Model Railway News March 1947

THE BRIDGEWATER RAILWAY

By ALEX. F. JACKSON
(Member of the Manchester Model Railway Society)

HISTORICALLY the line may be said to go back to 1919, when the Chief Operating Manager first became acquainted with something that propelled itself along rails. It has seen many vicissitudes since then, but memorable occasions were 1933, when a move was made to the garden, and 1939, when the first electric locomotive was built. The stock in those days was a motley collection mostly commercially made alleged 10-mm./ft. tinplate, but in 1941 it was resolved to give up the hitherto free-lance aspect and produce something more in keeping with L.M.S. practice about the year 1934, which is about the time most interesting in my opinion.

There are many reasons for railway modelling from the super-detail enthusiast, who takes years to make one locomotive, to the timetable enthusiast, who " operates " without ever studying the methods and signalling,, etc., of the prototype. And, unfortunately, there are model railways without any reasons, and others mere collections and often very expensive ones, too. The aim of the B.R. is to produce reasonably accurate and not over-detailed models that, when seen at work on the layout, will give a fair impression of what you see when

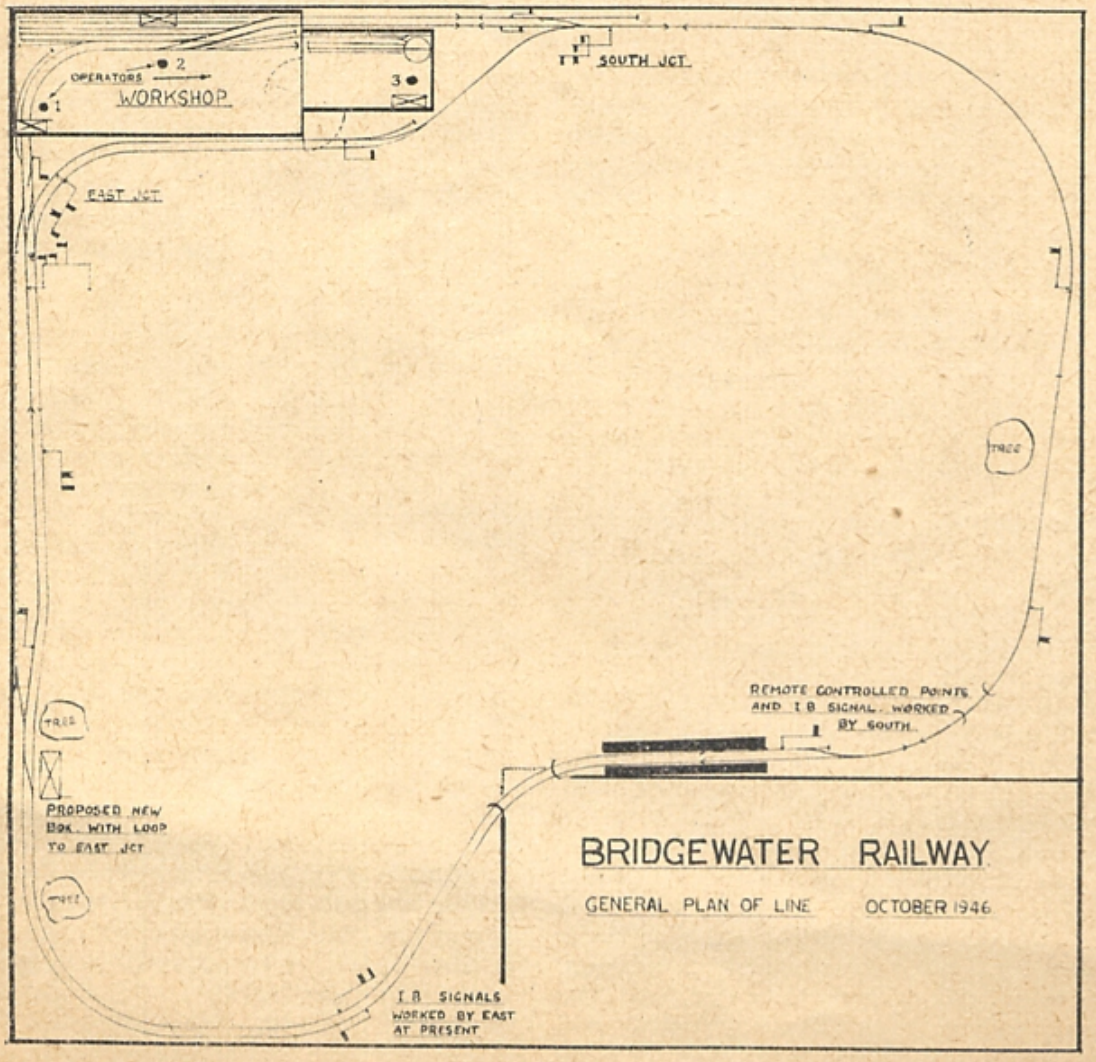

Fig. 1A

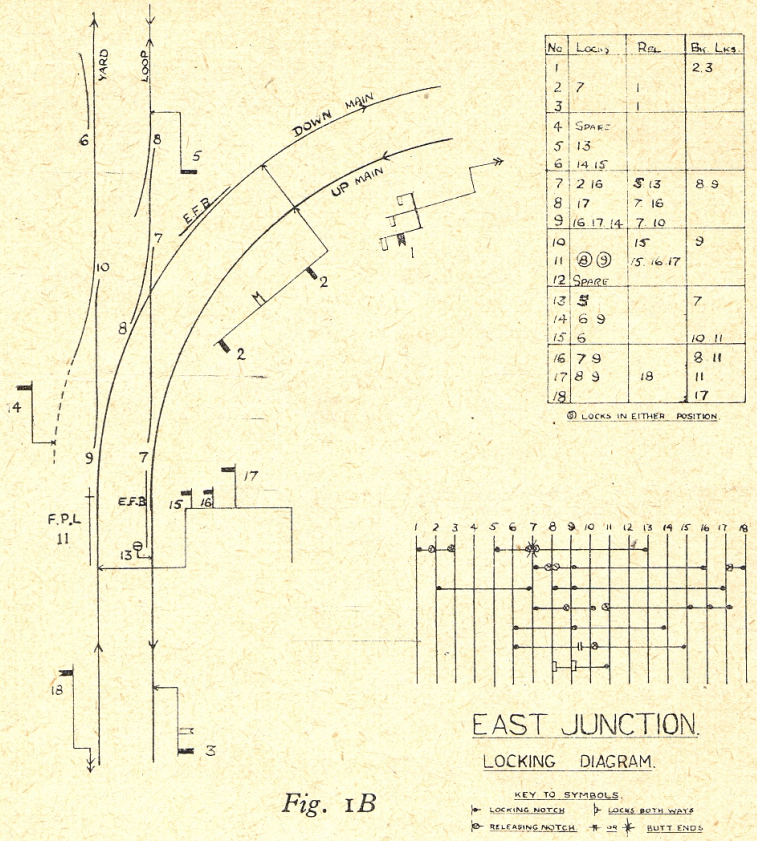

Fig. 1B

you look across a field at the real thing. They must work well, which has meant much experiment in the electrical and mechanical field, and they must also work correctly to prototype practice in signalling and basic principles of operation as far as possible. I realise that timetable working has a lot of attractions, especially as a good time is had by all engaged, but if it is done without attention to real practice, I consider it is inferior to fundamentally correct working over a section or two obeying as many principles as possible. The B.R. to date, halfway through my ten-year programme, has two main-line signal-boxes complete, with the extra sections at present worked by intermediate block signals. It requires at least three intelligent operators to work the line fully, although boxes can be switched out and testing or demonstration laps run singlehanded. However, with three operators, difficult as they are to obtain, working the two main-line boxes with full signalling and interlocking and the third man marshalling trains in the yard and attending the locomotives' various movements of a more or less realistic nature can be carried out. With reasonable operators you will not see two trains in a section at once and all trains will observe the signals, carry correct head and tail lights and side lights on freight trains, and traffic between the two boxes will be properly described on the bells, the block instruments also functioning in a correct manner. Such things as blocking back inside and outside home-signal, and ballast trains requiring to stop in section, as well as the ordinary run of several classes of freight trains, parcels, light engines, etc., will occur, and they will move about with realism. As yet no attempt at single-line working with the necessary forms has been tackled, and the next thing desired is another main-line box with a goods loop for permissive working, as this provides quite different working conditions and additional bell codes.

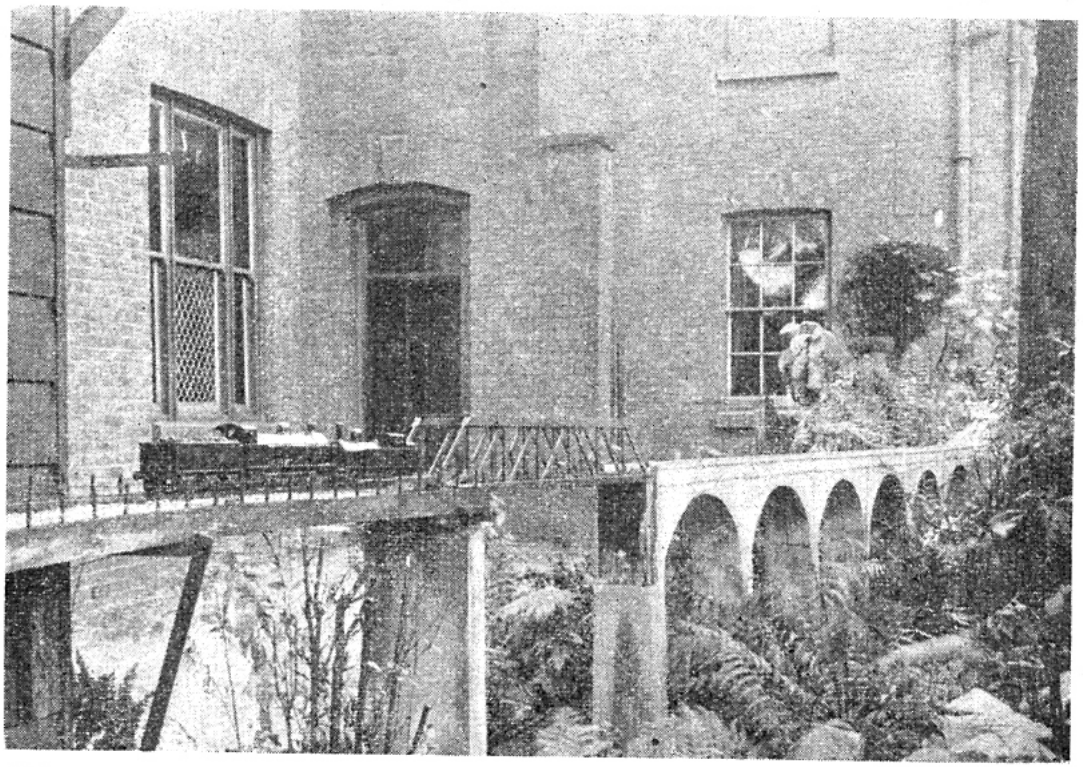

Fig. 2. View on the single-line portion, showing pre-cast concrete viaduct and hinged girder bridge

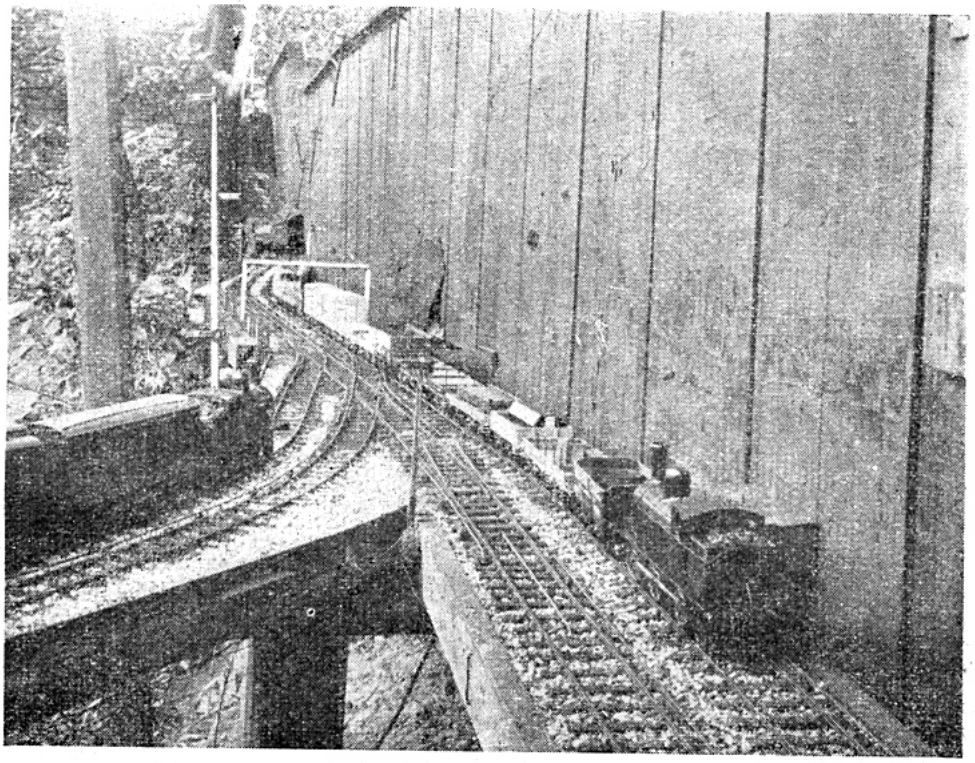

Fig. 3. South Junction as seen by its operator

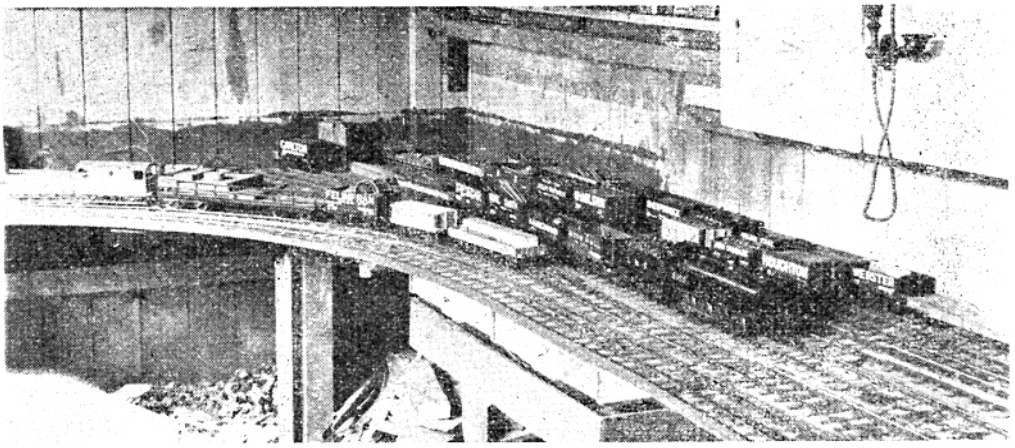

Fig. 4. The Goods Yard

Fig. 1A shows the general configuration of the layout, which is basically simple, though not ideal, and amounts to an irregular circuit of the back garden some 73 yards in length, none of the main line passing through the workshop in one corner of the garden. Junctions at either end lead into the workshop, which also houses the sidings, locomotive and carriage sheds, power units, controllers and main-line frames.

Permissive working only, but without block instruments or bells owing to the close proximity of the three operators, is allowed in the yards and all points are worked from a 30-lever frame, which at the moment is not mechanically interlocked, though it is electrically so, and if any conflicting movements are set up no power is available. Figs. 3, 4 and 5 show general views of the yard, frame and controllers. The electrical interlocking provides ample safety for the slow speeds of the shunting, but one day it is hoped to signal the yard with numerous ground discs and shunt signals, the difficulty being to make them robust enough to withstand the rough treatment they are bound to receive as the wagons are being coupled and uncoupled during shunting..

Fig. 1A shows the position of the three operators so arranged that the signal frames, controllers, etc., can be under cover. Operators 1 and 3 are about 25 ft. apart and separated by a door in the workshop. Fig 3 shows South Junction as seen by No. 1 operator,

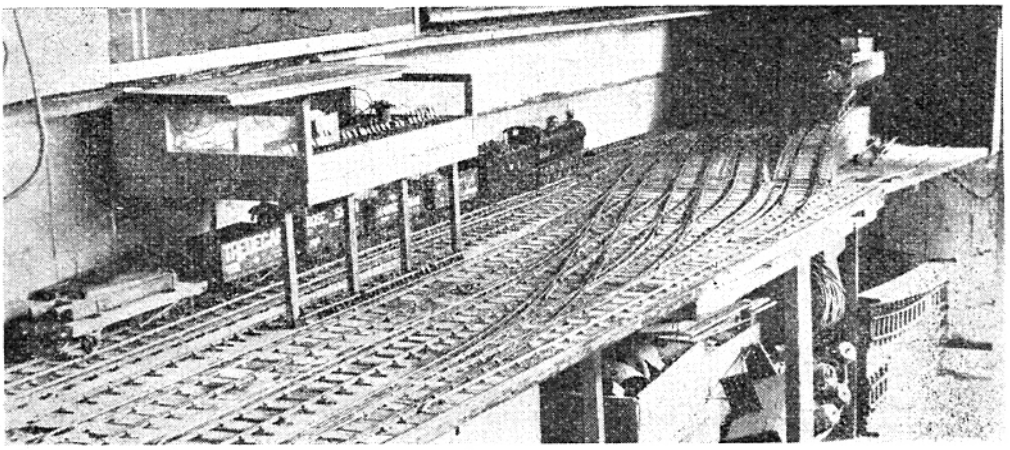

Fig. 5. Yard Signal-box. Roads to locomotive and carriage sidings. Tunnel leads out on to the main line at East Junction

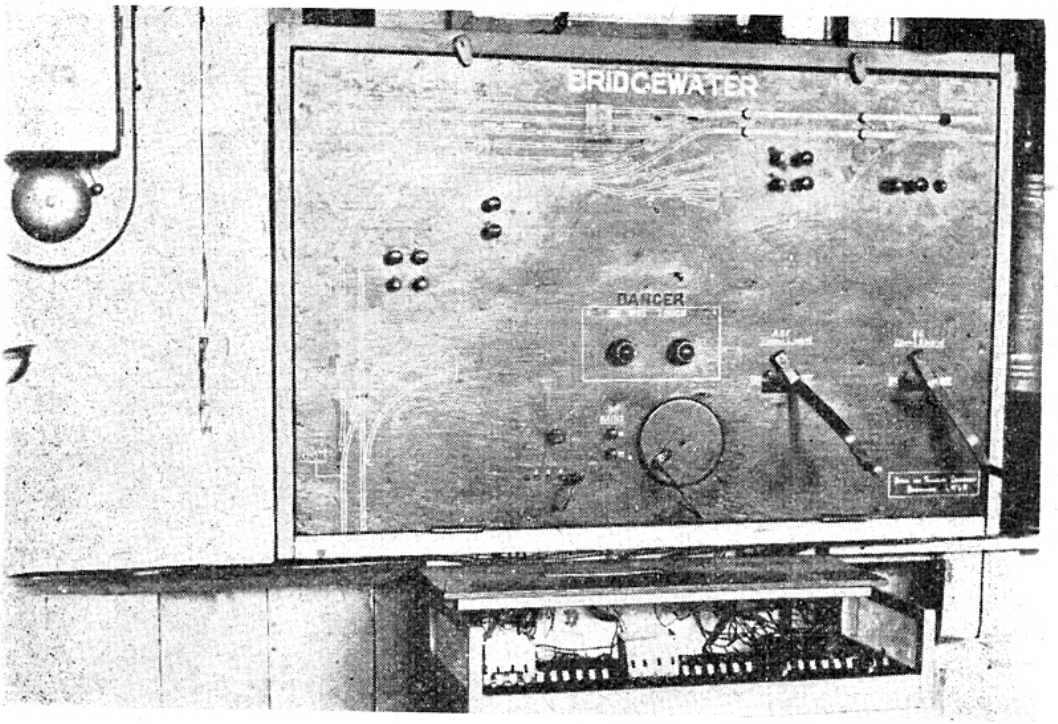

Fig. 6. The Yard Controllers. The main power unit, fuses, circuit-breaker, etc., are situated behind the board

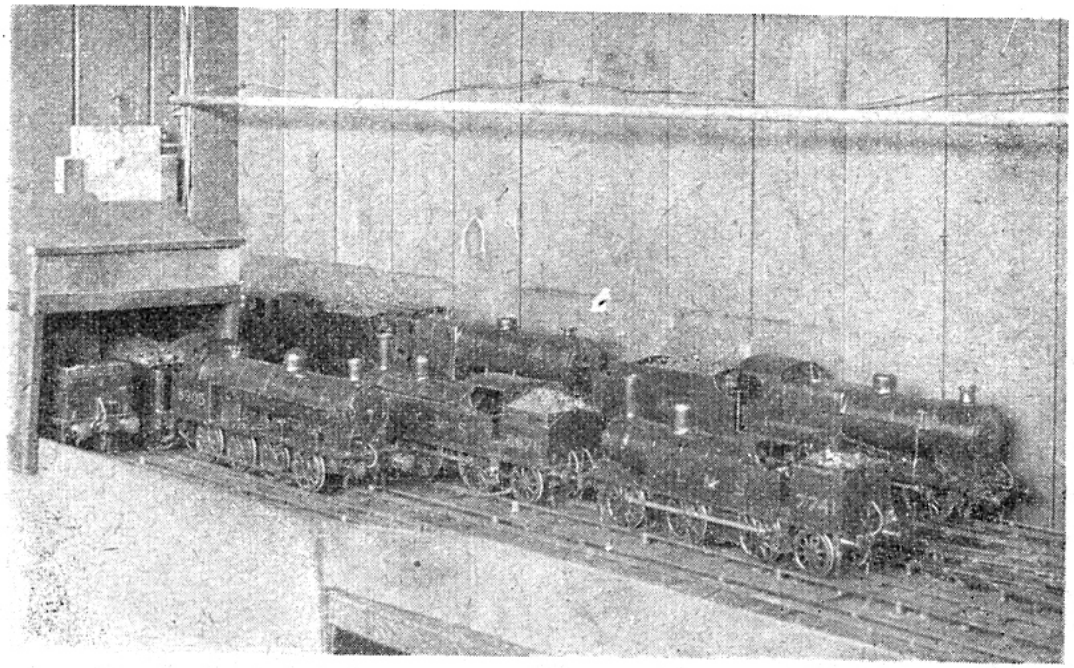

Fig. 7. Locomotives on shed

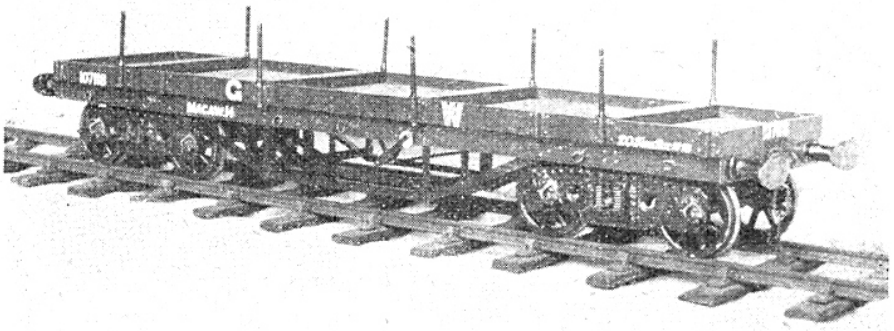

Fig. 8. Example of wagonry painted by G. H. Platt

and Fig. 1B] gives a complete diagram of the layout at this junction with the mechanical interlocking and arrangement of tappet bars to accomplish this. The frame itself is built up almost entirely of $\frac{1}{4}$ by $\frac{1}{8}$ in. steel bar, and looks something like a side-lever type electric power locking frame. Signals are worked by small electro-magnets having 1,500 turns of 36 s.w.g. and can be left on indefinitely and are quite silent at 13 V. a.c. The point motors are wound for 26 V. a.c. and have detector switches incorporated to prove the signal circuits. From the driving point of view there are two controllers, one for *up* and one for *down* and the yard loop, for example, is selected according to whether it is in use in an up or down direction.

In general the track is divided into sections from signal to signal, each section comprising an on-off switch and a button; thus, if a train is proceeding at a reasonable speed (as it should be) towards a signal at danger, it runs on to a dead section of about a yard or more according to the gradient and *stops*. If now it is required to move slowly forwards or in reverse away from the signal, for shunting movements, for instance, the button will liven the section, and if the signal is pulled off the button section is automatically connected to the main section. If also for any reason the whole section must be maintained *off*, the switch does it.

In practice very little use is made of the switches or buttons if the trains are driven in a railway-like manner. It should be realised that considering the *home* signal of any box the man in the rear actually drives the trains up to that *home* signal and when they run on to the dead section, are then out of his control and will be driven forward by the advance man as and when his *home* is pulled off. Also it is impossible,

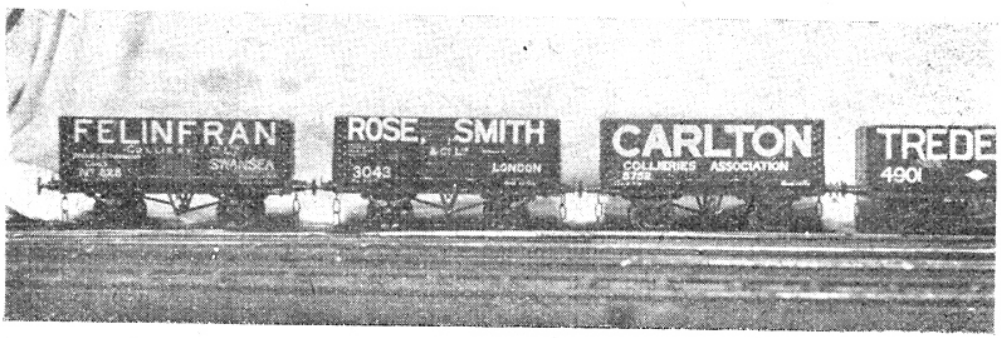

Fig. 9. Examples of wagonry painted by G. Heywood

Model Railway News March 1947

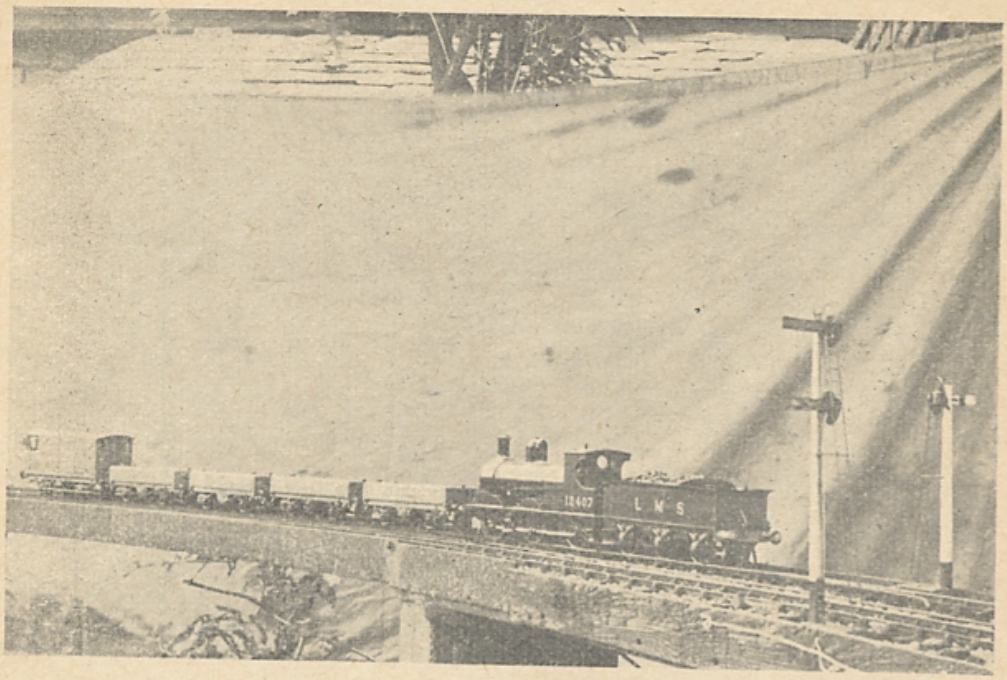

Fig. 10. Ballast train at the I.B. Signals

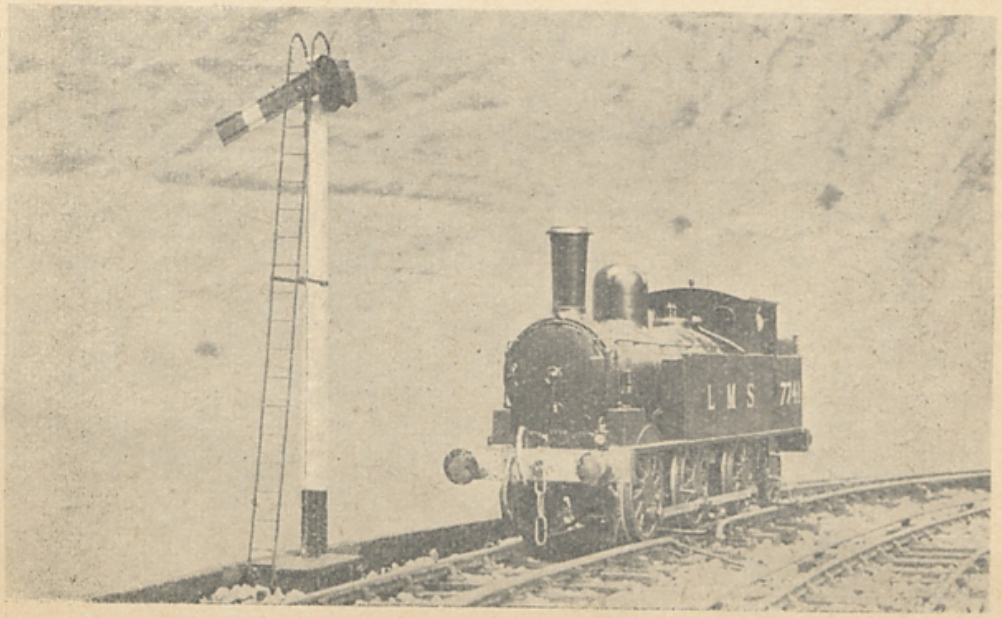

Fig. 11. Will look better when it is 2-rail!

or shall we say, unlikely, that a train will approach the *home* signal without the advance man being aware of it, as the *starter* of the man in the rear is electrically locked with the block instrument, so that a line clear must be obtained before a train can proceed on its way.

Well, after all that you might say, " But if anything is merely driven past a signal at danger, all these precious safeguards are negatived, and you would get two trains in a section, etc." But that is where the secret of several years' running without a serious accident comes in, as every main-line signal is fitted with a trip worked by the trains and passing any signal at danger blows the power circuit-breaker and cuts off all juice to the line with the exception of the signals. Thus, on any complete stoppage taking place, the cause can be investigated and errors and omissions pointed out ; it is remarkable that once the operators see that their inefficiency means no trains, without a great deal of fuss they proceed to act in a much better, if slower, but then generally, far more railway-like, manner, in the majority of cases. Facing point-lock mechanical bars are not used, as these could no doubt be reversed under the small weights of model wagons, so track circuits do duty, and if a locking-bar lever is reversed with anything standing foul, the main breaker again sees to it that no juice is available for points, and it is impossible to re-set the breaker as long as some error is set up. On each signal frame there are also something like 60 electrical switches, which, as well as controlling the points, signals and trips, also select power circuits according to how a particular road is to be used, and also where sidings or loops leading to trap points are concerned, render these dead unless the road is set up correctly for their use.

To date the B.R. is predominantly a goods line, with about 70 wagons, some twenty having been built by a friend, who has also had a hand in the civil engineering, and the rest home-made, using authentic drawings wherever possible, or my own, or friends' measurements taken from the actual wagons. I am not very fond of painting, so most of the wagons have been done by more artistic friends, whilst I have confined my activities in this direction to a few wagons and the locomotives. Figs. 8 and 9 will give some idea of the standards of wagonry and Fig. 7 shows the locomotives, and running to date, we have :—

Ex-L.N.W. 4-4-2T, Class 3P, No. 6827 ; built 1941, scrapped 1946.
L.M.S. Heavy-oil Engine, No. 1831 ; built 1942, withdrawn 1943.
Ex-L.N.W. 0-8-0, Class 6F, No. 8905 ; built 1942.
Ex-L.N.W. 2-4-2T, Class 1P, No. 6676 ; built 1942.
L.M.S. Standard 7F 0-8-0, No. 9542 ; built 1944.
L.M.S. Standard 4F 0-6-0, No. 4111; built 1944.
Ex-L.N.W. Side-tank Coal 0-6-2T, 2F, No. 7741 ; built 1945.
Ex-L.Y. Aspinall 0-6-0, Class 3F, No. 12407 ; built 1945, and under construction *ex*-M.R. Deeley Compound 4-4-0, all the above locomotives being finished as far as possible, as they might have been in 1934.

To complete the plan, under contemplation are *ex*-M.R. 0-6-0 Class 2F with Deeley cab and chimney, etc.; *ex*-North Staffs 0-6-4T and Standard L.M.S. 2-6-0 and 0-6-0T, but on the stretch of line on the Western Division, of which I imagine, the Bridgewater Railway is part, there were over fifty types to choose from in 1934, so the actual locomotives built is more a question of wheel castings and available data than anything else. New construction is also liable to be delayed, as the small tank engines with three-pole armatures are being re-built with better motors and gearing, and at the same time experiments are being made to see if two-rail is a practicable proposition on a garden railway using a somewhat higher voltage than normal.

In all tender locomotives the motor is mounted on rubber in the tender and drives by flexible shaft on to the rear locomotive axle through a totally-enclosed worm gear. All motors are fitted with flywheel and some of the later worm gears are reversible. As the motors are fed from a.c., each locomotive also carries a reversing switch which can be operated by remote

control at selected localities where reversing might need to be carried out, the inability to reverse a locomotive anywhere having a controlling effect on the exuberance of some operators who are perhaps more used to d.c. controlled layouts where reversing seems to occur far more than is called for, and in the most unlikely spots, thereby destroying the air of realism.

Owing to the flywheels, locomotives do not stop dead, and as an example, the Compound now building has an overrun after the power is cut off of over twenty yards, and in fact, when driving this locomotive on express work, it is essential to observe the *distant* signals and act on them from the position the driver, if on the locomotive, might see them. Needless to say, only top-link drivers can handle this locomotive with safety and for others and also for better control when working goods turns, it is fitted with a switch which selects a different field strength plus a large resistance thereby considerably taming it. Every vehicle and locomotive is equalised or sprung on every axle and it is the rule rather than the exception to see much traffic with trains up to or over 60 wagons and even being propelled through crossovers into the yards without any derailments. These, of course, do occur, but generally only due to twigs or leaves on the line or through carelessness.

As yet no coaches have been made owing to the scarcity of accurate data and the need for experiments with vehicles up to 57 ft. long, as I want the corridor connections to function correctly round the curves. The painting will also be more tricky and in this connection can anyone state when the lining-out fully in yellow round all panels was abandoned in favour of three or so horizontal lines only?

Now the probability is that the Bridgewater Railway leaves much to be desired from your point of view. For instance, there is little attempt at scenic effects, because in our opinion the first things are being done first, that is, the *railway* has to be equipped with enough stock and it has to work correctly before time is absorbed into bridges, etc. It should be remembered that nearly everything—transformers, controllers, circuit-breakers, solenoids, point motors, as well as the stock, signals and lever frames, has been made from raw material, junk or scrap.

Wheel patterns have been made, and wagon and coach wheels are die-cast in the shops, using a home-made brew of lead, tin and antimony. In fact, a great deal of otherwise scrap material has gone into this railway.

The majority of the photographs are by Mr. G. H. Platt, who, together with a certain Inspector from *Crewe*, has given much assistance in the technical line. Intelligently interested parties are always welcome so long as they will do their best and not expect *me* to do all the work.

THREE FAMOUS CLYDE SHIPS END CAREERS

Three well-known units of the L.M.S. Railway's pre-war Clyde steamship fleet, the paddle-steamers *Queen Empress*, *Duchess of Rothesay*, and *Eagle III*, have been sold for breaking-up following their return from war service. The L.M.S. decided that they were unsuitable for modernisation. *Queen Empress* and *Duchess of Rothesay* were sold to the Netherlands firm of Scheepslooperij de Kopphandel, Nieuw Lekkerland, and *Eagle III* to Messrs. Smith & Houston Ltd., Fyfe Park, Glasgow.

Queen Empress (411 gross tons, built by Messrs. Murdoch & Murray in 1912) served with the Royal Navy in both the 1914-18 and 1939-45 wars; as a minesweeper and A.A. ship, she shot down two German aircraft off the East Coast in 1943.

Eagle III (442 gross tons, built by Messrs. Napier & Miller in 1910) was also on active service in both wars; during the recent conflict she served as a minesweeper under the name of H.M.S. *Oriole*. At the evacuation from Dunkirk, she lifted 3,000 troops in a single trip, and was beached off the dunes for twenty-four hours in order to enable troops to wade out to her.

Duchess of Rothesay (338 gross tons), oldest of the three ships, was built by Messrs. J. & G. Thompson in 1895; she was employed as a minesweeper in the recent war and took part in the evacuation from Dunkirk.