

smith & smith

TECH HELP ARCHIVE 2006

Contents;

January 06 - **Fitting a new platform escapement**
February 06 - **Fitting a platform Escapement Part 2**
March 06 - **Fitting a platform Escapement Part 3**
April 06 - **Fitting a platform Escapement Part 4**
May 06 - **Fitting a platform Escapement Part 5**
June 06 - **Fitting a platform Escapement Part 6**
July 06 - **Fitting a platform Escapement Part 7**
August 06 -
September 06 -
October 06 - **Clock Dial Resilvering**
November 06 - **Clock Dial Resilvering part 2**
December 06 - **Clock Dial Resilvering part 3**

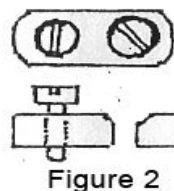
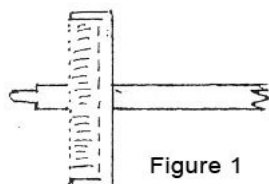
TECH HELP - Fitting a new platform escapement

Fitting a new platform escapement is not too difficult and most tradesmen have undertaken this task at least once. Methods used are many and varied and most obviously suffice and the job gets done. Because platforms are expensive unless care is taken when fitting damage can be done which can impair the proper functioning of the unit, or, as sometimes happens, destroyed completely.

The movement selected is a standard French Carriage Clock, the platform fits on top and is to replace the original jewelled lever platform.

A "medium" platform has been selected as a suitable replacement for this movement, it is fitted with an 8 leaf escape wheel pinion which has a .25 module. Because the screws securing the platform are randomly spaced and because the platform is not supplied "predrilled" it is necessary not only to drill holes but to drill accurately.

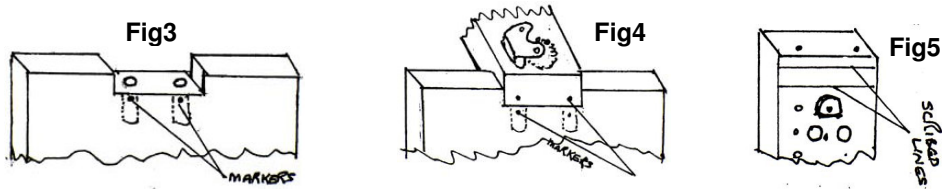
To do this first strip the movement completely. Refit the contrate wheel (**fig 1**). Reassemble the plates and fit the tapered pins. Make sure the plate holding the screw controlling the contrate wheel endfloat (**fig 2**) is in place and the endfloat correctly adjusted.



TECH HELP - Fitting a platform Escapement Part 2

Completely dismantle the platform and refit the escape wheel. Place dismantled parts in a clean and secure place for refitting later. Next, take both movement plates and immediately below the platform securing screw-holes make a small indentation or other such mark to indicate the position of the screws otherwise hidden when the platform is in place. (**fig 3**) First we need to work on the mainplate (dial side), so place the platform in position on top of the previously assembled plates. Hold it down gently and transfer the position of the screws from the plate to the platform (**fig 4**), if the platform overhangs the marks can be placed under the platform. Next, slowly move the platform forward until the escape wheel pinion meshes with the contrate wheel. Press down firmly on the platform to prevent it from moving and draw the forefinger of the other hand across the arbor of the contrate wheel. This will cause it to turn quite quickly which will in turn make the escape wheel rotate. If the meshing of the wheel and pinion is correct the two will turn with almost no sound but if there is an obvious noise the platform will have to be moved either closer or further away until the optimum distance is achieved. **AT NO TIME MUST EXCESSIVE PRESSURE BE APPLIED.** It is important that the platform does not move out of position, a line is then scribed on the underside of the platform to indicate the position of the plate. This must be done from between the plates and will indicate the position of the platform where it touches the plate. If the platform overhangs a line can also be scribed on the outside, however for this exercise we are expecting the platform to be flush with the mainplate. Remove the platform and it should look like

this (fig 5).



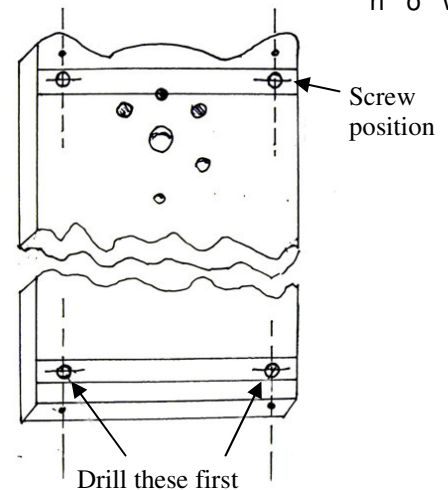
Next Month- Marking Out

TECH HELP - Fitting a platform Escapement Part 3

Scribe from the markers across the lines drawn on the underside of the platform. Dissect that line with a small cross line. (Fig 6.) Centre-pop where the lines cross and drill holes slightly larger than the diameter of the screws. Place the platform in position and line up the screw-holes by peering through the holes drilled into the platform. Hold the platform firmly and turn the contrate wheel.

If the marking out was performed correctly the escape wheel will rotate freely. If it is a bit tight don't worry too much at this stage but if it is obviously too tight the screw-holes must be enlarged until the desired freedom of movement is reached. This is not the desired method but it serves to emphasise how important it is to mark out properly in the first place. **Under no circumstances should the platform be screwed into place if it is too tight** Next screw the plat-

form through the two holes just drilled and tighten firmly into place. You must scribe the front of the platform in exactly the same way as the back. Remove and mark out as in fig 6, drill two holes and remount the platform from the back. The reason for this is these have already been correctly aligned. If you peer through the two front holes you should see the screw-holes directly below and correctly aligned. If they are not the holes will need to be adjusted until the screws fit freely into the screw-holes below. It may be necessary to relieve all 4 screw-holes to ensure perfect wheel and pinion meshing.



Next month: More problems to resolve

TECH HELP - Fitting a platform Escapement Part 4

It seems most clocks coming into the workshop for replacement platforms are Carriage Clocks and a fair percentage are fitted with CYLINDER escapement platforms.

Although specialist repairers can resurrect even severely damaged cylinder platforms in order to retain the integrity of the clock, fitting a new lever platform is in most cases an appropriate and acceptable practise.

There are important differences between the cylinder and lever escapements and these must be clearly understood before any attempt is made to replace an original cylinder with a lever platform. A lever platform has 3 components, a Balance wheel, a Pallet (lever) and an Escape wheel. (Fig 7) A cylinder escapement has only 2, a Balance wheel and an escape wheel. (Fig 8) This brings the escape wheel and pinion close to the centre of the platform and the contrate wheel is also close to the centre rather than near the front plate as you would expect to find in a clock fitted with a lever escapement. (Fig 9A/B)

To complicate things even more the train speed has to be calculated to determine if a new platform can be fitted without more work needing to be done. Count the train and include the new platform in the calculation bearing in mind the standard count is 18000 beats per minute. If you are not sure how to calculate the train speed I suggest you purchase a copy of **Practical Clock Repairing** by Donald de Carl. Some clocks fitted with a cylinder escapement have a 14400 train and a new platform will fit, it may even run but if the train speed is wrong the clock will not keep time.

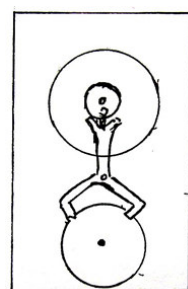


Fig7

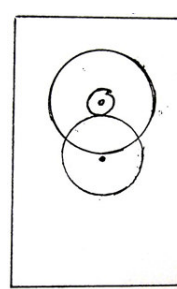


Fig8

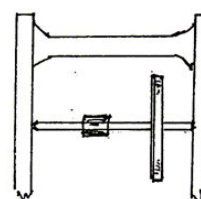


Fig9a

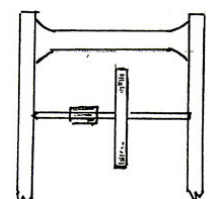


Fig9b

TECH HELP - Fitting a platform Escapement Part 5

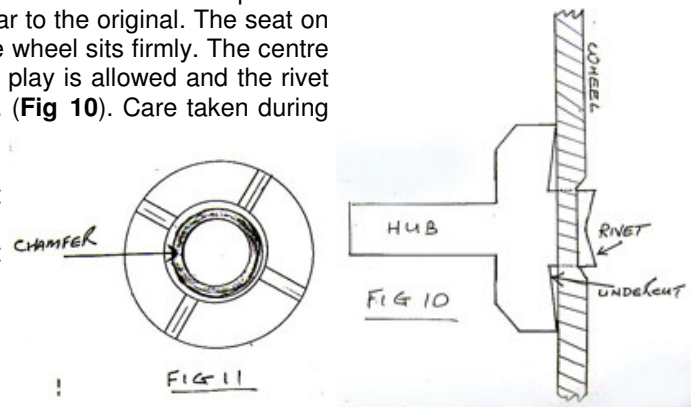
When replacing a cylinder escapement with a lever escapement the following observations need to be made. Firstly, as mentioned previously, calculate the train speed. Failure to do this may result in an expensive platform being modified to suit your particular repair and then finding the train speed is wrong and the customer unwilling to pay what could be a large increase in the cost of the repair to overcome this predicament.

Secondly, select the correct sized platform. Imagine you have purchased a "Medium" platform for the job at hand, the dimensions are similar and physically it will fit "as is" or with little modification. After placing it in position you will become aware the teeth of the platform are nowhere near the escape wheel pinion and this is the problem we have to overcome. The only adjustment that can be done is to move the contrate wheel to bring it into mesh. This is not an easy task as the wheel is soldered to the arbor, the arbor is almost always tapered and the hole in the hub of the wheel larger than the diameter of the arbor at its largest diameter. Because of the taper, resoldering is done at an even smaller part of the arbor and the wheel will almost certainly not run true.

Technically it can be done by setting the wheel between centres, melting the solder and spinning the lathe at high speed. This creates centrifugal force which forces the solder to be spread evenly before it hardens and the wheel will be dead true. The other method is to remount the contrate wheel on a new hub. This of course means you need a lathe and an idea of how to go about preparing and making a new hub which will run true. Failure to bring a contrate wheel to truth will have dire consequences when you think the repair is finished. This will be the preferred method for most repairers and will be detailed **next month**.

TECH HELP - Fitting a platform Escapement Part 6

Remove the contrate wheel and hub by melting the solder. Apply just enough heat to melt the solder, too much heat will draw the temper in both the wheel and pinion. Remove the contrate wheel from the hub by turning back the rivet until the wheel falls away. Use a step chuck or something similar to hold the contrate wheel in the lathe to make sure the mounting hole is dead centre. It is a good idea to use a boring tool and take a skim from the hole to prove it is running true. How important it is to have that wheel running true cannot be overstated. Next take a piece of brass rod of suitable diameter and turn a hub something similar to the original. The seat on which the wheel sits can be undercut slightly to make sure the wheel sits firmly. The centre of the hub must be an exact fit to the mounting hole, no side play is allowed and the rivet section just long enough to stand slightly proud of the wheel. (Fig 10). Care taken during these operations will save a lot of heartache later. It is a good idea to slightly recess the mounting hole to keep the rivet flush with the wheel, a large round engraving burr is excellent for this job. (Fig 11) Drill a hole through the centre of the hub, this can either be a friction fit hole or just big enough to fit over the arbour for soldering or using Lock-tite. There must not be any wobble, if there is the wheel will not run true.



Next month-Fitting the wheel

TECH HELP - Fitting a platform Escapement Part 7

Place the contrate wheel on the seat you have just turned, fit the complete wheel in between the plates and pin them up. Secure the platform taking care the escape wheel does not come under any pressure from the contrate wheel. After making sure the contrate wheel is upright check to see if the meshing is correct. If it is not the following adjustments need to be made. If the contrate wheel is too close the hub can either be pushed down or the seat turned back but if it too far away the hub will need to be pushed up the arbor until the correct depthing is achieved. This is one of the advantages of a friction fit hub rather than one which has been soldered in place.

Although it is rare, it can happen that the contrate wheel when moved forward (particularly when changing from cylinder to lever) can get caught up on the minute wheel screw. (Fig 11) If this happens it may be just a case of reducing the head of the screw but if this is not enough you must reduce the height of the minute wheel pinion reduce the length of the minute wheel screw and it may be necessary to cut the thread back to lower the head of the screw sufficiently to clear the contrate wheel. (Fig12) I hope most of the problems you have experienced will have been resolved through this series of articles. I know there are many other issues I could address but to do so would make what is really a simple job seem overly complicated and this is clearly not in my best interests. I would not sell as many Escapements.

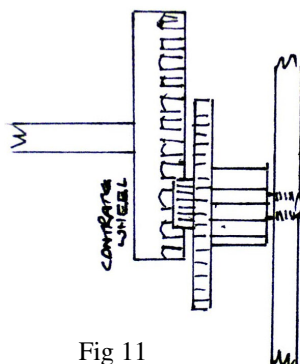


Fig 11

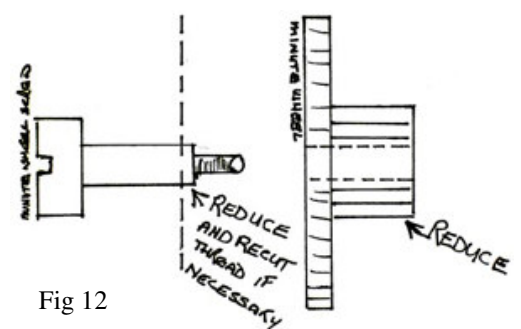


Fig 12

Tech Help – Clock Dial Resilvering

Because of the availability of modern silvering compounds resilvering is now affordable, quick and safe. Unlike yesterday when such compounds were made up from some pretty nasty things. The need to resilver is not something you have to think about, if the silver finish is damaged, scratched perhaps or tarnished or completely missing it is obvious something needs to be done. There are a number of processes one has to go through to get to the finished product and they are quite tedious but the end result will make it all worthwhile. My first suggestion is for to take some time out and find clocks which have dials with original finish or that may have been refinished. Take note of the grain on the dial surface, whether it is a circular pattern, fine or coarse or anything else you may think noteworthy. By doing this you will have an idea what sort of finish you can get and by experimentation work out how it can be achieved.

The first items on your shopping list will be the silvering compound itself RE285 and black dial wax RE376 without these you cannot get started. Do not start by trying to resilver your favourite dial normally resident on the front of your Thomas Tompion or George Graham long cased clock. An old dial or even a piece of brass from the scrap box will do to start with as long as the surface is in a reasonable condition. Next, you need to make sure something is engraved into the surface, this does not have to be complicated, just a depression which can be filled with black wax. You will also need a number of pieces of cardboard to be used as spatulas when the time comes to distribute the wax. There will be other items required but the extent of these will vary depending on what you are starting with.



Next month: Getting Started.

Tech Help – Clock Dial Resilvering Part 2

To prevent any mishaps you can start your resilvering career by using a piece of scrap brass into which you have made a suitable depression to simulate an engraved dial. We will assume it is your intention to grain the surface to make it look original after having determined it was once grained. Lets assume for a moment you do have an actual dial to work on, the first thing to do is to check the surface for damage and determine how much work needs to be done to bring it back to a flat damage free condition. Next check the original wax, it may be in good condition with just a little retouching needed or it may be in very poor condition and a lot missing altogether. Metal polish used over eons tends to work its way under the wax and bit by bit it falls out leaving the engraving filled with remnants of the polish.

Make sure you note the direction of the graining, working the surface can remove all traces of the original finish. A digital camera comes in handy when it comes to having a record of what the dial looked like before you got stuck in. So lets get started. Remove any loose wax but take care when doing this, you do not want to add to damage already there. Lose concentration and a sharp pointed object has travelled several centimetres across the surface. Next take a piece of wet and dry and using it wet gently rub until a matt finish is obvious over the surface. If the dial is in good condition this may be all that you need to do before waxing can commence. At the very least it will show up any surface damage and whether that damage is light or severe and it is now where you have to determine what compromises you are prepared to make when considering the final finish.

Next Month: The hard yards

Tech Help- Clock Dial Resilvering Part 3

If the dial surface is in good condition the final finish will also be good but if the surface is damaged the extent of that damage will determine your next move. If for instance there are a number of light scratches these can be removed using the same fine grit wet and dry you have already been using to highlight the surface blemishes. A gentle wide arc motion should be used to prevent a depression appearing in the area of the scratch as this will show up when the final graining is being done. If it looks like you will have to remove too much material, leave it alone, the final graining will make it virtually invisible. An expert can do miracles by working from the back of the dial but don't do it unless you are using a piece of scrap brass and are experimenting.

Compromises will have to be made if the damage is severe, such damage can be considered part of the ageing process. Removing too much material will damage the dial and push it beyond the point of restoration particularly if it has been worked on a number of times over its lifetime. One of the major problems with old dials is the engraving is too fine (the result of too many refinishes) and the wax will not take so it is important to resolve this before any more work is done. If this is something you cannot do there are a number of good hand engravers who can engrave names in the original style or if it is the numbers or minute track I would expect a commercial engraver can do this for you.

Next Month: Waxing

