French Bulle Clock

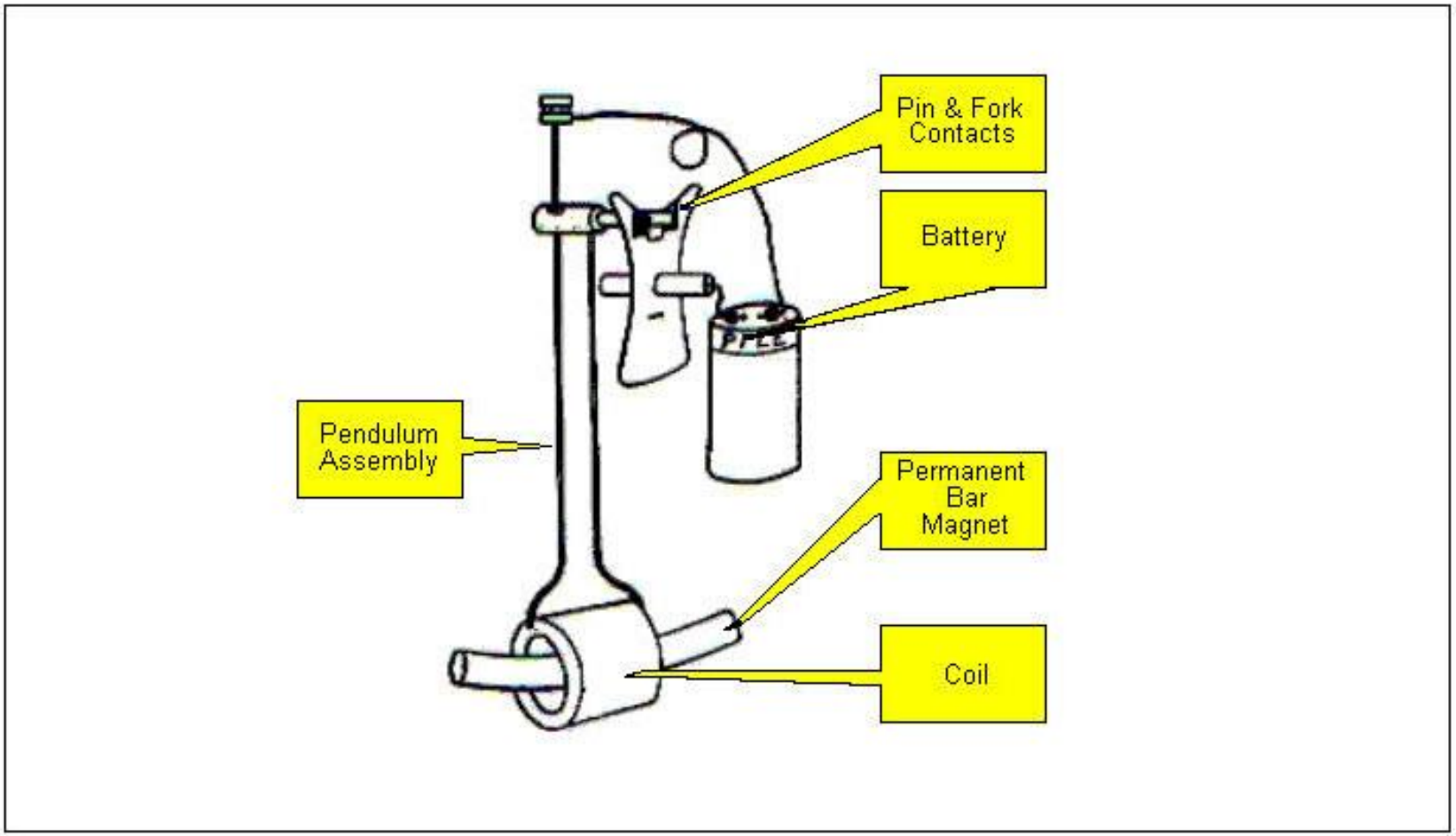
History

- Development in France just prior to the Great War (1914-1918) to try and achieve a good battery powered clock.
- Two Frenchmen independently worked on developing concept of using electric solenoid in clocks. Andre Moulin and Maurice Favre-Bulle
- Andre Moulin (Doctorate in Science in 1910) developed 3 pole magnet system for clock in 1912 and used it in 1914.
- Maurice Favre-Bulle born into family of clockmakers. Worked in engineering lab during Great War developing military timers, watches, timing systems and telegraphy.

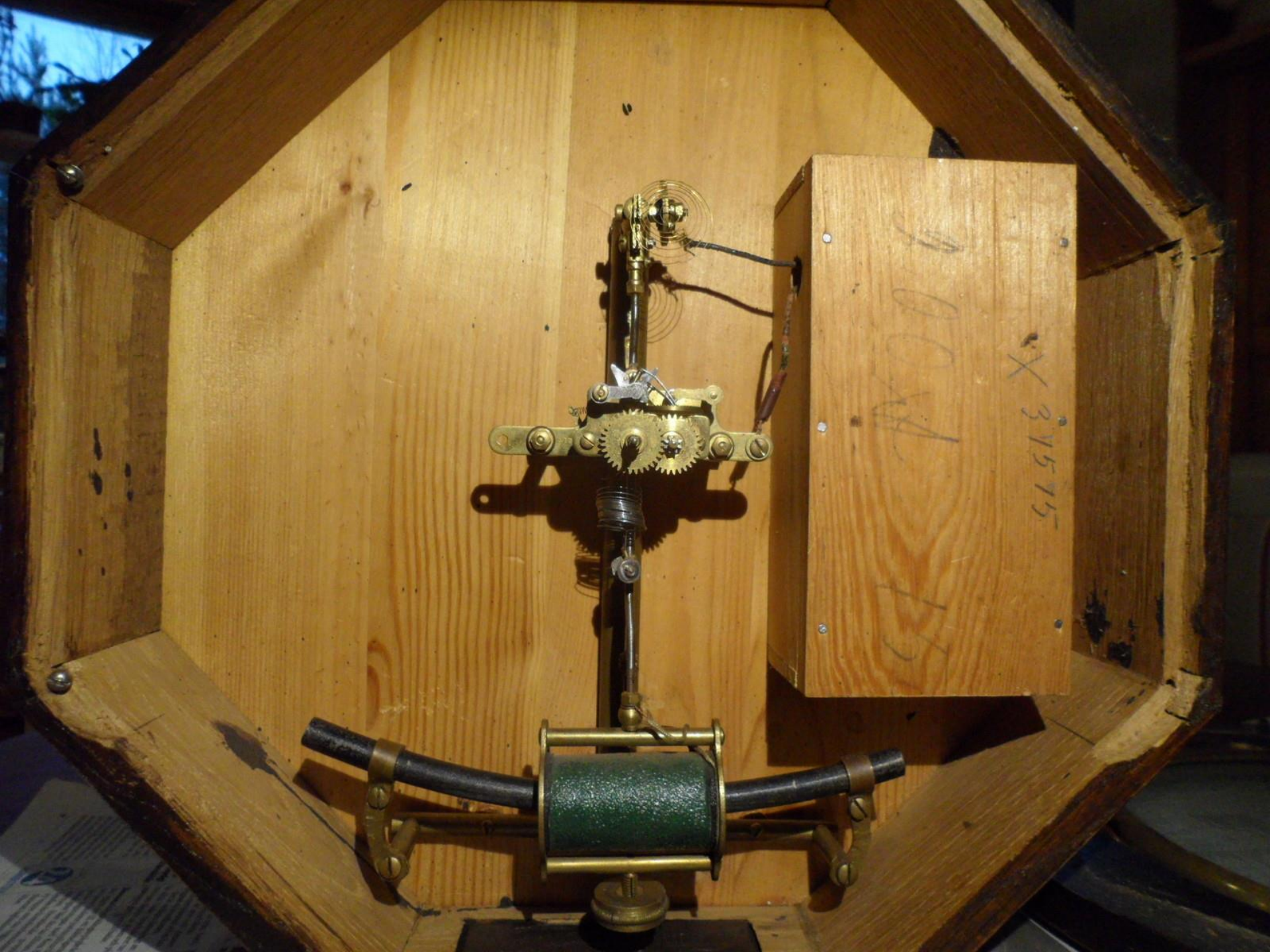
- Favre-Bulle and another fellow (Marius Lavet) formed La Societe Bulle et Cie after war to produce prototype movement.
- 1920 Favre-Bulle and Moulin's widow (Madame Veuve) patented electric clock for commercial production.
- Compagnee Generale des Appareils Horo-Electrique was established to commence the commercial production of the Bulle clock.
- 1920-1952 estimated 300,000 and over 100 models produced.
- Movement basically same, only materials changed

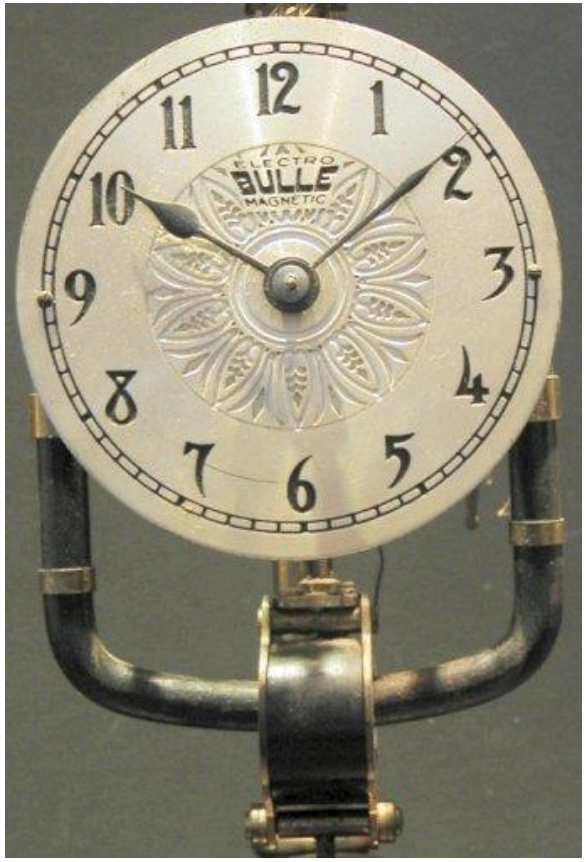
Operation

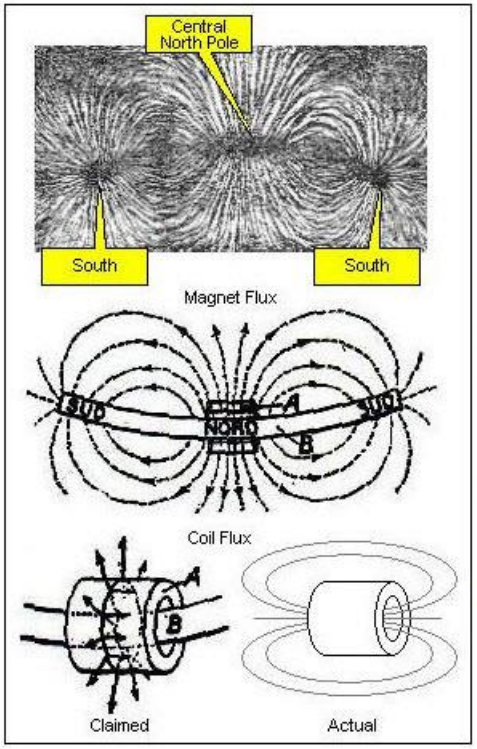
- Basic operation is reaction between a permanent bar magnet and an electric coil and is therefore classified as an electromagnetic clock.
- Coil forms part of the swinging pendulum moving over a 3 pole magnet.
- Pendulum drives movement

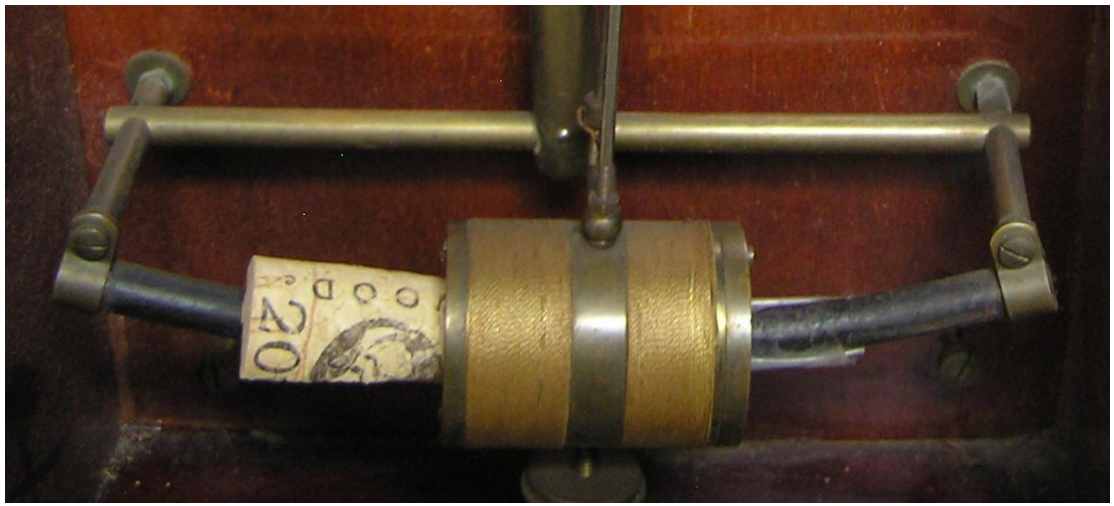


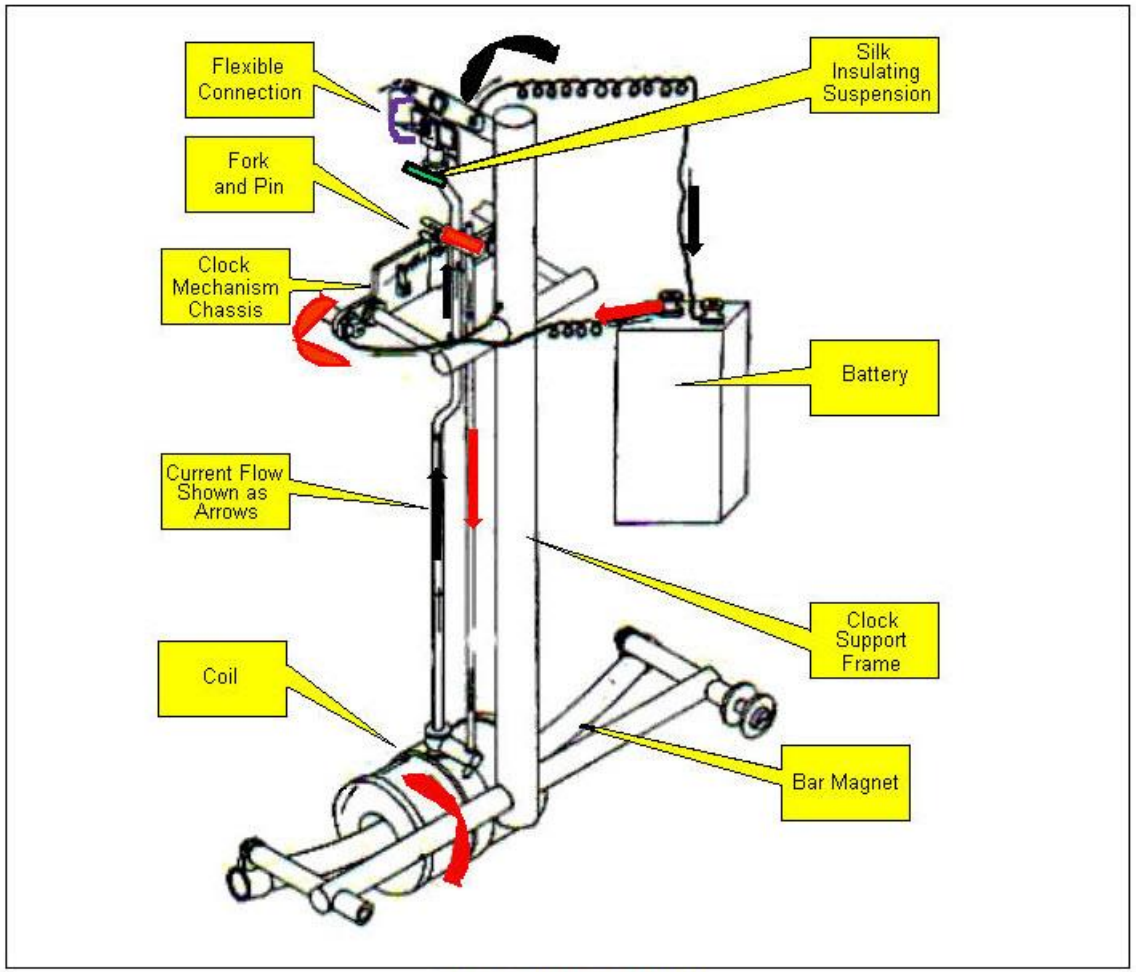
From Lindsay Bramall Chap 72, 2008


X 31515


ELECTRO
BULLE
MAGNETIC

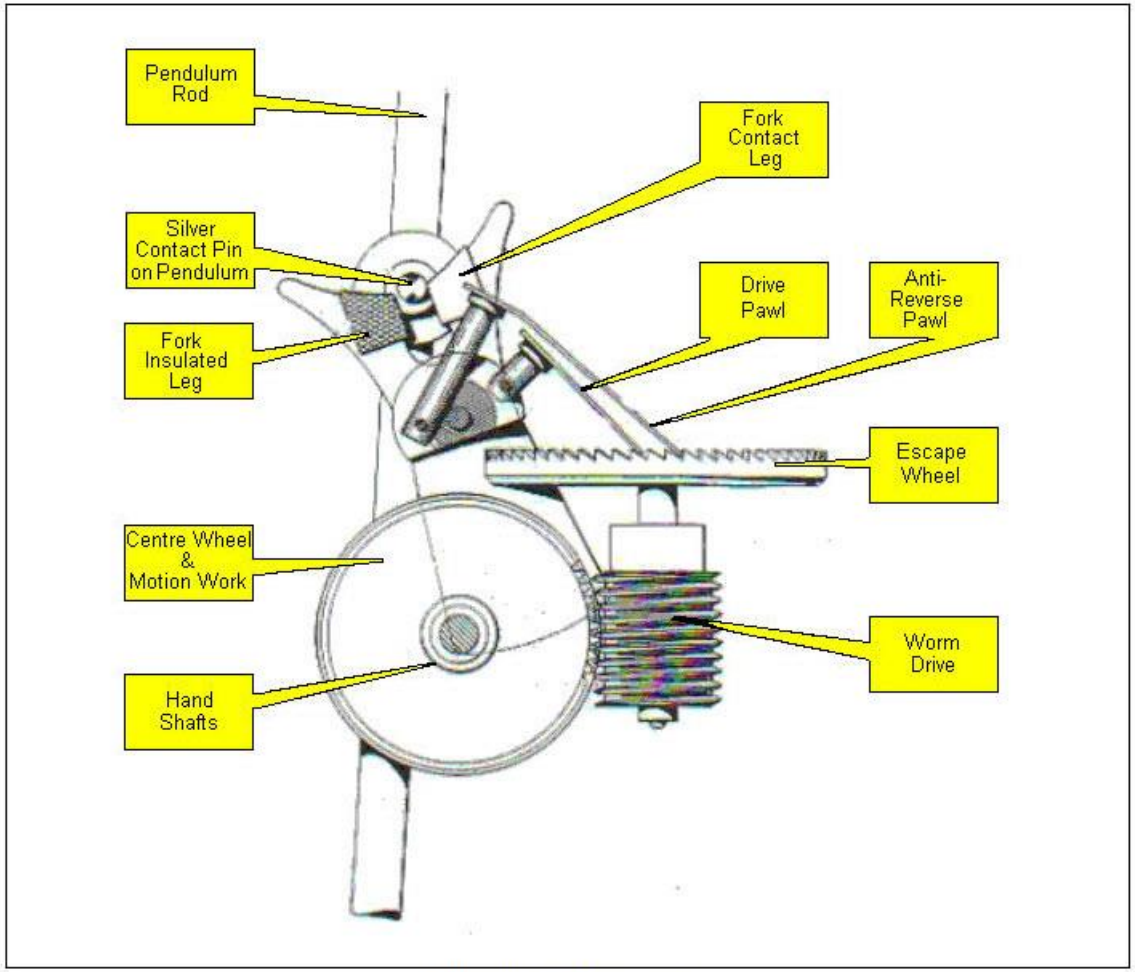

Central
North Pole
South
South
Magnet Flux
SUD
NORD
SUD
A
B
Coil Flux
B
Claimed
Actual





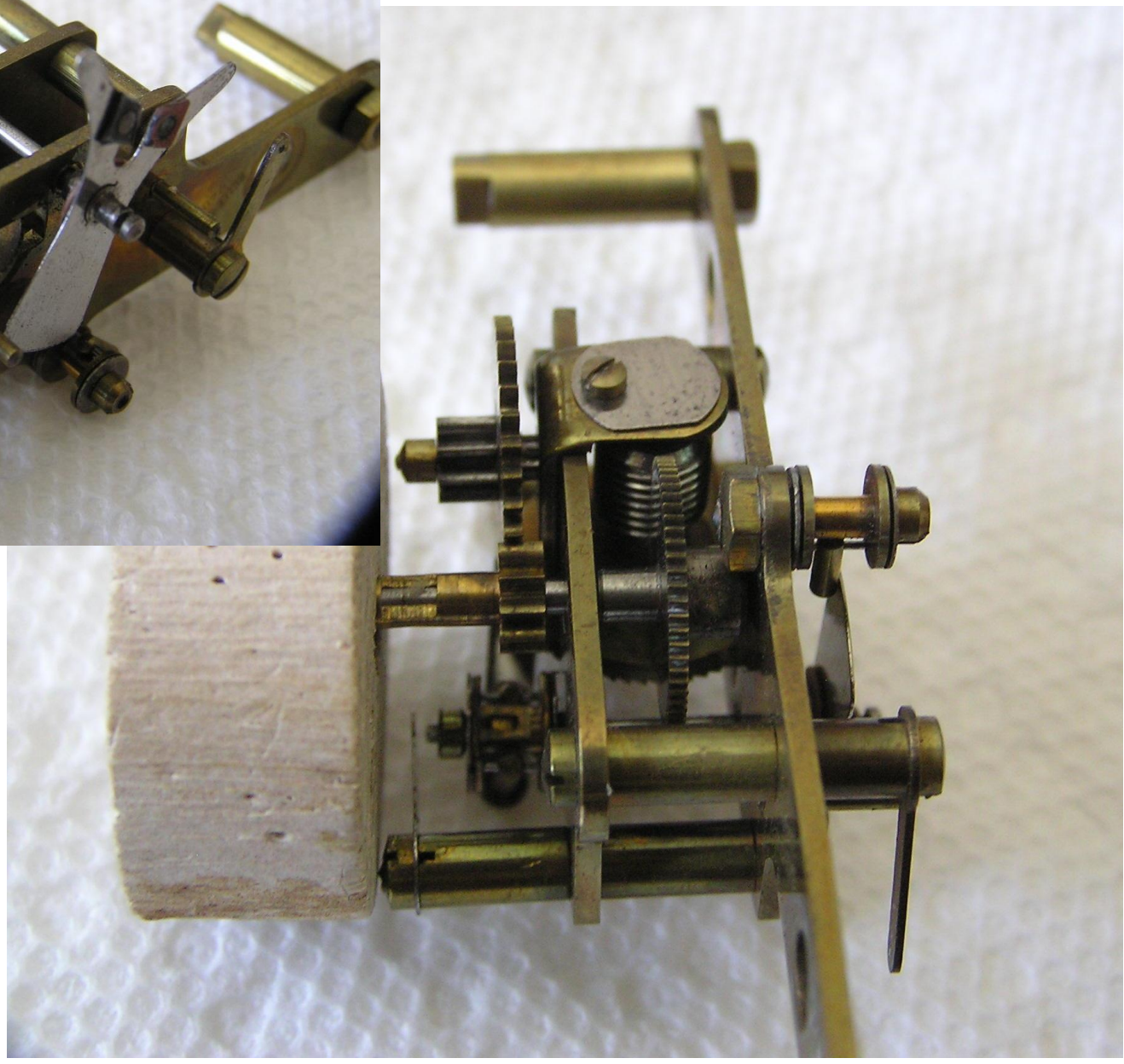
The Electrical Circuit

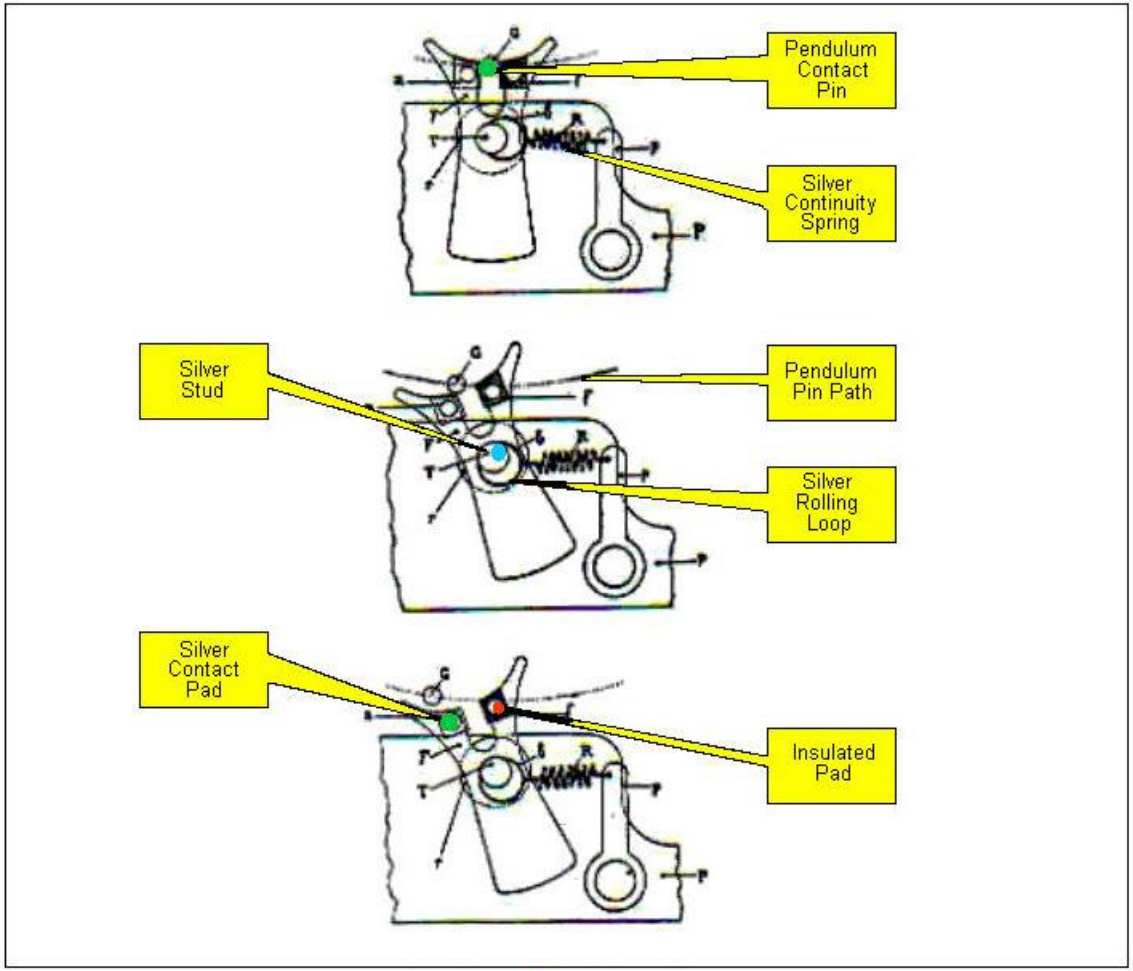
from Lindsay Bramall



The Clock Movement

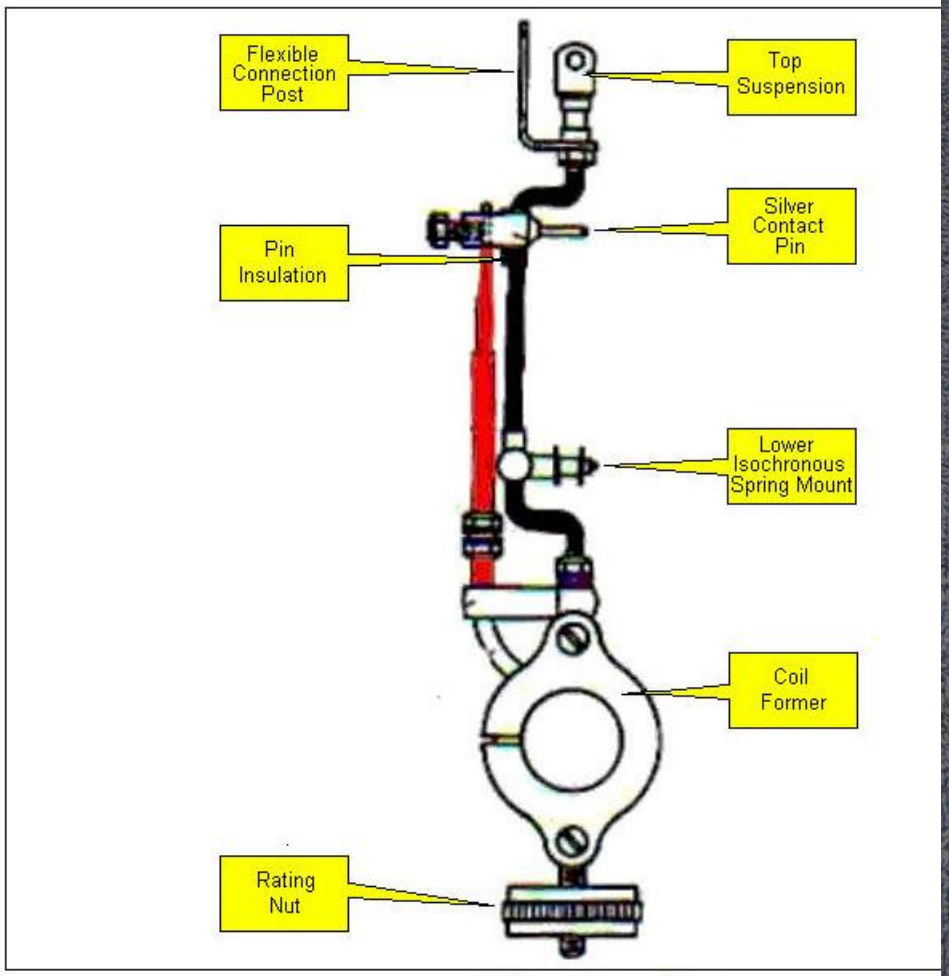
from Lindsay Bramall





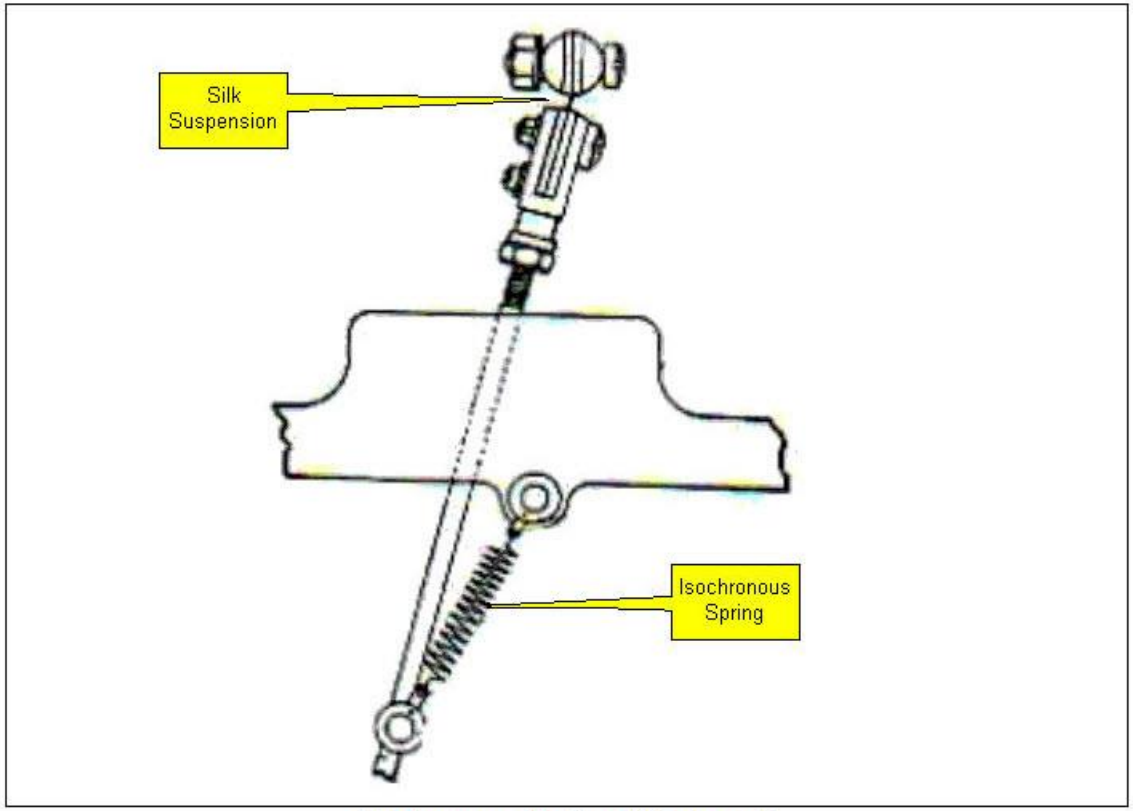
Fork and Pin Operation

from Lindsay Bramall



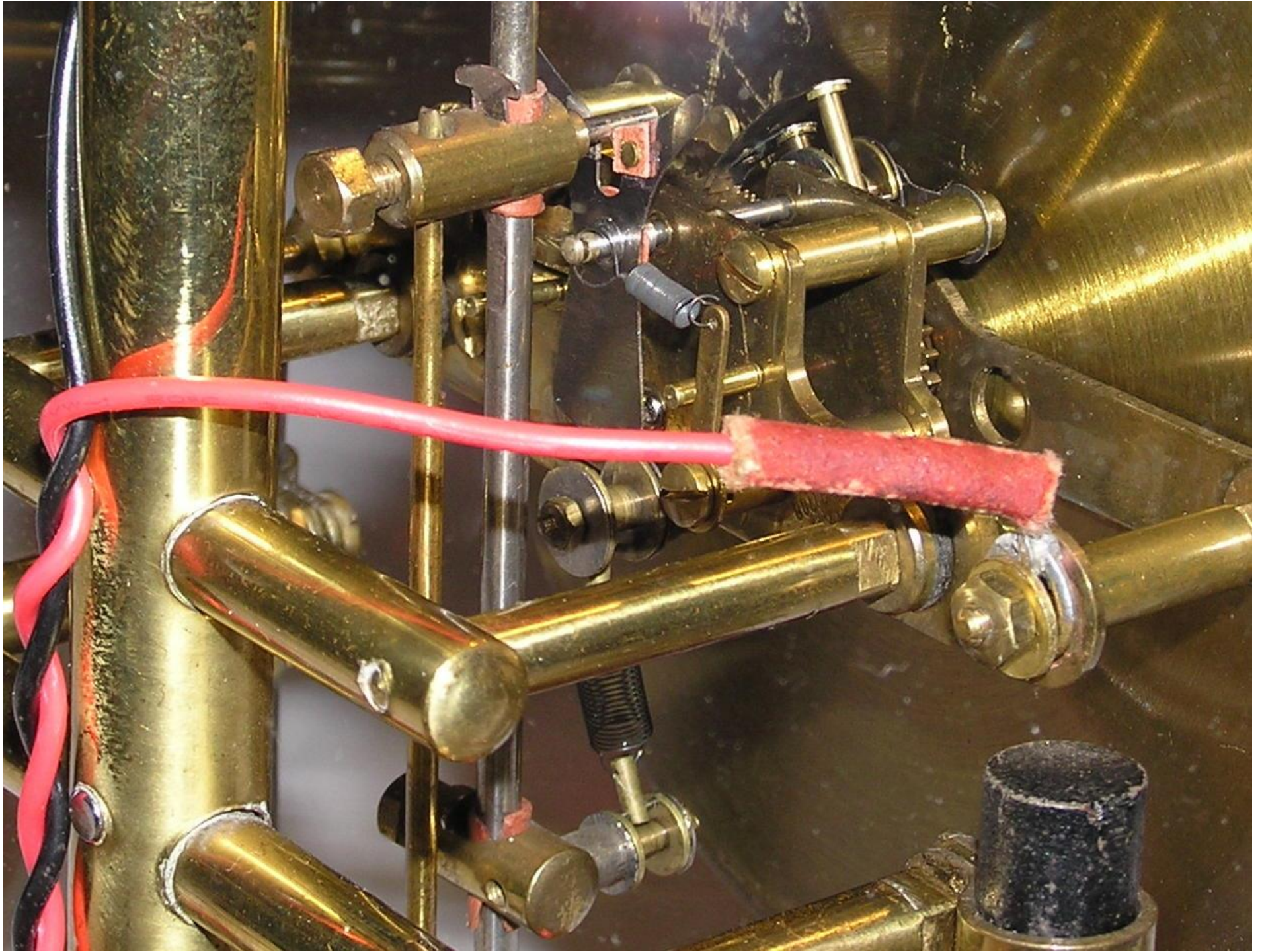
from Lindsay Bramall

Pendulum Assembly



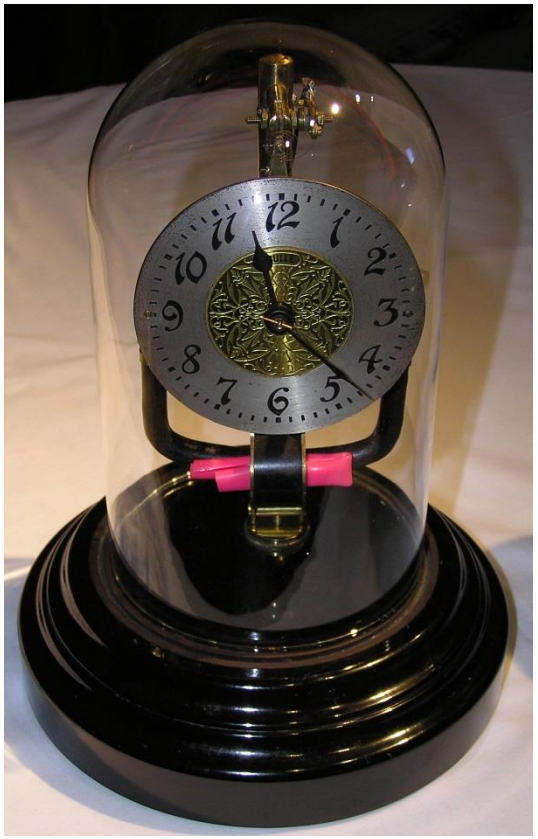
Isochronous Spring Attachment

from Lindsay Bramall



Examples

Clockette

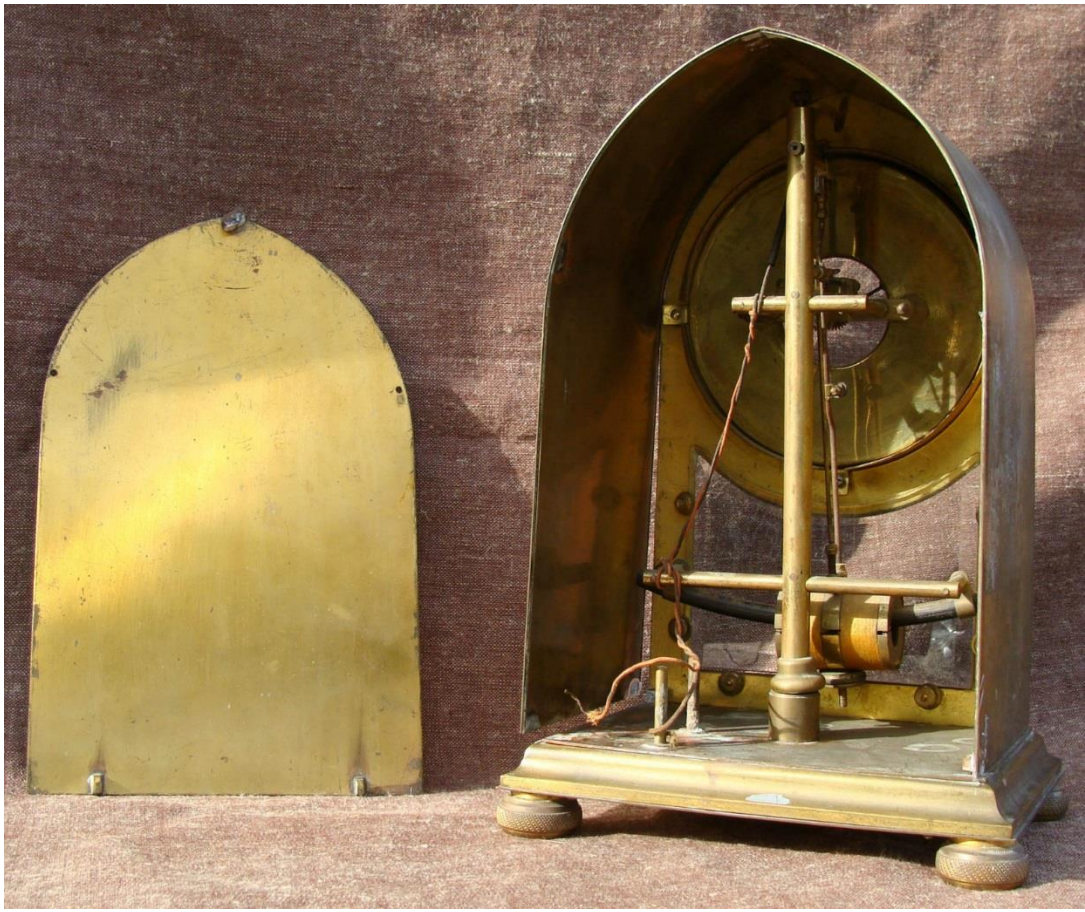


Examples

Wood

Examples

Brass Gothic



Examples

Art Deco

Examples

Wall

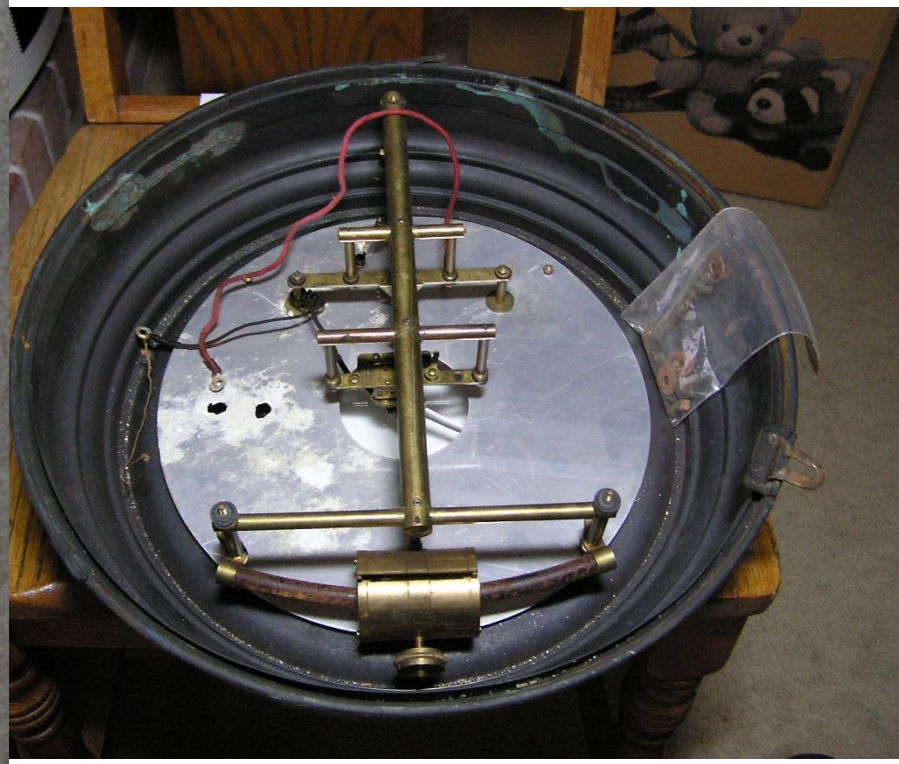
Brass and Glass

Examples

Round Wall

Examples

Round Wall



Examples

Examples

Examples

Common Problems

Dirty - clean

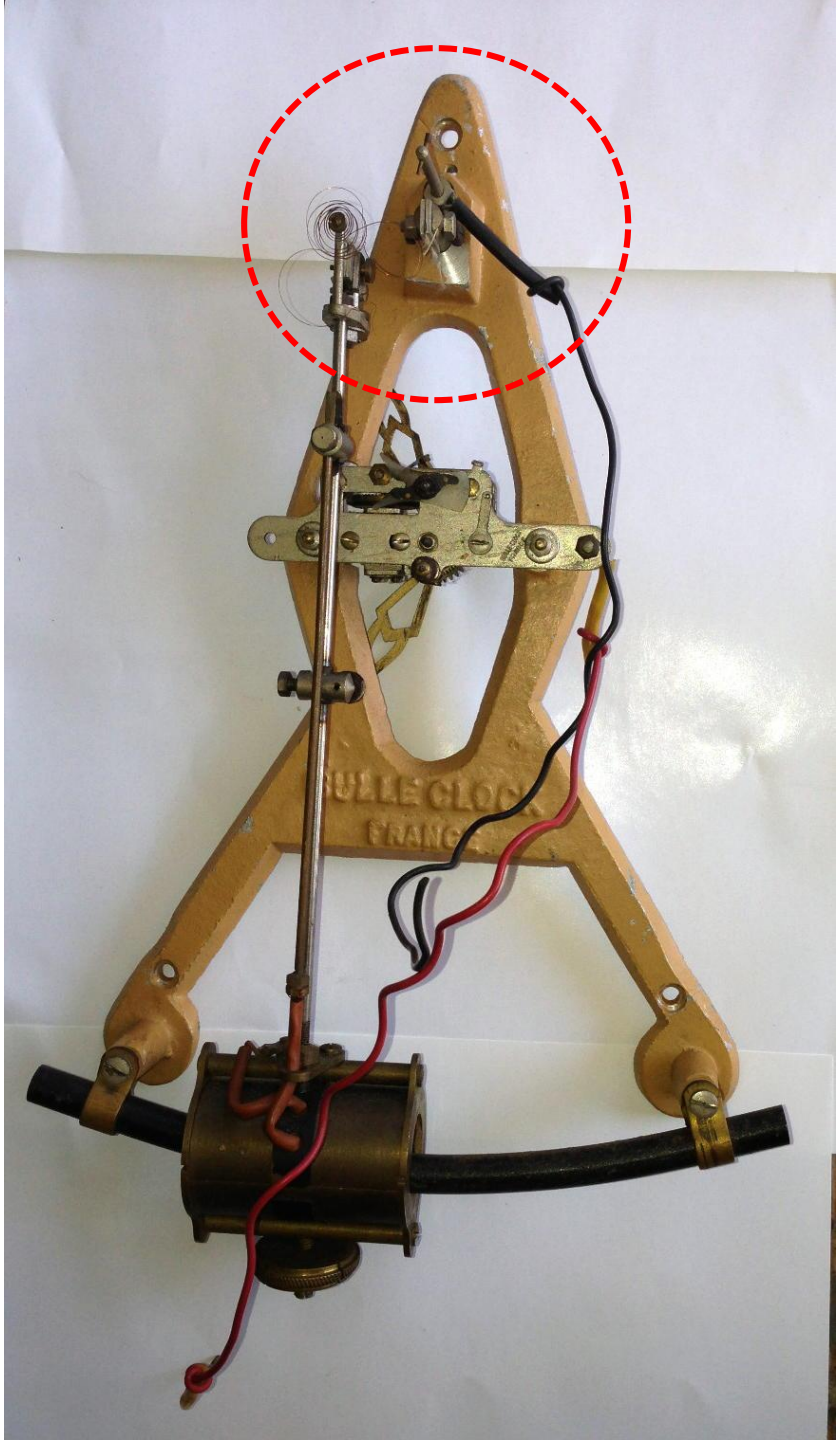
Continuity – electrical rules

Suspension - $$$ or $

Construction Of A Bulle Clock Suspension

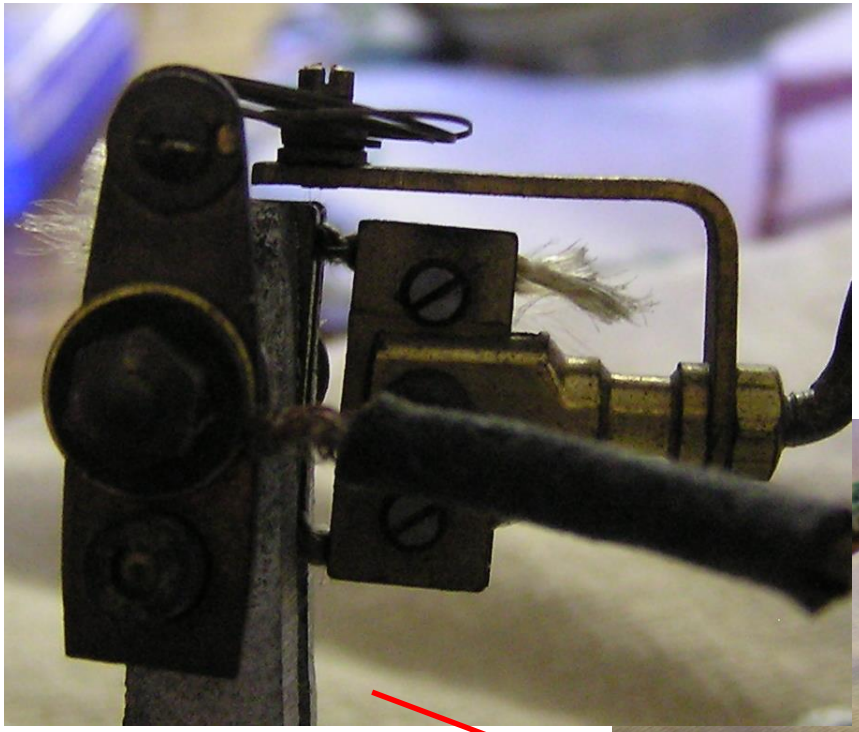
(For Just About A Buck)

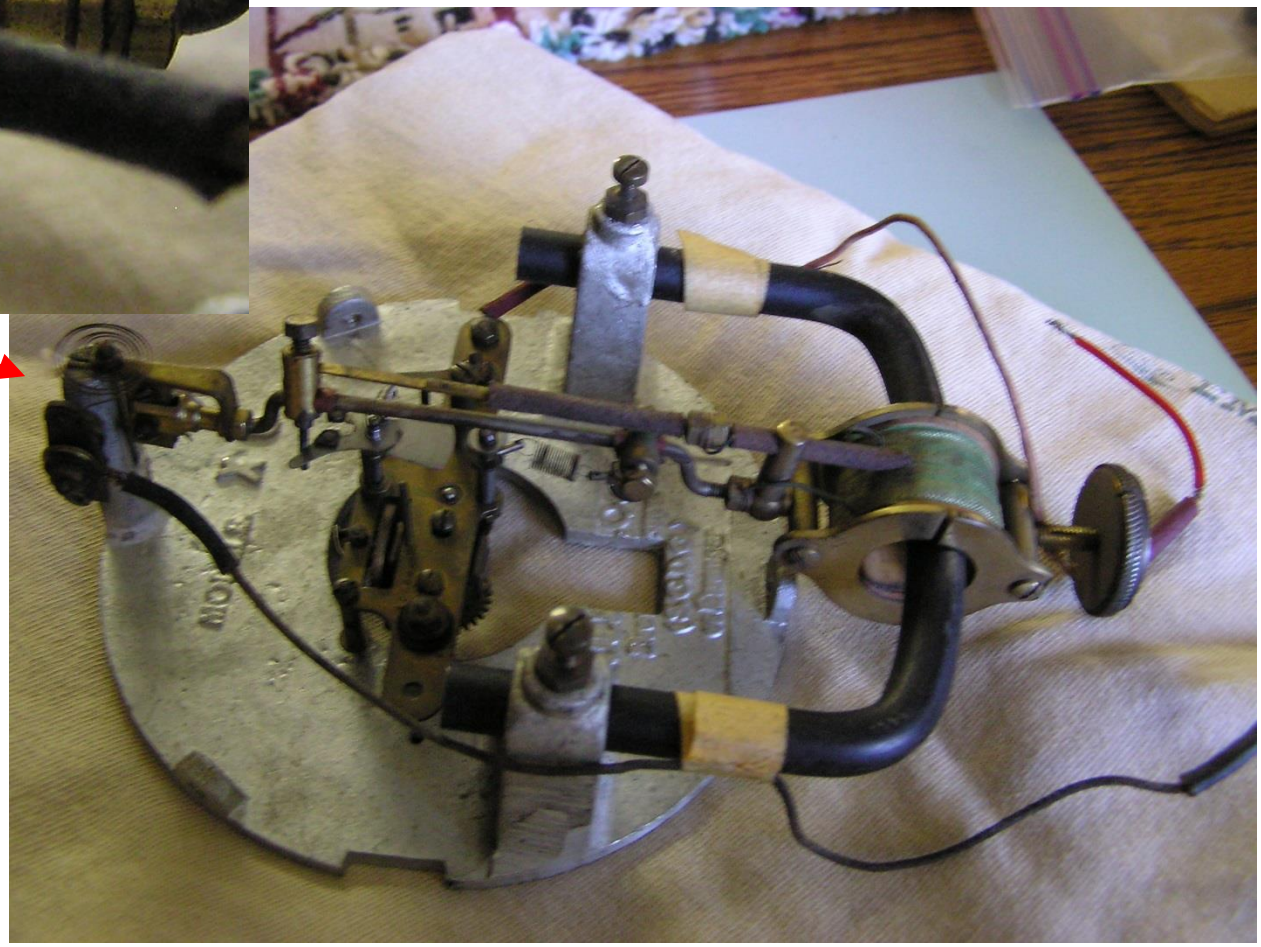
Obvious Problem With Suspension



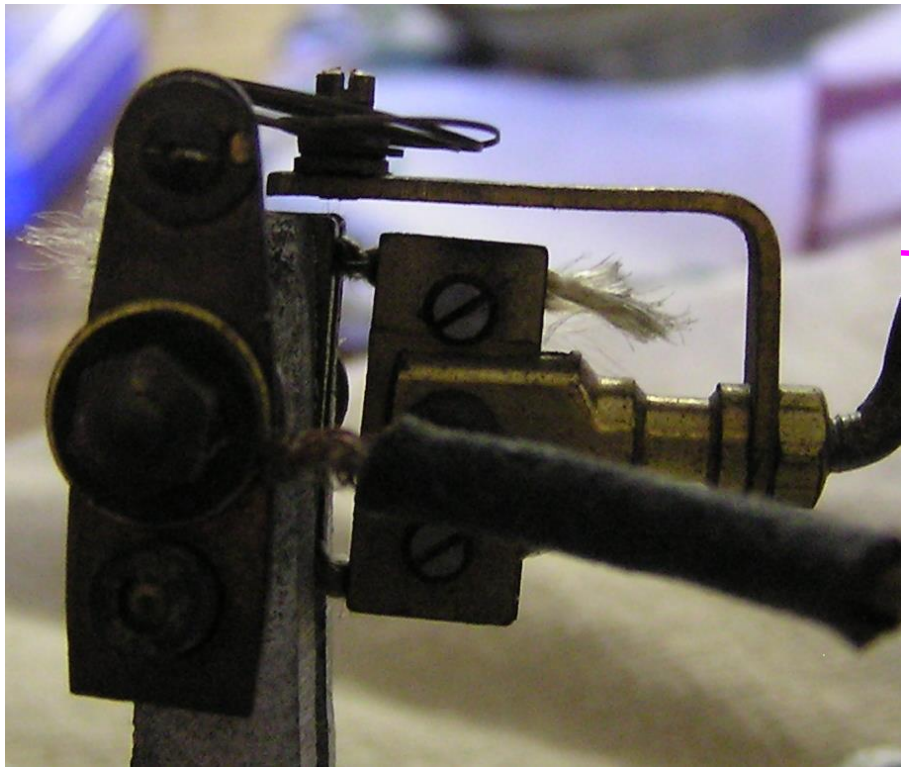

BULLE-CLOCK
BREVETE S.G.D.G.
PATENTED
F. Luthi
FRANCE

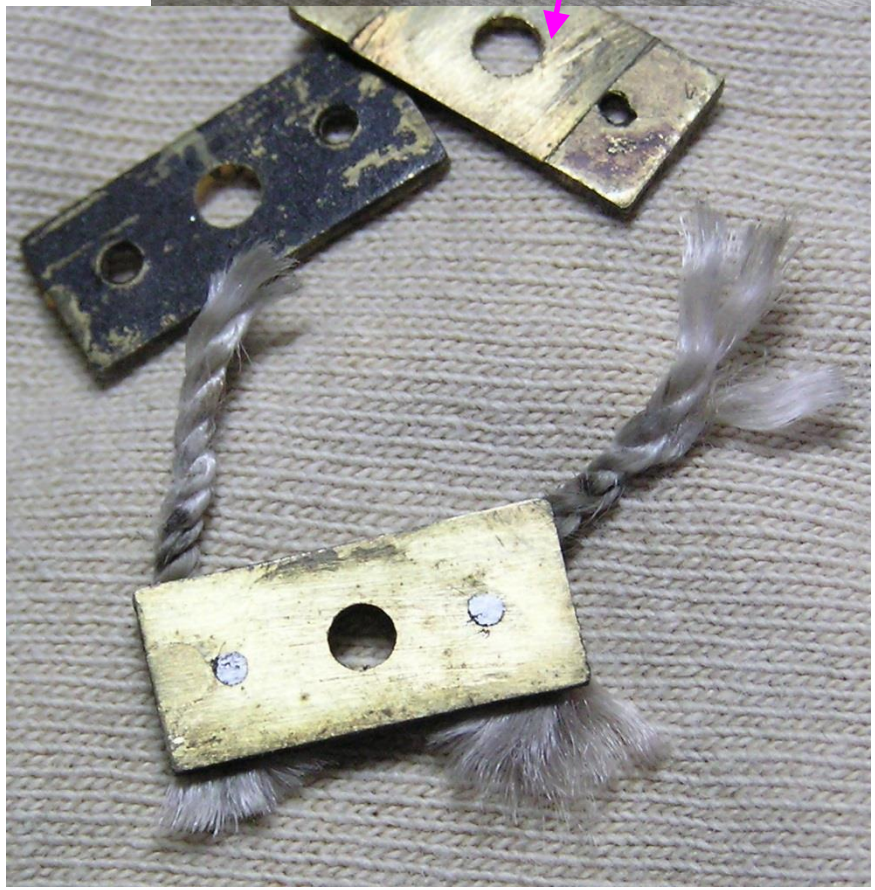
Worn Out

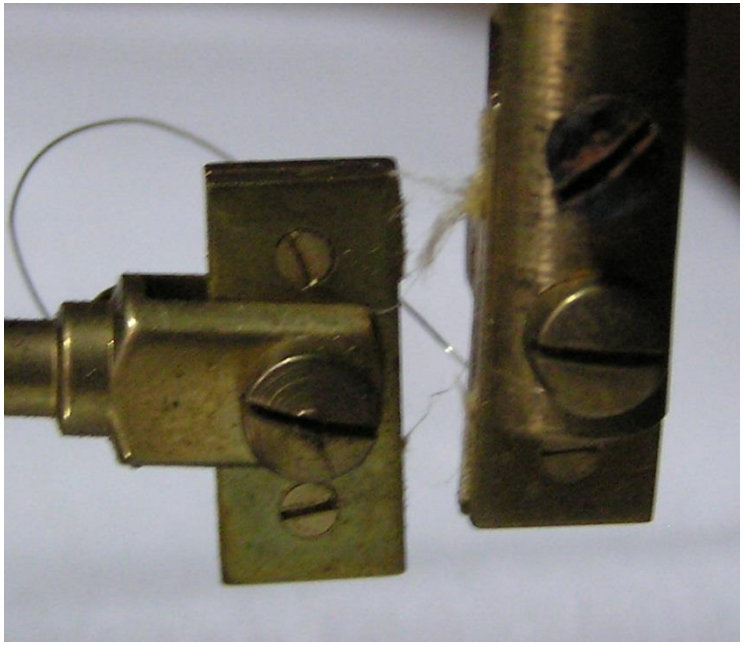


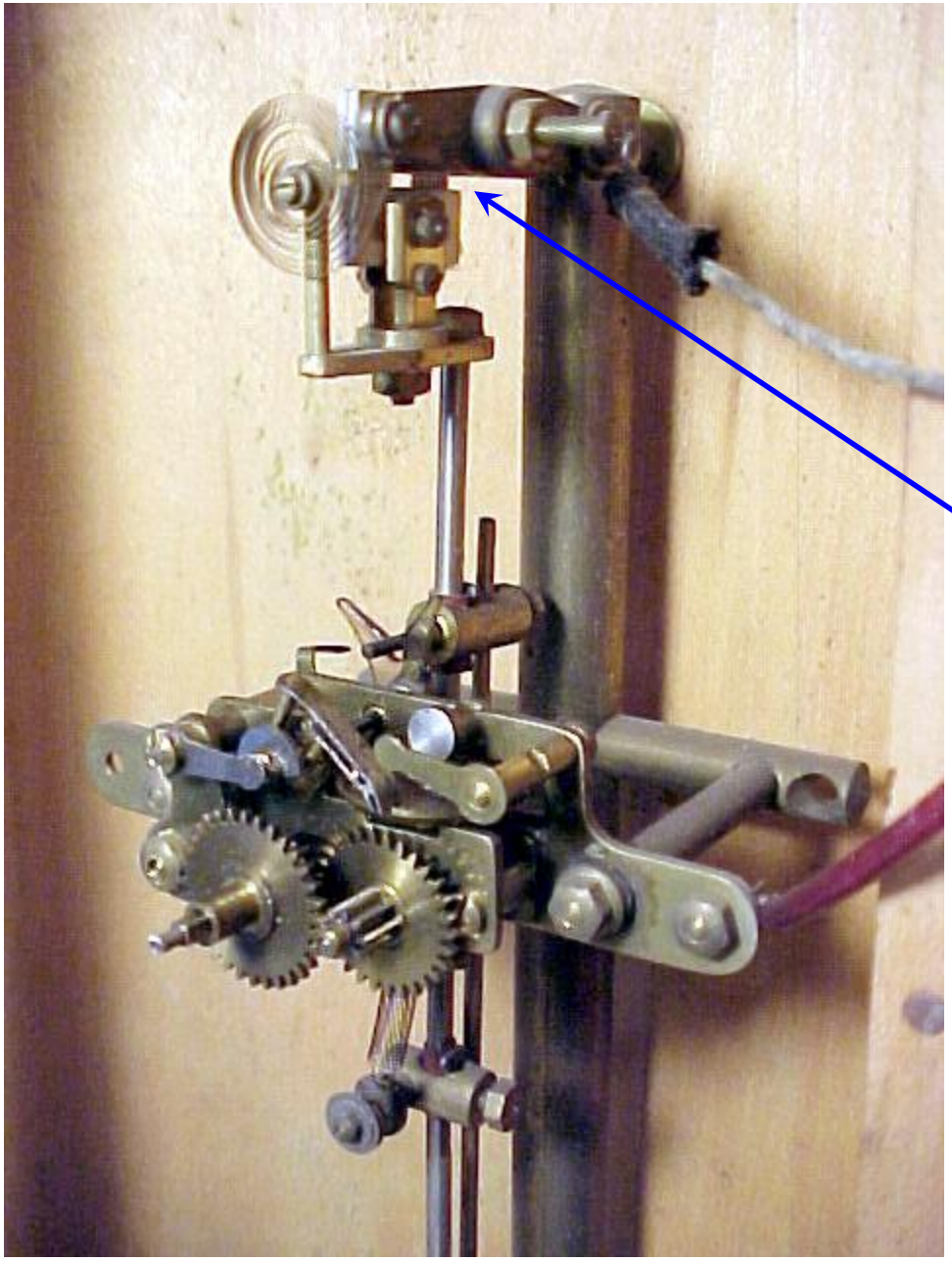


Note: coil position with magnet





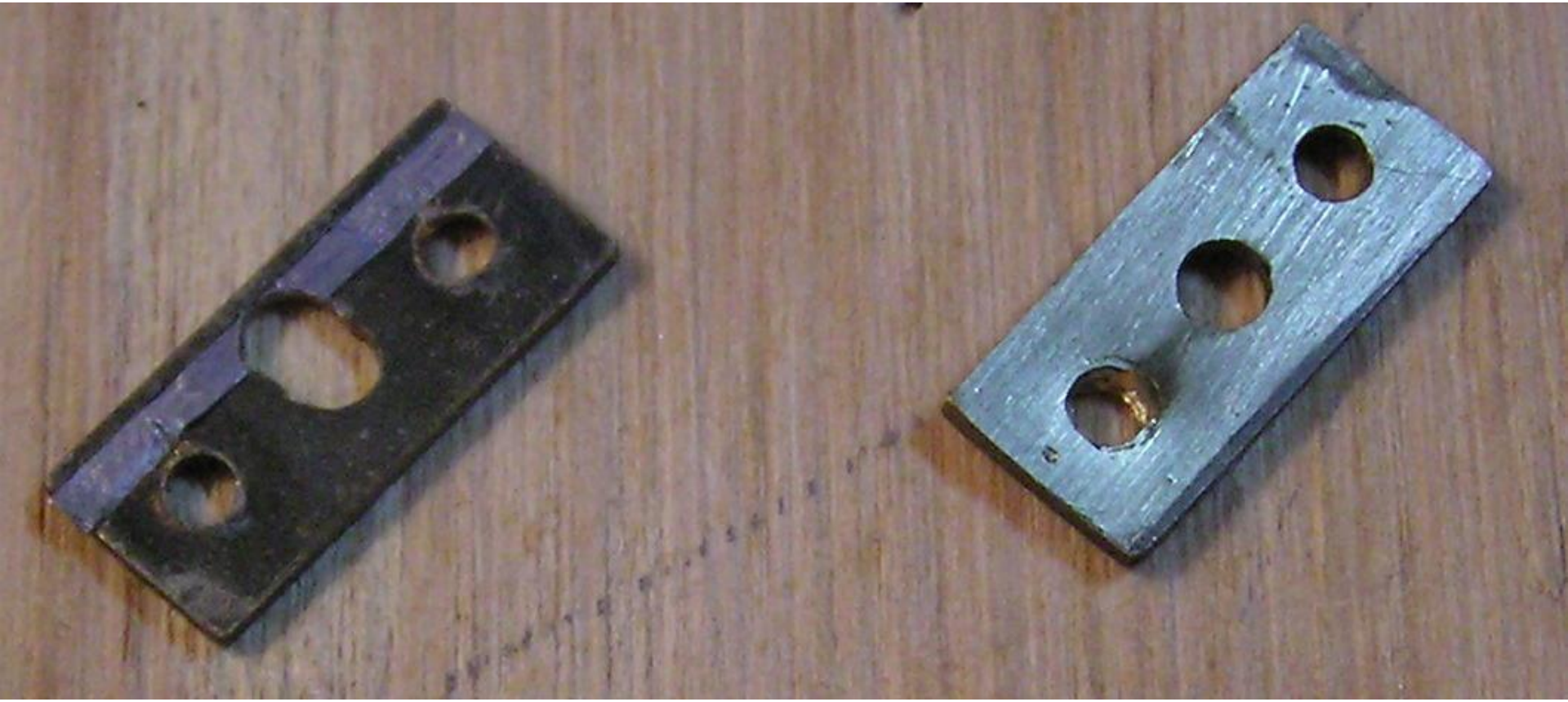



Stretched

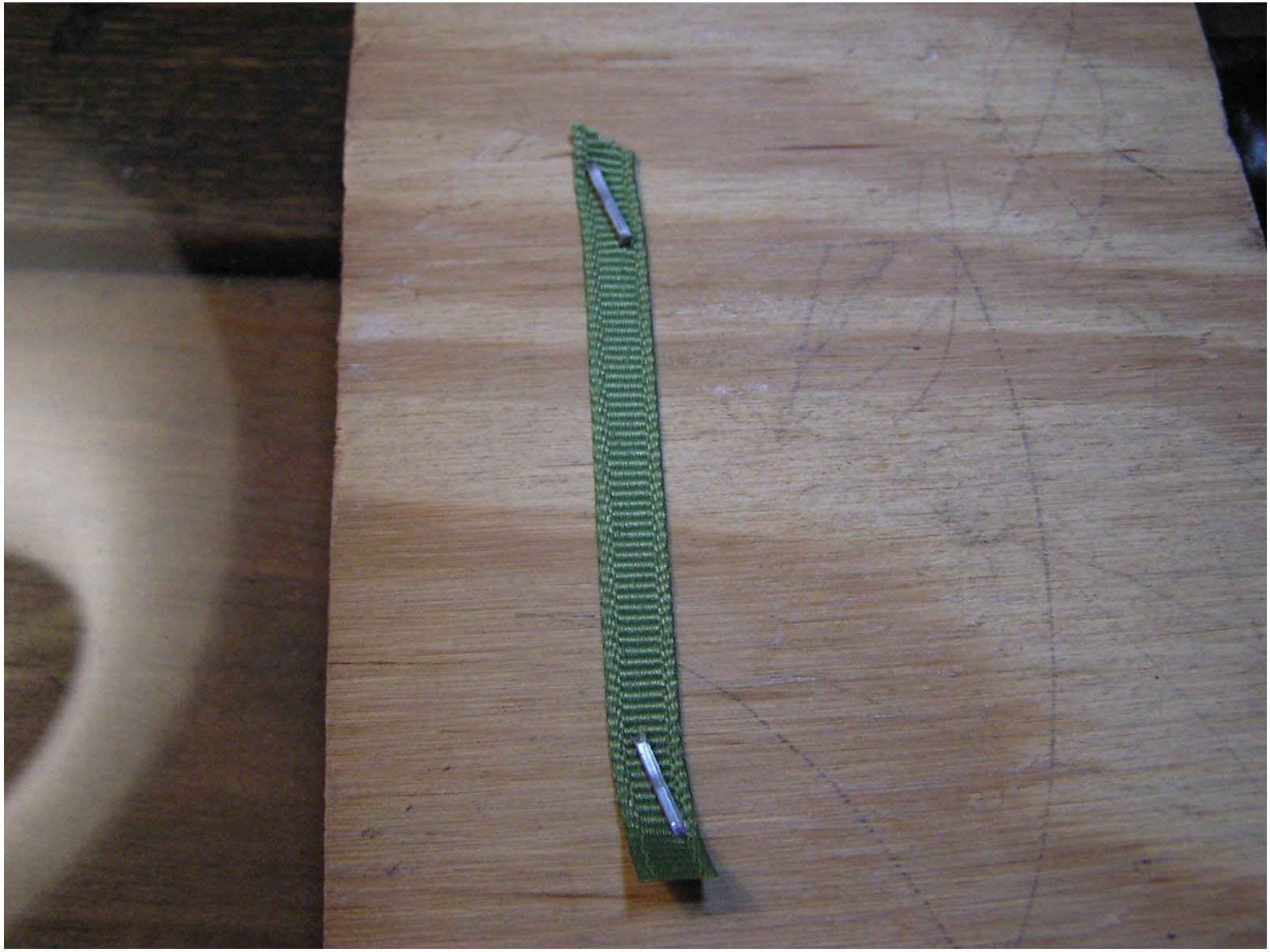
Materials

- Original plates (~7x11x1mm) or new (brass)
- Working base (1/4” plywood)
- 100% silk ribbon (woven edges)
- Copper wire
- Stapler or fastener (tacks)
- Adhesive
- Clamp
- Marker pen and ruler

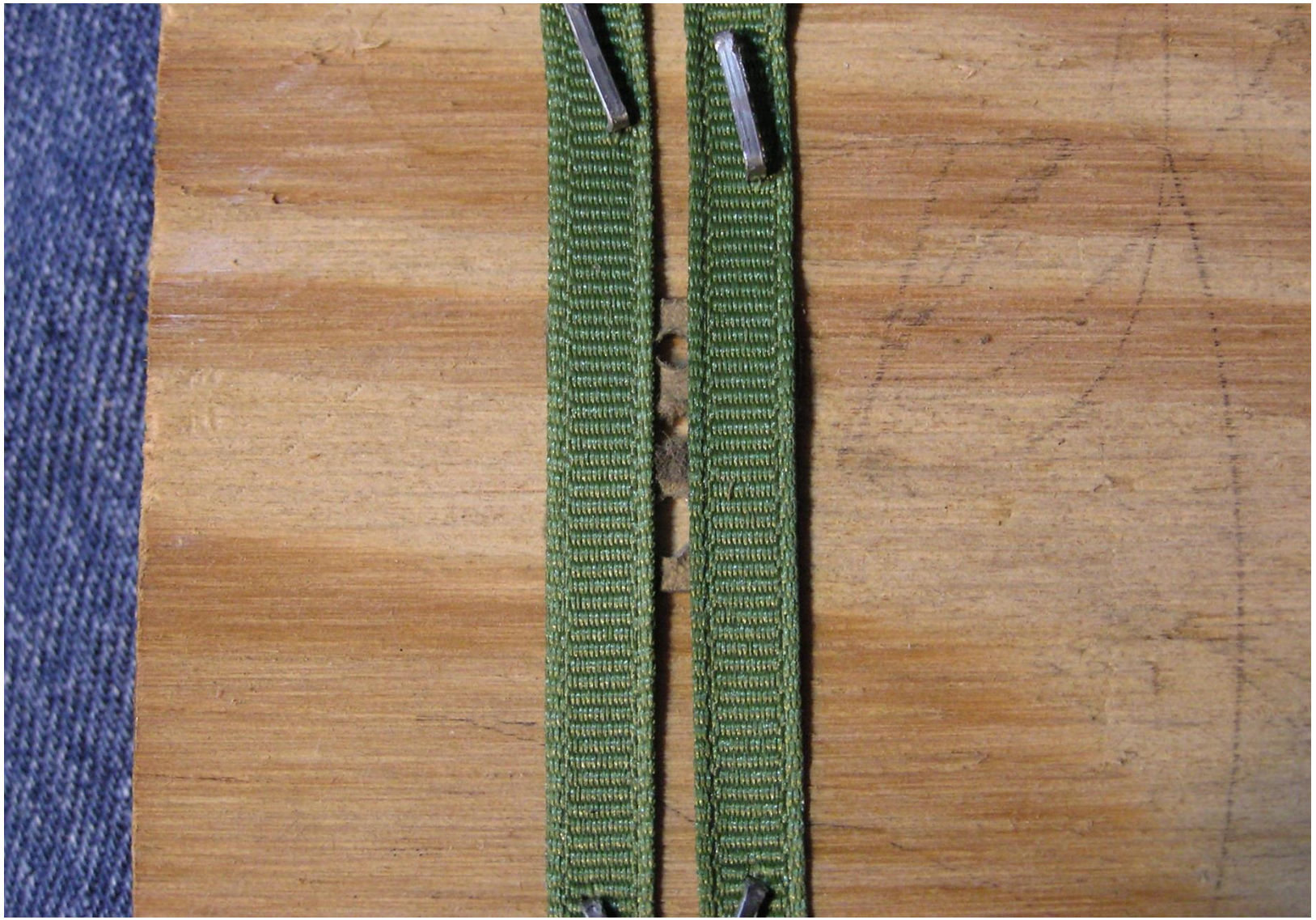
Remove rivets/screws from plate pairs and clean up for re-use




approx.
100% Silk
Jungle Greens
7102
Variegated
7mm (Approx. ¼ in) width
Ribbon Embroidery
Made in China
Bucilla®
Bucilla Corp. Hazleton, PA 18201



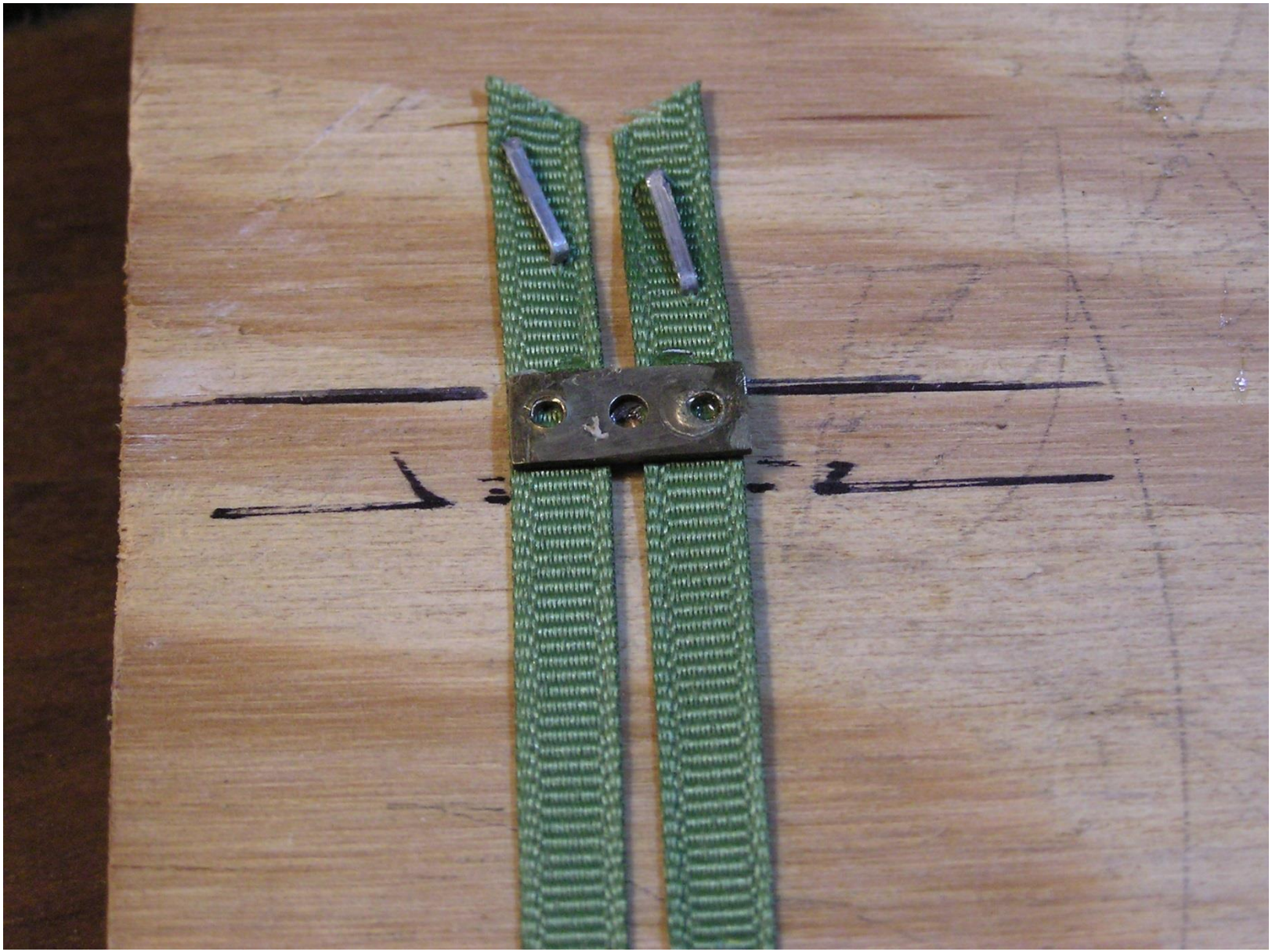
- Staple silk ribbon to board



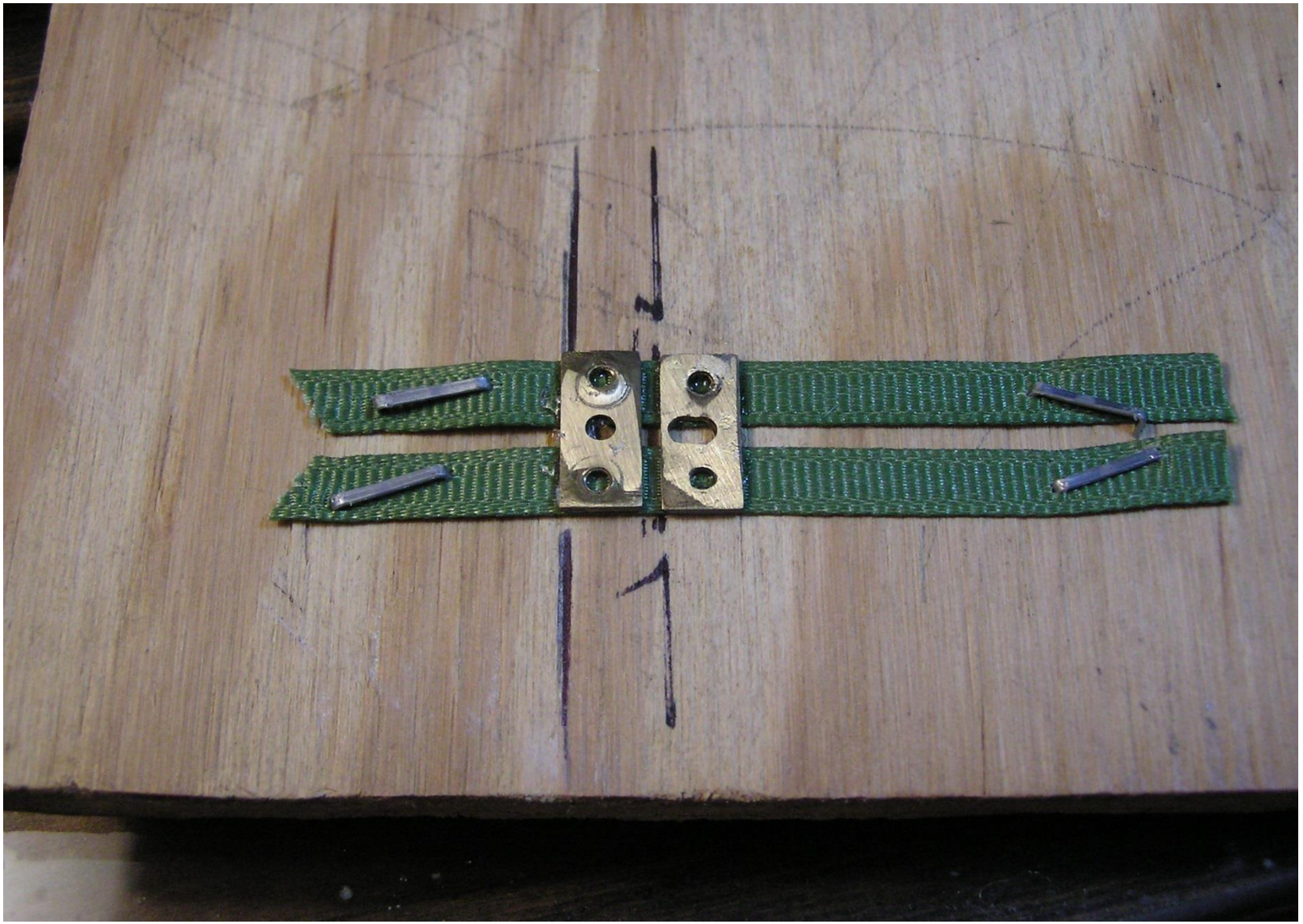
- Staple second silk ribbon – parallel to brass width

(Note cardboard spacers from original suspension)

- Cement or EPOXY one brass to both ribbons

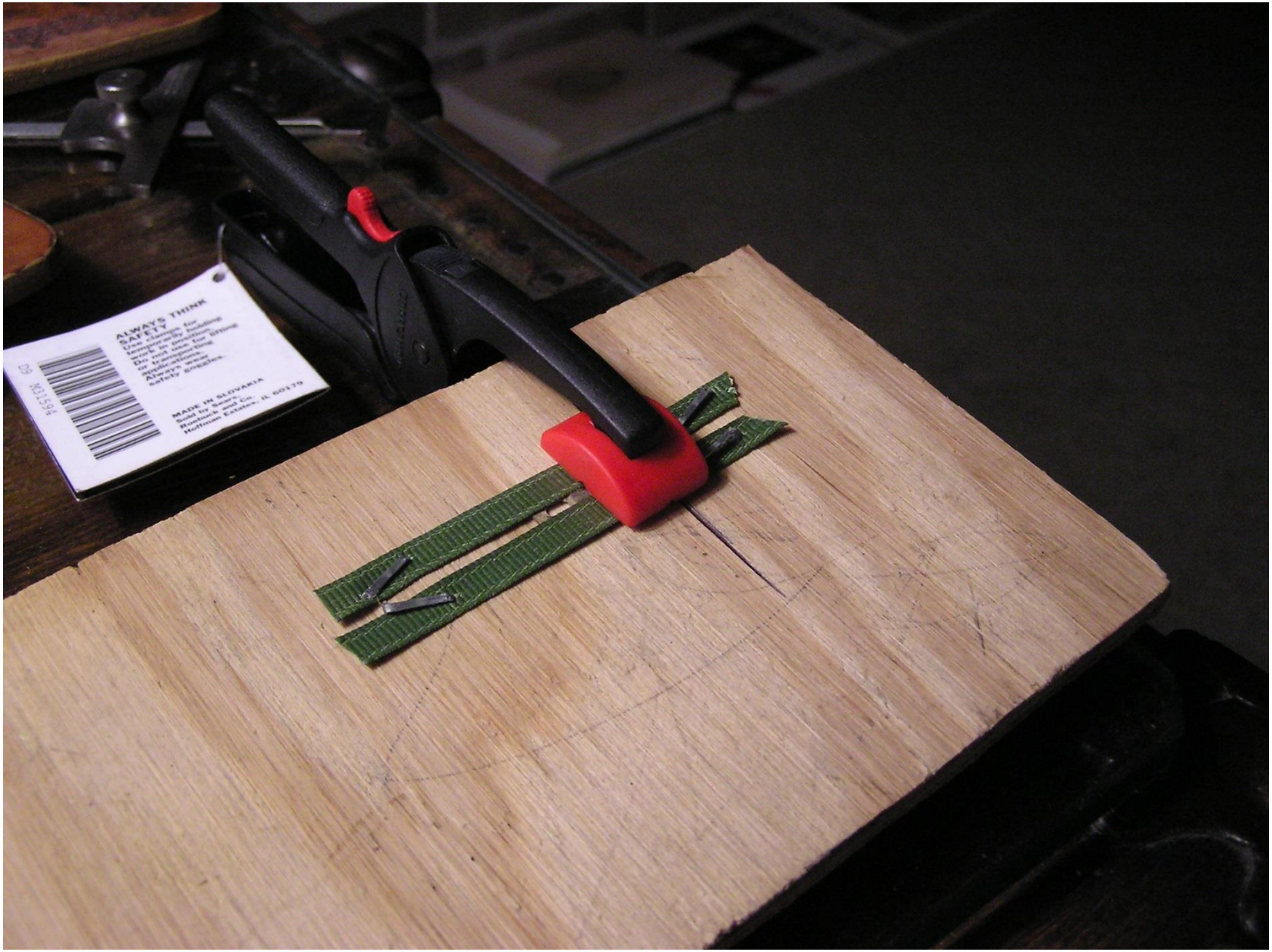


- Measure 1/8” spacing for second brass



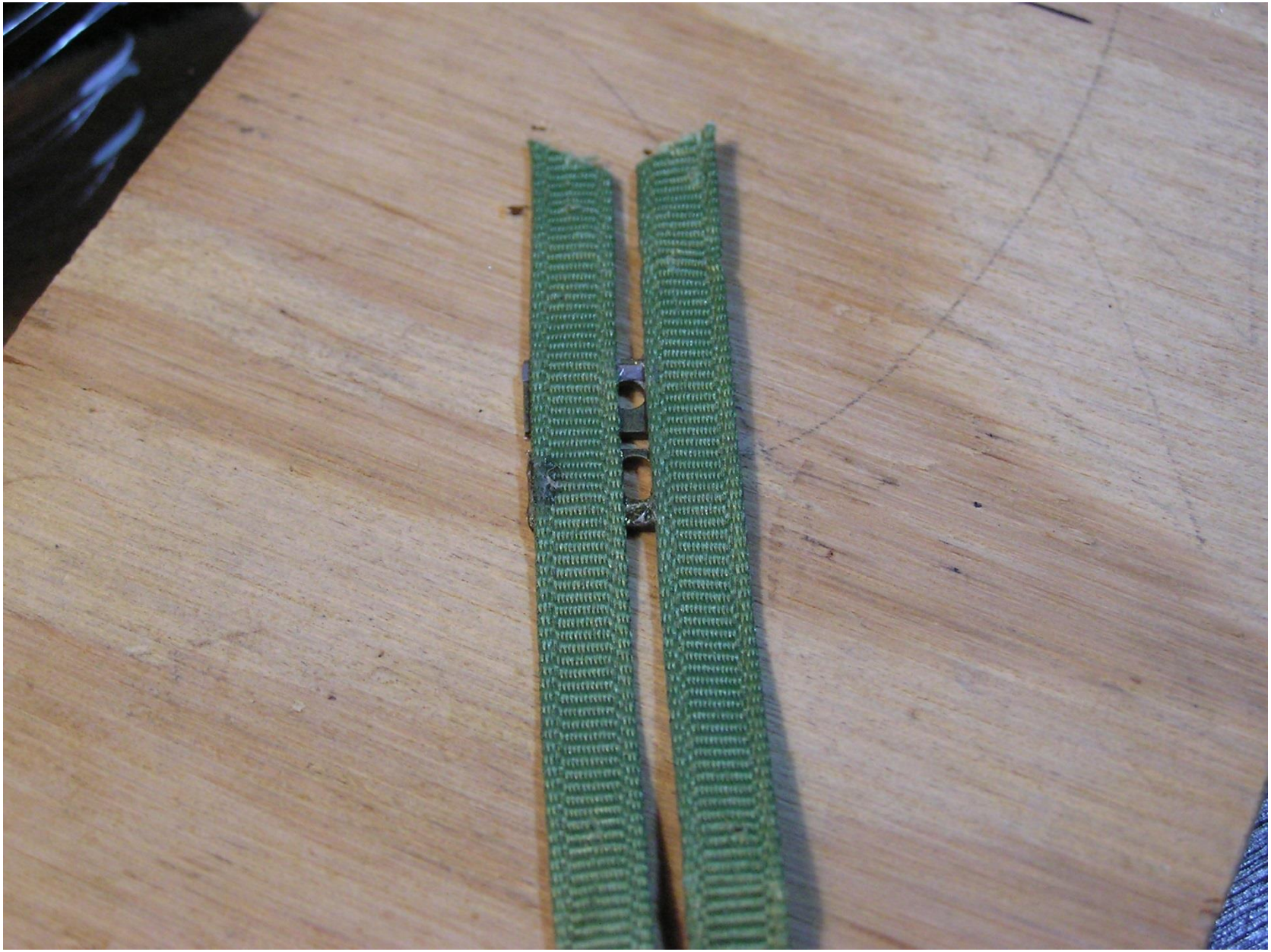
- Cement second brass parallel to base of first

(Spacing between bars critical)



- Clamp or press with weight until dry

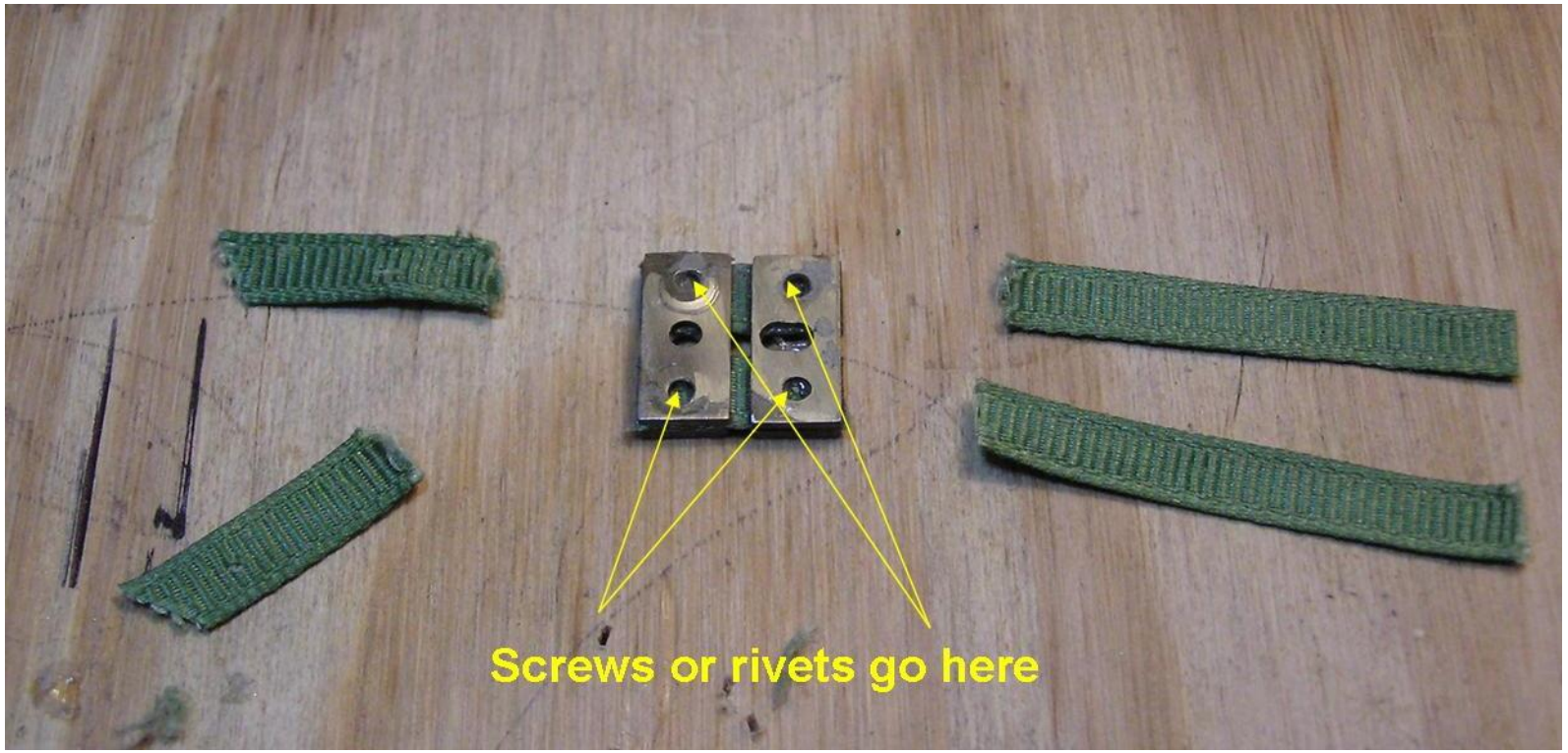
Remove staples



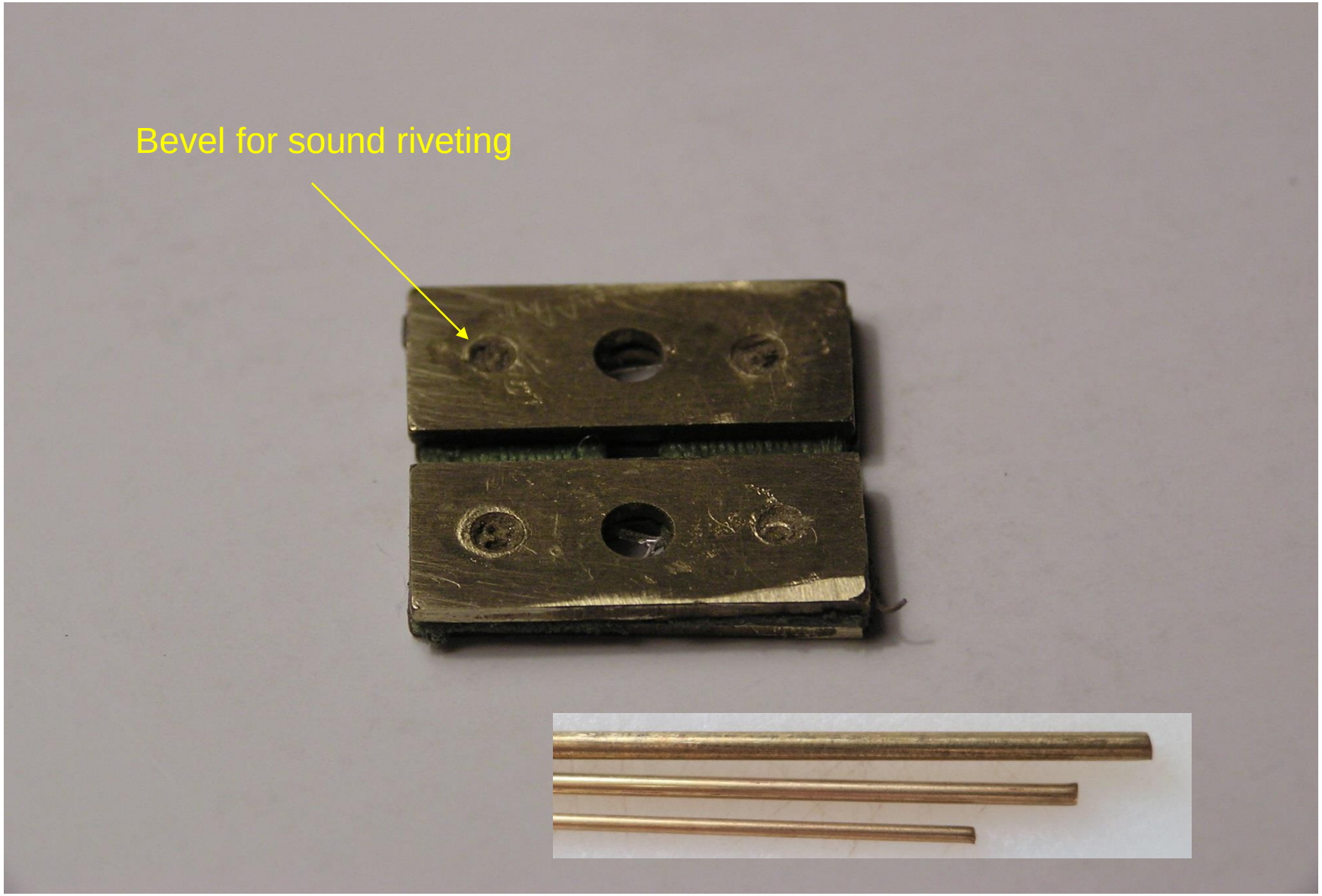
- Flip over so cemented brass bars are underneath

- Use cemented brass bars as guide when attaching remaining bars

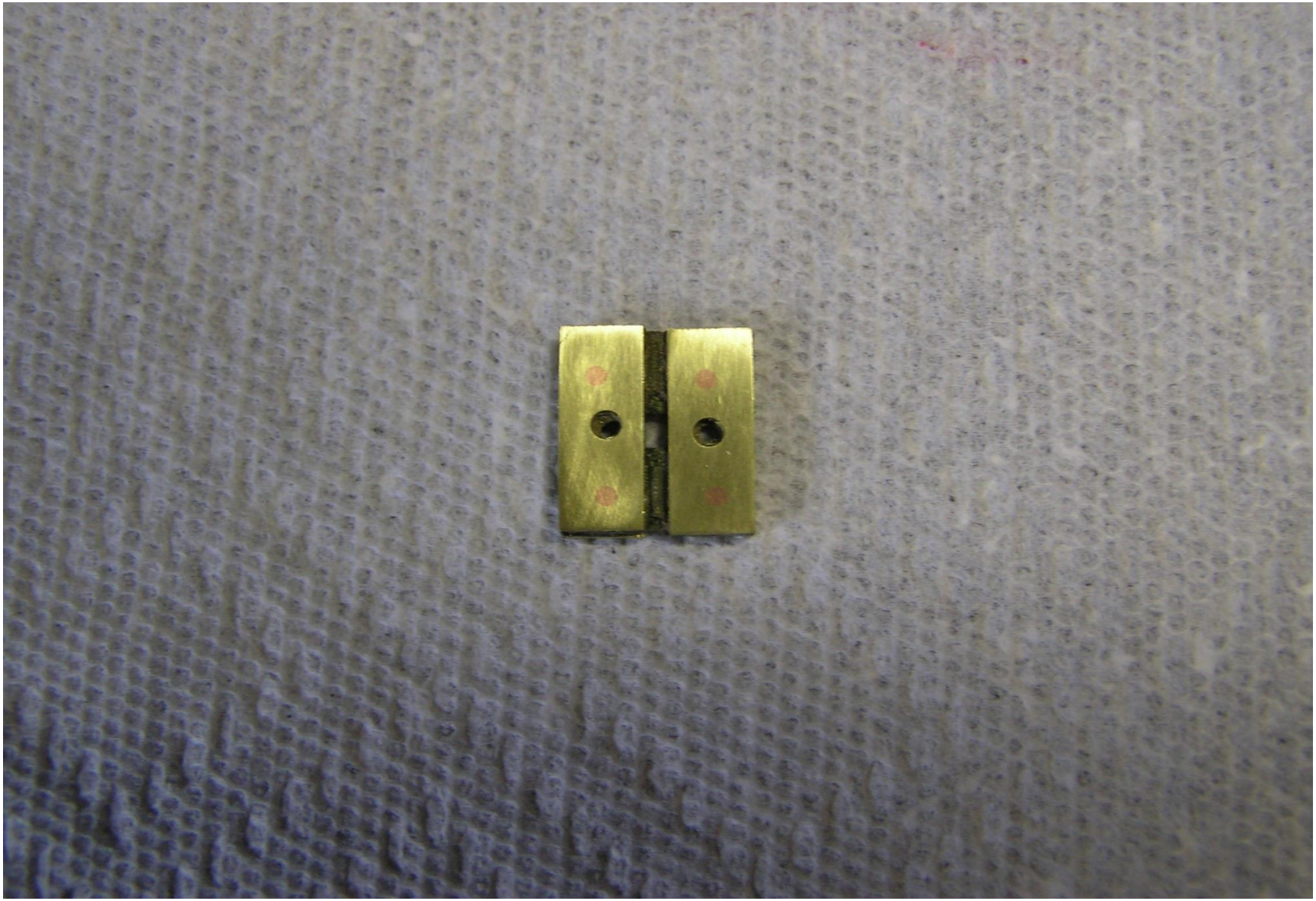
- Note alignment of bars when cementing



- Clip excess and clean holes

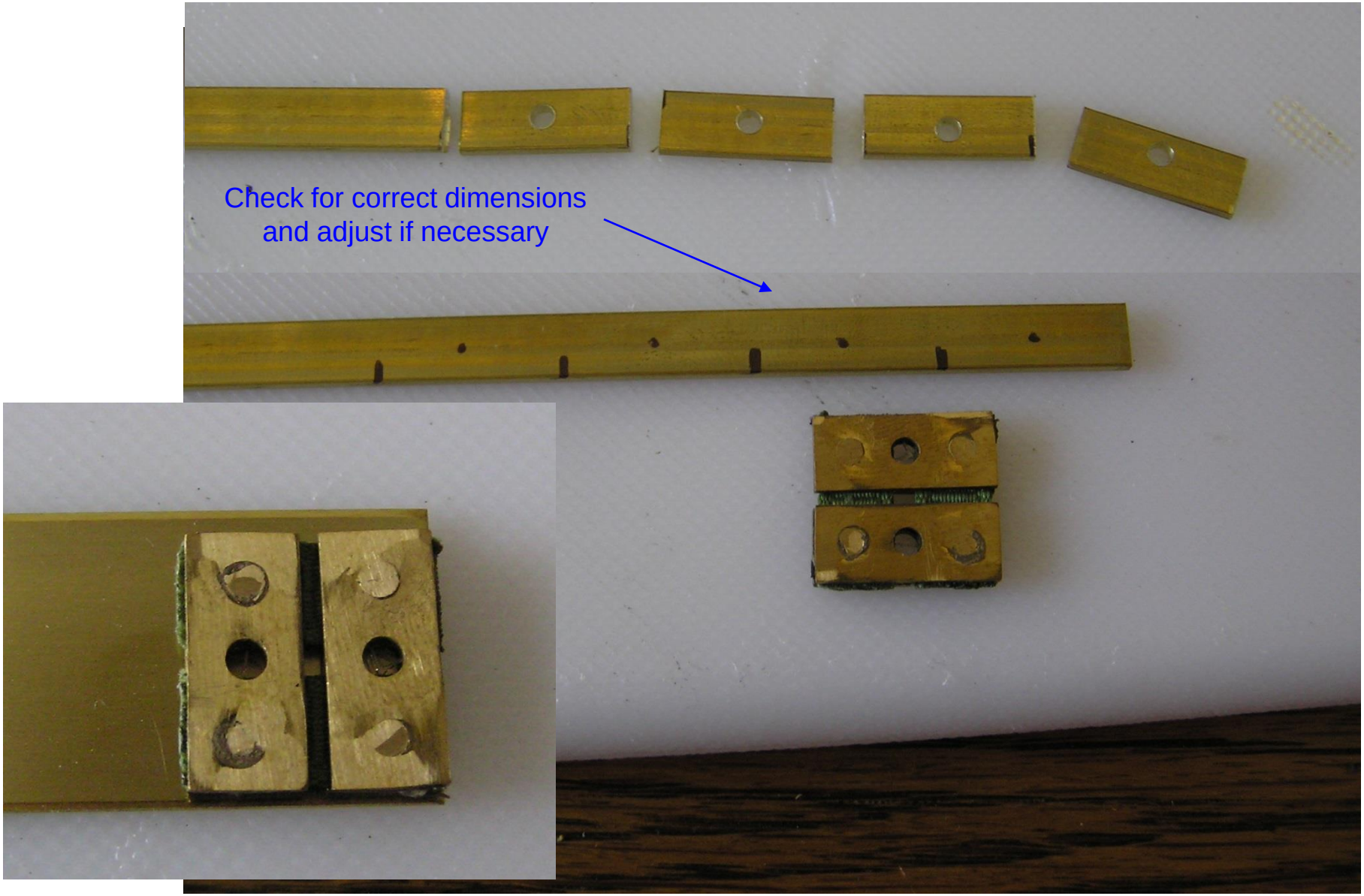


- Clean holes and rivet with brass or copper wire



Riveted, sanded and cleaned

Replacement Material



References

- Miles, Robert H. A., 1995, The Bulle-Clock of Favre-Bulle Practical Manual, The Electrical Horology Group, 55pp.
- Belmont, Henry L., 1975, La Bulle-Clock Horlogerie Electrique, Millot & Co., 156pp.
- www.aussieclocks.com/gallery_archive/articles/bulle/bulle.html (Lindsay Bramell)
- www.horologix.com (Peter Smith)
- www.ukclocks.com (parts)
- www.timesavers.com (parts)

We are done now!