Re-casing interesting and rare watch movements 1

Mike Beckingham suggests a different way to re-case old watch movements.

Introduction

Like many watch makers and watch collectors I have, over the years, collected a number of watch movements that have lost their gold or silver cases to the bullion dealers. Some of these movements are interesting and some are not only interesting but also complicated and rare and have come from the workshops of some of the great makers of the 19th and 20th centuries.

Whilst these movements are very interesting to look at, it is often difficult to show them off to their full advantage owing to the difficulty of activating such functions as repeat mechanisms, chronograph operation, musical trains etc, to say nothing of the difficulty of winding some of the keyless examples.

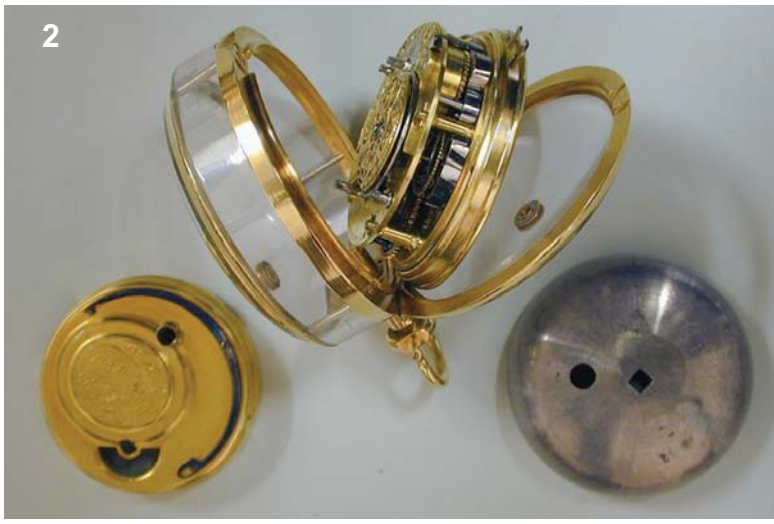
When I started to collect these movements it was with the idea that one day I would have the time to make cases for them so that they could be restored to full working order. Now, in semi-retirement and so not having to count every hour, I have finally been able to implement this plan.

Those of us who have been fortunate enough to see the excellent video by Martin Matthews are left in no doubt that the art of watch case making is something not to be undertaken lightly. It requires not only considerable skill and years of experience, but also a workshop with all the necessary machinery and equipment. I would highly recommend this video to those who have not seen it. It is certainly one of the best horological videos I have seen and a must for anyone interested in making watch cases.

My objective has been to make the cases in the general style of the original but to make them in such a way that they would not only make the movement fully functional but would also show it off to the best advantage. In other words, highlight the beauty of the movement rather than the case. To achieve this I decided to glaze the back of the watch as well as the front, and in addition, to glaze the band in those watches such as chronometers, repeaters, etc. with interesting features between the plates.

All the movements that have been re-cased have been retained in their original form. That is to say that they have not been modified in any way in order to re-case them.

In this and future articles I will endeavour to explain how I have achieved this.



Selecting a movement

In selecting a movement you would like to re-case, I recommend for a first attempt choosing one that has some interesting features but is not too complicated. The movement I chose was by John Roger Arnold, **Figure 1.** This movement has an Arnold spring detent escapement and Z compensation balance, is fitted with Thomas Prest's keyless work and is one of only two recorded as being so finished. When I purchased this movement in London many years ago it was not in going order owing to broken balance staff jewels. It also lacked hands and a dial.

The first thing to do was to overhaul the movement, replace the jewelling, make a new set of hands and consider what was to be done about a dial. The hands are quite substantial and this is so that you can set the time with your finger, as with a clock, making the watch truly keyless. The minute hand is secured with a screw into the cannon pinion, which is D shaped. I decided to attempt a transparent dial so that the Prest winding work could be seen. This was achieved by photographing another dial and putting the ARNOLD name on with Letraset.

The case is machined from solid free cutting brass bar stock and is then nickel plated using a bright electroless process

before electro-plating about 15 microns of 24ct hard gold, using the Autronex process. Further details of these plating methods will be covered later.
Other examples of movements that have been re-cased are:

Figure 2 - a movement by John Arnold, circa 1775

This is a half-quarter repeater based on the Stogden type, with ruby cylinder. The case is machined from solid free cutting brass then nickel and gold plated. Note that the front and back glasses are pierced and fitted with ferrules with caps to make it possible to wind and set the movement without opening the case. The front bezel and movement are hinged on a common hinge as was customary in this period.

Figs 3a and 3b - a movement by Hunt & Roskell, circa 1850

This is a quarter repeater with an interesting long spring detent mounted in a slot in the dial plate. The case is machined from sterling silver and hard gold plated. It is glazed front and back, and the bezels are screw-on, with the back one marked to assist replacement.

Figs 4a and 4b - a movement by Lange and Söhne

It can be seen that this movement was originally in a hunter case. This raises the question of where to put the pendant and winder. In this case I decided to put the pendant at 12 and a small winder with the Lange patent hand setting at 3. The case is machined from sterling silver and hard gold plated. The front and back bezels are snap-on.

Figs 5a and 5b - an early 19th century minute repeater with duplex escapement by Robt. Roskell

This movement required a lot of work as the motion work was missing and the lower part of the balance staff, including the cylinder, had been broken off. There is an interesting message inscribed on the back of the silver dial: "*This movement bought from W Perry (Walford) Sunday May 16th 1943 by G N Hyde (Sleaford) for 10/-. Cost Perry £11 & was then in 18ct gold case which he sold for £17-10/-*".

The new case is machined from sterling silver and hard gold plated. It is glazed front and back and there are three glazed windows in the band. The front glass is pierced with a ferrule and cap for hand setting. The bezels are snap-on.

Figs 6a and 6b - an unsigned French quarter repeater with sapphire cylinder escapement

I could not resist making this case in Amy Gros collier form with a reeded band, which was so popular with early Breguet watches. The case is machined from sterling silver and gold plated. The bezels are snap-on. I must confess I balked at fitting hinges to such thin bezels. Perhaps next time.

Figures 7 - a typical Swiss minute repeater with chronograph, moon phases and day, date and month indicators

Again, this movement would have been in a hunter case but this time, unlike for the Lange, I decided to make it a 'side-winder' and leave the pendant and winding at 3. The case is gold plated sterling silver and the front bezel is hinged.

Choosing the case material

The choice of case material is largely a personal one. It might be influenced by the type of the movement, and economy could also have a bearing on the decision. My first choice has been sterling silver, however for both the Arnold movements I have used free cutting brass.

Free cutting brass

This can be purchased from any non-ferrous metal dealer and is available in solid bar stock in all the diameters that would be required for a watch case. Sometimes it can be obtained in heavy walled tube, which can save a lot of time in machining. If only solid bar stock is available it can be ordered cut to length. Alternatively, you could order it rough machined from a machine jobbing shop, **Figure 8**. The big advantage with free cutting brass is that it is, unlike silver, very easy to turn, drill and tap.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Silver

Silver can be ordered from bullion dealers in a number of different forms. It is not generally available in round bar stock except in small diameters. I usually purchase it in bar form, where it is available up to about 6mm thick and 60mm wide, ref. **Figure 9**. Sometimes I have ordered it cut to the required diameter in plate form, which saves time in machining. Another way is to have the parts centrifugally cast using the lost wax process. This saves quite a lot of time in the turning process but means that you have to first make the patterns in carving wax. Silver is not an easy metal to machine. It tends to be very sticky, rather like copper, and the choice of cutting agents is very important. I have tried a number of proprietary cutting fluids but without much success. The best fluid that I have found is kerosene (paraffin) or mineral turpentine. Traditional case makers use spit, but I find that I tend to run out after a short time, but it certainly does work.

The cost of silver is something that must be taken into consideration. At the time of writing it was about £0.30 per gram and the price for scrap was between £0.20 and £0.25 per gram. From **figure 9** it can be seen that the total weight of sterling silver for a typical 55mm diameter case is 490 grams, the cost of which would be about £147. The total amount of scrap for such a case is about 50% so the total cost of the silver for the finished case is about £98, based on 245 grams of scrap at £0.20 per gram.

Gold

So far I have not made a complete case out of solid gold because of the high cost. I have made some parts, such as pendants, using the lost wax casting method.

Glazing material

For the front and back glazing I have used traditional flat or double lunette glasses for the older key wind movements, and bevelled raised crystals for the more modern keyless movements. I am lucky to have a large stock of these. For movements that have interesting mechanisms between the plates I have made the bands of toughened acrylic, which is available from most plastics suppliers in a wide range of inside and outside diameters. It is not as hard as glass but is very scratch resistant and it is easy to machine at quite low cutting speeds, using kerosene as a cutting fluid. This is very important when drilling and tapping small holes.


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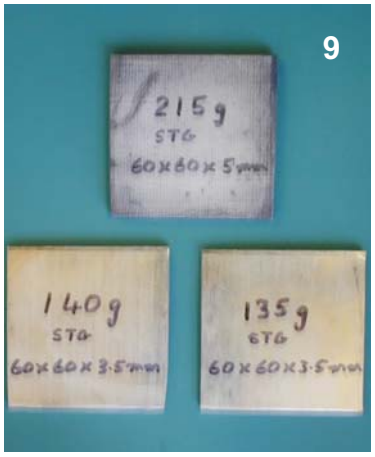

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Workshop equipment

There is an old saying 'give me the tools and I will do the job. This certainly applies to watch case making. I do not have the skills, experience or tools that Martin Matthews has so I have had to adapt my methods around the skills and equipment that I do have. I owe a great debt in this regard to Dr George Daniels whose book *Watchmaking* has been my constant guide not only on case making but also in many other fields.

I have three general-purpose lathes in my workshop. On the left in **Figure 10** is an Emco Compact 5, 12mm lathe with compound slide and screw cutting facilities. I have modified the head-stock to carry Schaublin collets and chucks. I have also adapted an Emco Unimat lathe to act as a vertical mill, which works very well.

On the right in **Figure 10** is a traditional Boley 10mm centre lathe with most of the Boley accessories including compound slide, drilling tail stock, a full range of collets, including step collets and a full range of clockmaker chucks.

Also in the picture is a standard Ryobi five speed 11mm drill press.

In **Figure 11** is a Lorch, Schmidt 6mm lathe with most of the standard watchmaking accessories, which include a compound slide.


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In next month's HJ, Mike explains how to make the case parts and looks at electroplating.