

reversing block, motion and driving wheels have been retained with only minor modifications. The lubricator has also been retained, but reduced in diameter to fit the scale diameter smokebox, while the boiler and superstructure are completely new and other additions include the remote control gear, stud-contact and outer-third pickups, and a pressure-gauge, mounted horizontally immediately below the sliding ventilators in the cab roof, which are made to open, thus rendering the gauge readily visible. Another useful addition is a water trap in the exhaust pipe which catches all liquid expelled from the cylinders and drains it into a drip tray incorporated into the pony truck, leaving the steam to exhaust in the proper manner.

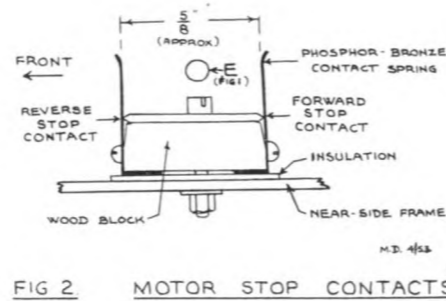
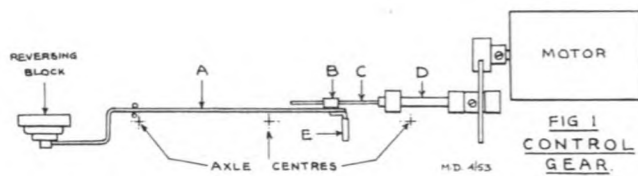
Before describing these components in more detail, it might be as well to give some general notes on the operation of this locomotive. A special controller has been built for it incorporating a variable resistance for regulating the heater current, and a telephone type key which is virtually a double-pole, double throw switch with central "off" position for the D.C. control motor current. It will be appreciated that the ability to control both the rate of steam generation and the throttle setting simultaneously enables the locomotive to be driven in a very realistic and satisfying manner, though the incorporation of a more sensitive regulator would still further improve matters. Moreover, one has to learn to drive an engine of this type, and this is all part of its charm. It has certainly made my once-prized electric locomotives seem dull and lifeless things by comparison, and I never noticed before what an objectionable noise they make!

A very large measure of speed control can be obtained after a little experience by the use of the heat regulator alone, and when non-stop running is called for I normally run the engine with the throttle wide open and adjust the boiler pressure to suit the load and speed required. Start-stop running however calls for rather higher boiler pressure and use of the throttle for speed control. When the first experiments with remote control were carried out it soon became apparent that this gear should be rapid in its operation to give the best results, though the faster it is the more difficult it becomes to obtain fine adjustment of the throttle. If the operation of the gear is too slow, however, it will not be possible to start and stop the engine in a reasonably short distance, and shunting operations become somewhat hazardous as a consequence. With the gear as finally assembled the engine can be started and stopped in a distance of about

four inches, and now that I am acquiring a bit of skill, I find little difficulty in running it on to the turn-table and off again without any undignified pushes to get all the wheels on the table at once. As for hauling power, the locomotive will comfortably handle trains of ten coaches and will steam continuously with this load on rather less than full power, though I should mention that most of my passenger stock, which started life as commercial products weighing some 30 ounces each, have been reduced in weight to an average of just under a pound a piece, and run on needle bearings. Any appreciable increase in load above this figure results in excessive wheel-spin and consequent rapid loss of steam, and in this connection it is presumably the uneven torque of the steamer that makes it noticeably more prone to slip than an electric locomotive of comparable weight. However, as No. 2537's normal workings only call for trains of seven or eight coaches I am not unduly bothered about this, but my next engine, when I get around to it, will have sprung drivers and better bearings for the driving axles, in the hope that improved adhesion and reduced frictional resistance will appreciably add to the maximum hauling capacity.

The use of an outer-third rail for control purposes is admittedly something of a drawback, particularly on a system that was converted from outer-third to stud-contact partly to improve the appearance of the track. However, use of an extra rail could have been avoided by using insulated rims on the drivers and supplying the control current on the two-rail principle. Apart from the difficulty in obtaining suitable wheels and other complications, this would have meant scrapping the track-circuiting already in use on my layout and modifications to all existing stock. This was considered to be not worth while and so outer-third it had to be. Of course, this rail need only be laid in comparatively short sections, though early on I learned the wisdom of providing it on a fairly liberal basis to begin with, until a certain amount of experience has been obtained in operation, when lengths which are found in practice to be unnecessary can be taken up again.

The principle dimensions of the model are closely to scale, and it is unusual for an O Gauge steamer in conforming to scale loading gauge. The principle departure from correct outline is the leading extension to the footplate, which is rather longer than it should be. However, this was deliberately left unaltered in an effort to counteract the visual effect of the over-scale cylinders. The



width over the cylinders is also too great, but this could be reduced if fine-scale wheels were fitted.

So much for the general details, and now for some notes on the various components. I do not intend to trespass too much on our Editor's valuable space by describing the construction in great detail, but will confine my remarks to a general indication of the design and function of each part, taking them in order of assembly.

The First Stage.

The "Mogul" was first completely stripped down and a set of drawings prepared in which the outline of the completed engine was superimposed on the "Mogul" frames and the positions of the remote control motor and other parts determined as accurately as possible. After this the frames and footplates were cut, drilled and filed where required, the reversing block replaced, and the remote control gear assembled.

The Remote Control Gear.

Readers familiar with the "Mogul" will know that the combined throttle and reverse control consists of a commutator block operated by a shaft normally moved to and fro by a lever in the cab. When the shaft is moved fully backwards steam is admitted to the inner valve ports, and the outer ports are connected to the exhaust, the return cranks usually being set so that this results in forward running. When the operating shaft is moved fully forwards the block reverses the steam and exhaust connections to the valves, thus reversing the engine, and in the mid-way position steam is shut off. It is a fairly simple matter, as other writers have shown, to operate this control electrically by connecting the shaft to a nut traversing a rotating threaded shaft driven through suitable gearing by a reversible motor.

The arrangement finally adopted is shown in Fig. 1, in outline form. The operating shaft A is fashioned from the original part and to the end of it is soldered the 8 BA traversing nut B (more of this anon). The threaded portion of the rotating shaft C is a 1 1/2 in. length of 8 BA steel rod, and this is securely soldered into a hole drilled centrally in the end of the main rotating shaft D, which is a length of Meccano axle—No. 43 drill, by the way. On the end of this shaft is a 50-tooth Meccano gear which engages a 19-tooth pinion on the motor shaft, these two gears being at 15/16 in centres. The bearings for the rotating shaft are simply Meccano collars soldered to the inside of the offside main frame in such a position that the whole mechanism just clears the upper surface of the coupled axles. Before leaving this, mention must be made of the insulated projection E on the operating shaft. This is so arranged that when the shaft reaches the limit of its travel in either direction the projecting arm opens an electrical contact and stops the control motor automatically. The Motor Stop contact assembly is illustrated in Fig 2. Its sole function is to prevent the threaded shaft from jamming tight by forcing the reversing block hard against its stops, and it will be seen from the wiring diagram Fig. 5 (next month) that while the opening of the appropriate contact prevents further rotation of the motor in one direction it does not prevent rotation in the opposite direction when the control key is changed over.

A GAUGE O STEAM LOCO FOR BEGINNERS.

Part 13.

By

"1121"

Cross head.

This is a simple block of phosphor-bronze, made from 3/16 in. x 5/16 in. bar. (This size bar can be used for several other bits on the engine later on). Cut off a piece to clean up to 3/8 in. long and mark the positions of the piston rod and guide bar holes on one edge, as shown in Fig. 63. Do not mark or drill the cross-hole for the pin at this stage. It is obviously important that the two holes should be truly parallel, so the piece should preferably be held in a machine-vice for this operation. If you haven't one stand the crosshead alongside a square block of metal, and clamp the two together with the toolmaker's clamp, so that the piece is held vertically and can't shift during drilling. Drill both holes No. 51, the guide bar hole right through and the piston-rod hole for a depth of 3/16 in. Open out the guide-bar hole with a 3/32 in. drill. Put your 8 BA tap in the drill chuck and get it started in the piston-rod hole by rotating the chuck by hand. Release the chuck leaving the tap sticking out of the hole. You can now continue tapping by hand and be reasonably sure that the tapped hole is parallel with the guide bar hole. Finish tapping with a plug tap to get the threads as deep as possible. Note that little bits of metal can get down in the bottom of the hole and prevent the tap going right in, so the tap should be removed and these bits knocked out. You will probably find that the tap will then go in a bit deeper.

Assembly.

Push the piston-rod through the back cylinder-cover. You will almost certainly be prevented from doing this due to a little bit of metal which the die has left projecting where it finished the thread, so this should be

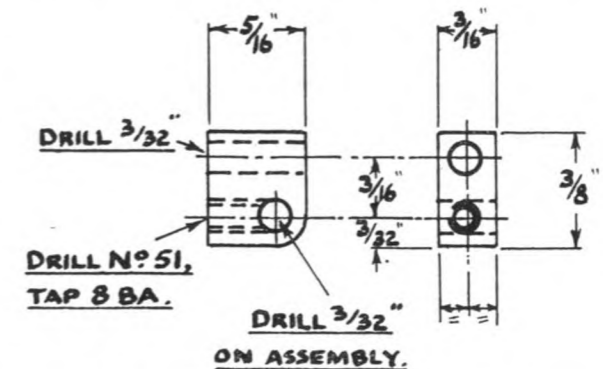


Fig. 63. Crosshead. (Shown finished but the cross-head pin hole is not drilled at this stage).

filed off carefully. Whenever a piece of threaded rod has to be pushed through a hole a mysterious reluctance to go through can usually be traced to this cause. Thread the gland screw over the outer end of the rod, and before screwing it into the boss on the cover wrap a little bit of a single strand of graphited packing round the rod, and stuff it into the hole in the cover. Screw the gland screw down on to it tightly, then withdraw it again, and if necessary put a little bit more packing in until the screw goes into the hole two or three threads. It doesn't need to be in very tight—little more than finger-tight is necessary, otherwise it will cause excessive binding on the rod.

Next screw an 8 BA nut on the other end of the rod, followed by the crosshead, and lock the two together firmly.

Make a pair of brown-paper joints or gaskets for the front and back cylinder covers respectively. These should be of good hard quality brown paper, not woolly stuff, and are cut out as follows. First rub a little bit of the paper over with oil, and stick it down on to the end of the cylinder-block. You will be able to see the

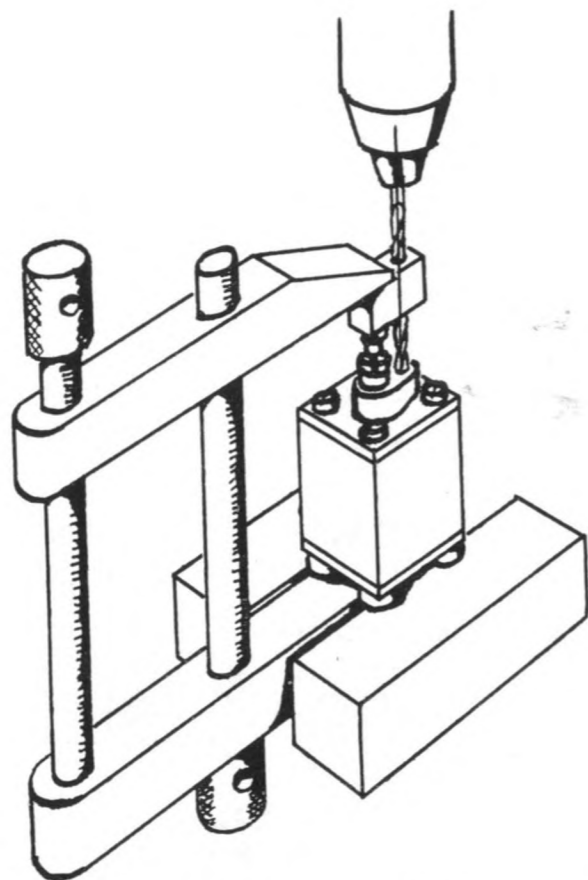


Fig. 64. Spotting through the crosshead to position the guide-bar hole. (See Fig. 55)

shape of the block through the paper, and the first thing to do is to push the point of your scriber into the four screw-holes. Now very gently tap round at the end of the bore with the ball-pane of your hammer, which will cut through the paper far more neatly than you could do it any other way, and fish the unwanted circle of paper out of the middle. This hole should be cut in the front joint as well as the back one, otherwise the exposed bit of paper in the end of the bore will go soggy when the steam gets at it, and you will have tremendous trouble through it stopping up the steam passages, and getting under the valve and preventing it from seating properly on the port-face. You can either cut away the excess paper round the outside of the block by tapping round the edge with the hammer, or prune it off with a razor blade after the cover is screwed on.

Push the piston into the back end of the block, and screw the cover down firmly with 8 BA cheesehead screws, $\frac{3}{8}$ in. long, and attach the front cover in the same way. The crosshead itself is now used as a jig for drilling the hole for the guide bar in the back cover—twist it round until it stands vertically when checked with your square with the block standing on the surface-plate. Put your toolmaker's clamp right over the whole thing—it can rest on the screw-heads on the front cover if necessary—and rest it on a pair of pieces of metal the same thickness, to clear the clamp jaw, (Fig. 64). Now spot through into the small end of the boss on the back cover with the $\frac{3}{32}$ in. drill through the guide-bar hole in the crosshead. Replace the drill with the No. 43, and put this in $\frac{1}{8}$ in. deep.

The guide bar is a $1\frac{3}{16}$ in. length of $\frac{3}{32}$ in. diameter silver-steel, and the outer end should be filed to a slope on the underside, as shown in the assembly drawing Fig. 65, to clear the top of the connecting rod. It doesn't need very much taking off—the rod only just fouls it. Make sure you leave no burrs when doing this, as these will jam in the crosshead, and similarly remove any others you can find on any part of the guide bar. Slide the guide bar through the hole in the crosshead, and try the end for fit in the back cover. If it seems too tight, file a slight "lead" on the end in the lathe or drill.

When it will begin to stick into the hole, push it in tightly by bringing the drilling-machine chuck down on to the end of it, checking first that the chamfer at the outer end is in the right position.

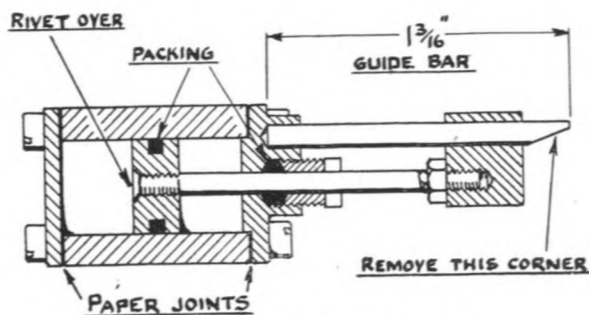


Fig. 65 The assembly at this stage.

Publications.

'TRAMWAYS OF THE WEST OF ENGLAND' by P. W. Gentry. 140 pages, 85 tramcar illustrations, 75 ticket illustrations and 17 maps and diagrams. Published by Gentry and Walker, 245, Cricklewood Broadway, London, N.W.2. 14/6 board sides, 16/6 full cloth.

This book gives detailed descriptions of 12 tramway systems in the West Country and ranges from the Lynton and Lynmouth Cliff Railway to the elaborate systems of Bristol, Bath and Plymouth, etc. The painstaking research which has gone into this volume is a credit to the author and it is to be hoped that he will produce further volumes on the same subject.

The photographs are extremely well selected and constitute an admirable record of a form of transport which has now nearly passed into history. A particularly interesting chapter is that devoted to the Camborne layout which was the only street tramway ever constructed in Cornwall and was one of the first and only lines of its kind to cater for mineral traffic.

We can thoroughly recommend this book and know that it will be welcomed by the large army of tramway enthusiasts as well as those interested in all other branches of transport.

'RAILWAY MODELLING' by E. F. Carter. 88 pages, 21 diagrams, 5 half-tones. Published by W. G. Foyle Ltd., 119-125, Charing Cross Road, London W.C.2. at 2/6 nett.

To the Editor.

Model Tramways.

Dear Sir,

I must congratulate you on following the lead of your American contemporary 'Model Railroader' in publishing articles of tramway interest. After all the principle of rail traction is the same in both cases, therefore, the tram should not be despised by British railway modellers.

An interesting prototype for the man who is short of space would be the inter-urban electric railway. Such lines, examples of which may be found in America and most European countries, operate heavy electric trains on both street track and private right of way. A train may consist of anything between one and five cars.

Models of inter-urban cars may be constructed using Standard British motor bogies, such models should be able to traverse a 9 inch radius curve in OO gauge.

Yours faithfully,

F. W. HUNT.

Congratulations, Merseyside.

As we close for press we learn that the Exhibition organised by the Merseyside Model Railway Club from 24th—26th, September attracted over 11,000 visitors just over 5,000 of whom attended on the last day.

Change of address.

Messrs. True Model Co., have acquired new premises at 284, Upper Richmond Road, London, S.W.15 where Mr. E. Miskin will be pleased to welcome old and new customers. A full range of models, tools and accessories are available and the premises are laid out to give the best possible service to modellers.

BACK NUMBERS.

Limited stocks of the following are available at 8d. each post free:

1936. July and August.

1937. June and July.

1938. June to July, Sept. to Dec.

1939. Feb. to May and Oct.

1940. Mar., May to Sept.

The following are 11d. each, post free:

1944. July and Oct.

1946. August.

The following are 1s. 2d. each, post free:

1948. June and July.

1949. July to November.

1950. May to August and Oct.

1951. May to August, Nov. & Dec.

The following are 1/5 each, post free.

1952. February to Sept., Nov. & Dec.

1953. January to October.

THE MODEL RAILWAY CONSTRUCTOR,
104a, WEST STREET, FARNHAM, SURREY.

Club Notes.

Bletchley & Dist. Model & Exp. Society.

Will readers please note that the post of Hon. Sec. has now been taken over by S. C. Langford, 36, Walnut Drive, Bletchley, Bucks, to whom all communications should now be addressed.

Billericay Society Model Engineers.

The Society has been fortunate enough to secure permanent headquarters in Billericay and a welcome is extended to all modellers in the district. All branches of modelling are catered for and an extensive programme has been planned for the winter months.

Hon. Sec. R. Leach, 6, Mayflower Road, Billericay, Essex.

The "Four and Two" M.R. Club.

The Gunnersbury M.R.C., late of 526 High Road, Chiswick, W.4., which had to be disbanded owing to the loss of premises, has now been reformed and renamed "The Four and Two M.R.C."

New premises have been obtained in Chiswick and the Club meets every Friday evening at 8 p.m. The OO (2 mm) layout as shown at the 1951 and 1952 Exhibitions at Central Hall, Westminster has been installed and is now in the process of modification. It is hoped to make a start on the OO (4 mm) layout based on the original Gunnersbury M.R.C. layout early in the New Year. All the necessary equipment is available.

There are vacancies for new members in both the OO and OO Groups and all interested should contact the Hon. Sec., Major C.D.A. Provo, M.B.E., 143, Watchfield Court, Sutton Court Road, Chiswick, W.4.