

## Technical Stuff

### Know Your Jewels by *Tim Rymer*

There it was, staring up at me from the parts tray, like someone caught by the birds in Alfred Hitchcock's movie! Shocked, I said, "What happened to the jewels?" The swap meet seller managed a sheepish half-smile and told me he tried to get them out intact but they disintegrated, "aren't they valuable?"

That poor watch was the victim of a common misconception. Each jewel is worth very little (like one dollar or less) in the modern watch. Yes, they are rubies, but synthetic (or the polite term, "lab created") and so dinky the main value is in reducing friction in the watch, instrument, or small clock. Of uniform color, they are easily matched and mass-produced. It's a little different if you have an old watch and have to locate a jewel of the right size and color from the many natural variations so it looks right along with the rest.

Small, natural stones, usually rubies and sapphires, have been made into anti-friction bearings for watches, small clocks, and measuring instruments since about 1704. Being hardness 9, the only thing that would cut and polish them were tools tipped with diamonds, which have a hardness of 10. Jewels didn't catch on right away. After 1800 they started to appear, but only on the highest-grade watches at first. Some makers chose large pale ones that showed off the highly polished pinion gears below. They are known as "Window Jewels" and can be seen on many English watches.

Some of the stones not on "display", such as the roller pin or roller jewel of old watches and some of the smaller hole jewels will actually show dark spots after going through the cleaning machine. These are natural inclusions or flaws and impurities in the stones as they formed. By the 1890's, artificial rubies were perfected and by 1900 the economics and reliability of made-to-order jewels won the day.

In making repairs, I find most pocket watch jewel problems are related to the broken balance staff accident itself. That is, when the watch is dropped or otherwise receives a shock large enough to cause the balance wheel's weight to break its thin end pivot, it often cracks the cap jewel, hole jewel, or both in the process. So the job is not only a staff replacement, but calls for the finding and replacement of one or more jewels of the proper diameter also.

The roller jewel is the next most commonly found problem. Sometimes a well meaning watch examiner will try to get the balance wheel going by "shoving it around a little". Not a good idea since the roller jewel pin is so fragile. If the escape wheel is sticky and teeth are resting against both pallet stones, the pin can break against either fork ears. Or if "over banked", where the roller jewel pin has left the confines of the fork and rests against one side, the wheel will rotate freely one way,

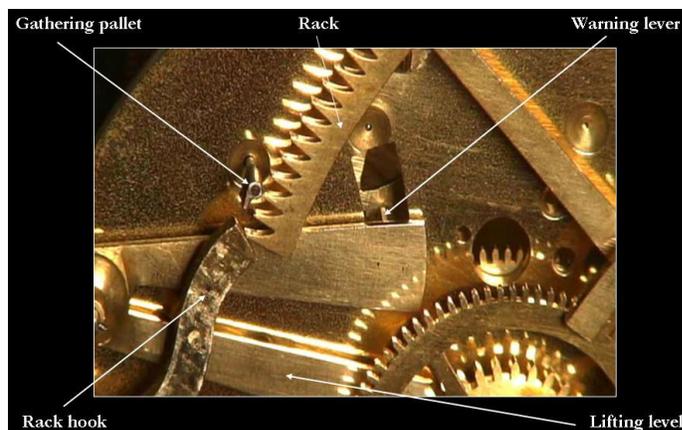
but crash against the pallet fork in the other direction either breaking the shellac loose which cements the pin in the roller or breaks the roller pin off.

I have had the distinct privilege of having spent part of the last 45 years learning more and more about how to repair watches and clocks. I try to pass a bit of it over to other members so they can enjoy their hobby even more. The next installment will offer some techniques to make repairs to balance, plate, and roller jewels.

### Movement Comparison by *Mark Edgar*

For last month's Chapter Program, I presented a comparison of a striking mechanism for a French Empire clock made in the 1830's with the striking mechanism of a French Empire clock made in the 1890's. The first picture below is of the French Empire clock from the 1890's and the second picture is of the 1830's French Empire clock. The parts of the striking mechanisms are labeled in both pictures. The major difference between the striking mechanisms is found in the gathering pallets. The gathering pallet in the 1830's clock lifts the rack from inside the clock plates via a cam on gear S4 and a wire that extends from the cam through the clock plate. The gathering pallet for the 1890's clock is simply placed on the S4 arbor on the outside of the clock plate.

French Empire Clock – 1890's



French Empire Clock - 1830's

