

Section 4

The Column Bar Magnet and Base

4. Disassembly- Column & Base

First things first. Remove the power source. Be prepared for anything at this stage. Although a Bulle should be run on 1.5 volts, I've seen everything from 3 to 9 volts and it wouldn't surprise me one day to find one with a mains lead attached !! You never know. Once the power is removed then proceed to the hands and dial. I place the dial in a plastic wallet and put it somewhere safe until the rest of the clock is finished. Likewise with the hands.



Photo 4/1

As I stated earlier this one had a broken hour hand that will need replacing. Disconnect the positive (red) wire connected to the movement. This is normally on the right hand side. In this clock it has been connected direct to the pendulum and as I do not intend to put it back when finished, I just cut it in two. Whoever connected this one to the contact pin on the pendulum did not understand the Bulle fork and contact pin mechanism in switching the coil on and off. It may not of course be red, as can be seen in **photo 4/3**

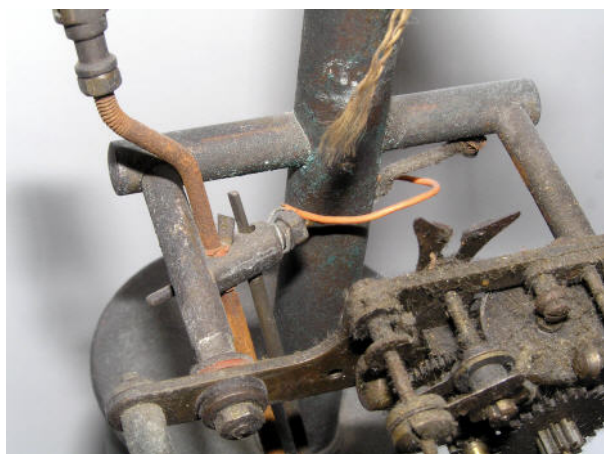


Photo 4/2

The wiring could have been changed over the years. We need to disconnect the Isochron spring next. One end is attached to the pendulum via a bracket and 'T' pin and likewise to the back of the movement. On this clock it is only connected to the pendulum which you can just about see in **photo 2/6**. For clarity I include a **photo 4/3** of a restored clock here to show it's normal position.

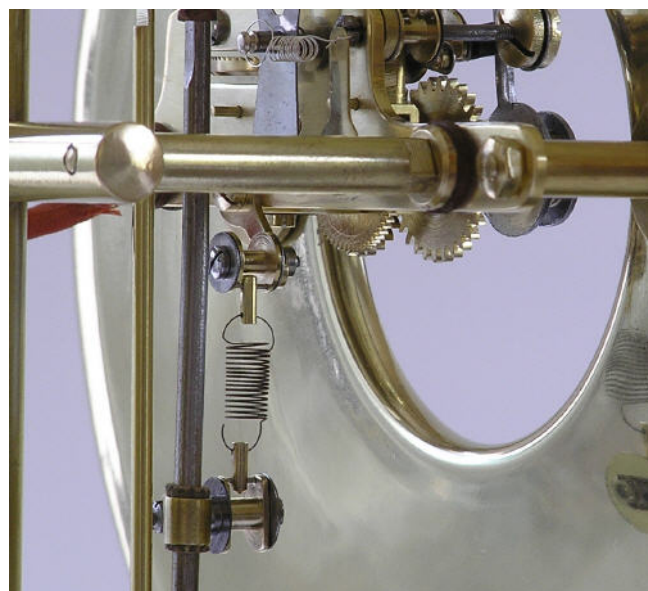


Photo 4/3

You'll need a little patience with this procedure as the spring needs to be unhooked from the small 'T' piece. In this photo you can see that the ends of the spring are semi circular and will easily pull out from the 'T' piece if it is turned anti clockwise first. Be careful not to overstretch it (the spring not you. Although that could be disastrous too). The spring when free should look like **photo 2/9**. Two pairs of tweezers are useful here. Now we should be clear to remove the movement sub assembly.



Photo 4/4

Use the nut spinner and undo the nuts holding the movement to the frame. There should be a thick brass

washer and a fibre insulating washer behind the nut. Sometimes they can be so dirty and caked that they may come off in one piece. Remove the movement. Behind the frame is another fibre washer and brass washer.



Photo 4/5

This inner fibre washer is slightly different in that it has a protruding collar (red in **photo 4/5**) that normally engages completely in the movement frame just removed. It therefore electrically isolates the movement sub assembly from the rest of the frame. I show the parts of the nut and washer assembly in **photo 4/5**.

Put the movement to one side for now (in a wallet of course). We need to get the pendulum disconnected. Again this clock is different in that the suspension and associated brass ware are missing So I show them from another clock in **photo 4/6**.

Place a folded piece of paper under the pendulum first so that the rating nut does not damage the wooden surface. It's probably easier to remove the top nuts and studding from the clock frame first. The other end can wait till the pendulum is free.

This clock is an older version and only has a loop of wire connected to the frame via the same nut and stud that holds the top of the suspension to the frame so once the nut is undone the wire should be free. There are also two blued steel screws on opposite sides of the frame column. Remove these also.



Photo 4/6

Their job is to allow adjustment to be made to the angle of the suspension when setting the pendulum up. Now we turn our attention to the pendulum bob and the curved magnet at the base.



Photo 4/7

Photo 4/8

The magnet is held at each end by two brass brackets (**photo 4/7**). Remove the long screws and release the magnet. Watch out for the two shaped spacers that may fall when the screws are removed. The screws have no nuts. Instead they pass through a clearance hole in the front pillar and screw into a thread on the rear pillar (**photo 4/12**).

Remove one bracket and then slide the pendulum clear of the bar magnet before releasing the other bracket. Be careful not to allow the pendulum rating nut scratch the wood. Place the pendulum carefully to one side.



Photo 4/9



Photo 4/10

Once the brackets are removed and the magnet is clear the pillars each side can be pulled out. They are not screwed in. The best way to remove them is to pass a small bar or screwdriver (**photo 4/10** blade through the screw holes and twist while pulling. Note the positioning of the spacers in **photo 4/9**.



Photo 4/11



Photo 4/12

They have the widest part against the magnet bracket, the thinnest against the pillars. There are similar washers under the pillars. Don't confuse the two types. Keep them separate. The front and rear pillars are shown in **photo 4/12**. The rear pillar is threaded.



Photo 4/13

At this point we should be left with the column and base as in **Photo 4/15**. The two movement supports can now be unscrewed. Use the small spanners for this as in **photo 4/14**. There are two squares provided for the purpose at the ends of the pillars. Next we remove

the three or four brass wood screws holding the column to the base. Use a long handled screwdriver for this as the screws are too close to the column to get a good grip with a shorter one. It may slip and gouge the wood or damage the screw slot. We should now be in the position shown in **photo 4/15**.



Photo 4/14

The final part of this first stage of disassembly is to remove the steel door on the underside of the base. It is attached by a simple steel wood screw. In some cases the screw may be badly rusted and refuse to turn.



Photo 4/15

Be careful you do not shear it off. Also remove the brass third foot which is just a large knurled screw. (photo 4/19)

We shall continue with the pendulum and movement a bit later. But we can start the cleaning process on the column and base.



Photo 4/16

So after this stage we should end up with four major elements besides the dial we have put to one side. The movement, pendulum, column and base.



Photo 4/18



Photo 4/19

Cleaning Solutions.

Besides cleaning, the column needs to have any battery acid neutralised and cleaned off. You can use abrasive for as long as you want on battery corrosion, but unless you can get into every little pit mark it will still continue eating away the brass until it sees daylight on the other side. The best way to fight it is with a two pronged solution attack. First use something like Horolene which is an Ammoniated water based cleaner. Be very careful how you handle this stuff especially in enclosed situations. Always follow the manufacturers instructions carefully. The problem with the column is that it's an odd shape to fit into a container using the minimum of cleaner. I have tried all sorts of container over the years. Those that are big enough require large amounts of the cleaner to be used. This is wasteful. It also needs to have a lid

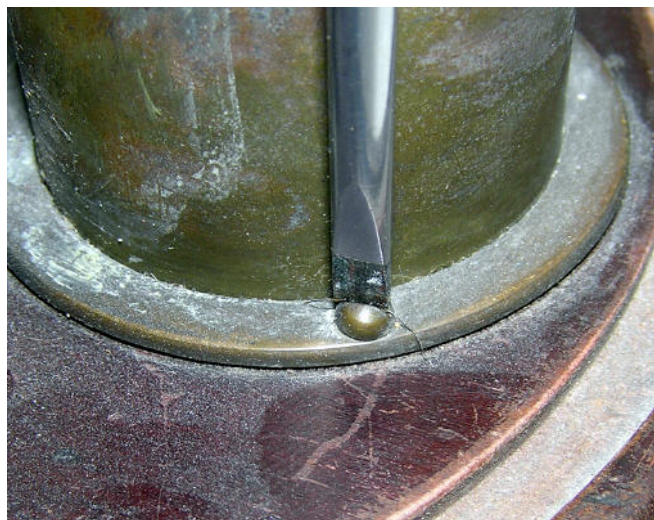


Photo 4/17

because the fumes are very unpleasant and not recommended for deep breathing exercises or your general well being. I have found the ideal container in the form of a Stainless steel Spaghetti storage jar with a clear Perspex top. Mind you, as it wasn't designed for the purpose (surprise) I had to weld around the base to seal it from dripping. But it works an absolute treat. (photo 4.20).



Photo 4/20

The column can be seen in it's un cleaned state with labels still attached. After leaving the column in the solution for three hours, checking it occasionally and brushing any sludge off with a toothbrush, we end up with something a little bit brighter in **photo 4/21**. It's a hell of a lot better but still has battery acid in the column. The best way to get rid of this is "White Vinegar". I have used this successfully on many clocks. It eats away the acid no matter where it may hide. But you need to make sure the whole column is immersed. I need about two litres to fully submerge the column in the Spaghetti container. I leave it for up to 5 hours depending on the degree of corrosion. In this case the results can be compared between **photo 2/4** and **photo 4/22** I have dried the column and brushed away and residue. It may not be a good photo but you should be able to see the corrosion has gone although it has left tell tale marks on the outside. Most

of this will polish out but there may be some marks left when we've finished.



Photo 4/21



Photo 4/22

(Since finishing this clock at the suggestion of a number of people, I have tried using Bicarbonate of Soda at six parts water to one part Soda. This seems to have worked just as well and is the obvious choice being an alkali).

At this point the suspension arm, that protrudes from the top of the column, was shown to be loose and was only held together with dirt and consequently

parted company with the column (**photo 4/23, 4/24 & 4/25**). This was cleaned, the old solder removed and then soldered back in place. We now need to correct the movement support arm from listing to starboard. The original pin was made from 1.5mm mild steel whereas this replacement is brass and slightly smaller. This is the cause of the droop. It is too weak and has worked loose.



Photo 4/23

I removed the pin by placing the stem over a hard steel stake and punching out with a punch slightly smaller than the pin. The stem with arm removed is shown in **photo 4/25**.

These stakes are useful tools and have lots of holes from about 1mm to 6mm and are perfect for the job (**photo 4/26**). The photo shows the stake and a clock pin that could be used. The arm should then be easily slid out.

If you haven't got a lathe to make a new pin then use a large clock pin obtained in boxes of about 50 from a material supplier. They can be bought in mixed sizes or 50 of one size. Choose one that will fit tight in the stem hole but will still protrude from both ends. A pin with a slight taper should be used rather than a hard taper.



Photo 4/24

Clean up the arm and replace. Tap the pin through and then place on the stake with the pin in the closest fitting hole. Keep tapping until the arm will not twist. Tap firmly home.



Photo 4/25

Cut the ends of the pin leaving about 1mm to round over. Place the stem back over the stake but this time on the hard surface and not a hole.

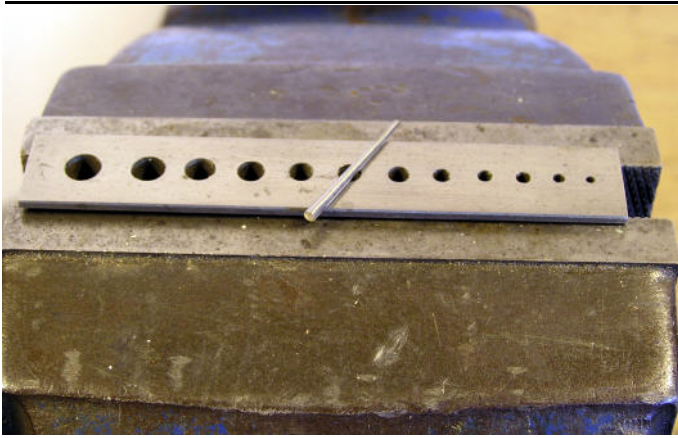


Photo 4/26

Again tap quite hard too make the pin swell out but not hard enough to damage the stem. If your not sure about this then practice on some old brass first. Use the round polished end of the hammer to round over the pin and form a dome (**photo 4/27**). I know it's easier for me to write this than it is for you to do it but once you've practiced a few it is quite simple.



Photo 4/27

The tricky bit is leaving enough of the pin protruding to form the domed head. Too much and it's an unsightly lump. Too little and it won't hold. Remember also that they weren't perfect when they were new. **Photo 4/28** shows the replaced arm from the back.



Photo 4/28

The arm is then checked to be tightly riveted and that it will hold the movement and dial at 90 degrees to the stem. For comparison I screwed back one of the arms to check it is truly horizontal. Compare **photo 4/29** and **photo 2/6**. You should see a marked improvement.

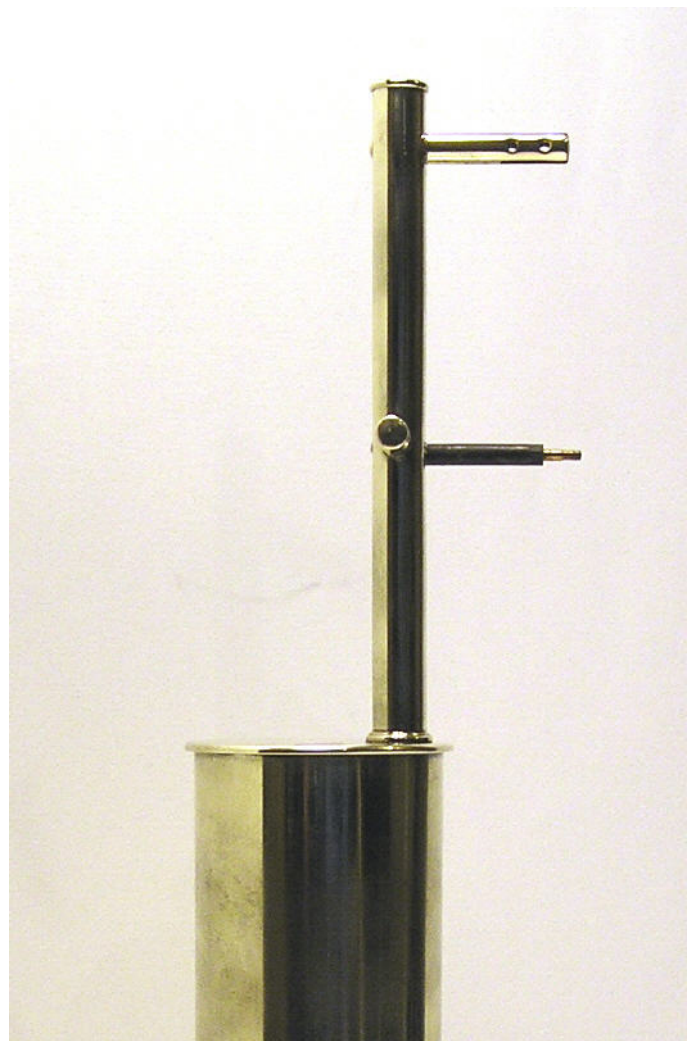


Photo 4/29

The whole of the column can now be polished. I use a combination of elbow grease and a buffing wheel. The wheel is great for the larger items but you need to be very, very careful. It has a tendency to grab your work and throw it around the workshop. Destroying your hard work is bad enough but it can destroy your sight if you're not careful. So please make sure you are fully conversant with the machine and the manufacturers instructions before using. If you are using natures grease then try 0000 grade wire wool first if the parts are very dull. Follow with a good paste chrome cleaner and cloth. **Photo 4/29** was taken after the first polishing session.

There are still marks in the large part of the tube and they will take a lot of work to remove. It may not be possible to erase them entirely.

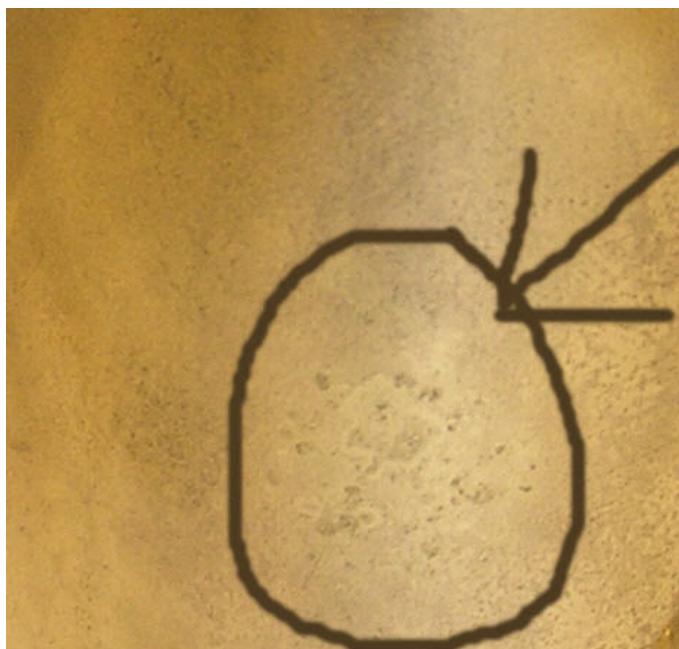


Photo 4/30

The large acid burn on the inside has left a mark on the outside but it is not much more noticeable than the rest of the marks (**photo 4/30** before polishing). They will still show when the column has it's final polish but to try and remove them will result in thinner walls and bigger holes.

Photo 4/31 shows the column after one last polish. There are still marks left in the brass but these are quite deep like a crazy paving and will not come out unless we remove lots more metal. The tube is too thin to try much more so I've decided to leave it as it is. It looks pretty good and, to me, is very acceptable considering what we started with. Finally apply a coat of lacquer.



Photo 4/31

Bar Magnet.

We can now leave the column and look at the bar magnet. This was quite rusty (**photo 4/8**) and needed to be blacked up again. Fortunately this is an easy task. I use Fire grate black which leaves a nice lustre without the gaudy brightness of paint. Of course, you can use spray paint if you wish but my experience is that you tend to manipulate the bar magnet a lot when rebuilding the clock, especially with the brass clamps that hold it to the base. These may be slid on and off quite a few times whilst testing and it will tend to scratch and peel the surface.



Photo 4/32

The rust was cleaned away with a wire brush and 0000 grade wire wool. I then applied two coats of black The result can be seen in **photo 4/32**

The Base.

The base has been scratched by the pendulum bob, had a few other gouges and was generally tired. The owner of this clock wanted to have some input into the restoration and so decided to repair and polish the base himself.

The first job was to remove all the old finish and repair the scratches. Some areas had become quite bleached of colour and he needed to remove all the polish so that any stain applied would 'take' consistently over the entire surface. After a gentle rub down (H'mm.... I think he meant the base) with 0000 gauge wire wool the polishing process was commenced. He used Button polish as his preferred colour. His method is to apply 2 to 4 coats in a day then gently rub down with 0000 grade wire wool on commencement of the next days polish. In this way he takes about a week to apply 20+ coats.



Photo 4/34



Photo 4/35



Photo 4/33

The final finish was obtained by using the wire wool impregnated with a good clear Beeswax polish after the last coat has been left to harden for a couple of days. The result can be seen in **photo 4/36**.

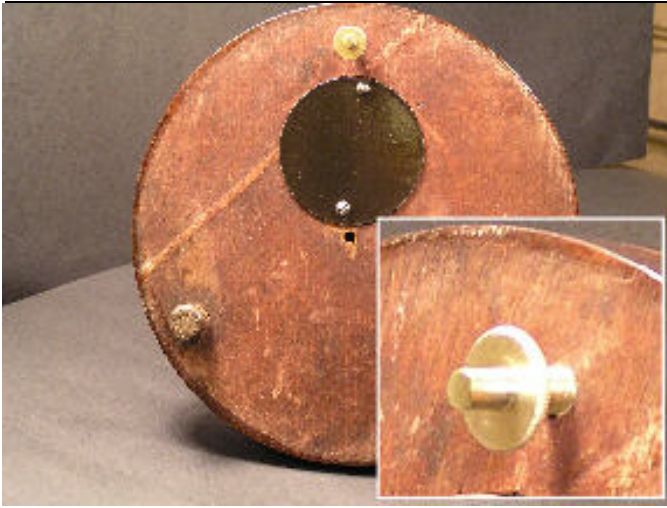
The bottom cover (**photo 4/35**) was treated at the same time. All rust was removed with a wire brush and treated with a rust cure.



Photo 4/36

The metal was then primed and finally give a few coats of Black spray paint. The screw was buffed with a revolving wire brush.

The third leveling foot was cleaned in the usual way with Horolene then given a rub over (including the thread) with a soft wire brush mounted in a flexible shaft on a Dremel. The end result can be seen in **photo 4/37** and insert.

**Photo 4/37**

The three Brass wood screws that hold the column to the base have been cleaned, polished and given a coat of lacquer. When dry the column was reunited with the base ready for the pendulum (**photo 4/38**).

The base has a slot that runs around the top that accepts the glass dome. You can either leave this as is or fill it with a baize. There are original clocks around with it still intact and are predominantly green. The other item yet to be added is the 1.0mm decorative brass wire that runs in the groove about a centimetre up from the bottom of the base.

It starts and terminates in a hole at the back of the base. On later clocks they are usually omitted. This one has the hole and a small piece of wire still left in it. We'll leave this to one of the last jobs.

**Photo 4/38**