

A Steven's Lever Frame

Manufactured by: Scale Signal Supply, 135 Green Meadows, Westhoughton,
BOLTON, BL5 2BW. Tel: 01942 817 350

This is modelled at 1" to the Foot.

While visiting Guildex some years ago (about 1997 I think), I was intrigued by the example of a working lever frame on the Scale Signal Supply's stand. My aim is to run my railway (still unbuilt of course) as close to prototype as possible and this means using real interlocking combined with infrared control of battery operated locomotives (now changed to DCC).

Therefore, at the Reading show I ordered a 9-lever frame to experiment with and test out my ideas. John Matthews (now Peter Stephenson 2003) of Scale Signal Supply (usual disclaimer) makes it abundantly clear that there is a good deal of work involved but since most of the construction uses nuts and bolts, much of this is in cleaning up and polishing the castings.

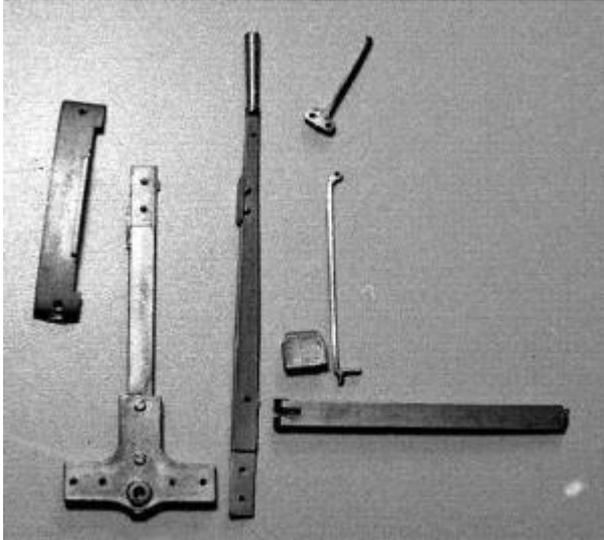
The parts arrived some weeks later and consisted of a large number of lost wax castings in nickel silver and brass, some 16th brass angle, sundry nuts, bolts, rivets, and a 1-inch square timber baulk.

The kit represents a 1 inch to the foot Stevens "Glasgow" lever frame. The parts are well cast with little flash. The parts are quite soft so some care is needed until they have become work hardened. I began by sawing all the various parts from the sprues with a piercing saw, separating them into different piles, and then sorting out all the parts for each lever.

The frame castings require some cleaning but the job was not onerous and the basic side frames were soon mounted on the timber baulk that is supplied. However, it is, as the instructions state, important that this be assembled square and accurately. It is worth taking time over.

I chose not to mount this on a wooden base at this stage - though the instructions recommend it - but mounted it in a vice. At this point one has the choice of cleaning up all the parts and then putting it all together, or to do the job lever by lever.

I chose to take the lever-by-lever route, as it seemed less prone to be boring and would provide motivation as the number of levers increased. There is great deal of information in the instructions but it is still a good idea to get the standard books on mechanical signalling by H. Raynar Wilson since he provides so much background data.



The first photo shows the various parts required for one lever and tappet bar after they had been cleaned up.

The most delicate item is the lift rod. For this it is useful to make a jig by drilling a small hole 48mm from the edge of a piece of ply and gently open it up to accept the short right angled end. This will allow of accurate filing without risking bending or breaking the part.

Another hole drilled to accept a small nail that is a close fit in the hole at the other end will help to hold it firm while filing the sides. The fourth side is more difficult but can be completed with care.

The lever is made up of two parts. The upper is nickel silver while the lower part is brass. The upper part needs careful cleaning up and the handle should be burnished. I used a 2 cut file to shape the rounded top to the handle. This is a little fiddly since this is also, where the casting sprue was attached though there probably is no other way of casting them. Then a 4 cut file for finishing followed with wet and dry to get a really burnished finish, like those I remember from days long ago working in Stetchford box as a booking boy.

It is a good idea I think at this stage to open out the holes to correct size in all the parts (except the brass angle where the floor plates go) and deepen the countersink in the floor plates until the bolt head is fractionally lower than the surface. The instructions are clear on what is which.

I also tapped all six holes in the end of the operating arm 10BA so that operating angle irons can be screwed directly into them.

The catch handles also need careful cleaning up. I found that the slot in them fitted well over an old needle file with some paper packing to protect the inner surface. Fitted thus in the vice made filing and polishing much easier on the pinkies and quicker too.

The latch block is perhaps the most difficult since it is not easy to set it up in the vice to file up. It required in some cases considerable filing and appears to be the part that is most prone to distortion during casting. It is however, essential that it slides very easily on the lever.



Important too to remember that the block must continue to move easily once the lever has been painted. The lift arm is soldered inside this and the short angle at the base trimmed to size.

I used 180-degree solder wire and a resistance-soldering unit (RSU)

with flux paste (but would now use Carr's 179-degree non-acid solder cream instead). The arm will need to be held tight in place with a small wooden peg that is a force fit in the slot.

By applying solder from the bottom end, it is easy to watch for the first trace appearing at the other and avoid having much to clean up afterwards. It may need some solder filing out of the slot to get it to slide easily on the lever.

Then it is time to do a trial fitting of the parts to test that the block falls under its own weight. I found that if the catch handle was first riveted to the lever and checked for free movement before the lift rod was riveted in place, the process was less prone to seizing up.

The first lever had to have the rivets removed and replaced before it worked well. Make sure that the lift lever is dead straight.

I soft soldered the two parts of the lever together, again with 180-degree solder and the RSU and found it adequate but you may prefer to use silver solder.

The parts have locating lugs and holes that are quite accurately registered. For each completed lever, I tapped one side of the slotted fitting in the tappet 10BA and bolted them in place so that they can be fitted and removed when the levers are in situ. This will make producing the interlocking less time consuming.

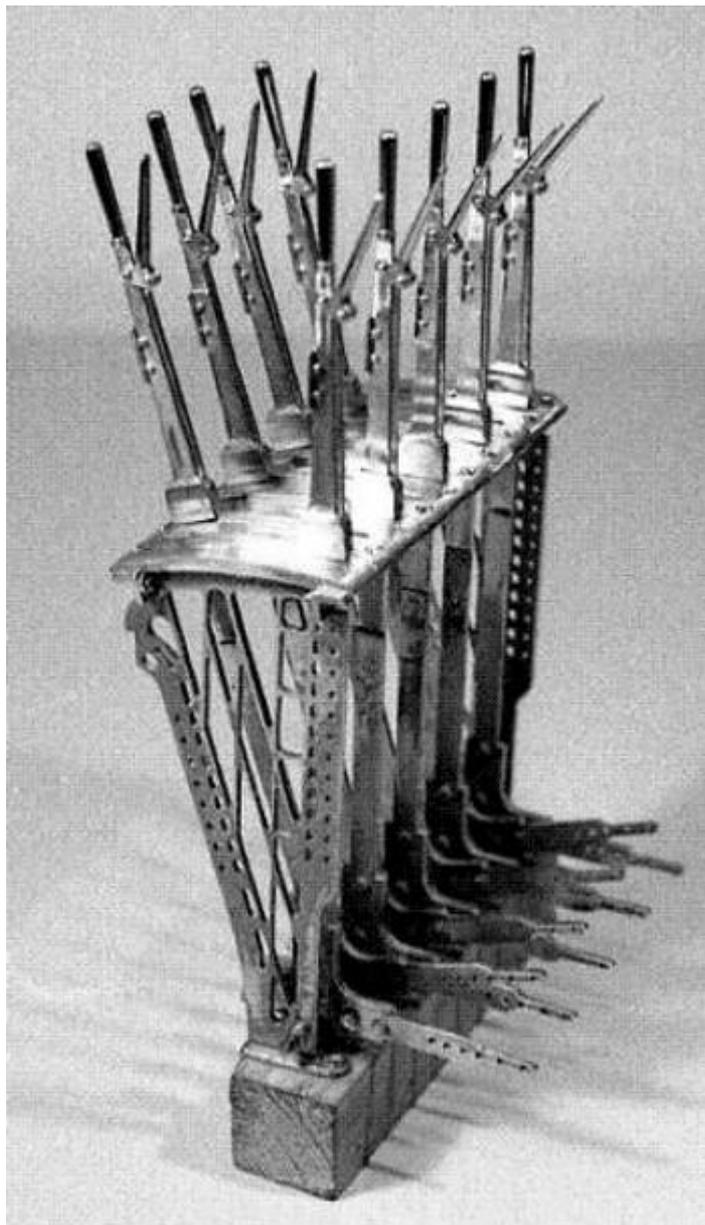
Each lever needs the fulcrum polishing to exact size in the frame so it is advisable to number them to ensure they always go back in the same place.

Photo 2 shows all the parts ready for assembly and the embryo locking tray, which has four locking channels. It is constructed from 1/16th brass angle

tapped 10BA and bolted from underneath through more brass angle and then filed flush.

I got it from Reeves of Birmingham but Eileen's Emporium will probably be able to supply the brass angle by now as he did the brass strip for the locking bars. Once the levers are built, assembly is quick and relatively simple.

I chose to tap the support angle bars on top of the frame to take 10BA bolts to



secure the floor plates, but drilled and tapped them one hole at a time to ensure accuracy. The first one on the left of No: 1 lever is critical to get right since the remainder simply butt up to one another.

The last picture shows the almost finished frame awaiting completion. Finishing the locking and painting, will not be possible until I finalize the exact layout for the experimental track work, turnouts, signals and locking bars.

If the Editor permits then I shall be happy to describe the building of the locking trays and track in a later article.

These are excellent parts that build into a satisfyingly real piece of hardware from the era of block signalling though the process does demand a good deal of hard work and patience.

Time taken averages out to about 3.5 hours per lever so, around 32 hours. However, I used only hand tools and think that a small power drill would speed things up considerably probably to under three hours per lever.

I plan to be mechanized before beginning the 30+ levers needed for the layout. The next job is to get the locking and operation of both turnouts and signals to work using only mechanical means above the baseboard, just like the real thing!