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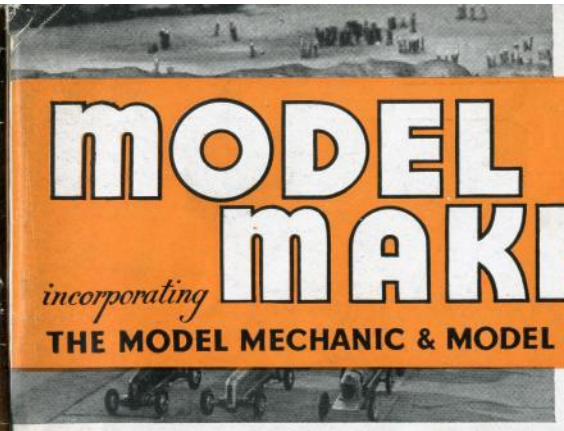

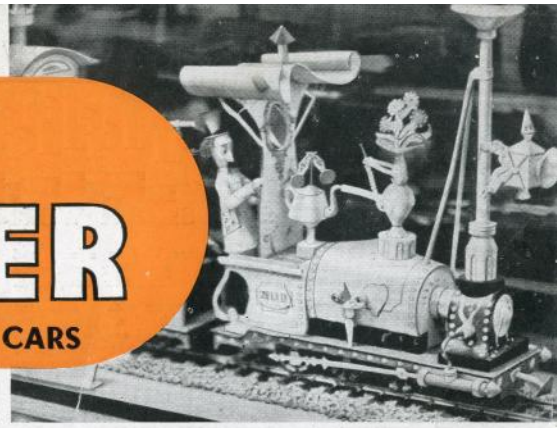

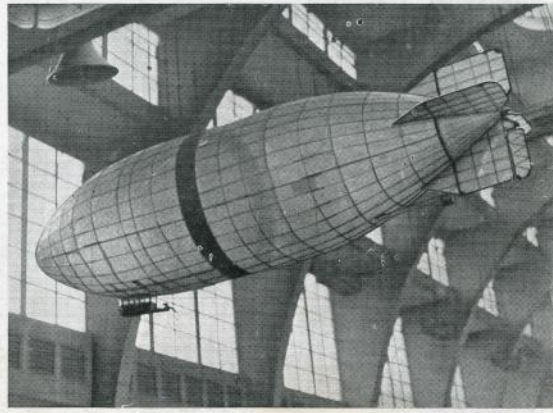

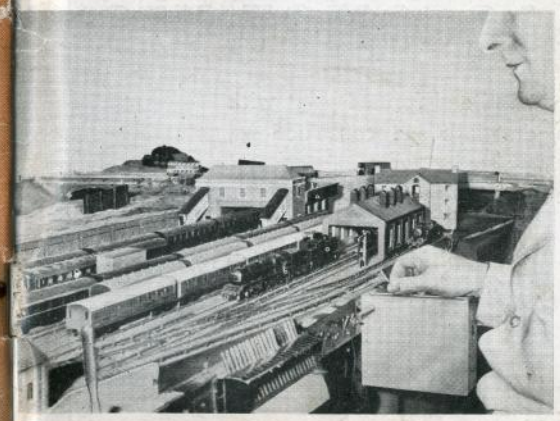

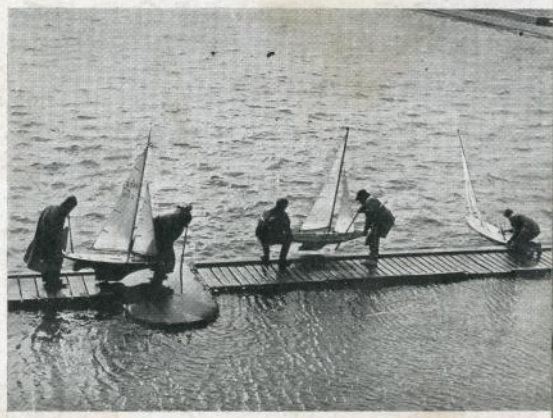

VOLUME 1 **NUMBER 11 (New Series)** **OCTOBER 1951**

2/-

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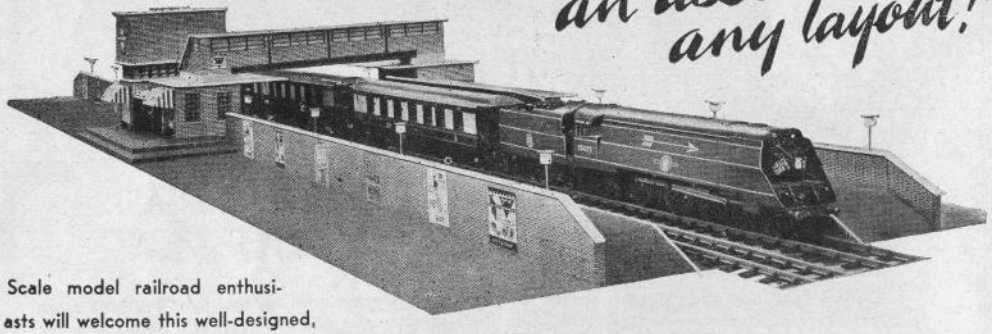

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incorporating THE MODEL MECHANIC & MODEL CARS

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VOLUME I No. 11 (New Series) OCTOBER 1951

PROBLEMS OF SUPPLY

IT is a distressing fact that periods where crisis swiftly follows crisis in our international affairs are usually notable in our own small world for an increasing interest and active participation in modelmaking, yet, by the very nature of these larger upsets, the materials to satisfy that urge are, in part, diverted to uses designed to avert such conditions.

At times when blacker and blacker headlines match the black news they announce it is natural for the saner amongst us—and high in this list must we rank model makers!—to seek relaxation in pursuing their manual skills in the peace and quiet of their own homes. No famine or disaster attacks our model villages, no disastrous railway accident sheds gloom upon our garage layout, our model armies are lined up on no neighbouring frontier, whilst our model cars present no problems of vast financial outlay or impossible delivery dates. Small wonder that we turn to these essentially sane activities to forget the larger worries around us!

But, alas, these worries continue to plague us, for national re-armament and general belt-tightening programmes demand their quota of the raw materials from which our models are made. Manufacturers who are eager to provide the goods we like find their supplies cut short, others must divert part of their factories to potential war production, so that goods now out of stock may be hard to obtain again for many a weary month.

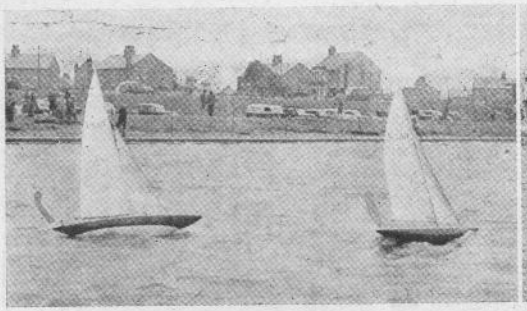
While we are reluctant to recommend that modern horror of "stock-piling", we would urge our readers to acquire items that they need just as quickly as their purses permit, and not defer purchases in the belief that there are plenty more where they came from.

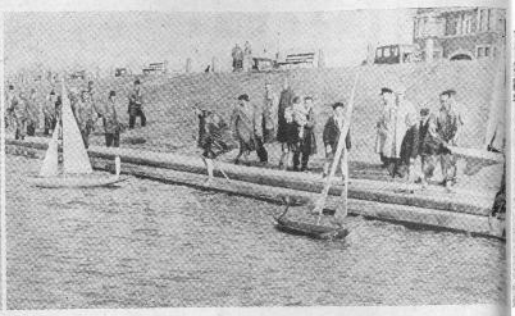
Now might well be a time to consider how individual modelling sections can continue with a limited use of metal. Already manufacturers have turned their hands to the production of such items as model station packs, that require only the addition of wood to complete an elegant and necessary lineside decoration. Wooden bodies for model cars have long shared popularity with those of metal; they should be quite practical for model locomotives too, while in the smallest sizes bristol board is not to be despised as a building medium.

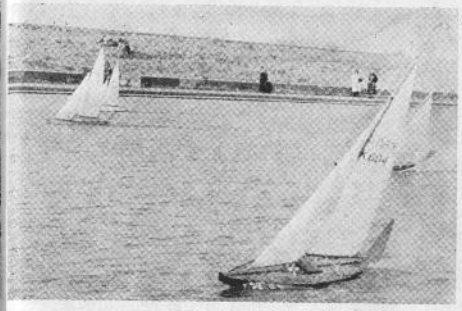
One bright spot emerges from this tale of shortages. It is possible to obtain a wide range of imported model materials. One well-known dealer is getting accessories from far-off Australia, many kits and parts are coming in from Italy, and now some interesting miniatures in TT gauge are arriving from Germany.

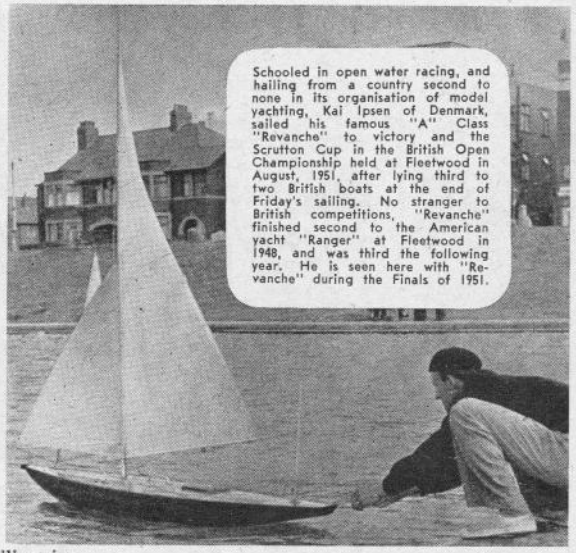
ON THE COVER . . .

Top : A. C. Polyblank's cardboard model of Emmett's Far Tottering & Oyster Creek loco "Nellie". Centre left : Henri Baigent's Grand Prix Circuit, showing cars coming under "Dunlop Bridge". Centre right : An airship model of topical interest in view of "Bournemouth's" trials. Bottom left : Part of the Ilford & West Essex M.R.C.'s layout, with loco shed in foreground, and main station glimpsed beyond. All the above were pictured at the recent M.E. Exhibition. Bottom right : Start of a board from the pontoons in the finals of the International 'A' Class Contest at Fleetwood. (Model Maker Photos)





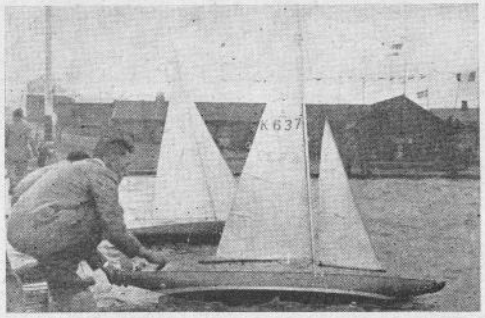




Schooled in open water racing, and hailing from a country second to none in its organisation of model yachting, Kai Ipsen of Denmark, sailed his famous "A" Class "Revanche" to victory and the Scrutton Cup in the British Open Championship held at Fleetwood in August, 1951, after lying third to two British boats at the end of Friday's sailing. No stranger to British competitions, "Revanche" finished second to the American yacht "Ranger" at Fleetwood in 1948, and was third the following year. He is seen here with "Revanche" during the Finals of 1951.

G. H. DEASON PRESENTS A "MODEL MAKER" PHOTO FEATURE OF FINAL HEATS IN THE

"A" Class Championships at Fleetwood

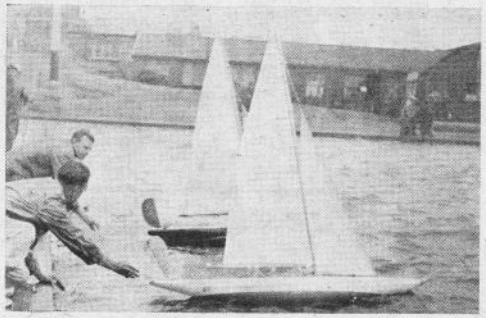


(Head of page) Left, "Helios", runner-up in the Finals, led by A. McGruer's "Fiona" on a close reach. (Centre) Boats retrimmed during a beat. The skipper in the centre seems to have set a personal spinnaker! (Right) Two "Boards" in progress together. Nearest the camera "Black Empress" leads "Fiona", with "Yeoman" ahead of "Westwind" on the seaward side.

THE British Open "A" Championship, held at Fleetwood from August 9th to 25th, attracted 50 entries, 48 of which actually took part, these including six Scottish boats, two from Ulster, three French and a lone Danish challenge by Kai Ipsen with *Revanche*, which finally defeated its rivals and ran out a close winner by four points in the finals, from W. Douglas' *Helios* from the Barrow Club.

Weather during the week was distinctly mixed, ranging from light and fickle breezes from all points, through a flat calm, to gale force for the final rounds, which began on Friday the 24th. By this time, *Dou, Phibou,* and *Zef*, the French contenders, were all eliminated, leaving only the redoubtable Kai Ipsen to contest the issue with the British contingent of which two, *Flame* and *Westwind*, were sailing in home waters.

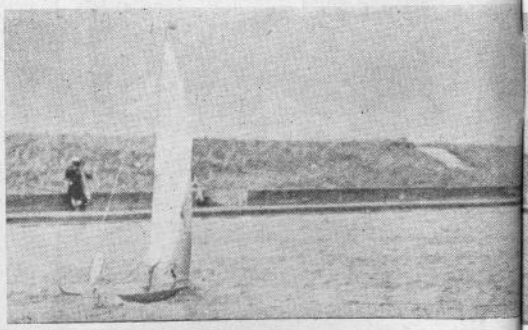
By the time *Model Maker* arrived at the lakeside for the first round of the finals on Friday the wind, absent in the morning, had freshened considerably, reaching gale force at times. On the windward courses both beating and reaching conditions prevailed, but full use of spinnakers on the South-to-North run gave some fast sailing, and the handling of the competing boats was of the very high standard one would expect of Open Championship events. J. Freedman's *Rapture* and B. H. Priest's *Yeoman* led the Danish boat at the end of the day by five and four points respectively, but after a hard tussle on the Saturday, during which the weather again

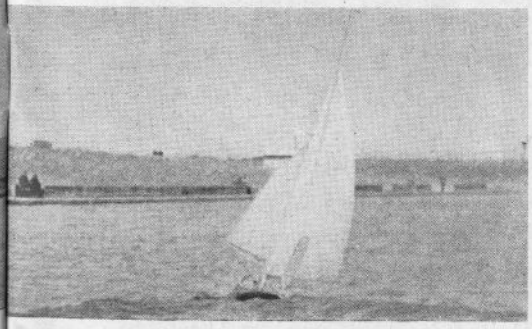


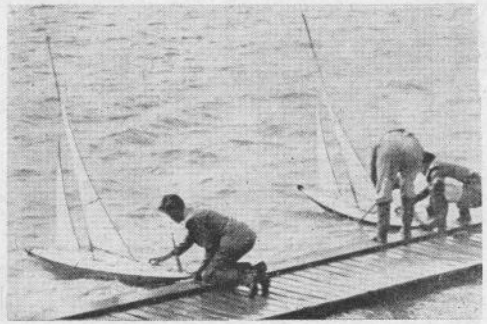
(Below) An overhead shot from the bridge, showing "Yeoman" and "Black Empress" being trimmed at the pontoon before a "board". Sea-boots were the order of the day, and the big "A" Class boats called for skilful handling under these conditions.

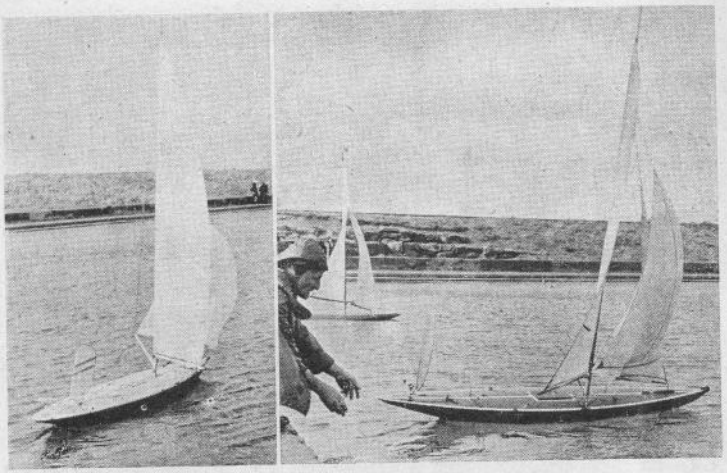
(Above left) Start of a beat, with "Yeoman" in foreground matched against the ultimate champion, "Revanche". (Below) Battle with a mainsail, W. G. V. Blogg's "Sharma" changing a suit of sails on the north bank. (Below centre) The Fleetwood salt-water lake from the south end, showing "Fiona" and "Westwind" running a fast board with spinnakers set.

(Above right) With the commodious Clubhouse in the background, H. Scott-Freeman of South London starts "Zenith" on a beat against a Fleetwood boat, E. L. Dawson's "Flame". These two boats finished fourth and fifth in the final results.









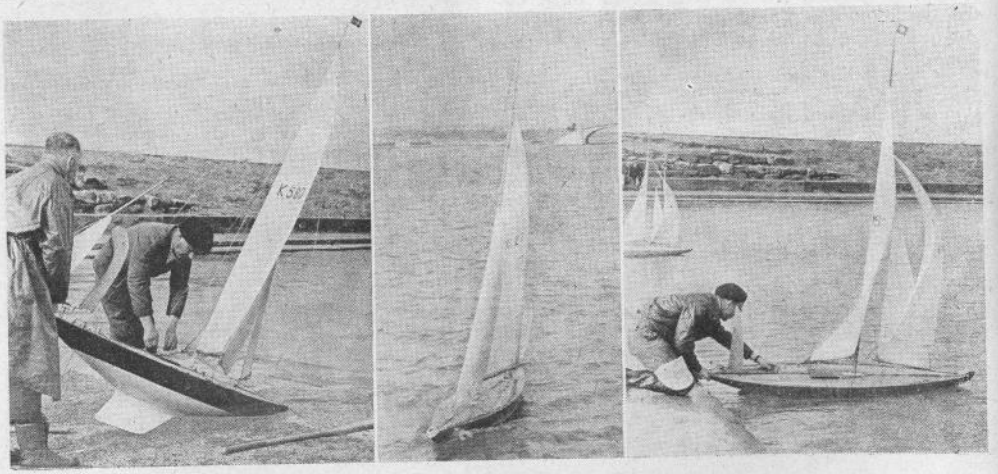
(Left) "Rapture", J. Freedman's Yorkshire entry, third in the final placings, running in a moderate breeze, and A. McGruer's Scottish boat "Fiona" away with canvas drawing well.

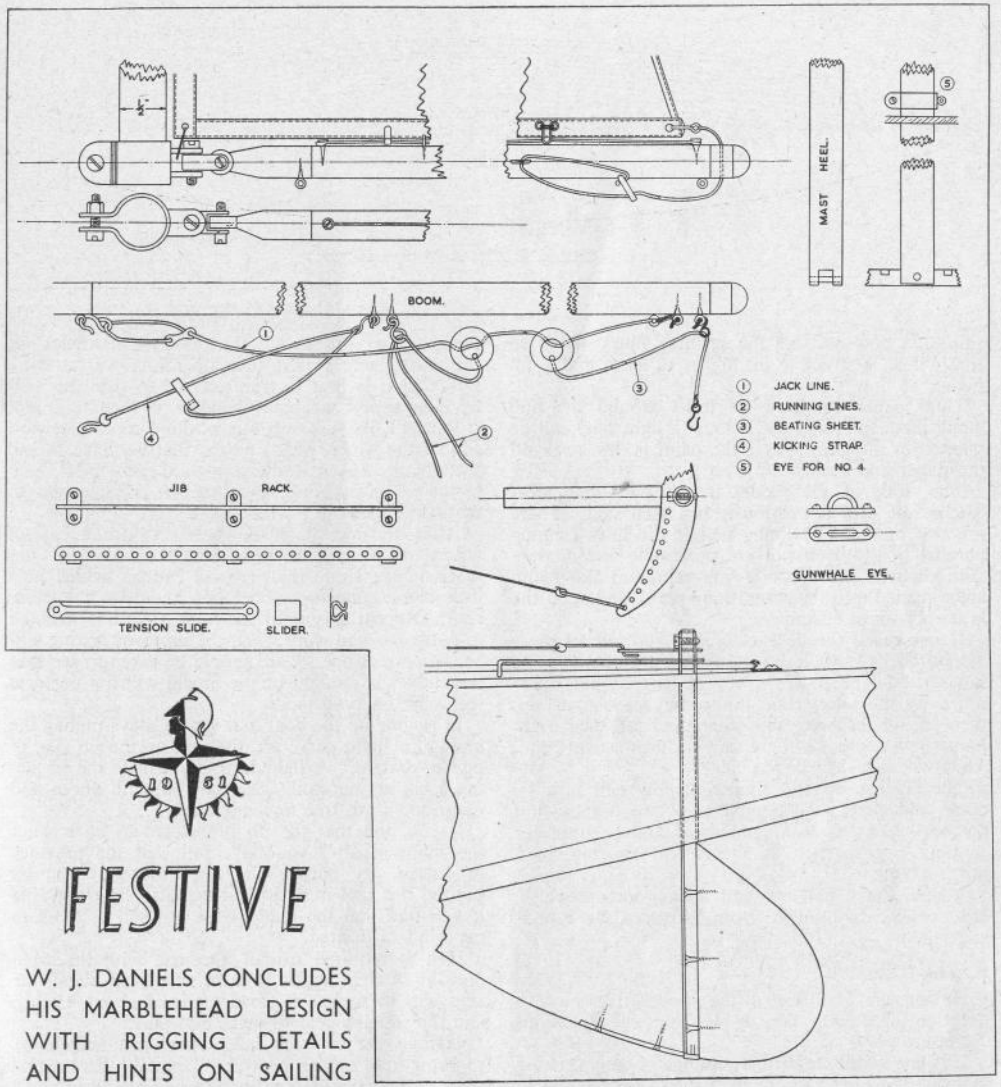
deteriorated, Kai Ipsen sailed *Revanche* to the front to win the Challenge Trophy.

The Mayor of Fleetwod, who took a keen personal interest in the Regatta, officiated at the prize distribution in the Fleetwood Clubhouse, and a gift of five bronze medallions, by M. Boussy of France, were awarded to competitors as a special recognition of merit.

			DIVISIONAL HEATS					FINALS	
Yacht	Skipper	Club	Sun./Mon.	Tues.	Wed.	Thur.	Division	Friday	Saturday
1. Revanche	Kai Ipsen	Denmark	33	54	73	90	B	33	72
2. Helios	W. Douglas	Barrow	32	48	67	80½	B	30	68
3. Rapture	J. Freedman	South Yorks	38	48	65	76½	B	38	65
4. Flame	E. L. Dawson	Fleetwood	29	45	60	84	A	33	65
5. Zenith	H. Scott-Freeman	South London	28	43	58	78	A	20	55
6. Grenadier	E. Marsh	Birkenhead	39	57	73	84	B	29	54
7. Black Empress	R. Bradley	Bolton	30	47	65	79	A	19	52
8. Panther	J. Tregenna	Ulster	19	39	50	69	B	22	51
9. Yeoman	B. H. Priest	Birkenhead	42	61	81	89	B	34	49
10. Westwind	R. Pilling	Fleetwood	30	42	62	80	A	25	44
11. Fiona	A. McGruer	Helensburg	26	39	54	80	A	20	43
12. Sharma	G. Blogg	Y.M.6m.O.A.	27	40	61	84	A	27	41

(Left) W. Douglas of Barrow, second in the Championship, trims the spinnaker of "Helios". (Centre) E. Marsh's "Grenadier", sixth finisher, close hauled in the Finals, and (Right) Lancashire boat "Black Empress" provides a satisfying sight with boom out and spinnaker filling nicely.



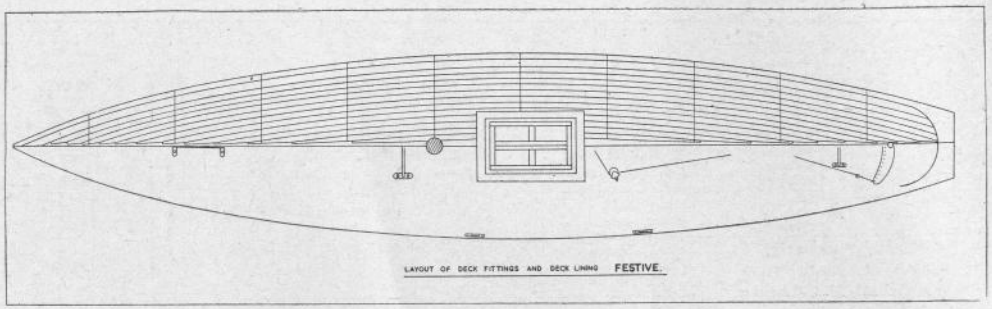


FESTIVE

W. J. DANIELS CONCLUDES HIS MARBLEHEAD DESIGN WITH RIGGING DETAILS AND HINTS ON SAILING

THE point has now arrived when consideration must be given to the finish. Most model yachtsmen who are expert at planking a model do not like to cover up their work by painting, but a plain varnished boat does not display her shape unless there is something to indicate the topsides from the underbody.

A line known as a boot top will achieve this and set off the finish. After applying one coat of varnish as a filler and allowing to dry, rub down with fine paper. Turn the model upside down on a flat surface and with a scribing block arrange it so that the water line is parallel to the surface, and mark round the model the load waterline. Having done this



LAYOUT OF DECK FITTINGS AND DECK LINING FESTIVE.

raise the bow and set the scribing block lower so that a line is struck $\frac{3}{8}$ in. higher at stern and $\frac{5}{8}$ in. higher at bow.

Gum paper can now be fixed around the hull along these lines and the colour (a light one) can be painted in the gap. After the paint is dry, soak off the paper and varnish all over.

The deck of the model is the part that most catches the eye, as previously has been said. There are two methods of lining it, but the lines running parallel to the deck rail are preferable and comply with modern practice. If you represent the plank ends joggled into the centre king plank and stain the latter it is most effective.

If you make the deck coamings and taffrail piece of obechi they should be stained a dark colour. The latter should be fixed with $\frac{3}{8}$ in. copper pins. Do not drive the latter right home, but leave $\frac{1}{8}$ in. up, then cut off the head with pliers and tap them right home with a series of light taps to form a rivet head. They will not then be visible.

The rigging up and final assembly can now be done, and the model completed. Use nothing but the best cord. Cotton bobbins should be used for running rigging such as sheets and steering lines, outhauls, etc.

All necessary bowsers, sail hooks, cord, bobbins, etc., can be obtained from Arthur Mullett as advertised.

Sailing "Festive"

Having now completed the model it is now a question of *tuning* her up so that she functions correctly.

It is one of the unfortunate things of vane steering that one is inclined to use the vane to get the course desired before everyhing is arranged for the model to give her best performance. As at the moment the model is fitted with quadrant steering the matter does not arise, but it must be borne in mind that although sailing is a mechanical operation a yacht can never be an exact piece of machinery. Sails are liable to change shape slightly, and to stretch, and even the hull does not stay put. Some model yachtsmen have graduations marked on the spars and keep notes of the trims by this means, but a slight dampness of the atmosphere or rise in temperature will alter all this, and it is best to train oneself to trim the sails by their aspect when the wind is on them.

We will first take up our position at the leeward end of the water, which means that we have to sail close hauled to get to the windward end. First, haul in the jib fairly close, and then set the mainsail so that it is slightly at a wider angle.

After starting the boat on her course a careful watch will note if she is keeping her sails full. On reaching the shore the mainsail can be hauled in a little closer ,and the model put round on the other tack. Repeat this until the boat at last is inclined to come head to wind when the previous setting will be the correct one. Care should be taken to see that the rudder is straight or the model will not perform the same on both tacks.

In rigging up the boat first set the stays pulling the mast in a slight curve aft, then set up the jib stay to pull it straight. A tight forestay ensures the jib being a correct aerofoil. See that both jib boom and main boom are free to swing easily.

If you find that the jib is inclined to back wind the mainsail after you have followed the previous procedure, try putting the mast more upright by putting the keel in a slot further aft. The opposite if you find that the model does not sail as close to the wind as desired.

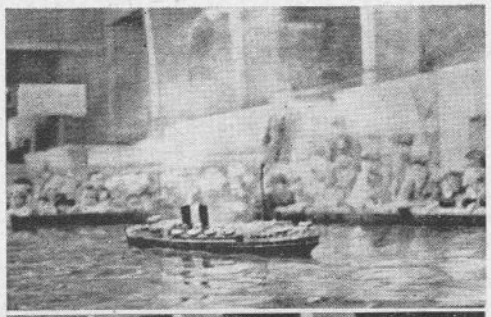
If it is required to sail a course with the wind blowing at right angles (known as a beam wind) the sails should be let off to an angle of about 45 deg. and the steering gear brought into play.

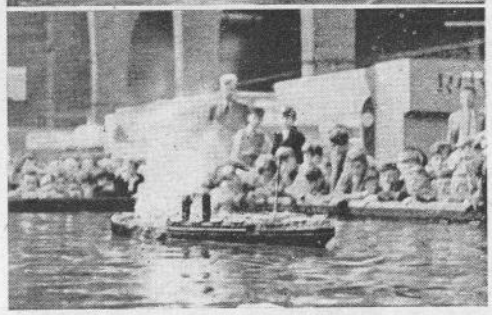
Tighten the centring line elastic just sufficiently to bring the rudder central. Unhook the beating sheet so that the lines to the steering quadrant come into play.

If you find that the model sets up to weather of the course the pull on the quadrant must be put further away from the rudder head and close it in if the boat breaks away off the wind too much.

The running line that is not operating should be hooked on the outer limit of the quadrant so that if the model gets the mainsail over the wrong side

(*Continued on page* 689)





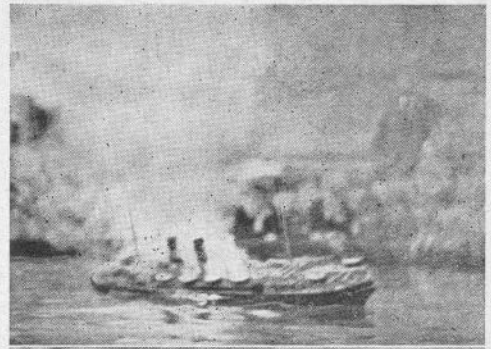
SINKING OF S.S. EGYPT

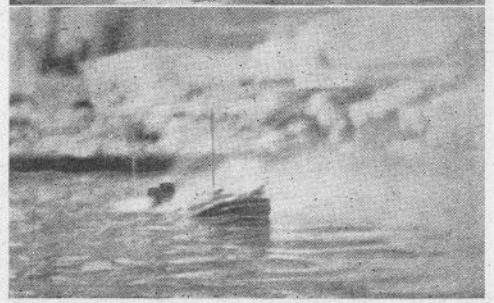
ON a murky night in May, 1922, the P. & O. liner S.S. *Egypt* was steaming quietly along just off Ushant, that rocky little isle some twelve miles from the coast of Brittany. In her strongroom reposed a fortune in bullion — a responsibility that her captain would not be sorry to hand over on arrival in port. But this was not to be. Suddenly out of the darkness loomed up a chunky little Welsh collier which stove into the *Egypt*. Almost within minutes she had sunk in flames, bullion and all consigned to the deep. From that day to this its salvage has been the dream of the adventurous, but the sea holds on. This dramatic sinking formed the subject of one of Dr. Rex Stansfield's remote controlled displays in the Marine Tank at the recent Model Engineer Exhibition.

Throughout the exhibition S.S. *Egypt* sank realistically in flames approximately every two hours. Just how Dr. Stansfield managed this we would not like to say. We do not think the same system of underwater sound transmission that operated his other setpiece S.S. *Port Brisbane* was utilised, but rather a delayed action timing mechanism, set just before the boat was released. Whatever the method employed the sinking was realistic enough, as our photographs endeavour to convey.

Here we see in the top picture, the first signs of fire breaking out, with a whispy cloud of smoke rising from the afterhold. Next, it is evident that the fire has taken a good hold, and the trim is beginning to shift. Then in the third picture her unhappy fate is clear; fire is spreading forward, there is a distinct list, and orders to abandon ship must be executed without delay. The final picture shows the last of S.S. *Egypt*, as bow first, she sinks in a final burst of fire and smoke.

For the benefit of interested readers these pictures were taken without flash at an aperture of f3.5 and a speed of 1/25th second, using Kodak Super XX film. Camera was an Agiflex II.





MODEL MAKER MODEL YACHT TROPHY

WE publish below relevant correspondence between this magazine and the Model Yachting Association with regard to the presentation of a silver challenge trophy. Under the circumstances we are happy to abide by the decision of the M.Y.A., and accept their suggestion for its annual award.

Model Yacht Club Committees are therefore invited to make offers to place their sailing water at our disposal for the purpose of a Novice 36-in. Restricted Class Contest to be held on a convenient date in 1952. We should prefer interested Committees to have the whole handling of the event, and would agree the rules mutually with them. We have no wish to regulate the actual contest, though we should appreciate the invitation to serve on the Contest Committee. Our part will be to provide the Trophy and to present the winner with a voucher to the value of Five Guineas. It is hoped to hold the event at a different venue each year, so that should a Southern Club be agreeable to stage the 1952 contest then a Midland or Northern venue would be sought in subsequent years.

MODEL MAKER *to Secretary, Model Yachting Association.*
23rd April, 1951.

Dear Sir,

It is our desire to present a silver cup together with an annual award of £5 5s. 0d. for model yacht competition.

I should be glad to know whether the Model Yacht Association will be prepared to accept this offer of a Challenge Trophy for annual competition.

. . . . . .

I should appreciate your comments and hope that you will be able to make use of this offer.

Yours faithfully,
D. J. LAIDLAW DICKSON,
Co-Editor.

The Model Yachting Association to MODEL MAKER.
24th April, 1951.

My Dear Sir,

I beg to thank you and the MODEL MAKER for your most generous offer of a Silver Cup and Annual Award of £5 5s. 0d. as contained in your letter of the 23rd inst., The M.Y.A. only hold in trust (as their property) the six National Championship Cups, i.e., one for each of the Classes recognised by the Association. Individual Clubs of course, each have many Trophies for their own Club competitions and others for Open interclub events. Pre 1938 the M.Y.A. held in trust (not as their own property) quite a number of valuable Trophies, each one having its own conditions (as laid down by the Donors). When these trophies were raced for, the Clubs with which the Trophy was directly associated, always expected Headquarters to arrange and sponsor these events, and to allocate a sum of money towards prizes, etc. This resulted in a very severe and dangerous drain on the then as now, very limited funds of the Association. In 1938 it was agreed at an Annual General Meeting that the M.Y.A. could not possibly stand this continued financial liability and it was agreed that ALL Trophies other than the National Championship ones, be handed back to the donors or Clubs. This was done. . . . I shall have the greatest pleasure to submit your letter to Council at their next meeting (in June) and will then inform you of their decision. I am afraid that your suggestion would be impractical for the Association as such to employ. I do most sincerely trust that Council may offer a suggestion to you, for your consideration. With very kindest regards and best wishes,

Believe me to be,
Yours very sincerely,
CHAS. R. SEABROOKE,
Hon. Secretary, M.Y.A.

MODEL MAKER *to Secretary, Model Yachting Association.*
26th April, 1951.

Dear Mr. Seabrooke,

Thank you for your letter explaining the general attitude of the M.Y.A. towards cups and trophies. I had rather anticipated that this might be the Association's official viewpoint, but felt that it was both right and proper to make the unqualified offer in the way that I did to give their officers an opportunity of some say in its ultimate destination.

Under the circumstances—may I add that I consider the M.Y.A. shows admirable restraint in this matter, for multiplicity of awards can be a real burden on administration —I should be glad if you would put up an alternative suggestion to the Council.

That is, that a MODEL MAKER Trophy will be available for annual award as a challenge cup, together with a Five Guinea Prize, for the best performance by a novice skipper (first or second year men who have never won a national award before) in any of the six National Championship Classes in the Cup Competitions. . . .

We are, of course, quite open to any other suggestion the Council may put up—our intention is to make some gesture of encouragement to the newcomer—they are so often neglected while the expert has always the goal of international sport and the possibility of an overseas trip as a national representative.

Yours sincerely,
D. J. LAIDLAW DICKSON,
Co-Editor.

June 23rd, 1951.

The Model Yachting Association to MODEL MAKER.

My Dear Mr. Dickson,

As promised in my letter of April 28th I was happy to present all the correspondence between us to the Council of the M.Y.A. at their Statutory meeting held in London on June 21st. The matter of your thoughtful and kind offer was very seriously and sympathetically considered. I regret that Council could not see their way clear to depart from the practice that it had adopted since 1938 re further trophies. The suggestion that it could be allied with a Championship, on a meritorious performance by a novice's performance in such a race, was deemed to be impracticable, as a novice as such, does not and are not entered by their Clubs for these high standard races. It was felt that your object would be best met if you contacted one of the affiliated Clubs of our Association and got them to arrange an 'Open Novices' race. By a novice we mean one who has not won a cup or trophy. We suggest that as most novices start with the 36 in. Class this would be the best class to start with. You could then in future years offer the trophy for each of or any one of the other classes in turn. In this way, you would be sure that the trophy was won on merit by a genuine novice. The prize money must not, of course, be given as a cash prize, that would make the receiver a non amateur, i.e. one who has never competed for a money or cash prize . . . It is on the instructions of Council that I have to convey to you, their thanks for your kind offer in the interest of the sport.

I am, yours sincerely,
CHAS. R. SEABROOKE.

MODEL WINDMILLS PART V

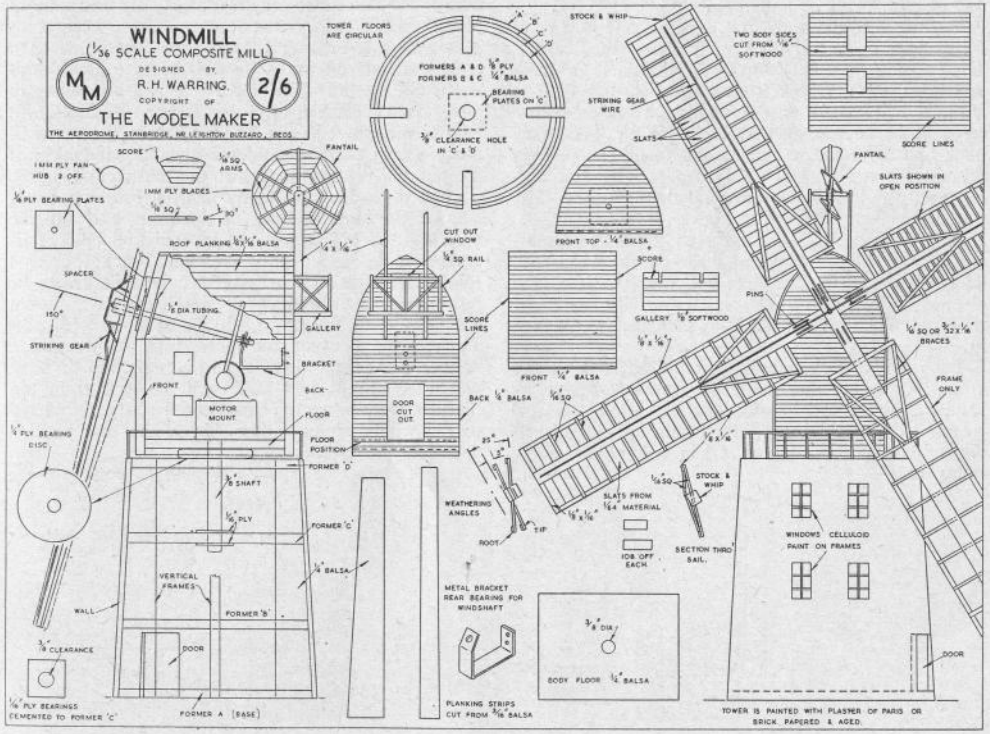
A Model Composite Mill

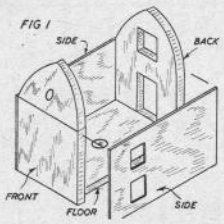
BY RON WARRING

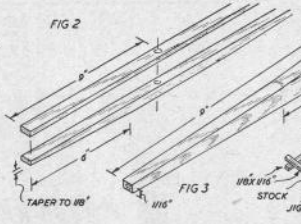
This completes our Model Windmill Series. Plans are available from Model Maker Plans Service, in addition to Composite Mill below, of an Open Trestle Post Mill, a Tower Mill, and a Smock Mill, in one-thirtysixth scale, at 2/6 each.

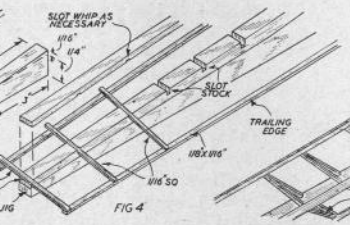
THE fourth of our models is that of a composite mill which, as the name implies, is a cross between two contrasting types—the tower mill and the post mill. All composite mills, in fact, comprise a post mill type body accommodation the mill stones, mounted on a brick or stone tower. This tower is invariably shorter than that normally associated with a tower mill, but considerably larger than the roundhouse sometimes employed with the post mill. There is also one other significant feature with regard to comparison with the latter type. The mill body of the composite mill is mounted like the cap of the tower or smock mill, not on a central post.

Most of the composite mills which were built in this country appear to have been produced by taking the body of an existing post mill and mounting it at some new location on a tower, having modified the mill body to the new method of rotation. Shifting post mills from one site to another appears to have been relatively common practice. Most were re-erected on a new post surmounted by a brick or stone roundhouse, usually with increased elevation. Just a few were turned into composite mills. There are no composite mills left working in this country today.









So much for general details. Construction of the model follows the practice introduced with the earlier models, both for the shortened tower and the rectangular body. The sails, however, are again of different type. In order to complete the series we have chosen to fit the composite model with double patent sails, which type can also be applied to any of the other mill models. The first article of this series described the historical sequence of the development of the different types of sails and how early mills with common sails (often unweathered) came to be fitted with later types of sails. No type of sail is common to any one type of mill. Typical mills of each tpye may have any of the sail types, even a combination of, say, one pair of common sails and one pair of spring or patent sails.

Starting with the body first, this is made in a similar manner to that of the post mill described earlier. The two sides are cut from $\frac{1}{16}$ in. material, the back and front and the floor from $\frac{1}{4}$ in. sheet balsa. The front is in two pieces, the upper part being chamfered at 15 deg. along the glueing face. The sides, back and front are scored as shown on the plan to represent boarding; each side has two window cut-outs and the back a window and door cut-out. The initial assembly is shown in Fig. 1.

At this stage it is a good plan to make and assemble the sails and mount these on the windshaft. The sail assembly can then be completed and the electric motor drive linked up, if the sails are to be powered. The roof of the body can then be planked in.

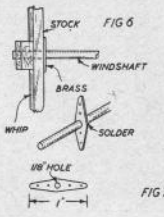
Each pair of sails is built up on a single stock and whip, glued together with the frame cross-pieces sandwiched between them. The stock or rearward member is from $\frac{3}{8}$ in. x $\frac{1}{4}$ in. hardwood, tapered as shown in Fig. 2. The whip is $\frac{3}{8}$ in. x $\frac{1}{8}$ in. hardwood, untapered.

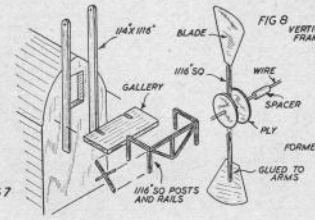
To get the required twist of weather in each sail a tapered jigging piece is used to hold the stock off the plan whilst building. Details of this are given in Fig. 3. Note the stock to take the $\frac{1}{8}$ in. x $\frac{1}{16}$ in. cross-pieces (birch) at the appropriate angle, glueing in the slots in the stock and to the $\frac{1}{8}$ in. x $\frac{1}{16}$ in. trailing edge member pinned out flat on the plan (Fig. 4). The whip can then be glued over the top of this assembly, notching at the cross-piece positions, as required, to bed down flat against the stock. After this the leading edge member of $\frac{1}{8}$ in. x $\frac{1}{16}$ in. can be glued in place.

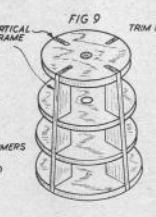
When the frame has set, remove from the jig and turn over. Each cross-piece is then backed up with $\frac{1}{16}$ in. sq. members on the underside, as shown in Fig. 5. Cut these to length individually and glue in place. When each of the four sails have been completed in this manner they can be assembled as a complete unit on the $\frac{1}{8}$ in. dia. brass tubing windshaft, cutting the whip of the rear sail arm away to allow the two stocks to glue together. A friction fit on the windshaft would be satisfactory, but a small brass fitting can be soldered to the windshaft, if desired and pinned through to the rear stock (Fig. 6).

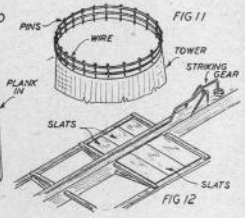
Glue the 1 in. square ply bearing faces on either side of the sloping front of the body and slip the windshaft in position. It is located and held at its correct angle of 15 deg. by the metal bracket screwed to the rear face of the body. If the sails are to be powered it is now a relatively simple matter to mount a small electric motor on a block of wood with suitable gearing between the motor and the windshaft. A worm and gear drive giving a reduction of 40:1 would be about right and once the gear train has been lined up correctly, small metal washers soldered to the windshaft on either side of the rear bracket complete the assembly.

At this stage it is a good plan to complete the









fantail assembly before planking in the roof. The fantail is carried by two $\frac{1}{4}$ in. x $\frac{1}{16}$ in. birch arms glued to the rear face as shown in Fig. 7. To this, and level with the bottom of the window cut-out, is glued the gallery platform cut from $\frac{1}{8}$ in. material. A handrail and suitable framing of $\frac{1}{16}$ in. square material is added to complete the assembly.

The fan itself is made by cutting six blades from 1 mm. ply, scoring and cementing to $\frac{1}{16}$ in. square arms. These arms are chamfered off at 30 deg. at their lower end and sandwiched between two small discs of 1 mm. ply. The whole fan is then mounted on a wire axle and located between the centre of the uprights by suitable spacers (Fig. 8). To complete the body, glue in a 3 in. length $\frac{3}{8}$ in. dia. dowel into the hole in the centre of the floor and plank in the roof with strips of $\frac{1}{4}$ in. $\frac{1}{16}$ in. balsa. Sand the roof planking down and cover with paper.

The tower is built as shown in Fig. 9. Cut the four circular formers or floors from $\frac{1}{4}$ in. material, ply or balsa and the four vertical members from $\frac{1}{4}$ in. balsa. Assemble the skeleton famework, making sure that this is accurate. The whole tower is then planked in with tapering strips of balsa, cut from $\frac{1}{16}$ in. sheet (Fig. 10). When complete, sand down to circular section and cut the windows and door. It is a good plan, incidentally, to add ballast to the lower floor to give the completed model greater stability, e.g. glue a slab of lead or heavy material to the base, before planking in the tower.

The body pillar ($\frac{3}{8}$ in. dia. dowel), fits in the holes drilled in the top two floors. A circular collar cut from $\frac{1}{4}$ in. ply glues under the floor of the body to give the necessary clearance. If the assembly is to be made permanent the body will have to be assembled on the skeleton tower and located by a small collar glued to the pillar under the second floor. There is a certain advantage, however, in being able to dissemble the mill by lifting the body clear.

Only final details remain to be added. The tower can be covered with brick paper and then stained to give an aged appearance, or painted over with a thin pase of plaster of Paris, dyed light stone, medium stone, or left white. The windows can be glazed and a hinged door fitted in the door cut-out.

A handrail should be fitted around the top of the tower. This can be of a very simple type, such as stout pins pushed in around the periphery with two rails of soft wire soldered in place around them (Fig. 11). Alternatively, wooden posts and rails could be fitted.

Some detail also remains to be added to the sails. The slats must be cut out and glued in place in the frames, either in the fully closed or open position (Fig. 12). The dummy striking gear should also be cemented in place. This is of wire, glued along the top of each whip and cranked at the centre to disappear inside the hollow windshaft. The small brackets can be bent from pins and pushed into the whip. Note also the $\frac{1}{16}$ in. sq. strut bracing on the inner portion of each sail, which is simply glued in place.

Colouring for sails, body, fantail assembly and the small gallery is matt white. A touch of contrast can be added, such as a black roof and black tips to the fan blades. The striking gear wires should be black.

MODEL MAKER CHALLENGE CUP FOR MINIATURE RAILWAY LAYOUTS

For the benefit of more recent readers we republish below a summary of the rules apertaining to our Layout Challenge Cup. Now is the time to consider projects for entry: we await these with keen anticipation.

Particulars of Entries

1. Individual or group (club) entries eligible, either amateur or professional modellers.
2. All gauges up to and including 0 Gauge may be entered.
3. Superficial area of layout that may be entered is as follows:—

000	-	-	25 sq. ft.
00	-	-	50 sq. ft.
0	-	-	100 sq. ft.

Where layouts exceed this size a continuous area not greater than specified may be selected by the entrant and will be judged without consideration of that part not entered.

4. Each entry must comprise three items:—
(i) Plan of layout showing track, lineside features, gradients and railway buildings, stating loft, basement, club premises or other general location.
(ii) Photograph of layout in operation, or part thereof.
(iii) Description not exceeding 500 words of purpose, objects, running and general operation of layout.

Scope of Award

5. The "Model Maker" Challenge Cup will be held for one year by winner and an annual cash award of Five Guineas will accompany it.
6. Winner will be the entrant of the layout that, in the opinion of the judges, represents the most outstanding model railway conception with regard to realism in construction, true railway practice in layout and operation, ingenious approach to problems of site, and skill in fabrication.

Latest Date for Submitting Entries

7. Entries will be accepted up to the last post on December 31st, 1951.

Conditions

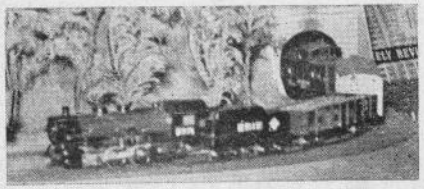
8. No restrictive conditions—no entry fee.
9. The Judges' decision is final and legally binding.
10. "Model Maker" reserves the right to publish all or any of entry particulars submitted on payment of their usual fees.

Method of Judging

11. All entries will be considered by a panel consisting of one member of standing in the Model Railway Movement, one member of "Model Maker" staff, and a practising railway traffic expert (we trust that British Railways will co-operate in this matter).
12. A final selection of three "probables" will be personally inspected by at least two of the judging panel who will report back to the panel for the selection of the winner.

Presentation of the Award

A suitable public occasion will be taken for the presentation of the year's award, details of which will be announced nearer the closing date of the contest.



BACKGROUND TO TT MODEL RAILWAYS

The TT and 000 Gauges are NOT new. They have been gaining in popularity for some time in this country, but have lacked the valuable impetus given by the introduction of ready-made locomotives and rolling stock as exemplified in the Rokal Scale Model Railway. Above we show one of the American commercial sets running on Peco Sub-standard Minilay, as pictured by our photographer at the Model Railway Exhibition held in the Spring.

R. G. W. Bryant's miniature Highland line — the Inversnecky Railway is a miracle of what can be achieved by the skilled craftsman in this gauge. Now for the first time everyone can "have a go".

For the benefit of those wishing to make a start we list below some of the Rokal parts which will be available, as distinct from the complete layouts. Those who would like Rokal locomotives and rolling stock but prefer to lay their own track can obtain the raw materials through any Peco stockist. Peco-tied sleeper strips and scale F.B. nickel silver rail when used with cork ballast underlay and rail nails enables a realistic line to be laid with pleasing and satisfactory results.

Ready to use Rokal units will range from an Express Train set, comprising loco, tender, three coaches, controller, straight and curved rails, spare brushes, shoes, etc., in wooden box retailing at £11/7/-, to a simpler goods train set, less elaborately packed and without speed regulator, at £9/1/6.

Individual items include: Locomotive and tender (£3/11/-), Mail Van (£1/0/6), Pullman Coach (19/6), down to an Open Wagon at 12/2. Track is available at 3/6 per length for straight or curved. Points range from £1/15/10 for manually operated to £3/11/- for the electrically operated remote control pattern; remote control uncoupler is priced at £1/7/-; speed regulator incorporating reversing switch sells at £1/15/9.

These individual items, by the way, will be available normally through local model shops, who will also handle the complete sets. Should readers have any difficulty in contacting their local stockist we shall be happy to advise them of their nearest appointed dealer.

TT RAILWAYS AVAILABLE TO ALL!

THE ROKAL MODEL RAILWAY

THE FIRST COMPLETE COMMERCIAL SCALE MODEL RAILWAY IN THIS MINIATURE GAUGE OFFERED TO ENTHUSIASTS IN THIS COUNTRY REVIEWED BY "MANXMAN"

Special Note : All illustrations are published without re-touching to indicate quality of finish

AND now here is the T.T. gauge of 12 millimetres with a modelling scale of 1/125th not only a working proposition but in large scale supply as a fully equipped train system available to all.

It seems to some of us but yesterday that the first commercially produced 00 gauge trains were making their appearance on the market. They were regarded as the 'irreducible minimum' in the matter of size and many predicted quite confidentially that they 'would not catch on' because no reliable mechanism or motor could possibly be housed in such small locos! And yet these commercially produced 00 gauge trains made an instant and dramatic appeal. Not only did they prove themselves completely reliable in operation but they made it possible to put down a layout in a quarter of the space needed for the equivalent in the hitherto universal 0 gauge.

And now come the Rokal trains to prove that the 00 gauge railway by no means represents the limit in what can be achieved in the direction of a compact reliable railway system for the home.

But the Rokal claim to consideration is not based merely on its small size important although this is in these days of acute house shortage. It represents several entirely new and outstanding advances in the miniature railway world.

To begin with it is two rail.

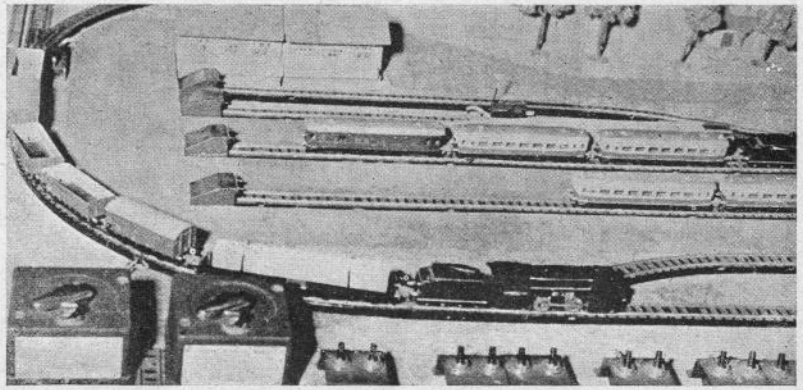
Its diminutive but sturdy locomotives work off the ordinary AC house supply through a transformer rectifier unit which supplies the track rails at 12 v. DC. This means not only that the steam outline locos look correct running on a two-rail track but also that reversing the train for shunting or setting back is completely positive. Throwing a switch on the controller reverses the popularity of the rails and so definitely controls the direction in which the loco moves.

Despite their small size these locos are extraordinarily heavy and this means not only that they develop a surprising tractive effort and will haul big loads but also that they run in a steady and most realistic manner.

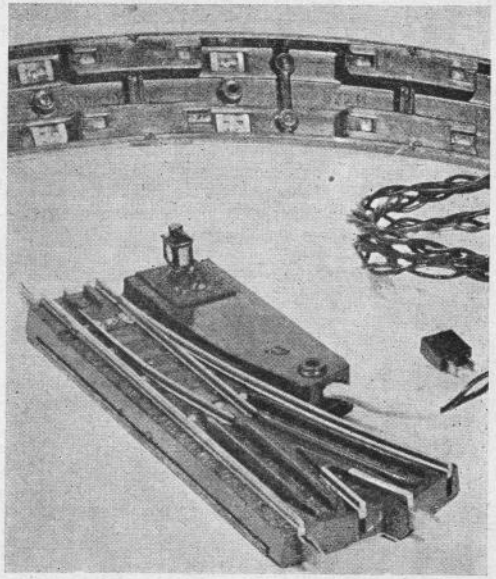
They pull away from rest slowly and gracefully, they hold the track steadily when running and they glide equally slowly to a standstill. The net effect is to give a completely convincing impression of a train in motion without any of the 'bustle' and wobble so often observed in toy trains.

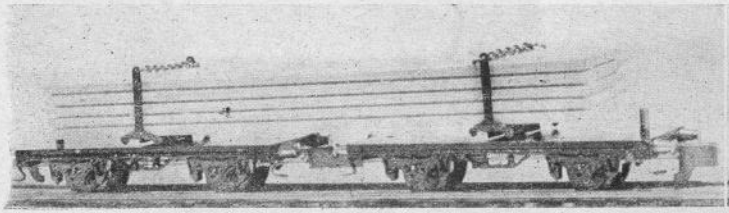
No doubt this steady and convincing running can be ascribed in some measure to the track work on which subject alone an entire article could be written.

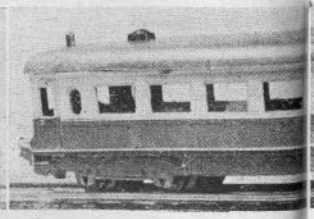
To begin with the curved track sections are made in two standard radii. The smaller radius is one of 12¼ inches and the larger 13 inches. It will at once be seen that relatively to the gauge of 12 mm. these



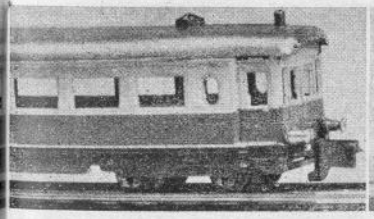
Above : Part of the 8 ft. x 5 ft. layout at the M.E. Exhibition, showing Rokal Goods and Passenger Trains; speed regulators and point switches will be noted in foreground. Below : Underside of standard track showing ready moulded connector points where it may be cut. Standard point is also illustrated showing use of bakelite frog and check rails to ensure trouble-free operation.

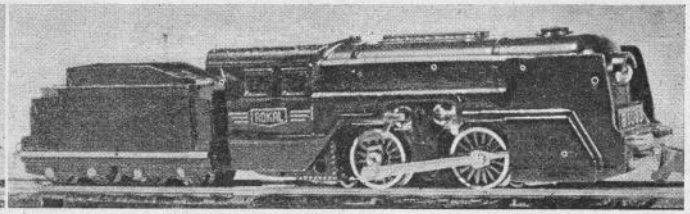




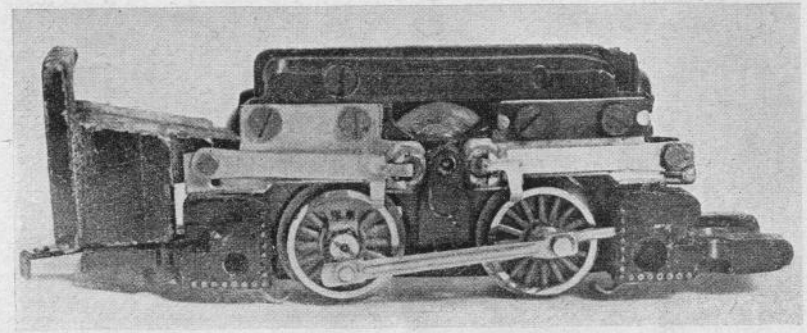


Left : The log truck, which is in effect two open trucks with suitable attachments. Centre shows the standard Pullman Coach.





Right : Locomotive and Tender, buffer to buffer 6½ in. long. These three pictures are approximately two-thirds full-size.



An enlarged view of the mechanism, taken on the brush gear side. Overall length, excluding small coupler on left is 3½ in. Weight of locomotive mechanism plus body is 11½ oz. Drive is to all four wheels via a gear train placed between the wheels on far side, direct to gears located behind the wheel flanges.

are exceedingly easy curves thus avoiding any sudden jerk and swerve when the train enters or leaves a curved section.

Not only so. The smaller radius curves are supplied in no less than four standard lengths representing respectively $\frac{1}{8}$, $\frac{3}{32}$, $\frac{1}{16}$ and $\frac{1}{32}$ of a circle. The larger radius curves are likewise supplied in two standard lengths representing $\frac{1}{16}$ and $\frac{1}{32}$ of a circle.

A little consideration will show that these large and small radius curves form correct "six foot way" where a two road line is laid on the curve. But there is another and far greater advantage. These short and long sections of two different radii can be clipped together so as to form almost any desired shape of curve. In short Rokal brings you the advantages of a flexible track but without any tedious laying and without any possibility of getting out of gauge.

This feature alone would merit a high award but we must add to it two more claims. The straight tracks are supplied in four standard lengths of $8\frac{1}{2}$, $6\frac{1}{2}$, $4\frac{1}{4}$ and $2\frac{1}{8}$ inches and in addition any rail may be cut through with a fine saw by the constructor and mated up with the simple connectors supplied so as to give the exact length or curve required.

Locos and vehicles couple up on the lightest impact and uncoupling is effected either by remote controlled track ramps or manually by depressing a ventilator on the coach roof or similar fitting on goods trucks. The coupling itself, although it may give the impression of being clumsy when viewed at the end of a vehicle, is completely unobtrusive when the train is coupled up and it has the great advantage of not only providing a locked coupling under pull but when a train is set back—even at full speed there is no question of buffer locking on derailment writing the locomotives are all of the 0-4-0 persuasion a fact which is skilfully concealed by the undercarriage but we understand that the 4-6-2 now undergoing tests is due for release shortly together with a diamond crossing for the track and a complete range of station buildings miniature passengers and cattle and other scenic effects.

The short here at last is the railway that can seriously claim to provide in full measure the fascinating hobby of miniature train operation for the man who must consider both operating span and pocket. As to the rail itself this is of solid brass to correct section and nickel plated to give convincing appearance and good electrical pick up.

Points are supplied either for manual or for electric (remote control) operation. The latter operate off 12 v. DC and are completely positive in action in that they follow the setting of the point lever.

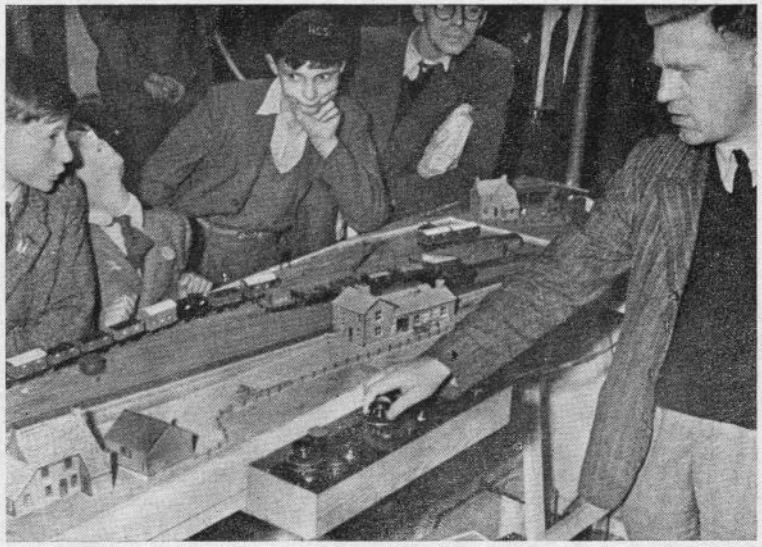
Finally it should be noted that the points are electrically selective. That is to say that the setting of a point energises only the selected track leaving the other one dead and automatically providing safety against collision at points.

Since the track can be 'sectioned' at any part of the layout by a fine saw cut through the metals it can be seen that taken in conjunction with the selective point operation a field of endless operating possibilities opens out to the fortunate owner.

Other attractive features of this ingenious Rokal railway are the coupling and uncoupling devices the lighting up of the loco headlamp and the die cast alloy coaches and wagons with a skilful reproduction of minute detail.

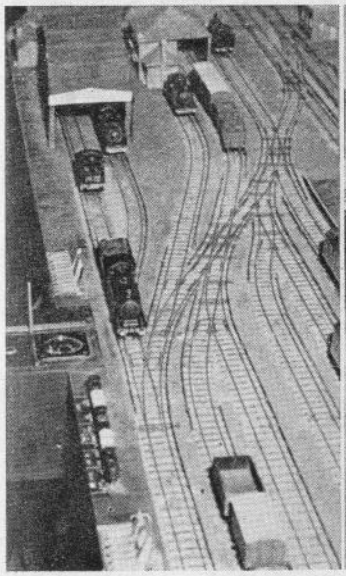
A REGULAR TT FEATURE. We believe that there is a big future for this ultra-small gauge, and propose running a regular monthly feature dealing with its special problems. Like most such articles much of its success will depend on the response that you — the readers — give. Many will be making this their first attempt at railway modelling, and in their novice stage may find the many text books on model railways bewildering, and fail to find their particular difficulty explained away. We welcome the opportunity of hearing from them, and will answer questions of general interest in these columns. Queries demanding immediate attention, or of less general interest, we shall be happy to deal with by post. At the same time we should welcome pictures of miniature layouts and rolling stock, and the story of how individual model railways came into being.

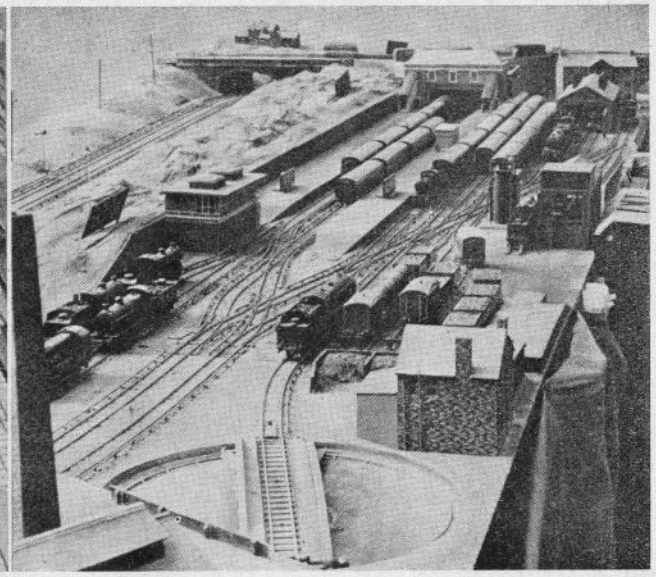
On the right: Part of the layout on Messrs. James Rogerson's stand, featuring the new Acro 00 track, which is formed by a metal to metal bond with a special resin base glue. In spite of its unusual construction it stood up well to exhibition rigours. Note proximity of spectators' "tiny fingers"!



Below: Two scenes from the elaborate 00 layout installed and operated by the Ilford & West Essex M.R.C. Lower left shows to advantage a typical example of their ambitious trackwork, which never seemed to let them down. On the right is the electrically operated turntable, with the main station in the background. Altogether a grand "combined operation".

MODEL RAILWAY LAYOUTS AT THE "M.E."





On the Right Track

A REGULAR FEATURE FOR ALL '00' ENTHUSIASTS

BY R. WATKINS-PITCHFORD

THIS MONTH THE AUTHOR CALLS "TIME GENTLEMEN!"

SO far as we are aware there is no system of time table running for model railways that has been used on a sufficiently wide scale to warrant being denominated "accepted practice". If this be so, any system that has been found to give reasonably workable results may be worth using, at least as a basis for one's own experiments and for adaptation where necessary to one's own requirements. The system that was used on the Norchester and South Leigh lines, like Topsy "just growed" and, if in some respects, it would have sent a professional Traffic Superintendent into convulsions it can at least be said that it afforded a great measure of entertainment to, and food for an even greater measure of argument between the Directors-cum-Drivers-cum-Shunters, in the persons of Dick and myself.

Of course, the first requirements for any satisfactory schedule running is a good balance of stock. The total number of locos and pieces of rolling stock must be balanced up with the footage of track; the track itself must be balanced as to lay by and goods yard accommodation vis a vis, main and branch line running track, and thirdly the rolling stock must be balanced out as to the proportions of the various kinds of vehicle. Thus there would be so many passenger coaches to so many goods trucks, with the coaches and trucks being again subdivided in accordance with the needs of the system as a whole.

Naturally one had to compromise at every turn when it came to imitating real practice. Since the "Train Room" itself was no more than a small spare room it was not possible to have anything approaching scale length platforms. Moreover, since the two terminal stations at Norchester and South Leigh respectively had approach gradients of about 1 in 36 we were constrained by the R.S.P.C.M.L. (Royal Society for the prevention of cruelty to Miniature Locos) to limit our main line trains to five coaches —nominal sixty-four footers—and one luggage van, horsebox, milk tank, or other fitted wagon. The usual make-up behind a Pacific was 3rd solid, 1st solid, restaurant, 3rd solid (or composite) and 3rd brake. The fitted wagon was run either at the head or tail depending upon circumstances. Goods trains had to undergo a similar foreshortening. There were also two "electric" units of three coaches each which were meant to represent Southern Region M.U.'s. (It was Southern Railway in those happy days!)

In all there were a dozen locos—making with the aforesaid electric coaches fourteen "Prime movers" and 98 items of rolling stock. Actually there were some twenty spare items of rolling stock, but 98 was the maximum permitted to be in use on the track at a time.

Every loco and item of stock was identified by code number. Locos normally working from the Norchester sheds were designated U1, U2, etc. Those working from South Leigh were D1, D2, etc. The electrics (set trains) were UE and DE. Passenger coaches were numbered serially from 1-24. Numbering was scratched in tiny figures at opposite corners of the roofing—a gramophone needle in a pin vice was the scriber and the numbers were in no way conspicuous. In some manner we came in the end to recognise these coaches individually without referring to the numbers. Presumably shepherds do likewise with their flocks.

The 74 goods trucks required some different identification, and were accordingly split up into groups. Fish, fruit, milk and cattle vans had the prefix A for Agriculture, thus A8, A17, etc. There were similar prefixes for Mineral, Fuel, Tarpaulin, etc., and minute cards bearing the number of each truck were glued to the body immediately above the solebar.

Having numbered and identified all locos and items of rolling stock it was next necessary to treat similarly all sidings and dead ends at each of the four stations—any part of the track in short, where trains could be held up or sorted and their locos sectioned out.

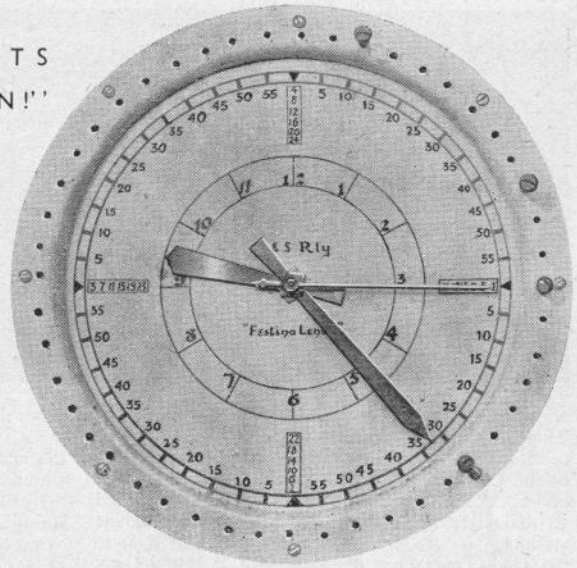
This was done by serial numbers prefixed by N. Norchester, S. South Leigh, E. East Drome, and W. Wessington. The point lever and the sectioning switch for any given siding carried the identification number, thus S8 was the coaling stage at S. Leigh.

With every loco, vehicle and track section identified it next became necessary to decide upon a disposition of the various items throughout the track as at the starting time of operations which for convenience we called 0300 hours.

At that time for instance, a newspaper train would be at No. 1 platform (N1) consisting of four parcel vans headed by the 4-4-0 U3. Similarly a fish train comprising seven covered vans would be ready to depart from South Leigh with the overnight catch from the trawler fleet. Being a train fitted throughout with vacuum brakes this train would be permitted to travel at "express" speeds of 50-60 m.p.h., and would thus on the UP run be able to keep level pegging with the newspaper train on its DOWN run.

Each train would call at the intermediate stations depositing newspapers or fish for the benefit of the local community and picking up agriculture produce from the rural districts served by Wessington, and manufactured products from industrial East Drome. The latter station derived its name from the large airport in the vicinity whence "specials" were run for pageants and to serve airways routes, while Wessington was famous for its racecourse, thus opening up further traffic possibilities. In passing it may be said that some weeks before the track laying was begun a sort of Baedeker's Guide was written up concerning the four towns and the general district served by the railways. Items such as populations, market days, early closing days, chief industries, etc., were noted down, and we lived with these towns as a novelist lives with his characters. Only so was it possible to draw up an intelligent and probable timetable. To return: the position of every loco and item of rolling stock was noted down on a Disposition Sheet as at 0300 hours, and it was assumed that at this moment no trains were actually en route (improbable, but convenient!)

The next problem was to devise a shorthand code by which the timetable could be expressed in terms of operating instructions. Thus "0300 U3P Dep N1" would indicate the departure at 3 a.m. of a parcels (newspaper) train headed by the 4-4-0 loco U3 from Norchester Central, Platform 1.



Scale Clock : This mains-driven clock with specially calibrated dial giving "four times time" was used to run timetable schedules on the author's Norchester & South Leigh Railway. Scale time is read from the minute and seconds hands only. From "quarter past" to "half past" equals one hour on the minute hand or one minute on the seconds hand. The red and green pegs inserted in holes on the bezel indicated times of arrival and departure for UP and DOWN trains. The clock is here reading 1.33, or 5.33, or 9.33 (a.m. or p.m.)

This train's first call was at East Drome at 0332, where an 0-6-0 tank was standing by ready to attach two covered vans destined for South Leigh. This operation was presumed to be going on while the East Drome's district consignments of newspapers from the city press at Norchester was being bundled on to the platform.

In shorthand this manoeuvre was represented by:

0332 U3P Arr. E2. $D5\sqrt{G11\ G18} < \frac{E2}{E5}$

+U3P—D5 > E4 X.

0336 U3P(6) DEP E2.

Here E2 represents No. 2 platform East Drome.

D5 an 0.6.0.T.

G11 and G18 the two covered wagons.

The vinculum indicates that G11 and G18 are coupled and are moved as one train.

< represents "sets back".

$\frac{E5}{E2}$ means "from siding E5 to platform E2".

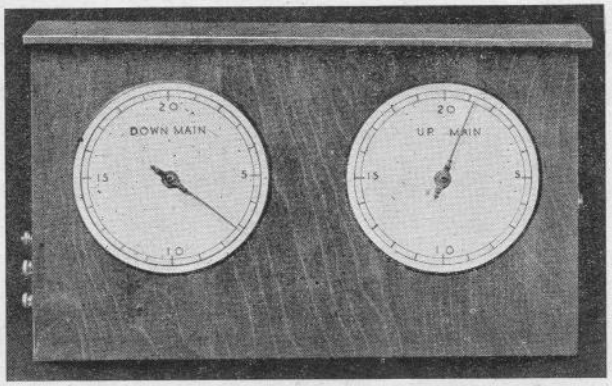
+ means "couple up".

—D5 > E4X implies "uncouple D5, return it to siding E4 and section out".

U3P(6) indicates that the parcels train now consists of 6 vans and, finally, it Departs from E2 after a four minute stop at 0336.

No doubt this may appear somewhat fearsome at first sight, but in practice it worked simply and well. Each of us had his own set of serially numbered 8 x 5 card index cards with the "score" in shorthand as above written out and covering the 24 hours (using Continental time) up to 0259 hours the following morning.

There were three circuits; A comprised the two high-level terminal stations at Norchester and South Leigh together with their gradient approaches. B consisted merely of the double track main line continuous circuit—once round representing half a mile of run. This double track passed through a long tunnel under South Leigh station and ran down a long retaining wall below Norchester. These two features served largely to minimise the monotony of trains "chasing their tails" during a long run. Circuit C comprised the two intermediate stations East Drome and Wessington, their respective goods yards and sidings, and the approaches thereto via the two double junctions from the main line. The three circuits were electrically independent of each other, being isolated by fine saw cuts in the track across



Circuit Counter : By a simple solenoid, plunger and ratchet wheel each train was made to count up the number of laps of the continuous circuit it had covered. One lap was the equivalent of half a mile. Each train had to run the correct distance and arrive at its destination at the time indicated by the appropriate red or green peg on the clock bezel.

which trains could pass under their own momentum. Thus a train started on circuit A was "handed over" to circuit B. It thereupon became the responsibility of the Low Level Operator (who controlled both B and C circuits from his panel) until it had completed its main line run and calls (if any) at intermediate stations. It was then subsequently handed over to the High Level Operator, who ran it into its appointed bay at the arrival terminal.

It will thus be seen that one operator had charge of all the main line running and the shunting work in East Drome and Wessington. He had to accept trains from and hand them over to the respective gradient approaches, and while trains were running on the main lines he carried out any necessary shunting in the precincts of the intermediate stations which were under their own set of controllers and on a separate circuit from the main lines.

As against this, the other operator was responsible for all arrivals at and departures from the two eight road terminal stations including the "watering", coaling, and cleaning of the various locos.

But it must not be supposed that the trains lapping round the UP and DOWN continuous tracks were left to run aimlessly until such time as it was convenient to switch them into a station. They were set to run a specified distance in a specified time. A simple electro-magnetic ratchet device coupled to a short ramp rail totted up the number of laps of half a mile each, performed by each UP or DOWN train. A glance at the UP or DOWN dial showed how many miles the train had covered since being admitted to the main line circuit. Throwing the points leading to or from the main lines automatically set the appropriate counter back to zero.

This preliminary sketch of the system has been necessary in order to form a background to the problem of scale distance, scale speed and scale time.

It was quite obvious after only short considerations that some juggling on a grand scale would be necessary here.

Any attempt to reduce these distances, times and speeds to their true scale equivalents would have involved us in a time division on the clock face that would have been difficult to read. Various methods came up for consideration, including the well known one of exchanging hour and minutes hands and of gearing the clock up to show 12 times time. But it was finally decided.

(a) That the mechanism of the clock should be left untouched, and that second, minute and hour hands should preserve their relative rates of revolution.

(b) That the "scale" time should be provided by fitting the clock with a specially calibrated dial.

Since it was necessary for both operators to work to the same time, and to save any question of synchronising separate watches or clocks, it was decided to have one large clock easily readable by all concerned.

A dial some 10 in. wide was therefore drawn up on white "artist's board" and fitted to an electric self-starting clock motor driven off the mains.

The circle was marked off into divisions of $7\frac{1}{2}$ deg. There would thus be 12 such divisions in each quarter of the dial. The first division was marked 5, the next 10, and the third (which had a bolder line) 15, and so on round to "3 o'clock" which now represented the first hour, and was therefore marked 1. Six o'clock became 2, nine o'clock became 3 and twelve o'clock 4. Three o'clock second time round now became 5, and the series went on.

Thus when the minute hand of the clock pointed to our normal 3 o'clock the time could have been 1, 5 or 9 o'clock (scale) with the addition of 13, 17 and 21 to complete the Continental time.

It will be seen that the minute hand indicated the minutes in graduations of five minutes at a time, as well as showing the hours. On a big dial the space between these graduations was wide enough to permit of a fairly accurate guess at odd times such as 17 or 32 minutes past the hour, but if needed these could be read accurately from the big second hand which recorded a scale minute for every 90 deg. of revolution.

The hour hand of this clock was not used in the schedule running, but since the clock could be set to record actual as well as scale time, the hour hand served often as a reminder that "it was high time to

(*Continued on page* 680)

BOOK REVIEWS

TWO RECENT BOOKS OF INTEREST TO MODEL MAKERS REVIEWED BY D.J.L.D.

A Man and His Lathe

By L. H. Sparey. A Tool News Publication. T. Garner and Sons Ltd., Redbrook Works, Gawber, Barnsley, Yorks. 84 *pages, size* $7\frac{1}{4}$ x 5 *ins.* 65 *half-tone illustrations,* 28 *line drawings. Two-colour cardcover, thread sewn binding. Price* 6/-.

The first print of this new book is already sold out, and we had quite a struggle to part the author from a spare copy for review purposes. Such an immediate success speaks well for the confidence of a wide public in any work emanating from Lawrence Sparey—a confidence that has been safely reposed for we would predict a following equal to that of his *Amateur's Lathe* that has already sold some 20,000 copies.

Its title is exactly descriptive of the contents. It deals with the Myford ML7—a lathe that has been L.H.S's constant friend since its inception, and covers all those points of usage and improvement that have been proved over a period of use by one of our leading home workshop engineers. We do not presume to call the author an amateur, for, apart from the love of his work implicit in that word, his handling is always the equal of the best professional. Indeed, it is no secret that he held a skilled job during the war years in that most exclusive professional province—the tool-room of a large engineering works. Here his "amateur" experience was often called to the aid of the so-called experts in solving particularly unorthodox or tricky problems that came their way.

Although dealing with one make of lathe, it must not be regarded as a manufacturer's book, for the author is fully alive to the limitations of his tool, and makes many useful suggestions for improving the standard model, from better oiling methods to elaborate accessories. Many of these accessories while primarily designed for the Myford can equally well prove of service on other popular makes of small lathe.

A number of these accessories, including cross-slide index dial, cross-slide stop, reversing dieholder, running and running tube centres, filing jig, toolposts, boring head and test indicator set are described with fully dimensioned drawings to enable the reader to make his own. For those unwilling to take off dimensions from comparatively small drawings, the publishers are offering full-size prints at little more than production prices.

Altogether, *A Man and His Lathe* is a book that it would be folly for any Myford user to lack, and a sound investment for *every* small lathe worker.

Your British Railways

Designed for British Railways by Alfred Pemberton Ltd. 48 *pages, size* 13 x 10 *ins., printed on art paper. Full colour glazed card cover.* 141 *half-tone illustrations,* 1 *cut-away wash drawing. price* 2/-.

No railway fancier should be without this superbly produced record of British Railways under Nationalisation. In entrusting its production to Alfred Pemberton Ltd., the Railway Executive showed considerable wisdom, for as a firm specialising in the presentation of a wide variety of goods to the general public, they were particularly suited to putting over the story of this great national undertaking in a manner both instructive and enthralling.

Photo credits are not given, and though a number of illustrations were obviously posed it is evident that the whole resources of the Railway Executive and the leading agencies were combed to provide the variety available. It is not a text-book in any sense, the text matter is never much more than an elaboration of the captions beneath the pictures, but it tells a splendid picture story.

Those who are interested in railways as such will find much to enjoy, but it is the model railway enthusiasts amongst us who will derive the most benefit from it. The size and quality of its pictures are in the main more informative than can be normally offered in the model press, both on account of space and paper quality, and give detail that only the model maker with access to the actual prototype could equal.

Those who specialise in lineside detail will find many new aspects of a railway system to delight them, with signal gantries, platforms, post-office mailbag pickup posts and so on.

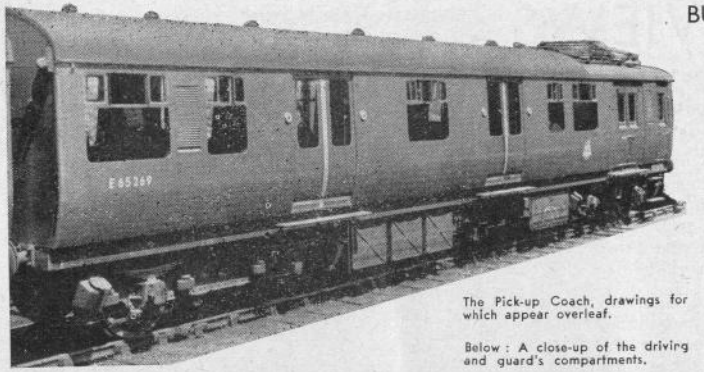
Others who fancy a variety of model figures to add reality to their layouts may fall for such things as the Railway Policeman and his trained dog. The many potential builders of new B.R. locomotives will find the cutaway wash drawing of the new standard "Pacific" type engine provides a lot of large size detail.

Again, our own particular fancy was taken by the rail-barrow in use, lifting lengths of rail into place—a few of these with appropriate figures would enliven any unfinished section of a layout. Another thought for our future winter work, came from the small shot of the platform Autotruck—alas a little too small here for accurate modelling, but happily accessible in the future for pictures and scaling down.

Its modest price of 2/- makes it a "must", and we have no doubt that many benevolent though hard-up uncles will enhance their reputations by a judicious purchase of these books for railway-conscious nephews.

BUILDING 4 MM. SCALE ROLLING STOCK BY A. H. DADD, B.Sc.

EASTERN ELECTRIC STOCK. Pt. I



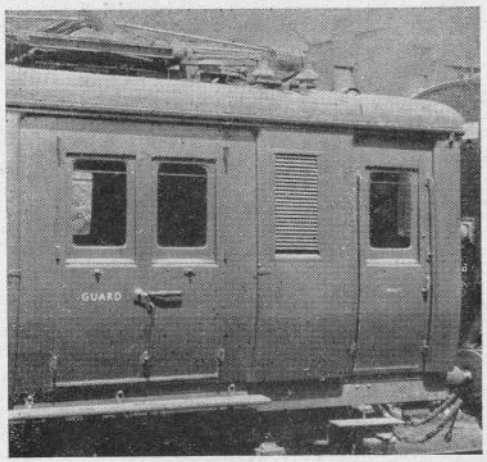
The Pick-up Coach, drawings for which appear overleaf.

Below : A close-up of the driving and guard's compartments.

DRASTIC changes in the policy of railways, is comparatively rare at the present time, but the decision by British Railways that future electrified lines outside the Southern Region should use the overhead system of pick-up, was one of major importance. At last the system used throughout the continent has been adopted as standard for our own railways.

In addition to a change in electrical pick-up, the design for these new trains was brought into line with present day requirements. As they were to serve suburban areas, it was essential that boarding and alighting should be as speedy as possible. The obvious design to be followed was that of the London Transport system where this requirement is foremost. The result was a layout combining features of both London Transport and standard North Eastern practice.

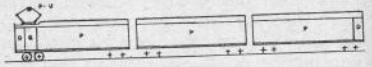
These trains were put into service on the E. Region between Liverpool Street and Shenfield, and at once proved successful, cutting the original travel time by nearly one-third, and providing a service frequency impossible with steam power.



For modelling, these trains present the enthusiast with a chance to build something completely different from the usual. That overhead systems can be modelled with complete success in 4 mm. scale has been demonstrated many times before. Commercial models using this form of pick-up are common in Continental countries, and are now available here. One of the biggest difficulties to the "scale" man will undoubtedly be the pick-up itself, which when scaled down appears very fragile indeed, but by careful thought it is possible to strengthen this part sufficiently without making it obviously "over scale".

The trains are run in combinations of three car sets. Each set consists of three types of coach. The first is the pick-up car which besides driving compartment also has a guards compartment and the overhead pick-up. This is followed by a trailing coach and finally another driving coach, the latter being without guards compartment or overhead pick-up (see Fig. 1).

FIG. 1



The Pick-Up Driving Coach

The general outline of this stock is just about as simple as one can find for modelling, but in spite of this, some experience is desirable in that practically all the components will have to be made from sheet or strip metal by the builder. A few commercial parts can be adapted, and this will be suggested where possible.

The prototype is constructed from steel, so that it is desirable that the bodywork should be cut from sheet metal, brass of say 28 s.w.g. being ideal. Of course, it is not essential that metal should be used, card (of good quality) gives a satisfactory result and even wood might be used, but it is much more difficult to obtain the scale "metallic" finish with these materials.

Whatever your choice, commence by cutting out the sides and ends. Cut out the windows, being careful to retain the bars for the opening windows at the top.

The shaping round the guard's and driver's compartments present a problem unless you are an expert at metal beating or can enlist the help of one. One method of getting over this difficulty is to insert false pieces on the inside of these areas, and file the edges formed to the desired shape. To do this, proceed as follows. Cut out these areas on the sides. On the inside of each, solder a piece of 18 s.w.g. sheet so that it is about $\frac{3}{32}$ in. larger at narrowest point than the area cut out. Re-cut out the area. Now all that remains to be done is to file the edges of the area round to give the correct shaping. The cut out area is filled in with 28 s.w.g. sheet brass put on the inside of the false piece, the windows having been previously cut out.

Such detail as doors and door frames is best indicated by scoring the metal before the sides and ends are assembled. The windows can be glazed by fixing celluloid, or better still thin "Perspex" along the inside of the sides. On completion, bend the sides to shape and solder (or glue, according to the material being used) the ends in position.

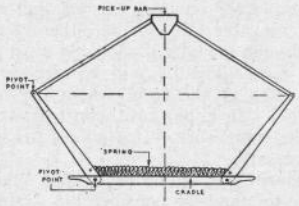


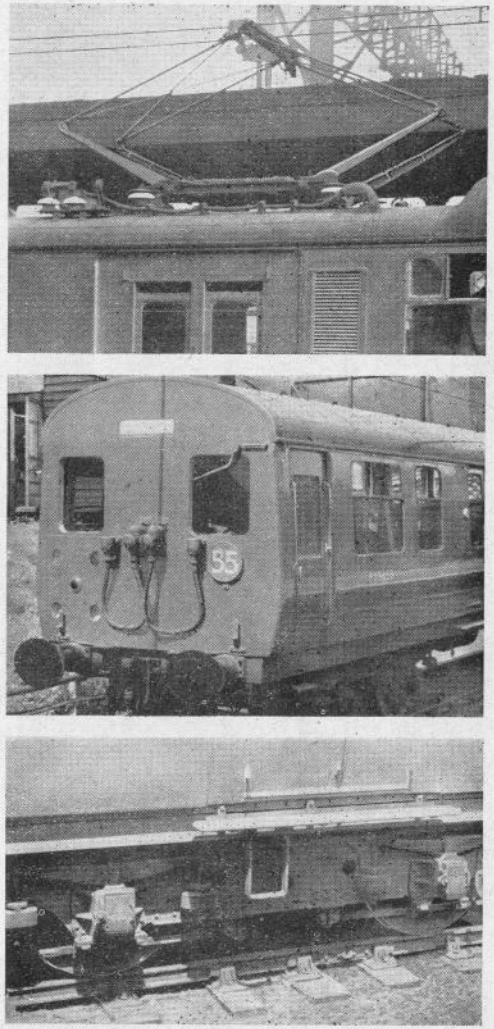
FIG. 2

The Underframe

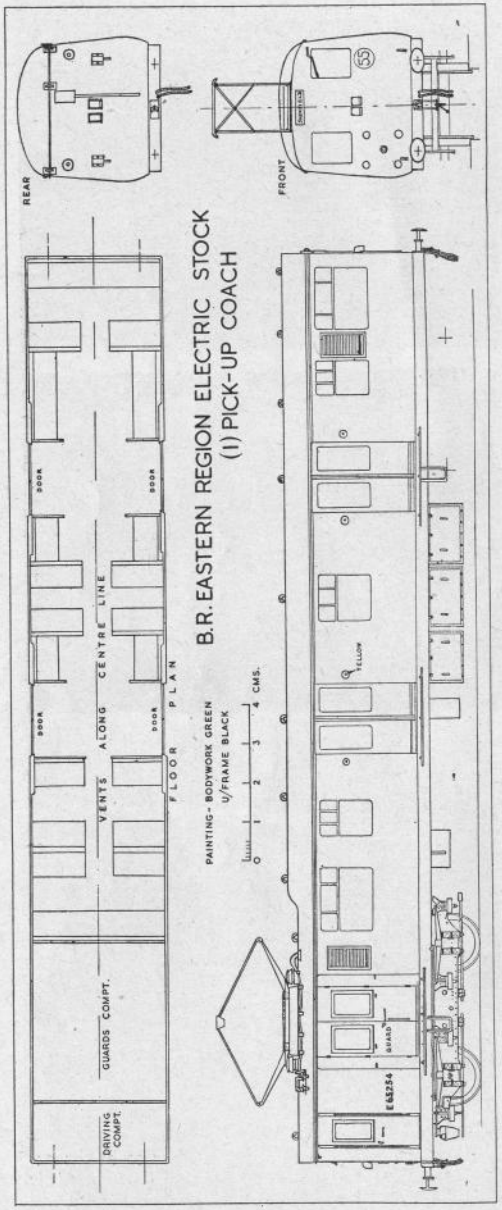
For this you need some 3 mm. 24 or 26 s.w.g. brass strip. Cut to the correct length and solder up. Add the buffers. Note that these are of two types, those at the front or driving end are long and have an extended base, while those at the rear are simply narrow parallel type. The latter can easily be made from standard coach buffers with a little filing, but the front ones are more difficult. If it is not possible to get them turned on a lathe, the next best thing is to adapt the standard type. To do this, cut from thick brass sheet two small discs the size of the extended base or a little larger. Drill them out so that they pass over the fixing shaft of the buffer and solder in position. File to the correct shape. The stem can also be filed a little to give the thin parallel type of the prototype.

Add the couplings and vacuum pipes. It will be found necessary to support the sides of the underframe with cross members. Two of these should be placed at the centre line of the bogies so that they are available for the pivot points. One or two others should be provided to ensure rigidity.

From metal or wood cut out a floor to fit the assembley. Glue or solder in position. If wood is used avoid using anything too thick or difficulty will be experienced in fitting the seats inside. Now solder or glue the bodywork to the underframe. If a wood floor was used, a few screws inserted through the cross members and into the floor will ensure a



Top : Detail of the pick-up. Centre : End view of the trailing coach, very similar in detail to the pick-up coach. Bottom : The bogie detail.



This drawing of an Eastern Region Electric Pick-up coach is reproduced two-thirds fullsize for 4 mm. scale, but can be scaled up by means of the centimetre measure thereon.

firm job. The rest of the underframe detail can be added later.

Bogies

These are of a new type and no castings are so far available. It is possible, however, to use cast tender axle guards as follows. Cut out the plate side frames from brass sheet, and solder the tender axle guards in the correct position. By the addition of blobs of solder and subsequent filing, it is possible to convert these into the correct type. Drill through the sides to allow the axles to pass through. Add as much of the other detail as desired using solder or small pieces of brass. Add the wheels and axles and assemble the bogies in the normal manner. Attach to the coach.

Interior Fittings

A plan of seats is provided. Seats can be constructed of card or balsa wood, a soft wood easily cut with a razor blade. It is also very light and so will not add much weight to the coach. The partitions are glass in the prototype from seat level to the level of the tops of the windows. Racks are provided all round except over the doors. There are two rows of lights along each side of the coach.

The Roof and Overhead Pick-Up

It is desirable for obvious reasons that the roof should be removable. It can be either metal, card or wood, although the later is probably most suitable. If metal is used difficulty will be experienced in shaping the step at the front where the overhead gear is located. In either case, construct it so that it fits into the framework. If a good fit is made no fixing is necessary.

The overhead pick-up needs a little "thickening up" in order to stand the considerable strain put on it. Brass strip is recommended for the framework, with phosphor bronze for the pick-up bar. Use 22 or 24 s.w.g. for the arms and cut oversize in width. Then file down until, whilst retaining sufficient strength, the whole does not look too much "overscale". Small brass pins can be used as rivets at the pivot points. This is fixed to a rectangular cradle which is in turn fixed to the roof of the coach. The tension on the wires is obtained by two springs on the lower arms of the pick-up as shown in Fig. 2. Note that if non-insulated wheels are used with a metal roof, the cradle must be insulated from the roof by a strip of "Perspex" or similar material. A lead can be taken through the roof to the motor contained in the guard's compartment.

Add the final details such as the ventilators (torpedo type) and electric insulators (made from conductor rail chair insulators).

The handrails and pipes can be made from brass wire (22 s.w.g.) and the end detail can be cut from card and glued in position.

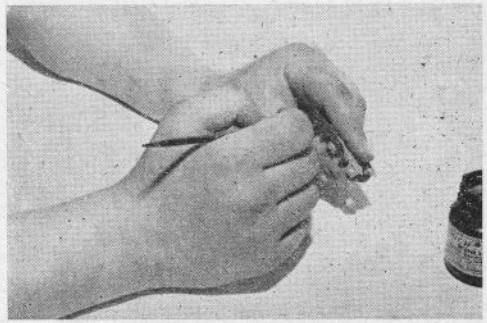
Full instructions for finishing will be included, with drawings for the remaining two coaches of the set, in the next part of this series.

Paints & Painting

PART I

BY BOYCE MARTIN

A DIGEST BY COURTESY OF OUR AMERICAN CONTEMPORARY "MODEL RAILROADER"



General Introduction

Model railroad painting is an essential part of construction, for the paint film is the last visible portion of the model. A good paint job makes good craftsmanship on the model appear to even better advantage and aids considerably in covering mistakes if the craftsmanship isn't perfect. A poor paint job ruins the entire effect of the model even if the workmanship is excellent.

Some of the difficulties of model painting arise from a lack of understanding as to the basic components of the different types of paints. It will be the purpose of this article to describe the various types of paint used in model railroad work, to outline the necessary steps which must be taken to prepare the model for painting, to discuss the various methods of applying paint, and to summarise the principal characteristics of the various model railroad paints now on the market.

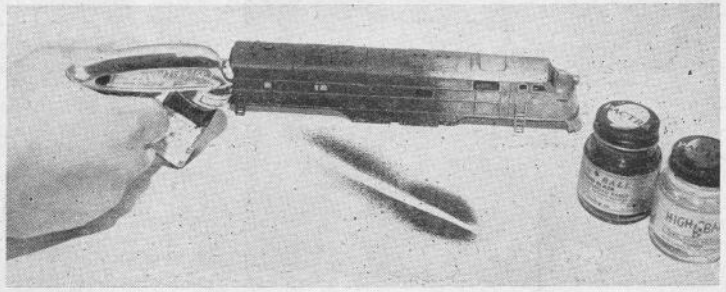
Although there are a number of chemical and technical variations in the different types of paints, they can be divided into three general groups: oil or varnish base paints, cellulose lacquers and water paints. There are many types of paints within these groups, but for the model maker these classifications are adequate. They can be best remembered in terms of the thinners used. The oil paints are thinned with turpentine or mineral spirits and dry by oxidation of the paint film. The lacquers are the quick drying paints and each manufacturer recommends his own thinner for his paints although acetone can be used for some of the model paints on the market today. Shellac should probably be classified in the lacquer group because it is a natural gum soluble in alcohol.

It is also relatively quick drying. Water is obviously the thinner for water paints sometimes called tempera or showcard colours.

These three groups of paints must be kept separate, both in mixing and painting. Oil and water obviously will not mix, nor will lacquer be applied over oil paints. The lacquer acts as a solvent and the oil paint under it blisters. Similarly, oil paint should not be applied over water paints. It is best, of course, to use only one type of paint on a model, although different colours of the same type of paint can be applied with the help of masking tape and paper.

There is a place for all types of paints in model railroad work and each person will have his own preferences. In general, lacquers are preferred by many for painting rolling stock, for lacquers can be used in sprays and the resulting finish is even and does not obscure detail. Oil paints are useful for scenery and structures because the slower drying time permits better colour blending. Water paints are also useful for background scenery, structures and for painting the necessary clothing and features on the inhabitants of the towns and villages of the layout.

(*Continued on page* 681)



Heading picture : Trucks should never be spray painted, but should be painted with a brush.

Right : An undercoat of black provides a firm base for bright colours.

An Old Type Brick & Timber SIGNAL BOX

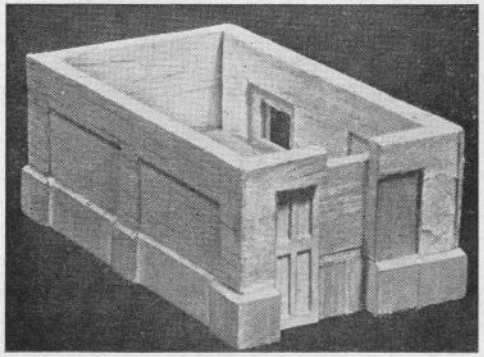
DESIGNED BY P. R. WICKHAM FROM OFFICIAL DRAWINGS & CONSTRUCTED & PHOTOGRAPHED BY MODEL MAKER STAFF

FULLSIZE 00 SCALE DRAWINGS AVAILABLE, PRICE 2/-; FROM MODEL MAKER PLANS SERVICE, BILLINGTON ROAD, STANBRIDGE, LEIGHTON BUZZARD

THERE is surely no more characteristically "railway like" object that the old type brick and timber signal box. While it cannot be said to present an "easy" subject for the model maker, it is certainly a very rewarding one, for properly made and finished it exudes as "pure" an atmosphere of "railway" as the smell of engine smoke!

The particular design on which the plans are based, is that used by the old London, Brighton and South Coast Railway, the plans being prepared from "official" drawings dating from about 1912. Each of the pre-grouping companies had, of course, its own distinctive variant of the basic style, and anyone building a "pre-group" layout would find it worth going to great pains to get his signal boxes exactly right for the particular company modelled. But the present design is sufficiently typical not to look at all out of place on many layouts other than the L.B.S.C.R., S.R. of Southern Region lines for which it is obviously completely authentic. The "free lancer" in particular should find it an entirely acceptable item.

This is, as I have suggested, a model requiring some care in its construction, particularly in the fitting of the various parts and in detailing and finishing. It is not extraordinary skill that is called for, but care and patience and, in particular, an avoidance of the attitude that because this is a "lineside effect" it ought to be completed and ready to take its place on the layout after a couple of evenings' work.



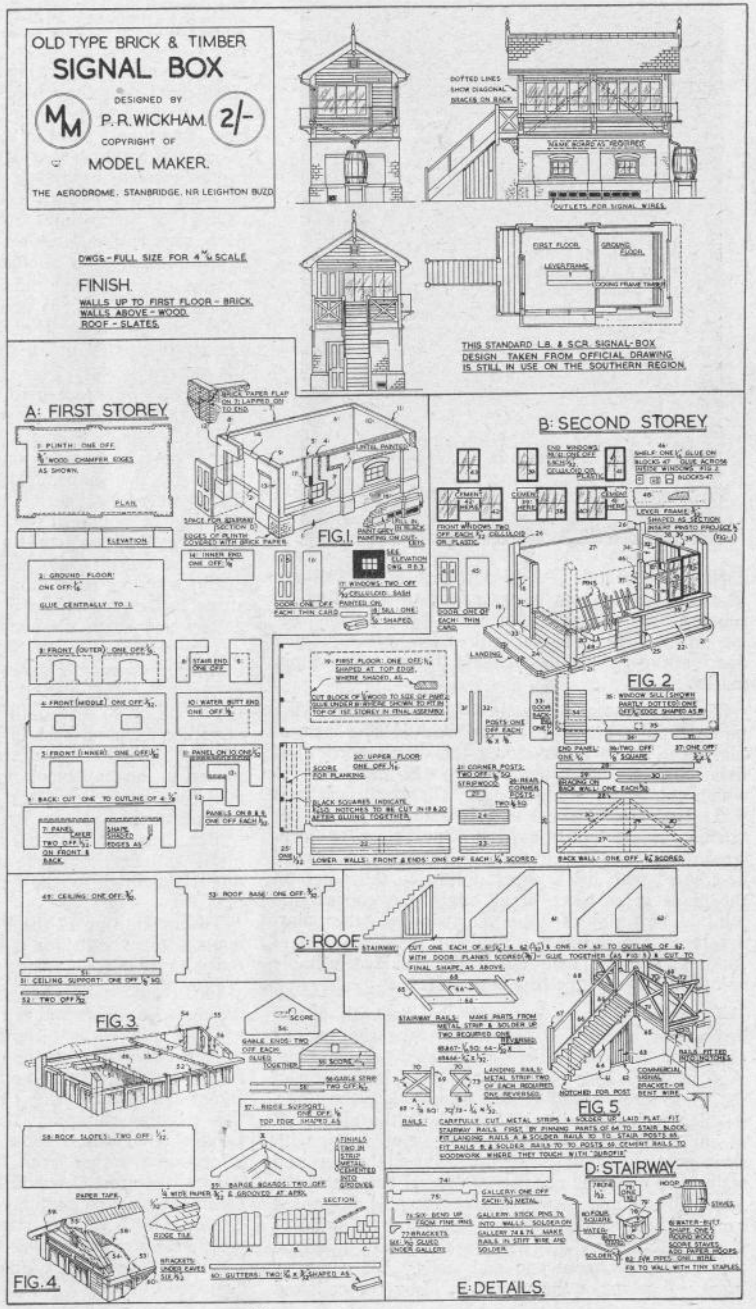
Most of the tools required are those likely to be in the possession of the railway modeller. A fretsaw is practically essential for cutting out the numerous shaped wood parts, and some form of cutting tool for the cardboard and smaller wood parts. As to the latter, I take this opportunity of recommending the Stanley Handy Knife No. 199, a die cast tool with removable razor edged blades, which is now available at most good tool shops. I was presented with one of these tools some months ago, when they were still very hard to get, and have since relegated that dangerous implement, the razor blade, to occasional very delicate jobs which require an ultra fine cutting edge.

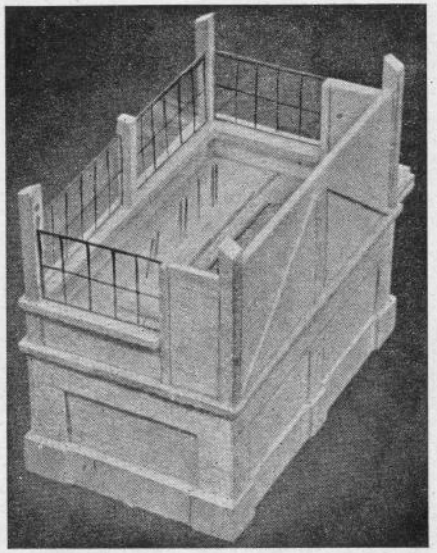
Quantities of materials needed are mainly quite small and the scrapbox may well provide much of what is required. Wood in $\frac{3}{8}$ in., $\frac{1}{8}$ in. and $\frac{3}{32}$ in. thickness can be obechi or other fine grained wood, according to what is available locally (but not balsa on any account; in my experience it is hopelessly unsuited for modelling buildings). There are some $\frac{1}{16}$ in. and $\frac{1}{32}$ in. parts, which can be in thin plywood if available, otherwise in good quality white cardboard. Some card of about postcard thickness is also needed, in fact good quality postcards would serve, but if you like to be luxurious, a sheet of three-sheet Bristol Board will more than repay its admittedly rather high cost. Windows can be celluloid or transparent plastic, about $\frac{1}{32}$ in. thick. Metal strip is required $\frac{1}{8}$ in. x $\frac{1}{32}$ in. x $\frac{1}{16}$ in. square and $\frac{1}{16}$ in. x $\frac{1}{32}$ in., also a little sheet metal about in. thick. Stripwood in $\frac{1}{16}$ in. x $\frac{1}{8}$ in. square section, a few odds and ends (such as panel pins, household pins, wire, etc., a good tube adhesive such as "Seccotine", "Durofix" for cementing windows, and paints, of which more will be said later), and we are ready to begin.

In a model of this sort the order of assembly is rather important, and the lettered sections on the sheet and the numbering of the individual parts provide a guide. Assemble as you go along, checking each part against those previously fitted. It is hopelessly confusing to have a lot of unassembled

Top left : The completed signal box as made by Model Maker staff. Balsa of thin section was used in place of card in some parts, while most of the stairway and landing rails were carried out in wood in lieu of specified metal.

Bottom left : First storey completed to stage shown in Fig. 1 of the drawing. While the use of balsa looks less finished at this stage the final effect is almost equally pleasing.





First storey has now been added, as shown in perspective sketch Fig. 2 of drawing. The added neatness and convenience of painting in window sash bars at this stage will be appreciated.

parts lying around. As all parts are drawn full size on the plan they can be traced off direct, either by rubbing over the back with a *soft* pencil, then tracing down to the material with a *hard, fine pointed* one, or by pricking through and linking up the pin marks.

The perspective sketches and accompanying photographs, should make the method of construction clear. The lower storey (the brick portion) is first built. A solid block forms the plinth on to which the walls are erected. The back and end walls have two layers, a plain one and a cut-out "panel" layer; and the front four layers to form window recesses and frames. All these parts should be treated with brick paper, following the notes on the plans so as to cover all edges and conceal the joint. The fitting of doors and windows, the painting in of the dummy outlets for point and signal rodding, and the painting of the inside a suitable colour completes this first assembly.

The second storey assembly begins with a two layer floor, notched as shown to take the various posts and with the gallery end scored for planking. A $\frac{1}{8}$ in. thick block is then cut to fit in the top of the first storey assembly and fitted below the floor, its placing being critical as it affects the alignment of the final assembly. The low front walls, with their posts are now fitted up followed by the end walls each of which consists of several parts, and the rear wall and rear corner posts. All walls are scored for planking and the rear wall has thin bracing strips glued on outside. The window sill is next fitted on top of the low front and end walls. We can now break off to make the windows. Lay the celluloid or plastic over the drawing and score the frame lines; wash paint over the whole window and immediately wipe it off so as to leave colour only in the scored lines, and finally paint in the outer frames and edges. When the windows are dry, the three raised sashes can be cemented in place, and the finished windows and the dividing parts cemented up, an operation calling for some care. Note however, that wood parts next to the windows should be painted before fitting the latter, as should all interior walls.

How much interior detail is fitted depends on individual taste, but it is well worth fitting at least the lever frame and shelf of block instruments, which are readily made up in dummy form as shown in the sketches.

We can now proceed to the roof, first cutting and fitting the two ceiling layers. The gable ends, each of which has two layers, go in next, between the corner posts and resting on top of the end walls, followed by the shaped ridge support strip. Fitting the $\frac{1}{32}$ in. roof slopes should cause no trouble, and they can be bound at the ridge with gummed paper tape. Slate paper gives an easily applied finish, but it is well worth while going to the trouble of producing a proper relief modelled roof with overlapping strips, as detailed on the plan. Barge boards, finials, gutters and ridge tiles complete the roof assembly.

The stairway consists of a three layer block which is cut into steps after assembly. Making the various handrails is simplified if the full size drawings are traced off on to a smooth block of wood. The tiny parts can then be held in position by headless pins while the joints are soldered. The stairway rails are pinned to the stair block and the landing rib cemented to the projecting floor and soldered to the stair rib and to each other. Bent pins are driven into the walls to support the front and end galleries, and the metal galleries soldered on. A wire hand rail is finally soldered to the upward projections of the pins.

The making up of the little water butt and its attendant pipes calls for a little more delicate work, but is most effective when done.

Finally, a word about painting. Use only *flat* drying *oil-colours,* and if ready mixed ones are not available mix tube oil pigments with turps and a little Brook's Art Medium (obtainable from artist's supply shops, in small bottles) which hastens drying somewhat. I regret that I have no information about the painting adopted for these cabins by the L.B.S.C.R. Perhaps some reader could provide the information, either from memory or from records. A free lance model would look well painted fawn or cream on planked portions with framing picked at in brown. All brick and slate surfaces should be well weathered by rubbing with a rag just moistened with black oil colour, as signal boxes are always well "smoked".

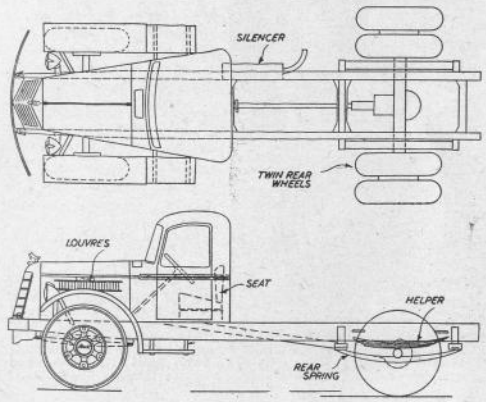
MODELLING A MACK TRUCK

BY A. M. COLBRIDGE

Standard Mack truck fitted with mechanical tipper or "dump" body.
(Photos by Mack Mfg. Corporation)

This is not an elaborate model yet, for all its relatively simple construction is a worthwhile scale component to add to any model railway scene, or similar layout. *Mack* trucks are, of course, American, built by the Mack Manufacturing Corporation and are just about typical of American practice in the truck or lorry line. The model described is one of the smallest in the series, but the larger eight-wheeled vehicles are essentially similar in appearance and construction. An interesting feature of all the range is a ten-speed gearbox. Engines are of the six-cylinder L-head type, of from 353.8 cu. in. displacement, upwards, equivalent to about 120 h.p., upwards at 2,700 r.p.m.

To fit in with the various model scale requirements basic drawings of the EQX model truck are reproduced to 0 gauge (7 mm. to the ft.) and 00 gauge (4 mm. to the ft.). H0 gauge can be duplicated, of course, by halving the 0 gauge figures.

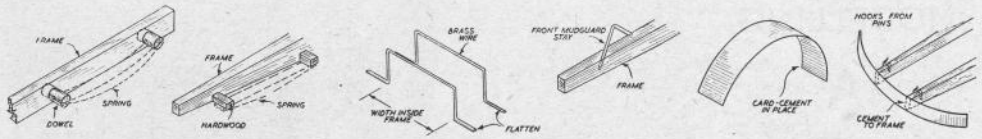


Similarly, any other scale required can be produced by sealing up or down, as required. Leading data can then be taken directly off the drawings, whilst the basic dimensions of the chassis frame members are summarised in the table.

For our model we favoured built-up construction since this was relatively simple and gave a much more realistic finished appearance. The type of body or van fitting carried behind the cab is entirely up to the individual builder and some idea of common practice will be gleaned from the accompanying full-size truck photographs. A certain amount of licence has been taken over the simplification of detail which, in a small model, is justified, if the model itself is not intended as an exhibition piece. If more detail is required, then again a study of the full-size truck photographs will provide useful information.

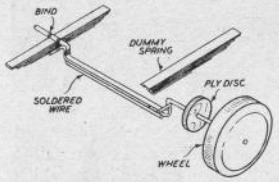
The whole model is assembled around an elementary chassis frame. The side and cross members should be made from hardwood strip, cut to size and then pinned and glued together. The front of each of the side members is tapered off as indicated in the drawing and table. Wood sizes have been adjusted to accommodate standard strip dimensions.

When the chassis frame is completed it should be painted grey or black, and then the suspension added. Dummy springs can be made from strips of card or shim brass bound together with thread. The front axle is made from three pieces of wire, soldered together. The centre piece of wire, which should be of smaller diameter than the other two pieces, is finished off with a cranked end just inboard of the spring position. This is bound to the spring and locates the assembly properly. Mounting blocks for the springs are simply made from short lengths of dowel plugged and glued into the side frames (rear springs) and small hardwood pieces notched and glued into the frames (front springs). Glue the



springs to these blocks and again bind with cotton. All the springs should be painted black.

Scale diameters of the wheels required are shown in the table. The full-size wheels are actually 11.20 x 20 balloons, the same on all six wheels. The rear axle is formed from a length of dowel and the enlarged differential assembly can be added, if desired. The popeller shaft can be made from a length of thin dowel, or wire.



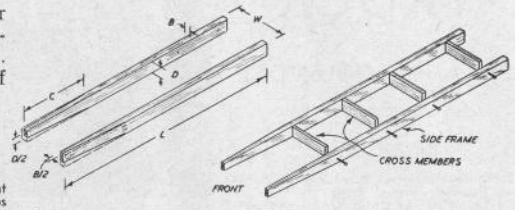
Dummy springs and front axle detail. Other steps in chassis construction are shown above.

To complete the basis chassis, make the running board supports from brass wire, bent as shown in the diagram and glued inside the chassis frame. The ends of the wire can be flattened by hammering. The front mudguards stay and the light brackets can also be made from brass wire, pushed into the side frames. The front mudguards are simple in shape and can be made from card, cemented in place. Card or thin sheet wood can be used for the running boards, also cemented in place. The front bumper attaches directly to the front ends of the side frames and can be made from card or thin metal.

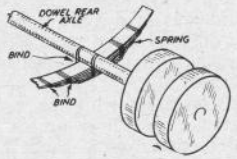
The radiator shell should be carved from a block of balsa or similar wood. This should be proportioned to fit exactly between the side frames, where it is glued in place. The radiator then forms a useful point for assembly of the cab unit.

TABLE OF DIMENSIONS MACK MODEL EQX TRUCK

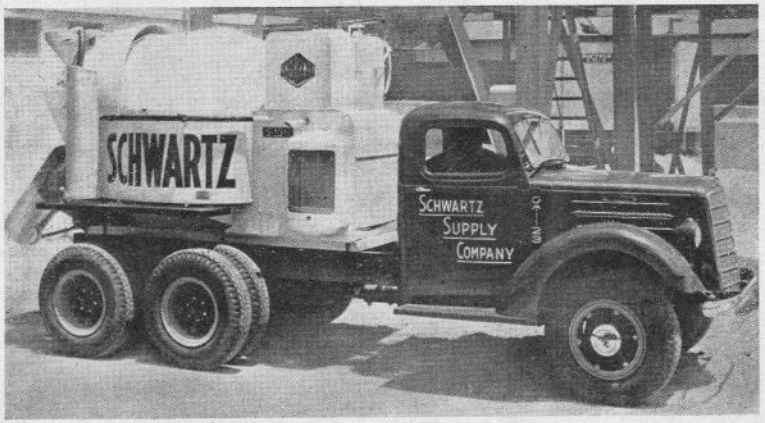
(all dimensions in inches)



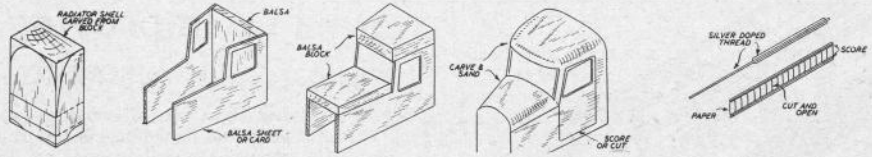
Scale	L	W	B	C	D	Gauge
3.5 mm.	$2\frac{3}{4}$	$1\frac{1}{8}$	$\frac{1}{16}$	$\frac{3}{4}$	$\frac{1}{8}$	H0
4 mm.	$3\frac{1}{8}$	$1\frac{1}{4}$	$\frac{1}{16}$	$\frac{3}{4}$	$\frac{1}{8}$	00
7 mm.	$5\frac{1}{2}$	$2\frac{1}{4}$	$\frac{3}{32}$	$1\frac{3}{16}$	$\frac{3}{16}$	0
1/72nd	$3\frac{5}{16}$	$1\frac{5}{16}$	$\frac{1}{16}$	1	$\frac{1}{8}$	
1/36th	$6\frac{5}{8}$	$2\frac{5}{8}$	$\frac{3}{32}$	2	$\frac{1}{4}$	
1/12th	20	8	$\frac{1}{4}$	5	$\frac{3}{4}$	
Full Size	238	96	$3\frac{1}{4}$	62	$9\frac{1}{16}$	Full Size



Dummy springs, and twin rear wheel assembly. Cab, radiator and bonnet details are set out on opposite page.



In this official photograph of a Mack truck, an additional set of twin rear wheels have been added, presumably to cope with the particularly heavy loads evidently handled by the Schwartz Supply Co.



There are several possible methods of building up the cab. Quite the easiest we found was to make the sides (cab and bonnet) in one from this sheet balsa and the cab back of thicker balsa sheet. Balsa block was then added for the cab top and bonnet top and all these parts then assembled over the chassis, cementing to the radiator shell. When the cement has dried it is then a relatively simple matter to sand the assembly down perfectly smooth and work in the rounded bonnet and cab roof. Windscreen and side windows are added later in the form of thin celluloid or acetate sheet cut accurately to fit. Before glazing the cab, however, all the paintwork should be completed.

To fill balsa prior to painting, if cellulose paints are to be used an excellent filler for balsa is balsa cement. Simply coat all the balsa with cement and smooth down and leave to dry. Sand lightly and then give another overall coat of cement. A final light sanding and the cellulose finish can be applied.

Incidentally, the cab assembly is best fitted with a floor. This will be necessary in any case if interior detail is to be added and the doors hinged to open. Thin ply or card will make an ideal floor.

Motif and louvres should be added to the bonnet after painting. The stainless steel strips can be represented by silver-doped cotton or thread, carefully glued in place. Louvres can be simply represented by a scored and cut paper strip. Open up the louvres slightly and paint in the required colour before cementing or glueing in place. The front radiator grille can be finished in a similar fashion.

Any remaining details can then be added, according to choice. For example the fuel tank, not shown on the drawing, is almost invariably mounted on the outside of the left side frame—see photograph—with the tool box immediately in front of this. In some other arrangements the tank is mounted in the cab. The photograph, incidentally, also provides most of the details required to construct a scale 'dump' body.

C. V. WATSON REVEALS **MORE ON THE STEAM HORSE**

Mr. Wickham's most interesting article in September *Model Maker* has cleared up one of the main uncertainties which exist as to the working of this mechanism.

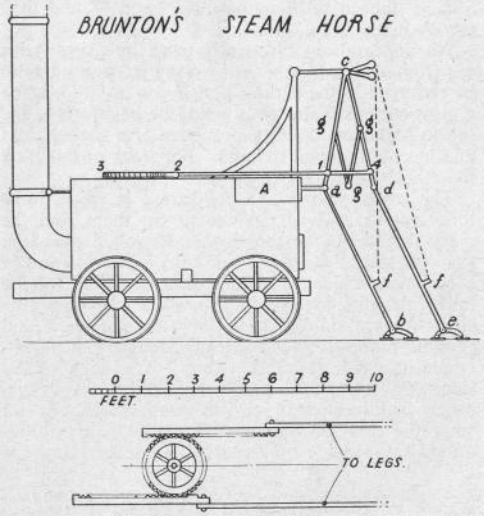
I think that I can suggest the purpose of the linkage " g g g " in the drawing shown in this article. Its object is to constrain points "a" and "d" to move in a straight line in exactly the same way as the parallel motion fitted to a "grasshopper" beam engine guides the upper end of the piston rod. The rods " g g ", in fact, act as radius bars being pivoted at the centre of the reciprocating levers " c a " and " c d ", respectively at their upper ends, and to a rigid bracket supported by the boiler at their lower end. This bracket has presumably been omitted from the drawing as it would hide some of the details of the linkwork.

By this means the weight of the upper portion of the linkwork is supported, and points " a " and " d " are forced to move horizontally.

I hope that other readers will be able to suggest how the legs were lifted from the ground during the return stroke and also, if possible, suggest what form of valve gear was fitted to this engine. Presumably a rod and tappet gear as fitted to " Puffing Billy " would suffice.

Further articles dealing with the older types of steam engines might well be welcomed by some readers, including the author.

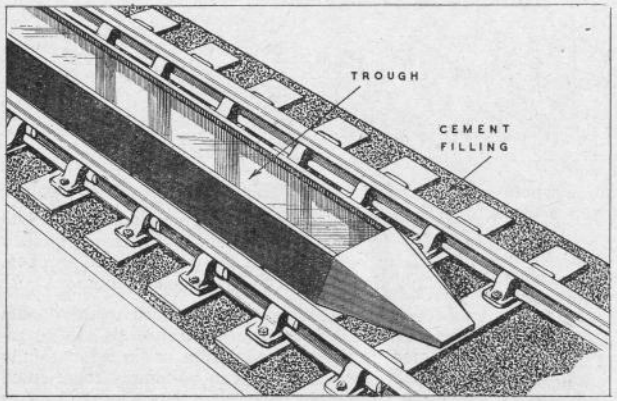
P. R. Wickham's drawing which appeared in the September issue is again reproduced for the benefit of readers, many of whom have expressed a keen interest in this kind of modelmaker's "whodunit".



CONJECTURAL PLAN OF RACKS. (NOT TO SCALE)

Improving the Miniature Railway Layout

H. A. ROBINSON CONSIDERS MORE USEFUL 0 GAUGE ACCESSORIES



Realistic Troughs

AN accessory not often seen on model railways are the between-rail water troughs which allow of trains picking up water at speed. As will be generally known, a scoop is lowered from the tender, the water rising into the tank by the forward rush alone. Water troughs are laid on dead level stretches of track and in practice are of considerable length, being a ¼ mile from ramp to ramp.

It would be quite impossible to put scale troughs (in length) on the average indoor gauge 0 track, but a much shorter version can look sufficiently realistic and give a pleasing effect, and the trouble taken in their making is well worth while.

Imitation troughs should not be shorter than 2 ft. 6 in. — indeed this length will do well — and they can be made as follows.

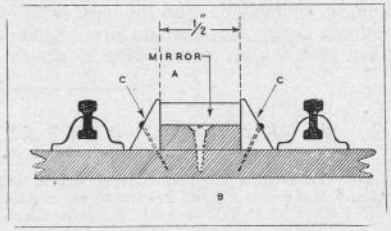
An appearance of water is given by using strips cut from a discarded mirror. Some accuracy has to be observed in the cutting, and if you do not possess a glass-cutter's diamond it would be best to take the job to a glazier. Paint shops often also supply glass and have a diamond to hand. For work of this kind the wheel-cutter is useless.

The strips—shown as (a) — are ½ in. wide, in as long lengths as it is possible to cut them, and the glass should not be too thick. Required also is a strip (or several strips) of wood (b) ½ in. wide and of a thickness which will bring the top surface of the mirror lengths to about rail-head level. The side strips (c) are sloping from their base upward and suitable pieces of wood already shaped can be obtained at a picture-framing shop. The angle at the sides of the trough assemblage should be as shown, but a slightly steeper (or less steep) angle will not spoil the final appearance. Finally, there are required two sloping blocks as (d) to act as ramps, a few short screws and a number of very fine model maker's pins. The ramps in actual practice are to prevent damage to the scoop should it be lowered too soon.

Most trough lengths have some sort of solid filling round the sleepers —often setts—to help drain away water splashed over. This can be represented in the imitation length by filling between the sleepers to their upper surface and for a little distance out either side with cement, or plaster of Paris darkened a shade.

The stretch of model line to be given a trough must be permanently laid, or if the line is portable the trough section must be in one piece.

A start on the construction of a length is made by laying the cement. As it hardens quickly a dead level finish with the sleeper tops at once, especially between the rails where any inequality will interfere with nice lying of the trough.



Location of the trough between rails.

Now comes the laying of the tank. First put down the strip (b), securing it with the small screws—one at each 6 in. Drill to begin with so that there is no chance of the strip splitting. Also, make a good cavity for the head of each screw so that it does not stick up above the surface—which would prevent the mirror sitting flatly on top.

Next put on one of the side pieces (c) along the whole distance. This is held by glue on its base and the side that comes against (b), and also by an occasional pin pushed in at an angle to the sleeper below. These very fine pins, it will be found, can be pushed home without any tapping. Following the fitting of the side comes the placing of the mirror strips. These are glued on the underside and stay in position by this and the grip of the two side pieces.

Now add the second side, pinning it tightly up so that the mirrors are well held, and then complete with the ramps at either end—these being sufficiently small to hold by glue alone.

It is important in getting the right appearance that the top edges of the sides shall stand a trifle higher than the surface of the glass—if level the effect of contained water is lost. Unless dealing with very accurate pieces, therefore, it is best to have the sides rather higher than necessary to start with and then take them down by gentle rubbing with sandpaper of a fine grade wrapped round a block.

The troughs are now completed, but as a last touch paint the sides and ramp a not too dark brown.

Peopling Your Railway

THE truly mechanically-minded model railroader is always rather afraid of anything that savours of "toys". And quite rightly so, for there is nothing further removed from this somewhat doubtful description than small-sized scale railway equipment. Yet on the other hand I think that some workers at times go too far in the other direction, and I have seen some technically excellent layouts quite spoilt by an arid appearance, just for the want of a few items that might feasibly fall into the toy category. Particularly the absence of people has been noticed and the unpleasant "emptiness" that such absence produces.

Model personnel certainly do give life to a station or other scene, or even to locomotives and guards' vans if suitably sized officials can be made to lean out from the cab or stand on the rear platform.

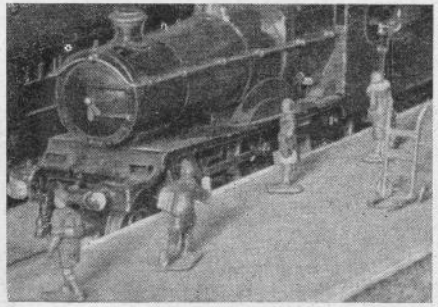
Sets of miniature people can be commercially obtained, but one has to watch carefully to get a uniform scale. Often there is a tendency for sets to be somewhat outsized, but this does not matter if all the people in any one location are the same. It is the giant amongst a set of smaller people which gives the impression that there is something wrong somewhere. For Gauge 0, men should be a little under 1½ in. high, while for 00, ¾ in. is about correct. A shade out either way does not offend the eye greatly and this goes for finish also. The little people are seldom examined in detail, and it does not matter if the painting is quite broad. It is the fact of there being a figure of some sort at this or that point which counts.

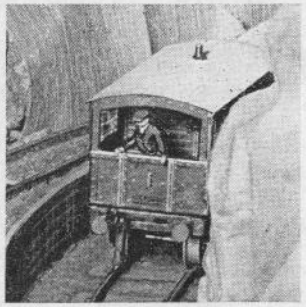
Model personnel for the whole of a large layout are seldom bought at one time, but are rather a matter of slow and careful collection. No source should be considered too humble for a find, and occasionally some quite good figures are to be discovered in small farmyard, military sets, etc.

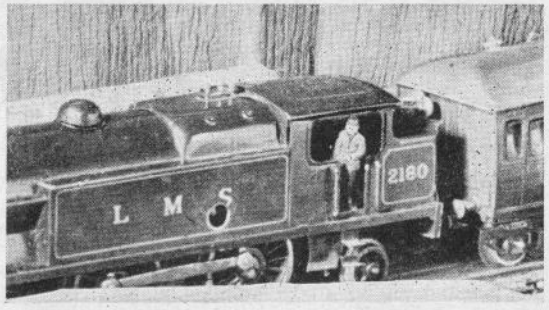
The solid base employed to make these leaden people stand is, of course, a big drawback, and if they are to be moved about from time to time it seems a necessary evil. A certain amount of camouflage can, however, be effected by carefully filing the base on the underside and so bringing the edge all round to a knife-like finish. This makes the junction with the underlying surface not so noticeable. If a figure so treated is to stand permanently on say, a grey concrete platform, then painting the base up to around the feet in the same grey will further help in hiding this unnatural part.

Another way to get rid of the base when figures are to be permanetly placed is by sinking it in a layer of plaster or cement. This can be effected when the whole of the paltform top is to be so finished or when the figures are required to stand about a goods yard or loco depot. The base here is not removed, but covered up to foot level by the plastic, and in this case it does good work by holding the figure quite firm.

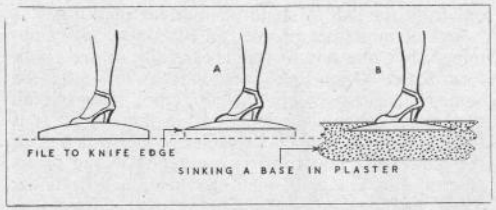
When a figure is to be used as a driver in a locomotive cab, or as a guard, the leaden base must be







A selection of lineside pictures showing the benefit of a miniature population. The ladies may perhaps point out that our Lilliputians are not dressed in the latest styles, but the mere male will not be so critical !



The necessary lead base which will usually be unavoidable. "Permanent" figures can of course be fixed in position without its aid.

filed right away and the figure jammed in the desired position by the feet being pushed into a little plasticine or putty which on the floor of the cab or van will not be noticed. To give the impression of a figure leaning—as looks well with some engine drivers—the figure must be tilted slightly. For a guard on his can platform, the upright position is always the best.

If model people can be made to stand other than by their underlying lump of lead, it is good to make them do so. Tiny persons so treated will, as a rule, have to be fixtures. Methods of baseless standing naturally vary a lot, but porters can be supported by their barrows and passengers by nearby items such as weighing-machines—or even by their own luggage. In all these cases the leaden base can be filed right away but it should be noted that the feet must be taken to an angle which nicely contacts the ground. A model too much on its heels or toes does not look natural.

The most easily placed, and in some ways the most effective miniatures are those of seated persons. These can be set on station seats and in my opinion look extremely realistic. Quite a big range of seated persons can be commercially obtained, but again watch the scale.

Re locations for personnel—a few on the platforms, certainly, but a fogman near his hut looks well, as do a few model shunters about sidings. Loco depots, too, should have a man or so around, and a signalman at the door of his cabin gives another touch of realism.

And finally, for a "made" scene, how about some platelayers at work, relaying a stretch? A real "set piece" can be made of this, there being a length of track from which the ballast has been removed and put in heaps. The gang should stand either side of the line and the scene is completed by a few piles of sleepers and lengths of new rail. It is not hard to supply the men with shovels.

ON THE RIGHT TRACK (*continued from page 666*)

awake out of sleep" and quit our dreamland for the harsh realities of a mundane existence.

It enabled a full 24 hour schedule to be run in six hours, and it gave sufficient time for deliberate operation without fluster or panic. It also meant that trains were kept down to a realistic speed and the natural tendency to rush was discouraged by the sage if whimsical motto of the company *Festina lente*.

As noted each UP or DOWN train recorded its own distance run in half-mile circuits, and from the word "Go" the two operators read their instructions from the cards containing the shorthand score and communicated only by telegraph key. Since both clock and power packs were on the same main switch the entire system could if it was impossible to complete the schedule at one sitting, be stopped and started again with the trains in correct disposition relatively to the clock. It only remains to explain the series of holes on the bezel surrounding the clock dial. Into these were fitted small pegs. There were three red pegs for the Up line, and three green ones for the Down. If an Up train was due to leave South Leigh at 1350 and arrive at Wessington 22 miles away at 1420, red pegs would be plugged in opposite these times. The Low Level operator would then be responsible for seeing that this train had recorded 44 half-mile laps of track so as to arrive on time, having run the required distance. A thtird red plug inserted at 1425 would indicate that the train was due to leave again within the five minutes, and as soon as it had started the red plug from 1350 was removed and inserted opposite 1445 at which time the train was due to arrive at East Drome 18 miles further on. Similarly for the Down trains and the green plugs.

The various shunting and marshalling operations were carried out at the four stations, while trains on the main lines were running. The shortest distance between two stations (Wessington and East Drome) was 18 miles, thus leaving a minimum of about 4½ minutes (actual) in which to attend to shunting, time checking, setting points and sections and . . . lighting the inevitable pipe.

There was also a rudimentary system of signals and the loco head codes to be kept going—but that is another story.

CONTRIBUTORS are welcome! You need not have a famous name, you need not have a fully equipped workshop—just as long as you have something of interest to our readers we shall be pleased to hear from you. Good photographs are our lifeblood, but your diagrams can be mere sketches—we will re-draw them for publication. Not more than 1200 words for a first article. We will acknowledge all articles submitted—and be pleased to give advice on likely articles, even if not suitable as at first submitted.

PAINTS & PAINTING (*continued from page 671*)

These are not hard and fast classifications. Many beautifully detailed locos and carriages are painted with oil paints and some people prefer lacquer for scenery. So, as usual in model rail-roading, the best thing to do is to investigate thoroughly the pros and cons. You can make up your own mind as to what practices you will experiment with and then decide what will be used as standard practice in your shops.

Preparation for Painting Metals

Before any painting is attempted, careful preparation of the model is necessary. In some ways this preparation is more important than the painting itself, for even good paint properly applied will peel and chip from metal which has not been properly prepared. Wood surfaces should also be prepared for painting but the problems there are not as difficult as for metal. More paint failures are caused by lack of preparation than for any other single reason.

In preparing metal surfaces for painting it should be remembered that things that cannot be seen often cause trouble: a microscopic film of oil, grease from a fingerprint, a tiny streak of soldering flux, specks of dust or metal that cannot be seen. Paint applied over these foreign substances will eventually flake off. Oil and grease are the greatest offenders for metal. Removal can be accomplished either by cleaning with naptha or benzine or by washing the model in a solution of water and some of the new synthetic detergents.

Some models cannot be immersed in water so the naptha or benzine bath is necessary. Such cleaners are volatile and inflammable, so extreme caution is necessary. Use them outdoors if possible. If used indoors, all flames in the vicinity should be extinguished — even in a water heater—and precautions should be taken against accidentally striking a spark. Carbon tetrachloride can be used for cleaning if the fire hazard is too great, but the fumes of this cleanser are dangerous and my experience has been that the oily film is not entirely removed by carbon tetrachloride.

Further preparation of some metals may be necessary. When painting brass, for example, a solution of 5 to 10 per cent. white vinegar in water will etch the metal just enough to give a good bond with the paint. Special care should be taken with any metal having a high gloss, for trouble will develop later if proper precautions are not taken.

After the metal has been thoroughly cleaned, apply a first coat of primer. When using lacquers the primer coat can consist of the thinner for the lacquer being used. If oil paints are used, a regular metal primer can be purchased at any paint store. The primer coat is more important when brushes are used than in spraying. As will be discussed later, several coats of spray work can be applied without obscuring detail, but two coats of brushed paint are usually the maximum for models having fine detail.

Preparation for Painting Wood

Wood is porous, and paint generally adheres satisfactorily to it. The problem is to produce a satisfactory surface after the paint is applied. Sanding is necessary, for the irregularities of the wood and even the grain, which is often raised somewhat by the paint, are major imperfections in scale models. After sanding, a sealer or filler may be used if the surface needs further finishing. This is usually necessary where the wood is to simulate metal. Sometimes a coat or two of paint applied and sanded down is perfectly adequate as a filler.

Usually it is necessary to protect parts of the model which are not to be painted particularly in spray work, for the direction of the spray cannot be controlled too accurately.

Detachable parts such as trucks and side rods should be removed entirely. Masking tape helps on flat surfaces and is, of course, necessary where a two-colour job is to be applied.

Painting with a Sprayer

Anyone can master the art of spray painting with a little practice and experimenting on expendable materials or models.

There are various types of paint sprayers, the simplest of which is the A.C. unit which combines the sprayer and paint container. Other simple types include the mouth operated sprayer, the throat atomiser, and the common type of hand operated spray gun. The principal advantages of these sprayers are availability and economy. The difficulties encountered include lack of control, variation in the diameter of the apertures and in the pressure applied—which makes it difficult to produce an even spray—and oversize containers, requiring excessive batches of paints and thinners. A somewhat more expensive spray is that designed to be attached to an inner tube or tyre or some other type of air reservoir providing a constant pressure. The most expensive and most effective sprayers are those which have the electric motor and air pump as an integral part of the units and deliver the paint through a special paint gun or airbrush.

Spray paint must be thinner than brushed paint. It is sometimes desirable to use paint which has been thinned at a ratio of one part paint to one part thinner. This is usually the maximum amount of thinner to be added to any type of lacquer paint. The amount of thinner required depends on several factors including the type of sprayer used, the number of coats desired and the colour of the paint. As a general rule, light colours need more thinner than do dark colours. The amount of thinner also will vary with the amount of pressure required to operate the sprayer.

BASIL R. S. CHAMBERS PRESENTS

A Treadle Lathe Stand

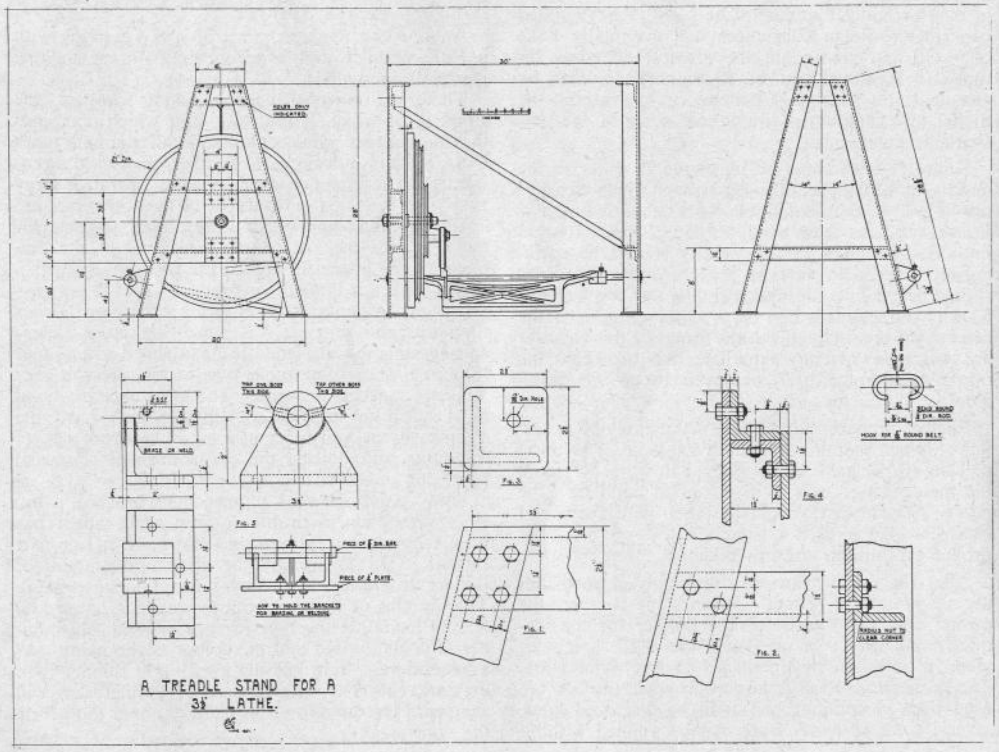
I FEEL sure that there must be very many model engineers who, like myself, have to be content with an "all-manual" shop, despite all the attractive advertisements for motorised lathes, drills, grinders, etc. Further, it may be that many would-be newcomers to the hobby are discouraged by the high prices asked for new motorised equipment; after all, not many of us can afford to spend a hundred pounds or so all at once on equipping a hobby workshop, and it is to beginners that my remarks are mainly directed.

Now, to save time, we'll assume that you already have a bench, vice and a few other tools, and that you have just acquired a bench lathe; not necessarily a new one, but perhaps not quite so old as mine! As you have only one bench, it seems a pity to take up most of it with the lathe, so let's make a really business-like stand for it.

The stand about to be described is one I have recently made up for a friend who has a similar Drummond to mine; it is treadle operated and has a standard Drummond flywheel and treadle. You should be able to obtain a wheel and treadle to suit your particular lathe through a "small ad." in one of the model magazines—I had over 20 replies to my advertisement!

The general arrangement drawing shows the finished appearance. I was unable to obtain a photograph before delivering the stand and the photo herewith is of a similar, but lighter, stand which I made for a 2 in. Wade lathe. Here is the materials list:

Legs and treadle brackets: 2 in. x $\frac{1}{4}$ in. angle iron, 12 ft.
Cross-ties and brackets: $1\frac{1}{2}$ in. x $\frac{1}{4}$ in. ditto, 5 ft.
Lathe mounting brackets: $2\frac{1}{2}$ in. x $\frac{5}{16}$ in. ditto, 14 in.
Flywheel mounting plates: 4 in. x $\frac{1}{4}$ in. B.M.S. —10 in., plus $7\frac{1}{2}$ in.
Bolts and nuts: $\frac{1}{4}$ in. B.S.F. x 1 in. (or $\frac{3}{8}$ in.), 5 doz.
Feet: $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x $\frac{1}{4}$ in. B.M.S., 4 pieces.



A TREADLE STAND FOR A 3½" LATHE.

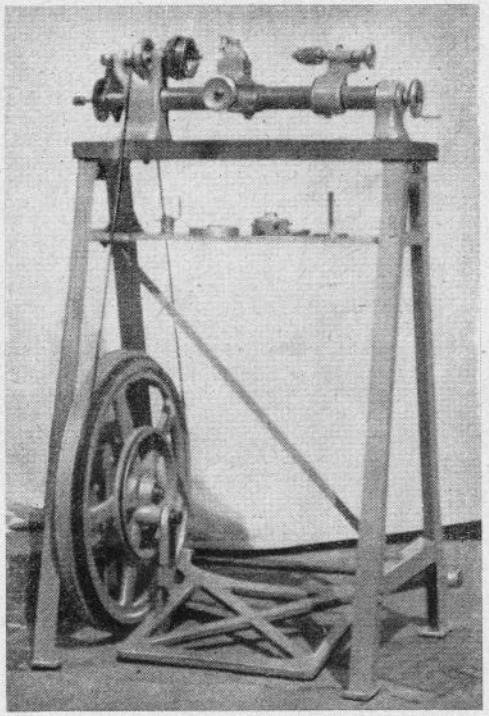
Distance piece: $\frac{5}{8}$ in. x $\frac{3}{4}$ in. steel tube—$1\frac{1}{2}$ in. (finished).
Diagonal stay: $\frac{3}{4}$ in. x $\frac{1}{4}$ in. black iron, 38 in.
Treadle pivot bar: $\frac{5}{8}$ in. dia. B.M.S., $30\frac{1}{4}$ in. (finished).
Treadle-bar bosses: $1\frac{1}{2}$ in. dia. B.M.S., 2 pieces, $1\frac{1}{2}$ in. (finished).

As already stated, this stand was made for a Drummond lathe, and the prospective owner wanted the mandrel centre to be 40 in. from the floor, which is slightly lower than the lathe maker's stand; this gives a mandrel centre height of $43\frac{1}{2}$ in. I find that for comfortable working the mandrel centre height should be about elbow height, or a very little lower —same as the classic rule for determining the height of one's vice jaws. You can, therefore, arrange your stand to suit your own individual requirements. If you make much alteration to the height it would be advisable to modify the angle of the legs in order to retain approximately the 20 in. spread at the bottom.

Having decided on the height for your stand, start by sawing off and filing up the four legs, using the 2 in. x $\frac{1}{4}$ in. angle iron. Saw as close to the line as possible to avoid excessive filing, and get the angles accurate—it helps the finished stand to go together correctly and, obviously, all four legs should be the same length! A little cutting oil on the blade will make the sawing job easier; for filing up, I used a 10 in. second-cut hand file, followed by an 8 in. smooth-cut ditto.

Satisfy yourself that the legs are all that they should be, then cut off the two apex brackets from $2\frac{1}{2}$ in. x $\frac{5}{16}$ in. angle iron; $\frac{3}{8}$ in. thick angle can be used—it only means a bit more work in the sawing and filing department! True up the ends to the correct angle (14 deg.). I clamped mine to the lathe cross-slide and used a fly-cutter, but as you haven't got your lathe working yet, you'll probably have to use that file again. Radius the ends to clear the inside corner of the legs and temporarily clamp one pair of legs to each bracket so that you can check the spread of the legs at the floor end. Mine came to within $\frac{1}{4}$ in. of the calculated dimension, which is near enough. If everything is still o.k., remove the clamps, mark out and drill the fixing holes in the top of each leg, as Fig. 1. Mine being an "all manual" workshop, I drilled all the holes in my stand with a two-speed hand bench drilling machine.

Use a $\frac{1}{4}$ in. drill for all the fixing holes; no drill cuts dead to size and you will find that this drill makes a hole that just takes the $\frac{1}{4}$ in. bolts comfortably with very little slack. This adds to the rigidity



of the finished stand. Regarding bolts, I bought mine 1 in. long and shortened them to $\frac{3}{4}$ in. in order to have a longer plain portion; the bolts then act, more or less, as dowels. Now clamp the legs, one at a time, to the apex brackets and drill through, putting in a bolt as you go to make quite sure the job doesn't shift whilst you are drilling the remaining holes.

You should now have two exactly similar leg assemblies and can measure the correct lengths of the $1\frac{1}{2}$ in. x $\frac{1}{4}$ in. angle cross members; two at the flywheel and one at the other end. Cut these off and file up the ends to the correct length and angle, then drill and fix as for the apex brackets. Fig. 2 shows the bolt spacing; the reason for placing one bolt so close to the inner corner of the angle was intentional, the idea being to keep the bolts the maximum distance apart. Note that at the flywheel end the angle cross members are positioned with the plain sides facing towards one another.

Now is a convenient time to braze on the feet (Fig. 3). These are essential if your lathe will rest on a wooden floor and are advisable in any case. This job will need a lot of heat, and if you haven't the facilities you could approach a local garage

WORKING DRAWINGS FOR THIS TREADLE LATHE STAND CAN BE OBTAINED FROM MODEL MAKER PLANS SERVICE, THE AERODROME, BILLINGTON RD., STANBRIDGE, NR. LEIGHTON BUZZARD, PRICE 3/6, POST FREE

which sports oxy-acetylene welding equipment. I was able to do mine at work by just standing the leg assemblies on the feet in the correct position and brazing all round.

The next job is to drill the 10 in. piece of 4 in. x ¼ in. flat steel which forms part of the flywheel spindle mounting; this goes on the outside of the stand. I fixed mine by drilling through into the cross members *in situ*. It's a bit awkward this way, but you are sure of getting the plate in the right position. Now cut off and clean up the two 4 in. lengths of 1½ in. x ¼ in. angle for holding the 7½ in. piece of 4 in. x ¼ in. plate. Drill only the three holes for fixing these angles to the cross members at present. Butt one of the angles against the plate already fixed and clamp it to the cross member—make sure you have it the right way round—see Fig. 4. Remove that cross member with the angle bracket clamped to it and drill through using the short angle as a jig. Bolt up, remove clamps and replace the lot in the leg assembly. Do ditto with the other angle and cross member.

The shorter piece of 4 in. x ¼ in. plate can now be drilled, then clamp it in position using the flywheel spindle, or a bolt that fits the centre hole, and you will be sure that the two plates are correctly in line; don't forget the distance piece—this is merely a 1½ in. length of ⅝ in. x ¾ in. dia. tube. Drill through the angle brackets and bolt up.

The two brackets for the treadle-bar bosses (Fig. 5), are made from pieces of the 2 in. x ¼ in. angle left over from the legs. Drill the fixing holes after sawing and filing to shape. I put my brackets on an angle plate mounted on the lathe faceplate and bored the semi-circular "holes" for the bosses. If you have no kind friend to do this for you it can easily be sawn and filed. The bosses are merely 1½ in. lengths of 1½ in. dia. mild steel with a ⅝ in. dia. hole through the middle. If your lathe is complete as regards change-wheels, chuck, etc., it would be possible for you to make up a simple handle to fix on to the end of the mandrel, set up the change-wheels to give the finest possible feed and bore the bosses yourself, providing you drill at least a ⅜ in. dia. hole through first; it would not be the first time this form of "hand turning" has been indulged in!

Make up a "jig" as shown to hold the bosses on the brackets when brazing or welding. In the absence of brazing faciliteis, perhaps the local garage-man would again oblige for a small consideration.

The best way to ensure that the bosses are in line when fixing to the stand is to place the two leg frames on the bench in their correct relative positions, put the ⅝ in. dia. treadle-bar through the bosses and clamp the lot to the frames. When you are satisfied that the treadle-bar is level and at the prescribed height from the floor (or rather, the bench) remove each of the back legs in turn with the treadle-bar bracket still firmly clamped in position, drill through and bolt up. I drilled and tapped the set screw holes in the bosses after the frames were re-assmbled; this was the easiest way (for me!) to hold the brackets at the correct angle to get the set screws upright, not that it really matters whether they are vertical or at an angle.

The frames can now be spaced the correct distance apart, treadle gear, etc., assembled and, if your lathe is complete with chip-tray, this can be bolted directly to the two apex brackets. If you have no chip-tray mount the lathe on a piece of hardwood, such as oak, about 1½ in. thick; in this case it would be a good plan to make up a light steel tray, brazed at the corners, to go between the lathe and the wood top. This will form a chip-tray, and will also stop oil and cutting fluids from soaking the wood. Don't forget to allow clearance for the belt when making the tray! For comfortable treadling arrange the length of the crank arm so that the treadle, in its lowest position, clears the floor by the minimum amount—½ in. is ample clearance.

Having done all this and found that the end frames are upright, same distance apart from top to bottom and from back to front, the diagonal stay can be made. If you use ¾ in. x ⅛ in. black iron strip it can be bent and twisted cold, using the vice and a large adjustable spanner. Mild steel should be twisted whilst red hot to avoid cracking. Get the top end drilled, bent and twisted first, temporarily bolt up and you can then see exactly where to make the bottom bend. Don't drill the bottom hole until the stay fits nicely, otherwise you'll probably pull the stand out of shape trying to make two holes line up when they don't want to!

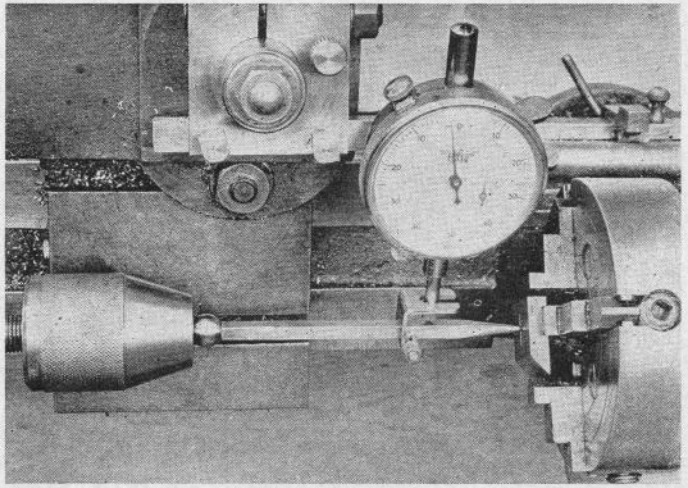
If you are extra fussy (like me) you can now take the stand completely apart and undercoat each individual part, then re-assemble and enamel. I did my stand this way firstly in order to remove all traces of cutting oil which I used when drilling the various holes; being a water soluble oil it would have given rise to rusting. Secondly, this method of painting gives maximum protection from outside rusting agents—most model engineers' workshops are very prone to rusting.

Here's a word or two on belt fasteners for round belts. This is always a controversial subject wherever modellers gather. I've tried several types and have found the simplest to be the best—a plain double hook as shown in the accompanying sketch. It is made of .063 in. dia. piano wire (No. 26 Music Wire Gauge). A piece of bicycle spoke of equivalent diameter would serve as well, but ordinary iron or mild steel wire is useless for the purpose. To make the hook for a $\frac{5}{16}$ in. round belt, grip two pieces of ¼ in. dia. steel in the vice with the ends projecting

(*Continued on page* 686)

Put that Dot on the Spot

BY L. C. MASON



Punch dot centring bar set up in the lathe with dial test indicator. The tool post mounting for the indicator is only one of several possible set-ups.

MOST drilled holes which require to be accurately located start from a centre-punch mark, which in turn is probably placed at the intersection of scribed lines. Given that the punch mark is in the right place, there are various ways of checking that the drill makes the hole also in the right place. When the job is held in the lathe and drilled from the tailstock prior to boring, a third possibility of error is introduced—not having the punch mark truly centred.

There are ways of checking this too, the most popular one being some version of the "wobbler". This generally takes the form of a long slender pointer, mounted near one end in a gymbal type of fitting so that it can pivot in all directions. The pointed end of the short arm engages the punch mark, the mounting is held rigidly in the toolpost, while the long arm makes a "geared-up" circular movement indicating the eccentric running of the punch mark.

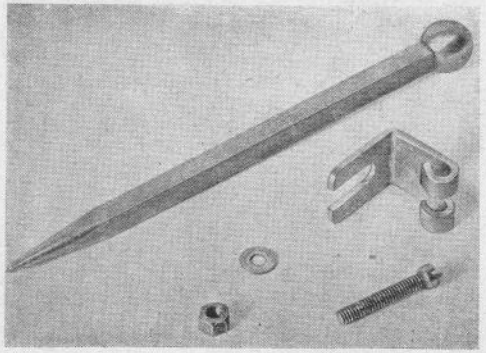
This works very well, but has two disadvantages; it doesn't indicate by how much the punch mark may be off centre, and it is left to the excellence of one's eyesight to determine when the free end is really steady.

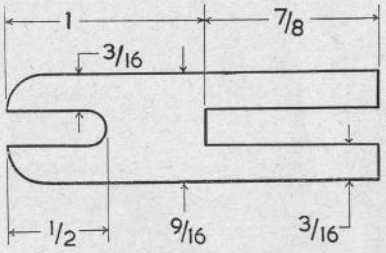
Those who have that invaluable gadget, a dial test indicator, can use it for yet one more job with the simple accessory shown. This indicates with a direct reading how truly or otherwise a punch mark may be centred, requires no effort to interpret its indication and is, if anything, somewhat simpler to make than a good wobbler.

As will be seen from the photographs it consists of a stiff bar of square section, pointed at one end to engage the punch mark and provided with a ball at the other end. Carried on the bar is a light clip, having a forked end bent over at right angles. The fork is a loose fit around the stem of the gauge, and serves to keep one flat of the bar presented squarely to the indicator button, while one end of the bar is swinging in a circle.

The bar can be any convenient length—say 6 in.—and is of $\frac{5}{16}$ in. square silver steel. Grip it in the four-jaw chuck and turn a gentle taper on one end, to about the same degree of taper as a scriber. At the tip, turn a smaller and more obtuse point to match the centre punch. This will then ride snugly in the punch mark. The other end is turned round

The completed parts for punch dot centring bar ready for assembly into this useful accessory.





The clip cut out in the flat, with all dimensions duly indicated.

for ¼ in. or so, and threaded any convenient thread. The one shown is 2 B.A. This end is furnished with a steel ball for a bearing, to allow the bar to pivot in all directions.

In use, the ball rests against the ends of the jaws of the tailstock drill chuck. This will be required for the next operation after centring the spot—drilling—so no alteration to the lathe set-up need be made. If the drill chuck can take the ball diameter, the jaws are opened only about three-quarters of that amount. If the chuck is too small, run the jaws well in and let the ball ride in the open end of the chuck body. The photograph shows a $\frac{7}{16}$ in. ball used with a ½ in. capacity drill chuck. The ball is a bearing ball from the scrapped race of a car back axle. It is softened for drilling by heating to dull red and very slowly cooled. When soft, chuck in the three jaw and turn a small circular flat on the outermost point, centre, then drill and tap to fit the bar. After tapping, re-harden dead hard and polish up. At the same time harden the point end of the bar which bears in the punch mark. This needs to be hard for only a short distance—say ¼ in.

The clip is cut and filed to shape from a fragment of 18 g. steel plate. The drawing shows its shape in the flat. The square opening should be a snug fit on the bar, and the arms either side of it long enough to be curled round a 6 B.A. steel bolt. The bolt forms the fourth side of the square embracing the bar, and when provided with a nut and washer, grips the clip firmly on the bar in any selected place. The arm encircling the bolt just under the head can be clenched tightly on the bolt if desired, then slacking off the nut for adjusting the clip position will be a one-handed operation.

The two arms bearing on the gauge stem should be long enough to reach about ⅜ in. up the stem from the bar, and to give a little lateral movement before the clip disengages.

The photograph of the indicator set-up with the centring bar shows the indicator held by a mounting bar in the tool holder. If the toolpost is already holding a boring tool, for example, which is about to be used there is no need to remove it. The indicator can equally well be used from above the bar, supported on a scribing block type of base.

Although a simple accessory, its extreme usefulness brings it into use more and more. If you don't possess a dial test indicator, a very fine setting can be obtained by feel, with a finger between the indicator bar and the end of a plain bar held in the toolpost. A lathe tool reversed does fine for this.

If you are a super-precision merchant—use the same set-up with feeler gauges!

A TREADLE LATHE STAND

(*continued from page* 684)

above the jaws; space them at ⅜ in. centres and bend the wire round. You'll find the job easier if you use a longish piece of wire and cut off the unwanted portions after forming the hook. Don't use your wire cutters for this or they will be ruined; grind a little nick in the wire and break it off. You could file the nick if preferred. Being springy, the wire will not fit tightly round the forming rods, but will open out to just the right size for the belt. Smooth the ends up with a fine file.

Now my opinion is that most of the trouble experienced with this type of fastener springs from the way the hole in the belt is made. Here's the secret of success—don't make a *hole* in the belt! Use the smallest blade of your penknife (be sure it's sharp), and with the blunt edge of the blade towards the end of the belt and with the point of the blade approx. the diameter of the belt from the end (i.e. $\frac{5}{16}$ in. for a $\frac{5}{32}$ in. round belt) "wriggle" the blade through the centre of the belt. This parts the fibres of the leather instead of severing them and the belt is not weakened. It doesn't matter about the slit being long; it will, in any case, be as long as your penknife blade is wide. Remove the blade and prise open the slit with a thin scriber point to make it easier to insert the hook. I find a pocket scriber ideal for this job. Regarding the length of belt required, pull it tightly round the appropriate pulleys and cut it 1 in. short of the indicated measurement. This will give you sufficient tension for all normal purposes; it is a mistake to run any belt too tightly. When the belt stretches in service, which it soon will do when new, merely cut off one end just behind the slit, make a new one and fit the hook as before.

If a correctly tensioned belt persists in slipping it can only mean that it is being called up to transmit power beyond its capacity. The belt may be saturated with oil, or one of the pulleys may be very small, resulting in too short an arc of contact with the belt. A new belt and cleaning of the pulleys should effect a cure in the first case; it's no good soaking a belt in petrol to free it from oil—you'll only ruin the leather. If the drive still slips the only real cure is a bigger section belt and/or larger diameter pulleys. "Anti-slip" belt dressings rather savour of the "gospel of the big stick" and should be avoided if at all possible.

PETER HUGO ON *Tuning a Dooling 61*

NEARLY everyone who has had any connection with model racing cars, especially the 10 c.c. class, appreciates the fact that to gain peak performance it is necessary to modify certain parts on the average factory-produced engine. In the following article I will try to describe some of the more successful modifications that can be carried out on a Dooling "61" engine.

I would like to point out, however, that nitrated fuels will *have* to be used if you do decide to modify your engine.

Venturi

The bore of the venturi is originally .375 in. This can be increased to .410 in., and blended into the bell and crankcase aperture, and afterwards polished to give as good a finish as possible. It is of interest to note that many of the fastest cars in the United States have a venturi bore of .425 in., while some world records are still held with engines using the .375 in. venturi.

Fuel Jet

The diameter of the fuel jet should be increased from .050 in. to .060 in. only if more than 20 per cent nitromethane is to be used in the fuel. I have found the standard jet to work quite well with up to 22½ per cent nitromethane.

Connecting Rod

Apart from lightening and polishing, little can be done to the connecting rod. It is not advisable to remove material from a Dooling connecting rod as even the standard ones have been known to break, but if you do decide to lighten it the sides can be milled away slightly to produce an "I" section.

Cylinder Head

To permit the use of nitrated fuels instead of straight castor-methanol, the compression ratio must be raised. Sufficient material must be removed from the cylinder head face such that 1.30 c.c. to 1.35 c.c. of thin oil or 50 to 54 drops of "3 in 1" oil (using a standard eye dropper) will fill the head to the top level of the plug hole, with the piston at T.D.C. Approximately .010 in. is the normal amount of metal to be removed in the case of the Model "A". This modification does not apply to the Model "B" since the compression ratio is already sufficiently high to permit the use of nitrated fuels. The inside of the head should also be polished.

Piston

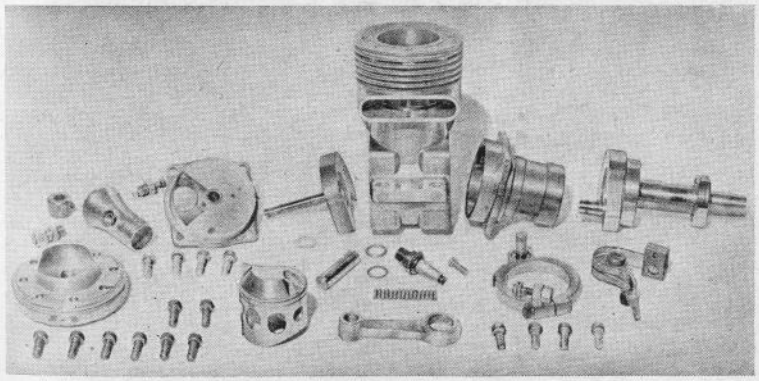
Only the inside of the piston should be modified. The wall thickness of the skirt below the gudgeon pin bosses may be reduced to some extent, but it is pointed out that excessive lightening in this region may lead to distortion under the considerable stresses to which the piston is subjected. Much of the material above the bosses may, however, be removed without unduly weakening the piston.

More efficient lubrication of the bore may be obtained by the provision of three equally spaced holes (say .0312 in. dia.) in each of the piston ring grooves.

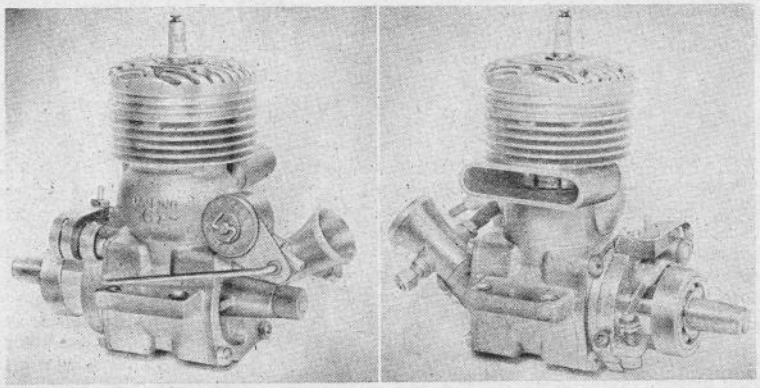
Finally, it is advisable to round off the inner edges of the three oval ports and of the skirt, and also to polish the piston head.

Piston Rings

In order to prevent rotation of the piston rings and thus eliminate a certain proportion of the friction, each ring may be located by a pin as shown in the sketch. A hole .046 in. dia. should be drilled centrally in each groove to a depth of .030 in., at a position corresponding to the third exhaust port for the one groove and to the fourth for the other. Using pins .060 in. long it will be necessary to "step" the ends of the rings to accommodate the .030 in. protrusion of the pins; it is desirable also to bevel the ends in order to obviate any tendency for the tips to spring into



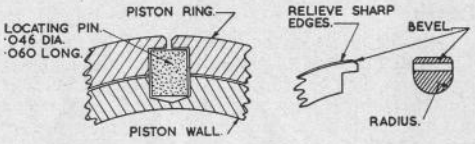
Left: The component parts of the formidable Dooling 61, the tuning of which Peter Hugo discusses in this interesting article.



Right: Two views of the complete engine, showing transfer and exhaust sides, with details of the robust contact breaker, and venturi.

the exhaust ports. The rings may be further improved by radiusing the inner edges as shown.

Rings which have some troce of serrations on the outside diameter due to machining, will be found to be more efficient than those which have been worn smooth.



When new rings are fitted, it will be found that you will get your fastest time during the car's fifth of sixth run, assuming all other conditions to be constant.

Contact Breaker

The moving contact breaker point can be domed off very slightly, using a very fine grade of stone, but points which mate absolutely flat may be found to suit your engine better; this depends largely upon your ignition system.

The points should have a good smooth finish, and be set to break at between .004 in. and .005 in., with battery and coil ignition.

In the case of magneto ignition it is advisable to maintain the gap specified by the manufacturer: this is normally somewhat greater.

The rivets situated just above the fibre pad which run on the cam should be soldered. This will eliminate any possibility of the fibre pad becoming loose under the action of the cam.

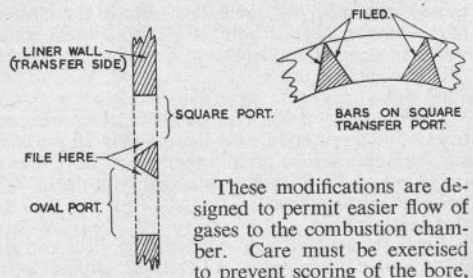
Platinum plating of the points may provide sufficient improvement to justify the expense it entails.

Liner

A chrome-plated liner, whilst not essential, is a desirable feature. It is important that the liner bore should not be more than .0001 in. out of round; this of course, applies also to the outer diameter of the piston. The diameter of the piston should be .0025 in. less than that of the liner bore.

The outer edges of the bars which separate the square transfer ports in the liner should be so chamfered as to produce a triangular section. Care must be taken, however, to ensure that the effective width of the bars is not reduced.

The bases of the square transfer ports and the tops of the three oval transfer ports are filed as shown.



These modifications are designed to permit easier flow of gases to the combustion chamber. Care must be exercised to prevent scoring of the bore, and all parts which have been modified should be finally polished.

Crankcase and Barrel

The exhaust and transfer ports on the main body of the engine should be well polished. Apart from this, little can be done to this component to increase the performance of the engine in any way.

Crankshaft and Front Cover

The crankshaft should be inspected for free running; there should be no sign of picking-up between the two ballraces. If new races are required, it is advisable to use a "two-dot" fit, with brass cages. When fitting new races make absolutely certain that the whole race is square in relation to the shaft and housing and also that no race clearance is lost by having too large an interference fit.

Rotary Disc Valve

The disc can be modified a great deal. First of all, to reduce a certain amount of oil drag, the diameter of the front part of the disc may be reduced by .020 in. for a distance of .187 in. as shown; this will also eliminate the possibility of the disc touching the walls of the crankcase when the spindle becomes worn.

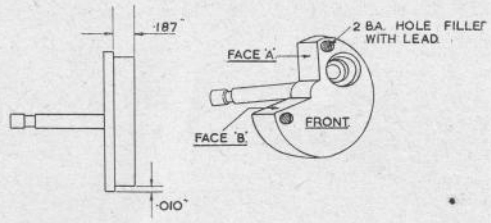
To allow more fuel and air to enter the engine, the 90 deg. section cut away from the disc can be enlarged. This modification affects easy starting to a slight extent, but may be found to increase the power and r.p.m. of the engine.

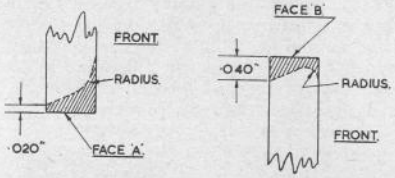
The area of the rotor port is increased as follows:

On face "A", .020 in. is removed as shown, filed away at an angle, and then finally radiused. If the recess that has been machined to clear the big end of the connecting rod is broken into, it will not matter a great deal from a performance point of view.

On face "B" the same operation is performed, only .040 in. is taken off the other side of the disc, the face then being filed off at an angle and radiused. The whole disc should now be very highly polished.

On my own engine I have found that the bearing spindle of the disc has been worn to a remarkable degree, causing the back of the disc to bind on the front face of the back cover. This wear is, of course, due to the rotary disc not being properly balanced. To improve the balance of the disc, 2 B.A. holes can be tapped near to the faces "A" and "B" and also near the outside edge, as shown, and then filled with solder. No flux should be used when doing this. A small amount of the solder should be left proud of the disc on both sides, and then gently tapped into the hole when the solder has set. The superfluous metal may then be filed away and polished flush with the outer face.





If the spindle has been very badly worn, it is advisable to turn it down to .125 in. and then fit two $\frac{1}{8}$ in. high speed races, there being just sufficient material on the back cover to provide space for the two housings. To prevent any leaks, a distance piece of .187 in. diameter should be fitted between the races. By substituting ballraces for the ordinary bronze bearing a further small amount of friction can be eliminated.

The foregoing suggestion which are based on personal experience are intended primarily to be of assistance to those readers who possess a Dooling "61". It is hoped, however, that they may also be at least of interest to others.

FESTIVE MARBLEHEAD

(*Continued from page* 654)

through a wind eddy she will excessive helm on the other tack which will jib her back to the proper course.

If the course desired is a run before the wind the mainsail should be let off nearly square and the helm arranged accordingly for the new course.

When you set the spinnaker see that the angle made by the line from outer end of spinnaker boom and the sheeting position on the deck rail is greater than the main boom angle otherwise the spinnaker is likely to get backwinded.

It is sometimes the case that in order to reach the end of the course it is not necessary to make a tack right across the pond to the other side. In this case a short tack can be made by attaching a gye from the end of the main boom to a point forward on the deck rail. This gye consists of a short length of rubber cord with a hook at one end for the sail eye, the rubber being extended by a length of bobbing cord passing through a bowser through a hook on the end of the main boom and back to the bowser. By adjusting this gye so that it pulls the main boom to amidships it will cause the model to sail into the wind and shake herself round to the original tack.

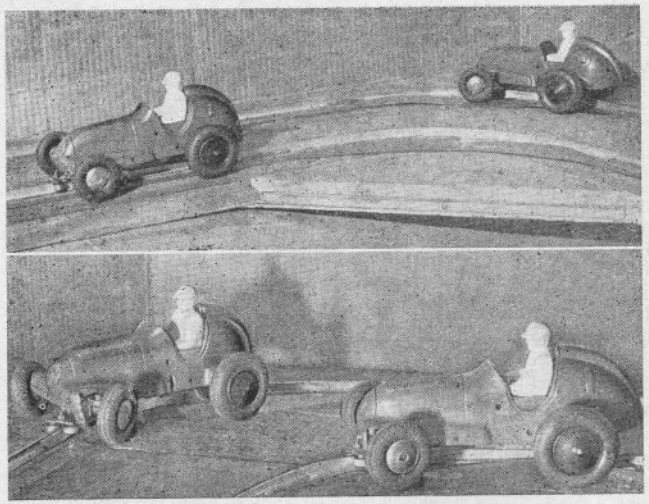
For winds that overpower the model in her No. 1 suit of sails it is necessary to have smaller suits. These must be arranged that all have their centre of drive in the same fore and aft position.

The same main boom can be used but each jib will require a separate spar.

Never sail the model so that she is labouring under too much canvas as she will sail much faster if comfortable.

Always see that the mast is not pulled to one side through one stay being tighter than the other. See that the rudder is perfectly free to move with the slightest puff of wind and that the elastic centring line is only just tight enough to bring the rudder amidships when the lines are slack.

It will be noted that a kicking strap is necessary with the modern high aspect sail plan. This prevents the boom rising excessively and allowing the sail to wrap itself around the mast if the model gibes. It should never be set tight especially when the yacht is close hauled as it will then spoil the natural flow of the sail.



THE PERSONAL TOUCH

BY IVOR LEWIS

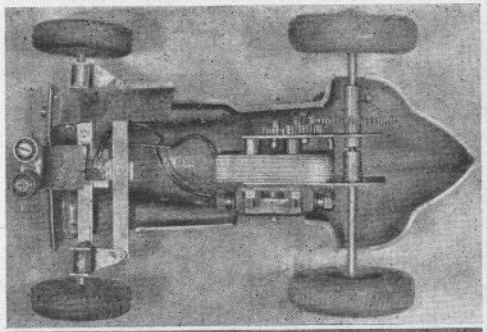
More on the Electric Track described recently by W. Boddy in "Model Maker".

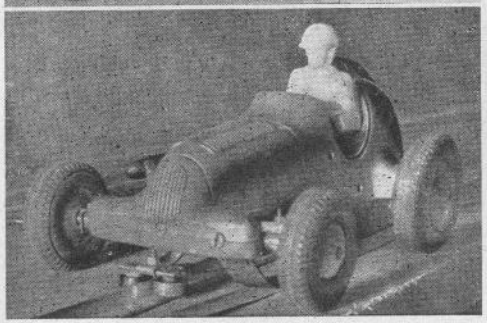
AFTER reading the chapter on railtrack racing in G. H. Deason's book *Model Car Manual*, I was struck by the thought "why not let the cars steer themselves round the bends instead of being dragged round by the 'zonker stubs'." Apparently about the same time, H. C. Baigent had a similar thought, but we were working towards different ends, as will be seen.

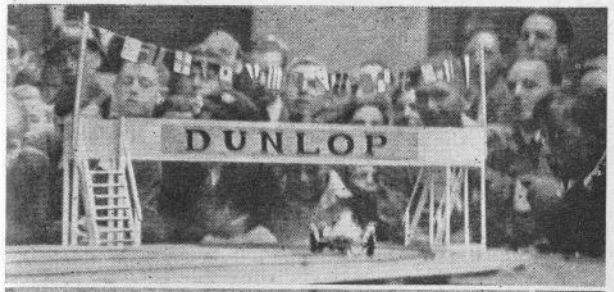
Firstly, I built a front axle assembly on full-sized lines, with axle beam, track-rod and stub axles, and having a steering arm, pivoted to the axle beam, running rearwards to the track rod, and forward of the beam and bent downwards to terminate in a pair of miniature ballraces. This assembly was fitted to a Woolworth plastic bodied speedway car, as shown in the accompanying picture. As previously described, the guide rail is of L-section alloy with a flat brass strip pinned alongside for the return current.

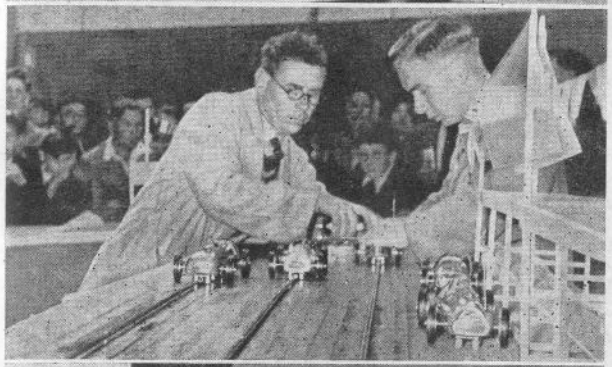
Various driving units were tried, the chief difficulty being the limited space in the body, but eventually a Frog "Revmaster" was used, geared down 7: 1, with the large gear just clearing the rail. Power is supplied by a transformer feeding a 3 amp. full-wave rectifier, the resulting current being controlled by a rheostat. Full voltage is 9 volts, and when the car is accelerating away from rest, consumption is 0.75 amp., flat-out running down the 20 ft. straight taking 0.5 amp. I have had a car running for four or five hours at a time with only brief stops, whilst half a dozen pals tried their hand at the track record, and the motor hardly gets warm. I have also tried "hill climbing" up a 6 ft. length of track raised 2 ft. at one end, and controlled it by "braking" on the down grade. Smaller rear wheels were sometimes used for this.

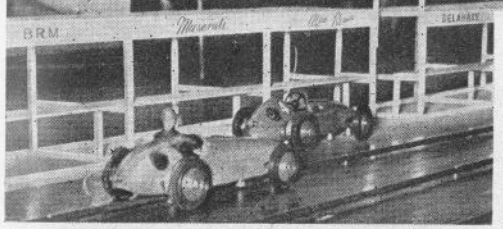
As I said previously, H. C. Baigent and I were working on rather different lines, my idea being to construct a car which could be controlled by the "driver", and which could crash if he took a corner so fast that his car would "run out of road", thus introducing the vital element of personal skill. My track is a very bumpy affair, made up of odd lengths of board, roughly 1 in thick, and packed up with thin card when necessary. The result was that cars were liable to bounce off almost anywhere (ask Mr. Boddy!) so weights were tried in the nose of the car but without success. Finally, the difficulty was overcome by moving the side contact from the rear to the front of the car, so that it now makes contact so long as the rollers are in position on each side of the rail, instead of losing contact when the tail slides away as previously.









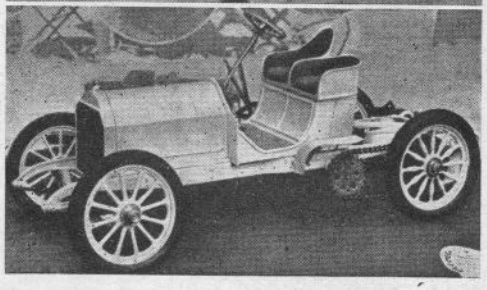


Notable Model Cars

AT THE M.E. EXHIBITION

Quality but not quantity might describe this year's model car exhibits at the Horticultural Hall. True, the cars had a "set piece" all to themselves, in the shape of the Grand Prix rail circuit in its prominent position on the dais, presided over by designer Henri Baigent and operated by G. V. Walshaw and his helpers. The course was well laid out and had realistic pits, gaily flag-bedecked and lettered with the appropriate *marques*, and the "Dunlop Bridge".

Although not an entry in the competition section, Major T. W. Stubb's magnificent Mercedes, chain driven and with its detail work in the chassis magnificently carried out, rather stole the show on the Army stand, but there was other fine work on view. The Rolls Royce limousine with balsa bodywork by L. Dagnall and S. E. Hamilton, and the very fully detailed Mills engined TC M.G. by L. A. Hancox both appealed as excellent amateur efforts, as did the pleasant lines of R. H. Shillito's semi-scale sports two-seater. In a different category, H. A. William's sprint chassis was a fine piece of work, although one would have welcomed more information on the intriguing in-line engine. Interesting also was K. H. Pritchard's 80/90 Talbot chassis, with plenty of mechanical detail, and a rather incongruous single-cylinder two-stroke engine out in front. We gather that this model is something of an experiment, however, of which we may have more details later, together with C. W. Field's very handsome 10 c.c. o.h.v. B.R.M.-based single seater which won an award, and which we hope to illustrate and describe in a future issue.



Letters to the Editor . . . .

Dear Sir,

One or two points have arisen from your recent issue of *Model Maker* in connection with my B.R.M., and other articles, and which I shall dispose of as briefly as possible.

Firstly the B.R.M. In my script I referred to M.S. wheel clips, which when printed became "mild steel"! M.S. refers to Model Shop (Newcastle), the wheel clips comprising of a steel wire spiral wound to appropriate diameter moulded inside "knock off" pattern hubs. They are very suitable for cars, but were designed for aircraft undercarriages in various s.w.g. sizes. The advantage is, of course, that they can be removed as required for wheel changes and replaced, without the necessity of having to cut screw threads on hard piano wire.

In the script I also wrote that the B.R.M. had never exceeded 60 m.p.h. in competition. Well, since then it has done 60 m.p.h. on several occasions and at Bradford Open bettered "Busy's" best with a rip-snorting 65.21 m.p.h. She also again qualified for the Nationals with a speed in excess of 62 m.p.h. at Ossett, but as my new job was faster, I could only run the latter at Cleethorpes. Grade B evidently slipped to Grade III in print and, actually before being up-graded the car won the award at three Open meetings (in three attended).

Secondly (!) your article on the Grading Scheme is very well balanced, but unfortunately you have slipped up in regard to the down-grading "terms of reference". This is, of course, a direct result of the failure of the M.C.A. to produce the booklets.

Actually, a "no run", as its name implies, does *not* constitute a run and if anyone is Grade A (or any other grade excepting the lowermost of a class) at one meeting and never manages another run, that season he is *still* Grade A.

The ruling stipulates the *recording* of speeds at three consecutive meetings not within the grading of the particular car under consideration, in other words, *runs must* be returned.

Jerry Cann in "Dope & Castor" refers to the speed wallahs (well known) with nipped noses and hand pulled smartly in downward direction—I think most of the speed men realised they would be penalised since the second or third would obviously rarely get an award in a graded race. However, this was the sacrifice that was made in order to provide encouragement for the up-and-coming would-be speed men.

Finally, no one who attended Blackpool could pretend that the M.C.A. Grading Scheme was responsible for the hold-up. I have attended meetings all over the country during the last three years, and I shudder to think what would have happened if they had had a large number of entries.

Organisation is the keyword!

Yours, etc.,

KEN PROCTOR.

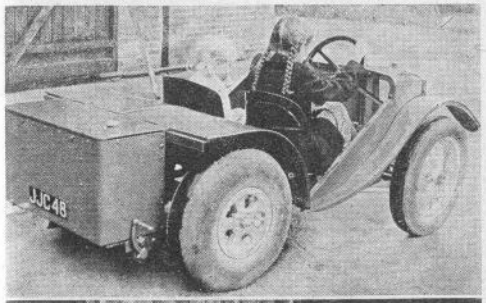
Sunderland.

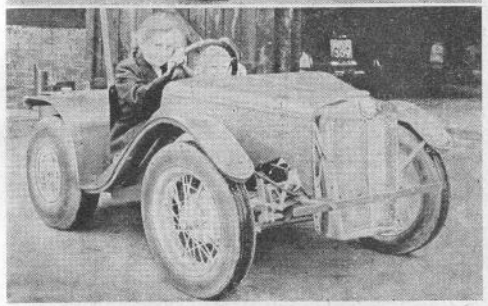
BIGGER & LITTLER (*Continued from page* 693)

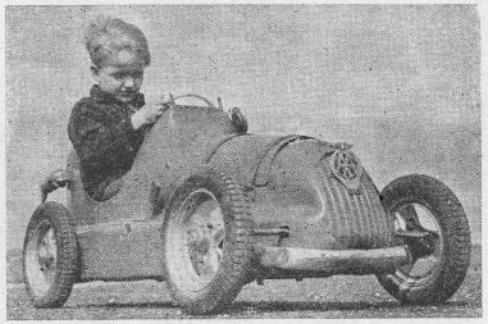
bicycle fitted with the same motor. If this should catch the builder's eye, I shall be pleased to have details of the conversion.

Item two in this story of the Kiddicars is something much more substantial, and once again I heard of its existence within a day or so of the Wasp episode. My spies informed me that within a mile or two of my home an intriguing children's car had been built from odds and ends, so I telephoned the gentleman in question and received a prompt invitation to come along and "have a go"! Mr. A. H. Cook, of Wavendon, Bucks, is an enthusiastic motorist himself, and believes in training his offspring in the way they should go at an early age. His house is ideally situated for this purpose, being a fine old converted farm house with an extensive garden and magnificent out-buildings, and here I found his "garden car" already warmed up and waiting. This vehicle has been built on extremely rugged lines, to withstand any amount of hard usage, which I'm told it certainly gets during school holidays! The chassis is made of heavy angle iron, tapering towards the front, and above this is bolted the transverse front spring from an Austin 7. The complete axle, road wheels, steering box, column and wheel are used, the drag link being reversed, as will be seen in the chassis photograph. The rear wheels are unsprung, but being ex-Hawker Hurricane, they take care of road shocks with something to spare, and have a quite beneficial rolling effect on the lawns!

The engine is an elderly 350 c.c. o.h.v. Enfield motor-cycle unit, housed behind the seat, and in order to obtain the necessary gear reduction, an additional countershaft is fitted above the gearbox, running in plummer blocks bolted to massive steel uprights, and the drive taken down again to the rear axle. Fan cooling is used, and the kick starter will be seen at the back on the offside. The colour scheme is pillar-box red and aluminium, and the final embellishment is a radiator shell from a burnt-out M.G. A throttle stop is fitted to the foot control to curb over-exuberance, but even so, after engaging top direct from low gear to save time, I found it possible to weave briskly round trees in the orchard and do circuits including lawn, drive and kitchen garden, in a most satisfying manner. The engine takes this calmly, despite an all-up weight which would distress Jack Moor more than somewhat.







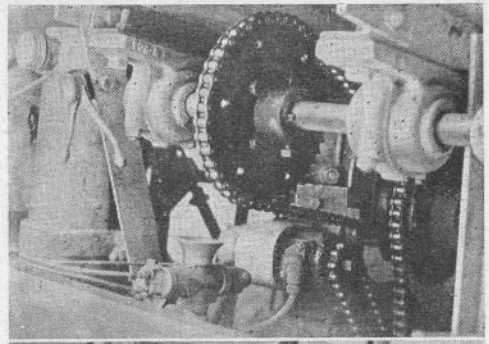
BIGGER & LITTLER

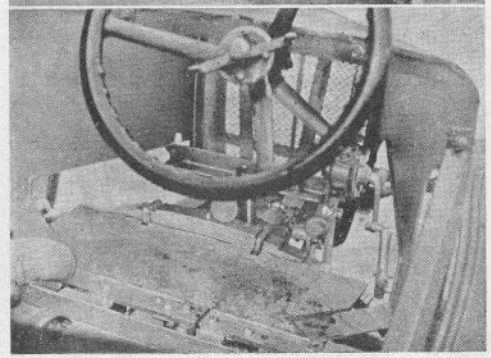
READERS PROVIDE MORE CHILD CARRYING CARS

HARDLY had the ink dried on my last month's article on Nicholas Moor's miniature racing car, the "Wasp Grub", when photographer Edwin Stoffel of Ilford sent along a couple of pictures, one of which appears above, showing one of those nice looking Austin Single Seaters which will be familiar to readers, for they are to be seen in most high-class toy shops and many motor showrooms.

They, in company with the charming little J40 touring cars, are made by a subsidiary branch of the Austin Motor Co. Ltd., in a factory on a South Wales Trading Estate, staffed by disabled ex-Servicemen, and are, I believe, constructed from scrap material from the Longbridge works. However this may be, they are highly desirable little vehicles, and I would have given my eyes for one when young! The real point of Edwin Stoffel's pictures lies in the fact that this particular example, the property of young Michael Passa, who is seen at the wheel, is powered with a Minimotor, one of those popular assisters of tired cyclists which normally drives by means of a knurled wheel in contact with the cycle's rear tyre. Now at the risk of making myself very unpopular with many readers, I have to admit that my information about this miniature racer is limited to the fact that it can reach a speed of 18 m.p.h., and I am unable to say how the transmission is arranged. The engine in standard form produces some 1¼ h.p. from something under 50 c.c., and the little Austin has about a similar performance to a

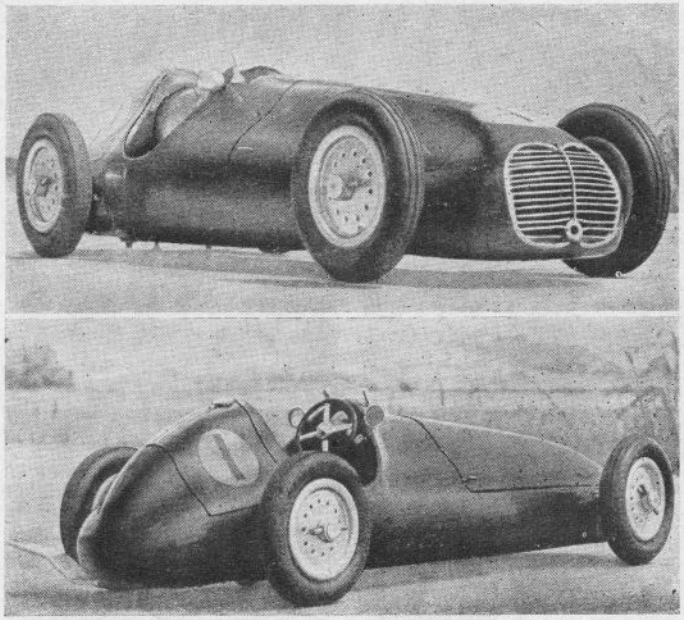
(*Continued on page* 692)



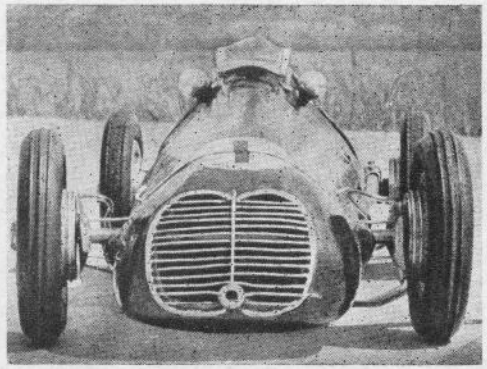


A Type 4CLT/48 MASERATI

AN ELEGANT "SAN REMO" MASERATI BUILT BY ONE OF OUR YOUNGER READERS FOR THE E.D. 3.46 C.C.



Not the easiest of racing cars to model, this 4CLT/48 Maserati built by a schoolboy of 16 has really caught the spirit of the original, and the finish and detail work is in keeping with the lines.



Using balsa and piano wire for bodywork and radiator grille, a very realistic result has been achieved. The characteristic Maserati windscreen will be noted, also the hydraulic brake lines.

IT has always been our policy in *Model Maker* to encourage the younger members of the model car fraternity to build and run their own cars; we have also striven to encourage the building of scale type models, which at least resemble a known prototype wherever possible, even though the internals must of necessity depart from full-sized practice.

It was with more than usual interest, therefore, that we received for inspection the "San Remo" Maserati about to be described, for it fulfils both the above conditions. Its constructor, Mr. L. Winsor, Pontypool, Monmouth, is not yet seventeen years of age, and is a pupil at West Monmouth Grammar School, and the model, which took eleven months of spare time to build, is not only extremely accurate as to its principal external dimensions, but succeeds to a most marked degree in "putting over" the spirit of this very individualistic Formula 1 favourite. Its choice as a subject was largely on account of its very distinctive appearance, and *Model Maker's* scale drawing was used for this first attempt, in conjunction with as many photographs as could be obtained. The car is built to the same size as the drawing, using $3\frac{1}{2}$ in. "1066" air cord tyres and wheels as a basis.

The builder tells us that workshop facilities were very limited from the start, and although his father is the owner of a small general engineering workshop and had allocated him a small space on his bench, all bodywork and marking out were done in a room at home. Moreover, such parts as could not be made had to be acquired by strict saving of pocket money, a trying process known to us all at one time or another!

The basis of the model is a flat baseplate of $\frac{1}{8}$ in. aluminium, stout enough to require no flanging, and the 3.46 c.c. Mark IV E.D. diesel engine is carefully positioned to come under the engine cover, and bolted down on to dural brackets which bring the drive into the correct line. A standard E.D. flywheel-clutch unit is fitted, and transmission is carried through a ball-and-pin universal to a "1066" rear axle, which was bought unmachined, and finished in the parental workshop. The axle centre line is considerably above the chassis plate, so the axle casing is bolted on to a cast aluminium mount which was originally a chassis cross member from an early "1066" chassis kit. Fuel is fed from a Juneero tank.

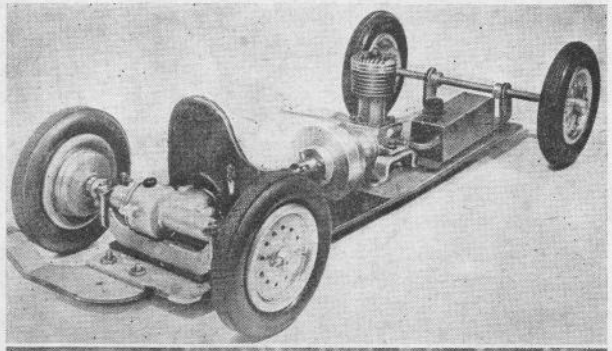
The front axle is of $\frac{1}{4}$ in. mild steel, rotating in a brass bracket bolted to the base and adjustable for steering. As stated previously, "1066" wheels are fitted, with their existing brake drums, and holes have been drilled round the discs and countersunk, which certainly gives an enhanced appearance. The front brake drums have additional dummy plates fixed to the body with a representation of the gauze fronted air scoops, and the hydraulic brake lines are represented by lengths of neoprene tubing.

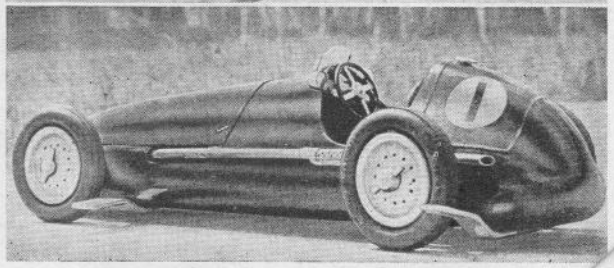
The bodywork is made entirely of balsa and is very well carried out. Thin formers are used at the scuttle arch and at the dashboard and back of the cockpit, also at each end of the engine cover. The nose and tail are of block balsa, which in the case of the nose has been carefully hollowed out for the radiator opening. The rest of the body is flanked, then sanded to shape, and considerable trouble has been taken to give the cockpit edges a realistic appearance. The engine cover is a very neat fit, and is held in place by authentic looking locking handles of piano wire, which really do work. The detachable body panelling over the rear fuel tank is represented by thin strip laid over the balsa, and the whole body fits neatly over the baseplate, being secured to it by one screw at the back, and by the front axle, which passes through it at the front, after which the dummy wishbones of the front suspension, together with the false back plates, are fitted. Thus the bodywork is not readily detachable, but since full access to both engine and fuel tank is obtained by removing the cover, this is of no account.

The instrument panel is well done and of correct shape, with the instruments inlaid in aluminium foil, and a Meccano steering wheel is just about the correct size for the job. The windscreen frame, of split tubing, is a particularly good example of the care taken to follow the original faithfully, and such details as filler cap, leather covered driving seat and rear view mirrors add to the model's good looks. To quote other examples of this attention to detail, the treads of the rear tyres are ground flat and diamond pattern treads have been cut, and the exhaust pipe is of correct diameter and has the familiar perforated shield at the cockpit opening. The individual exhaust pipes from the cylinder block are soldered on separately.

Whilst a model such as this cannot, by reason of its size and the completeness of its details, hope to compete with purely functional competition models in events based on all-out speed, there is nevertheless a very definite place for it in the many club competitions at present being staged, quite apart from the *Concours* pure and simple, and apart from competitive events, there is very real satisfaction to be gained from merely operating such a car of one's own construction.

So far as performance is concerned, 30 m.p.h. has been achieved "at approximately half engine revs.", but if it never goes any faster we will still congratulate L. Winsor on a first class effort, and we look forward to seeing the 158 Alfa Romeo with independent suspension which is to follow it.





The chassis is a flat plate, with all components substantially mounted. The rear axle casing was machined from 1066 castings and the engine is the E.D. Mk. IV. Below is seen the car from ground level on the exhaust side.

Latest Contest Results from the Model Car Clubs

REGIONAL TRIALS
National Championship Finalists

1.5 c.c.

	Burton	Sunderland	40.15

2.5 c.c.

1.	A. Snelling	Edmonton	83.33
2.	E. Armstrong	Sunderland	76.92
3.	Bennett	—	73.83
4.	Kayes	Medway	73.46
5.	Robinson	Medway	73.28
6.	K. Crow	Notts	73.17
7.	J. R. Parker	Meteor	70.03
8.	G. Laird	Edmonton	69.60
9.	B. Harris	Bristol	66.64
10.	H. Dean	Surrey	65.98
11.	M. Hodgson	Blackpool	64.74
12.	H. S. Howlett	Meteor	63.46
13.	K. Proctor	Sunderland	63.38
14.	D. Eaves	Blackpool	58.86

5 c.c.

1.	H. Dean	Surrey	96.98
2.	J. C. Cook	Sunderland	94.74
3.	Mrs. I. W. Moore	Derby	94.24
4.	J. Shelton	Surrey	92.68
5.	R. Harris	Edmonton	92.21
6.	E. Armstrong	Sunderland	87.37
7.	J. R. Parker	Meteor	87.29
8.	J. Hadlow	Edmonton	87.04
9.	J. Green	Sunderland	86.53
10.	E. Snelling	Edmonton	86.28
11.	N. Haslem	Bolton	83.33
12.	B. Hurn	Bath	80.32

10 c.c.

1.	I. W. Moore	Derby	125.69
2.	C. M. Catchpole	Surrey	120.32
3.	D. Garrod	—	119.20
4.	A. Snelling	Edmonton	116.12
5.	A. Gawley	—	111.94
6.	S. Honey	Surrey	111.80
7.	E. Redrupp	—	111.01
8.	G. Jepson	Guiseley	110.42
9.	F. G. Buck	Meteor	110.42
10.	J. C. Cook	Sunderland	109.75
11.	J. Riding	Blackpool	107.14
12.	B. Hurn	Bath	95.71

HARROGATE M.R.C. OPEN MEETING

1.5 c.c.

G. Burton	Sunderland	N.R.	

2.5 c.c

1. E. Armstrong	Sunderland	72.57	73.77	A	1st A
2. D. M. Eaves	Blackpool	N.R.	N.R.		
3. H. Hodson	—	53.89	60.00	B	1st B
4. P. Davison	Guiseley	N.R.	53.25	A	
5. R. J. Eaves	Blackpool	N.R.	N.R.		

10 c.c.

1. G. E. Jackson	Derby	102.30	107.14	B	Dooling
2. F. C. Petrie	Sunderland	98.91	N.R.	A	Dooling
3. J. R. Sutton (1)	Bolton	85.70	N.R.	C	McCoy
4. W. Jepson	Guiseley	104.60	105.90	B	Dooling
5. R. J. Eaves	Blackpool	N.R.	N.R.	D	Rowell
6. I. W. Moore(1)	Derby	113.50	N.R.	A	Dooling
7. W. Jepson	Guiseley	N.R.	N.R.	C	Rowell
8. J. C. Cook (1)	Sunderland	103.44	108.43	B	Dooling
9. H. Cook	Bolton	N.R.	N.R.	C	Dooling

5 c.c.

1. J. C. Cook (1)	Sunderland	93.75	92.75	A	Dooling
2. B. Walker (1)	Ossett	76.92	76.92	B	Eta
3. J. Atkinson	Sunderland	N.R.	N.R.		Dooling
4. D. M. Eaves	Blackpool	N.R.	N.R.	B	Eta
5. I. W. Moore	Derby	85.81	86.45	A	Fox
6. B. Winterburn	Guiseley	69.23	75.00	B	Eta
7. J. Atkinson	Sunderland	N.R.	N.R.	B	Dooling
8. J. C. Cook	Sunderland	72.57	70.31	B	Eta
9. J. L. Yates	Guiseley	N.R.	N.R.		Eta
10. J. Green	Sunderland	87.39	89.10	A	Eta
11. L. Biss	Derby	N.R.	N.R.	B	Eta
12. A. Gidlow (1)	Guiseley	58.82	62.06	C	Eta

SURREY M.R.C. OPEN MEETING Aug. 26th

1.5 c.c.

B. Griffen		Medway	54.97
		(Class Record)	

2.5 c.c.

1 Grade A	A. Snelling	Surrey	80.78
1 Grade B	C. Hart	Edmonton	68.33
1 Grade C	—		

Cleethorpes Open Day

(Left) Energy! Joe Shelton gallops the Borden Special away to win the 5 c.c. Grade A Class at 98.9 m.p.h. (Centre) Our correspondent, C. M. Catchpole obviously benefiting from the sea air, and (Right) Joe Shelton warms up his 10 c.c. job.

5 c.c.

1	Grade A	J. Dean	Surrey	98.68
1	Grade B	— Moorby	Grimsby	79.57
1	Grade C	C. Field	Pioneer	42.25

10 c.c.

1	Grade A	A. Snelling	Surrey	123.28
1	Grade B	— Hadlow	Edmonton	110.29
1	Grade C	J. Pickard	Edmonton	101.01

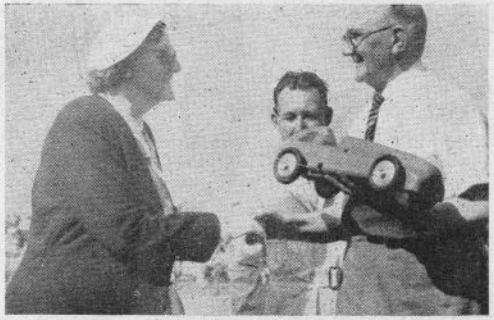
(61 Entries in all Classes)

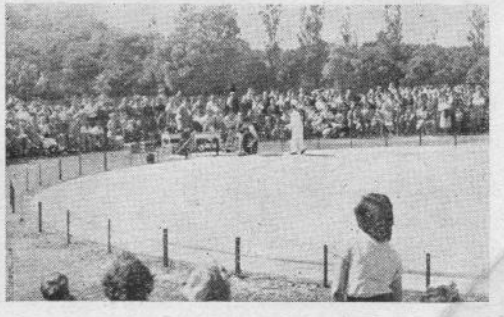
Open Event
CLEETHORPES MODELDROME, July 29th

Run to M.C.A. Grade Formula. Two Runs ¼ Mile Best to Count

No.	Name	1st Run	2nd Run	
2.5 c.c.				
1.	W. K. Crow	74.01	74.07	
2.	K. Proctor	61.05	58.44	
3.	R. Bunn	51.60	40.00	1st Grade B
4.	J. Dean	54.51	65.98	
5.	R. Page	43.90	N.R.	
6.	E. Armstrong	72.28	74.38	
7.	A. F. Snelling	76.66	74.07	1st Grade A
8.	C. W. Jacklin	50.13	49.88	
5 c.c.				
1.	G. Moorby	N.R.	67.92	
2.	J. S. Oliver	79.63	71.03	
3.	R. Page	51.78	N.R.	1st Grade C
4.	E. Armstrong	N.R.	88.32	
5.	Mrs. Ivy Moore	N.R.	N.R.	
6.	J. Shelton	98.90	N.R.	1st Grade A
7.	L. Biss	71.48	N.R.	
8.	E. Armstrong	70.42	69.07	
9.	C. A. Bunn	39.23	28.57	
10.	B. Walker	82.94	72.63	Tie 1st Grade B
11.	D. Broadbend	82.94	N.R.	Tie 1st Grade B
12.	R. Shillito	80.07	77.58	
13.	J. Cook	79.08	81.00	
14.	J. Dean	90.72	95.33	
15.	L. Fozard	71.14	75.63	
16.	C. M. Catchpole	88.66	91.74	
17.	I. W. Moore	82.94	88.66	
18.	B. Winterburn	63.33	N.R.	
19.	B. Winterburn	79.64	80.00	
20.	J. Cook	92.30	83.02	
10 c.c.				
1.	C. M. Catchpole	109.09	Scratched	
2.	K. Shaw	N.R.	94.33	
3.	J. Tarttelen	72.93	N.R.	
4.	F. C. Petrie	111.11	109.75	
5.	K. Proctor	104.52	N.R.	1st Grade C
6	G. E. Jackson	102.85	N.R.	1st Grade B
7.	I. W. Moore	121.62	113.92	
8.	J. Shelton	112.35	N.R.	
9.	G. E. Jackson	92.78	104.40	
10.	A. F. Snelling	122.44	120.80	1st Grade A
11.	W. Hamilton	N.R.	N.R.	
12.	J. Cook	N.R.	N.R.	

Very bright sunny day—very hot with nice breeze. Meeting started at 2 p.m., and ran quickly and smoothly due to excellent organisation. Spectators estimated to be between four and five thousand.

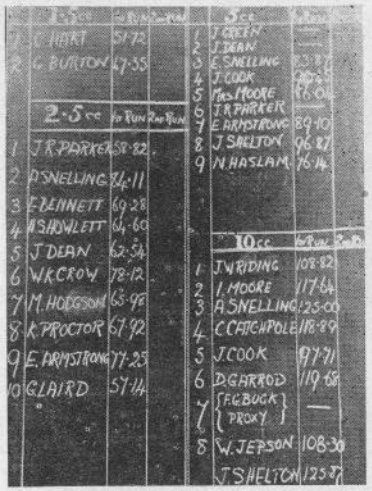




(Reading from above): Prize winner in the raffle, Mr. Thompson, received a model car from the Lady Mayoress; Two Guiseley members in the pit, with a Dowson Lightweight; Feminine members of the "Model Maker" reporting team, Mrs. Catchpole and Mrs. Snelling (standing), with a friend; and a general view of the fine Cleethorpes track.

MODEL CAR ASSOCIATION NATIONAL SPEED FINALS 1951

PICTURES AND REPORT BY "THE CATCHPOLE TEAM"



(Left) How they finished at Cleethorpes. (Below) Long-distance competitor. Surrey member A. W. Bennett and his wife, who drove from Eastbourne to take part.

WEATHER remained fine and sunny throughout the whole day in spite of a depressing weather report which threatened many heavy rain showers and other terrible things. The Grimsby Society of Model Engineers did a really fine job of organisation, the pits being securely guarded to keep the great crowd of spectators out.

The track was really well cleaned off and was in excellent condition. A prompt start at 2 p.m., the competitors were notified well in advance and were ready and waiting when their turn came. E. P. Zere was Scrutineer and Starting Marshall, and did an excellent job, keeping strictly to three minutes on the line and having the line ready for each car.

C. Hart won the 1.5 c.c. class although this class was very poorly supported. Alec Snelling put in a cracking run at 84.11 m.p.h. to set up a new British and Open 2.5 c.c. ¼-mile record. W. K. Crow of Nottingham, running a Streamline Oliver engined special, put up a very good show with 78.12 and 77.85. E. Armstrong of Sunderland, running a new Mark III, series two, E.D. 2.46 c.c. engined car, made a very good show at 77.25 and 76.72.

In the 5 c.c. event, J. Dean, who had been putting in runs during the practising period at 98 m.p.h.-plus, had very bad luck and burned out a glow-plug; on the second run he was unable to get away, the cause later being traced to "fluff in the jet", Joe Shelton being the victor, running a streamline Borden Special powered by a 5 c.c. Dooling "29" engine, J. Parker of Meteor Club being runner-up at 93.45 m.p.h. J. Cook of Sunderland confided that in his hurry to get away and reach Grimsby he loaded his car and drove off. Not wishing to practice he left his box unopened until just before racing was due to commence, then thinking it was time to prepare for his run he opened the garage and to his complete surprise and chagrin found he had brought the wrong car! Hard luck Jack, because we understand that best one is quite a lot faster than the other.

The 10 c.c. event opened with a really cracking run by J. Riding of Blackpool, with a Rowell engined Special. Mr. Riding has certainly discovered the secret of tuning a Rowell—108.82 m.p.h., then a second run at 111.11 m.p.h. Jolly good show for an all-British commercial engine. The big engines did not seem to like the rather high humidity of between 75 per cent and 80 per cent. Benzine percentage was rather lower than has been used. Alec Snelling put in a nice run at 125 m.p.h., which was quite enough to take 1st place.

Thus ended the Model Car Association Speed Championship for 1951, and it is safe to say that everyone thoroughly enjoyed this culminating event of the season, including a gathering of approximately three thousand spectators, who saw some really first-class racing. The area eliminating trials had done their job efficiently to provide a fair and representative entry of the fastest models from all over the country, and it was felt that the choice of Cleethorpes as a venue for the Finals was fully justified by the excellence of the track, spectator arrangements and the added attraction of a seaside situation. The members of the Grimsby Society are to be congratulated on the hard work they put in to ensure the smooth running of the event.

(*For full results see page* 700.)

(Left) Fatal minutes pass as E. P. Zere, inexorable track-marshal, watches a competitor battle against the time-limit. (Right) W. K. Crow of Nottingham, runner-up in the 2.5 c.c. class with his Oliver car.

(Right-hand column, from above) Cleethorpes track and timing hut; an area winner receives his medal from Mrs. Bellamy; Alec Snelling receiving the 10 c.c. Trophy from the Lady Mayoress. (Right) Bill Moore looks thoughtful, John Oliver listens for the right engine note, and Jack Cook erects a barrier against ace-cameraman Catchpole to preserve tuning secrets!

(Above left) A gathering of 2.5 c.c. experts discuss points whilst examining a new Oliver Mark 2 engine. Alec Snelling, clutching motor, lays down the law to John Oliver. (Right) A general scene in the pits during the Finals.

RESULTS

1.5 c.c.

Name	Club	1st Run	2nd Run
C. Hart	Edmonton	46.39	48.54
C. Burton	Sunderland	47.35	42.45

1.5 c.c. Class won by C. Hart of Edmonton.

2.5 c.c.

J. Parker	Meteor	58.82	63.92
A. Snelling	Edmonton	84.11	82.19
A. W. Bennett	Surrey	69.28	69.01
H. Howlett	Meteor	64.60	N.R.
J. Dean	Surrey	62.54	Scratched
W. K. Crow	Nottingham	78.12	77.85
N. Hobson	Blackpool	65.98	59.76
K. Proctor	Sunderland	67.92	70.03
E. Armstrong	Sunderland	77.25	76.72
G. Laird	Edmonton	57.14	57.98

2.5 c.c. Class won by A. Snelling of Edmonton.

5 c.c.

Name	Club	1st Run	2nd Run
J. Green	Sunderland	N.R.	86.12
J. Dean	Surrey	N.R.	N.R.
E. Snelling	Edmonton	83.87	82.72
J. Cook	Sunderland	90.45	90.36
Mrs. I. Moore	Derby	86.04	N.R.
E. Armstrong	Sunderland	89.10	90.00
J. Parker	Meteor	N.R.	93.45
J. Shelton	Surrey	96.87	N.R.
N. Haslem	Bolton	76.14	80.28

5 c.c. Class won by J. Shelton of Surrey.

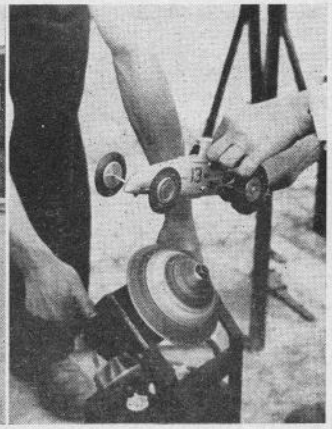
10 c.c.

J. W. Riding	Blackpool	108.82	111.11
I. W. Moore	Derby	117.64	N.R.
A. F. Snelling	Edmonton	125.00	122.11
C. Catchpole	Surrey	118.89	118.89
J. Cook	Sunderland	97.71	98.57
D. Garrod	Edmonton	119.68	118.73
W. Jepson	Guiseley	108.83	109.09
G. Buck	Meteor	N.R.	N.R.

Proxy—run by H. Howlett.

10 c.c. Class won by A. Snelling of Edmonton.

(Below l. to r.) J. Dean has a final look-see before Joe Shelton pushes off, Joe receiving the 5 c.c. award from the Lady Mayoress, and a close-up picture of the Parker Special being warmed-up on the new conical starter.



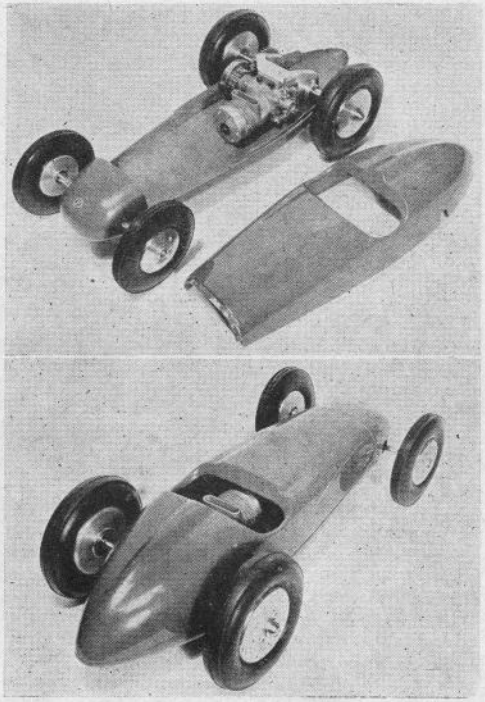
TRADE AFFAIRS

BY SIMPLE SIMON

ABOUT this time of year, by which I mean the time I'm writing this and not the time you are reading it, most model makers gravitate to the Horticultural Hall, either personally or in the pages of journals and catalogues, for the annual M.E. Exhibition, to inspect not only the handiwork of their fellows but to sample what the manufacturers have to offer them in the coming year. Looking round the Trade stands for things of interest to model motorists, I began to wish rather wistfully that I was a model railway fan, or a yachtsman, or a builder of model ships! In these branches of craftsmanship the manufacturers really *are* doing their customers proud, and if prices are high, the range and quality of model goods in these sections is better than in pre-war times. Alas, I can't say the same for the model car folk. With one or two notable exceptions, I think we can justifiably complain that we are a sadly neglected fraternity so far as the trade is concerned.

Now I am well aware that there are two sides to this question, and I can sympathise with my trade friends who defend themselves by saying that the model car hobby is an uncertain market, that as the youngest pastime it does not justify the laying out of capital for special tools and fixtures for quantity production of bits and pieces. I would reply by saying that there is such a thing as creating a demand, by offering attraction wares such as tempt the wavering model maker to start a miniature railway layout or to build a steam driven cargo ship. So here, for what they are worth, are a few suggestions.

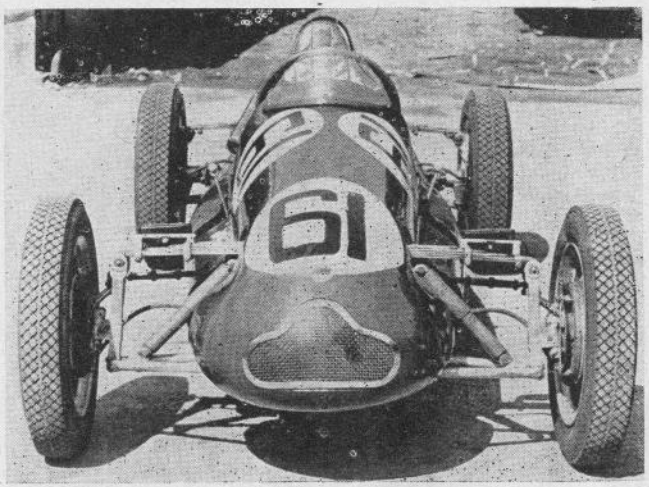
On my table as I write, staring at me with mute reproach from my "In" tray, are no less than seven letters asking me where the writers can buy scale tyres for models they have in hand. Two are from the Dominions and one is from America. Never a week goes by without one or two of these letters. "Ah", says my Trade friend, looking over my shoulder, "And for those seven enquiries, I should have to provide five different tyre sizes! I ask you!" Yes, Mr. Trader, but *would* you? If you provided a range of three different sizes ranging from say, 2 in. to 4 in. in diameter, with scale treads and of average modern section, I'll warrant that model makers would quickly adapt their chosen scales to fit your products, and I should be able to turn more cheerfully to my "In" tray! And how about a range of modern wheels to match them, of the dished perforated disc type, or sets of replicas of the alloy racing wheels as fitted to the Cooper and other half-litre cars? Or sets of knock-off hub caps in two or three sizes, ready to drill and tap to customers' requirements? How long are we to paint our instrument dials laboriously with mapping pens, fit ridiculously undersized steering wheels, and spoil otherwise nice looking models for lack of transfers of the correct size and colour? Small matters, I agree, but these are demands that might well be filled.



The Z.N. high-speed 5 c.c. model racer, which is available either complete or as a kit; 2.5 c.c. versions are in course of preparation.

In the engine department things are much brighter and, at anyrate in the smaller capacities, the racing man is very well catered for, although here again I suspect that we have the speed control-line flying folk to thank for many of our blessings. Not everyone is a racing man, however, and here again I have a plea to make. We don't *all* want fierce one-speed 15,000 r.p.m. motors thriving on nitrated fuels. Where can one buy a quiet easy-to-start slow-running small capacity engine, such, for instance, as would fit without offence into Major Stubbs' beautiful Gordon Bennett Mercedes? The kind of engine that powers a model diesel tug, for instance, but smaller, and at least a twin? Efficiency would be a secondary consideration, provided that the other characteristics were present. No market for such an engine? Don't you believe it! The lack of it is the greatest stumbling block to the building of more and better scale model cars. I for one would willingly put up with

(*Continued on page* 704)



PHOTOTYPE PARADE
No. 1

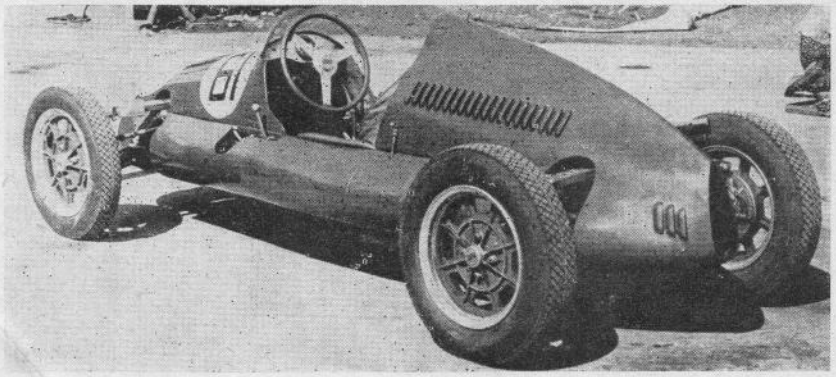
COOPER 500
MARK V

BY G. H. DEASON

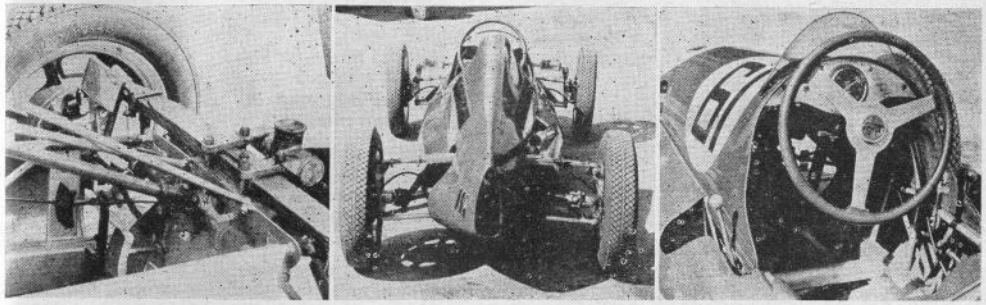
BACK in 1947 two extremely successful Jap engined cars of similar design, with slight outward differences began to challenge the supremacy of the established 500 c.c. "home-constructors", and Colin Strang, "Wingco" Aikens and Clive Lones had to contend at meeting after meeting with these two little silver Coopers, brilliantly driven by Eric Brandon and by designer John Cooper himself.

By the end of the season the name of Cooper was synonymous with 500 c.c. racing, and Coopers' Garage at Surbiton were beginning to produce modified cars for private owners. Many people were doubtful of the staying power of these air-cooled rear-engined jobs in races of any length, but when the R.A.C. staged a 50 mile curtain raiser to the first post-war Grand Prix at Silverstone, all doubts were dispelled, and the Cooper *marque* covered itself with glory by filling five of the first six places. Spike Rhiando's winning Cooper averaged 60.68 m.p.h. over the original Grand Prix circuit, against Villoresi's 72.28 m.p.h. in the G.P. itself. From then onwards it was Coopers all the way. "500" racing had come to stay.

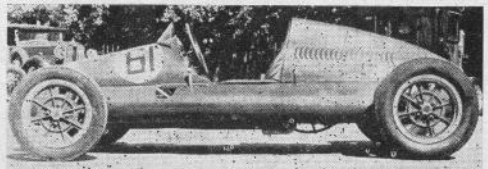
Like most classic racing cars the Cooper has changed but little throughout its career, being basically right from the word "go". The keynote of the design is simplicity, which goes hand in hand with reliability as a rule, and scientific weight paring without loss of strength. The chassis has box-sectioned side members tapering fore and aft, with tubular cross bracings, and both front and rear wheels are independently sprung by means of transverse leaf springs with "wishbones". Like a number of other "500's", the inspiration for this layout came from the Fiat 500 touring car, and Fiat components were used in the early cars, together with plain Fiat disc wheels. This arrangement is retained in the modern Coopers, but the wishbones are specially fabricated, and double-acting Newton Bennett telescopic struts control the action of the springs. The steel disc wheels soon gave way to something with less unsprung weight, and the latest versions have good looking wheels of magnesium alloy, with webbed spokes and integral 8 in. dia. brake drums. The brakes are hydraulic, with twin master cylinders. The tyres used as standard as 400/425 x 15 on the front and 500 x 15 on the rear wheels. Track is 3 ft. 11 in. fore and aft, and the wheelbase 7 ft. 2 in.

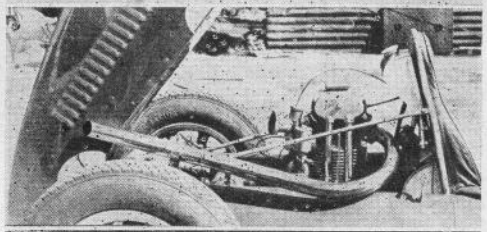


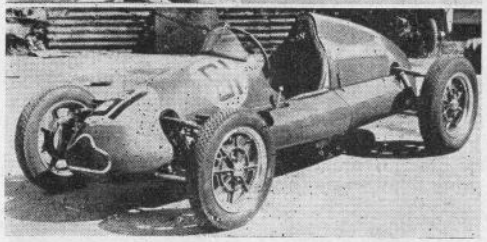
Two pleasing views of the little Cooper in its latest form. The car is so well proportioned that its diminutive size is not apparent.



Close-up detail shots which are almost self-explanatory and should considerably assist model makers. Above is the mounting of the transverse front suspension, with brake fluid reservoir ahead of the spring.





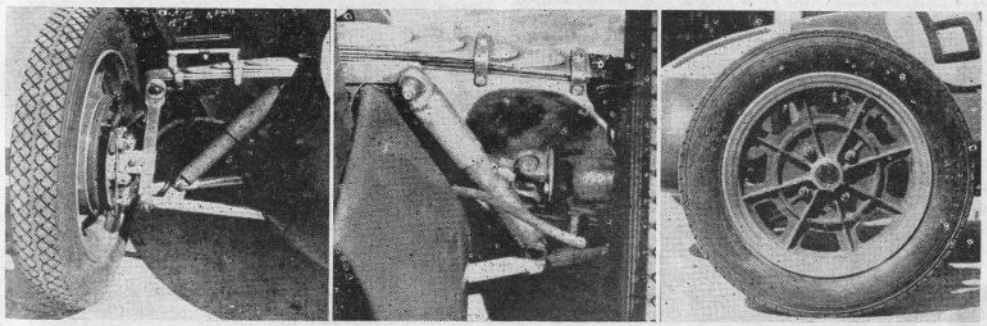


The latest car is intended to take various alternative engines, including the 1,000 c.c. twin, but Jap or Norton units are normally fitted to the half-litre version. The engine is, of course, housed immediately behind the seat-squab, and drive is by chains through a 4-speed Burman motor-cycle-type gearbox to the "solid" rear axle, which consists of the central sprocket and its shaft, and two short shafts with universal joints at either end taking the drive outboard to the wheels.

Gear control to the "positive stop" box is by a right-hand lever operating through a straight rod. On the latest version the gear lever protrudes through the side fairing with a handbrake on the left.

Cooling on the earlier cars was by means of a duct leading from the front grille, along the nearside of the body to the cylinder, and in 1949 large and unsightly side scoops behind the driving compartment were used for long distance racing, but the latest version relies on a scoop beneath the underpan, and

(Below) Left to right are details of the front suspension showing also the rear mirror mounting and brake backplate, rear suspension and outer universal joint on the half-shaft, and the magnesium-alloy wheel.



the oil tank behind the seat-squab forms a deflector to direct the incoming air-flow engine-wards. The front grille is now a dummy, for appearance only.

The earlier Cooper bodies were built on a flat steel strip frame welded to the chassis. On the 1951 model, however, a tubular sub-frame is used, with tubular former hoops, enabling the top half of the bodywork to hinge upwards in two parts, nose and tail, giving great accessability to all the engine and chassis components, whilst the lower one-piece side and under-fairing remains *in situ* and helps to stiffen the frame. The fuel tanks are now carried in the side fairings and not above the engine as in earlier models. The body gives the appearance of being slimmer, probably due to the knife-edge tail and smaller tail orifice, but the cockpit is extremely comfortable. The squab comes high up the back, and the cushion gives additional support under the knees. A pleasant 15 in. dia. three-spoked steering wheel has a thin leather bound rim to match the upholstery, and the driver is unlikely to be confused by his instrument panel, which carries merely a 3 in. dia. rev. counter reading to 8,000 r.p.m., and an ignition switch. A small curved "Perspex" screen tops the scuttle, and twin rear-view mirrors are carried outboard on the transverse spring ends.

A visit to any Half-Litre club meeting will show that Coopers come in all the colours of the rainbow, but the car I have illustrated is finished in a pleasing mid-green with light green upholstery, and an abundance of polished steel and alloy.

I am indebted to its owner-driver, O. Issard-Davies, for permission to photograph the car in detail, and to Alan Moore, at whose Edlesborough tuning establishment the car is maintained, for his unfailing good humour in pushing it about each time I wanted a new angle! I think that model car builders will agree that here is an ideal subject for either a powered model or a scale replica.

TRADE AFFAIRS

(*Continued from page* 701)

a cumbersome non-scale carburettor and even automatic inlet valves to obtain such a unit.

All this, of course, is to touch only the fringe of the subject and is crying for the moon into the bargain, but if some of the seeds fall in fertile ground I shall be more than gratified! So having had my little grouse, let us turn to what we have and be thankful! Chief amongst model car specialists, at the M.E. Exhibition and indeed the *only* specialist firm, was Z.N. Motors Ltd., and here the racing man could find some really high class wares to delight his heart. The excellent range of Z.N. racing wheels have been the speed-man's standby for a number of seasons now, and I particularly like the well matched set for 2.5 c.c. models, practical and finely proportioned and finished, which show just that necessary touch of imagination by being available in two sizes, 2.75 in. and 2.5 in., giving the correct proportions for back and front axles. Knife-edged front wheels could also be had to suit the various sizes, and the fittings in all cases are real engineering jobs.

The range of transmission units, both bevel and spur geared, and the spur drive engine mountings were all of a type and quality calculated to appeal to the serious racing builder, as are the smaller accessories such as ignition coils, oil-proof snap-on h.t. leads, and small spares for the popular American engines. The most interesting innovations in "Z.N.'s" display, however, were the new kit cars, in both 5 c.c. and 2.5 c.c. form. These new cars are based on a design which has proved a highly successful competition winner during the last two seasons' racing, and are likely to appeal strongly to those who want a finished or part-finished contest model without the necessity of either building it or "buying foreign". Both models have a similar body on somewhat "B.R.M.-ish" lines, and the price is £22/10/6 for the complete 5 c.c. model.

Another activity of Z.N. Motors which deserves our thanks is the persuasion of a well-known British firm of sparking plug manufacturers to produce a miniature plug capable of giving its best in modern "hot" engines, and these are now available in limited quantity at 7/4d. each including tax.

Turning to the more light-hearted side of the hobby, Victory Industries (Surrey), Ltd., exhibited two very charming scale replicas of the Morris Minor saloon and the Vauxhall Velox, both "official" models, produced, presumably with the blessings of the works concerned. Certainly they were both most lifelike reproductions, powered by the already well-known Mighty Midget motors with their built-in gear reduction, these little units being also exhibited separately. The model Morris Minor is already available, and the Vauxhall is in course of production.

For those with a taste for jet propulsion, Wilmot, Mansour & Co. Ltd., had a number of small car models on view, suitable for use with their Jetex engines, and only the queue of excited juniors deterred me from trying my hand at the model car driving competition on J. Lyons & Co.'s stand!

Finally, Electronic Developments (Surrey) Ltd., probably our best known manufacturers of miniature c.i. engines for aircraft, marine and car use, were well worth a visit, although the model car components other than engines and flywheel clutches were limited to E.D. Speedicord tyres.

The engines themselves, however, were all of a type suitable for our use, and I can see a great future in our ranks for the 2.5 c.c. E.D. Racer, which is already causing enthusiastic comment in model car circles, and for the willing little 1 c.c. "Bee" which is such a popular choice both with beginners and the rail track fraternity.

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