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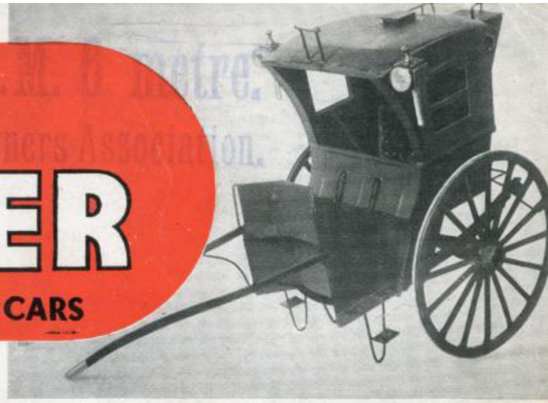

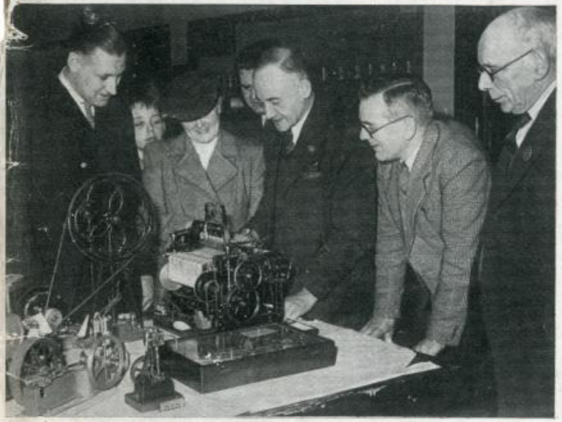

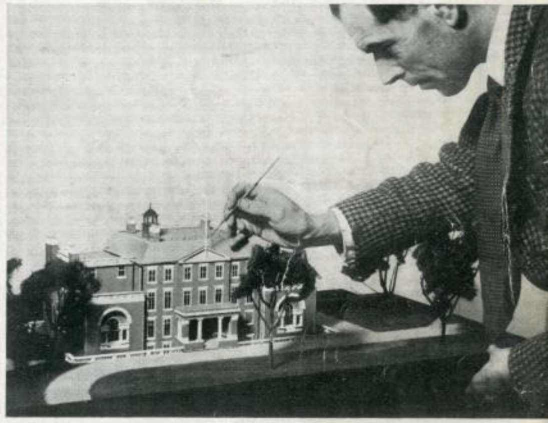

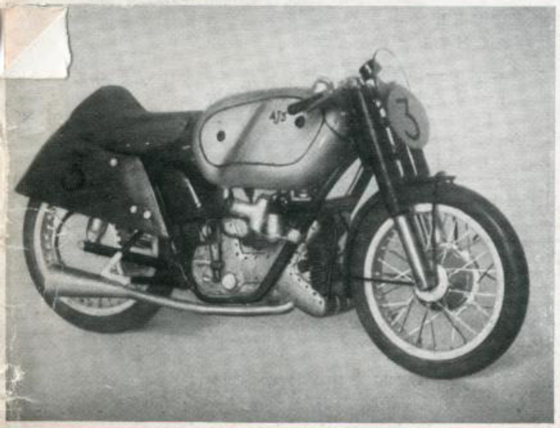

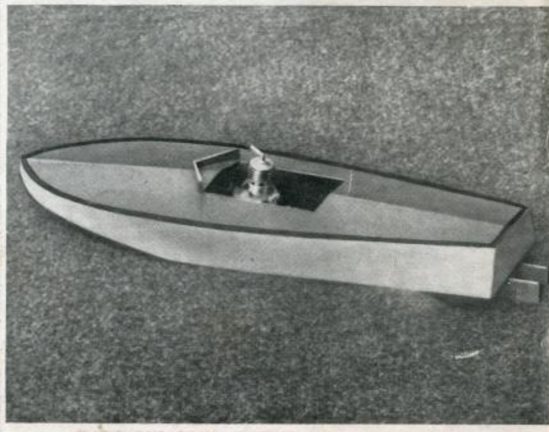

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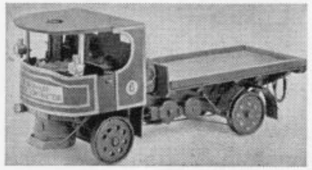

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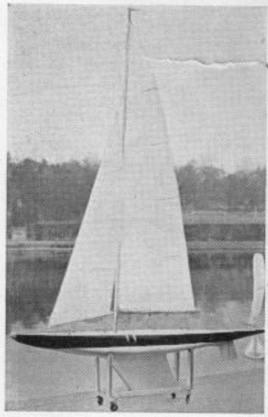

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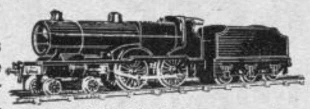

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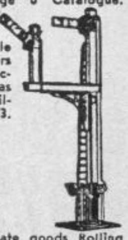

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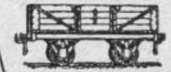

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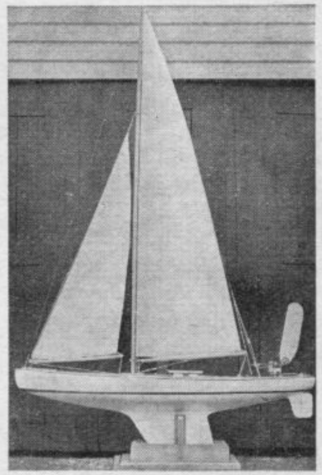

Mullett customer H. A. Grayson of New Zealand made this model of Littlejohn's Marblehead "Elusive" (Plans 12/6).

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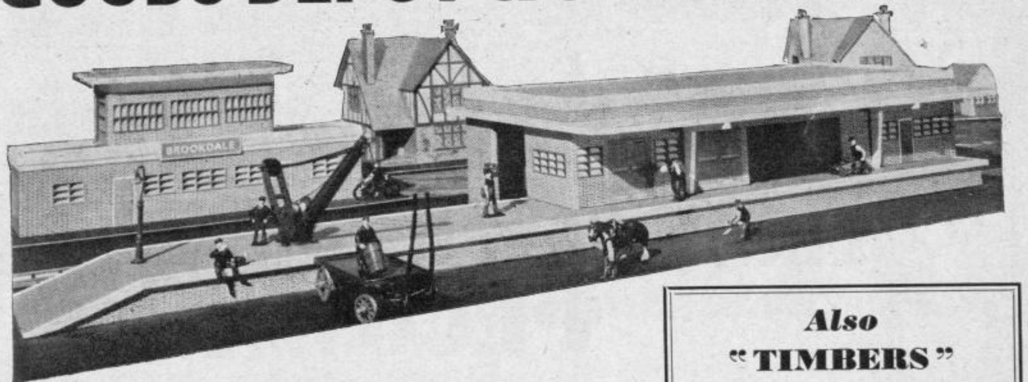

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Co-Editors:
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Contents

Seasonal Pleasures

WITH flaming June behind us and hopes of pleasant outdoor holiday months ahead it is natural to consider some of the seasonal aspects of model making. The greatest enthusiast may find it hard to stay indoors tending his 00 layout at times like this, but that is no real reason for ceasing work. We have enjoyed some very pleasant sessions making track in the open air—even, may we add, seated by the seashore in a comfortable deckchair—but our usual summer *modus operandi* is to take a substantial table and chair out into the shade of a suitable tree together with a small clamp-on vice and a box of miscellaneous tools and get on with the work of the moment until such time as the tingle of an itinerant ice cream vendor is brought to our notice by the ever eager junior members of the family. We have even rigged an extension lead to the soldering iron to use this too in the garden.

For the model yachtsman and boat enthusiast this is, of course, their heyday. The hours of winter toil are now rewarded by spanking breezes and sunlit water, and everything in racing trim, as new boats are launched amid envious acclaim. We are sure our readers will appreciate that such outdoor activities must take pride of place in our columns at this time of year, and realise that in their proper season more sedentary occupations will resume their rightful place. Our model car clubs, too, are now making the most of their open-air meetings, with the fumes of high speed fuels dissipated far more swiftly than in the confines of enclosed areas that have been the scene of other races.

Since *Model Maker* first appeared in its present form we have done our best to cater for all model makers in all seasons, and feel that we are now approaching that desirable mixture of our various interests. Once more we would remind those diehards who would like more of their own speciality that everyone will have their turn in due course: should there have been any notable omissions, we do urge those who think they have had less than their due to write to us—and the best sort of letter is one that says in effect: "You have not been doing much for such-and-such models so I am sending you an article herewith all about them!"

As a final thought for July, this is almost the last opportunity of reminding readers that the first *Model Maker* Yacht Trophy—this year for Marbleheads—will be taking place at Valley Parkway Pool, Bournville, under the auspices of the Midland District Committee on Sunday, August 3rd.

ON THE COVER . . .

Top: H. V. Tipper illustration of Geoffrey Porter's Model Hansom Cab, built for the Conan Doyle Exhibition. Centre left: Model Loom seen at the recent Northern Models Exhibition (Photo: Arthur Hamer). Centre right: Another Geoffrey Porter Model—Arnos Grove House in detail. Bottom left: Model Motor Cycle, fully described in this issue. Bottom right: "Jallopy" .5 c.c. Hydroplane complete with plan in this number.

"Jallopy"

HALF C.C. HYDROPLANE

BY A. M. COLBRIDGE

THIS LITTLE HYDROPLANE—SMALL ENOUGH TO GO IN A BICYCLE SADDLE BAG—IS SUITABLE FOR ANY OF THE UNDER HALF-A-C.C. ENGINES COMING ON THE MARKET. TITLE OF THE BOAT "JALLOPY" AFTER THE B.B.C.'S CHILDREN'S HOUR FROG WAS INTENDED TO TIE UP WITH THE RELEASE OF THE NEW FROG 50—UNFORTUNATELY AN EXAMPLE OF THIS ENGINE ONLY CAME TO HAND AS WE WERE CONDUCTING OUR FIRST TESTS.

A RELATIVELY simple project, the hull shown in the plan is suitable for the range of $\frac{1}{2}$ c.c. diesel motors now coming on to the market. These handy, compact power units are to be welcomed in all fields of modelling. Primarily designed for model aircraft work, they are equally adaptable to power boats or model cars, with the undoubted attraction that the resulting models are "pocket-size" and, of course, quite inexpensive.

The hull was designed specifically around the Frog "50" and E.D. "46" motors, where beam mounting can be employed. It will be a simple matter to adapt the mounting to any other engine of similar size, whether beam or radially mounted. There is ample room in the hull. The hull is, in any case, on the large side for a $\frac{1}{2}$ c.c. motor, and so power units of up to 1 c.c. could quite well be used as an alternative. With the larger engines, of course, maximum speed will be increased, possibly at the expense of a certain loss of stability.

The hull follows fairly orthodox "three-point suspension" lines. For ease of construction the sponsons are built as separate attachments glued to the main hull bottom. Every stage of construction has been kept as straightforward as possible so that no previous experience in power boat modelling is necessary to complete a satisfactory job.

Shown on the plan is an optional underbody fitting—two long strips extending aft from the trailing edge of the sponson keels and forming, in effect, a water tunnel along the underside of the hull. The hull will be quite stable without these, at moderate speeds, but you may care to fit them as an experiment. Their purpose is both to increase directional stability and propeller efficiency. The twin water rudders are also a slight departure from normal practice. Again you can fit an orthodox single rudder, if you prefer.

Now for the construction in detail. Identify the main deck plan shape and the hull bottom plan shape on the drawing. The former is transferred on to $\frac{1}{8}$ in. sheet balsa and the latter on to $\frac{1}{16}$ in. resin-bonded plywood, and both cut out. The deck also has a rectangular panel cut out for the cockpit. Most probably you will have to cut the deck from 3 in. wide sheet balsa—although 6 in. wide sheet is available at some model shops. If you use 3 in. wide sheet, cut one half deck and use this to cut out the other half. Then cement the two together.

Draw a line across the ply bottom at bulkhead 5 position. Score the ply lightly at this point and bend, as shown in the sketches. Then mount bulkheads 5 and 10 (the transom), both cut from plywood, in place. Glue and screw or pin in position through the bottom of the ply.

At this stage you would also be advised to mount the engine bearers. Check that the size shown on the plan will suit the particular engine you are using. Larger motors will need the height of the bearer blocks increasing and a corresponding modification to the angled top. The spacing between these bearers must also be adjusted to clear the crankcase of the motor. When correctly shaped, and the required spacing is marked on the ply bottom, secure the bearers flush against bulkhead 5. Glue well and screw to both bulkhead 5 and the ply bottom for a very rigid assembly. Needless to say, all glue used in construction of the hull should be of the water-proof variety.

The other balsa formers can now be added—cutting from $\frac{1}{8}$ in. sheet or strip balsa—and the deck fitted. The under portion of the extreme bow of the deck is chamfered to fit flush against the ply bottom which sweeps up to join it. Particular care should be taken over this joint. Hardwood reinforcing blocks for stern tube and rudder fixing should next be inserted. When the assembly is complete sand down the vertical edges of the bulkheads ready for the side planking.

Each side is planked with one strip of $\frac{3}{32}$ in. sheet balsa, roughly $1\frac{1}{4}$ in. wide and 18 in. long. To get this to conform easily to the curve of the hull, soak in hot water before applying; then, when the wood is soft and pliable, bend round to shape and pin in place. Leave to dry out, unpin and then cement back in place permanently, using pins to hold again until the cement has set. The sheet sides can then be trimmed down flush with the deck and bottom.

Strictly speaking, it would be advisable to mount the stern tube assembly in the hull before planking in the sides, but these instructions will deal mainly with hull construction leaving details of the power unit installation to the individual builder.

The main hull assembly is completed by the addition of the $\frac{1}{16}$ in. sheet balsa upper decking. First cement the appropriate sheet balsa formers in place, and then coaming strips of $\frac{3}{32}$ in. sheet hardwood at the sides of the cockpit cut-out. Do not forget to stick cockpit sides in place to render this area water-tight. The upper sheeting is then applied in two panels, joined at the centre, and cut out to fit the cockpit. As, owing to its V-shape it will be slightly wider than 6 in., it will be necessary to glue in an additional strip approximately $\frac{3}{16}$ in. wide to make up the width. This can be inserted on the centre line. The hull is then turned over and work started on the sponsons.

The completed hydroplane. Tether has not been attached as trials took place on a narrow canal on the "from me to you" principle. It will be noted also that the E.D.46 engine was used, mainly because it happened to be the most readily obtainable of the under 5 c.c. class. A supplementary tank was considered unnecessary for the short test runs.

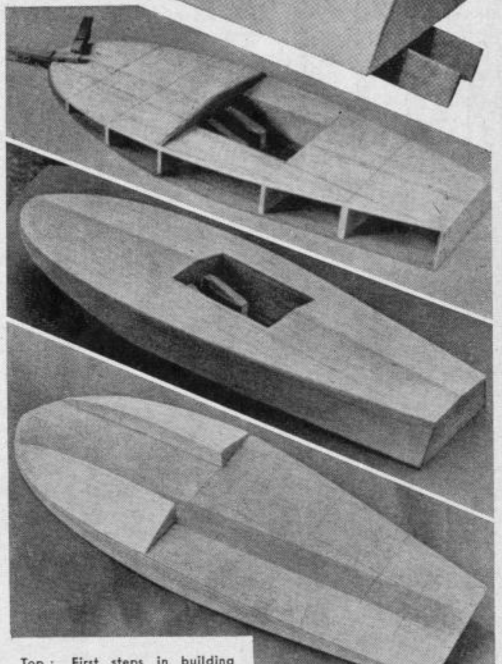
The two sponson keel members cut from $\frac{1}{8}$ in. sheet balsa are cemented in place, taking great care to align these accurately fore and aft. Then add the shaped blocks forming the bows of the sponsons and the triangular formers. Simply sheet cover the whole lot either with 0.8 or 1 mm. ply, or $\frac{1}{16}$ in. balsa. The former will be more durable, but the latter is easier to work and cement.

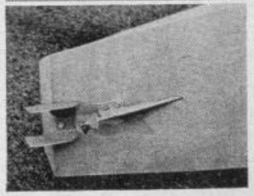
The whole hull can now be sanded down quite smooth and given several coats of grain filler, again sanding between each coat. The aim should be a perfectly smooth surface before applying any paint finish. If you prefer you can cover the whole hull with tissue paper, doped in place, for additional strength.

The fitting of the tunnel sides (if used) and the rudders is shown in one of the sketches. The tunnel sides are simply cemented in place whilst the rudder assembly is screwed to the bottom, the screws extending into the transom.

To facilitate installation and removal of the engine, the fitment detailed in the sketches is recommended. This consists of a strip of brass which fits on top of the bearers. This brass strip is drilled and fitted with screws corresponding to the mounting holes of the engine. Solder the heads of the screws to the brass strip and lock by soldering a small length of piano wire across the heads of the screws. The top of the bearer is recessed so that the strip fits flush. The strip itself is then secured to the bearers with three woodscrews.

The engine (assuming 0.5 c.c. size) must be fitted with a 1 in. dia. flywheel, about $\frac{1}{2}$ in. thick, turned from brass. If the E.D. "46" is employed a special flywheel assembly, weighing $1\frac{1}{2}$ ozs. is available. A propeller, shaft and stern tube can also be obtained ready for use. A threaded coupling joins engine shaft rigidly to the propeller shaft in the same straight line, so it is very important to line the stern tube assembly up with the engine. Alternatively, of course, you can employ a flexible coupling at this point.





Top: First steps in building the hull. Springer clothes pegs will be found useful in getting a good join at the bows.

Centre: Sides and top decking added — the boat begins to assume its shape.

Bottom: Underside of hull with small sponsons added. The "tunnel" pieces were not used in the prototype.

Bottom right: Close-up of twin rudder, skeg and propeller installation.

For the propeller shaft itself $\frac{3}{32}$ in. dia. steel wire will be ample. A heavy cycle spoke will be excellent. This runs in a suitable length of brass tubing, aligned with reference to the hull bottom by a skeg cut from sheet brass and screwed to the hull bottom. The propeller shaft tubing is soldered to the skeg.

The 1 in. dia. propeller is cut from $\frac{1}{32}$ in. hard brass, to the pattern shown on the plan. Drill to fit the propeller shaft and then bend to a pitch angle of approx. 30 deg. This can be adjusted later, if necessary. The end of the propeller shaft is threaded and the propeller locked in place by sandwiching between two nuts, with a third nut acting as a lock-nut. This assembly can be soldered together, if desired. Alternatively the propeller can be located with fuse wire bound round the shaft and the whole assembly securely soldered. This obviates any thread cutting. The propeller shaft unit can be detached from the engine simply by unscrewing and withdrawing from the stern tube.

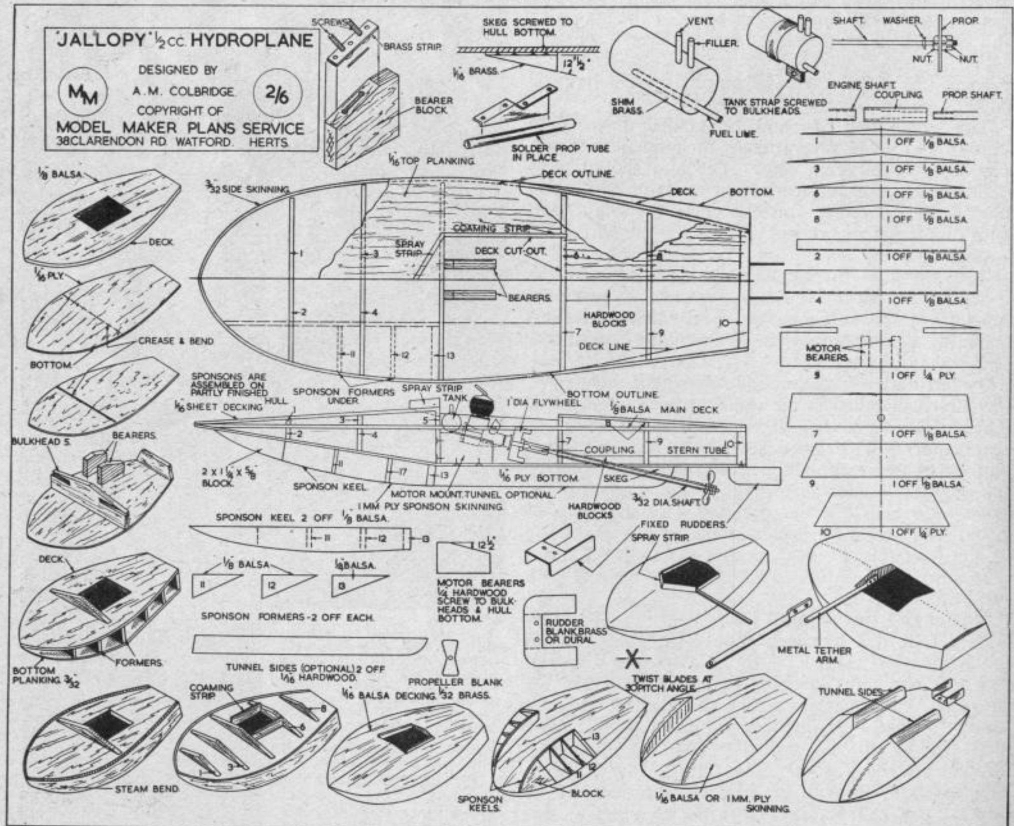
MATERIALS LIST FOR "JALLOPY"

2 sheets 3 ft. x 3 in. x $\frac{1}{8}$ in. medium balsa
1 sheet 3 ft. x 3 in. x $\frac{3}{32}$ in. medium balsa
1 sheet 3 ft. x 3 in. x $\frac{1}{16}$ in. hard balsa
1 piece 16 in. x $6\frac{1}{4}$ in. x $\frac{1}{16}$ in. resin bonded 3-ply
1 piece 10 in. x 5 in. x $\frac{3}{8}$ in. resin bonded 3-ply
6 in. brass tube for stern tube
1 bicycle spoke to fit above
Shim brass 6 in. x 6 in.
Brass sheet $\frac{1}{16}$ in. thick 6 in. x 6 in.
Hardwood bearer blocks, etc.

For reasonably long power runs a tank about 2 in. long and $\frac{1}{2}$ in. to $\frac{3}{4}$ in. dia. should be made. This can be formed from shim brass with soldered seams. Three 16 s.w.g. brass fuel pipes are then soldered in place—one for a vent, one for a filler and the other for the fuel line. The latter should lay along the bottom of the tank, as shown, emerging on the inboard side of the tank, if the model is intended for

(*Continued on page* 464)

FULL-SIZE PLANS OF "JALLOPY" ARE AVAILABLE FROM "MODEL MAKER" PLANS SERVICE, 38 CLARENDON ROAD, WATFORD, HERTS. PRICE 2/6 POST FREE.



MAKE THIS MODEL OF SHERLOCK HOLMES' OWN

HANSOM CAB

BUILT BY
GEOFFREY PORTER
PHOTOGRAPHED AND
DESCRIBED BY
H. V. TIPPER

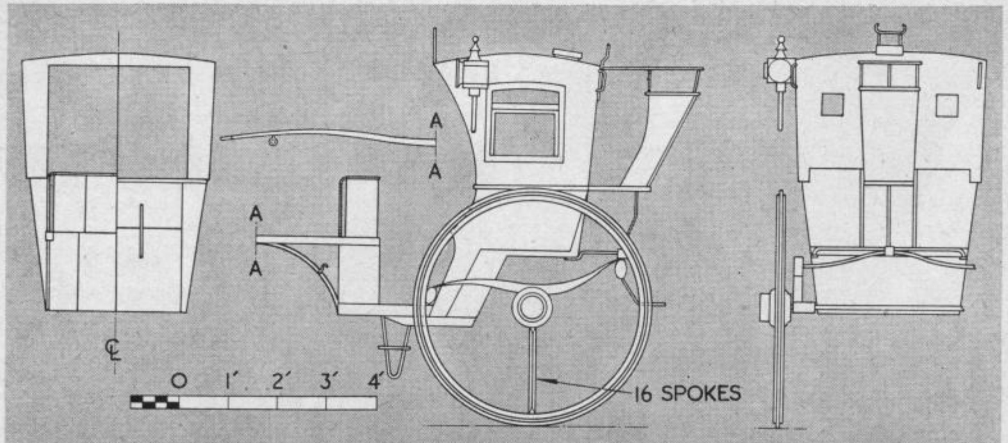
THIS one inch to the foot scale model was made to the order of Adrian M. Conan Doyle, for the Sherlock Holmes Exhibition, now on tour in the U.S.A. It represents, as exactly as the scale of the model will allow, the type of cab which Holmes is so often represented as requesting his friend Dr. Watson, to call and which, in the early 1900s, must have been a common enough sight in Baker Street, even though one never stopped at the door of No. 221B.

Most of the construction is of plywood, steamed into shape, glued and pinned. The body is of $\frac{1}{16}$ in. ply, $\frac{1}{8}$ in. ply being used for the floor. The roof was shaped from solid wood.

The leaf spring were each made separately from $\frac{1}{16}$ in. ply, steamed into shape, then pinned, thus giving the vehicle real springing, an effect which could not have been obtained by cutting the whole spring from the solid. One eighth inch wood was used for the shafts, steam again being used to obtain the desired curvature.

The wheels presented a delicate problem. They were cut from $\frac{1}{8}$ in. ply with a fretsaw, the spokes being filed into shape. One of the major difficulties here was to prevent warping, and the shaping of the spokes to prevent this took a considerable amount of the time spent on the whole model. All the handles, steps, etc., are of wire soldered, while

The completed model invites thoughts of pea-soupers in the Baker Street area, and the wicked Professor Moriarty in full flight.



DESIGN FOR MODEL HANSOM CAB. 1900 HACKNEY TYPE.

the windows are of acetate sheet. The upholstery is not quite so soft as it looks, being of Whatman's water colour paper, varnished and pinned with brass headed pins.

All the measurements and details were taken from an actual Hackney Cab of the period, and translated with the omission of as few details as possible, to the one-twelfth scale model. It is interesting to note the difference between a cab of this type and a Hansom made for private use. The latter had high curved "perambulator type" springs fastening on to the body at the rear, instead of the Hackney's much flatter springing. It also had a windscreen to protect the occupants. Presumably the passenger in the hired cab had to put up with whatever weather came across that low door!

In both types the driver was high and exposed. Both had the trap for passenger-driver communication, and both the handle which controlled the low, frontal door. Whereas, however, the Hackney was painted black, the private cab was not restricted as to colour.

In the photograph the cab is seen a matt black. This is because to avoid highlights inevitable with glossy varnish, the photograph was taken before the top varnish coat was applied.

And, to return to our friend Holmes, if you look carefully you can see a beautiful fingerprint on that matt black, which would have delighted the heart of the eminent sleuth. The photographer—clumsy fellow! — forgot that a Hansom Cab is turned by means of the shafts. Not by grabbing the body between thumb and finger!

JALLOPY, HALF-C.C. HYDROPLANE

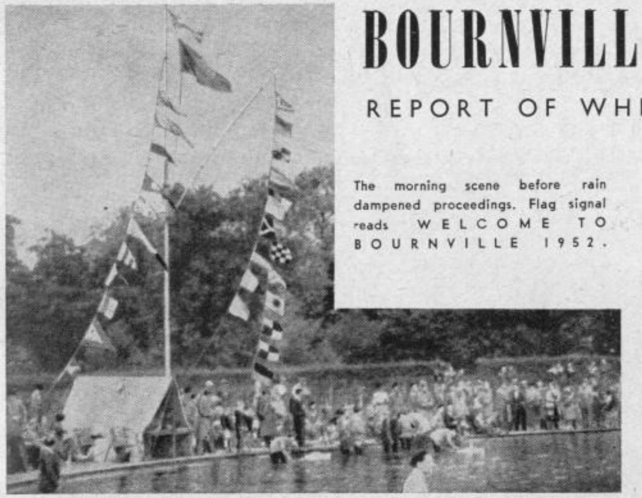
(*Continued from page* 462)

tethered runs. A brass strap around the tank is screwed to bulkhead 5, and holds the tank unit in place. For short runs the standard E.D. tank forming part of the engine unit will suffice.

The model can be operated on a line, or "free". In the former case, instead of the usual bridle, a single tether arm will be satisfactory. This should be bent from steel strip, as shown, and screwed to bulkhead 5. The extreme end of this strip is drilled to take the tethering line.

If the boat is to be run "free" then it is definitely advisable to fit a propeller guard—a loop of spring wire attached to the transom and passing forwards and under the propeller. If the boat then runs aground at speed this guard will protect the propeller blades from possible damage.

Maximum performance will be realised at one particular propeller blade setting (propeller pitch) depending on the power of the motor used and the finished weight of the model. This can only be determined by trial and error over a number of timed runs. Practice will also be needed in starting the engine (with the boat out of the water). This is best done with a pull-string around the flywheel, which should be cut with a V-shaped notch to accommodate the pull-string. To avoid stalling the engine when the boat is put in the water and the water resistance immediately slows the propeller, the model must be launched with a forward motion. Only practice will indicate the optimum needle valve and compression setting for the motor for consistent performance with the propeller submerged.



BOURNVILLE REGATTA

REPORT OF WHIT MONDAY MEETING

The morning scene before rain dampened proceedings. Flag signal reads WELCOME TO BOURNVILLE 1952.

FINAL RESULTS

STEERING COMPETITION:

Nicholls (Cheltenham) 7 pts.; Benson (Blackheath), 6 pts.
(23 entries, 9 scoring.)

SPEED:

500 yds. A Class, 30 c.c. (7 entries, 3 runs). G. Lines (Orpington), 55.5 m.p.h.
500 yds. B Class, 15 c.c. (6 entries, 4 runs). G. Lines (Orpington), *47.2 m.p.h.
500 yds. C Class, 10 c.c. (9 entries, 6 runs). Phillips (S. London), *44.2 m.p.h.
500 yds. C Restricted Class, 10 c.c. (9 entries, 5 runs). Poyser (Victoria Park), *52.0 m.p.h.
*Corrected times.

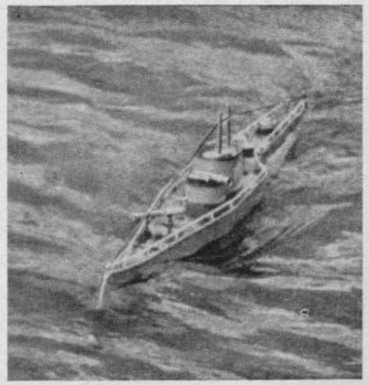
THE 28th Annual Whitsuntide Regatta, 1952, organised by the Bournville Model Yacht & Power Boat Club at Valley Lake, Bournville, opened with sailing by 6 metre models in a contest for the Bournville Cup, a valuable and attractive trophy.

Wind varied in strength and direction from south-west to south, and this created tricky conditions. Some of the skippers began with a good trim of the sails, but the necessity for frequent alterations upset any prearranged scheme and it was the test of rapid improvisation which counted in the final decision. The Cup was won with determination and tenacity by Alan Davis, the owner and skipper of *Dare*, securing 16 points, followed closely and creditably by Jack Ward who sailed his yacht *Dainty* and secured 15 points. Third place was obtained by Frank Brittan with *Lady Jane* and 13 points.

Model power boats from Runcorn, Wallasey, Derby, Victoria (London), South London, Blackheath (London), Coventry, Swindon, Cheltenham, Orpington, Southampton and Guildford, arrived on Monday when, at 11 a.m., the contests were opened by the Deputy Mayor of Birmingham, Alderman R. C. Yates, who was accompanied by his wife. Also present were Sir Robert and Lady Bird, Colonel G. E. Ross, the General Manager of the City of Birmingham Parks Committee, and Mrs. Ross. Mr. E. Westbury, the Chairman of the Model Power Boat Association of Great Britain, paid his annual visit.

A strong chilly south-west wind caused difficulty in Steering Competitions, but despite these adverse conditions some good results were registered. Heavy rain sent spectators to the marquees for shelter, but competitors carried on with Hydroplane racing.

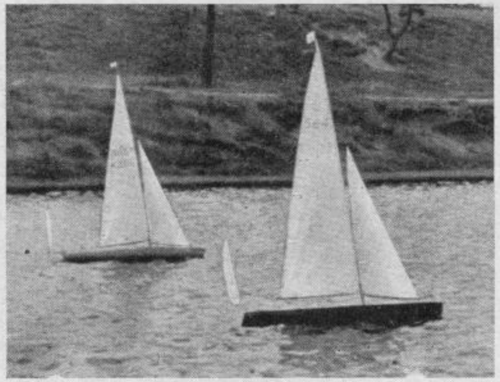
Some of the Steering Competition entries. Mr. Middleditch left with CT4 came third. On the right: A shot of the Wallasey Submarine just after surfacing.



British Open Event for Marbleheads at Witton

REPORTED BY D. J. LAIDLAW-DICKSON

Left : Flags of some of the competing clubs flying from the clubhouse staff. Below : A group of competitors on the second day. O.O.D. is on extreme right marshalling them into order.

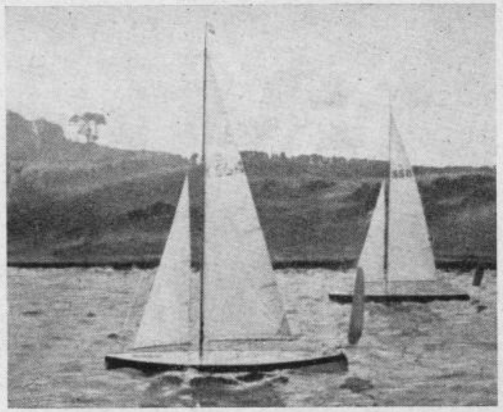


"Floreana" (winner) and "Suzanne" (last boat) meet in the first round. Below left : "Mistral", a local entry encounters most-travelled "Gypsy Girl" from Ulster. Below right : "Wendy", another Birmingham entry, meets "Otterspool" from Nottingham.

LIKE a Whitsun bride with "something old, something new", the British National Marblehead Championship was won by March-launched *Floreana* entered by A. R. Andrew of Birkenhead, with that much-travelled gentleman Wally Jones of the same club acting as mate. *Floreana* is developed from the American champion yacht *Sun Kiss* designed by Lassell. Of particular interest was the presence of *Fandango* from Bristol, built from the original *Sun Kiss* drawings without deviation, and employing a completely movable rig with a 2 in. movement. Comparison of the two boats showed that *Floreana* by fairing in the transom and a slight alteration of bow design had overcome the excessive centre of buoyancy movement that justified — and indeed necessitated ! — the fore and aft movement of the rig in the original. We hope to publish details of this interesting American in the near future.

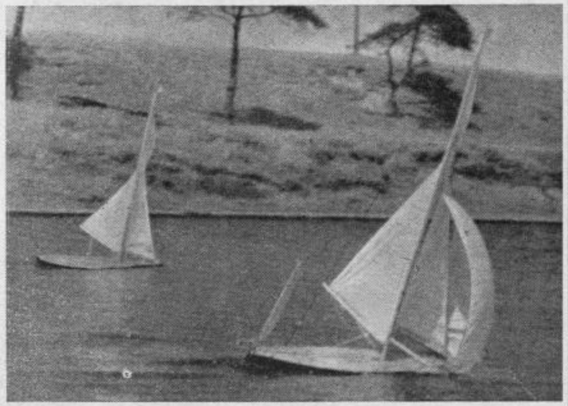
Sixteen boats from eleven clubs, covering leading English clubs from Birkenhead to Hastings, and one entry from Ulster, came under starter's orders, in a light variable S.E. breeze, veering southerly at times. The light tricky air provided a loose reach and a beat, scoring two and three respectively, which taxed skippers' skill in adapting themselves to local conditions. The first day's sailing showed *Floreana, Senlac IV, Mistral* each with 33 pts., and *Gypsy Girl* with 24 pts.

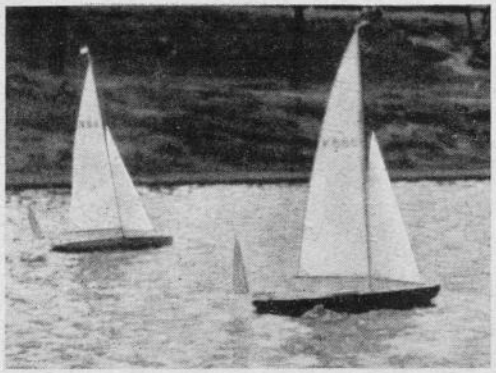
Wind had freshened by Sunday morning, veering S.E., involving the problems of to change suits or not. Spinnakers were in evidence, though with mixed success. Close heats were the order of the day, one of the best being between leading boats *Senlac IV* and *Floreana,* when the former managed

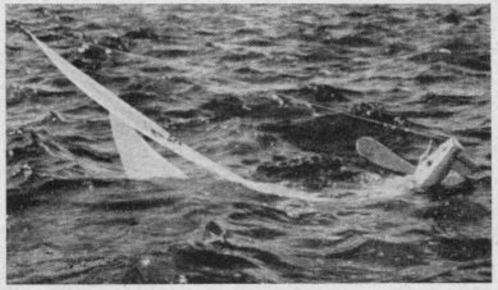


Top right : Winner "Floreana" meets "Fandango" from Bristol, a boat built from the same American source. Below right : Close-up of "Floreana", which by dint of good sailing allied to good skippering, proved a well-deserved winner. Below left : "Bridave", only Braine geared boat, meets "Kanchi".

				Pts.
FLOREANA	K.564	A. R. Andrew	Birkenhead M.Y.C.	89
SENLAC IV	K.583	M. Holt	Hastings ,,	81
TANGO	K.584	W. Grint	Norfolk ,,	66
GYPSY GIRL	K.574	B. Carson	Ulster ,,	62
WYLO	K.486	J. Edwards	Birkenhead ,,	58
BUTTONS	K.578	J. Kicks	Hastings ,,	51½
WENDY	K.531	D. Lippett	Birmingham ,,	48
MISTRAL	K.570	A. Thornhill	Birmingham ,,	45
Other results were :—				
HONEY	K.468	A. Mullett	Brighton & Hove	37
WOLVERINE	K.566	G. Stobbs	Bolton M.Y.C.	36½
FANDANGO	K.558	J. Weeks	Bristol ,,	35
KANCHI	K.256	G. Smith	Birmingham ,,	33
OTTERSPOOL	K.373	J. Lapsley	Nottingham ,,	28
WAIT-FOR-ME	K.576	W. Turner	Hastings ,,	27
BRIDAVE	K.502	G. Swinyard	Felixstowe ,,	26
SUZANNE	K.386	G. Walker	Danson ,,	17







Left: "Fandango" and "Wolverine". The latter boat competed in a thrilling dead heat with "Buttons Up". Above: A watery grave! "Buttons Up" bows down after losing her hatch; one of several sinkings that occurred during the meeting.

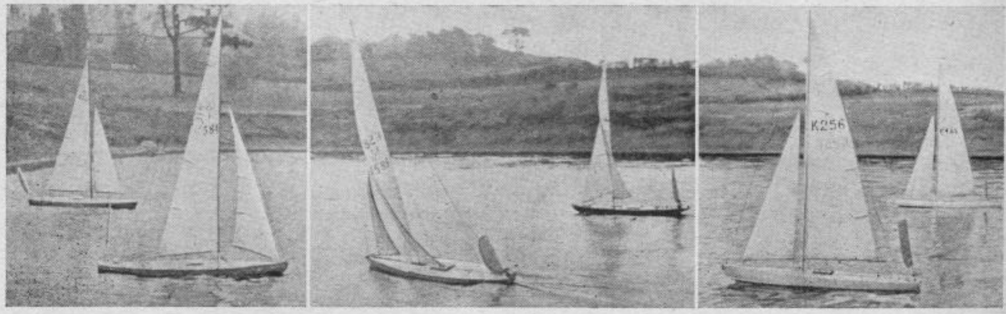
to gain five vital points in their two boards to end first round with a one point lead. In the windward board *Senlac* sailed completely through the lee of *Floreana* to win. Last heat of the first day between *Wolverine* and *Buttons*, which had sunk in the morning, provided the unusual result of a dead heat!

The eight leading boats entered a second round, carrying forward their first round points. Still heavier weather prevailed, and *Floreana* sported a light plastic spinnaker for the first time, which gave her immense power on the run. Her match with *Senlac IV* proved the turning point in the championship, for she reversed first round placings by taking both boards, though only by a matter of inches in the beat.

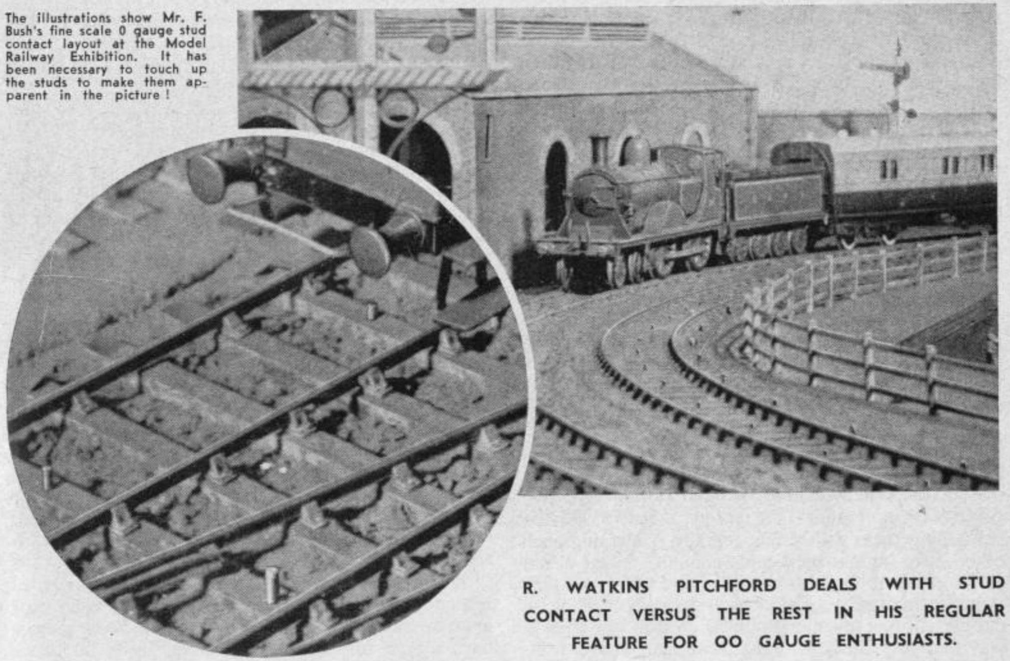
Ed. Hague proved a hard working and efficient O.O.D., and it was fitting that Mrs. Hague should present prizes to the winners.

The onlooker—who is said to see most of the game—could have found little fault to find with any of the entries. Good skippering on this tricky water undoubtedly had much to do with the final placings. In other weather, on other water, any of half a dozen boats might well have won. We have already commented on *Floreana* and *Fandango*. Some consideration of other designs might be of interest. Firstly, fifteen of the boats carried Vane steering, sole exception being *Bridave* from Felixstowe. Vane feathers showed a wide variety of shapes, most interesting innovation being on third boat *Tango* where "spoiler" strips were stuck to the trailing edge, for which improved response in light winds is claimed. Both commercial and own design gears were in evidence, many of extreme simplicity defeating their own object by limited adjustment. Is it perhaps significant that first and fourth boats, amongst others, carried Arthur Mullett's Mk. II gear? Arthur had his *Honey* with him, and just failed to reach the last eight. *Senlac IV*, latest in the long *Senlac* line, was a beautiful boat, of vertical bread and butter construction, finished in varnish to show the beauty of the wood, and built, we understand, by A. Levison of Farnham. We noted one local boat *Wendy* of hard chine construction, which sailed well enough to reach the final. The Danson boat *Suzanne* which came sixteenth, was by no means disgraced, but this was one of the boats that might have profited by a more adaptable Vane gear, though its home-made construction in brass and "Perspex" was very simple for limited application on less tricky water.

Left: Third boat "Tango" meets "Wylo" from Birkenhead. Centre: The beautiful "Senlac IV" with "Mistral" which at one time looked like placing high on local knowledge. Right: Oldest boat "Kanchi" sails against Arthur Mullett's "Honey" — top of the non-finalists.



The illustrations show Mr. F. Bush's fine scale 0 gauge stud contact layout at the Model Railway Exhibition. It has been necessary to touch up the studs to make them apparent in the picture!



R. WATKINS PITCHFORD DEALS WITH STUD CONTACT VERSUS THE REST IN HIS REGULAR FEATURE FOR OO GAUGE ENTHUSIASTS.

On the Right Track

PROBABLY every hobby has its pet "bones of contention" over which enthusiasts growl and snap in amiable rivalry. The model railway hobby is fortunate in being blessed with a number of such "bones", and one of the most succulent is the question of which type of track electrification is best. Which has the advantages and which the drawbacks—two-rail outside third rail, inside third rail, or stud contact?

You notice we say nothing about overhead third rail and pantograph collection. Our sons (or certainly their sons) won't be worried about making a choice at all, because in their day it will be all overhead traction and the steamer will, more's the pity, be a museum piece.

But today we have the four possible types to choose from and, of course, every one of them is the best! Indeed every one of them *is* the best from some point of view or other.

A great deal depends upon the type of railway the constructor is modelling and upon the stage of development he has reached. For example, let us consider the man who made his acquaintance with railway modelling by starting with a proprietary system having a centre third rail, e.g., the Hornby-Dublo with its centre third rail.

Later he may have extended his layout by adding some home-constructed scale track — continuing perforce to use centre third rail—and still later he may have converted his entire layout to this type of track. By now he is developing a keener sense of realism, and he is anxious to extend his loco stud beyond the range of models available with his proprietary make.

He has his eye on a particular loco that he would love to possess, but unfortunately it is arranged for two-rail running. Have it converted for centre third rail? Yes, it can be done, but isn't it rather a retrogressive step? "Surely", he argues, "the move in the right direction would be to convert my track to two-rail and make it look more like the sort of permanent way on which you see steam trains running." And then he pauses!

The matter of converting the track may not be a very formidable affair. But it does not end there. The existing locos must also be converted—and so, by Jove, must all the rolling stock. Of course, if this crisis is reached while the railway is still of modest dimensions, the remedy may not be so drastic. But how about the case in which the layout occupies a whole room and comprises a hundred feet or so of track work and many items of rolling stock? It is then that the constructor begins to wonder rather ruefully whether he did not make a mistake in starting on a system that has brought him to a dead end. "How much better" he says, "if I had started on two-rail in the first place." But the distant hills are proverbially the greenest.

The two-rail system has undoubtedly some features to recommend it. It saves the expense of a third rail; it is the type of track that the eye naturally expects to see where steam outline traction only is being used; locos can pick up current from the treads of their driving wheels and there are no unsightly skates or collector bars to catch up in things. Yes, there are all these advantages—and others.

But two-rail does not have it all its own way. It can present some problems in insulation which are the very deuce—not insulation between wheels and their axles, but insulation between rails of opposite polarity.

Keeping these rails from actually contacting each other is, or should be, simple enough. What is not so simple is to lay down one of the more complex point formations, such as a "scissors" crossing, a double slip, or even a double junction, in such a way that you can be sure that both leading and trailing bogies will pass through in either direction at all reasonable scale speeds without tripping the overload release through a short circuit at the wheel flanges.

In these small scales clearances are exceedingly fine—if you overdo the thing mechanically you get shorts electrically; if you ensure against electrical shorts by leaving a few thous. of extra clearance, then your heart is in your mouth for fear of the humiliating derailment that always seems to come along at the moment when you are demonstrating to a critical friend!

Then again, in two-rail or any other system where you depend upon the running rails to maintain difference of polarity, you cannot have reverse loops unless special switching is provided. And the reverse loop in some of its more subtle forms can be a very pelasant help to the layout planner as we all know. So, if the centre third rail system leaves something to be desired, so also does the two rail. You can object to the former because it is expensive in rail and unreal in appearance, and you can object to the latter because you cannot use reverse loops without special switching, and because insulation at the more complex point work can be troublesome, particularly to newcomers to the game.

As to the outside third rail system, this can be made to work well and to look well, provided always that the particular railway being modelled is one that normally does use outside third (e.g. some sections of the S.R.). Some folk claim that having to change the conductor rail from one side of the track to the other at frequent intervals is an unmitigated nuisance—others find it fun! And then there is the much-debated stud contact.

Perhaps controversy rages more fiercely around this than any other type of electrification. "It is the one system" people will tell you "that has no counterpart in the prototype. You do see two-rail and you do see both inside and outside third-rail, but you do *not* see a steam-outline train running along and scraping over the heads of metal posts sunk in the middle of the four foot way.

Be that as it may, the stud contact system is the choice of many of our foremost model railway men, and one can be sure that they would not have adopted it if there had been any serious drawbacks. In this system, as we know, the loco picks up its current from what is, in effect, an articulated centre third-rail. Instead of the conductor rail being laid on insulators down the middle line of the track, it is laid out of sight under the baseboard (actually it usually takes the form of a heavy copper wire) and metal studs soldered to this conductor protrude up through the ballast of the track where their heads can be contacted by a skate or shoe on the underside of the loco.

There is no necessity for these "studs" to be of heavy gauge. In fact domestic pins have been used in some cases and their cross sectional area is more than ample for the current taken by a 00 gauge loco. However, a thin stud of this kind is apt to vibrate under the rubbing action of the passing skate and to make the loco emulate the fine lady of Banbury Cross in having music wherever she goes.

On the other hand a heavier gauge stud is not so easy to conceal and is apt to show up rather prominently among the ballast. Naturally the shank of the stud protruding above the ballast is coloured to tone with its surroundings and only a minute polished spot on the rounded head is left for the skate to contact. Two important dimensions must be observed so far as the studs are concerned, namely, the centres on which they are spaced apart and the level of the stud heads relatively to the rail table.

The stud spacing must be such that the skate on the shortest loco used on the system will span two consecutive studs without any tendency to drop between them. Studs may, of course, be placed at close intervals and often are so where occasion demands. A maximum spacing of 2 in. with a skate length of $2\frac{1}{4}$ in. is a workable proposition for most 00 gauge systems.

As regards the height of the stud head relative to the rail table, this must be sufficient at crossings to lift the skate clear of any running rail with which it would otherwise make contact. It would, however, be unnecessary to have studs at this level throughout the layout as it would be very difficult in such a case to render them inconspicuous

We therefore arrange that the normal height of

(*Continued on page* 472)

ROKAL 2-4-2 ON TEST

MANXMAN'S REGULAR TT FEATURE

This "bridge-level" shot of the new Rokal 2-4-2 serves to give a vivid impression of its rugged character and ample detail.

TO the already existing 0-4-0 loco the Rokal people have now added a 2-4-2, and there are hints of Continental outline Pacifics and British outlines of various wheelbase arrangements to follow. There can be no denying that the addition of the leading and trailing trucks to the 0-4-0 has made this 2-4-2 into a handsome and impressive loco. It is indeed something more than "just the old 0-4-0 with a collar and tie on", because the manufacturers have wisely taken this opportunity to incorporate one or two minor, but very desirable refinements based on the experience gained with the earlier models.

The result is to make this new loco even more of a "glutton for work" than its predecessors—which is saying some!

As an instance of the sort of performance which may be expected, one of these 2-4-2 locos, a casually selected sample, was set to haul a short train around a piece of continuous track on the Peco stand at the Model Railway Club Exhibition in April last. It ran continuously during the hours when the exhibition was open, being switched on in the morning and off again at night. Not once was the loco taken off the track or touched in any way for brush adjustment or lubrication, and not once did it fail to throw itself into the collar the moment that juice was applied.

It is, of course, in reliability of operation, in sensitive response to controller settings, and in long periods of hard work without attention that these locos score so heavily over some of their more realistic looking rivals in the larger gauges.

It is one thing, and admittedly a very great thing, for us as British model railwaymen to have locos on our layouts that resemble British prototypes in outline, particularly if all the setting of the layout is essentially British. But when you come to deal with very miniature railways such as the TT gauge where there is, naturally, a greater proportion of scenery to railway, the exact outline of locos and carriages—particularly when in motion—seems to matter less in its contribution to the picture as a whole and the eye is more prepared to accept a general impression of a moving train.

But if in the smaller gauges the detail of the trains becomes more subordinated to the picture as a whole, so does greater importance attach to realistic performance.

If the trains behave in an uncertain and temperamental manner and need lots of surreptitious digs and jerks from giant hands before they will perform, the entire illusion is spoiled from the outset. It is in recognising this factor and in ensuring complete reliability in operation that the sponsors of the Rokal trains have shown such sound common sense.

The road holding qualities of this 2-4-2 loco are beyond reproach. Facing and trailing points presented no temptation to the pony trucks to derail and were taken when running both loaded and light in forward and in reverse at all reasonable speeds.

Unfortunately, owing to some delay in the delivery of the sample under test, it was not possible to test out these road holding qualities on built-up scale TT track and this test must be deferred to another time. But provided use is made of "universal" points such as that described in our columns (*Model Maker*, January, 1952) or, alternatively, provided that wings and checks are set to the Rokal flange thickness and back-to-back measurements, there is no reason to suppose that trouble will be experienced.

A feature that will make a stronger appeal to some than to others is that when these 2-4-2 locos are switched into circuit two peanut lamps (one forward and one at rear) light up and, by small reflectors, project four beams of light through "lamps" cut in the main casting above the buffer beams. A white light is thus shown both ahead and astern. This is not of much moment when a train is being drawn, because one pair of lamps or the other is hidden from view by the coach or truck next to the engine, but it is apt to look a bit odd when the loco is running light!

However, this is a minor criticism and, if anything, serves to throw into relief the extraordinarily good value of the loco which retails at around 100/-.

PROOFING MODEL YACHT SAILS

BY R. S. HAWGOOD (DANSO M.Y.C.)

I HAVE tried various methods of proofing—namely spraying with cellulose acetate (aircraft "dope) and waxing, as used for weatherproofing tents and clothing, etc. The main reason one wishes to proof a sail is to render it impervious to shrinkage due to moisture in the atmosphere, and so being able to retain the trim, it not being necessary to "slacken off" as is done with ordinary Union Silk Sails.

I would submit here that I have found that cellulose acetate however applied is *not* impervious to changes in the moisture content of the atmosphere and it will in fact "give", consequently the leech will suffer.

The problem was to find a suitable medium that would not change with changes in the atmosphere. The answer was obviously one of the Synthetic Resin groups. Dulux and Cerrux are examples of this group.

A 50 per cent mixture was used (be sure you have the specified thinners), and this was rolled on to the cloth with a rubber roller or "squeegee". A word about the cloth used—I finally decided on the lightest Union Silk available, approximately 2 oz. per sq. yd., as I did not want the finished sail to be too heavy. Before treating the cloth it should be very carefully ironed (do not stretch the material in any way) to get rid of the major creases. Using a flat board apply the thinned varnish *liberally* with a soft brush to the cloth, but again be careful not to stretch the material, and then immediately "squeegee" all over the cloth in the direction of the selvedge. I found from bitter (and expensive) experience that rolling "across grain" ruined the cloth. It will be found that the varnish will take a full 20-24 hours to dry, and after 12 hours, whilst the varnish is still damp, the cloth should be again ironed with *a very cool iron.* This is to get rid of any small creases in the cloth, as I found that once the material had dried it was impossible to remove any creases, these now being literally "built-in" the cloth! It is also advisable to treat the tape in the same way. Do not attempt (unless you are more successful than myself) to make the sails and then treat it, as the varnish has a shrinking action.

These sails have been immersed in water, and held in a jet of steam, but appear absolutely impervious to this treatment, and they definitely will not stretch!

A word of warning—when the cloth has been treated and "squeegeed" pin it to the door frame, or hang from the ceiling. On no account hang them over a line or chair, etc., as the fold will never come out, and the resultant sail will be useless.

The beauty of these sails is that not only are they moisture-proof, but being a "stiff" sail they are ideal for storm suits, or they can be cut absolutely flat, and what is more they will hold that flatness, and a perfect aerofoil will result. (Now watch for the indignant letters!)

These observations are the result of many months trial and error, and I would like to acknowledge the help given by Research Department of I.C.I. Paints Division, Slough, Bucks, and that of Mr. MacDonald of Clapham M.Y.C., who originally suggested the use of Synthetic Resin for proofing.

ON THE RIGHT TRACK

(*Continued from page* 470)

the stud head will be $\frac{1}{16}$ in. below rail table and the maximum height (at crossings) will be $\frac{1}{16}$ in. above rail table.

The transition from normal height to maximum and back again to normal will, of course, be gradual and even, and a vertical travel for the skate must be provided which will accommodate this rise and fall of $\frac{1}{8}$ in. with something in hand at both upper and lower limits. The stud heads must be of even height and the skate must not tilt. A form of skate favoured by some constructors is of the pantograph type, whereby the skate itself is of weighty construction and moves up and down on links like parallel rulers. Sufficient contact with the stud heads is provided by the gravity action of the skate and no resort is made to spring loading which would tend to rob the loco of adhesion and tractive effort.

Stud contact lends itself admirably to track sectioning and to the super imposition of H.F. currents and other methods of remote control. There is ample scope here for the electrically minded constructor to carry out experiments in automatic signalling and the finer shades of traffic control.

In fairness it should be pointed out that there are some snags in this as in every other Garden of Eden. Probably the chief is that of maintaining the studs at correct height. If ordinary brass tacks are used for studs and driven through the baseboard, it will probably be found that the shank of the tack expands under the heat of the soldering and then forms a loose fit in its hole when it contracts again. With the constant rubbing of the loco skate the sloppy fit becomes accentuated, until the tacks start to present an uneven surface to the skate resulting in jerky running or stopping. The remedy seems to be to use studs having small collars turned on them which effectually prevent this sinking into the baseboard.

It is perhaps significant that most stud contact layouts are owned by those who are by way of being "old hands" at the hobby, and it would also appear that in most cases these stud contact layouts have been built up from a standing start.

Building DEGLET NOUR

IN PART IV BERNARD REEVE PROVIDES AN ECONOMY METHOD OF BUILDING THE HULL AND COMMENCES DETAILS OF FITTINGS

WHEN building by the layer method a certain wastage occurs, as the interior cutouts of the obechi planks cannot be used, and this wastage has, of course, to be paid for.

In order to overcome this I have devised a composite system of construction using both layer and rib and plank method which should help the novice constructor as it overcomes the rather difficult bow planking. The illustration shows how this is done.

Only five obechi planks are required, the sheer plank and planks Nos. 1, 2, 3 and 4. Plank No. 5 comes from the cut out portion of No. 1. Plank No. 6 from No. 2 and plank No. 7 from 3, while the thin bottom plank is obtained from the cut out portion of the sheer plank. I have told you how to set out the cutting lines in my first article, so there is no need to repeat these instructions.

The blocks are glued up as already instructed, the slot cut for the keel and the whole block shaped as in building the complete hull by the layer method. When finished, recess the after edge $\frac{1}{16}$ in. deep to take the planks and cut out recesses for the stringers.

The keel is cut as previously described, but is a little deeper (see the drawing). This is let into the bow block and also into a solid transom of $\frac{1}{2}$ in. hard wood—mahogany is excellent.

The ribs are sawn from a sheet of $\frac{1}{4}$ in. hardwood, but I suggest 6 mm. resin bonded ply as so much of the hardwood obtainable today warps badly. This method may seem wasteful, but as we are dispensing with a building board and moulds it is the best way. A sketch of a rib is given to show its shape—this is typical only, and does not represent a particular rib.

These are set up on the keel plate and tied by fitting the gunwale stringer. Note how the top of this is planed down after fitting to the sheer line; also note the deck stringer to preserve the rise of sheer.

The transom can be cut right through to take the stringers as the end is plated with veneer which will hide the end grain. A block acts as a knee typing the transom to the keel. This is slotted to fit over the keel and then drilled for the rudder trunk.

Next fit the bilge stringers in the same way. These stringers are scarped into the bow block for 1 in. of their lengths, as shown. Finally, fit the garboard fillets between each rib, glueing and dowelling to the keel plate. These fillets carry the garboard plank and provide a firm fixing for it. Use dowels throughout as you can plane down without worrying about nail heads.

Now for the fairing up. Plane down all proud edges of the stringers and fillets until they blend with the ribs, hence the use of cane dowels.

The ribs also require slight fairing, so take a batten and offer it to the hull like a plank. This batten should bear evenly on each rib. Where it does not chamfer the proud edge with a file until it does.

Planking

Use $\frac{1}{16}$ in. resin bonded ply 1 in. wide. Start with the garboard, the plank next to the keel. Clip it to the hull with bulldog clips or brass tacks lightly driven in, and drill the $\frac{1}{16}$ in. holes for the dowels—I assume you have already made a supply as instructed. When the holes are drilled coat the garboard fillets with glue and fix the plank. Do this on the other side and then fit the gunwale or top plank. Proceed with upper and lower planks on alternate sides until you have only one plank to fit. To determine the shape of this get an assistant to hold the ply against the opening between the fitted planks, and run a pencil along the plank from the inside. This will show its shape. Cut outside this line and plane to a fit, then fix it in place.

If you have been careful with your plane each plank will touch its neighbour. Now give the inside a coat of varnish diluted with 20 per cent turpentine. When dry give two more coats.

Now rub down the outside until all the plank edges blend, give a coat of metallic pink priming, stop any cracks with white lead, another coat of priming, two coats of enamel undercoat and one of enamel in the appropriate colours. Take plenty of care, have infinite patience and you will make a nice job. Scamp your work and you will meet trouble.

A material list of timber requirements is appended.

MATERIALS LIST FOR "DEGLET NOUR" —COMPOSITE METHOD

Obechi for Bow Section all 1 in. thick

Sheer Plank $10\frac{7}{8}$ in. x $9\frac{3}{4}$ in.	Plank No. 2 $10\frac{1}{2}$ in. x 10 in.
Plank No. 1 $10\frac{3}{4}$ in. x $10\frac{1}{2}$ in.	Plank No. 4 10 in. x 9. in.
Plank No. 3 $10\frac{1}{4}$ in. x $9\frac{3}{4}$ in.	

$\frac{1}{8}$ in. x $\frac{1}{8}$ in. Spruce, Ash or Birch for Stringers, etc.

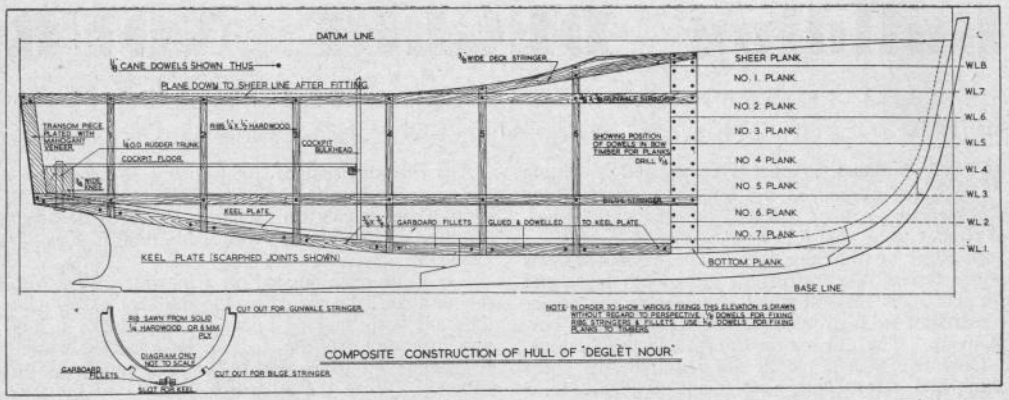
Gunwale Stringer ...	2 off each 2 ft. 3 in. long
Bilge Stringers	2 off each 2 ft. 3 in. long
Garboard Fillets	2 off each 2 ft. long

6 mm. Resin Bonded Ply for Ribs

Rib No. 1 $9\frac{1}{2}$ in. x 5 in.	Rib No. 4 $11\frac{1}{4}$ in. x $6\frac{1}{2}$ in.
Rib No. 2 $10\frac{1}{4}$ in. x $5\frac{1}{2}$ in.	Rib No. 5 $11\frac{1}{4}$ in. x $7\frac{1}{2}$ in.
Rib No. 3 11 in. x $5\frac{3}{4}$ in.	Rib No. 6 $11\frac{1}{4}$ in. x $7\frac{1}{2}$ in.

$\frac{1}{16}$ in. Resin Bonded Ply for Planking

2 off 12 in. wide x 26 in. long



COMPOSITE CONSTRUCTION OF HULL OF "DEGLET NOUR"

FITTINGS FOR *DEGLET NOUR*

BEFORE we consider the making of fittings let us follow full-size ship practice and decide upon the power unit we wish to install.

If the model is intended for radio control this question is already settled—it must be an electric motor, the only prime mover giving instantaneous starting and reversing by remote control, but we must be extremely careful in the selection of such a unit. A permanent magnet motor is essential as a considerable wastage of current occurs when energising a coil. Other points to look for are the air gap between the armature and pole pieces—this should not exceed $\frac{1}{64}$ in., and the gauge of wire used in the windings. A thick wire will give power, but uses a lot of current; a thin wire reduces power but is easy on the batteries. We can step up the power by gearing the motor, but battery wastage can be very expensive indeed. Ask the current consumption in amps., and check this by means of a milli-ammeter. It should give a reading of 1 amp. at the most.

Some commercial boat motors are rated at 6 volts 4 amps. This amperage is unimportant if a transformer can be used, but as we must run on either dry batteries or accumulators it is out of all proportion.

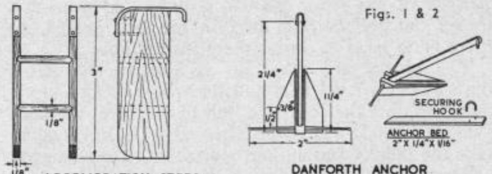
If you already possess such a motor it will repay you to rewind the armature with 32 gauge enamel wire. Sacrifice some power by keeping to 6 volts, and be in pocket on battery costs.

Should you decide not to use radio control an internal combustion engine will be found most suitable. Please do not install a steam plant. I have seen so-called model cabin cruisers so fitted, and I cannot imagine a more deplorable exhibition of how not to do things.

Compression-ignition engines I do not like except for speed work in small boats. They appear to have two speeds: go like a bat out of hell, or stop. A robust 10 c.c. o.h.v. spark plug engine is ideal. It is flexible, an easy starter, and can be adequately silenced, and this is important on many waters, especially those controlled by the London County Council.

FITTINGS.—I have set these out in full details so that those constructors who possess the necessary tools will be able to make faithful reproductions of the prototypes.

It is surprising what a variety of small turning can be done on a Wolf Cub drill outfit. I have had considerable experience of this tool, and during my description of the following fittings I will mention how certain fittings can be made in this way. Will those precision craftsmen with their ML7 lathes and other expensive tools pass over such crudities with forgiveness in their hearts for their less fortunate brethren!



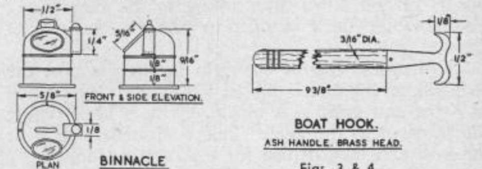
Figs. 1 & 2

ACCOMODATION STEPS
VARNISHED MAHOGANY

DANFORTH ANCHOR
FINISH: DULL NICKEL

FIG. 1. ACCOMMODATION LADDER.—A straightforward job in $\frac{1}{8}$ in. mahogany; dovetail the steps with a triangular file. Use 16 gauge brass wire for the hooks, annealing and flattening where it joins the wood. The finish is bright varnish.

FIG. 2. ANCHOR.—Material brass. Shank is $\frac{3}{32}$ in. x $\frac{1}{8}$ in., drilled at the top for the shackle and at the bottom for the $\frac{1}{16}$ in. wire arm (note taper on this part). The flukes are of 22 gauge brass, bent at right angles and filed to shape; solder base of flukes to arms. Finish, dull nickel or aluminium lacquer. The anchor bed is mahogany glued to the deck, the anchor being secured by a U-shaped pin over the arm.



BINNACLE
FINISH MID GREY.

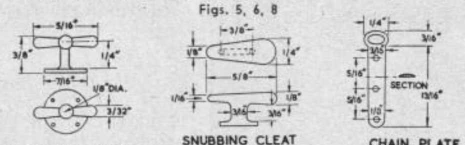
BOAT HOOK.
ASH HANDLE. BRASS HEAD.

Figs. 3 & 4

FIG. 3. BINNACLE.—This, probably, is the most difficult of all the fittings for the amateur to make. There are three ways of tackling the job. Chuck a piece of $\frac{1}{2}$ in. brass bar in the lathe, and turn to give the two ribs, turn the dome top, file a flat for the window. Cut a $\frac{1}{16}$ in. section of $\frac{3}{8}$ in. dia. tube and press to an oval and silver solder to the flat, pressing in a piece of "Perspex" for the window. The handle of the dome is filed up from $\frac{1}{16}$ in. wire and pressed into two holes, while the lamp house is filed to fit the dome and sweated into place. The bottom flange is a $\frac{5}{8}$ in. thin washer silver soldered in place. The second method is to proceed as before up to the base of the dome, this being spun from a piece of thin copper. The final method is to search for a piece already pressed into a thin dome. Cut the window opening and sweat in the window. In both these cases a dummy compass card can be fitted. I make my card by photographing an actual compass card, or an illustration of one, and reducing to size required.

FIG. 4. BOATHOOK.—Chuck a piece of $\frac{3}{16}$ in. rod in the lathe, drill a $\frac{1}{8}$ in. hole for the shaft $\frac{3}{16}$ in. deep. Then taper the rod, split the end, turn the ends down to form the hooks and file them to shape.

Figs. 5, 6, 8



BOLLARD CLEAT
3 OFF

SNUBBING CLEAT
LACQUERED BRASS
2 OFF

CHAIN PLATE
LACQUERED BRASS
4 OFF

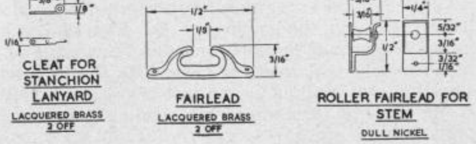
FIG. 5. BOLLARD CLEATS.—This is a simple lathe job turned up from $\frac{7}{16}$ in. brass bar, the cross pins turned as shown with $\frac{1}{16}$ in. dia. shanks to fit $\frac{1}{16}$ in. holes in the head of the cleat.

FIG. 6. SNUBBING CLEAT.—These are roughly profiled from $\frac{1}{4}$ in. brass plate with an abrafile, then filed to shape and polished.

FIG. 7. LANYARD CLEAT.—File up from a piece of $\frac{1}{8}$ in. square brass. I use some old variable condenser spindles from a discarded wireless component. The sides of the eye are filed quite thin and then drilled $\frac{1}{16}$ in.

FIG. 8. CHAIN PLATES.—A simple abrafile job from $\frac{1}{16}$ in. brass. Do not forget to oval the front of the plate after drilling the $\frac{1}{32}$ in. holes, also oval the shroud hole. If you do not possess a set of fine files known as Swiss needle files you should invest in a flat, a round and a square one. They are invaluable for these fine jobs. Also, when using fine drills of $\frac{1}{32}$ in. and under, fit them into a pin chuck so that only $\frac{1}{8}$ in. of the drill protrudes. Then put the pin chuck in your drill. Unless you take this precaution you will be surprised how often you can snap these little chaps. Perhaps you have already found out!

Figs. 7, 9 & 12



CLEAT FOR STANCHION LANYARD
LACQUERED BRASS
2 OFF

FAIRLEAD
LACQUERED BRASS
2 OFF

ROLLER FAIRLEAD FOR STEM
DULL NICKEL

FIG. 9. FAIRLEAD.—Mark off on $\frac{1}{8}$ in. brass plate, drill two $\frac{3}{32}$ in. holes for the throat and file them into one, cut down into these holes to form the top opening, and then profile to shape with an abrafile.

FIG. 10. FENDOFFS.—These call for little comment, being made of dowel rod of the appropriate size, drilled through, fitted with 6 in. of fine rope lay cord and painted white.

FIG. 11. FLAG STAFF SOCKET.—My method of making these is to turn and drill a piece of $\frac{1}{4}$ in. brass rod—the drill need only penetrate $\frac{3}{8}$ in. or so. Then file out a $\frac{3}{8}$ in. washer to fit the outside diameter, and solder at the correct angle.

FIG. 12. ROLLER FAIRLEAD.—The frame is bent to the shape shown from one piece of thin brass, or zinc if you have a piece, as this will polish to give the requisite galvanised finish. The roller is drilled and can be turned in the Wolf Cub drill using a small round file as a cutting tool. If the holes in the roller and frame are drilled with a No. 43 drill, and the hole in the stem with a No. 50 drill the latter can be tapped 8 B.A., and will thus form a good fixing. The lower hole is drilled to take a brass brad.

Figs. 10, 11 & 13

FENDOFFS
2 SIZES 7/8"X1/2" 4 OFF
5/8"X3/8" 2 OFF
PAINTED WHITE

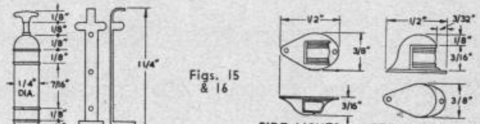
FLAG STAFF SOCKET
LACQUERED BRASS

KLAXON
BLACK FINISH

DETAIL OF BRACKET

FIG. 13. KLAXON.—Turn the dome from $\frac{1}{2}$ in. brass bar, drill and tap 8 B.A. for the trumpet. This is turned also from $\frac{1}{2}$ in. bar and hollowed out until quite thin. The bracket may be sweated on. The finish is black enamel, or better still chemically blacked by immersing in a solution of 1 oz. Copper Nitrate dissolved in 3 oz. of water. This gives a much finer and smoother finish.

FIG. 14. FILLER CAPS.—These are for the fuel tanks and are situated on the after deck. A simple job for the Wolf Cub. The holes for the opening key are pop-marked and lightly drilled with a fine drill.



Figs. 15 & 16

FIRE EXTINGUISHER
LACQUERED BRASS.
BRACKET BLACK.

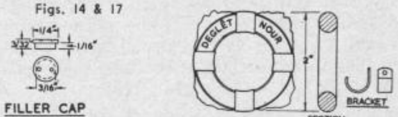
SIDE LIGHTS
2 OFF: P. RED LENS.
S. GREEN LENS
LACQUERED BRASS

STEAMING LIGHT
1 OFF: WHITE LENS.
LACQUERED BRASS.

FIG. 15. FIRE EXTINGUISHER.—This can also be turned in the Wolf Cub from $\frac{1}{4}$ in. brass rod. Turn handle complete with the body and then file the latter flat. The bracket is made of any soft metal—I used zinc for mine. The cupped end was first of all cut as a circle, then by means of a $\frac{1}{4}$ in. dia. ball bearing the cup was formed and the bottom drilled to take the nozzle of the extinguisher. Do not forget to leave the side arms and top long enough to turn down to grip the extinguisher.

FIG. 16. NAVIGATION LIGHTS.—These are not too easy to make. I find the best way is to turn the side lights together from $\frac{3}{8}$ in. brass rod, cut them in half, thus giving a pair of symmetrical half spheres; they are then profiled with a file, the slot for the "Perspex" lenses filed out, and then mount them on flat brass plates. The steaming, or head light, was cut from a piece of $\frac{3}{8}$ in. brass rod. Do not cut off until you have shaped it. Then mount on a brass plate as before. "Perspex" lenses stained red and green are then fitted.

Figs. 14 & 17

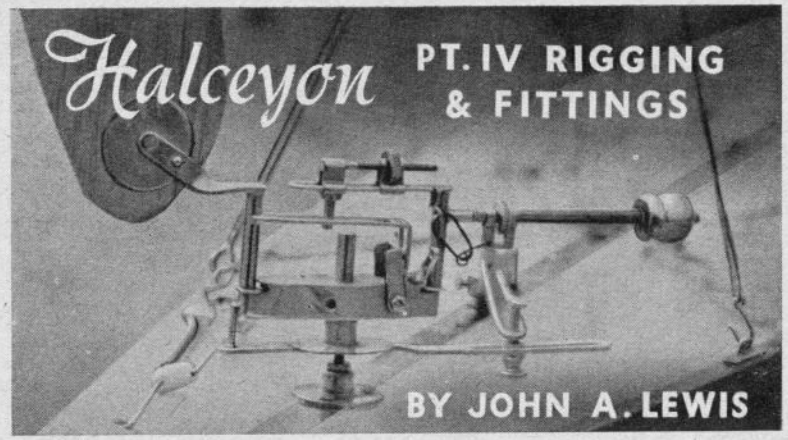


FILLER CAP
LACQUERED BRASS

LIFE BUOY
PAINTED MATT WHITE

FIG. 17. LIFEBUOY.—Please don't use any old curtain ring for this as it is quite easy to turn in a Wolf Cub. Using the latter tool I cut a circle of hard wood—I have used three pieces of $\frac{1}{8}$ in. ply cemented together—then drill a hole in the centre for a 4 B.A. bolt, chuck in the drill and turn the outside. With a sharp vee tool I scribe the inner circle line half way, turn the disc round and cut the other side. Finish off with abrasive paper, bind on the grip lines with thin surgical tape and paint white.

THESE FITTINGS WILL BE CONCLUDED IN OUR NEXT ISSUE TOGETHER WITH PROPELLER DETAILS. COMMERCIAL PRODUCTION OF MOST OF THESE FITTINGS IS UNDER WAY, AND DETAILS WILL SHORTLY BE ANNOUNCED BY A WELL KNOWN FIRM.



Halceyon PT. IV RIGGING & FITTINGS

BY JOHN A. LEWIS

THIS PART BRINGS THE DESCRIPTION OF "HALCEYON" TO A CLOSE. THE BOAT HAS FILLED THE EXPECTATIONS OF THE DESIGNER AND HE HOPES TO SAIL HER IN THE NATIONAL CHAMPIONSHIP AT FLEETWOOD.

IN OUR NEXT ISSUE JOHN LEWIS WILL DESCRIBE HIS EXPERIMENTS WITH ROTATING MASTS ON HIS 10-RATER "MOONSHINE".

THE mast being the most important item after the hull and sails it is fitting that considerable care should be taken to ensure that it remains erect. Although rigging a mast is very simple it is remarkable the number of yachts one sees with incorrect and useless wires festooning this unfortunate spar.

A perfectly rigged mast is basically a strut in compression, and providing it is kept straight it need only be of small cross sectional area in order to provide the required strength. However, although a small cross section is advantageous in reducing the interference that the mast offers to the flow of air over the sails, the extra rigging necessary offers considerable wind resistance which in itself impairs the performance of the yacht. On the whole I think that it is best to have a good strong spar and the minimum of rigging, and it is on this assumption that the rigging shown in Figs. 1 and 2 is based. An important fact which should not be overlooked is that one spends considerable time tuning a boat up to achieve maximum performance, and yet it is necessary to unship the mast when transporting the boat to some major event. If the mast rigging is complicated it is unlikely that it will be set up in an identical manner on arrival at the lake side, and the boat will not be able to give of its best.

Although I like the idea myself, of having the mast standing on the deck, for theoretical reasons, I do not now use this system in view of the last mentioned practical disadvantage. One should not forget that a boat which is a good sound practical job and easy to handle is the best bet for racing. It is not often that we see a yacht equipped with many fancy gadgets in order to obtain a theoretical 2 per cent here or ½ per cent there, up among the prize winners.

The rigging of the metal mast shown in Fig. 1 is perfectly straightforward, and it may be possible to do away with the lower shrouds, but they have been found necessary on the prototype *Halceyon*. Notice that the forestay runs down the luff of the jib. This stay should not be combined with the jib halliard, but should be tightened with its own bowsie. The luff of the jib having its own adjustment will not then have to withstand any of the load imposed on the forestay, which can be considerable. The backstay is not set up taut, but is used only to prevent the mast going over the bows when on the run or when reaching, thus there is no need to have a stay from the mast head to the stem which is so often seen.

The rigging of the wooden mast shown in Fig. 2 is almost the same except that jumper struts are introduced to stiffen the upper portion of the mast. It is very common to see that jumper struts positioned halfway between the hounds (i.e. the point of attachment of the main shrouds) and the mast head. A little thought will make it clear that this will not stop the mast bending at and just below the hounds. If one is going to permit some bending then let the mast take up an easy curve throughout its length.

The rest of the rigging is shown in the various sketches and does not call for much comment, as a lot can be left to personal preference. There are one or two points worth mentioning in this respect, however. Firstly, the kicking strap which is shown in Fig. 7; this hooks on to an eye on the mast near to the deck, and with the high aspect ratio sails of *Halceyon* requires to be set up quite hard in order to prevent the leach of the sail sagging off to leeward by an excessive amount. The point of attachment of the kicking strap to the mast should be directly under the swivel of the gooseneck in order that the boom may swing freely although the strap is dead hard. Incidentally, a spring-loaded kicking strap has been tried on the prototype, but proved unsatisfactory in controlling the sail on the run, in the very strong winds which the boat is capable of standing up to in top suit.

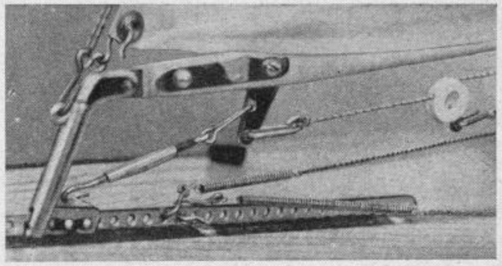
Secondly, the type of rigging cord used is important, and the only really satisfactory cord is braided flax fishing line; it is very expensive, but well worth the outlay. It is obtainable from most high class fishing tackle shops particularly those which supply sea shackle. This cord lasts for months, and does not shrink to any appreciable extent when wet.

The rigging wire for the main shrouds should be in stainless steel, and my usual suppliers are a firm of dental equipment stockists. What use dentists make of it I don't know, but it is sold in 1 oz. coils in all different gauges, and is just the stuff!

The metal deck fittings are not complicated, but it is necessary for them to be strongly made, nothing being more irritating than having any failure of equipment during a race.

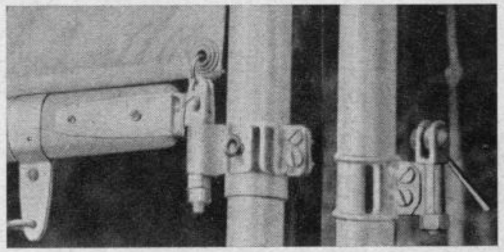
It is not necessary to describe in detail the construction of each fitting as the diagrams show the general arrangement well enough. It is strongly recommended that all joints be silver soldered as soft solder is hardly strong enough and deteriorates with age. A lot of people seem afraid of silver soldering, but it is just as easy as soft soldering. I do my fittings in the kitchen using a "Spitfire" blowpipe plugged into the gas oven, a small vice on the draining board—there is no need for a hearth for the small work involved in yacht fittings. I use "Easiflow" silver solder and flux and have no trouble at all in getting quite a good job done.

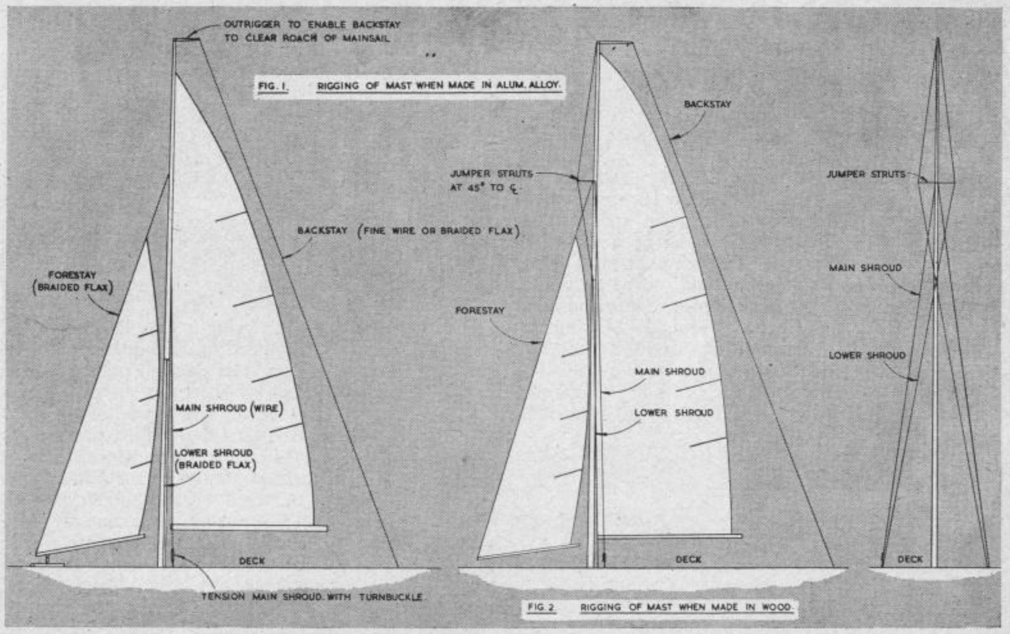
When considerable folding of the metal is required, for say, the mast slide, it is advisable to use a

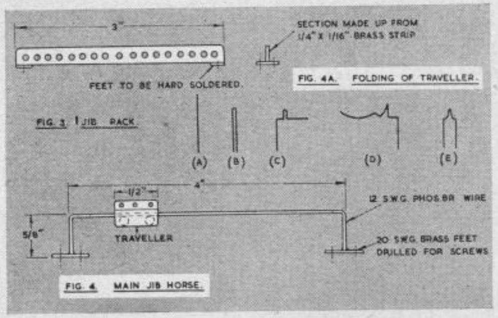


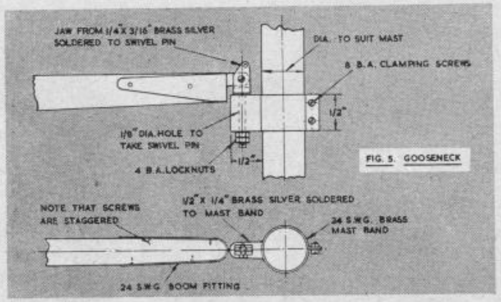
Above: Details of jib rack and jackline on the author's "Halceyon". This is a slightly more elaborate fitting than strictly necessary, a simpler form being described in the text.

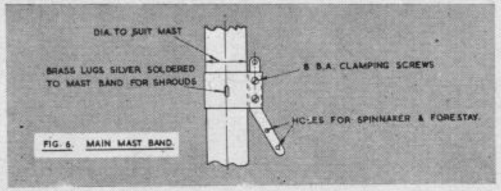
Below: Details of "Halceyon's" gooseneck (on the left) and main mast band (on the right). All these fittings repay care in construction and deserve plating either in bright chrome or the latest satin finish, which is gaining popularity.





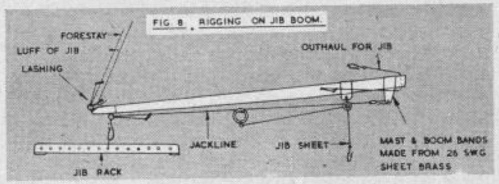


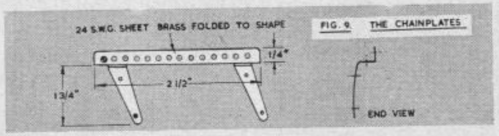


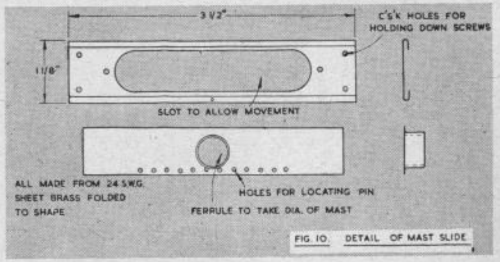


heavier gauge of metal than necessary, so that the hammer marks can be filed off to leave a smooth finish. The conventional sheet horse and traveller arrangements shown in Fig. 4, can be a source of trouble if not well made. The traveller must under no circumstances be liable to bind on the horse and neither must the sheets be able to take a turn around the end of the horse when backing. Making the travellers is perhaps a little tricky, and the successive steps in forming them are shown in Fig. 4a. The sharp corners are formed in a vice and the opening out of the partially formed traveller is done with the fingers to enable the last sharp fold to be made in the vice. The final shape is then obtained by squeezing the metal back to the required shape using a pair of pliers. The rollers can be cut from $\frac{1}{4}$ in. dia. brass rod and drilled to take 6 B.A. brass bolts to form the spindles.

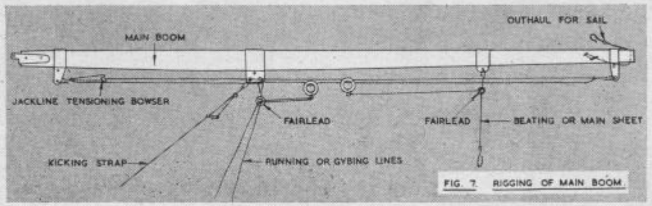
The chainplates which have to take all the pull of the main shrouds, need to be strongly made, and the design shown in Fig. 9 has proved quite adequate. The straps down the side of the hull look attractive, particularly if the fittings are chromium plated. Figs. 7 and 8 show the fittings necessary on the main and jib booms; these are quite simply made from strips of 26 gauge sheet brass folded round the boom and bolted on the underside with 8 B.A. nuts and bolts. This method has the advantage that the cross sectional shape of the booms is easily followed.







Most of the running rigging is also shown in Figs. 7 and 8, and does not need much explanation. The running or gybing lines pass through pulleys on the deck and are attached by means of hooks to eyes screwed to the gunwale on either side of the boat adjacent to the rudder post. Although vane steering is used, a quadrant similar to the Braine gear is mounted on the rudder post so that by using the running lines hooked into the quadrant both Braine and vane action can be employed at the same time.

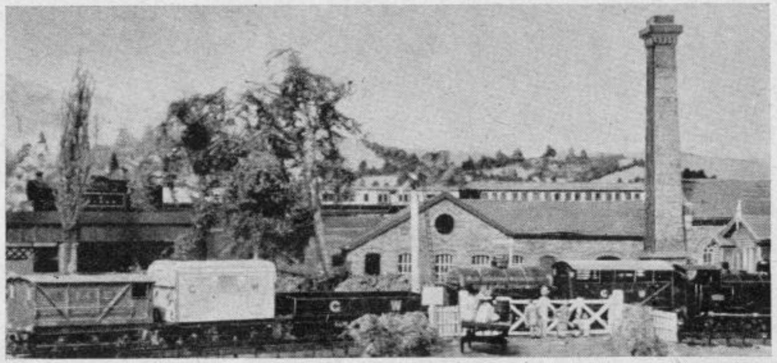


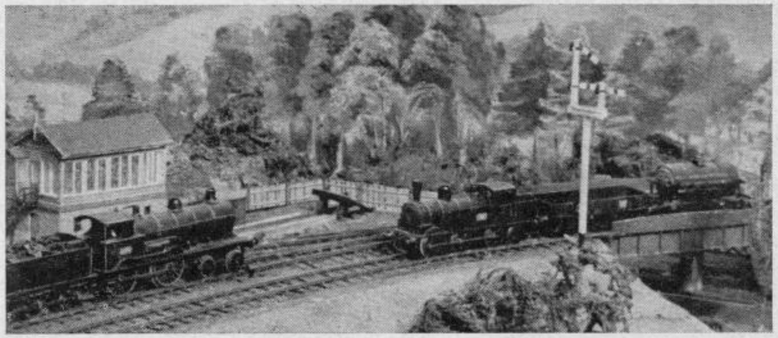
(*Continued on page* 484)

Ilford Junior Model Railway Club

A L.N.W.R. HO SCALE LAYOUT BY JACK K. NELSON

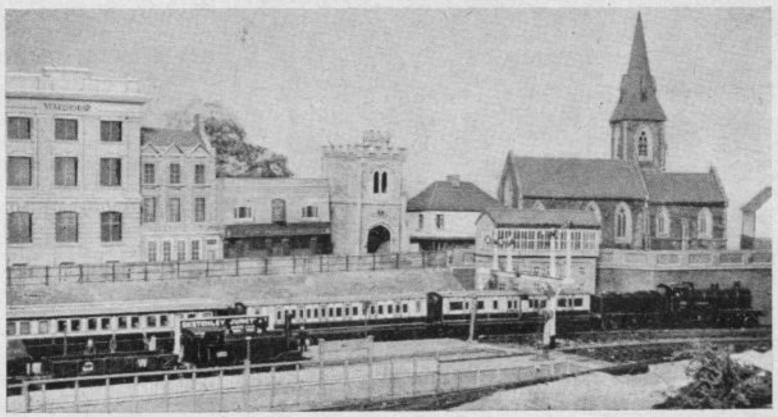
If these pictures of a layout by a member of Ilford JUNIOR M.R.C. are typical of the standard of work in those parts then enthusiasts are truly to be congratulated. On the right we see a saddle tank L.N.W.R. 0-6-0 heading the goods, whilst in the background Precursor Tank No. 527 hauls a main line train.

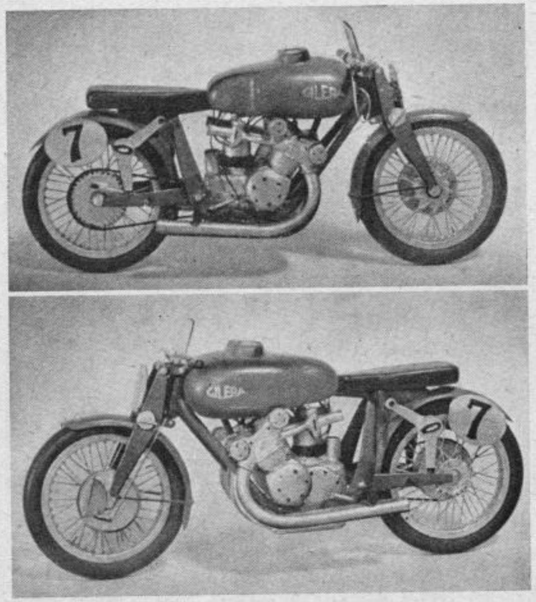




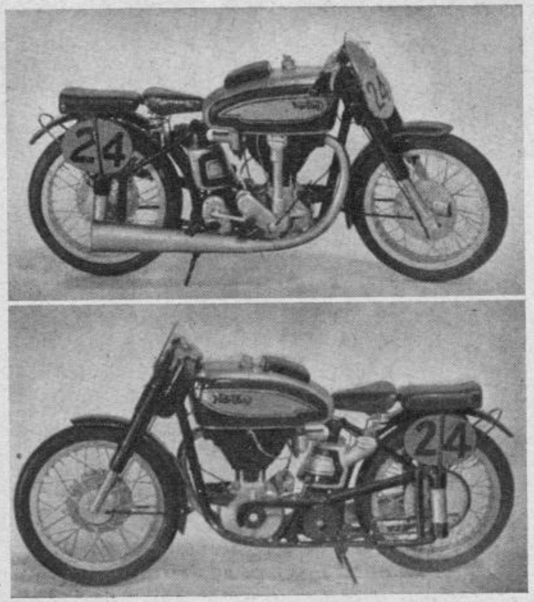
On the left: Typical L.N.W.R. practice in signalling, signal boxes, and railway structures of all kinds is followed in the layout. Scale is 3.5 mm., or HO, on two-rail system, working at 12 volts D.C., and layout is erected in a room used by the Ilford Junior M.R.C. open to all over 14 years of age.

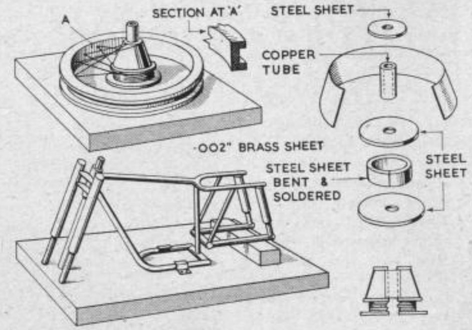
On the right: A main line train backing to coach sidings. Coaches were built from photostat copies of official Wolverton drawings. Express loco is a George V Class 4-4-0 No. 1595 "Wild Duck". The excellent photographs are the work of Ken Springate.

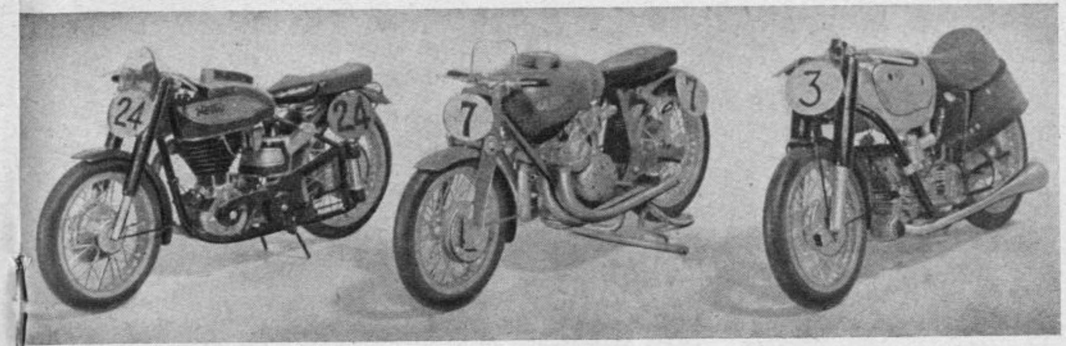




(Above): Two views of the fine model of a famous prototype, the four cylinder Gilera, finished most attractively in Italian red. (Below): A perfect replica of the Manx Norton, best known of all British racing motor cycles.







(Above): The Norton, Gilera and A.J.S. "Porcupine" make an impressive trio, and the work involved will be appreciated when it is realised that the models are approximately 4 in. long. (Below): Two views of the "Porcupine".

MOTOR CYCLES IN MINIATURE

THESE UNUSUAL MODELS ARE THE WORK OF ENTHUSIAST MOTOR CYCLIST F. W. WARE

WHILST literally hundreds of models of cars of all shapes, sizes and descriptions have been seen in the past few years, the number of model motor cycles could literally be counted on the fingers of one hand. This is a surprising fact, in view of the immense popularity of motor cycles at the present time, and the glamour surrounding the more famous racing types. It ceases to be so surprising, however, when one gets down to the thorny problems which immediately arise on attempting to produce something concrete. It was with greatest interest, therefore, that we received the three lovely little specimens illustrated on these pages, and we can only say of them that the pictures do the actual models less than justice. They have been inspected by knowledgeable motor cycle experts, who have been quite unable to fault them.

THE writer has been deeply interested in motorcycles, in all their various forms, for a number of years, and it was recently decided to build up a collection of models depicting the racing marques.

After various scales had been examined, the 1/20th scale was found to be the most easily used, allowing fairly comprehensive detail, together with the opportunity of using material which coincided with the scaled dimensions.

The frames were first built, brass, steel and copper tubes and wires being soldered together in a jig. It was found that if a very small and pointed soldering bit was used, heat could be concentrated locally, thus minimising the danger of the surrounding structure moving out of position. Having used "killed" hydrochloric acid as a flux, the frame was boiled for a while before the joints were filed clean, after which it was given a light coat of banana oil to avoid rusting, until the completed model was finally assembled and painted.

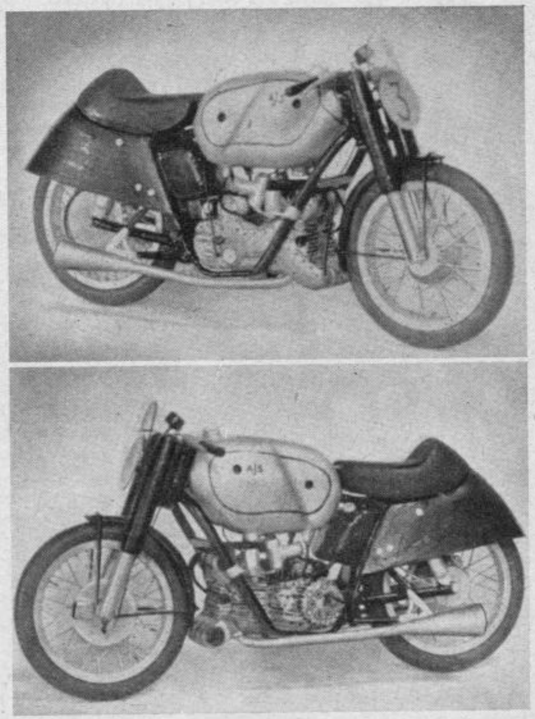
The wheels were next made, again being built on a jig. The hubs were made first as shown, when they were placed on the jig, and lightly glued in position. The wheel rims had previously been turned up, using a hand-brace, out of 1 in. dia. copper tube, with a U-section as a "well". The spoke centres were marked out, and then lightly punched through by means of an old darning needle. The rims were located concentric with the hubs, and the spokes, made out of 36 s.w.g. copper wire, were soldered in position, again using a finely tapered bit. After both front and rear wheels had been made, they were painted and set aside until final assembly.

Tanks, petrol and oil, saddles and the engine were made out of balsa wood, the engine being carved from a solid block. These components were doped and finished, by which time other small components, rev. counter, windscreen, petrol and oil pipes, mudguards, etc., etc., had been made.

The frame was again mounted in a jig, and the mudguards, foot rests, etc., were soldered on, after the frame had been cleaned of its protective coat. It was then finally painted, after which the engine, tanks and wheels, etc., were added.

The tyres were put on the rims, being ordinary strip rubber, cut to suit and joined together with rubber solution and retaining pin.

Each model took approximately two months of spare time, with an average of 15 hours a week. It is felt that so far the effort has been well worth it, as the miniatures look quite impressive. A Velocette K.T.T. Mk. VIII, and a 7R A.J.S. are at present under construction, and it is hoped that a collection of roughly fifteen models will eventually be built up, by which time the writes hopes to be in possession of a vice for the more intricate details.



More About Kites

A. M. COLBRIDGE WITH

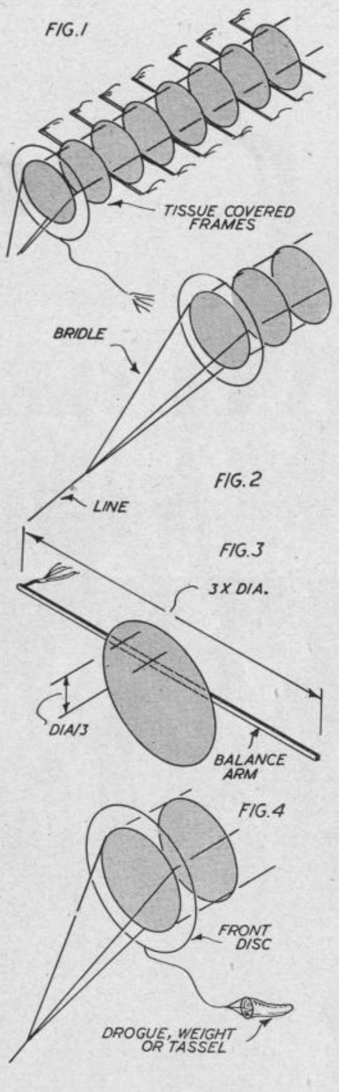


Fig. 1 : The famous Dragon Kite.

Fig. 2 : Bridle for the "dragon" body.

Fig. 3 : Balance arm with streamers attached to "dragon" discs.

Fig. 4 : Drogue or hanging weight attached to bottom of leading disc on "dragon" body.

A PREVIOUS article on the same subject described the various basic types of kites—standard layouts, in fact, which have proved their worth over a considerable number of years. Some further research has brought to light details of what could be termed "experimental" kites—unorthodox layouts which, as well as appealing on account of their novelty, can also give a satisfactory performance. These are not simply variations on the same basic forms, but original layouts. Kite flying is far from dead, and it is true to say that a good home-made kite will often outperform the best commercial equivalent. So for those readers interested in kites as a sport or a hobby—even if the excuse is "that it amuses the youngsters" — here are some further ideas.

Quite the most impressive of the "unorthodox" kites is the *Dragon Kite*, so called because it has the appearance of an overgrown centipede, a sea serpent or a dragon in flight. It consists, essentially, of a circular head frame, to which can be added suitable features, followed by a number of circular body discs, all of the same size, and strung out at equal intervals behind the "head". Almost any number of body discs can be added and the overall length of the kite can be 10 ft. or more, yet it conveniently folds up flat for transport.

The *Dragon Kite* is shown in Fig. 1. The frames of all the discs are rigid and covered with tissue paper. Bright colours are most effective, and there is no reason why tissue strips of other colours should not be overlaid for decorative effect or "realism". There is a wide choice of material for the frames. Bamboo, hardwood like birch or spruce which can be steamed to a circular shape quite readily, or aluminium wire being three of the best.

All the discs are the same diameter and all are completely covered with tissue. A suitable size would be a diameter of 12 in., or slightly less if 3 ft. wood strip lengths are used for the frames. Each frame needs to be as near true circular shape as possible, and all about the same weight.

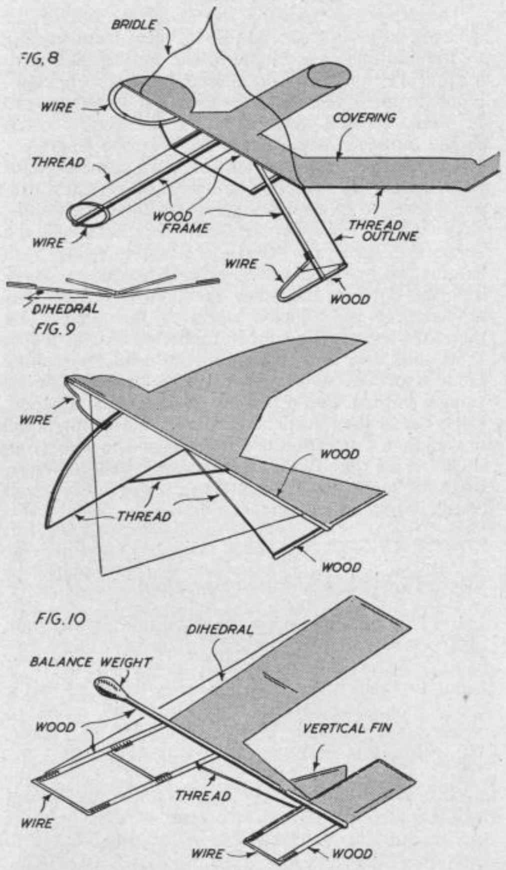
With the diameter specified, spacing of the individual discs should be at least 24 in. Ten discs would make a suitable set when the overall length of the kite would be 18 ft., fully extended in flight!

The discs are suspended by three strings attached at equidistant points around the circumference, as shown. For proper stability it is important that each disc be parallel to its neighbour, which calls for care in assembling the completed discs on the body strings. The flying lines are taken from the same three points on the head disc to form a bridle which can be adjusted in attitude for trimming. In flight the kite should remain substantially horizontal, although the "body" will undulate most realistically in the wind—and the bridle must be adjusted to suit (Fig. 2). This is easily done if the bottom string is so attached that its length can be altered readily.

For stability purposes, every disc except the first one should be fitted with a balance arm equal in length to three times the diameter of the disc. This again is made of thin, rigid wood, such as bamboo. The balance arm is bound to the frame at a point corresponding to one-third of the diameter from the top and horizontal with reference to the point of attachment of the top body lines. Small streamers of tissue can be attached to the end of each balance arm to still further improve stability, as in Fig. 3. The last disc of all should have long streamers attached to its balance arm.

The front disc can also have a balance arm, although this should not be necessary. It is an advantage, however, to fit hanging weight or drogue to the bottom of the disc, as shown in Fig. 4. This will assist in keeping the head upright when in flight.

If external features are added to the head, then the outline of these should be formed of aluminium wire or bamboo bent to shape and bound to the frame (Fig. 5). Ears, horns, etc., can readily be produced in this fashion, covered with suitable coloured tissue. An American version of the dragon kite also had a pair of eyes which revolved in flight, being made by pivoting two circular discs between suitable bearings, as shown in Fig. 6. The front upper and bottom lower halves of the eye frames are covered with stiff paper, suitably coloured. Unequal air pressure on the pivoted "eyes" then causes them to rotate, provided the bearings are reasonably free.



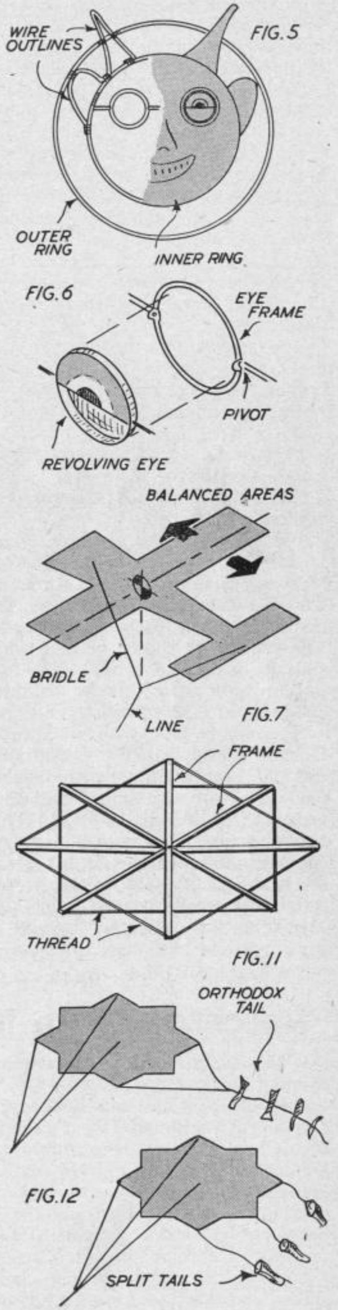


Fig. 5 : Head of the "dragon" made of aluminium wire or bamboo bent to shape.

Fig. 6 : Details of revolving eyes as fitted to an American version of this kite.

Fig. 7 : General force arrangement of the Figured Kite.

Fig. 8 : Suggestion for human figure outline.

Fig. 9 : A bird outline that is very effective.

Fig. 10 : This aeroplane shape could be used to advertise a model aircraft gala.

Fig. 11 : A variant of the hexagonal kite — the Star kite which always looks effective.

Fig. 12 : Tail variations for the Star—either orthodox or a split tail attached to three star points.

A little practice will be need to master the art of launching a dragon kite. An assistant has, literally, to pay out the kite until its full length is airborne, but provided the angle of the bridle is correctly adjusted and the individual discs properly balanced, it should be quite stable when airborne and climb readily.

Any tendency for the body discs to twist sideways independent of one another in flight is almost certainly due to one of two faults. Either the discs in question are out of line or are unbalanced laterally. A certain amount of undulation in flight is quite natural, but should not affect the climbing properties of the kite. Lightness and rigidity in the construction of the frames will result in improved performance.

The second unorthodox type to be described is the *Figured Kite*. The outline shape, as the name implies, is based on a particular figure, which can be human, animal, or even some typical object. A man, a bird, and an aeroplane would be typical examples of each. The secret of success depends on so proportioning the outlines as to preserve the required outline and still produce a kite which is stable without a tail.

Broadly speaking, all three types should be patterned on the same lines. This should provide a forward lifting surface and a rear stabilising surface with the kite properly balanced, fore and aft, with respect to the proportions of these two areas (Fig. 7). The framework should be as rigid and light as possible, consisting of a basic frame of wood with the outline built up of thread or thin wire. Typical examples are shown in Figs. 8, 9 and 10.

A common fault with all kites of this type is a lack of lateral stability. Invariably they are built flat and, even when correctly balanced laterally, still tend to slip to one side. Addition of vertical side area is often the only solution. This can be done in several ways. One is to add a vertical fin beneath the kite, although this is not always effective, for the keel area is really in the wrong place. Better stability generally results if this keel area is rigidly braced to the outspread forward area. Ideally, a top fin would be better, which can be incorporated in an aeroplane kite quite readily, but not so satisfactorily in the other two typical outlines. A vertical top fin, if used, must be braced to stay in the vertical position.

A solution with the bird and "man" outlines is to add dihedral to the fore and aft areas of the kite. That is, the legs or flat tail are inclined upwards in the form of a shallow V. Longitudinal balance will also affect the stability, however, and generally these types are quite tricky to fly Considerable experiment is often necessary in order to determine the best position for the line attachment. Two lines are recommended, attached as shown in the diagrams, with provision for quick adjustment of the relative attitude of the bridle. Most successful kites of this types, too, are on the large side.

Finally, there is the attractive *Star Kite* — not strictly unorthodox like the others, for it is really a variation of the hexagonal kite, although there is evidence that the "star" outline was, in fact, used before the straightforward hexagon.

The frame is basically the same as that of the hexagon kite with one additional spar member, but by the addition of a double thread outline, as shown in Fig. 11, the resulting shape becomes an eight-pointed star. Thin, flat section spar members can be used, crossed and bound at the centre. The thread outline is attached in two separate lengths.

The Star Kite needs a tail, and this can be one of two forms—the orthodox tail as used on the hexagonal kite, or split tails attached to three star points, as shown in Fig. 12. Of the two, the single tail version is generally the more stable, since tail lengths can be made just as long as necessary. Three separate tails, on the other hand, have an annoying tendency to get tangled up with themselves and therefore have to be kept to moderate length. These short tails can be made more powerful by making them after the style shown in the drawing, or by using a tail bar with a number of streamers attached. Each bar is then suspended on a line roughly equal in length to the overall diameter of the kite from each of the three rear star points. Alternatively, small drogues can be attached to the tail lines instead of the normal tail streamers.

"HALCEYON": PT. IV. RIGGING & FITTINGS *(Continued from page 478)*

One big advantage of this arrangement is that when running before the wind with the spinnaker set, the line which is in tension is hooked to its gunwale eye and has no action on the rudder, whilst the slack line is hooked on to the quadrant. Should the main boom accidently gybe over and let the mainsail blanket the spinnaker, full helm will be applied, causing the boat to turn and the boom will swing back into its original pointer. The vane gear then resumes its normal function of steering the boat.

Some people like to use light chain for the beating sheets, and this does have the advantage that shrinkage is eliminated, making the repetition of a certain trim possible to some extent. However, chain can be treacherous as it is difficult to see whether it is about to break. In any case, it is better to sail a boat by a good sense of trim than by trying to repeat mathematically precise angles for the booms. The calibration of booms is a waste of time.

All hooks used in the rigging should be made from stainless steel or phosphor bronze wire as brass is too inclined to over-harden in bending and will fracture easily.

THE ART OF SOLDERING

PART III — BY ED VAN LEER

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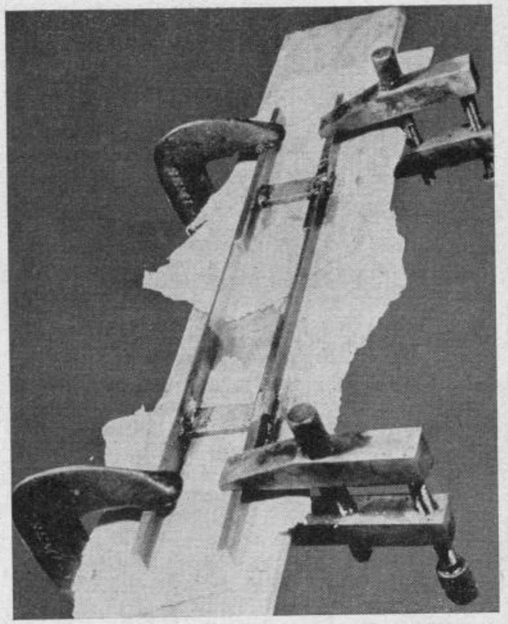
IT'S very difficult at times, to work without getting excess solder on the joint, so we need some means of removing the unwanted solder. I have always longed for some sort of acid that would eat away solder without hurting the base metal. What a handy thing it would be! But it's only a dream. The very nature of solder, chemically, makes this impossible—anything that will attack solder will ruin the usual metals being soldered. That means that we have to remove excess solder mechanically—with scrapers, files, a knife, sandpaper, hand-grinder tools, and anything else that your individual imaginations can conjure up. I use a sharp knife more than anything else. I also have a collection of dental tools reground appropriately for getting into tight spots. Old files can be very useful if reground for use as scrapers.

Holding work usually presents a problem. There are many inexpensive gadgets that are helpful here A few small wood blocks with good square sides, some small battery clips with the teeth ground or filed off, tweezers, pincher-type clothes pegs, rail spikes, and small pieces of $\frac{1}{4}$ in. thick hard felt are a few of the simple helps in holding work. Some assemblies will require special jigs which may take more time to construct than the assembly itself. However, the more difficult assemblies are often practically impossible without a special jig so that the time required for the jig is easily justified. Frankly, I've never spent too much time on complex jigging because its need seems to be the exception rather than the rule. Loco boilers offer good possibilities for using a jig. In this case, the jig is also a form over which the various sections of the boiler are shaped, and is so made that it can be used as a support during soldering and then withdrawn. Usually, when making a boiler rolled up from sheet, it is best to roll the sheet over the form so as to make a butt joint in the centre of the bottom. The sheet will work best if annealed. Some cutting and fitting will be necessary in order that a *tight* butt joint results. If, after the boiler is assembled on the form and the form removed, additional strength is required, and an extra reinforcing piece can be added. I think I have found far more utility in a few square-edged blocks, pieces of felt and battery clips. You don't need a lot of fancy doodads to do good soldering.

Now that we have talked at some length about tools, let's consider methods and procedures :



Work held in clamps for soldering, with asbestos paper underneath. Clamps on left are ordinary C-type, whilst those on right are of the parallel jaw variety, available from model shops.

1.—Always have surfaces clean—free from dirt, oxide, rust, grease and paint.

2.—Use a good flux—water has been known to work in emergencies.

3.—Work with a clean iron.

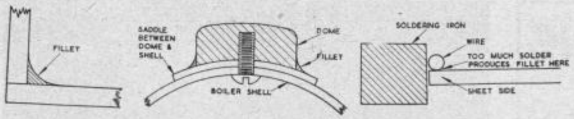
4.—Make certain that the parts to be assembled are square and true to shape. Any formed parts should be shaped, so as to assemble without exerting pressure to spring them into shape. Solder has relatively little strength and may eventually fail if required to hold against the strain of a part forced into shape. Annealing brass parts that are formed will help; hold in a gas flame until red and plunge into water.

5.—Use plenty of heat. *Both* parts being joined should be hot enough to permit the solder to flow. The iron should be in firm contact with *both* surfaces. Insufficient heat makes weak joints. One reason for a scrupulously clean iron is that the dirt and scale accumulated will block the transfer of heat to the work.

6.—Solder from the inside whenever possible. This eliminates much labour removing unsightly solder from surfaces that show.

7.—Strengthen inside corners with extra solder in the form of a fillet if necessary.

8.—Work rapidly to avoid spread of heat to other joints. Wet rags, properly placed, will help. Often,



a relatively heavy mass such as the jaws of a vice or pliers clamped between the soldering area and other joints will conduct heat away and protect the other joints. This robs heat from the joint to be soldered and requires plenty or iron capacity. Protection of this sort is usually more likely to be needed when working with a lamp than with an iron.

9.—Tin the surfaces to be joined prior to making the joint whenever possible. This is especially true when a difficult joint is encountered. Tinning is merely applying a *thin* coating of solder to each surface. This coating must be uniform and free from "globs", particularly if clamping for final assembly is used. If the clamps are set tightly against the glob, they'll loosen when the glob melts.

10.—Parts to be joined must be held firmly in relation to each other. A good joint is out of the question if either part moves before the solder is hard.

11.—When joining a small assembly to a relatively large mass such as a boiler or frame, it is often desirable to apply the heat (or iron) to the large part and let the large part transmit the heat to the small assembly. With tinned surfaces, this will usually avoid the danger of the small assembly becoming unsoldered before the large mass is up to soldering temperature.

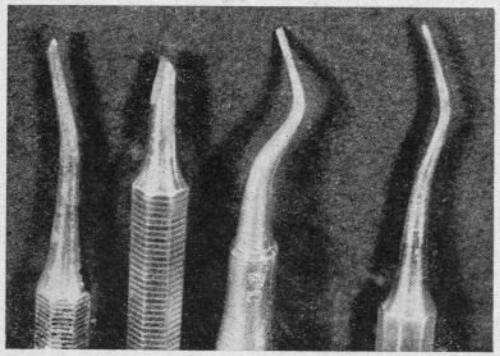
12.—Solder will usually produce excellent fillets which require no further finishing. Both parts should be hot enough and excess solder fed to the area and allowed to remain molten long enough for surface tension to form the fillet. This fact is especially useful when putting beads around stacks, tender, cab sides and so forth. Be careful, though, or there will be solder all over the place. Limit the flow of solder by limiting the application of flux. Solder will follow flux *and* heat anywhere, but when *either* or *both* are lacking, it's licked.

13.—Type metal (not zinc or aluminium) castings can be soldered with care—plenty of care. If you want to join brass or steel to a soft metal casting, tin the brass or steel well, use plenty of flux, and apply the heat to the steel or brass. When enough heat has been applied to melt the solder on the tinned surface, the molten solder will melt enough of the soft metal casting to effect a joint. But *be careful*, because the type metal melts at a relatively low temperature and will collapse into a globule if too much heat is applied. Type metal has a tendency to soften gradually as it gets hot and will sometimes bend out of shape if subjected to too much pressure in the form of clamps or other holding devices. I guess everyone has to ruin a couple of soft metal castings before mastering the technique. That's the way I learned. I distinctly remember trying once to solder a couple of very small type metal castings, and they just disappeared on the iron. When soldering type metal to type metal, the technique is slightly different, for type metal cannot be tinned easily. It's usually best to clamp or otherwise hold the two castings firmly in position, flux well and work with a full iron. In fact, the solder should actually hang as a droplet on the tip. Then, bring the droplet in contact with the joint and it (the droplet) will usually be hot enough to join the castings. Occasionally, a slight follow-up touch with the iron will finish the job. Sometimes two type metal castings can be melted together without solder, using only flux and a tinned iron. Watch out, too, for the effect of type metal picked up by the iron. It will mix with the solder on the next joint and form a new alloy which might be weak. So clean the iron thoroughly after soldering type metal.

14.—Soldered joints requiring unusual strength should be reinforced with a small screw drilled and tapped into the joint. This is often necessary in frames or bodies, particularly if more heavy soldering is necessary, which might soften the first joints. Occasionally, there are situations in which the protection of previous joints, as mentioned in paragraph 8 above, is not possible. It is much simpler to solder the parts together first and then drill and tap, because accurately locating drilled and tapped holes is difficult even for an experienced mechanic.

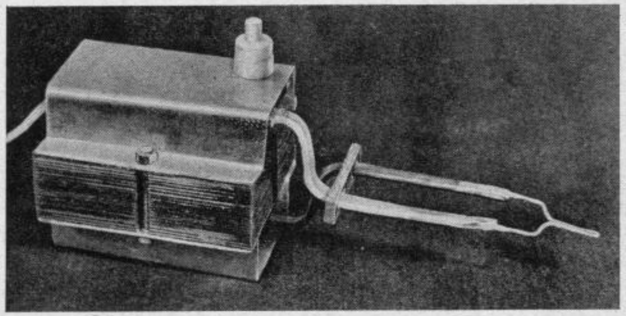
15.—Although we have already said that the copper should always be clean and well tinned, it should be remembered that an abundance of solder on the iron usually means an overabundance on the joint.

16.—Keep solder out of rivet detail. It's difficult to remove without spoiling the rivets. If solder accidentally gets into the rivet detail, the best way to remove it is to apply heat to the *back* of the sheet and, when the solder is molten, brush it out of the rivets with an old toothbrush.



Our old friend the dentist comes in again here with new uses for his discarded drills, which prove of value in cleaning up soldering work.

An Electric Soldering Iron



BUILT AND DESCRIBED BY A. SMITH IN RESPONSE TO READERS' REQUESTS

ALTHOUGH primarily for the construction and repair of mechanical engineering and woodwork the writer's workshop finds itself infrequently, in the position of having to undertake a small electrical repair job. This is usually related to the fitting of electrical motive power or switchgear on some form of machine tool.

A soldering bit which would reach soldering heat almost instantaneously was obviously the requirement. It must not, however, be too large or clumsy to handle, and the quantity of heat must be easily controlled so that burning of the bit would not occur.

An old wireless transformer was stripped and the laminations, which happened to be of E and I section, retained. It will be noticed that one side of each of these laminations is coated with whitewash to act as an insulation. This had been largely lost in the process of taking to pieces, so a new coat of whitewash was given to one side of each lamination.

A piece of timber was sawn out and planed up, so that its section was exactly the same as that of the transformer core, and about 4 in. long. In the centre of one end a $1\frac{1}{2}$ in. by No. 10 wood screw was fitted, and when firmly fixed with about $\frac{3}{8}$ in. of its shank protruding its head was cut off. This assembly was then held in the chuck by gripping the screw shank.

A length of strong brown paper of the gummed-one-side variety was cut so that its width was equal to the length of the transformer core, and wrapped four times round the wooden core former. It was then liberally treated with insulating varnish. Two end cheeks were cut from $\frac{1}{16}$ in. paxolin and fixed with varnish over each end of the new paper core.

The primary was wound with 30 s.w.g. enamelled copper wire at the rate of five turns per volt. This for a 230 volt supply, meant a total of 1,150 turns. The winding was done with the core in the lathe, by the simple method of setting up the screwcutting change-wheels for a thread with a pitch corresponding as near as possible to the diameter of the wire. The wire was then fed from the spool through a very small hole drilled in a piece of hardwood held in the toolpost.

Although the original intention had been to have varnish impregnated paper between each layer of wire, it was not found possible due to lack of space. Varnished paper was, however placed after each fourth layer. As the winding progressed liberal applications of varnish were made to both increase the insulation of the wire and bind the whole together. On completing the winding of the primary, three or four layers of varnish paper wrapped around it.

The secondary winding consists of two turns of $\frac{1}{4}$ in. half-round copper rod. Something of the nature of $\frac{1}{4}$ in. x $\frac{1}{8}$ in. strip would, no doubt, have been preferable, but the half-round happened to be available. It was annealed and beaten on an anvil to an almost rectangular section. It was then re-annealed, straightened and supported by its ends between two vices. Starting 6 in. from one end, tape was wrapped around the copper rod and liberally varnished, thus providing insulation. The secondary was then wound—this sounds easy, but in fact, it consisted of a large measure of wangling, using vice, pliers, and brute force, to get the copper rod to lie closely wrapped to the primary. The ends were then trimmed off to a suitable length and a bit, made from 16 s.w.g. copper wire, soft soldered into saw cuts in the ends of the secondary winding.

A cover for the transformer was made up from two pieces of aluminium sheet, and held in place by two 4 B.A. screws passing through holes in the laminations and nutted on the other side.

A small push button switch was incorporated in the primary circuit, and mounted in a convenient position on the casing.

The completed unit fits comfortably in the hand for use. In its present form it can be placed either vertically or horizontally on the bench so that the job may be brought to the bit rather than the bit to the job, a useful method when it is necessary to have both hands free.

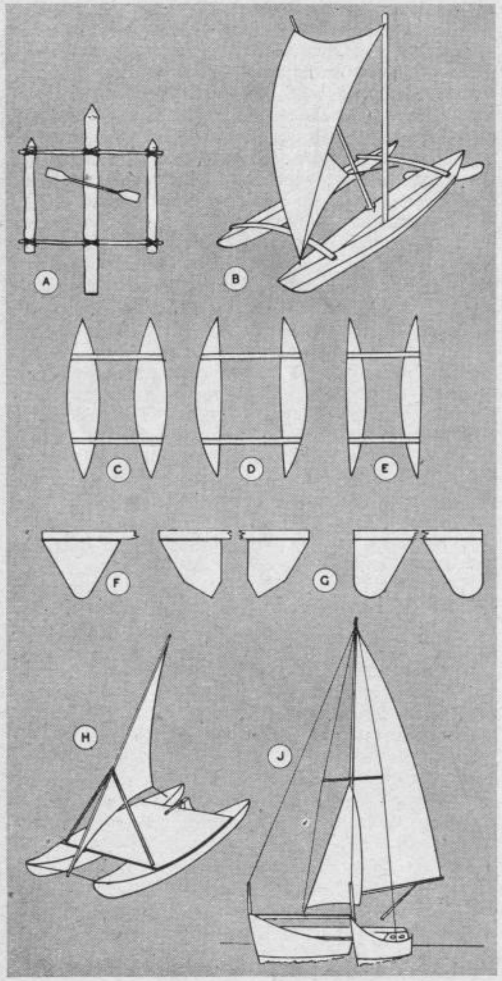
The bit takes about five seconds to reach soldering temperature, and is perfectly suitable for small electrical and radio work. It is important that the transformer should only be switched on during the actual soldering operation or overheating of the 16 s.w.g. bit will result.

CATAMARANS

NOTES ON THESE CURIOUS CRAFT BY P. W. BLANDFORD, A.I.N.A.

FOR the model boat builder with an enquiring turn of mind there is ample scope for experiment in the field of two- and three-hulled craft. Not much is known about their design and performance, either in this country or elsewhere. Catamarans are more popular in the United States than anywhere else, but craft built there are still largely experimental.

A catamaran is a fast sailer, and will usually outstrip any normal craft of the same length. It has ample stability, and will carry a large rig, which can be better stayed than on a normal boat. Against this is the fact that it is not so handy in going about and in the smaller sizes, at least, the accommodation for its crew cannot be so good.



Nowadays the word "catamaran" is generally applied to twin-hulled craft, and the Americans speak of three-hulled craft as "trimarans" although this is not strictly correct, if the origin of the name is considered. The word is probably Indian, where the Tamil spelling is "Kattu Maran", meaning "tied logs". The originals were merely three logs, with a paddler sitting on the centre longer one, while the other two provided stability when he fought his way out through the surf (A).

The sailing Indian catamaran would form the subject for an unusual model. The main hull is a log about 18 ft. long and 18 in. diameter, roughly shaped and its top hollowed, then the sides continued up by planks about 15 in. wide stitched on with rope. The outrigger is a thinner log, nearly as long, kept at a distance of about 10 ft. by arched spars, made by laminating flexible battens and binding them together (B).

The rig uses a single sprit sail on bamboo spars, with the mast mounted in the main hull and the sprit resting in a cup on the gunwale. For stability the outrigger must always be to leeward, and the method of going about at the end of a tack is unusual. The helmsman has a rudder consisting of a paddle loosely lashed over the side. He hangs his leg over the side and controls this with his big toe. His mate at the other end has a similar rudder out of use. To go about, the mate unhooks the forward corner of the sail and passes this to the helmsman in exchange for the sheet. The second rudder is lowered and the first raised, the corner of the sail is made fast at the other end, the sail blows itself inside-out, and the boat travels in the opposite direction, with the men's duties reversed.

The general-purpose catamaran in the U.S.A. has two similar hulls, with lengths between 16 ft. and 24 ft. Where there is room for experiment, both in full-size and model spheres is in the shape of the hulls and their distance apart. In the simplest form the two hulls are canoe-like and symmetrical, held at about 6 ft. centres by cross-bars and bracing (C). Some craft have been built with the hulls unsymmetrical in plan, with the outer edges curved and the inner edges almost straight (D), but more recent thought favours a reversal of this, giving most curve to the inner edges (E). This is believed to be faster, give less interference from the meeting washes, and be less liable to yaw in a following sea.

MODEL YACHT CLUB NOTES

BY "COMMODORE"

Wicksteed M.Y. & P.B.C.

THE Annual Model Power Boat Regatta of this club will be held at Wicksteed Park, Kettering, on Sunday, July 6th, commencing at 11 a.m. Events for Hydroplanes A, B, C and D Classes combined. Steering competition for Prototype Boats. Entries on day. Bookings for teas and/or lunches must reach Mr. D. Ward, 5 Noble Avenue, Irthlingborough by first post on Thursday, July 3rd.

Y.M.6m. Owners' Association

Rick Pond, Hampton Court, was the scene of the first Metropolitan & Southern District Championship for A Class boats, on 11th May, under the auspices of the Y.M. 6m. Owners' Association, with entries from nearly all the A Class clubs in the area. Mr. Steinberger was O.O.D.

Fresh to strong southerly wind, giving beat and run conditions, veered to S.W. with heavy rain squalls, and moderated later from the west. Most boats were reduced to second suits, and those clinging to first suits were heavily over-canvased in the vicious squalls. By lunch time leaders were *Fantasy* and *Jane* with possibles, followed by *Estella, Sharma* and *Arabesque*. As wind moderated *Jane* lost several boards, while *Fantasy* made a spectacular run, "double" planing most of the way to beat *Estella*, who had failed to find her trim on changing down to second suit.

Final placing of leading boats :—

Fantasy	356	N. D. Hatfield (Y.M.6m.O.A.)	46
Estella	611	R. Jurd (Gosport M.Y.C.)	43
Sharma	541	W. G. V. Blogg (M.Y.S.A.)	39
Arabesque	671	J. Anderton (M.Y.S.A.)	36
Jane	673	R. S. Hawgood (Danson M.Y.C.)	32
Hesperos	329	C. Whitmore (Eastbourne M.Y.C.)	31

Exeter M.Y.C.

News from Mr. C. B. Arnold of the Exeter Club features first season boats in the shape of H. Issaacs' 10-rater *Semper Fidelis*, which took the first of the club's 10-rater series and finished second in neighbouring Paignton M.Y.C.'s Silver Rose Bowl event as reported last month. Another good newcomer is Mr. Yeo's *Belinda II* which had her first outing just before Easter. This boat is unusual in that she is constructed of cardboard and brown paper, though no one would think so to see her. This is one of the first racing boats we have heard of so constructed, and hope that her builder will oblige readers with an account of his methods.

Trent Vale M.Y. & P.B.C.

This club seem to have acquired new water in the shape of a fine little lake about 400 ft. by 200 ft., and are in the process of cutting a good path all the way round. In the meantime the water is in use, and members "dig as they go" ! Weed are also something of a problem, but they are all working with a will to make it really first class.

They have already entertained their neighbours from Sheffield for the Founder's Shield, when the Yorkshire lads took all the prizes.

Fleetwood M.Y. & P.B.C.

In view of the differing attitude of local councils to model yachting activities, Press Rep. R. Howard, Jnr., of the Fleetwood Club thought clubmen in general might like to know the set-up of their club. In Mr. Howard's words: "Our lake is part of the Corporation's foreshore amenities and is built in the most suitable place. The lake is rectangular, measuring 800 ft. by 200 ft., and the centre line is roughly parallel with the prevailing wind, thus giving the maximum number of "beat and run" days. The Corporation maintain the condition of the lake and execute all repairs, also we have the use of our own boathouse free of rates. They also grant us the exclusive use of the lake for National and other such major events. In return the Corporation enjoy the publicity they derive from our sport, and have a major attraction for visitors. I have personally seen as many as a thousand people watching the sport and know that this lake has won many converts to a fine hobby. I venture to say that the Club's relations with the Corporation today are as cordial as they were when they built us our lake."

In a recent Spoon Race our old friends *Flame* (E. L. Dawson) and *Scamp* (L. K. Coroonin) finished level at 32 pts. In the run-off boats were neck and neck, with *Flame* slightly behind but coming up fast on *Scamp* on her third leg as the latter was about to be turned on hers. Then *Scamp's* mate snapped his pole in the act of turning, losing precious seconds to give *Flame* the verdict.

Bradford M.Y.C.

We welcome this club to our columns with a report of their big Easter meeting. Good Friday saw Birkenhead, Barrow and Manchester as visitors for the Bradford Cup (A Class). Mr. Priest (Birkenhead) won with his *Yeoman* followed by *Susie* (Mr. Eales, Barrow) and *Maybee* (Mr. Atkinson, Bradford). Easter Saturday was Marblehead day for the Clapham Cup. Here Bolton had a turn, *Black Hawk* (R. Bradley) winning from *Wylo* (Mr. Edwards, Birkenhead) and *Pahie* (Mr. Adams, Yarmouth). Sunday was set aside for 10-raters in the Claro Cup, with Henry Flatters as an unwelcome visitor. The old and lighter boats came into their own with *Renee* (E. Turner, Bradford) the winner; then came *Shooting Star* (S. Matthews, Leeds) and another Leeds boat *Tamsin* (Mr. Leeks). Last but not least, the 36 in. boats had their day on Easter Monday in the Victor Cup. Bradford took first two places with *Beaudon* (Mr. Playforth) and *Curlow* (H. Chadwick). Mr. Adams, of Yarmouth, chalked up another place with his *Condor*, equal third with *Margaret* (Mr. Redfern, Manchester).

Birmingham M.Y.C.

The MacDonald Trophy took place at Witton Lakes on May 10th with seven 10-raters under starters' orders. Variable winds kept spinnakers somewhat in the background, with a loose beat to windward and a broad reach. On this occasion J. Drury's *Opal* reversed recent placings by winning from John Lewis's *Halceyon* by 44 to 43 points. Next came J. Meir's *Flook* with 32, and F. Pitt's *Cunior* with 30.

Bournville M.Y. & P.B.C.

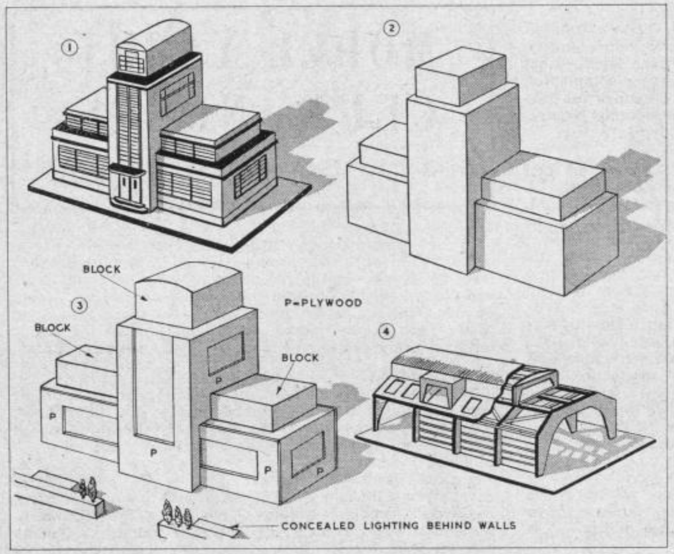
The 6-m. boats had an outing at Valley Lake in May, when the Henry Hackett Championship Cup was raced. Winner was J. Ward with *Dainty*, followed by R. Harris's *Ethel*, and Commodore W. H. Ray's *Una* in third place. It was a good week for the Ray family, for young Anthony won the Florence Ratcliffe Trophy for under 18s sailing 36 in. boats, with his *Brota*, beating *Thalia* (Allan Cole) *Bisto* (B. Briggs) and *Kestrel* (Devid Harvey).

Anthony Ray is only 11 years old, giving four years to the next boy, and two and one year respectively to third and fourth. Incidentally, it is only a few years since sister Ray tied for first place, and then won in the decider—as the youngest and only girl competitor !

Midland District Committee

The 36 in. Restricted Class Championship took place at Wicksteed Park early in May. That fine old boat *Mickey* in the hands of D. Smedley, Bournville, won by a point from *Argo* (L. Bagnall, Bournville) with home clubman E. Garrett in third place with his *Bedfordia*.

In spite of overcast skies weather was kind and lunch saw *Argo* well in the lead ; but veteran *Mickey* (beloved of *Mark* (note spelling) Fairbrother) pinched a close verdict by one point.



WE HAVE HAD SO MUCH CORRESPONDENCE IN CONNECTION WITH OUR VARIOUS MODEL BUILDING ARTICLES THAT WE ARE SURE A LARGE NUMBER OF READERS ARE INTERESTED. TO ENCOURAGE THEIR WORK WE WILL AWARD A MONTHLY PRIZE FOR THE MOST UNUSUAL ARCHITECTURAL MODEL PICTURE SENT IN—EXCELLENT PICTURES, OF COURSE, WILL STAND A BETTER CHANCE BUT SUBJECT MATTER WILL BE THE DECIDER.

MAKING ARCHITECTURAL MODELS

VICTOR SUTTON'S REGULAR FEATURE

MANY model makers may have the chance to take on work locally in this branch, and this article will deal in brief form with some of the styles which one can adopt for this.

Sometimes, at local exhibitions where commercial undertakings have a trade stand, they often wish to show their factory or works. Expense on a large model is not quite justified, but I have made simple wood and cardboard models for these people and they have been highly delighted, paid well, and adopted it for the office or other exhibitions.

In the sketch No. 1 you will see quite an imposing little model, and this is simple to make, and even the most inexperienced worker might try it. I favour this type of model making as a start to the more serious buildings. It is, in fact, the method used in leading schools and colleges where model making forms part of the training.

The design here is simple and very modern. It can be built in solid block form and covered with rough-cast paper. Note in sketch No. 2 the formation of the blocks before the main assembly work. I worked this idea out on graph paper first and made up a sample. Such previous work will prevent you getting the building out of proportion. One can see errors of judgment better on this paper than when drawing freehand.

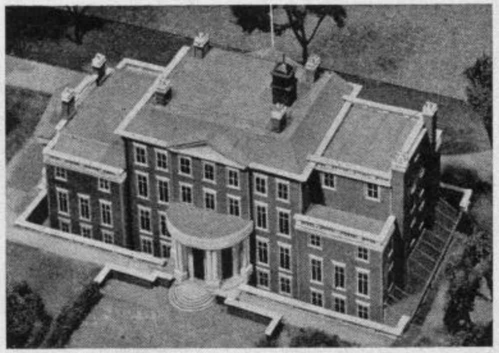
Based on this idea the windows would then be painted on good class Bristol board and carefully lined in with a mapping pen before fixing on. Shading with a light blue pencil is the best way to shade the windows. This is better than water paint which tends to curl the paper and cause the lines and bars to run. Beadings and mouldings can all be added with various thicknesses of cardboard as explained in my previous articles. In turning corners always score lightly on the card otherwise this will split and cause a rough patch which you cannot remedy afterwards. This will be found with all types of cardboard which are, after all, a series of card sheets. In any case, no building has a rounded edge or corner.

It is on the cross grain ends in wood block model making where one has to be careful. It is most difficult, in spite of sandpapering and other precautions to get this down to a fine art. Paint is absorbed quickly and leaves a dull and noticeable sheen. On these parts I suggest that you cover with fairly thick cardboard as I have shown and tack with small pins. You will then be able to sandpaper the whole off well, and the cardboard will not notice, but you must sandpaper in towards the block and not away from it. Cardboard is a very handy standby and much respected by some model makers, even professional ones.

It would be advisable to give the whole model a coat of flat grey paint before putting on the various doors, windows and beadings. This will even off the wood and make it appear more solid.

Such a model will look well if illuminated, and these are always an attraction at any exhibition. For this version I have given separate sketches using plywood and blocks. The blocks can still be used in parts which will not light up. This idea gives a better model because as you will see the window ledges and door features are really real and show depth. Be sure to clean off all edges, and I find it a good plan to line window edges with cardboard as shown. However you clean off down the side of

An "aerial" view of a model of Arnos Grove House built by Geoffrey Porter. The closely cut lawns beyond the house environs are our old photographic standby, an ancient army blanket !



the cut-away window you will still have a very rough edge. Incidentally, this does allow a much neater painting job all round. Window edges do not paint well.

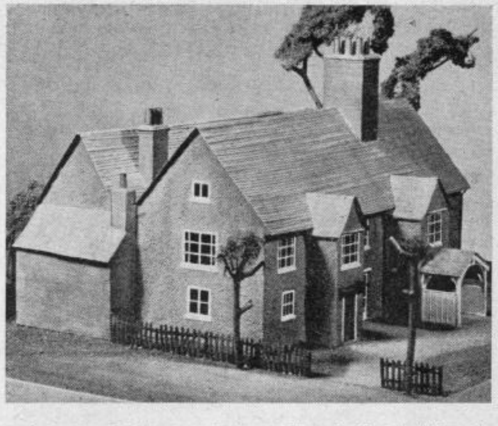
Go carefully into the light question and ask some advice from your local electrical firm. Models are not easy to illuminate and owing to the confined space the heat question must be considered. The arrangement of the plywood should ensure a good all-round illumination and cut out the possibility of looking through the model and seeing the lighting units.

If you mount the model on a board such as I have shown, the making of some attractive scenic effects could be carried out. A study of any good commercial journal will help you with some ideas in the way of design. Most modern factories are rather well set out. This opens up the chance of you floodlighting the model from the low wall at the front. Here you will need some help as the lighting must be properly screened. It is an interesting subject and well worth doing properly.

In quite a different class we have the model for structural firms, and I understand that often these people have given orders for models to be made up to show their work. I recently dropped into an order for fifteen model barns at a trade exhibition. I was well paid for the work, and have since very much benefited through the pages of this journal for their reproduction.

This type of work is quite different but very interesting. You need to have a good fretwork machine and good at freehand drawing, although the squared paper idea should be utilised at all times. There is a technique about this phase of model making which should be carefully studied by those interested.

You must first of all visualise and draw the whole model unit to know what it actually looks like. From this you can then build the model and allow for the "skeleton" parts. In my sketch you will see what I mean, and whether you make this for pleasure, profit, or just to keep yourself amused you will, I am sure, not waste your time. One can imagine this model completed as a very super coaching station on the layout. From the business point of view it is intended to show the design of prefabricated construction and lighting in connection with civic centres, schools and modern buildings.

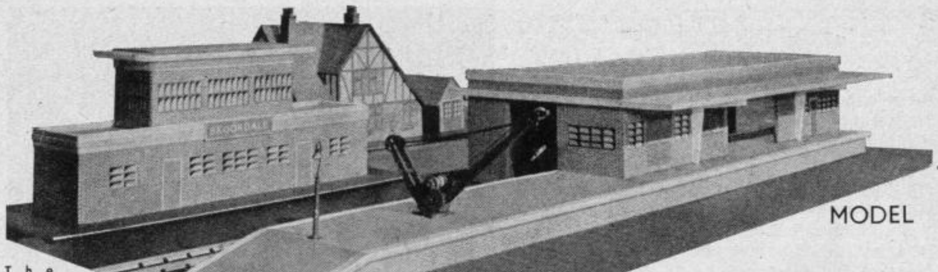


A front view of Salisbury Hall Manor. The roof effect is obtained by thin $\frac{1}{8}$ in. wooden slats, each glued separately in place, also built by Geoffrey Porter. (Photos H. V. Tipper.)

This type of model can also be used for the various types of materials used in construction. The layout of the roof affords splendid opportunity for showing various panel boards, roofing materials, tiles and finishes. Lower down we see the use of sets of windows which show here quite clearly and allow for demonstration purposes.

If contemplating making any models like this I would approach some well-known industries connected with the trade and find out just how this model could fit in with them. Partially built it could also display all the shades and other materials used in the interior. Fittings and floor coverings could also be shown to great advantage.

Make it firmly fitted to a good baseboard.



The complete Goods Station and Signal Cabin. Crane on the platform is another G.F. kit, as is 'The Timbers' in background shortly to be described in our columns.

MODEL MAKER BUILDS THE GRAHAM FARISH

Goods Depot & Signal Cabin

IT is over six months since we described the building of Graham Farish's Brookdale Station—an article which, incidentally, was reprinted in Australia, and has virtually gone round the world. The manufacturers claim that more Brookdale kits have been sold than any other comparable building unit in the world, including America! There should it seems be a lot of layouts ready and waiting for extensions to that modern station, and we were delighted to find the next in the promised series was a "double" kit containing instructions and materials for both Goods Depot and Signal Cabin in the same modern style.

The original idea behind these kits was to provide something so foolproof that those unaccustomed to make their own scenic accessories would not be discouraged at the start, and to this end the whole structure was developed by the assembly of a series of rectangular boxes, involving only square cutting. In the Goods Depot and Cabin kit this same simple method is developed a stage further. This does not mean any additional complication, but rather added use. The station was intended as scenic unit through which trains would only pass under the footbridge. In the case of the Goods Depot it is more truly three-dimensional in that open access is given via the loading platform, and suitable Road Transport (or private haulage!) vehicles can be incorporated, and perhaps even a variety of scale figures, delivery vans and the like be added in due course.

The Basic Kit

This comprises all the necessary building papers, window effects, doors, British Railway posters, and so on, neatly lithographed and ready to be cut out. In our kit we had brick paper in that browny-yellow which is widely used by Midland Region, notably in a fine new signal box approaching Euston from the North, which, by the way, is a big brother of the Graham Farish Signal Box design! All that it is necessary to buy to complete the two models are three 3 ft. lengths of $\frac{1}{8}$ in. balsa sheet and a tube of cement, costing under 4/-, so that with the kit at 7/6d. the job works out at 11/6d. complete. We have not mentioned the need for a few small pieces of card as these will be found in any home—we used the cardboard stiffeners from a couple of writing pads.

Constructing the Model

This is particularly well covered with stage by stage drawings and exactly dimensioned cutting details. The novice who has never tackled a building before could safely tackle this. First item is the Goods Depot made up of five major pieces and three small parapet strips. To avoid confusion the loading platform which joins up with it is on a separate sheet. Only item that offers any difficulty is cutting out the canopy supports, which are right-angled brackets, and must therefore have the balsa grain running "weak" one way. But by using a *sharp* razor blade and cutting carefully they should not split. Once assembled, of course, the weak grain is cemented in place and no longer fragile. As an alternative the two canopy supports could be cut from a thick piece of card.

Loading platform when assembled fits neatly into the bottom of the goods depot building: if it does not then an error has crept in, in measuring off dimensions. The plans are correct but fractional differences can arise in cutting, making a larger cumulative error. However, it is not a critical matter, and an undersize can safely be made up with scrap packing, as the whole is shortly to be covered with brick paper anyway.

At this point we would interpose a note to be sparing with the sandpaper. It is better to smooth up pieces before assembly rather than be vigorous with the completed building boxes, for it is so easy to round off corners that should be sharp and right angled. This is often the only sign of a novice's model that can be detected, and is the result of trying to do too good a job. In spite of pride of craftsmanship, there is really no point in spending time achieving a finish to parts that will not be seen—a sufficiently smooth surface to take unwrinkled building paper is quite enough.

Having assembled goods depot and loading platform there remains only the short extension to this platform to complete the basic model ready for covering. Only one such platform is provided for in the instructions, but many builders will repeat this right-handed to increase total length.

The Signal Cabin

This is a very simple unit, built up in the Graham Farish fashion from two rectangular boxes, one of which rests on top of the other. Here for the first and only time sandpaper is used to round off brick corners for the first floor unit

The whole model is now complete "in the white" and ready for covering with brick paper.

Those who have already built Brookdale are advised to check that their kit contains brick paper of a similar style to that already used, as it would be unlikely that two types of brick would be used for almost adjoining buildings. Most model shops will be happy to sort out their kits to ensure this continuity of style.

Covering With Brick Paper

As the Goods Depot is open to view we recommend that the *inside* as well as the outside should be papered. This may mean extra paper being required, and those wishing to keep to budget figures can avoid it by painting the inside instead with ordinary water colour paint to a neutral buff shade.

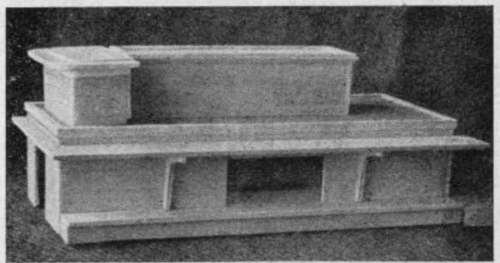
In the past we have used "Rubber Gum" for attaching brickpapers, but lacking this when building the model we used the remains of our tube of balsa cement, which acted perfectly, though on account of its quick drying nature attachment should be brisk. (N.B.—G.F. do not recommend this!)

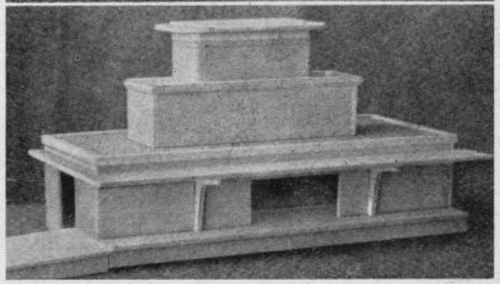
Do not attempt to cut out the window openings—the special stick-on sheets for these are put on over the brick paper. Remember, however, to arrange them all with the same shadow effect, otherwise the curious state of having sun coming from two directions will result.

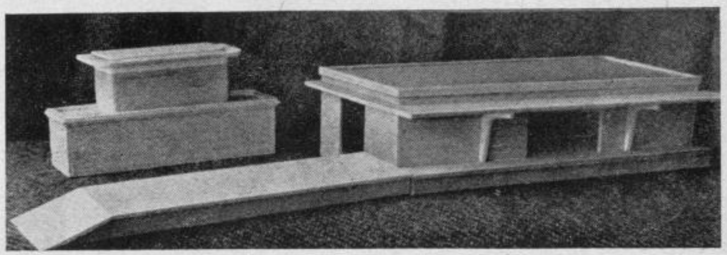
Final Comments

This second effort of ours with a Graham Farish kit proved a faster job than Brookdale Station. The latter took a week's spare time work, or just under sixteen hours, but the Goods Depot and Signal Cabin were completed in a weekend only, of under twelve hours total building time. Perhaps this was because the whole of the work was done in balsa wood, no hardwood platforms being specified.

For those who would like to be different, or to build several of these sets for parts of the layout radically different in terrain, the manufacturers offer no less than six alternative layouts. We have followed the "standard" with our model, but have assembled the unfinished parts in two alternatives. Another, using the top part of the signal cabin only, to provide a small box in a cutting, suspended on cantilever brackets, should appeal to those with suitable cuttings.





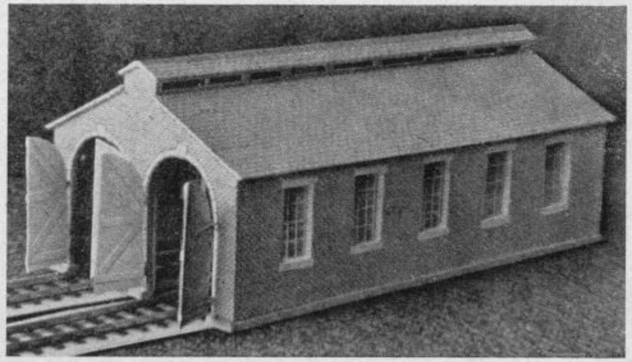


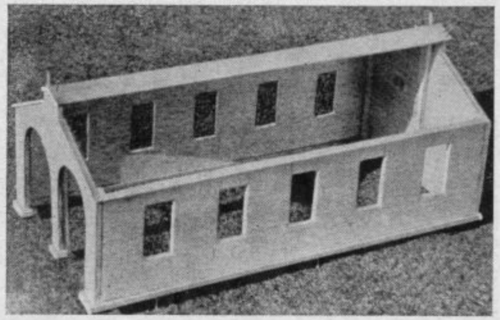
These pictures show the Goods Depot and Signal Cabin after assembling the cut-out balsa pieces, but before covering. We have set them out in one or two alternative layout arrangements suggested in the comprehensive instruction booklet.

LOCOMOTIVE SHED

ONE OF THE ANORMA KITS BUILT BY "MODEL MAKER"

Below : The partly completed model assembled with pins to prove fit of parts. On the right : The finished model. Note realistic opening doors, and the good appearance of windows. We did not fit gutter and down pipes, but will probably remake roof in card for true-scale reasons.





THIS is a practical model for the traditional layout—there must be literally thousands of locomotive sheds exactly like the Anorma product dotted all over the country in Victorian Railway Architecture. We pass three at least in the twenty mile train journey to the office.

The kit is complete, except for cement and paints, that is to say in addition to building paper, plan, instructions, and miscellaneous features, the necessary wood is included. We may say we have seldom had a kit with harder wood, which means that the work of cutting square edges to walls, and in particular window openings, was greatly facilitated, though the use of a really sharp cutting knife was essential.

Considerable care had evidently gone into its preparation for adequate instructions were provided to ensure the immediate strengthening of across grain sections. The shed is made up of the four main pieces, two sides, front and back. Window openings should, of course, be cut before assembly. The building is mounted on a small plinth.

Roof pieces should next be tried for size and pinned in place. They can then be removed and covered with tile paper before glueing permanently in place. The tops of the walls should be chamfered to provide good glueing surfaces. Purists who consider the thickness of the roof material out of scale may prefer to use thin card for the roof, but we built entirely from materials provided. The walls can now be covered with brick paper, going straight over the window openings. The plinth had previously been painted medium grey to obviate any need for painting to a straight line.

Window openings are next slit vertically, and the brick paper stuck back to cover the upright return walls. Small paper sills and cornices are next cut to cover bare wood top and bottom. For simplicity these should be drawn on a piece of rough surfaced paper and cut out in bulk. The use of card is not recommended as it is harder to stick down, and thickish paper looks very well

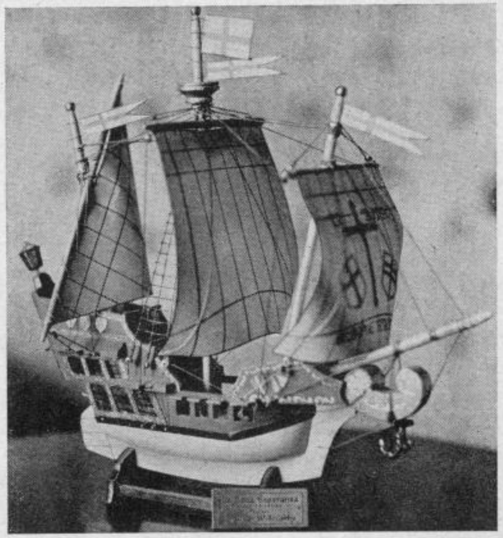
Celluloid windows, with sash bars already lined in are provided, and should be stuck in place. Put cement on the inside of the frames rather than on the celluloid to make the neatest job.

Roof top ventilators are the next task, and repay a little extra trouble in fitting neatly. They should be painted dull black on the inside before assembly otherwise it is a fiddlesome job. There remains only the fitting of stone arches to the portals, and cutting out the actual doors. These are strengthened with card on the rear and make up very well. Any tendency to cockle can be cured by painting over *both* sides with dope or rubbing in cement and, when dry leaving overnight pressed between heavy hooks. They are attached to the building with small pin-hinges and cardboard straps. The dope coating strengthens them considerably and they are fully strong enough to be actual working doors, regularly opened and shut.

A rapidly approaching press date prevented our fitting the gutters and downpipes to our model, which are all that is required to finish it. Those desiring to house more than two locomotives can extend their shed both in length or add a similar building to the side, or both. In this way suitable covered housing for the whole of the locomotive stud can be obtained in scale surroundings. They have, too, the practical advantage of protecting locos from dust !

MATCHBOX WORKSHOP

BY H. HARRISON IBBOTT



OUR recent invitation for less famous model makers lacking adequate workshops to describe their activities has brought response from Mr. H. Harrison Ibbott, who claims to fill these desiderata, though modestly declines to accept the mantle of a model making Bernard Shaw !

His workshop consists of sixty matchboxes arranged doll's-chest-of-drawers fashion as depicted in the sketch. This keeps all those little items so necessary to the ship-modeller duly separated and yet to hand—a feature that many more luxurious workshops might find useful in their turn. As an additional luxury he has a building board of ½ in. balsa measuring 4 ft. 6 in. by 3 ft.

MATCH-BOX CABINET

RAZOR O BLADES	HOUSEHOLD O PINS	1/4" PANEL O PINS	1/2" PANEL O PINS	1/2" BRADS O	DEAD O MATCHES
DEADEYES O (LARGE)	DEADEYES O (SMALL)	CANNONS O	BALSA O CUTTERS	3/4" NAILS O	1" NAILS O
1 1/2" NAILS O	2" NAILS O	DRILLS O	SEWING O NEEDLES	ELASTIC O BANDS	SCREWS O (SMALL)
SCREWS O (LARGE)	GRAM. O NEEDLES	AERO O WHEELS	AERO O TYRES	DRAWING O PINS	ANCHORS O
FINE WIRE O	WASHERS O	TRANSFERS O	FLAGS O	RIGGING O CORD	LANTERNS O
THREAD O (BLACK)	THREAD O (BROWN)	PAPER O CLIPS	DRAWING O NIBS	MAPPING O PENS	CAPSTANS O
SPRINGS O (SMALL)	ERASER O (PENCIL)	ERASER O (INK)	PENCIL O LEADS	STAIRWAYS O	CHAINS O
HATCHES O	CELLULOID O PIECES	O	O	O	O
O	O	O	O	O	O
O	O	O	O	O	MISC. O

HANDLES MADE OF DOWELLING—PINNED & CEMENTED ONTO BOX.

With the aid of this modest equipment he has built practically all the well known galleons, and made and flown a number of rubber-powered model aircraft while abroad in Tanganyika, covering most of International Model Aircraft's range in that direction !

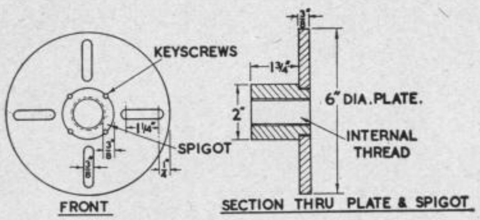
Heading picture shows his version of *La Bona Esperanza*, built while in lodgings in Dorset. We always feel that model making under the probably disapproving eye of a houseproud landlady is the hardest art of all !

Second Rally of Sailing Ship Models at Hove Lagoon

WE are advised that last year's rally was so successful that a Second Rally of Sailing Ship Models will be taking place on Hove Lagoon on Sunday, 27th July, commencing at 2.30 p.m.

This is being organised jointly by Hove and Brighton M.Y.C. and The Thames Shiplovers' Society. All sailing models are eligible *except* model racing yachts. A model yacht hull rerigged, as say, a schooner, is *not* debarred. Square rigged ships, schooners, local and native craft are specially welcomed, while a *sailing* galleon would be just the thing !

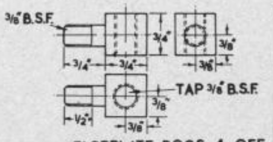
There are no entry fees, all will be welcome. An annual challenge trophy consisting of a circular plate of beaten copper with a series of engraved and pierced ship designs in silver has been presented by The Thames Shiplovers' Society. Competing boats will have to *attempt* a passage up and down the lake, though failure so to do will not necessarily debar from the prize. It is primarily a Rally rather than a contest so that beginners are particularly welcome. Those intending to take part should drop a line to Mr. H. V. Evans, 134 Sunningfields Road, Hendon, N.W.4, giving their name and address, name of model club, if a member, name of model, size, rig, or type, and builder.



Centre Finder for Lathework

THIS tool is of great use when setting up irregular shaped work for machining and boring on the lathe. Sizes given may be varied as required, and the construction is such that with proper use it will last for years.

A $\frac{5}{16}$ in. dia. ball from a ballrace is softened and a $\frac{1}{8}$ in. dia. hole is drilled through its axis, and the ball is then rehardened.



FACEPLATE DOGS. 4 OFF.

WORKSHOP ACCESSORIES

MADE AND DESCRIBED BY F. ILSTON

A Lathe Faceplate for a Home-Built Machine

FOR the amateur who is building his own lathe, this article shows details of how the faceplate can be fabricated with a minimum of cost.

Sizes given are for a 6 in. dia. plate, but can easily be altered to suit personal requirements; machining of course being as accurate as is possible.

The first part to be made is a spigot turned from B.M.S., internally threaded to suit the drive spindle of the lathe, and shouldered and threaded for a distance of $\frac{3}{8}$ in. with a fine thread, of approx. 11 t.p.i. Case hardening of the internal thread is then carried out, and work on the plate begins.

A piece of $\frac{3}{8}$ in. thick B.M.S. plate is roughly cut to 6 in. dia., and a hole is bored and tapped in the centre to suit the threaded shoulder of the spigot. Having completed the foregoing operations the spigot is screwed firmly into the plate, and four holes $\frac{1}{2}$ in. deep are drilled and tapped 2 B.A., equidistant around the circle formed by the joint of spigot and plate, their centres being exactly on the line.

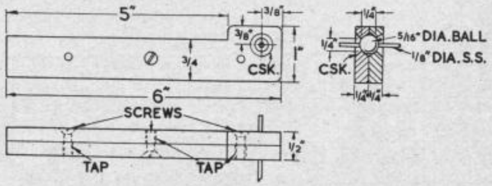
Four key screws are next screwed tightly into the holes, and are cut off flush with the plate surface, the screws in this instance being 2 B.A. x $\frac{3}{4}$ in. long.

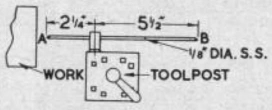
The face and periphery of the assembled plate are then lightly machined, and the slots marked and cut out.

This completes the actual faceplate and all that remains is for the dogs to be made.

These, when used, form a simple chucking arrangement, and considerably increases the scope of the work which may be performed with the plate. The dogs are easily made, as shown in the sketch, being turned from $\frac{3}{4}$ in. square B.M.S., drilled, tapped, and case hardened.

When doing a job which is not suitable for attaching to the plain faceplate the dogs are fitted. The threaded portions pass through the slots and are secured by $\frac{3}{8}$ in. B.M.S. washers and $\frac{3}{8}$ in. B.S.F. nuts, the workpiece being clamped firmly as required by a 2 in. x $\frac{3}{8}$ in. B.S.F. hexagon head setscrew passing through the tapped hole in each dog.



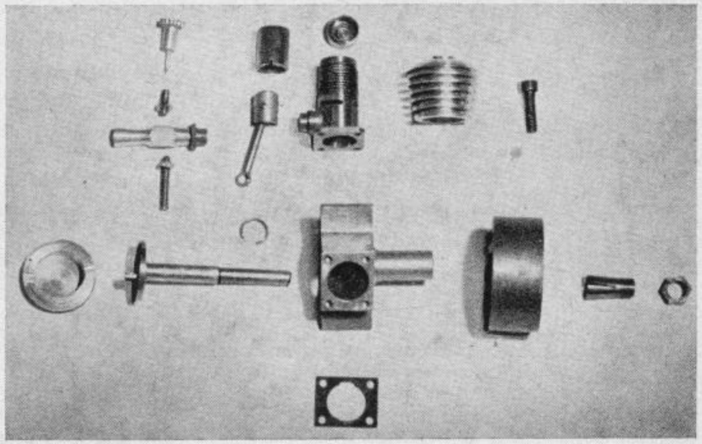


PLAN OF SETUP

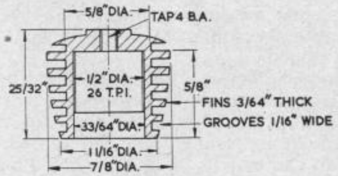
Next, a piece of $\frac{1}{8}$ in. dia. silver steel, $7\frac{3}{4}$ in. long, is soldered into the ball as shown, and the ends are ground to an angle of approx. 45 deg. Two plates are cut from 1 in. x $\frac{1}{4}$ in. B.M.S., and fixed together by $\frac{3}{16}$ in. B.S.W. countersunk screws $\frac{1}{2}$ in. long. A $\frac{1}{4}$ in. dia. hole is drilled through the plates, and they are then separated while the $\frac{1}{4}$ in. dia. hole in each plate is being countersunk with a $\frac{3}{8}$ in. dia. drill on both sides, the inner countersinks being just sufficiently deep enough that when the ball is placed between the plates it is held firmly, but is still capable of being rotated by slight pressure.

Casehardening is then carried out on the end portions of the plates in which are the $\frac{1}{4}$ in. countersunk holes, and the tool is then finally assembled. Use of the tool is very simple and needs but a few words of explanation. It is mounted in the toolpost with the centre of the $\frac{1}{8}$ in. dia. rod in line with lathe centres, and the work which has a small centre punch mark at the required centre, is set up in the chuck or on the faceplate, as accurately as is possible by eye. The tool is then fed along to the work until gentle pressure holds point A in the punch mark. Chuck or faceplate is then revolved and any discrepancy of the work centre will be noted by the exaggerated circular motion of point B, adjustment of the work being carried out until point B remains perfectly steady, which will occur when absolute centre has been found.

PART II OF A STEP-BY-STEP SERIES ON AN ALL FABRICATED ENGINE FOR HOME WORKSHOP CONSTRUCTION BY A. F. WEAVER AND W. W. RANSOM.



A 1C.C. C.I. ENGINE



CYLINDER HEAD.

5. Cylinder Jacket (Phase 1)

This is turned from $\frac{7}{8}$ in. or 1 in. dural round bar. Place the material in the chuck and rough bore after centre drilling and drilling a clearance hole $\frac{9}{16}$ in. deep. Turn the outside to the rough shape and cut in the fins. A piece of power hacksaw blade ground to shape and fitted in a suitable holder makes an ideal tool for this job. Ignore the top of the jacket at this stage.

Now finish the bore to $\frac{7}{16}$ in. dia., $\frac{5}{8}$ in. deep, and screw cut $\frac{1}{2}$ in. x 26 t.p.i. (This is a standard thread and if one prefers it can be cut with a tap). Next bore the bottom end of the jacket $\frac{33}{64}$ in. for $\frac{1}{16}$ in. deep. Lastly, drill through the top of the jacket with a No. 34 drill for the contra piston control, and tap it 4 B.A.

6. Cylinder. Bore 10.5 mm., Stroke 11.5 mm. (Phase 1)

The cylinder is turned from $\frac{7}{8}$ in. mild steel bar. Chuck sufficient material for the full length and enough for chucking. Rough turn the outside to size and rough bore the inside. Then finish the outside to $\frac{1}{2}$ in. dia. and inside to .404 in. dia. Screw-cut (or use die) the outside $\frac{1}{2}$ in. x 26 t.p.i. for $\frac{1}{2}$ in. and reduce the first .1 in. to the core diameter of the thread.

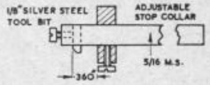
7. Cylinder Jacket (Phase 2)

Screw the prepared part-finished jacket on to the cylinder and turn the top to shape.

8. Cylinder (Phase 2)

Part off the cylinder to the correct length, not forgetting to allow for the cylinder seating flange. Remove the work from the chuck. Turn up a spigot to the internal cylinder size, place the cylinder on it and face up the bottom of the seating flange. Square off the cylinder seating to size, i.e. $\frac{3}{4}$ in. x $\frac{5}{8}$ in.

The transfer belt must now be turned. The accompanying sketch shows a tool which is easily made and which will be found to be most efficient for the job.



TOOL FOR CUTTING TRANSFER BELT & CIRCLIP RECESS IN PISTON

The next procedure is to drill the transfer passages. The method recommended is to turn a brass spigot to fit the cylinder and put it in place so that the end of the spigot is flush with the bottom face of the seating flange. Mark out and centre punch the positions of the five passages on the line of meeting of the spigot and the cylinder wall. Now drill each passage with a No. 52 drill as far as the transfer belt, and follow up with a No. 41 drill. Care must be taken here as the cylinder wall is quite thin and lack of caution might cause a break-through. It will be found that when drilling the drill will run slightly off centre towards the brass. This is the desired effect as the passages are not quite semi-circular.

We now come to the exhaust ports and inlet port. Set up a right-angled plate on the cross-slide, drill a hole from the chuck (and therefore at centre height), and tap it ¼ in. Whitworth. Set up the cylinder on this with the seating on the plate. Pass a bolt through the cylinder with a washer at the head and bolt it down to the right-angled plate.

With a slitting saw .060 in. thick the ports may be cut. The three exhaust ports should have 3/16 in. uncut wall between them, and the cylinder should be turned through 120 deg. before each cut, starting with the one on the opposite face to the inlet port. The inlet port should be 3/16 in. across and is placed parallel to the crankcase door.

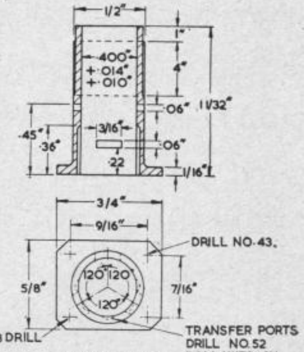
Remove the work from the set-up and mark out the hold-down bolts holes in the seating flange. Drill the holes with a No. 50 drill. Mark the position through these on to the crankcase seating and drill with a No. 50 drill, being very careful not to break through into the crank chamber. Tap these holes 8 B.A. Now enlarge the holes in the cylinder seating flange with a No. 43 drill.

The cylinder has now to be casehardened. Put some moistened "Kasenit" into the bore and push the cylinder into the dry powder so that more adheres. Heat it to cherry red for ten minutes and quench in cold water. This will caseharden to approx. .005 in.

9. Carburettor Stub

This is turned from 5/16 in. brass rod. Chuck the material, centre drill and drill with a 3/16 in. drill. Tap 7/32 in. x 40 t.p.i. Part off .275 in. long. Make a spigot of the same brass rod and thread it 7/32 in. x 40 t.p.i. Screw the prepared stub on to the spigot and turn to shape outside and recess the end ¼ in. dia. for 1/16 in. deep. The recessed end must now be radiused to mate with the outside cylinder wall. Remove from the spigot and soft solder it to the cylinder side over the inlet port.

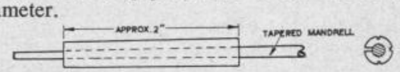
10. Cylinder (Phase 3)



CYLINDER LINER

The final process is lapping the bore. The accompanying sketch and photograph shows the lap recommended. It is about 2 in. long with a taper bore (this can be done with a standard taper reamer or home-made bit, and need not be an accurate fit on its mandrel), and fitted on a tapered mandrel (if you can obtain a "cotton spindle" at your local junk stall it is ideal for the job). It is advised that no attempt be made to turn the lap perfectly parallel. With a very slight taper any out-of-parallel in the cylinder bore can be felt. If the lap is perfect a lack of parallel in the bore can pass unnoticed. The lap should be adjusted to maintain a close fit in the bore, and the lapping medium should be well bedded into the soft metal lap with no free paste floating around.

To proceed. Smear a little fine lapping compound on the lap which must be revolved in the chuck at a low speed. The work is traversed up and down and reversed frequently from end to end until no high spots can be felt. The bore should be checked for size with a spigot turned to the correct internal diameter.



INTERNAL LAP FOR CYLINDER

COMPLETE WORKING DRAWINGS APPEARED IN JUNE 1952 ISSUE OF "MODEL MAKER"

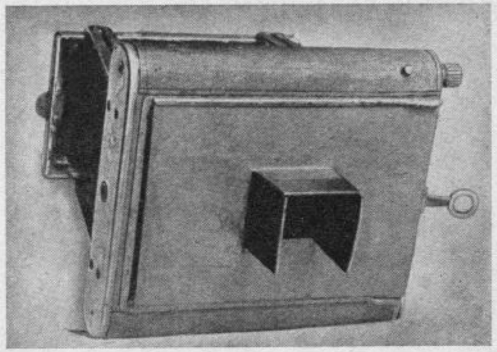
WATCH THAT TETHER !

As we close for press a report has been received of the Ossett Open meeting, held on June 8th, and with it a special appeal from the Club's Chairman, Mr. K. Shaw, that we should give publicity to a disturbing incident which occurred during the running of the second round of the 10 c.c. class. One of the competing cars was pushed off at a somewhat awkward angle, twisted round and entangled the cable, which snapped. In this instance the car came to a standstill within a few feet, so no harm was done. A second cable was fitted, which had been in use at one previous meeting last year, having had approximately 32 runs with 5 c.c. and 10 c.c. cars, after which it was oiled and carefully stored until the day in question. I. W. Moore's 10 c.c. car was the fourth model to use the substituted line, and after having clocked an official 121.62 m.p.h., and been switched off, the cable broke in the next lap, at a point about 6 ft. from the centre. The car struck the safety fence, tore through it, and travelled some 100 ft. outwards before coming to rest, being, naturally, a complete wreck.

The safety fence was of 2 in. 10 gauge galvanised mesh, secured at 6 in. intervals by 10 gauge steel galvanised wire, and was in sound condition, untouched by rust. As Mr. Shaw points out, the speed of the car was doubtless materially reduced by the impact with the fence, but nevertheless very serious injuries would have been inflicted on any spectators who might have been in its path. Fortunately, at that moment, there was none in this particular spot, but an accident such as this should, in the interest of general safety and the good reputation of the sport, be brought to the notice of other organisers, in order that they may take special precautions to prevent a recurrence. Up to the time of writing no cause for the cable breakage has been discovered.

FOCUSING AID FOR BRIGHT LIGHT

BY H. A. ROBINSON



PHOTOGRAPHERS who have a camera with a back focusing screen will know how difficult it is to see the image on the glass in bright sunlight. The reason for this is that the hoods usually fitted are much too shallow and allow light from behind to get on to the surface.

It was with the idea of cutting out back light that the cameraman of some time ago put a cloth over his head and screen for easy focusing, but ordinary amateurs nowadays do not want to be bothered with a cloth.

Here, however, is a method by which a brilliant image can be seen without a cloth even with the brightest back light, and which the writer worked out to overcome this very real operational fault on one of his instruments.

The brilliance of the image on a ground-glass focusing screen is not only regulated by the depth of the hood, but by its depth in relation to the amount of glass surrounded. The smaller the area of glass, the greater the shading effect of any given hood depth. This is the principle used in the suggested method, and it is put into effect by making an extra cover (of card) to fit over the existing screen in which there is an opening that allows only a small section of the glass to be seen.

The opening is "hooded" by strips of card on the sides and top which have the effect of complete shading, the small portion of image inside this, therefore, always being very brilliant.

Of course, only a small bit of the picture being taken is seen, but normally with small cameras of the back focusing screen type the screen is only used to assure sharp focus—a direct or other finder being employed for composition and to see what is being included. The "peephole" cover, as we might call it, quite fulfils these conditions, but gives a really bright section of image on which to focus.

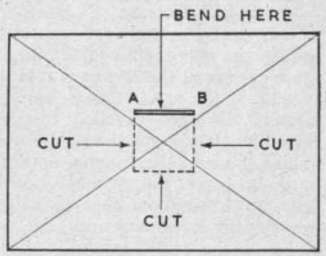
To construct the cover, a rectangle of fairly stiff card is cut which just slips into the hood of the existing screen. It must be a nice fit, so that when pushed up against the glass it holds by friction on the sides. It is best to cut the card a little too large to start with and then get the correct size by trimming off a little at a time.

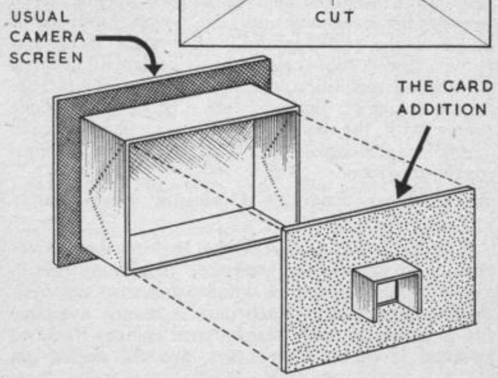
This being ready, draw in diagonal lines to find the centre, about which mark out in squares of 1 in. to 1½ in. sides according to the size of the camera (Fig. 1). Now with a sharp razor blade cut through the two sides and bottom lines, the piece of card thus released being bent up along the top line *ab* which has been slightly creased by running something blunt along it. The seam is reinforced then with this adhesive tape.

Next two side flaps are put on. These are squares of card 1 in. x 1 in., and they are attached by their inner edges to the main piece by more of the adhesive tape. If well made, these side pieces are held in the open position by the natural downward pressure of the top flap, which is still part of the big rectangle.

The whole cover is now painted with a matt black and the job is done. For closing, the side flaps (which must be freely hinged) are turned inward and the top flap brought down over these, the whole then being held by an elastic band. Thus closed down, the extra cover can easily be carried in a pocket or slipped into a camera case. Opening up and fitting is but the work of a moment.

These sketches show how the hooded screen is made: size must, of course, depend on the type of camera for which it is required.





IN PT. II "PROFESSOR" COMPLETES HIS . . .

Introduction to Model Car Building

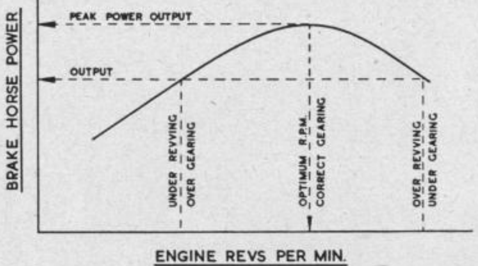


FIG. 2. TYPICAL B.H.P - R.P.M. CHARACTERISTIC WITH REFERENCE TO GEARING.

Choosing the Gear Ratios

THE assumption was previously made that the cars under consideration were "correctly geared", and since the failure to achieve this is another failing of the novice, a word or two on this subject will not be amiss.

Reference has already been made to "maximum transmittable horsepower" which we have equated to "brake horsepower", but on consulting Fig. 2, which shows a typical B.H.P. - R.P.M. characteristic for a small i.c. engine, it is seen that the maximum output is only achieved at one particular engine speed.

If this speed is not achieved maximum power will never be developed and, similarly, if this engine speed is exceeded the maximum power will not be held, but will decrease.

A correctly geared car is therefore one which fully utilises the maximum engine output, that is, at maximum car speed the engine is rotating at the optimum speed. If the car is *under*-geared, that is, the "designed" distance travelled by the car per engine revolution is too small to fully absorb the available engine power, the engine naturally "revs up" to optimum power output, but since this cannot be usefully absorbed, continues to increase engine speed beyond the optimum until the power produced is equal to the power usefully absorbed. If the car is over-geared, that is too large a "designed" distance per engine revolution, the speed equivalent for optimum engine revolutions is too high to the *available* power with the result that the car cannot reach "peak" engine revolutions and never even develops maximum power.

Know Your Engine's Optimum Performance R.P.M.

It is therefore apparent that before the correct gear ratio can be designed, the maximum B.H.P. (approximate) should be known and also the optimum engine speed. Such data is readily available for most of the high performance engines likely to be used in model racing cars, and the skilled enthusiast who builds his own engine should be equally capable of doing his own horsepower tests.

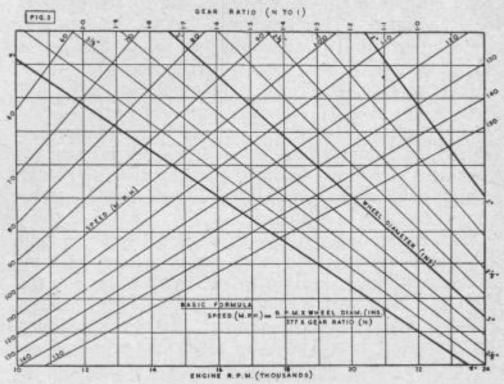
At this stage the novice can profit by the experience of the experts and sometimes gauge the approximate speed that is likely to be obtained with his car using a similar engine to that of the expert. In some instances, if fortunate, he can also obtain gear ratio and tyre sizes, but in any case a word or two on the manner in which these are ascertained will be useful.

The "gear" of a car is determined from consideration of engine revolutions, gear ratio, driving wheel size and "slip" between tyre and track. Of these, driving wheel size and "slip" are not constant (for any particular set-up). Tyres expand with increased wheel revolutions, thus tending to increase the gear ratio—a factor which is utilised to the utmost—and "slip" is as elusive as the name implies.

Calculating Slip Losses

For initial calculations "slip" can be taken as *approximately* 10 per cent but, since tyre expansion is also *of the order* of 10 per cent at least one expert does "straight" calculations initially, that is, he assumes that tyre expansion is nullified by "slip". It is, of course, well known that there are three grades of certain tyres available, namely, soft, medium and hard, and that therefore for a certain size tyre different degrees of expansion are obtained, but it is here reiterated that the purpose of this article is to prevent flagrant violations of simple theory.

The novice can therefore safely follow the initial calculation based on this assumption, and the "gear" therefore becomes constant at all speeds. One excellent way of expressing the "gear" is in terms of "miles per hour per thousand engine revs. per minute", and the novice is well advised to follow this method as it is very useful later on. It can be shown that :—



$$\text{M.P.H./1,000 r.p.m.} = \frac{2.975 \times \text{wheel diameter (in.)}}{\text{gear ratio}}$$

$$\text{or approximately} = \frac{3 \times \text{wheel diameter}}{\text{gear ratio}}$$

Consider a 5 c.c. engine developing 0.75 B.H.P. at 17,500 r.p.m., 2 to 1 gears and $3\frac{3}{4}$ in. dia. tyres.

$$\text{M.P.H./1,000 r.p.m.} = \frac{3 \times 3\frac{3}{4}}{2} = 5.625$$

Optimum Engine Revolutions = 17,500 per minute

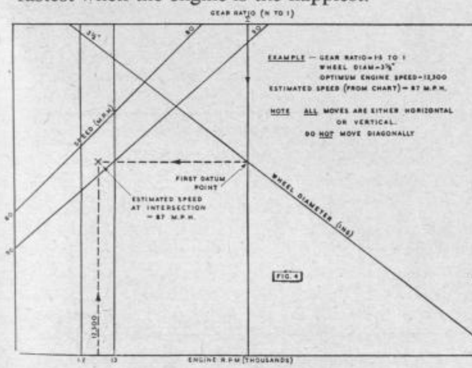
$$\text{Anticipated Car Speed} = \frac{5.625 \times 17{,}500}{1{,}000} = 98.5 \text{ m.p.h.}$$

This result obviously puts the type of car in the high performance or purely functional group, and though perhaps a trifle optimistic, particularly for the novice, it was emphasised as *developing* the stated output.

This is perhaps a good point at which to state that such a performance would only be anticipated in a car presenting the minimum cross sectional area and with carefully planned "lead-in" to give a good streamline coefficient. Therefore, since wheels (unless fitted under spats) present *additional* cross-section to that of the body, it is often advantageous to fit smaller wheels wih a lower gear ratio, though in both cases the "gear" is equal.

Experiment With Gear Ratios

If the anticipated speed is not approached, within reason, on the trial trip (assuming engine run-in), or subsequent trips do not produce any more promise, divide the speed (m.p.h.) attained by the gear factor and thus obtain the engine revs. If these are a good deal less than the optimum revs. per minute decrease the tyre size (or fit harder tyres) until the car is operating at the optimum engine revolutions. Remember the makers quote an "average" or "nominal" figure, and the engine used may be either faster or slower than the quoted figure, but one check always remains—the car will always go the fastest when the engine is the happiest.



Just in case any doubts exist, a car with the wheels fitted directly to crankshaft extensions is equivalent to a 1 : 1 gear ratio, and there m.p.h./1,000 r.p.m. = 3 x D.

Using the Performance Chart

The chart (Fig. 3) will facilitate the carrying out of rapid calculations concerning "gear" though, since it is designed for "reversible" operation, no allowance is made for "slip" or wheel expansion. It would be a great help if manufacturers would quote both static diameters and diameters at say 10,000 r.p.m. for tyre ranges.

Reverting to the chart, as an example it is desired to calculate the speed of a car fitted with $1\frac{1}{2}$: 1 gears, $3\frac{1}{2}$ diameter tyres, and 12,500 optimum engine revolutions per minute.

1. Locate gear ratio figure of $1\frac{1}{2}$ on the upper horizontal scale.
2. Drop *vertically* from $1\frac{1}{2}$ (1.5) until $3\frac{1}{2}$ (3.5) inch tyre line is reached. This is the first datum point.
3. Move horizontally across the chart from this datum until a vertical drawn upwards through the 12,500 r.p.m. on lower scale is reached.
4. Estimate speed by consideration of appropriate diagonal speed lines, i.e. second datum lies between 80 m.p.h. and 90 m.p.h., or approximately 87 m.p.h. This example is illustrated in Fig. 4 and, obviously, if three of the four variables are known, the fourth can be found by suitable variation of the above sequence.

Centrifugal Force and Fuel Feed

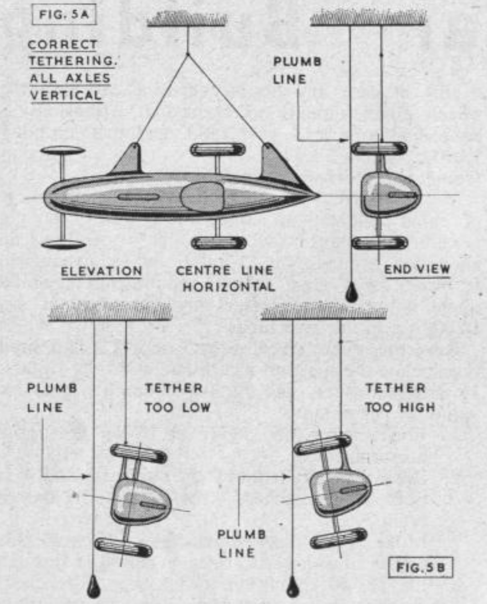
It was earlier assumed that the novice was getting the most out of the engine, and it need hardly be said that if careful attention has not been given to the fuel feed at all speeds, this will be a forlorn hope. However, my article "Designing Fuel Tanks by Graphical Methods" (April, 1951, *Model Maker*) covered fairly comprehensively this subject from the viewpoint of the beginner.

The article previously referred to provided a good lead into the subject of centrifugal force and, if there are still doubts regarding the magnitude of this, attention is drawn to a further article "A Chart for Calculating the Magnitude of Centrifugal Force" (March, 1951, *Model Maker*).

Tethering Problems

This, it is regretted, is the department in which the novice apparently prefers to flaunt his more flagrant breaches, possibly due to the fact that it is the last item to be made, and despite the fact that more articles have appeared in print on this subject than any other subject.

If the novice is unable to obtain a satisfactory solution and arrives at the track with a bridle which is obviously wrong, or even if the satisfactory nature of this item is doubted, please *do* tell the club secret-



ary, or your would-be benefactor, *before* you get on to the track itself. The reader is assured that such an action will be appreciated and, at the same time warned that no self-respecting club official will allow a novice to "have a go" without first checking this item, so do not allow yourself to be made to look small.

Assuming that the bridle has not yet been made, the first step is to find the centre of balance of the car when in running order but with tank only half full. A practical method of determining the position is to move the car backwards and forwards along a knife edge at right angles to the main chassis centre line until the car balances see-saw fashion on the knife edge. The position may also, if so desired, be found by calculation, since its distance from the free axle along the centre line will be equal to the wheelbase times the weight on the drivers divided by the total weight.

Making the Bridle

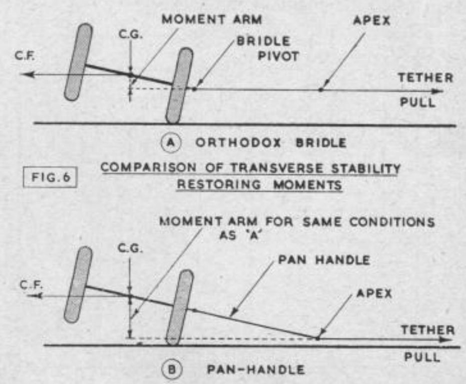
The normal bridle (piano wire preferred) is V-shaped, the apex being between 9 in. and 10 in.—preferably about $9\frac{1}{8}$ in. from, and perpendicular to, the main centre line of the car, passing through the centre of balance. A soft wire pattern should now be made to satisfy these conditions and when completed and fitted to the tether lugs the car should be suspended from the apex. It is recommended that the novice should first try a "dead beat" setting (Fig. 5), in which case, when suspended from the apex, both axles should be vertical in elevation and end view, that is, the main car centre line should be horizontal in elevation, and if this is not so the apex should be adjusted until it does comply, which means of course, that the axles are vertical when viewed in elevation. From end view a plumb line should be used. If outer wheels are clear, tether is too high; if inner wheels are clear tether is too low. The height of the tether lugs should be adjusted until this condition is also satisfied. Experts often set for outer wheel lift of $\frac{1}{8}$ in. and front wheel "toe in" (in elevation) of up to $\frac{1}{4}$ in. For guidance when using piano wire, the following sizes are satisfactory, the straight length material being preferred to that from coils: Class $2\frac{1}{2}$, 22 s.w.g.; Class 5, 18 s.w.g.; Class 10, 16 s.w.g.; or 14 s.w.g. for small tracks. *Never* attempt to straighten out and rebend an incorrect bend; discard offender and start again. The actual bridle is, of course, made by using the correct soft wire "mock up" as a pattern.

"Pan-Handle" Advantages

The attention of the novice is also drawn to the "pan-handle" form. This is not a fad, but has several definite advantages over previous methods, the greatest of which is increased transverse stability due to the outrigger effect (Fig. 6). This is due to the fact that the "orthodox" tether actually pivots at the tether lugs, whereas the corresponding "pivot" of a pan-handle is actually at the apex hole. The ratio of corrective moments varies therefore, directly as these distances, thus, for a typical Class 10 car, tether lugs to centre line is 3 in., apex hole to centre line is 9 in. — corrective moment = 9/3 = 3 times as great.

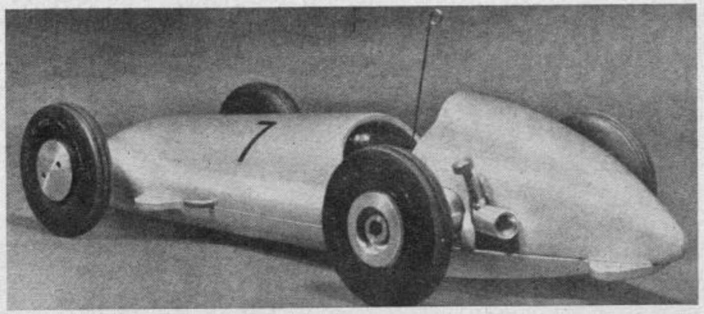
In closing, let it be reiterated, none of the foregoing is infallible (the real intention of this article is to give guidance to the novice), but intelligent reading and application will do much to prevent undue wastage of time at the track as well as bitter disappointment.

Remember a little more time spent on careful consideration is time *saved*, but never forget ultimate perfection, or near perfection is *only* achieved by actual experiment on the track.



OLIVER CAR KITS

REVIEWED BY MODEL MAKER



(Right and below) The trim appearance of the Oliver Mercedes is evident here, and the two halves of the body-castings are shown in the lower picture.

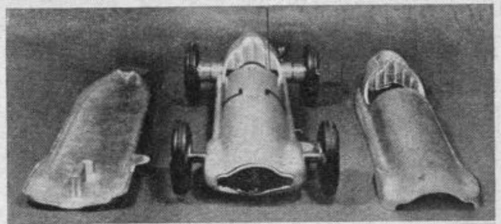
LIKE all good motor manufacturers, J. A. Oliver (Engineering) of Nottingham are quick to take advantage of the successful experiments of their products' "owner-drivers", and it was no surprise that, following Alec Snelling's record-breaking run with a linered-down Tiger, arrangements were made to market conversion sets to enable other Tiger owners to operate in the 1.5 c.c. class. A 'phone call to Nottingham and a chat with Young John produced a specimen conversion set by return, and it will be seen from the photograph that this consists of cylinder-liner bore .430 in., gudgeon pin, piston, contra piston and carburetter body, all readily interchangeable with the standard 2.5 c.c. racing engine components. The price is 48/6d., and it is interesting to know that Cyril Catchpole is reported as having achieved a trackside conversion in about eight minutes.

Sample body castings of the Mercedes, as developed by Harry Howlett as a sequel to his Alfa Romeo, together with a finished car, were also sent along for inspection, and we would certainly commend this smart little model to those who want something just a little less utilitarian than the pure and simple speed models. There is no unnecessary detail to worry the competition user, but the lines are excellent, as is the finish, and in publishing the price of the complete car as £15/19/6d. we hereby tender our regrets to the Oliver concern for the spate of orders resulting in the price of £5/19/6d. quoted in error in their advert. in our last issue! We are told that the bargain hunters were legion!

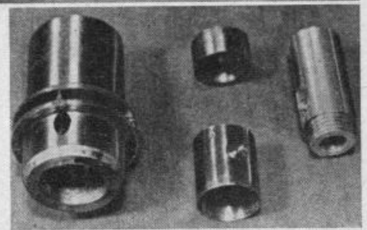
The Mercedes, like the Alfa, can be built up from castings and finished parts, which are available as follows. Castings, as cast, £1/5/-; B.B. wheels, front £1/7/6d.; front axle, clamp, etc., 12/-; tank 10/-; "Sneaker" tap 7/6d.; bridle assembly with screws 4/6d.; and, of course, the Tiger Mk. II unit with rear wheels complete £8/18/6d.

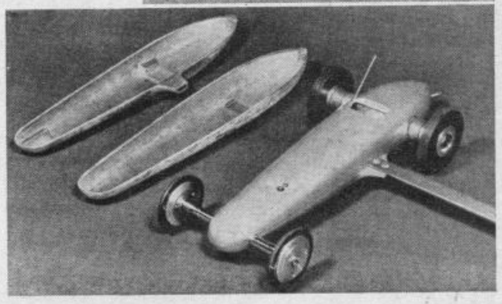
Finally, there is that other example of ingenious adaptation, "Bottoms Up", now more elegantly named the "Tiger Cub". As most racing folk will know, this out-and-out speed model originated from the very successful mating of two standard Tiger bottom-half castings by Cyril Catchpole, with which Mrs. Joan Catchpole had a most successful season in 1952, running the car as a 2.5 c.c. job. The makers took up the idea, and supplied a set to Alec Snelling two days before the "Dees' Do" at Croydon, where as a 1.5 c.c. entrant it broke existing class records handsomely, covering a quarter-mile at 69.45 m.p.h. These castings are available from the makers, at 136 Radford Road, Nottingham, for 16/6d. per pair, and a finished "pan-handle" tethering attachment can be had for this model for 3/6d.

Delivery of cars is given as 28 days, and units 21 days.



(Right and below): The 1.5 c.c. conversion set, and a view of the Tiger Cub speed model with a pair of castings.





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Ossett & District M.C.C. : L. Fozard, 20 Broadowler Lane, Ossett, Yorks.
Sheffield M.C.C. : Mrs. F. Shirt, 157 Infirmary Road, Sheffield, 6.
Sunderland M.E.S. : K. Proctor, 198 Durham Road, Sunderland.

THE Association has issued an up-to-date list of affiliated clubs, together with name and address of secretaries, and in view of the large number of enquiries received by *Model Maker*, we are publishing the information for readers' benefit. The Hon. Records Officer, Ken Proctor, has also issued a list of official records standing at May 24th, 1952, which will be found tabled on this page. It is interesting to note that most of the long distance records have stood since 1949 and 1950.

Regulations for the Percival Marshall Trophy to be competed for at Nottingham on August 31st next, are as under :—

PERCIVAL MARSHALL MEMORIAL TROPHY RULES

The competition is open to all home-constructed cars up to 10 c.c. capacity, provided they comply with M.C.A. Rules.

Permissible commercial components will be limited to engine castings, tyres, gears, and ignition equipment. *These must be of British manufacture.*

Points will be awarded for workmanship, design and performance, allotment to be as follows :—

	pts. max.
Workmanship	25
Design	25
Own Engine Design	15
Own Castings	10
Performance :	
(a) Starting	10
(b) Speed	15

The speeds required in each class to obtain maximum points under Rule P.M.3 will be revised and published each year. Cars returning speeds lower than that required for maximum points will receive points pro rata.

The judging will be done by two independent Judges, preferably invited from a Model Engineering Society.

Three minutes only will be allowed for starting.

Two ½-mile, flying start, runs will be allowed, best speed to count.

Each competitor will be allowed one assistant only.

If the competition is run in conjunction with an Open Day, the Competitors shall be allowed two special runs for the P.M. Trophy, if his car does not comply with Rule P.M.2 when it is run in the Open Day event.

The Judges' decision in all matters shall be final.

The venue shall be decided at the M.C.A. Annual General Meeting each year.

Speeds necessary to obtain maximum points in this year's event are: 10 c.c., 105 m.p.h.; 5 c.c., 85 m.p.h.; 2½ c.c., 65 m.p.h.; 1½ c.c., 50 m.p.h.

The following letter has been received from the Hon. Secretary, I. W. Moore.

Dear Sir,

I feel that several points raised by "Jerry Cann", in "Dope & Castor", May issue, call for clarification, since it is obvious that he is under some misapprehension on M.C.A. matters.

Dealing first with ". . . if there is any future contemplated for anything but the out-and-out speed model". When the Rules Committee recently considered the revision this was one of the main points discussed, and a considerable amount of time was spent on it. However, the final decision was that there were few rules needed for other types of model which were not already covered by the so-called "Speed Rules", and which could be used on a national basis. And further rules required would be promulgated as special regulations applicable to the particular contest. Which brings me to the next point—the statement "The only National competition . . . contains no event for anything *but* the out-and-out speed model". This is not correct. There are, in fact, three competitions of National status, organised by the M.C.A., of which only one is decided by speed alone. All these contests are for Trophies donated by individuals or firms, whose privilege it naturally was to state the main conditions of award. In the National Speed Trophy, it was speed alone which was to be the criterion. The Percival Marshall Trophy is awarded on a points system, and speed can only count for 15 per cent of the total, and above a basic speed no additional points are awarded. In the Sutton Trophy, a system of points is again used, and speed does not count *at all*, unless there is a tie in workmanship points, when it is used to decide the tie. It will be seen, therefore, that speed is not the main factor, except when specifically requested by the Donors.

Finally, may I point out that the M.C.A. is the body joining the Clubs together : the Clubs themselves *are* the M.C.A. No official, or group of individuals has any power to make or alter Rules, or dictate policy. The Rules existing are there by vote of the majority, every Club having had the opportunity to give its views. If any Club wishes to alter or add Rules for scale or other models, it is perfectly free to put forward a suitable proposal, which would then be voted on by all the Clubs.

I am sure that, if Jerry Cann cares to offer a trophy for competition on the lines he suggests, the M.C.A. would be only too pleased to accept it, and organise an annual competition (provided that the rules comply generally with standard rules on weight, etc). I will guarantee to safeguard his nom-de-plume!

Yours faithfully, IAN W. MOORE.

KEN PROCTOR REPORTS OPEN DAY AT

GUISELEY

HARRY PICKERSGILL and his helpers did an excellent job in organising the Guiseley "Open" on May 25th, and were rewarded by fine weather and an entry of 52 cars, representing a wide variety of types from scale to functional speed models, including a refreshing number of new designs.

Apart from the home club, representative entries were received from Bolton, Derby, Grimsby, Ossett, Sunderland, Meteor, Lincoln, Oldham and Sheffield. Ted Armstrong of Sunderland was opposed in the 1.5 c.c. class by two late entries from Oldham, but led the class with a final run with his own-built job at 45 m.p.h. This engine-gear-unit is destined for a scale model at some future date.

The 2.5 c.c. class failed to produce a Grade "A" winner (over 75 m.p.h.), but mention must be made of the new 2.5 c.c. car from the Bill Moore stable, which by reason of the extensive "carvery" to reduce frontal area might be referred to as a "chip off the old block"! This model has a single-shaft Oliver Mk. II engine driving the rear axle through bevels. Ted Armstrong's 1952 version of his record-holding 1951 E.D. spur geared car scored another win in Grade "B", from H. Tate of Guiseley, his second tour being at 75 m.p.h., and Harry Howlett of the Meteor Club won Grade "C" at 64.92 m.p.h. with his scale (ex-Busy) Alfa. P. Robinson of Sheffield had an unlucky day, losing the jet needle of his Oliver on his first run and being smitten by his car as he left the track in round two. Twenty entries competed, with few no-runs, an unusual absentee being Ken Proctor, who spent the day explaining why he wasn't competing!

Ted Armstrong receives his awards from Councillor Mrs. Martin. (Photographed by Ken Proctor)

Right : Bill Hamilton of Guiseley with his 10 c.c. magneto ignited Dooling.

Left : Jack Yates, also of Guiseley, grins happily after his winning run in the 5 c.c. class.

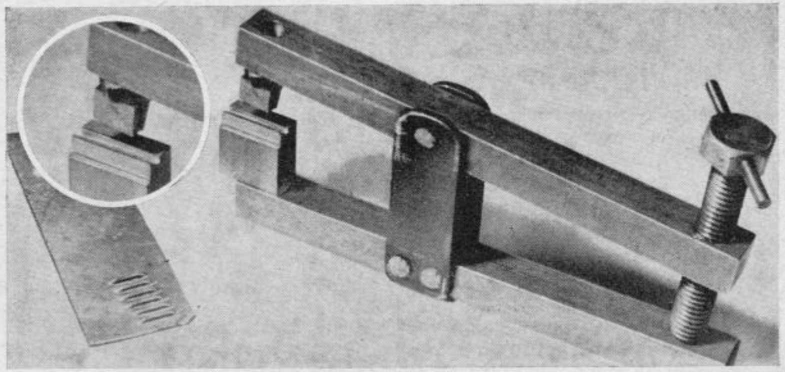
Of the twenty-one 5 c.c. cars, fastest speed was recorded by Jack Yates of the home club, with his Dooling engined Special, at 96.7 m.p.h., narrowly pipping Jack Cook's Dooling and Mrs. Ivy Moore's bevel driven motor, which scored 94.47 and 92.75 respectively. In Grade "B" John Parker (Meteor) and Bill Hamilton (Guiseley), dead-heated with 89.12 m.p.h. apiece, John running his E.T.A. powered car against Hamilton's Borden Dooling. John emerged the winner on the spin of a coin. Another E.T.A. engined car, entered by B. Winterburn of Guiseley, took Grade "C" at 78.94 m.p.h., whilst a Winterburn Special, this time with a McCoy motor and run by R. Stokes, took Grade "D". Harry Pickersgill's all-home-built car was handled by Jack Yates, who recorded a personal long-distance record before the motor fired, and two good runs were recorded.

In the "Ten" class magneto ignition was much in evidence, as also were no-runs, the two facts being in no way connected. Bill Moore's Moore Dooling clocked a rocketing 123.3 m.p.h. to win the "A" Grade, Bill Hamilton clinched the "B" award with his Dooling Special at 104.6 m.p.h., and B. Jepson's Dooling Arrow took Grade "C" at exactly 100 m.p.h. Harry Howlett ran his scale Mercedes in this class, and J. Tartellin of Grimsby strove hard to return a run after having to convert his Series 20 McCoy engined Teardrop to Glo-plug ignition, following the loss of a contact-breaker point.

Over 1,000 spectators were entertained to an excellent day's programme, and loved every minute of it, the Guiseley track being well situated in a natural amphitheatre and having a first-class racing surface. At the conclusion of the meeting prizes were awarded by Councillor Mrs. Martin, wife of the Chairman of Aireborough District Council, who have given much encouragement to the activities of the Guiseley Club.

LOUVRE CUTTING MADE EASY

MANY METHODS OF CUTTING LOUVRES HAVE BEEN TRIED BUT THIS PRACTICAL TOOL WILL SAVE VALUABLE TIME AND TEMPERS OF ALL THOSE DESIROUS OF GETTING A QUALITY FINISH TO THEIR CARS.



MOST builders who have tackled a scale type model car at any time will know how easy it is to ruin the appearance of a good model with badly cut louvres, or no louvres at all where louvres there should be. Because of this difficulty we have from time to time described various solutions evolved by readers, some employing simple methods and some quite complex equipment. We were interested, therefore, to be shown the gadget described whilst visiting Eric Snelling recently, which may be said to fall between the simple and the complex. Briefly, the tool consists of a screw-operated press, made as will be seen on the "tongs" principle, with a hardened form tool and die at the business end. Using this there is no difficulty in lining up the job, and much more consistent results can of course be achieved than by using any form of punch which requires a hammer blow to pierce the sheet metal. All that is necessary is to insert the sheet and screw down the tommy-bar till the perforating process is completed, and to judge by the specimens we were shown, the result is an excellently formed louvre, with no signs of tearing or mis-alignment. The total length of the device is about 10 in., and punches and dies of different widths can, of course, be accommodated. We are indebted to Eric Snelling for permission to publish the description and illustration of this useful piece of equipment.

M.C.A. RECORDS STANDING AT 24th MAY, 1951

Distance Miles	Speed m.p.h.	Name	Club	Track	Date
British and Open 1½ Class					
¼	69.49	A. F. Snelling	Edmonton	Dees (Croydon)	15.3.52
½	43.06	B. Griffin	Medway	Eaton Bray	23.9.51
British 2½ Class					
¼	86.45	Mrs. J. Catchpole	Surrey	Edmonton	11.5.52
½	80.64	A. F. Snelling	Edmonton	Eaton Bray	23.9.51
1	76.84	A. F. Snelling	Surrey	Surrey	12.5.51
5	66.18	J. R. S. Parker	Meteor	Edmonton	11.5.52
10	45.79	F. G. Buck	Meteor	Stoke	27.8.50
British 5 Class					
¼	94.64	E. V. Snelling	Edmonton	Cleethorpes	27.8.50
½	85.71	J. T. Green	Sunderland	Ossett	4.6.50
1	75.00	J. C. Cook	Sunderland	Sunderland	21.7.51
5	41.60	F. G. Buck	Meteor	Stoke	27.8.50
10	32.45	F. G. Buck	Meteor	Stoke	14.9.50
British 10 Class					
¼	114.64	F. G. Buck	Meteor	Derby	3.9.50
½	113.56	F. G. Buck	Meteor	Derby	3.9.50
1	105.50	F. G. Buck	Meteor	Eaton Bray	15.5.49
5	69.77	I. W. Moore	Derby	Derby	16.1.49
Open 2½ Class					
¼	86.45	Mrs. Catchpole	Surrey	Edmonton	11.5.52
½	80.64	A. F. Snelling	Edmonton	Eaton Bray	23.9.51
1	76.84	A. F. Snelling	Surrey	Surrey	12.5.51
5	66.18	J. R. S. Parker	Meteor	Edmonton	11.5.52
10	45.79	F. G. Buck	Meteor	Stoke	27.8.50
Open 5 Class					
¼	98.68	F. J. Dean	Surrey	Cleethorpes	26.8.51
½	94.24	C. M. Catchpole	Surrey	Eaton Bray	22.7.51
1	84.24	C. M. Catchpole	Surrey	Surrey	12.5.51
5	41.60	F. G. Buck	Meteor	Stoke	27.8.50
10	32.45	F. G. Buck	Meteor	Stoke	14.9.50
Open 10 Class					
¼	132.35	J. A. Shelton	Edmonton	Edmonton	13.4.52
½	122.95	I. W. Moore	Derby	Derby	19.8.51
1	105.50	F. G. Buck	Meteor	Eaton Bray	15.5.49
5	69.77	I. W. Moore	Derby	Derby	16.1.49
10	57.14	P. J. E. Hugo	Derby	Chiltern	18.4.49

Hon. Records Officer: K. Proctor, 198 Durham Road, Sunderland.

The 3.3 Litre BUGATTI G.P.

DESCRIBED BY

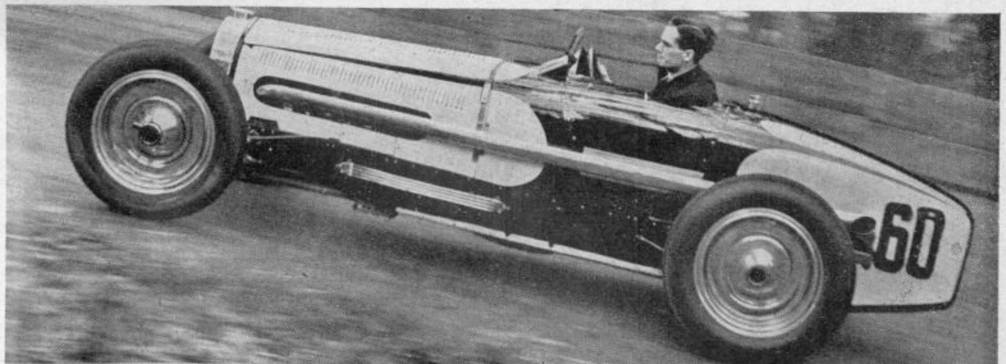
G. H. DEASON

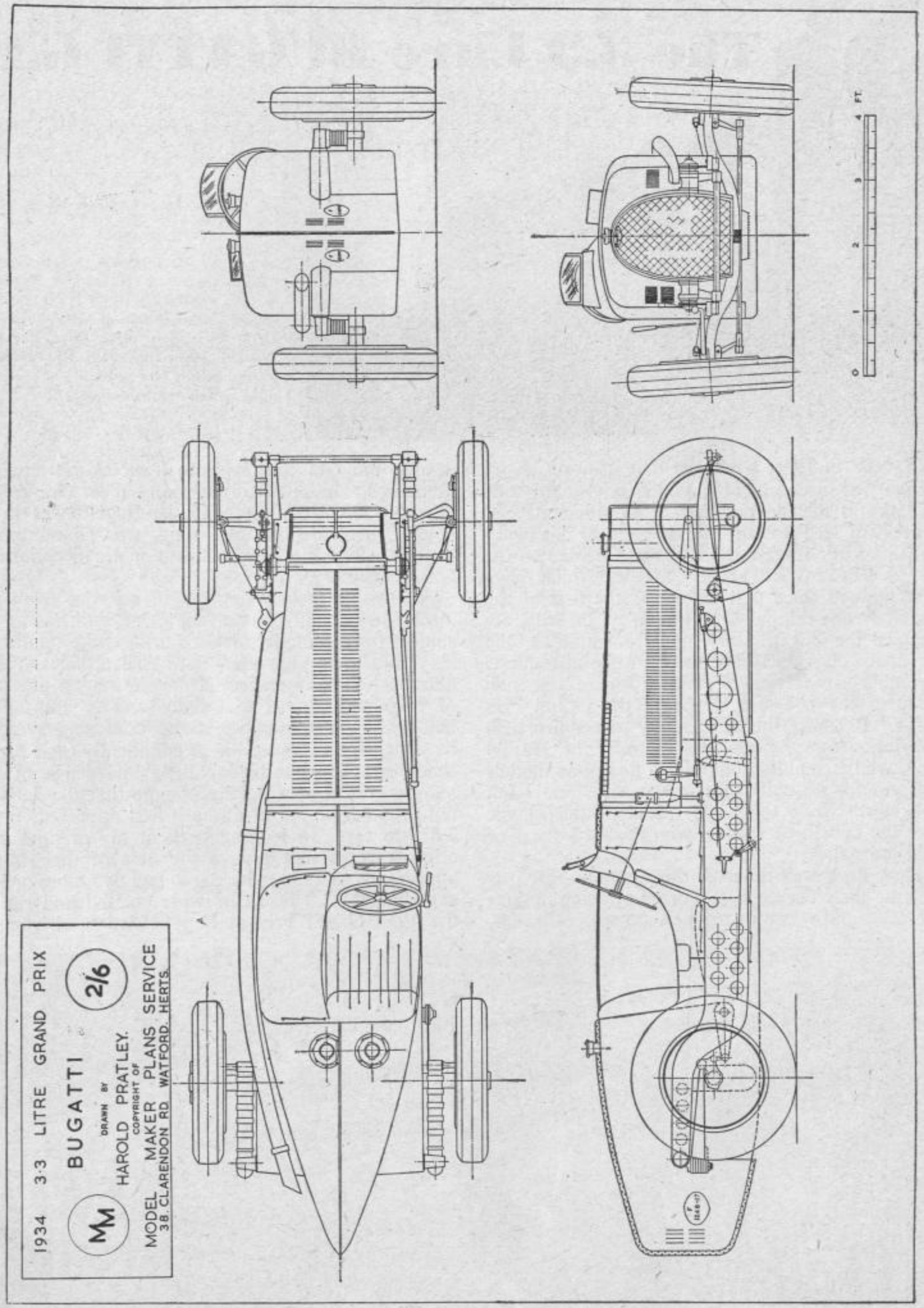
Left: The 3.3 litre G.P. Bugatti seen here in the "dead car" park at Dieppe in 1935, with Freddie Dixon in the background. Below: One of Louis Klemantaski's finest shots, of C. Ian Craig at Prescott, accelerating hard for Pardon hairpin. Note the external oil-cooler pipes outside the frame-member.

WAY back in 1946, when the first issue of *Model Cars* was in course of planning, a visit to Rodney Clarke at the old premises of Continental Cars at Chobham, led to an introduction to his well-known 3.3 G.P. Bugatti, and this in turn led to the series of "Prototype Parade" articles which have been continued since that date. As the first of the series, and with time at a premium, no drawing accompanied the Bugatti story, and from time to time over a space of years I have received urgent requests from enthusiasts in many countries for an authentic drawing of the last and fastest of the Grand Prix Bugattis. Recently the opportunity to acquire such a drawing arose through the courtesy of Harold Pratley, who is building one of his fine scale models of this car for an enthusiast in America, and I felt it well worth while to give a repeat of this classic car for the benefit of readers who missed issue 1 of the old journal.

The car itself well deserves this attention, for it is one of the truly classic G.P. Formula racing designs of the past, and was an extremely potent performer, despite the fact that its actual successes were not numerous. The powerful German bid for Grand Prix honours, which by the time the Bugatti was in its second year was in full swing, was sounding the death-knell of the more conventional conceptions of G.P. machinery.

All this, however, detracts in no wise from the attraction of the 3.3 as a racing car, still less as the subject for the model maker's art. Quite unmistakably Bugatti in character, it was nevertheless vastly different in many respects from the racing products of Molsheim up to that date, and is unusual in having no Type number, those confusing symbols by which the *cognoscendi* so confidently (and sometimes erroneously) display their knowledge of the *marque*. It is also worthy of note that the 3.3 was not originally a 3.3 at all as it first appeared, but a 2.8 litre car. In looking back at my original description I see that I gave the date of their initial appearance as 1934, whereas in fact two more or less experimental 2.8 litre cars were entered and ran in the 1933 Grand Prix at San Sebastian, driven by





Varzi and Dreyfus, who finished fourth and sixth.

This end-of-season fixture marked the demise of the old Formula, and the introduction of the 750 kg. ruling for 1934 led to a reconsideration of engine size, as provided that the cars came under the weight limit (approximately 14½ cwt.), there was no limit to engine capacity.

Our Bugatti, however, ran its first race of 1934 as a 2.8, this being at Monaco, where four cars were entered, driven by Dreyfus, Benoist and Wimille, and fourth being an independent entry by Nuvolari, Dreyfus driving into third place behind Guy Moll and Chiron in Alfas. For the French Grand Prix the engines were bored out to 72 mm., and thus became the 3.3 litres which they officially remained. Alfa Romeos continued to dominate the scene here, finishing in the first three places, but Robert Benoist wasn't far behind in fourth place. At Spa in the Belgian G.P., however, Dreyfus got home first ahead of Brivio's Alfa and Sommer's Maserati, at 86.9 m.p.h., the gallant Benoist again in fourth place. Alas, one looks in vain for another major win; several creditable places are recorded in the lists, but the battle of the litres was proving too much for this fine motor car, which gradually dropped out of the picture so far as the Grandes Epreuves were concerned, to pass into the appreciative hands of private owners.

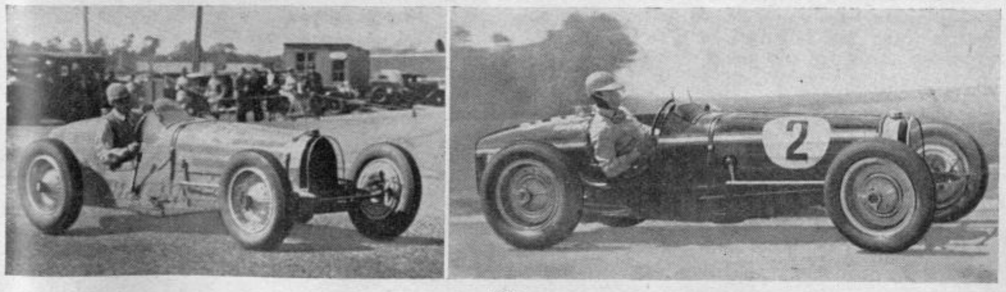
This "last of the classics" deserves a detailed description. A straight-eight engine of typically Bugatti designed is housed in a much deeper than normal frame, having massive and lavishly-drilled side-members which form a notable part of the exterior "scenery". Ettore Bugatti was said to view independent suspension as the last resort of those who couldn't design a chassis, and in consequence the 3.3 retained the traditional "cart-springs", albeit with the reversed quarter- elliptic arrangement at the rear, but the tubular front axle, through which the half-elliptic springs pass, bowed to some degree to the modern trend by having a joint in the centre to permit a limited degree of flexion. De Ram shock-absorbers damped road shocks, and the resulting chassis in some measure justified M. le Patron's faith in the old order, being a magnificent road-holder.

The twin-o.h.v. engine, with supercharger mounted on the offside, developed some 300 b.h.p., which gave the car a fine performance, though by now its rivals were outstripping it in this respect. A four-speed gearbox was used, operated by the lever shown outside the body. Brakes were cable operated, with huge and satisfying drums, and the wheels were of very special construction, possibly the 3.3's most notable external feature. These wheels had not only splined hubs but backplates integral with hub and brake drum, and carrying serrations through which the drive was taken to the rims and tyres, there being no driving load on the spokes, which are radial and numerous. I can find no official record of their number apart from my own statement that there were eighty in each wheel assembly, so presumably I conscientiously counted them at the time! These were made up of thirty-two outer ones from spoke to rim, sixteen to the inner edge of the rim and the remaining thirty-two passing through the wheel from rim to hub.

The body again represented the old order in being a two-seater, at anyrate dimensionally, with the driver sitting alongside the transmission line. Slim and elegant, this is probably the most beautiful of all Bugatti's functional bodies, having lost all the previous rather barrel-like characteristics. (A remark for which I shall probably be banned from Prescott for evermore!) The 30-gallon fuel tank is carried in the usual position aft, and has twin fillers, one on either side of the prominent tail rib. The instrument panel is on the driver's side only, carrying a large rev. counter above the 3 in. dials of thermometer, oil and air pressure and boost gauges. The ignition lever and magneto distributor protrude through into the cockpit in time-honoured fashion.

I hope shortly to have the opportunity of photographing Harold Pratley's scale model of the car, which, remembering his really lovely little 2.3 litre model described a year or two ago, should be a job after my own heart.

Two further pictures of the 1935 G.P. de Dieppe, showing (Left) J. P. Wimille on his way to second place, and Earl Howe taking the corner just before the pits in the same race.



DOPE & CASTOR

By JERRY CANN

THREE main meetings to happen in recent weeks are the Edmonton Open on May 11th, the Guiseley affair which is reported more fully elsewhere in this issue, and the Sunderland Open. Regarding the latter I haven't yet had details, and let me hasten to add that this is more my fault than that of the Sunderland boys, so I must ask their forbearance on this occasion, my plea being pressure of work in other directions.

First piece of news from Edmonton is the resignation of the secretarial work by Jack Pickard, and I know that the Club as a whole, not to mention many outside it, will greatly regret his decision, which is caused by that common complaint, far too much work to do in other directions. Jack has been on the job since the formation of the club, five years ago if my ageing memory is hitting on all its cylinders, and during that time he has been the livest of live wires and has carried the club from strength to strength.

Taking over the reins from Jack is another old friend and frequent visitor on this page, L. A. Manwaring, known to customers for his cartoons on model car topics, if not personally on the track. Les has been in the game since its earliest days, too, and is the keenest of enthusiasts, so the Edmonton fortunes should continue to flourish under his guidance. His address for club correspondence is 90 Pulteney Road, South Woodford, E.18.

By nature a peaceable man, my first instinct when some enraged victim of my well-meaning chatter is announced to be pacing the waiting-room, wearing a brooding look and hob-nailed boots, is to reach for my false moustache and slip quietly out by the back door, to the "Plug and Dumbiron", there to meditate until the All-Clear has sounded. When, therefore, the Ed. summoned me the other day and with a sinister leer enquired how and why I had trodden on the corns of the Moguls of the M.C.A., he obviously expected to see that hunted look settle on the Cann features, accompanied by a quick glance at the wrist watch to see if they were open. (The pubs, not the features.) A look approaching awed admiration came over him, however, when, having read the letter which is published on page 504 from the pen of the Association's Hon. Secretary, not only was there no sign of repentence, but Cann was distinctly heard to say "Tchah"! Which, broadly speaking, meant that I stood by what I said the first time. So perhaps you'd better read the letter again to get yourselves abreast of things.

You've read it? Right. Now Bill Moore is a pal of mine, and if I were to meet him in the "Dumbiron" I'd be the first man to let him stand me a half of mixed. But facts is facts, and I contend that he has continued to evade the main issue, which is down in black and white as Object (a) of the Association—"To encourage *all* phases (my italics) of the development of model cars". I will go further, and hang Object (e) in front of him—"To promote interest in model cars . . . etc." Now nobody has wrought more mightily than I. W. Moore to encourage and promote model *speed* cars, and I am all admiration for the work done by the officers of the Association in this phase of the movement. I repeat, "phase of the movement". The plea that "the Association is really the Clubs" doesn't seem to me to alter things one way or another. If it does, it merely means that my complaint is against the Clubs whose voting power sways the Association. So far as I recall, the announcement of the rules and venue of the Percival Marshall Trophy and Sutton Trophy came to hand after I had penned the offending paragraph, but whether they had or not would make little difference to my views. I am delighted to hear that the P.M. Trophy is being organised on a National basis by the M.C.A., but can't repress a sneaking feeling that the Speed Championship will continue to be given precedence as the Association's *piece de resistance*. I suppose that it is too much to ask that all should be given equality of status and run at the same meeting, even if this meant a two-day affair. As to whether the P.M. Trophy rules produce the type of car I feel it was intended to encourage can best be judged after seeing the 1952 winning model.

Bill certainly scored a neat one in suggesting that Cann himself should donate a trophy and cook up his own rules. The idea has its undoubted attractions, and when the charabanc touring season closes and the barmaid at the "Plug and Dumbiron" relaxes her rigid supervision of the pint tankards, you never know but what something might come of it!

A note to hand from W. K. Crow, Hon. Sec. of the Nottingham M.R.C.C. announces a new arrangement to cater for enthusiasts living some distance away from the track. A Country Membership scheme has been inaugurated, those living 15 or more miles from Nottingham paying a sub. of 10/6d., plus 1/- insurance and 1/6d. M.C.A. affiliation fee. Applications to 51 Graylands Road, Bilborough, Nottingham.

STOP PRESS!

EDMONTON RESULTS

A.E.U. Trophy for Team Event Won by Surrey. Team:

Mrs. J. Catchpole	2.5 c.c.
J. Dean	5 c.c.
C. Catchpole	10 c.c.

Individual Estimated Speed

Winner:	J. Wadham	.17 sec. error
*2nd:	R. Cottrell	.35 sec. „
*3rd:	J. Oliver	.35 sec. „

*Tie decided by toss-up.

Fastest in Each Class

C. Catchpole	1.5 c.c.	65.78 m.p.h.
Mrs. J. Catchpole	2.5 c.c.	86.45 m.p.h.
J. Dean	5 c.c.	85.38 m.p.h.
C. Catchpole	10 c.c.	122.95 m.p.h.

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Made and printed in Great Britain by Bletchley Printers Ltd., Bletchley, Bucks for the Proprietors The Model Aeronautical Press Ltd., 38 Clarendon Road, Watford, Herts. Published by the Argus Press Ltd., 42-44 Hopton Street, London, S.E.1, to whom all trade enquiries should be addressed. Registered at the G.P.O. for transmission by Canadian Magazine Post.