550 001	Upper unlocking wheel
282 021	Clutch wheel	4555 001	Lower unlocking wheel
353 006	Upper unlocking wheel spring	4580 072	Speaker block
353 011	Lower unlocking wheel spring	4586 002	Sound diaphragm
354 060	Winding stem	011 541	Upper hole jewel for step rotor
356 002	Alarm setting stem	011 541	Lower hole jewel for step rotor
383 072	Setting lever	011 715	Lower hole jewel for fourth wheel
384 021	Yoke (Clutch lever)	012 162	Train wheel bridge screw
388 016	Setting lever spring	012 162	Circuit block screw
391 021	Second setting lever	012 162	Coil block screw
426 006	Train wheel bridge support	012 162	Screw for holding ring for dial
☆470 181	Day star with dial disk	012 164	Setting lever spring screw
491 260	Dial washer	012 164	Unlocking wheel spring screw
556 016	Date finger	012 164	Date dial guard screw
560 006	Friction spring for fourth wheel & pinion	012 164	Screw for alarm setting stem holder
603 001	Alarm setting jumper	012 164	Screw for speaker connection (+)
610 001	Alarm setting indicator lever	012 165	Screw for intermediate alarm setting wheel cover
☆611 001	Alarm setting indicator	012 308	Screw for date driving wheel
☆611 002		012 703	Screw for lower bridge for third wheel
☆611 003		013 975	Eccentric dial pin
☆611 004		017 176	Tube for circuit block A
☆611 005		017 177	Tube for date dial guard A
701 016	Fifth wheel & pinion	017 178	Tube for train wheel bridge
706 016	Sixth wheel & pinion	017 179	Tube for circuit block B
735 006	Alarm setting stem holder	017 180	Tube for date dial guard holder B
☆801 101	Date dial	017 181	Tube for circuit block C
☆801 102		017 182	Tube for date driving wheel
802 021	Date driving wheel	017 183	Tube for train wheel bridge
808 032	Date dial guard	017 184	Tube for coil block B
817 016	Intermediate date wheel	017 185	Guide tube for rotor stator
868 016	Day finger	017 186	Tube for date dial guard holder C
☆884 116	Holding ring for dial	017 187	Tube for unlocking wheel spring
950 001	First intermediate lower unlocking wheel	017 188	Tube for circuit block D
954 001	Intermediate alarm setting wheel	017 189	Tube for coil block A
963 016	Snap for day star with dial disk		

—continued on next page—

☆⇒Please see remarks on the next page.

Part numbers in light letters are not shown in photos.

# Cal. 7223A

PART NO.	PART NAME	PART NO.	PART NAME
017 894	continued Yoke pointer pin		
☆Toshiba WG10 ☆Maxell SR1130W ☆U.C.C.389	Silver oxide battery		

## Remarks :

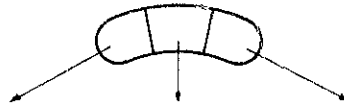
### Day star with dial disk

☆470 181 (English ↔ Spanish, black figures on white background) .....Used when both the crown and the calendar frame are located at **3** o'clock position. If any other type of day star with dial disk is required, specify the number printed on the disk.

### Alarm setting indicator

☆611 001  
☆611 002  
☆611 003  
☆611 004  
☆611 005

.....There are five different color of alarm setting indicators as specified below.



PART No.	Alarm is disengaged	Alarm is engaged	Alarm time setting
611 001	Black	Gold	Orange
611 002	White	Gold	Orange
611 003	Black	Blue	Orange
611 004	White	Blue	Orange
611 005	Gold	Blue	Orange

The color of alarm setting indicator is determined based on the design of cases and dials. Check the case number and refer to "**SEIKO Quartz Casing Parts List**" to choose a corresponding Alarm setting indicator.

### Date dial

☆801 101 (White figures on black background) } .....Used when both the crown and the calendar frame are  
 ☆801 102 (Black figures on white background) } located at **3** o'clock position  
 If any other type of date dial is required, specify ① Cal. No. ② Jewels ③ The crown position ④ The calendar frame position and ⑤ Dial No.

### Holding ring for dial

☆884 116 .....The type of holding ring for dial is determined based on the design of cases and dials. If the shape of holding ring for dial is different from the photograph, check the case number and refer to "**SEIKO Quartz Casing Parts List**" to choose a corresponding holding for dial.

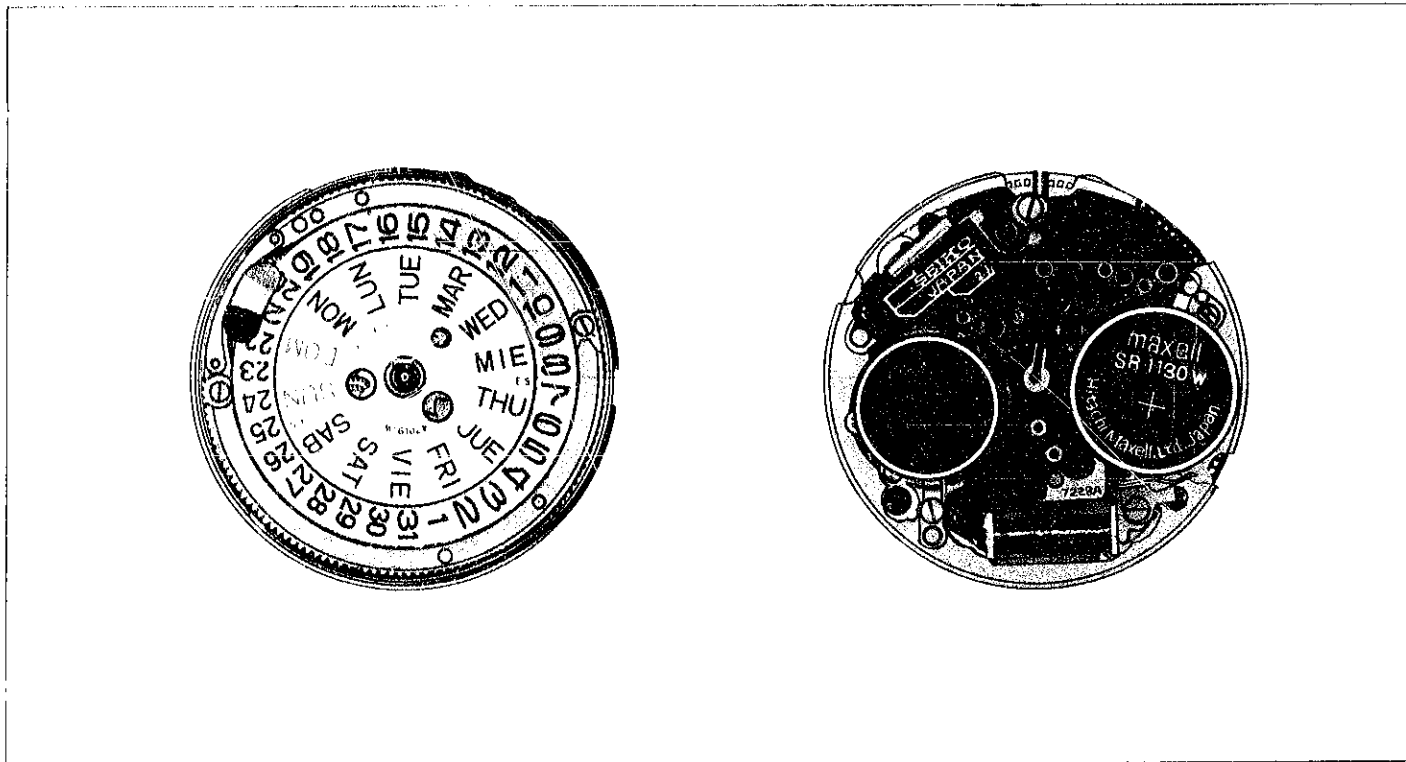
### Battery

☆Toshiba WG10 }  
 ☆Maxell SR1130W } .....The applied battery for this calibre might be added the substitutive in the future.  
 ☆U.C.C.389 } .....In that case, please refer to separate "**BATTERIES FOR SEIKO QUARTZ WATCHES**".

# TECHNICAL GUIDE

**SEIKO**  
QUARTZ

CAL. 7223A



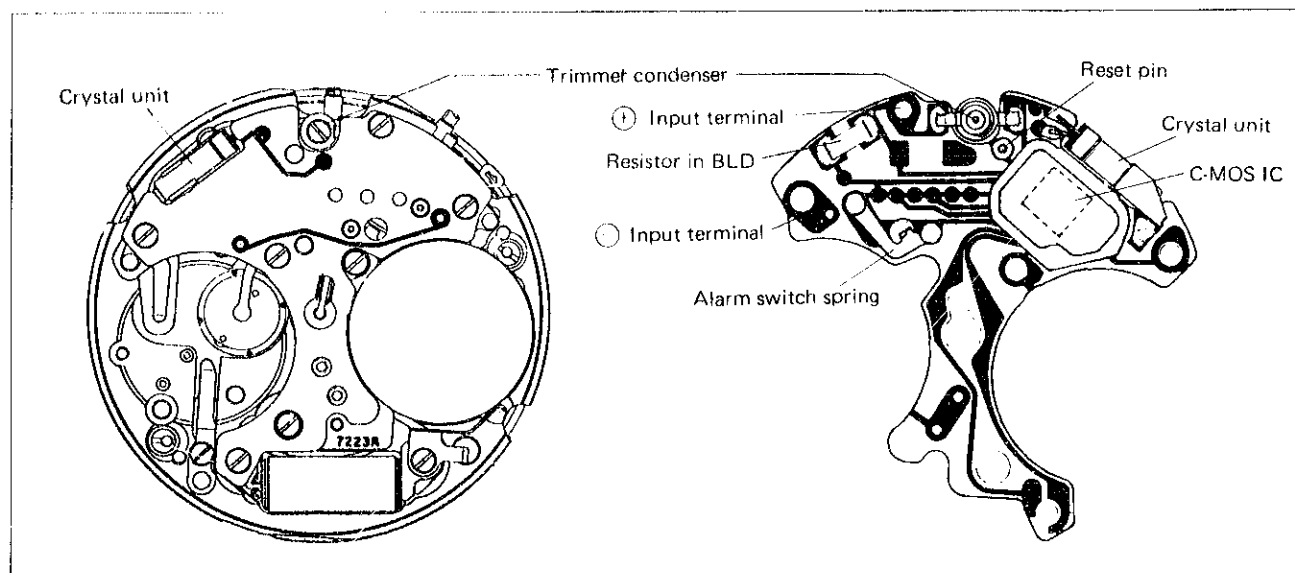
## CONTENTS

I. SPECIFICATIONS .....	1
II. STRUCTURE OF THE CIRCUIT BLOCK .....	1
III. DESIGNATION AND CROWN OPERATION .....	2
1. Designation and crown operation .....	2
2. How to use the alarm .....	2
IV. DISASSEMBLING, REASSEMBLING AND LUBRICATING .....	3
1. Indicating and alarm mechanisms .....	3
2. Electronic circuit .....	7
3. Gear train mechanism .....	8
4. Setting mechanism .....	9
* How to reassemble the hands .....	10
V. CHECKING AND ADJUSTMENT .....	13
• Check output signal .....	13
• Check battery voltage .....	13
• Check battery conductivity .....	13
• Check circuit block conductivity .....	13
• Check second setting and reset conditions .....	13
• Check coil block .....	14
• Check speaker block .....	14
• Check current consumption .....	15
• Check setting condition of hour and minute hands .....	15
• Check accuracy .....	15
• Time accuracy adjusting .....	15
• Check alarm test system .....	15
• Check appearance and functioning .....	15

## I. SPECIFICATIONS

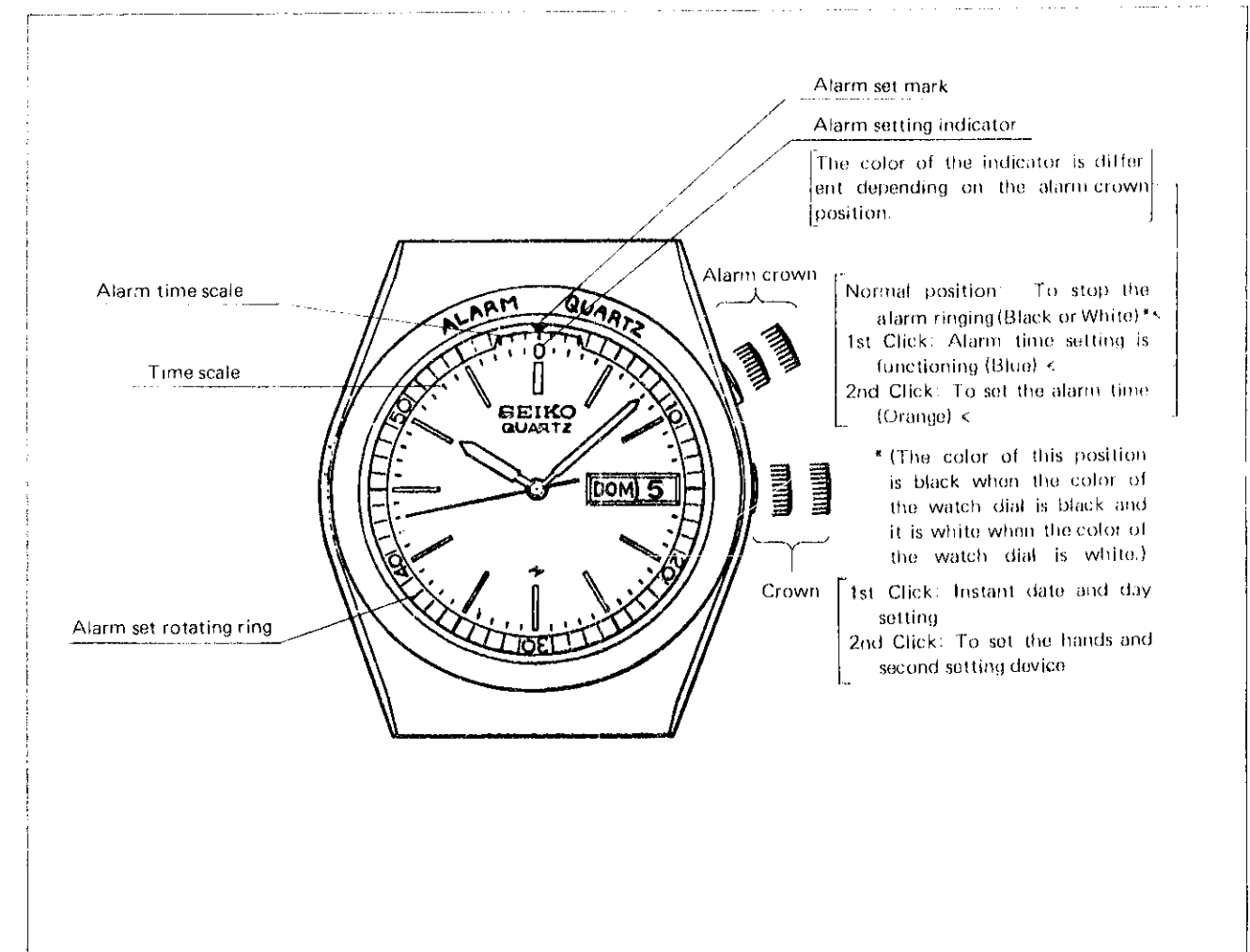
Item	Cal. No.	7223A
Time indication		3-hand time indication (hour, minute and second)
Additional mechanism		<ul style="list-style-type: none"> <li>• Calendar (day and date)</li> <li>• Bilingual changeover system for the day of the week</li> <li>• Instant day and date setting</li> <li>• Second setting device (stops at every second)</li> <li>• Electronic circuit reset switch</li> <li>• Battery life indicator</li> <li>• Alarm mechanism (the alarm time can be set at every five minute intervals.)</li> <li>• Alarm test system</li> </ul>
Loss/gain		Loss/gain at normal temperature range Monthly rate: less than 15 seconds (Annual rate : less than 3 minutes)
Casing diameter		φ28.1mm
Height		3.9mm without battery
Regulation system		Trimmer condenser
Measuring gate by Quartz Tester		Any gate is available.
Battery		Toshiba WG 10 or SR1130W, Maxell SR1130W or U.C.C. 389 Battery life is approximately 3 years. Voltage: 1.55V
Jewels		2 jewels

## II. STRUCTURE OF THE CIRCUIT BLOCK



## III. DESIGNATION AND CROWN OPERATION

### 1. Designation and crown operation



### 2. How to use the alarm

- The alarm can be set to operate at any desired hour and five-minute interval. To start the alarm at the designated alarm time correctly, turn the crown to set the time to the time signal, 0'00'', 5'00'', 10'00'' . . . . . 55'00''.
- When the time is not set by a five-minute time signal, the alarm may ring sometime between 5 minutes to and from the designated alarm time.
- When the alarm does not ring exactly at the alarm set time, reset the time correctly. Be very careful to reset the time when the second hand is stopped in use or when the seconds are required to be reset.





## IV. DISASSEMBLING, REASSEMBLING AND LUBRICATING

### • Disassembling and reassembling

Disassembling procedures Figs. : ① → ⑥5

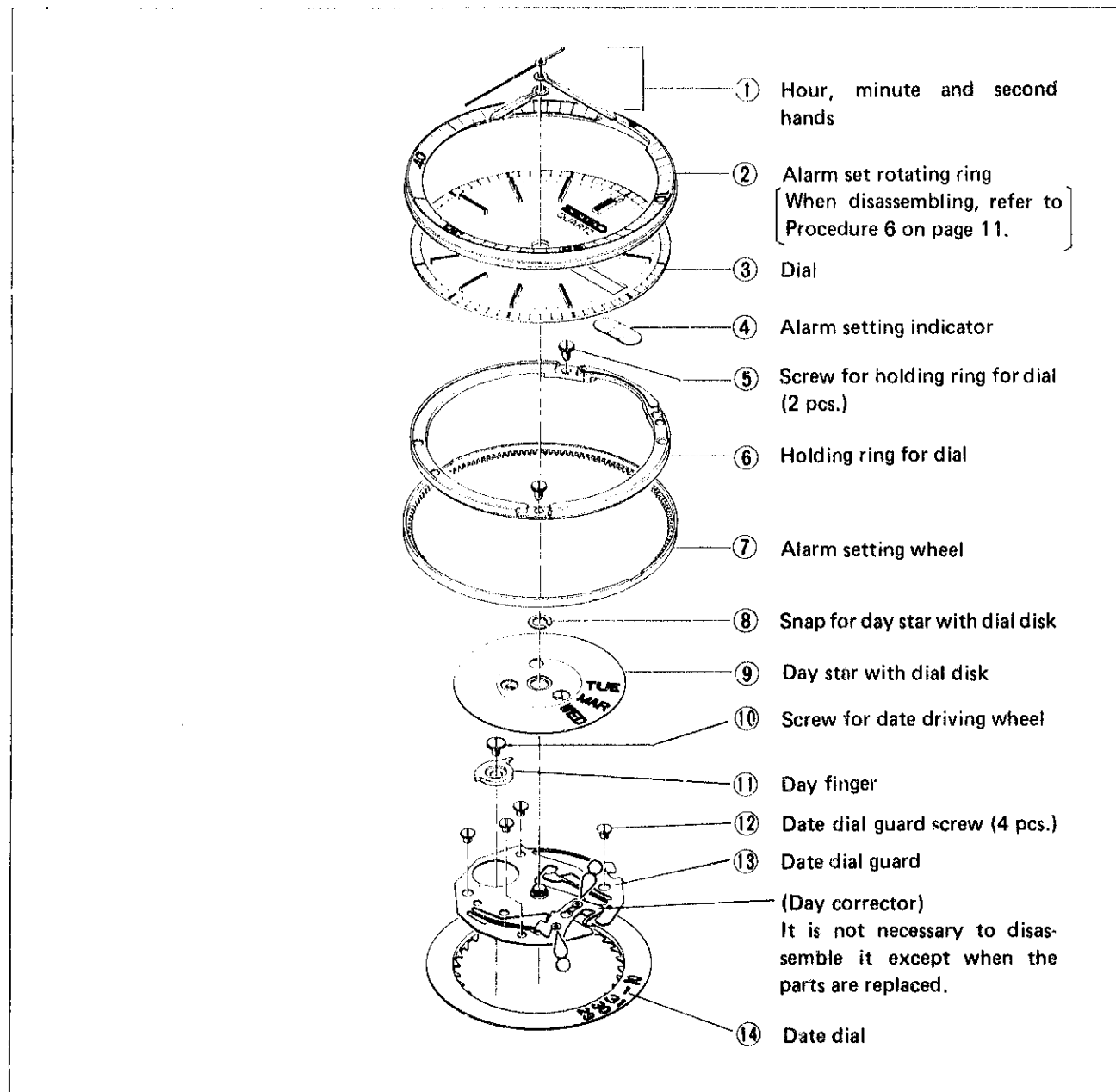
Reassembling procedures Figs. : ⑥5 → ①

### • Lubricating

Types of oil		Oil quantity	
Moebius A		Normal	
SEIKO Watch Oil'S-6		Extremely small	
Never lubricate the portions marked ⊗.			

- Use the movement holder S-669 for disassembling and reassembling.

### 1. Indicating and alarm mechanisms



### Remarks for disassembling and reassembling

#### ④ Alarm setting indicator

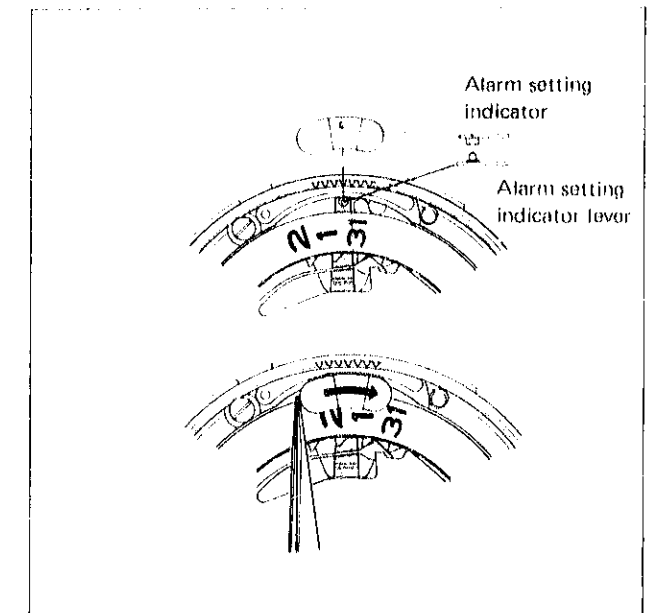
- How to reassemble the alarm setting indicator

With the alarm crown pulled out to the first click, reassemble the alarm setting indicator as shown in the illustration on the right.

Check to see if the alarm setting indicator returns to its original position when it is slightly moved very carefully with tweezers in the arrow-marked direction and then released.

#### Caution:

If the alarm crown is operated without the dial reassembled, the alarm setting indicator may occasionally spring out of position.



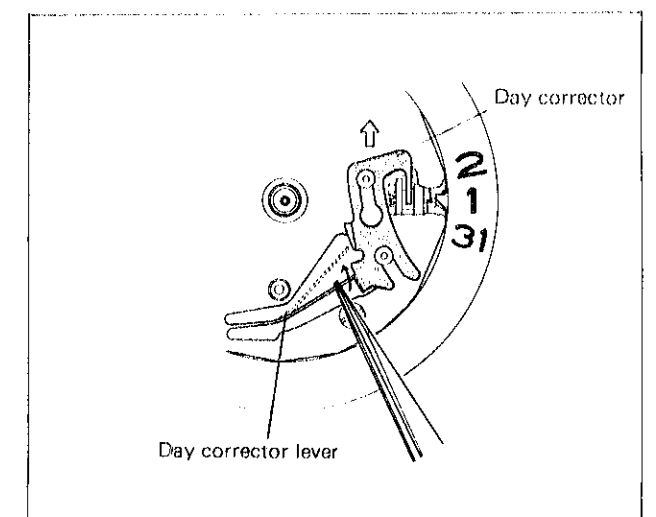
#### ⑬ Date dial guard

- How to disassemble the day corrector

① Hold the day corrector lever portion of the date dial guard with tweezers and slide it inward to disengage it from the day corrector. Be careful not to deform the day corrector lever.

② Slide the day corrector until it stops in the arrow-marked direction and remove it.

\* To reassemble the day corrector, proceed in reverse order to the above procedures.

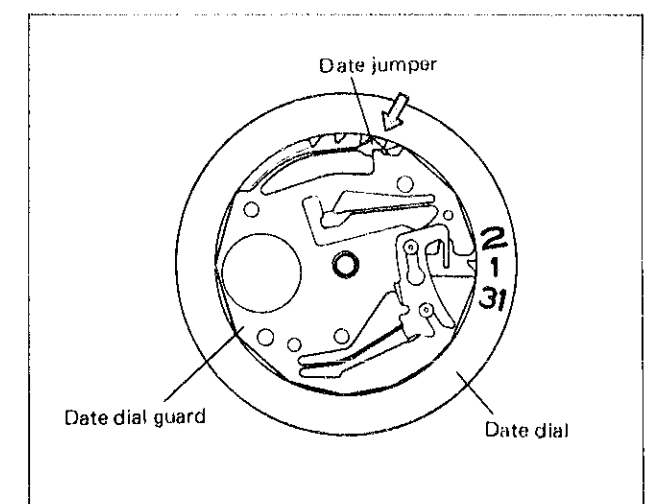


#### ⑭ Date dial

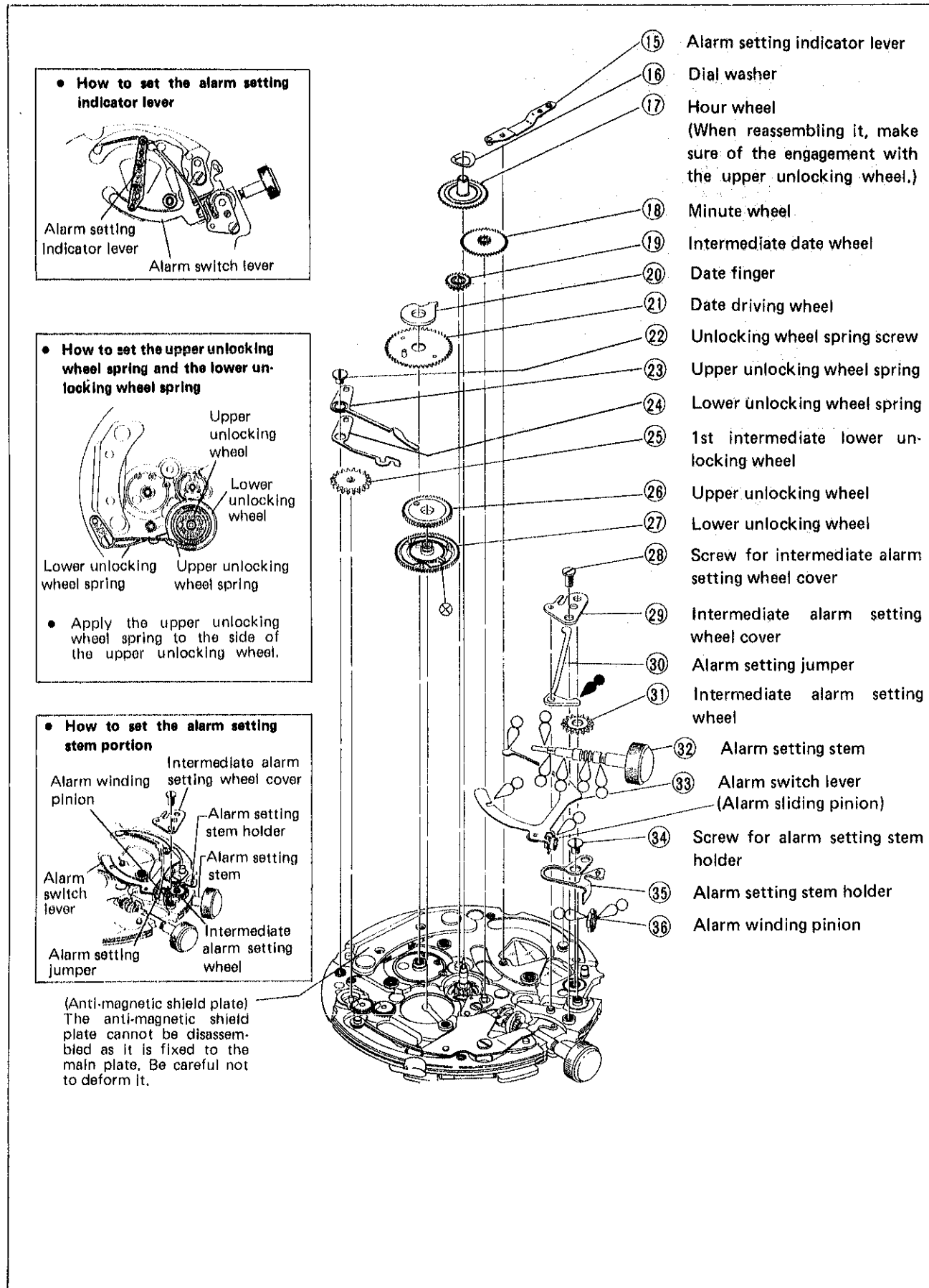
- How to reassemble the date dial

When reassembling the date dial, first set the date dial guard to the date dial and then reassemble it to the main plate.

That will facilitate the reassembling. Check to see if the teeth of the date dial and the tip of the date jumper engage properly.



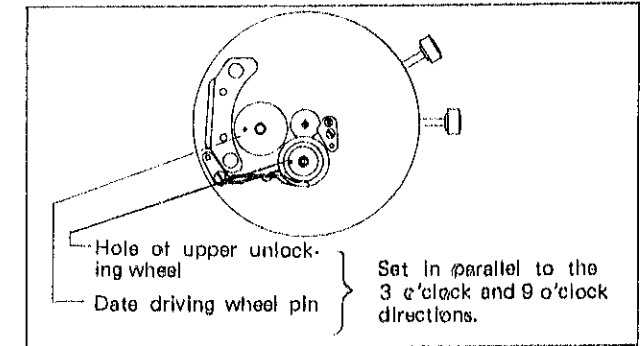




Remarks for disassembling and reassembling

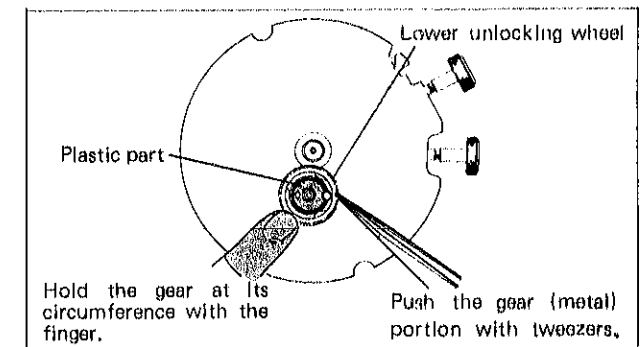
21 26 Date driving wheel, upper unlocking wheel

- How the hands are set has influence on when the alarm rings. In order to omit the resetting of the hands, set the date driving wheel and the upper unlocking wheel at the positions shown in the illustration on the right.



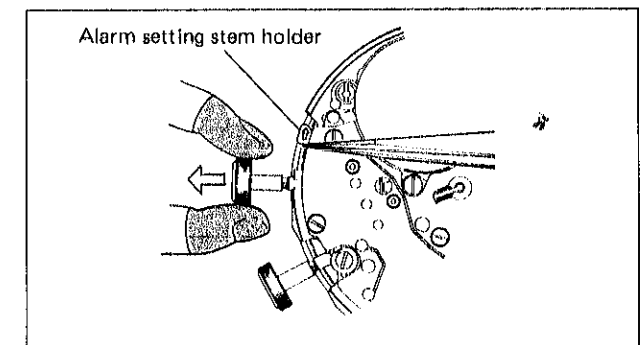
27 Lower unlocking wheel

- How to reassemble the lower unlocking wheel  
When reassembling the lower unlocking wheel to the main plate, be sure to push it at its gear portion with the tips of tweezers. When disassembling and reassembling the lower unlocking wheel, be careful not to hold the plastic part of it with tweezers as it may be scratched. Also be careful not to separate the gear portion from the plastic part.



32 Alarm setting stem

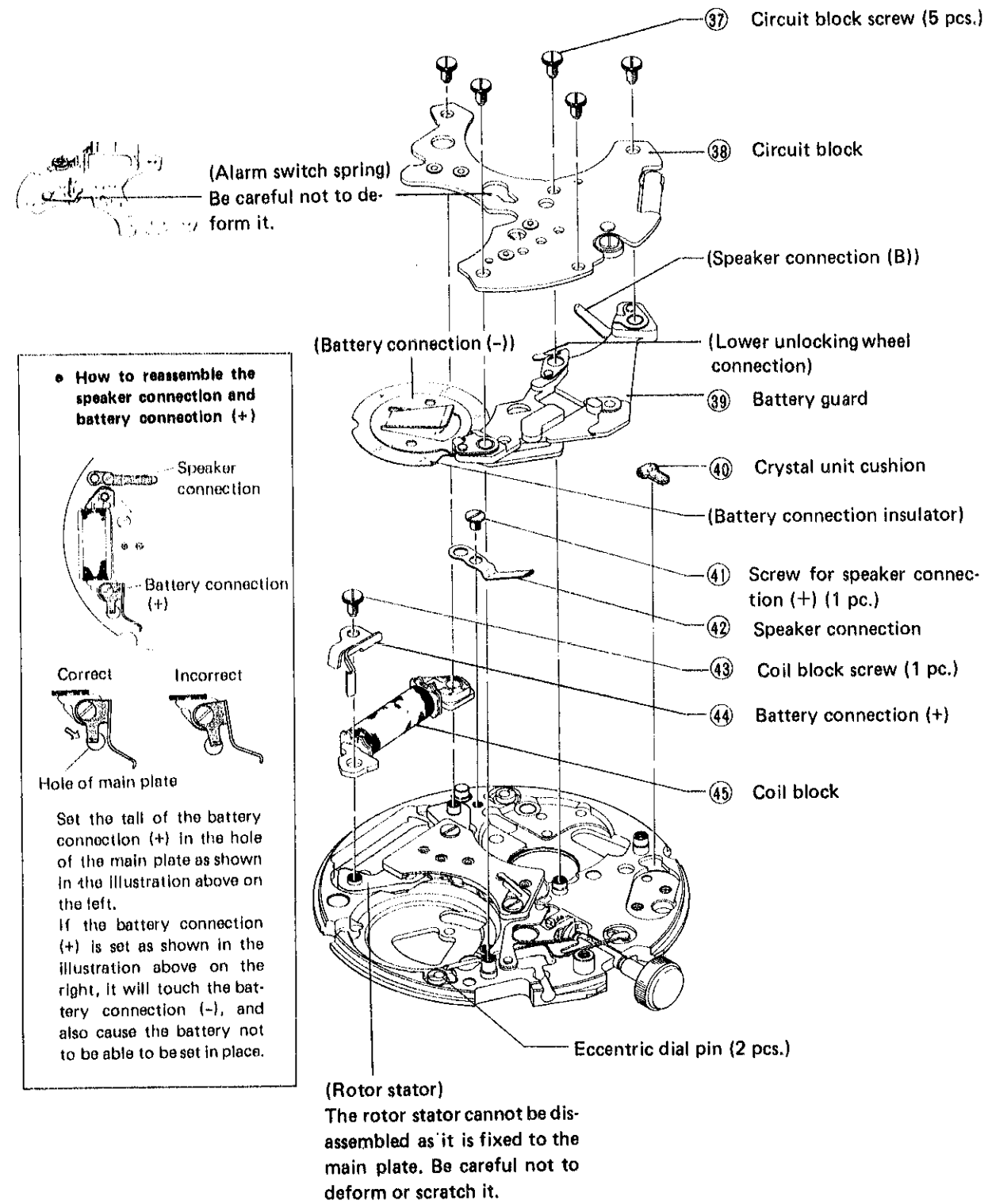
- How to pull out the alarm setting stem  
Move the alarm setting stem holder in the arrow-marked direction with tweezers and pull out the alarm setting stem. When reassembling the alarm setting stem, only push it in.



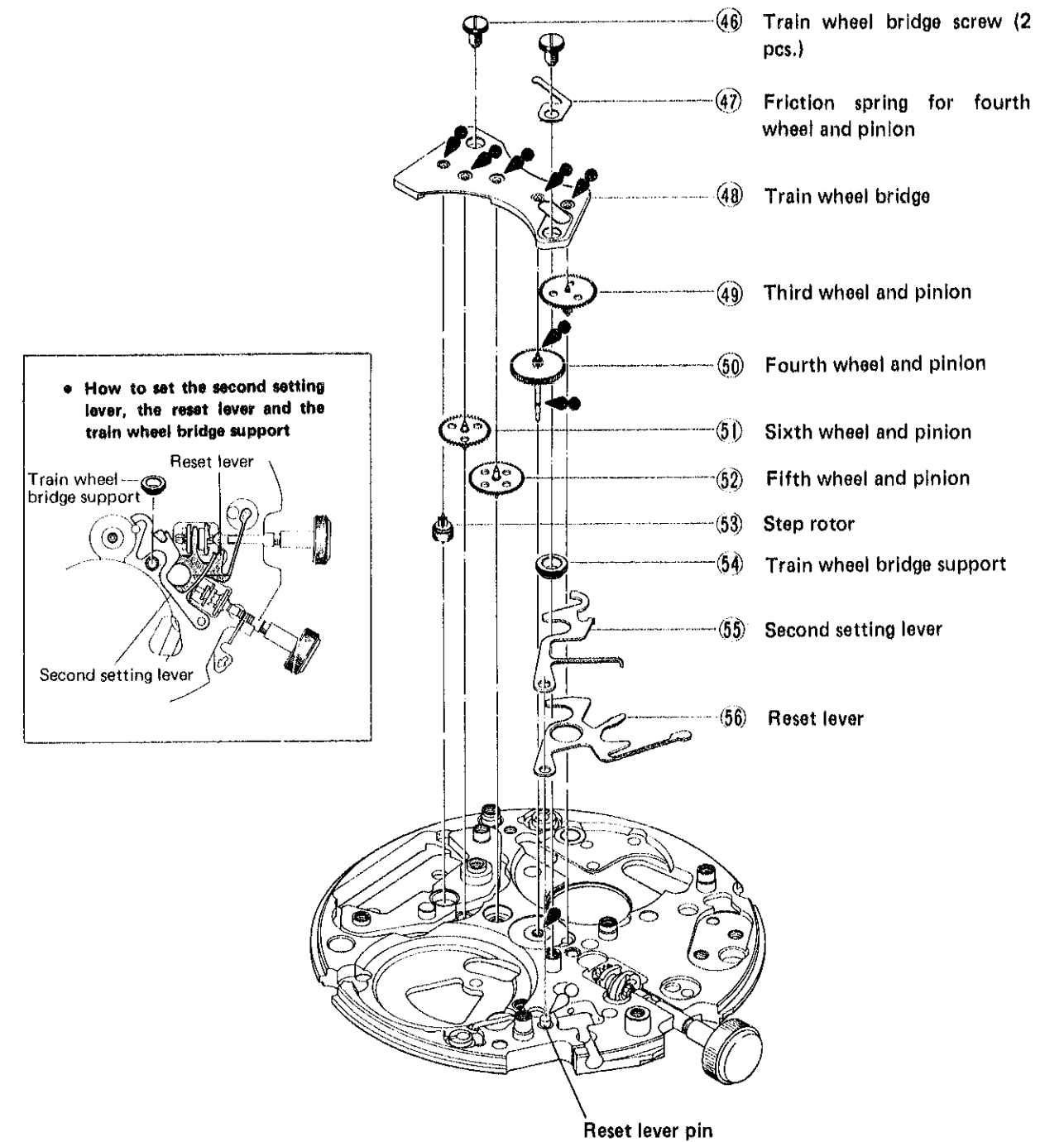
• List of screws used

Screw for holding ring for dial (2 pcs.)	Setting lever spring screw (1 pc.)	Screw for date driving wheel (1 pc.)	Screw for intermediate alarm setting wheel cover (1 pc.)	Screw for lower bridge for third wheel (1 pc.)
Circuit block screw (5 pcs.)	Date dial guard screw (4 pcs.)	Unlocking wheel spring screw (1 pc.)		
Coil block screw (1 pc.)	Screw for alarm setting stem holder (1 pc.)			
Train wheel bridge screw (2 pcs.)	Screw for speaker connection (+) (1 pc.)			
10 pcs.	8 pcs.	1 pc.	1 pc.	1 pc.

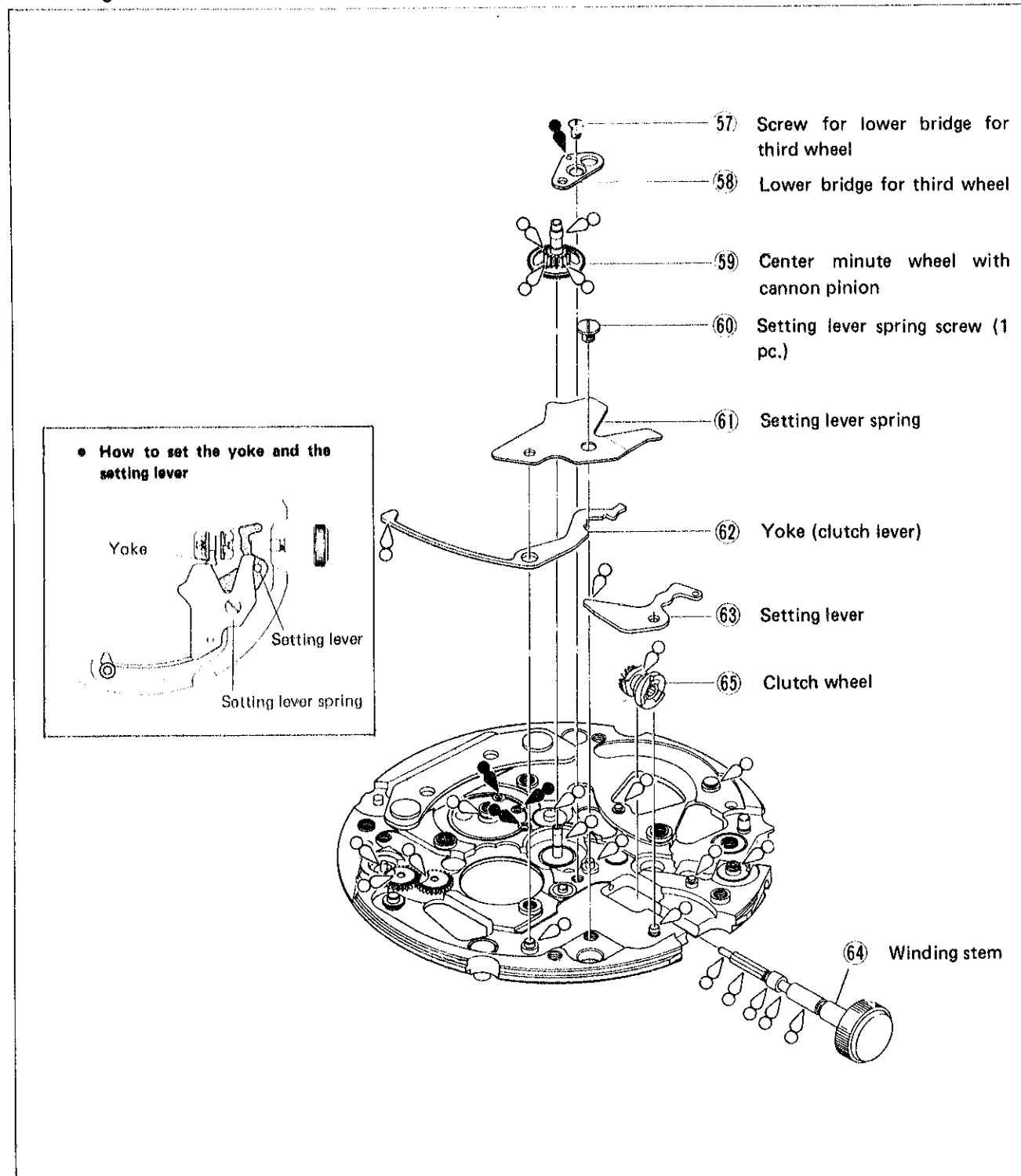
## 2. Electronic circuit



## 3. Gear train mechanism



#### 4. Setting mechanism



#### [How to reassemble the hands]

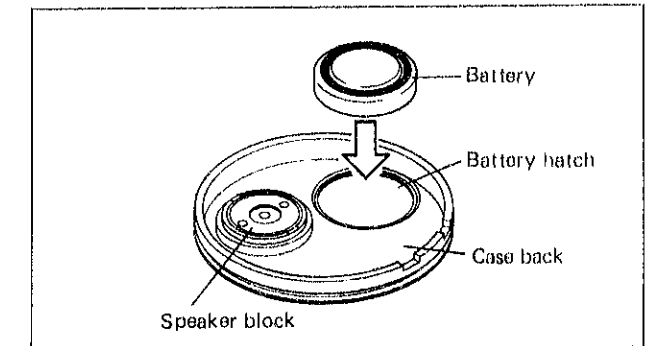
- Cal. 7223A has the alarm mechanism.  
If the hands are not reassembled correctly, the alarm does not ring exactly at the designated alarm time.  
Follow the procedures below and set the hands correctly.

#### Procedure 1

#### Preparation

Make the following preparations before reassembling the hands.

- Remove the case back gasket from the case back and set the battery hatch on the case back. Then place the battery on the battery hatch with its (-) side faced up.



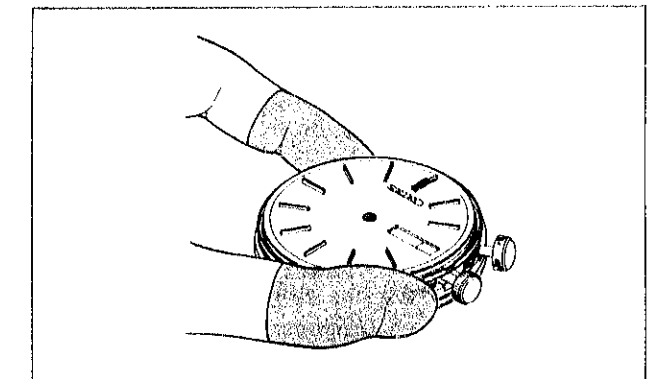
#### Procedure 2

**Pull out the crown to the second click (with the alarm crown pushed in to the normal position).**

#### Procedure 3

**Set the movement with dial in the case back prepared in Procedure 1.**

Hold the movement and the case back together with the finger so that a close contact is secured between the battery and battery connection (-), the speaker and the speaker connection (B), and the lower unlocking wheel connection. (Be careful not to smear any silicone grease on the dial.)



#### Procedure 4

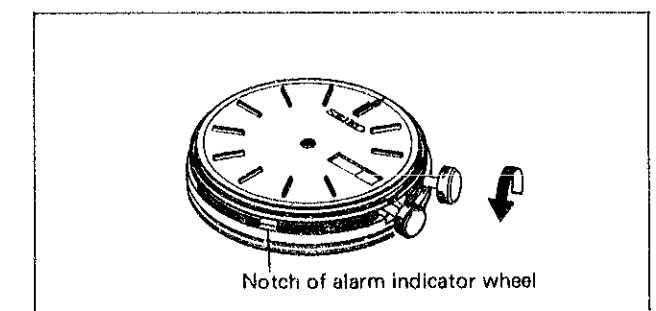
**Turn the crown clockwise (pulled out to the second click) and advance the calendar by one day.**

When the calendar starts to change, turn the crown slowly and stop when the calendar changes.

#### Procedure 5

**Pull out the alarm crown to the second click, turn it until the alarm rings and stop it.**

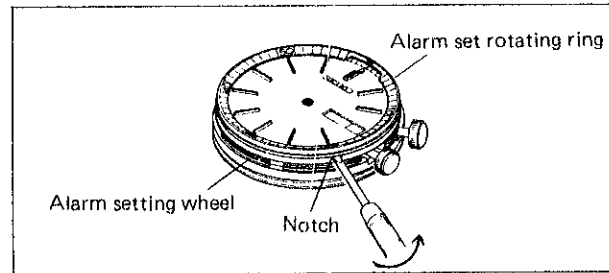
To locate the position where the alarm rings, turn the alarm crown once and find the position with the two notches of the alarm setting wheel as a guide. Next, turn the alarm crown once again and find the position where the alarm rings by turning the alarm crown slowly click by click starting from the position a little before where the notches appear.



**Procedure 6**

Position the alarm time set mark ( ▼ ) which is on the alarm set rotating ring at the alarm time scale corresponding exactly to 12 o'clock on the dial and push in the alarm set rotating ring. (After setting, be careful not to touch the alarm set rotating ring.)

When removing the alarm set rotating ring, put the edge of a screwdriver into the notch of the alarm setting wheel and pry it up.



**Procedure 7**

Turn the crown (pulled out to the second click), turn it slowly from the time just before the calendar changes and stop it where the alarm starts ringing.

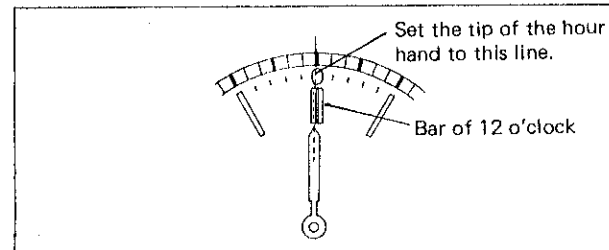
**Procedure 8**

Place the movement on the movement holder.

**Procedure 9**

Put the hour hand.

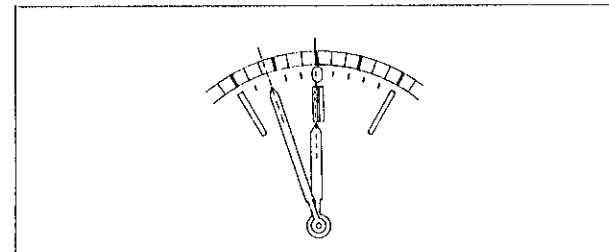
Put the hour hand at the position of 3 minutes to 12 o'clock. The position of the hour hand in the illustration on the right ensures the setting of 3 minutes to 12 o'clock.



**Procedure 10**

Put the minute hand.

Put the minute hand at the position of 57 minutes.



**Procedure 11**

Check the setting condition of the hour and minute hands.

Place the movement in the case back in which the battery is set. Turn the alarm crown and set the alarm set rotating ring at 12 o'clock. Next, check to see if the alarm rings at each of the 4 positions of 12, 9, 6 and 3 o'clock when the hands are turned and positioned between 55 and 59 minutes

**Procedure 12**

Put the second hand.

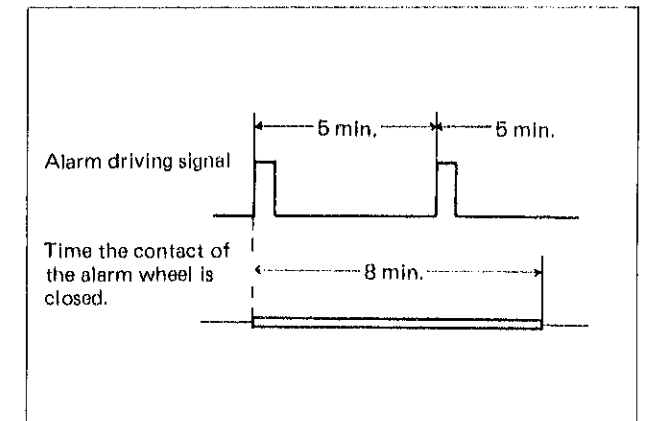
After putting, check to see if the hour, minute and second hands touch one another or if there is clearance among them and between the hour hand and the dial.

\* When the hour and minute hands cannot be set correctly in Procedure 11, refer to the CHECK SETTING CONDITION OF HOUR AND MINUTE HANDS in IV. CHECKING AND ADJUSTMENT.

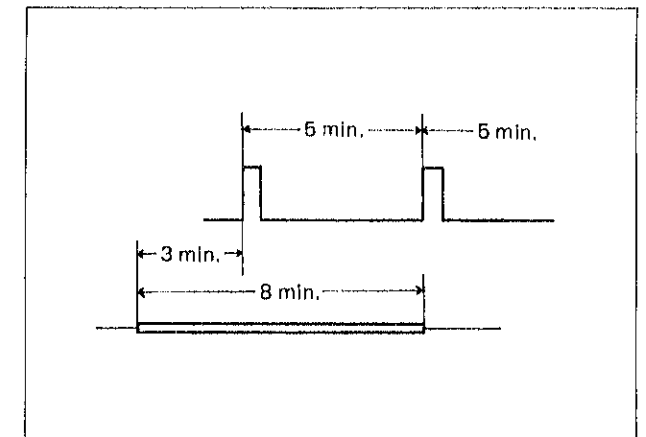
[ Why put the hour and minute hands at the position, 3 minutes to 12 o'clock ]

- The alarm driving signal is generated from the circuit block to the alarm mechanism at 5 minute intervals. The alarm mechanism functions the alarm to ring for about 8 minutes from the time the contacts of the upper and the lower unlocking wheels are turned on until the time they are turned off. The alarm is so designed that it rings when the alarm driving signal is transmitted to the alarm mechanism and the contacts of the alarm wheels are closed.

If the hour and minute hands are assembled at the time when the alarm driving signal is being transmitted and when the contacts of the alarm wheels are being closed, it is expected that at possibly some other set position, the time of the closing of the contacts of the alarm wheels may be delayed owing to the backlash between the alarm and the other wheels, etc., though the alarm functions at the designated alarm time at the position where the hands are put.

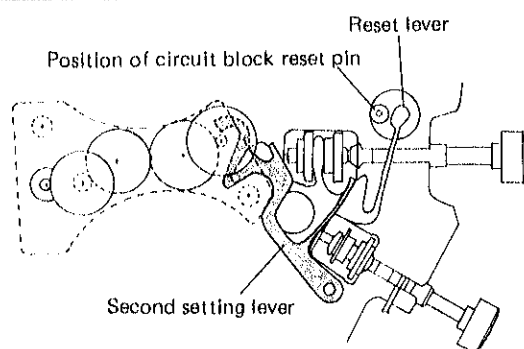
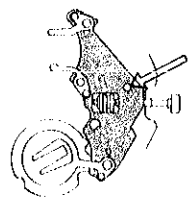


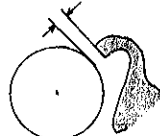
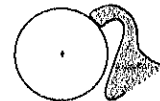
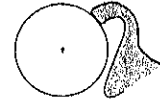
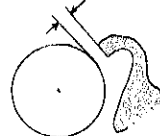
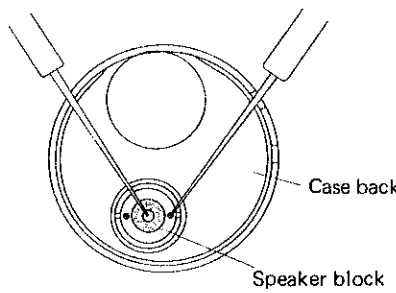
To remove the possibility of this delay, it is therefore required to put the hour and minute hands at the position 3 minutes short of the 12 o'clock position so that the alarm may ring correctly at any position where the alarm time is set, even if the time to close the contacts of the alarm wheels shifts more or less.



## V. CHECKING AND ADJUSTMENT

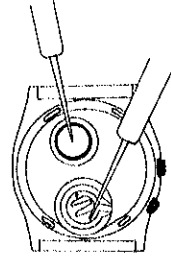
- Refer to the "SEIKO QUARTZ TECHNICAL GUIDE, GENERAL INSTRUCTION FOR ANALOGUE WATCHES" for details.

Procedure	
<b>CHECK OUTPUT SIGNAL</b>	<p><b>Result:</b> 1-second blinking: Normal 1-second does not blinking: Defective</p>
<b>CHECK BATTERY VOLTAGE</b>	<p><b>Result:</b> Less than 1.5V: Normal More than 1.5V: Defective</p>
<ul style="list-style-type: none"> <li>Be sure to set the battery with the alarm crown pushed in to the normal position (alarm stops). With the alarm crown pulled out to the first or second click position, the alarm is ready to ring or to be set. If the alarm rings, the pulse for checking the battery voltage is stopped. Consequently, it may occur, with the battery voltage being normal, that the battery life indicator will cause the second hand to move at 2 second intervals.</li> </ul>	
<b>CHECK BATTERY CONDUCTIVITY</b>	
<b>CHECK CIRCUIT BLOCK CONDUCTIVITY</b>	
<b>CHECK SECOND SETTING AND RESET CONDITIONS</b>	<p><b>Result:</b></p> <ul style="list-style-type: none"> <li>The second hand is sure to stop when the crown is pulled out to the second click and moves one second after it is pushed in to the normal position: Normal</li> <li>The second hand does not stop when the crown is pulled out to the second click and moves irregularly when it is pushed in to the normal position: Defective</li> </ul>
	<ul style="list-style-type: none"> <li>Check for the clearance between the reset lever and the circuit block reset pin through the hole of the reset pin of the battery guard. (Check with the circuit block disassembled.)</li> </ul>
<p>① The crown at the normal position and at the first click</p> 	<p>The reset lever cannot be seen through the reset pin hole of the battery guard: Normal</p> <p>The reset lever can be seen through the reset pin hole of the battery guard: Defective</p> <p>⊕ Replace the reset lever.</p>
<p>② The crown at the second click</p>	<p>The reset lever can be seen through the reset pin hole of the battery guard: Normal</p> <p>⊕</p> <p>The reset lever cannot be seen through the reset pin hole of the battery guard: Defective</p> <p>○ Replace the reset lever.</p>

Procedure	
<ul style="list-style-type: none"> <li>Check for the clearance between the second setting lever and the fourth wheel and pinion. (Check with the circuit block disassembled.)</li> </ul>	
<p>① The crown at the normal position and at the first click</p>	<p>Clearance: Normal</p>  <p>No clearance: Defective Replace the second setting lever.</p> 
<p>② The crown at the second click</p>	<p>No clearance: Normal</p>  <p>Clearance: Defective Replace the second setting lever.</p> 
<b>CHECK COIL BLOCK</b>	<p><b>Result:</b> 2.0 K<math>\Omega</math> ~ 4.0 K<math>\Omega</math>: Normal</p> <p>Less than 2.0 K<math>\Omega</math> (Short circuit) } Defective More than 4.0 K<math>\Omega</math> (Broken wire) } Replace the coil block.</p>
<b>CHECK SPEAKER BLOCK</b>	<p><b>Result:</b> 70<math>\Omega</math> ~ 90<math>\Omega</math>: Normal</p> <p>Less than 70<math>\Omega</math> (Short circuit) } Defective More than 90<math>\Omega</math> (Broken wire) } Replace the speaker block.</p> 

**Procedure**

**CHECK CURRENT CONSUMPTION**



**Result:**

Less than  $2.8\mu\text{A}$  : Normal

More than  $2.8\mu\text{A}$ : Defective

Check the electronic circuit portion.

- With the alarm crown pushed in to the normal position (alarm stops), check the current consumption with the battery placed on the case back as shown in the illustration on the left. With the alarm crown pulled out to the first or second click, the alarm is ready to ring or to be set and therefore more current for ringing the alarm will flow to cause the pointer of the Volt-ohm-meter to scale out.

**CHECK SETTING CONDITION OF HOUR AND MINUTE HANDS**

- When the hour and minute hands are set out of position, reset them by following the procedures below.

- Procedures
- ① Pull out the minute hand.
  - ② Set the battery in the case back with speaker block and set the movement.
  - ③ Turn the alarm crown and set the mark on the alarm set rotating ring at the 12 o'clock position.
  - ④ Turn the hands and find the position where the alarm rings.
  - ⑤ When the alarm starts to ring somewhat early, attach the minute hand after advancing it a bit forward from the position of 57 minutes. When the alarm somewhat delays, turn back the minute hand a bit from the position of 57 minutes and attach it.
  - ⑥ Check the setting condition of the hour and minute hands according to the Procedure 11 on page 11.

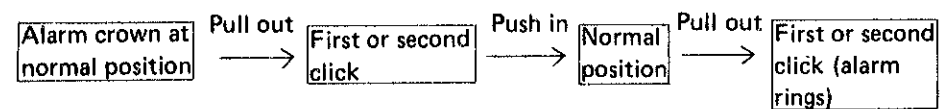
**CHECK ACCURACY**

**TIME ACCURACY ADJUSTING**

**CHECK ALARM TEST SYSTEM**



- Check to see if the alarm rings just at the designated alarm time by operating the alarm crown within 4 seconds as shown below.



- To stop the alarm ringing, push the alarm crown to the normal position.

**CHECK APPEARANCE AND FUNCTIONING**

All procedures of Disassembling, Reassembling, Checking and Adjustment are completed.