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Eureka Clock Serial Number 9247

Restoration of Eureka Clock Serial Number 9247

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Photos by kind permission of the owner.

This tall movement Eureka in an oak case I saved till last as I thought it would be the most challenging clock to restore. As it turns out, it was! You will see why shortly. But first impressions are that it is a complete movement with a nice clean ceramic dial and two bearing balance wheel. Nothing out of the ordinary so far.

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This photo of the dial should have given the game away but I didn't spot it. Can you see a problem?

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As I said, it is not obvious from the front but is pretty blatant from the rear! A quartz movement has been inserted but using the original hands which had the collets filed to fit the movement. But there was worse to come!

Meanwhile it seems that the balance wheel and contacts were untouched.

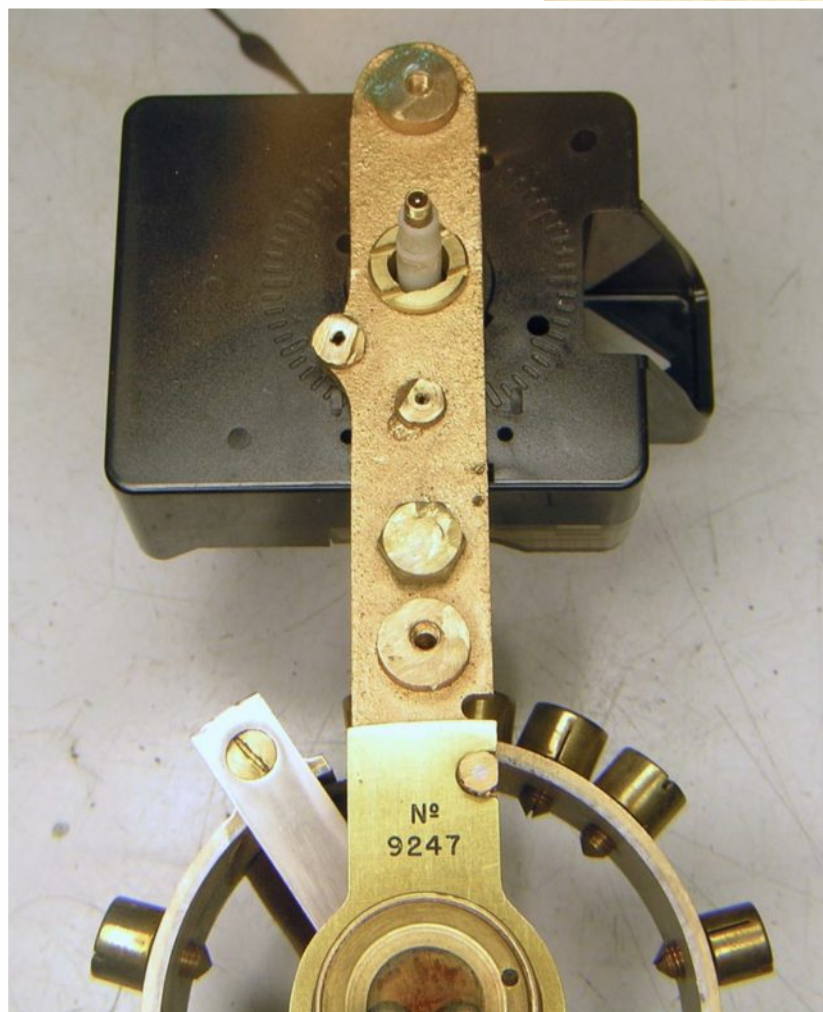
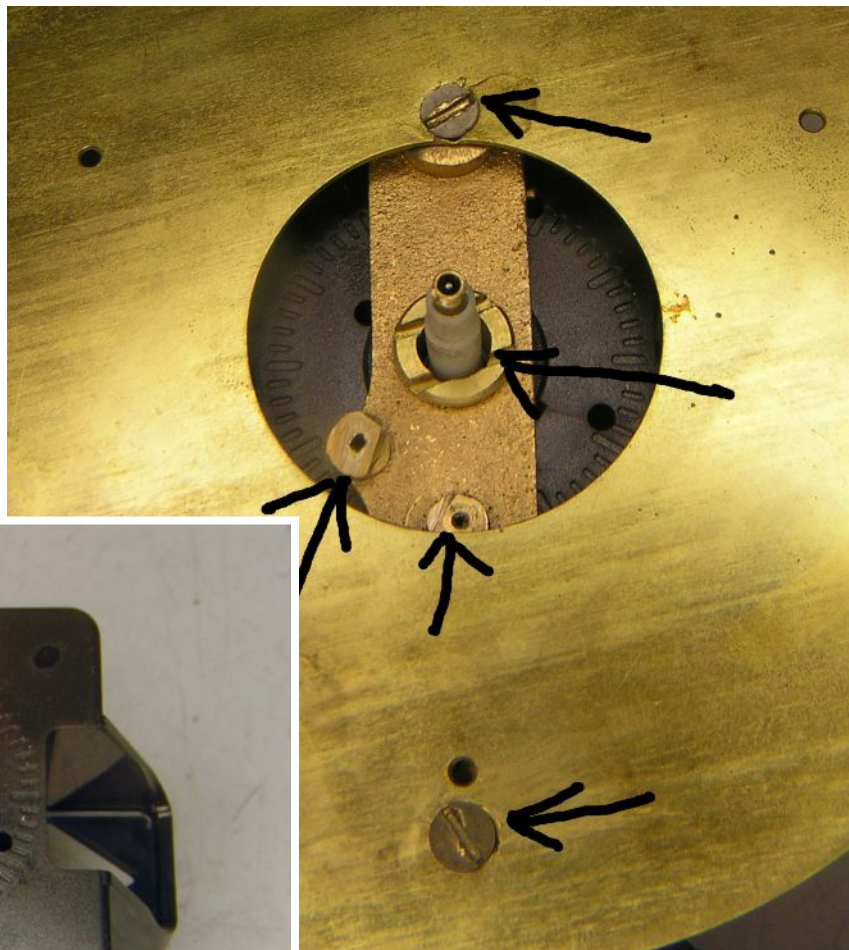
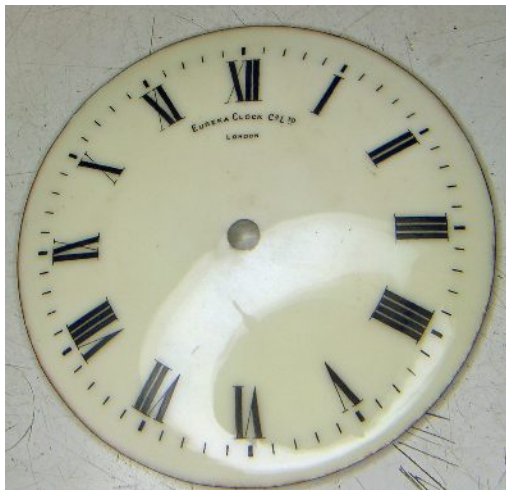
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With the dial removed we can start to see the extent of the problem. Note the arrows that show that whoever fitted the quartz movement decided to completely destroy not only the wheelwork which is completely missing, but also file down all the pillars and collars that held the dial pan and wheels.

The dial itself escaped any mishandling.

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The plate on the left is an original which is untouched. The plate on the right is our modified plate from the inside. Note the large hexagonal hole (probably done with a broach) which held the quartz movement via the centre boss. This will have to be made round before trying to fit bushes. Note also the ground down pillars and hardened steel arbour of the impulse arm which is completely missing along with the wheel work.

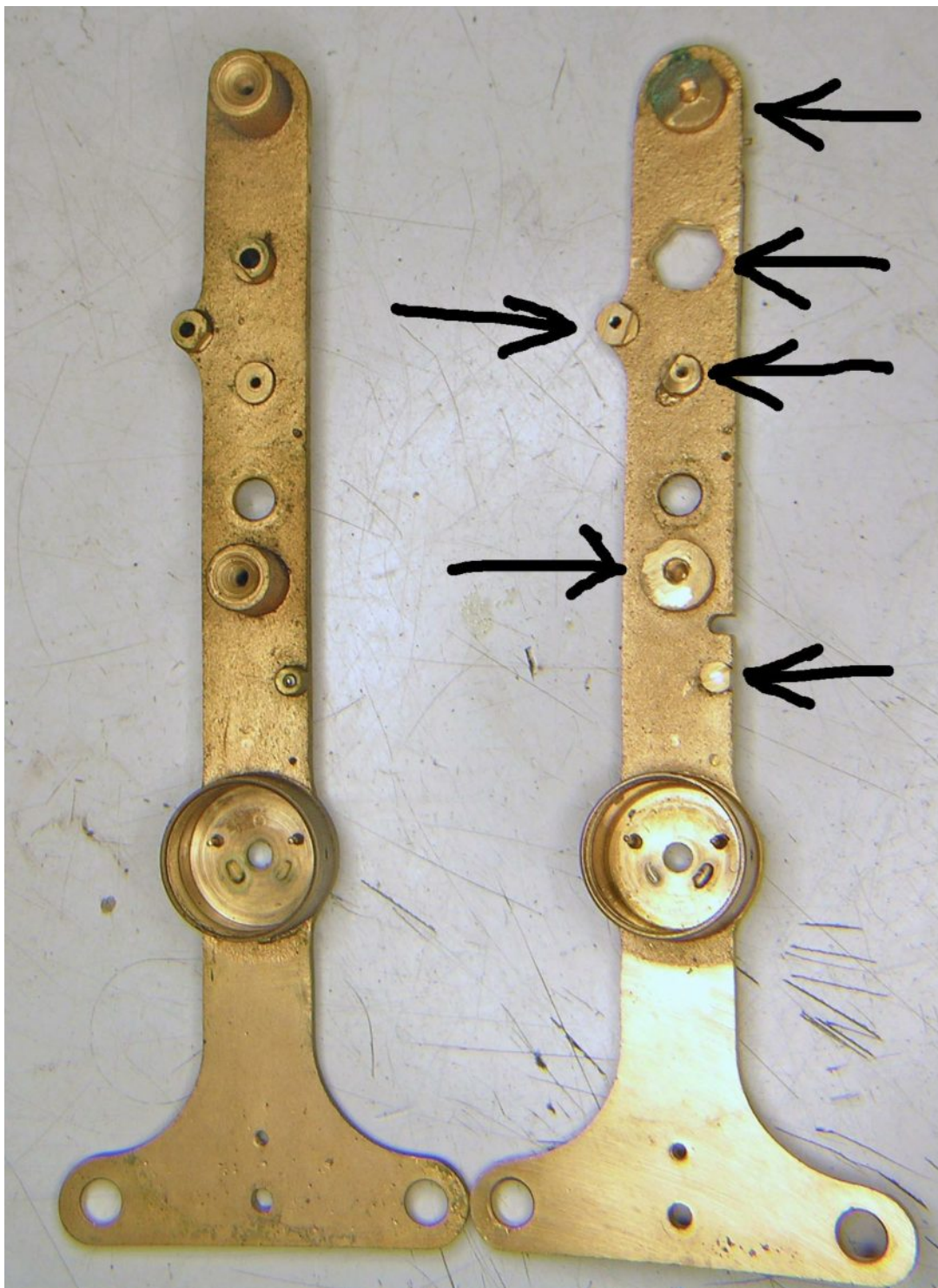
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This photo again shows an original plate on the left and outside of our modified plate. All the points arrowed have been ground down. Lots of work to do. My plan of action was to straighten and level up the ground down pillars and round off the large hole. Over to the milling machine.

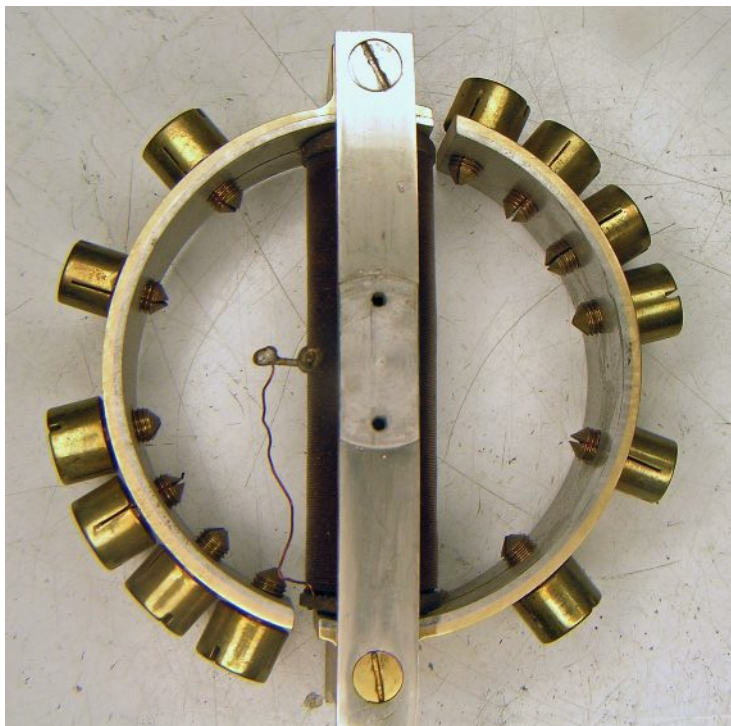
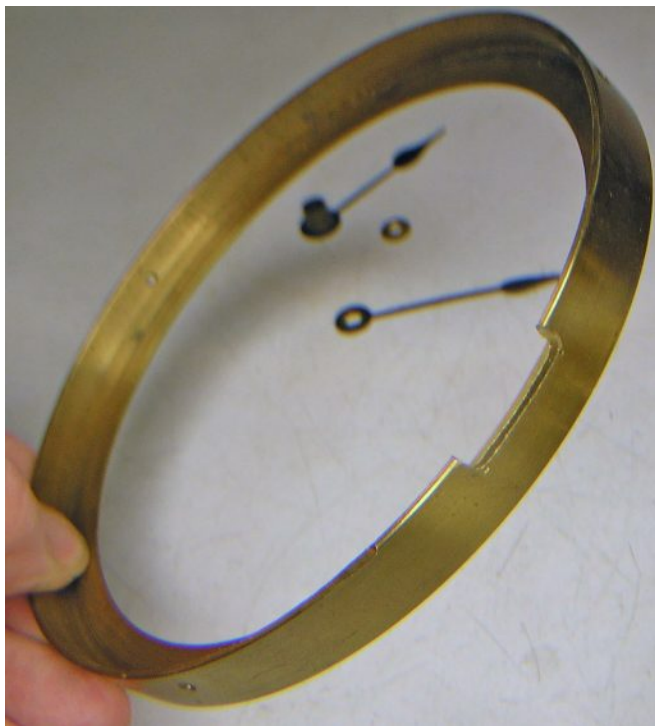
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Meanwhile it seems the bezel didn't escape the onslaught of the file or grinder with a rectangle taken out of the rim. Luckily this is below the dial and to the rear so it won't be seen at all.

The balance wheel was in good untouched condition with a resistance of 20 Ohms.



This photo shows the plate after rounding out the holes and levelling off the pillars. I decided that round inserts would have to be soldered in place and the wheels replanted somehow. Remember that Eureka wheels are planted in one plate only and therefore the pivots cannot easily be broached to fit due to the depth of the pillar to hold them. Unlike mechanical clocks which have two narrow plates.

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These photos show the inserts being fitted before soldering. They protrude for different lengths on both sides of the plates. A nightmare to work out. Not only have the wheels got to be depthed horizontally to ensure accurate meshing, but they also have to be depthed vertically to ensure correct engagement with the next wheels pinion or teeth.

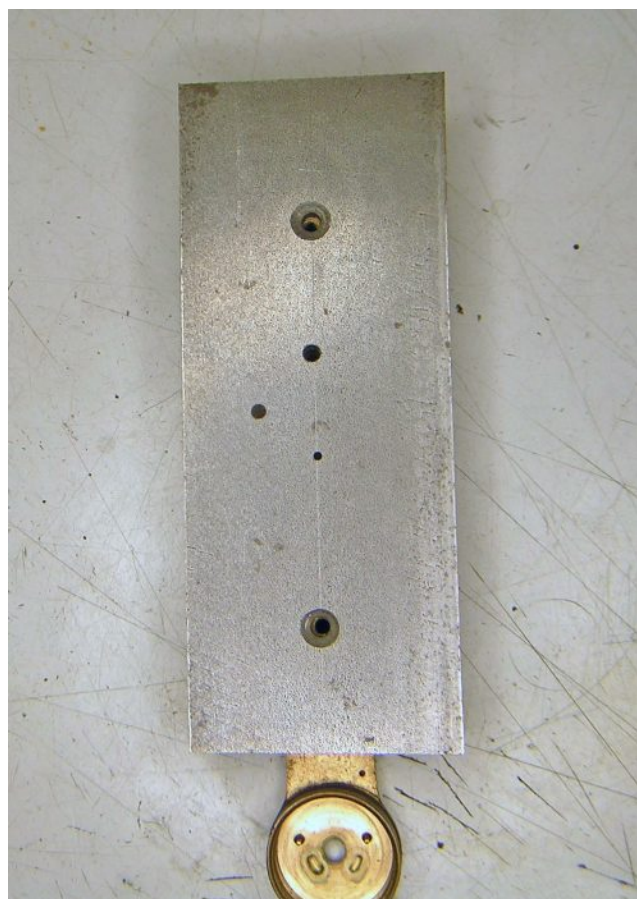
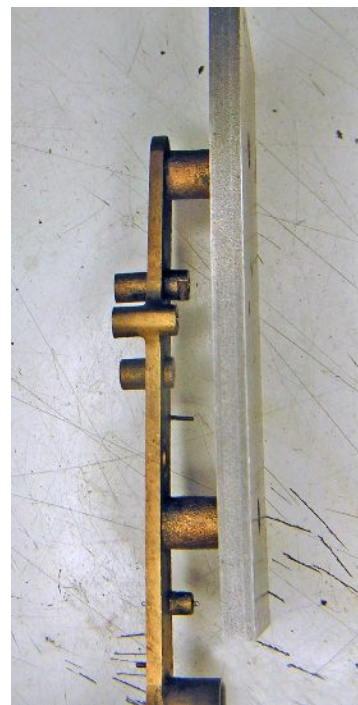
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I decided the only way to plant the wheels was to make a template from a thick piece of steel which would be held by the two pillars that the dial pan is screwed to on the original plate I had. This would then allow me to turn it upside down and drill through the plate to the steel template, thus transferring the wheel layout accurately. Obviously I had to get this as accurately as I could by making transfer drills if I didn't have a drill to fit.

When the template was finished. I then made the two dial pan pillars for the modified plate and threaded them ready to receive the template. It was then just a matter of drilling through the template to the new pillars in the plate. This method also allowed me to ignore the different heights of the pillars, as well as any vertical or horizontal errors in soldering the pillars in place.

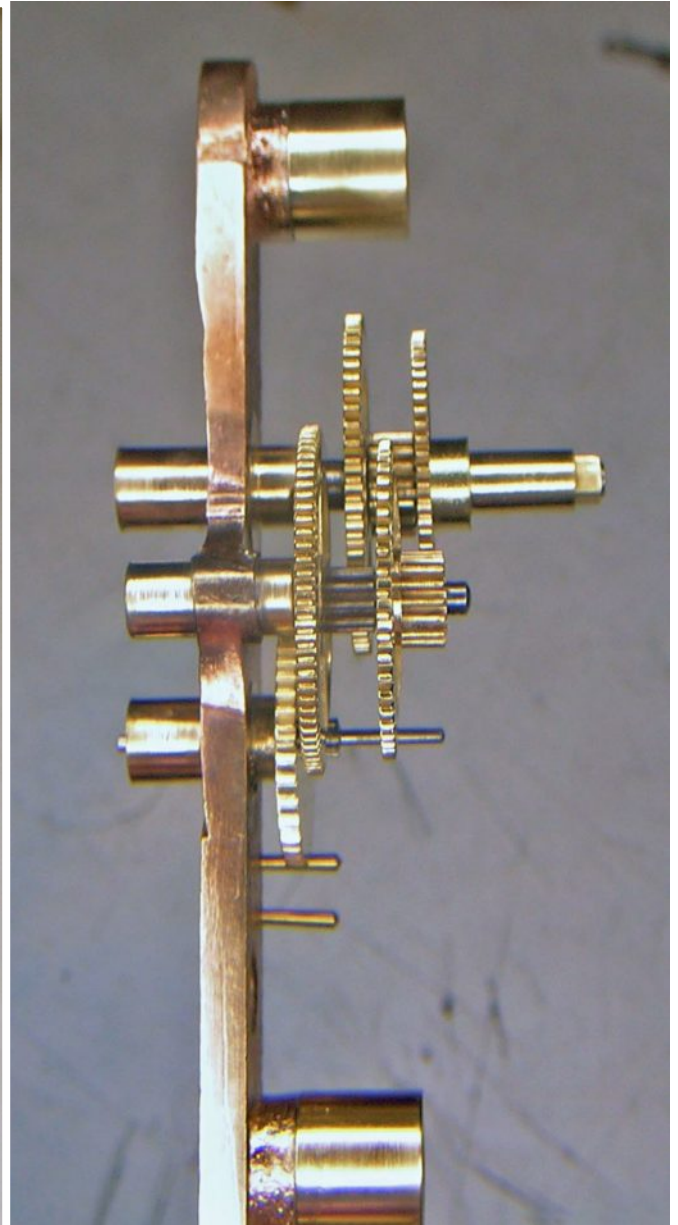
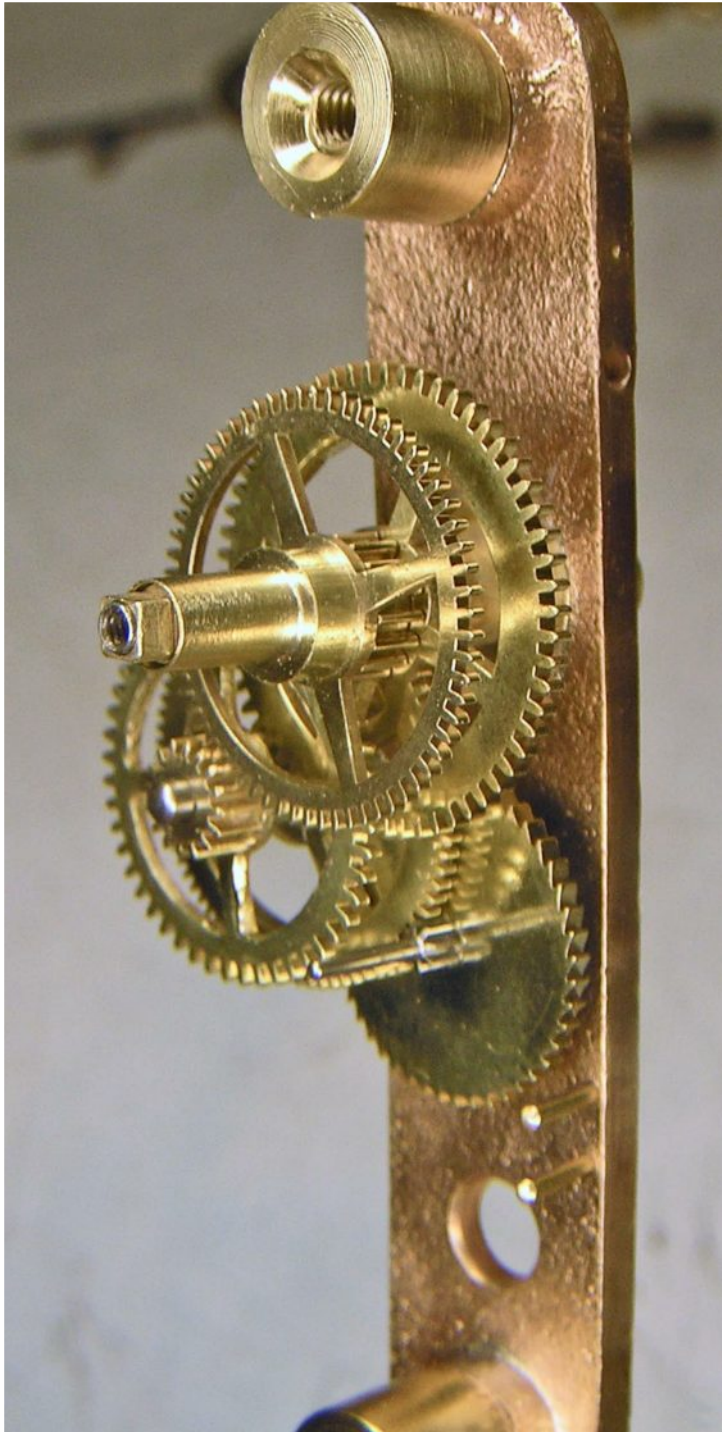
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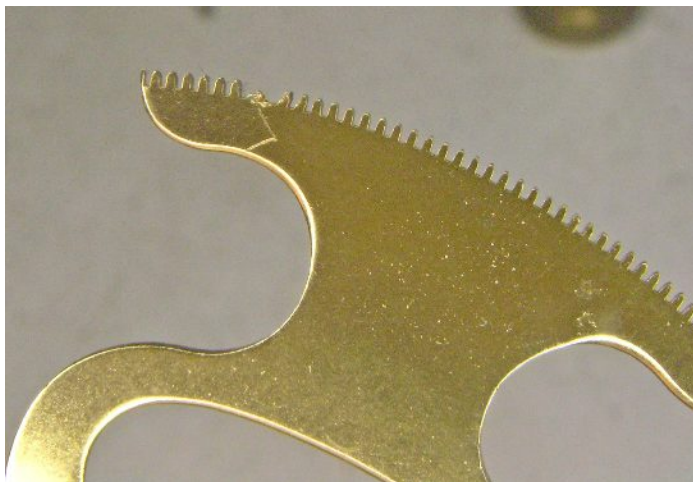
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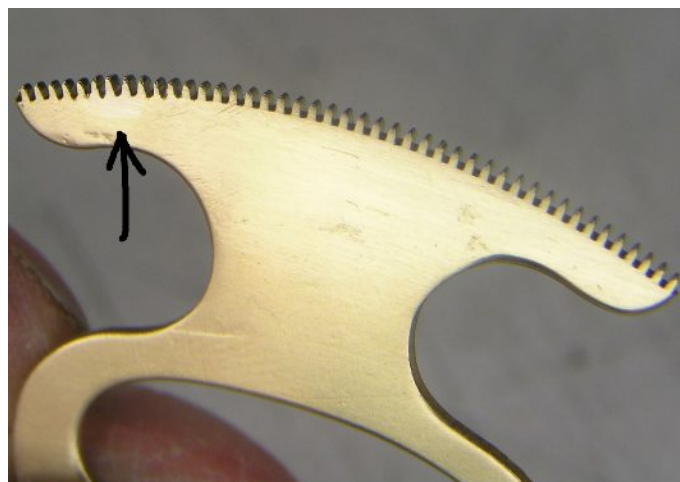
The wheel work can then be tested for engagement. The pillars then had to be milled down to the correct heights such that the wheels and pinions engaged vertically. The rear pillars also had to be milled down to accept the various retaining pins and screws.

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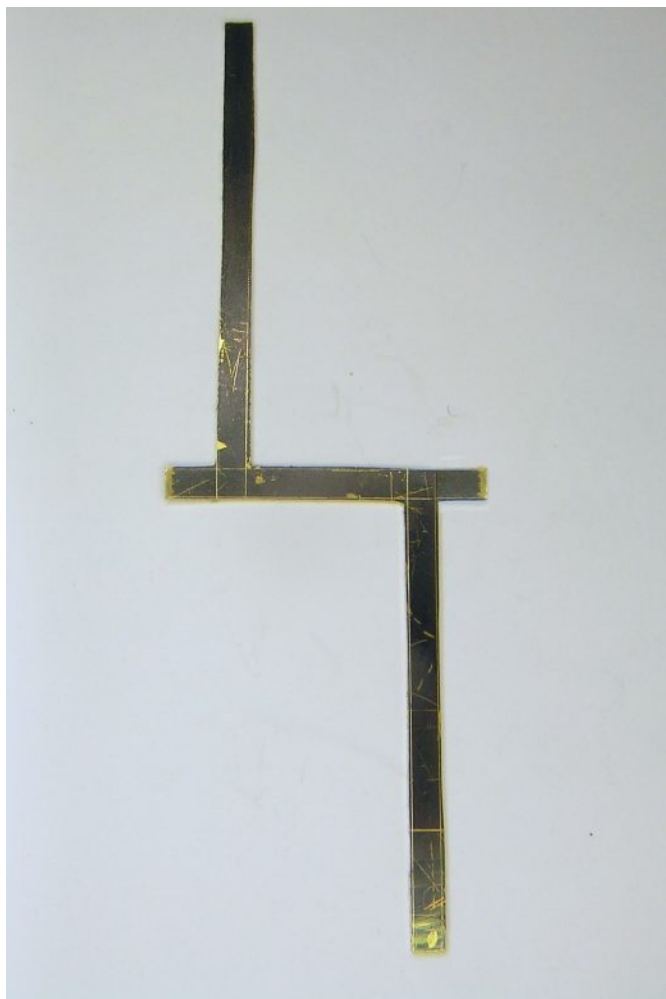
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The regulator segment seems to have a few teeth missing, probably from the butcher with the grinder



The problem was resolved by soldering I a segment of brass and filing the missing teeth out from the plate. A couple of trials with the segment in place soon had the teeth engaging all along the segment.



The next problem was to manufacture a one piece impulse arm. After a bit of thought I cut out the blank as shown on the left. This blank would have to be filed down to the correct widths, bent in three dimensions to fit the clock and have three sets of pivot holes drilled through. Then I would have to make the pawl and wheel follower.

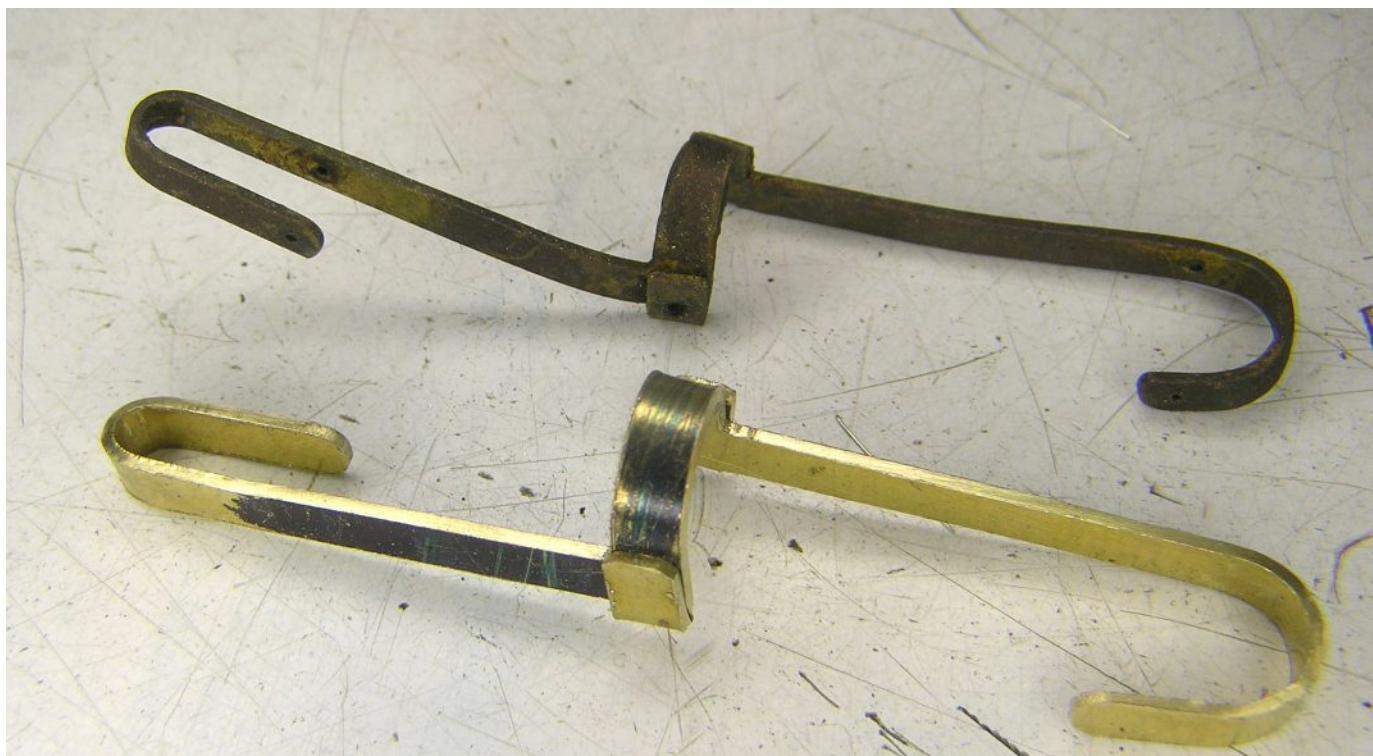
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An original and the new impulse arm after the first bends.



And after the final bends. Were close enough to layout the pawl and wheel.

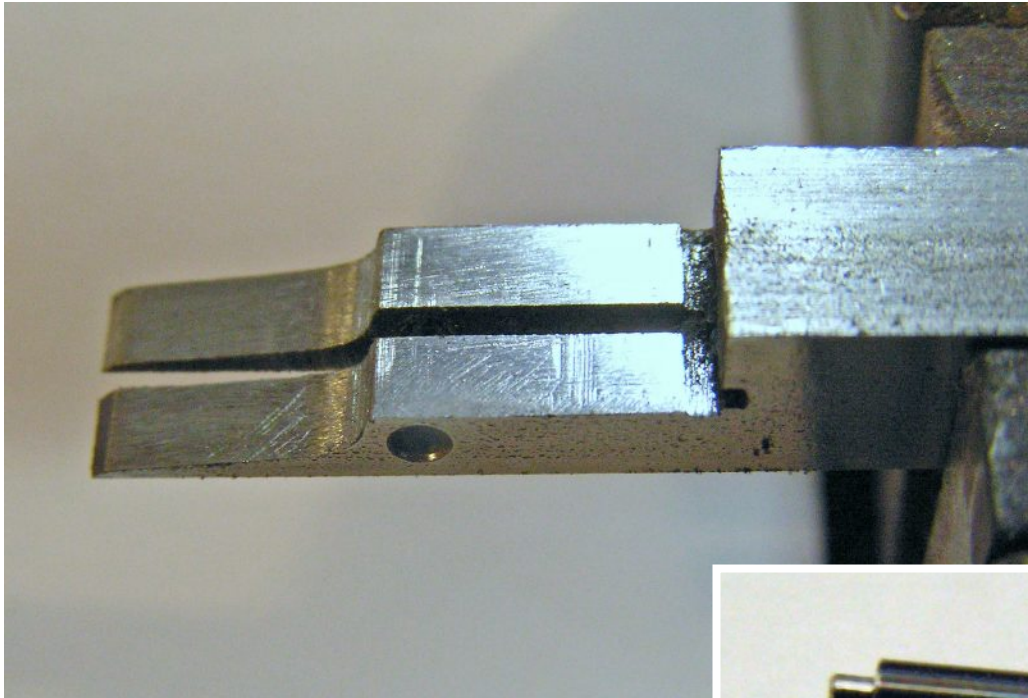
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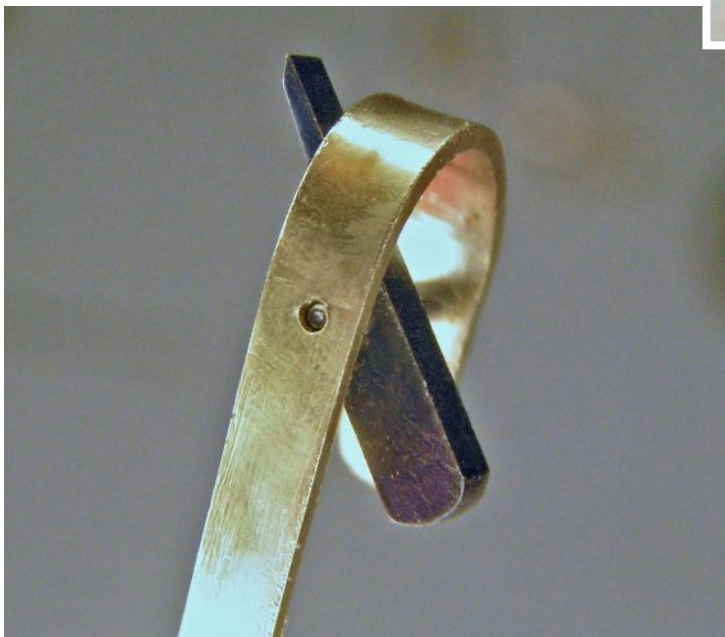
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*Here can be seen two paws
being cut out from silver
steel. Final shaping and
polishing will be done be-
fore separating from the
bar which aids in holding
the work in progress*

*The old and new pawl arbour
made from blued pivot steel.*



The pawl in place in the impulse arm.

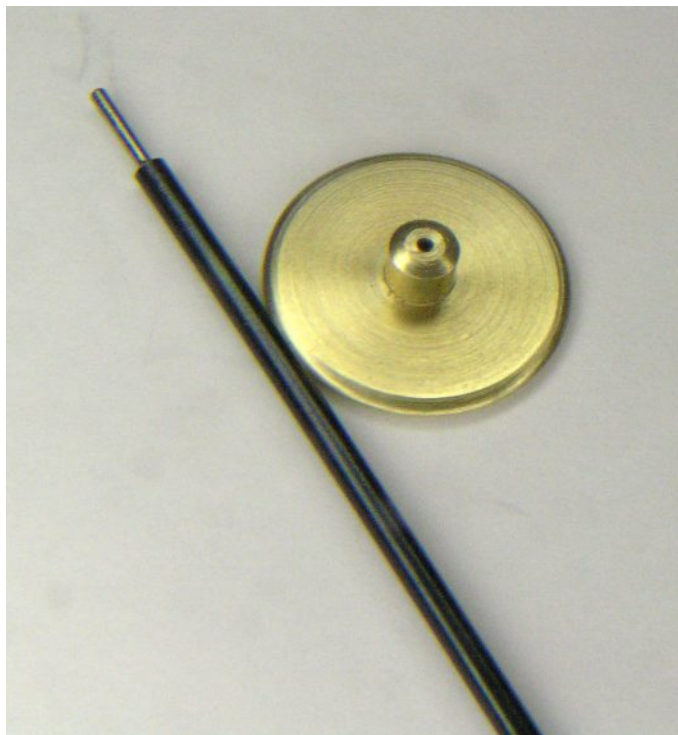
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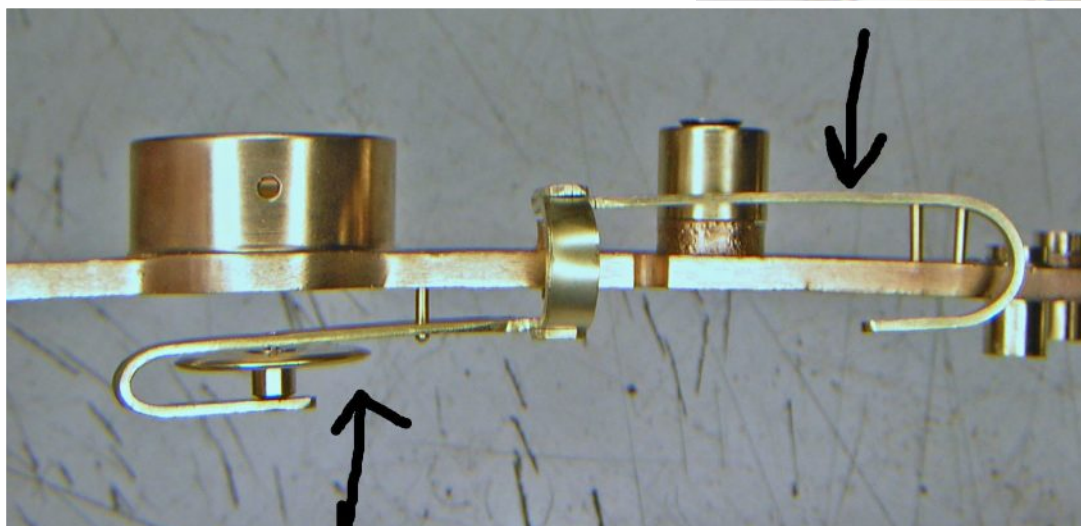
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The impulse wheel and arbour ready to be assembled.

On the right is the arm in place to check positioning



A little more bending required to line up the arm

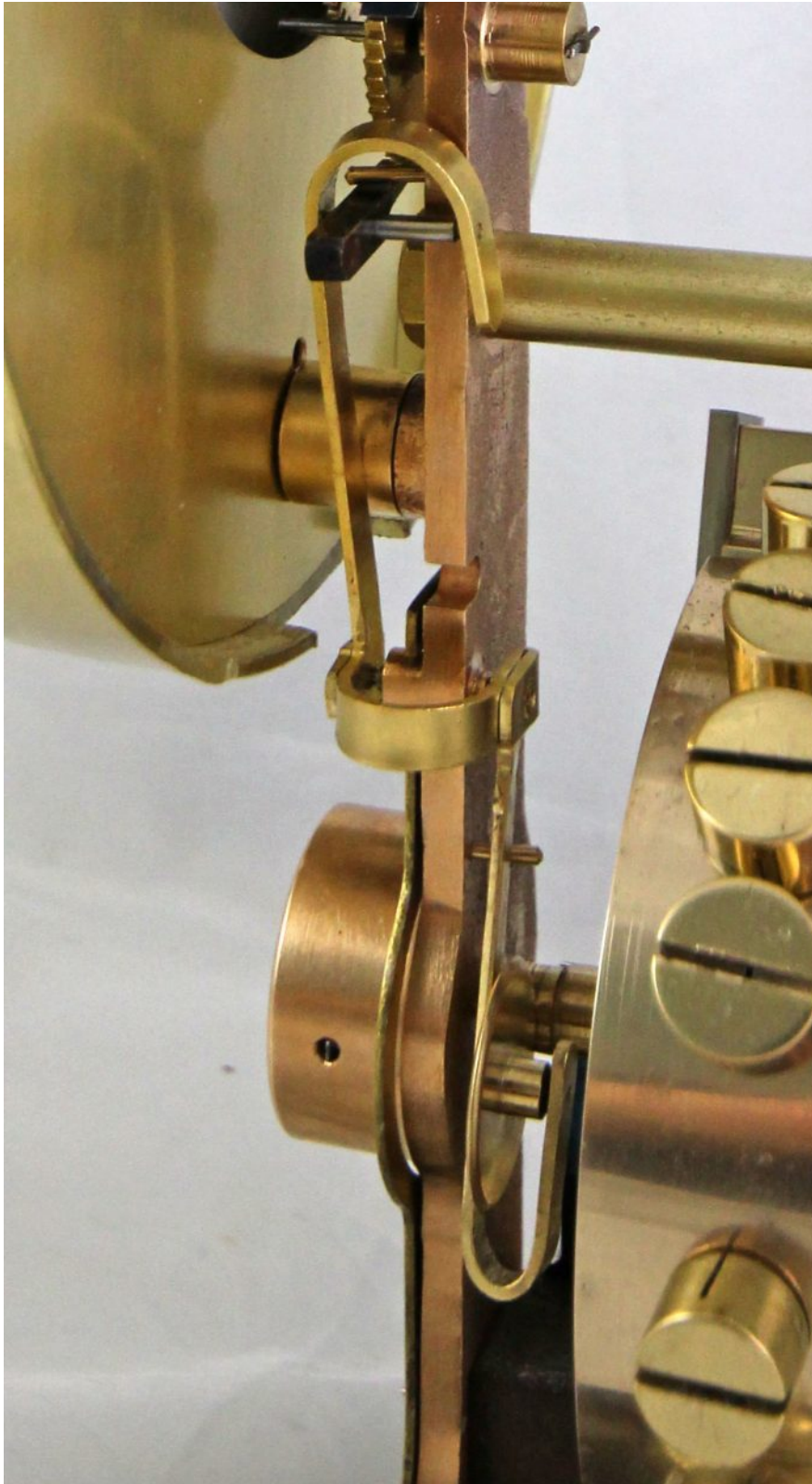
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The new impulse arm in position and being checked to see if one tooth is impuled on each swing of the balance wheel. There are brass pins at the pawl end as well as the wheel end to allow adjustment and positioning. All seems to be functioning correctly.

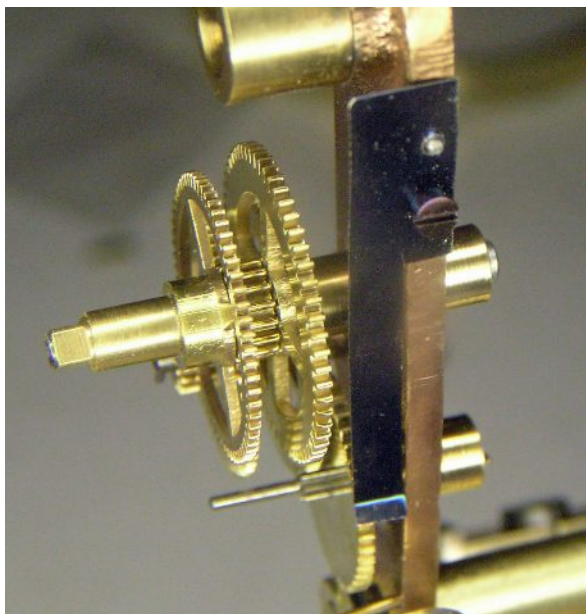
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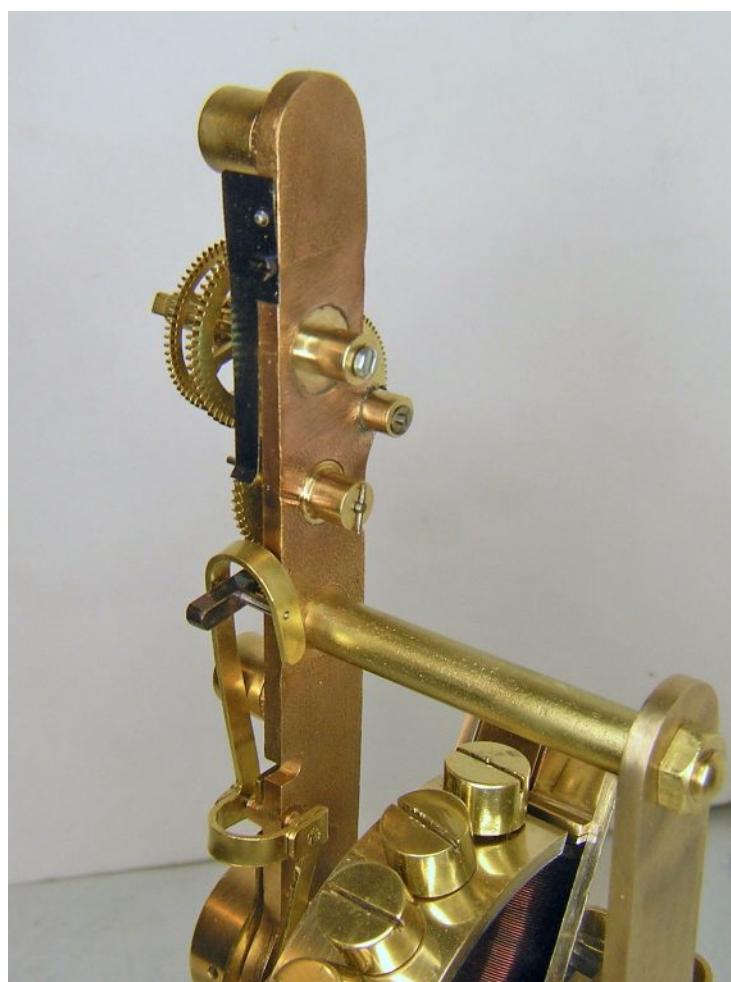
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The new click spring and screw.



Rear view of finished plate

Front view of clock

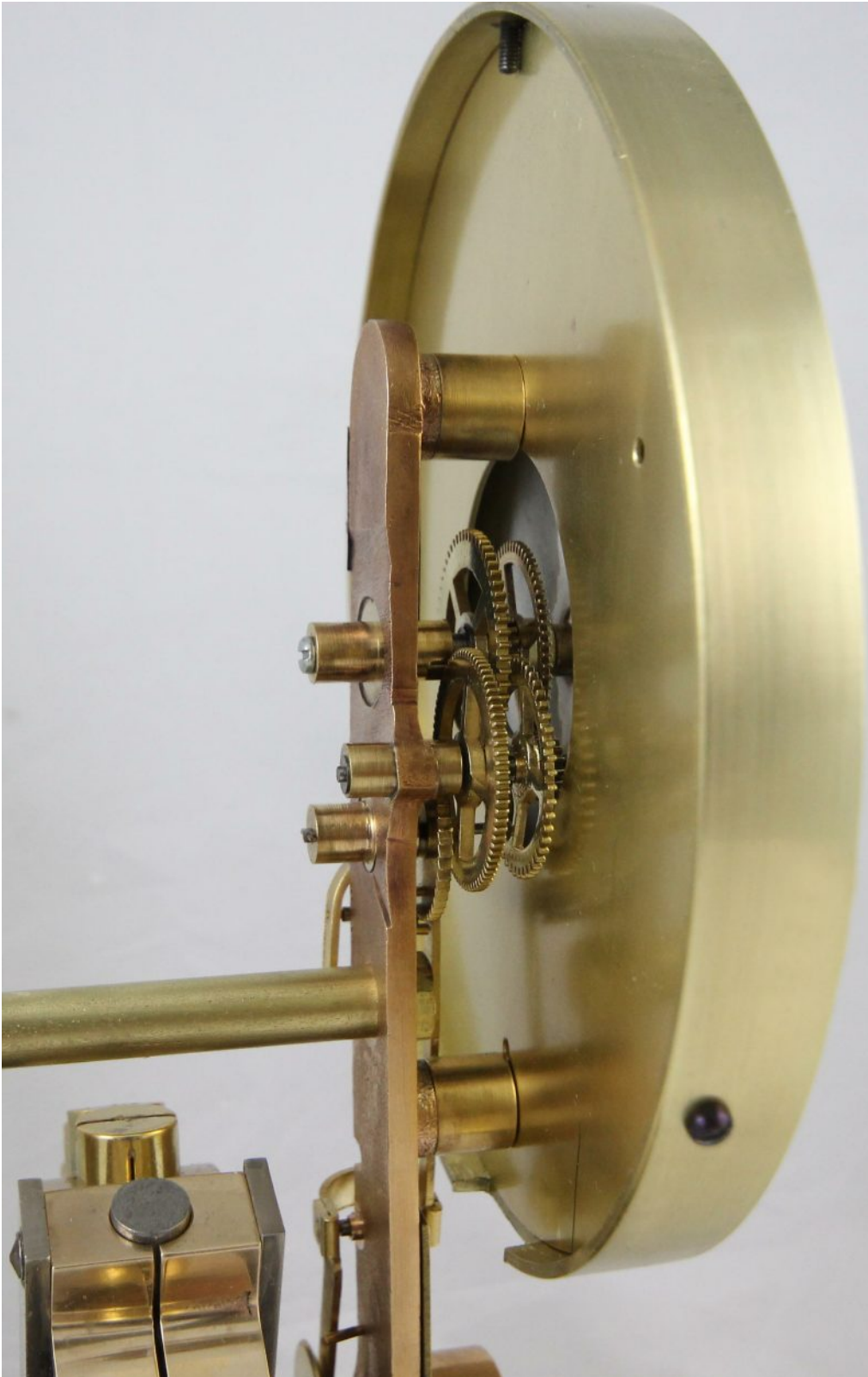
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*View behind the dial. All
parts now in place.*

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The clock on the test stand.

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On Test



These two photos show the front of the finished clock. Note that the rectangular cutout in the bezel cannot be seen from this normal viewing angle. Note also that the hands have been collected and a new central collet and screw made to suit.

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Back in the case.

The case itself was in quite good condition and only required the application of some good wax polish.

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Views of the finished clock with a new Horologix Battery Fitted. I normally set the voltage at 1.6 volts which is what can be expected from a new "D" cell.



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Completed Clock