smith & smith

TECH HELP ARCHIVE 2003

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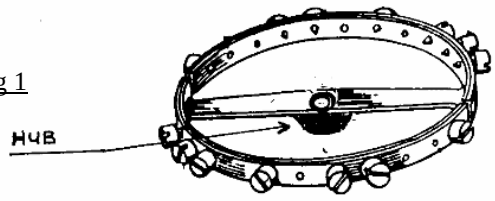
TECH HELP July 03 - Fitting a Waltham 16s balance staff

In spite of the fact this watch has been around for over 100 years, fitting a balance staff seems to be a mystery to many of our customers. The following information will make your next repair much easier.
The construction of the wheel differs from its Swiss equivalent in one important area – the blued steel centre hub is separate from the staff (see fig 1). This staff is a push-in type and has a distinctive shape (see fig 2). Removing and fitting of the staff is simple, just push it out and push it in. The blued hub MUST NOT be removed from the balance wheel, so care must be taken to ensure the hub well supported in the staking tool. Likewise when refitting the staff, ensure the hub is well supported to prevent damage to the balance arm, the system devised by Waltham is very good in that damage to the balance wheel is avoided and poising and truing mostly unnecessary.
The next customer to send me a staff with a hub attached will be sent a framed copy of this article!

Michael

Fig 1



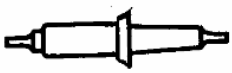
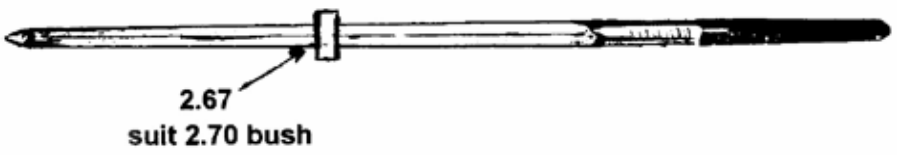


Fig 2

Hints and Helps - August 03

Major tools are expensive and if not in regular use, may not be economically viable. The clock bushing tool is just one example. Whilst we stress the importance of having the right tool for the job, here is a way to ensure accurate bushing for the minimum outlay.
Most clockmakers use Bergeon or KWM bushes and without the correct tools, reaming holes for the various diameters is a matter of trial and error. To overcome this problem select a number of reamers from your range (or buy new ones). Take a reamer and fit a brass collar onto the reamer about 1cm from where the reamer will cut the correct size hole for the bush intended for the repair. Place the reamer upright in a vice (don't clamp it) and tap the tang forcing the bush further onto the reamer. As you get close to the correct spot, stop and ream out a hole. If the bush falls through you have gone too far and will have to start again. If too small tap the collar a bit further along until the desired result is achieved. You can now open out holes with your eyes closed, you will never make a mistake again!



TECH Help - Tuning gong rods - September03

Tuning gong rods has always been an impossible task for me, my musical capabilities are below zero and things like octaves and the like a complete mystery. However I realized there must be some relationship other than a musical note which determines what sort of note a rod of given length will give.

The information that follows may not be an exact science and I look forward to any additional information which helps me to make it exact but it does work as is and will most certainly get you out of trouble.

Our example will be a simple 4 rod Westminster Chime mantle clock but the method applies to any number of rods of any length.

In our example is the longest rod is 256mm. You can include the thread in the measurement or just the rod, it makes no difference

The next longest is 224 mm which is 87.5% of 256 mm
The third rod is 212 mm which is 94.6% of 224 mm
The shortest rod is 196 mm which is 92.45% of 212 mm

Let us assume the third rod is missing. You know by this formula the third rod is 94.6% the length of the second longest rod, so multiply 224 by 0.946 and what do you get?

My calculator says 211.904 but 1 think you will find 212 mm will give you the desired note.

Another way is to multiply the shortest rod by 1. 14 and this will give the length of the next rod, multiply that by 1.06 for the next rod and multiply that answer by 1. 14 to give you the length of the longest rod.

If all else falls measure every set of rods you get and keep this in your diary, you will find when you do this the formula will prove itself.

TECH Help - Fitting American mainsprings - October03

The American Shelf clock is one of the most common clocks to come into the workshop for overhaul and one of the simplest to repair. However some less experienced repairers, like watchmakers, sometimes have difficulty dealing with the mainspring, particularly if they don't have a mainspring winder. Here are few handy hints to help you.

1. Removing. If the spring is intact bind it loosely with string, wire or whatever you have to hand. (You can buy special clamps available from yours truly for this job) If you use a let down key, move the click spring away from the click, turn the key backwards until the click is out of the ratchet wheel and in a controlled manner let the spring down into the loose wire until all tension is removed from the spring. If you only have a standard key you will have to use the time honored method of letting it down a few ratchet teeth at a time. Disassemble the clock and remove the springs, take them from their securing wire and clean them up, examining them in the process to make sure they are worth replacing. You know where you can buy new ones!

2. Replacing. First fit the mainspring onto the mainwheel, secondly, fit the mainwheel into the plate with the loop end of the spring located over the post, as it was originally. The bulk of the spring just hangs around in a long loop and care must be taken to ensure it does not tangle in the way only American springs can. Next fit the second wheel in its position and put the top plate onto these two wheels, securing them with the pillar nuts. The next step is to secure the second wheel by wiring it to one of the plates or whatever other method you choose to make it immobile. All you have to do now is to wind the mainspring in the normal way until it is slightly smaller than the diameter of the wheel. Bind it and release it in the manner described above. Remove it from the clock and repeat the procedure for the second spring. The spring is always under control eliminating any chance of injury to you or to the clock

TECH Help - PIVOT REPAIR AND POLISHING : PART 1 - November03

To obtain a good action and therefore a good and consistent rate, it is necessary to restore train wheel and where applicable the balance pivots, to an original finish. In the case of American clocks, much better than original - time taken to learn and apply these skills brings about its own reward.

The basic tool is a pivot file and burnisher. They are available in two sizes, known as watch and clock. This implies one is larger than the other but it does not mean exclusive use on one or the other timepiece. There are also two types of each available, one is right hand and the other left hand, again this does not imply a singular method of application. Looking at the end profile you will note the shape FIG 1 or FIG 2. Half the tool is a fine file and half a burnisher. The burnisher is flat steel with a fine grain cut at right angles into the surface - burnishers can be resharpened to restore the finish. You will also notice one edge of both file and burnisher is rounded from the top to about half way down. This is important and its use will be described later. The file and burnisher is most frequently used with a Jacot Drum (FIG3) - either as a lathe accessory or as a complete stand alone tool. The Jacot tool is used with a bow whereas the lathe can be used with a motor or in the case of a 6mm model a bow can also be employed.

A bow will turn the work backward and forwards (which can be an advantage) and a lathe only in one direction. The burnisher must be used to take advantage of the direction of rotation.

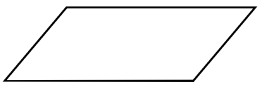


FIG1: right hand

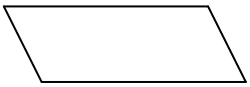


FIG2 : left hand

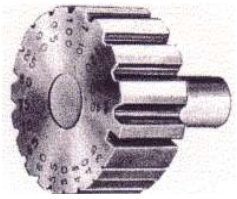


FIG3 : Jacot Drum

Part Two will describe how a file and burnisher should be used to achieve the best results.

TECH HELP - Pivot repairs and polishing Part 2 - December03

Clock pivots are most likely to require restoration, mainly because the damage is more obvious, emphasis must be made however that every pivot is worthy of inspection. A lathe with a reasonable range of collets is essential before even starting to think about clock repairs so therefore it must be assumed that this is already part of your workshop. Pivot restoration can be done with the lathe driven by a motor or in the case of a 6mm lathe, a bow. Some tradespeople are right handed and others left handed so you need to hold the burnisher in that hand. The headstock of your lathe would be on the right hand side if you are left handed. For this exercise we are not using the Jacot tool but simply holding the wheel arbor in a collet leaving the pivot to be polished unsupported. Support is not a requirement for some wheels but in most cases it is essential. We will ignore this fact for the moment to concentrate on the method employed to restore the pivot.

Two trains of thought regarding where the tool should be placed are in vogue. Some say over the top of the pivot as with a Jacot tool or underneath the pivot. My personal preference is under the pivot, my reasoning for this approach will become clear as we progress. As I am left handed the headstock is to the right. I am working underneath the pivot so I would use the burnisher in Fig 1 (last issue). Because the burnisher is a parallelogram in shape you can see the side closest to the arbor slopes away from the shoulder allowing the burnisher to work right up in to the corner of the pivot, (Fig 4). If you were left handed and working from above the pivot you would use the burnisher shown in Fig 2 (last issue).

FIG 4
Right hand burnisher being used underneath the pivot to ensure sharp corners. Lathe headstock is on the right hand side.