

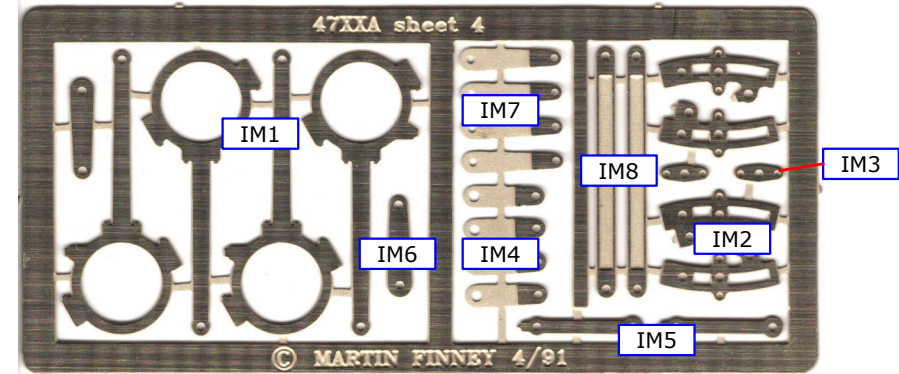
## GWR 47XX & 51XX CLASS INSIDE VALVE GEAR

### ETCHED COMPONENTS

- IM1 Eccentric rod/sheath (4) 158
- IM2 Expansion link lamination (4) 159
- IM3 Expansion link hanger pivot (2) 160
- IM4 Reversing arm lamination (4) 161
- IM5 Link hanger (2) 162
- IM6 Rock shaft inner lever (2) 163
- IM7 Rock shaft outer lever lamination (4) 164
- IM8 Extension rod (2) 165

### OTHER COMPONENTS

- Short rivets (10)
- 0.7mm Brass wire for pinning eccentrics together
- 0.8 mm Brass wire for stuffing box studs
- 1.2 mm Brass wire for link hanger pivot
- 1.6 mm Brass wire for reversing shaft
- Brass eccentrics left (2)
- Brass eccentrics right (2)



The valve gear kit is designed to produce a working model of the Stephenson's link valve gear. For practicality two deviations from the prototype have been made. First the link block hangers have been omitted and instead the motion is suspended from the reversing shaft; there are no separate link blocks and the motion is permanently in full forward gear. Second the rock shafts which transfer the motion over the frames from the inside to the outside are omitted.

Study the diagrams carefully. The right side eccentrics lead the left by 90° to match the crankpins. The left side of the motion mirrors the right lagged by 90°. Chemically blacking moving surfaces at soldered joints can help ensure that the solder only goes where it is needed.

### ASSEMBLY.

Construction uses solder and pin construction. Use 60/40 cored solder with plenty of La-Co flux paste and a micro flame to generate enough heat. Use a sacrificial cheap brush and brush more flux round the axle whilst hot. More solder is good! Either solder the complete assembly in one go or assemble and then solder each side in place on the axle separately.

**Eccentrics.** Ream out the holes in the eccentrics so that they are a tight fit on the axle. Then carefully open out the small holes in the eccentrics, so that the 0.7mm wire fits in the holes. Check the fit of the eccentric sheaths on the eccentrics. Drill a 3/16" hole in a small block of wood leaving the drill in the hole to act as a mandrel to align the eccentrics. Assemble the eccentric sheaths, eccentrics and 0.7mm wire pin in pairs over the mandrel and solder the wire pin to both eccentrics. Cut the wire flush with the face of the eccentrics.

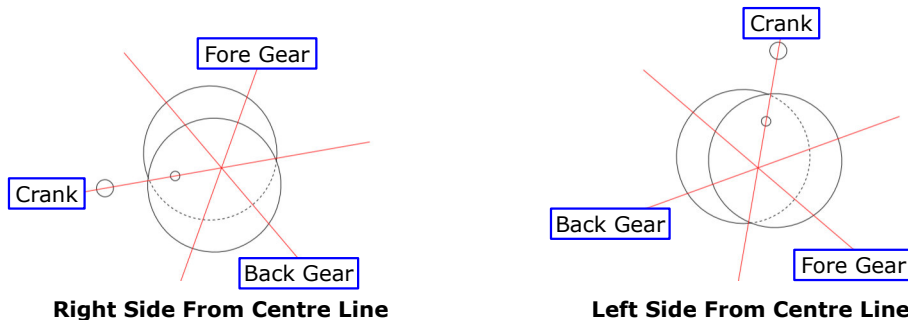
**Assembly.** Fit the eccentrics to the crank axle using the drawing to ensure correct orientation.

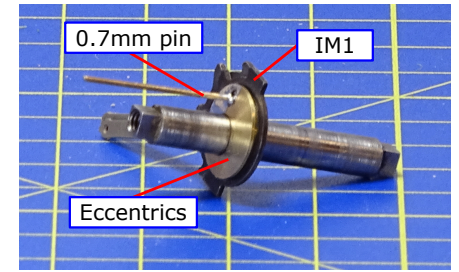
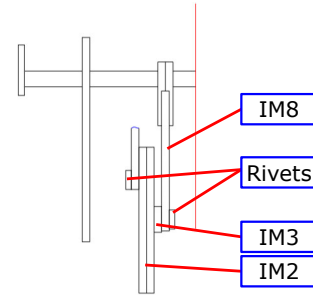
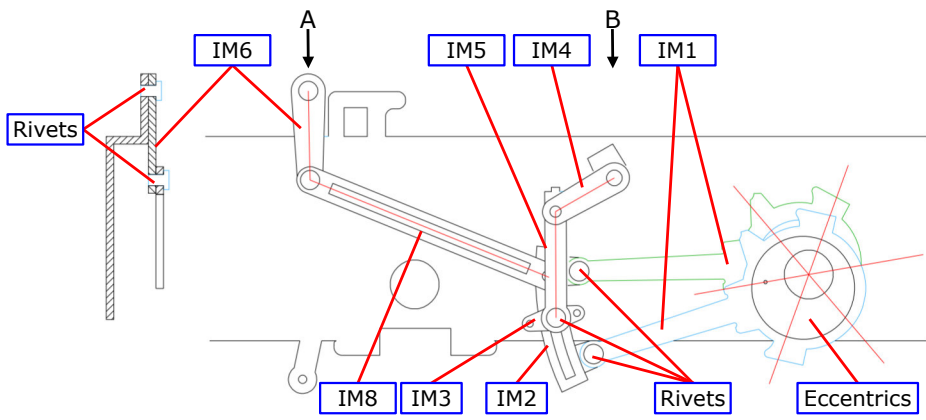
The eccentric should be fixed at 6mm centres for finescale and 8mm centres for S7. It is probably easiest to mark the inner alignment of the eccentrics on the axle. Space the eccentrics on the axle so that pairs of eccentrics are at the correct centres and they are in the correct position with respect to the cranks. Solder the eccentrics to the axle as described above. Check all joints are properly soldered and clean up.

**Reversing Shaft.** Solder the reversing shaft laminations to the 1.6mm wire reversing shaft so that the reversing arms are at 4mm centres for Finescale and 6mm for S7. Trim the left hand end of the shaft so that it fits in the housing on the left frame while the reversing arms are centred on the frame centre line and that sufficient wire projects through the right frame to later fit the reversing shaft lower arm (U37). Open the hanger pivot holes in the reversing arms to 1.2mm so that the wire is a tight fit.

**Testing.** Fit the axle and bearings into the centre hornguide and fit the rock shaft tubes through the slots in the frames. Temporarily suspend the extension rods and rock shafts with a piece of wire through the frame brackets; a suitable piece of wire insulation can space the rock shafts apart. Fit a piece of 1.2mm wire to suspend the link hangers. The valve gear should move without flopping about.

**Finishing.** The valve gear is permanently fixed by riveting the rock levers to the frame brackets and soldering the link hanger suspension wire in place. Solder the reversing shaft to the frames.

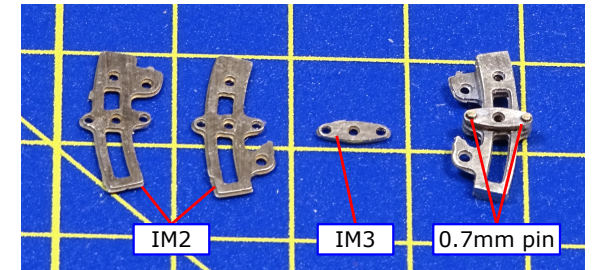
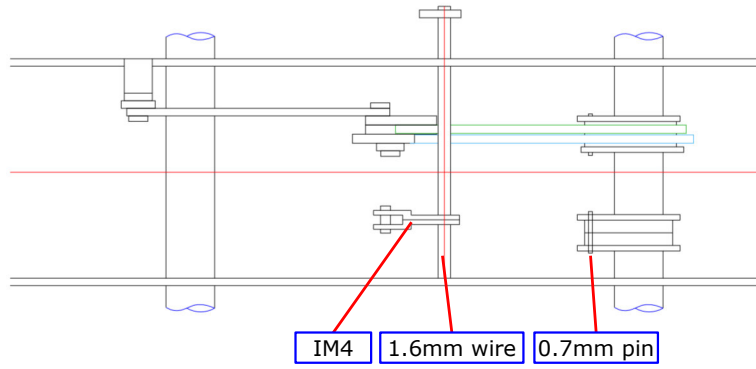




Section on AA

View from C/L

Section on BB



Valve Gear Construction

