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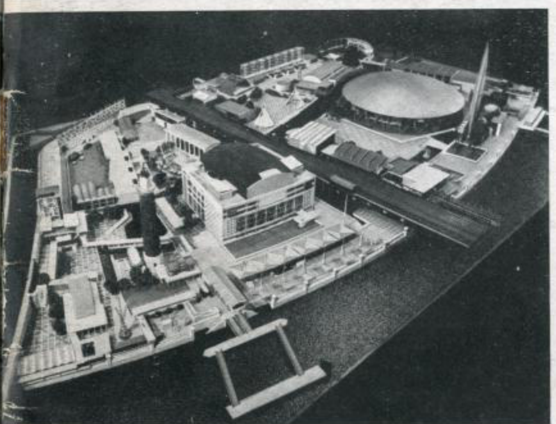

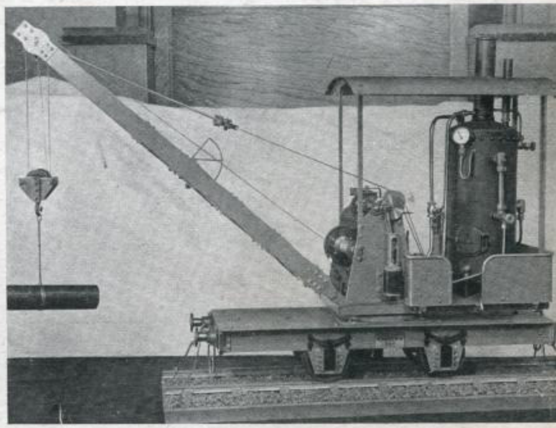

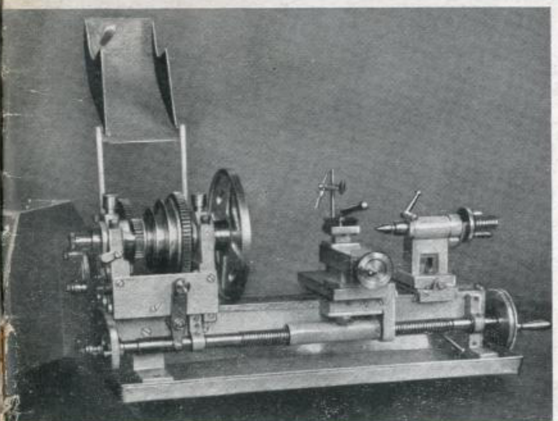

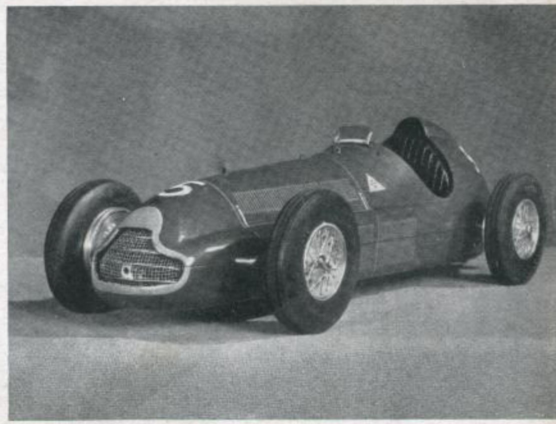

VOLUME 1 NUMBER 8 (New Series) JULY 1951

2/-

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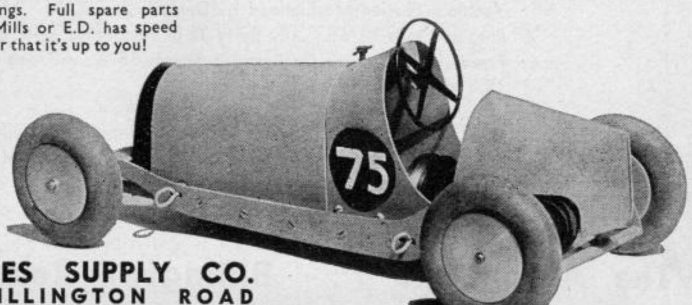

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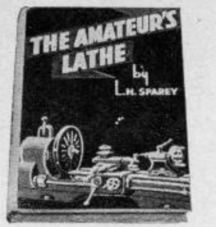

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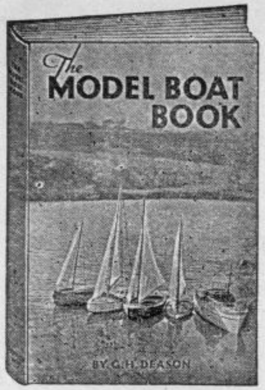

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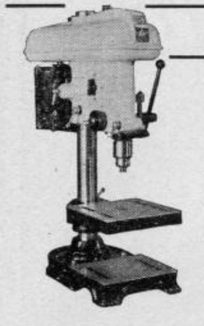

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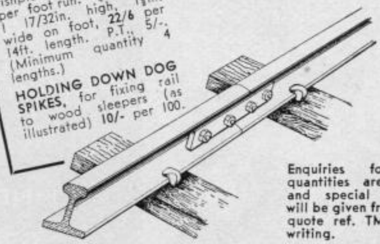

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VOLUME I No. 8 (New Series) JULY 1951

HOLIDAY TASKS

AT this time of year most of us are either frantically thumbing Holiday Guides in a last-minute effort to arrange a seaside stay, or sitting back in contemplation of enjoying pleasant bookings arranged with careful providence many months ago. Some diehard enthusiasts there may be who will pack off the rest of the family to hotel or boarding house whilst they remain to feed the cat, water the garden, and catch up with some of those neglected model making tasks such freedom from domestic supervision will at last make easy. Other unfortunates may already have been forced to take holidays at what are traditionally more wintry times of year, or may perhaps have gaily disposed of their holiday funds in securing a coveted piece of workshop equipment.

But by far the greater number will be journeying from home, leaving tools, workshop and unfinished projects behind them for a week or two. But let them not entirely neglect their hobby interests during this time of enforced idleness. In this Festival Year there is an unequalled choice of exhibitions to be seen in the remotest parts of the country, and in most of these will be found items of model interest.

Even the stay-at-home holidaymaker travelling but a mile or two from his doorstep may encounter new aspects of model making. Only a week or two ago we met such a case in a little country inn, where we found a typical farm labourer displaying a marvel of "Perspex" carving in the shape of a matchbox size tractor, accurately detailed and with fully moving parts, which he proceeded to demonstrate with the aid of a huge claspknife as screwdriver, handled with surprising dexterity. While justly proud of his efforts, he seemed quite unaware that he had achieved anything really out of the ordinary.

There must be endless cases of these lone hand model makers who would be glad to make the acquaintance of some like-minded enthusiasts. We suggest, therefore, that every reader takes upon himself the holiday task of searching out and chatting with some new modelling friend. It may be the charabanc driver who takes you to the coast, the pier attendant on the front, the holiday newsagent, or even the man next door that you have hardly spoken to in twenty years. You may find new interests for your own talents in the intriguing holiday game of "hunt the model maker".

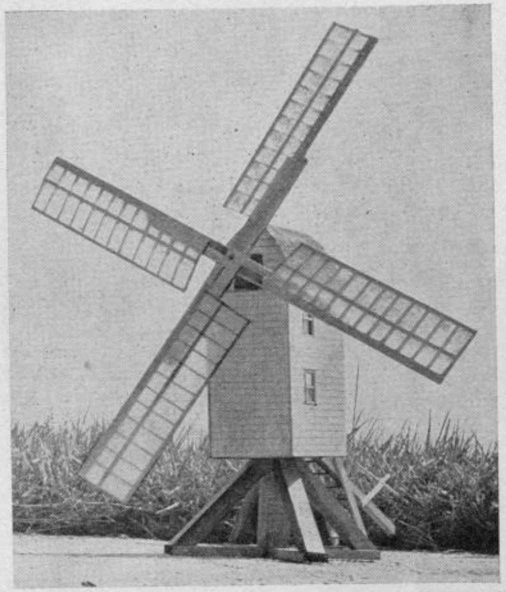
ON THE COVER . . .

Top right : D. R. Barber's "May" sailing in M Championships at Dovercourt. Centre left : A scale model of The Festival of Britain by Modelmakers (Brighton) Ltd., now on tour. Centre right : J. W. Mercer's half-inch scale coal-fired steam crane from the Northern Models Exhibition. Bottom left : Home-made lathe by J. A. Murrell, appearing in this issue. Bottom right : H. Howlett's Alfa-Romeo development of the Oliver "Busy".

'different' MODEL OF THE MONTH

Windmills—An Open Trestle Post Mill

RON WARRING CONTINUES HIS SERIES OF SCALE MODEL WINDMILLS



FOR our first model we have chosen one of the earlier types of post mills, with open trestle and tailpole and common sails. In the three following models we shall be describing other forms of sails and this first model can, if desired, be "modernised" by converting to spring or patent sails.

Rather than produce models of particular mills we have chosen *typical* mill layouts of each type, and all will be proportioned to a similar scale—1/36th full-size. Besides producing a model of handy size, both for construction and appearance, the proportions are also acceptable for gauge 0 model railway layouts. Construction and detail have been simplified as far as possible, and no interior detail incorporated. We do, in fact, suggest that the interior space be used to accommodate a small electric motor driving the windshaft and thus rotating the sails.

The more ambitious modeller may prefer to complete a scale interior with appropriate gearing driving the millstones, the general layout of such gearing being described in the first article of the series. Probably the most outstanding model mill ever produced —now in the Science Museum, London—does, in fact, include such detail. However, once started along these lines we must point out that there is almost no end. The particular model mill in question took fifteen years to complete!

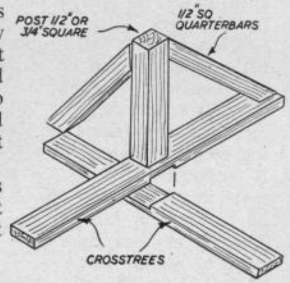
Now for the construction of our model. The plan is reproduced one-quarter full-size and full-size working drawings are available, if preferred. There are three basic components, the trestle, the mill body and the sail assembly. Each of these should be tackled in turn and we would suggest starting with the trestle.

The trestle consists of two crosstrees of ¾ in. x ¼ in. hardwood, each 6½ in. long, morticed together at right angles. At the centre is glued the post of ½ in. square hardwood, 3¼ in. long. It would actually be an advantage, and in keeping with scale, to use a thicker post than that shown — ¾ in. square would not be excessive. The post can be glued directly on to the crosstrees, although in actual mill practice it would be socketed in place. The assembly is then braced by four quarter bars (Fig. 1). The quarter-bars are cut from ½ in. square stock.

Woodwork of all these members should be quite rough, for true scale appearance. They would, over the course of years, assume a weathered appearance which can be reproduced by bruising and denting the edges of the members. The whole assembly should then be stained. Oak was a common wood for the post, and the attendant members.

The body is constructed next. This rests or balances on the post. In full scale practice a heavy member called the crown tree was socketed to fit over the post. In the model we have used a floor of generous thickness into which a shallow socket can be cut to fit the top of the post and allow the mill body to rotate. This is backed up with a collar cut from ¼ in. balsa.

The body ends and floor are cut from ¼ in. sheet



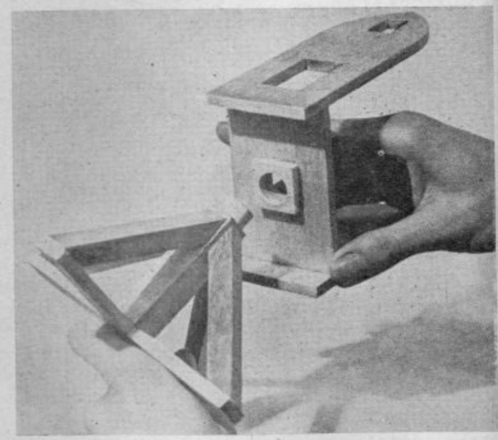
On the left : Two views of the completed Post Mill, which, while typical rather than an exact copy, closely resembles Brill Mill in Bucks.

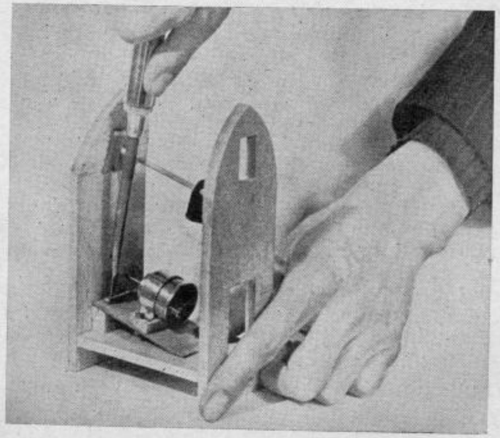
Above : A five-sailed mill from Spalding, Lincs. (Photo "The Field")

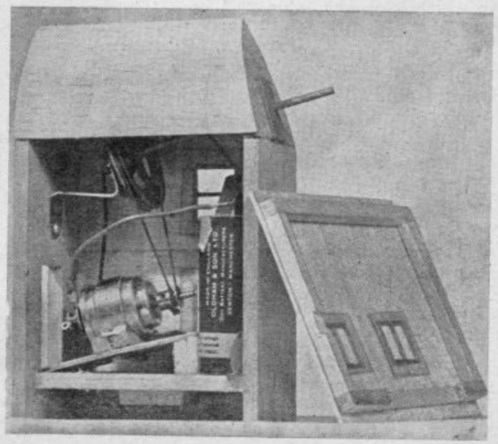
Below : Constructional pictures : fitting the trestle-post, installing the "works", the Minelec motor and belt complete.

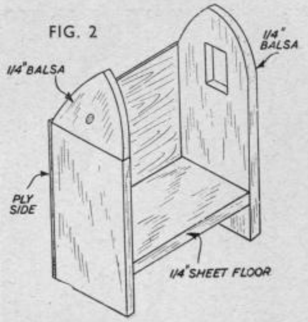
1/36th scale drawings to suit 0 Gauge Model Railway layouts are available of this Post Mill, price 2/6d. post free.

For the benefit of 00 Gauge enthusiasts who would also like a lineside mill, half size—or 1/72nd scale—drawings are also available, price 1/6d.









balsa. The two sides are of $\frac{1}{16}$ in. ply, and the roof is planked in with strips of $\frac{3}{16}$ in. x $\frac{1}{16}$ in. or $\frac{1}{4}$ in. x $\frac{1}{16}$ in. balsa, as shown, and then covered with paper. The body should be constructed as in Fig. 2, leaving one side to be added later. This will enable the interior fittings to be added and the mill balanced. It is a good plan, in fact, to hinge this side when finally fitted to permit access to the interior at any time.

The sides and ends are scored with a sharp point to represent planking and then glued and cemented together. Note that the front "end" is in two pieces, the top piece being chamfered off at 12 degrees before cementing in place.

Five windows are required. Cut out the window panels from the sides and back and make up the glazed window frames separately and glue in place from the inside. A very easy way of making these windows is to build up the frame from $\frac{1}{16}$ in. square material cemented on to a piece of celluloid 1 in. x $1\frac{1}{2}$ in. These are then cemented in place to the inside walls. The tailpost of $\frac{1}{4}$ in. square hardwood passes through a slot in the back and into the floor, cementing securely. Check that the angle is correct. With the body resting on the trestle the lower end of the tailpost should just clear the ground. A thread bracing line is taken from about half-way down the tailpost up to the back wall. At this stage leave the body and set about the sails.

Each pair of sails is mounted on a common stock, to which is glued a whip of $\frac{1}{4}$ in. x $\frac{1}{8}$ in. hardwood. This, in fact, forms the leading board of each sail. To simulate bolted assembly, use pins, as shown. The two pairs of sails should each be made as a separate integral unit. They are later joined, the rear sail (pair) being drilled and cemented to the front of the $\frac{1}{8}$ in. dia. dowel windshaft, and the front sail (pair) glued to this assembly at right angles.

The framework for each sail must be built up separately. Material for this is $\frac{1}{8}$ in. x $\frac{1}{16}$ in. spruce or birch, with a strip of $\frac{1}{8}$ in. $\frac{1}{32}$ in. material added later. The sails may be built with "weather" — that is, a twist from centre to tip so that the tip angle is less than the centre angle, or without "weather".

The easiest way to build the sail frames is shown in Fig. 3. The leading board (stock and whip assembly) is supported off the plan, as shown, and the trailing edge member pinned flat over the plan. The $\frac{1}{8}$ in. x $\frac{1}{16}$ in. ribs are then cut to length, tapered and glued in place. The leading board is notched to take these ribs and give a stronger assembly.

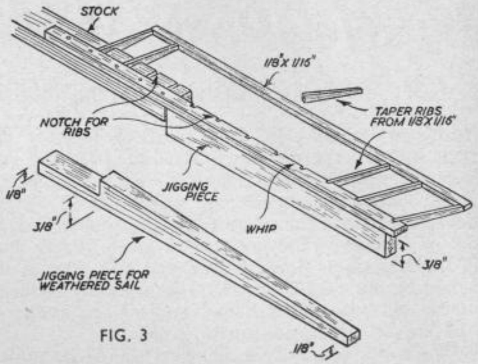


FIG. 3

For sails without weather the jig piece is simply a strip $\frac{3}{8}$ in. high. This gives a sail angle of some 20 deg. — common practice for this type of sail. For "weathered" construction the jig piece tapers from $\frac{3}{8}$ in. at the centre to $\frac{1}{8}$ in. at the tip, representing a change in angle of from 20 deg. at the centre to 5 deg. at the tip. Either way the construction is greatly simplified by the jig piece. The $\frac{1}{8}$ in. x $\frac{1}{32}$ in. strip should be added before removing the frame from the jig.

When all four sail frames are completed the two main members can be mounted on the windshaft, as previously described. The windshaft passes through a hole drilled in the front (sloping) face and the rear is supported by a metal bracket secured to the rear face. The front bearing surface should be backed with a piece of $\frac{1}{16}$ in. ply each side (Fig. 4). Check carefully that the windshaft is inclined at 12 deg. to the horizontal so that the sails rotate parallel to the sloping face of the body.

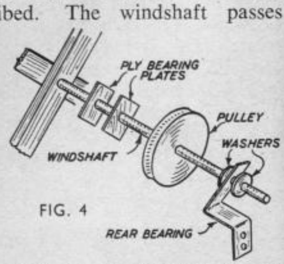


FIG. 4

Before making this assembly permanent a spacer must be fitted between the sail hub and the sloping face so that the sails will clear the body when rotating. A $1\frac{1}{2}$ in. dia. wooden pulley should also be slipped over the windshaft to take a belt drive, if the sails are to be motor driven. Do not glue this pulley in place yet. Then locate the windshaft assembly fore and aft by glueing washers to the windshaft on either side of the rear bearing bracket.

The electric motor should now be mounted in place. Build up a simple ramp sloping at 12 deg. to the floor to align motor and windshaft. Since we shall use the motor position to balance the mill, the ladder assembly should next be added.

The ladder is constructed from two pieces of $\frac{3}{8}$ in. x $\frac{1}{16}$ in. material, 5 in. long. Nine strips of similar section material are fitted. File slots on the inside of each side member, at the appropriate angle, and glue the steps in place (Fig. 5). Each step is exactly 1 in. long slotted into the sides about $\frac{1}{32}$ in.

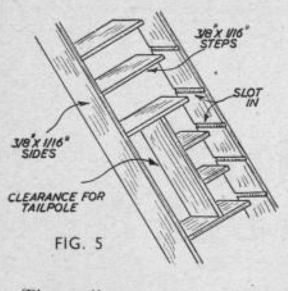


FIG. 5

The tailpost passes through the ladder, close against one side. Steps Nos. 4 and 5 (from the top) have to be cut away to clear, and a small false side added, as shown in the figure. The top of the ladder is pivoted to the sill, cemented to the back of the body, immediately underneath the doorway (Fig. 6). A simple hand lever pivoted to the tailpost raises the steps clear of the ground when lowered.

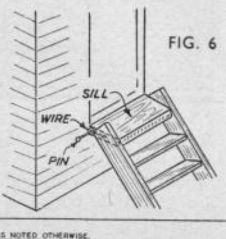
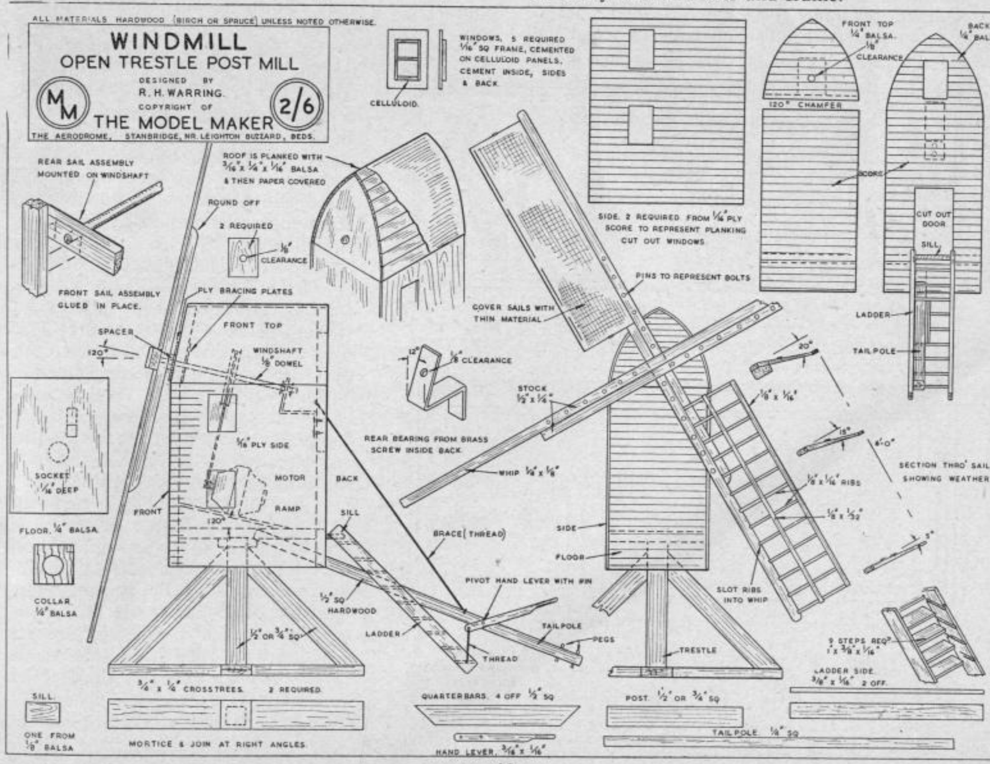


FIG. 6

The whole body assembly can now be mounted on the trestle—or rather the post of the trestle assembly. Weights must now be balanced so that it will balance truly vertical on the post, and the motor position can be adjusted accordingly. Once found, screw the motor down, align the driving pulley on the windshaft and glue this in position. Connect up the belt drive. The reduction ratio should be such that the sails do not revolve faster than about 150 r.p.m., preferably less. If the mill is not to be powered, then weight the body as necessary to balance. The remaining side can then be glued or hinged in place.

The sails are covered with strips of thin material, stretched taut from end to end and leading to trailing edge. The normal furled position of the sailcloth is wrapped around the leading board. A windmill not driving would normally have the sails furled.

Finally, the colour scheme. The trestle assembly, as we have previously described, is just stained. The whole of the body except the roof should be painted flat white. The roof should be tarred (black), or could again be painted white. The ladder and tailpole can be left natural wood, or painted white. Similarly with the sails and frame.



A SCENIC MODEL OF THE

NILE VALLEY

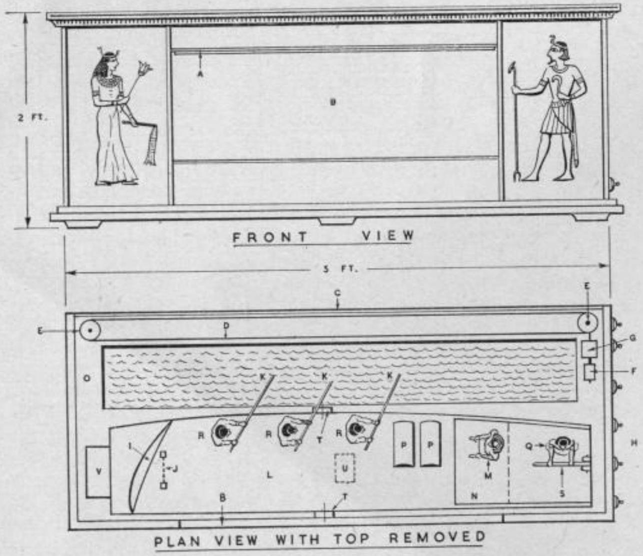
IN THE DAYS OF THE PHARAOHS

BY RAYMOND MORSE

SOME readers will no doubt remember seeing the description of my Egyptian figures in the February, 1951 issue of *Model Maker*.

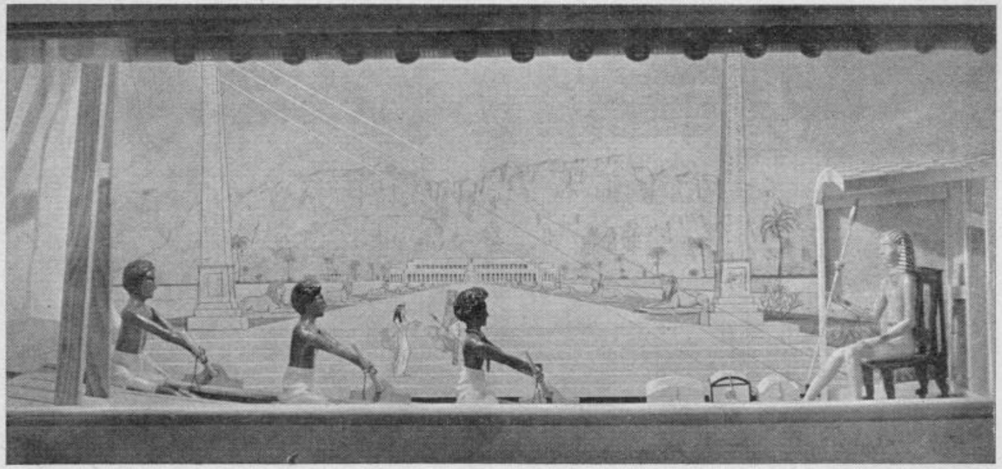
Well this time I am going to describe a scenic model which I built recently to illustrate Egyptian life of the Eighteenth Dynasty. It is arranged in the form of a miniature stage built into a wooden glass-fronted case with internal lighting. In the foreground may be seen the deck of a boat with the Pharaoh seated to the right under the canopy of his cabin. To the left is the A-shaped mast with bellying sail, whilst the rowers, or shall we say Nubians, may be seen on thwarts, each with their paddle-like oars. The scenery in the background painted on thin canvas revolves slowly on drums thus giving the viewer the impression that the boat is travelling on the Nile, passing steadily by the distant landscape. With the mechanically operated oars, and the cam under the deck to give the boat a slight pitching motion, it is not difficult for the observer to visualise himself being carried along on the deck, particularly if viewed closely so that the edges of the case are not seen.

I will now describe the construction of the model, a glance at the accompanying sketches will explain the general layout and thus save columns of print. Throughout the entire production I made use of much scrap material, odds and ends of wood and metal can be made to give excellent results if selected with discretion, particularly for the stage equipment where a certain amount of fake is all that is required. For example, parts such as the travelling trunks (see photo) need only finishing on those surfaces seen by the observer.



A DROP CURTAIN
B VIEW PANEL
C HINGED BACK
D SCENERY BELT
E ROLLERS
F MOTORS
G REDUCTION GEAR
H SWITCHES
I SAIL
J MAST
K OARS
L DECK
M PHAROAH
N CABIN
O TROUGH FOR REAL OR ARTIFICIAL WATER
P TRAVELLING TRUNKS
Q HELMSMAN
R ROWERS
S STEERING BLADE
T TRUNNIONS
U MOTOR FOR ROWERS BELOW DECK
V WEIGHT BOX TO BALANCE DECK ON CAM

The case itself measures externally 5 ft. long, 2 ft. 1 in. wide, and 2 ft. high. The base is made from the discarded door of an old coal shed retrieved during the conversion of our house. The sides and top of the case are of ⅛ in. plywood, stiffened with 1 in. square pine at all edges, the corners being further strengthened by the addition of pressed steel shelf brackets, obtainable from Woolworths or most hardware stores at quite a low price. The viewing panel of glass measures 3 ft. by 1 ft. 1 in., this is fixed to keep out dust, access being at the rear where a 3/16 in. ply door is fitted. This is hinged at the top of the case so that it can be swung up out of the way when any attention to the mechanism, such as oiling, is required. Lighting is by four 40 watt, 110 volt globes mounted in the front top corner of the case, arranged so as to cast no shadow on the background scenery from the objects on the boat. Besides the white light the other globes are red, green and blue, each having a separate switch on the right hand side of the case, where the operator stands. By combinations of various colours quite fascinating effects can be demon-



strated, and anything from moonlight to brilliant sunshine readily represented. Standard 230 volt globes could be installed if required as the model is wired for mains use, but since we use 110 volt off a transformer in our workshop, I have fitted up my model accordingly. Other controls consist of a handle to raise and lower the drop curtain, also two independent switches for the two motorised units, one controlling the 8 volt motor to work the rowers, the other to revolve the scenery belt; both of these motors are run by dry batteries, Ever Ready No. 800.

The rowing motor is attached to the underside of the deck where it is coupled to a light clockwork unit with spring removed, so as to form a reduction. This in turn carries a cog with chain drive passing under the rowers below deck level, each end of the chain runs on cogs to the spindles of which are fitted two crankshafts with coupling rods to connect them. It is from this rod that the rowing motion is obtained, a thin wire passing up to the oar situated between the hands of the Nubians controls the movement of the oars, the rowers themselves being merely linked loosely to them by the hands, whilst their backs and shoulders are also hinged to give added realism. The drive also carries a cam below deck again, which contacts a copper plate, giving the boat a slight pitching motion, the whole assembly being balanced on trunnions amidships.

A similar reduction drive is used for the scenery belt, in this case reduction gearing is coupled to a vertical roller in the corner of the case, another being positioned in the opposite corner, suitably spring-loaded at top and bottom bearings to maintain the belt in a taut condition whilst revolving. The rollers themselves are made from the roller of a blind, the scenery belt being the blind itself. Plywood flanges are fitted to the bottoms of the rollers, similar to those on a film spool, the belt itself being hemmed to prevent fraying. This blind canvas is ideal for the job. It is light and strong, reasonably stiff and takes artist's oils readily. Incidentally, I used turps only with my colours when painting the scenes, as any thick ingredients would soon tend to crack or peel after a time with the repeated movement over the rollers.

The scenes represent the well-known Gizeh Pyramids and Sphinx, Queen Hatshepsuts' temple at Der-el-Bahari, and a typical eighteenth dynasty temple of the more orthodox design.

The deck and cabin are constructed of ⅛ in. ply, the checkered cabin roof being painted in blue and white squares to imitate the dyed leather panels used in those days. On the roof, not visible however in the photo, is an Egyptian boy who acts as steersman by holding an extension of the oar-like blade used as a rudder, this being balanced in a crutch at the rear of the cabin roof close to the stern.

The figures themselves took many hours to model, their skeletons are of wood and wire, covered with plasticine, the Nubians, of course, are pivoted as explained previously, to follow the motion of the rowing mechanism. After modelling, each figure was liberally coated with aircraft dope, the resulting cellulose skin thus forming a comparatively hard, yet flexible crust. I have found that plasticine thus treated remains firm and rigid with little tendency to crack or bend, even as in the case of my model where the temperature has ranged from freezing to 80 deg. Fahr. After the doping process each figure was finished in artist's oils, the imitation gold ornaments on the Pharaoh were made from gold chocolate foil. The travelling trunks are of balsa wood covered with white cardboard, lined finally with Indian ink. The lion-legged chair is made of plywood and balsa, the finish of glossy black to represent ebony.

Making Model Buildings

VICTOR SUTTON DESCRIBES SOME SIMPLER BUILDINGS OF APPEAL TO THE NOVICE

THERE may be many junior readers of *Model Maker*, and to them some of the better type model buildings may seem a little too difficult for a start. Perhaps they have a model railway and a fleet of their own scale vehicles. The construction of a suitable garage and a set of buildings to go with the layout will be welcome.

The garage is not complicated and would hold about six scale vehicles. It is also designed with a loading dock which is an added feature. As the model will be shifted about try and base it on a plywood panel at least 10 in. by 7 in. so that you can chamfer off the slope in the front for easy access to the interior. The style is fairly modern and has two gables, part flat roof and a "light" let in which makes it very much more different from either the flat roof type or the continued adherence to the ordinary pointed roof.

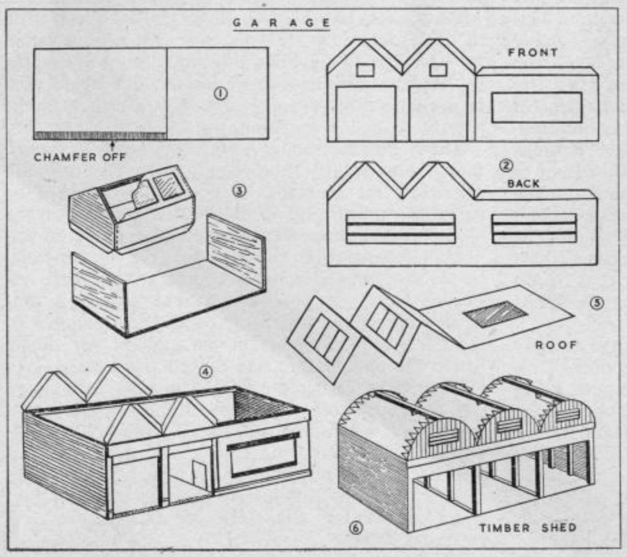
If you have plenty of strip wood, then you will be able to make the whole thing with cardboard found from large cartons. The two gables, doors and the office and loading dock are all embodied in the front single design. Length will be 10 in. with height to main room level $4\frac{1}{2}$ in. Do not make it too lofty. Note the design and measurements for the front and the back. You will also see that in the case of the back long windows are made right along. Note the modern, long straight bars of the frames.

When cut out fit up on the base board and see if in order and then start to reinforce with the struts of wood as shown. This will then mean that the whole framework is complete and ready to fit to the two sides.

In making the sides, try and get some Hobbies wood or plywood. Failing this you will find the boards from an orange box handy for this work. Always build with a firm base and all short sides of solid wood if you can. If you follow this idea the rest of the building will come to no harm. I have over a hundred buildings which have knocked around for 25 years and still quite sound.

The whole model will now look like the sketch shown which means that it is ready for the roof. Before doing this, line the inside with tiled brick paper, coloured paper of some sort, or you may paint it. Whatever you do, get this done now. Floor can be lined with "Modelcraft" gravel paper or flat grey paint. Put in the windows in tracing paper because so often this type of building has frosted windows.

This part finished, struts of $\frac{1}{4}$ in. x $\frac{1}{8}$ in. wood can now be fitted as shown. If you are keen on detail then the imitation girder work shown will improve the model very much. You can also add a cardboard section to note the offices and entrance to loading dock.

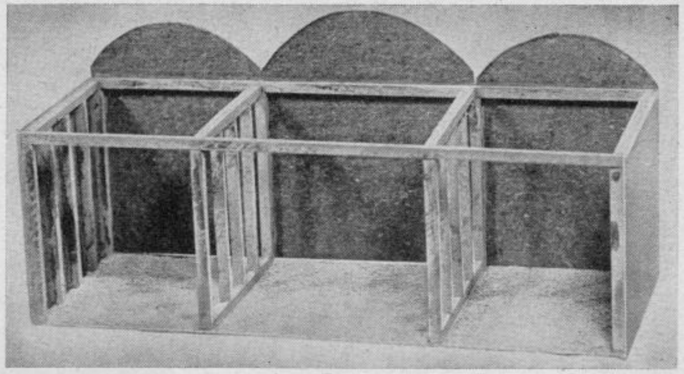


At this stage you can add the various pieces of wood and cardboard to make the facia and other building effects. All this should be done before any papering.

The roof is now designed in one piece and fitted to the wide flaps provided. If you like you can paint this flat white underneath and it will add to the light in the garage. As the fanlight over the end of build has been cut out this should be strengthened with cross bars, otherwise the card will bend and the addition will not fix on firmly.

Long lights are provided in the roof sections and these can be fitted in with tracing paper. Greaseproof paper is also a good substitute. Stiff crimp paper used for packing biscuits can often be utilised for this.

The whole model is now ready for assembly and you can then follow your own ideas of covering. Flat grey, cream distemper or wallpaint will do. Scale model paper is also ideal.



Basic structure of the timber shed before the addition of the curved roofs to the bays. This is a model that younger readers could well make, and enjoy adding the many simple accessories after its completion.

(Photo — Valerica Studios)

If you intend to make a larger one it would be better to make two like this than one long one.

The timber yard is a simple construction and could be made up quite cheaply. It is an easy job to do indoors when you cannot get in your workshop. Being of a fragile type once again, floor base board is most essential as shown. It is meant to be a stacking yard and most welcome for the scenic layout. Base should be 9 in. x 6 in. so that your bays are 3 in. wide.

As the roof sections are the familiar rounded type seen at the docks and the railway siding the best idea is to cut at least three sections as shown first so that you have the roof formers all in one. Plywood or thin board will do for this. As shown you will see that the roof, made of bent cardboard can then be made in one piece and ready to fit on the back and the uprights. Vents are made in the top at the front but as a rule represent shutter effects and no glass. Allow the roof to overhang $\frac{1}{2}$ in. each end. Note the cross sections to save the framework from twisting.

The roof would probably be wood and therefore you could paint this with flat brown paint, Indian ink or brown "Solignum" as used for garden work. The front top part would be boarded and therefore scored down with a penknife to represent boards. These should be about $\frac{1}{8}$ in. wide.

Back and sides can now be fitted and would be, as a rule without any windows. As these would be boarded then treat them in the same way.

The balance of the main construction would be with $\frac{1}{4}$ in. square wood. Follow the same sequence on the two boarded sides and the two centre sections. Struts like this are always a danger from the damage point of view. It would therefore be wise to fit in flat pieces on the floor base and between the "legs" of the building. Such a building, constructed like this will stand no end of knocking about and would not come apart. Paint the inside in a dull shade as one never sees a very modern looking timber store. If you have a timber tractor and what we know as a "timber truck" then this will make an added attraction to the model.

You can make your timber stock from oddments of balsa wood and don't forget the short "trees" waiting to be cut up. There are many accessories you can make for the next exhibition. Long crowbars from wire, odd lengths of chain, stacks of wood in shorter lengths and glued into piles, ready for transporting. This is not all because you can copy one of the heavy type cranes and mount this on four wheels. Also, one often sees the tree section shaved of its bark and ready for cutting. This leaves it nearly square, but with slightly rounded corners. Along the edges we should have some dabs of dark brown paint where the white wood does not show entirely. These are mostly stacked in sixes for drying purposes with cross members underneath to raise them from the ground. Boards with rough, brown edges can also be shown.

There is plenty of variety in a timber yard if you only look for it.

AWARDS FOR YOUNG ENGINEERS

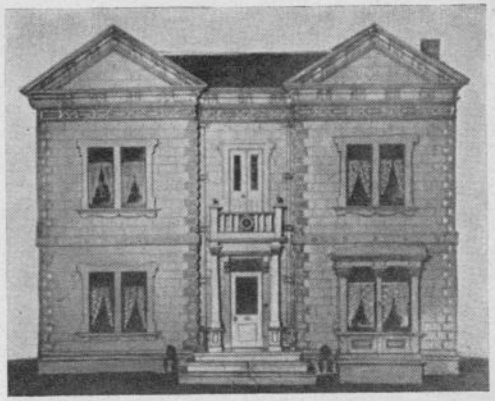
WE are advised by The Junior Institution of Engineers that through the generosity of the Maudslay Society, it is able to offer a scholarship, to be known as the "Maudslay Scholarship" to assist young engineers in their technical education and practical training. The value of this scholarship is £125, and is normally tenable for one year, though in suitable cases it might be extended.

The Institution also offers for annual competition their Durham Bursary of the value of £20, which will be awarded on the submission of a thesis, specially written for the Bursary on some engineering technical or scientific subject.

Readers who are interested in these awards are urged to get in touch with The Secretary, The Junior Institution of Engineers, 39 Victoria Street, London, S.W.1. Closing dates are respectively 31st July and 1st August, so that early application is recommended.

AN EDWARDIAN

Model House

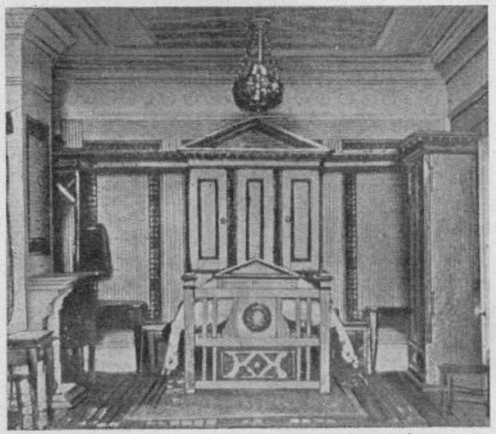


This amazing handicraft comes from Drighlington near Bradford, the maker being Mr. Batty. Started in 1908 the work took virtually a lifetime to complete. Outside, the building is fairly unpretentious and austere, being of the stone-faced type so often found in Victorian days, but once the front is removed its true wonders come to light.

There are two lower and two upper rooms together with a wide and ornate hall and stairway. The rooms comprise an oak-panelled dining room, Louis XIV drawing room, oak bedroom and tapestry-panelled guest chamber.

To give some details of each. First, the oak-panelled dining room. This has a finely built ceiling (as have all the rooms) and is supplied with accurately finished oak furniture, tastefully upholstered in warm red Morocco. There is a miniature bookcase in which are still more miniature books, and on the sideboard are a decanter and cigars. Also can be seen small pewter plates and a glowing fire, while the floor, which itself is parquet laid, is three-quarters covered by one of the remarkable carpets.

In the drawing room we get a complete change, for here is gilt and the delicate finish of Louis XIV style. The tiny table is inlaid with mother-of-pearl, while the furniture is actually covered with 22-carat gold leaf. There is a perfect 8-octave grand piano, $\frac{3}{4}$ in. high, with each of its sixty-four white keys separately cut from billiards balls. The black keys are separate too, and came from ebony sticks. Two Dresden china ornaments are valued at £50 each, while there are three more pieces valued at several pounds. Delicate paintings panel the walls and cupids and fleecy clouds adorn the ceiling.



Workmanship of the same fine grade is shown in the bedrooms. Beds, wardrobe and other pieces of furniture have all an accurate finish almost beyond belief. The oak bedroom shown in the photograph has a remarkable moulded ceiling, and the bed is complete even to a "shoe cupboard" at its near end.

The guest chamber has tapestry-panelling and inlaid furniture. Here there are three tiny chairs and a precisely-finished dressing table complete with mirror. The floor surround is polished and in this room we get the fourth wonder carpet—of entirely different pattern to the others.

Mention should be made of the hall-way and stairs. The hall is laid in marble, and the minutest of statues stands near the door. Two sets of stairs, one on either side of the main lobby, lead up to a spacious landing. They are correctly carpeted and rodded, and are supplied with beautifully wrought bannisters.

As suggested, the outside of the house looks fairly plain, but even here examination reveals some wonderful detail. The roof is made up of no less than six hundred slates, each cut separately from the old-time school variety, while the casements are all finished with accuracy, as also is the massive front door. There are twenty-six windows in all—four at each end as well as those back and front—and from each of these can be seen peeping neat curtains and above the porch, and approached from the landing, is a balcony in true Victorian style, the front of which is tastefully railed in.

The whole story of the house is one of patient endeavour and a continual urge for correct detail, regardless of time taken. Thus we find a bedside telephone that must have taken hours to make, in one room, and a minute copy of a popular national journal in another, and yet in a third a perfectly finished electric fire. It is conservatively estimated that more than one hundred trades and crafts are represented in the building.

BRITISH M.Y.A. OPEN CHAMPIONSHIP "M" CLASS AT

DOVERCOURT

WHITSUN 1951

General view of competitors preparing their yachts. Below: D. R. Barber's "May", eliminated in the preliminary sailing, makes a pleasing shot for the photographer.

(Photos by Alfred H. Smith, Dovercourt)

LONDON clubmen took three of the first four places in the British M.Y.A. Open Championship for the Marblehead Class, held at Dovercourt over the Whitsun holiday. A nearly record entry of 33 boats were entered, which made it necessary to race in two divisions. Six finalists were chosen from each division on Saturday and Sunday, and finals were sailed on Monday.

Ultimate winners: (1) *Doris II* sailed by N. W. Wareham of "London"; (2) *Babbie* with 38 pts., sailed by R. Redhead, of M.Y.S.A.; (3) *Anemone* with 31 pts., sailed by F. Fitzjohn, of Danson; (4) *Kittiwake II* with 29½ pts., sailed by A. W. Littlejohn of M.Y.S.A. This last boat tied with J. Edward's *Wylo Bach*, and proved the winner of a deciding windward board.

Weather was fairly kind throughout the meeting with little rain. For the most part wind was blustery from the N.N.E. On Saturday most of the boats were sailing with spinnakers set, but on Sunday and Monday a fluky reaching wind demanded a high degree of skill from skippers and mates, and spinnakers were not practicable.

Dovercourt is fortunate in having keen support from its local authorities. The Mayor, Councillor Horn, started the first boats on Saturday, and in company with the Mayoress, and a number of Aldermen and Councillors, attended the local club's dinner to visiting competitors held at the Phoenix Hotel. In a speech of welcome the Mayor emphasised the encouragement that would continue to be given by his council to the local club and model yachting in general, and hoped that many more such events would be held there in the future—without forgetting the hope that local skippers would secure some of the premier awards, he would always be delighted to see the visitors winning, say, second place.

Local club secretary, M. Bonner, handled general arrangements, while officials in charge of racing included: Officer of the Day, C. R. Seabrooke; Judge, J. Pritichard; Starter, W. Francis; Umpires, C. Francis and E. Rankilor; Scorer, Mrs. M. Bonner.

Competitors and spectators alike were appreciative of the excellent organisation which enabled the large number of entries to be handled smoothly. The splendid support given to the Marblehead Class bodes very well for its continuing popularity and should do much to establish it still more strongly as the most active of all racing classes today.

The Pictorial Approach . .

CONSIDERED BY P. R. WICKHAM

EVERY time I look at a model railway magazine, or visit an exhibition, I am struck by the very narrow conception of our craft which the majority seem content to accept. Granted the considerable advances in technical quality of locomotives and rolling stock, and such excellent developments as true-scale track and wheels and "two-rail" electric supply (though this is still too much the province of the expert few, and too little available to the majority, at least in '0' gauge) there are only a few layouts today which, in what might be called their general conception, shows any real advance on the best work of the early 1930s. It can still be said that the majority of layouts bear no more relation to a possible section of actual "country".

It is still possible to see, at any exhibition, and in goodness knows how many private railway rooms, perfectly respectable locomotives condemned to spend their lives in lapping endless loops of track packed, with ingenuity worthy of the designer of Hampton Court Maze, into a space just about adequate for a single station and serving stations so close together than any able-bodied passenger could walk the distance in the time it would take to book his ticket!

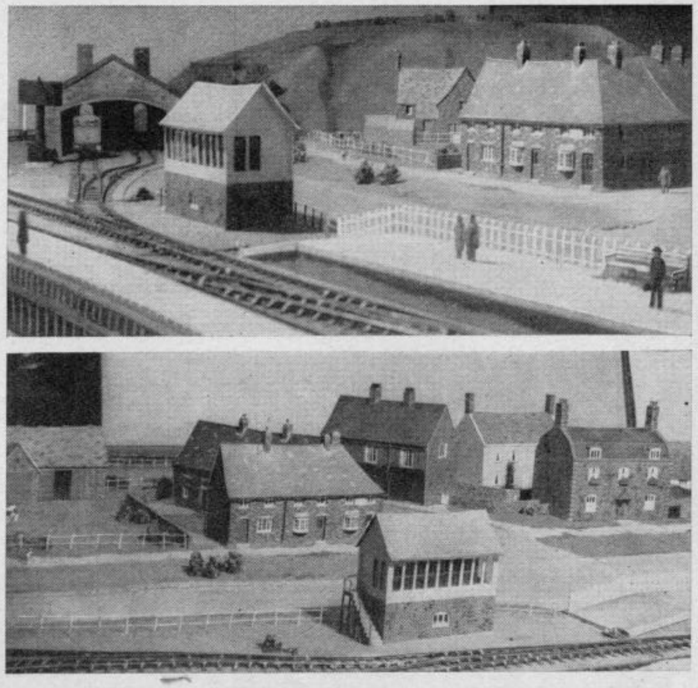
When we come to consider the setting of the model railway, the sterility of our craft becomes even more painfully apparent. Some builders at least go the full length by letting their line stand in "splendid" isolation, free of all the "encumbrances" of the towns, villages, and countryside which the prototype exists solely to serve ; but free also, surely of all the breath of human and pictorial appeal of the full-size railway. Others, probably the majority, accept the principle of a scenic setting, but are content to treat it as an afterthought, to be fitted in wherever the track plan leaves space, with no attempt at planning the whole model as an entity.

Now it seems to me that those who are satisfied with these types of layouts are those who approach our craft primarily from the viewpoint of an enthusiasm for the full-size railway (usually with the locomotive as first love), and are only interested in the craft of model making insofar as it allows them to recapture their beloved trains in miniature. Let no one think that I presume to deride that approach (except perhaps, in its more extreme manifestations) it is certainly the oldest approach to railway modelling, and we probably owe the very existence of our craft to it. But when I am asked to believe that it is the only possible approach, the highest attainable ideal of railway modelling, I am apt to become somewhat restive. For it must be remembered that it is also possible to approach our craft (as I do myself) primarily through a desire to actually make models and an interest to direct one's main efforts into this particular branch of railway model making. And since I believe that any deliberate restriction of the scope of a craft is dangerous to its well-being, and may eventually prove fatal to its very existence, I feel that we should welcome anything which tends to broaden our common field of interest, and brings new outlooks to bear on our work. While surely, the worker whose primary interest is in craftsmanship may well have something very valuable to contribute to railway modelling, which, let us be honest, stands today much in need of recruits whose interests extend beyond the mere assembly and operation of commercial kits and models.

In advocating a "broadening of horizons" one has to exert considerable self control lest one merely ends by suggesting that such a "broadening" process should itself be restricted to one's own field of interest. Let me hasten to make it clear then, that I am fully aware that there are many other possibilities of developing new interests within the borders of railway modelling besides those I am here concerned with, some of which I have indeed touched on in previous writings. The possibilities of narrow gauge layouts; "period" layouts representing a line at some definite period in the past; and various specialised types of railway such as industrial lines by modellers to date, and these are only a few of and mountain railways have all been barely skirted the possibilities for unusual layouts. There is, indeed, no excuse at all for railway modelling ever to become the hackneyed craft it threatens to become today.

But, of course, the subject of this article is less a particular branch of railway modelling than an outlook on the craft; an outlook which I have tried to suggest previously in terms of the difference between the "mechanical" aspect and the "artistic". Naturally, I do not wish to suggest that the modeller who favours the "pictorial approach" has no interest in the mechanical aspects of railway modelling; indeed, I would stress the necessity for a very high standard of construction and finish in all the equipment of the railway itself, if it is to contribute its full share to the final pictorial effect. But it can, I think, usually be safely assumed that the modeller with this outlook will not be content merely to reproduce what lies within the railway boundaries. His interests naturally tend to be wider than those of the conventional railway enthusiast, and his desire for pictorial effect will naturally make him wish to give his railway an attractive setting. This is not to say that the railway need become "lost" in the scenic setting; indeed, this is far more likely to happen where scenic effects have not been planned from the start, but crammed in

afterwards to fill every vacant space, than in a layout properly planned and built as a complete entity. For it is surely obvious that any pictorial composition must have a "focal point" and in our case this is, of course, the railway, the interest of which will be enhanced rather than reduced, by a properly planned scenic setting.



Two of the author's own lineside arrangements, which give a fine air of versimilitude to the track layout, without in any way swamping it. Note in particular the wide variety of buildings even in this small compass.

At the same time we ought to realise that there is no fundamental reason why the railway should be the main focal point of a model setting. It would be quite possible to construct a model village or town in which the railway was only an incidental. I know this thought will deeply shock many readers, and perhaps deepen suspicions that I am a thoroughly subversive influence, but we really must try and maintain a sense of proportion, and not suppose that the railway is the be all and end all of scenic modelling. However, apart from any natural bias which railway enthusiasm may give us, it is certainly true that the railway does make a particularly satisfying focal point for a model setting. It adds to the pictorial appeal of buildings and scenery, great and varied mechanical interest; many of its component parts are usually satisfying as model prototypes (some such as locomotives and passenger coaches often obtaining real beauty of line and colour); and, not least important, it can readily and convincingly be made to work in miniature, to add the final quality needed to bring a model scene to life, motion! I suppose theoretically motor traffic might be made to perform the latter service, but most existing methods of activating miniature motor vehicles seem crude and unsatisfactory, and in any case the many separate scurrying units of motor traffic could never satisfy as does the majestic graceful motion of a train. While it may be considered sentimental, there is surely, too, an irresistible appeal about the thought that the train is the largest single man-made unit to move upon land, as well as being man's first significant attempt to move on land by any other power than his own, or his animal's limbs!

These latter reflections may, perhaps, help to compensate the purists among railway modellers for my previous "heresies"; I hope so, for our differences are rather ones of degree than of principle. I too hold the railway in great affection, but I see it, not as something in isolation, but as the focal point in a much wider scene, full of varied human interest and pictorial delight, which I want to reproduce in miniature, with all the techniques that model making puts into my hands.

And what exciting techniques they are, all the more so to me because I believe we are only beginning to glimpse their great possibilities. Here we are, setting out to build up a picture in which all three dimensions are our province; in which our materials are absolutely anything which the needs of the situation may call for and our skill enable us to use; and in which the elements of light and movement are available to us as additional tools. Surely we are not going to let lack of imagination interfere with all these great possibilities and cause us merely to copy and adopt what others have already done? Far too many layouts are, in effect, "models of models" far too few modellers show any signs of realising the full potentialities of the craft.

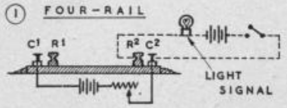
On the Right Track

A REGULAR FEATURE OF INTEREST TO ALL 00 GAUGE FANS BY R. WATKINS-PITCHFORD

This month the thorny problem of two or three-rail operation is considered.

SYSTEMS OF TRACK WIRING

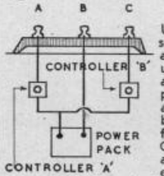
(1) FOUR-RAIL



r1 and r2 = running rails, c1 and c2 = conductor rails on insulators. r1 and r2 are short circuited by wheels and axles of the trains and are thus at a common potential.

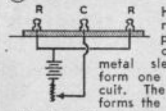
c1 and c2 are insulated from each other and from r1 and r2. Although r1 and r2 do not carry the current that drives the train, they can, in conjunction with c1 and c2, be used as a conductor to operate accessories such as signals as shown by dotted lines.

(2) TRIX 'TWIN' OR DOUBLE TWO-RAIL



Unique in that it secures four-rail advantages whilst using only three. a and b form one pair, b and c form another; all rails being insulated from each other. Careful insulation at wheels, axles, etc., essential. Reversal of locos is effected by impulse-actuated sequence-reverser in cab and not by changing relative polarities of rails on track.

(3) INSIDE THIRD RAIL

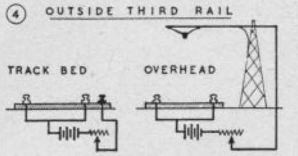


Here running rails r are at common potential—they are often mounted on metal sleepers—and thus form one "leg" of the circuit. The conductor rail c forms the other "leg".

Having the running rails at common potential permits use of metal wheels on metal axles.

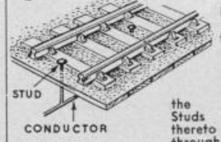
If fibre or insulating sleepers are used with this system, running rails should be bonded not only at joints, but to each other, in order that trackway as a whole shall form low-resistance return path for current. Reversal of locos (DC) effected by reversing power supply by suitable switch.

(4) OUTSIDE THIRD RAIL



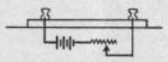
The principles involved here are the same as for Inside 3rd Rail, namely the use of "bunched" running rails as one leg of the circuit.
The choice as between the various systems will be governed either by the prototype being modelled or—in free lance railways—by personal preference.

(5) STUD CONTACT



Here the trackway forms one leg and the conductor 'rail' is let along under the baseboard. Studs soldered thereto protrude through the ballast to correct height and spacing and serve, in fact, as an "invisible" Third rail. At points and crossings the studs are set high so as to carry the spring loaded collector skate on the loco clear of the track rails which are being crossed.

(6) TWO RAIL



This is the system that will be the natural choice of those who are modelling railways which carry only steam or diesel outline locos. Current is fed to the loco along one rail and returns via the other.

There must, therefore, be no short-circuiting of the rails by soldering to metal sleepers, using metal wheels on bare metal axles, etc. This type of track is simple and inexpensive to lay and is realistic and efficient in operation.

IF the notes in this column appear to have laid emphasis on track-work to the exclusion of other aspects of 00 gauge railway modelling, it is through no inadvertence on the part of your scribe. Rather is it because the matter of track design and track laying does not appear to receive in contemporary handbooks and publications anything like the attention to which it is entitled by its bearing on the successful working of the railway as a whole.

One sometimes hears the argument advanced that well laid scale track is too expensive to put down on anything like a large layout — "All very well for a few feet of showcase display" says the Club Oracle with an air of profound wisdom. And yet that same wiseacre will see nothing inconsistent in spending £15 or £20 on one super detailed loco . . . you can put down quite a sizeable layout in scale 00 gauge track for £20, and, what is more to the point, you can have great fun doing it.

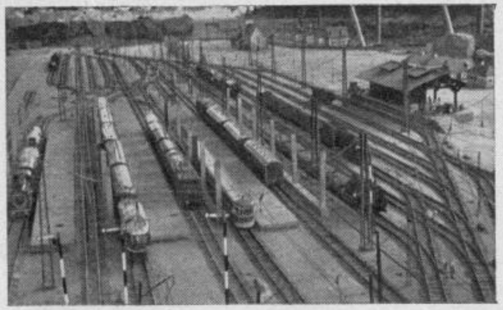
After all, building up trackwork is as much model making as the construction of a loco, wagon, or lineside building. Moreover, a slight blemish in the construction or the painting of a loco or coach may not be noticeable as the train flashes by, but an ugly bit of trackwork is a perpetual eyesore and, unlike the train, it is static. It is the sort of thing that you hope optimistically the visitor—and the camera!—will fail to spot.

But good trackwork is not merely a matter of looks; there is performance also to be considered.

In 00 gauge railways electric traction is far more common than clockwork or steam and, therefore, the trackway has not only to afford an even surface along which the loco can develop its tractive effort and haul its coaches or trucks, but it also has to convey the current to the loco as it goes along.

Now in any electrical circuit there must be a "path of return" as well as a "path of supply"; in other words whether we supply current to the loco by means of a separate conductor rail or not, the running rails and their joints must act efficiently from an electrical as well as a mechanical point of view.

For the benefit of those who are new to the hobby, it may be as well to point out that there are several systems by which a miniature railway track can be supplied with current for running the loco. Broadly these can be classified as Two-Rail Systems and Three-Rail Systems. It is, of course, possible to have



Occasional sunny days at this time of year encourage the devotee of outdoor layouts which give what seems unlimited opportunity to the designer after the more rigid limitations of loft or basement.

a four-rail system as in certain sections of the London Underground railways, and in this case both the "supply" and the "return" of current is provided by specially mounted conductor rails.

These conductor rails play no part in bearing the weight of the train or the stresses implied by acceleration and braking. This is all looked after by the running rails, but it is important to note that the latter are, nevertheless, bonded and used as an electrical circuit for the operation of auxiliaries and for signalling.

The Trix Twin Railway, by an ingenious adaption, contrives to give the advantages of four rails while using only three and, for those who are electrically-minded, the possibilities of remote control opened up by this system are virtually limitless. Not only can two loops be run independently on the same line of track without "sectioning" (as when coupling up or detaching vehicles from a train) but electrical impulses can be superimposed on the track for operating points, signals, level crossing gates, and other accessories without affecting the running of the trains.

The Trix system is, of course, highly individualised—that is to say that locos and rolling stock having wheels made to scale dimensions cannot be used satisfactorily, but from the point of view of the operating facilities it provides it is probably unequalled, and affords a "happy hunting ground" for those to whom time table operating forms a strong appeal.

To revert, however, to the matter of track-way. In three-rail systems the so-called "conductor" rail is insulated from the running rails, and is mounted either outside the track-way (outside third rail) or centrally between the running rails (inside third rail). Strictly speaking it is misleading to refer to this as the "conductor rail", because this implies that the running rails are not concerned in handling electrical current, and are there only for tractive purposes—a fallacy that has accounted for many a grey hair amongst railway modellers.

In the South of England particularly, it is common to see the outside third rail system in operation and also to see steam locomotives hauling trains on tracks equipped with third rail. But some, to whom the idea of a "hot water can" running on a three-rail track is unsatisfactory and out of keeping, are anxious to retain the advantages of the third rail, while at the same time having a track that to the superficial glance at least appears to be a normal two-rail road.

They, therefore, achieve both these requirements by carrying the third rail (usually in the form of a copper wire) along under the baseboard.

Brass or copper pins are then driven through the baseboard so that their points can be soldered to the copper wire, while leaving the heads projecting above the ballast of the track along its centre line. Suitably sprung shoes or skates on the loco bear on these pin heads and carry the current to the motor, the return path being by way of the two running rails. This system, known as the stud contact or surface contact system, claims certain advantages of its own. For one thing there is no necessity to insulate the running rails one from the other; they can be soldered to metal sleepers, thereby retaining them rigidly in gauge whatever the vagaries of sun or moisture. Again there is no need to take special precautions about insulating the wheels and axles of locos and rolling stock either from each other or from the chassis or frame of the vehicle and the risks of track short circuits at complicated point formations like double slips are obviated.

However, the stud contacts cannot be rendered invisible and, to the extent that they are conspicuous, they mar the appearance of the trackway. It is usually necessary to fit some form of stop or collar to each pin to prevent its working down into the baseboard so far that the collector skate fails to contact with the head. Free access must be obtained to the underside of the baseboard at all parts, and soldering the conductor wire to the stud points in some confined corners is apt to call for acrobatics of no mean order.

The stud contact system has a lot to recommend it and is warmly upheld by those who have operated it successfully. But the method of supplying current to the track and the locos is, like many other aspects of the hobby, highly controversial and the two-rail enthusiast will refer you pointedly to the advantages of his system and the drawbacks of the others. The third-rail system, whether outside or centre will, according to him, look all out of place unless it is used in an appropriate setting.

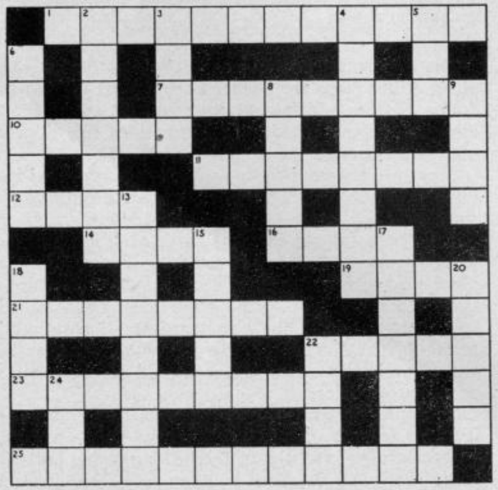
For example, one might model a layout which included a station such as Wimbledon in S.W. London. Here the London Passenger Transport Board has a terminus for its district trains and also the roads of the main S.R. line runs through the station and carry both the multiple unit electric trains (for which an outside third rail is provided) and the steam trains on the same tracks. On such a model, therefore, provided that the scarlet district trains were confined to the centre third rail section, and the appropriately coloured steam and electric S.R. trains were run on the outside third rail section, and provided also that station buildings, signals and signal boxes were of the type found in this part of the country, the model as a whole would be appropriate and convincing. But if the section of line to be modelled represents a district in which no electrified track is found, then a three-rail system is out of place and only the two-rail will give completely satisfactory appearance.

In two-rail running the rails themselves not only look after the traction, but also supply the current to the loco and provide a return path. It follows, therefore, that direct metallic connection between the rails whether on the trackway or through the wheels and axles of vehicles, would offer a short circuit and rob the loco of much of its power. In the early days of two-rail working these problems of ensuring complete insulation between the two rails, except through the mechanism, did present some difficulties. But it is safe to say that these have been completely overcome by the use of such devices as the Insulaxles made by Peco, the plastic-centre loco wheels by Hambling, and other ingenious and practical accessories.

Well laid and properly ballasted two-rail track with the metals of good conductivity solder-bonded across at the joints (in addition to fishplates) can be made to look highly convincing and realistic as well as to provide smooth trouble-free running. This system is, of course, economical in that it saves the expense of the third rail (a consideration in these days of metal shortage), and the extra work and soldering implied by the stud contact method. For the beginner who has not made up his mind on which system to adopt, the two-rail has a great deal to recommend it, particularly if locomotives of steam or diesel outline only are to be used.

It has not been possible in this short article to deal with the many problems which arise when wiring up complicated points and crossings, nor have we been able to deal with the all important matter of sectioning the track so as to permit of having several locomotives on the lines at the same time. Such matters must form the subject of future articles, but it should be appreciated that the technique of wiring differs considerably as between the various systems of two-rail, three-rail, stud contact, etc., and the beginner is strongly advised to make his choice at an early stage, stick to it and not be tempted to change horses in mid stream. There are no bad methods of track wiring, only different kinds of good ones.

MODEL MAKER CROSSWORD *(Solution next month)*



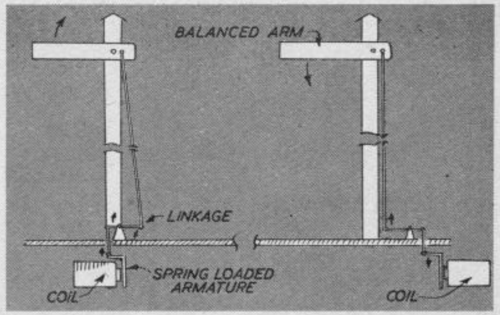
Across

1. Top of the puzzle and the "pot" (8, 4).
7. Farm scents about artisans! (9).
10. State of models' decks sometimes (5).
11. Mixed fat in heart of transmission system (8).
12. May adorn the yacht or pave the floor (4).
14 and 16. Woodworkers don't pull these punches (4-4).
19. Sort of performance put up by the supreme models (4).
21. Interrupted in hired den (8).
22. Badly bored condition (5).
23. 2 ft. 2 in. divided by solution of 3 (6-3).
25. Prime movers making a spirited start (6, 6).

Down

2. South American source of mahogany (7).
3. A trifle stolen from the yard (4).
4. He eats it — but not without pause (8).
5. May lubricate modeller but not model (3).
6. Wrafs just going to waste (5).
8. Residences which can be produced by filing (5).
9. The represent one form of harnessed horse-power (4)).
13. One of the plant maintenance men (8).
15. Real thing or model, it's often thumbed (5).
17. This clasps Ann about the middle (7).
18. Such blasting in this hot weather may be deadly (4).
20. They sprung from planes and old blocks (5).
22. Shorter way out than exhaust pipe (4).
24. Scot's comment on a small scale job (3).

Signal Operation



ADEQUATE power for signal operation is provided by a simple type of relay which consists of little more than a small coil wound to approx. 6 ohms. resistance, and a L-shaped armature, utilising the movement of the top of the armature to raise or lower the semaphore arm of the signal via suitable linkage. The two main diagrams show the linkage required in schematic form, details of the linkage being arranged to suit specific requirements and obtain the required degree of leverage. In either scheme, when the coil is energised, the armature, via the linkage, will hold the semaphore arm in the "all clear" position as long as the coil circuit is closed. Breaking the coil circuit releases the armature and returns the semaphore arm to the horizontal position.

It has been found that, for best results, the semaphore arms themselves should be balanced about their pivot and the return action is then governed by the tension of the return spring bearing on the armature of the simple relay. This avoids overloading the armature and linkage.

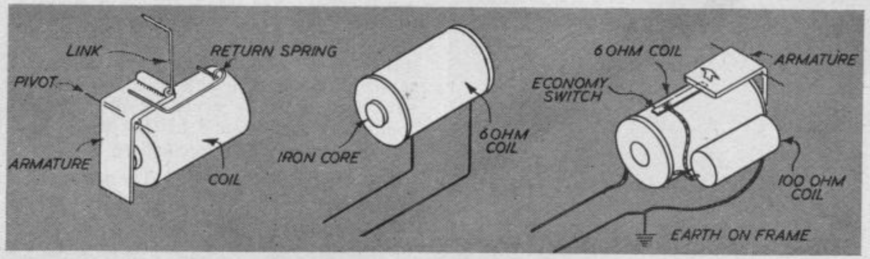
The basic design of a suitable relay is shown in the second series of diagrams. The main parts are simply the coil itself, an L-shaped armature pivoted just in front of the coil, fitted with a suitable link and a light return spring. About $\frac{1}{8}$ in. travel should be allowed between the armature and the pole piece of the coil. A suitable coil for 6 or 12 volt operation would be 23 yards of 32 s.w.g. wire, giving a resistance of approx. 6 ohms. This corresponds to a current consumption of 1 amp with 6 volt supply, and 2 amps with a 12 volt supply.

For battery operation it is desirable to incorporate a current saving device to reduce battery drain whilst signals are to be held in the "operated" position. This consists of adding a 100 ohm "economy" coil to the circuit. This economy coil is wired in series with the main 6 ohm coil and controlled by a shorting switch. The action of this switch is as follows.

One side of the supply is earthed on the frame of the relay, the armature itself then being earthed. A light spring strip on top of the main coil is normally in contact with the armature in the "open" position, but breaks with it as the armature is drawn in. The "break" should occur just before the armature is drawn in to its fullest extent.

The economy coil is wired to this switch so that all the while this spring strip is contacting the armature the economy coil is shorted out. Thus whilst the armature is being drawn in the main coil only is in circuit drawing 1 amp (or 2 amps), and providing a strong attraction sufficient to operate the linkage. The required movement of the semaphore arm should be completed before the economy switch breaks or opens.

This final movement of the armature, breaking the economy switch, puts the high resistance coil in series with the main coil so that the total resistance is now 106 ohms. The current drain immediately drops to .057 amps (6 volts) or .113 amps (12 volts). The magnetic field provided by this reduced current is still quite sufficient to hold the armature in position, but it would be insufficient to draw the armature in from its "free" position and operate the necessary linkage. The current saving is well worth the trouble involved. Initial setting of the economy switch is apt to be a little tricky, but once correctly adjusted will hold that adjustment indefinitely, if undisturbed. For this reason, as well as appearance, it is recommended that the relay be located below the baseboard carrying the signal, with only the lever system visible. The wiring to suitable "signal box" switching or the main control panel is obvious. A suitable 100 ohm coil is given by 33 yards of 44 s.w.g. wire wound on a suitable spool or bobbin.



Improving the Miniature Railway Layout

H. A. ROBINSON TACKLES THE PROBLEM OF AN AWKWARD DOOR & CONSIDERS FINE OR COARSE STANDARDS IN 0 GAUGE

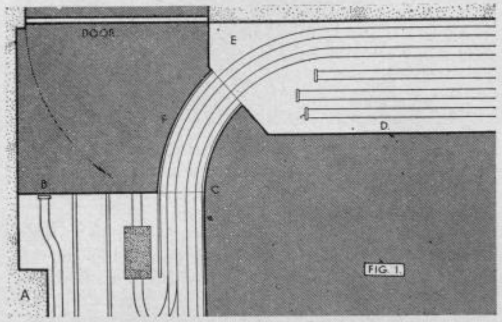


Fig. 1. The layout as it was originally.

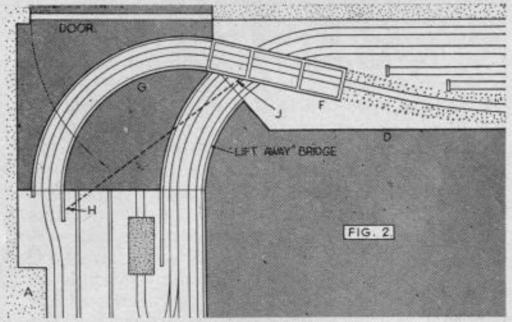


Fig. 2. Connection round from B to D. The new section span swings up about the dotted line.

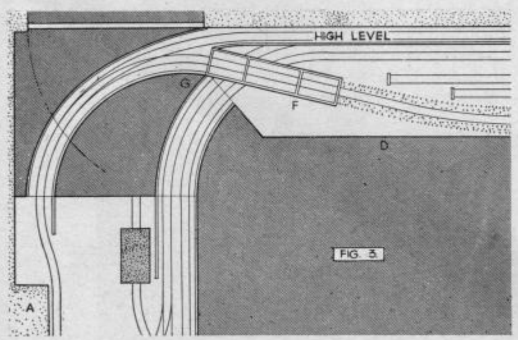


Fig. 3. Shows how the high level section was taken off the curved rising span.

IT has always seemed to me that greatly increased interest is given to a miniature layout if there is continually some project or the other on hand, which presents real engineering problems in model size. That is, really tough problems such as faced the actual constructors when they took their tracks out to Key West in the Caribbean, or up to the high plateau of Brazil.

Of course, different angles of model railwaying appeal to different minds. Thus. I recently met an enthusiast who had spent years on an item that would comfortably go in a cigar box and another so keen on correct signalling with lever frames and bells that I believe he would be quite content if tennis balls were rolled between the stations as long as they came and went to the beats of his block instruments.

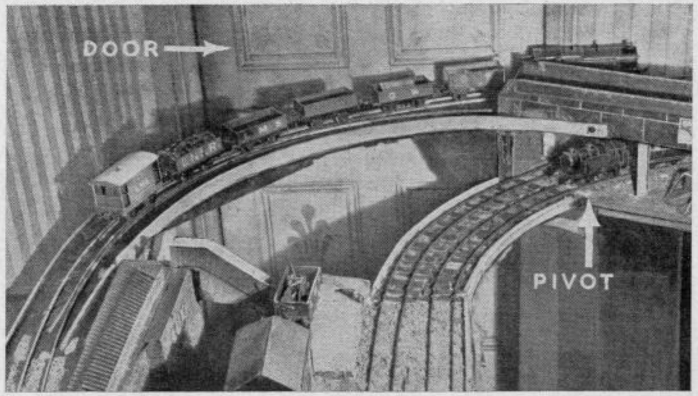
All aspects of the hobby can produce problems, but the kind I have in mind at the moment are those which deal with the laying of track, and in particular with the getting of rails to some location which nine out of ten workers would say was quite impossible. Then one feels the thrill of the real railroad engineer who has managed to throw his track across the "unbridgeable" chasm or taken it over some "impassable" barrier of beetling rock. The interest during the working out of the problem is great as is the satisfaction when one sees the rails, now supported above the baseboard, and now slung beneath, slowly creeping towards the "impossible" goal.

To illustrate all this let us quote an actual case. Fig. 1 shows the west corner of a layout in which the "impossible" was effected, and where by a certain ingeniousness a palpable terminus became a through station and trains rolled where the concensus of opinion was that no wheel could ever turn.

The first diagram gives the layout when the idea of extension was first mooted. (A) was a terminal station which due to the general layout was slightly above the rest of the track. The terminal road ended at the dead end (B) which because of a general upgrade was still higher above the corresponding roads at (C).

The "urge" was that it would be good for general running and train operation if (A) could be made into a through station. But the question was how could this be done? To carry the terminal track round to say (E) was impracticable as the down grade would have been much too steep, but all would be well if it could be carried round to (D) where an approach embankment of any size could be built.

"No," said the doubting Thomases, "it can't be done." The minimum radius of 2 ft. could not be got in the space available, and what about the irregular heights, to say nothing of the door? This latter certainly seemed an insurmountable stumbling block, for it opened inwards, and only just far enough to allow persons to enter by the lift bridge in the main tracks at (F).



Without doubt the carrying of the track round seemed impossible, but against this the presented facts were just the kind to give a challenge of the first order, and moreover a connection between the points in question would give the equivalent of many more yards of run, and open up quite a new route to all trains. So the civil engineers went into a huddle and said "it must be done".

The connecting track would, of course, have to go up and measurements showed that it could be made to pass over the main line if there was the absolute minimum of distance between the trains below and the wheels of those above — also the 2 ft. radius could just be got in if some curved type of lift bridge could be designed. There was a big query about this, for lift bridges on curves are not easy to make satisfactorily.

A general survey having shown that the connection was possible, work started by building an up-grade embankment to (D) (Fig. 2), and working out a special bridge (F) to cross the tracks below. The minimum height for the top track to climb was obtained by making an imitation high-sided bridge out of a single sheet of tin and soldering the rails straight to the "deck". Thus sleepers were eliminated, and any thickness to the bridge deck, this latter not being noticeable due to the closed-in design.

The track had thus been brought as far as (G) and the grade up past (D) was quite easy, but now came the problem of the lifting span. Something which would hinge up and down, it was thought, would be much preferable to any "lift away" arrangement, and so there was evolved a bridge which hinged on two extension spars at (H) and (J). This meant that when the span was raised an arch came into being under which persons entering the room could easily pass. Complete rigidity was given by two triangular blocks with a 7 in. or 8 in. vertical depth, which sat tightly against vertical faces on the main base. These triangular pieces fitted well across the span and in effect gave an arch, albeit the ends at a slight angle to one another.

The track on the span was check-railed throughout, a length of the rail protruding on either side so that when the span was down a distance of the approach rail became check-railed also.

Thus the impossible had been done, and trains began to roll from the one-time terminus to the grade at (D). For heavy trains a system of double-heading came into operation which was very effective. Despite the awkward curve, span and inclines, derailments were never experienced at this spot.

Later the "awkward span" became useful in another way. In the search for a longer run still, it was desired to make a high-level section. This was made feasible by putting a set of points in on the bridge and continuing over the main track as Fig. 3. To do this the span had to be widened, but this did not in any way interfere with the general working, indeed, it gave greater stability, for a second triangular block was placed under where the new track on the span connected with the elevated section.

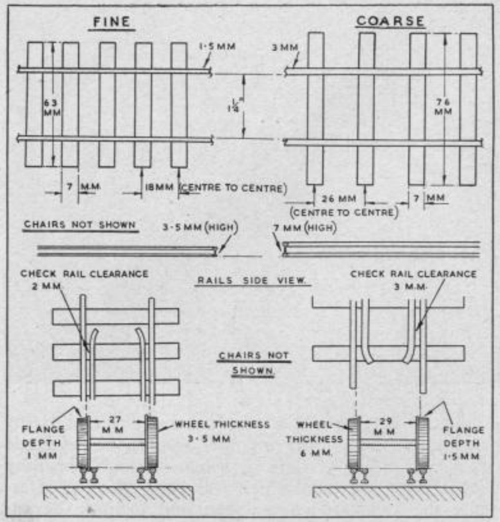
By careful grading it was found feasible to slightly reduce the incline to trains running on to the high level and also to give them a curvature of nearly 3 ft. radius in the place of the 2 ft. to (D). Indeed, so successful was the high-level section that eventually a greater number of trains were run on this than to the inner route.

There, then, we have the general idea of "having a problem" as suggested at the beginning of the article. Try one on your own layout—you will not be disappointed at the experiment.

Fine or Coarse Standards

AS well as deciding the gauge of his proposed line the modern model railwayist should be very clear upon what standard within that gauge he wishes to adopt.

When small-sized model railways came to the man in the street about fifty years ago, tin-plate track was almost universally used. This, as readers will know, bears little resemblance to the real thing. But it had the advantage of being cheap to make, easily mass-produced, and its lengths were readily pegged together by the tyros of the day.



Later, to gain some degree of realism, a "scale-model" rail was produced. This looked good for it was of bull-head section and was held to as many sleepers as you wished to put in, by chairs of one type or another. But the term "scale-model" was a misnomer for it was much too high and wide.

It was not long before the discrepancy was noted by keen workers, and a considerable demand for true scale track was heard. To meet this demand, therefore, manufacturers started to turn out an accurately scaled rail with sleepers and other fittings to match.

But here snags arose, the main one being that although true scale-model track is so excellent it cannot be used by vehicles intended for the larger rail as the flanges foul the chairs. Also the fittings for the older rail are useless for the newer.

Rather than coin a fresh name for the new standard, as the 00 and HO of the ⅝ in. gauge, it is generally spoken of as the "fine standard", while the bigger stuff goes by description of the "coarse".

To clarify the situation a certain body, known as the British Railway Modelling Standards Bureau, has drawn up a set of figures for true-to-scale track which they recommend should be used for gauge 0 and gauge 1 in the future as *the* correct standards. Perfect scaling in some cases would give impossibly small fractions of the millimetre, but the results obtained by the bureau are as near true scale as one is ever likely to get.

Dealing with gauge 0, we find that rail height in the coarse standard is 7 mm., but that in the fine it is 3.5 mm. This comparison alone shows the improvement in scaling provided by the more accurate calculations. Other comparisons are: rail width, coarse, 3 mm., fine 1.5 mm. Thus we see that a true-to-scale rail is really very small, and it is easy to see why rougher built stock cannot be run on it.

There is not so much difference in sleeper sizes as one might expect, for while the coarser standard accepts 7 mm. x 76 mm. as correct, the finer only takes off 10 mm. from the length and gives us 7 mm. x 63 mm. With the spacing, however, things are rather different, for while the former has accepted a 26 mm. space as being passable, the latter demands a spacing of only 18 mm.

When dealing with correctly scaled track, wheel thickness is of considerable importance, and here there is a really big difference in the fine and coarse standards. The latter for long has given us a uniform 6 mm. width, but true scale is only 3.5 mm. This means that flange thicknesses vary also, there being ½ mm. difference between the two. The correct scale width is 1 mm. A ½ mm. variation may not sound very much, but it can make all the difference between easy and tight running on scale cross-overs, etc.

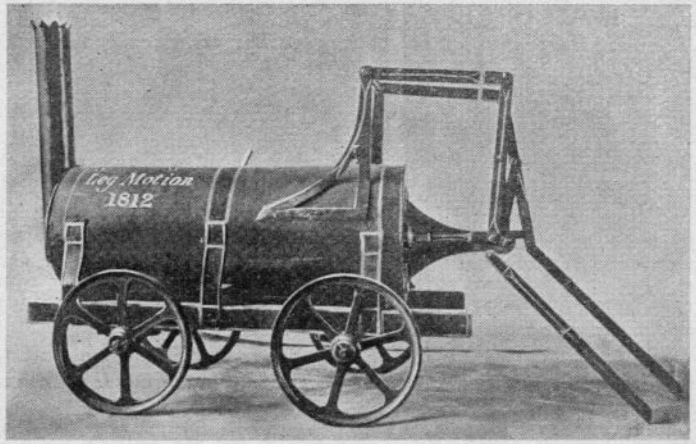
In scale check-rail work the flangeway should be 2 mm. on the straight, increasing to 2.5 mm. on curves. In the coarser standard these figures are accepted as 3 mm. and 3.5 mm. respectively.

Flange *depth* also comes into the picture. In the fine scale this has been set at 1.5 mm. as against the 2 mm. (and more) of the coarser. With stock having vertically sprung axles the 1.5 mm. can be reduced to 1.25 mm., but stock so sprung is a rarity in gauge 0, and so 1.5 mm. can be considered as the figure to be aimed for. Flange depths are of paramount importance for as pointed out it is the greater depth of the older standard that prevents stock so built running on the newer. Thus it is quite useless to decide on fine scale track if the rolling stock is all to the coarser pattern, and hence, as we say, the importance of newcomers to the hobby being quite clear upon the standard *within* their chosen gauge that they wish to adopt.

Another measurement which is of paramount importance in the sweet-running of vehicles through switches and check-railed sections is the wheel back-to-back distance. Indeed, this is of more importance than the flange width—although both play their part. The back-to-back distance in true scale is actually 2 mm. more than in the coarse, the figures being 29 mm. and 27 mm. Coarse scale vehicles for this reason alone are very tight on true scale track.

Another gauge 0 fine dimension which will be of use to the reader is the "six-foot way" (i.e. the distance between parallel tracks) taken from centre to centre—or from one rail to the corresponding rail of the second pair— which is 80 mm. for main lines and 85 mm. for close-in tracks in sidings and station yards. For the electric traction enthusiasts we have 2.5 mm. as the correct scale height for a conductor rail above the level of the nearby running rail, while the distance horizontally outward is 5 mm.

BRUNTON'S STEAM HORSE



AN OLDTIME PATENT THAT SETS MODERN MODELMAKERS A PROBLEM IN LINKAGE

By A. M. COLBRIDGE

THIS is really a problem model — a test of the model maker's ingenuity. Brunton's steam horse, which propelled itself along by the pushing motion of two feet, was built and tried out in 1813. It certainly worked. That much we know, for there are records in letters of a top speed of 2½ m.p.h. It was not a sound proposition, however, but, if only on account of the novel principle of operation, is of definite historic interest.

Trying to accumulate data for a working model it was found that apart from a copy of the original patent specification drawing, all details of the steam horse are lost or long forgotten. The patent specification would have been adequate, but for one point. The mechanism, as drawn, would not work. Either William Brunton deliberately missed out part of the mechanism when he filed his patent on May 22nd, 1813, or the draughtsman was guilty of an error. To work from, therefore, we have an incomplete drawing and the knowledge that the finished steam horse did most definitely work.

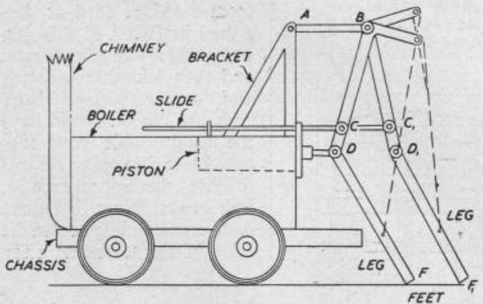


FIG. I

A simplified version of the original patent drawing is given in Fig. 1. The working mechanism consists of two jointed or pivoted "legs", interconnected by a slide. Leg BDF is directly connected to the piston of the engine at D. Outward movement of the piston would lock the foot against the ground and force the carriage forward. On the return motion of the piston, as far as is known, the second leg BDF was responsible for a similar forward push. The two legs were connected by a rod or slide at D and D, with a common pivot at B. Broken lines on the original drawing, and reproduced in Fig. 1, together with the angled tops of the legs, would indicate a wire or rope mechanism for lifting each leg in turn clear of the ground, to be placed down again at the commencement of each respective "power" stroke.

The system as drawn appears incomplete. The most likely motion resulting from the outward movement of the piston would be for leg F to dig into the ground and lever the rear of the engine up into the air. Quite a number of attempts have been made fully to analyse the original drawing and discover the discrepancy, and a suggested modification by Loughnan St. L. Pendred (1922) is sketched in Fig. 2. This involves the addition of two further links to transform the motion into the parallel link type, or very nearly so. The motion is not truly parallel link, but the arc involved in small and the radius long and, as in Fig. 2, would appear quite workable.

(*Continued on page* 502)

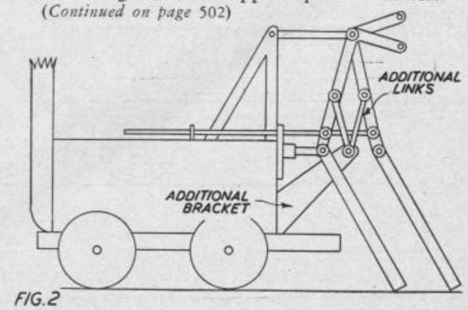


FIG. 2

Building 4 m.m. Scale Rolling Stock

TWO MORE INTERESTING OPEN WAGONS OFFERED BY A. H. DADD, B.Sc.

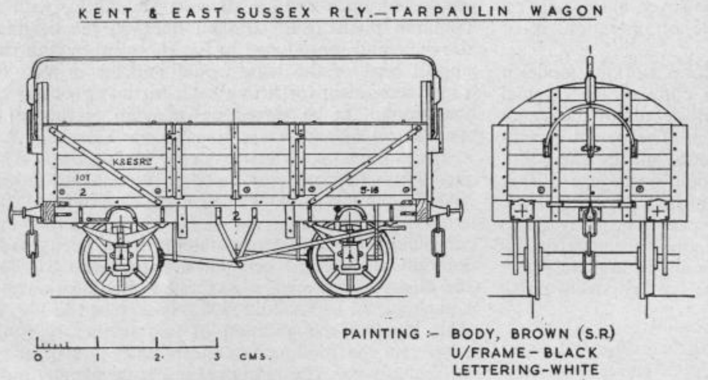
Two Light Railway Open Wagons

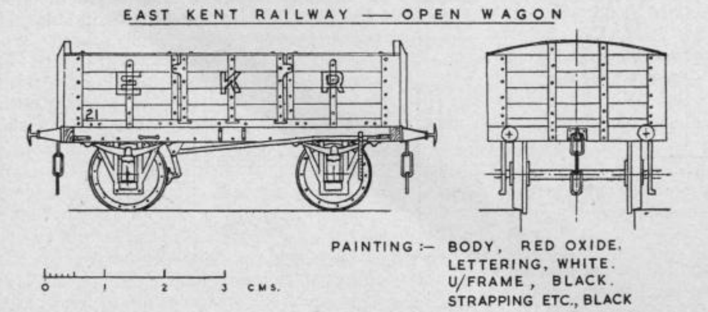
MODELLING a light railway? Or perhaps it's a branch line. In either case, the two wagons illustrated this month will be of interest. They are both typical of light railway or branch line types and are standard gauge. The tarpaulin wagon (they are still used on British Railways) will add variety to any layout.

The prototypes were taken from the two Colonel Stephens railways, which remained privately owned until nationalised. The East Kent Railway was perhaps the most fantastic little line in the British Isles, excluding Ireland, which survived the grouping period. Running from the village of Shepherdswell, through wonderful Kent scenery, up and down gradients no enthusiast who had not visited the line would believe existed on a surface railway, it finally ends in a field. "Connecting nowhere to nowhere" has often been said of this little line, and a better description is hard to find.

The Kent and East Sussex (originally the Rother Valley) Railway was a little more active, and under nationalisation, it has been brought up to date, but the atmosphere of the light railway remains.

All the old rolling stock has now been removed and destroyed, but fortunately drawings and photographs remain, and by means of models we can bring back those days of the private railways and the varied range of rolling stock which was their characteristic feature. As much of the stock was obtained from other railways (more often than not when they had been discarded as unfit for service), many prototypes selected from them can also be finished in the original owners' colours if desired.





East Kent Railway Open Wagon

This is the perfect example of a light railway open wagon, a considerable number of which were possessed by the E.K.R. Construction is simple and the following notes should be used as a guide to the chief features.

Cut the sides and ends from wood or card as described in Part I of this series. Frame up the wagon and then add the strapping and corner plates. Both ends are the same and have the usual double wood support. Use strapping on this to give the appearance of bolt heads. Note that there is an iron capping round the edge of the sides and ends.

The underframe will have to be built up as it is not standard length. The axle guard castings available on the market can be easily adapted by the use of a file. The solebar is best made from wood as in the prototype and the detail can be added in the form of paper strips. The use of paper in modelling rolling stock is often despised by experienced modellers, but a more useful material for adding detail where this has to be less prominent than usual, is hard to find. One word of warning. When cutting paper into narrow strips, use a razor blade drawn against a metal straight-edge, and you will get clean edges and the strip will be of constant width. Scissors will never give you this however sharp they are.

Add the buffers and couplings. The brake gear will have to be cut out from brass sheet. Cut the whole lever part out in one piece and double over to represent the brake block. Note that the brake is on one side only and works on one wheel, a real touch of light railway practice.

A final clean-up and you are ready for painting. This is where only care and patience can produce the desired result. More models are spoilt at this stage than at any other. The aim is to obtain complete covering of the wagon without obscuring the detail and to end up with a "scale" finish.

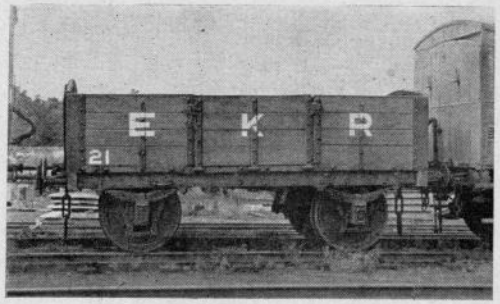
Spraying is of course the ideal method. Unfortunately many do not possess the equipment necessary and cannot stand the cost of having this done by the trade. A satisfactory job can be done with a brush providing the following points are observed. See that the wagon is entirely free from hairs or the dust from sanding. Use an oil-bound paint, a type that produces an egg shell finish is available in small quantities for model work. Cellulose base paint should be avoided. Thin the paint with turpentine until when tested it dries down to a very thin film, while still covering.

Give the wagon one coat, brushing out well. Allow to dry, and then add the second coat. The number of coats required will depend on the amount of thinning and the colour being used. The number of coats does not matter, as long as each is brushed out well. For the black underframes, a preparation known as "Blackboard Paint" is very satisfactory and gives a matt finish.

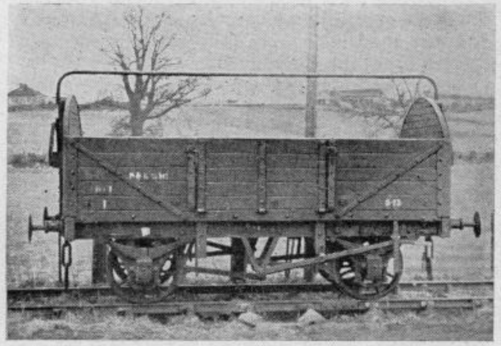
Lettering is done with a pen and white paint. I use a mapping pen and thin the paint until it runs fairly freely on the nib. If it is thinned too far, it will run when applied to the wagon. If the paint is thick, an embossed effect will be obtained which will completely ruin the wagon.

Kent and East Sussex Tarpaulin Wagon

This is a popular prototype for modellers. The Southern Railway owned a large number of these wagons mostly used on dock goods services. The photograph shows one brought from the Southern by the K. & E.S.R. and stationed at Rolvenden.



East Kent Railway Open Wagon photographed at Shepherdswell.


Kent and East Sussex Railway ten-ton tarpaulin wagon.

Construction of this wagon follows closely that given for the Sharlston coal wagon in Part I of the series. The bar, which is able to swing from side to made up of nickel silver or brass wire. It is pivoted at the ends. This is easily done by bending the wire at right angle and passing into a short piece of brass tubing inserted in the end of the wagon.

The slide may be cut from brass sheet or even card. Glue to the wagon.

The prototype had apparently not been painted since being transferred to the K. & E.S.R., and was in a very bad condition when photographed. They were originally finished in the standard S.R. dark brown with black underframes. Lettering was white.

The modelling of light railways is becoming increasingly popular, and if sufficient interest is shown in such prototypes, it is hoped to produce drawings of others in future issues, including locomotive and coach drawings.

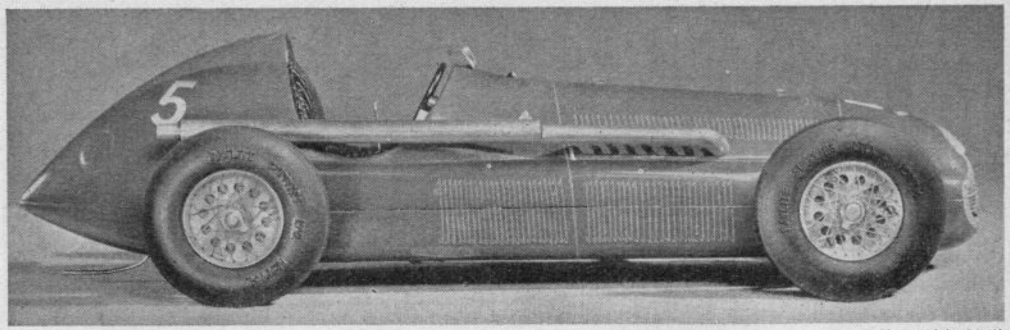


Photo : John Martin

Alfa Romeo

METAMORPHOSIS OF "BUSY"

An account, from notes supplied by J. A. Oliver and H. S. Howlett, of an interesting conversion of a very successful "flying test-bed" into a fast and handsome scale model racing car, and its commercial sequel.

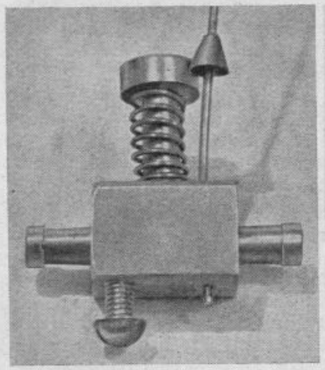
WAY back in February, 1950, *Model Cars* published a lively account by J. A. Oliver of Nottingham, of the birth of "Busy", the extremely adequate though not very beautiful little car which covered itself with glory in the first-ever International model car racing fixture in Sweden. Following these conquests of foreign fields, nothing much was heard of this wheeled stick of dynamite; a pity, we felt, since what she lacked in looks she made up in character. However, it was plain in the months that followed that the potent little "Tigers" which began to appear at meeting after meeting and dominate the 2.5 c.c. class were Busy's direct progeny, and we couldn't help drawing a mental parallel between the Olivers in the model car world with the all-conquering Coopers in the larger field. Both were produced by practical enthusiasts and both seemed to be the recipe for success in minimum racing for those who preferred to buy rather than to build.

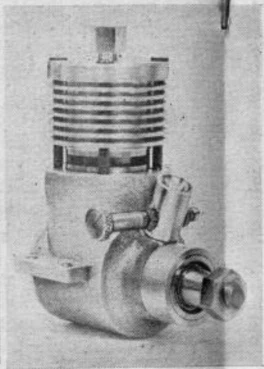
Earlier this year word filtered through to us of an extremely eye-worthy model Alfa, the work of Harry Howlett of the Meteor Club, which we were assured would take the Editorial fancy at a glance. Well, to cut a long story short, we went post haste into this intriguing matter, and blow us down, if it wasn't old "Busy" once more, but a "Busy" beautified beyond belief!

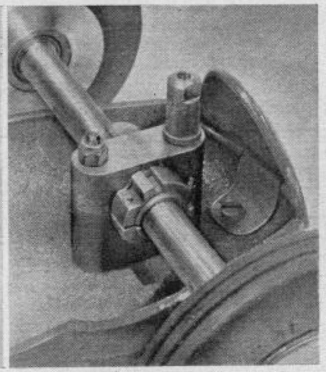
Here's how it happened. During the M.C.A. visit to Sweden, six "model widows" were left behind on the quayside, and evenings abroad were spent, so we are assured, in fourteen solid nights of modelling chatter, ad infinitum (and ad nauseam to all but the

(Above) Another view of the "production" car as built from the castings, and (below) two further shots of the fully detailed Howlett Alfa, with the original "Busy" as she conquered foreign fields, shown between them.

Photo : John Martin

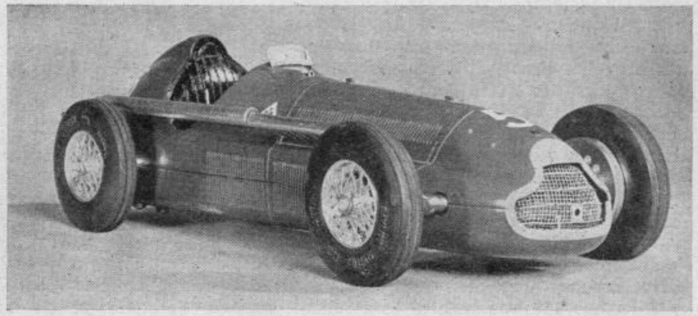


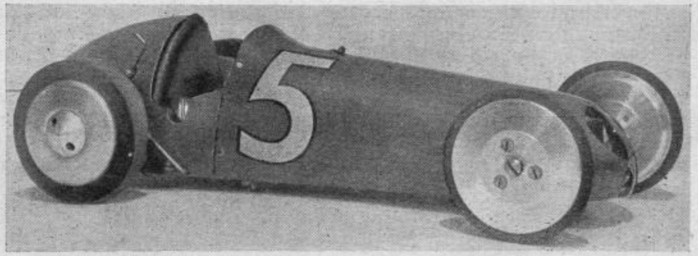


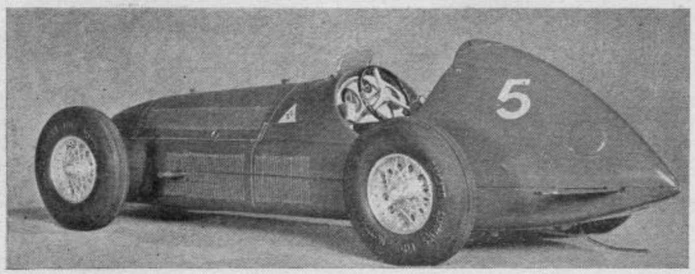


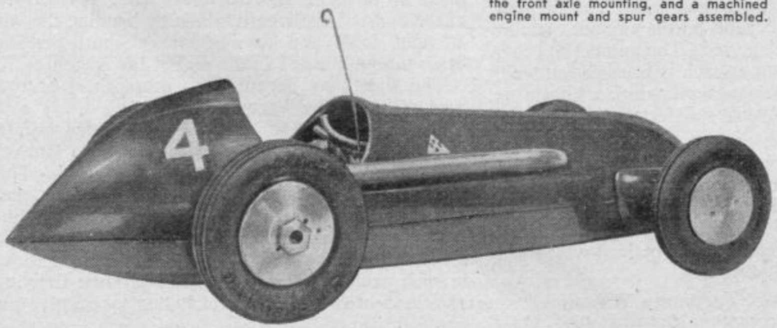
Model Maker Photos

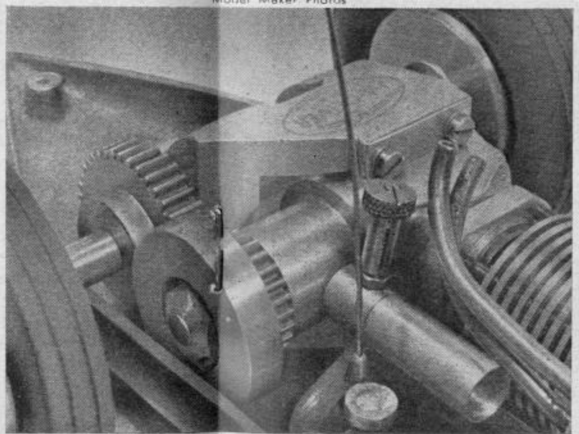
(Heading picture) "Busy" as she finally emerged after Harry Howlett's ministrations, looks every inch an Alfa Romeo 158. (Below) A competition car produced by J. A. Oliver of Nottingham from castings from the Alfa patterns, which he is now marketing. The close-up pictures show the "Sneaker" fuel cut-off valve, the new Oliver engine for gear-drive, the front axle mounting, and a machined engine mount and spur gears assembled.

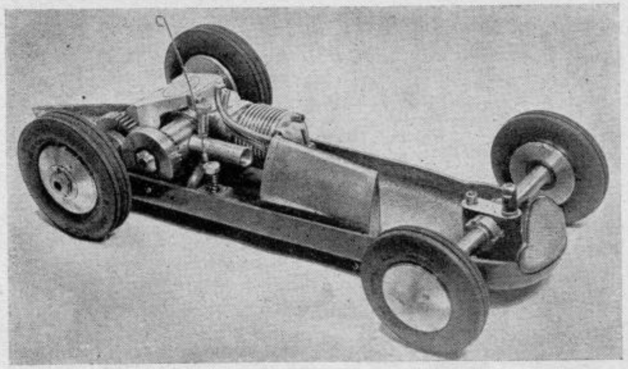












Model Maker Photos

ticularly that of Mrs. Howlett, until to put an end to Harry's sufferings she cunningly suggested "why not sew them with nylon fishing line and paint them with silver dope". Of course, it worked like a charm, proving once more, as John Oliver says, that women *are* wonderful. (We think it was rather big-hearted of Harry to own up to this bit, ourselves.)

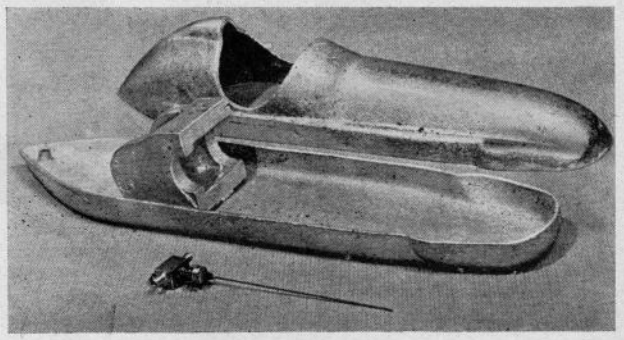
All the trimmings that you are likely to see on the outside of a "158" were added, including wheel, instrument panel, exhaust pipe, screen and rear view mirrors, and the louvres and panel joints very expertly lined in. Front grille, engine cover catches, seat and racing numbers complete this little work of art, which can still exceed 60 m.p.h. despite fripperies. ("Busy" circulated at around 64 m.p.h. in her dowdy days.) The "Howlett Alfa Busy" in fact, is about the prettiest 2.5 c.c. racing job we have seen.

So charmed was "the works" with this chrysalis-into-butterfly act that forthwith they put the castings into production, together with a special geared-drive engine mount to suit their new single shaft engine. Thus those who would do likewise may build themselves a geared version of this attractive little car, and pictures on these pages show not only the components, but the complete car built from them, in a simplified form. Please note that castings *only* can be supplied for body and engine mount, priced respectively at 25/- and 7/6, whilst another 7/6 buys the crafty little "Sneaker" fuel cut-off. Spur gears are not supplied, but can be had from various sources. Front wheels on the production version are $2\frac{1}{4}$ in. Raylite, and rear wheels are 2.5 x .56 in. air cored Z.N. productions, obtainable from Z.N. Products Ltd., 904 Harrow Road, London, N.W.10. The overall length is 12 in., wheelbase $7\frac{1}{2}$ in., track $4\frac{3}{8}$ in., and weight, less "panhandle" tether plate is 2 lb. 6 oz.

participants). Having pursued the subject of mechanics even to the extent of exploring the ship's propeller shaft tunnel, and finding nothing to redesign in these hot and thirsty regions, Harry Howlett's roving eye fell upon the hapless "Busy" resting after her exertions. Admitting that she could go like nobody's business, Harry took a poorish view of her looks, and made the ungentlemanly observation that if she were his, he'd give her a decent Bond Street trousseau and make an honest woman of her. Her womanly feelings somewhat nettled, "Busy" returned to her native shores, won the M.G. Trophy for J. S. Oliver at Easter, and then went into retirement for a quiet course of beauty treatment from her new owner, Harry Howlett having bought her for her heart of gold.

Readers may judge the results for themselves. The Alfa Romeo 158 was selected as a suitable subject, and considerable experimental pattern making and trial casting took place before a really pleasing top and bottom halves pair was produced. The original "Busy" power unit was retained, but little else. Front suspension of trailing arm type was made up, and the wheels were modified Raylite. Here much tribulation ensued, as spokes were a *sine qua non*. Pins were tried, wire was tried, patience was tried, par-

(Above) The chassis of the production version of H. S. Howlett's model, using the base and body castings and engine mount casting, finished fuel valve and the special Oliver short shaft engine, all of which are now available to the amateur constructor.



(Right) The base and body castings and engine mount for gear-drive, together with the "Sneaker" cut-off valve, as supplied by the makers, J. A. Oliver (Engineering), of 136 Radford Road, Nottingham.

A Darkroom Timer

BY DAVID WILLIAMS

AT the time when it was necessary to obtain a permit to buy an alarm clock, a neighbour gave me two broken ones and asked me if I could make one good one out of the two.

This was accomplished, and left on my hands a complete alarm clock of the 2/11d. pre-war vintage, complete that is, but for two adjacent teeth on the escape wheel. I decided to keep this for spares, so proceeded to assemble it to avoid losing bits and pieces. When this was done, out of idle curiosity I wound it up and gave it a shake, whereupon it started to tick merrily with one peculiarity. When the pallets entered the space left by the broken teeth, I noticed the hands jumped forward but the clock did not stop.

This set me thinking and eventually arrived at this conclusion. The escape wheel had 16 teeth (originally): if all the teeth except one were removed the clock would then be speeded up 15 times, then the minute hand would complete one revolution of the dial in four minutes.

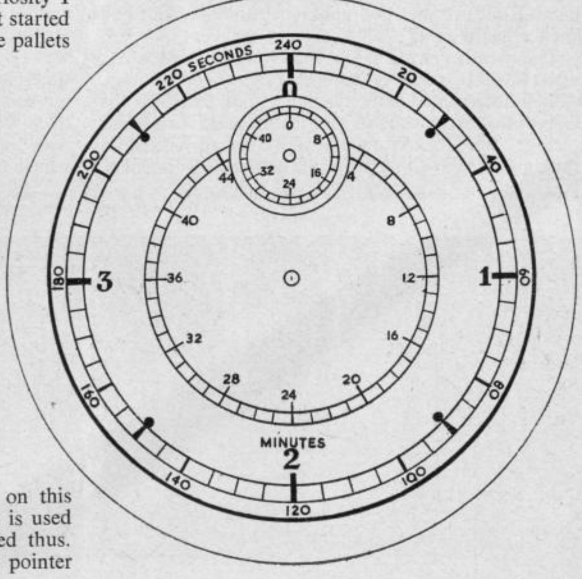
The next step was to remove 13 more of the teeth and file the rim of the escape wheel smooth, and I found that the clock ran without any trouble, so I set to and evolved the dial printed here.

It will be seen that the outer circle, on which the point of the large hand moves is divided into four minutes and half-minutes indicated by the black dots, then sub-divided into 240 seconds. The inner circle is divided into 48 minutes, and the readings on this are indicated by the small hand. The alarm is used in conjunction with this circle, and I proceed thus. Both hands are set at zero and the alarm pointer advanced the number of minutes required, and when the small hand reaches the number indicated by the alarm pointer the bell will ring.

The tick of the modified clock is quite audible and the exposing of enlargements can be accurately controlled by counting in time with the clock.

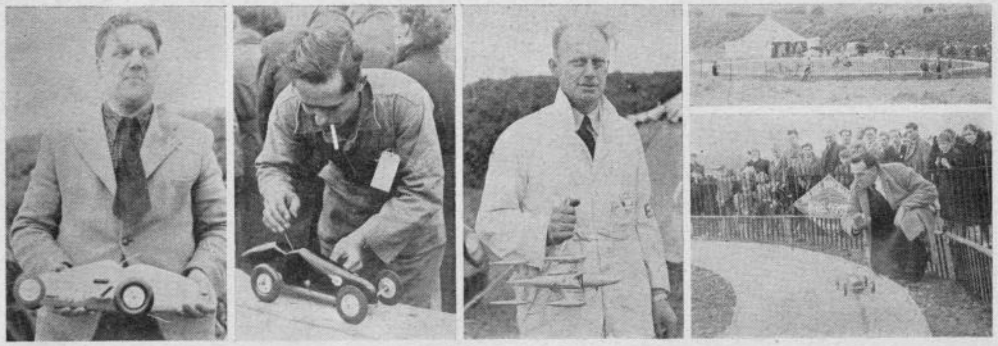
One does not need to be a clock maker to convert any standard alarm clock into this timer. Proceed as follows. Unscrew the legs, bell and bell pillar, remove winding keys and hand buttons, take off back and manoeuvre movement out of its case. Now take off hands, pointers and dial. Slightly loosen all four nuts holding the plates in position, then remove the one adjacent to the escape wheel. The opposite one is unscrewed as far as possible without actually removing it. It will now be found that the plate can be lifted sufficiently to allow the pallets and escape wheel to be removed with a pair of tweezers or thin nosed pliers, without disturbing the rest of the works. The wheels of these clocks are generally made of hard brass, and with a good pair of pliers it will be found that the teeth can be broken off close to the rim, and any roughness should be removed with a smooth file till a perfectly smooth finish is obtained.

The clock is reassembled in a reverse manner. The new dial cut from these pages, having been pasted on the old one the holes in the new one matching those in the old. It may be necessary to file the small hand to a sharper point to give a more accurate reading.



The Whitsun "Opens"

Sunderland Personalities. (Left) Jack Cook worries while Peter Hugo works. (Centre) Pit confab between B. Walker of Ossett, J. Yates of Guiseley, the 2.5 c.c. winner and L. Fozard of Ossett. (Right) Winning smiles from Bill and Mrs. Moore.



Edmonton illustrated. (Left to Right) D. Garrod with Saturday's record car, Joe Shelton with his fast Dooling, Alec Snelling displaying his remarkable all-streamlined 2.5, and two views of the new track, with Deputy Mayor starting the first car.

Edmonton's New Track

AN event of some importance to model car folk in the London area was the opening of the Edmonton Club's new track in Pickett's Lock Lane, at Whitsun. The club has had some severe setbacks in their search for a permanent home, but the new site is so located as to make any complaints about racing extremely unlikely. In fact we didn't believe that there was such a wide-open space in London, outside the parks! Future visitors to the track would do well to obtain a "map of the camp" before starting on their travels, for even in neighbouring Montague Road we met two apparent residents who had "never heard of it".

The weather wasn't too kind on Whit Monday, when a wind straight from Siberia blew over the track with uninterrupted ferocity, but it didn't disturb the Edmonton arrangements nor spoil some first class racing. The track is magnificently fenced with stout railings, lined with appropriate advertising banners, and we believe a timing hut is planned. Meanwhile, we place on record our admiration of the devoted timekeepers who sat in a flimsy bivouac all afternoon, facing into the wind aforementioned. An impressive arrangement of flashing lights on the far side of the track kept their minds off their discomforts, however, and George Thornton, cunningly concealed in the shelter of a lorry cab, put over an excellent running commentary.

The track was opened by the Deputy Mayor of Edmonton, Councillor Grant, who released L. A. Manwaring's old "Monoposto" to circulate sedately and the afternoon's programme began with a team contest for the A.E.U. Trophy, fought out between Surrey, Meteor, and the home side. The atmosphere was against high speeds generally, but some excellent times were recorded, and Edmonton managed to pull out a winning run to put them ahead of the Meteor team, consisting of Harry Howlett and John Parker with an assortment of scale and near-scale models which went very prettily. A notable feature of the racing was the despatch with which C. M. Catchpole of Surrey Club operated his 5 c.c. Dooling Special, taking something like 50 seconds to put his car on the track, hook up, push off, and record a time for the quarter!

In the individual runs, fastest time of the day was clocked by D. Garrod's 10 c.c. Dooling Special at 113.06 m.p.h., considerably slower than its Surrey form, when it established a short-lived record of 122.11 m.p.h. the previous Saturday. Eric Snelling's 89.10 m.p.h. topped the 5 c.c.s, and despite the presence of Alec Snelling's formidable 2.5 c.c. streamliner, L. Kays of Medway club scooped the smallest class at 71.42 m.p.h.

Alec Snelling's 2.5 c.c. car is a remarkable piece of work, illustrated on this page, and we should be most interested to know just what amount of difference the wheel spats make to maximum speed. This is the little projectile which clocked 76.79 m.p.h. for the ½ and 1 mile at Surrey two days before, thus claiming British and Open records.

Sunderland Open Day

It was perhaps a fitting reward for the members of the Sunderland Club that, at the eleventh hour, on Whit Monday, following a bleak and threatening morning, the weather clerk decreed that the sun would shine.

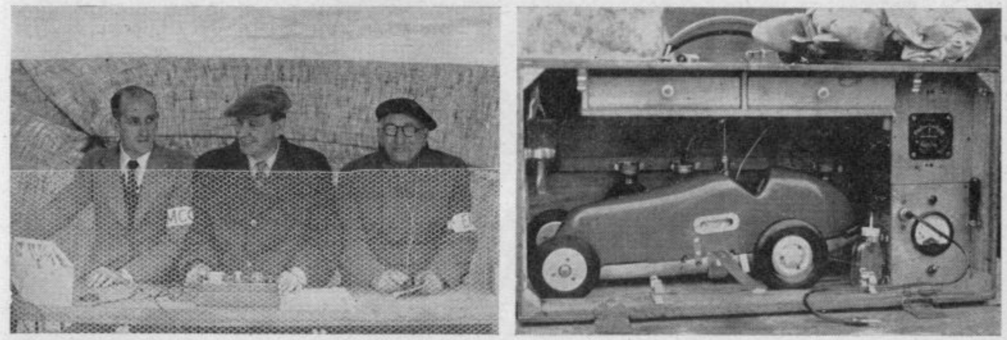
Everything that could be done to ensure the success of the meeting had been done, including a new brush finish surface on the track itself, and the advent of the sunshine, although it was still fairly cold, seemed to add the finishing touch.

The meeting was officially opened by Jack Cook (Chairman, Sunderland Model Engineering Society; Vice-Chairman, M.C.A.) at 2.30 p.m. and ten minutes later all tickets and programmes had been sold and the gates to the enclosure shut.

The visiting clubs came from as far afield as Derby, in addition to Bradford, Guiseley, Harrogate and Ossett, and speeds put up during the practice periods were such as to produce a hubbub of excitement both within the pits and the spectators' enclosure.

Sunderland Starts. (Left to Right) Jack Cook plays leapfrog, F. C. Petrie demonstrates the Lindrum touch, and Bill and Mrs. Moore show how to take the first steps in record breaking.

(Left) "Baby, its cold outside"! Gallant trio of timekeepers face the gentle Southern breeze at Edmonton. With coats on, Cyril Catchpole and E. P. Zere. Hon. Sec. Jack Pickard is made of sterner stuff. (He put his on after the picture was taken.) (Right) S. Honey's neat transport box, complete with test and charging circuits.



(Left) Midland Invasion. The Meteor Club's encampment at Edmonton, with John Parker and Harry Howlett preparing to do battle. (Right) Timekeepers and scoreboard assistants at the Sunderland track.

Regarding the actual racing, in the 1.5 c.c. event, Ted Eames of the home club had a "walk over", but did not spare his effort in spite of this, romping home with his diminutive 1.3 c.c. Mark I Mills powered sports car at 47.87 m.p.h. and 48.20 m.p.h. respectively to win the "A" grade plaque, and create a new Open and British Record (subject to confirmation) as well as the Track Record.

In the 2.5 c.c. event, Jack Yates of Guiseley won the "A" grade plaque at 61.77 m.p.h. with his ball-race Tiger engined Oliver car, having failed to return a first run, whilst Ken Proctor won the "B" medal with his B.R.M. powered by a plain bearing Tiger, at 58.25 m.p.h., the "one vigorous push" start of the latter car being contrasted by Jim Noble on the public address system to that of its larger sister. Ted Eames proved that speed was not all, and recorded two exactly equal runs at 54.54 m.p.h. in the cause of consistency.

The 5 c.c. event produced fireworks in the shape of Mrs. Moore's (Derby) 97.82 m.p.h. which was returned by her spark ignition Dooling 29 car, to win the "A" plaque, break the track record, and subject to M.C.A. confirmation, create a new Open Record. Jack Cook won the "B" medal at 80.93 m.p.h. which is regarded in certain quarters as the finest piece of "Cooking" in recent times! Jack Green was easily the fastest ETA powered car present, but did not quite touch form, returning 87.12 m.p.h., Bill Moore's new Fox Racing 29 powered car proved difficult to start, but just qualified for "A" grade after vigorous hand launching. Perhaps the highlight of the afternoon was the premiere appearance in Open Racing of Ted Armstrong's beautiful ETA powered Connaught which captivated all hearts with a rousing run at 70.36 m.p.h. In contrast, his Dooling Arrowmite gave its best run to date at 89.82 m.p.h.

Great things were expected in the 10 c.c. event following much surreptitious stopwatch clicking during practice runs and sure enough Bill Moore romped home with 126.05 m.p.h. to win the "A" plaque, break the track record, and again subject to confirmation, create a new Open Record. The fact that he sheared a taper pin during the run and therefore had to withdraw his car from the second run probably prevented an even higher speed being recorded. W. Jepson (Guiseley) with a Dooling Arrow, by masterly control, won the "B" medal at 108.95 m.p.h., whilst Peter Hugo (Derby) who had had ill luck with his new car, won the "C" class medal (was his face red!).

With the exception of the 2.5 c.c. class, new records had been created in all classes, and again, barring the previous exception the percentage of no runs was remarkably small, which ensured the easy flow of the meeting.

The public were kept well informed by Jim Noble over the public address system, as well as by the useful data contained in the programme, and the use of our "scoreboard".

The prizes were presented by Coun. Mary Burlinson, who proved a stickler in having all the facts correct, causing much high speed impromptu work on the part of Ken Proctor, who in turn presented Councillor Burlinson with a suitably engraved medal.

Surrey's Individual Handicap Event

Some fine speeds were recorded on the Chertsey Mead track on Whit Saturday, which provided more favourable weather than the two succeeding days, when the Surrey Club ran their Handicap event. A full report has not been received, but the results are given in full below. The 10 c.c. and 5 c.c. record speeds by D. Garrod and C. M. Catchpole were exceeded at Sunderland on the Monday, but Alec Snelling's 2.5 c.c. records for ½ and 1 mile remain, so far as we know, unbeaten.

M.C.A. RECORDS STANDING AT MAY 25th, 1951

Showing all records made since last issue.

In all cases the latest dated speed is the current record.

BRITISH 2½ CLASS						OPEN 2½ CLASS					
Dict.	Name	Club	Track Where Made	Date	M.P.H.	Dict.	Name	Club	Track Where Made	Date	M.P.H.
¼	F. G. Buck	Meteor	Eaton Bray	13.5.50	72.00	¼	F. G. Buck	Meteor	Eaton Bray	13.5.50	72.00
½	A. F. Snelling	Surrey	Surrey	12.5.51	76.66*	½	A. F. Snelling	Surrey	Surrey	12.5.51	76.66*
1	A. F. Snelling	Surrey	Surrey	12.5.51	76.84*	1	A. F. Snelling	Surrey	Surrey	12.5.51	76.84*
5	F. G. Buck	Meteor	Stoke	27.8.50	47.95	5	F. G. Buck	Meteor	Stoke	27.8.50	47.95
10	F. G. Buck	Meteor	Stoke	27.8.50	45.79	10	F. G. Buck	Meteor	Stoke	27.8.50	45.79
BRITISH 5 CLASS						OPEN 5 CLASS					
¼	E. V. Snelling	Edmonton	Cleethorpes	27.8.50	94.64	¼	Mrs. I. W. Moore	Derby	Sunderland	14.5.51	97.82*
½	J. T. Green	Sunderland	Ossett	4.6.50	85.71	½	Mrs. I. W. Moore	Derby	Liverpool	50	91.37
1	F. G. Buck	Meteor	Stoke	14.9.50	61.23	1	C. M. Catchpole	Surrey	Surrey	12.5.51	84.24*
5	F. G. Buck	Meteor	Stoke	27.8.50	41.6	5	F. G. Buck	Meteor	Stoke	27.8.50	41.60
10	F. G. Buck	Meteor	Stoke	14.9.50	32.45	10	F. G. Buck	Meteor	Stoke	14.9.50	32.45
BRITISH 10 CLASS						OPEN 10 CLASS					
¼	F. G. Buck	Meteor	Derby	3.9.50	114.64	¼	I. W. Moore	Derby	Sunderland	14.5.51	126.05
						¼	I. W. Moore	Derby	Ossett	20.5.51	126.76*
½	F. G. Buck	Meteor	Derby	3.9.50	113.56	½	D. H. Garrod	Surrey	Surrey	12.5.51	122.03*
1	F. G. Buck	Meteor	Eaton Bray	15.5.49	105.50	1	F. G. Buck	Meteor	Eaton Bray	15.5.49	105.50
5	I. W. Moore	Derby	Derby	16.1.49	69.77	5	I. W. Moore	Derby	Derby	16.1.49	69.77
10	—	—	—	—	—	10	P. Hugo	Derby	Chiltern	18.4.49	57.14

* Subject to no claim for greater speed, elsewhere on the same day, being received within 21 days of the date the record was set.

STOP PRESS! 1½ c.c. Claim ¼ mile E. W. B. Eames Sunderland 14.5.51 48.20 m.p.h. Both British and British Open

SURREY MODEL RACING CAR CLUB

INDIVIDUAL HANDICAP EVENT

Name	1st Run ¼ Mile 8 Laps Speed Corrected	Time 6%	Handicap	2nd Run ½ Mile 17 Laps Speed	Time	Average 2 Runs	Name of Car
D Garrod	112.05	7.55	121	122.11	14.75	117.08	Dooling 10 SPL
C. Smith	92.36	9.16	90	92.11	19.54	92.23	Dooling 10 SPL
H. Brookman	57.82	14.63	62	69.29	28.44	60.55	Oliver 2.5 Tiger
E. Bryant	58.83	14.38	63	N/R			Oliver 2.5 Tiger
G. Thornton	N/R		86.5	N/R			Dooling F Type
R. Cato	103.77	8.15	105	108.69	16.56	106.23	Dooling Arrow
F. Smith	N/R		80	N/R			Home Built SPL
C. Child	53.78	15.73	67	58.67	30.68	56.22	O.K. 60 SPL
C. J. Wilson	N/R			N/R			5 c.c. SPL
A. Poyser	N/R		105	N/R			Dooling 10 SPL
A. Snelling	107.09	7.9	118	104.98	17.16	106.03	Challenger Dooling
C. Catchpole	92.13	9.2	95	89.37	20.15	90.75	B.R.M. 5 Dooling
C. J. Wilson	N/R		64	N/R			Mercedes McCoy 20
A. Snelling	75.94	11.14	73.5	74.75	24.08	75.34	Streamline 2.5 SPL
C. Catchpole	103.93	8.14	115	105.88	17.00	104.9	Dooling 10 SPL
N. May	N/S		38	N/S			M&E 6 c.c. Stentor

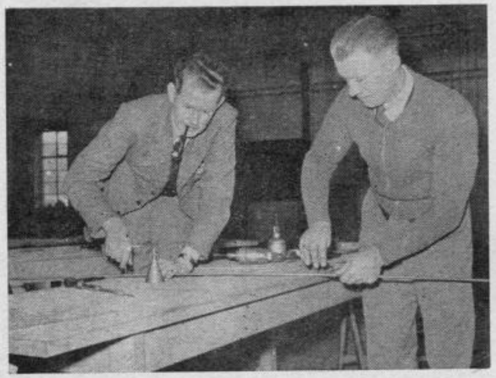
Winner C. Smith +2.23 m.p.h.; Second A. Snelling +1.84 m.p.h.; Third R. J. Cato +1.23 m.p.h.

The Meteor Club's RACING CIRCUIT

The second and concluding part of F. G. BUCK'S description of the construction of the Meteor Club's rail-track, with photographs by F. A. BUCK

Story without words. John Parker, chief tapper of the Meteor team is hard at work, pipe drawing well and not a care in the world—then —"crack"—"Oh my, oh my, whatever will Gerry say about this?"

(Below) All is forgiven, a new tap cutting nicely, and a reinforcement brought up to help to complete the night's quota. Strict discipline and no talking was the order.



Assembly was a reasonably straightforward process, the best method being to lay the section on two tables, spaced far enough apart for one of the less lengthy members to sit on the floor and insert the screws from underneath, thereafter screwing up tightly, the board having previously been drilled 6 B.A. clearance and lightly countersunk.

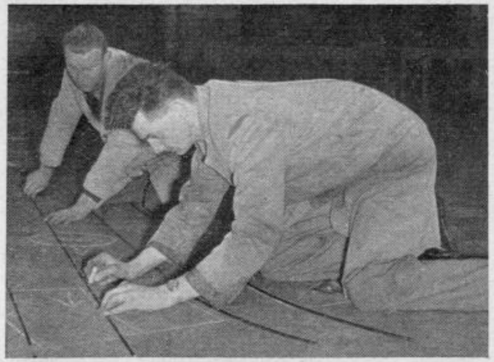
In designing the layout it was decided to simplify matters as much as possible by making all bends or curves geometric, i.e. capable of being marked out to a definite radius by means of a length of cord and a stick of chalk.

The actual bending of the rails was also a factor to be accomplished accurately, and for this job the writer designed a very elementary bending machine which proved quite successful. Although it *may* have been possible to form these bends by hand or round formers, it is strongly recommended that a simple bending machine of the type illustrated be constructed, as it makes all the difference between a smooth bend and a rough "kink", one which is liable to give the guide pulleys and attachments a hammering.

In order to minimise risk of "winding", or the producing of a curve that will not lie flat, this machine was arranged to be used flat on the floor so that the latter could act as a guide and so help bring about the desired "flatness of curve". In this point too, the object appears to have been attained.

After the marking out had been done in chalk on the boards, the $\frac{5}{16}$ in. bar was passed through the machine until it conformed with the chalk line, and then and not until then, were the ends trimmed to length and dowelled.

Incidentally, it may be well worth while to pass on a simple tip that saved much time. When received, all the $\frac{5}{16}$ in. bar was heavily coated in thick grease, which, of course, had to be removed. Scraping and wiping with rags proved a lengthy, tedious and messy process, which eventually was rendered much simpler and quicker by drilling and reaming a $\frac{5}{16}$ in. hole in a small piece of steel plate of about 16 gauge, and passing the rod through this hole. Once through was quite enough to remove 99 per cent of the grease after which the remainder was very easily removed by a petrol soaked rag.

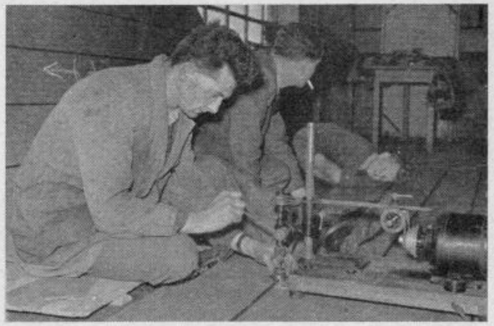


It may also be worthwhile mentioning that each section was completely finished before commencing the next, so that it could be used to ensure a really accurate alignment with the next one under construction. When things got really "warmed up", and there were enough "tappers" present, it was found that the drilling of the rail was the "bottleneck" owing to strict adherence to the aforementioned policy, but this was overcome to a large extent by working on both ends of the track at the same time, so to speak, all boards having been previously cut to shape and fitted with the locking plates which ensured alignment even before the rails were fitted.

The foregoing more or less gives a reasonable idea of the construction of this particular track, but it is felt that those wishing to embark on a similar scheme, and there are already signs that many will, may have to make serious amendments to suit their own local conditions. It is believed that at the time of writing all the materials used in our track are generally available, and we quite honestly cannot find any point on which improvement could be made, bearing in mind our available space and the fact that the track has to be laid and taken up each time it is used, and that storage space is valuable to the firm who so very kindly allow us the use of their premises.

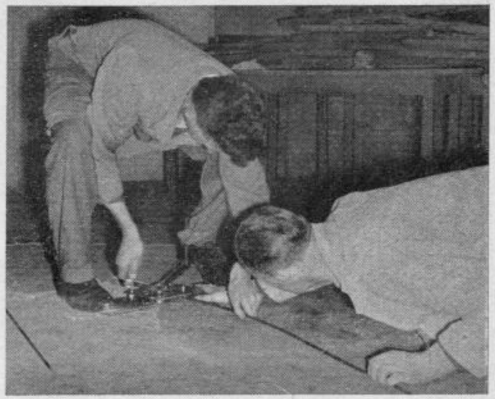
Assuming five or six members are present the entire track can be laid in about twenty minutes—rather more quickly than was anticipated; and dismantling and storing away is a ten to fifteen minutes job. Even these highly satisfactory times may be improved upon as work is now in progress on a tubular steel framework on which the sections will be stored and clamped to keep them flat, and this will be fitted with four large castor wheels to facilitate handling.

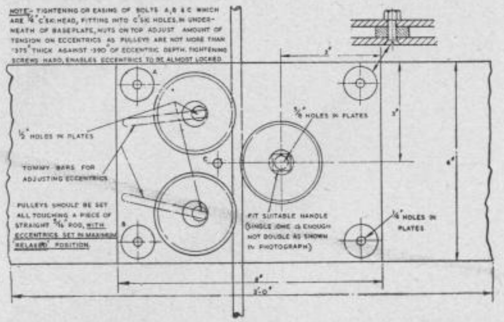
Preliminary trials with a car of 2.5 c.c. proved that although both car and track were quite capable of standing up to the strain, the speed was much too great (believe it or not!) and the cornering was unbelievable. The cars powered with engines of 1.5 c.c., however, appeared to strike a happy medium and should be just nice.



(Above left) Curves were laid out geometrically, on a radius drawn with chalk and string. (Top right) Using the spacing gauge to check rail clearance. (Above) Gerry Buck operates the portable power drill with special drilling jig which ensured centralized holes in the rail.

To facilitate rail bending this special fixture was evolved, a detailed sketch of which is given overleaf. It was used flat on the floor to obviate "winding", i.e., producing a curve which would not lie flat.





Rail Bending Jig

It was considered highly desirable that on the starting line the cars should be released by remote control, and furthermore that they be capable of being released independently if necessary in order to allow certain cars a few seconds start in the case of a handicap race. At first it seemed that a form of overhead starting gate like a row of mousetraps was the only answer, but a much neater and more effective method was finally used which consisted of four stops sliding in slots in the board and which prevented the car from moving forward when set in front of one of the guide pulleys, but which could be pulled clear by means of a thin steel strip fastened to each stop individually and passing underneath the hardboard, all four emerging side by side at one edge and being fitted with knobs or other means of operating.

Very much more could and undoubtedly will, be written on this subject in the future, but the writer quite genuinely feels that model car racing has, through the medium of H. C. Baigent's brainwave, taken on a truer and vastly more realistic aspect in which physical danger is reduced to practically nil, expense in general is considerably cut, many different types of races are made possible, including lost distance events requiring several pit stops, and the presence of an "uncle" in a strategic position overseas cannot assist in the attaining of synthetic victories!

In bringing this "Tale of a Track" to a close, the writer would like to offer thanks to Henri C. Baigent for bringing this model road racing system to his notice and for granting permission and giving assistance to the Meteor Club to make use of his patented idea.

Many thanks are also due to Ken Whiston, of Stockport, who not only supplied all the screws and nuts for the whole job, but made the club a gift of same. A most generous and very much appreciated gesture.

Salutations too, to *all* the Meteorites who worked so long, hard and well at the job, especially the members from Stafford who continually travelled a good many miles each week in order to assist in the construction. This is truly the spirit that counts and makes the whole thing worthwhile and successful.

A SIMPLE FUEL CUT-OUT

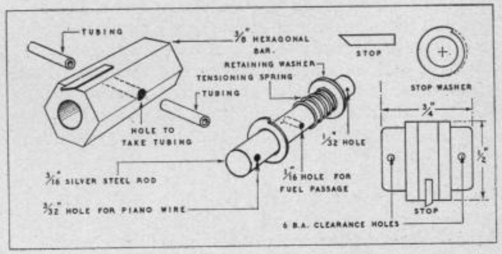
FOR cars up to 5 c.c., $\frac{3}{8}$ in. hex. rod and $\frac{3}{16}$ in. silver steel can be used with a $\frac{1}{16}$ in. hole. Over this size use $\frac{1}{2}$ in. hex. rod and $\frac{1}{4}$ in. silver steel with a $\frac{3}{32}$ in. or $\frac{1}{8}$ in. hole. The cut-out should be made as detailed below to avoid any difficulties.

First drill $\frac{1}{2}$ in. length of $\frac{3}{8}$ in. hex. rod $\frac{3}{16}$ in. dia. through its length. Do not worry if the hole is drilled too big, as this can be rectified later on. Cut a length of $\frac{3}{16}$ in. dia. silver steel about 1 in. longer than necessary. Obtain a washer slightly larger than the hex. rod and solder on the silver steel rod.

Now, with a $\frac{1}{16}$ in. drill, drill right through the hex. rod so that when the rod is on one face the drill holes are parallel to this face. This means drilling through the apex of two sides. Then solder a scrap piece of mild steel on top face of rod so that it projects a little more than the thickness of the washer. This is the stop.

Next file washer as shown so that when inserted in the hole in the hex. rod the face will come up to the stop and no further. File outside diameter down to clearance.

Insert bar in hex. rod and drill $\frac{1}{32}$ in. hole at opposite end to the stop washer. This is for inserting a piece of soft wire to hold on tensioning spring.



Use a strong spring and cut about $\frac{1}{16}$ in. oversize. Put spring over silver steel, push on a washer and bend a piece of wire through $\frac{1}{32}$ in. hole to retain the assembly together tightly.

Now turn the silver steel so that washer comes hard against stop. Keeping it in this position drill $\frac{1}{16}$ in. hole through silver steel using 1/16th in. holes already in hex. rod as guides. It is best to drill from both sides.

Remove $\frac{3}{16}$ in. silver steel and whole assembly. Now cut two small pieces of $\frac{1}{16}$ in. inside diameter tubing and open out holes in hex. rod so these are press fit inside.

Put assembly together again and push through both pieces of tubing, silver steel and hex. rod and

(*Continued on page* 512)

BOOKS TO READ. . . REVIEWS BY G. H. DEASON

"Racing Cars in Miniature"

By Rex Hays. Percival Marshall & Co. Ltd., 7/6.

MOST builders of non-working scale model cars, many of which deserve a better title than "solids", will know the author of this little book by name, and will probably recall some examples of his work. Rex Hays has been modelling racing cars for many years, and amongst other things was responsible for the design of the racing car kits marketed by Modelcraft Ltd., a series of three ($4\frac{1}{2}$ litre s/c Bentley, 3.3 litre G.P. Bugatti, and G.P. Mercedes Benz) which employed an unusual technique in their construction; namely, the extensive use of card impregnated with shellac in place of metal. This method is described at considerable length, the reader being, as it were, invited to join the author in building the old Bentley, no pains being spared to ensure that the readers spare no pains! I confess that I could have followed him with even greater enthusiasm had he chosen to describe the 1924 G.P. Sunbeam model, an illustration of which appears, somewhat tantalisingly, only in plan view, as I saw and admired this little model when it was exhibited some years ago, but this is a purely personal preference.

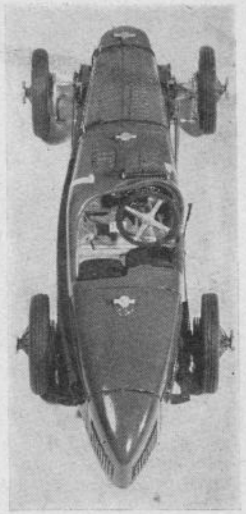
Other chapters deal with chassis and body details, and for those who like their motors sleek and simple, the building of a Type 158 Alfa Romeo is described, emphasis being always on the use of homely materials. Whilst it is admitted that the substitution of metal would produce even better models, the book is designed to appeal to those who are forced by circumstance "literally to fashion their models on the dining room table without disturbing the rest of the family by the beating of metal and the rasping of files". This point of view so enlists my sympathy that I can even forgive the author for having rather unkindly quoted a comment of mine, made a number of years ago, in a spirit in which it wasn't meant!

For the benefit of those materially-minded readers who like to know what they are getting for their money, the book contains 14 photographs, 53 line drawings and sketches, and 94 pages of text.

"Continental Sports Cars"

By W. Boddy. G. T. Foulis & Co. Ltd., 10/-.

IT has always been my contention, and I know from my correspondence that very many readers agree with me, that the model car hobby cannot be separated from the real thing, and that interest in the smaller sphere almost invariably springs from or begets interest in the larger. If things were otherwise the pursuit would rapidly lose its point and finish in a *cul-de-sac*. For this reason most model car builders find the study of prototypes a fascinating facet of their recreation, and like to keep abreast of the times with their motoring literature.



A fine model of the old G.P. Sunbeam by Rex Hays, from an illustration in his book, "Racing Cars in Miniature".

Messrs. Foulis have done much in the last few years to give the car lover the kind of books he enjoys browsing over, and their latest publication deals with a hitherto neglected aspect, that of Continental sports cars. The author, W. Boddy, Editor of *Motor Sport*, is, of course, an acknowledged authority with a very wide personal experience of his subject, which he contrives to treat with a nice blend of technical accuracy and pleasantly informal reminiscence. This is the kind of book which, if read with a reasonably retentive memory, will enable the reader with a purely superficial knowledge of the subject to pose as an expert when next he finds himself involved in one of those recurring discussions on the more obscure types!

Not unnaturally in a book of 128 pages, dealing with 71 makes, a full and comprehensive account of each is impossible, but the more famous names are dealt with faithfully. As might be expected, Alfa Romeo, Mercedes and Bugatti come in for a lion's share, and the author has the courage to devote a page and a half to sorting out those mystic Type numbers of the latter which so baffle the layman, and even some motoring broadcasters as well. Not surprisingly, strong "Vintage" sympathies are in evidence, but full credit is given to the moderns where it is due, and I particularly sympathise with the author when, having decided not to have a three-wheeler section, he just can't resist the D'Yrsan. The immortal French light cars are comprehensively described, and younger readers will find names and pictures of cars they never knew existed, such as the Lombard, that only fear of my bank manager prevented me from owning 20 years ago, and the Senechal, the headlamp of which an acquaintance of mine belaboured into a shapeless mass of metal with his starting-handle, after using said handle legitimately and fruitlessly for half an hour!

The book is very well illustrated, and an ideal companion volume to Gregor Grant's *British Sports Cars* published by the same firm.

E. ARMSTRONG MAKES A 5 c.c. POWERED SPORTS MODEL OF THE

Connaught Competition 2 Str.

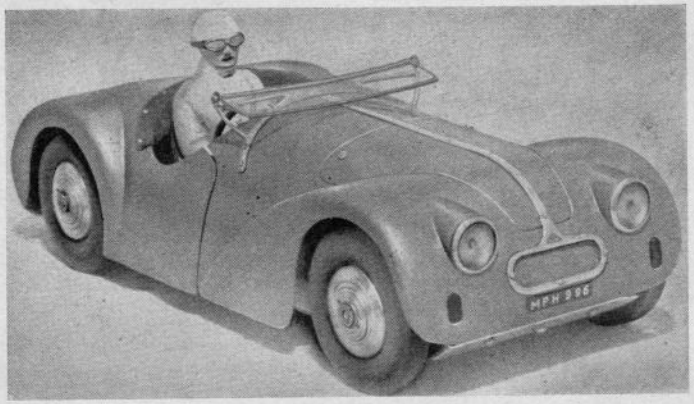
THE urge being upon me during the closed season to build another car, the question arose, what? Having at hand an ETA 29 job which was badly in need of a rebuild, and a great liking for the simple styling of the Connaught, a combination of the two provided the answer.

If the readers will bear with me, I would like to mention that I was one of the first to use an ETA 29 in a car (May, 1949)), and that the layout of the car has remained the same through two full seasons, without any major troubles. The only thing that puzzles me is that it always runs better away from home!

The result was that the engine unit, gears, etc., were already available, a considerable saving in both time and money. A successful correspondence with Rodney Clarke, of Connaught Cars, Ltd., produced some excellent photos and full-size dimensions. Also a little bird whispered that an article on the subject was to be forthcoming in "Prototype Parade". Now, I thought, having all the information, photos, drawings, etc., at hand, I could make a start, but no—first it was necessary to move house, and in so doing reorganise my workshop.

To get on with the model, it was decided to use the existing wheels, 2$\frac{3}{4}$ in. Z.N. combined with 1$\frac{1}{2}$:1 E.D. gears as before. This worked out to be approx. 1/12th scale, giving a wheelbase of 8$\frac{7}{8}$ in., and a 4$\frac{3}{4}$ in. track. The "chassis" is straightforward, being a sheet of 18 s.w.g. aluminium 12$\frac{1}{8}$ in. long x 3$\frac{7}{8}$ in. wide with a $\frac{1}{2}$ in. turn-up all round. The engine unit is at the front with the centre line of the cylinder at approx. 30 deg. to the horizontal, and offset $\frac{5}{8}$ in. from the centre line of the chassis.

The rear wheels are 2$\frac{3}{4}$ in. dia. Z.N. ball bearing wheels connected by a cranked strip of 16 s.w.g. stainless steel with stub axles brazed on the ends. The wheel hubs are standard Z.N. all round, modified slightly to give more scale effect. The "urge" now installed, and the chassis supported at four corners, the problem of how to get the body made, and a suitable medium arose. Panel bashing would have been ideal—if I could panel bash! Papier mache is apt to be messy, so back to the balsa butchery and a fretsaw.



(Above) The front of the Connaught model is arranged to hinge as in the original, revealing the somewhat unorthodox position of the 5 c.c. Eta engine, and giving access to the fuel tank.

(Left) An extremely realistic effect has been achieved by the carefully thought-out use of balsa and plywood in building the distinctive body.

(Opposite page) Two further views of the 5 c.c. Connaught model. The boot lid lifts to admit the push-stick and battery leads to the glow-plug sockets. All detail work has been faithfully carried out, and our only criticism is the illegally small number-plates.

(Photos : W. Thompson)

It was deemed necessary to follow the style of the prototype, and make the bodywork forward of the dashboard hinge from behind the front number plate, giving the necessary access to the tank, etc., without removing the body.

The front wings were made of frames of $\frac{1}{8}$ in. balsa supported by $\frac{1}{16}$ in. ply, joined by $\frac{1}{4}$ in. square beech at the front and highest point, and by a ply and balsa former at the rear. Next a sheet of 1 mm. ply was glued to the front and pulled over to the rear to form the top of the wings. Then followed the trickiest development of the lot, namely the shape of the bonnet. Two trial pieces of cardboard, and a template for the 1 mm. ply bonnet was ready. With the bonnet in position the whole of the front was strengthened up internally by several gussets of balsa wood and then put to one side, for the time being.

A similar procedure was followed for the rear half of the body, the dashboard forming the crosspiece at the front, the seat support in the centre, and at the rear block balsa was used to allow for forming the well-rounded tail. After the glue had set, the boot cover was cut out and replaced by a piece of thin aluminium. Three small brackets were fitted, one at the rear and one at each side below the dashboard, which serve to hold the rear half to the chassis.

The main former of the body being completed, the various fittings were made; the two bucket seats out of balsa, covered with green leather, a mottled aluminium instrument panel on the sandwich principle. The headlamp fairings were built up with plastic wood, fitted with aluminium rims and "Perspex" glasses; a brass steering wheel with spring steel spokes painted black and silver came next. The hood canvas was a workshop duster which happened to be handy. I apologise to the ladies for the stitching.

A "Perspex" windscreen on an aluminium framework, number plates, licence holder, bonnet studs and boot handle completed the accessories. After drilling the necessary holes for their fitting they were put aside whilst the body was painted.

Several coats of banana oil, a touch of plastic wood here and there, followed by half a dozen coats of polychromatic light green cellulose rubbed down between coats with "wet and dry", and two finishing applications of hot-fuel proofer completed the exterior. The interior was painted black and protected with fuel proofer.

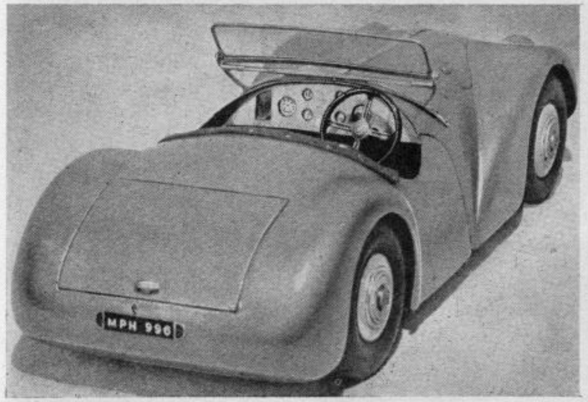
The fittings were replaced and the two halves of the body fitted to the chassis, so that I might see how much room was left for a tank. Quite frankly, there wasn't much. However, by dint of much fiddling, a satisfactory, if rather small tank was constructed of brass sheet connected by a fuel valve to the engine. The cut-off valve works in the horizontal plane. Incidentally, I always make my tanks to metric dimensions so that capacity calculations are simplified.

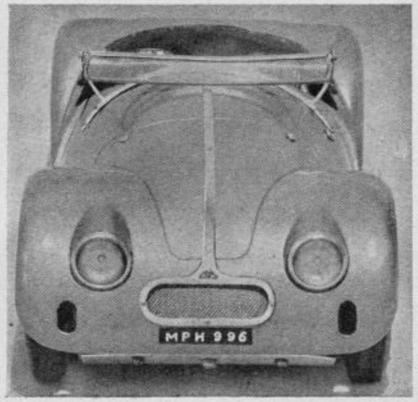
Tank capacity is a point rarely mentioned, but after all there is no point in carrying excess fuel around. Personally I consider 25/30 c.c. ample for a "fiver", allowing for warming up and a full quarter mile with a few drops to spare if it is necessary to do the half-mile. However, I am digressing, and to continue: the glow-plug connections are under the boot lid, this being spring loaded to close after withdrawal of the two-pin plug and battery leads.

The tethering arrangements consist of a stainless steel panhandle of $\frac{1}{2}$ in. x $\frac{1}{8}$ in. streamlined section, to the latest specification of the M.C.A., i.e., 9-10 in. from apex to centre line of body. Unusual perhaps for a scale model, but simple to fit and effective.

As to performance, the Weather Clerk has put paid to outdoor trials in the north-east for the moment. In the previous car, however, the ETA 29 managed a fairly consistent 80-85 m.p.h., and it will be interesting to see just how much difference a heavier and more enveloping body will make.

STOP PRESS.—First trial run — 68.91 m.p.h. Running rich, weather cold and windy. No bits fell off!



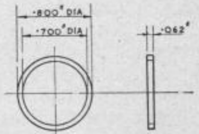


model maker IN THE WORKSHOP

Constructing a 5 c.c. RACING ENGINE Part IV

Continued from last month by

G. M. BARRY



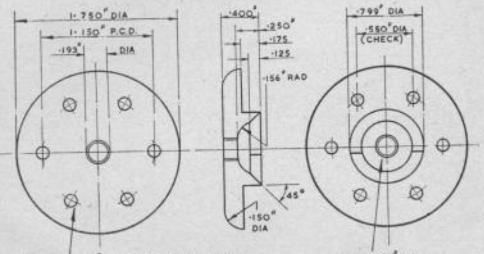
PISTON RING
CENTRE CAST IRON. 2 OFF

Piston Rings

THE piston rings are to be made from cast iron. The same remarks apply to these as to the cylinder liner, i.e. use centricast or meehanite, if you can get it. I also think that steel rings, if properly hardened, would be very suitable, but I have no experience of them. So let the rings be cast iron.

Chuck the piece of bar 1.00 in. dia. in the 3-jaw, leaving about 1.00 in. to 1.500 in. out. Drill .3125 in. dia. for 1.500 in. deep, open out to .625 in. dia., then bore to 762 in. dia. Turn outside to .925 in. dia., for length projecting from chuck, and using a narrow parting tool, part off rings from bar, making them .0625 in. thick. You should get a dozen or so rings, depending on length of bar. Face both sides of each ring, first by rubbing on medium grade emery paper, laid on steel or glass plate, second, same process using fine paper, and third, finish by lapping on plate glass, using fine carborundum paste. Make all rings the same thickness within .002 in. or so. Now sawcut all rings at 45 deg., .062 in. wide cut. You will not find any difficulty in doing this, if care is taken when sawing the gap. No jig is necessary, as the angle can be judged sufficiently accurately by eye, and the only precaution I take is to hold each ring in the vice between two pieces of ground $\frac{1}{4}$ in. plate, leaving just enough of the ring proud to clear the sawcut. I cut the gap with an Eclipse Junior saw, and then use a fine flat Swiss file to open out each gap to .062 in. Use a piece of strip stock as a gauge for the gap. Get as good a finish as possible on ends and sides of rings. Cut all the ring gaps at this stage.

Now chuck a piece of .875 in. dia. mild steel (or aluminum or brass) in 3-jaw and turn a step on it, of sufficient length to accommodate all your rings, leaving the last one proud, about .025 in. That is to say, if you have 12 rings, each one .062 in. thick the length of step will be .719 in. (.744 in. less .025 in. = .719 in.). The diameter of the step on bar should be such that it will allow the rings to be a nice slide fit, when gap is closed. So take one of your rings, squeeze to close the gap, and try it on step, turning the step down until ring will slide on. Drill down step piece from tailstock, .213 in. dia. x 1.00 in. deep, and tap .250 in. dia. Whit. or B.S.F., again from tailstock drill chuck. Obtain a large washer, .875 in. dia., with .250 in. dia. hole, and a .750 in. long, .250 in. Whit. or B.S.F. set screw. Put your rings on step piece, put washer on screw, and screw into step piece, until rings are just pinched. Now close each gap, and further tighten screw. Check each ring, making sure that each gap is closed, then finally tighten screw. Many methods have been described or suggested for closing all the gaps together, jubilee clips, adhesive tape, string, strip steel clamps, etc.; all have their merits, I suppose, but using the method described, I find it possible to close each gap separately. If however, you have any difficulty in doing this I would advise you to turn a sleeve, same length as step and with a bore which will just allow a closed ring to enter. Place rings on step, slide sleeve over them, then fit and tighten up screw and washer. Then slip sleeve off. (Obviously, using this method, the washer must be about .075 in. less on diameter than bore of sleeve to allow it to slide off.) Having got rings closed and clamped, turn to .800 in. dia. — 1 over whole length. Get as good a finish as possible on rings, and if necessary finish by lapping. It is possible to dispense with this, however, and to finish rings to a high polish with blue-back emery. Rings should now be a tight fit in cylinder liner. Don't worry about this, as when the engine is assembled and motorised over, you will find that the "bedding in" which will take place between rings and liner, will give you the required clearance. It is sometimes found necessary to lap rings into liner. To do this fit rings on piston, and using either connecting rod, or a piece of steel strip in place of rod, work piston up and down cylinder bore, turning it, as it goes up and down, and using metal polish as the medium for the lapping. This method can give a very fine finish indeed, and is usual in full-size practice when fitting new rings to motor-cycle engines. I consider, however, that it is additional to, and not in place of, the "motoring over" process. This completes rings.



6 HOLES ·128" DIA EQUALLY SPACED ON 1·150" P.C.D. N.B. IT IS IMPORTANT THAT THESE 6 HOLES BE CORRECTLY POSITIONED RELATIVE TO CYLINDER HEAD DEFLECTOR CUTOUT.

CYLINDER HEAD
ALUM OR DURAL. 1 OFF.

Cylinder Head

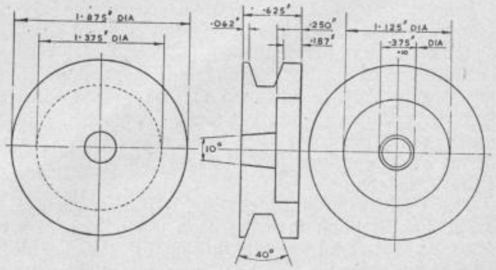
This can be made either from solid stock or from a casting. Unless a die casting is used, I think it preferable to machine from the solid. I have found that the amount of cleaning up to be done on a sand casting is so great and the general finish so poor, that one generally ends up by machining all over, anyway! There is, too, much less danger of porosity, using bar stock, and a much wider choice of materials. So I think it may be safely said that it's both easier and better to produce from solid, than from sand casting. In any other head design, either finned or with special internal shape, this might not apply, but here I think it does. The material may be dural or aluminium. Chuck a piece of 1.750 in. dia. bar in 3-jaw, leaving 1.00 in. out. Turn to .799 in. dia. for .175 in. length. Drill .193 in. dia. for .500 in. depth. Open out to .550 in. (approx.) dia. for .250 in. deep, using a boring tool with a .156 in. radius at tip. (This is, of course, not critical.) Set over topslide to 45 deg. and chamfer this bore .125 in. deep. Part off (how easy it is just to write this!) leaving a piece about .450 in. thick. Re-chuck on small diameter, and face off large diameter, making piece .400 in. to .450 in. thick. Put a .150 in. radius on edge, and tap centre hole .250 in. dia. x 32 t.p.i. for glowplug. Remove from chuck. Take a piece of mild steel or dural plate, about 2.00 in. dia., and .050 in. thick (.062 in. will do), mark off and centre pop centre of plate. From this centre, scribe two circles, of .400 in. and .575 in. radius respectively.

On large circle, mark off six equal arcs, and centre pop on each bi-section. Chuck plate in 3-jaw, so that scribed circles run true, and bore out centre to .800 in. dia. Remove from chuck and drill the six centre pops .104 in. dia. Place this disc on head, locating by centre hole in disc, and spot through for holding-down screws. Without moving disc, and using scribed centre line as guide, file a slot .062 in. wide across head spigot, apart from centre line by .031 in., as shown on drawing. File groove down to plate (if .050 in. thick no further filing is required—but if .062 in. thick, file a further .012 in. out). Remove plate, drill spotted holes .128 in. dia. This completes cylinder head.

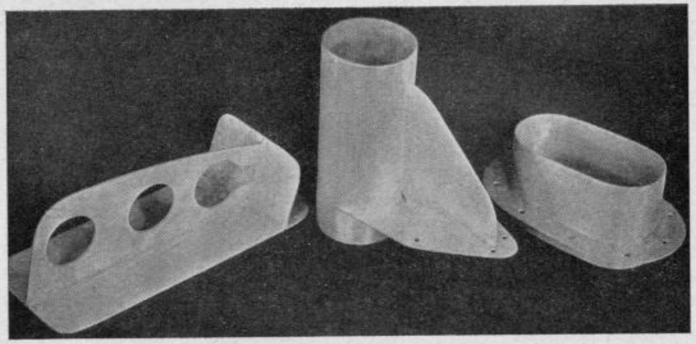
Flywheel

This is to be made from mild steel. Obtain a piece of mild steel bar, 1.875 in. dia. x .750 in. thick. Chuck this in 3-jaw. Face side, and drill through .250 in. dia. Place boring tool in toolholder, and turn recess 1.125 in. dia. by .250 in. deep. Set over topslide 5 deg. and bore and taper until large end is just under .375 in. dia. When boring this taper turn the bore to suit your crankshaft, and keep trying as you near the size to ensure a good fit, and so that the flywheel does not go completely on taper. I feel I ought to apologise here to anyone who may be making the engine, because the flywheel would have been better made at the same time as the crankshaft so that the tapers would have been turnd out with one setting of the topslide. However, if care is taken, and the topslide adjusted, if necessary, a good fit can be made. Incidentally, another omission. When turning the taper in flywheel, use the boring tool upside down, and take the cut on the far side of the hole. This is necessary to ensure concentricity for the next operation. When bore is completed, remove flywheel from chuck and chuck a piece of .500 in. dia. steel or brass bar, leaving about 1.00 in. out. Without altering setting of topslide, but using a normally positioned tool, turn a taper on this piece, until flywheel blank will just nicely fit. If your tapers are good, this is all that is required, but if you are at all uncertain, or prefer to take all precautions, drill and tap piece for a 2 B.A. set screw. Use this and a washer to hold wheel in position. Centre drill head of screw, and bring up tailstock centre for support. Take a skin cut over edge of wheel, to ensure absolute truth in running, and in the process, reduce width of wheel to about .625 in., though this is not at all important. Now turn the groove. This can be done, either by grinding a tool to 40 deg. included angle, and machining groove by traversing carriage backwards and forwards while feeding tool in, or by using a parting tool and setting over topslide 20 deg., turning one side of groove, resetting topslide to 20 deg. other side of zero and turning other side of groove. I myself use and prefer the first method, which I consider both quicker and easier. Turn the groove to about .250 in. wide at top, though of course, this is not important. Slide back tailstock, remove screw and washer, if used, and take a finishing cut over face of wheel, cleaning off where washer fitted in the process. The flywheel may now be ground into the crankshaft taper, using flour emery and plenty of oil. This completes the flywheel.

(Part V of this series will appear in the Aug. issue.)

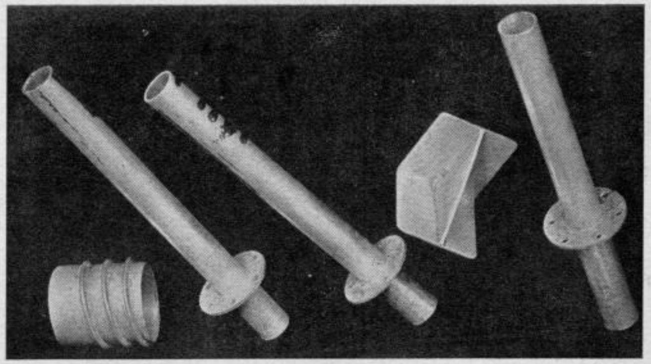


FLYWHEEL
STEEL. 1 OFF.



Flame BRAZING OF ALUMINIUM

AN AUTHORITATIVE ARTICLE SPECIALLY PREPARED BY A. T. COX OF THE BRITISH OXYGEN CO. LTD. FOR MODEL MAKER READERS



These two illustrations by The British Oxygen Co. Ltd. show a variety of small parts in light gauge aluminium sheet that have been successfully flame brazed.

THOSE familiar with fusion welding of light gauge aluminium sheet will appreciate the difficulties often encountered when welding is specified for joints near edges such as narrow fillet or close corner joints. Fusion welding under such conditions is at best very difficult, due to the melting back of one or both edges. Blueprints of small sub-assemblies often indicate a fillet weld with a short upstanding edge fully retained, a joint that is almost impossible to execute, and calls for the highest degree of welding ability.

These troubles can be largely overcome by "flame brazing" using silicon aluminium filler rods. This process has the advantage that the low melting point filler metal percolates around and into the joint, driving out flux which would otherwise become entrapped, and more particularly, eliminates the danger of melting away edges or projections which must be retained in their correct profile or condition. The bond is made at a temperature well below the melting point of the parent material.

It will be observed that the advantages of flame brazing which make it suitable for production of small components from aluminium sheet and extrusions are also directly in line with the requirements of the model maker.

Aluminium brazing is a relatively simple operation if attention is paid to certain fundamental principles.

Parent Material

Brazing has been employed on commercial aluminium and to a lesser extent on some types of alloy. Commercial material of the L.4, L.16 and L.17 type is brazed most readily. Aluminium magnesium alloys within L.46 specification can be brazed satisfactorily, provided the magnesium content is not more than 2 per cent. The same remarks are true of the aluminium-manganese-magnesium alloys.

Filler Material

The filler material or brazing rod must have a lower melting point than the parts to be joined. It must be clean and smooth flowing in action, with good penetrative or "wetting" powers which cause it to flow into and around the joint readily as soon as its melting point is reached. It must do this before the temperature in the parent part causes sagging or plasticity. Such a filler material is the B.O.C. "Silotectic" rod, 10 per cent to 12 per cent silicon. This rod has excellent mechanical properties and is ideal for the flame brazing of aluminium.

A copper-silicon-aluminium rod with a lower melting point—the B.O.C. "Alcubraze"—is also available and should be used where the melting temperature of the "Silotectic" appears to be too high for the job in hand. The melting point of "Alcubraze" is about 27 deg. C. lower than that of "Silotectic".

Owing to its copper content, some consideration will need to be given before using "Alcubraze" where extremely corrosive conditions are likely to arise. Apart from this it is normally interchangeable with "Silotectic" and has the further advantage of being amenable to heat treatment of the work after brazing, so as to restore the full mechanical properties of the parent material.

Flux

Borax base fluxes used for brazing metals other than aluminium are not suitable. A flux which will remove the oxide (alumina), and will melt at a temperature below the melting point of the rod, is essential for easy operation. The flux when heated to its liquid state must spread or flow smoothly and cleanly ahead of the molten filler metal.

A specially compounded flux for brazing is the B.O.C. Aluminium Brazing Flux in powder form. It flows rapidly ahead of the filler metal and greatly assists the brazing operation, by "wetting" and cleaning both the joint and brazing metal so causing the latter to spread quickly and smoothly and penetrate the joint.

Strength of Filler Metal and Joint

When using the 10 per cent to 12 per cent silicon-aluminium alloy, every confidence can be placed in the physical properties of the joint produced. It has a Brinell hardness of 47 and a melting point of 585 deg. C. This melting point gives it a temperature range or latitude of 73 deg. C. between it and commercially pure aluminium sheet whose melting point is 658 deg. C. This temperature difference is sufficient to allow a welder of average skill, after some practice, to make a brazed joint of full strength without melting the parent metal.

Fuel Gas Employed

For aluminium brazing the oxy-acetylene flame is much to be preferred. The greater temperature and localised heat concentration enables the operator to generally preheat the part at or about the joint fairly rapidly, and then by blowpipe manipulation to apply the additional heat to brazing temperature close to and alongside the joint without danger of melting small edges or projections which may be near the point of the brazing operation.

A further advantage of the oxy-acetylene flame is that the operator can concentrate upon the flow of the filler metal without having to divide his attention by watching this and other parts of the structure, which, with a greater heat spread might tend to collapse. This is especially true of some of the "brazeable" alloys with melting points nearer the fluid temperature of the filler material.

Equipment

Standard welding equipment is used, but care must be exercised in adjusting the flame to strictly neutral conditions. For this reason it is desirable to use a high pressure blowpipe and two-stage type regulators. This ensures that steady and stable flame conditions are maintained. The power of the blowpipe used is usually a little less than would be used to fusion weld the same part. For very small assemblies a nozzle one size smaller than for fusion welding working at standard gas pressures will be found to be more effective than the larger nozzle with gas pressures reduced. This is because a flame at standard gas pressures has a better "driving" effect, so causing the fluid filler rod to drive or run ahead more readily.

For large assemblies, or greater mass of metal, the nozzle as would be used for fusion welding is necessary to compensate for greater heat loss by radiation or conduction.

Flame Adjustment

The flame must be adjusted to the strictly neutral condition as previously stated. After lighting the acetylene flame the blowpipe oxygen valve should be opened slowly until the inner cone is well defined, but with a slight haze or mistiness around its point. This haze should be as small as possible; if the cone appears "ragged" it is burning with an excess of acetylene, which is definitely incorrect for a neutral flame or for brazing aluminium.

Adjusting the flame as described is desirable because as the nozzle becomes hot the flame tends to revert to slightly oxidising conditions, so losing the mistiness. This condition is then a visual tell-tale, or indication to the operator of what is happening, and he should immediately rectify or re-adjust his flame when the haze disappears.

Preparation

Press fits and very close tolerances are not recommended since diffusion is apt to render the molten filler metal rather less fluid during brazing, resulting in incomplete penetration. Slight clearances are advisable to enable complete penetration of brazing metal and flux to be obtained. The amount of clearance should be determined by trial, but as a general rule it may be said that the wider the lap, the greater the amount of clearance necessary.

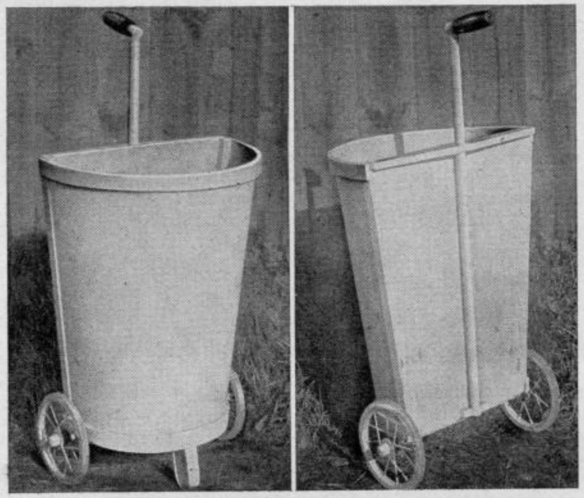
Commercially pure aluminium sheet can be brazed without mechanical removal of the normal surface shine or oxide film provided the sheet is new and clean, and the surface is free from grease or other foreign contamination. Degreasing can be carried out by a quick dip in an organic solvent such as carbon tetrachloride, or trichlorethylene. The brazing operation should be completed as soon after degreasing as is practicable. The line of joint or surface area which will receive the brazing metal should not be handled unnecessarily between the degreasing and the brazing operation.

Aluminium alloys must have the surface oxide removed mechanically by brisk scratching with a piece

(*Continued on page 508*)

A Wheeled Shopping Carrier

H. E. WHITE DESCRIBES A USEFUL DOMESTIC "BRIBE"

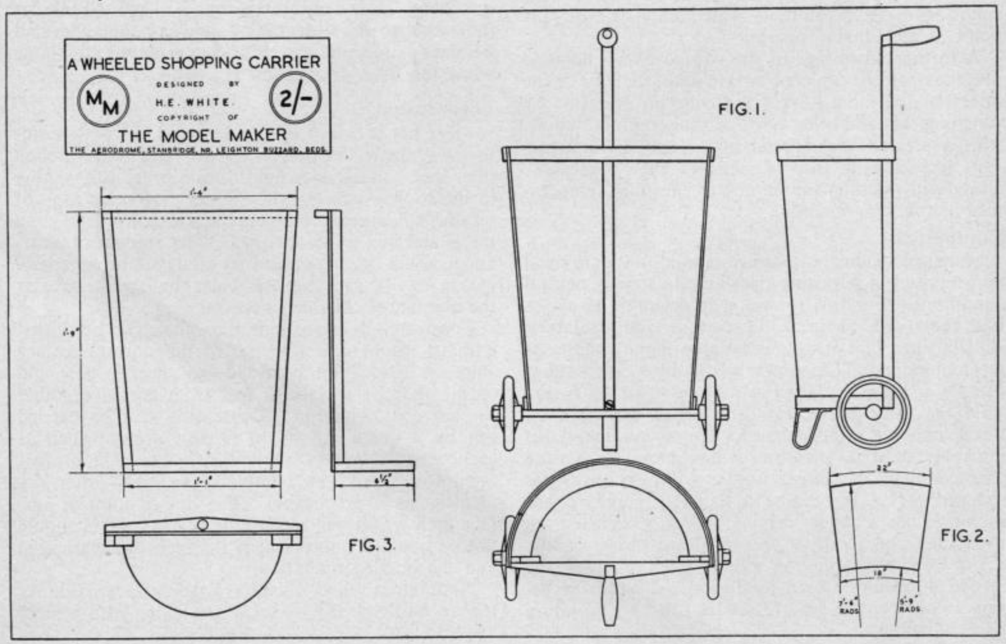


On the left: Front and rear view of the wheeled shopping carrier. Below: The pleased recipient of the prototype carrier demonstrates its use. (Photos by the author)

THIS is a simple piece of domestic utility engineering which may appear at first sight to be a little removed from the more usual amateur engineering job. It is, however, well within the capability of the average amateur or model engineer, and his Domestic Authority may be more inclined to view his activities favourably if he can turn his attention to the production of domestic equipment occasionally.

The acquisition of a pair of pram wheels, complete with axle, gave rise to the original idea, and the design given will be found to be suitable for use with almost any type of similar wheels.

Make the back of the body first. This is cut out from a piece of plywood or hardboard, to the size and shape shown in Fig. 3, and edged on the two sides with $\frac{3}{4}$ in. square beading, glued and nailed. No beading is needed at the top edge, because this is stiffened by means of the stretcher forming the housing for the tubular handle. This stretcher is shown in the plan view in Fig. 3 and is cut out from $\frac{1}{2}$ in. x $1\frac{1}{2}$ in. wood. When the stretcher has been glued and nailed in place, the semi-circular baseboard should be cut out and nailed on. In these days of timber shortage, it will probably be necessary to build up this baseboard by glueing together two or three pieces of wood about $\frac{3}{4}$ in. thick: they should not be less than $\frac{1}{2}$ in. thick.



The Curved Front

To make the curved front of the body the following procedure was adopted. First of all select a piece of plywood or thin hardboard (I used an old piece of $\frac{1}{8}$ in. thick material which had already served many other purposes). Cut it roughly to the shape shown in Fig. 2. Now make up a temporary top-piece for the body, in the form of a semi-circular "lid" which can be lightly nailed to the back-board, leaving a little of the nails projecting so that they can be easily withdrawn when the front is built up. This temporary "lid" forms a bending jig both for the front of the body, and the beading for the top edge. Apply the front piece, bending it round to fit the two semi-circular boards at the top and bottom, and glue and nail it to the beading at the sides of the back-board, and to the baseboard. Do not nail it to the temporary "lid". The easiest way to make up the beading which is fixed round the top and bottom edges of the curved front is to use laminations of $\frac{1}{8}$ in. thick wooden strips. Strips of wood — preferably hardwood of some kind — are cut to size (1 in. x $\frac{1}{8}$ in.) and glued and nailed one over the other, three layers being used. The glue used throughout the job was one of the well-known casein glues, although one of the modern synthetic adhesives would probably be better, as they are quite waterproof. When the glue is set, the temporary "lid" may be carefully removed, and all superfluous nails withdrawn.

Undercarriage

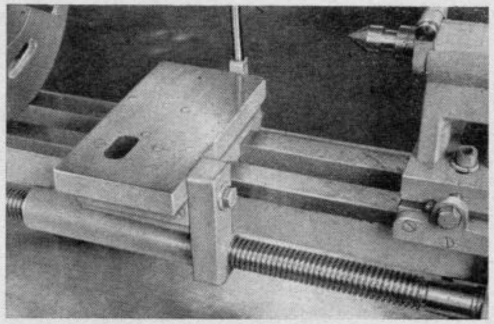
This is very simple. Turn the body upside-down and fix the axle in place with a couple of screws. If the axle has not already been drilled for the screws, drill it. A skid should be bent up from strip steel and screwed in position as shown; this skid acts as a support which enables the carrier to stand upright.

Handle

Most of these handy little appliances are fitted with a handle made from a walking-stick, but my engineering instincts got the better of me, and a steel handle was provided. This is easily made from a length of $\frac{5}{8}$ in. o.d. steel conduit tubing. One end is filed to "saddle" the cross-piece which forms the handle, and the joint can then be brazed with a blowlamp or gas blowpipe. All open ends are then plugged with hardwood, and a neat finish can be given to the handle by purchasing a rubber handle-grip from the local cycle shop. To fit this securely, ordinary insulating tape is wrapped round the handle until it is a tight fit inside the rubber grip. Apply rubber solution to the wrapping before slipping the rubber grip into position: this will make it easy to fit, and will prevent it from coming off.

The other end of the tube is passed through the hole in the stretcher which was nailed across the upper edge of the backboard, and its lower end is fixed at the bottom with a c.s. wood screw which passes right through a hole drilled through the tube and its plug, and into the baseboard.

All that now remains is to give the whole job a couple of coats of paint. I used a light green paint for my carrier, and my wife now enjoys the envy of her neighbours, who please her immensely by asking her where she bought it—a great compliment to an amateur mechanic!



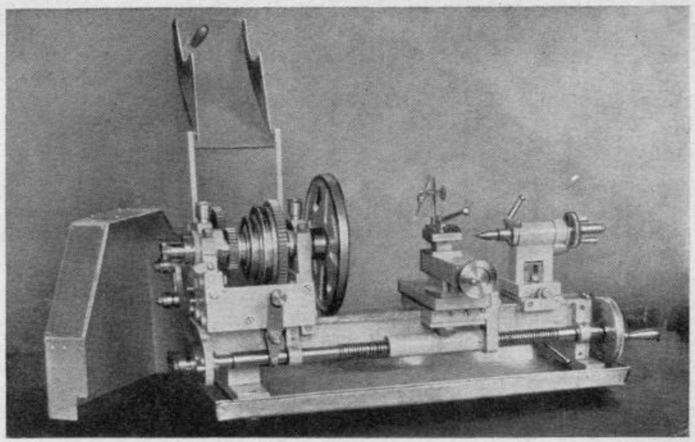
Building a Lathe

PART I

CONSTRUCTION OF BED, HEAD, STOCK & SADDLE

By J. A. MURRELL

This lathe will be described in four monthly parts, with appropriate reduced scale drawings. These can be ordered as a set at the completion of the series, or may be obtained month-by-month at 2/6 per single sheet.



Above: The completed 3 5/16 in. Screw-cutting Lathe, which has all the appearance of a high-class "manufacturer's" model, thanks to the detailed attention to finish. On the left: A close-up picture of the saddle.

THE lathe illustrated was constructed in a small workshop using only scrap and easily obtainable stock.

It will be seen that a great deal of $\frac{5}{8}$ in. plate is used in the construction. In the case of this machine, the $\frac{5}{8}$ in. plate started life as a stove bedplate about 18 in. square. Many other parts are made from short ends of bar, the majority of which can be found in any scrap yard.

The only castings used are home-made aluminium ones, the alloy being obtained from a broken washing machine.

The back gears are standard lathe changewheels of 16 D.P., two of 30 teeth, and two of 70 teeth. Three of these were from a scrap heap, the other being made.

All the work, apart from one back gear and a little welding on the tailstock, was carried out in the workshop, the machines used being a 4 in. lathe and a power drilling machine. Milling was carried out on the lathe, the only cutters used being three end mills, 1 in. dia., $\frac{3}{4}$ in., and $\frac{1}{2}$ in. dia.

The changewheels are made from $\frac{1}{4}$ in. mild steel plate, and at the moment are in the course of production, a home-made gear-cutting attachment being used to cut them.

The experts among us may find much to criticise in the design, but it must be borne in mind that this lathe was designed around the material at hand, the only special order in this case being a length of $1\frac{1}{4}$ in. dia. silver steel for the mandrel.

The finished job, however, is very strong and capable of high class work.

The specification is as follows:—

Height of centres	$3\frac{5}{16}$ in.
Admits between centres ...	9 in.
Pitch of leadscrew	8 t.p.i. sq. thd. L.H.
Centres	No. 1 Morse Taper
Swings over saddle ...	$4\frac{1}{2}$ in. dia.
Bear gear reduction ...	5 4/9
Changewheels	20 D.P.
Set over tailstock	

Speed Range:— 50, 92, 167, 274, 500, and 915 r.p.m.

The Bed

The bed was made from $1\frac{1}{2}$ in. x $\frac{3}{4}$ in. B.M.S. and some short ends of 1 in. x $\frac{3}{4}$ in. B.M.S.

Two pieces of the $1\frac{1}{2}$ in. were cut off $19\frac{1}{2}$ in. long and the ends squared up, using a 1 in. end mill in the lathe.

Next the two distance pieces were squared up, one piece 5 in. long, and one piece 1 in. long.

The parts were then placed on a surface plate and clamped firmly together and drilled and reamed for the $\frac{1}{4}$ in. dowel pins.

The dowel pins were fitted and the bolt holes were drilled and tapped. After bolting the pieces together, the bed was scraped flat and square.

Next the feet and distance pieces were cut off to size and drilled as shown. Using one of the distance pieces as a jig, the underside of the bed was drilled and tapped and the feet and distance pieces were then bolted into position.

The bed was now complete except for some more holes which were drilled later.

The Headstock

The headstock is built up from $\frac{5}{8}$ in. plate M.S. or C.I.

In my case this was made from the stove bedplate. The pieces were roughed out by drilling and sawing and then finished to shape on the lathe, using a 1 in. end mill in the chuck, the job being clamped to the topslide.

The angle bar was cut to size, the heavier section being at the back as shown. The whole lot was then drilled and tapped and bolted together.

The job was then mounted on the faceplate and the tops of the end plates faced down to the required centre height, in this case $3\frac{5}{16}$ in.

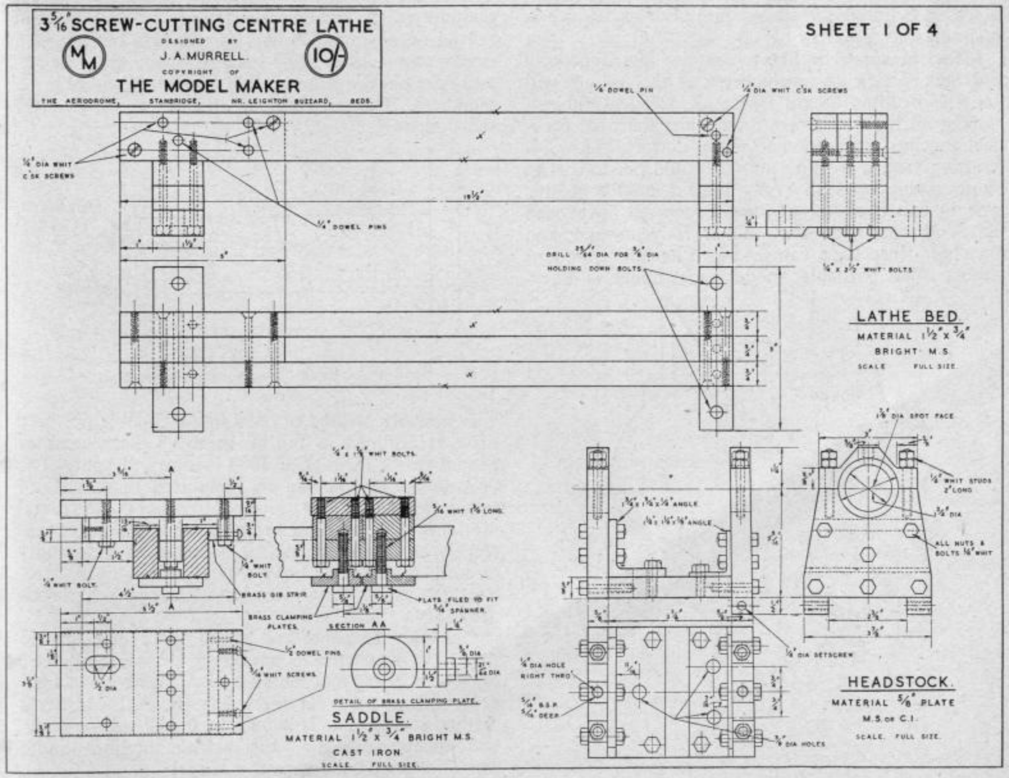
The caps were made and the studs fitted to the headstock. The caps were fitted and with the nuts tightened up the job was marked out for boring.

This is a hefty job for a small lathe to tackle, but if the lathe is fitted with a boring table the job can be done quite well. It may mean mounting the job upside down in order to get the necessary centre height.

The headstock was bored right through $1\frac{3}{8}$ in. dia., and faced to $1\frac{7}{8}$ in. dia. on the front of the forward end, and both sides of the back end. The holding-down bolt holes were drilled next, and also the lubricating holes.

The headstock was now placed in position on the bed and the holding-down bolt holes marked off. These holes were now drilled and tapped in the bed and the headstock loosely bolted down.

Two $\frac{1}{4}$ in. B.S.F. set screws were fitted into the lugs on the front end-plate, and for the time being the headstock was left.



The Saddle

The saddle was started before the $\frac{5}{8}$ in. cast iron plate had been discovered, and consisted of two pieces of $1\frac{1}{2}$ in. x $\frac{3}{4}$ in. stock, 4 in. long, laid side by side and clamped together by two $\frac{1}{4}$ in. end plates as shown.

The slots were then milled in using a $\frac{3}{4}$ in. end mill for one, and a 1 in. end mill for the other. The job was clamped to an angle plate bolted to the top slide.

After milling the slots were scraped flat and the saddle bedded down. By now the cast iron plate had appeared so a piece was cut off $5\frac{1}{2}$ in. x $3\frac{1}{8}$ in. and faced both sides until it was $\frac{9}{16}$ in. thick. This was now bolted to the top of the original saddle making a much sturdier and heavier job.

A piece of $\frac{5}{8}$ in. square bar was bolted under the centre of the saddle and into this the clamping bolts are screwed, as shown.

The brass clamping plates were turned from a stub end of 2 in. dia. brass end, cut to shape as shown in the drawing.

A slot $\frac{1}{2}$ in. wide by 1 in. long was now cut in the saddle as shown, this is to take the topslide holding bolt.

A $\frac{1}{4}$ in. square brass gib strip was fitted, being held in position by two $\frac{1}{8}$ in. dia. dowel pins and adjusted by two $\frac{3}{16}$ in. dia. screws.

No more could be done to the saddle at that time, so work commenced on the topslide.

BRUNTON'S STEAM HORSE (*Continued from page 477*)

There is quite an interesting sidelight on this in that parallel link motion, as such, was not "known" in 1813. This was introduced later by Scott Russell, but when he did so he admitted that the geometry of parallel motion had been known for some time although he was the first to apply it in practice. Whether Brunton forestalled him on this feature is an interesting point.

Model makers who like to exercise their ingenuity and tackle intricate mechanisms of this nature will find the Brunton Steam Horse an excellent subject. Almost all the details are there—just the final practical touches are needed to make it work. How interesting such a working model would be, too. The photograph shows the only known model of this type in existence—or at least known to have been built. It was made some 60 or 70 years ago, and may long since have vanished like its full-size counterpart. This particular model, incidentally, is different in many details from Brunton's original patent drawing. The linkage has been modified, and it would appear that there may be two separate pistons, one driving each leg.

The basis of a suitable model is shown in Fig. 3. The secret of working lies in the linkage. The remainder of the model consists only of a boiler supported on a simple chassis of two side beams, with one or two suitable cross spacers. Fixed axles clamped to the chassis beams could take the place of cross members. The tall chimney attaches to the front of the boiler.

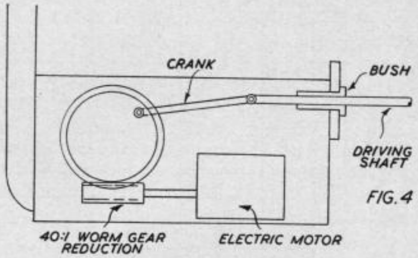


FIG. 4

A possible method of obtaining a suitable powered drive is outlined in Fig. 4, using an electric motor geared down through a 40:1 worm and spur. The "piston" push rod can be supported in a bush of moderate length to give satisfactory horizontal motion. The necessary motor and gearing could readily be housed inside the boiler, even the battery as well, if required, leaving possibly an open "fire-box" for access to the interior to change batteries as necessary.

Out with the paper and pencil and sketch around that linkage scheme to produce a workable system! Some modellers may be able to work it out in their head, others may get more fun by trial and error methods. The details shown in Fig. 2 *nearly* work, and appear authentic. Just a little modification to some detail and the answer is there!

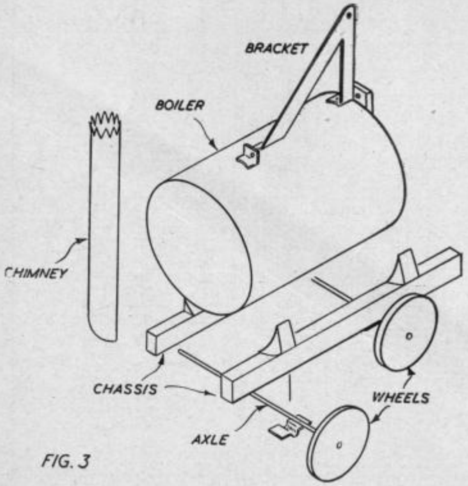


FIG. 3

IN RESPONSE TO OUR INVITATION TO READERS B. M. RUSE DESCRIBES HIS

POWERED HACKSAW

THIS simply rigged little power hacksaw is based on a tubular Eclipse handsaw, fixed to a vice, and an assortment of miscellaneous junk usually to be picked up for next-to-nothing. In spite of this it has proved a very real friend in need, and is capable of tackling without effort jobs that would normally have used up a lot of not-so-surplus physical energy.

The idea of such a simple device was considered for some months as its need became apparent. Odd junk likely to be of service was picked up as occasion offered. First came the big end plate, which had started life as a motor-cycle clutch plate: then a 1928 vintage Dodge connecting rod with the big end sawn off, and a piece of pram axle for connecting the little end of the con. rod to the hacksaw tube. Other parts acquired included some steel angle piping and so on. The only items actually bought were the saw complete and the vice.

Medium blades have been used so far, though I have since bought some 12 in. high speed blades, which will involve slight adjustments as the medium grade in use are only 10 in. long.

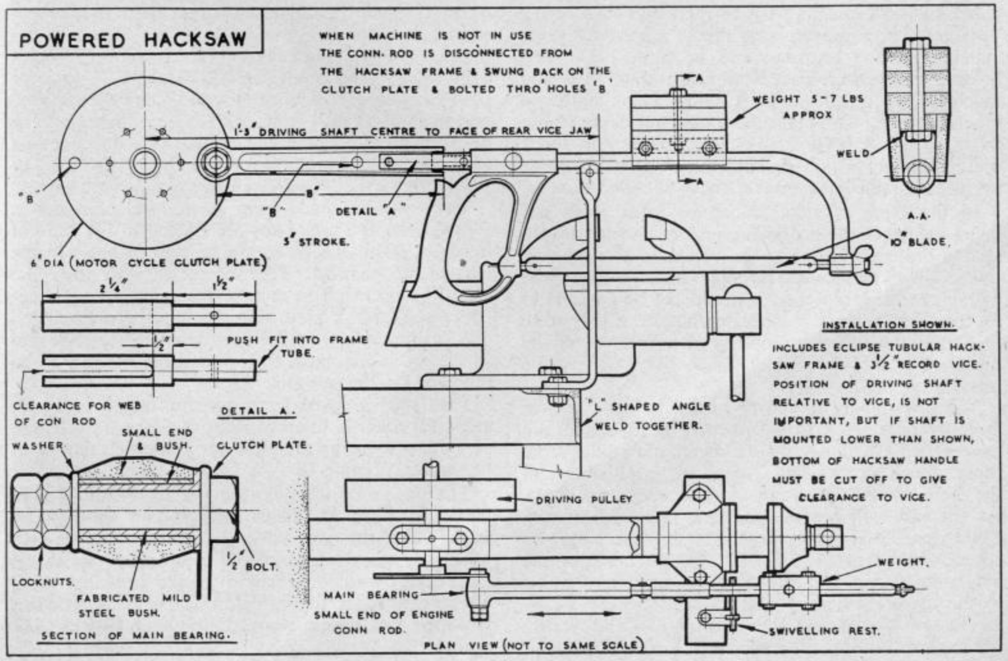
Slow speed is best for cutting—at about the same rate as hand operation.

In order to be able to put the whole device away easily the pram axle connector is held to the con. rod with a silver steel pin. Normally, this is not necessary, but in my case the saw happens to be right in the way of my lathe—so placed for convenience in picking up the power drive. Dismantling takes only a moment.

Considerable weight is added on the hacksaw tube just above the centre of saw rocking point. When the saw has finished cutting or gone to its full depth it moves or drops on to a $\frac{1}{4}$ in. pin fixed on the left of the vice. This pin, or rest, swivels to enable the hacksaw to be lifted up when inserting work in the vice jaws.

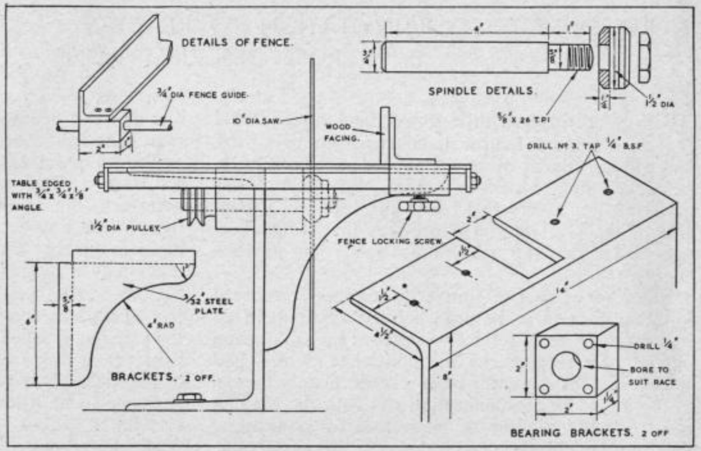
No doubt some device could be attached to this arm to switch off, but throughout I have aimed at the simplest possible solution—even if it may seem against the best "workshop principles".

The only point to remember when cutting angle is to place it in the vice pointing towards the machine, otherwise the rocking of the blade will be liable to encourage breakage should the machine start cutting when springing slightly one way or the other.



A CIRCULAR SAW BENCH

By A. SMITH



HAVING recently acquired a 10 in. dia. circular saw blade in excellent condition, it naturally followed that a bench had to be made so that the saw might be put to some good use.

Due to shortage of space, a state of affairs which seems to go hand in hand with the home workshop, the completed saw-bench had to be capable of being mounted upon an out-of-the-way corner of the wood-work bench.

A search round the workshop for suitable material brought to light a 14 in. length of $8\frac{1}{2}$ in. x $4\frac{1}{2}$ in. channel section structural steel and this, it was decided, had to form the basis of the machine.

Two roller races were available which proved to be suitable for the bearings, and to carry these, two bearing blocks were cast from scrap aluminium and machined up on all surfaces before being bored to take the races. To obtain the maximum depth of cut from the saw, a portion was cut out of the top flange of the channel which permits the bearing blocks to be placed immediately under the $\frac{1}{8}$ in. thick top.

In the event of suitable ball or roller races not being available the bearings could be formed by inserting bronze bushes into the blocks or else pouring them in situ with some type of anti-friction white metal. In the latter case, it would not be possible to tin the inner bores of the bearing blocks; if they were of aluminium, however, one or two holes could be drilled into the bore which when filled with white metal would form keys.

The saw spindle should be turned between centres from oversize stock to ensure that all diameters are concentric. Obviously the diameters may differ from those shown as they will depend on the diameter of the hole in the saw and on the races available. As the saw will be running at a speed of approx. 2,000 r.p.m. it is vitally necessary that the pulley be securely fixed to the spindle. If the facilities are available keying will prove much more preferable to the usual method of using a grubscrew.

The saw washers are plain turning jobs and require no explanation except that their internal surfaces, that is where they grip the saw blade, should be relieved similar to those of a grinder, a fact that is not shown on the drawings.

The bench top is composed of a piece of $\frac{1}{8}$ in. steel plate, which was slotted to take the saw by the simple expedient of drilling a series of $\frac{1}{8}$ in. holes and then filing them out to form a slot. Holes were also drilled and countersunk to take the four $\frac{1}{4}$ in. B.S.F. screws which hold the top to the upper flange of the channel. It is important that the tops of these screws should come just flush with the surface of the bench. Either side of the top has a length of $\frac{3}{4}$ in. x $\frac{3}{4}$ in. x $\frac{1}{8}$ in. steel angle screwed along it. This serves the dual purpose of materially stiffening the top and is extended slightly towards the rear to carry the $\frac{3}{4}$ in. dia. fence guide bar, which is reduced at its ends to $\frac{5}{16}$ in. dia., and threaded $\frac{5}{16}$ in. B.S.F. The size of the top is 16 in. x 14 in.

Two brackets made from $\frac{3}{32}$ in. steel plate act as supports for the top. They are riveted to the top but fixed by $\frac{3}{16}$ in. B.S.W. screws to tapped holes in the web of the channel. This is necessary to allow the top to be taken off to remove the saw blade, if races have been used. If plain bearings have been employed this is unnecessary as the spindle is free to slide out as the nut is loosened, thus permitting the saw to be removed via the saw slot.

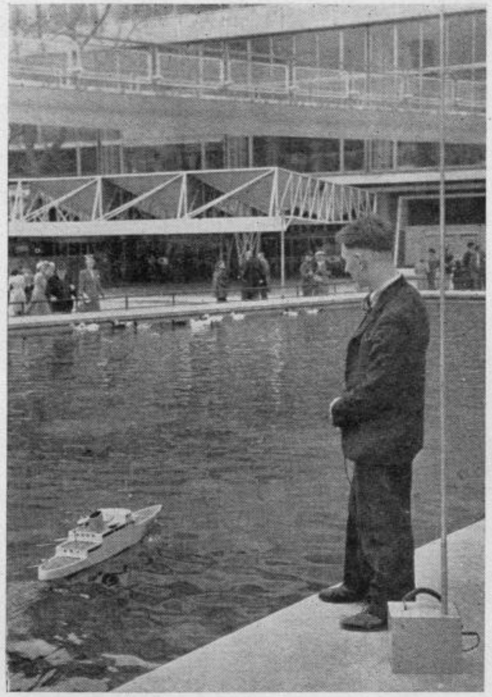
The fence is made from a 10 in. length of $1\frac{1}{2}$ in. angle to which is fitted at right angles a 2 in. length of 1 in. x 1 in. bright steel bar accurately bored to fit the fence guide bar. A locking screw is fitted.

The design of the guard is left to the individual, as its structure will depend largely on the type of work which the saw will in general, be required to undertake, i.e. rise and fall, or completely removable.

Lastly, a word of warning: make sure that there are no nails in the timber before you saw it, and when you have made sure, make doubly sure by checking again!

A RADIO-CONTROL BOAT AT THE FESTIVAL

PICTURED BY E. D. STOFFEL

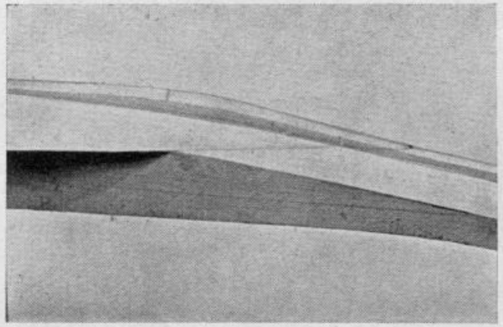


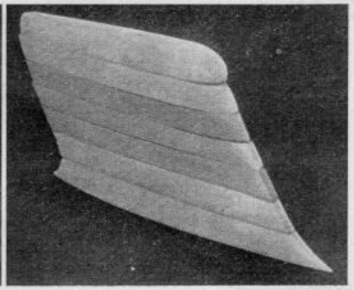
Down from Birmingham for the weekend, P. T. Such gave a radio controlled launch display for the benefit of visitors to the Festival of Britain. Powered by electricity the model runs for several hours before batteries need to be renewed. Certainly an ideal model for R/C demonstration, it can reverse and be manoeuvred in a very small space. The actual model was built by V. J. Howell, whilst Mr. Such made the radio unit, mainly from government surplus equipment. Both are members of the Birmingham group of the "International Radio Controlled Models Society".

W. J. DANIELS' NEW MARBLEHEAD DESIGN

FESTIVE

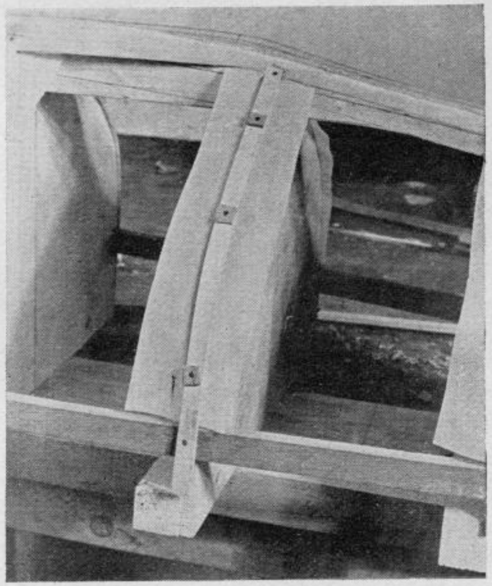
A Photofeature showing further steps in the construction of "Festive." Next month the Sail Plan will be covered: if your boat is well ahead we will gladly send you prints of the sail dimensions in advance.

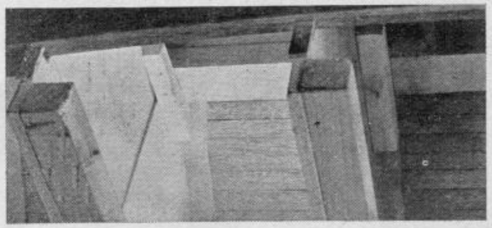


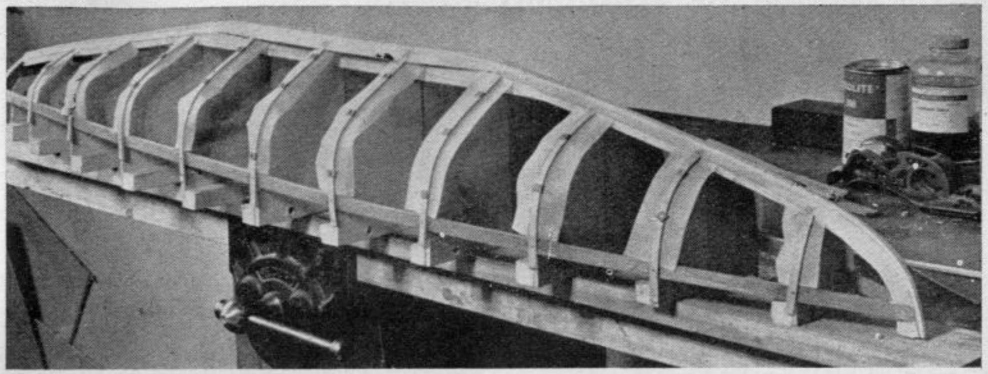


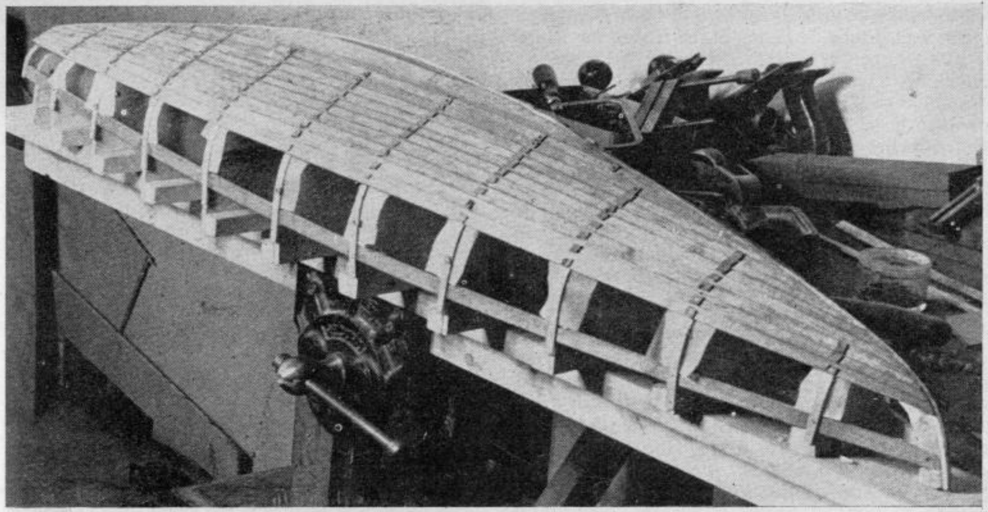
On this page. Top left: close-up of the backbone, just forward of the keel, showing method of chamfering to take planks. Below: Grain of the Honduras mahogany as supplied to us by Arthur Mullett for planking. Bottom left: Two shots of the keel "bread-and-butter" cut and shaped ready for glueing. Lime and white pine was used in this instance from stock in hand. Above right: Ribs shaped over mould, and rebated into backbone. Note use of paper behind to prevent sticking, and card pieces to assist in removal of temporary fixing brads.

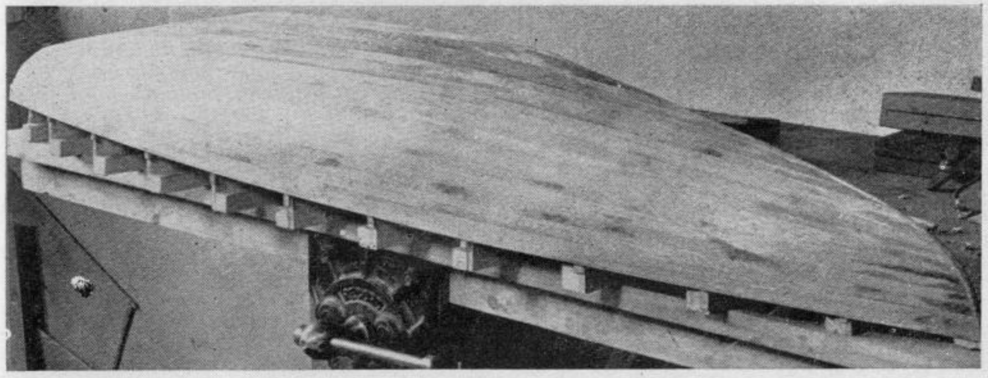
On the opposite page. Shaped backbone, moulds paper covered, and ribs fitted in place, inwhale fixed, and all ready to proceed with planking from "in frame". Centre: Planking partly completed. Note that full length pieces are used, each shaped individually to mate with the preceding plank. Holding brads, with card "lifters" are again extensively used. All these joints are made with the two solution Aerolite glue seen in its containers in the upper picture. Bottom: Planking completed, and temporary brads removed—keel will be put in place temporarily before removing from the moulds.











FLAME BRAZING OF ALUMINIUM (continued from page 497)

of steel wool, wire brush or file. Strict attention to this detail is necessary if a satisfactory, smooth and attractive-looking joint is to be obtained.

Material edges must be smooth and all burrs and projections removed by filing. A sheared edge which is usually burred or uneven needs this attention.

Sleeved type joints should have the short inserted portion restricted as much as possible—preferably it should be less than $\frac{1}{2}$ in. The outer sleeve well or socket can be left square on the end. It is an advantage, however, to bevel this end to 45 deg. for half its thickness, to provide a trough or recess to receive the filler metal; also to treat the inserted end likewise to assist penetration.

An alternative to this for tubular joints is to slightly bell mouth the end of the receiving tube.

Where relatively heavy sections, as for example a heavy plate or cast flange, are to be brazed on to a light walled tube, bevelling of the face of the flange as well as the back of the flange is desirable, although not a necessity.

Summarising the question of preparation, therefore, it may be said that cleanliness and good fitting joints are the first requirements. A light bevel or chamfer to 45 deg. to provide a recess or "lead" for the filler metal is always desirable. Wherever possible abutting or contacting surfaces should be brought to equal thickness or near equality of section. This latter preparation considerably aids the brazing operation and reduces the possibility of contractional stress or cracking.

Flame and Rod Manipulation

After the part is assembled and set up for brazing it should be generally pre-heated with the envelope of the flame, the inner blue cone being held about 2 in. clear of the metal surface. The blowpipe and rod are held at approximately the conventional angles as for fusion welding. The end of the rod is then heated and dipped into the flux. A small amount of flux will adhere to the rod. The "tuft" of flux is then touched down upon the surface of the joint to check the temperature. At the correct temperature the flux will melt and begin to flow smoothly and rapidly forward along the joint. Then and only then should a small amount of filler metal be added and the rod withdrawn.

It is most important that no filler rod should be melted off until the flux can be seen flowing freely induced by the heat of the work. In this connection, however, it should be noted that long periods of heating are apt to render the flux less active, thus making the brazing operation more difficult.

At the moment the rod metal begins to flow, the blowpipe is moved towards the joint until the inner cone is almost at the normal welding position. At the same time, and in conjunction with this movement, it is moved rapidly forward with a flicking action, drawn away and brought back to the original distance, but at a position opposite that to which the molten metal has travelled for the movement to be repeated.

Capillary attraction, together with the driving action of the flame moved close to the joint surface, causes the molten metal to run forward along the joint.

A good brazed joint should not affect the underside of the metal. If the oxide film is crinkled or shows signs of disturbance the temperature has been unnecessarily high.

Flux Removal

Due to the corrosive nature of the flux all residue must be completely removed after brazing to prevent possible corrosion and to improve the appearance of the finished part. Dipping the part into water while it is still hot removes the greater amount of surplus flux, as the fluxes used as soluble in water, but this is insufficient as a complete treatment.

A simple method is to scrub the part with a stiff bristle brush during immersion in hot soapy water and then to rinse in clear water.

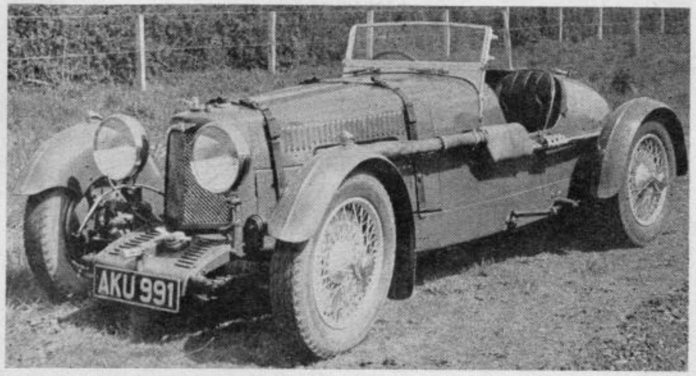
Some Applications and Procedure

There are many applications of this process in model making and some examples of joints are shown in the accompanying illustrations.

An interesting feature is the small tube shown on left of illustration. This is an experimental section to screw into the end of a flexible metallic tube. It was made up by winding a pure aluminium wire of $\frac{3}{32}$ in. dia. around a $1\frac{1}{2}$ in. bore aluminium tube. Brazing the wire to the tube was accomplished as the wire was wrapped with the tube slowly rotated.

PROTOTYPE PARADE No. 32 by G. H. DEASON

The ULSTER ASTON MARTIN



Model Maker Photos

The Aston Martin Ulster Replica, with full standard road equipment is a fine example of a real sports car of the 'Thirties.

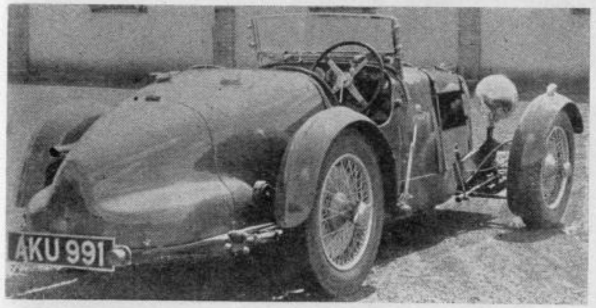
THE Aston Martin in one form or another is long overdue in this series, and would assuredly have appeared before now but for a chain of circumstances which led to a suitable example eluding my net. The name has stood for sporting motor cars to the exclusion of all other types since it was first whispered with respect in motoring circles soon after the 1914/18 war, a distinction which it shares with no other current product that I can call to mind with the exception of Frazer Nash. Originally built in Kensington under the aegis of Lionel Martin, it derived the other half of its name from the historic Aston Clinton Hill Climb where both the proprietor and his motor cars regularly performed with distinction.

The early A.M.'s were $1\frac{1}{2}$ litre s.v. models, although a number of highly efficient twin o.h.c. cars also added lustre to the name. However, as has happened before in the motor world, the firm went into liquidation in the middle 'twenties, changed hands, and the cars thereafter assumed a subtly different character. The respective merits of the old "Bamford and Martin" Astons and the Feltham built "Bertelli" Astons is still the subject of heated argument in enthusiast circles. Be that as it may, it is pleasant to record that the new chief of the concern was also a sports and racing driver of repute, A. C. Bertelli having made a great name with the Enfield Alldays and with a car of his own.

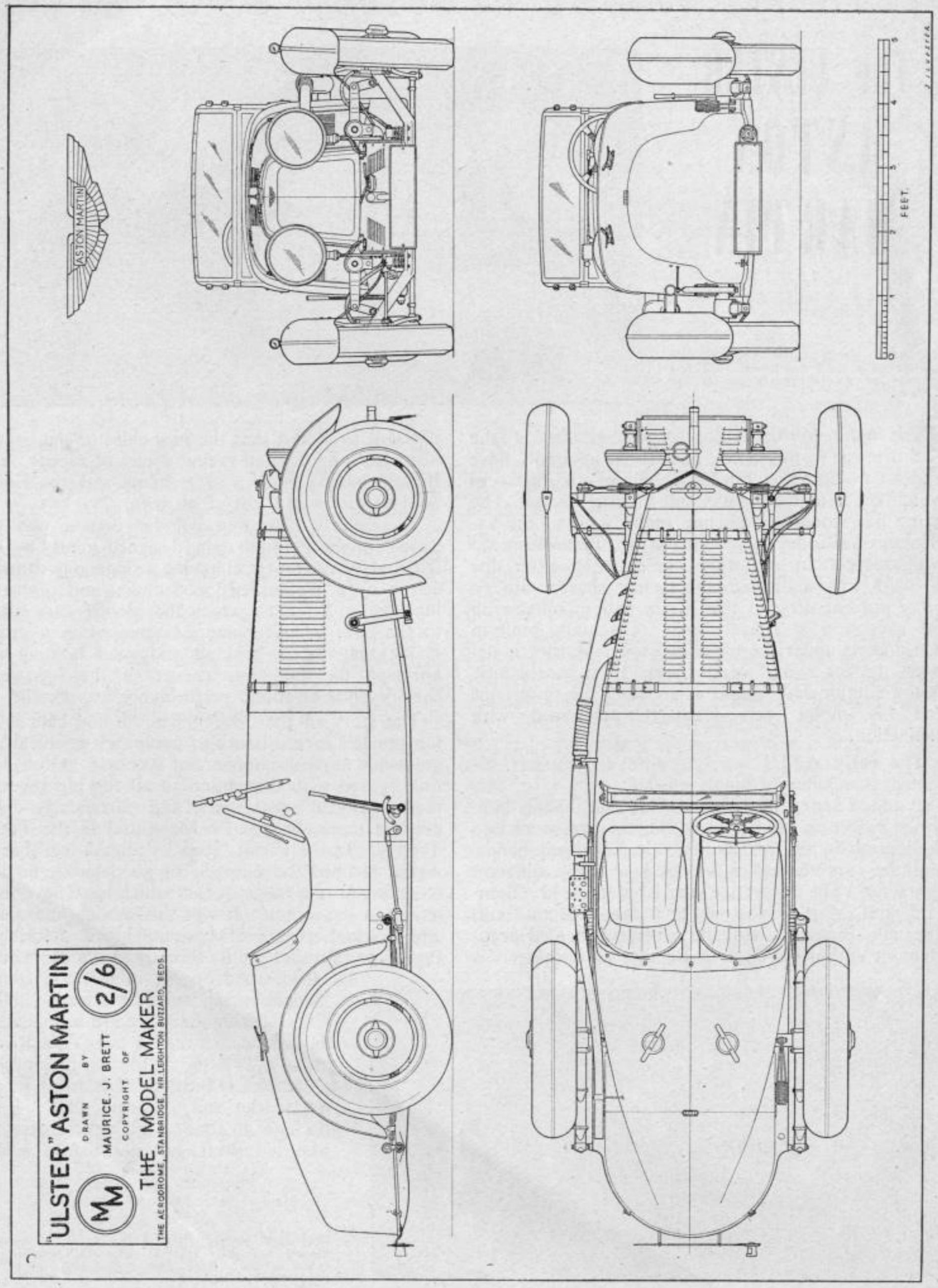
An entirely new four-cylinder engine was produced for the Feltham cars, designed jointly by Bertelli and W. S. Renwick, having a single o.h. camshaft driven by a Weller tensioned chain, and dry sump lubrication, a feature which the $1\frac{1}{2}$ litre cars carried to the end. This engine was housed in a chassis giving magnificent braking and road holding and, although the cars were never in the lightweight category, the all-round performance was excellent.

The story of the development of the cars is too long to tell here, a story of continual technical progress and modest commercial success. Aston Martins figured with distinction in all the big races for road equipped sports cars, and particularly distinguished themselves at Le Mans and in the Tourist Trophy. In the Ulster "Rep." I always feel that the Aston reached the pinnacle of good looks, no light compliment to a range of cars which have never been less than handsome. It was this model, unmodified and original, that I always sought to describe in Prototype Parade, until recently without success.

However, dropping in to do a spot of "neighbouring" with my friends Chiltern Cars of Leighton Buzzard a few weeks ago, there, between a trim Alfa Romeo and a T.T. Riley sat this month's subject, a completely unspoilt "Ulster" in gleaming scarlet and glittering plate. I was back in no time at all with camera and Maurice Brett, but not before a brief



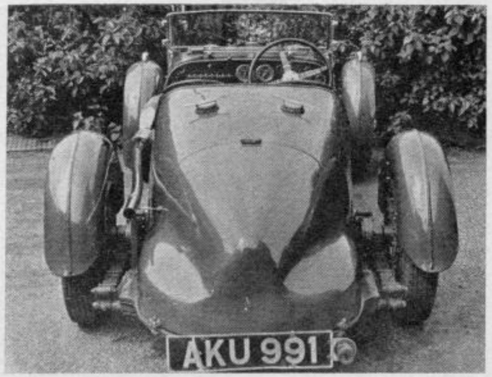
Rear three-quarter view of the Aston, showing the hinged rear half of the tail, which conceals the spare wheel. Note the close-fitting wings with strengthening ribs.



gallop had been taken by way of working up atmosphere!

Now to details! AKU 991 has no known racing history, being a 1936 Replica, but since all Aston Martins are potential competition cars, her future may well be livelier than her past.

In catalogue trim the Ulster model was guaranteed 100 m.p.h., and on removing a filler cap a powerful aroma of benzole suggested that the original 9.5:1 compression hadn't been tampered with. Eighty b.h.p. is delivered at 5,250 r.p.m. in this trim, and the "ton" comes up at a shade under 5,000 r.p.m. on the 4.11 axle ratio. (In the case of my acquaintance with AKU 991 it didn't, a plug lying down on its job.) Walking round the car, starting at the front, the graceful shallow V-fronted radiator has a painted shell, and the fairing between the dumb-irons conceals a 2½ gallon oil tank. The large filler cap is external and has a tommy bar atop. The radiator cap incorporates a small steam valve. The front axle is polished steel, covered at the moment with a protective layer of grease. Front shock absorbers of friction type are set transversely, and the massive 14 in. brakes are cable operated. The backplates carry the front wings, rigidly bolted to them and turning with the steering. The bonnet is handsomely louvred, and a very functional looking exhaust system makes a bee-line for the rear end, terminating in a smaller diameter chrome plated tail pipe. The tail is unmistakable, having a flared-out "skirt" which conceals the spare wheel, carried horizontally, this portion of the tail hinging upwards from the visible joint. The springing is half-elliptic all round, the springs being outrigged back and front, and the rear shock absorbers work "fore and aft". The outside handbrake, with adjusting device, is outside the body, which has, of course, no doors.

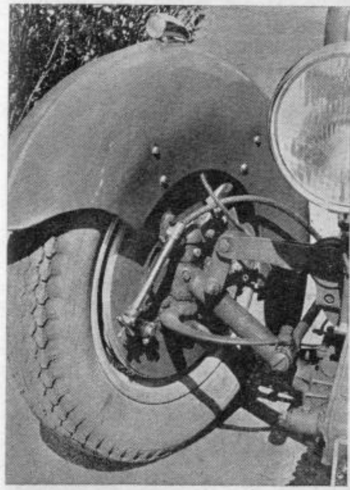


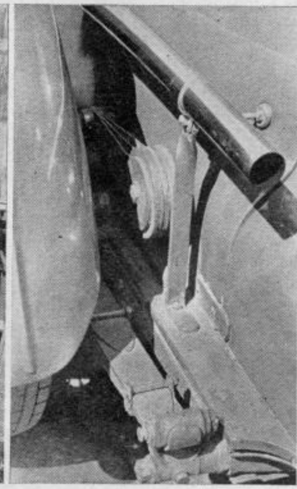
Inside the cockpit everything is well arranged, neat but not gaudy. A line of switches on the left control lighting, ignition and fuel pumps, rev. counter and speedometer are of modest diameters and devoid of the fancy coloured segments beloved of the "St. Christopher badge and grab handle" brotherhood, and the subsidiary dials are on the right. The spring steering wheel boasts no cord binding, but a typically Aston ignition lever protrudes from the centre of the boss. Separate pleated leather bucket seats are fitted, and the short gear lever is carried centrally.

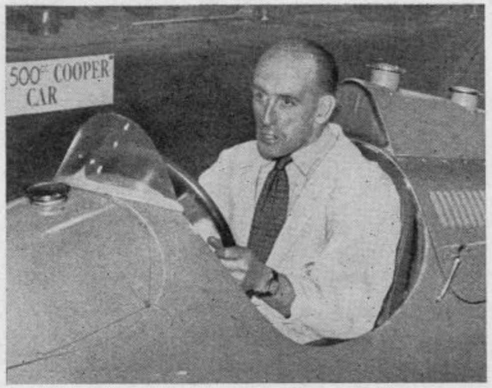
Altogether a thoroughbred, fully justifying Gregor Grant's description in the frontispiece of his book "British Sports Cars", the "Beau Ideal of the Sportsman of the Middle 'Thirties".

(Above) This view of the tail gives a clearer idea of the panel curvature than can be indicated in a drawing. (Below l. to r.) Detail close-ups for the scale model builder, showing front brake back-plates, transverse shock-absorbers and wing mounting; rear suspension and exhaust tail-pipe fixing, and a view of the driving compartment.

Model Maker Photos







DOPE & CASTOR

By JERRY CANN

THE Speed Kings were certainly active over Whitsun, when records took the knock in every class. I for one didn't expect to see the 10 c.c. Open increased more than fractionally from the two miles a minute mark upwards, and felt that D. Garrod had done pretty well at Surrey with his 122-odd. But when the Sunderland figures came in, with "Bill" Moore's staggering 126.05 m.p.h. on the new "brush finished" surface, I decided to leave prophecy alone for a bit. Add to that the 97.82 m.p.h. "on the distaff side" which collared the 5 c.c. Open and you have the ingredients of a Moore day-out!

If ever there was a trier it's Alec Snelling, and his latest thing in 2.5 c.c. jobs leaves no stone unturned in the search for m.p.h. I'm sure he won't mind my referring to it as a "thing", either, although his efforts to decrease drag have resulted in a decidedly pleasing, if highly unconventional, shape. I feel that Alec and Sig. Taruffi should get on well together! Anyway, the new streamlining paid off handsomely, as his 76.79 m.p.h. at Surrey shows, and the 80 m.p.h. mark should be reached any moment now. Shades of that first M.G. Trophy meeting!

Speaking of the M.G. Trophy this, as announced last month, will take place at Eaton Bray on July 22nd, at the same time as the Austin affair for 10 c.c. cars, and since the 1.5 c.c. class is officially recognised now, a separate M.G. Plaque will go to the winner of this category also. A 5 c.c. event will be held at the same time, also on non-handicap basis, so there'll be room for everybody. Entries to G. H. Deason, Hon. Secretary B.M.C.C., The Aerodrome, Billington Road, Stanbridge, Nr. Leighton Buzzard.

A copy of the *Nottinghamshire Guardian* of June 2nd contains a page of pictures taken at the new Nottingham M.R.C.C.'s track at Bassingfield, and gives the club welcome publicity. The accompanying write-up is more accurate than is usually the case when the lay press chronicle our doings, and some handsome models are depicted, including an Aston Martin by Eric Clamp, builder of the Mercedes described in these pages some months ago. The new 70 ft. track is having its first meeting shortly, with the Derby boys as guests.

You've probably heard the story of the man who tried to sell real five pound notes in Oxford Street for a tanner a time, and failed to find a customer, such being the cautious approach of the average citizen to a "something for nothing" proposition! A rather similar response was reported to me recently by E. A. Tasker, who offered 1:1 and 1½:1 bevel gears for the cost of the postage through these columns, he having a surplus stock of them by him, and a kind heart! With the idea of helping beginners the offer is still open, and the address is 247 Derington Road, Tooting, S.W.17.

Bill Moore tells me that the Howard Frank "Lecture by Proxy" has been very well received by the clubs who have taken advantage of it, and its first "tour" finishes about the end of June. One or two dates are already booked for the second round, but Club Secretaries who would like to book it should write direct to I. W. Moore, 2 Bridge Street, Derby, enclosing a stamped envelope for reply.

This month's heading picture has been in cold storage for some time, but a work of art of this kind improves with age! The sitter, of course, is Jack Pickard, whose hard work has put the Edmonton Club in such prominence. I don't think he's really likely to desert his 10 c.c. jobs for a "500", but he has the right expression for the job. The Cooper is J. Leary's, at the Edmonton exhibition.

A SIMPLE FUEL CUT-OUT

(*continued from page 490*)

$\frac{1}{16}$ in. drill. Drill will ensure these are correctly in alignment. Now solder tubing to hex. bar. Remove drill and take cut-out to pieces again. Cut $\frac{1}{16}$ in. thick piece of brass for base and drill two 6 B.A. clearance holes at each end. Solder the hex. rod to this base, leaving plenty of solder for strength.

Place base, etc., in position in car and insert silver steel and bring up to stop. Drill $\frac{3}{32}$ in. hole through silver steel outside the car body so that $\frac{3}{32}$ in. piano wire can be soldered in place to actuate cut-out.

All that must now be done is re-assemble the complete cut-out and connect to tank and engine. Bring lever up to stop to open. Make sure fuel passage is clear and open out with $\frac{1}{16}$ in. drill if necessary.

To ensure cut-out does not vibrate shut, make it so that it is difficult to close and open by hand.

If $\frac{3}{16}$ in. hole for silver steel is drilled oversize it can be tightened by using a centre punch around edges of hex. rod. Finish off by trimming off excess silver steel.

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