TRAINING UNIT

NUMBER 9

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WATCH ASSEMBLY

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There are approximately 125 separate parts in the watch of today. Each one has its important function in the complete mechanism which measures intervals of time. When each wheel, each lever, each bridge is fitted and assembled in its proper position, an efficient accurate timepiece has been completed.

Two important requirements of every expert watchmaker are a thorough knowledge of each part and a full understanding of its necessary function in the working watch machine. In our modern civilization, the millions of watches being used daily in every type of activity require occasional servicing by the watchmaker. Servicing may mean a periodic cleaning involving a complete disassembling and reassembling of all the parts of the watch, or it may require a properly fitted replacement part.

Regardless of the type of job necessary, the high grade watch repairer must be able to fit and reassemble all the parts of the watch into an accurate instrument which will satisfy every requirement of its original maker.


BULOVA
WATCH Co
U.S.A.
17 JEWELS
10 AK

HOW THE WATCH FUNCTIONS

MAJOR UNITS of the WATCH

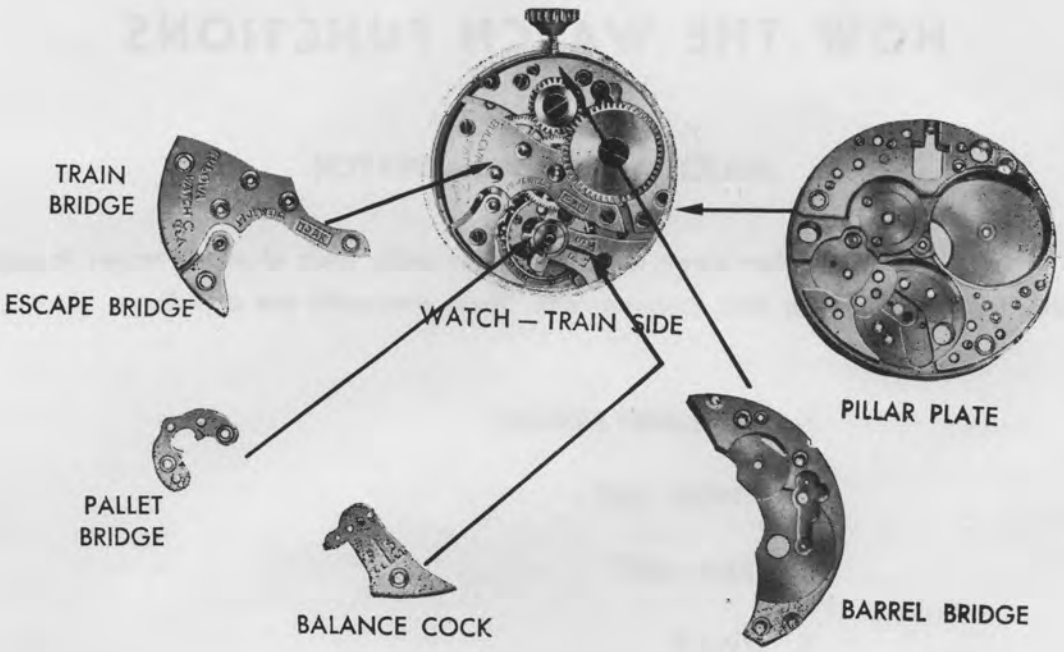
The watch can be broken down into nine major units, each of which serves its separate function in this machine for time measurement. These nine units are as follows:

1. PLATE AND BRIDGES
2. POWER UNIT
3. TRAIN UNIT
4. JEWELS
5. ESCAPEMENT
6. BALANCE AND HAIRSPRING UNIT
7. WINDING AND SETTING MECHANISM
8. DIAL AND HANDS
9. WATCH CASE

The functions of these units are briefly described and the parts illustrated under each group.

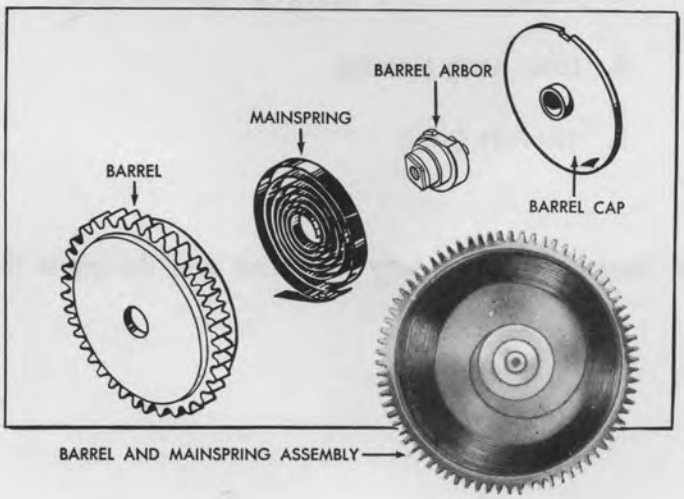
1. The **PLATES AND BRIDGES** form the foundation of the watch and hold all the parts in proper relation to each other.

Fig. 1



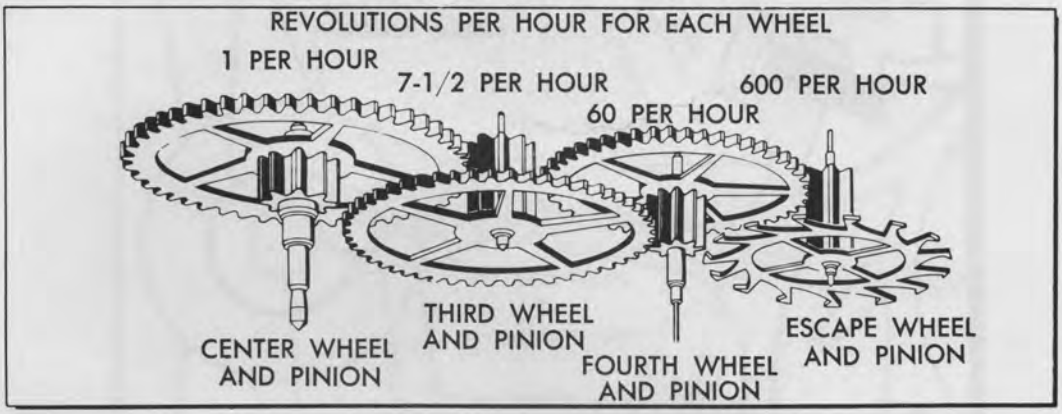
2. The **POWER UNIT** consists of the mainspring coiled around an arbor within a barrel. When the watch is wound by turning the crown, sufficient power is stored up in the wound spring to drive the gears.

Fig. 2



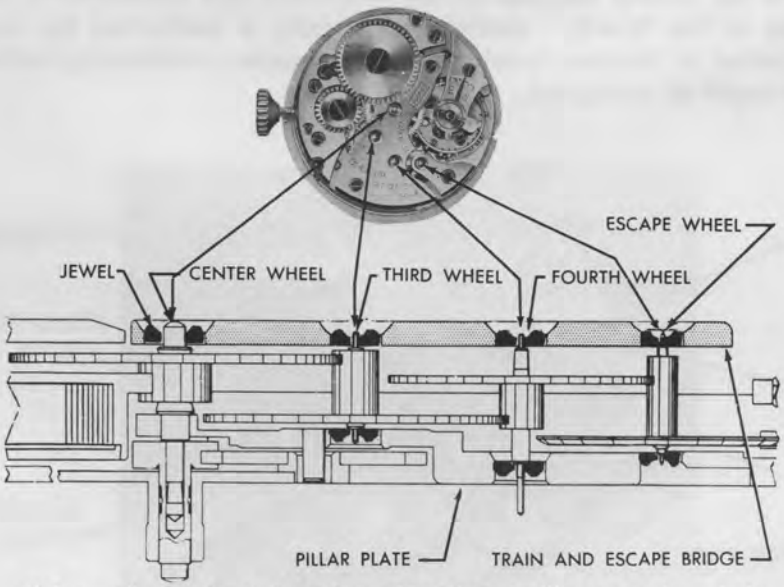
3. The **TRAIN UNIT** which includes the center wheel and pinion, 3rd wheel and pinion, 4th wheel and pinion, escape wheel and pinion, transmits the power from mainspring barrel to pallet and also supports the hands of the watch.

Fig. 3



4. The **JEWELS** are located in the plates and bridges, and form the bearings for the train, escapement, and balance pivots. The bearing surfaces of the jewels and pivots are highly polished and thereby reduce friction. The jewels are shaped with an oil reservoir which holds an oil supply sufficient for approximately 8 to 18 months lubrication. In this way, the life of the watch is prolonged.

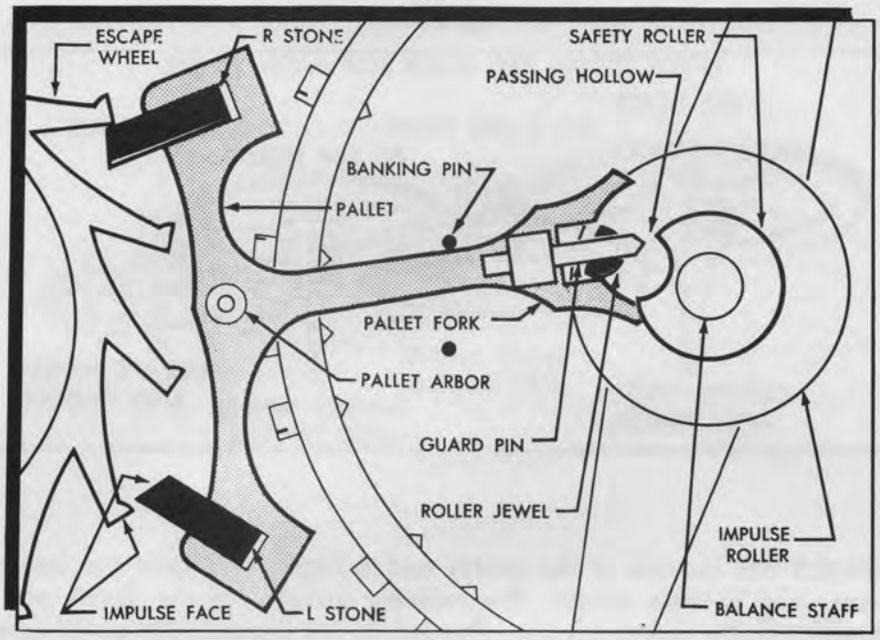
Fig. 4



This profile sketch of the Bulova 10 AK Train illustrates the relative positions of the jewels and settings.

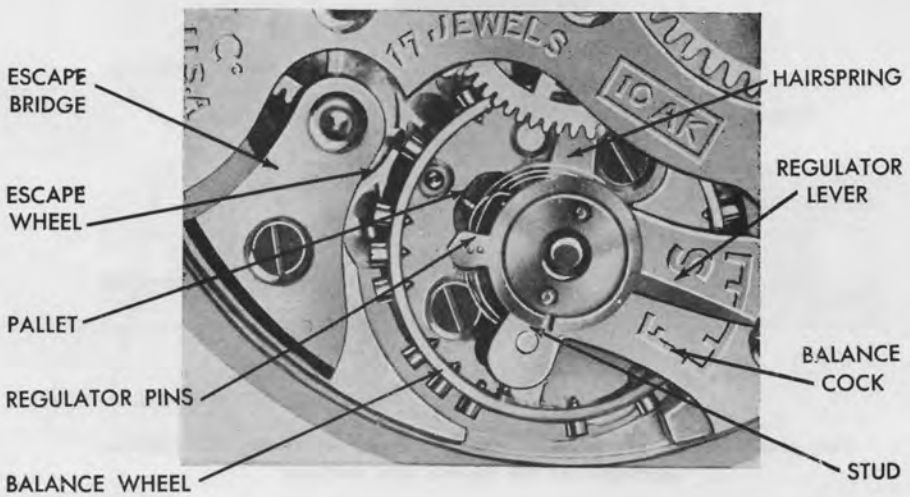
5. The ESCAPEMENT changes the rotary motion of the escape wheel to a back and forth motion of the pallet. At the same time, the pallet imparts an impluse to the balance wheel, causing an oscillating or vibratory motion.

Fig. 5



6. Because of the control features of the BALANCE and HAIRSPRING UNIT, it is often termed the "Brains of the Watch." Actual timekeeping is performed by the balance and hairspring whose period of vibration is established by a correct relationship between the weight of balance and strength of hairspring.

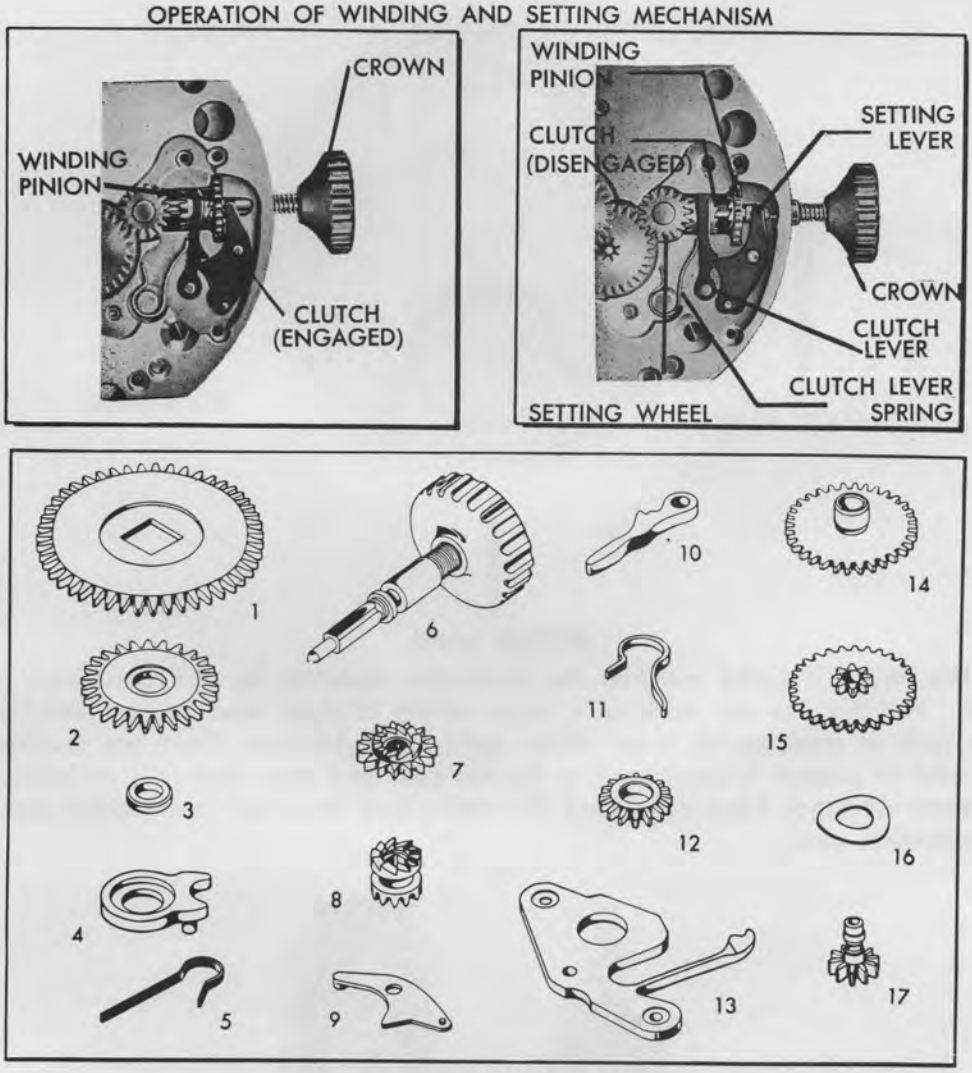
Fig. 6



7. WINDING AND SETTING MECHANISM provides the means of storing up energy in the mainspring when the crown and stem are turned clockwise. Also by means of a simple system involving the shifting of a setting lever, clutch lever and clutch wheel, as the stem and crown are pulled out, this unit permits the setting of the watch hands.

Fig. 7

OPERATION OF WINDING AND SETTING MECHANISM

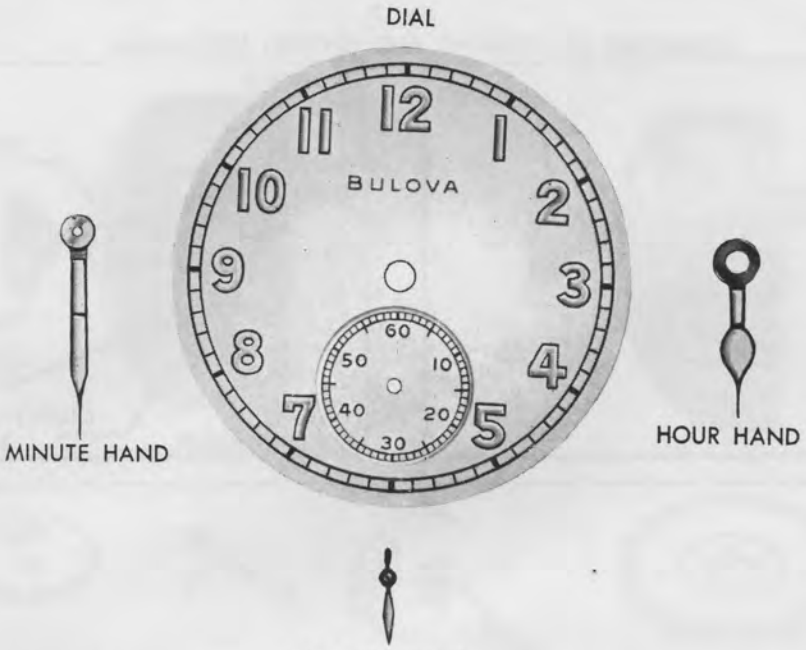


WINDING & SETTING PARTS

1. **Ratchet Wheel**
2. **Crown Wheel**
3. **Crown Wheel Center**
4. **Click**
5. **Click Spring**
6. **Stem and Crown**
7. **Winding Pinion**
8. **Clutch Wheel**
9. **Setting Lever**
10. **Clutch Lever**
11. **Clutch Lever Spring**
12. **Setting Wheel**
13. **Yoke**
14. **Hour Wheel**
15. **Minute Wheel**
16. **Dial Washer**
17. **Cannon Pinion**

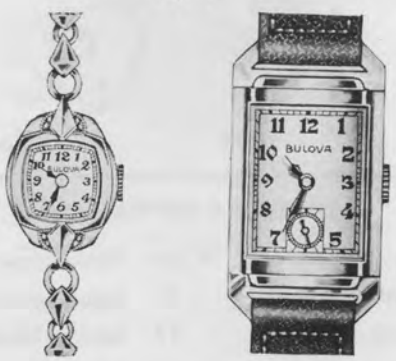
8. DIAL and HANDS indicate the elapsed time. The dial is usually graduated into hours, minutes, and seconds over which movable indicators called hands are rotated. **Actually, the hands denote the time periods of the balance and hairspring unit.**

Fig. 8



9. The **WATCH CASE** provides the protective covering for the completely assembled movement. Watch cases are made in a large variety of styles and designs and from various materials such as steel, nickel, brass, silver, gold, and platinum. Gold has survived the test of Time, and at present is considered to be the best and most desirable material for watch cases. Recent demands have developed the water and dustproof cases which are generally made of stainless steel.

Fig. 9



In Fig. 10, can be seen two different views of all the operating parts assembled into a complete compact instrument. Although each unit performs its own particular job in the complete assembly, the parts are closely linked together to operate as a coordinated machine.

The bridges are secured to the pillar plate by bridge screws and are accurately positioned by semi-friction tight steady pins. Because the back of the movement has been divided into several bridges, each unit may be disassembled without disturbing the other parts. This arrangement facilitates repair and assembly work.

Fig. 10