

DAVID LANGAN DESCRIBES HIS 4 mm. SCALE MODEL OF AN L.N.W.R. SIGNAL BOX THAT WON AN AWARD FOR HIM AT THE RECENT MANCHESTER M.R.S. EXHIBITION

LINTHWAITE

LINTHWAITE, before its recent dismantling, was situated between Golcar and Slaithwaite on the line from Huddersfield to Marsden. The portion of the wall on which the box was supported during its latter years belonged to a goods depot which was dismantled prior to the last war. The box stood over two sidings leading to coal drops, the main line at this point consisting of both slow and fast lines. The unusual design and great character of this box provided the incentive for modelling and produced a few interesting constructional problems. The model was constructed from very excellent drawings by Eric Blakey which appeared together with photographs in the September and October, 1955, issues of the "Model Railway Constructor."

For the model in 4 mm./1 ft scale the actual construction was carried out in three main sections—(a) the cabin and cross-members underneath, (b) the wall and (c) the vertical supporting. The steps and handrails were added after assembly of the three main sections. As the model was not being built for any particular layout a suitable base was

chosen about which more will be said later. It was decided that, to bring out the full character of the box, as much internal detail as was practicable should be included. Thus the inside of the box is fitted out with a lever frame, overhead shelf for the block instruments and a writing desk. It was impracticable, however, to include full signal and point rodding from the box to the ground.

The main cabin

The sides and ends of the cabin are constructed from 1½ mm. plywood. The sides are marked to the correct scale length of the box, all openings for windows being drawn in as in Fig. 1, from which it is seen that no attempt has been made at this stage to mark out the dividing pieces between adjacent window frames. The latter are so delicate in their construction that it was found easier to fit one set of window frames, then the intermediate piece, followed by another set of window frames and so on. The ends are marked out in a similar fashion remembering that they fit inside the sides and so

1½ mm. has to be cut off from each side. It is also noted that the end containing the door fits on top of the floor and not on the side of the floor as do the other walls. All planking on the sides and ends is first lightly scribed with a razor blade and then more heavily with an old steel gramophone needle held in a pin chuck. This produces a very neat and smooth groove. All openings are cut out with a fretsaw keeping a little on the waste side of the lines, so that subsequent filing with a needle file produces a very clean and accurate edge. When carrying out this filing process I hold the job between two straight edged steel bars located together by a peg to ensure that a perfect edge is obtained each time. This is shown in Fig. 2.

Using 1/32 in. plywood, the floor is marked out to fit inside the walls and include the side cabin and door end verandah. I would have preferred to have constructed the floor of a slightly thicker material, but as I wanted the cabin floor and verandah to be made all in one piece for strength and ease in construction the thinner plywood was

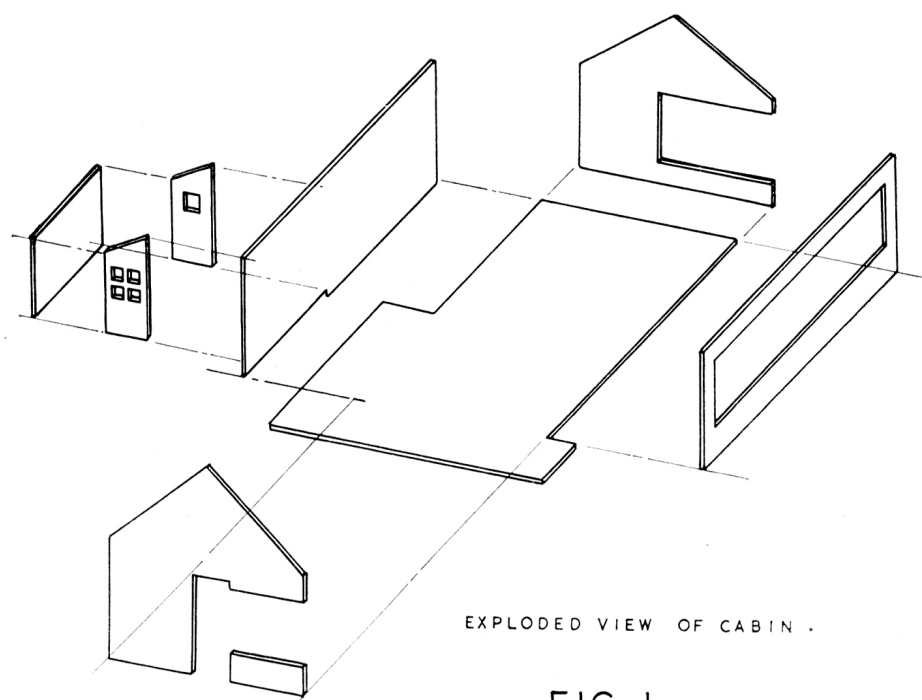


FIG. 1.

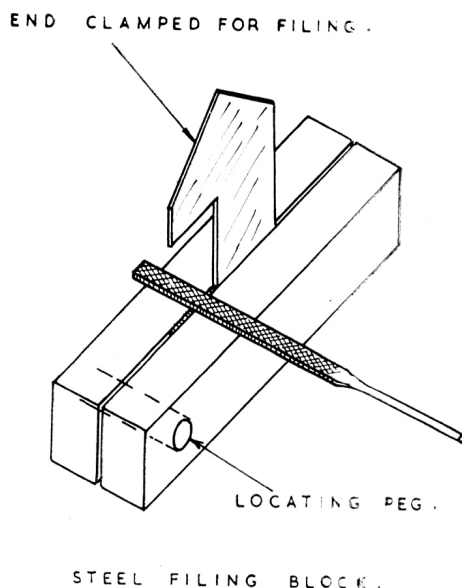


FIG. 2 .

chosen. After scribing and cutting out the floor, the main body of the box is ready for assembly.

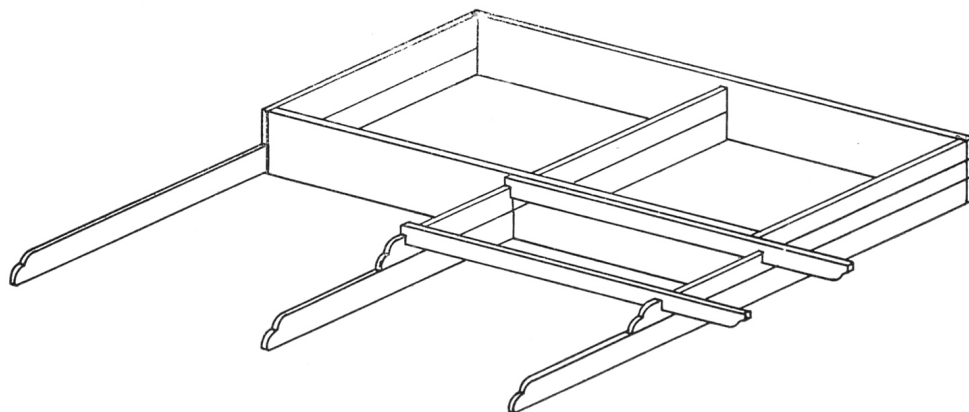
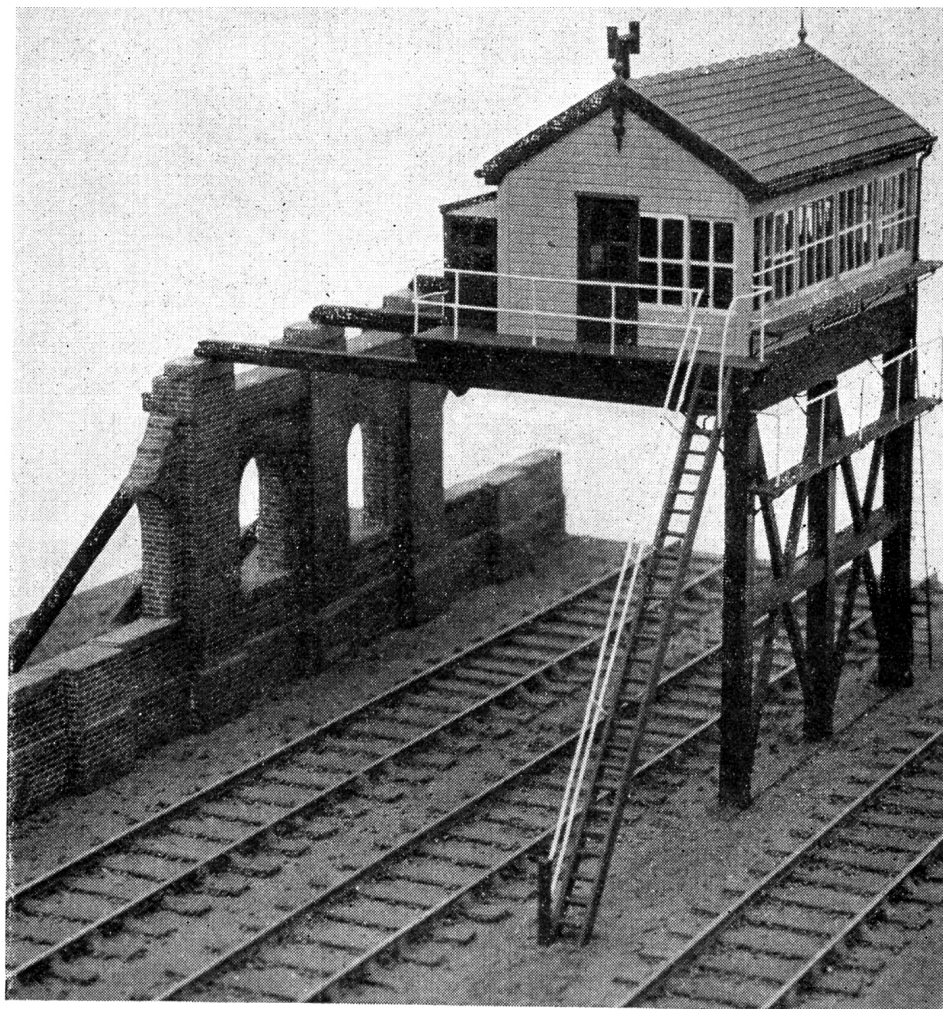
"Croid" glue is most satisfactory for the larger fixing jobs as it allows plenty of time for manipulation before setting, and doesn't "string" unduly. Thus "Croid" is applied to the appropriate edges of the main framework, the whole assembled, and after making sure that all is perfectly square, a couple of elastic bands are put round the body to hold the latter in position until everything has set hard. The box is set aside for at least 24 hours, after which it is lightly sanded with fine glass paper to keep the job "clean." I prefer this method of gently sanding a few times during construction as opposed to one mammoth sanding when the painting stage is reached, as with the latter method a lot of detail tends to get lost or at least makes it difficult to sand round small details.

As the floor was made from not very strong plywood, for reasons explained above, it was imperative that the framework of cross-members underneath should be constructed and fixed as soon as possible to keep the box in shape. In the prototype, at the front of the box, there is a drop-down inspection flap providing access to the lever equipment underneath the floor of the box. On the model this whole section from the floor down to the vertical supporting pillars is constructed from 2 mm.-thick plywood with planking scribed on as before. The large beams which support the box on the wall are also cut from 2 mm. plywood, the ends being shaped with a file and glasspaper. The supports under the lavatory closet are shaped from 1½ mm. plywood. Using "Croid" glue again all these various members are fixed to the floor of the box and afterwards the whole sandpapered lightly (see Fig. 3). Attention could now be paid to the cabin details of "Linthwaite."

The inside of the box is given a couple of coats of dark stain making sure that the surface doesn't become shiny. This gives the inside of the box a satisfactory dark appearance. At this stage the whole of the outside of the box is given a coat of thin shellac, as a protection from any tendency to warp and also to prevent the paint soaking too much into the wood.

The small lavatory closet at the side of the main box is constructed from 1/32 in. plywood, the ends and sides being first marked out, then scribed and finally cut out. The windows in the door are cut out by the following method which is the same as that used for the main door and all the windows in the signal box.

After marking out, a hole, big enough to allow a fretsaw blade to pass through, is drilled in each window opening. The window is cut out, slightly on the inside of the lines, using



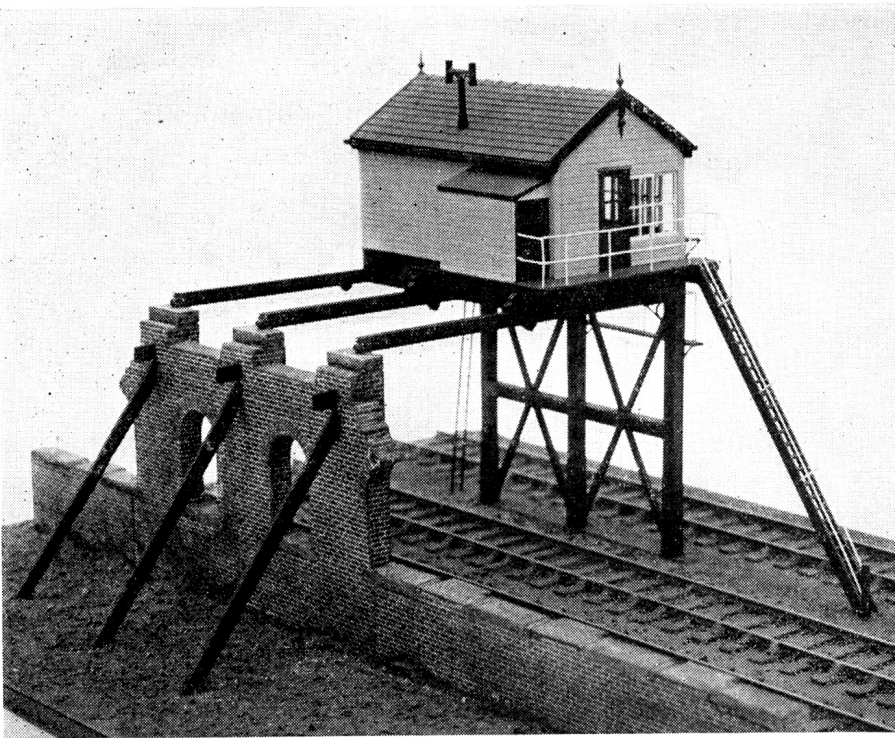
FRAMEWORK OF BASE OF CABIN .

FIG. 3 .

a fret-saw. The frame is then filed to the line "by eye" using a square cornered needle file. The method I have found to be most successful is to file all the corners square first and join up the corners. The wood used for this operation must not be too dry or little pieces of the frame tend to chip off. After some practice the operation was achieved with a good degree of accuracy and, in fact, was found to be more accurate than the previous method described, using the steel bars. This is

due to the fact that when the cross-pieces, which are between ½ mm. and ¾ mm. wide, of the window frame are being filed, the job cannot be gripped tight enough and a window produced by this method has the appearance of Fig. 4. This method of constructing windows although tedious and frustrating at the start, especially when a few breakages occur, provides a much more realistic result than that achieved by the more usual method one sees of painting the window frame on to perspex strip.

MODEL RAILWAY NEWS



The levers are stuck into the slots in the base remembering that a few levers will probably be "off." The base is painted matt black and the levers painted their various colours noting that in London and North Western days the distant signal levers were painted green and not yellow.

Above the lever frame is a ledge on which are the various block instruments, the latter being constructed from odd bits of wood and the ledge from 1/32 in. plywood supported on matchsticks (see Fig. 6).

Also prominent in the box is a desk for writing the train log. Oddments of wood are used in its construction after which it is painted brown. A small piece of white card stuck on top of the desk to represent an open log book adds an extra touch of realism (see Fig. 7).

To complete the interior, a little stove and stack are constructed and fitted at the rear of the box underneath where the stove pipe will protrude through the roof.

Although all these interior fittings cannot themselves be seen in detail their overall effect completes what would otherwise be an "empty" appearance.

The roof

To my mind slate paper doesn't give a

After lightly sandpapering the window frame in the door of the closet, the latter is glued and assembled on to its base.

The main door and all the window frames are then cut out and filed as described above. After sandpapering lightly the inner sides of the window frames, the complete frames are cut out using a very sharp razor blade. Great care and patience are required at this final stage as a few window frames were ruined by the razor-blade sticking in the wood with subsequent buckling of the frame. The top and bottom edges, after lightly sandpapering, are fitted into the sides and ends making certain that those windows which slide are in the right positions. When glued in position along with the intermediate dividing

pieces, which are made from 1/32 in. plywood, the frames are given a couple of thin coats of "Humbrol" matt white paint and then the "glass" is fitted. For this purpose small pieces of 0.010 in. thick perspex are used, each pane being tailor made for its frame. In order to obtain a snug fit in the frame the corners of each pane are cut off very slightly. "Durofix" was used for fitting the "glass." The fitting of individual pieces is again a very tedious job but the realistic effect produced when light catches each pane from a different direction is well worth the time and perseverance.

The interior

The most important item of the interior is, of course, the lever frame. After much experimenting with the metal and wood as materials, Plastikard was found to afford a quick and satisfactory result. A piece of 0.030 in. thick Plastikard is cut to the required dimensions for the base and then further strips of 0.030 in. thick Plastikard 1 mm. wide are cut and stuck on to the base leaving appropriate gaps for incision of the levers. After application of all the strips the base is sandpapered to shape using flour paper (see Fig. 5). The levers are cut from 0.010 in. thick Plastikard, the rounded handles being formed using flour paper.

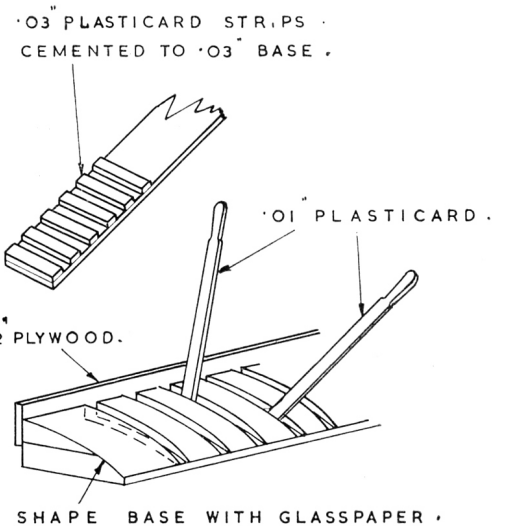


FIG. 5.

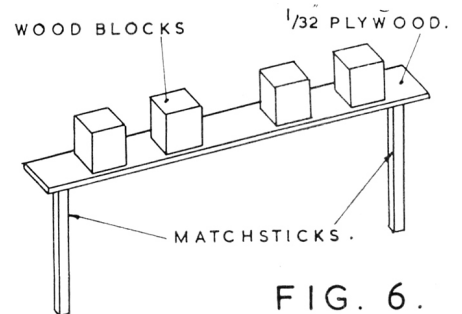
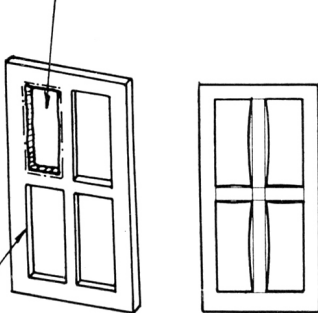


FIG. 6.

ROUGH OUT WITH FRETSAW .



FINISH BY FILING TO PENCIL LINE .

EFFECT OF LOOSE CLAMPING WHEN FILING CENTRE .

FIG. 4 .

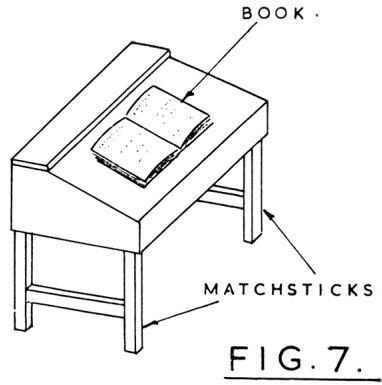


FIG. 7.

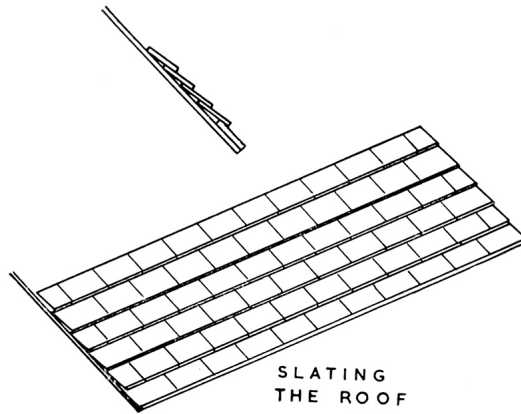


FIG. 8.

very realistic and, therefore, satisfactory finish and so some time and patience was given to the construction of the roof. Each side is constructed separately by first cutting a piece of card the size of one side of the roof. Using the same card, strips 6 mm. wide and the length of the roof are cut and a line is drawn lengthwise down the middle. On one half of the strip are marked out the tile widths, these lines then being scribed lightly using the gramophone needle as described earlier in the article. It should be remembered at this stage that alternate strips will have half tiles at the ends. Starting at the bottom edge of the roof, the strips are stuck on to the roof base, each strip overlapping the previous one as in Fig. 8.

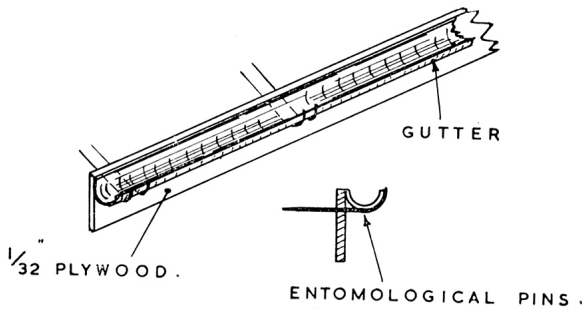


FIG. 9.

To prevent the roof sagging when fixed in position, two pieces of stripwood are stuck between the two ends of the cabin. Both halves of the roof are then glued and held firmly while the glue is allowed to set. The ridge is made of card with small pieces of card stuck on to represent the lip where one ridge-tile overlaps another. The barge boards are cut out and shaped from 1/32 in. plywood and stuck on to the ends of the box. The London and North Western Railway finials, which consist of a ball and spike, are turned from brass in the lathe using a form tool. On the prototype, the lower finial is halved and attached to the box, but as in the model the finials are rather delicate, a small indentation is made with a drill in the end of the box and the ball of the lower finial let in.

The boards which support the gutters are set away from the cabin side and so to make a strong job of it on the model a small fillet of 1 1/2 mm. plywood is glued between the side of the box and the gutter board, the latter being constructed of 1/32 in. plywood. "U"-shaped brass strip is used

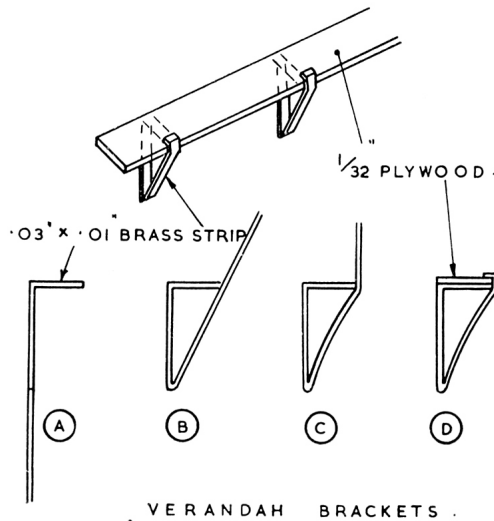
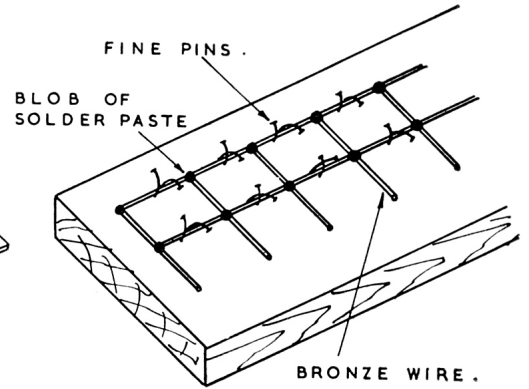


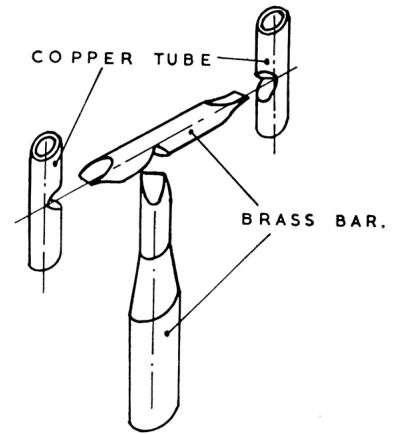
FIG. 10.

for guttering. When fixing guttering to a model it is usually difficult to obtain a strong joint. Bearing this in mind it was decided to utilise the idea of gutter brackets on the prototype to achieve the necessary strength. Taylor's No 20 Entomological pins are fixed into the gutter board in the same positions as the brackets on the prototype. The pins



SOLDERING OF HANDRAILS.

FIG. 11.



CONSTRUCTION OF CHIMNEY.

FIG. 12.



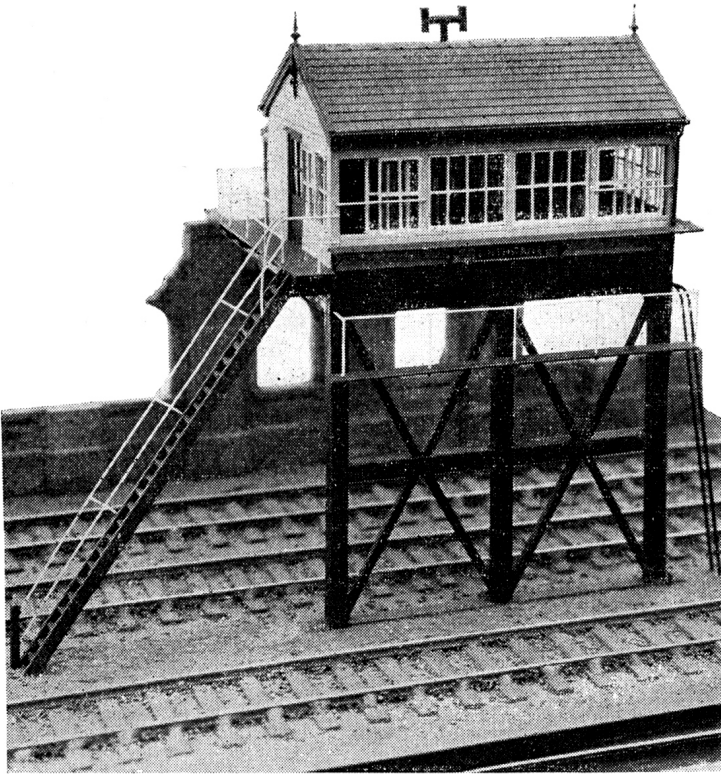
FIG. 13.

are then bent upwards and cut off at the required height to provide a firm support for the gutter which is then glued to the board for good measure (see Fig. 9).

All that is needed to complete this stage of the main body of "Linthwaite" is the addition of the closet roof (which, on the prototype, is roofing felt) and the barge-boards, all of which on the model are constructed of card.

The vertical supports

Now is the time to select a base for the box; and a well seasoned piece of plywood 12 in. by 10 in. was found to be ideal. The positions of the



wall, vertical supports and track are marked so that a well balanced setting for the model is obtained. As "Linthwaite" was modelled as it would have appeared in L.N.W.R. days, the goods shed should also have been modelled, but as the wall only acted as a support for the box the former was modelled as it appeared prior to demolition. The utmost strength is required from the supports which are sandpapered 4 mm. square from a fairly hardwood strip. Holes are cut in the base to hold the supports in a tight fit and plenty of adhesive added to complete the job. Before the glue is allowed to set the supports are tested with a square to ensure that they are vertical. The two horizontal sections of framework are constructed from the same materials as the vertical supports, contrary to the prototype where it is required that the wires and rods for the signals and points should pass through these pieces. The diagonal strips are shaped from 1½ mm. plywood.

The wall

Although the wall is modelled in its shortened form it is surprising how much work is involved. The construction throughout is from plywood covered with Modelcraft brownbrick brickpaper slightly dirtied with thin black water colour. A liquid glue is used for fixing the brickpaper. The only tricky operation in the construction is that of making sure that the signal box fits perfectly horizontally on the wall and supports.

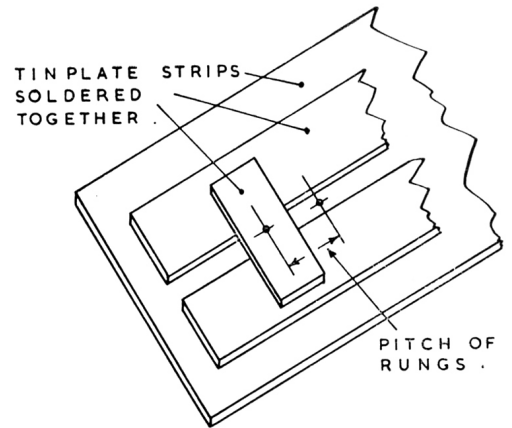
Miscellaneous

Before fixing the main body of the box to its supports, the scenic part of the base is finished to prevent any accidental damage to the box. Therefore, when the track has been laid and the base painted, the box is firmly attached to its supports.

The first coats of paint are now applied. The main body of the box in L.N.W.R. days was painted buff. Not being able to obtain any buff paint, "Humbrol" cream was mixed with "Humbrol" matt white to obtain the appropriate shade. After lightly sanding the body again three very thin coats of paint are applied. The gutters, barge boards and doors are painted L.N.W.R. brown which was slightly lighter than G.W. brown. The roof is not painted at this time as it is still required at times for somewhere to get a steady grip when attaching some small details. The vertical supports and all beams under the box are painted with black Indian ink which soaks into the wood, giving the appearance of a creosoted surface.

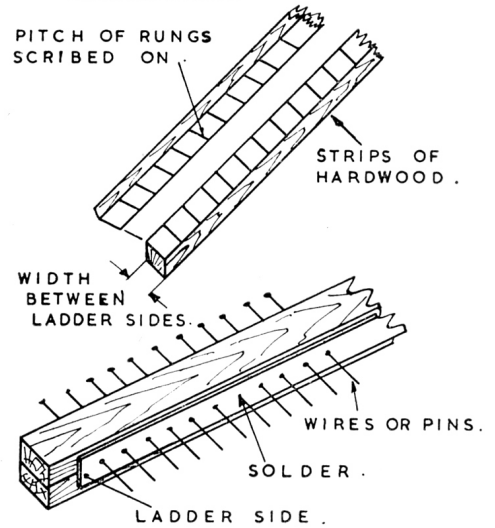
Drainpipes, like gutters, are very easily pulled away from a model. Thus the prototype method using clips is applied to the model, where they are made from bent entomological pins with their heads cut off. The actual pipes are made and shaped from 0.040 in. diameter copper wire which allows for ease in bending.

Small bolt heads on various parts of the box, especially along the front, are represented using cut-off heads of entomological pins.



DRILL JIG FOR LADDER SIDES.

FIG. 14.



LADDER SOLDERING JIG.

FIG. 15.

The verandahs, for cleaning the outsides of the windows around the side and end of the box, are cut from 1/32 in. plywood and supported by small metal brackets. The latter are bent from 0.030 in. by 0.010 in. brass strip, each being arranged to clip on to the verandah for extra strength (see Fig. 10).

One job, put off until nearly the end, was the making of the handrails down the steps and along the main verandah outside the doors, but first the steps have to be made. Again 1/32 in. plywood is used throughout. The sides are cut out to shape and then the requisite number of steps made. The steps are stuck to one of the sides so that when the completed ladder is attached to the box the steps will be horizontal. The other side is then stuck on to complete the sandwich. Any steps which are either slightly undersize or oversize soon show up during this operation and are replaced.

Continued on page 71

LINTHWAITE

Continued from page 52

After much thought and experimenting the following method was worked out for the construction of the handrails. Although in the prototype the handrail along the verandah and down the steps is in one piece, for ease of construction in the model this is made in two pieces. First, a piece of white paper is stuck on to a sheet of hardboard. The handrails are then drawn to scale on the white paper. Lengths of 0.015 in. diameter phosphor bronze wire for the longer lengths of handrail, are fastened in their respective positions using entomological pins as can be seen quite clearly from Fig. 11. The pins are placed one on either side of the wire and then bent over to hold the wire firmly in position. The small vertical pieces are cut to length and while being held with the finger, or pliers if you prefer, are soldered in

position using a spot of solder paste on the joints. The use of solder paste for this makes a very neat joint and ensures the minimum amount of solder on the job. Small holes are drilled in the box where necessary to accommodate the handrails which have now to be handled with extreme care.

The chimney is turned in the lathe and is in four sections as can be seen from Fig. 12.

The small strengthening brackets underneath the box are constructed from brass strip. The circular portion is made from the strip by forming it on a round rod of appropriate size, the ends then being soldered using solder paste. The remainder is assembled as in Fig. 13.

All that is necessary to complete the model is a ladder which provides access to the lower inspection verandah. The commercial stampings sold for ladders in 4 mm. scale are much too heavy in their appearance compared with that of the rather delicate prototype. With this in mind a drill jig is made from tinplate as shown in Fig. 14 to ensure

that the holes in the ladder sides are both central and of the correct pitch of rungs. The sides of the ladder are of brass strip, and for 4 mm. scale strip 0.030 in. by 0.010 in. is used. These are soldered together and cleaned up before using in the drill jig. After the first hole has been drilled (0.015 in. for 4 mm.) the strip is moved up until the first hole is opposite the mark for the pitch of the rungs. After a sufficient length of ladder has been drilled the two sides are separated.

Entomological pins are used for rungs, these being threaded through one ladder side and then placed between the fixture (Fig. 15) and clamped. The fixture is made of hardwood and scribed as shown. The second ladder side is fitted and the rungs soldered to the brass strips on the outer sides. The excess of wires is clipped off and the sides of the ladder cleaned up. This method of construction produces a surprisingly strong ladder.

The construction of "Linthwaite" took six months spare time.