East Bedfordshire Model Railway Society

A simple sojourn into the world of point rodding

Picture yourself in this scene. It's dark; the only street light is flickering between life and death, and a cool wind is whipping up fallen leaves into swirling columns. You tuck your face deeper into your collar and rewind the scarf around your neck. There's a building ahead, some hope of shelter as spots of rain start pattering on your head and coat, and a flash is quickly followed by a broad rumble of thunder. You brace yourself and step on, dashing into the doorway and as your eyes adjust to the porch light you see the notice on the door. An icy chill stabs you like a knife in the stomach when you see the words "**Tonight: a simple sojourn into the world of point rodding**". Have you made a horrible mistake? Someone, somewhere, lets out a hideous, gargling scream but it's too late, a gnarled hand, scarred from years of soldering-iron abuse, emerges from the doorway and guides you in.....you are now in the darkly esoteric world of.....The Railway Club.....

I've been aiming to write this for some time, in support of the point rodding needs for Finchley. It is a broad and complex subject, more so than I think we need concern ourselves at 1:76 scale. I shall principally keep to what seems pertinent for Finchley in the hope it makes it simpler, but before I start I'll remind you I worked out a signalling scheme based partially on what we know existed, alongside the need for adaptations for our created scheme. Then there was a debate about the kinds of signals to be used, changing some of the planned semaphores to electric light, which has made me reconsider what the signal box functions need to be and so it resulted in some changes to the scheme and the required rodding. Did I say I'd try to keep it simple?

Here, then, I will consider the mechanical operation of points, point locks, signal arms and signal detection, and your challenge is to correct or question anything you think is amiss!

You should all be familiar with the image of the signalman in his box, duster in hand, standing by a fine raft of colourful levers with polished handles and a shelf of burnished walnut block instruments. Craftsmanship at its finest! The levers control the locks, points and signals and for each of these there is a linked rod mechanism beneath the frame which pivots down through the floor (and interlocking tappets) to cranks in the base to transfer onward movement.

Signal Wires

Signal wires are wound from 7 strands of wire at about 15swg to 17swg. The signal wires are supported on small pulley wheels, about 1¾" diameter, on posts about 13" to 18" tall, around 24' apart with multiple wires, up to 30' apart if only a single wire is being supported. And for changing direction a larger pulley wheel is used, with a chain of about 6' around the pulley to avoid the wire chafing. The 'normal' wheel size is about 10" but could be anything from about 6" up to 24" depending on position and potential wire slack to be dealt with. Signal wires were also commonly supported from any suitable surface, not just wooden posts.

For Finchley we need to resolve whether to model any of these items – the wheels and posts are obvious to the eye, but the wires are less so and may be too delicate or awkward to include for exhibition working. Perhaps someone can suggest something suitable or even provide a small demonstration? It will need to be robust. Where we will now use electric light signalling we don't need the mechanics, but we do need to look at whether we need to fit cable trunking, another aspect someone can help to research.

Point rodding

Rodding: First patented by Webb of the LNWR in 1874, which used square channel and is what we will use on Finchley. For comparison, round section came in 1 & 5/16" section lengths of 16' . Square section was 1 5/8 x 1 7/32 and in lengths of 18' to 18'6". Rodding was supported at joins and in the centre of the length using pulley wheels – round section at 2 ¾" centres, square section at 2 1/2" centres.

1 Lead-off bed outside Wansford signal box

The first appearance of the rods and signal wires will be through openings at the base of the box, where a set of pulley wheels (for signal wires) and cranks (for rodding) are set out on the lead-off bed. Some lower quadrant signals situated near the box may be operated by rodding, e.g. M.R. practice. The lead-off bed can be a cramped space, so the various wheels, cranks and runs are arranged at different heights to negotiate each other. Note the photograph which shows the lead-off bed as a set of sleeper timbers as there's a lot to secure, but individual bases may be utilised. For lever frames set at 4" centres the bases are set at 55 degrees (from the box) to ensure the movement forces are along the line of the base. The angle changes in accordance with the lever centres.

There are two basic types of crank for lead-off bed positions, the standard right-angle crank and a semi-circular accommodating crank for when space is limited. These can be 'handed' to continue the pull or push movement, or change pull to push & vice-versa.

Onward from the box we need to consider walking routes, cabling, tracks, buildings and whatever other railway accoutrements might be in the way. And, of course, they need to be supported off the ground.

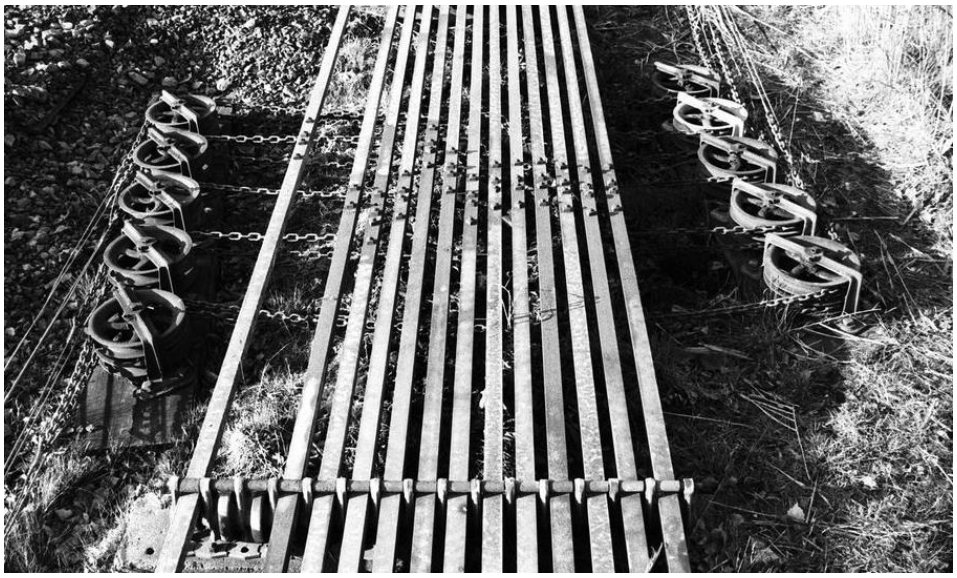
This picture shows a typical point-rodding stool, showing the concrete base, frame and wheels to ease movement.

2 Point rodding stool, SVR

The point rodding isn't particularly bendy, so to change direction requires further cranks. We note also it is made from metals which expand and contract with fluctuations in temperature. In 1925 the Board of Trade/Ministry of Transport set a limit of 350 yards for mechanically operated points, and a 350 yard run can vary by as much as 13¼ inches compared to the 4¼ inches required to move point blades. Anything over 10 yards requires a means to compensate for this variable, so a compensating crank is used.

3 Compensating crank, SVR

The compensating crank allows for thermal expansion, but also changes movement from push to pull/pull to push. Note here that the crank is at floor level, mounted on a timber base, and is connected to the rodding by angled links. Joins in the rodding can also be seen. There needs to be the same amount of push as pull in each run……



This image shows a considerable run, and how the signal wires have been required to change position by going underneath using wheels and chains.

So, we now have a view of some basics of the rodding and signal cables to get us away from the box – but we can't quite get to the points yet! In places using facing points there needs to be a locking mechanism.

4 Hopefully we don't need this much on Finchley!

A passenger line has a requirement for a full point lock, but a non-passenger line makes do with a simpler bolt lock, and the signal wire is linked to the point rodding nearby so that the signal can only be changed if the points are in the correct position. This is called' Detection'; a bar linked to the point tie bar is notched so that the corresponding signal wire bar can't be moved unless the notch is aligned correctly. The following three pictures illustrate the principle.

5 Facing point and detection at Bewdley, SVR

This picture shows an interesting array of equipment to change the points, lock it, detect the point position and signal wire runs. It also shows, right, some signal wire cranks which change direction of movement and happen to lift wires above the detection equipment.

6 A closer view of a point with facing lock and signal detection, quite close to the point

7 Another example showing the detection equipment a little further away.

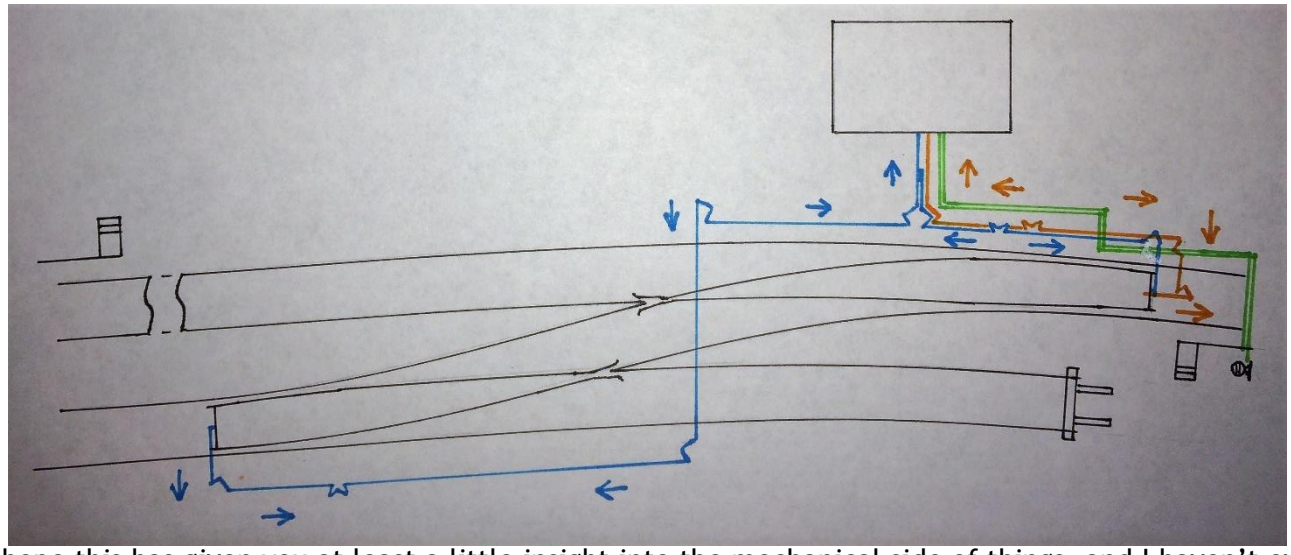
Pictures 6 shows a detector with three separate signal cables, and they are linked to both the point and the point lock.

Picture 7 shows similar but with one signal wire, and also sows the adjustable crank for the point change – there is an adjustable bracket fixed to the nearer arm on the crank for fine-tuning the overall movement.

Having got this far you now know about as much as me. Simples? When portrayed on Finchley at least we don't have to make it work! But I do propose we include representations of the key bits.

As a starter for 10 this last picture - illustrative at this stage - shows the crossover on the branch between Finchley and the Midland line, which is single line on the Midland side and requires a bolt lock. It is also covered by a signal and shunt signal from the single line side.

One lever changes both points, the rodding runs splitting from one rod on the lead-off bed. The run is shown in blue, including the cranks at the position required and the obligatory compensating crank as a sort of 'M' shape. The point lock run is shown in orange and signal wires in green, with the detection needs being close to the point blades. Arrows show push and pull directions on each length.



I hope this has given you at least a little insight into the mechanical side of things, and I haven't even touched on the links to the electric signals, which operated on a local basis with electrical links into the box. If you can add any further detail on any of this it would be most welcome.

Sources

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