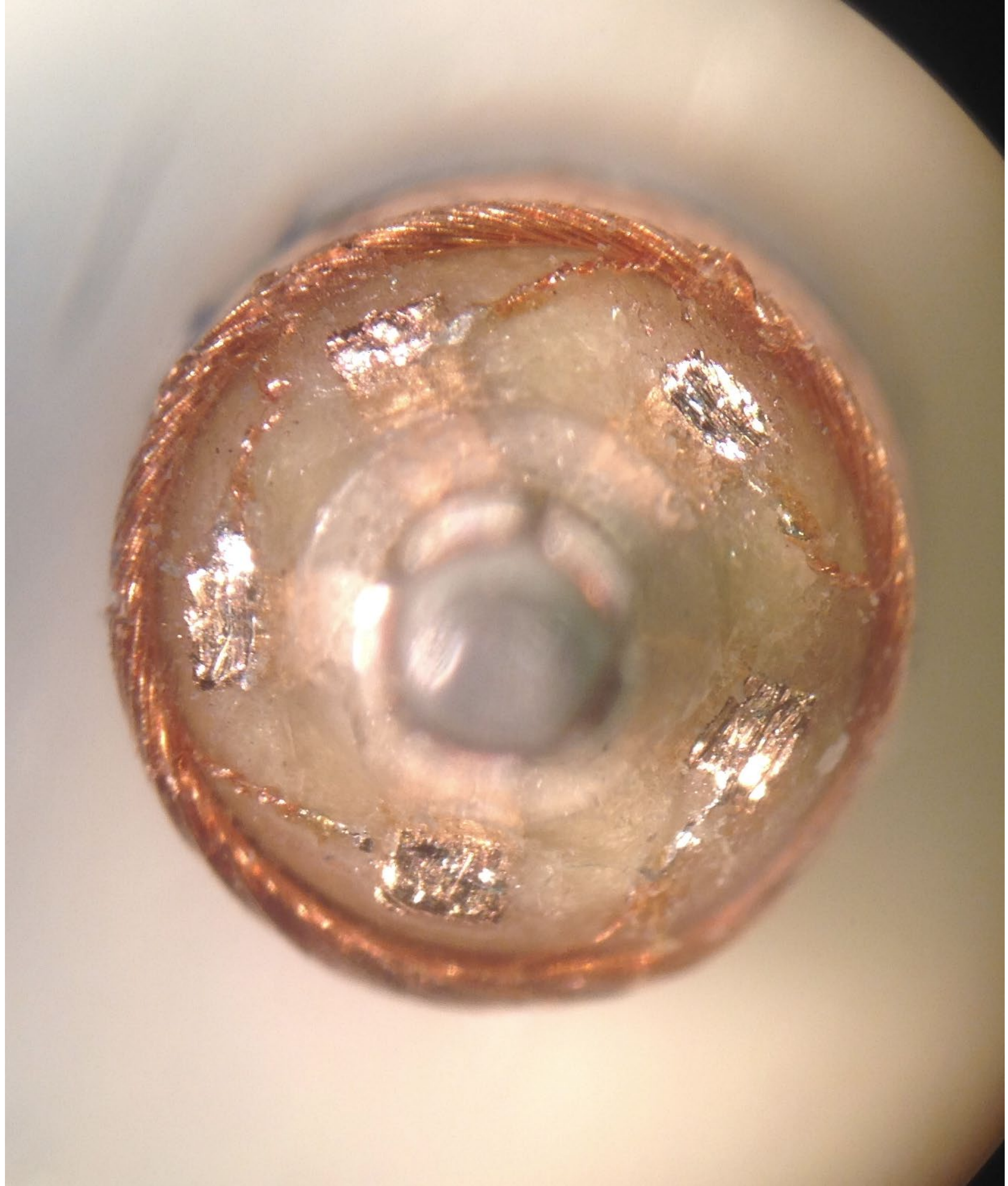
Custom Made HO Scale Operational

Wig-Wag Crossing

Bruce Kingsley
January 14, 2025 (Revision 3)

The 3mm (.118 inches) stepper motor was from a small camera focus driver.

The motor bushes connections are now removed.

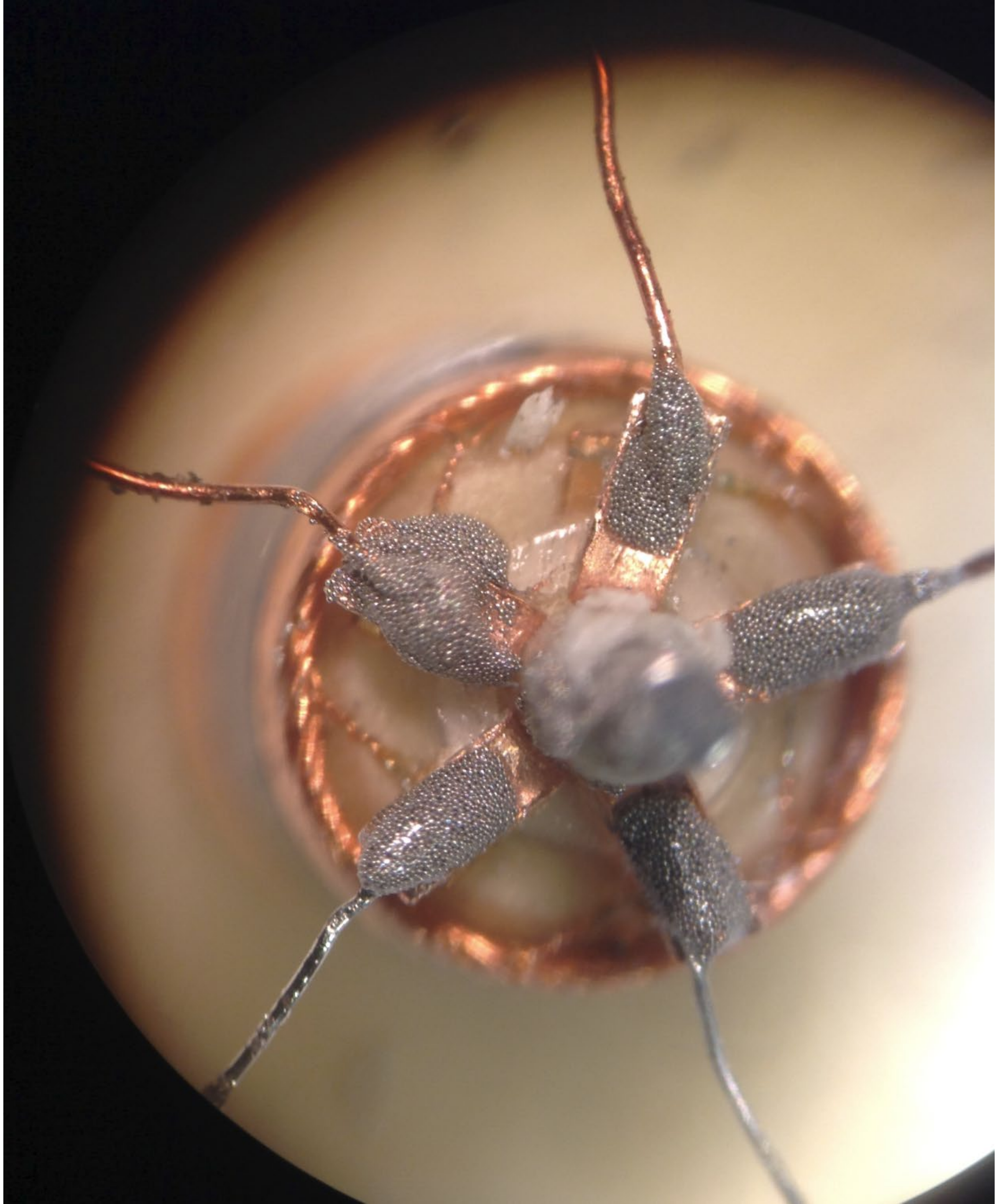



3X

That’s only 48-gauge wire that I had to remove the varnish on the ends.

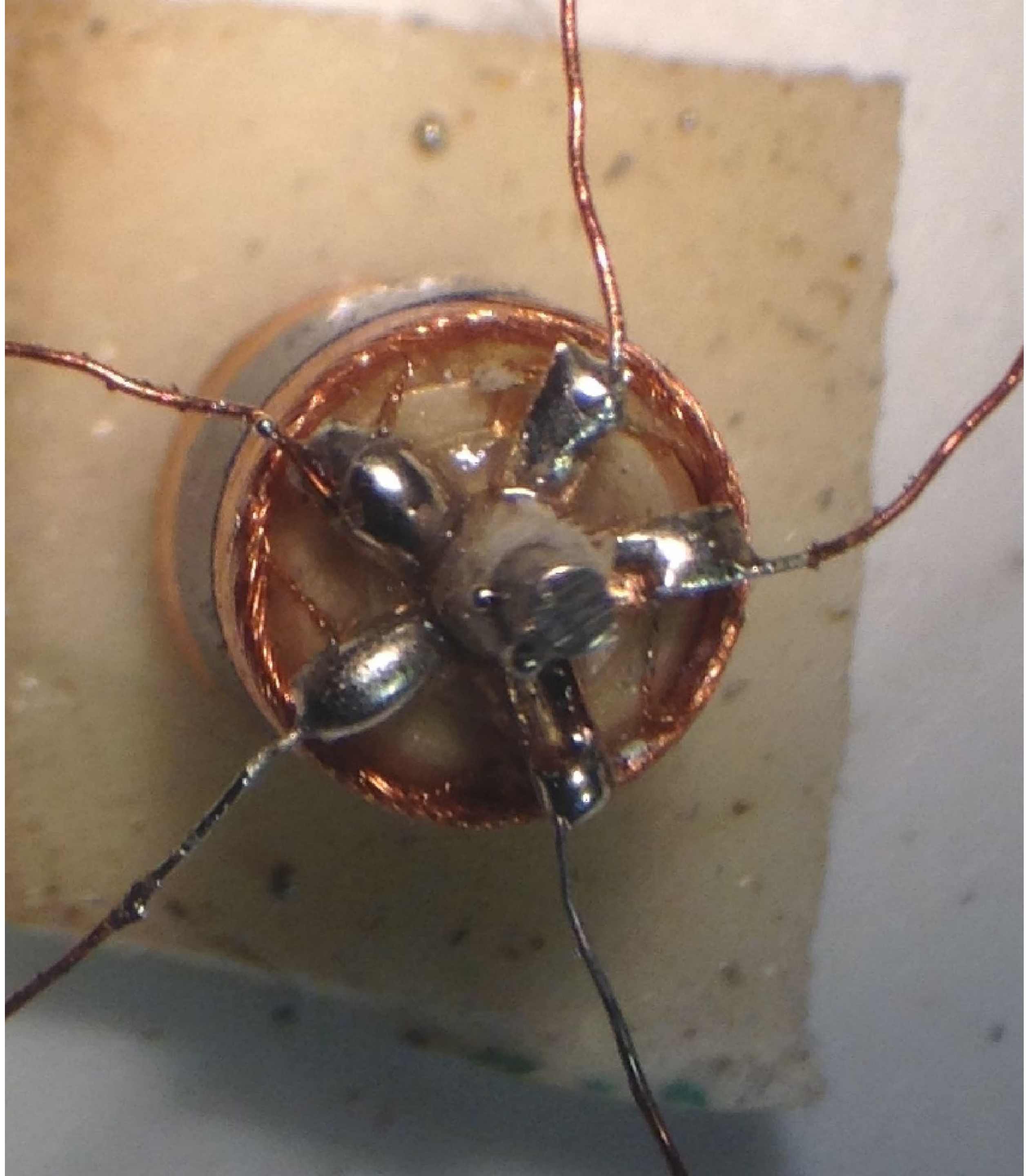
The silver solder paste looks like paint by the naked eye, under the microscope it’s tiny beads in flux.

This was applied using the tip of a very small needle pin.



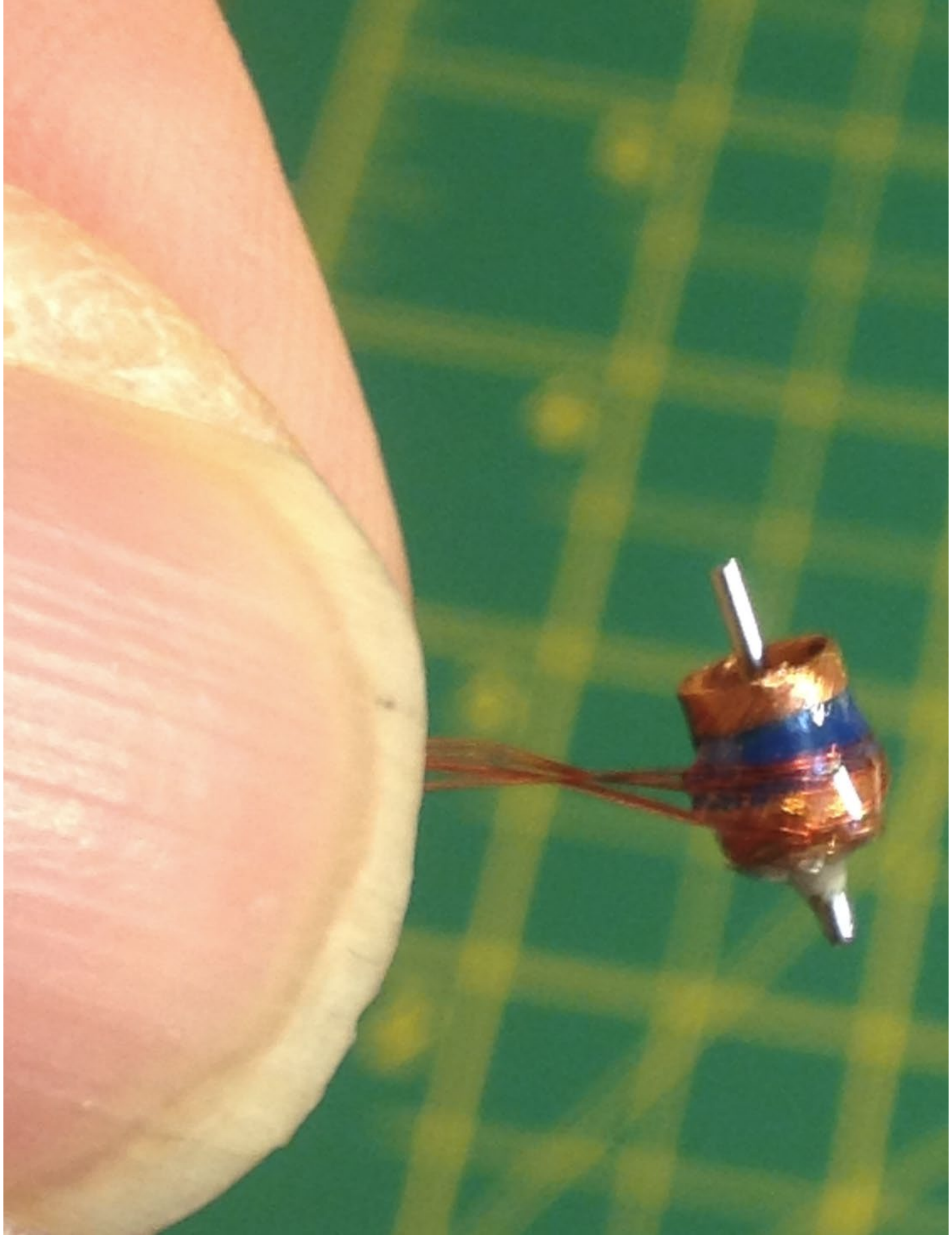
After only 1.5 seconds of hot air to melt the solder paste.

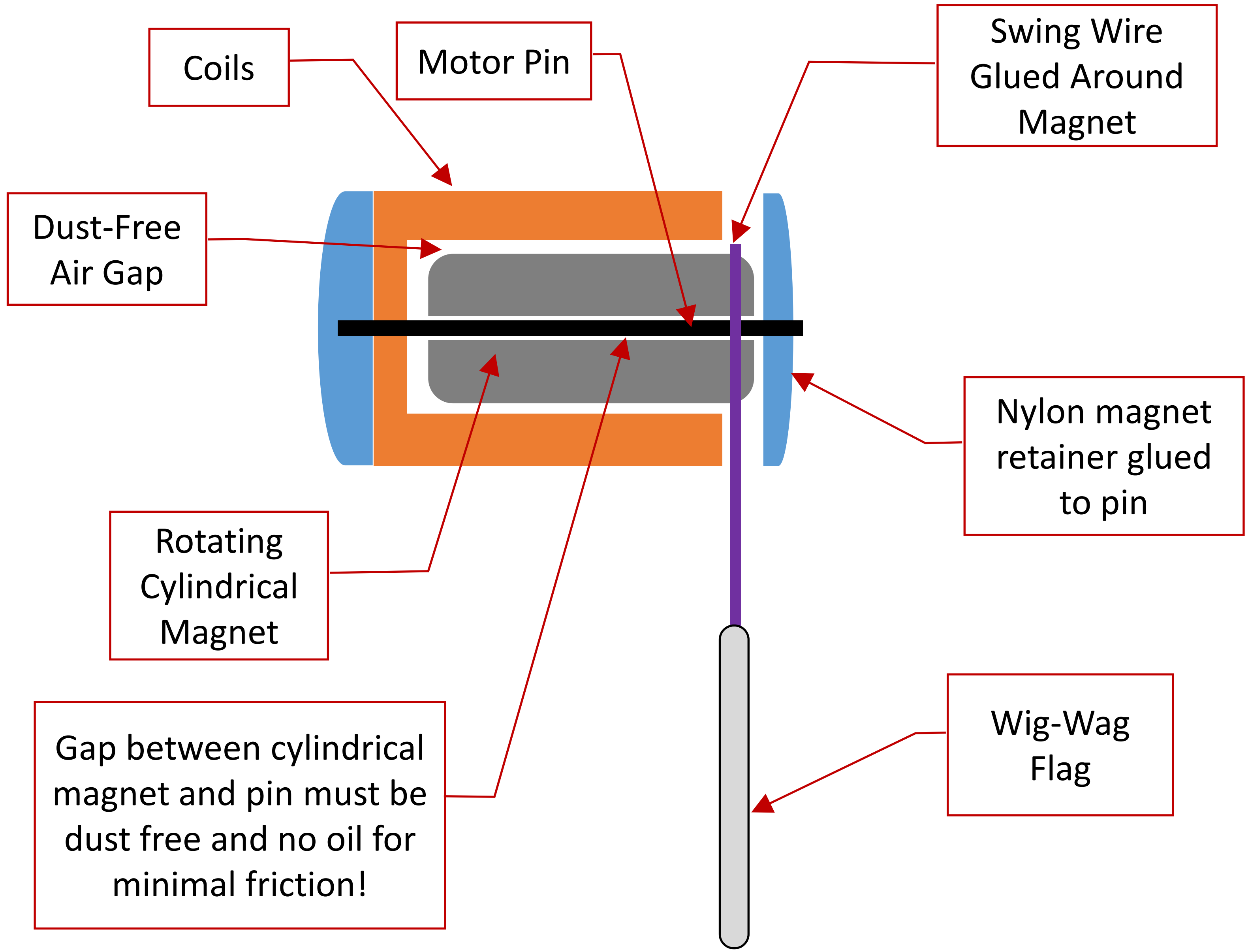
I went through four motors before I soldered it without melting the motor.



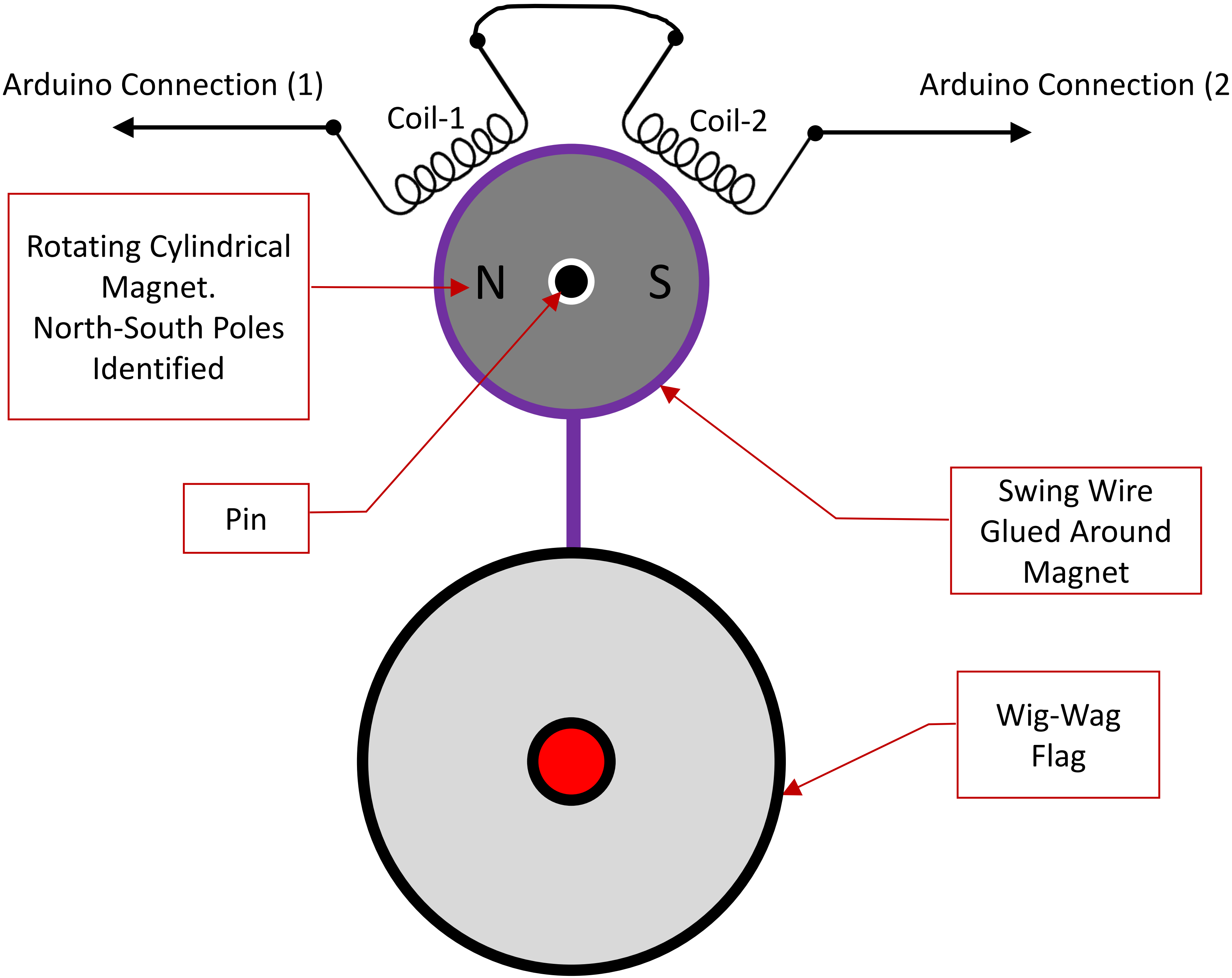
Applied Epoxy to secure the wires that can easily break just handling them.

Hard part done.

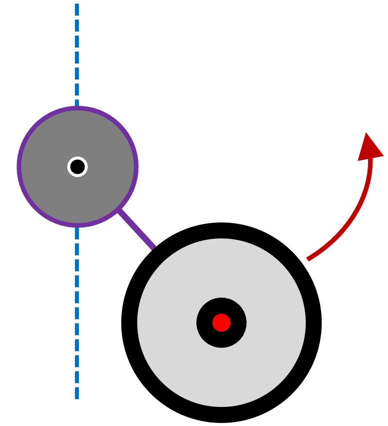




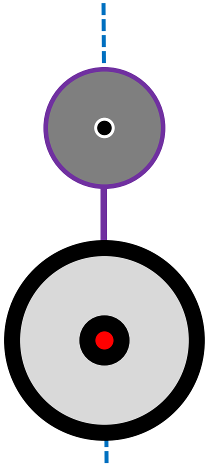
Cross-Section Only Cylindrical Magnet Rotates


Arduino Connection (1)
Coil-1
Coil-2
Arduino Connection (2)
Rotating Cylindrical Magnet. North-South Poles Identified
N
S
Pin
Swing Wire Glued Around Magnet
Wig-Wag Flag

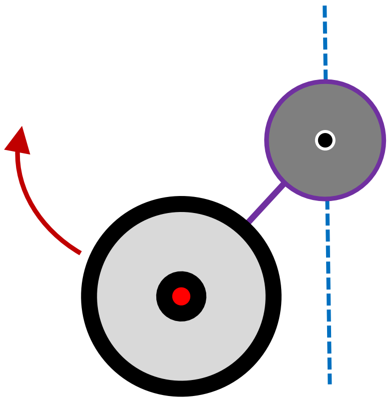
When a positive voltage is applied to Arduino Connection (1) and zero volts is applied to Arduino Connection (2) the magnet rotates Counterclockwise (CCW).



When zero volts is applied to both Arduino Connection (1) and Arduino Connection (2) the magnet rotates down using gravity.



When a positive voltage is applied to Arduino Connection (2) and zero volts is applied to Arduino Connection (1) the magnet rotates Clockwise (CCW).

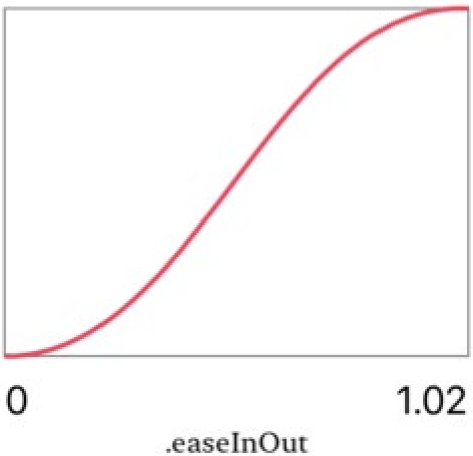


The Arduino software must use the PWM Analog output function as well as a Sine “Easing” function to produce a more natural swinging look.

Without this, the flag will very quickly rotate CCW, down and CW.

On my Wig-Wag I had to put current limiting resistors on both coil connections.

You will need to run tests to determine what two (2) of the five (5) stepper motor coil connections are required to get the two apposing phases.



The coil is now stationary mounted in a brass housing.

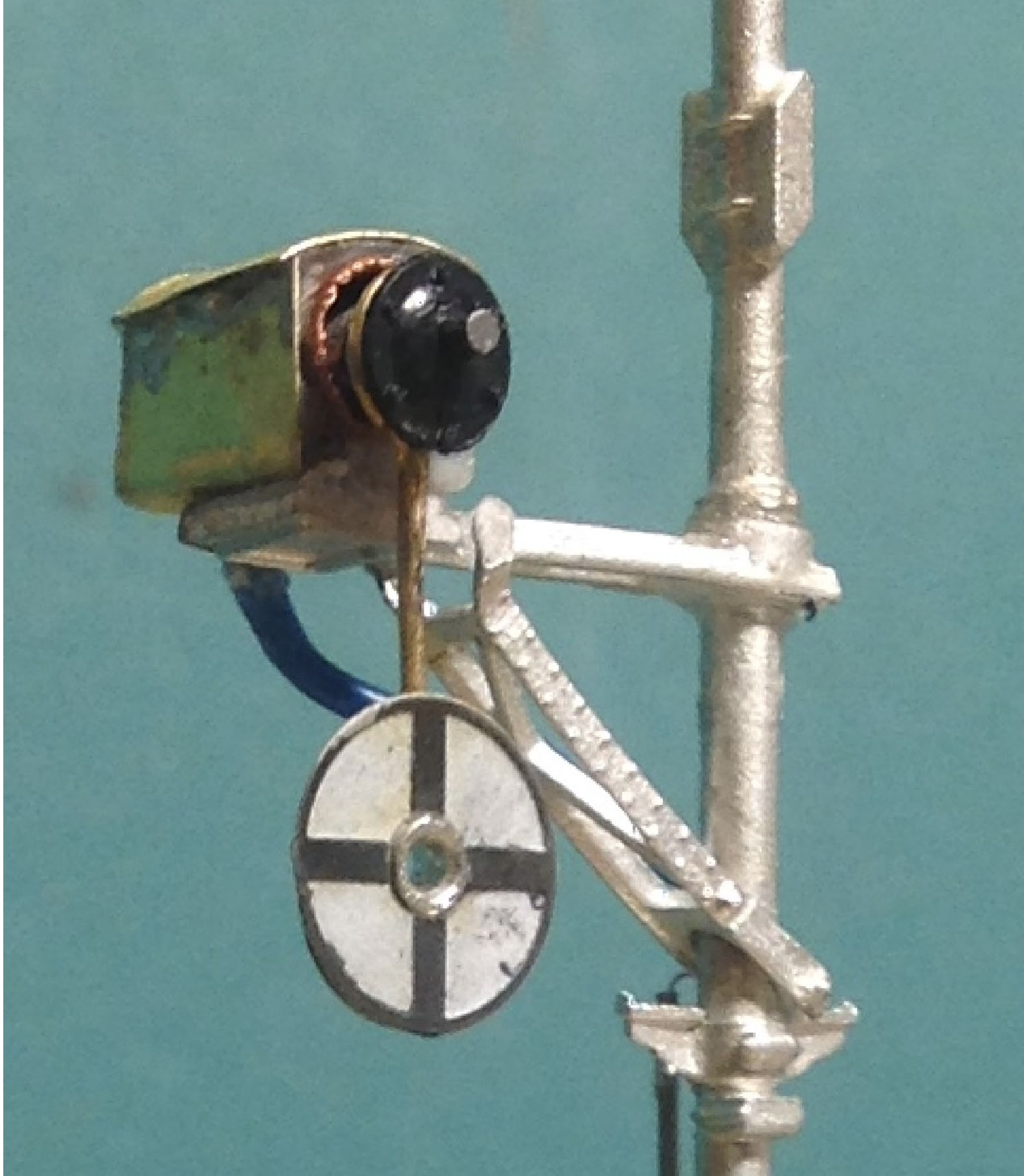
The swing harm is connected to a cylindrical magnet that rotates within the coils.

Like a real Wig-Wag, the coils swings the arm up, gravity makes it swing down.

Mounted to:

Showcase Miniatures
HO Magnetic Signal Co.
Model 10 Wigwag Flagman Kit

[Link to Product]



Painted and weathered.

Connected to an Arduino, a variable PWM current is applied to the coils to swing the arm.

[Link to YouTube Demo Video]