

TECHNICAL GUIDE

CAL. Y432 A

ANALOGUE QUARTZ

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I. SPECIFICATIONS

PULSAR Quartz Cal. Y432A

Item	Calibre No.	Y432A
Time indication		2-hand time indication (hour & minute)
Additional mechanism		Electronic circuit reset switch
Crystal oscillator		32,768 Hz (Hz = Hertz . . . Cycle per second)
Loss/gain		Loss/gain at normal temperature range Monthly rate : less than 15 seconds (Annual rate : less than 3 minutes)
Casing diameter		15.1 mm x 13.0 mm
Height		2.9 mm without battery
Operational temperature range		-10°C ~ +60°C (14°F ~ 140°F)
Driving system		Step motor system (2 poles: steps once every 10 seconds)
Regulation system		Trimmer condenser
Battery power		Silver oxide battery TR621SW Battery life is approximately 2 years. Voltage: 1.55V
Jewels		6 jewels

II. DISASSEMBLING, REASSEMBLING AND LUBRICATING



● Disassembling and reassembling




Disassembling procedures Figs. ① → ③⑥

Reassembling procedures Figs. ③⑥ → ①

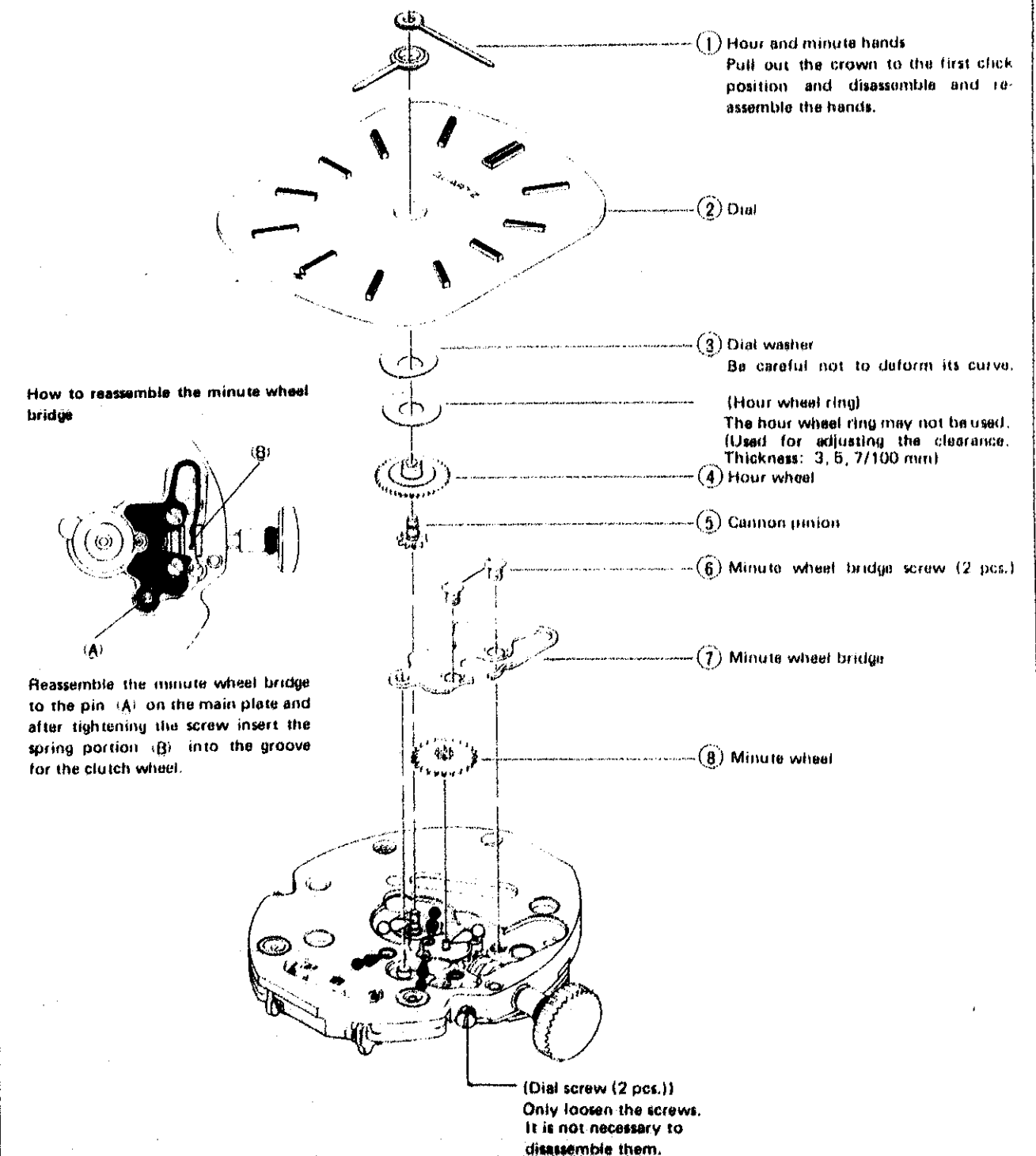
● Use the movement holder S-664

● Lubricating

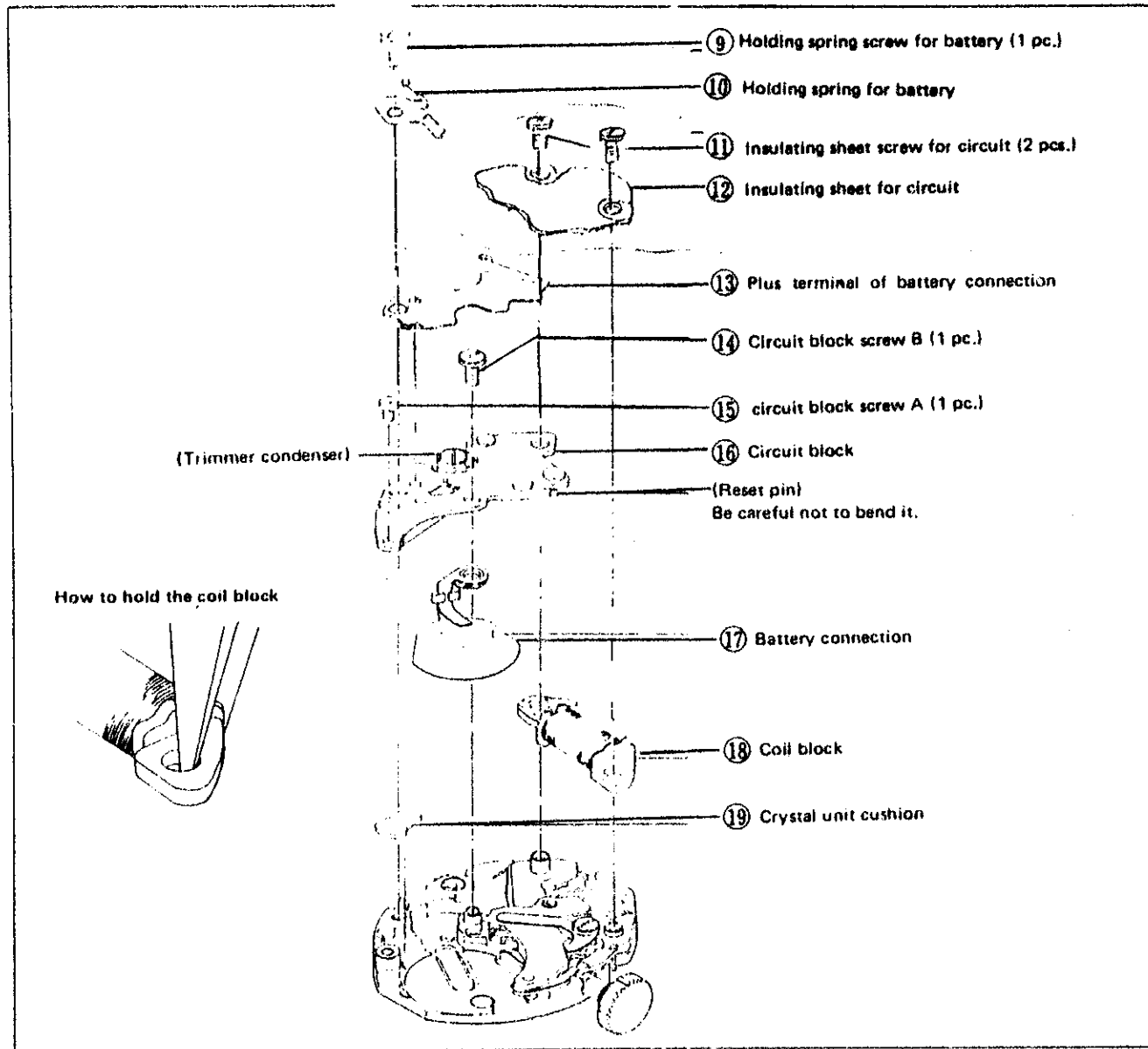
Types of oil
 Moebius A
 Watch Oil S-6

Oil quantity
 Liberal
 Normal
 Extremely small

1. Indicating mechanism



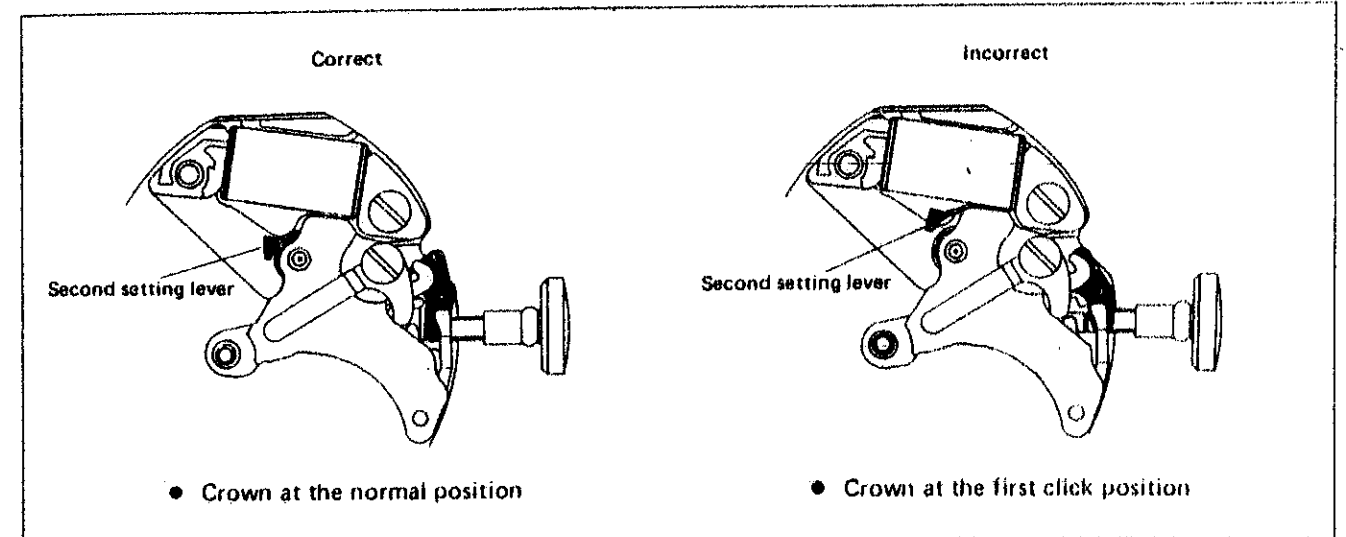
2. Electronic circuit



• Remarks for disassembling and reassembling

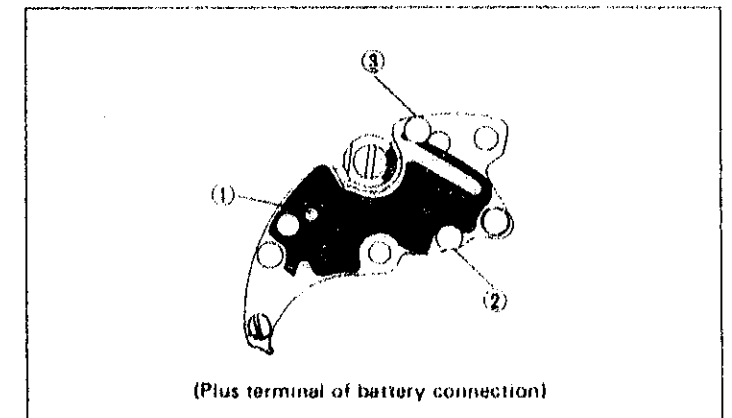
Circuit block ⑩

When disassembling and reassembling the circuit block, be careful that the reset portion of the second setting lever does not touch the reset pin with the crown at the normal position.

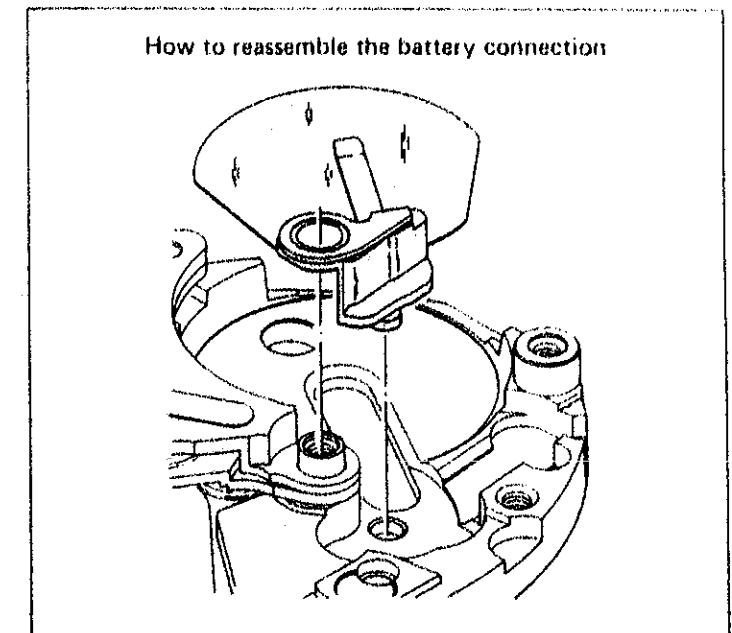


Plus terminal of battery connection ⑬

When the plus terminal of battery connection has been replaced, reassemble it in numerical order and lastly hook its spring portion ③ inside the pin.



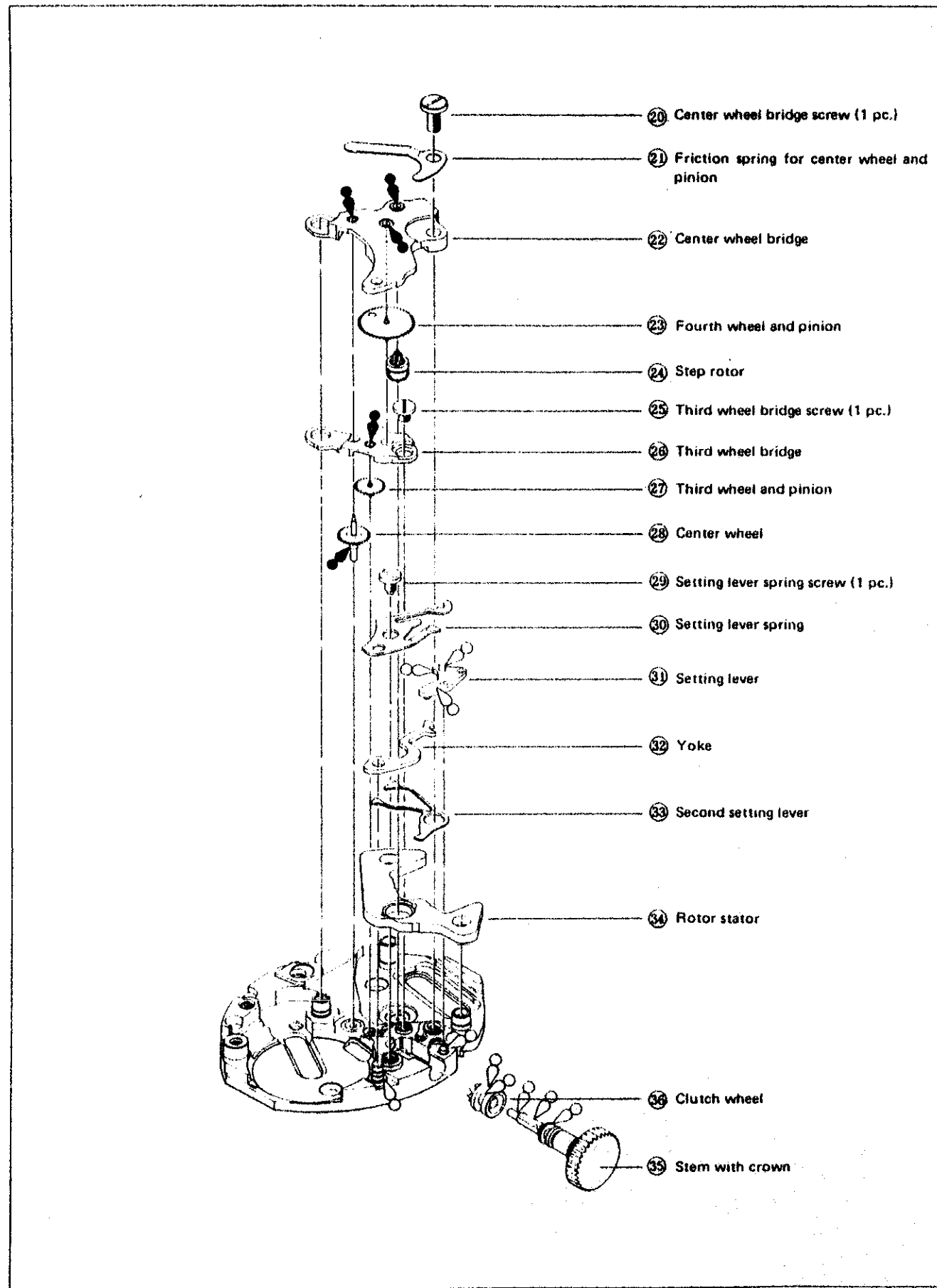
Battery connection ⑰



• List of screw used

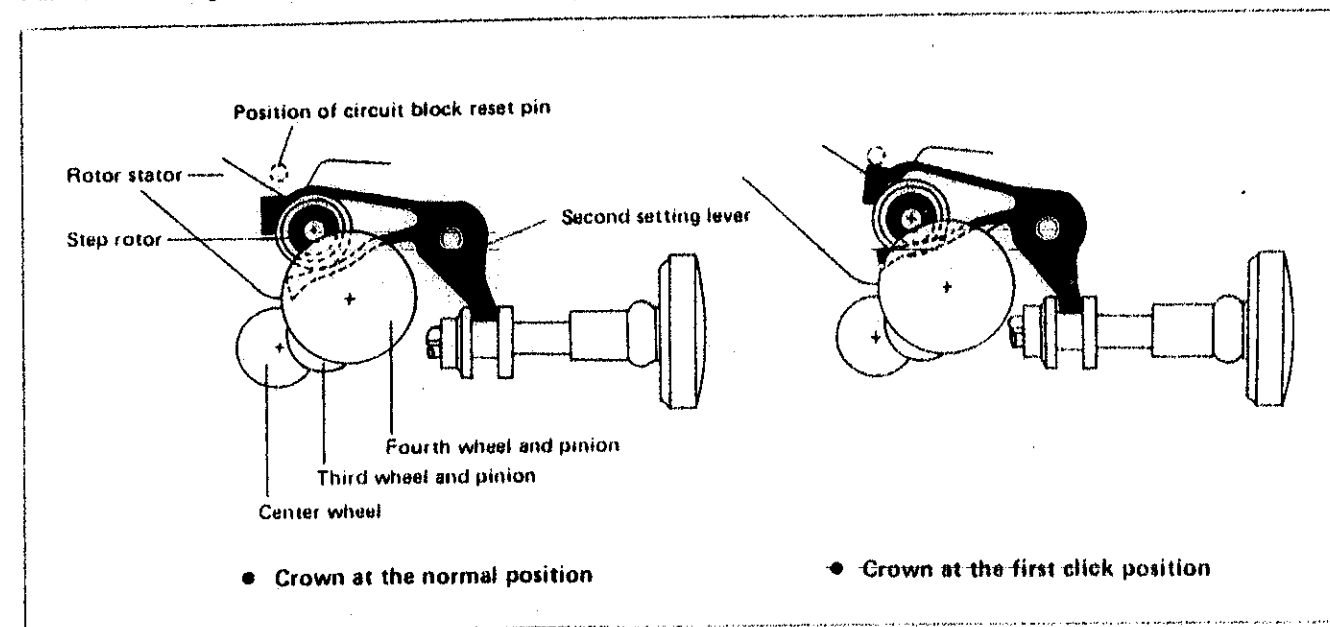
Circuit block screw B	Center wheel bridge screw Circuit block screw A Coil block screw	Holding spring for battery	Circuit block screw A	Third wheel bridge screw	Setting lever spring screw	Minute wheel bridge screw	Dial screw	Insulating sheet screw for circuit
1 piece	1 piece	1 piece	1 piece	1 piece	1 piece	2 pieces	2 pieces	2 pieces

3. Gear train and setting mechanism



• Remarks for disassembling and reassembling

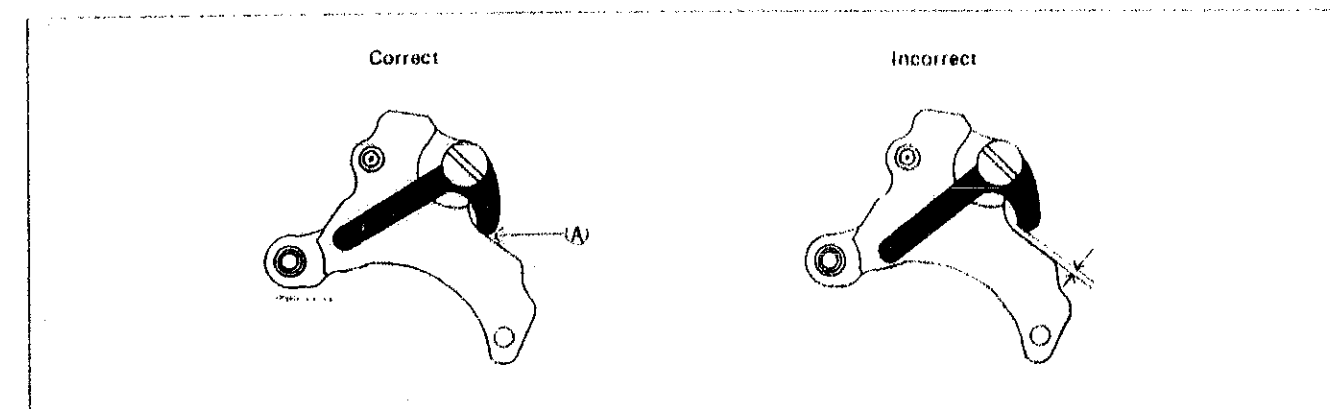
Functions of the gear train and the second setting lever 23 ~ 33



- When the crown is pulled out to the first click position, make sure that the second setting lever sets securely the step rotor and at the same time it touches the reset pin.

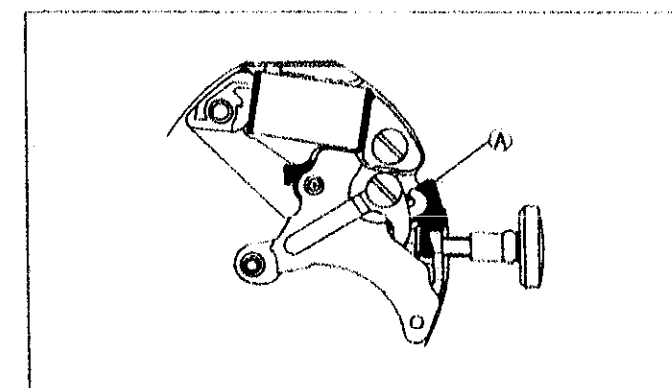
Friction spring for center wheel and pinion 21

First make sure that the portion (A) touches the side of the center wheel bridge and then tighten the center wheel bridge screw.



• How to pull out the stem with crown

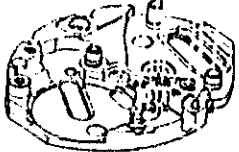

Pull out the stem with crown while pushing the portion (A) of the setting lever with the crown at the normal position.



3. Cleaning

Since several parts (electronic parts, etc.) of Cal. Y432A differ from those of the conventional mechanical watches, use the following method when cleaning.

1) How to clean

Name of parts	Cleaning	Drying	Solution	Remarks
Main plate  Step rotor 	Rinse or wash with a soft brush.	Warm air	Benzine	<ul style="list-style-type: none"> Do not disassemble or deform the parts combined with the main plate. Use a clean solution as the step rotor has a magnet. Use adhesive tape or Rodico to remove dust and filings which cannot be cleaned with the solution.
Plastic parts	Rinse or wash with a soft brush	Warm air	Alcohol, benzine	
Other parts (except circuit block coil block and insulating sheet for circuit)	Clean with a cleaner, rinse or wash with a soft brush.	Warm or hot air	Benzine, Trichloroethylene	

2) Parts that must not be cleaned



Circuit block



Coil block

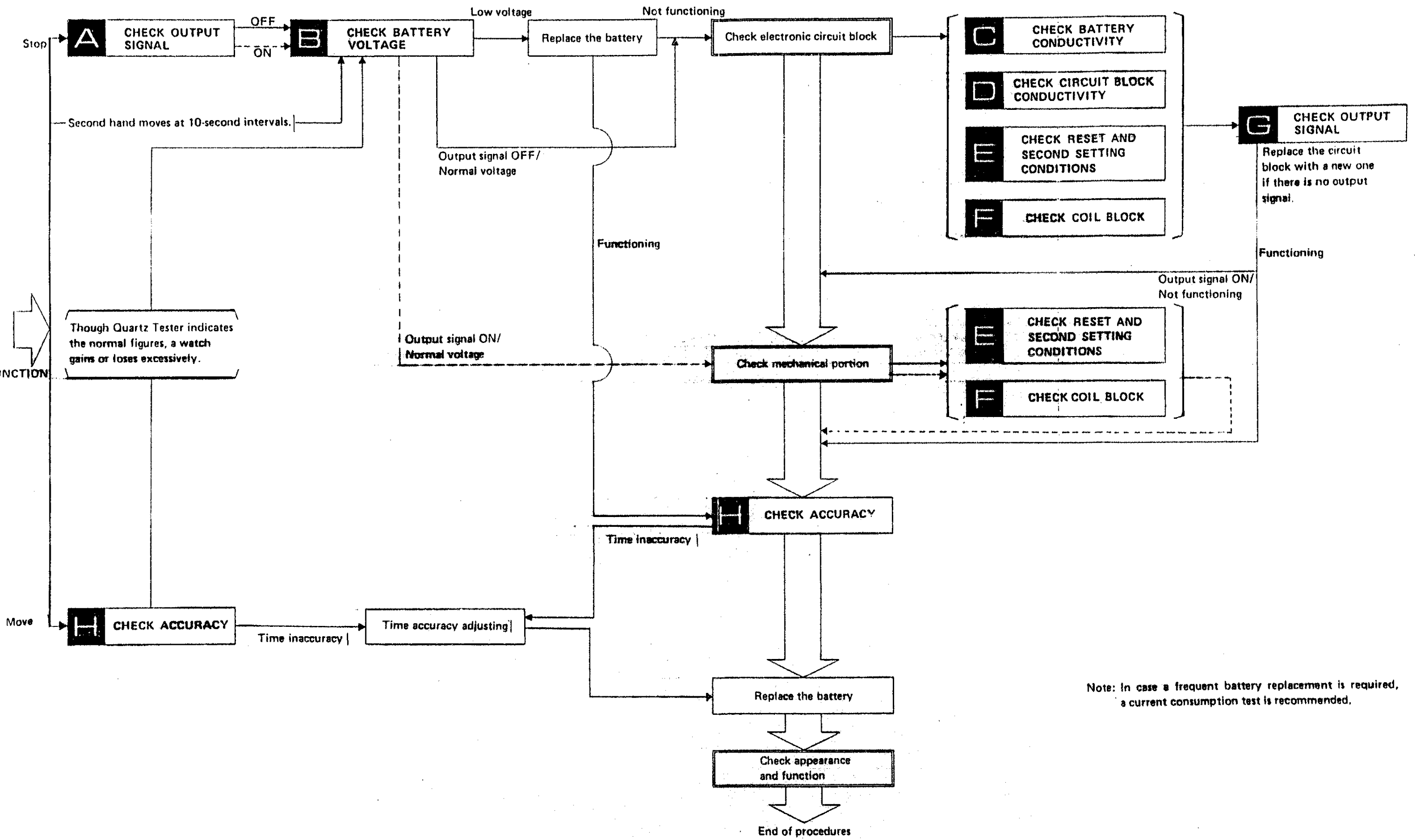


Insulating sheet for circuit

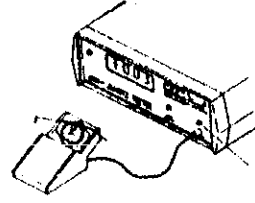
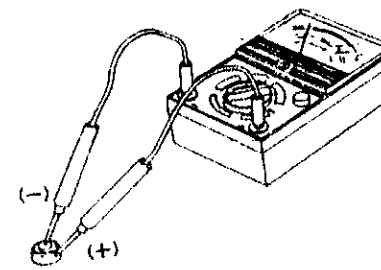

- Only the conductive portions should be wiped with a cloth moistened with benzine or alcohol and dried with warm air.



III. CHECKING AND ADJUSTMENT

1. Guide table for checking and adjustment



2. Procedures for checking and adjustment

	Procedures	Results	Adjustment and repair
CHECK OUTPUT SIGNAL	<p>A</p> <p>Check output signal.</p> <ol style="list-style-type: none"> Set up the Quartz Tester. Turn the measuring time selection switch to the "10 second" position. Checking Check for blinking input indication lamp. <p>Note: Push in the crown to the normal position.</p> 	<p>Ten-second blinking → Proceed to B.</p> <p>No ten-second blinking → Proceed to B.</p>	
CHECK BATTERY VOLTAGE	<p>B</p> <p>Check battery voltage.</p> <ol style="list-style-type: none"> Set up the Volt-ohm-meter. Range to be used: DC 3V Measuring <ul style="list-style-type: none"> Probe Red (+) ... Battery surface (+) Probe Black (-) ... Battery surface (-) <p>Note: When handling the battery, use non metallic tweezers or fingercot.</p> 	<p>More than 1.5V → In procedure A if ten-second blinking is found, proceed to Check mechanical portion.</p> <p>→ In procedure A if ten-second blinking is not found, proceed to Check electronic circuit block.</p> <p>Less than 1.5V → Proceed to Replace the battery.</p> <p>If a watch operates after battery replacement, proceed to B.</p> <p>→ If a watch does not operate after battery replacement, proceed to Check electronic circuit block.</p>	
CHECK BATTERY CONDUCTIVITY	<p>C</p> <p>Check battery conductivity.</p> <ol style="list-style-type: none"> Make sure that the circuit block screws are tightened firmly. Check for any contamination on the connecting portion of battery, the battery connection and the plus terminal of battery connection. 	<p>No loosened screws → Proceed to C 2.</p> <p>Loosened screws → Retighten the screws.</p> <p>Untamminated → Proceed to D.</p> <p>Contaminated → Wipe off carefully.</p>	

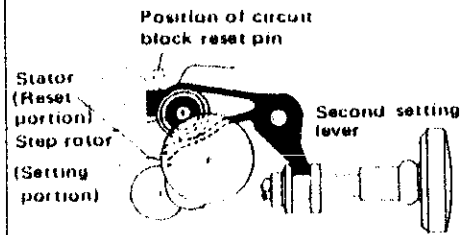
HOW TO CHECK BATTERY ELECTROLYTE LEAKAGE AND REPAIR	<p>D</p> <p>How to check battery electrolyte leakage and repair</p> <ol style="list-style-type: none"> Remove the movement from the case. Wipe off battery electrolyte on the circuit block. <ol style="list-style-type: none"> Wipe off battery electrolyte with a cloth moistened with distilled water. (If distilled water is not available, use tap water.) <p>Note: Do not expose the trimmer condenser to water or alcohol. If it is exposed, there may be a change in the condenser capacity and eventually in the time accuracy.</p> <ol style="list-style-type: none"> Wipe them with a cloth moistened with alcohol. Dry with hot air by using a dryer. (If the cleaned portions remain wet with water, they will corrode with rust.) <ol style="list-style-type: none"> Wipe off battery electrolyte on the other parts in accordance with the "HOW TO CLEAN". Reassemble the movement. (Replace the battery with a new one.) Check to see if the time setting functions and the current consumption are normal. 	
CHECK CIRCUIT BLOCK CONDUCTIVITY	<p>D</p> <p>Check circuit block conductivity.</p> <ol style="list-style-type: none"> Check to see if the insulating sheet screw for circuit, holding spring screw for battery and circuit block screws A and B are tightened firmly and if the spring portion of the plus terminal of battery connection touches the pin.  Check the circuit block for any break in the welded portion, short circuit, pattern break and contamination.  	<p>No loosened screws → Proceed to C 2.</p> <p>Loosened screws → Retighten the screws.</p> <p>No break in the welded portion, short circuit, pattern break or contamination. → Proceed to E.</p> <p>Break in the welded portion, short circuit or pattern break → Replace the circuit block.</p> <p>Contaminated. → Wipe off carefully.</p>

Procedures

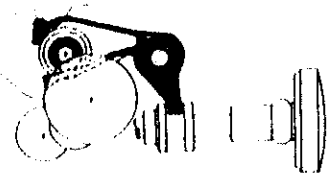
Check reset and second setting conditions.

1. Check to see if the second hand stops immediately after the crown is pulled out to the first click position and if it starts promptly after ten seconds when the crown is pushed in to the normal position.
2. Check for the clearance between the tip of the second setting lever (reset portion) and the reset pin (with the circuit block removed).

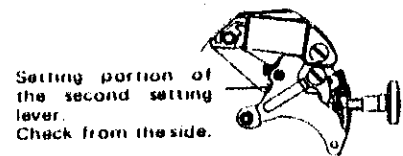
(1) With the crown at the normal position



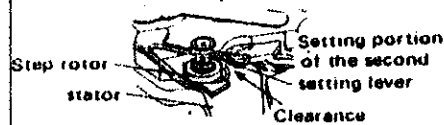
(2) With the crown at the first click position



3. Check for the clearance between the setting portion of the second setting lever and the step rotor (with the circuit block removed).



(1) With the crown at the normal position



(2) With the crown at the first click position

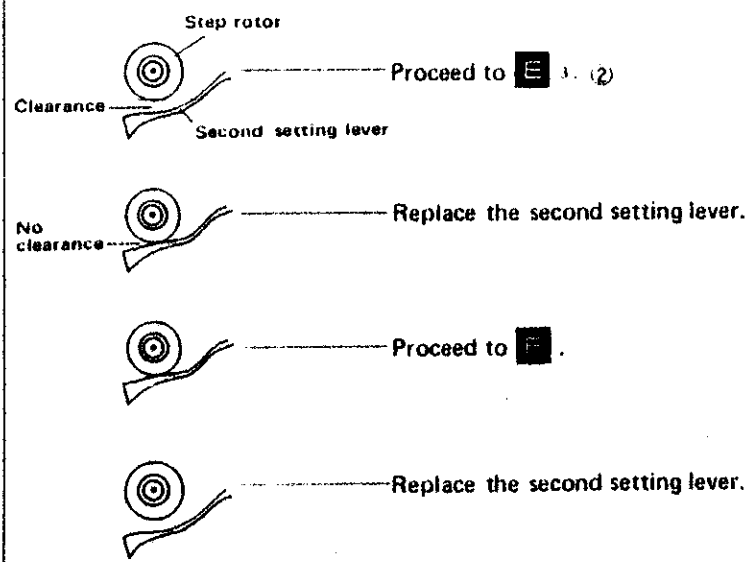
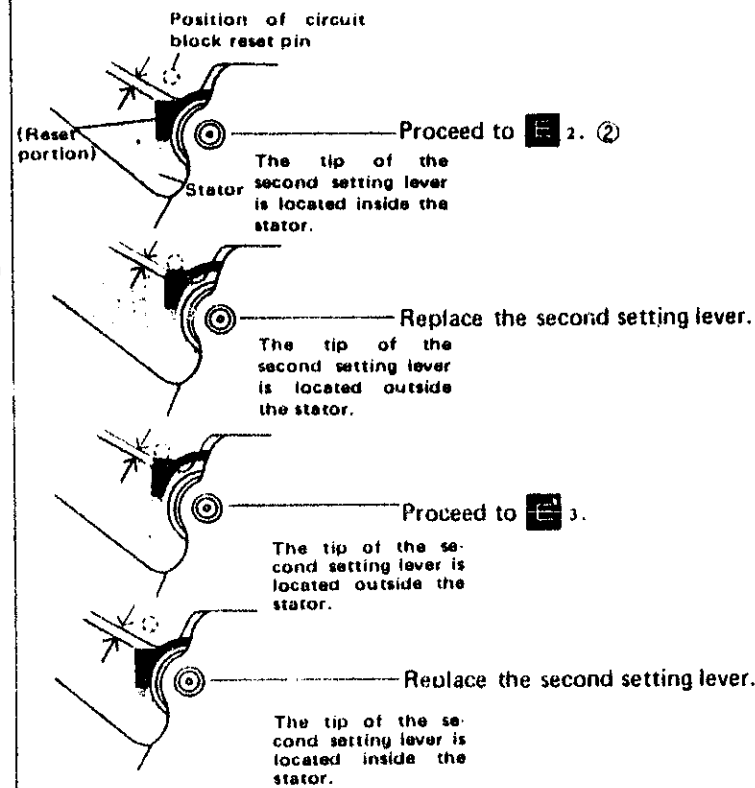


Results

Adjustment and repair

Stops completely and starts after ten seconds → Proceed to **F**.

Does not stop or moves irregularly → Proceed to **E** 2.



Cal. Y432A

Characteristics:

Casing diameter: 15.15 mm × 13.00 mm
 Maximum height: 2.99 mm including battery
 Jewels: 6 j
 Frequency of quartz crystal oscillator: 32,768 Hz (Hz=Hertz. . . . Cycle per second)
 Driving system: Step motor system (2 poles)
 Regulation system: Trimmer condenser

PART NO.	PART NAME	PART NO.	PART NAME
121 141	Center wheel bridge	017 146	Tube for center wheel bridge screw
131 140	Third wheel bridge	017 147	Tube for third wheel bridge screw
224 142	Center wheel with canon pinion (3.61 mm)	017 148	Tube for setting lever
231 140	Third wheel & pinion	017 150	Tube for coil block
241 140	Fourth wheel & pinion	017 151	Tube for circuit block A
261 140	Minute wheel	017 160	Tube for circuit block B
271 142	Hour wheel (1.00 mm, silver)	TR621SW	Silver oxide battery
282 140	Clutch wheel	(SEIZAIKEN)	
351 142	Winding stem (14.10 mm)	SR621SW	(Maxell)
383 140	Setting lever		
384 140	Yoke (Clutch lever)		
387 140	Minute wheel bridge		
388 140	Setting lever spring		
391 140	Second setting lever		
490 140	Center wheel friction spring		
491 140	Dial washer		
493 160	Hour wheel ring (Thickness 0.03 mm, gold)		
493 161	Hour wheel ring (Thickness 0.05 mm, silver)		
493 162	Hour wheel ring (Thickness 0.07 mm, gold)		
4001 142	Circuit block		
4002 140	Coil block		
4146 140	Step rotor		
4216 141	Insulator for circuit		
4225 140	Holding ring for battery		
4239 140	Rotor stator		
4242 142	Plus terminal of battery connection		
4270 140	Battery connection		
4446 140	Crystal unit cushion		
011 326	Upper hole jewel for third wheel		
011 326	Lower hole jewel for third wheel		
011 326	Lower hole jewel for fourth wheel		
011 541	Upper hole jewel for fourth wheel		
011 541	Upper hole jewel for step rotor		
011 541	Lower hole jewel for step rotor		
012 155	Dial screw		
012 156	Center wheel bridge screw		
012 157	Third wheel bridge screw		
012 208	Setting lever spring screw		
012 374	Screw for holding spring for battery		
012 460	Screw for circuit block insulator		
012 461	Circuit block screw B		
012 464	Circuit block screw A		
012 777	Minute wheel bridge screw		

Part numbers in light letters are not shown in photos.