What else happened? Only a good number forgot to include the index which we had to write and request. Another section took out the wrong pages which we had to retrieve. Another group specialised in sending cash for issues to complete the volume which were out of print and we had to return parts and money. Quite a few who had overlooked a stamped addressed card to acknowledge the parts have since written to enquire if we received them safely. Anything else? Oh yes, we had to return sundry letters (often unposted), bills, leaflets and other oddments which had been left in the pages of the issues and just be on our guard against the fellow who included a June 1952 issue instead of 1953 in the set.

All in all it was the worst binding season we have had and we hope it will not occur again. And if you want to write and say that you didn't do anything like this with *your* set of parts, don't forget to put your address at the top.

Our Cover Picture.

Shows a view on the Gauge O layout built by Mr. N. S. C. Macmillan. The engines are an H.R. "Castle" and a Caledonian Railway 0-4-4 tank. We shall be describing these locomotives in more detail in a future issue.

INTERURBAN CARS.

An American reader—Mr. J. G. Dickinson—describes his HO model cars.

Readers will doubtless be interested in these HO scale American Interurban Cars constructed by M. J. G. Dickinson, Durham, North Carolina, U.S.A. The following notes are supplied by Mr. Dickinson.

The centre picture shows a Budd RDC-1 Car in 3.5 mm. scale and operating on 16.5 mm. track. The motor is inside the car at the right hand end.

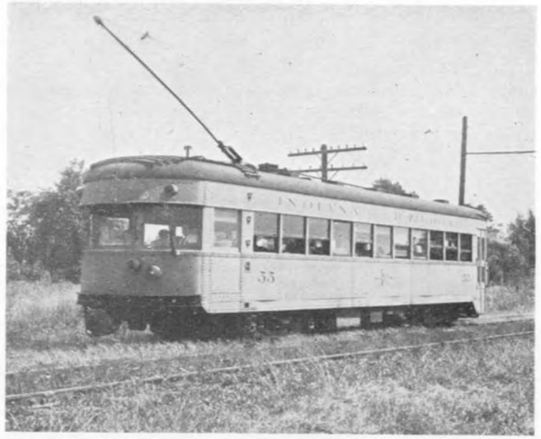
The right hand picture is of a model of a PCC Car (President's Conference Committee) and is a newer type of vehicle. This car is a somewhat standard design and is used by several surface lines such as Boston, Cleveland and Los Angeles. The model is No. 16 and is equipped with couplers so that it can "MU" with my Indiana cars.

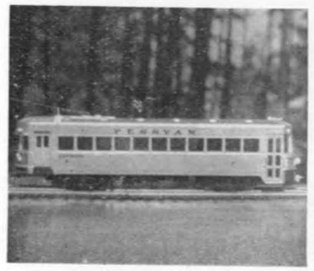
The left hand photo shows a model of an Interurban Car which operated in the State of Indiana about ten years ago. The prototypes were built in 1931 and scrapped for their aluminium content around 1941. Speed was 75 m.p.h. and they could operate in trains up to three cars. Weight was 52,000 lbs. and they were known as "The Indiana Railroad High-Speed Lightweight Single End MU Interurban Cars." This is quite a long title for such a short car of only 46 ft. overall length.

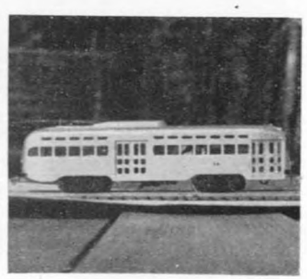
Note that the entrance door at the front end is only on one side (the right side), similar to the Talyllyn coaches, as is the express door at the rear. My model has such an express door which I cut in the body casting myself.

The car shown is No. 7 and is one of the six cars that I own. This car is my standard car and I have two of these with a passenger-express combination and four as straight passenger coaches. Of the six cars four are motored and two are trailers.

The remaining picture shows the prototype car and it will be noted how closely the model follows the original. The model is a die-casting, body and floor, two pieces and held together by two screws. The motor comes installed in the floor piece. Body casting has plenty of detail such as rivets, roof walks and vents on the roof and the model costs $22.50. Its length is 6¼ inches overall and like the prototype has current pick-up through the trolley or can operate on two-rail.







A Gauge 0 Steam Loco for Beginners.

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Part 16. By "1121."

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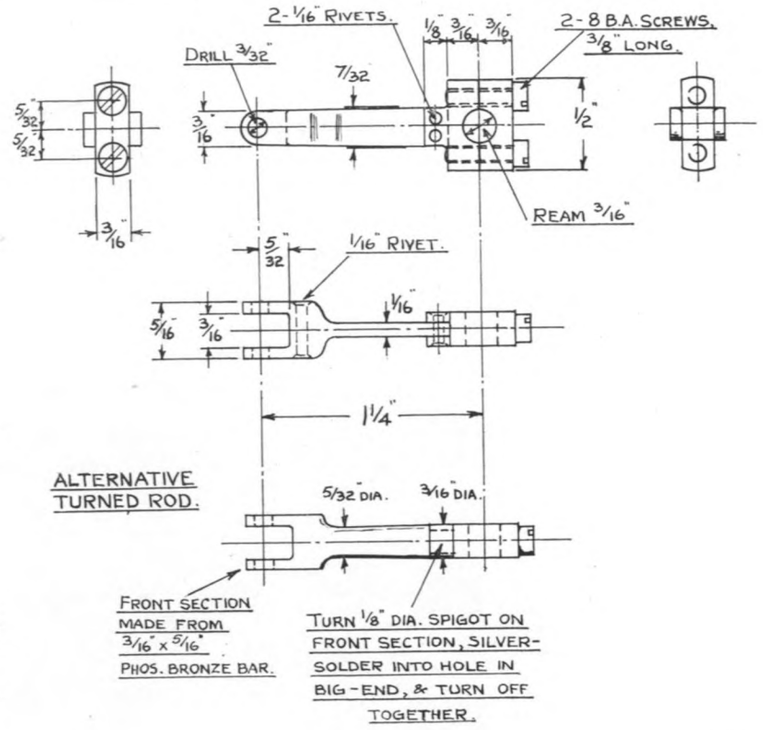


Fig. 77. The connecting rod, showing also an alternative all-turned rod for those who prefer it. (Drawing actual size for model.) Photo: M. Longridge.

There is one little job to do on the steam-chest, and that is to drill and tap the hole in the top into which screws the lubricator, this fitting also combining the entry of steam into the steam-chest. As this hole has to be truly vertical it is easiest to drill and tap it with the block in place in the frames, and thus held at the correct angle. The position of the hole is shown in Fig. 76, and it is a simple matter to mark and centre-pop it on the centre-line of the top edge of the steam-chest, and drill it with the frames on the drilling-machine table.

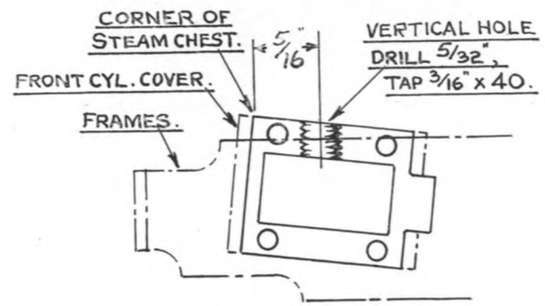


Fig. 76. Showing the position of the steam entry hole in the steam-chest, drilled with the cylinder-block in the frames.

The valve and spindle should *not* be in place in the steam-chest while this is being done, and next time the block is removed from the frames the burrs should be cleaned off the inside.

CONNECTING-ROD.

A drawing of this complete is shown in Fig. 77, and we are stipulating a flat rod built up from 1/16 in. by ¼ in. steel strip or 1/16 in. plate, as this is about the easiest method for a beginner a little shaky on fancy taper-turning in the lathe, but those with more experience may prefer to turn up the proper little marine-type rod shown as an alternative, and will know how to go about it from the information given.

The "sequence of operations" diagrams, Fig. 78, show how the flat rod is built up, the "little-end" fork being made first on the end of your strip, the method being to produce a sandwich with two other little bits of the same material on each side, the whole thing being held together with the tool-makers's clamp while a 1/16 in. drill is put through all five pieces. The job is then held together with a long rivet, made from a piece of 1/16 in brass wire if you haven't a rivet long enough, and the whole lot silver-soldered up solid and cleaned to a nice shape by filing.

The "big-end" is made from two bits of 3/16 in. by 5/16 in. phospor-bronze bar, cut sufficiently over the finished ½ in. length to allow for cleaning up, the back

half being sawn down to be only 3/16 in. square, as shown. These two pieces are now temporarily soft-soldered together, making sure they lay flat and true, and at this stage it is a good idea to make a small centre-pop mark in each half at adjacent corners so that after dismantling they may be re-assembled again correctly. On the back end of the assembly centre-pop the positions of the two bolt holes, and holding the block so that it is truly upright in both directions in the machine-vice, or clamped up against a square block of metal, drill them No. 51 right through. Now unsolder, and cut the front half to shape as shown. Tap this half 8 B.A. right through both holes, and open out the back half No. 43. Remove all solder and burrs. Assemble the two halves again with 8 B.A. cheesehead steel screws, $\frac{3}{8}$ in. long. and put the toolmaker's clamp over them as shown to hold them firmly together for the next operation.

This is to centre-pop on the joint between the two pieces, and on their horizontal centre-line, and drill right through at this point No. 13 and ream 3/16 in. Put a slight chamfer or radius on both ends of this hole, and file up the remaining edges of the two blocks together to finish to shape. Dismantle and remove any burrs between the two halves.

The vertical slot into which the rod fits is now sawn and filed, and the rod portion cut to length so that it will fit in to give the dimension of 1-3/32 in. to the inside of the fork. The end of the rod is pushed into this position in the slot (if it is not a tight fit the slot can be closed up very slightly to make it so) and the two parts soft-soldered together. A pair of 1/16 in rivets should now be put right through, finished into slight countersinks on either side and filed off quite flush.

With a bit of axle-steel through the big-end hole the position of the crosshead-pin hole in the fork can now be marked as shown in operation 7, Fig. 78, the figure being 1-5/32 in., this allowing for half the diameter of the big-end hole. The crosshead-pin hole can now be drilled 3/32 in. right through both sides of the fork at one go, with a bit of 3/16 in. brass or aluminium plate jammed in the fork to protect it from the drill pressure. It is important, of course, that this hole should be truly parallel with the big-end hole (both, that is to say, being square with the centre-line of the rod), otherwise stiffness of running will result: To achieve this squareness the rod should be set up on 1/16 in. packing as shown,

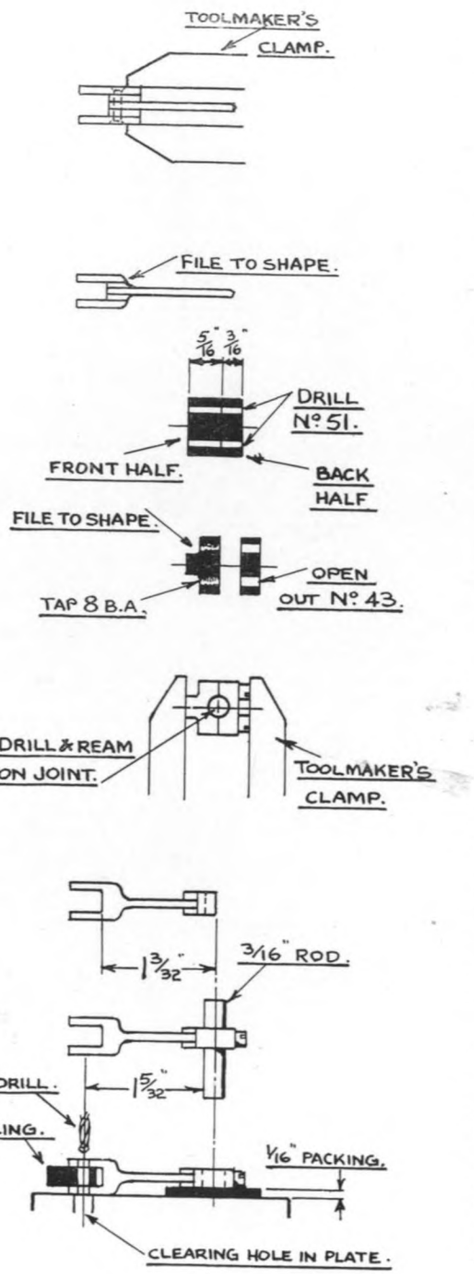


Fig. 78. Sequence of operations for making the flat-type connecting rod.

1. The five pieces of 1/16 in. plate clamped together, drilled and rivetted to make the little-end fork.

2. Silver-solder and file to shape.

3. Soft-solder together the two parts of the big-end, and drill right through No. 51.

4. Separate the two halves, file front half to shape and tap 8 B.A. Open holes in back half No. 43.

5. Screw halves together, hold with toolmaker's clamp, centre-pop, drill and ream on joint

6. Cut slot in front half, cut rod to length to fit in slot to give 1 3/32 in. length.

7. Mark position of crosshead-pin hole from rod through big-end.

8. Drill crosshead-pin hole with rod packed level.

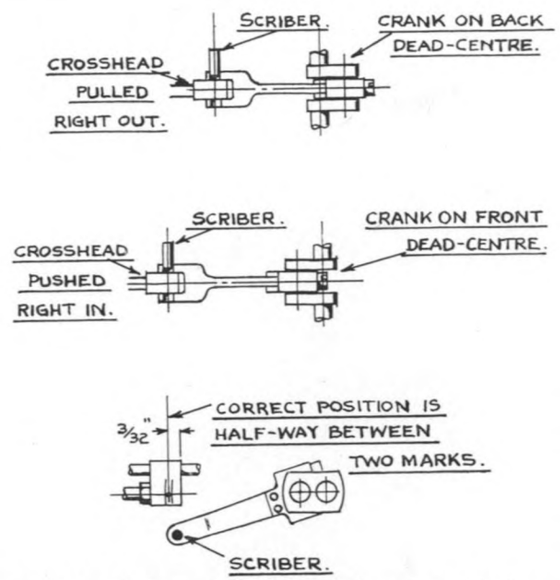


Fig. 79. Marking the crosshead by means of the special scriber in the connecting-rod little-end.

which will bring it level while the hole is drilled on a piece of plate with a hole in it to let the drill through. After drilling, a piece of 3/32 in. rod through the little-end hole can be checked for parallelism against the 3/16 in. rod through the big-end, and squinting along the length of the rod from the front end will show whether the two rods lay parallel from that aspect. Any slight error here can be corrected by a little judicious twisting of the rod. Now finish the whole rod off to shape, and clean off burrs from inside the little-end fork.

The rod should now be assembled in position on the crankpin, making sure it runs quite freely but without end-slackness, and also is quite free between the crank-webs when the crank is rotated, and from any position will slip over the crosshead. With the cylinder still in the frames, we can now use the rod for the purpose of marking the position of the hole in the crosshead. This position obviously must be such that the piston will clear both cylinder-covers by about the same amount at the ends of its stroke, and the method of ensuring this is as follows.

Make up a special little scriber by running a bit of 3/32 in. silver-steel in the lathe and filing the end to a rather obtuse point (like the point of a drill), making sure the point is reasonably central. Cut it off about $\frac{1}{4}$ in. long (there is no need to harden it for this job). Pull out the piston-rod to its fullest extent, turn the crank until it is as near as you can judge on its back dead-centre, put the sharp end of your little scriber into the hole in one side of the little-end fork, and make a little mark with it on the crosshead by swinging the connecting-rod up and down. If your fingers are of the fat variety and won't go in there you can easily hold the scriber in the hole with something a bit thinner, such as your rule. Do exactly the same thing with the piston-rod

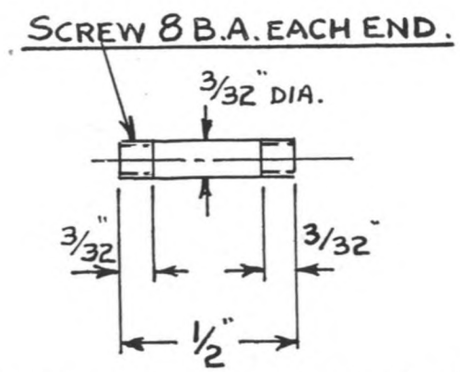


Fig. 80. The crosshead-pin. Material 3/32 in. silver-steel.

pushed right in as far as it will go and the crank on front dead-centre. You will now have two little arcs scribed on the crosshead, and half-way between them is the position of the crosshead-pin (Fig 79). This position should be at approximately 3/32 in. from the back of the crosshead. If, somehow or other, you have got it wildly out of position you can adjust the crosshead on the piston-rod by rotating the latter and tightening up the locknut, and remark the crosshead. When you are satisfied, remove the cylinder-block from the frames, mark a horizontal line on the same side of the crosshead at the centre-height of the piston-rod, centre-pop in the right position, and hold the crosshead down firmly on your piece of plate with clearing hole and drill through 3/32 in. Finally round off the bottom corner of the crosshead.

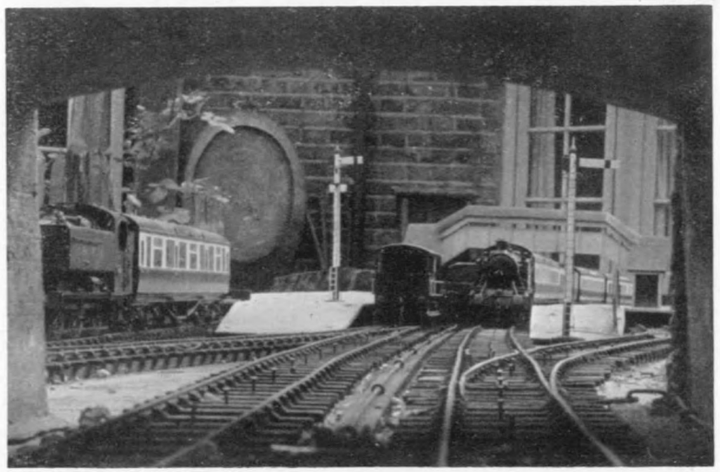
The connecting-rod is most easily pinned to the cross-head while the block is out of the frames, any subsequent dismantling being done from the crankpin end. The crosshead-pin is a simple enough job, and is shown in Fig. 80 It is merely a bit of 3/32 in. silver-steel, $\frac{1}{2}$ in. long, screwed 8 B.A. at both ends. Remember two things—firstly that 8 B.A. size is a bit smaller than 3/32 in., so you should open your die up a little for the first cut, or it will chew the thread to pieces through having too much to take off. Then run the die over again in its normal position to finish the thread, and check with a nut. Secondly, if you are not used to working with silver-steel, we should mention that due to the process by which the bars are cut off, the extreme ends of a new bar are often "dead hard" and will ruin a die or lathe-tool, although this is more noticeable in the larger sizes. It is always a good idea, therefore, either to grind over the end or saw off $\frac{1}{8}$ in. or so when starting a new bar. We implore you not to forget this, as such unaccountable wrecking of tools is one of those things which can turn the beginner away in disgust at his own inability or of model engineering and model engineers generally, due merely to the need for knowing about and understanding a simple little "trick of the trade."

Screw an 8 B.A. nut tightly on to one end of the crosshead-pin, put it through the little-end fork and the crosshead and screw on the other nut. One other thing—watch out for a little burr pushed up by the die at

the inner end of each length of threading, and preventing the pin from going through the holes. Reassemble the cylinder into the frames, and check that the connecting-rod clears the end of the guide-bar when it swings over the top of its circle. Another possible fouling-point is the top corner inside the little-end fork against the back of the crosshead, which can be cured by filing a small radius in the fork.

A 7 mm. Scale Outdoor G.W.R. Layout.

Part 2. **By G. E. MANN.**



Churston from rail level. Up local waiting to depart with 2—6—2T No. 6117. Brixham auto train in bay. Photo: M. Longridge.

Storage of rolling stock and locos is a great problem. To store them indoors means taking them out, assembling trains and so on, and at the end of an operational session it has to be done in reverse. With a stud of 8 coaches and 4 locos time spent in this way is considerable and with the increases in stock which are down for construction, the period will be further lengthened. However, some easing of the situation is in sight. My wife, after holding out for some time, has now given me "running powers" into the pantry. By putting a shelf under one of the existing ones and knocking a hole in the wall for entrance and exit, I can lay 3 sidings 5 feet long. The connecting line will join the main circuit about 20 feet out. But I shall still have to pack and unpack coaches and goods stock—the latter non-existent so far, except for a 20 ton brake van.

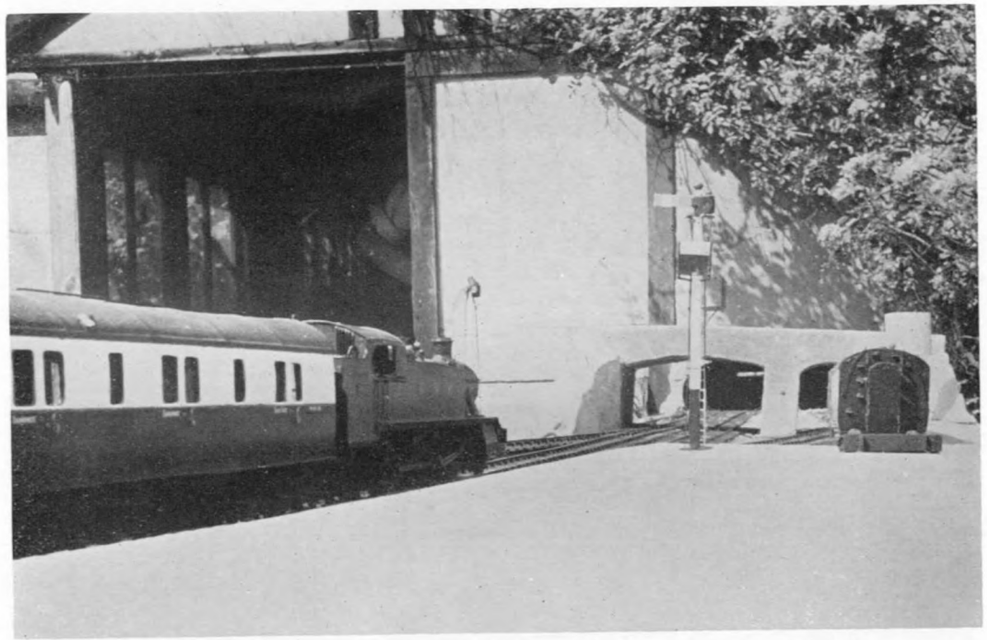
Signals and points are interlocked with the power, so that it is impossible for a train to overrun a signal, while if a crossover is set for crossing, the tracks behind the points are 'dead,' so no train can collide with another, or run against the points. This effect is achieved by a remarkable lever frame, which would make Heath Robinson absolutely green with envy. A sketch was given last month (Fig. 3) showing the idea, and how it works —it does too. Signals and some points are solenoid operated through Zenith levers and "passing contact" fittings. Rods run from the lever's extremities and through a brass bearing. On the rod, made of 1/16 in. steel, is forced a fibre bush, or bushes which as the rod moves to and fro, pass over spring brass contacts, the free ends of which when pressed down by the bush make contact with a brass screw on which is soldered the appropriate lead. A second frame is being installed by Greenway Tunnel. This will control the "open" side of the line. Mechanical interlocking between points and signals is also installed.

Much still remains to be done. The signals on the "open" side of the line have yet to be made, also scenic effects station buildings, signal cabin and other items, to say nothing of the Pantry line. New stock down for building is made up of 3 locos, 10 coaches and about 20 freight vehicles, enough to keep me busy for some time. I think at this point I should pay tribute to my wife's unfailing patience, which is sorely tried at times when trying to do jobs in the kitchen with its table permanently decorated with a vice and tools, and the gas stove with soldering bits. So far no brass filings in the pastry! But I do owe much to her co-operation and understanding.

Operation is as on my last line. A train leaves the garage and arrives at Churston Down platform, another train has left the garage by the Greenway Tunnel and

(*Continued on page 80.*)

An interested spectator from next door watches the operations.



Up local leaving Churston with 2—6—2 Tank No. 6117. **Photo: M. Longridge.**

The prototype of Mr. Mann's Layout. A view of Churston Station by C. Gordon-Watford. "Hall Class loco No. 6975 is entering Churston with a down stopping train for Kingswear. 14xx 0—4—2T No. 1466 heads the Brixham branch train in the bay.