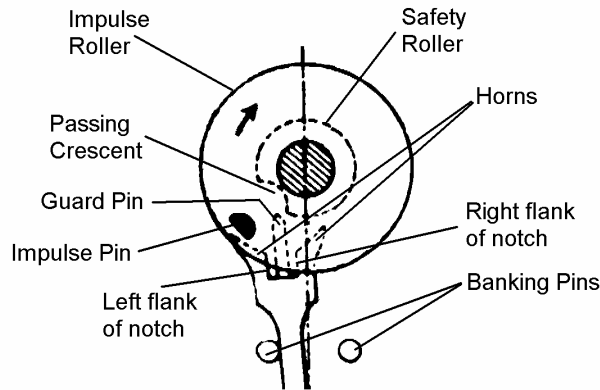


Nearly finished the Technician Grade Course ? answer to theory question

- a) Draw a diagram showing clearly the forked end of the lever and double roller assembly in a jewelled lever escapement. Label the following items: impulse roller, safety roller, impulse pin, passing crescent, horns, guard pin, banking pins, and the left and right flanks of the notch.**



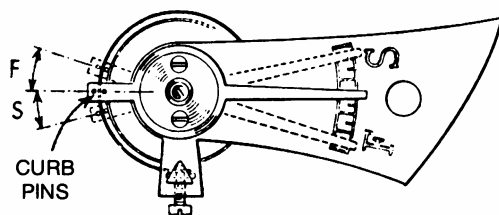
- b) Describe the safety action of the escapement and explain why it is necessary.**

The diagram shows the lever resting against the left banking pin, the safety action prevents the lever moving across to the right banking pin in the event of a shock – overbanking. Over banking will stop the watch because the impulse pin is then on the wrong side of the lever to enter the notch and unlock the escapement.

There are two distinct measures present in the safety action to prevent overbanking - a shock could occur either when the impulse pin is away from the lever (1) or at the point when the impulse pin is about to enter the notch (2).

- 1 When the impulse pin is away from the notch a shock could cause the lever to move away from the banking pin. If this were to happen the guard pin would touch the safety roller thus preventing overbanking. Draw returns the lever to its position against the banking pin. The guard pin can only move across when it is in line with the passing crescent
- 2 If a shock were to occur at the moment when the guard pin is in line with the passing crescent, but just before it enters the notch, the lever could move across. The horns prevent this by guiding the impulse pin into the notch.

- c) Use notes and sketches to show how regulation is most commonly achieved in a watch fitted with this type of escapement. (6 marks)**



The index is a moveable steel arm mounted on top of the balance cock; there are two projections which embrace the hairspring (curb pins or boot and curb pin). The curb pins are adjusted so that there is the minimum clearance between them and the balance spring. The effective length of the balance spring, which controls the rate of oscillation of the balance, is from the curb pins to the collet at the balance staff. As the index is moved the effective length of the balance spring changes. In the diagram, if it is moved towards the "F" the balance spring becomes "shorter" and the watch will go faster; if it is moved towards the "S" the balance spring becomes "longer" and the watch will go slower.