BIG FREE PLAN for Seven Powerboat Tops!

meccano magazine

March

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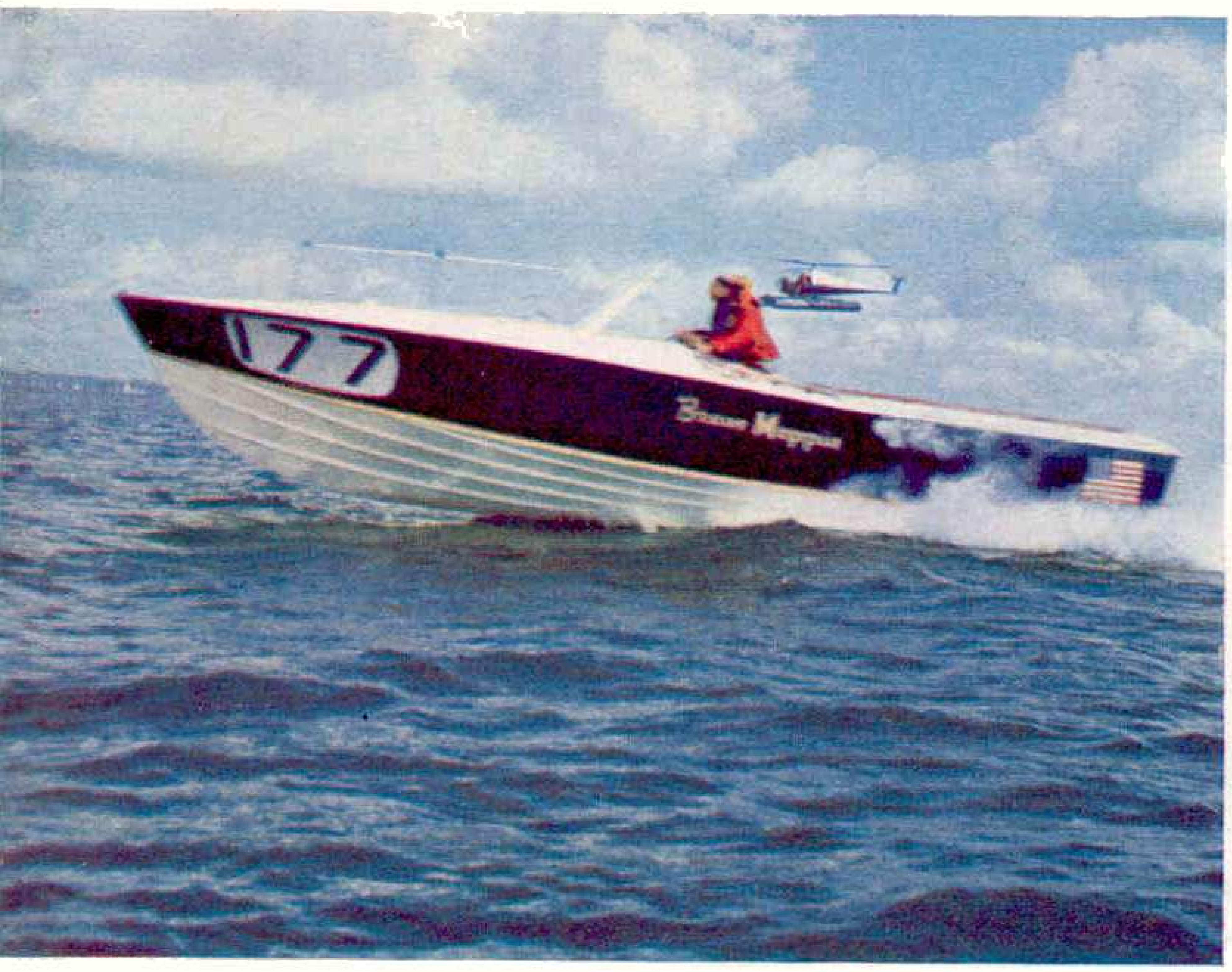
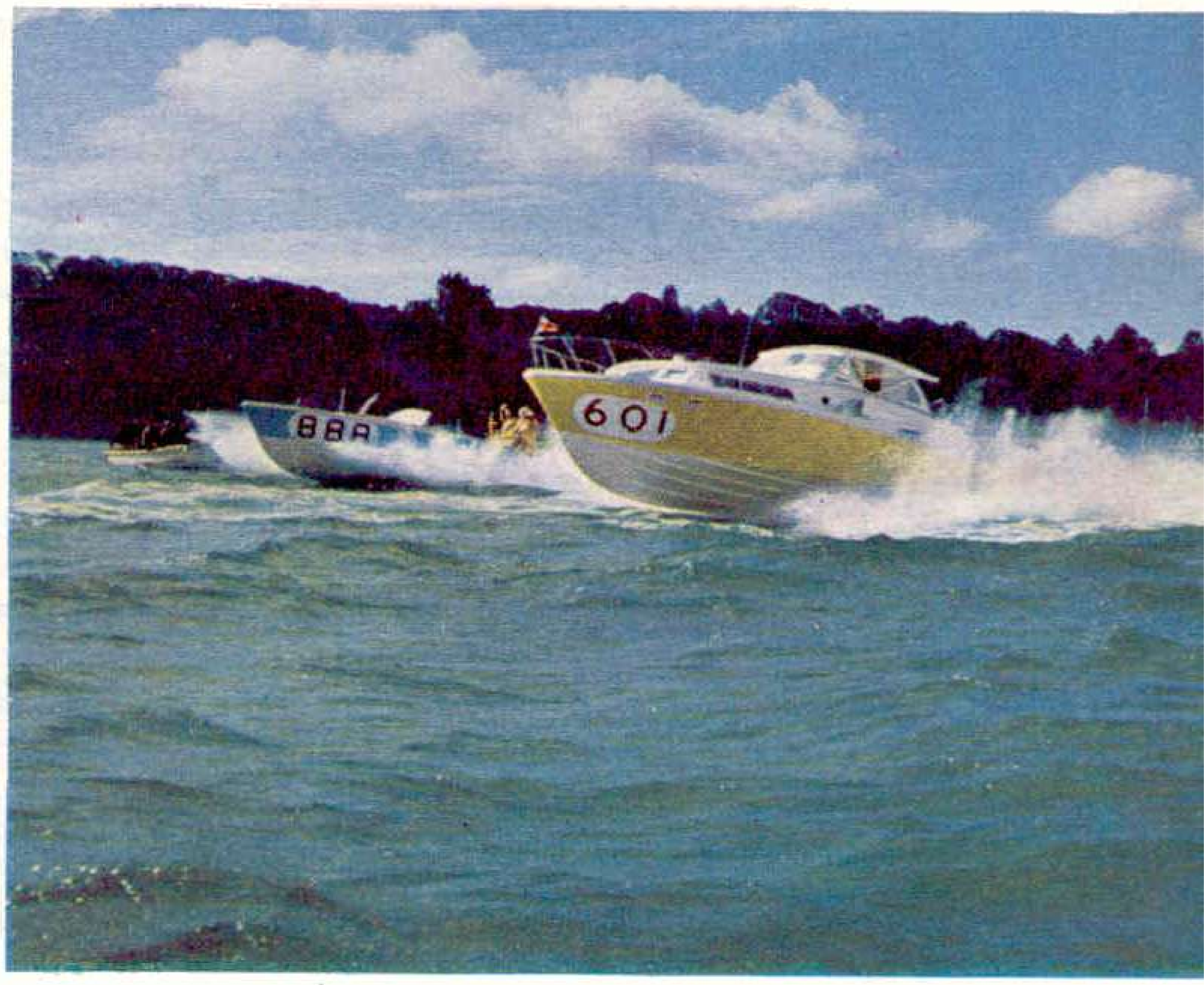




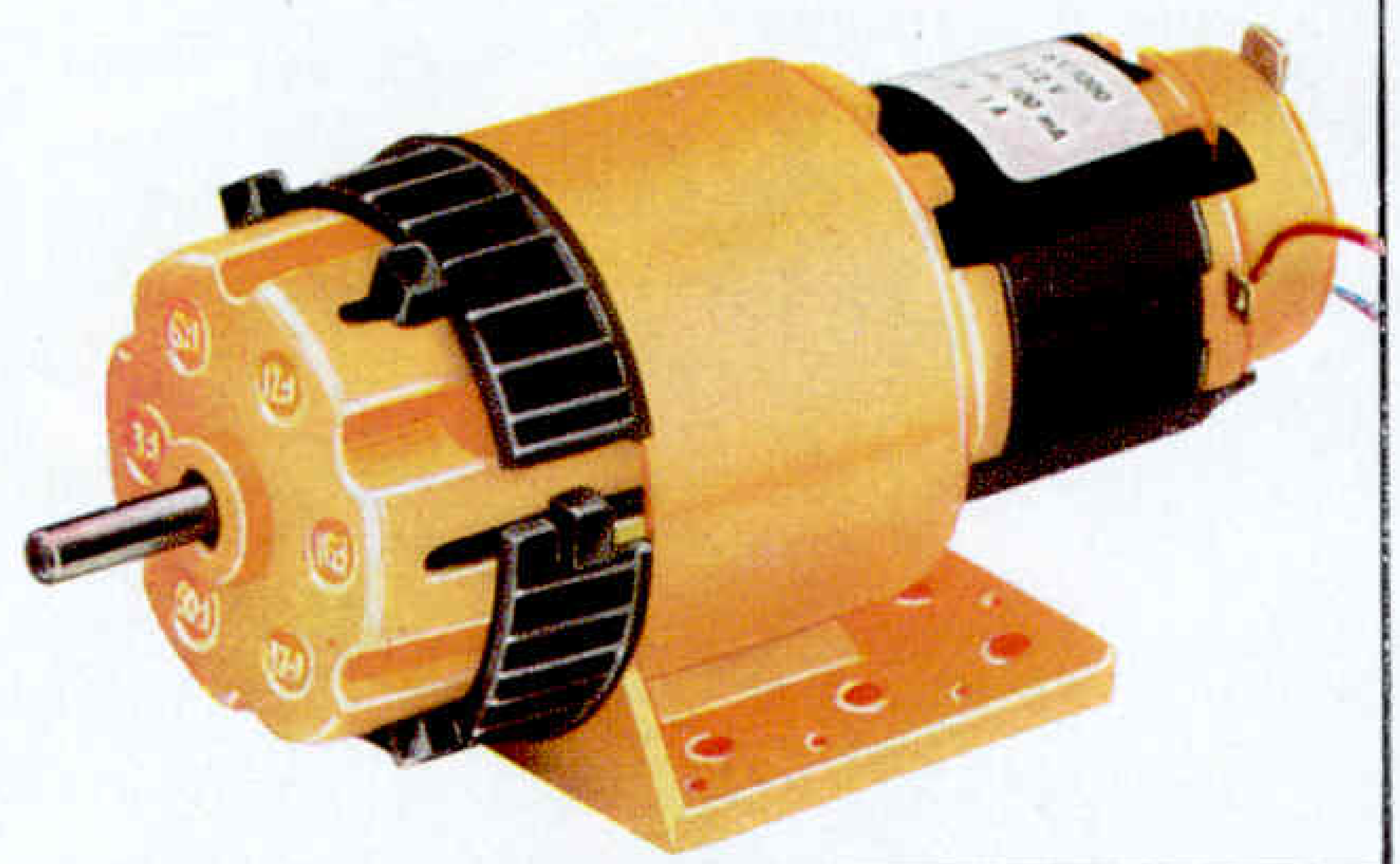
the practical boy's hobbies magazine

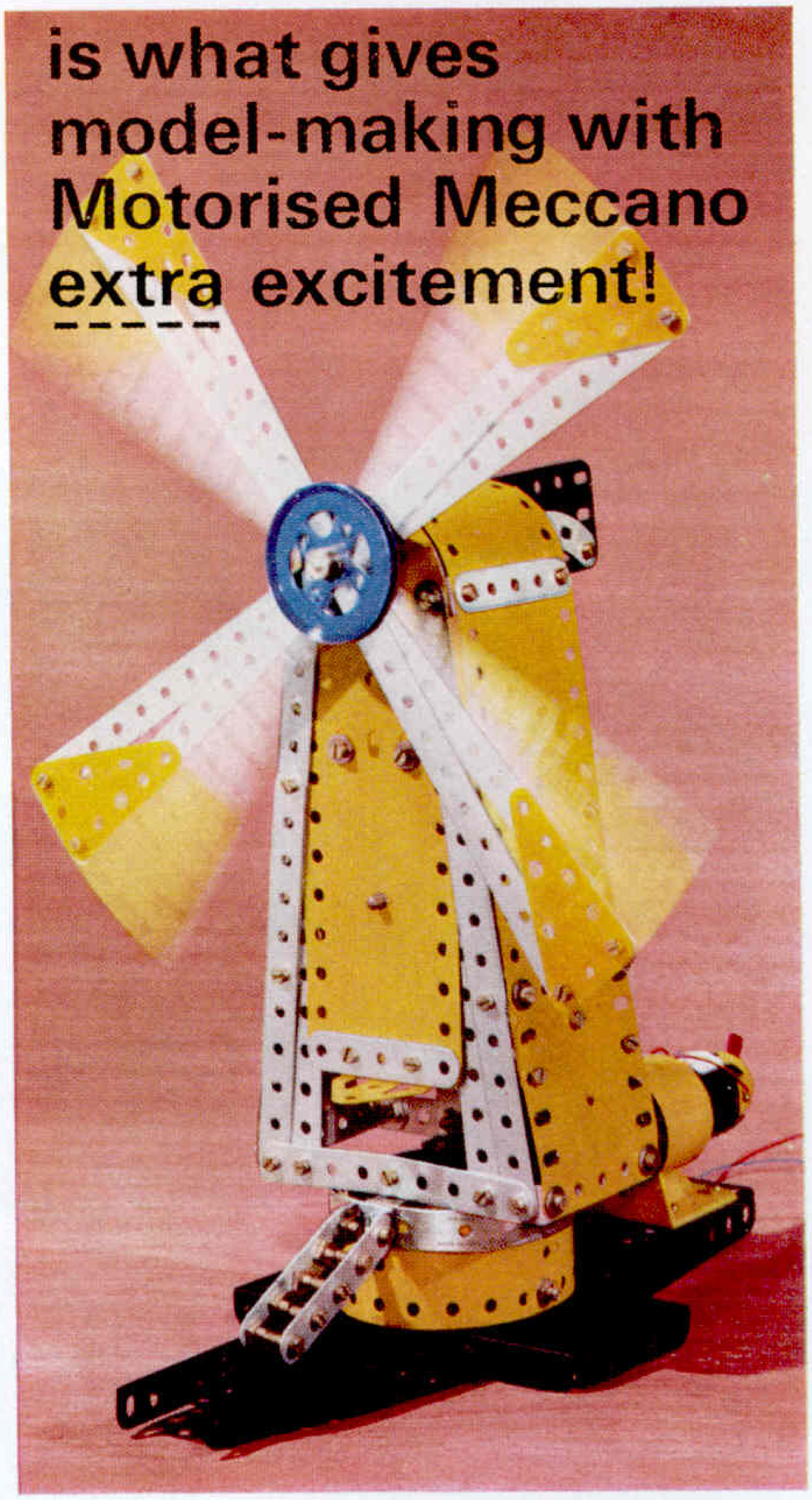
1966

IN THIS ISSUE

- Build a Training Brig
- Black Widow Plastic Feature
- Atom Bombs for Peace
- 50 FREE Dinky Toys to be won

This . . .





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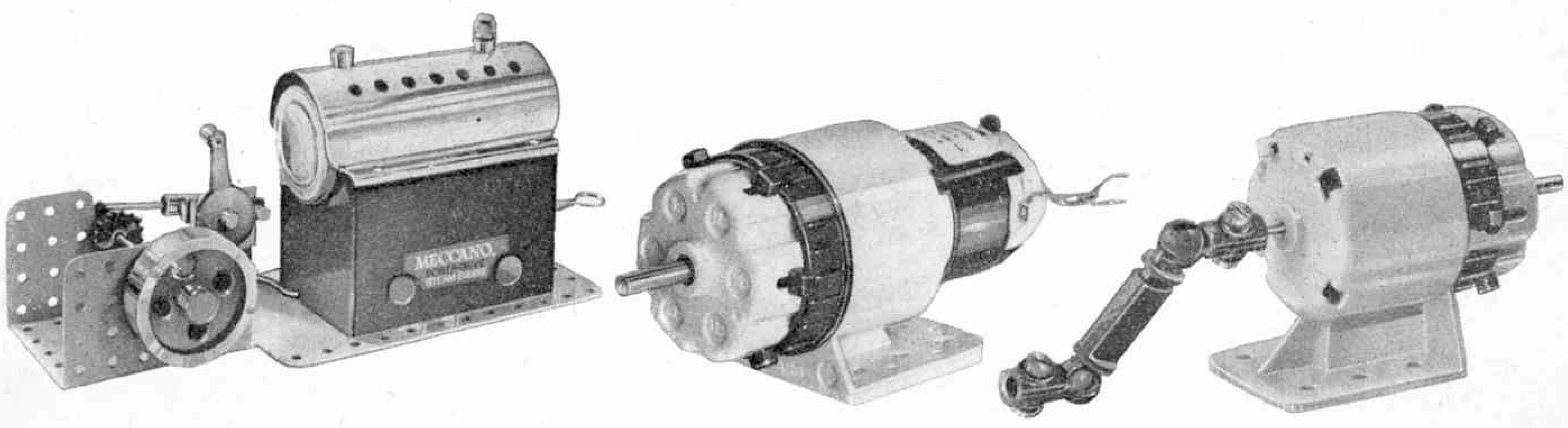

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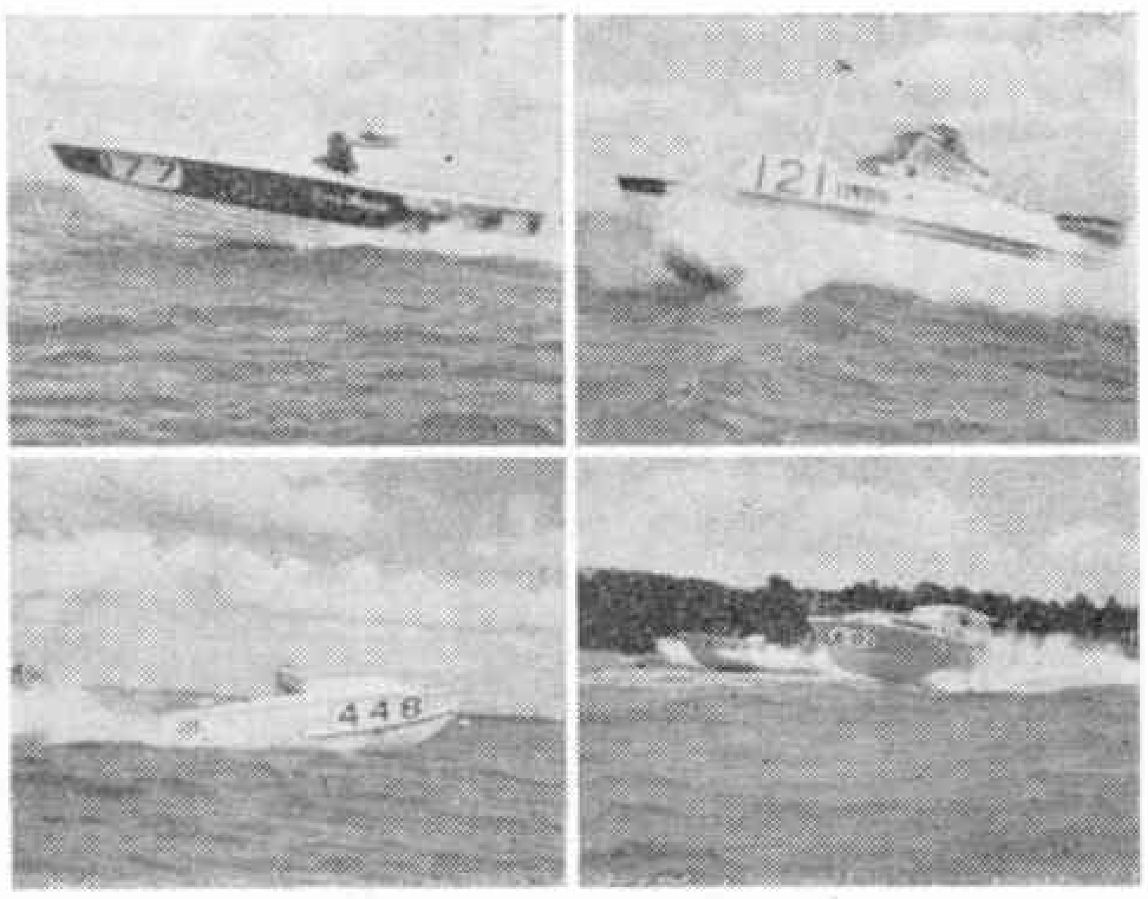
AEROMODELLING □ RADIO □ ELECTRONICS □ CAMPING □ CYCLING □ STAMPS □ FISHING



Our four cover photographs by Geoffrey Simpson will certainly inspire you to build one of the seven powerboat variants of Project 66 on this month's free plan: Top left: Brave Moppie: *Top right:* Blue Marlin, *Bottom left:* Migrant, *Bottom right:* Vivacity.

Contents

Ordering the Meccano Magazine Overseas Readers overseas can order the Meccano Magazine from Meccano dealers or direct from the publishers, or from the publishers' offices listed above. The subscription rate for 12 months is the equivalent of 20s. sterling at the current rate of exchange, U.S.A. and Canada $3.00.

In this age of space flight, intercontinental missiles, anti-missile missiles, rocket-launching submarines and supersonic airliners, it is sobering to stop and consider that a mere hundred years ago, our defence relied upon the wood and canvas sailing ships of the Royal Navy. These vessels spread our influence around the world and established a great empire.

The fascination of that sub sub-sonic age of not so long ago increases as it recedes and becomes ever stranger to our present way of life.

But the sailing ship is not yet dead. Many people believe it to be the *only* kind of craft in which a seaman can properly learn his trade, and sail training ships are therefore still to be seen along the shipping routes of the world.

In the great days of sail, the Brig was often used for training and this month, on page 23, we are featuring a fine drawing of a typical vessel of this type. It's the first of a series that all sea-dogs, old and not-so-old, will want to collect. Ian Stair's story of the brig makes most interesting reading, and modellers will find there sufficient information and inspiration to get a brig onto their stocks right away.

Binding. Meccano Magazine readers like to preserve their copies for future reference, and to this end, many of you buy our smart orange and black clip-in binders to store your issues as they arrive, then, at the end of the year have them permanently bound in a uniform style. We know of many long-time readers who have such unbroken sets dating back to the twenties!

If you would like to take advantage of this permanent binding service, pack your year's issues carefully and send them, together with correct remittance to: T. L. Duncan Ltd. (Bookbinders), 20 Cumberland Street, Liverpool, 1. The charge for binding the 1964/65 volume is 18s. 6d. 1961, 1962 and 1963 volumes cost 17s 6d to bind, and 1960 is 14s 6d.

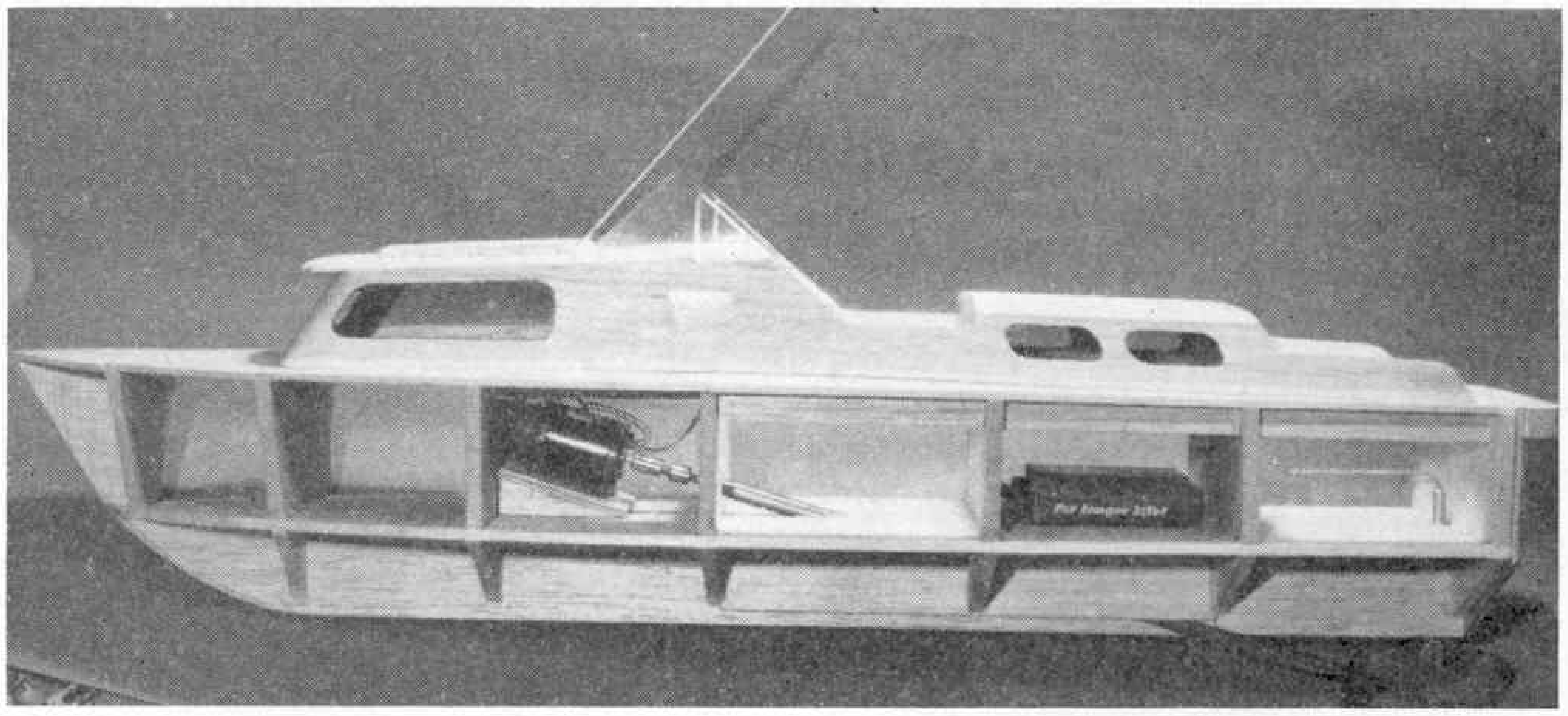
The Editor

Next Month: A special CYCLING NUMBER and the last part of Project 66, which will show you how to fit out your boat with radio control.

PROJECT '66

PHASE – 3

BY
RON WARRING



7 SUPERSTRUCTURES

Huntress
Ranger Tropical
Surfrider
Thunderbird
Christina
Coronet
Dell Quay Ranger

In the January issue of Meccano Magazine we gave you a free full size plan to make the hull of Brave Moppie. Last month we showed you how to instal diesel or electric motors. This month there's another free full-size plan with details of seven superstructures that can be added to your hull to represent other famous power boats. Next month we will show you how to fit any of these models with radio control!
If you missed either of the earlier issues, they can still be obtained from our back-numbers department price 2/- each including postage.

THE full size plan this month shows the parts required to make SEVEN more models based on the same (Brave Moppie) hull—all well known high speed craft. These, together with 'Brave Moppie', make up a complete fleet of off-shore racers. You can build them all—or, perhaps better still, get together with some other chaps and each of you build a different racer for trying out against each other on the local pond.

Remember, the hull and fitting out details are exactly the same as described in Parts 1 and 2 for all the models. It is merely a case of 'converting' this hull by the addition of a cabin and related details, the cabin shape being different, and differently placed, in the seven models shown on this month's plan. Having done this it may then be necessary to remove some of the original after decking so as to produce an open cockpit. Details like this are given in the individual descriptions of the various models.

The method of building up the further models is the same in each case. Two cabin sides are required, traced or copied off the full size outlines given. These are then joined by formers and the cabin unit then cemented in place on the hull, the after part of the sides coming over the deck beam position so as to leave the aft *side* decking intact. The exact position for fitting the sides can be determined from the full size plan.

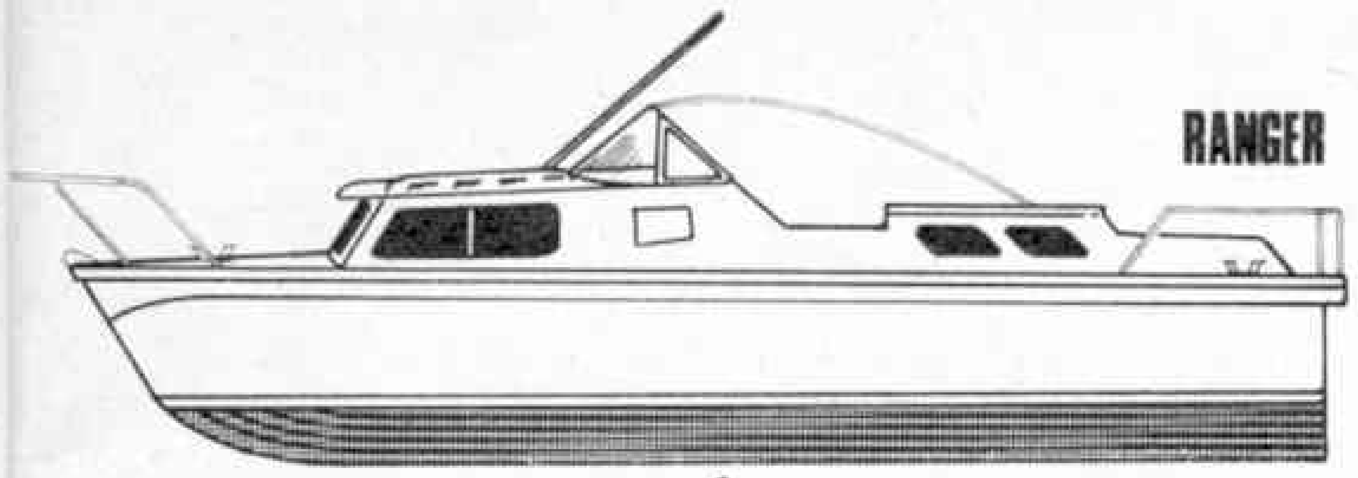
Motor installation (diesel or electric motor) should be completed as described in Part 2 *before* fitting the cabin in place and the original forward deck hatch can be left off as this area is covered by the cabin. In the case of an electric powered model the cabin roof can be cemented in place permanently. With a diesel powered model the cabin roof must be made detachable, in order to get at the engine for starting.

Glazing of all cabin windows is done with clear plastic sheet, which for best appearance should be cut to the shape of the window, but slightly oversize, and cemented on the outside. Alternatively, cabin windows can be painted on in black (or cut out from black paper cemented in position). This is necessary in the case of the 'Coronet' cabin windows in any case because of the large window area. To cut out windows of this size would weaken the cabin sides unduly.

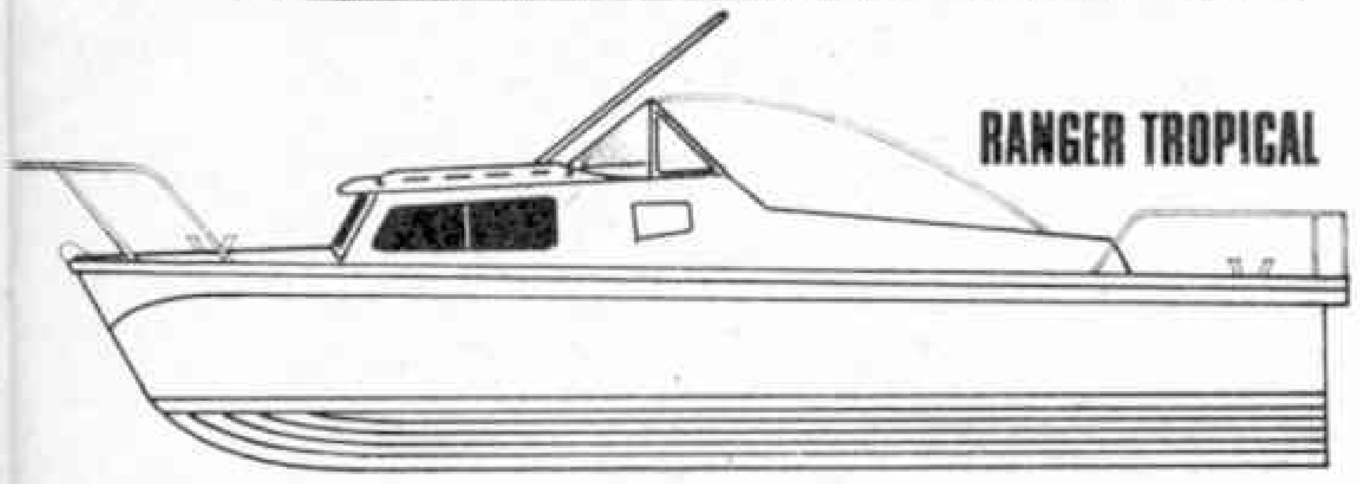
Many of the models employ a wrap-around windshield, which should be cut to shape by trial and error from thicker plastic sheet. The metal frame outline and vertical struts can be indicated by painting on in silver.

Further details such as the pulpit, side rails (where appropriate) and deck fittings such as cleats and fairleads, can be added to the model after painting in the form of plastic fittings. These will add considerably to the realism of the model and the cost of such fittings is usually only a few pence each. You can use your own ideas as to what fittings to add and where to position them. For guidance on this subject, study photographs of the full size craft. There is really no standard layout for deck fittings, etc., and individual owners have their own ideas on this subject.

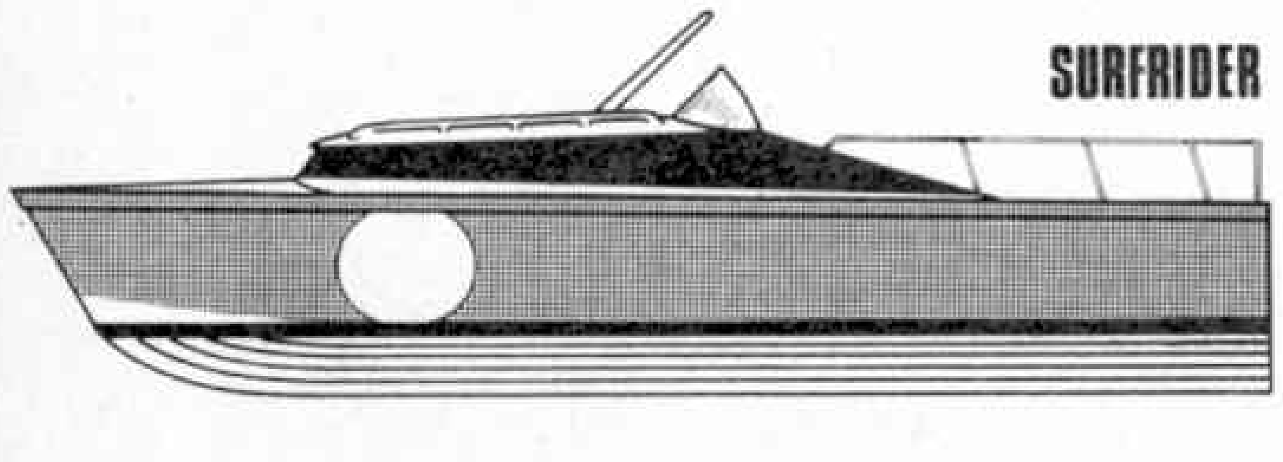
Note: The full size patterns for the sides and formers, etc., are to approximate size (slightly oversize) to allow for chamfering to fit snugly and accurately on the deck. It is impossible to give exact sizes as individual hulls may vary



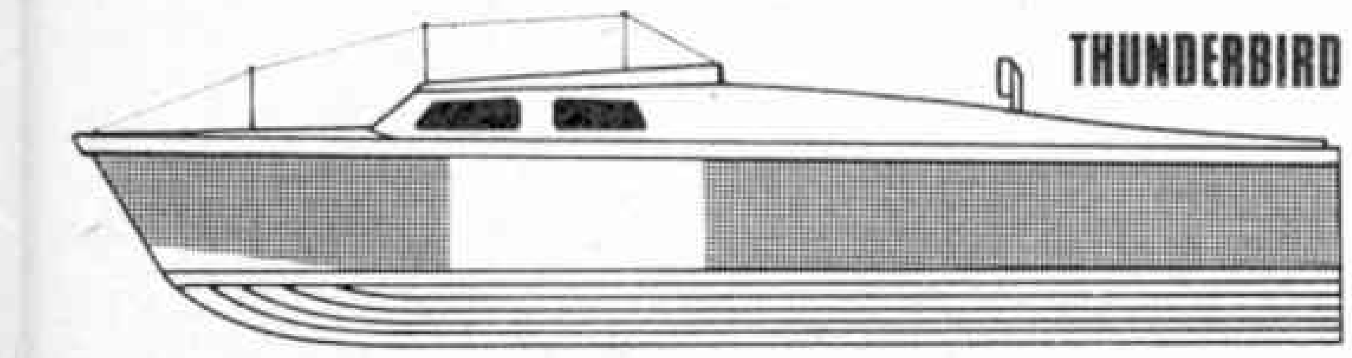
RANGER



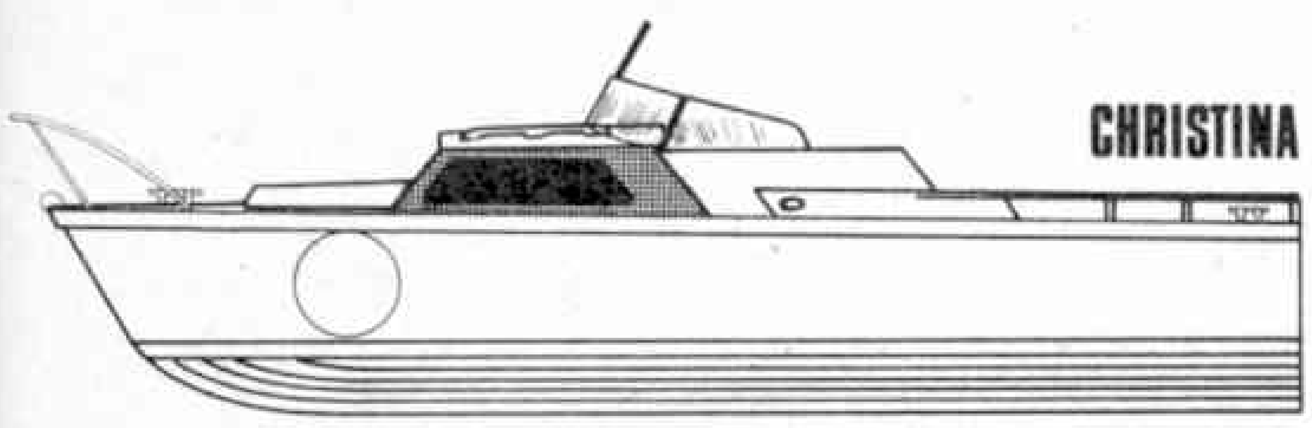
RANGER TROPICAL



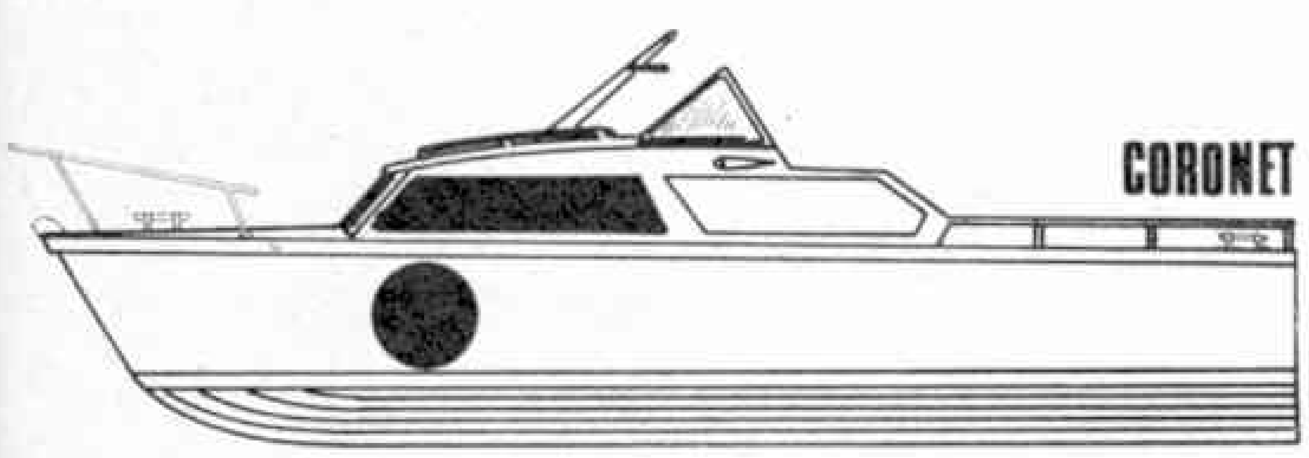
SURFRIDER



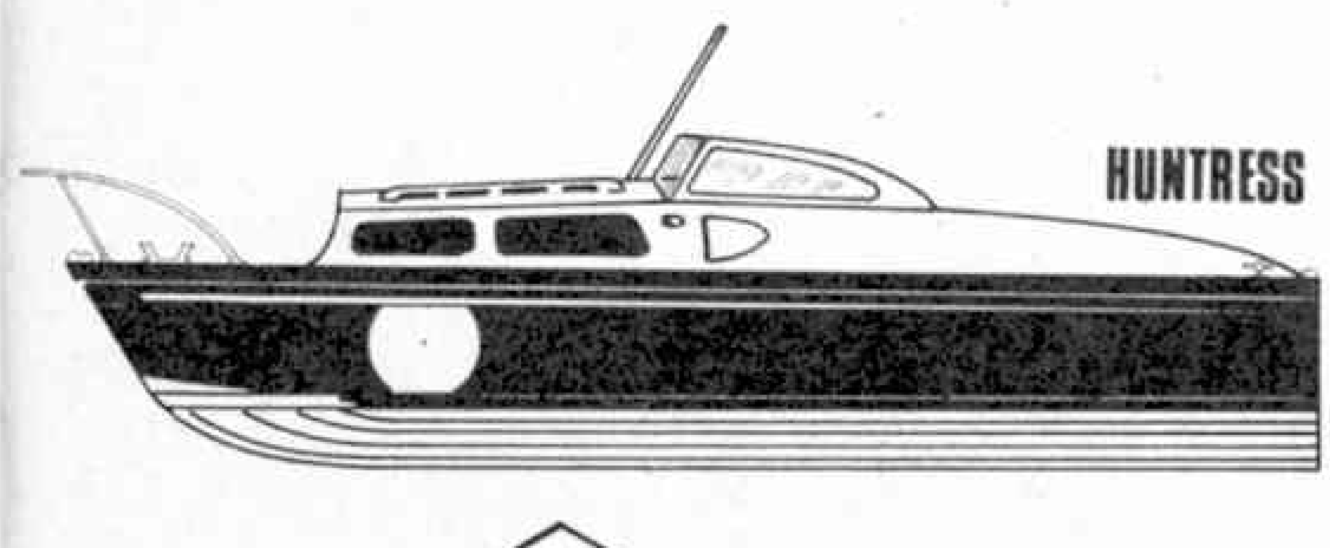
THUNDERBIRD



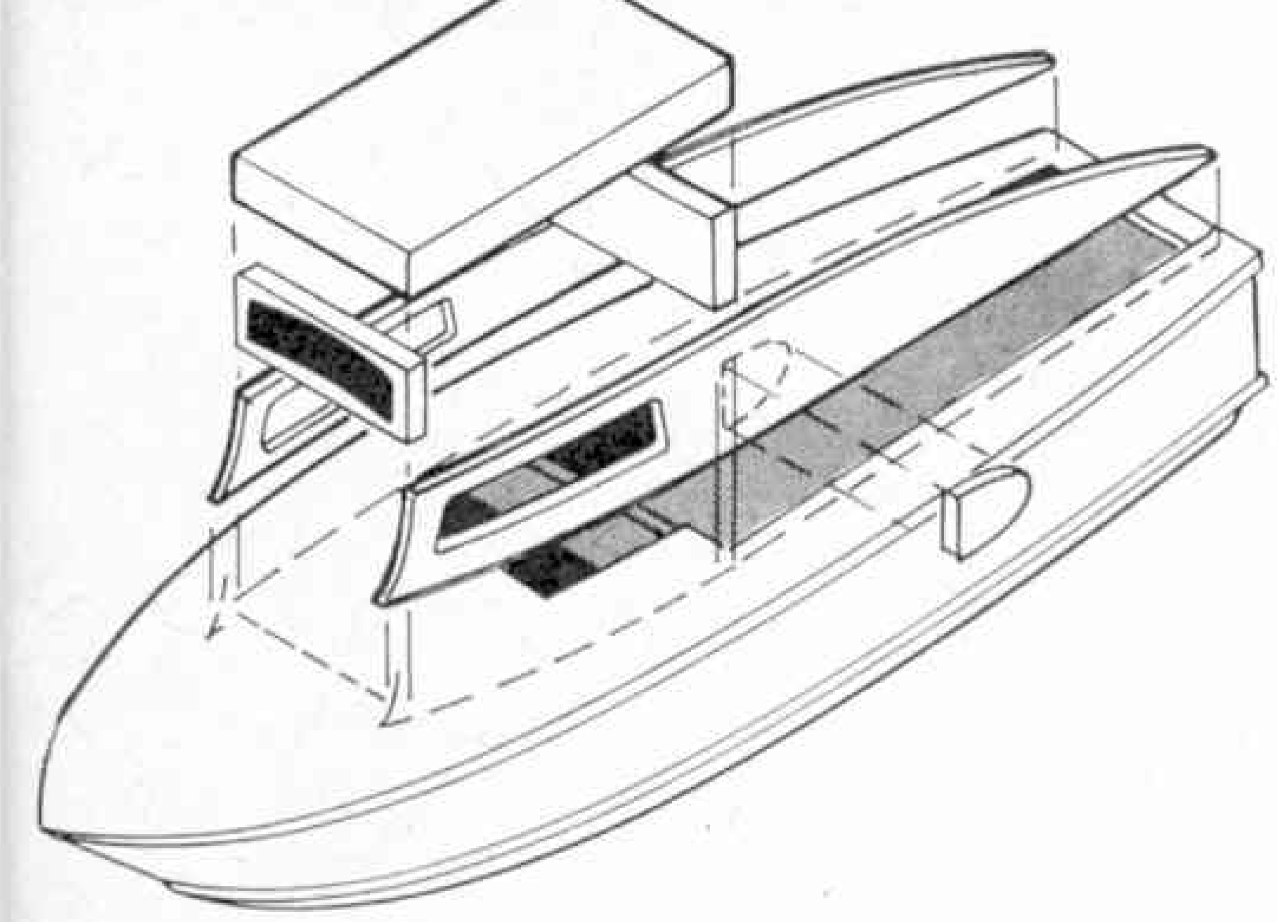
CHRISTINA



CORONET



HUNTRESS



The simple construction of the 'Huntress' superstructure is fairly representative

slightly in deck curvature. In all cases, therefore, a certain amount of trimming up is required on the parts to ensure accurate final assembly. This is quite a straightforward job and should present no difficulties.

In all cases the sides are cut from $\frac{1}{4}$ in. soft sheet balsa, except where noted (e.g. 'Christina' sides 2 and sides 3) and for 'Huntress' (sides from $\frac{1}{8}$ in. sheet).

Dell Quay Ranger

Full size patterns are given on the plan for cutting the following parts needed to complete this model.

2 'Ranger' cabin side pieces cut from $\frac{1}{4}$ in. sheet balsa.
1 Cabin roof from $\frac{1}{4}$ in. sheet balsa* (note pattern is half plan of the shape required).
1 Aft cabin roof $\frac{3}{16}$ in. sheet balsa* (half plan shown).
1 Off each bulkheads R1, R2, R3 and R4, from $\frac{1}{4}$ in. balsa sheet.
1 Deck extension cut from $\frac{1}{8}$ in. sheet.
2 Grab rails cut from $\frac{1}{8}$ in. sheet.
2 Air scoops from $\frac{3}{16}$ in. balsa; $5\frac{1}{2}$ in. length $\frac{1}{16}$ in. dia. dowel; fairly thick celluloid or acetate sheet for the windshield.

* Cut two pieces each from 3 in. wide sheet and cement together.

The cabin sides need to be slightly chamfered along the bottom edge to conform to the curvature of the deck and stand vertically. Assemble by cementing formers R1, R2, R3 and R4 between the sides. Note that R1 needs to be chamfered top and bottom and is cemented only just inside the front edges of the two sides. This joint is then backed up with scrap lengths of $\frac{1}{4}$ in. sq. balsa and the front of R1 sanded to a curved shape. The whole assembly is then cemented permanently on to the deck in the position shown on the plan.

Trim the tops of the formers flush with the sides, as necessary, and fit the two roof panels in place. In the case of a diesel powered model, do not cement the front cabin deck in place but cement a frame to the underside to make it a plug fit between R1 and R2. In the case of an electric powered model, the aft cabin roof should be made detachable to get at the battery compartment.

Round off the two cabin roofs, shaping the ends as necessary, and sand to finish flush with the cabin sides.

Cement the deck extension piece on to the transom in line with the top of the deck.

Windows should be 'glazed' by cutting out pieces of clear plastic sheet to the same shape as the window cut-outs but slightly oversize and then cementing in place on the outside. In the case of a diesel model, do not glaze the side windows of the forward cabin.

The superstructure is finished by cementing the two grab rails in place to the cabin top, shaping the scoops from $\frac{3}{16}$ in. balsa and cementing in place and also adding the wrap-around windshield cut from thicker clear plastic sheet. The pennant mast is a length of $\frac{1}{16}$ in. dowel pushed into the cabin roof and held with a touch of cement.

Other details such as the pulpit and rails, anchor, cleats, etc., can be added in the form of plastic fittings obtained from any model shop.

Suggested colour schemes:

Hull—white, dark blue or light green; with red, green or blue bottom.

Decks—white, natural wood or stained with a light coloured wood dye.

Superstructure—all white.

Ranger Tropical

This is very similar to the 'Ranger' except that the shape of the sides is different from behind the windscreen and there is no aft cabin. The sides must be cut to the dotted line aft and R3, R4 and the aft cabin roof are not required.

The model is fitted up in a similar manner as before. When completed the after decking is cut away right up to the sides from R3 to a distance of 1 in. in front of Bulkhead 6 position in the hull. Bulkhead 5 should then be cut away down to floor level to provide an unobstructed cockpit area.

Suggested colour schemes: as for 'Ranger'.

Surfrider

This is the 1964 Power Boat Race winner featuring a low cabin shape and no windows. Parts required to complete this model are:

2 Sides cut from $\frac{1}{4}$ in. balsa sheet to the shape shown.
1 Each S1, S2, and S3, from $\frac{1}{4}$ in. sheet.
1 $1\frac{1}{2}$ in. sq. panel of $\frac{3}{16}$ in. sheet (hatch).
Pennant mast cut from $\frac{1}{16}$ in. ply.

S1 has to be chamfered to line up with the front of the sides, and the bottom edges of the sides must be slightly chamfered so that they conform to the curvature of the deck. Join the sides by cementing S1 and S2 in place. S3 is cemented into the hull itself through the cockpit reaching right down to the chine shelf. When this is fitted, cement the side assembly permanently in place.

The cabin roof is shaped from an $8\frac{1}{2}$ in. by $5\frac{1}{2}$ in. panel of $\frac{1}{4}$ in. sheet balsa, rounded off as shown and trimmed down flush with the edges of the sides. The hatch is sanded to a concave shape on the underside to fit snugly on to the deck and cemented in place. Add the pennant mast, and the simple windscreen cut from thin clear plastic sheet.

The whole of the decking from bulkhead 5 right aft to the transom (bulkhead 7) is now cut away between the sides, i.e. in line with the deck beams. Bulkheads 5 and 6 are also cut away vertically right down to the chine shelf to produce a completely open cockpit. Colour scheme: blue or green hull with white bottom. Decks and cabin sides and top white, with colour band in same colour as hull topsides or darker colour. Authentic racing number '66'.

Thunderbird

This was the second place boat in the 1965 Power Boat Race, close behind 'Brave Moppie'. Construction is very similar to that of 'Surfrider' except that the cabin sides are longer and extend well aft to protect the occupants from spray. Join sides first with T1 and T2 (after chamfering T1 and the bottom edges of the sides) and then cement to the hull and line up with the position of the deck beams.

The cabin top is shaped from a $5\frac{1}{2}$ in. by $5\frac{1}{2}$ in. piece of $\frac{3}{8}$ in. sheet balsa (join two 3 in. wide pieces) and either cemented in place or made a plug fit.

Cut away the after decking back to the point shown on the full size plan and cement in a reinforcing piece of $\frac{1}{2}$ in. by $\frac{1}{4}$ in. strip running between the two deck beams. The backrest is made from $\frac{1}{2}$ in. by $\frac{1}{4}$ in. strip with four lengths of $\frac{3}{16}$ in. strip cemented in place. When set, cement in place to the reinforcing strip previously fitted. Colour scheme: hull topsides—yellow, hull bottom, deck and cabin sides and top—white. Authentic racing number '283' in black on white panel on each side, and in black across the cabin roof.

Christina

A 'Christina' won the first Cowes-Torquay Power Boat Race and remains one of the 'classic' craft of its type, noted also for its attractive styling.

Parts required to complete this model are:

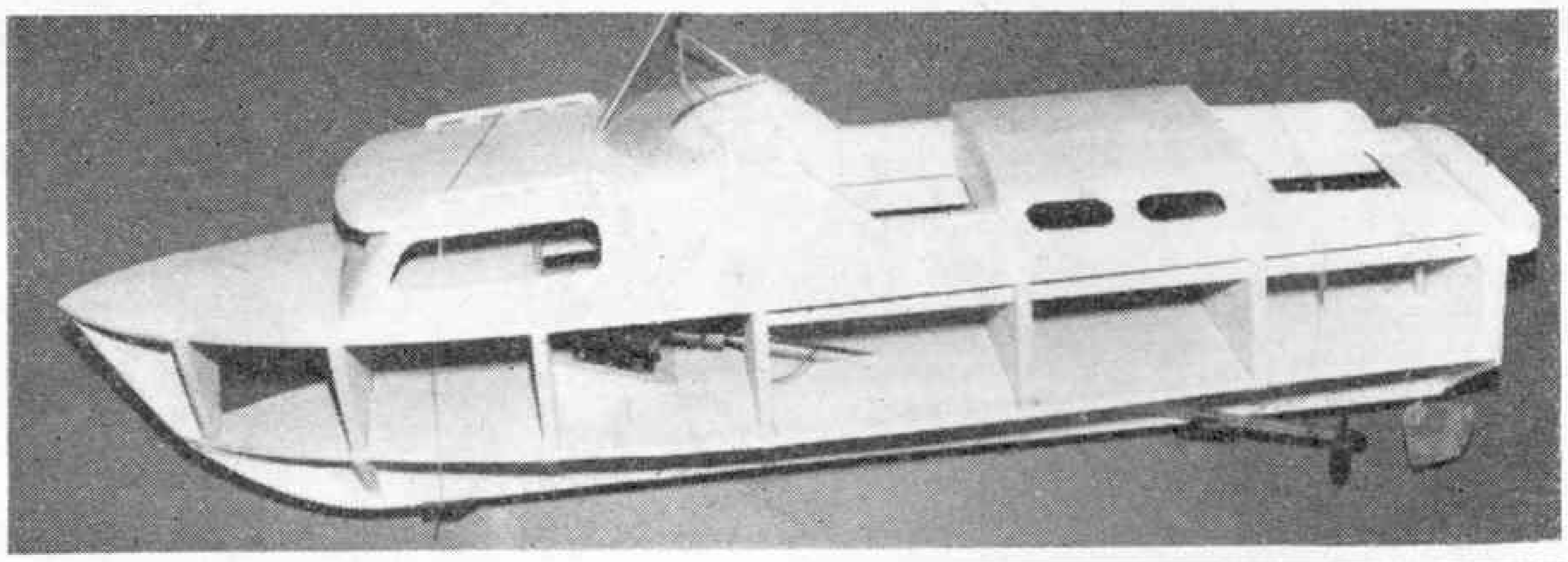
2 Side 1's from $\frac{1}{4}$ in. balsa.
2 Side 2's from $\frac{1}{8}$ in. balsa.
2 Side 3's from $\frac{1}{8}$ in. balsa.
Formers C1 and C2 from $\frac{1}{4}$ in. sheet.
6 in. by 4 in. by $\frac{1}{2}$ in. balsa block (for front cabin).
Two 11 in. lengths of $\frac{1}{8}$ in. by $\frac{1}{16}$ in. spruce or obeche for handrails.
About 4 in. of $\frac{1}{8}$ in. or $\frac{3}{32}$ in. dowel; celluloid for windshield.

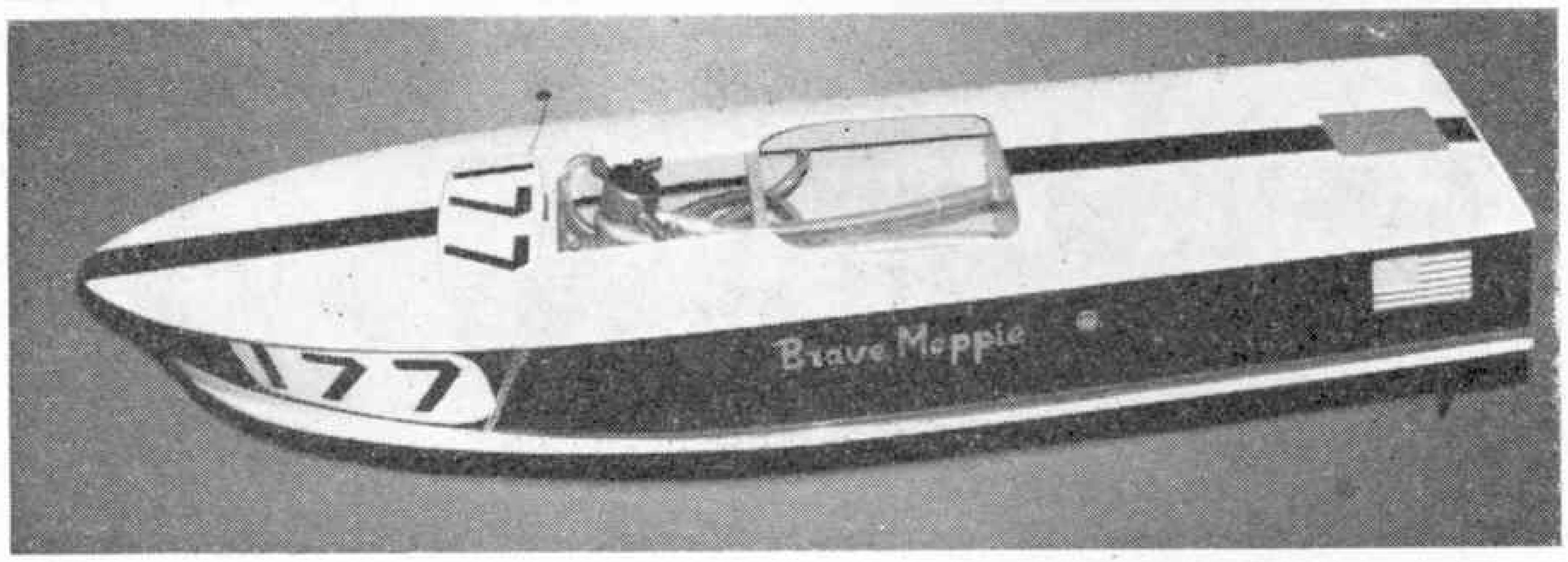
Start by fitting former C2 in the position shown on the full size plan. Note that this former extends right down to the chine shelf and fits between the deck beams. Fill in between the sides of this former and the sides of the hull below the deck line with scrap sheet.

Now fit the cabin sides and C1, chamfering C1 to angle back correctly, and also chamfering the bottom edges of the sides to conform to the curvature of the deck. Carve and fit the front cabin block, shaping the top curve to match the curve of the front window.

Cement the two Side 2 pieces in place; and the two Side 3 pieces outside them, as shown. Complete by adding the handrail supported on short lengths of dowel. For greater security of fixing the deck can be pierced to insert the dowels which are then levelled off and the handrail cemented on top.

The cabin top is covered with $\frac{1}{16}$ in. sheet balsa. In the case of a diesel powered model the top will have to be cemented to a built-up framework so that it is a plug fit and can be removed for





As thousands of readers saw them at the Schoolboys and Girls Exhibition. The Editor's completed, diesel powered Brave Moppie, and above, the 'un-skinned' hull, with Dell Quay Ranger superstructure temporarily fitted in position, as described in this feature

access to the motor for starting. With an electric powered model simply cement the $\frac{1}{16}$ in. sheet cabin top in place.

The whole of the aft decking between bulkheads 5 and 7 should now be removed, out to the position of the deck beams. Bulkheads 5 and 6 are then cut down vertically in line with the deck beams and the centre parts removed to leave a completely unobstructed cockpit.

Colour schemes: hull usually white with red, green or blue bottom.

Decks: natural wood or stained with a light coloured wood dye, or painted white.

Cabin: Sides 3 and front cabin part, white. Sides 1, mahogany. Sides 2, very pale blue or green. Cabin top, same as Sides 2, or white.

Wrap-around windscreen: blue or green tinted celluloid.

Coronet

This model has a fairly deep cabin with large windows. The windows should be painted on rather than cut out, otherwise construction is similar to the other models, except for the cabin roof. Since the cabin shape is 'square', the roof can be planked with $\frac{1}{8}$ in. sheet balsa with the grain running from side to side. The edges are then rounded off with sandpaper.

The second former (G2) is shown fitted between the deck beams roughly 1 in. behind bulkhead 4. If preferred, this can be extended down to the chine shelf and filling the complete space between the hull sides to blank off the cabin completely.

The windscreen is built up as a complete framework of $\frac{1}{16}$ in. sq. balsa which is then covered with panels cut from clear plastic sheet after cementing to the cabin top. Note that the cabin roof finishes just behind G2.

The two rails extending back to the transom are of $\frac{1}{8}$ in. by $\frac{1}{16}$ in. hardwood strip (spruce or obeche mounted on $\frac{1}{8}$ in. sq. uprights (balsa or obeche). This rail does not extend across the transom.

Cut away bulkheads 5 and 6 level with the deck beams to give an open cockpit from G2 aft.

Colour schemes: hull—white with red, blue or green bottom (or all white).

Deck, cabin sides and top—white.

Racing number in white on black circle.

Huntress

Designed and built by Fairey Marine, the 'Huntress' is a well known offshore power boat racer together with its larger counterpart, the 'Huntsman'.

The cabin sides in this case extend backwards almost to the transom, but the whole of the cockpit is open from F3 (fitted over bulkhead 4) to the transom. The sides are cut from $\frac{1}{8}$ in. sheet.

The cabin roof for this model is cut from $\frac{3}{8}$ in. sheet carved and sanded to a well rounded shape. The front window is painted in F1. Note that F1 is vertical and does not slope backwards .

The windscreen sides are cut from $\frac{1}{16}$ in. ply and cemented directly on to the main side pieces in the position shown. The windshield assembly is then completed by covering both sides with celluloid (or thin plastic sheet) and adding a curved windscreen front. The complete screen (sides and front) can be cut from a single piece of celluloid on a trial and error basis, if preferred.

Typical colour scheme: hull topsides —dark blue; bottom—red or white.

Cabin sides and top—white.

Racing number in black on white circle.

THE BIG BLAST

Atomic bombs can be creative as well as destructive. MICHAEL HOLT tells how the U.S. Atomic Energy Commission wants to use them to dig a new Panama Canal! He also reveals some other peaceful bomb projects that may surprise you

BY 1980 the Panama Canal will be choked with ships. This prediction is so probable that President Johnson has appointed a committee to study four possible routes for an alternative canal to be cut through the Central American isthmus. The likeliest looking one runs from Sasardi to Morti and lies about a hundred miles to the east of the Panama Canal, still in Panama. Whichever route the committee plump for, the cheapest method for digging the canal is going to be by H-bomb explosions. This is the latest way of shifting earth and the techniques for carrying it out are the concern of an organisation set up by the U.S. Atomic Energy Commission called *Project Plowshare.*

The name 'plowshare' (American spelling) comes from *Isaiah* in the Bible and refers to the project's aim of beating atomic swords into peaceful ploughshares.

Why is the United States interested in building another canal? The reason is that the present canal is run by a U.S. Government owned organisation, the Panama Canal Company. This company collects an average of $55 million a year in tolls of which it pays the U.S. a sizeable proportion. Shipping traffic through the present canal has been doubling every 25 years. Ships pay by size and amount of cargo space, an average yearly toll for one ship being about $5,000. But charges can be staggering. The U.S. supertanker, *Orion Hunter,* paid the biggest toll in the canal's history of over $30,000. The canal is not large enough to take the largest ships and cargo boats. Hundreds of ships have to reduce their loads to get through. As President Johnson said, the new canal 'will be free of complex, costly, vulnerable locks and seaways' unlike the existing canal, that will be replaced by a 59-mile canal 60 feet deep and 1,000 feet wide all along joining the Atlantic and Pacific oceans directly by a sea level channel for the first time in history. This gash will be gouged out of the rocky land, 1,000 feet high in places in 14 sections by a string of 250 bombs. The biggest would be 7 megatons equal in strength to 7 million tons of TNT.

This term *megaton* needs explaining. It rates the explosive strength of a bomb by the equivalent number of tons of TNT to produce the same sized explosion. A megaton means 1 million tons.

Besides the hazard of radioactive fallout, there is the political danger because of the perennial unrest in the area. Should the Sasardi-Morti route be chosen, however, it won't affect the Panamanians unduly for the route will still pass through Panama so that they will not lose revenues by the change. If it were not for these hazards the project could begin at once. It will likely take four years to survey the area, build roads, set up bases and establish communications. Then drilling can start. Derricks every half-mile will mark the explosion sites. Beneath each, a third of a mile down, will hang an oil-drum sized hydrogen bomb. Before blasting begins the last trucks will have departed

Here's the crater left by the detonation of a 100 kiloton device in the Nevada desert on July 6th, 1962. This was 'Project Sedan', and the crater measured 1,200 feet in diameter, 320 feet deep. 7·5 million cubic yards of earth were removed by the explosion

with riggers, scientists, and officials. Only the birds will break the silence with their incessant cries. In far cities citizens will wait for the signal to show that the first section of the new canal has been blasted out. The total blasting operation is expected to last about two years.

When the canal is built, what then? There will be a steady fine rain of longer-lived radioactive debris falling over vast areas of the world. When the oceans are joined for the first time tides will raise their own special problems. Pacific tides are some size feet higher than those of the Atlantic. Tidal bars and hydraulic gates will be needed to control the seven mile an hour current that will follow if corrosion and landslides in the canal banks are to be prevented.

But how did scientists discover the way to use H-bombs for excavating?

The very first hydrogen bomb explosion in 1952 showed its staggering potentialities for earth shifting. A whole island on the Pacific atoll Eniwetok was blown clean out of the sea. The bomb was 500 times stronger than the one dropped on Hiroshima. A large box affair, it weighed 50 tons and had the explosive force of 10 million tons of TNT—10 megatons. By 1962 the Plowshare scientists had fined down the device to a canister the length of a telegraph pole and a yard across.

That summer in the parched, remote Nevada desert, they carried out the now historic *Sedan* test. They drilled a hole 635 feet deep, sunk the bomb in it and covered it with sand. The bomb went off with the explosive power of five 'Hiroshima' sized bombs. An underground bubble of gas formed, unimaginably hot and bursting like an explosive blister, left a crater ¼ mile across and 320 feet deep. A study of it helped in interpreting the photographs taken by *Ranger VII* of craters on the moon because of their obvious similarities.

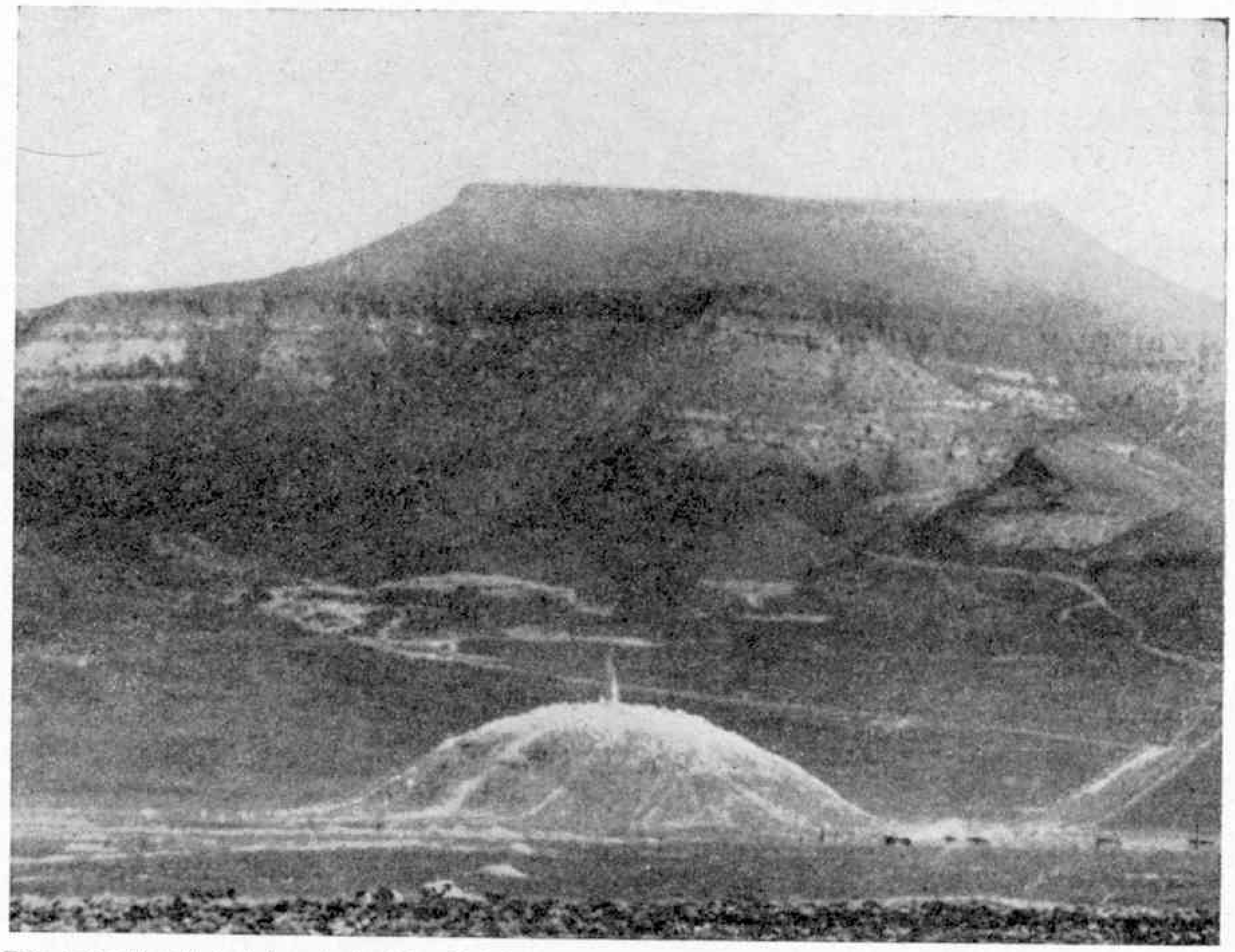
The 'clean' bomb

A typical moon crater has a rim standing 100 feet or so above the surrounding plain with a steep descent inside to the crater floor. This is very similar in shape to the *Sedan* crater. According to one theory, the moon's craters were formed by the impact of meteorites, the rocky boulders that hurtle continuously through space. When a meteorite crashes into the moon it creates tremendously high temperatures which match the temperature of the *Sedan* gas bubble.

The *Sedan* test showed nuclear excavation is dirt cheap. It can break up and remove rocks and earth all in one go. The bomb cost £160,000 and excavation with it cost about 6d. a cubic yard of earth shifted, roughly a hundred times cheaper than TNT and other chemical explosives. But what were the snags? The test also produced dangerous fall-out; 10 times the normal background radiation that rains on us all the time was detected 50 miles away. Today this distance has been just about halved.

The 'clean' bomb of tomorrow will probably reduce this figure to a mere mile or two. It was not safe for a man to enter the *Sedan* crater until four months after the explosion. Today that figure would only be a matter of weeks.

Bombs work out cheaper the bigger they are but, to avoid excessive radiation, they must be buried deeper which increases drilling costs. Bigger bombs also produce tornado-like air blasts (a 1 megaton bomb can break windows 100 miles away) and earthquake-like shock waves. Scientists now know how to control these hazards.



This is the 'bubble' of desert alluvial soil rising as the 'Sedan' device explodes. The 'bubble' rose to a height of 290 feet three seconds after the explosion. The small structures at the right are about 10 feet high

One unexpected result has come out of this test and others using chemical explosives to simulate nuclear explosions. When the explosives are properly spaced in a row and fired together the sum of the separate excavations is greater than all the individual explosions. The earth is mostly thrown out in ridges along the furrow and almost none at the ends of the furrow.

But the scientists' greatest problem is still to clean the bomb. To see why, we must see how one is constructed. An H-bomb has an outer layer of litium deuteride (deuterium is a close relative or isotope, of hydrogen) packed round a fistful of uranium-235. The uranium releases neutrons by fission and triggers the fusion process in the outer packing. A pound only of this packing, fully fused, will create a 'clean' explosion, equal to 25,000 tons of TNT. The fly in the ointment is the uranium trigger in the centre of the bomb. Not only does it create a 'dirty' biological hazard, it is expensive, costing nearly £2,000 a pound. The match to light the fire is, so to speak, far more expensive than the fire itself.

The unknown

The *Sedan* bomb was 30 per cent 'dirty' due to its fission products, but today bombs that are 99·9 per cent 'clean' are possible.

However, scientists still don't know what are the long term effects of the unfused (unexploded) critium because its subtle dangers are tricks to predict.

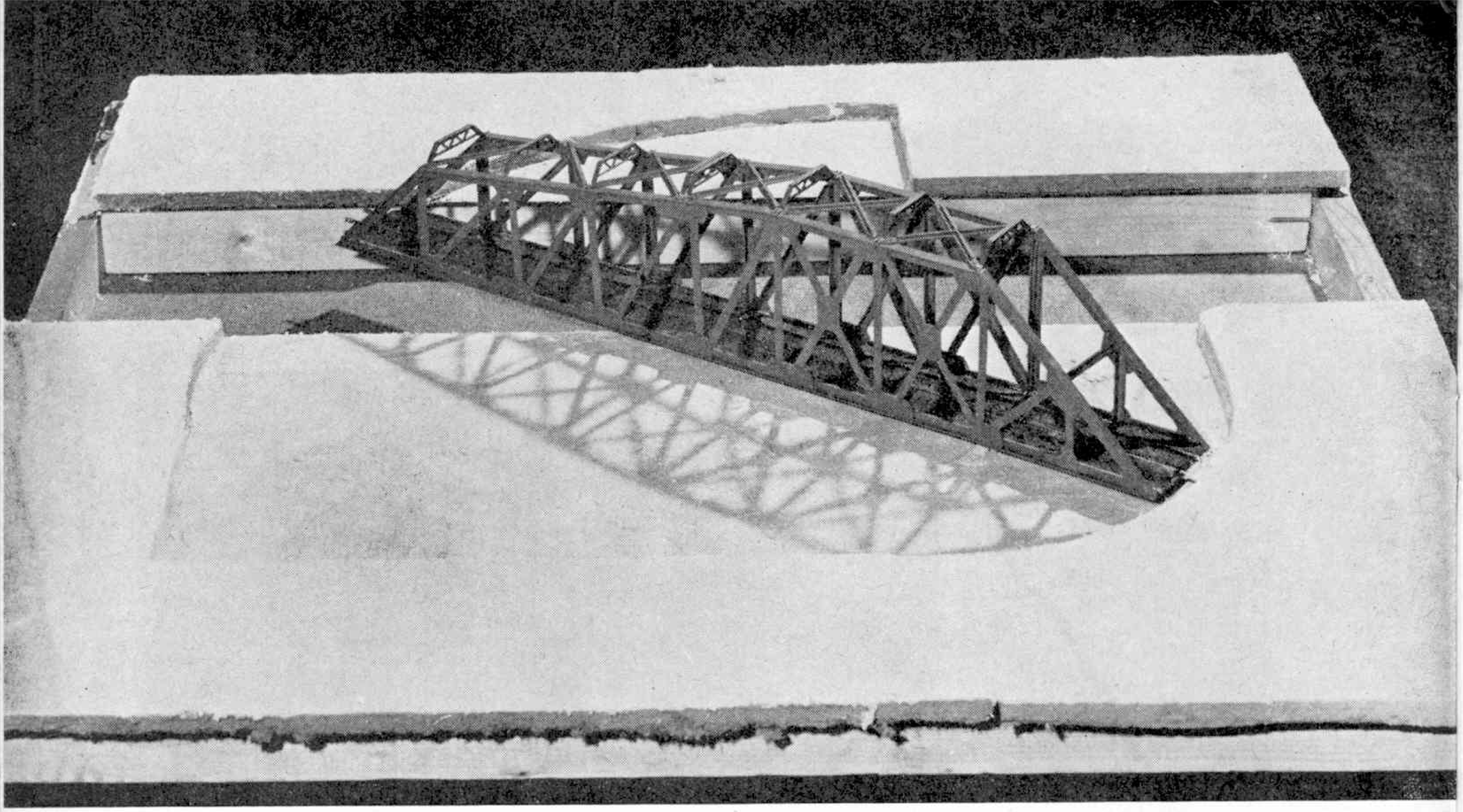
To sum up, nuclear-powered earth-moving devices can extend the range of existing machines to build mountain passes for roads and trains; to redirect rivers for irrigation or for industrial use; to blow enormous underground caverns for storing liquid or gaseous fuels; to excavate dams and deepen them to eliminate silting up. A handful of nuclear tests in different sorts of ground, from granite rock to desert sand, should provide the necessary engineering know-how to create a smooth furrow of even depth—the first requirement in most kinds of excavations.

What of the future

Project Plowshare only recently announced a scheme that rejoices in the comic name of 'Gasbuggy' to use H-bombs to blow out underground caverns as reservoirs for natural gas. H-bombs would be the ideal device for diverting the waters of Lake Chad in Africa to flood the southern desert region of the Sahara. This is no pipe dream—it has seriously been proposed. Another apparently far fetched idea is to use H-bombs to blast a Suez 'by-pass' through the Israel desert from the Mediterranean to the Persian Gulf; this was proposed by an American scientist at the time of the Suez crisis in 1957.

But perhaps *Project Plowshare's* most ambitious scheme in a power-hungry world is its plan to form an artificial lake in North Africa to create hydro-electric power.

Not 40 miles from the Mediterranean Sea lies the northernmost tip of a giant depression nearly the size of Wales, the Great Quattara Depression, as it is called, which is some 440 feet below sea level with only a narrow range of hills hundreds of feet high cutting it off from the sea. If a canal were gashed through the range, the depression would fill up with sea water. This would evaporate at a colossal rate—nine million million million gallons a year—and create a steady flow of water, which could then be harnessed to provide electricity for the whole of the United Arab Republic.



SWING IT PART 2

Making a realistic setting for our swing bridge is described here by MIKE RICKETT. The mechanism is shown on page 36.

THE Bascule swing bridge described in last month's magazine is only part —admittedly an important one — of the complete scene that can be built round it, and which can, when finished, be added as a complete unit to a model railway.

There are many advantages in building the scenic section or bridge base, as a complete unit, and one of the greatest is undoubtedly the ease with which the scenery and the base itself can be built. It will also allow the bridge mechanism, situated below the base, to be properly adjusted. There is, of course, nothing to stop those of you that wish, from building the base *in situ* on the layout, but if, like me, you find it difficult to lean over baseboards wider than about 18 inches, you will realise the difficulty added to construction. The bridge base is, in any event, considerably wider than 18 inches, and would therefore make the task of building the surrounding scenery and making final adjustments, even more difficult.

You will need, to build the base, six pieces of 2 in. by 1 in. timber, 2 ft. 6 in. long, and also material 2 ft. 6 in. square for the surface. Later, off cuts of ½ in. fibre board will be needed for the second and final surface of the base, and a total area of about 18 in. by 9 in. would be quite adequate. Four of the 2 in. by 1 in. pieces will need to be shortened by 2 in., and the remaining two, which are used for the side of the base, left their original length. The shorter pieces will be used for the end and middle supports, which also incidentally form the sides of the canal. The top of the base—that is the river bed, and also the canal banks—can be made from either plywood or hardboard about $\frac{1}{16}$ in. thick. I have used the latter because of its lower price and also because the surface will be covered over at a later stage. It is, however, unfortunately necessary to nail into the surface material, and this is the only serious disadvantage in using hardboard.

Once the material for the base surface has been decided upon, three pieces can be cut, all 2 ft. 6 in. long, and 16 in., 7 in. and 7 in. wide. These should be nailed to the edges of the four shorter pieces, as shown in one of our photographs, leaving the two longer pieces for the ends. Before these can be nailed on, you must decide what depth to have your canal. Remember that an additional piece of softboard will eventually be laid on to the hardboard, and do not therefore make the canal too shallow. I have built the surface of the canal at a height of 1 in. from the bed, and this I think gives the right affect. This measurement can, however, be varied, and generally, the deeper the canal, the stronger the ends of the base will be.

A slot must be cut in each end piece if a 'dam' appearance is to be avoided, and it will be necessary to draw a line the depth of the canal—in my case 1 in. —along each piece. The width is also marked on in the right position, and a saw cut made down to the correct depth. It is advisable, when doing this, to hold the end member in the right position against the base, and to mark the width on *in situ*.

A chisel can be used to cut away the wood above the line between the two saw cuts, or an alternative is to use a coping saw if your chisel work is not all it should be. Once these two slots have been made, the two end pieces can be nailed, or preferably screwed, into position.

The base is now complete, and it should be quite a rigid structure. If any pieces show a tendency to come apart, it is wise to screw them together and not to depend on the nails you will already have used. Where the structure is to be added to an existing layout as a complete unit, firm joints are not quite as important (although they are still desirable), since the layout substructure itself will tend to keep the base together. One point that I cannot stress enough, however, is that the base be made as flat as possible. Time spent at this stage will save many hours of frustration later on. The reason for this is that the bridge will tend to lift or sink at both ends where the base has any tendency to undulate, and this can make final adjustment of the track very difficult. If possible, use a spirit level to ensure that the base is flat in all direction before proceeding any further.

A hole should now be drilled for the bridge pivot, and although its exact position is not terribly important, do ensure that there is at least one inch of "ground" round the bridge ends, both when it is open and closed. Also, be careful to avoid the timber support on the side of the canal that you decide to pivot the bridge, and drill the hole at least two inches behind this piece of timber.

Once the hole has been drilled, the radius of both ends of the bridge can be marked on to the hardboard surface with a felt tipped pen, by simply holding against the edge of the bridge and turning through 90 degrees. The resultant lines indicate the space the bridge will need to turn, and they can be used to complete the shape of the two wells—one each side of the canal—that will eventually be formed.

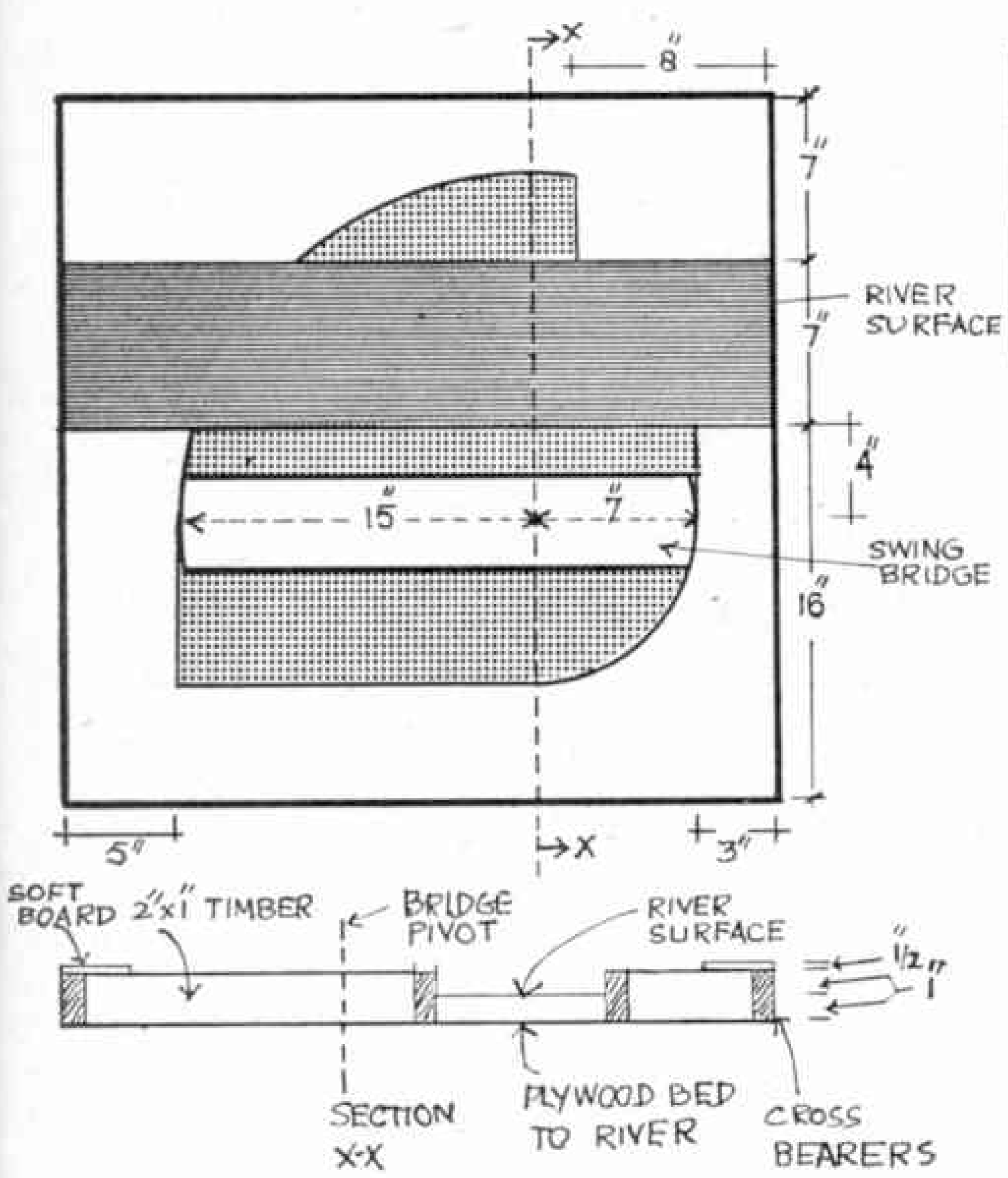
The Meccano mechanism that has been specially designed for this bridge, and which is described elsewhere in this issue, can now be screwed on to the underside of the base, leaving approximately $\frac{5}{16}$ in. of rod protruding above the board. The bridge itself can now be loosely mounted on this rod, allowing it to swing round through 90 degrees. Check that the radius lines marked on the base coincide with the actual curve made by the bridge, and make any corrections that may be necessary with a felt tipped pen. Remember, however, that approximately $\frac{1}{2}$ in. of rail should protrude beyond the end of the bridge, and do not position the pen at the ends of these, but at the outside, leaning against the corner of the bridge end.

When you are quite satisfied that you have drawn accurate lines on the base, and that the bridge itself is not lifting or drooping at any particular point, and that it is about $\frac{1}{2}$ in. above the base, offcuts of $\frac{1}{2}$ in. thick softboard can be cut to shape with a sharp modelling knife and then nailed to the surface with 1 in. panel pins. An example of this can be seen in one of the photographs.

Once both banks have been covered in this way, and the curve on both sides of the canal accurately cut and trimmed, allowing the bridge to swing freely, the 'ground' mixture can be prepared. Our old friend Polyfilla is used once again, with a quantity of fine silver sand mixed to proportions of about 2 to 1 of sand to give a rough appearance. This is made in small mixes, because of the fast drying time of the plaster, and is then spread over the surface of the softboard. Deal with only small areas at any one time, and rough the mixture up gently with the edge of the knife to bring the sand in the mixture into relief. This will also have the secondary effect of obliterating knife marks which can ruin scenery. Do not plaster the inside edges of the softboard since this might cause an obstruction to the bridge, and will in any event be covered with brickpaper at a later stage.

A mixture consisting of one part plaster to one of sand is used for the two bridge wells, since this is not intended to represent earth, but rather concrete or rock. Both exist in dock or canal areas and you therefore have a choice when painting the surface. This should not be roughed up with the knife edge as for the earth parts, but smoothed over with the flat part of the knife. Only small areas should be dealt with at any one time, and it is wise to make only small mixes.

The bridge should once again be tested loose on its pivot to ensure that nothing is restricting its movement, and if all is satisfactory, it can be screwed on to its pivot, according to the position of the commutator in the bridge mechanism. The easiest way of adjusting the bridge and mechanism is to run the motor in either direction until the commutator reaches the end of its travel and the motor stops. Do not, under any circumstances, try turning the bridge when it is screwed to the pivot, since this may cause damage to the mechanism gearing. Once the motor has stopped, the bridge can be turned until in the appropriate position, and the two nuts under the bridge tightened up.



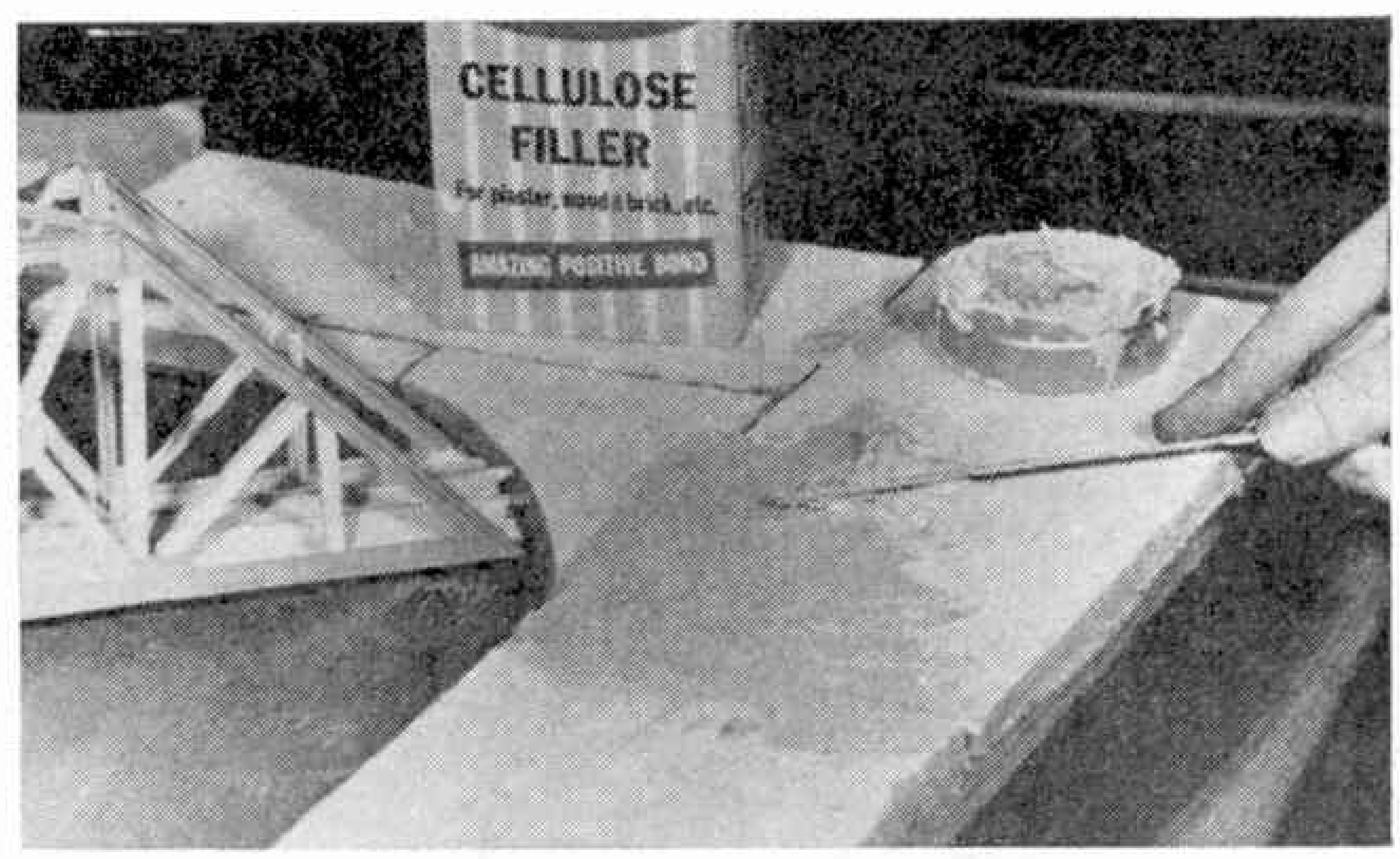
Next month Mike Rickett will complete the scenic setting and deal with the construction of the canal

A *Nailing the hardboard surface on to the cross supports of 2 in. by 1 in. timber, and showing the radius lines of the bridge ends*

B *Nailing the off cuts of softboard on to the hardboard surface after they have been trimmed to shape with a modelling knife*

C *Spreading the mixture of plaster and sand over the covering of softboard*

B



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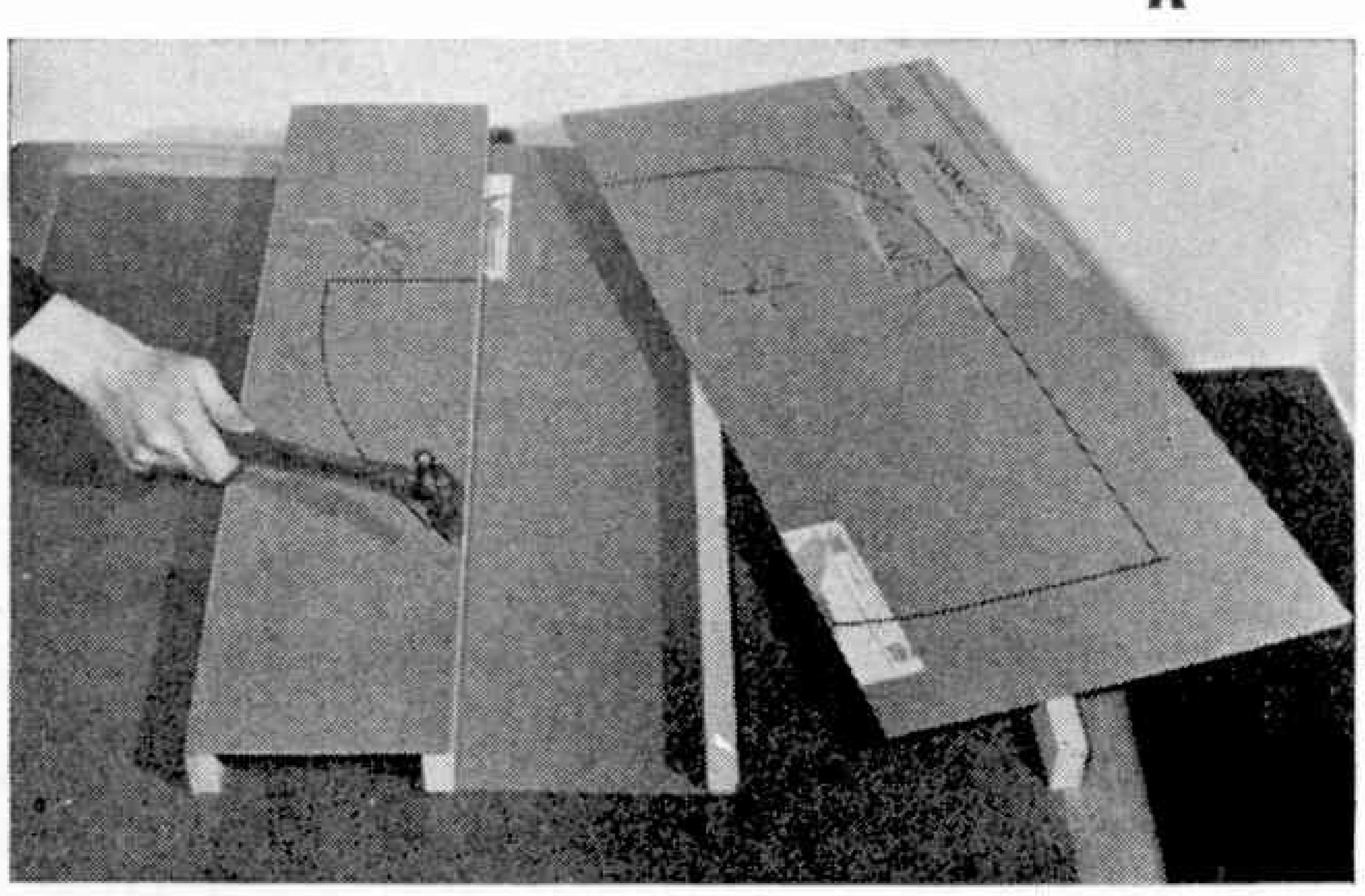

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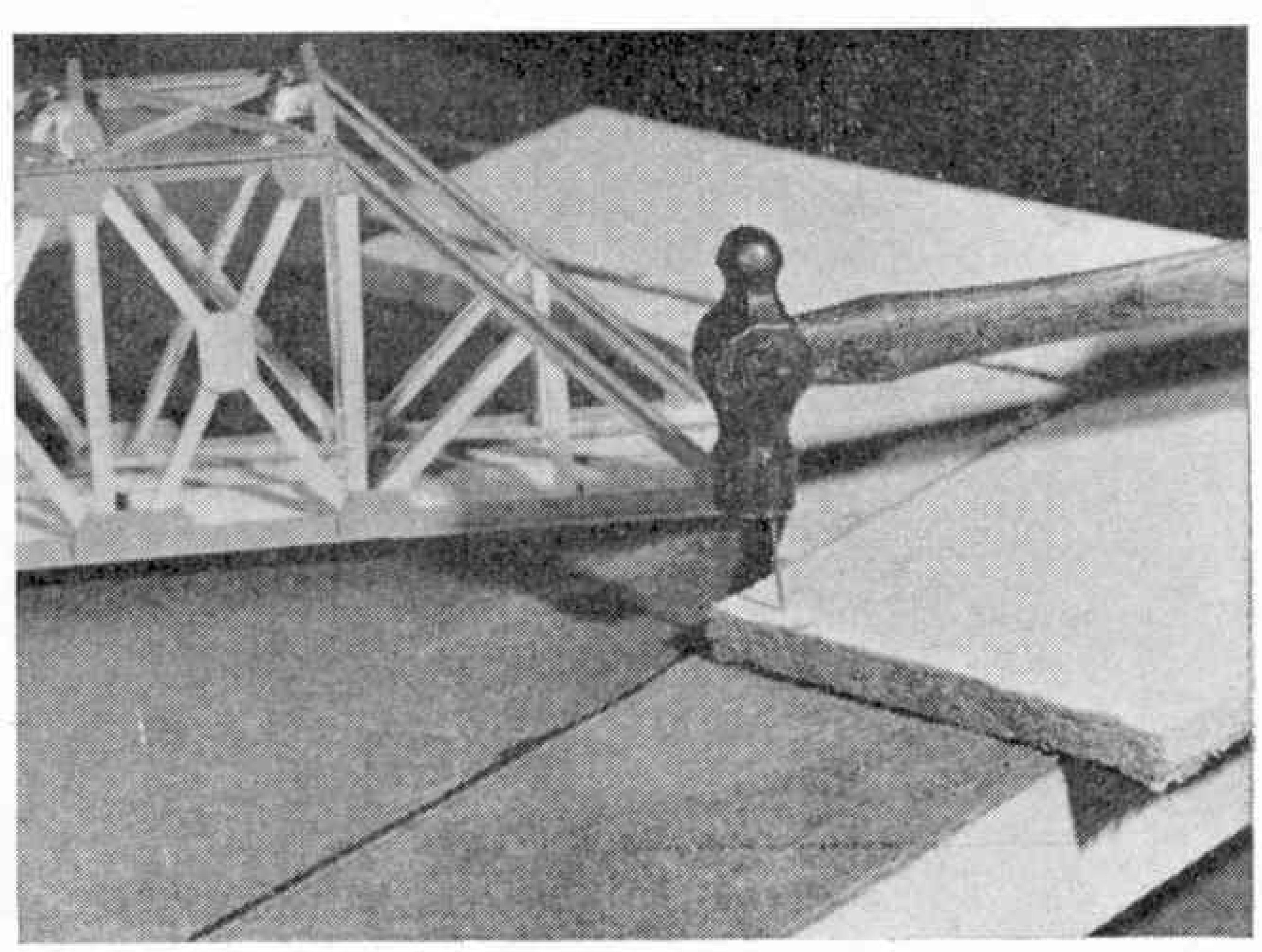


Tom Sheridan*

Have you a problem—in science, history, literature or any other subject—to which you cannot find the answer?
Ask Tom Sheridan and he will do his best to answer it. Questions should be sent on postcards bearing your full name and address, but these will not be published if you put them in brackets and just add your initials. Address them to Tom Sheridan, Meccano Magazine, Thomas Skinner and Co. (Publishers) Ltd., St. Alphage House, Fore Street, London, E.C.2.

Writing machine

Q. When was the first typewriter invented?—R. H., Birmingham.

A. The first patent for a typewriter was granted as long ago as 1714. The inventor was Henry Mill, an English water engineer; but the patent does not disclose how his machine worked, and no drawings have survived. The first writing machine known to have been built was the Typographer, patented in Detroit, U.S.A., in 1829 by William Austin Burt. It could not produce more than five words a minute. Many experimental models were produced in England, France, Italy and elsewhere before the first practical machine was designed by Christopher Sholes, a printer in Milwaukee, U.S.A., who took out patents in 1868. It was from this machine, first marketed in 1875, that the famous Remington typewriter developed.

Battery car

Q. Why can't electricity, supplied by batteries, be used in cars in preference to petrol?—Nicholas Thorn, Slough.

A. At least three small car manufacturers are now working on converting them to electric power. If the prototypes are successful, specially designed electric cars are certain to follow. They are likely to cost slightly more than petrol-driven vehicles, but overall running costs should be halved. Besides providing a cheap means of transport by which two or three people could commute from the suburbs to city centres, such cars would help to get rid of traffic jams. Visualised for city streets is a car which could run at a top speed of 30 m.p.h., cover 50 miles on one battery charge, and recharge overnight on 13-amp. domestic mains. Fuel cost would be a fraction of a penny per mile.

So be it

Q. What is the origin of the word Amen, and what does it mean?—S. L. Baker, Holbeach, Lincs.

A. It is an old Hebrew word meaning verily, or so be it. The early Christians used to shout it after the bread and wine had been blessed in the Lord's Supper; so it came to be said at the end of prayers and sung to conclude psalms and hymns. The word is also used in Jewish synagogues and in Moslem mosques.

Jupiter's moons

Q. Can you tell me the names and something about Jupiter's twelve moons?—Ronald Catherick, South Belmont, Ayr.

A. Only four of Jupiter's satellites are big enough to be seen with a small telescope. First observed by Galileo, they are (with diameters in miles): Io (2,310), Europa (1,750), Ganymede (3,200) and Callisto (3,220). Nearer the planet is Amalthea (about 100 miles diameter), discovered in 1892; and revolving in orbits beyond Callisto at distances of 7,120,000 to 14,7000,000 miles are Hestia (100), Hera (30), Demeter (25), Adrastea (15), Pan (20), Poseidon (35), and Hades (20 miles). These were discovered between 1904 and 1951. The four last-named revolve in an opposite direction to the rest, Hades taking 758 days to complete a revolution.

Mini-coin

Q. When did the silver threepenny 'bit' become obsolete?—B. F. W., Maidstone.

A. This coin has not been minted for the United Kingdom since 1941, but it is estimated that about 70 million of them are still in circulation.

Floating menace

Q. How much of an iceberg floats underwater?—H. T. B., Falmouth.

A. The popular belief is that nine-tenths of an iceberg is below the surface of the sea. But the density of glacier ice is always less than that of freshwater ice. The density of sea water also varies, but is always greater than pure water. An iceberg, therefore, tends to ride higher in the sea than a lump of pond ice in freshwater. Measurements taken by the International Ice Patrol near Newfoundland show that between five-sixths and a half of most icebergs is submerged. Bergs coming down from Greenland into the North Atlantic (one of which is pictured here) are often more than 200 ft. in height; the maximum height recorded is 447 ft. Though few normally exceed 1,000 ft. in length, they may be as much as 3,000 ft. long.

Blackpool trams

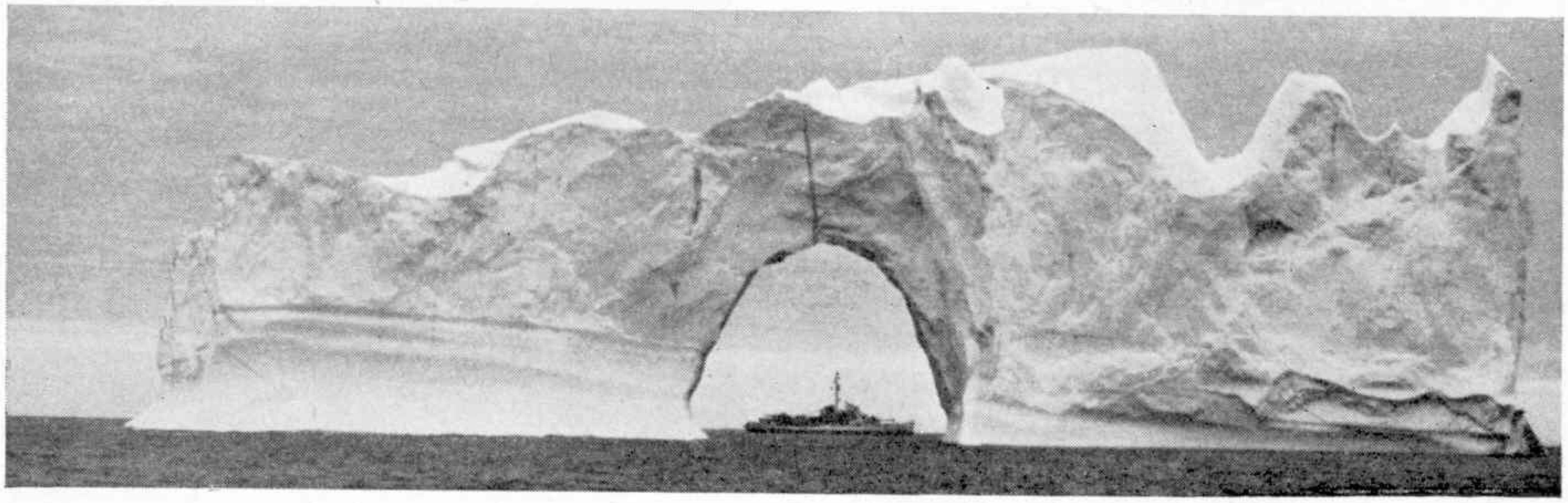
Q. Is there a book giving the history of the Blackpool tramways, with a route map?—C. A. Gankroger, King's Lynn.

A. See *The Tram That Went to America*, by D. F. Phillips and F. K. Pearson, available price 1s. 3d. from the Light Railway Transport League (Publication Officer), 21 Endymion Road, London, N.4.

Railway sounds

Q. Where can I obtain tape recordings of railway locomotives?—Michael Peacock, Gateshead.

A. F. C. Judd (Sound Recording) Ltd., 174 Maybank Road, South Woodford, London, E.18, will supply you with sound effects of steam, diesel and electric locos on a single full-track, $3\frac{3}{4}$ i.p.s. tape, suitable for any tape recorder, or on a 45 r.p.m. disc. The disc costs 8s. 6d., the tape 18s. 6d.



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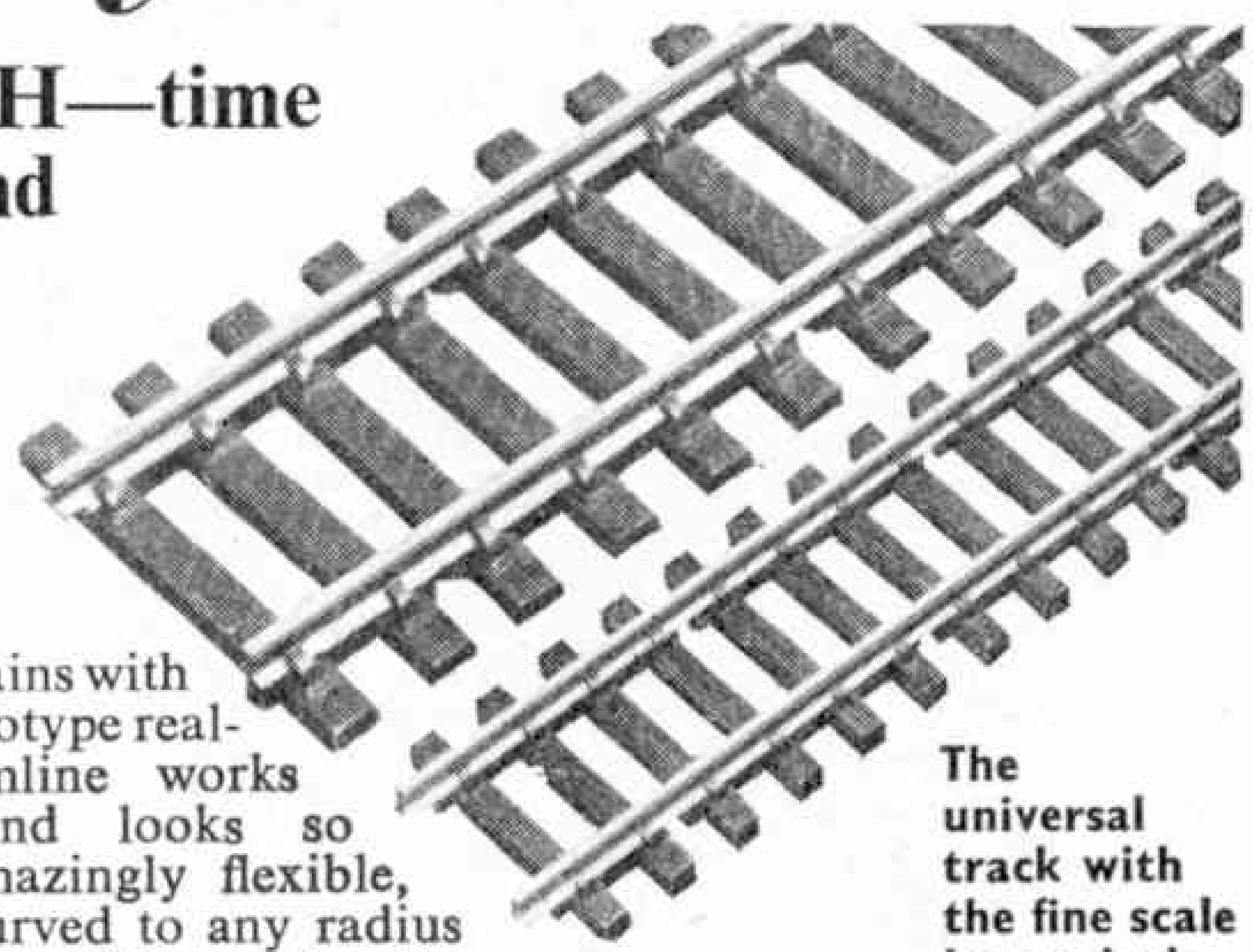

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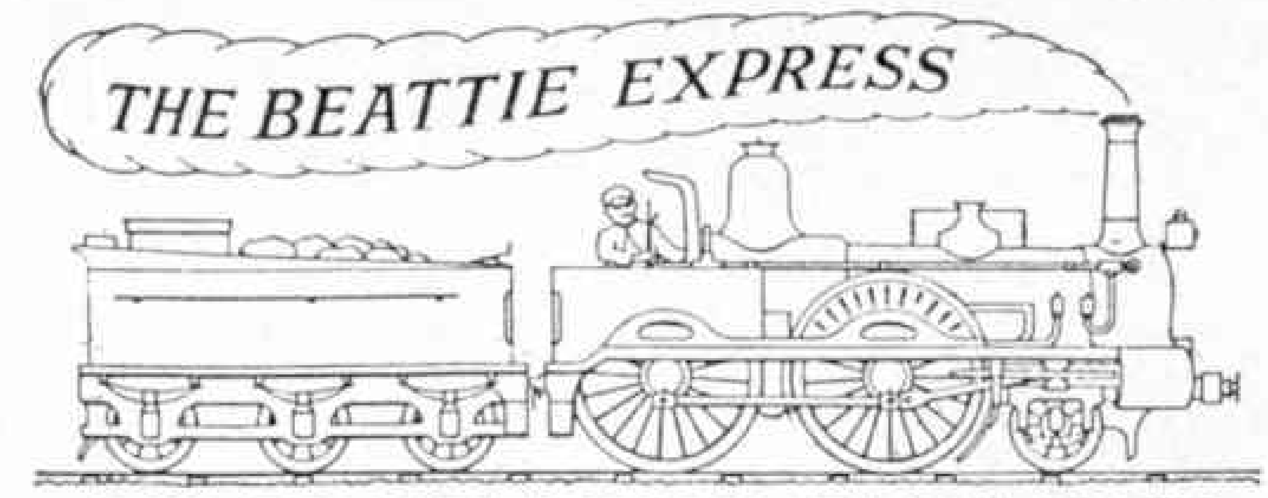

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THE BLACK WIDOW

TWENTY-FIVE years ago, during the Autumn and Winter that followed the Battle of Britain, the Royal Air Force began to take an increasing toll of German night bombers sent to attack London and other cities. Newspapers explained that R.A.F. pilots were eating raw carrots by the dozen, and that the vitamins in these vegetables helped to give them exceptional vision in the dark. In fact, the key to Fighter Command's ability to find and track down the *Luftwaffe* aircraft at night was contained in the letters 'A.I' — standing for Airborne Interception radar carried by its night fighters.

Over in America, the U.S. Army Air Corps. (re-named U.S. Army Air Forces in mid-1941) knew the secret of Britain's successes against enemy raiders and asked for samples of our radar sets. Except for two prototype Curtiss PN-1 biplanes bought in 1921, it had never had any specialised night fighters; but its leaders realised that the time had come when such aircraft were essential for survival in war. So, to fill the gap until a specially-designed night fighter could be designed and built, they fitted A.I. radar and extra guns to 164 Douglas A-20 bombers, which were redesignated P-70 Havocs.

Meanwhile, the Northrop company was given a contract to develop the completely new night fighter that was needed so urgently. The job was not easy, and the choice of Northrop to tackle it was rather suprising as they had never before had a fighter accepted for production. This lack of experience was hardly serious as the new aircraft, designated P-61, had to carry so much armament, fuel and equipment, and so many crew members, that it finished up larger and heavier than the P-70 Havoc, which had begun life as a bomber.

The first of two prototype XP-61s flew on May 21, 1942, only 16 months after Northrop received a U.S.A.A.C. contract to begin its design and construction. After a time, it was given the usual night fighter camouflage of black paint and looked so sinister, with its armament blisters above and below the fuselage, that it became known as the 'Black Widow', after the venomous spider of that name.

Basically, the XP-61 Black Widow was an all-metal monoplane, with twin tail-booms, a retractable tricycle undercarriage and two 2,000 h.p. Pratt and Whitney R - 2800 - 10 Double Wasp 18-cylinder radial engines. An unusual feature was that it had only tiny ailerons, at the tip of each wing, leaving most of the trailing-edge free for large flaps. These enabled it to land at only 80 m.p.h., in half the distance needed by other aircraft of its weight and high-speed performance.

To supplement the tiny ailerons, retractable spoilers were fitted in slots forward of the flaps on each wing. It was the first time that control surfaces of this kind had been used on operational aircraft and they proved so effective that the Black Widow could outmanoeuvre any other American fighter of its period. Top speed was 369 m.p.h. at 20,000 ft., service ceiling 33,100 ft. and combat range 700-800 miles.

A.I. radar developed by the Massachusetts Institute of Technology from current British sets, was mounted in the nose of the fuselage nacelle. Three aircrew were needed, with the radar operator behind the pilot in a raised cockpit and a gunner in a glazed cabin to the rear. Armament comprised four 20 mm. cannon, with 600 rounds of ammunition, in a bulged fairing under the fuselage and a remotely-controlled dorsal turret containing four 0·50 in. machine guns, with 1,600 rounds. The turret was normally locked to fire forward, under the control of the pilot, but could be used also by the gunner as defensive armament, with a 360-degree field of fire.

Production version of the 'Reporter' with engine supercharger intakes and underwing pylons for long-range fuel tanks. Our conversion (overleaf) was based on the modified, unsupercharged P-61A

Development

Flight testing went well, except that the dorsal turret created airflow problems over the tail unit, leading to 'buffeting'. Nothing could be done about this on the 13 pre-production YP-61s and the first 37 production P-61A Black Widows, as they were too far down the assembly line. To save time, the U.S.A.A.C. had ordered the YP-61s on March 1941, a first batch of 150 P-61As on September 1 of the same year and a further 410 on February 12, 1942 — all before the first flight of the prototype.

From the 38th P-61A onward the turret was deleted and the crew reduced to two. Another change from aircraft No. 46 was the introduction of R-2800-65 engines, capable of giving up to 2,250 h.p. each in an emergency.

Altogether, 200 P-61As were built. Delivery to front-line squadrons began in 1944 and the first success in action was recorded by a crew from the 421st Night Fighter Squadron who trailed and shot down a Mitsubishi 'Dinah' twin-engined bomber over Japen Island, off the coast of New Guinea, on July 7.

In the same month, Northrop began delivery of 450 P-61Bs. These differed from the 'A' mainly in having underwing attachments for four 1,600-lb. bombs or 300-gallon drop fuel tanks. So equipped, they became intruder fighters, able to harass targets deep in enemy territory, as well as formidable night fighters. Furthermore, the tail buffeting problems had been overcome by this time; so the dorsal turret and third crew-member were reinstated on the last 250 P-61Bs.

Black Widows first reached units in Europe in August 1944, and by the end of that year equipped all night fighter squadrons of the U.S.A.A.F. Although they were far superior to the makeshift types they replaced, the opposition also had improved. To increase performance, Northrop switched production to a new model, the P-61C with turbosupercharged R-2800-73 engines, giving 2,800 h.p. each. The 'C' had a top speed of no less than 430 m.p.h. and ceiling of 41,000 ft.; but only 41 had been built by the end of the war, when further production was cancelled.

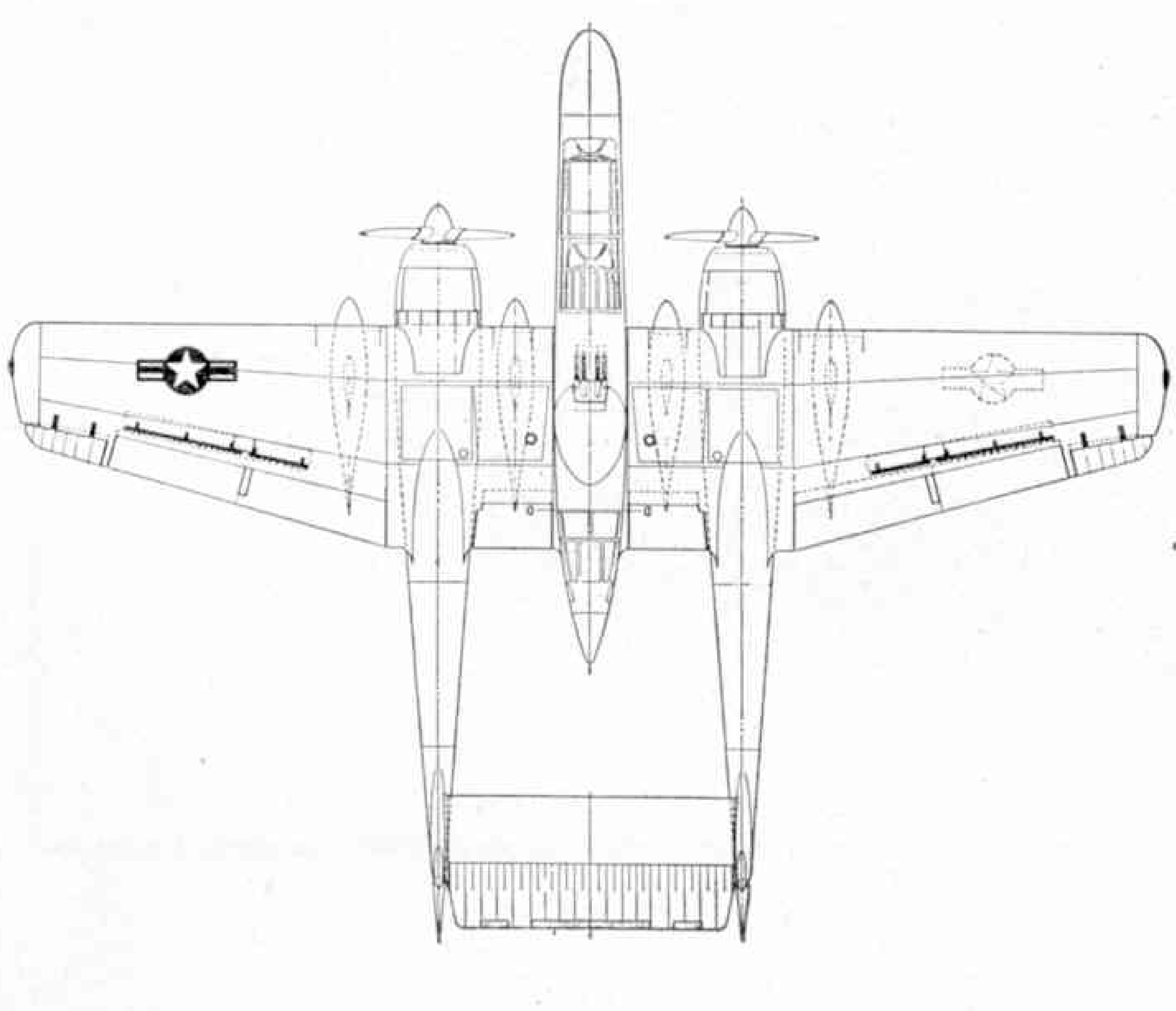
In addition to the three production versions of the Black Widow, there were two experimental marks. The two XP-61Ds were converted from 'As' and had R-2800-77 engines with new turbo-superchargers. Two XP-61Es, completed early in 1945, were converted 'Bs' with R-2800-65 engines. They were intended as prototypes for a long-range day fighter version of the Black Widow and had a smaller, more streamlined fuselage, without radar and top turret and with a crew of two seated under a one-piece blister canopy. Four 0·50 in. machine guns in the nose supplemented the under-fuselage cannon.

Main task of the 'E' was to be the protection of U.S. Bomber forces in the Pacific, during long-distance raids on Japanese targets. By the time it was built, the Allies had battled their way so close to Japan that there was no need for such a fighter. So one of the XP-61Es and a P-61A were converted into prototypes of a photo-reconnaissance aircraft known as the F-15 Reporter.

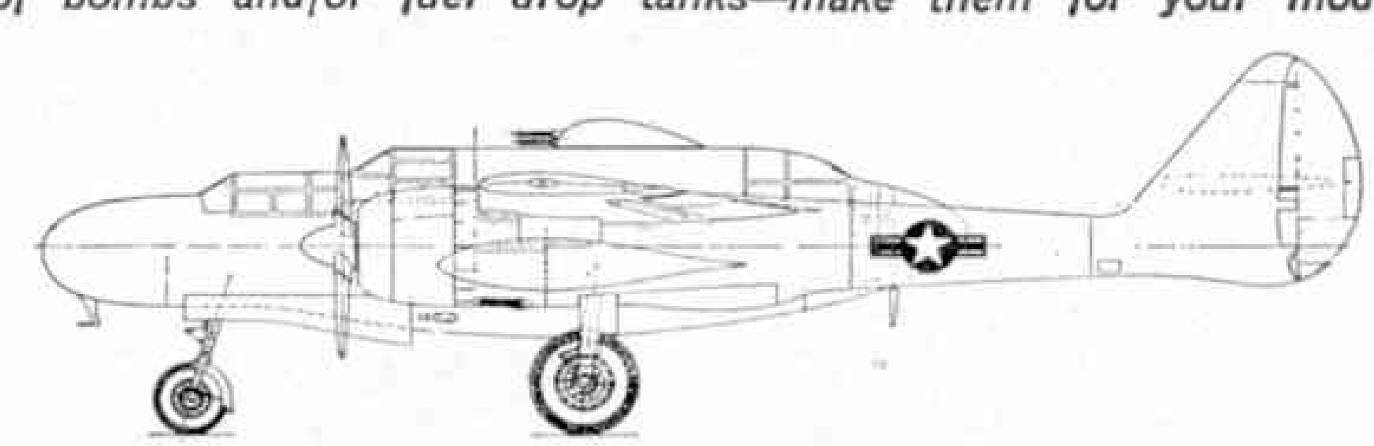
The Reporter carried six cameras, had a top speed of over 440 m.p.h. and could fly more than 4,000 miles when fitted with underwing tanks. To make life easier for the pilot on such long flights, his seat could be tilted back to a reclining position, like the passenger seats in an airliner, enabling him to rest while the autopilot was in control. Unfortunately, by the time the Reporter entered service, the jet aircraft had already made piston - engined reconnaissance aircraft obsolescent and only 36 F-15As were built. They remained in service from 1946 until 1952, being redesignated RF-61C during the last four years of their active life. **John W. R. Taylor**

Data (P-61B):

Span 66 ft. Length 49 ft. 7 in. Height 14 ft. 8 in. Wing area 664 sq. ft. Weight empty 22,000 lb.; loaded 29,700-38,000 lb. Max. speed 366 m.p.h. at 20,000 ft. Climb to 20,000 ft. in 12 min. Service ceiling 33,100 ft. Max ferrying range 3,000 miles.

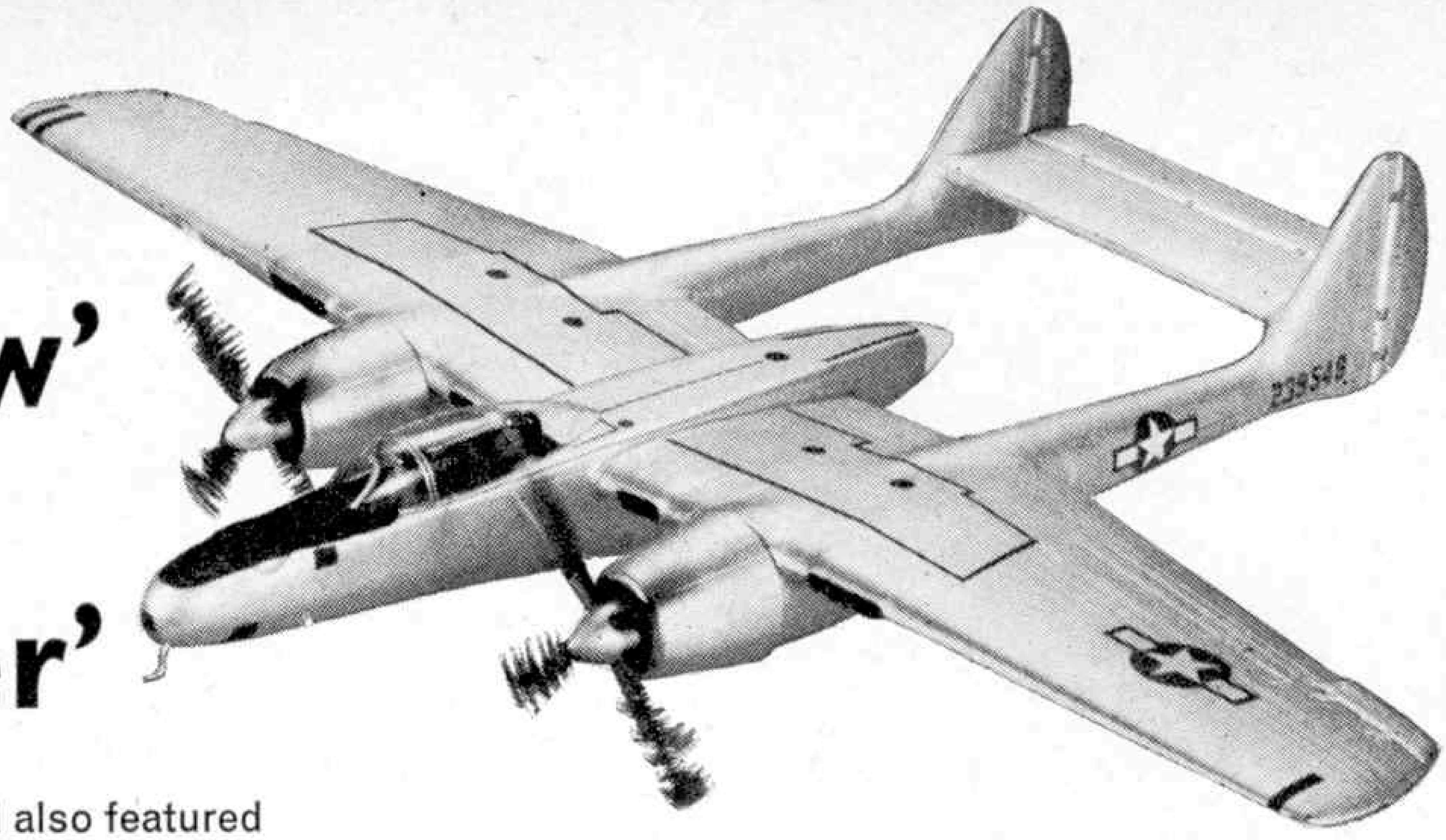


This drawing shows details of the four-gun top turret and positions of bombs and/or fuel drop tanks—make them for your model



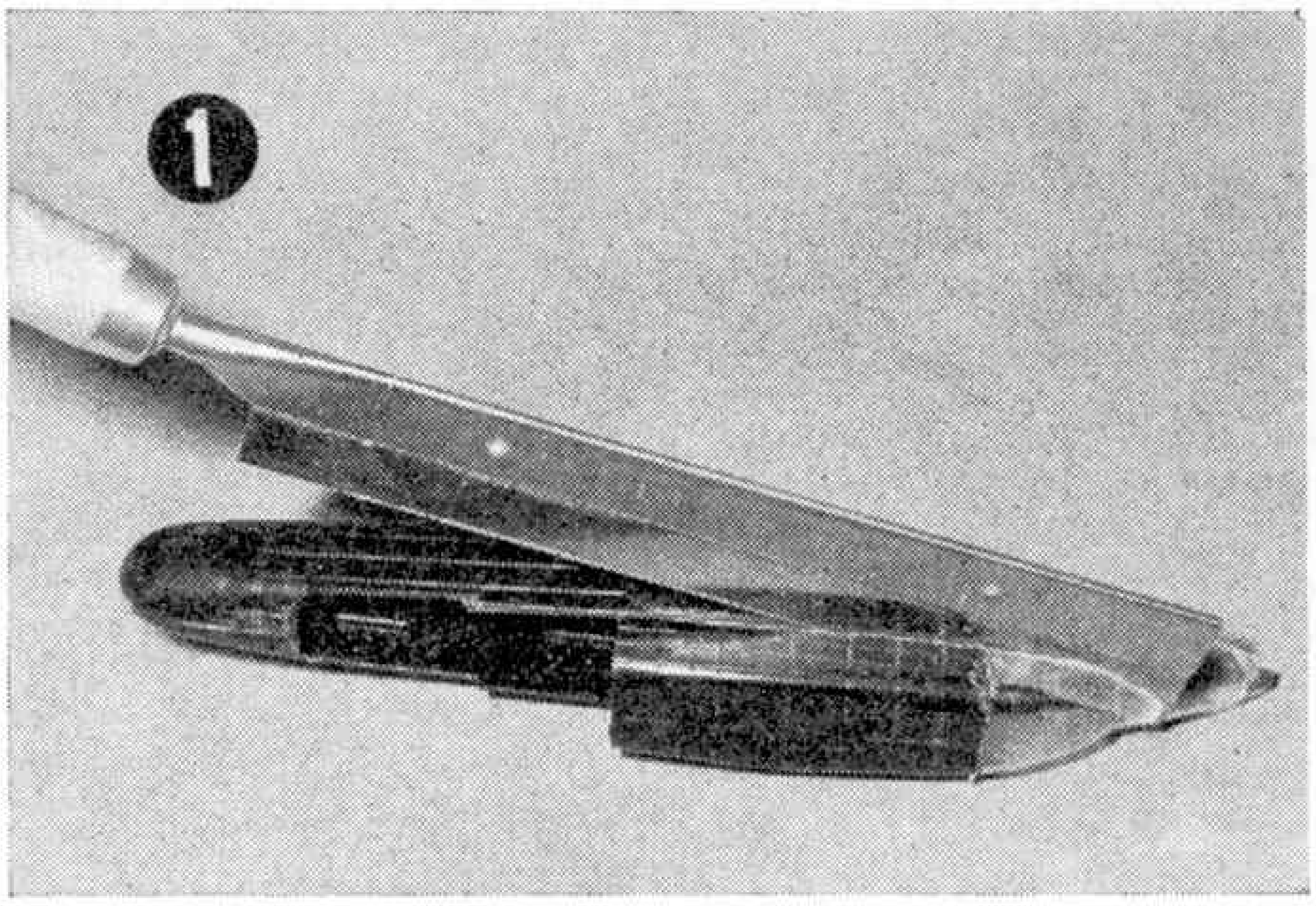
★ **Turn the page for full details about how to convert the Frog 'Black Widow' kit into a 'Reporter'**

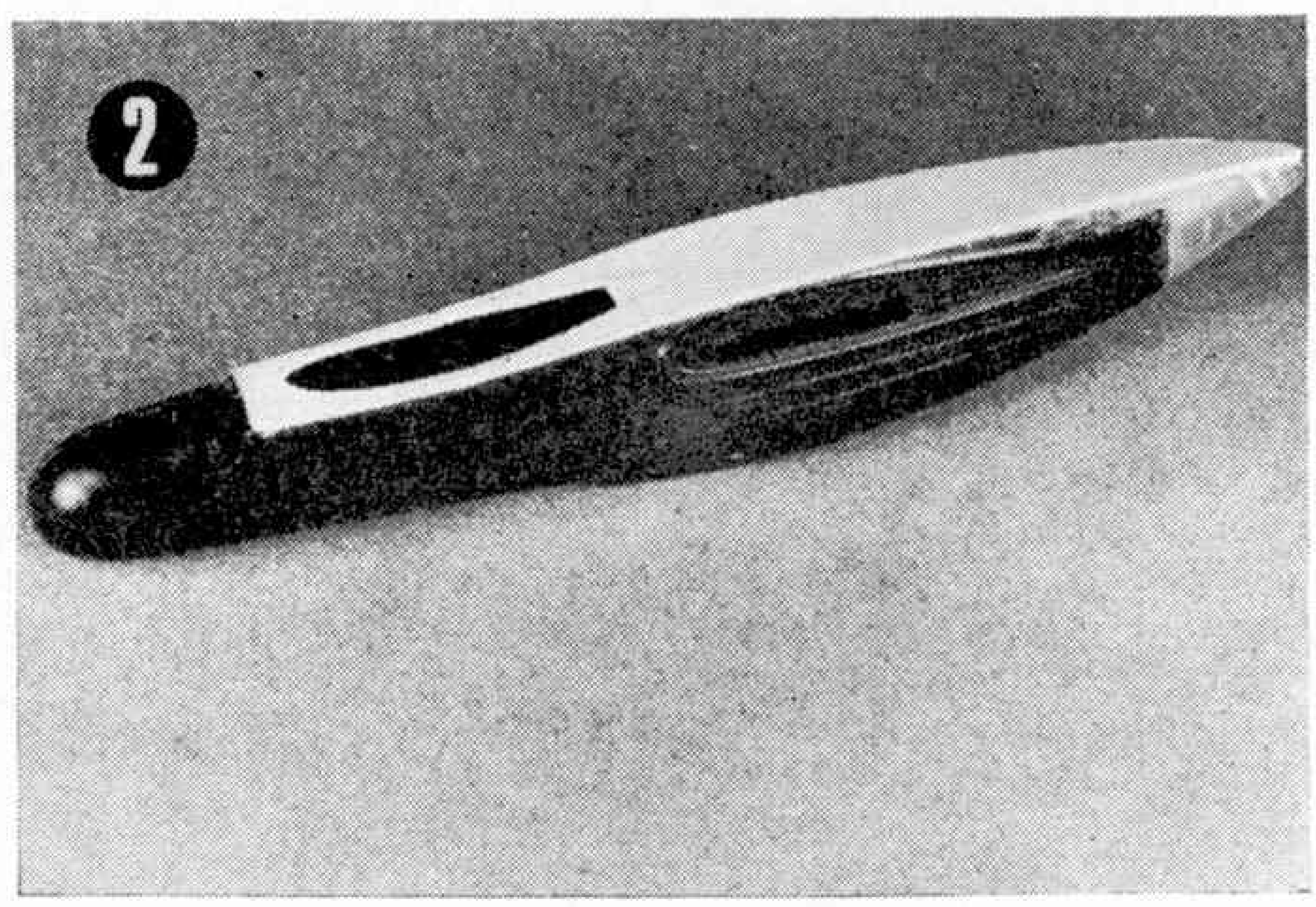
The 'Black Widow' makes a Fine 'Reporter'

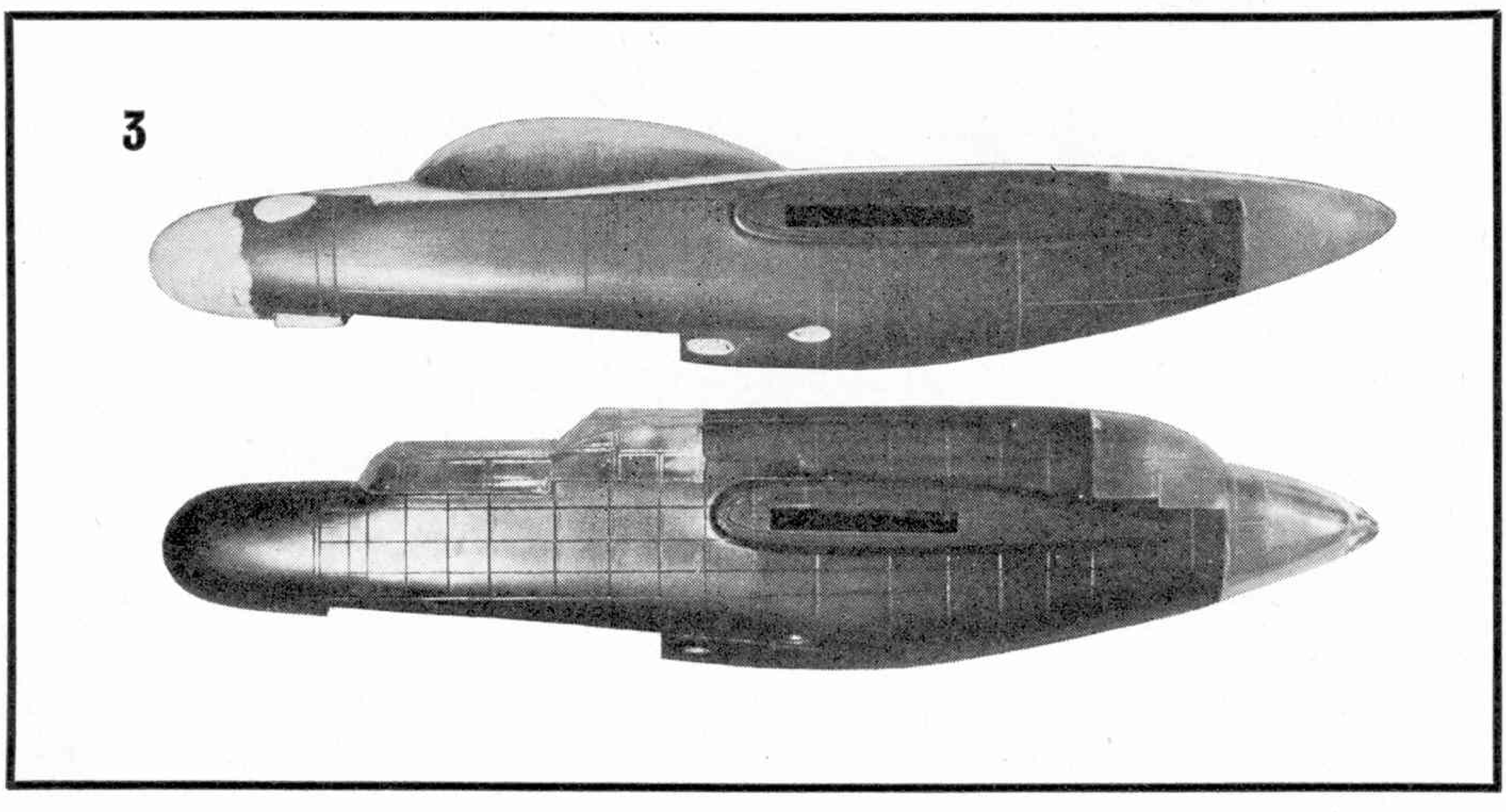


Subject of the latest FROG plastic kit, and also featured in John Taylor's article on page 16, The Northrop 'Black Widow' offers the 'plastic surgeon' lots of scope for his skill and ingenuity. On these two pages, Doug McHard shows how he converted the 'Black Widow' into a sleek photo-recce 'Reporter'.

Compare this photograph of the completed model with those on pages 16 and 17







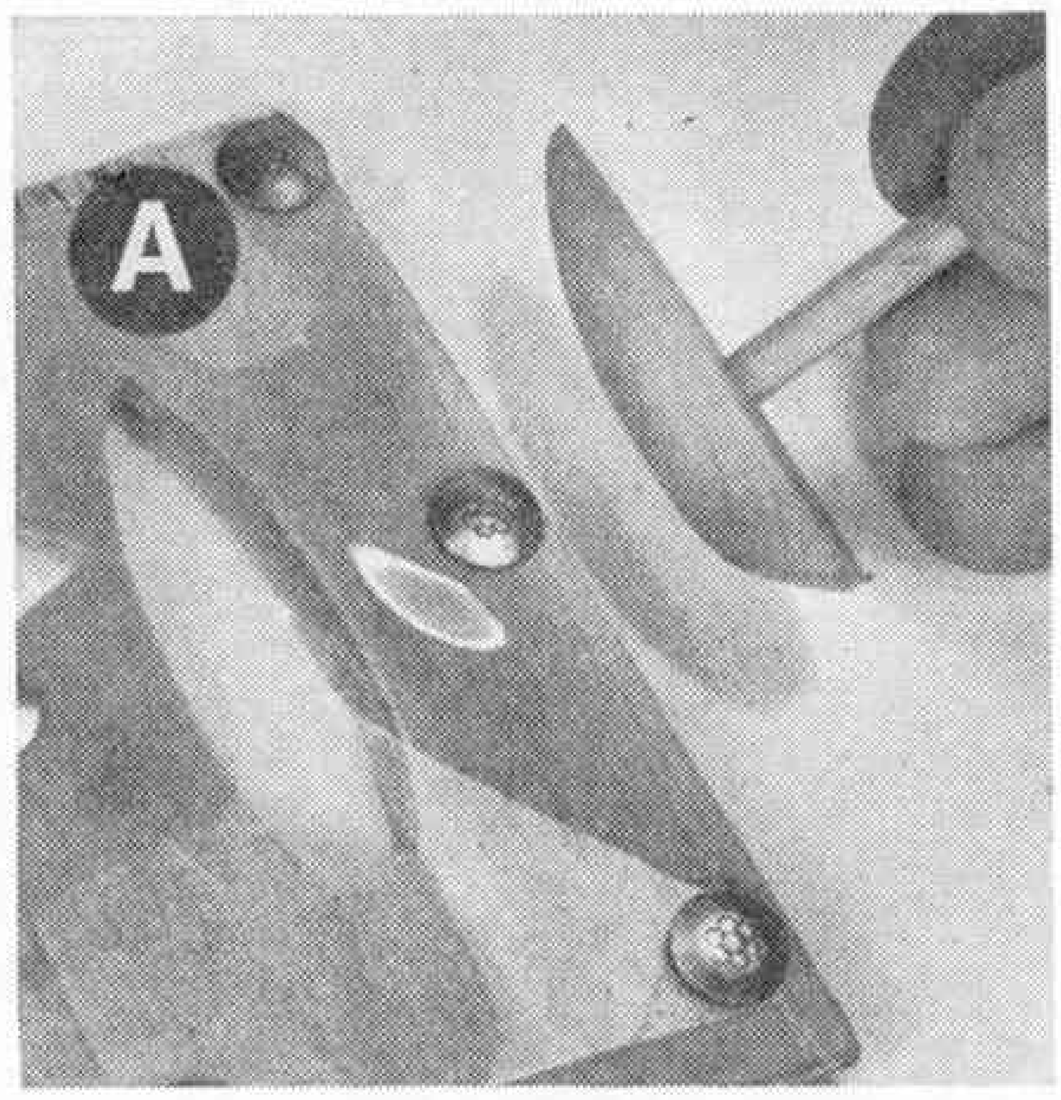
1 **Cement the rear transparency in position and allow it to set *completely*. Then saw off the top of fuselage, using the horizontal line just above the wing root as a guide.**

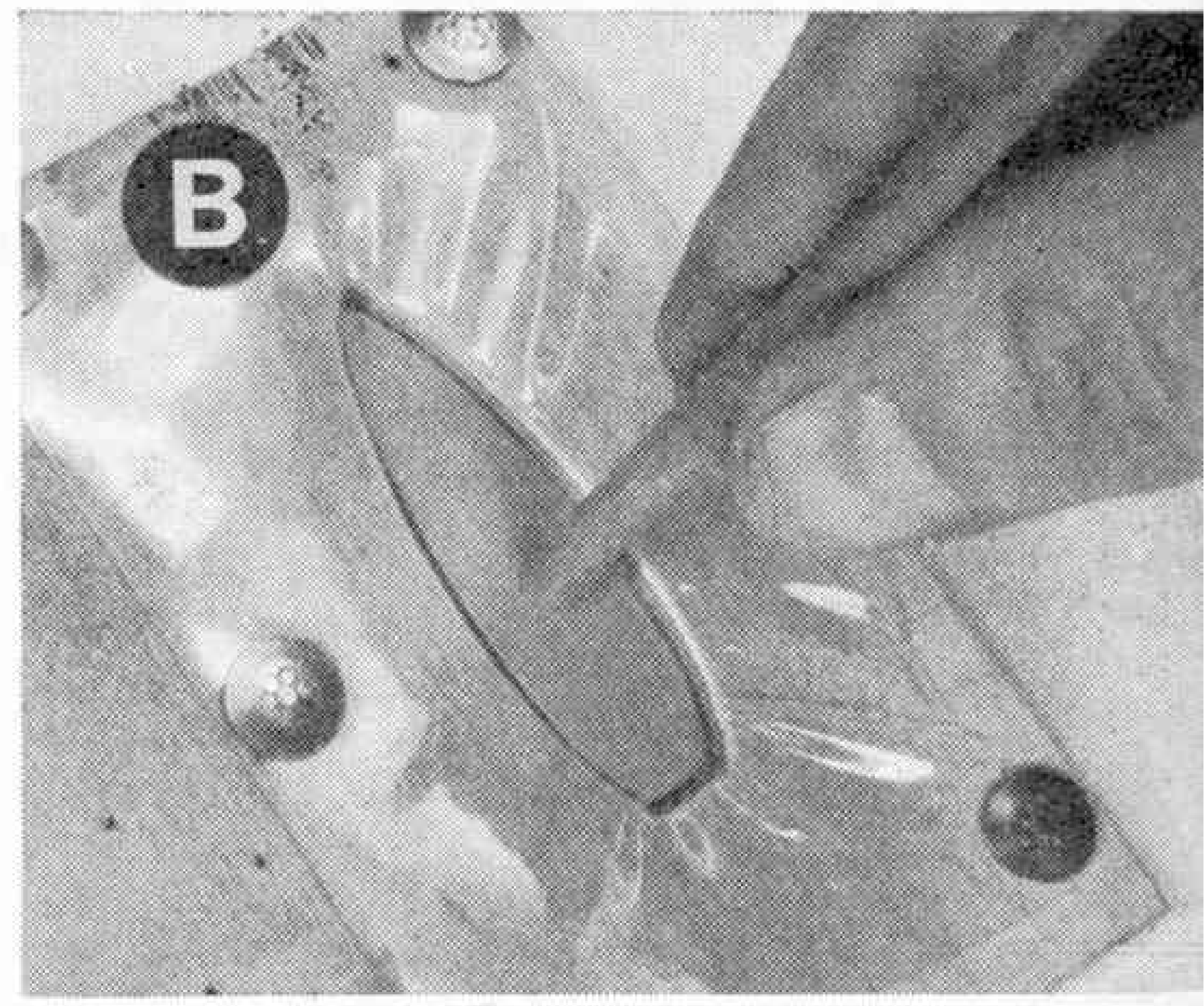
2 **File the upper fuselage contour to a gentle curve, and cut a piece of 30 thou. Plastikard (polystyrene sheet) slightly oversize. Cut out the cockpit area and then cement in place.**

3 **This full size photograph of the modified fuselage shows the exact shape of the upper contour. 'Body Putty' is used to build up the nose. Add an extra $\frac{1}{4}$ in. to the original length—a thin layer at a time. The same material is used to fill in the gun ports in the lower fuselage, to shape the two top nose blisters, and to build up the flat-bottomed 'box' just ahead of the nosewheel bay. Sand off all panel ridges with No. 400 carborundum paper and replace them by the scored lines where shown.**

4 **After silver painting, indicate the positions of the camera windows using dark blue paint to which has been added a touch of silver. Notice that all camera windows are filed 'flat' before the base colour is applied.**

5 **Wing-walk areas are defined by a black outline applied with a ruling pen, charged with slightly thinned down paint. Follow the lines already engraved on the wing surface and use a straight-edge guide.**





THE COCKPIT CANOPY

The shapely transparency does a lot to transform the somewhat angular Black Widow into a sleek Reporter. Its production is not at all difficult.

Carve a solid wooden canopy from some close grained wood such as Parana Pine or Lime. Make the wooden forme a little deeper that the finished transparency and slightly smaller in other dimensions to allow for the thickness of the clear sheet. The forme must be smoothed to a very fine finish. It should then be drilled and mounted on a $\frac{3}{16}$ in. dowel. Now cut a hole in a piece of $\frac{1}{8}$ in. thick plywood slightly larger all round than the plan view of the forme. Smooth the inside edges of the hole and round off the upper edges.

The canopy is moulded from clear acetate sheet. This material is a thermo plastic and becomes soft when heat is applied. It should be no less than 15 thou. thick, thinner sheets are difficult to mould. Cut a piece of acetate about 2 in. by $3\frac{1}{2}$ in. and, using drawing pins secure it to the plywood as shown in pic A.

Now hold the mounted acetate in front of an electric fire until it becomes quite soft and floppy. At this point the forme should be very quickly pressed into the hole which will draw the clear sheet over the forme to produce the canopy. (Pic B.)

The process is simple but it needs practice to achieve perfection. The acetate cools very quickly, so you must be very nippy to get the forme through the sheet before it cools and re-hardens. If it does cool before you can strike, it is easily re-softened by re-heating.

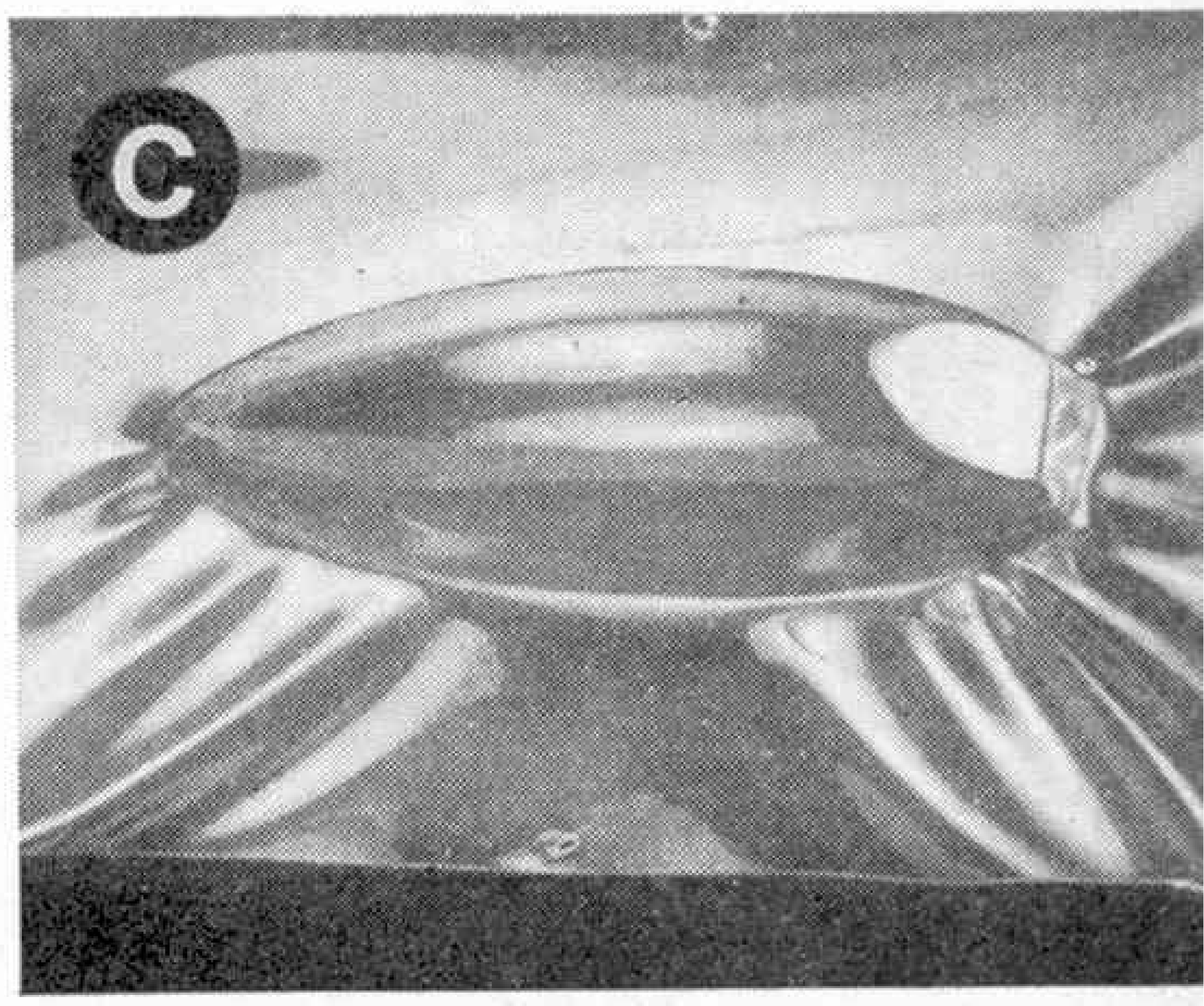
TOO THIN a sheet of acetate will cool too rapidly to allow you to work comfortably.

TOO SMALL a piece of acetate will not stretch sufficiently to produce a good moulding.

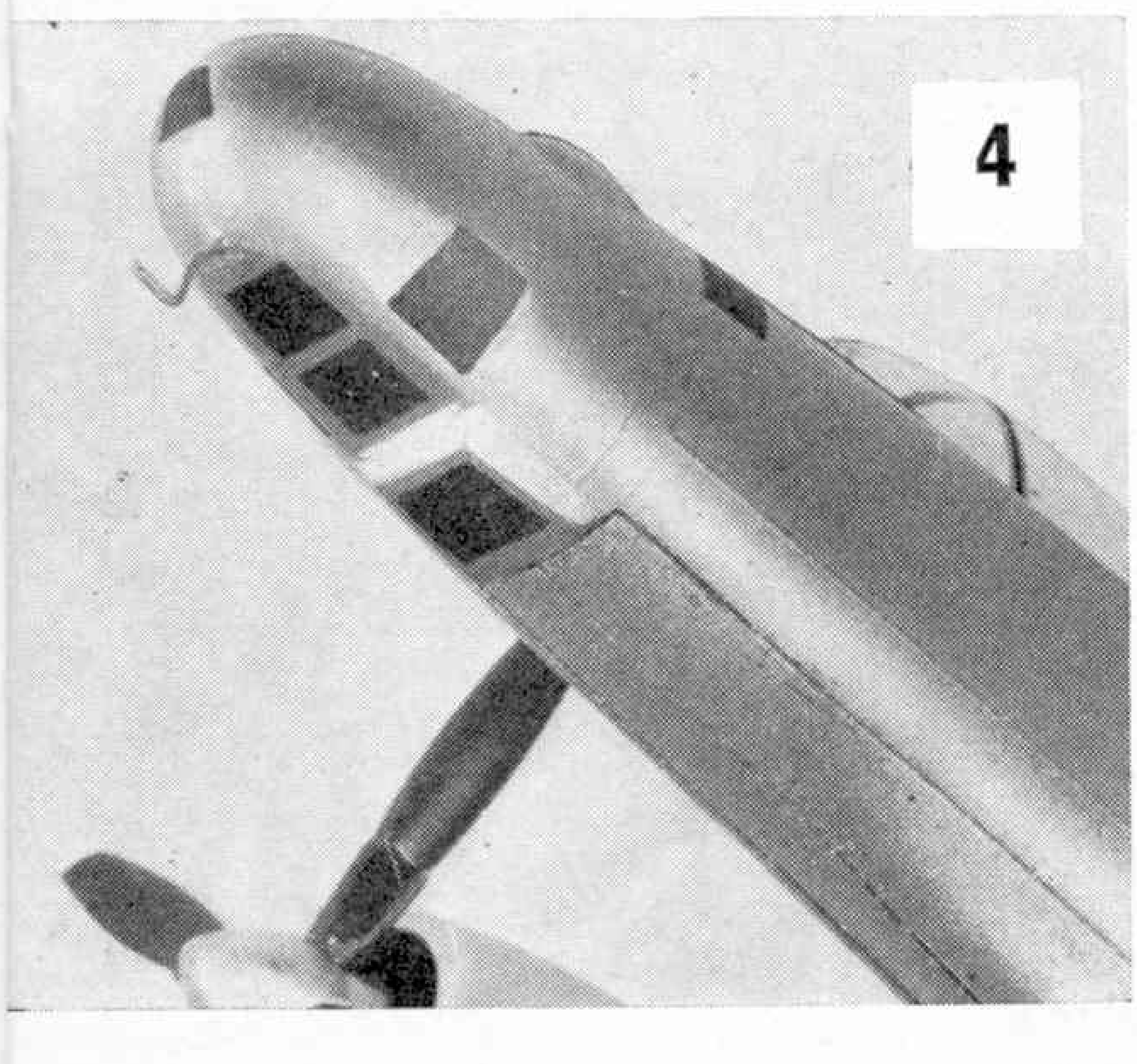
TOO MUCH heat will cause the acetate to blister and bubble.

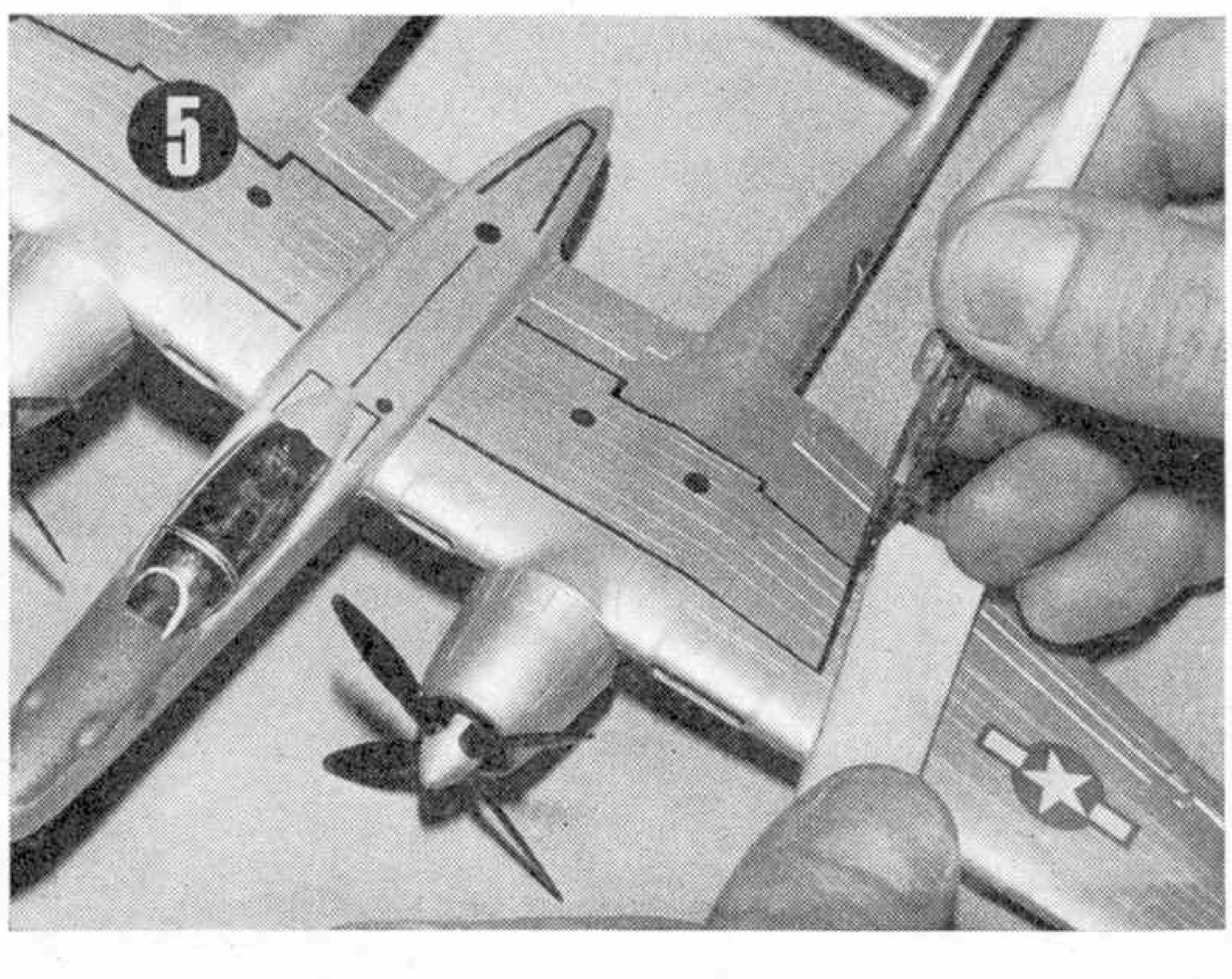
TOO LITTLE heat will produce a milky appearance in the finished transparency.

Polystyrene sheet cannot be moulded in this way, and acetate cannot be stuck with polystyrene cement! So you must stick your finished cockpit cover to the body with a contact adhesive such as Evo-Stik. A neat way to do this is to leave the transparency with shallow 'skirts' each side, below the line of the cockpit edge. These can then be stuck to the *inside* edges of the cockpit opening.



Pic C: Here's the finished transparency ready for trimming





Build a baggage truck Part 2

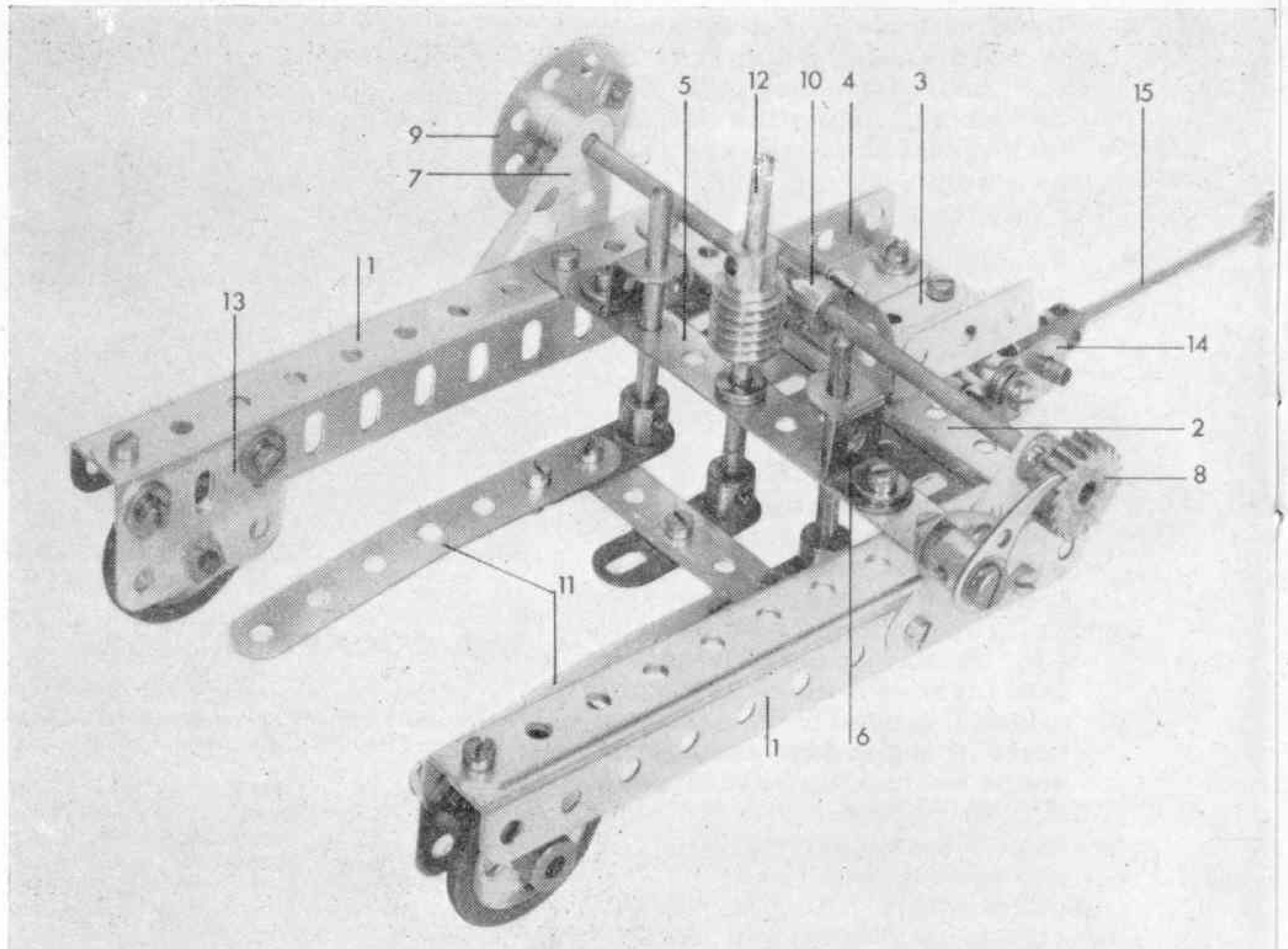
THE TRAILER

IN these pages last month I gave full building instructions for a Meccano model based on the Lansing Bagnall TD 220, a small but powerful tractor similar to those used to pull baggage trucks at railway stations. Illustrated with the tractor was an extremely interesting trailer that also was based on a piece of real-life equipment, and you will find constructional details for this below. The full-size version is, in fact, a pallet trailer of a new design, incorporating a hand-operated hydraulic lift, which makes it virtually self-loading.

A three-wheeled frame affair, it can be easily moved into position straddling a pallet which is then picked up on the forks by actuating the hydraulic system. Once off the ground, the trailer is free to move. If required, however, a specially-provided bar can be locked across the end of the trailer. This bar carries a pin, which can be fitted into the "eye" at the end of the handle of another trailer and in this way a whole "trailer train" can be formed.

Turning to the Meccano model, this is built up from two 5½ in. "U" girders 1, each obtained from two 5 in. Angle Girders. Girders 1 are connected at one end by a 4½ in. "U" girder 2, obtained from two 4½ in. Angle Girders. Bolted to the top flange of girder 2 is a 1½ in. by 1½ in. Flat Plate 3 overlayed along three sides by three 1½ in. Angle Girders 4. A 4½ in. Strip 5, carrying two ½ in. Reversed Angle Brackets 6, is bolted between girders 1.

Fixed to the outside of each girder 1 is a 1½ in. Corner Bracket 7, in which is journalled a 5½ in. Rod held in place by a Ratchet Wheel 8 and an eight-hole Bush Wheel 9, and supporting a ½ in. Pinion 10. A Threaded Pin attached to the Bush Wheel acts as a handle. Secured to one of the Corner Brackets is a Fishplate and fixed in this is a Pivot Bolt carrying a Pawl with boss. The Pawl engages with the Ratchet Wheel.



The interesting trailer for the baggage truck (described last month and illustrated below). Based on the Lansing Bagnall design, this working model—fitted with the new six gear Power Drive motor unit—makes an exciting project

A "fork" is now built up from two 3½ in. Strips 11 connected by a 2½ in. Strip to which three Cranks are bolted. Fixed in the bosses of the Cranks, respectively, are a 2 in. Rod, a 2½ in. Rod 12, carrying a Worm and two Washers, and another 2 in. Rod. The Rods are passed through Strip 5, making sure that the Worm engages with Pinion 10.

Wheel Arrangement

Both rear assemblies are similarly built. A Threaded Pin is fixed in a 1½ in. Flat Girder 13 which, in turn, is bolted to the inside of girder 1. Mounted on the Threaded Pin are two Washers, a 1 in. loose Pulley with Rubber Ring and a Collar, in that order. The Pulley must revolve freely.

In the case of the single front wheel, the assembly is a little more complicated, although not difficult. A 1 in. by ½ in. Double Bracket is lock-nutted to the front of Flat Plate 3 and, to each of its lugs, a 1 in. Corner Bracket extended by a 1½ in. Strip 14 is bolted. A 1½ in. Rod carrying a 1 in. loose Pulley with Rubber Ring flanked by four Washers on each side, is journalled in the Double Bracket, being held by Collars.

A 1 in. Rod, on which is mounted a Coupling flanked by two Washers each side, is journalled in the end holes of Strips 14, the Rod passing through an end traverse smooth bore of the Coupling. Fixed in the longitudinal bore of the Coupling is a 3½ in. Rod 15 to the end of which an End Bearing is secured. This End Bearing "mates" with the Small Fork Piece, mentioned last month, which is attached to the rear of the Tractor. A locking pin is provided by a 1 in. Rod carrying a Collar.

Spanner

Parts required

1 of No. 2a	2 of No. 17	1 of No. 63
2 of No. 5	1 of No. 18a	1 of No. 74
1 of No. 5a	2 of No. 18b	2 of No. 103h
2 of No. 6a	3 of No. 22	3 of No. 115
4 of No. 9	1 of No. 24	2 of No. 125
2 of No. 9a	1 of No. 26	2 of No. 133
3 of No. 9b	1 of No. 32	2 of No. 133a
1 of No. 10	32 of No. 37a	1 of No. 147a
1 of No. 11a	31 of No. 37b	1 of No. 147b
1 of No. 14a	30 of No. 38	3 of No. 155
1 of No. 16	3 of No. 59	1 of No. 166
1 of No. 16b	3 of No. 62	

TRANSPORT IN HUNGARY

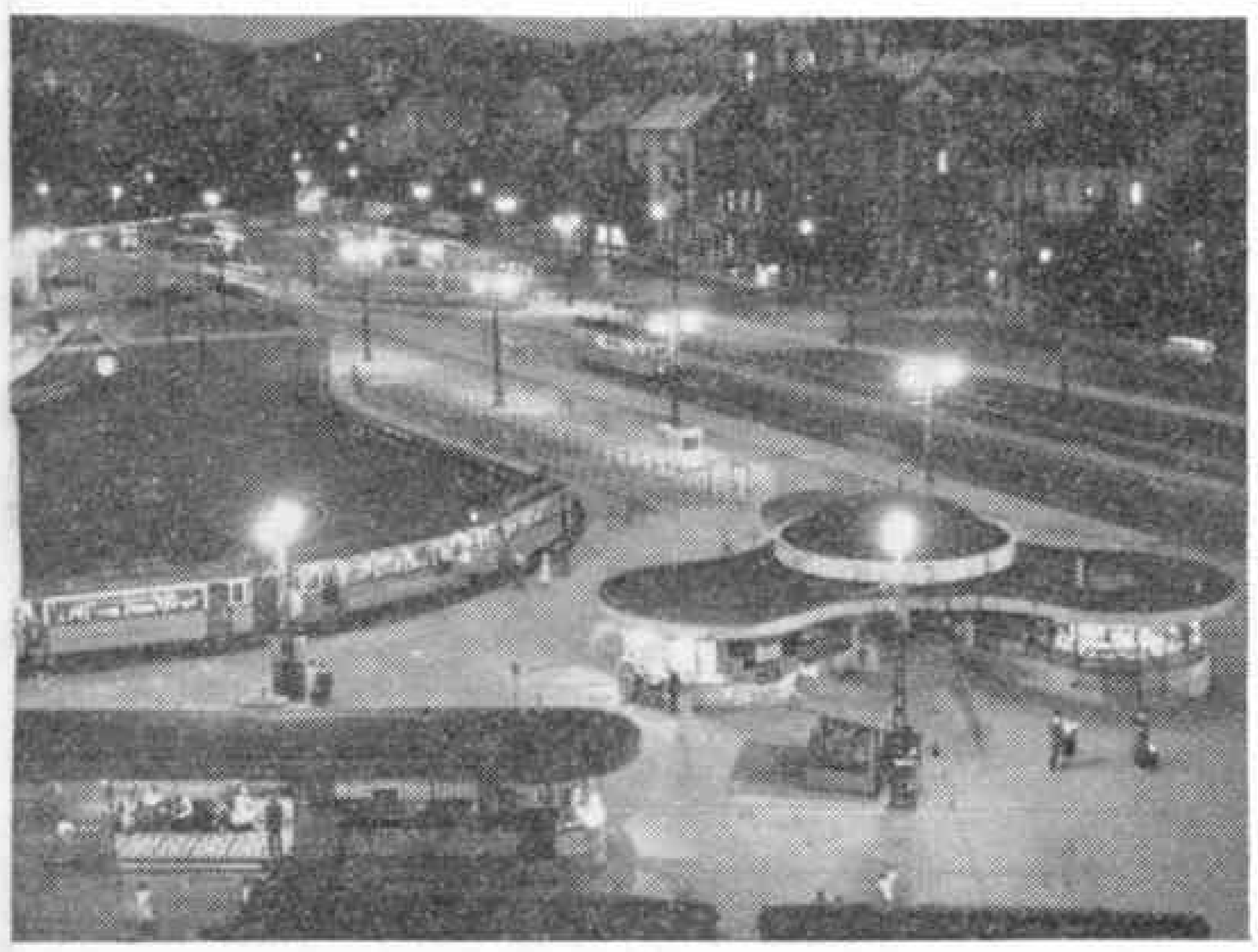
This article from Meccano Magazine reader Robert Grange was written shortly after he had returned from a holiday in Hungary. We think it will be of interest to all our readers—particularly considering that at the time of writing it Robert was only 11 years old!

LAST year, I was fortunate enough to spend a holiday on the Continent behind the Iron Curtain, and the first 10 days were spent in Budapest, the capital of Hungary. During this time, I was able to observe the difference and similarities between methods of transport there, and at home.

Personal means of transport are restricted mainly to bicycles and motor cycles—these latter are enjoying a growing popularity. Because of the absence of privately owned motor cars, public transport in the cities of Hungary is in greater evidence than towns in Western Europe, every town and city having large fleets of buses and trams.

The Budapest trams are rather shabby and painted in dull greys and greens. They operate like trains, consisting of three or four carriages in the rush hour, and are jammed full of people, some hanging out of the doors! Under these conditions it seemed hardly possible for the conductors to collect the fares. A number of these trams are driven by women.

1



2

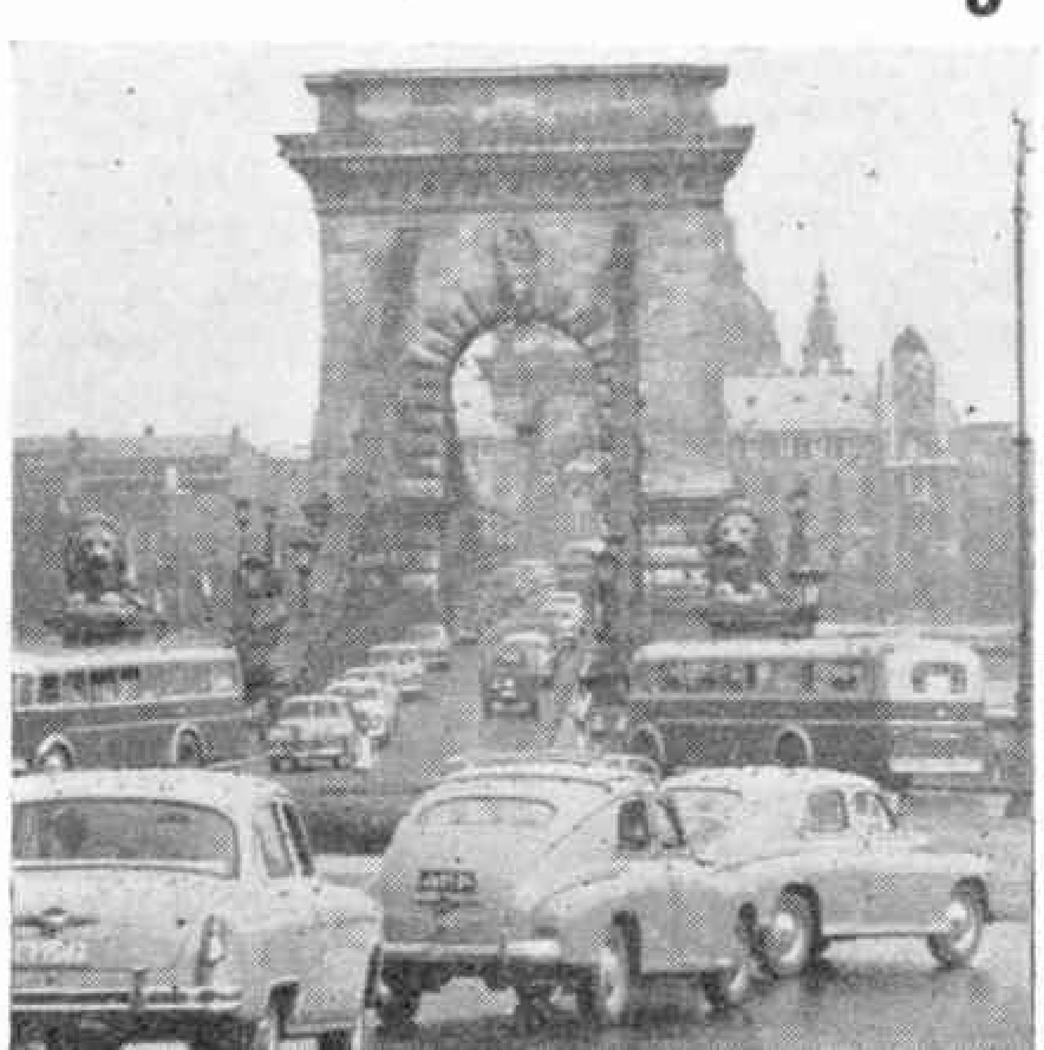
There are lots of buses, too. Some interesting ones have concertina middles to obtain extra length and seating accommodation without seriously affecting their ability to corner. Others are in two parts, a front motive part and a rear trailer. Like the trams, they are all single deckers. Taxis are everywhere, all the same model and made in Russia, but they look rather like our own Standard Vanguard with a very ugly bonnet and rear, and all in dull drab colours.

Roads are generally very poor, especially in the towns. They are in the main, very narrow, and we met some terrible surfaces. Many of them are cobbled, and one day we actually saw cobbles being laid, a very slow and tedious job. Often one would get stuck behind an old farm cart on a narrow road, unable to pass.

This brings me to farming, which is one of the main Hungarian industries: there are, therefore, lots of farm vehicles. We came across little wooden farm carts that look as if they would collapse with very little weight, let alone the great loads they carry. They were pulled by pairs of horses, donkeys, but, nicest of all, oxen — gleaming white ones and chestnut brown. The drivers, usually old men with hats, chewed straw and gave a friendly smile and wave as we passed by. There is very little farm mechanisation, maybe this will come later, who knows?

Railway engines are very well cared for, all the paintwork looking very smart, quite different from the trams! The brasswork was polished and shone very brightly. They are mostly large 4-8-0 steamers with large black blinkers and huge buffers, their whistles are very strident and shrill. Watching these trains come thundering down the track hooting away, you could imagine you were back in the days of the Wild West!

3

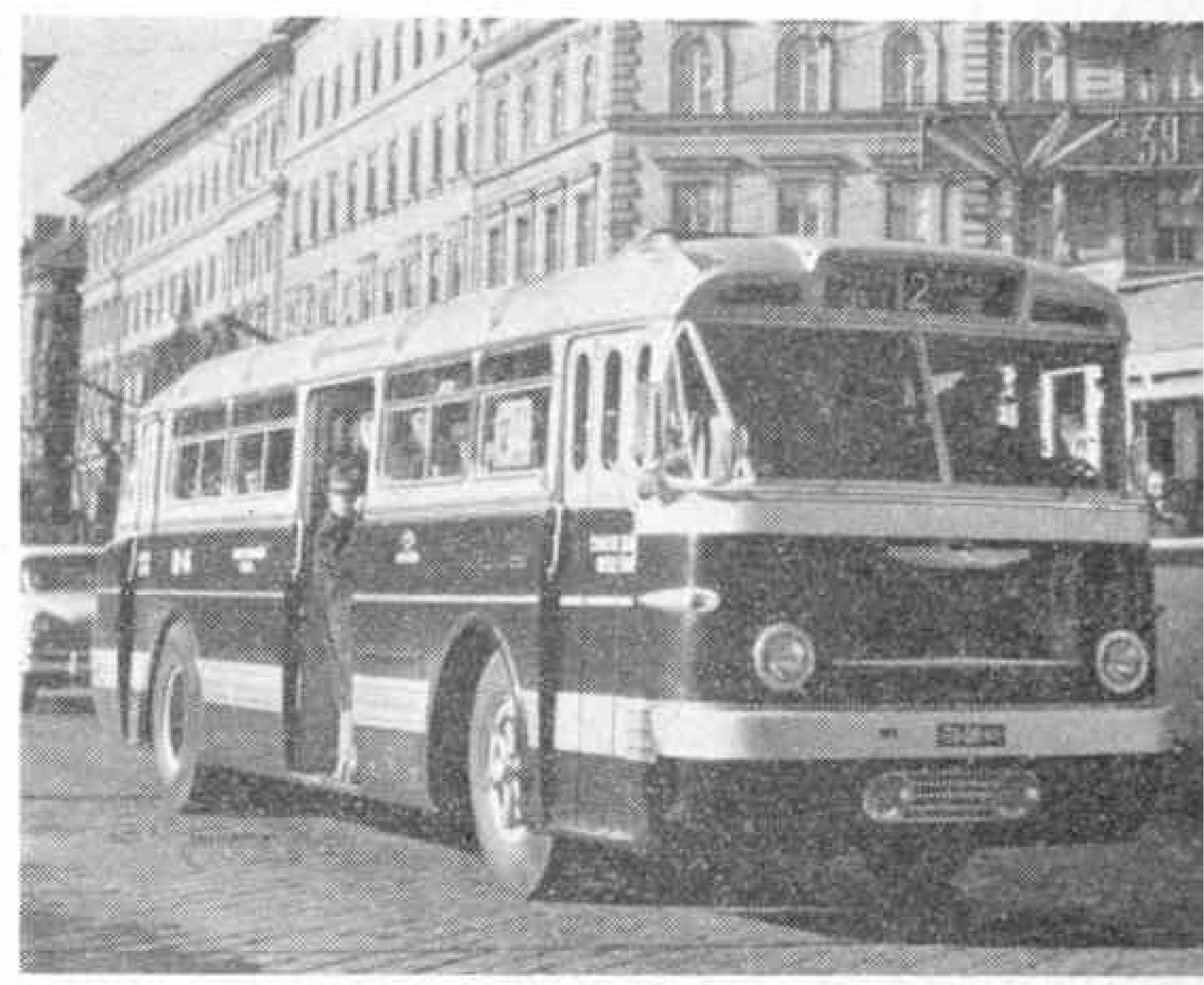


The level crossings are just booms, some being raised and lowered automatically, others had to be wound by hand. Unlike our own, hardly any of the track mileage was fenced off. The goods trains usually hauled some 40-50 loaded trucks, physically larger than our own, at a good speed, and we were held up at level crossings so many times that I could not possibly count them. The diesels were smart and clean, looking very fast, they were nearly all green and white, very streamlined with the cab some distance from the ground. The majority of goods were moved by rail, and all through the night trains could be heard whistling and screeching over the tracks.

The River Danube is an important part of Hungary's transport system, large fleets of barges can be seen carrying coal and other bulk goods on this great river.

I enjoyed my stay in Hungary very much and I hope this letter will give you a general impression of the transport situation in this interesting country behind the Iron Curtain.

4



5

1 *Night in Moscow Square—Budapest's busiest tram junction*

2 *The Vienna—Budapest express with its 'ground level' doors*

3 *One of the 'Vanguard-like' taxis and the famous chain bridge*

4 *A crowded 'Ikarus' bus. Notice the cobbled road surface*

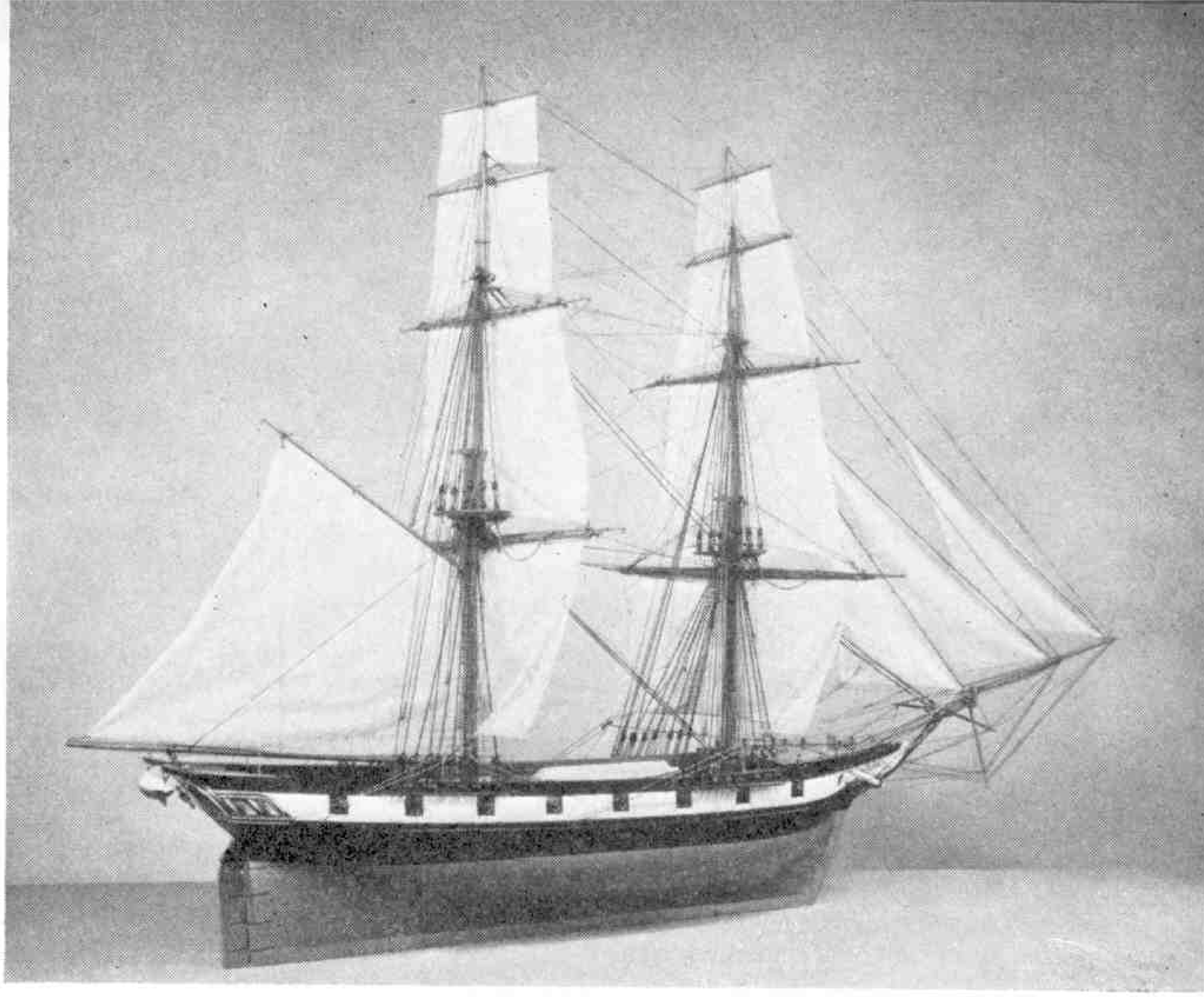
5 *Commercial activity and barges at Csepel Port on the Danube*

SHIPLANS

NO. 1

THE TRAINING BRIG

by Ian R. Stair



This fine model of H.M. brig "Fantome" (1839) can be seen in the Science Museum London. (Science Museum negative No. 27120) A photograph showing the deck fittings is also available from the museum (negative No. 3420)

This is the first of a new series of drawings and articles featuring interesting seagoing craft of all types. The fine drawings will build up into a wonderful collection and they can also be used by ship modellers as working drawings. If you like the idea, write a postcard to the Editor and let him know what types you would like to see dealt with in forthcoming issues.

THE training brig's chief claim to posterity is due to its being the last type of sailing ship to be used by the Royal Navy. Even without this distinction, the beauty of the two tall square rigged masts rising over the black and white hull would endear the type to all ship lovers.

Brigs were used by the Navy from early in the 18th century, but the first true brig to be built as a warship was the 'Alert' in 1775, designed by Sir John Williams.

In the early 19th century the frigates which had been the Navy's jack-of-all-trades had become quite large warships and many odd duties performed by His Majesty's small ships fell to the sloops, brigs and cutters. Of these the brigs became increasingly popular and they were built in large numbers during the eighteen-thirties and forties.

These brigs were used for scouting and 'showing the flag' in all parts of the world. This is now referred to as 'gunboat diplomacy' and many stories could be written on the work they did in the suppression of the slave trade.

During 1844, an experimental squadron of brigs was formed, with vessels of different hull form. The results of this experiment could not have been of much use to the Navy as the days of the sailing warship were numbered.

In appearance these brigs were similar to the accompanying drawings except that they would not be fitted with davits and boats at the sides.

In 1846 the iron brig 'Recruit' of 12 guns was built at Blackwall, London, and this had the distinction of being the only sailing vessel built of iron for the British Navy.

As the Navy became a fleet of steam ships, the larger sailing warships disappeared, but a number of the brigs carried on as training ships and it is in this role that they are chiefly remembered today. Their tall masts were a familiar sight in Plymouth Sound and around other naval ports until the early years of the present century.

The Model

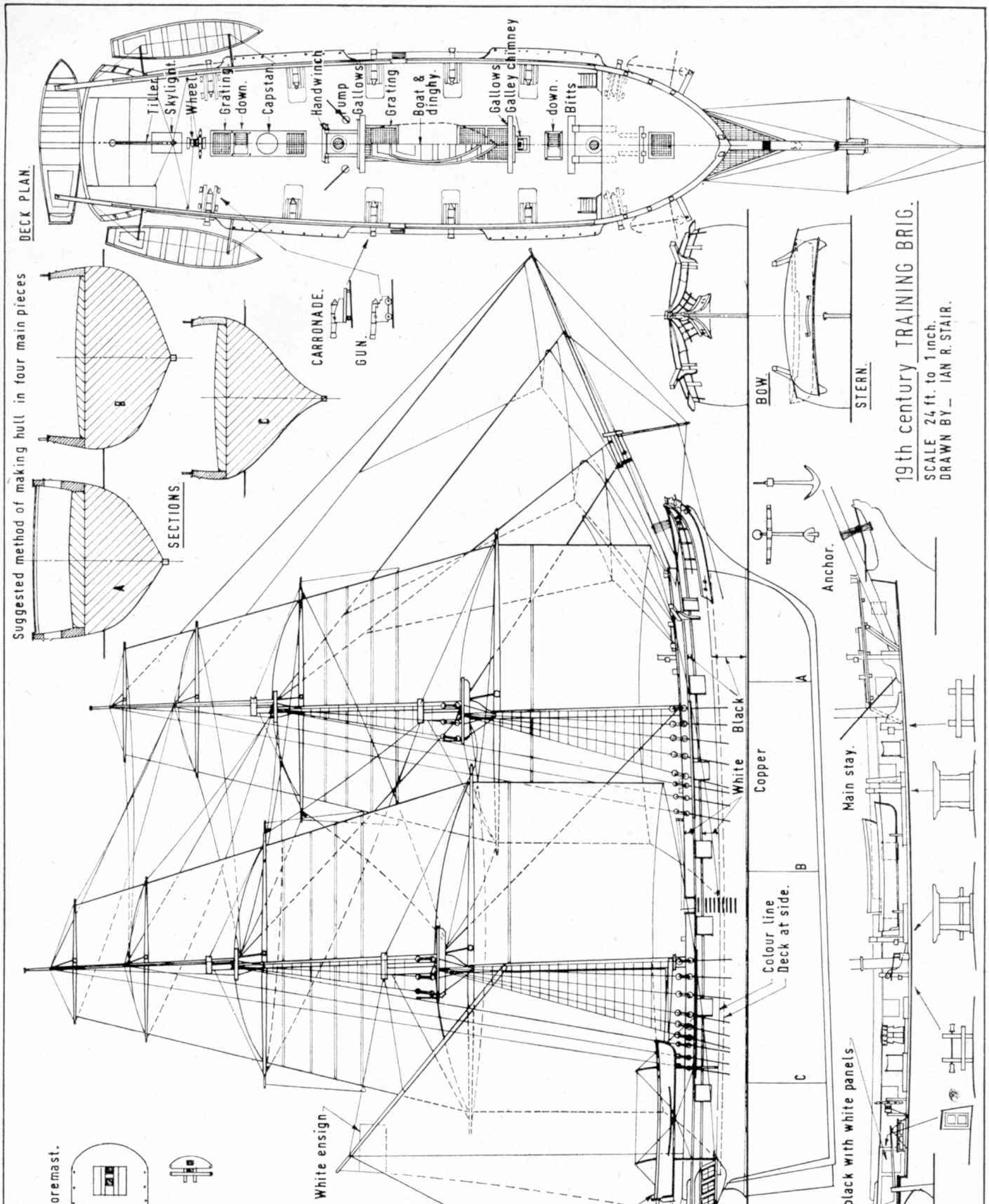
The lofty rigs made the brigs very 'tender' vessels to handle and the crew had to be very alert in squally weather to prevent disaster. If you make a scenic model, mount it on a fairly calm sea, or only set the topsails and topgallant sails, plus the headsails and gaft sail.

The drawings show a typical training brig at the turn of the century. The rigging has been greatly simplified to avoid confusion for those wishing to make a small display model.

Compared to most models of this type the brig presents few problems, the main one being the deep bulwarks. I suggest the hull be made in four main pieces as shown in the sections:—Hull, deck and the two bulwarks; the fitting of the last two to the deck piece must be carefully done. This method also enables the deck and insides to be finished before assembly. After the glue is firmly set, the outside is finally rubbed down. The deck fittings are all quite simple, but make sure the main stay is securely fixed to the deck before fitting the forecastle deck, as it will not be possible to do so afterwards.

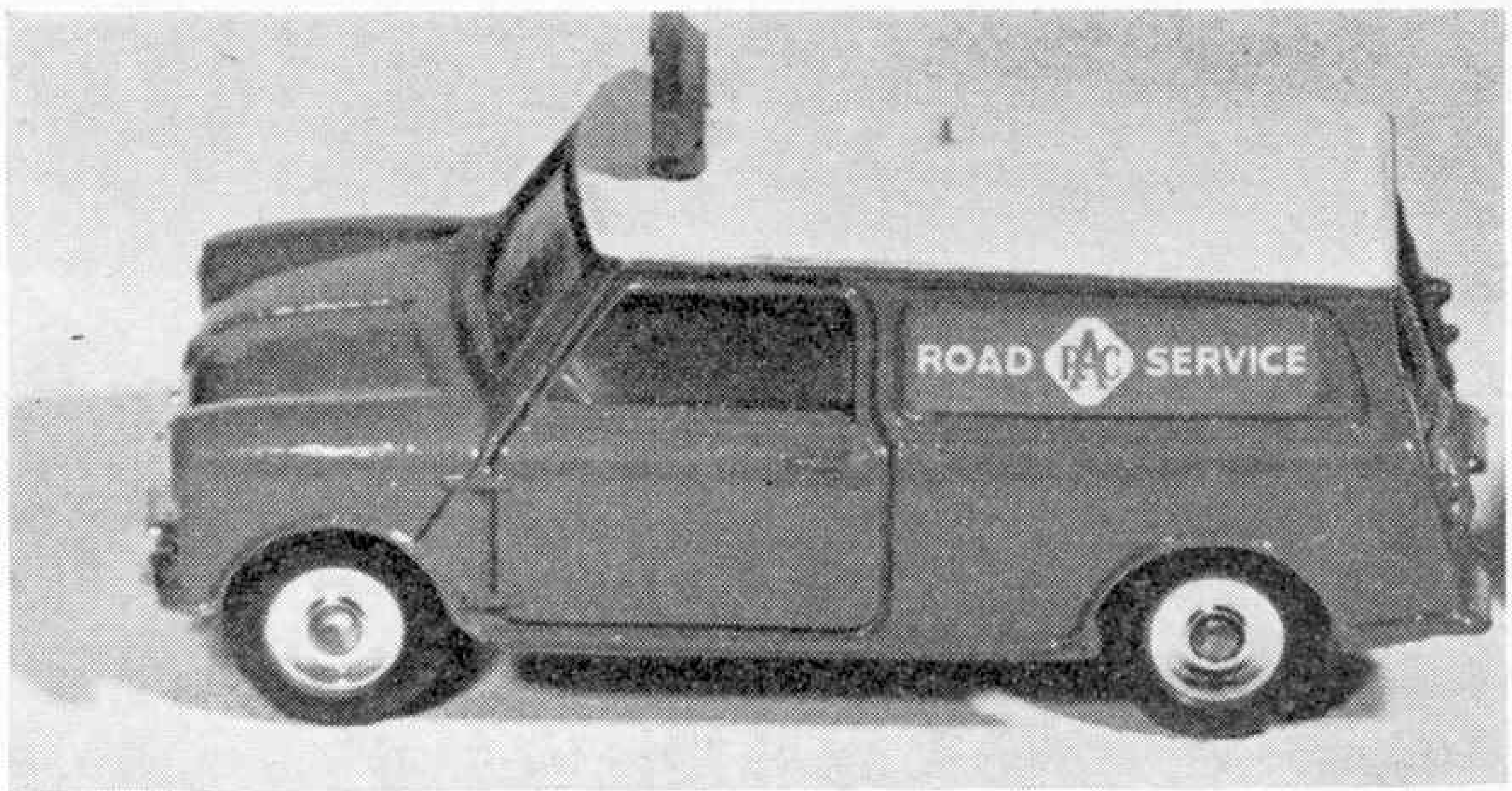
The choice of wood you use depends a lot on the tools available, but if you have a coping saw, a ¼ inch chisel and heavy model maker's knife, I would recommend a close grained wood. A joinery timber now in common use is Parana Pine; this is not too hard to work, and it takes a good finish. Balsa and obechi need too much work in grain filling to obtain a really good finish for small scale work.

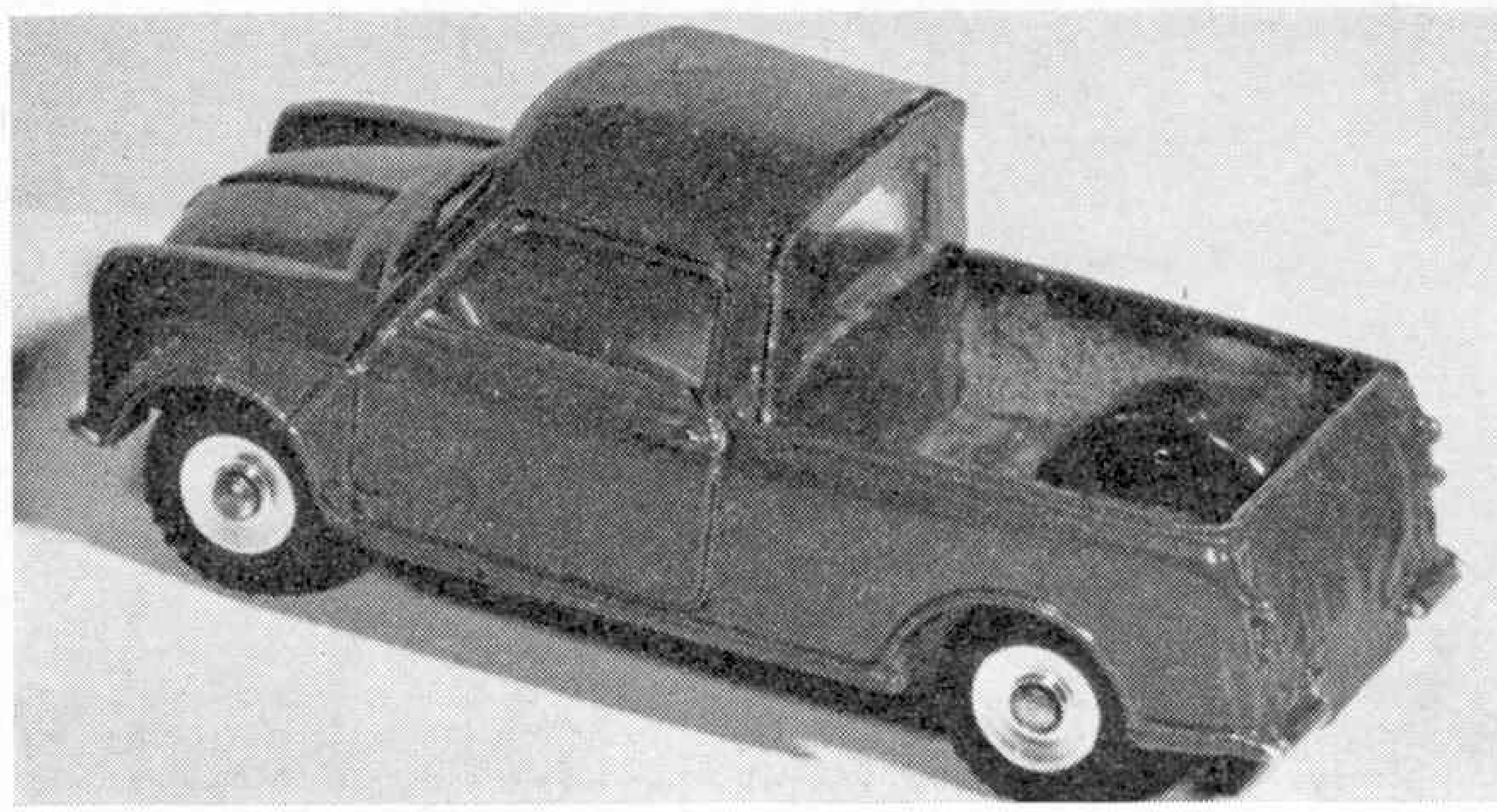
Colours not mentioned on the drawing are: inside bulwarks—yellow ochre; guns, bitts, gallows, capstan and yards—black. Masts, deck and other deck fittings, including gun carriages—natural wood. Ship's boats—white with black rubbing strakes.


DECK PLAN.
Tiller
Skylight.
Wheel
Grating
down.
Capstan
Handwinch
Pump
Gallows
Grating
Boat & dinghy.
Gallows
Galley chimney
down.
Bitts
Suggested method of making hull in four main pieces
A
B
C
SECTIONS.
CARRONADE.
GUN.
BOW.
STERN.
19th century TRAINING BRIG.
SCALE 24 ft. to 1 inch.
DRAWN BY_ IAN R. STAIR.
Anchor.
Main stay.
Black
White
Copper
Colour line
Deck at side.
White ensign
Cabins black with white panels
TOPS
Mainmast. Foremast.
NOTE
These boats were not carried on the earlier gun brigs.
SIDE VIEW.
DECK FITTINGS.

Chris Jelley

SHORT BACK AND SIDES





OF all the world's motor manufacturers, the British Motor Corporation produces one of the widest range of vehicles anywhere. Dozens of models are in current production, ranging from luxury limousines such as the Austin Princess, to the huge trucks like the Morris 3-tonner, but perhaps the most famous type of all is the little B.M.C. Mini. The basic Mini design is available in several different versions, from the standard Mini-car to the Mini Moke, and including other examples such as the Van, Countryman, Cooper and Pick-up. Meccano Limited, in their Dinky Toy range, produce models of both the Mini Van and the Countryman, but none of the others, as yet. With a few tools and a little modelling material, however, it is possible for you to increase your range of model Minis yourself by converting the standard Dinky A.A. or R.A.C. Patrol Van into a Mini Pick-up. For this article I used the R.A.C. version.

The essential tools required are a hacksaw or a razor saw, a modelling knife, a small file and a hand brace and bit; a soldering iron is also useful but not essential. Materials needed are a sheet of 30 thou. plastic (Plastikard) and a small tin of cellulose stopper, both obtainable from most model suppliers. Also a plastic solvent and a contact adhesive, such as Bostik 1 or Evostik. When working on the model with the file or saw, it is advisable to use a vice, although we have not done so for illustration purposes.

Begin work by first removing the head board and then the base of the model, using a $\frac{3}{16}$ in. drill in the hand brace for the latter operation. All that needs to be removed with the drill is the 'turned-over' end of the spigot that holds the base in position at its front end. Do not remove the floor attached to the base. Once this has been done, take the body casting and withdraw the seat and window mouldings, making sure that you do not damage them.

On the roof, there is a small raised portion which represents the actual vehicle's roof ventilator. Immediately in front of this ventilator, make a cut with the saw, and extend it vertically downwards to the lower indentation marking the edge of the side panels. If you are not using a vice during this part of the operation, you will find that a suitable block of wood can be used to hold the casting steady, as shown in picture A.

Now cut inwards from the rear along the lower edge of each side panel in turn until the vertical cut is reached (picture A) and remove the section of the body which is no longer needed. Clean up all cut edges with the file, using the window moulding as a guide. The rear edges of the cab should be flush with the back of the window moulding. Inside the casting you will find two raised areas, one each side, half-cylindrical in shape. These should be filed away (picture B), but remember to leave a 'lip' coinciding with that running the length of the body.

Before rebuilding can begin, the two holes in the roof, which held the head-board, must be filled in, using the cellulose stopper. Apply this with the modelling knife, but make sure that none protrudes inside the cab through the holes. Allow to dry hard and then smooth down with the file or with a piece of fine emery paper.

Re-building

Replace the window moulding, then add the seats and fit the base, which is where the soldering iron would come in useful. With the base in position a 'blob' of solder on the end of the spigot would hold it firmly in place. The cab back should now be cut out of the plastic sheet. When cutting, incidentally, it is only necessary to score the sheet with the knife and the section required can be broken off. Cut out a rectangle, the inside distance between the sides of the model in width, slightly more than the distance between the floor of the load platform and top of the cab in height. Make two notches in this to accommodate the 'lip' on each side, then place it in position. Mark round the upper half of the cab with a pencil, remove the plastic sheet and cut to shape, obtaining the final perfect shape with the file. Also cut out the rear window, which is shaped as shown in picture D, then glue the back in position, using the contact adhesive.

Although the model already has a floor, it is best to add another layer. From the plastic sheet cut a second rectangle, large enough to cover the entire load platform. Cut out spaces for the wheel arches and fix in place with the plastic solvent.

All that now remains to be added is the tailgate which is rather an unusual shape. If you look at the back of the model, you will see that, instead of a single rear bumper, there are two small bumpers which protrude slightly, and also the distance between the sides is less at the top than at the bottom. To obtain the tailgate, therefore, cut out a sheet of plastic, the bottom distance between the sides in width and with a short 'tail' the width of the distance between the bumpers. Now taper the sides of the tailgate until it fits snugly between the sides of the model and fix in place with both contact adhesive and plastic solvent, using the latter where the tailgate touches the floor of the load platform.

This completes the alteration, but the model should, of course, be repainted. For this, we recommend any of the Humbrol range of plastic enamels which can be purchased from all dealers in handicraft supplies.

Last word before finishing — I will again be describing the new Dinky Toy releases next month.

Answers to February Puzzle Page

Quick Quiz

1. The 2·9 mile long track at Silverstone.
2. 'Cello.
3. 13 triangles.
4. Chevron.
5. Holland.
6. Borzoi.

Tricky Teasers

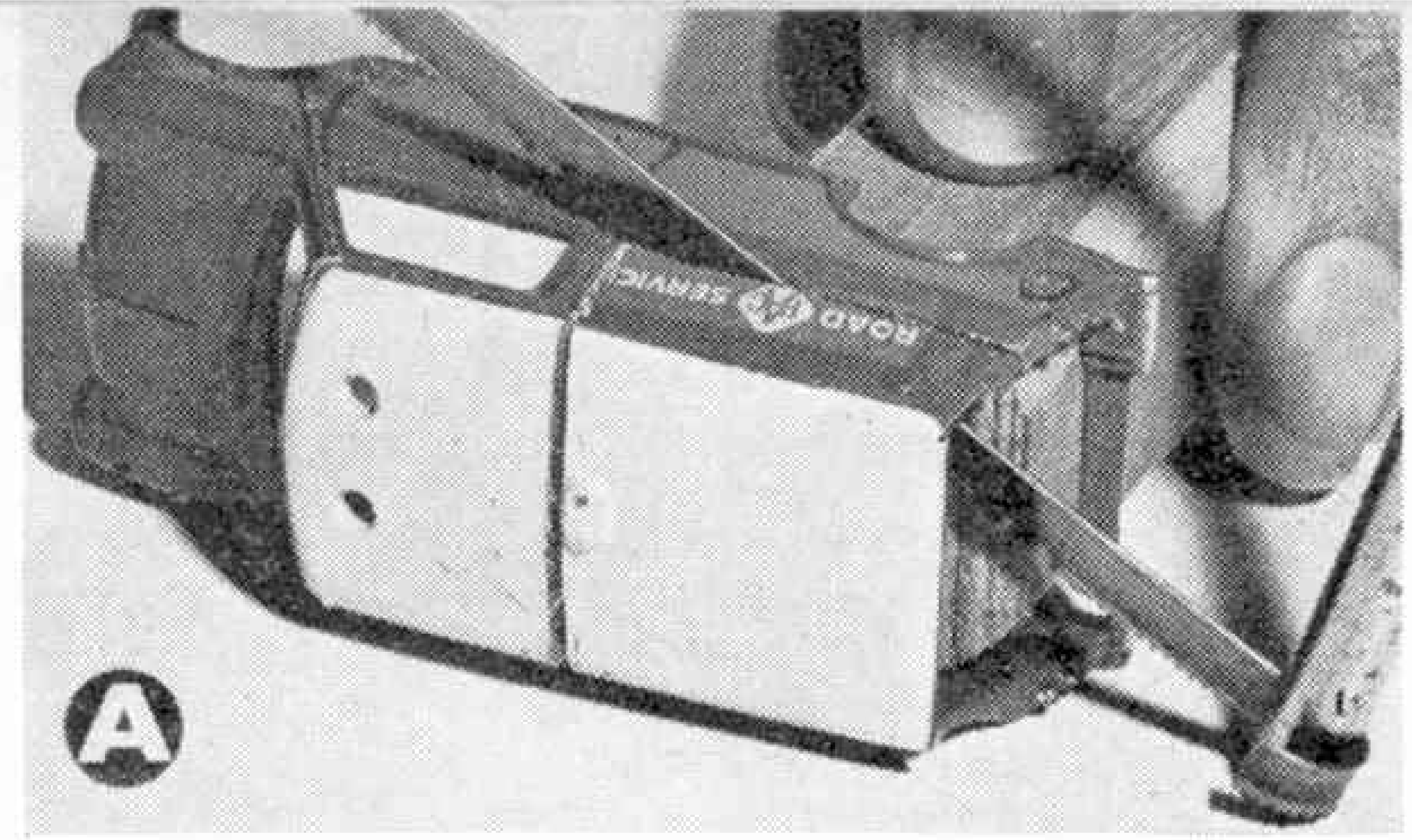
A. Honduras, Portugal, Scotland, Tasmania, Rhodesia, Colombia.

B. 840 days.

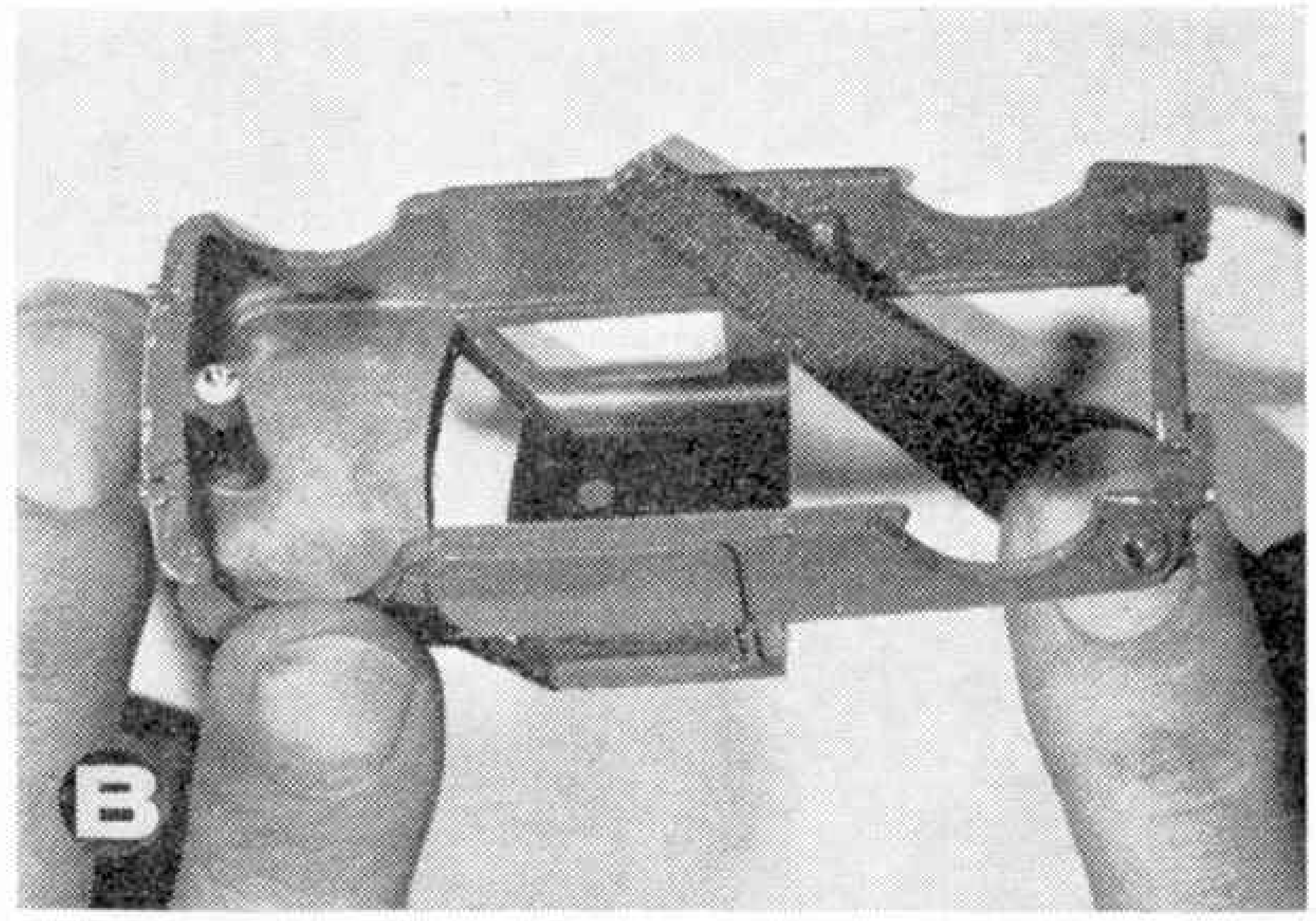
C. 1, President. 2, Resident. 3. Independent. 4, Prudent. 5, Impudent. 6, Student. 7. Accident. 8, Evident. 9, Confident.

Crossword Puzzle No. 12

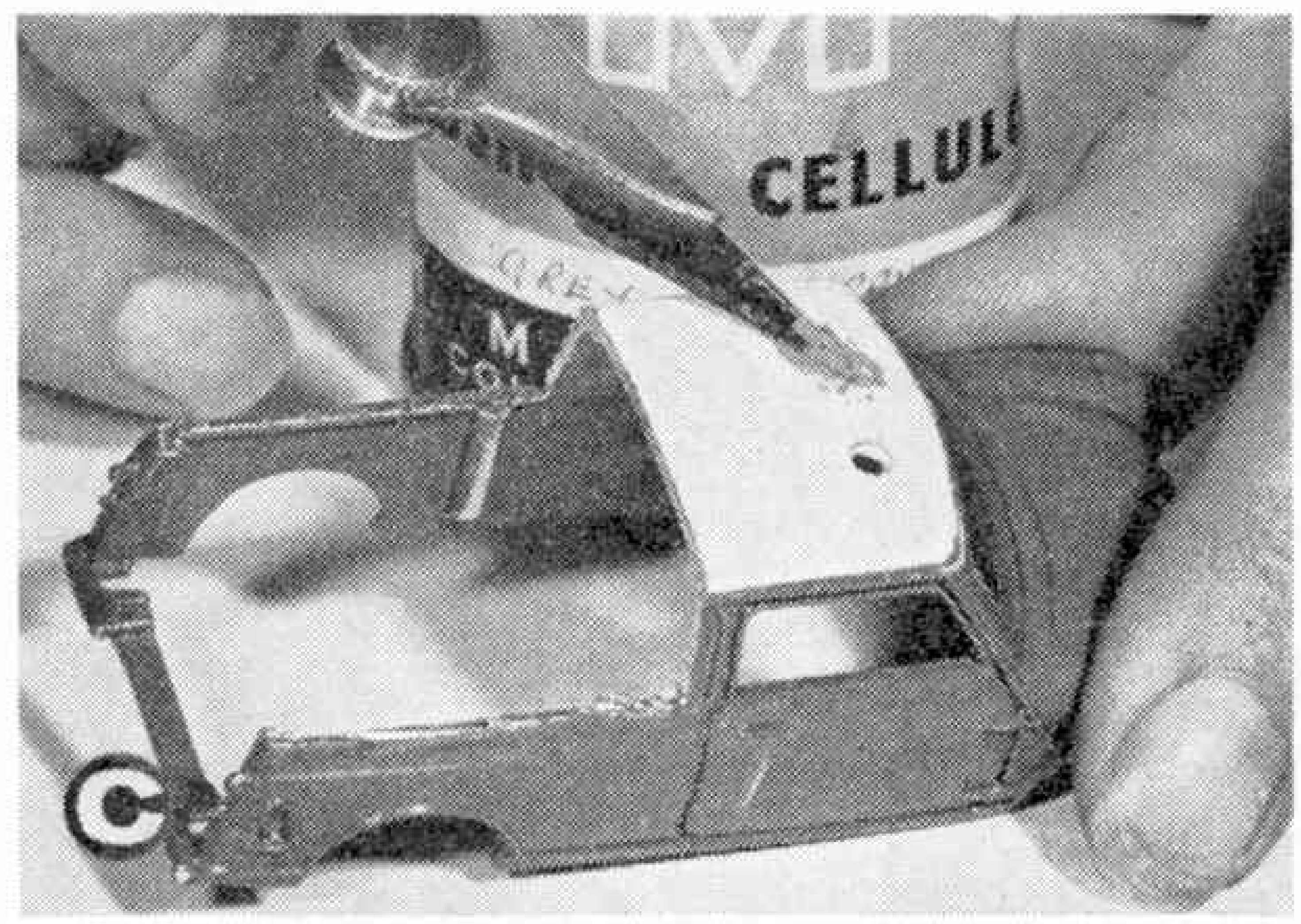
E	N	G	I	N	E	D	R	I	V	E	R
N	■	R	■	■	G	O	A	L	■	V	A
G	R	E	A	T	■	N	I	L	■	A	T
L	I	E	F	■	D	■	N	U	N	■	T
I	O	T	A	■	O	F	■	S	O	U	L
S	T	E	R	N	E	R	■	T	■	■	E
H	■	D	■	■	S	O	U	R	C	E	S
■	B	■	S	O	■	B	R	A	Z	E	N
A	R	E	A	■	M	I	N	T	■	N	A
S	U	R	T	E	E	S	■	I	E	■	K
I	T	A	■	A	A	H	■	O	■	■	E
A	A	■	■	S	■	E	R	N	A	■	■
■	L	A	N	T	E	R	N	■	B	A	G



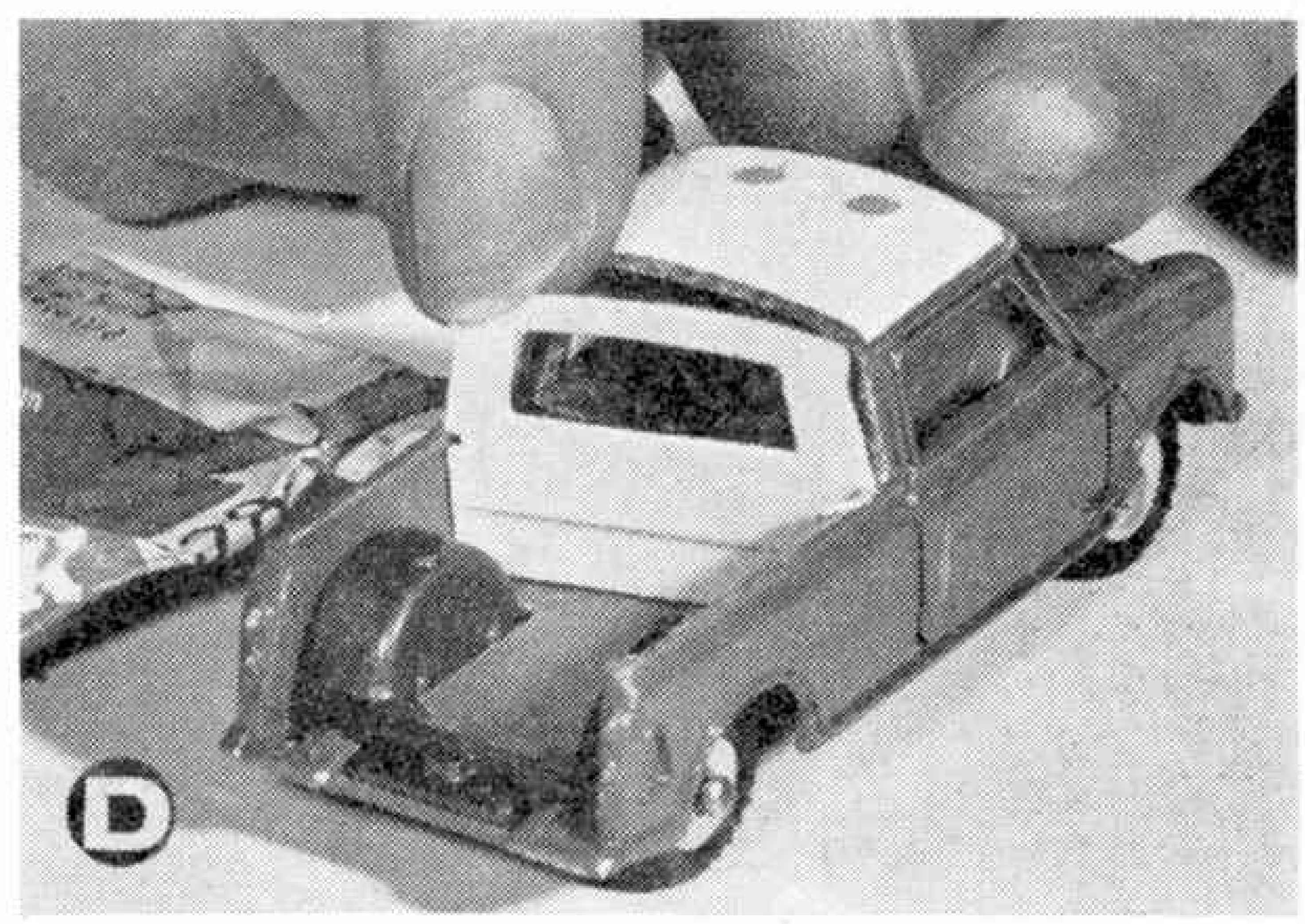
A First step in turning a BMC Mini Van into a pick-up version. The base headboard and window and seat mouldings having been removed, the upper rear section of the body casting is cut away. If a vice is not available, a suitable block of wood can be used to hold the casting steady



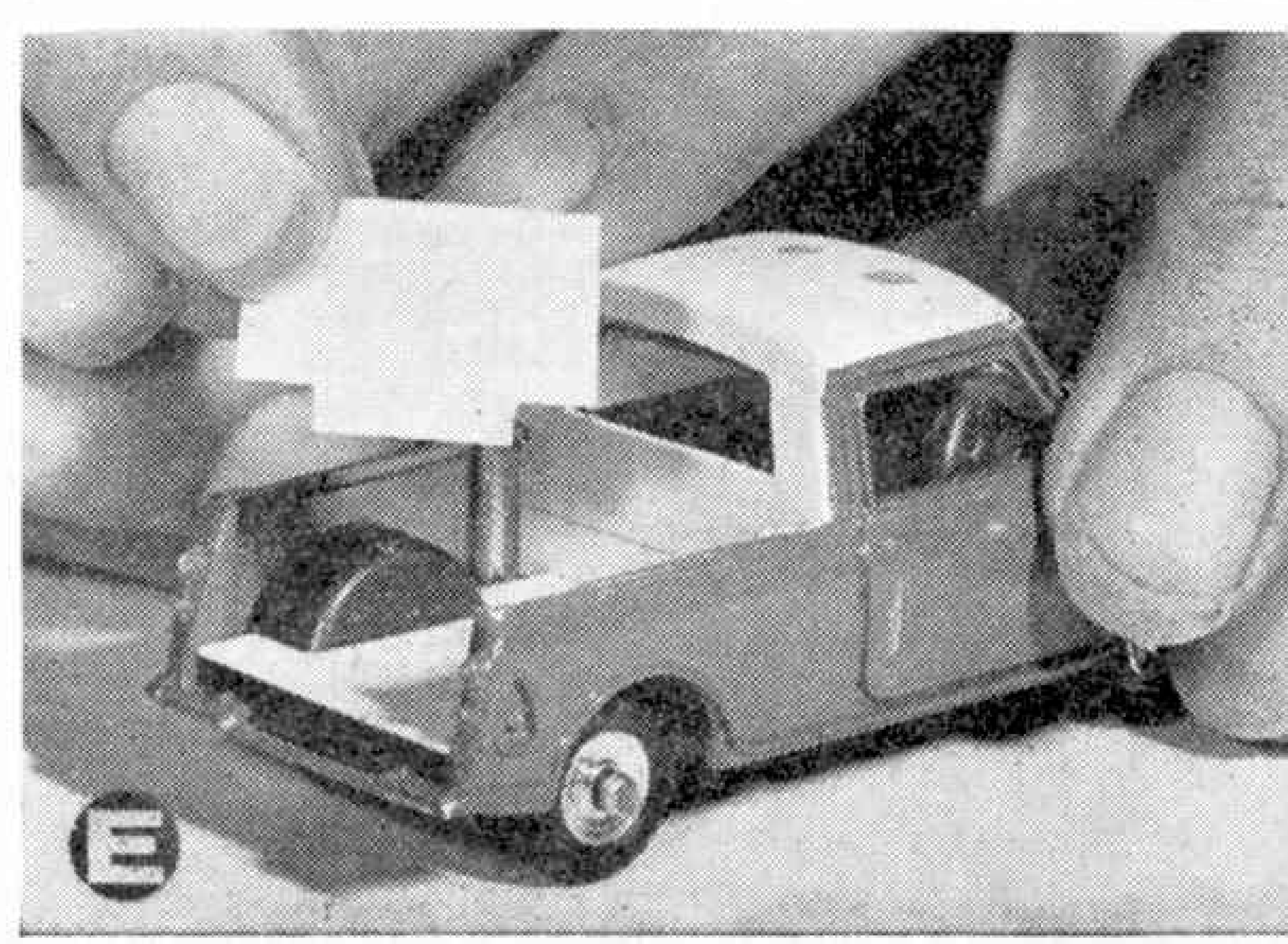
B After removing the upper rear section of the body, the edges are cleaned up with the file and the internal half cylinders removed



C Before rebuilding, the holes in the roof for the headboard are filled in with cellulose stopper. When dry, the stopper is smoothed with a file or fine emery paper



D A back for the cab is cut out of 30 thou plastic sheet and glued into position with contact adhesive

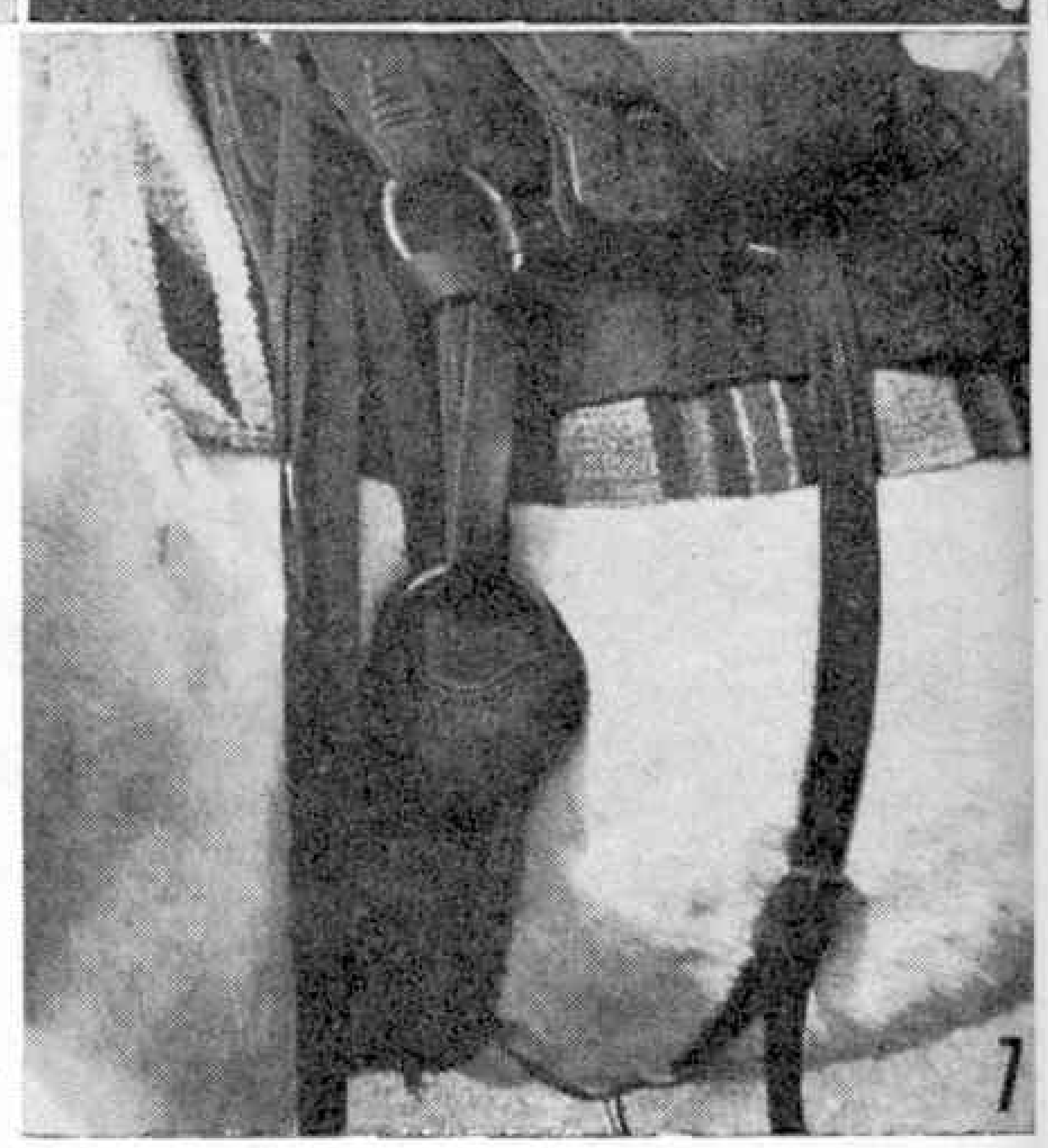


E A floor for the load platform and a tailgate are both cut from plastic sheet. The floor is fixed in position by plastic solvent and the tailgate by both plastic solvent and contact adhesive

By Doug Mitchell

You don't need to go to Texas to ride the trail or try your hand at roping. No Siree! You can do it right here in England. The Flying 'G' Ranch at Burley near Ringwood in Hampshire can offer pretty nearly everything you'd find on a dude ranch in the States.

HOME ON THE RANGE



1 Next to his pony, a cowboy's saddle is his most prized possession. This one is around 60 years old and must have seen many long hours on the range. The high cantle is there for comfort—almost like a chair back and, if you have a fresh bronc, you can jam your knees under the big 'swells' in front until he quits bucking.

2 A saddle is basically in two parts laced together by the saddle strings, usually three on each side. They are left long deliberately so that they can also be used to tie things to the saddle, like this slicker a Flying G guest has decided to take on a ride in case of rain. The metal discs through which the thongs pass are called conchos.

3 If you want to stay friends with a cowpoke, don't ask him to lend you his saddle! Every man on the range has his own especially made to fit him. Even the stirrup leathers—see how tough and strongly they're made—are his exact length and don't need buckles. Once they're right, they're laced up with rawhide thongs and stay that way.

4 Western stirrups aren't small iron things like the English-style rider uses, they're big, light, bent wood reinforced with metal. Where the leathers loop through the top, small straps called hobbles are buckled round to stop any chance of the stirrup twisting if you dismount fast. The broad flaps, called fenders, are attached to the leathers and are for leg comfort.

5 The best cinch (or cincha, to give it its correct name) is woven from mohair, like this one. It has an iron ring at each end to hold the saddle in place and is pulled up tight under your pony's body. For extra strength, this one has been made from 18 separate cords knotted in pairs round the ring.

6 Fixed to the saddle is a long, supple leather strap called the latigo. Unlike the English-style girth, there is no need for buckles. The latigo is passed twice through the cincha ring, pulled up tight so that the cincha grips your pony's barrel and, as the picture shows, is fastened by a simple hitch. A well fixed latigo never will slip.

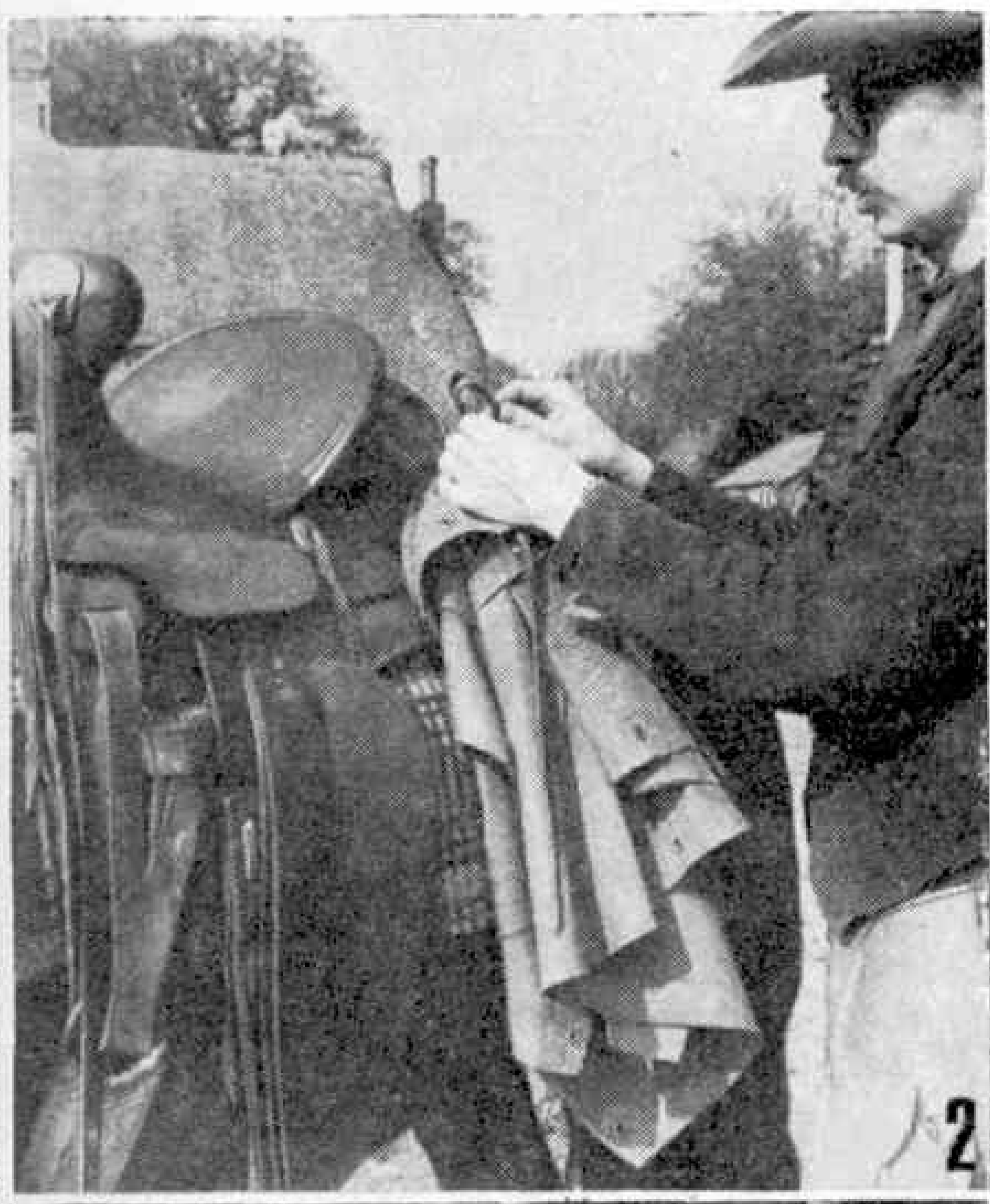
7 If there's branding to be done there's roping to be done. This calls for a 'Double-rig'. In addition to the cincha, a second leather latigo is fixed to another pair of rings at the rear of the saddle. This braces it when the lariat snaps out tight with a calf on the end. Here's where a buckle may be used for convenience sake.

Ex-BOAC Captain Leslie Gosling started his outfit four years ago with five ponies. Since then, riding Western has become so popular that he now runs a string of 17 horses and boards 10 guests in the bunkhouse. And don't imagine that you'd be one boy among a host of girls; at the Flying 'G' you get as many, if not more, boys than girls. If you go there on your own, you have to be twelve or over, but if you are with an adult there's no age limit. Beginners needn't worry, the wranglers who accompany each ride will soon teach you, and not on a lead rein in the paddock as in most English style schools—beginners go out in the forest with the rest of the bunch from the start.

Another advantage about Western style riding is that you don't need elaborate kit. A pair of jeans, a check shirt and a 'kerchief round the neck and you're all set to roam the 92,000 acres of the New Forest in real cowboy style — Captain Gosling might even be able to find a hat and boots to fit you.

The daily routine is usually a two-hour ride in the morning and another two hours in the afternoon. One day a week, usually on Wednesday, there's an all-day ride, meeting the chuck wagon somewhere for the midday meal.

Apart from getting to the Flying 'G' by car — an easy three hours from London—the ranch will meet guests at Brockenhurst Station by arrangement. The cost?—£18 a week all-in.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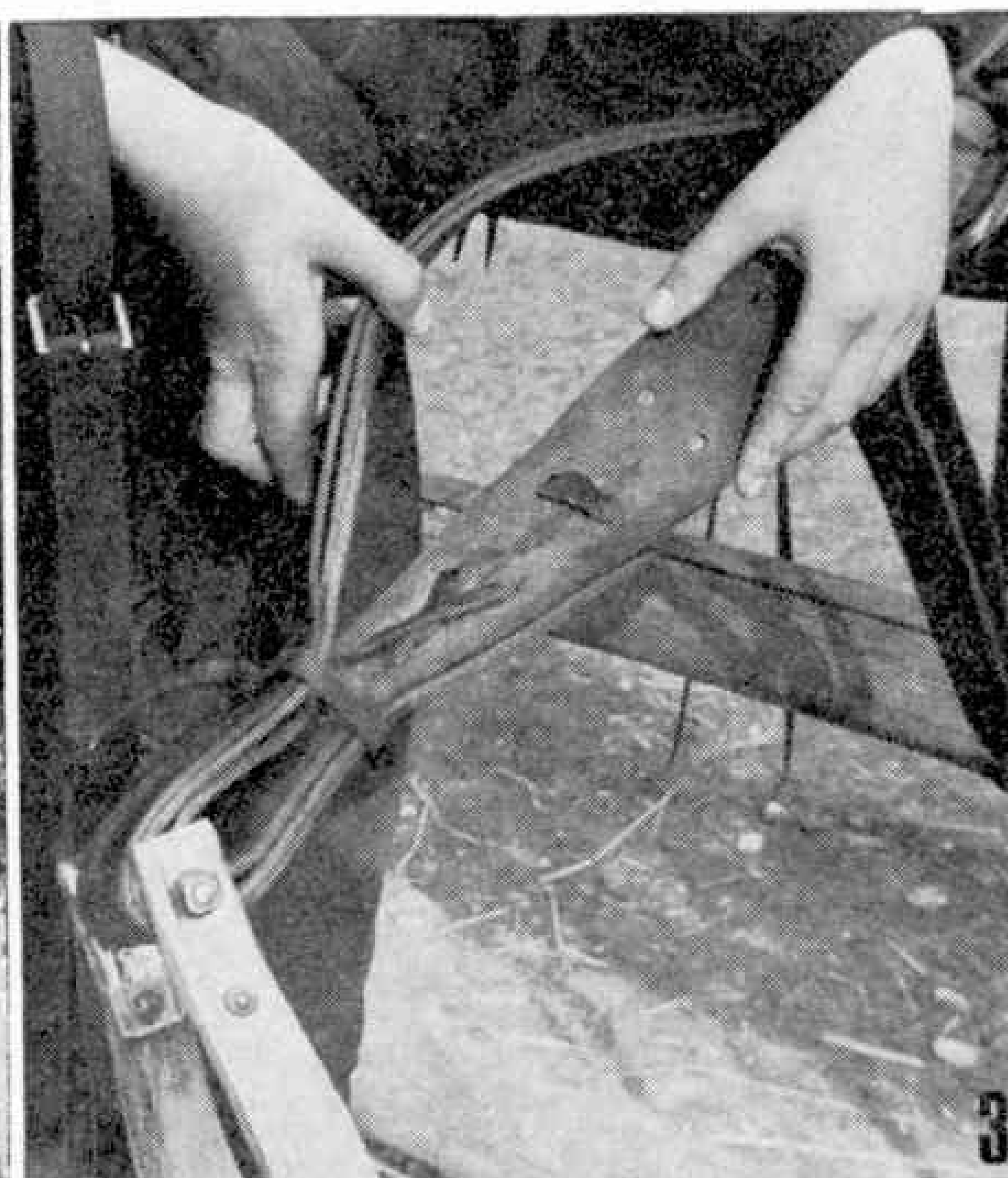
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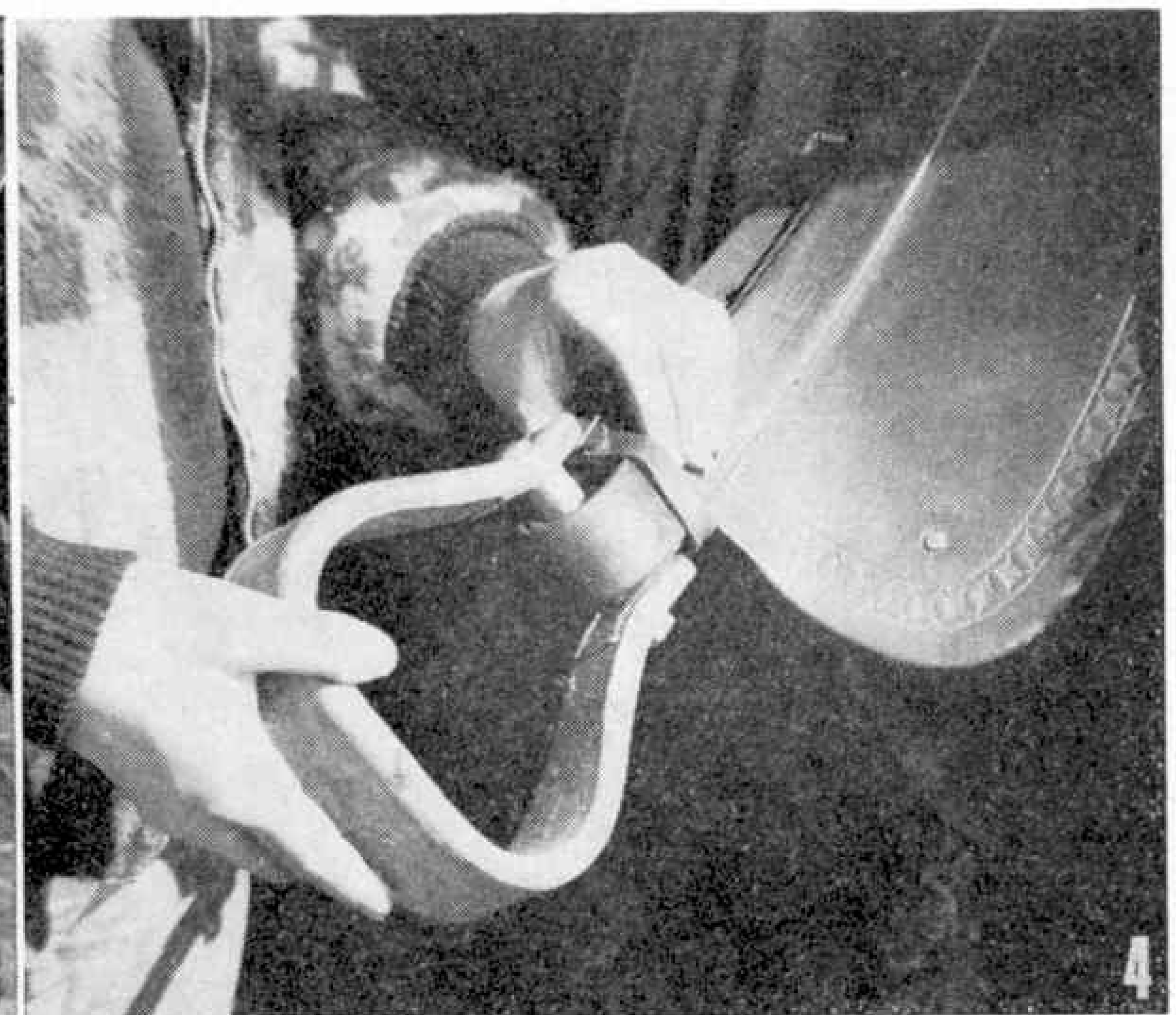
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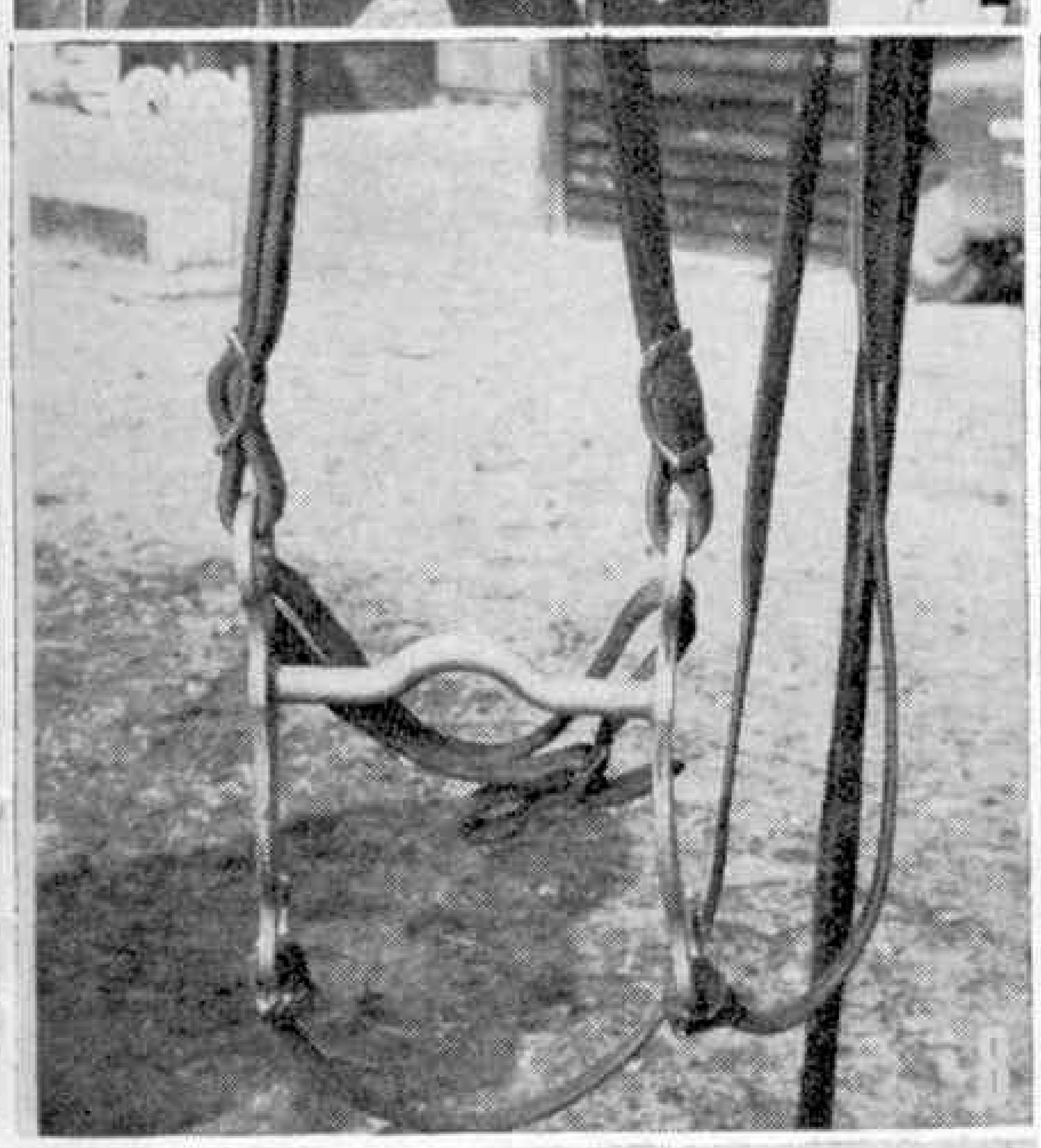
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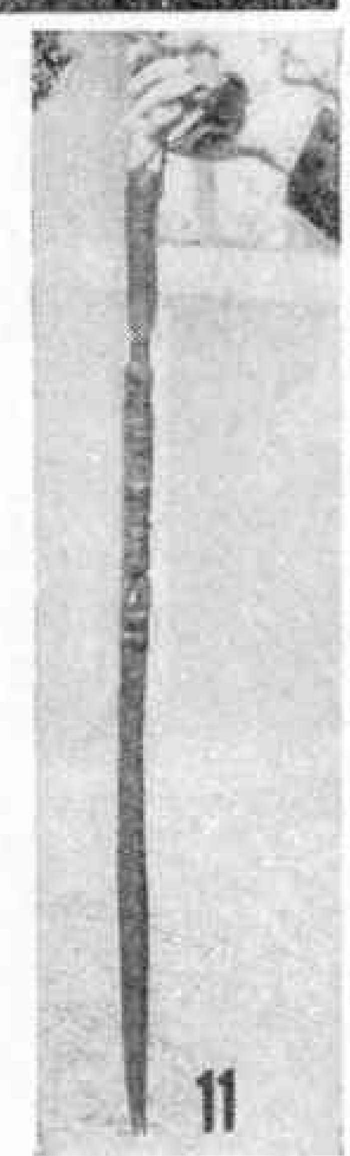

11


12

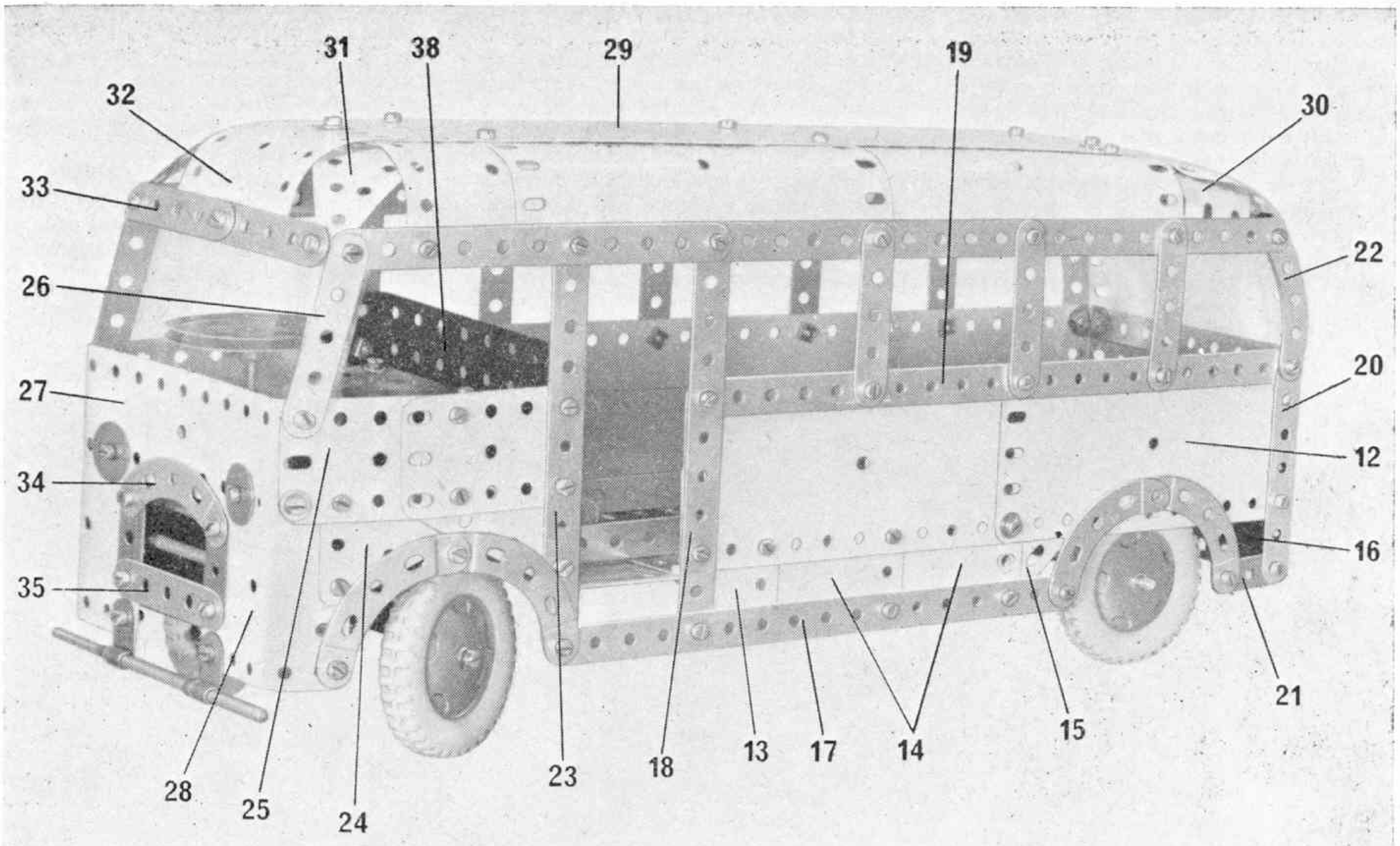
8 Modern cowpony bits are made from aluminium which is light, strong and never rusts. The old type were made of iron. It's a severe bit and the long arms to which the reins are fixed give enough leverage to hold a really keen bronc. At the same time, it needs a light hand not to ruin a well-trained horse with a sensitive mouth.

9 The Western bridle is a very simple arrangement holding the bit in place by the aid of, usually, only two straps. A short one passes under the pony's jaw while the other goes over the head. A single ear loop as here or, sometimes, a loop round both ears prevents the head strap from slipping forward. The reins consist of two separate unjoined straps.

10 Those high heels aren't just for appearance. If you have to brace your feet when roping a steer, they stop your boots from slipping through the big stirrups. Spurs as large as these need to be used very carefully. A feather touch is all most lazy ponies need to make them pick up their feet. The jingle reminds your horse that you're wearing them!

11 Like so many of the words which describe the cowboy's equipment, 'quirt' also comes from Spanish. This one is about 80 years old and has the handle loaded with lead shot. In the days when the West was Wild, the quirt was almost as much a weapon as a whip. The modern cowboy doesn't find so much use for it!

12 You'll most likely see more guns at the Flying G than on the Texas range. Not that cowboys don't have guns these days—they just don't carry them as often as they used. These hombres are not only pretty quick on the draw, they're all members of pistol clubs and first-class shots. And those guns are real.



build the no.7 bus

with spanner

A Number Seven outfit will, with only one extra part, enable you to assemble this realistic bus

MECCANO models of all kinds are attractive to the true Meccano enthusiast. While being interested in all models, however, even the most enthusiastic fan prefers a particular type. Road vehicles have perhaps the largest following or, at least, are the most frequently built, but one type of road vehicle which does not often appear in model form is the common bus, be it double decker or single decker. To fill the gap, therefore, here are full building instructions for a reasonably simple single deck bus that can be built with Outfit No. 7, plus one 2½ in. Stepped Curved Strip, Part No. 90a.

Chassis and steering

The main chassis members are provided by two 12½ in. Angle Girders 1, extended four holes at the front by a 3½ in. by 2½ in. Flanged Plate 2 and extended three holes at the rear by another 3½ in. by 2½ in. Flanged Plate 3. A 3½ in. by ½ in. Double Angle Strip 4 is bolted between Girders 1.

At the front, the bolt fixing each Girder 1 through its end hole, to the Flanged Plate also secures a 3½ in. Strip and a ½ in. Reversed Angle Bracket to the underside of the Flanged Plate. Bolted to the free lugs of these Reversed Angle Brackets is another 3½ in. Strip 5. A 1½ in. Rod 6 is journalled in each end hole of this Strip and the corresponding holes of the previously mentioned Strip, being held in place by a Crank and a Collar 7. Screwed into one tapped bore of Collar 7 is a ¾ in. Bolt, which carries a 2½ in. Road Wheel. This Road Wheel must be free to turn on the Bolt.

Lock-nutted through the end holes in the arms of the Cranks is a third 3½ in. Strip 8, at the same time lock-nutting a 3 in. Strip 9 in position, as shown. The other end of Strip 9 is lock-nutted to a Fishplate bolted to an eight-hole Bush Wheel, on a 4 in. Rod 10. This Rod is mounted in Flanged Plate 2 and in a Double Bent Strip bolted to the upper side of the Flanged Plate, Collars holding it in place. A 2 in. Pulley mounted on the top of the Rod acts as the steering wheel.

Bearings for the rear axle are provided by two Flat Trunnions bolted to the chassis members. A 5 in. Rod 11 is mounted in the apex holes of these Flat Trunnions, being held in place by Collars. Two 2½ in. Road Wheels are mounted on the Rod as shown.

Building the body

As already explained, the two sides of the model, while similar in design, are built up using different parts to a certain extent. I will deal first with the left-hand side.

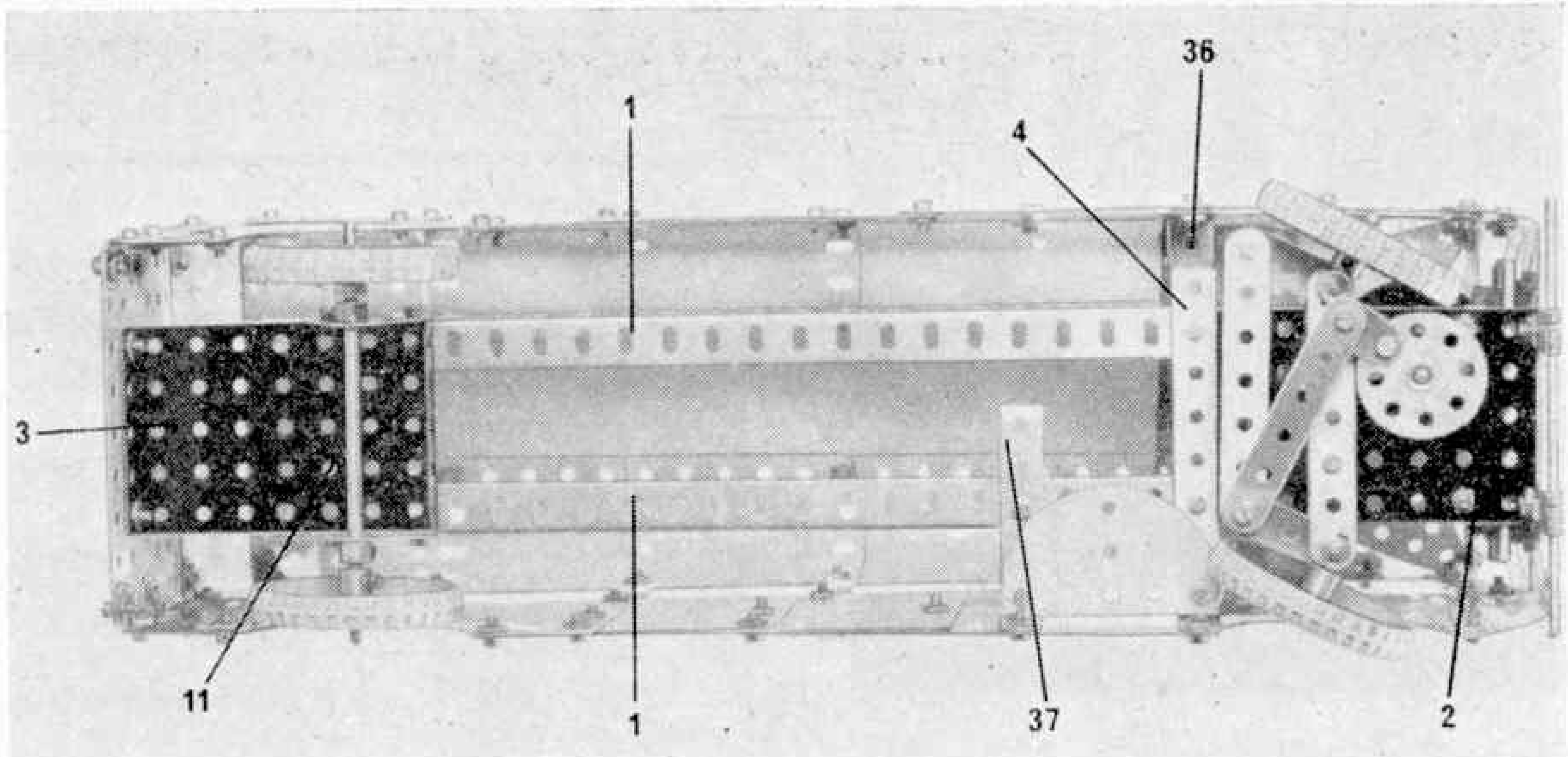
A compound 10½ in. by 2½ in. Flexible Plate 12, obtained from two 5½ in. by 2½ in. Flexible Plates, is extended downwards by a 2½ in. by 1½ in. Flexible Plate 13, two 2½ in. by 2½ in. Flexible Plates 14, a 2½ in. by 1½ in. Triangular Flexible Plate 15 and a 2½ in. by 1½ in. Plastic Plate 16. The Plates are then edged, as shown, by a compound 8½ in. Strip 17, built up from two 5½ in. Strips, a 5½ in.

Strip 18, a compound 10½ in. Strip 19, also built up from two 5½ in. Strips, a 3½ in. Strip 20, a 1½ in. Strip 21 and two 2½ in. Stepped Curved Strips. Three 2½ in. Strips and a 2½ in. Curved Strip 22 are bolted to compound strip 19 to represent window frames, then another 5½ in. Strip 23 is bolted to the front end of compound strip 17.

Attached to Strip 23 are a 2½ in. by 1½ in. Flexible Plate and a 2½ in. by 1½ in. Triangular Flexible Plate, both of which are extended respectively by two similar Plates 24 and 25. Also added are a 2½ in. Strip 26, a 5½ in. by 2½ in. Flexible Plate 27 and a 2½ in. by 2½ in. Flexible Plate 28, which will later be curved round to form part of the front of the model. Two 2½ in. Stepped Curved Strips are used to edge the wheel arch.

In the case of the right-hand side, a section at the forward end is built similarly to that described in the previous paragraph, but, as there is no door, the remainder of the side is filled in by a 12½ in. by 2½ in. Strip Plate extended downwards by two 4½ in. by 2½ in. Flexible Plates, overlapped one hole, and a 2½ in. by 1½ in. Plastic Plate. The complete arrangement is edged by suitable Strips as is the left-hand side, and 2½ in. Stepped Curved Strips are again used for the wheel arches. Four 2½ in. Strips and a 2½ in. Curved Strip are bolted to the top edge of the Strip Plate.

A 15 in. compound strip, obtained from a 12½ in. and a 5½ in. Strip can now be bolted to the top of Strips 22, 23 and 26, etc., at each side, but the roof must be added at the same time. The roof is built up from two shaped 12 in. by 2½ in. compound plates, joined by a 12½ in. Strip Plate 29. Each compound plate is comprised of a 2½ in. by 2½ in. and two 5½ in. by 2½ in. Flexible Plates. A 5½ in. by 1½ in. Flexible Plate 30 is added as also are another two 2½ in. by 2½ in. Flexible Plates, curved to shape and attached to Curved Strips 22 by Angle Brackets, at the same time securing a 4½ in. by 2½ in. Transparent Plastic Plate, edged by two 2½ in. Strips, in place. This Plate serves as the rear window and the rest of the back is filled in by two 4½ in. by 2½ in. Flat Plates, connected to the sides by Angle Brackets.



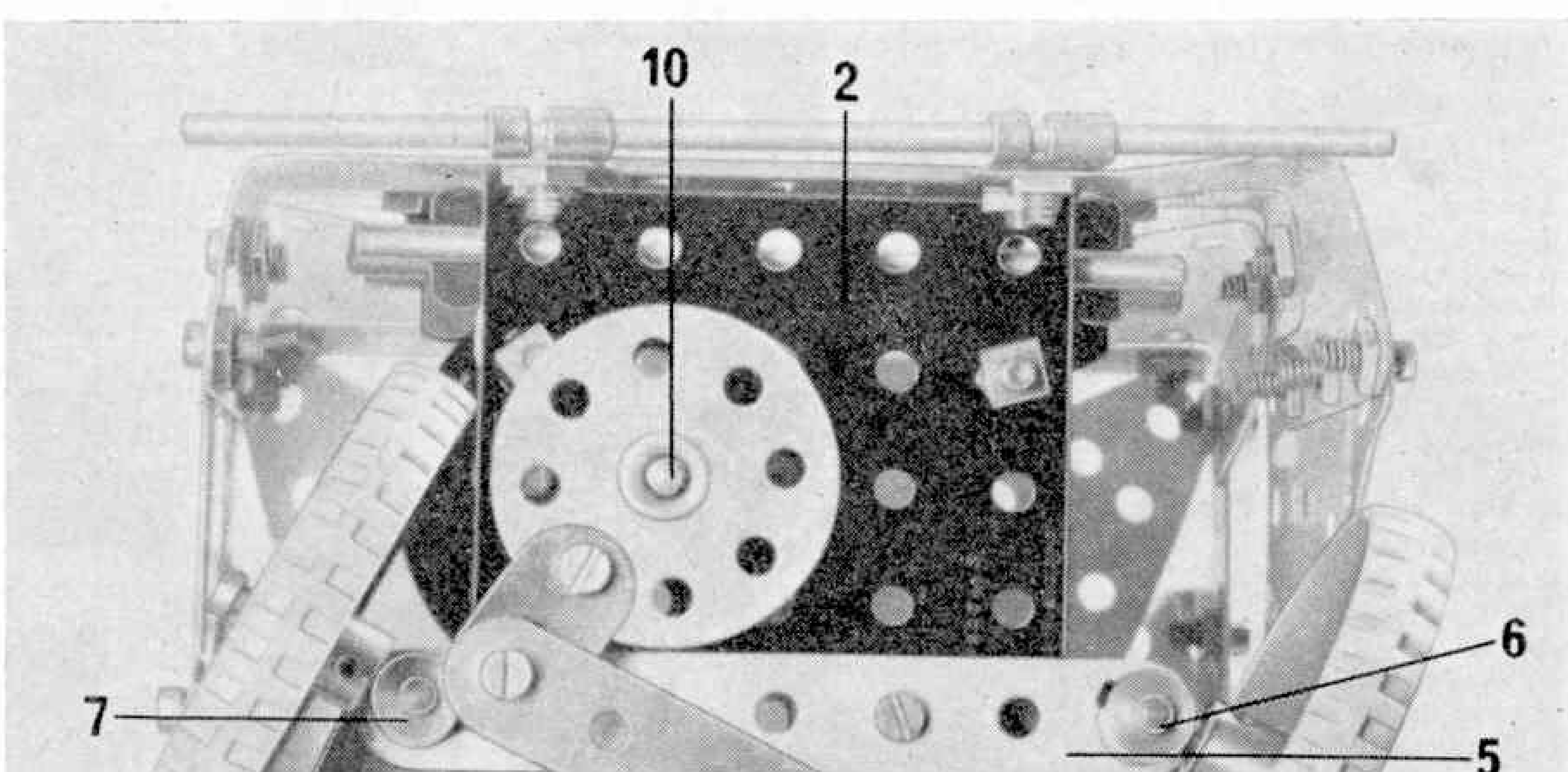
In this underneath view of the Bus the layout of the chassis is clearly shown

At the forward end of the roof two 2½ in. by 2 in. Triangular Flexible Plates 31 and a 2½ in. by 2½ in. Curved Plate 32 are fixed in position. Plates 27 and 28 can now be curved round and joined, at the same time adding a 5½ in. by 2½ in. Transparent Plastic Plate, edged by two 2½ in. Strips 33 to form the windscreen. The radiator-grill is represented by three 3½ in. Rods held in the flanges of a 2½ in. by 1½ in. Flanged Plate by Spring Clips. This Flanged Plate is actually fixed to Flanged Plate 2 of the chassis by Angle Brackets in such a position as to appear in the correct place when the body is mounted on the chassis. On the body itself, the radiator is surrounded by a 2½ in. Stepped Curved Strip 34, two 1½ in. Strips and a 2½ in. Strip 35. A 5 in. Rod, fixed to the body by two right-angled Rod and Strip Connectors, acts as the front bumper, while two ¾ in. Washers serve as headlamps.

It is now advisable to fit the body to the chassis, which is done by bolting Flanged Plate 3 to the lower Flat Plate at the back of the body, and by bolting Flanged Plate 2 to Flexible Plates 28 at the front. Double Angle Strip 4 is connected to the body sides by two Double Brackets 36, bolted one to each lug. Left-hand Angle Girder 1 is connected to the rear door pillar by a 2½ in. by 1½ in. Double Angle Strip 37. Bolted between this Double Angle Strip and the corresponding Double Bracket, fixed to Double Angle Strip 4, is a Semi-circular Plate that serves as a 'door-step'.

Finally, a seat is provided by a 2½ in. by 1½ in. Flexible Plate attached by Angle Brackets to a 3½ in. by 2½ in. Flanged Plate 38. This, in turn, is bolted to the right-hand side of the body.

A close-up view showing the steering mechanism



Parts Required

3 of No. 1	135 of No. 37a	2 of No. 126a
10 of No. 2	125 of No. 37b	4 of No. 187
6 of No. 3	14 of No. 38	6 of No. 188
1 of No. 4	2 of No. 38d	4 of No. 189
14 of No. 5	1 of No. 45	2 of No. 191
4 of No. 6a	1 of No. 48a	6 of No. 192
2 of No. 8	1 of No. 48b	1 of No. 193c
1 of No. 10	1 of No. 51	1 of No. 193e
2 of No. 11	3 of No. 53	2 of No. 194
12 of No. 12	2 of No. 53a	2 of No. 197
1 of No. 15	6 of No. 59	1 of No. 200
1 of No. 15b	2 of No. 62	1 of No. 214
3 of No. 16	2 of No. 90	4 of No. 221
2 of No. 18a	8 of No. 90a	2 of No. 222
1 of No. 20a	2 of No. 111	1 of No. 223
7 of No. 35	2 of No. 125	

FUN & GAMES

Turn to page 39 for the answers to this month's puzzles.
Answers to last month's puzzles appear on page 25.

Count-Down Snag

Ask someone to try to count from 10 to 5 backwards in ten seconds. Chances are, he'll fail. Try it yourself. Then see comment below. There's a catch to it, of course.

Remember to stress time limit when pulling this stunt on your friends.

Answer: To count from 10-5 backwards correctly you must start with five.

Trick is a Pushover

Try this at an outdoor party: Divide guests into teams. Pair up members of teams according to size. Rivals stand facing each other with toes touching. Palms of both hands also touch at the sides at chest level. At the word 'go' opponents push each others' hands until one is forced to step back. Players who force their opponents to step backward, are, of course, the winners, and new matches begin.

Tricky Teasers

A. Here is something fresh in problems. Just study the following three columns of figures:—

1 1 1
3 3 3
5 5 5
7 7 7
9 9 9

Now, can you cross out nine of the figures so that the total of the remaining figures amount to 1,111.

B. If there are 25 stations on a railway line, how many different tickets are required to connect every station with every other station? If you can work this out quickly you deserve to be top of the form.

Ask a friend to stand with his back to the wall and with his heels against the wall. Put a penny on the floor about two feet in front of him, and tell him that if he can pick up the penny without moving his heels from the wall, he may keep it.
Dont' worry, you will not lose your penny!
And here is another one for you to try.
Draw a line on the floor with a piece of chalk and then try this:
Keep your toes on the line, kneel down and get up again, keeping your arms folded all the time.
It sounds easy—but just try it for yourself!

Why is a watch like a river?
Because it will not run long without winding.

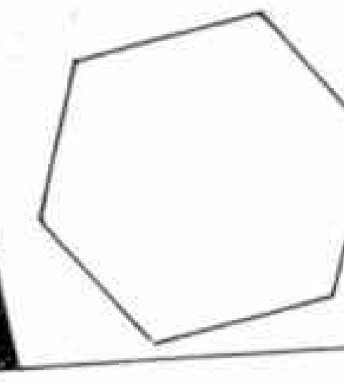
'I said I'd make you proud of me, Dad!'

Quick Quiz

❶ Which country has the greatest number of war vessels afloat?

SCORE 7

❷ What is this figure called—Heptagon, hexagon or pentagon?



SCORE 7

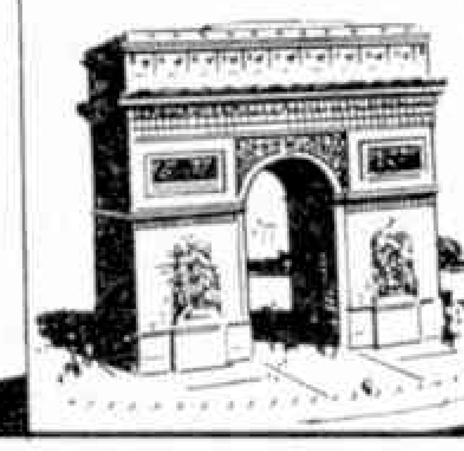
❸ Why do owls do all their flying at night?

SCORE 5

❹ Which is the smallest county in England?

SCORE 5

❺ Can you identify this famous building?

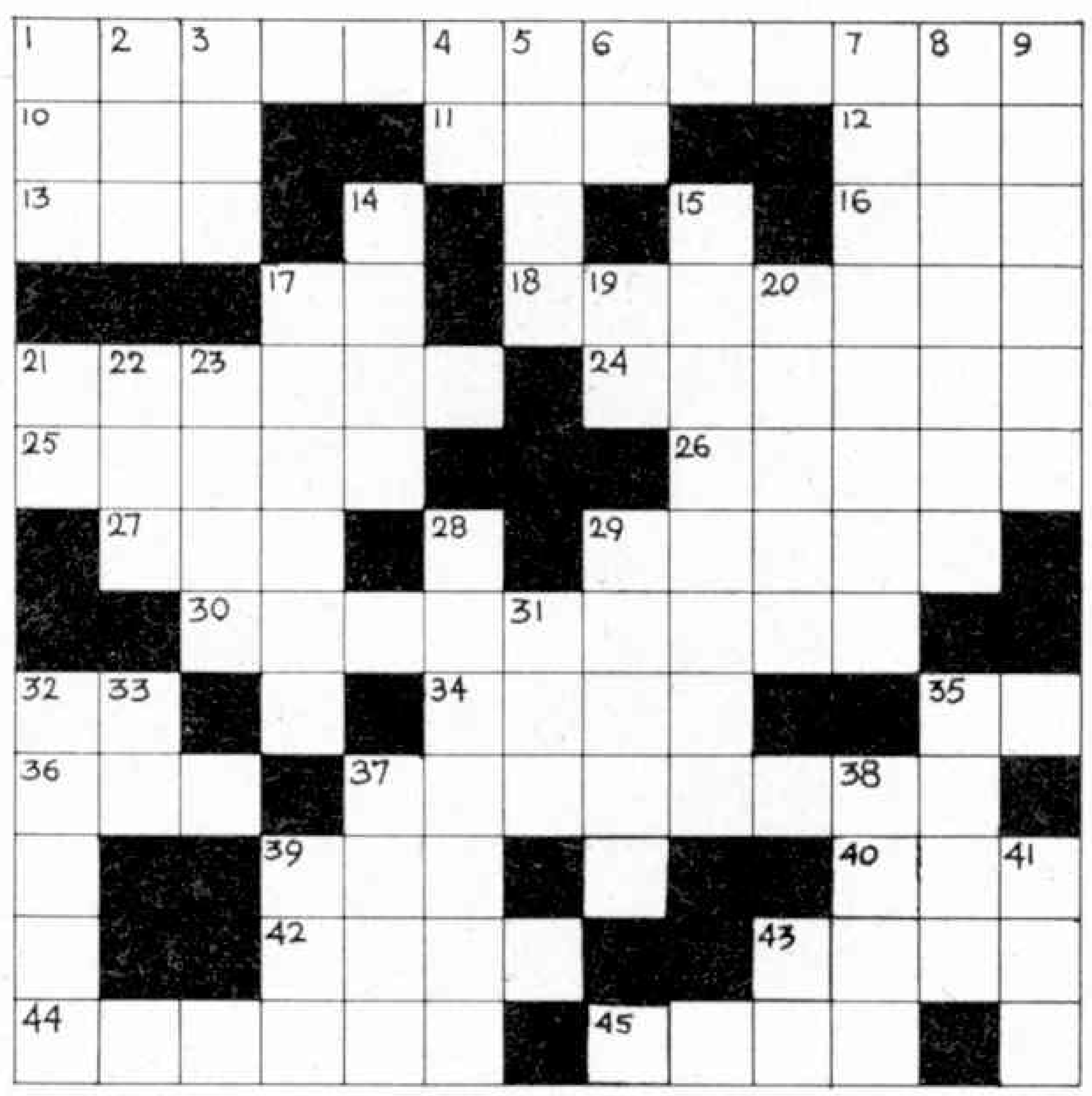


SCORE 6

❻ Is this the Victoria Cross, Distinguished Conduct Medal or the D.S.O.?

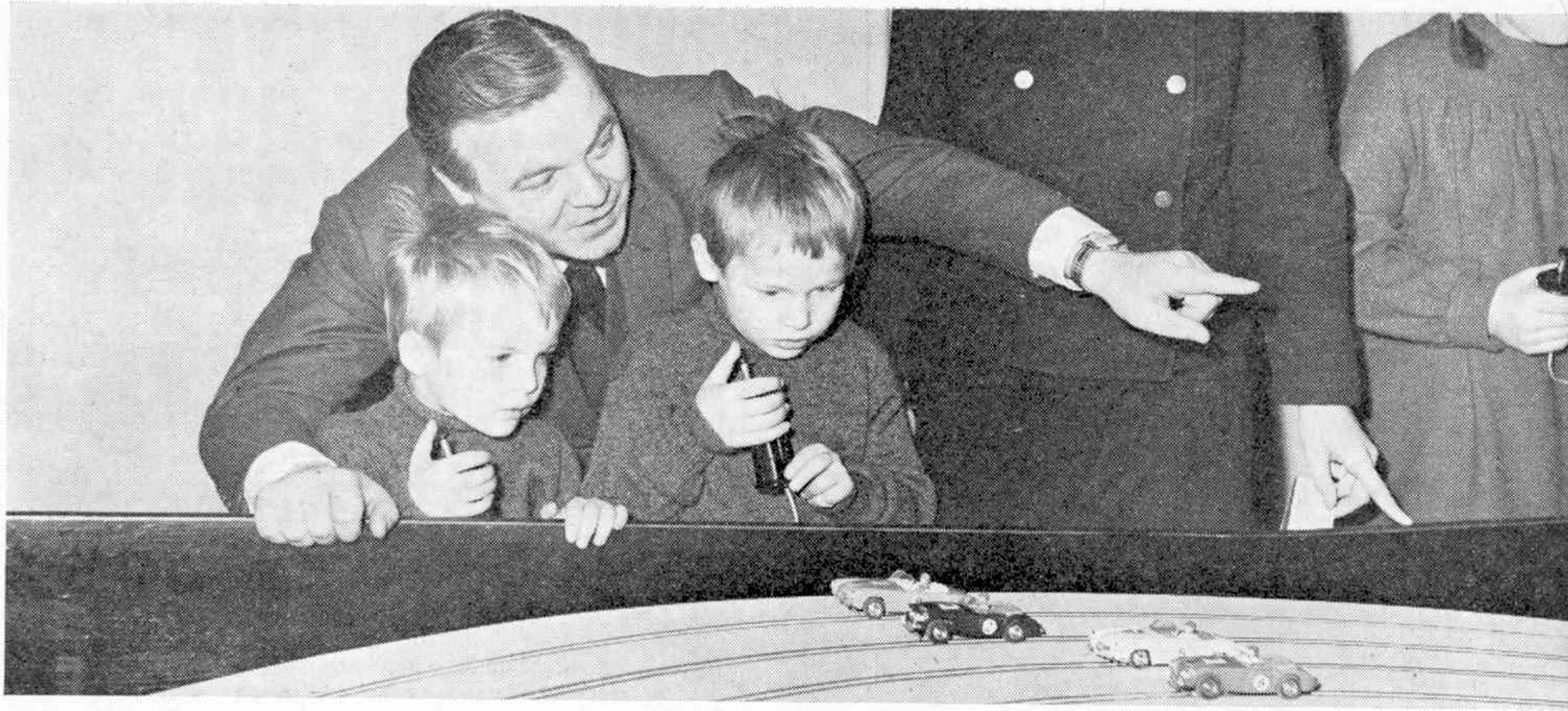
SCORE 7

Crossword Puzzle No. 13



Across
1 A human spanner
10 To point
11 To trim off
12 Measurement of time
13 Pinnacle
16 Floored by this?
17 Italian for yes
18 Seaside resort
21 Agreement
24 Son of Pope Alexander VI
25 A holy person
26 Middle portion
27 It's dynamite
29 Sharp stone
30 Struggling
32 Not you
34 Boy's name
35 Car club
36 It's sometimes addled
37 Seen on the stage
39 Also
40 Animal
42 Produced by trees
43 You need this for journeys into some countries
44 Absentee
45 A signal

Down
1 Winged mammal
2 Part of de Janeiro
3 Sprite
4 Spanish for the
5 A sail pole
6 Not down, this one
7 Harmful
8 One who thinks too much of himself
9 Encore
14 Useful to drop this sometimes
15 Watch out when you hear a dog doing this!
17 Guard
19 Naval rank
20 It's corny
21 Like
22 Past sitting
23 To make a musical sound
28 To rise suddenly
29 Blemishes
31 Turn over, please!
32 Intended
33 For example
34 To fire
35 Mountains
37 Quickly
38 Liquid
39 American airline
41 A good listener
43 A good mark on homework



POWER DRIVERS

Distinguished visitor at the 8 lane Scalextric circuit at the Schoolboys and Girls exhibition, was Rediffusion Television star Patrick Wymark. Following his success as John Wilder in The Plane Makers, he is currently to be seen in The Power Game. Playing with power on this track, Patrick enjoyed himself enormously, and to judge by the expressions on the faces of the two budding Jim (Wymark) Clarks under tuition—so did they!

During the week, Clive Swain of West Drayton, Stephen Mitchell of Ealing and Peter Bruce of Pinkney's Green put up the fastest track times. They are to be the guests of the Daily Mail at the British Grand Prix at Brands Hatch.

Penny Plain...

MOST Scalextric enthusiasts, in their eagerness to get the race under way, seldom stop to examine the fine detail moulded into every car body. Production difficulties and cost prevent the manufacturers from picking out all this detail in correct colour but there's nothing to stop you from doing the job yourself. As an example we took a light blue Mercedes 190 SL and went to work with a No. 00 sable brush and a couple of tins of plastic enamel; the results are shown in this photograph. There's certainly a lot of satisfaction to be had from driving such a 'De Luxe' racer that's so distinctive.

SILVER: front and rear badges; windscreen frame; windscreen wipers; door handles; body side trim; top edges of doors; hood cover studs; rear light surrounds.

RED: rear lights.

BLACK: seat back; hood; instrument dashboard; steering wheel disc centre; wheel centres. (Paint the whole of each wheel centre, then carefully wipe off the surface to reveal the Mercedes three-pointed star in chrome.)

TAN: steering wheel surround and cross bar.

BROWN: driver's gloves.

Small Scale Car Production on a Big Scale

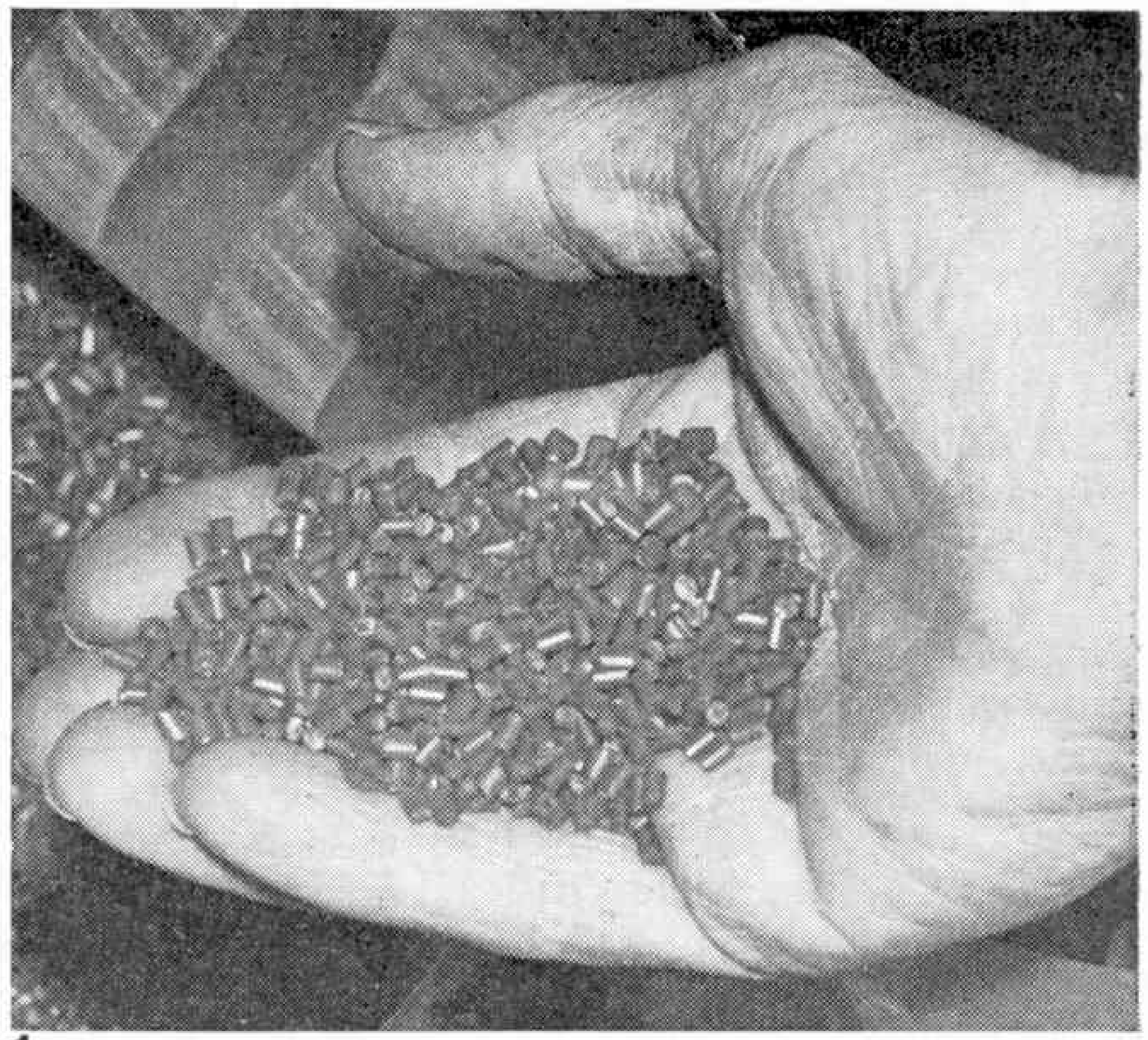
Here are some more pictures from the Scalextric factory.

1 This is where it all starts—This handful of plastic granules will shortly be transformed into a racing car body in one of the enormous moulding machines that were shown in the January issue.

2 Every car is assembled by hand and then individually tested.

3 Here's the end of a long line of 'Mercs' being joined by the start of a Vanwall production line.

4 Tyres by the thousand are here seen being fitted to their wheels; they'll soon be rolling round tracks all over the world.



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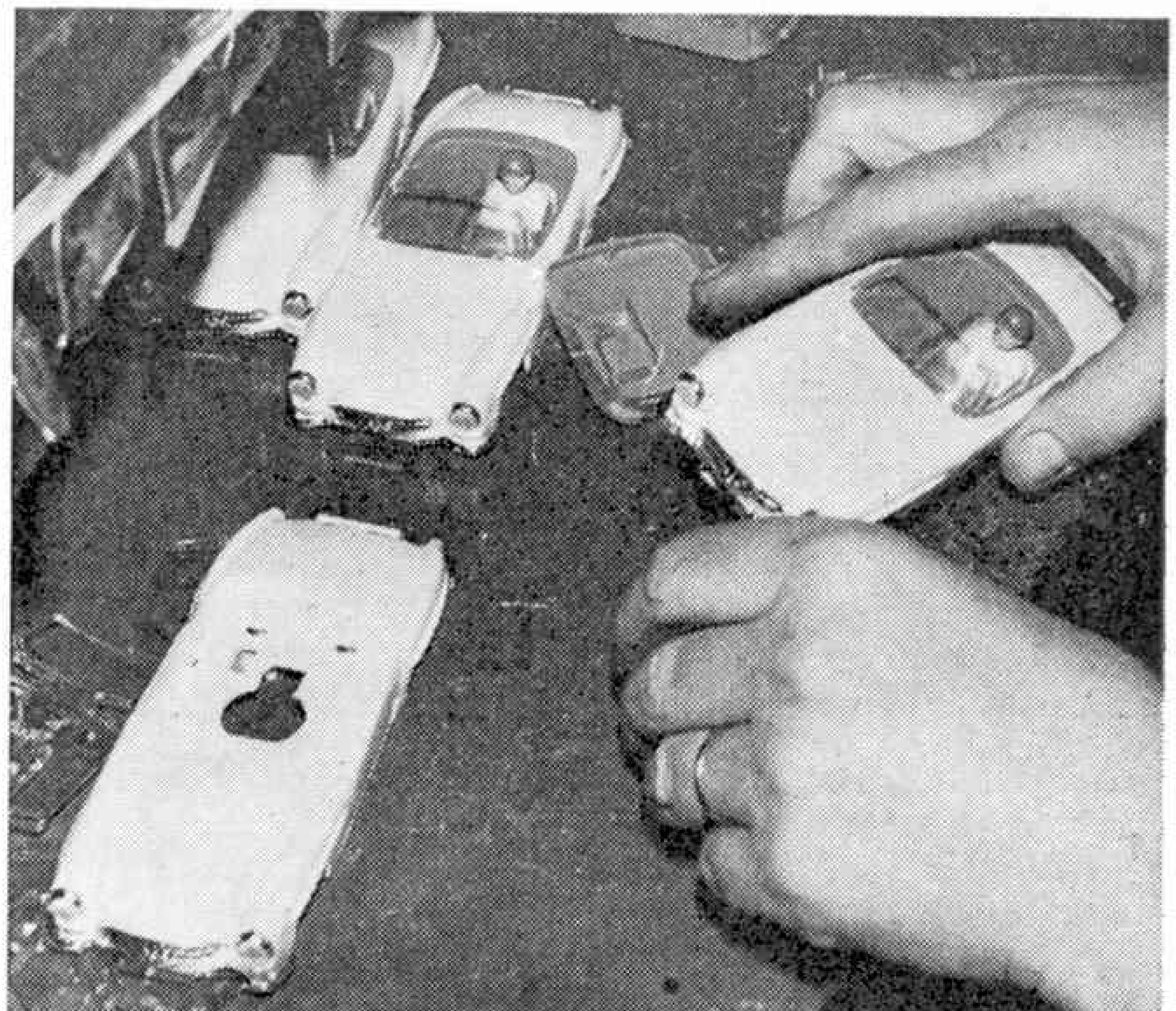

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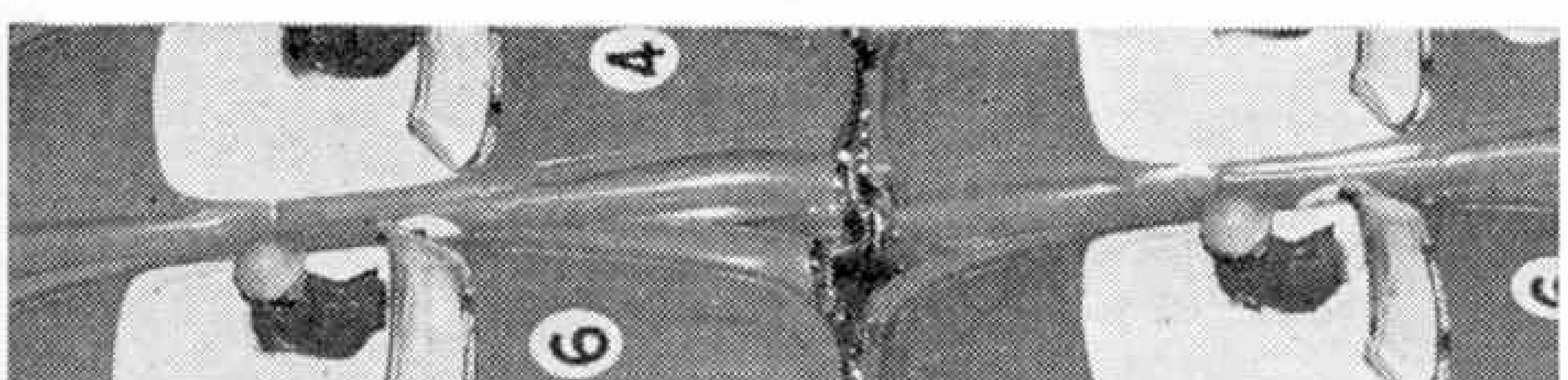

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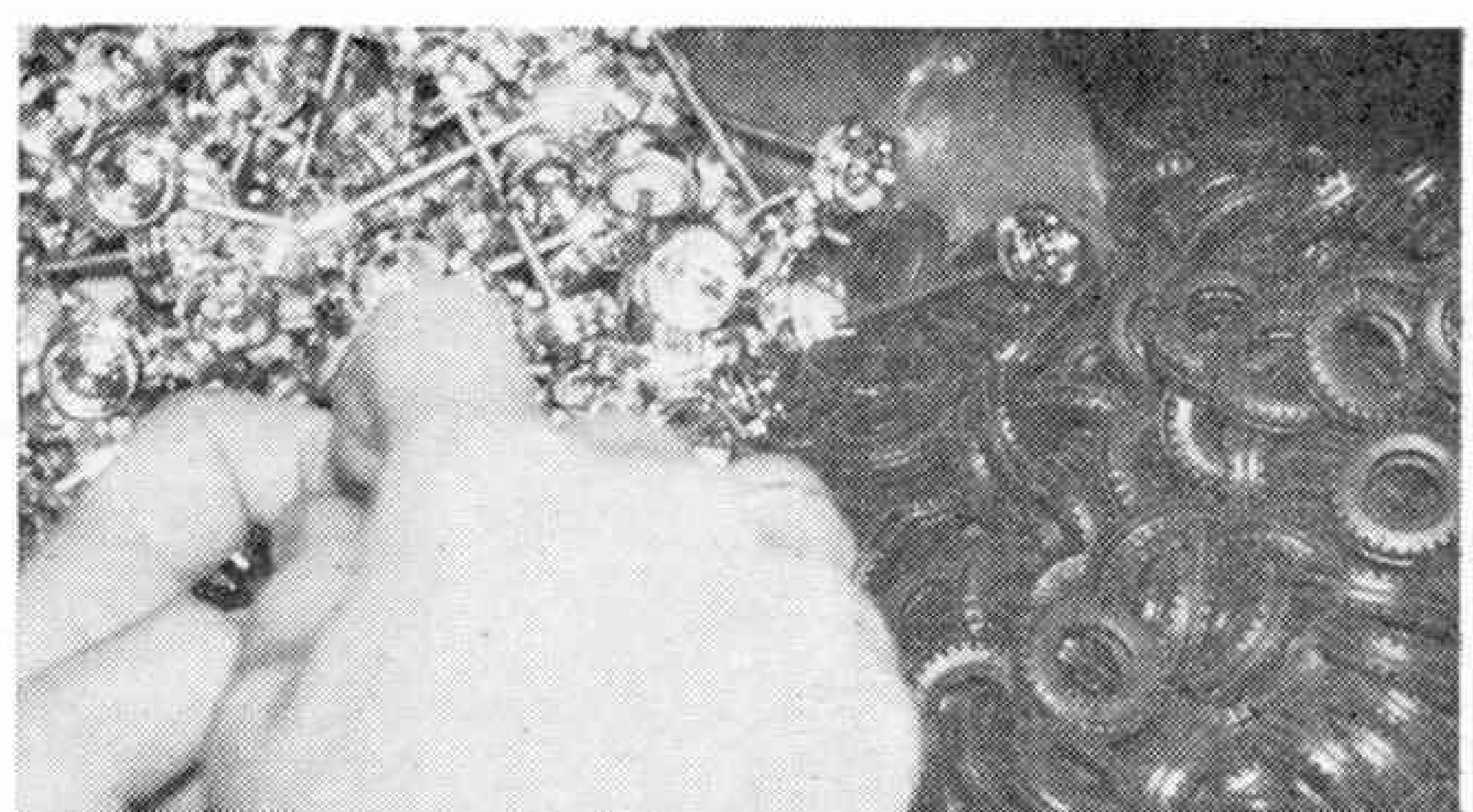
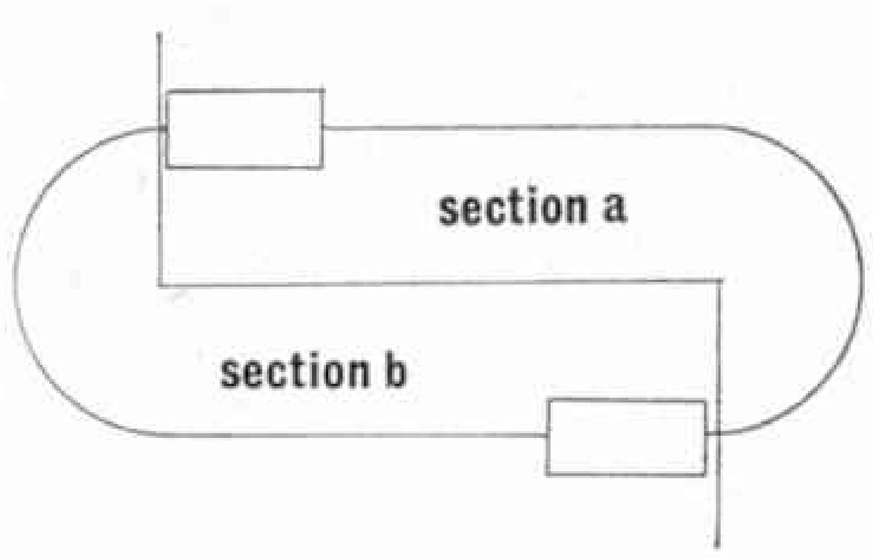
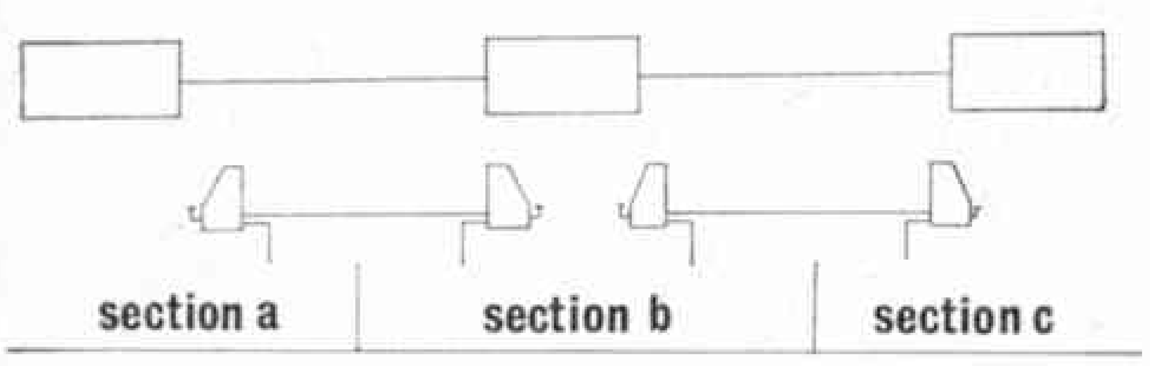


4

CALLING ATTENTION

Much added enjoyment can be derived from your model railway if you operate it in true 'full size' fashion. MIKE RICKETT helps you to do this with this description of the workings of the Tri-ang Hornby Bell Code Set.





MODEL railway operation is a subject that many enthusiasts find of great interest—indeed many of you will already have derived added enjoyment from running trains in a similar way to B.R., rather than just running them round and round—something that can become boring after a while. It is by operating trains properly, that model railways can become a really fascinating hobby, especially if the methods used on the real railways are followed as closely as possible. Many of the methods used by B.R. lend themselves admirably to the average model railway layout, and can often be successfully used. The timetable described in the January 1965 issue of 'Meccano Magazine' is but one example, and many of you have since devised a timetable similar to this and subsequently found it of great value in adding interest to the layout.

Our attention this month is not on timetables, however, but is instead focused on equipment that I recently noticed in the Tri-ang Hornby range, and which those of you interested in timetable operation will find extremely useful. It can, as with a timetable, be used in a similar manner to the real thing, and would add that extra touch of authenticity to a model railway. This is, of course, the Tri-ang Hornby Bell Code Set-RT 268, which costs 47s. 6d.

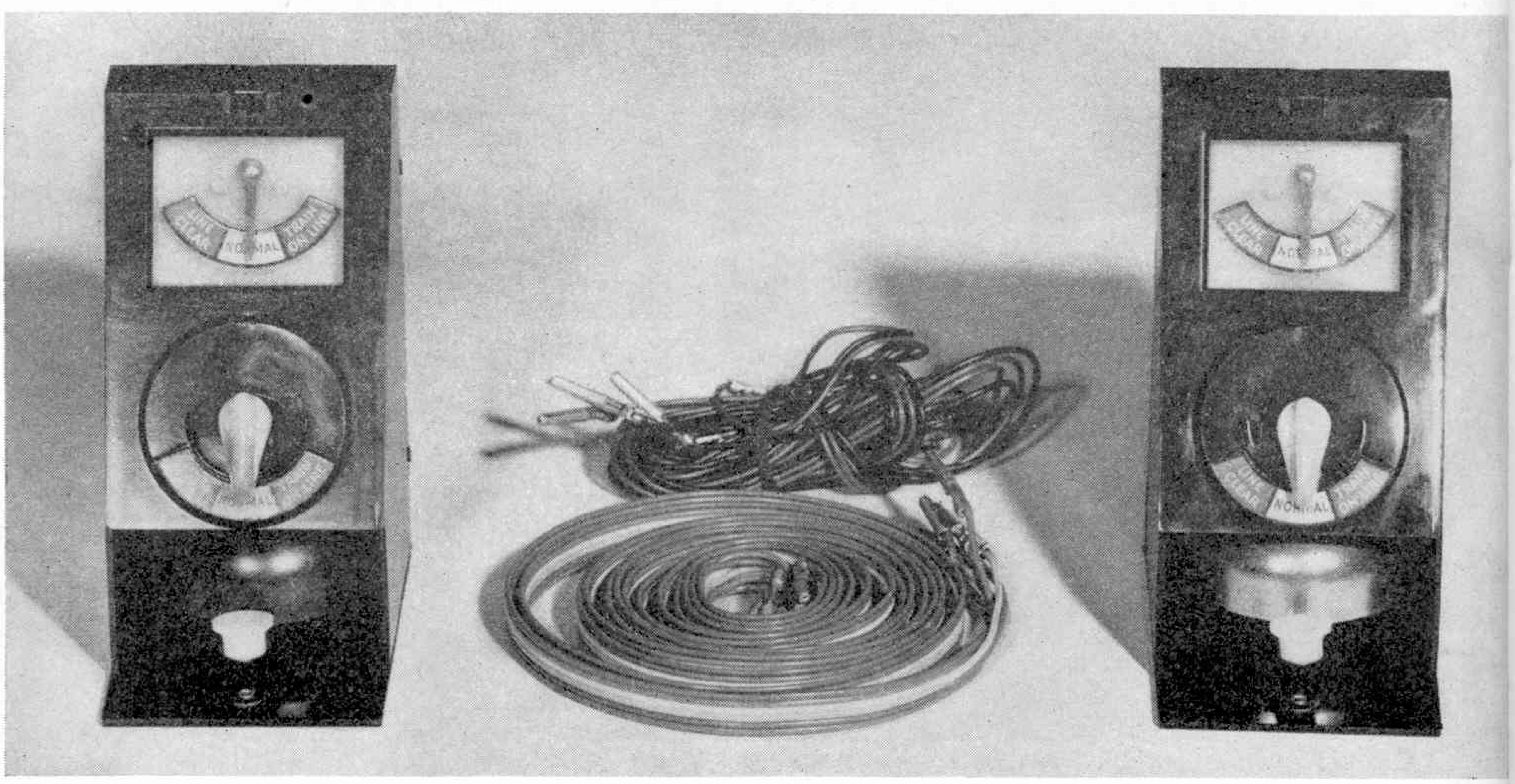
This set is a reproduction in miniature, of the block instruments used on B.R., and which are supplied to nearly every signal box. The set consists of two block instruments and sufficient wire to connect the two instruments to each other, and to a power source of 12/15 volts.

The bell code is an important means of communication between signalmen on B.R., and it is used to prevent more than one train entering a section at any one time, and also for indicating the type of train entering a section: functions, incidentally, that can be served by the Tri-ang Hornby Set. The use of the bell code and block instruments gives the operator control, by the use of signals and points, over any train about to travel in his block section.

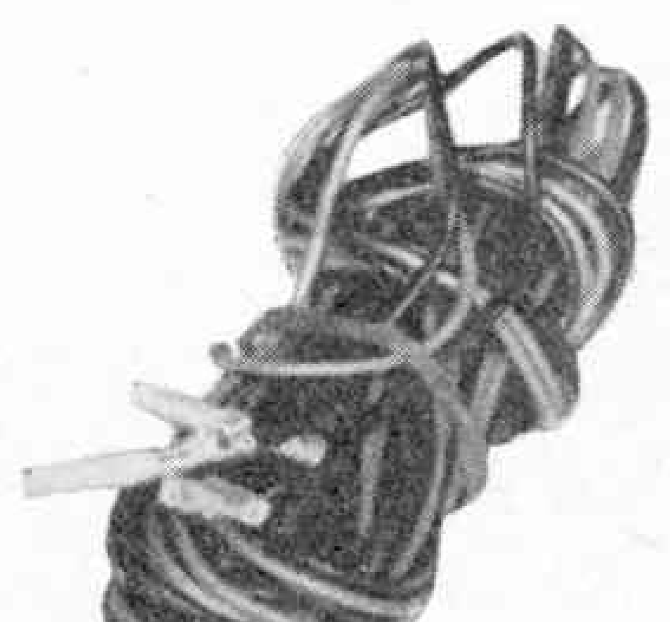
The power input on the two block instruments is located at the back of the unit, where there are two sockets marked B and R. The additional six sockets at the back of each unit should be used for wiring the two units to each other by connecting socket 1 on unit A to socket 1 on unit B, and so on to socket 6, by using the multiple flex that is supplied with the set. If great distances are involved, six lengths of normal bell wire can be used, stapled to the intervening baseboards. It would also be wiser, under these circumstances, to provide each instrument with its own power.

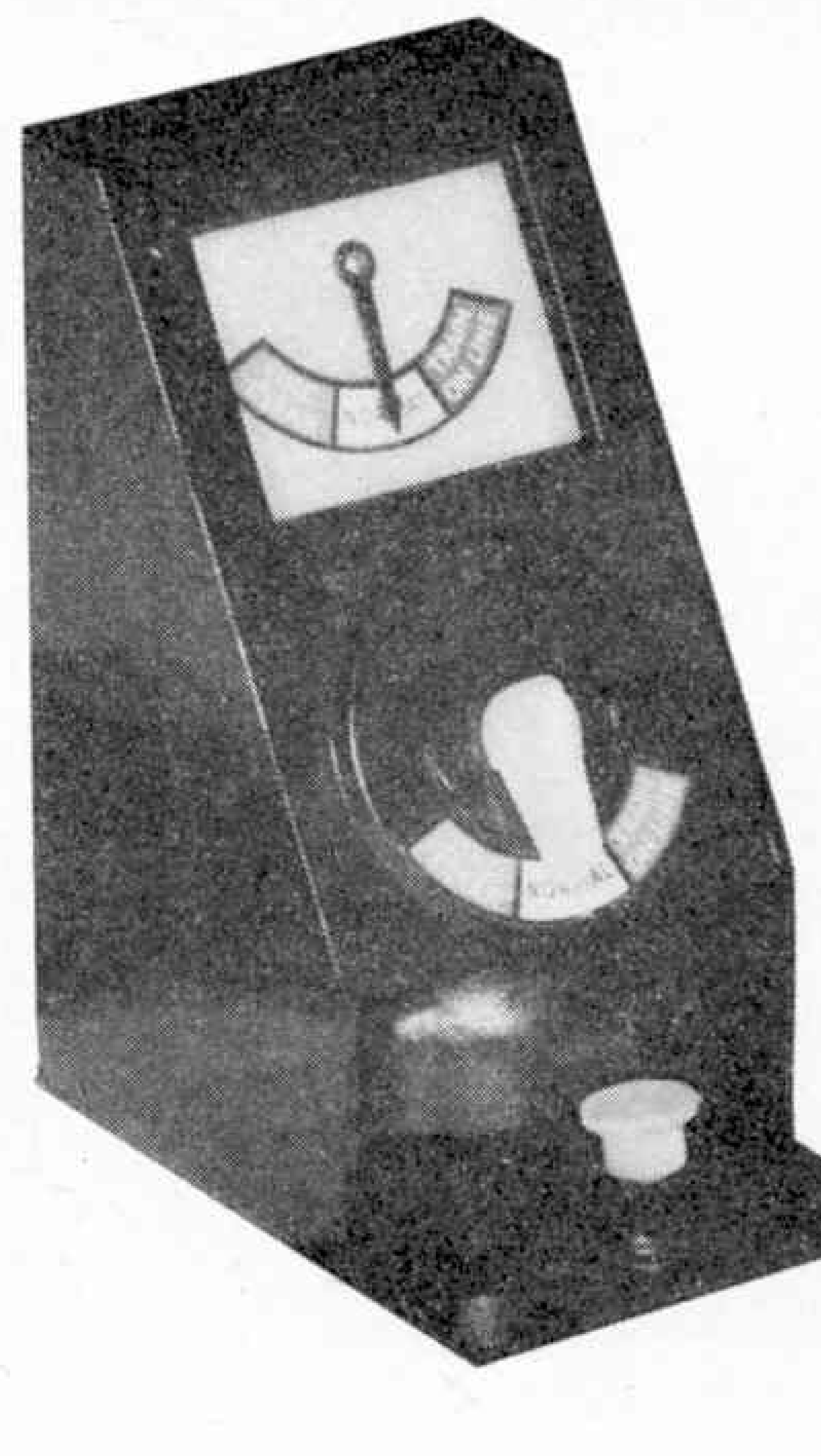
The block instruments are suitable for almost every type of model railway where two or more operators are likely to control trains, but there are certain types of layouts where the set becomes particularly useful. This is an end-to-end layout design which many enthusiasts are now using, and which is particularly suited to the bell code and timetable operation. It will be necessary, where three stations are involved, to install one block instrument at each end, with two at every intermediate station. The instruments are always connected up in pairs, to allow communication to take place between adjacent stations, as shown in

This is what you get when you buy a Bell Code Set, it makes the operation of your system a real 'two-man' job!



Wiring-up is a simple matter of inserting the ready-made plug connections into the appropriate sockets in the back of each block instrument





the sketch accompanying this article. The above does not, however, exclude the bell code from use on continuous layouts, although in some instances, difficulties can arise, e.g., those involving a reverse loop, if divided into two sections.

Before installing the block instruments, the entire layout should be divided up into sections or "block sections", as they are known on B.R. On an end-to-end layout this would be quite simple and a section would extend half-way to the adjacent stations, or if the length of run is very long, and includes a feature such as a goods yard, three sections, one half-way from station A to the goods yard B, and another half-way from there to station C. The goods yard operator B would, therefore, have two block instruments at his command, one for communicating with station A and the other for station C. Where a fairly large oval with a station on either side is concerned, it would be advisable to create two sections, as shown in our drawing. A layout involving a reverse loop might be difficult if the entire loop is not controlled from the nearest station and formed into one block section.

I would suggest a simple shelf, built alongside the control panel, so that the block instruments can be mounted permanently in position, and also to prevent damage occurring by them being dropped. Where two instruments at any one point are required, this arrangement will also be found to be more convenient, for the operator can then communicate, without moving, with other operators.

The operating procedure is very similar to that used on B.R., and it is first of all necessary to acquaint yourself with the bell code. I would suggest that copies of either the full code, or the simplified version be made for each control panel.

An operator in section A wishing to pass a train to section B would first indicate that his signal box is open by tapping 5 pause 5 pause 5 (signal box open) on his instrument key. He will then tap 1 on his instrument, calling section B to attention. The latter will then acknowledge by repeating one tap on his instrument, leaving A free to indicate the type of train. This may appear unimportant, but on the more important railway lines, the type of train would dictate the particular track that they would run on—up fast, up slow, goods loop, etc., and if your layout is a large one, the chances are that you might have the equivalent of these tracks.

Let us suppose, therefore, that section A wishes to pass an express freight to section B. He will tap 3 pause 1 pause 1 on his block instrument, which means, in effect, 'is your section clear for a train of this type?' If section B is able to to accept such a train, he would clear the appropriate signals and points and then repeat the signal on his key to A, also setting the switch on his instrument to the 'line clear' position, which will be repeated on the indicator of the instrument in section A. After section A has cleared any signals and points on his section, he will now be able to pass the train forward, and he rings 2 (train entering section) on his key, which is acknowledged by section B, who also alters his switch to 'train on line', which will be repeated by the indicator in section A. When the train has reached section B he signals 2 pause 1 (train out of section) to A, and resets his switch to normal, which is once again repeated by the indicator on the section A instrument.

Should operator B have been unable to accept the train from A, he would simply not acknowledge the signal sent by A and would have left his switch, and therefore the indicator A, at 'Normal' (line blocked). If more than two stations are included, operator B would then offer the train to C, and the same procedure would be followed.

Comprehensive Bell Codes

Opening signal box	5–5–5
Call attention	1
Express passenger train	4
Electric express passenger train	4–2
Local electric passenger train	3–1–2
Express freight train	3–1–1
Local passenger train	3–1
Branch passenger train	1–3
Empty coaching stock (main line)	2–2–1
Electric empty coaching stock	2–2–1–2
Empty coaching stock (branch)	1–2–2
Express unfitted freight	3–2
Perishable freight	1–3–1
Through freight or ballast train	1–4
Stopping freight, mineral or ballast train	3
Branch freight train	1–2
Special freight stopping in section	2–2–3
Breakdown train	2–2
Light engine	2–3
Light engine with not more than two brake vans	1–1–3
Mineral or empty wagon train	4–1
Train entering section	2
Train out of section	2–1
Train approaching	1–2–1
Line clear	3–3–5
Train at a stand	3–3–4
Train divided	5–5
Engine arrived	2–1–3
Shunt train to allow another to pass	1–5–5
Train clear of section	5–2
Working in wrong direction	2–3–3
Cancelling	2–5
Danger obstruction	6
Close signal box	7–5–5

Simplified Bell Codes

Opening signal box	5–5–5
Call attention	1
Express passenger train	4
Local passenger train	3–1
Express freight	3–1–1
Stopping goods train	3
Empty coaching stock	2–2–1
Light engine	2–3
Mineral or empty wagon train	4–1
Train entering section	2
Train out of section	2–1
Obstruction danger	6
Closing signal box	7–5–5

Swing it with gears

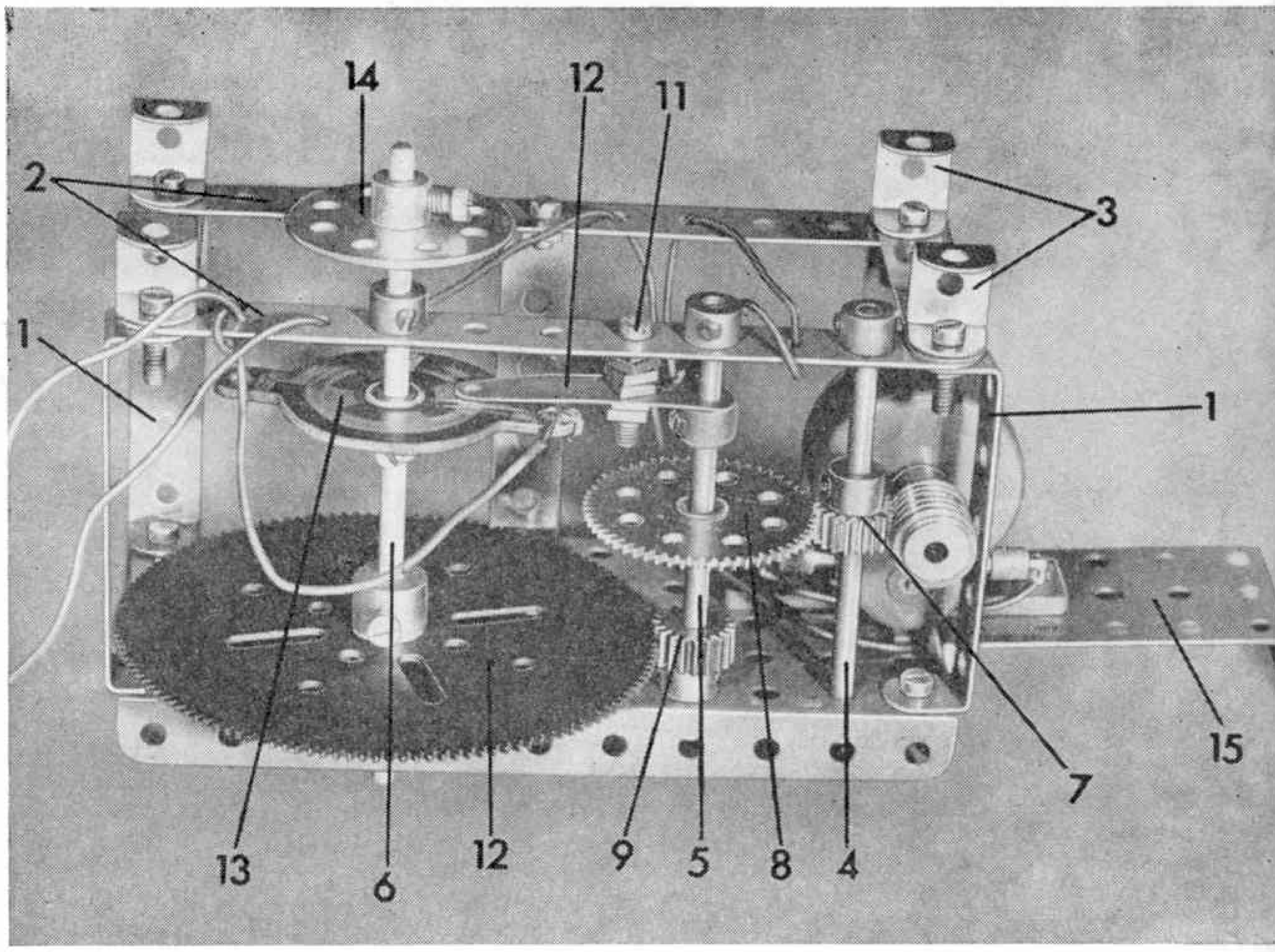
TO turn Meccano Magazine's own Swing Bridge from a highly realistic but, nonetheless static model, into a working piece of layout equipment, it must be motorised, and must also be fitted with a reduction-ratio gear box and an electrical contact which will allow it to turn through exactly 90 degrees and no more. When building the original bridge, Mike Rickett used a Meccano Emebo Electric Motor as the power plant, and Meccano standard and Elektrikit parts for the gear box and electrical system respectively. The complete unit, illustrated on this page, is built as follows:

Five 2½ in. by 2½ in. Double Angle Strips 1 are bolted to a 5½ in. by 2½ in. Flanged Plate, one at each corner and the fifth mid-way between the Double Angle Strips which appear at the back in the first illustration. All the Double Angle Strips are then connected at the top by two 5½ in. Strips 2 and two 2½ in. Strips, at the same time bolting four Double Brackets 3 in position at the corners.

Journalled in front Strip 2 and the Flanged Plate are two 3 in. Rods 4 and 5, and a 4 in. Rod 6, Collars holding these Rods in place. Mounted on Rod 4 is a ½ in. Pinion 7 in constant mesh with a 57-teeth Gear Wheel 8 fixed on Rod 5. Also fixed on Rod 5 is another ½ in. Pinion 9 and a 1½ in. Wiper Arm 10 which rests against a Collar. In addition the Wiper Arm is held by Nuts on a ¾ in. Bolt 11, being spaced from Strip 2 by four of the Nuts.

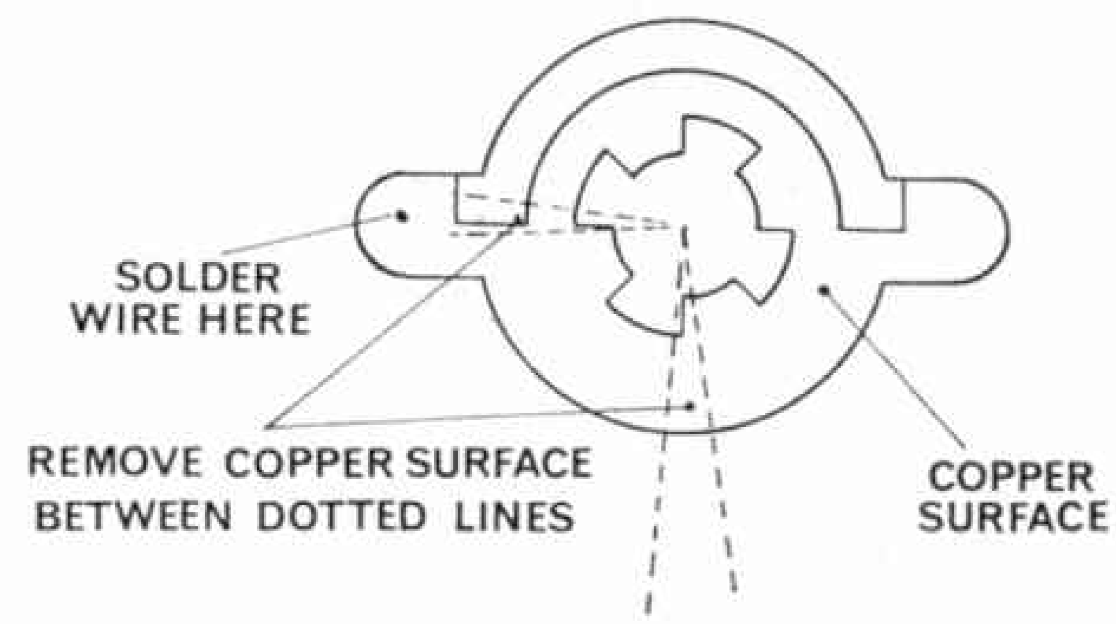
Pinion 9 meshes with a 3½ in. Gear Wheel 12 on Rod 6, which also carries a modified Commutator 13 and an 8-hole Bush Wheel 14. The Commutator is modified by cutting and removing gaps in the copper contact area ONLY with a sharp modelling knife, in the two positions indicated on the accompanying plan. Note that Bush Wheel 14 should already be fixed to the bridge at this stage, as described by Mike Rickett in his February article. It has only been included in the above photograph to show that the pivot for the bridge is provided by Rod 6. You will have realised, therefore, that this Rod is the one which protrudes through the appropriate hole in the baseboard.

Before the Motor can be fitted, the 5½ in. by 2½ in. Flanged Plate must be extended by a 2½ in. by 1½ in. Flanged Plate 15. An Emebo Motor is then bolted in position as shown, a Worm on its output shaft engaging with Pinion 7. The anchoring points for fixing the completed unit to the underside of the baseboard, incidentally, are provided by Double Brackets 3.



The completed mechanism showing the correct position for the Commutator and wiper arm. Note that the Bush Wheel (14) on the bridge pivot is mounted in the opposite way (inverted) on the bridge

The wiring that is necessary in the mechanism is quite simple, and involves only three wires. The first is connected from the control panel to one terminal of the Motor, the second is soldered to the arm of the Elektrikit Commutator with the insulation gap running opposite it, and the third has one end soldered to the wiper arm positioned to the right of the Commutator, and the other terminal of the Motor. The two wires that emerge from the mechanism are connected up to the control panel which will be described next month.



A drawing showing the portions of the Commutator surface that should be removed

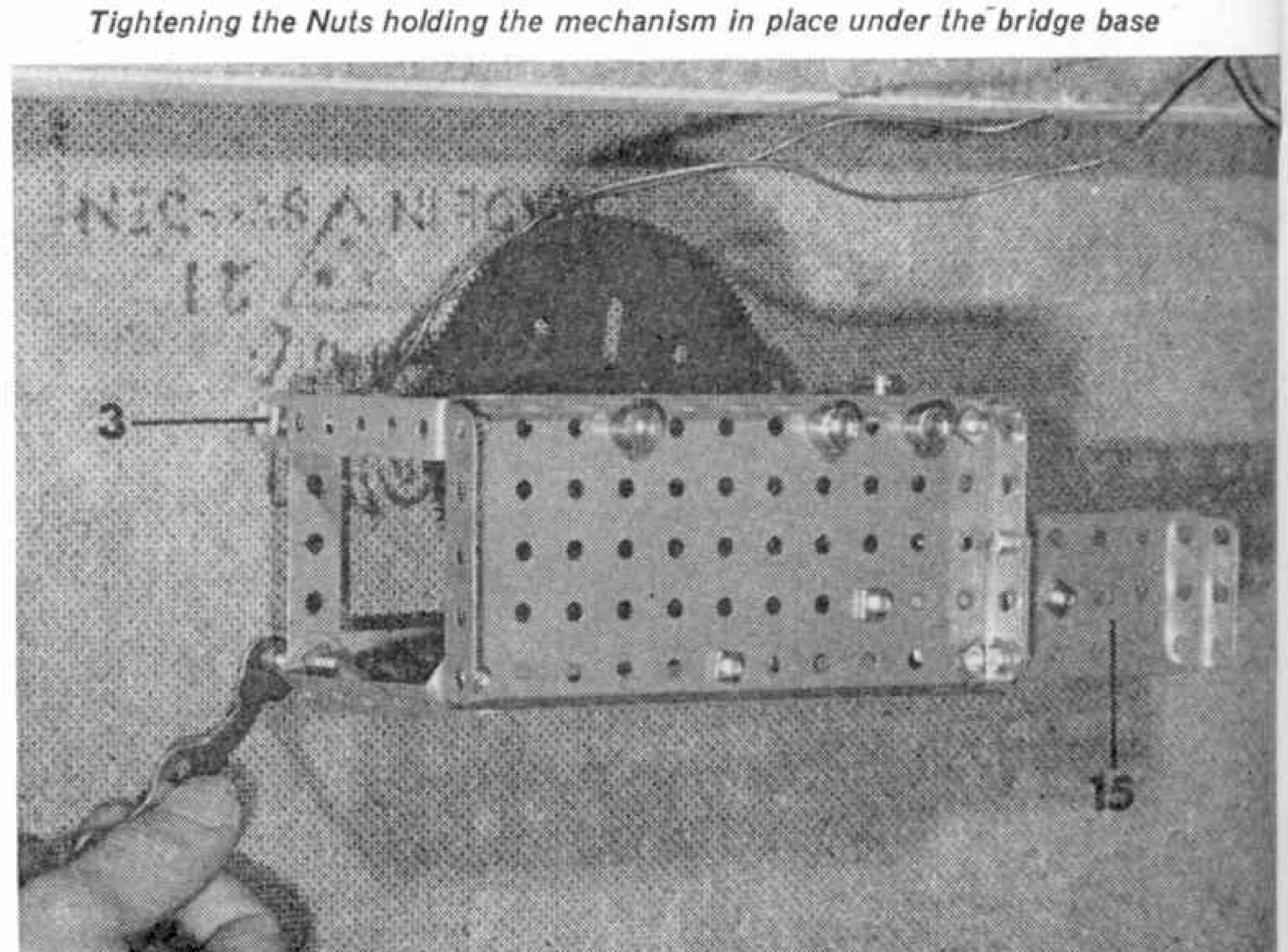
Parts required

2 of No. 2
2 of No. 5
4 of No. 11
1 of No. 15b
2 of No. 16b
1 of No. 24
2 of No. 26
1 of No. 27a

1 of No. 27b
1 of No. 32
20 of No. 37a
8 of No. 37b
5 of No. 48a
1 of No. 51
1 of No. 52
7 of No. 59

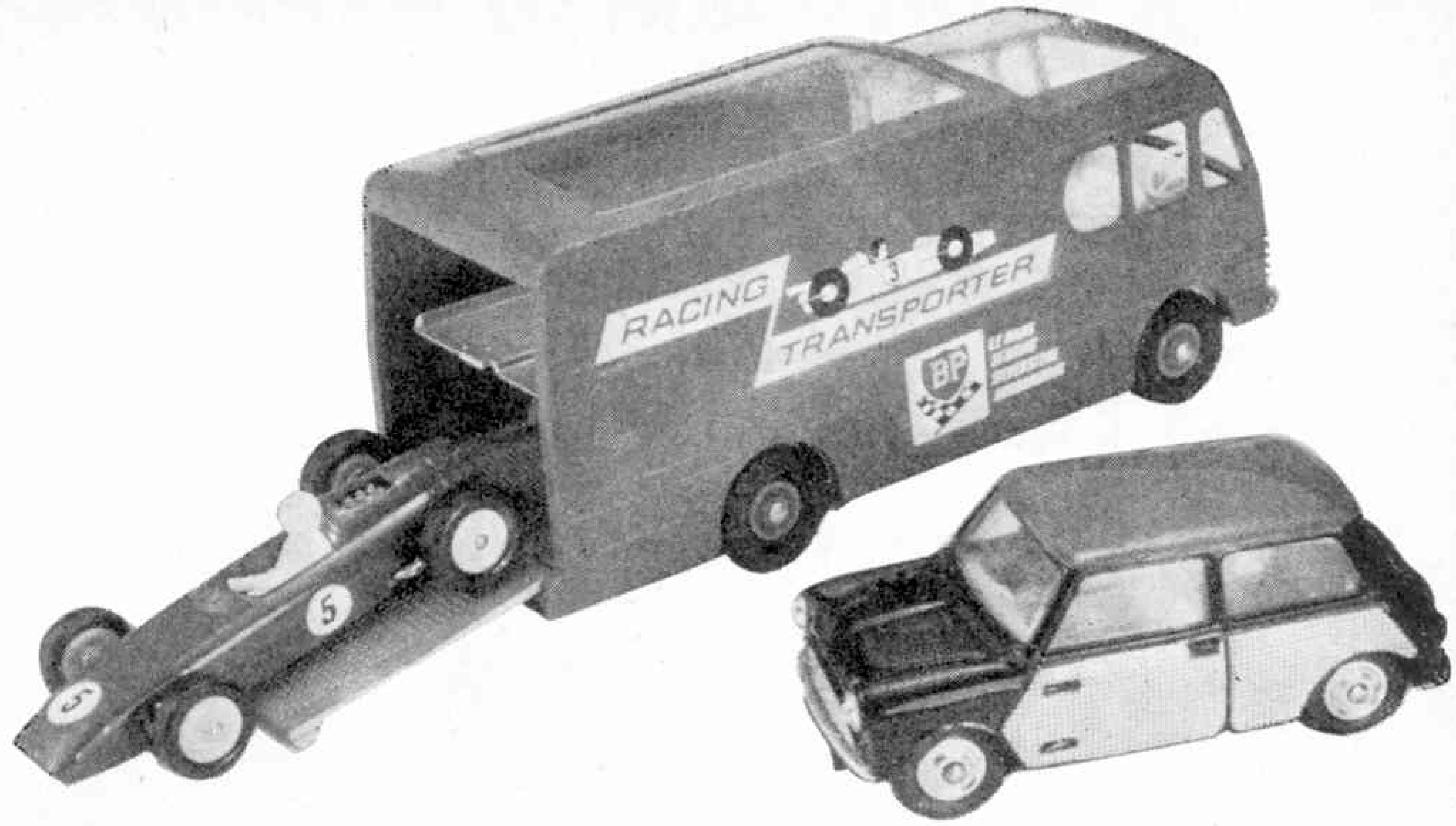
1 of No. 111
6 of No. 111c
1 of No. 532
1 of No. 551
1 Emebo Electric Motor

Tightening the Nuts holding the mechanism in place under the bridge base

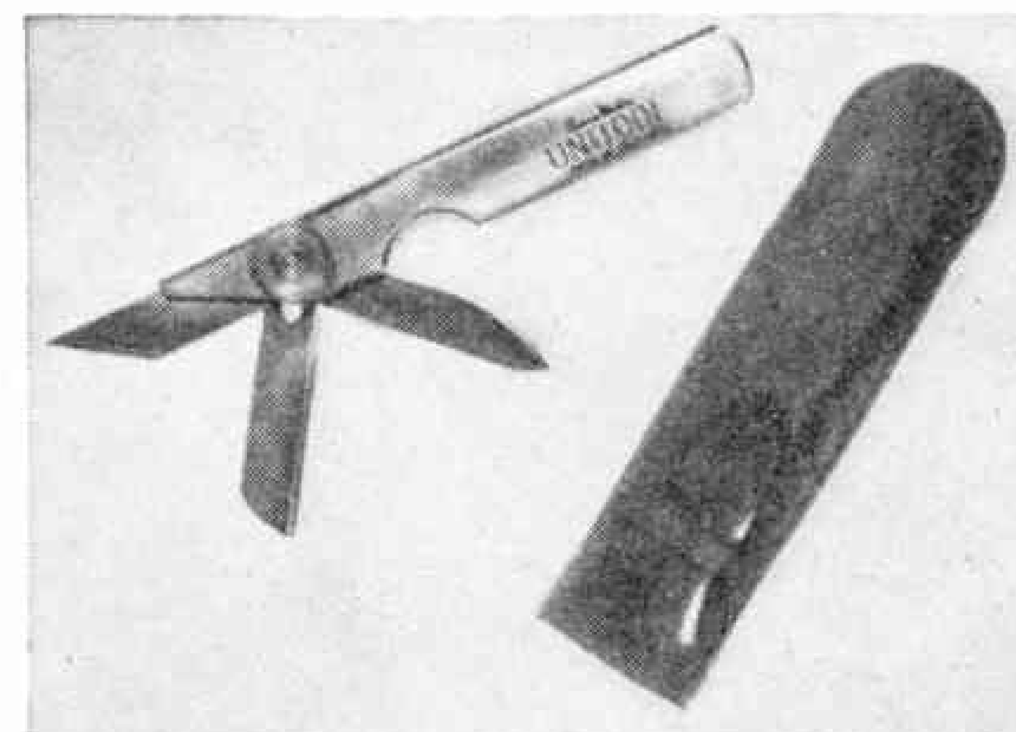


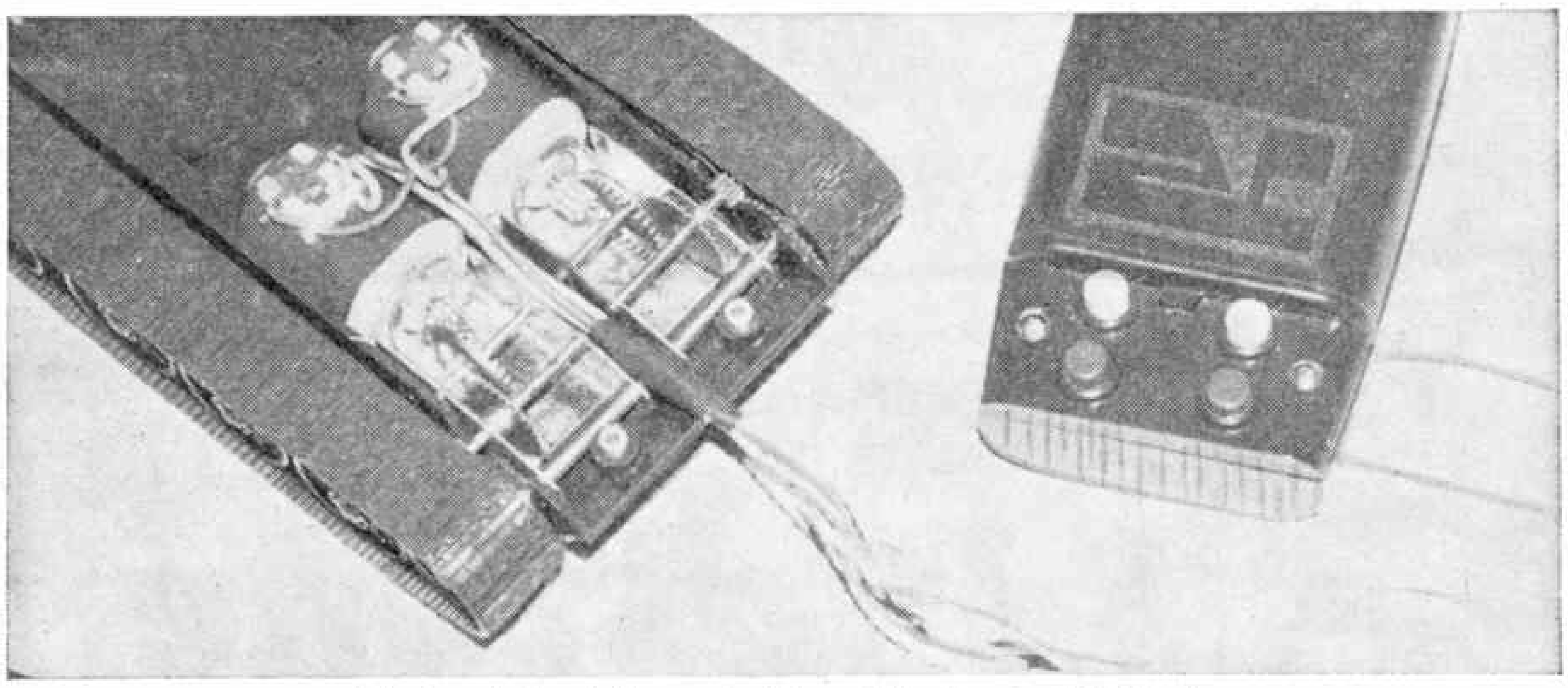
HAVE YOU SEEN?

This interesting little group of vehicles just *breathes* the atmosphere of the race track. The colourful little Mini-Cooper with its wickerwork finish, black body and red roof comes from the *Corgi* stable and costs 4/11. Right behind it, the Racing Transporter and the B.R.M. car are recent *Lesney* 'Matchbox' models. The Transporter has a transparent roof and an elevating top deck with folding access ramp. Just emerging from it, the dark blue B.R.M. is a beautifully detailed model with intricately reproduced suspension and engine—all plated. The Transporter costs 7/6 and the B.R.M. 2/-



Nice gift for any modeller is the new *Swann Morton* 'Unitool'. This company has always enjoyed a good reputation for the quality of its products and this latest one continues the tradition. Both balsa and plastic kit enthusiasts will find the three bladed tool very convenient to use, and any of the blades can be selected for use and locked securely in position very quickly. The two unused blades are safely locked away within the substantial brass handle. Complete in smart plastic wallet, the 'Unitool' costs 6/-





The 'works' and the control box of the Tamiya T-34 tank

The item that really caught everyone's attention at the Meccano Magazine Stand at the Schoolboys and Girls Exhibition was undoubtedly the remote controlled Tamiya T-34 tank. This impressive 1/35th scale model rumbled around our stand every day of the two week exhibition, burning out several motors in the process, but coming through the gruelling test with flying colours. Working off two 3V batteries enclosed in the hand-held control box, the tank will travel both forward and in reverse, turn left and right or turn in its own length by reversing one of the tracks. It will climb almost any gradient you confront it with too! The Tamiya T-34 is a most realistic model and is really simple to put together. The two gearboxes with which it is equipped come completely finished ready to bolt in place and one motor drives each box. The kit for this model is not yet obtainable in this country but will eventually become available through B.M.W. Models, 329 Haydons Road, Wimbledon, S.W.19. Price is not yet known, but will be in the region of 30/- complete. As we go to press, two of the larger tanks, operating on the same principle as the T-34, *are* in stock at B.M.W. They are the M-4 'Sherman', and the M-40 'Big Shot', each at £3/17/6.

Don't miss the *Revell* 10th Anniversary catalogue. It's choc-full of beautiful full-colour pictures of the entire Revell line. Price 1/-.

The *Corgi* Toys 1966 catalogue, reveals a surprisingly diverse range of vehicles and accessories with every one illustrated in colour. Price 3d.

The *Humbrol* set of 'Monster Colours'—Ghoulish hues for those weirdie kits. The price of this set (incorrectly quoted in an earlier issue) is 6/9.

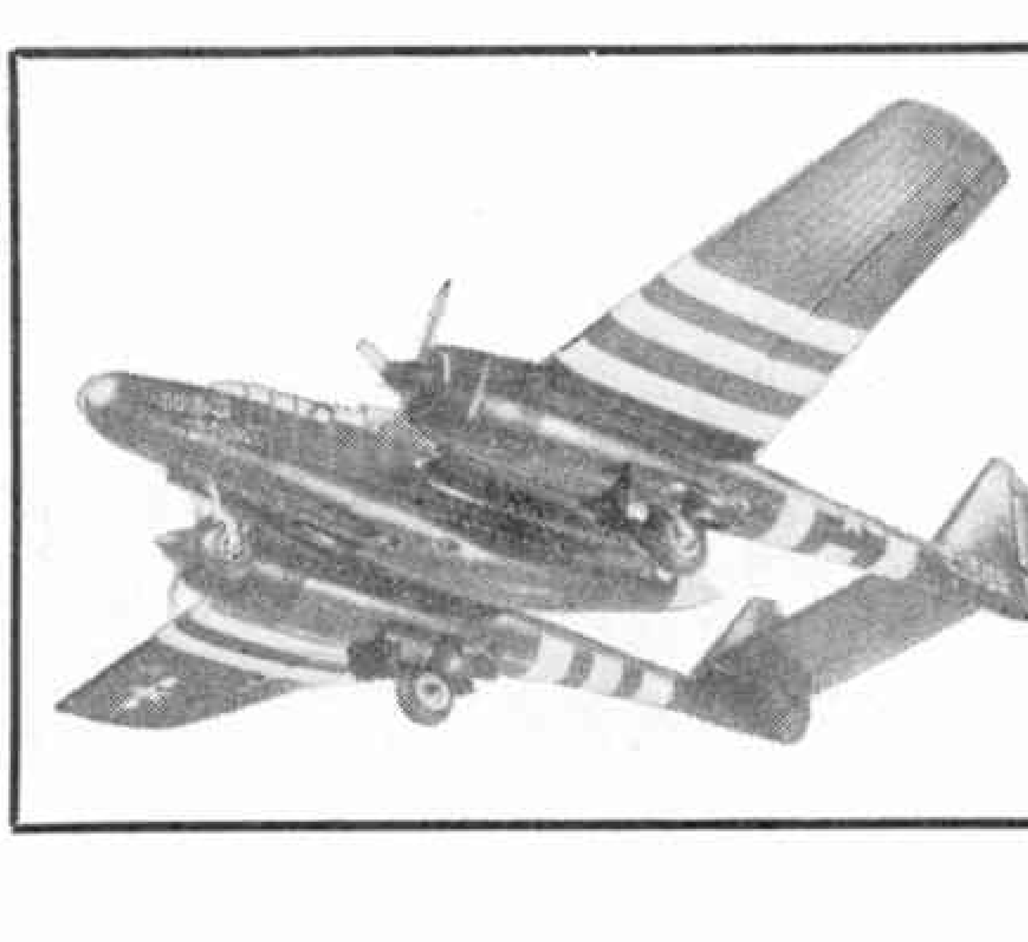
The long-awaited *Revell* Focke-Wulf Condor. A four engined beauty in pale blue plastic—now available, price 12/6.

James Bond does everything larger than life, so it is only fitting that the demand for the *Corgi* model of his famous Aston Martin should follow suit. Since its introduction, thousands of boys have been disappointed in trying to find a shop with one for sale and the manufacturers have been working night and day to try to meet the unprecedented demand. Just about everything on the model works! There are retractable machine guns, telescopic overriders, pop-up rear bulletproof screen, opening roof and ejector seat that really *does* eject the unwanted passenger, and the special box opens to reveal a sealed wallet of 'secret instructions'. Price of this Corgi winner is 9/11.

STOP PRESS!

This car won the first Toy of the Year award and the prize for the Best Boy's Toy at this Year's British Toy Fair.

Pictured on the right is the new Frog 'Black Widow'. The article on page 18 shows you how to convert this 1/72 scale 6 shilling beauty into a Northrop 'Reporter'.



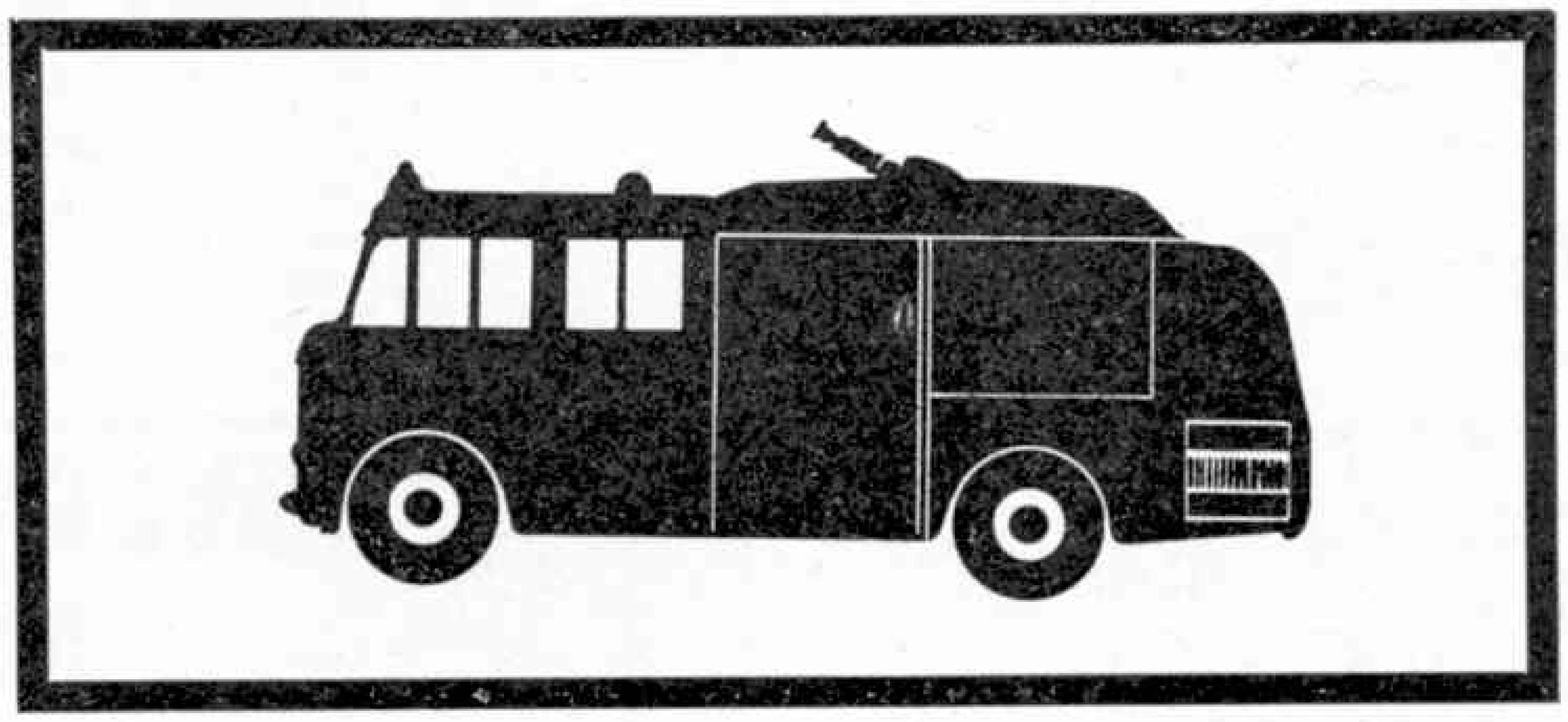
vehicle outline COMPETITION

50 Dinky Toy Models to be won!

Fill out the form and send it to us. The names of the senders of the first 50 correct answers will be published in the next issue of Meccano Magazine. The winners will then be expected to write to us to claim their prize. The competition will be judged by the Editor of Meccano Magazine. His decision will be final and no correspondence can be entered into.

FIVE MODELS will be reserved for OVERSEAS READERS. These will be selected one month after publication date.

To:—Meccano Magazine: Competition J, St. Alphage House, Fore Street, London, E.C.2.



The vehicle illustrated is:—

....

....

....

NAME ....

ADDRESS ....

....

DINKY TOY WINNERS

Below is a list of fifty names of readers whose entries for last month's 'Silhouette' competition were the first correct answers to be selected by the Editor. If your name appears in this list, then write on a postcard to: *Silhouette Prize, Meccano Magazine, Thomas Skinner & Co. Ltd., St. Alphage House, Fore Street, London, E.C.2,* and claim your FREE Dinky Model Ford Capri. If your name does not appear in this list, even though you entered for the competition, don't be too disappointed—try again!

D. Baker, Clitherow Ave., Hanwell, London, N.7. *R. Ball,* 21 Clandeboye Place, Bangor, Co. Down, N. Ireland. *C. Barnett,* Stainbeck Lane, Leeds 7, Yorks. *P. S. Berry,* Walsham-le-willows, Bury St. Edmunds, Suffolk. *Master D. Bowen,* 24 Churchfields Road, Salisbury, Wilts. *T. Brook,* Hamilton Terrace, London, N.W.8. *C. Bushell,* Countess Road, Amesbury, Wilts. *D. R. Clark,* Carlton Road, Walton-on-Thames, Surrey. *A. Collier,* Paget Street, Grangetown, Cardiff. *R. Cooper,* Holake Road, Mapperley, Nottingham. *D. Cotterill,* Balfour Road, Preston, Lancs. *K. Curtis,* Springfield Ave., Holbury, Southampton. *A. Davis,* Budshead Road, Whitleigh, Plymouth, Devon. *N. Delandy,* Park Way, Nassington, Peterborough. *A. Egner,* Victoria Terrace, Jarrow, Co. Durham. *I. Gibson,* Byron Ave., Coulsdon, Surrey. *A. Goodwin,* Henley Wood Road, Earley, Reading, Berks. *S. Grundy,* Walthwaite, Chapel-Stile, Ambleside, Westmorland. *P. Gummow,* North Field Drive, Parview, Truro, Cornwall. *P. Harratt,* 39 Kynance Gardens, Stanmore, Middx. *R. Harse,* Blackborough Road, Reigate, Surrey. *Robert Hawtree,* Chatsworth Road, Hayes, Middx. *D. Hedges,* Meadow Way, Gt. Bookham, Surrey. *P. Hooper,* West Ave., South Shields, Co. Durham. *M. Hulse,* Severn View Drive, Eardington, Bridgnorth, Salop. *D. A. Keller,* Argyll Mansions, Beaufort Street, Chelsea, S.W.3. *J. Kirk,* Brookside, Brightons, Falkirk, Stirlingshire, Scotland. *Martin Leach,* Baizdon Road, Blackheath, S.E.3. *P. Leverkus,* Well Street, Thetford, Norfolk. *J. Lloyd,* Allimore Close, Welwyn Garden City, Herts. *J. Lovell,* Balmoral Road, Longwell Green, Nr. Bristol. *T. Irving,* Boston Ave., Benton Lodge Estate, Newcastle-upon-Tyne, 7. *C. Jackson,* Plaistow Ave., Hodge Hill, Birmingham, 34. *H. J. Mayson,* Middletonn Ave., Ickley, Yorks. *S. Mulcahy,* Kennet Close, Upminster, Essex. *M. Neave,* Highgate Road, Kentish Town, London, N.W.5. *Master R. Oliver,* Elms Drive, Chelmsford, Essex. *C. Perrott,* The Westra, Dinas Powis, Glam. *J. Perry,* Hillside Ave., Kingswood, Bristol. *A. Raby,* Newbold Ave., Chesterfield. *H. Robinson,* Rookhope Post Office, Bp. Auckland, Co. Durham. *A. Rudd,* Lilac Grove, Whitby, Ellesmere Port, Cheshire. *A. G. Smith,* Taller Road, Quarn, Nr. Loughborough, Leics. *J. Smith,* Broom House, Breetton Lane, West Bretton, Nr. Wakefield. *R. Wilson.* Medway Cres., Gateshead, Co. Durham. *C. J. Worboys,* Whin Knoll, Ave., Keighley, Yorks. England.

Overseas Winners of Competition H

J. C. Bourgeois, 161 Avenue Louis Plana, 31 Toulouse, France. *R. Theison,* Rue Michehal foch Virton, Chorince le Lusen Bourg, Belgium.

Answers to this months puzzles

Quick Quiz

1. United States of America
2. Hexagon
3. Their eyes being made very wide, to catch every ray of light, they can see at nights food which other birds miss.
4. Rutland
5. Arc de Triomphe, Paris
6. Victoria Cross

Tricky Teasers

A.
```
   . 1 1
   3 3 .
   . . .
   7 7 .
   . . .
  -------
1, 1 1 1
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B. 600 different tickets

B	R	I	D	G	E	B	U	I	L	D	E	R
A	I	M			L	O	P			A	G	E
T	O	P		H		O		G		M	O	P
			S	I		M	A	R	G	A	T	E
A	S	S	E	N	T		B	O	R	G	I	A
S	A	I	N	T				W	A	I	S	T
	T	N	T		U		F	L	I	N	T	
		G	R	A	P	P	L	I	N	G		
M	E		Y		S	T	A	N			A	A
E	G	G		S	H	O	W	G	I	R	L	
A			T	O	O		S			A	P	E
N			W	O	O	D			V	I	S	A
T	R	U	A	N	T		S	I	G	N		R

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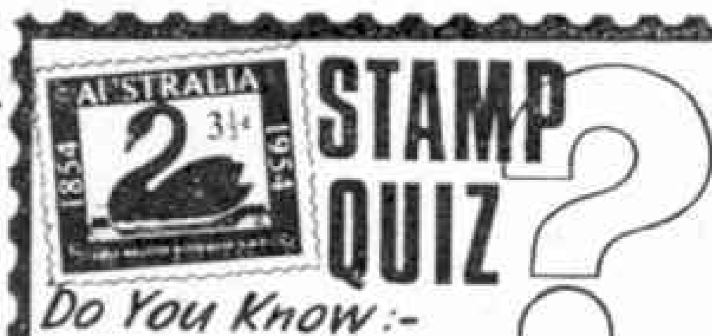

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STAMPS

Down Under

As these lines appear in print, collectors will be getting their first glances at the new stamps which were issued February 14 to coincide with the change, by Australia, from pounds, shillings and pence, to dollars and cents. Other islands are, of course, also making the change. In previous notes I mentioned this matter, and now I had better go into more details, for as can be seen, collectors will be taking these new stamps very seriously, due to the fast growing interest in Australian issues. There is not room to describe the designs of so many stamps, but here are the values. *Australia*: 1 c, 2 c, 3 c, 4 c, 5 c, 6 c, 7 c, 8 c, 9 c, 10 c, 13 c, 15 c, 20 c, 24 c, 25 c, 30 c, 40 c, 50 c, 75 c, \$1, \$2, \$4. Incidentally, the 3 c and 4 c stamps are also repeated in coil form and, whilst the two values in sheets are recess printed, in coils they are photogravure, so not only should you go in for both, as far as the coils stamps are concerned, but you need these in pairs, because they have what is known as the varied perforation, to enable them to be used in a machine. *Nauru*: 1 c, 4 c, 7 c, 8 c, 10 c, 30 c, 50 c, \$1. *Norfolk Is.*: 1 c, 2 c, 3 c, 4 c, 5 c, 10 c, 15 c, 20 c, 25 c, 30 c, 50 c, \$1 (overprints). *Papua* and *New Guinea*: 1 c, 3 c, 4 c, 5 c, 10 c, 15 c, 20 c, 25 c, 50 c, \$1, \$2. As recently as last year both British Solomon Is. and Gilbert and Ellice Is. brought out new sets (that for G. and E. was very attractive) in the now obsolete Australian currency (£1=16s. sterling). These two territories will also have new stamps in due course. But in the meantime their current stamps will be surcharged in the new dollars and cents. Now that's the currency kick-off as far as the postage stamps are concerned. Later, though not this year, Fiji Is., New Zealand and Dependencies, will follow suit, so there you have a fine little group of stamps to take up, if you are looking for new philatelic fields well worth conquering. More about that later on in these notes.

G. B. Issues

I have more than once referred to our own new stamps, but due to their growing importance with collectors, I make no apology in mentioning them again. In fact I will probably go on writing about them from time to time, such is the position they are taking amongst home and Commonwealth collectors. When, last year, the P.M.G. announced all the stamps which were to be issued, many thought that it was all just a flash in the pan. Now it can be seen, however, that whoever happens to get the job as head of our Post Office, we are likely to get new stamps every month or two, and as can be seen already, we are rapidly becoming quite a stamp conscious nation. In fact, I would say that those now collecting modern G.B. stamps (particularly the issues of the present reign) have easily doubled in numbers during the past 12 months.

Now let us suppose that you have decided to collect Great Britain Q.E. II issues. Of the ordinary definitive issue, there are three watermarks, and also variations in watermark positions (inverted sideways, etc.), which you should go in for. The Commonwealth and Elizabethan catalogues give full details. The definitives should be taken up at once, as new stamps are soon to be released, and stamps with watermark inverted or sideways (which the two catalogues will explain) whilst readily obtainable as I write, at reasonable prices, will cost a lot more money as time goes on. You can also have a lot of fun and perhaps profit, looking for the varieties, which may exist on the stamps you buy in the normal way at the Post Office. I don't mean just those rarities which get mentioned in the papers, and which bring hundreds of pounds in auction, but the more modest items. The catalogues will tell you all about them, and the Commonwealth at 12s. 6d. and Elizabethan at 15s., could prove good investments. Most dealers will be able to supply. And then there are the special issues. These generally have some interesting varieties, the most outstanding of which get catalogued in the two works in question, and my word you can have some fun searching for them. Summing up G.B., if you feel you would like to have a go, do not waste a minute, for the obsoletes are going up all the time, and ever more rapidly.

The Post Office Tower issue and some of the dependencies issues mentioned in the text

The Tip of the Month

I have already written about the prospects for G.B. stamps, and how popular they are becoming. But there are not enough of them to keep an active collector cracking. So why not have a shot at the new Australasian issues referred to above. Most of these stamps are printed by the Australian State Printary, and it is perhaps because they have been doing such fine work this last year or two (this is the reason why they are almost my first favourites, also with the issues of South Africa, a country which never exploits collectors, as do so many others) and producing such interesting, and attractive stamps, that their popularity has simply shot up, and their philatelic sky looks like being the limit. Australia and Dependencies should be proud of their stamps, and I warmly recommend them as issues well worth your attention. And if you buy whilst they are current, they should prove quite a nice little investment. Not that that should be your sole aim. There is more to stamp collecting than a cash gain.

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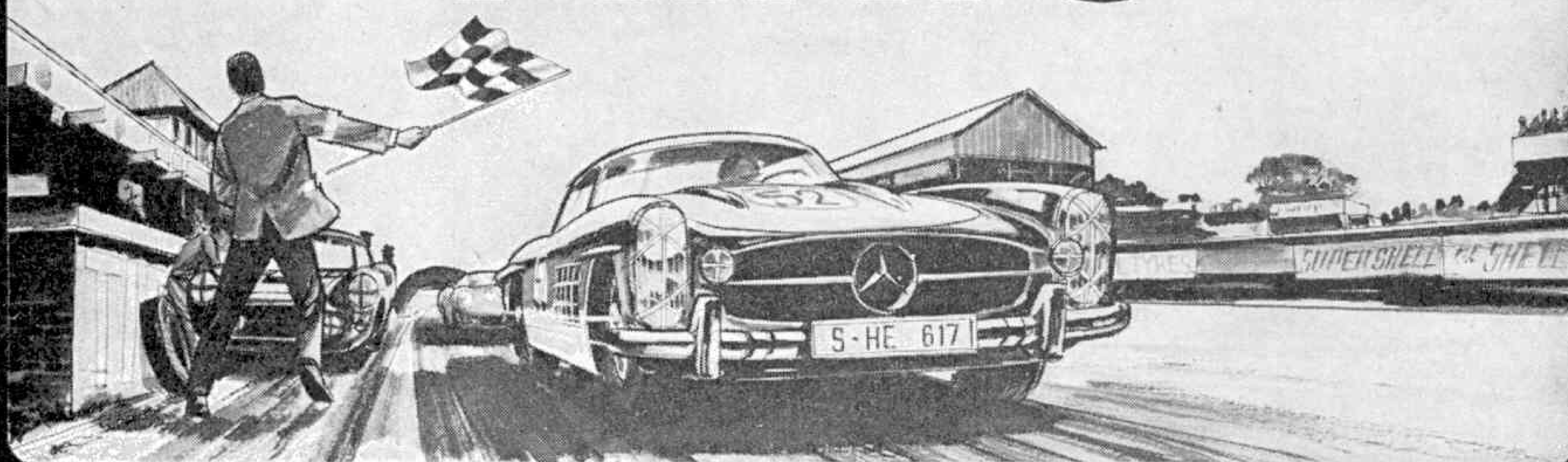

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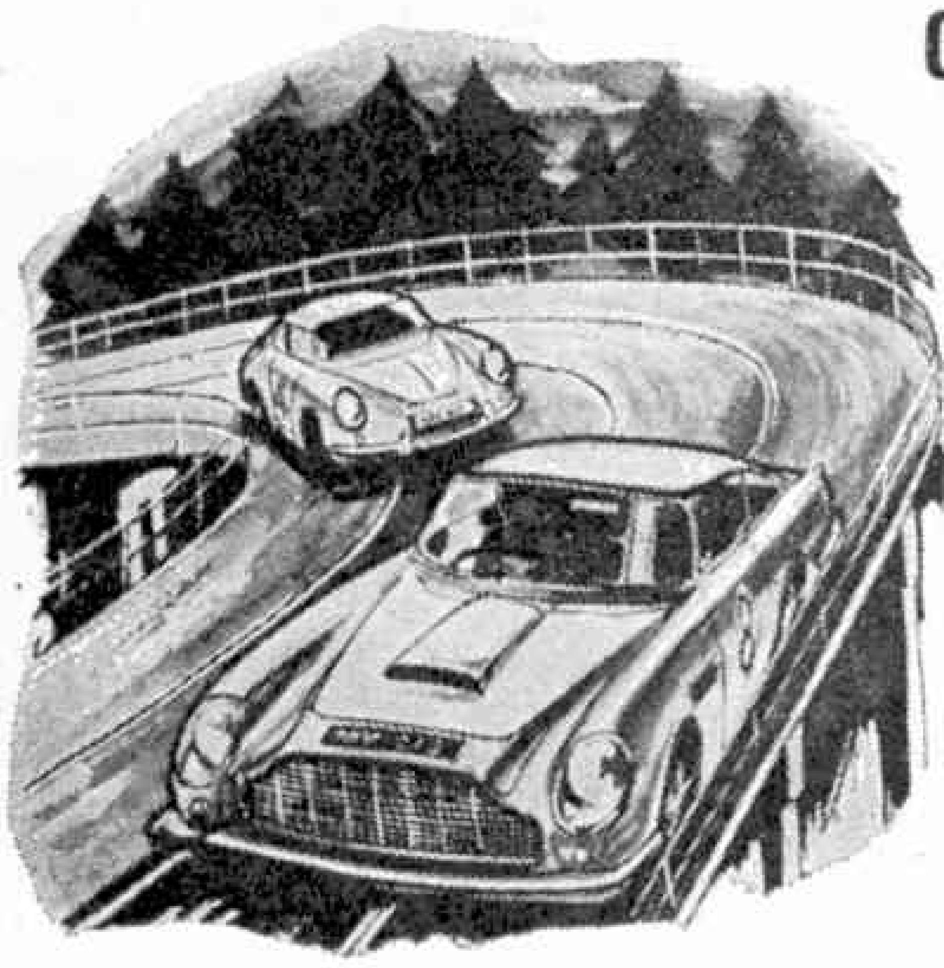

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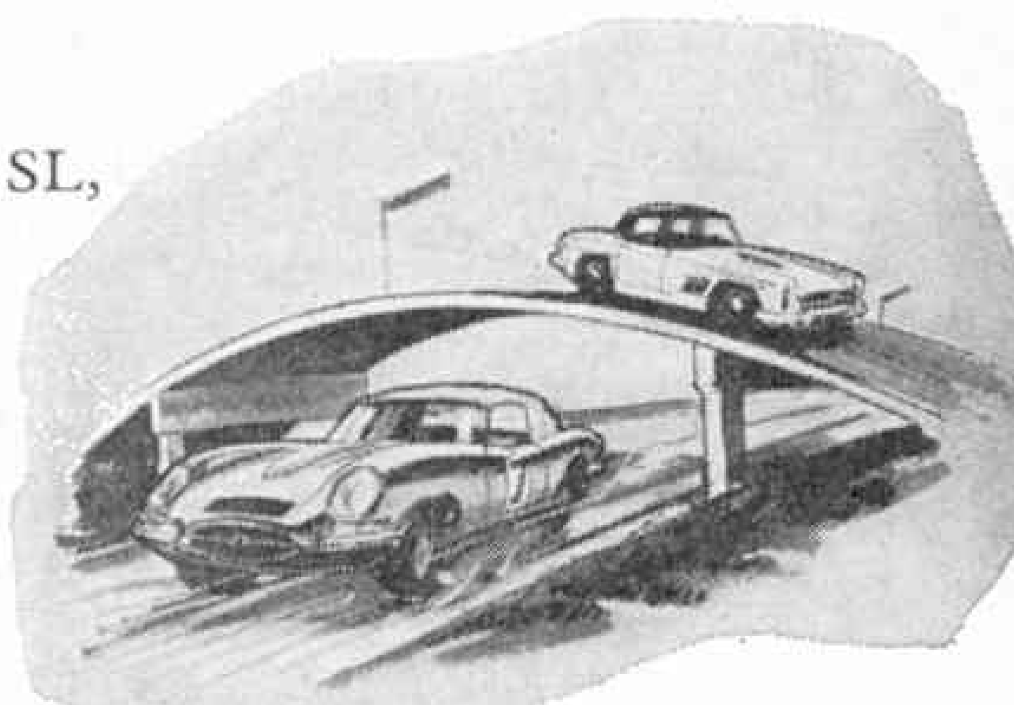

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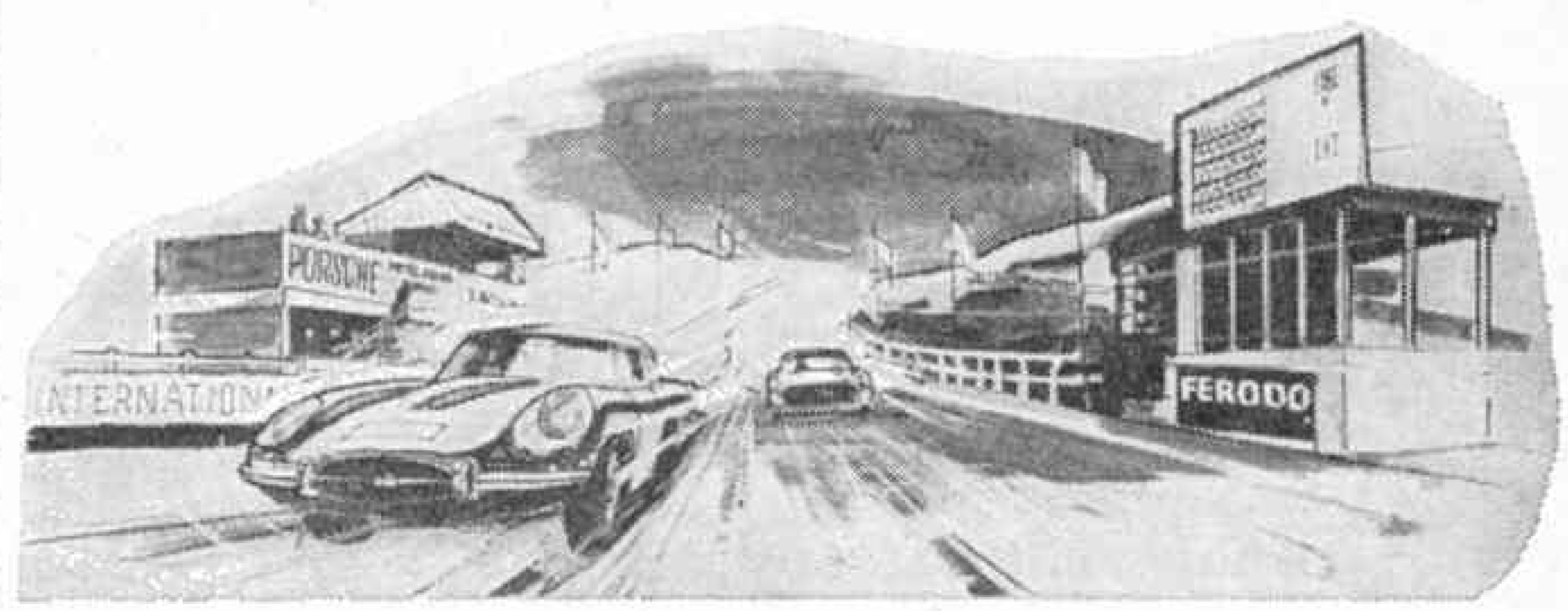

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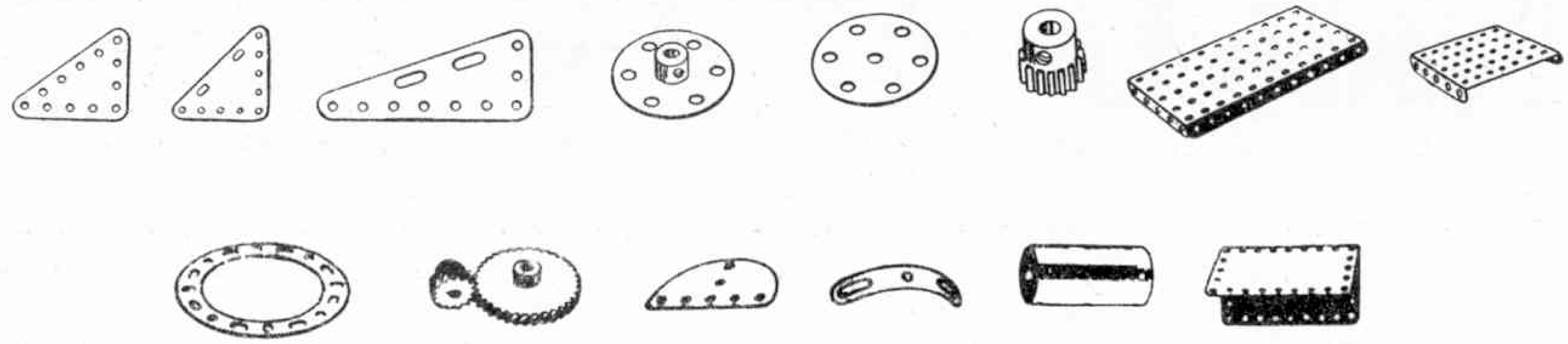

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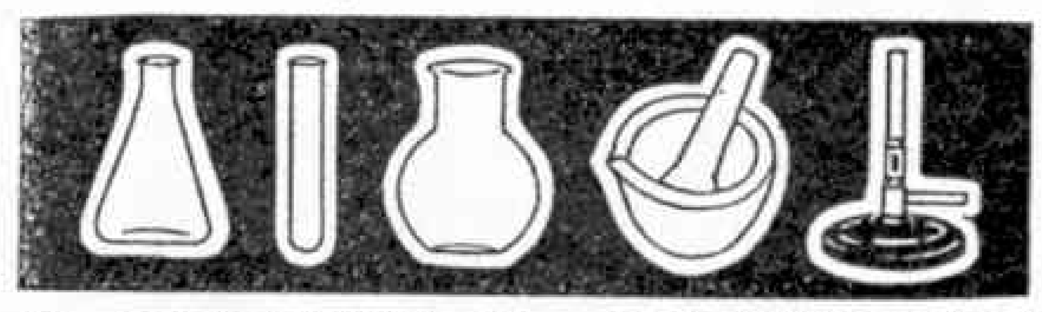

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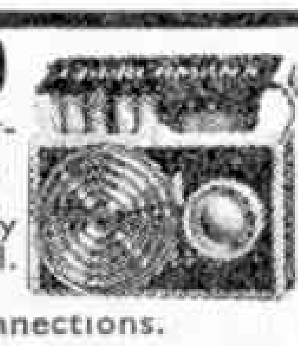

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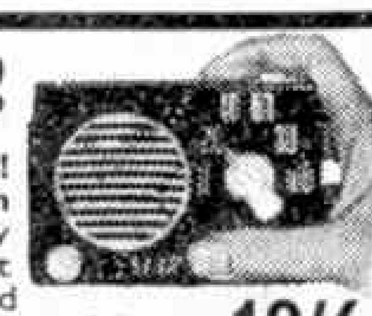

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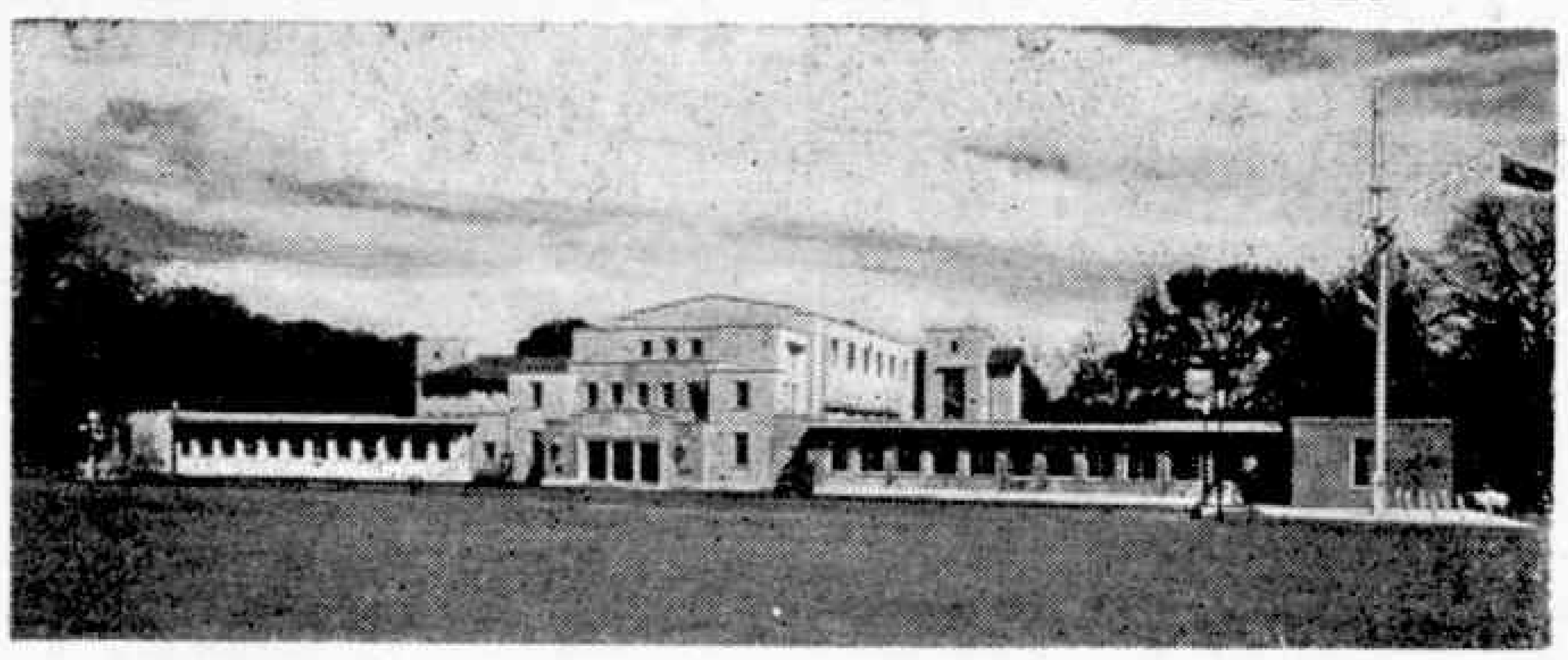

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★ Cadets on entry are enrolled as Cadets R.N.R.

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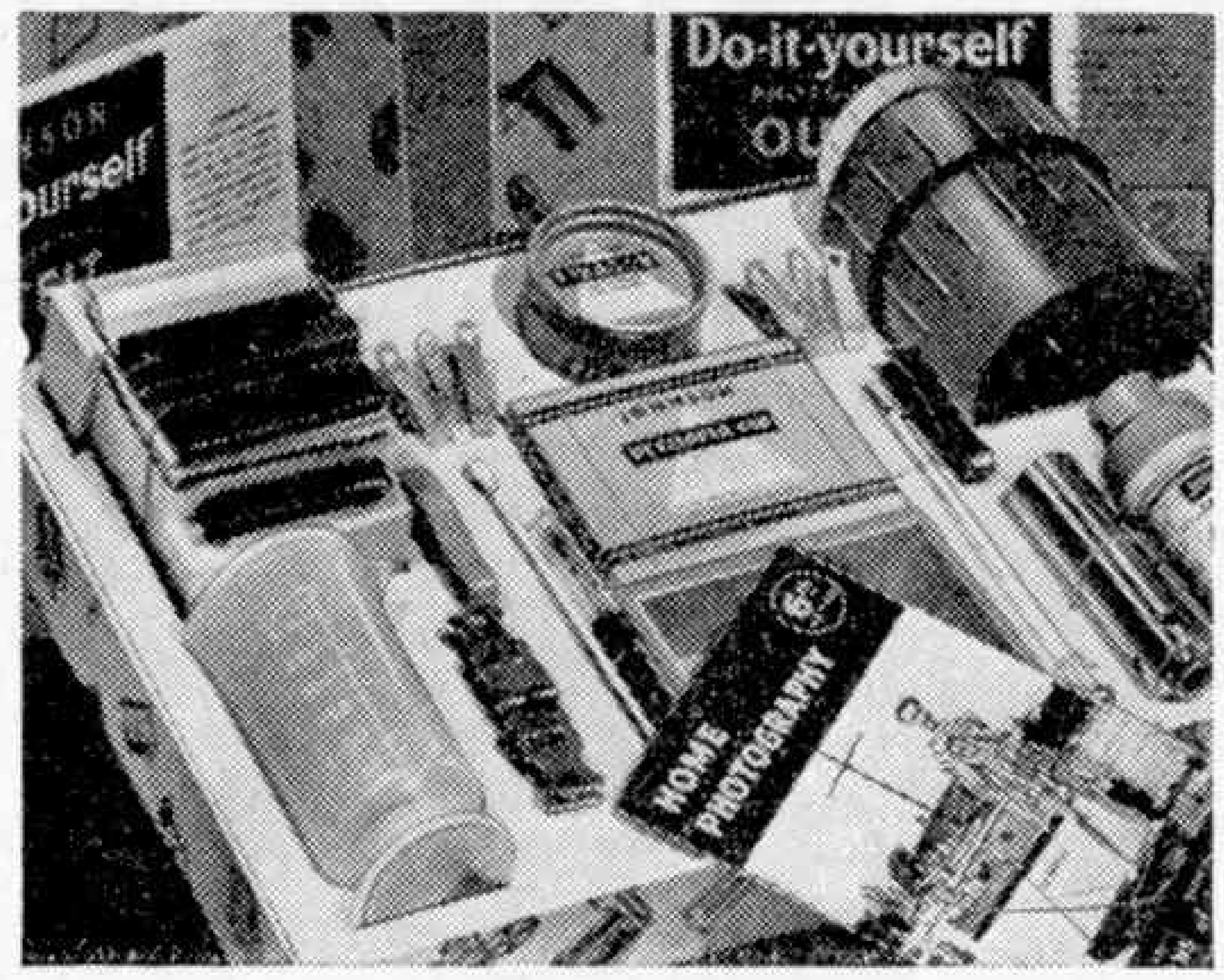

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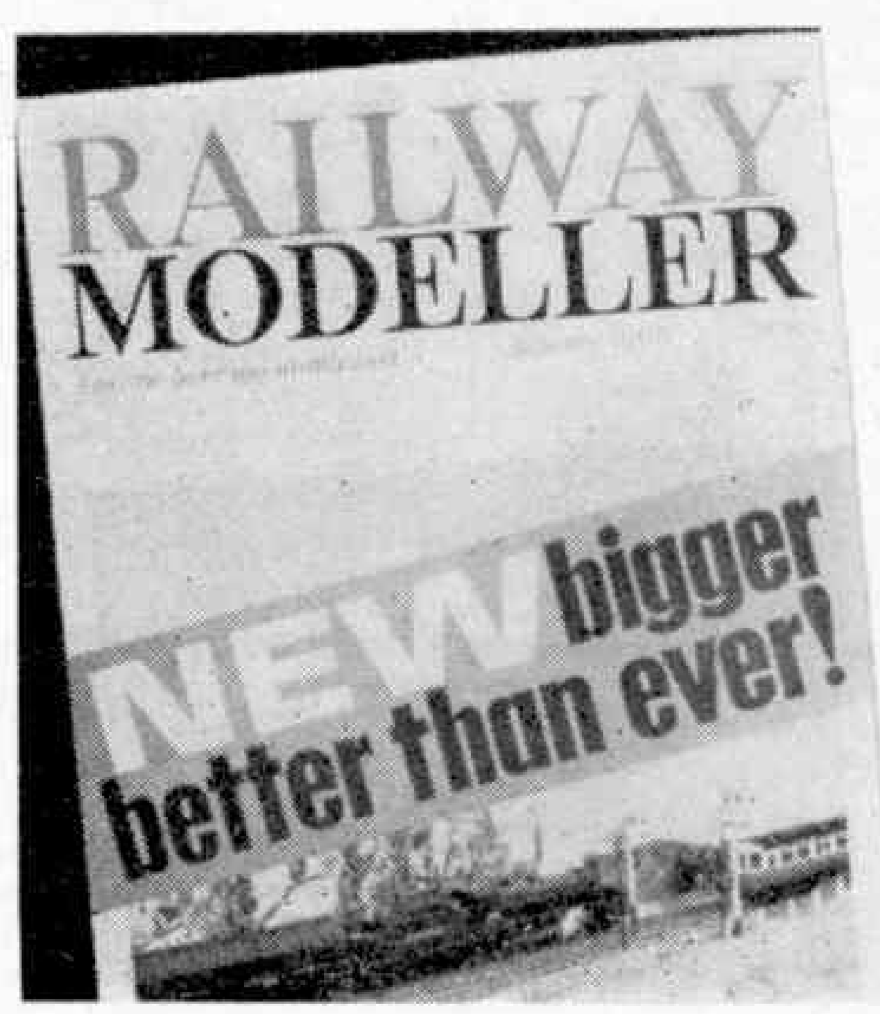

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includes the following features:—

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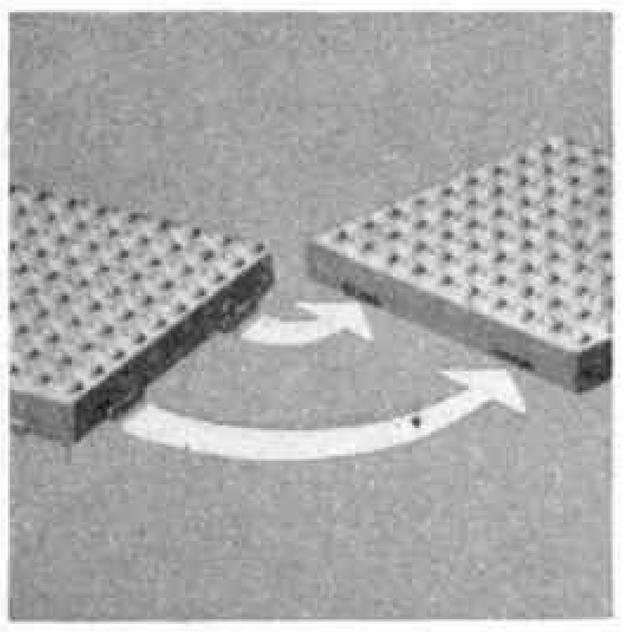
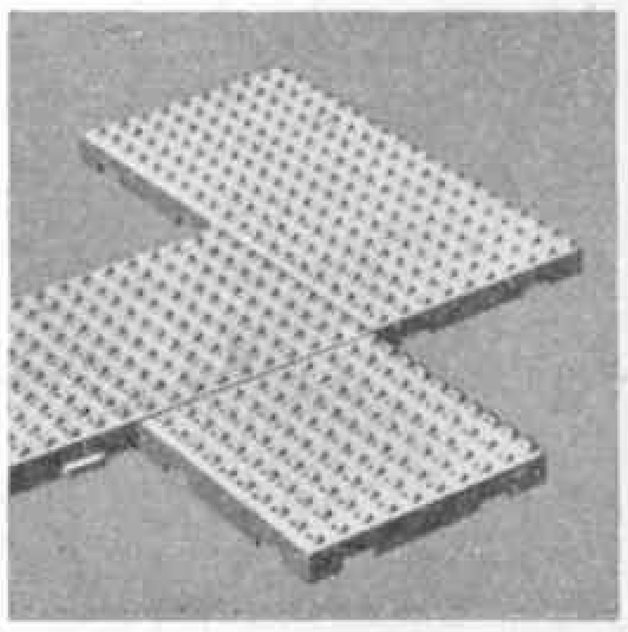
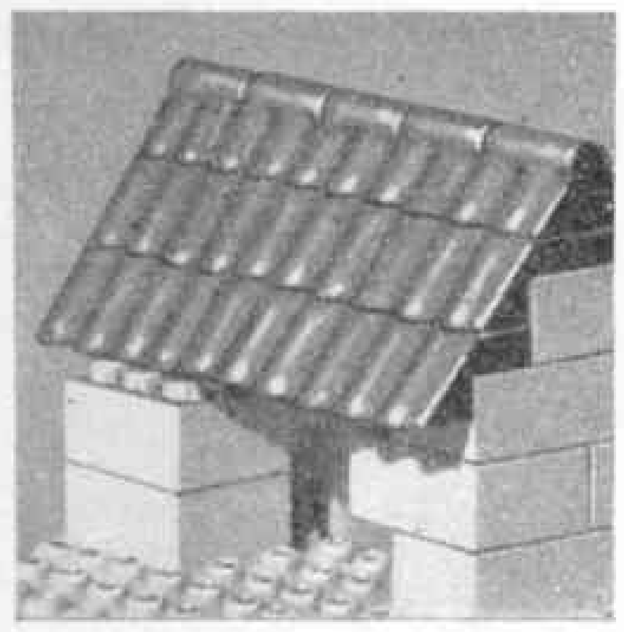
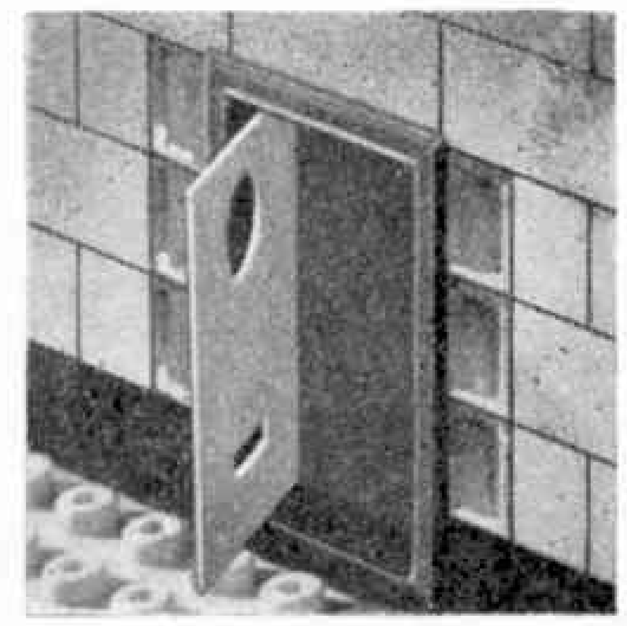



baseplates that *lock* together with special locking points—cannot fall apart



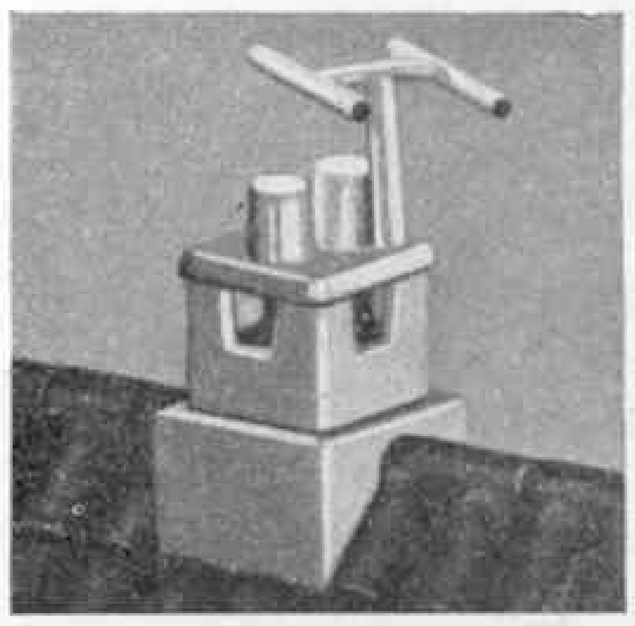
roofs that have tiles and look just like real roofs

windows that open and shut

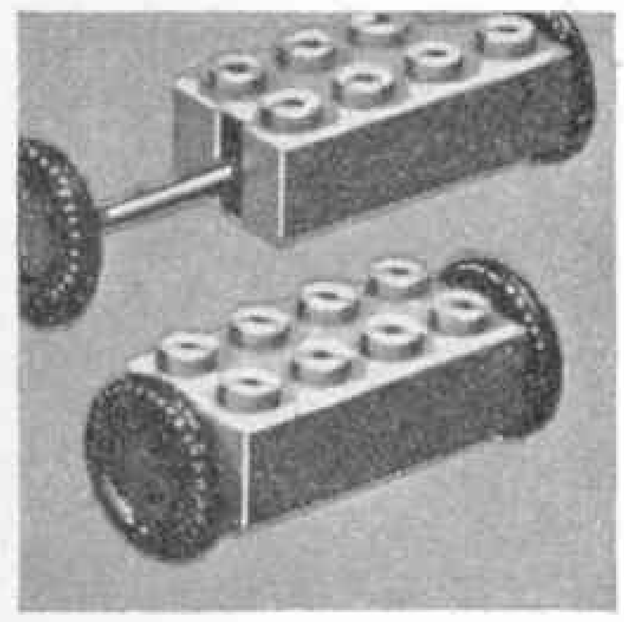


doors that are hinged to open and close

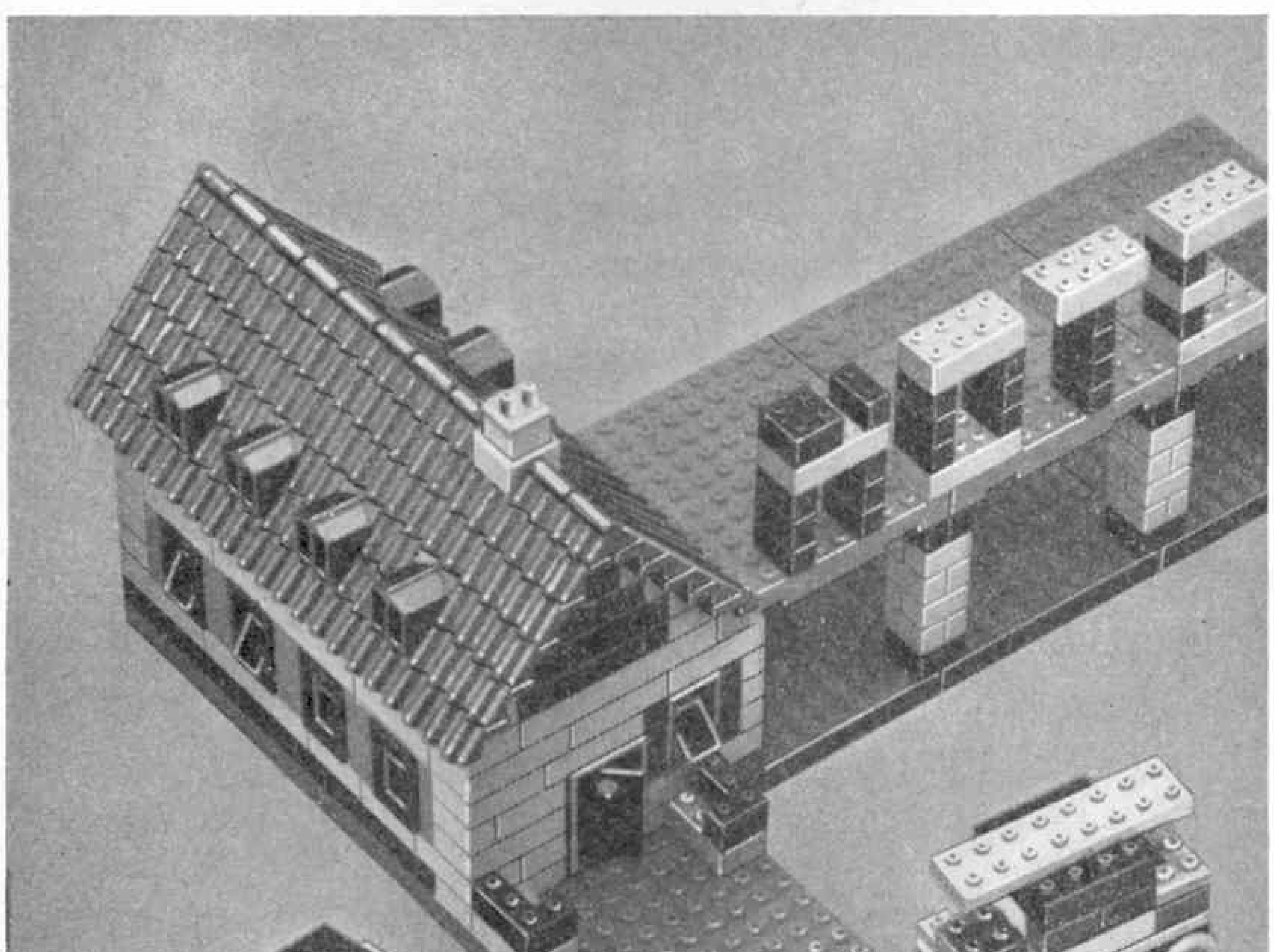
neat little bay windows with flowers in a bowl



chimneys, TV aerials and many more finishing touches



with *every* set there are wheels, axles and special holed blocks for making pushalongs



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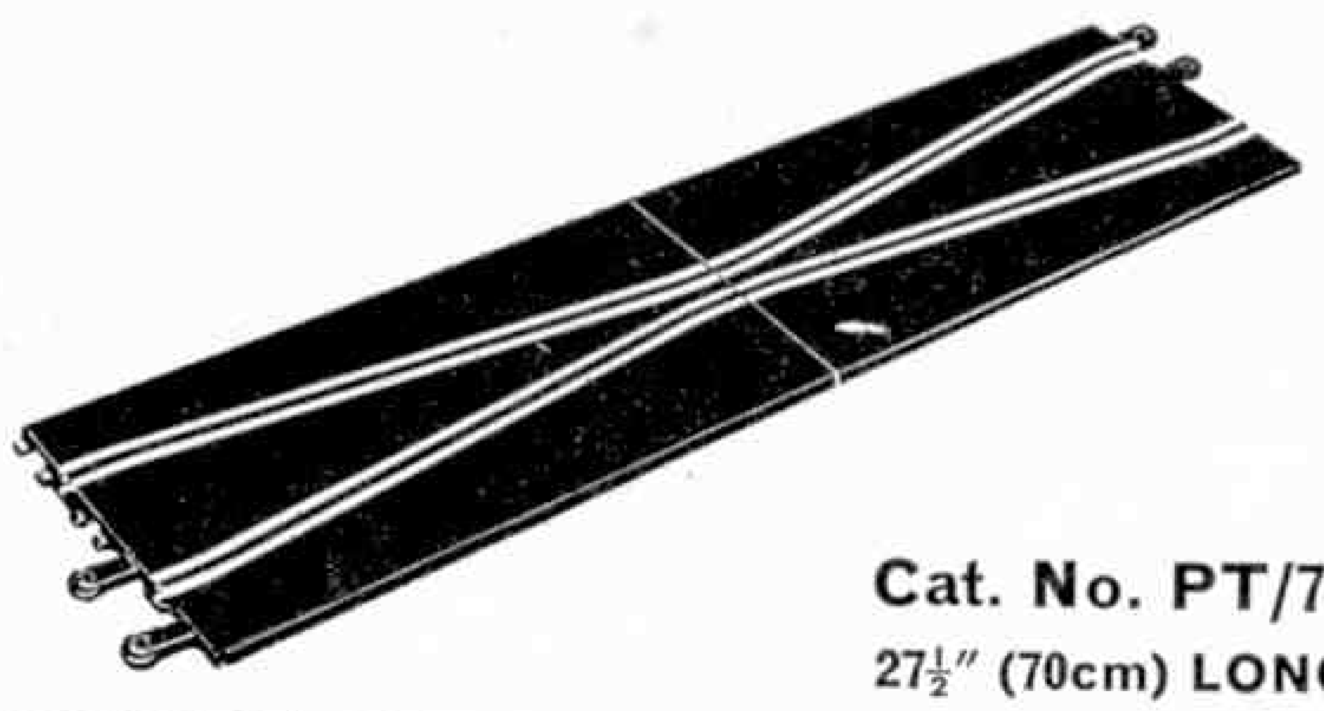
Over 30 different exciting track sections to choose from.

THE ACCEPTED STANDARD IN SCALE MODEL MOTOR RACING



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(Red or Green)

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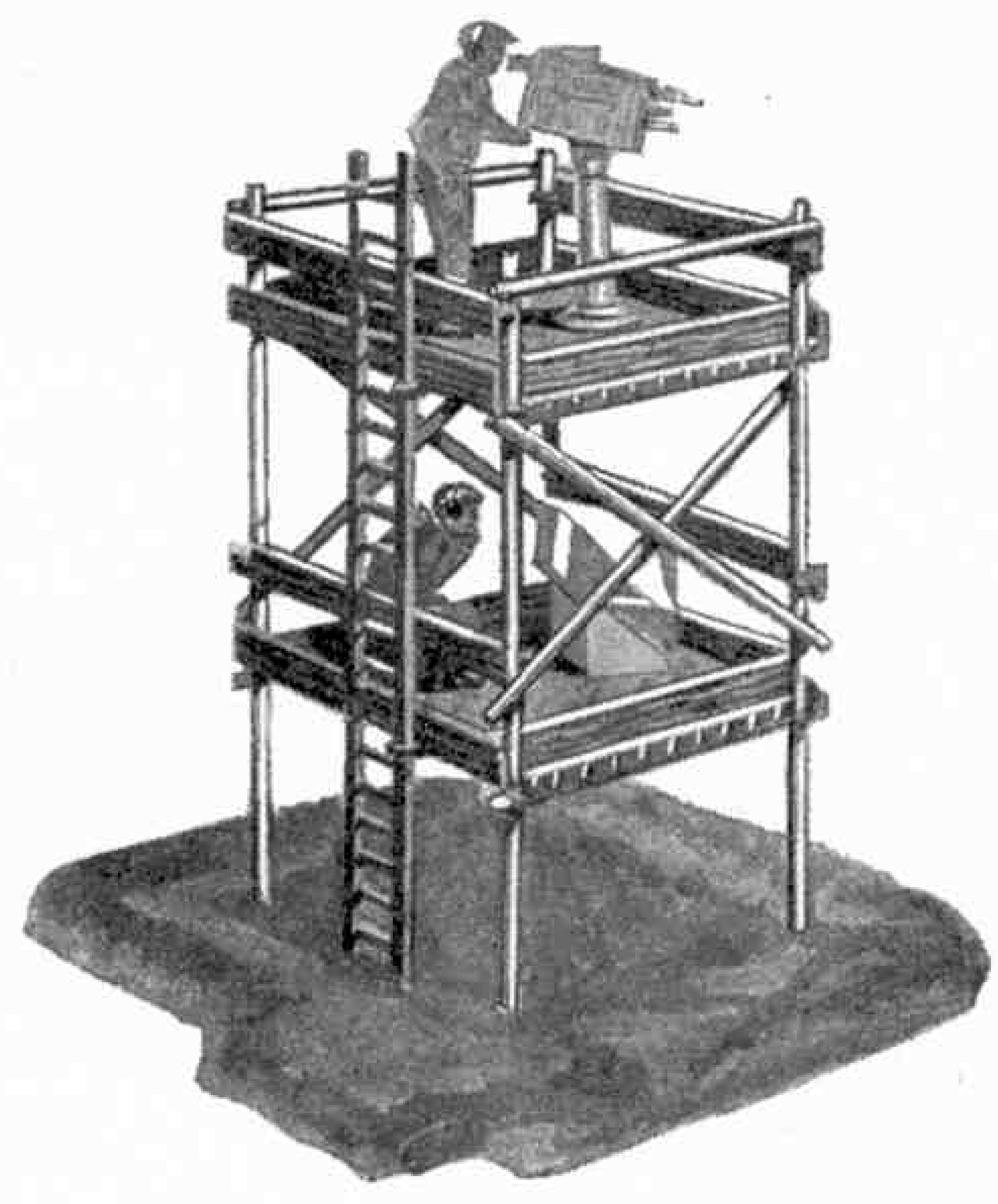

T.V. CAMERA AND CREW SET

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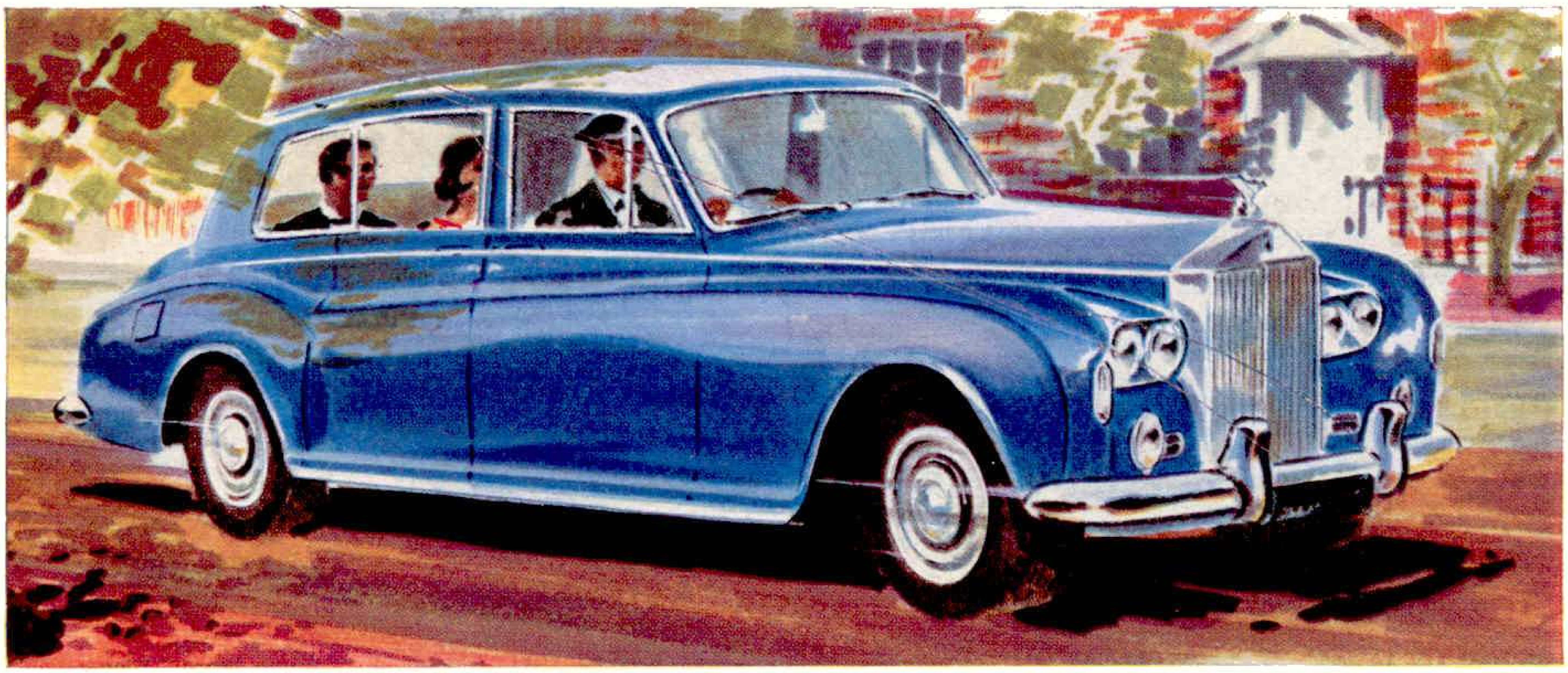


THREE GREAT NEW DINKY MODELS

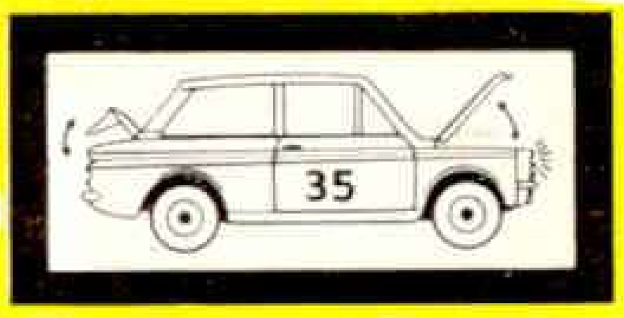
ANOTHER STAUNCH MONTE COMPETITOR

Hillman Imp

RALLY CAR

Rugged! Sturdy! Another beauty from Britain—and Dinky! The Dinky Hillman Imp has all these exciting action features: Monte stickers, number on each door, opening bonnet, opening boot with detailed rear engine, jewelled headlights, extra spots on front bumper, prestomatic steering and detailed interior.

Model No. 214
Length 3⅞″ Price: **5/11**



DINKY EXCLUSIVE
4 OPENING DOORS

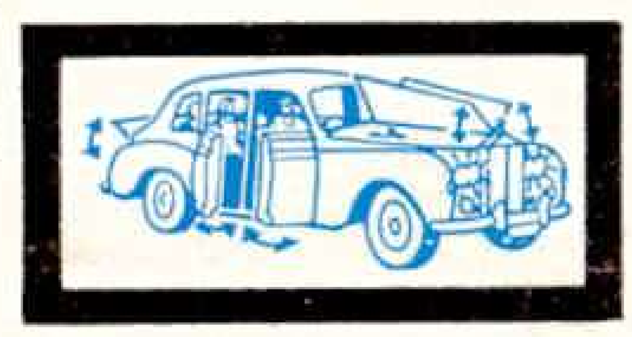
Rolls-Royce

PHANTOM V

Superb! Luxurious! The Phantom V with chauffeur and 2 passengers. Has a wonderful collection of action features. All four doors open. Boot lifts. 'Gull wing' bonnet opens to reveal detailed engine. Jewelled twin headlights and spot and indicator lights 'Chromed' radiator and bumpers.

Model No. 152
Length $5\frac{9}{16}$″

Price **14/11**



ALWAYS SOMETHING NEW FROM

DINKY TOYS

PRECISION DIE-CAST SCALE MODELS ®

Cortina

RALLY CAR

This famous winner for Britain is in authentic rally colour finish with number, and advertisements. Swivelling roof light and 3 extra bumper spotlights, as well as jewelled head and rear lights. Opening doors and tipping seats.

Model No. 212
Length 4″

Price **6/11**

Published by Thomas Skinner & Co. (Publishers) Ltd., St. Alphage House, Fore St., London, E.C.2. Printed by James Cond Ltd., Charlotte St., Birmingham 3

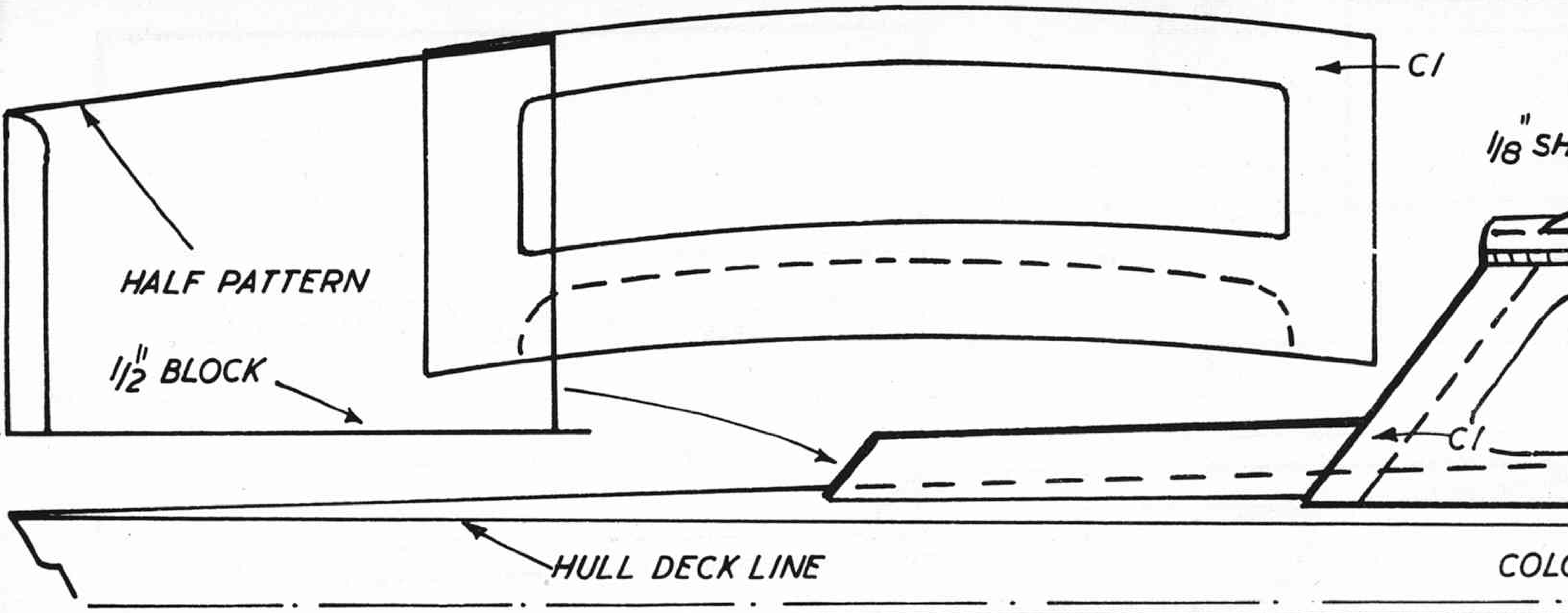
PROJECT '66

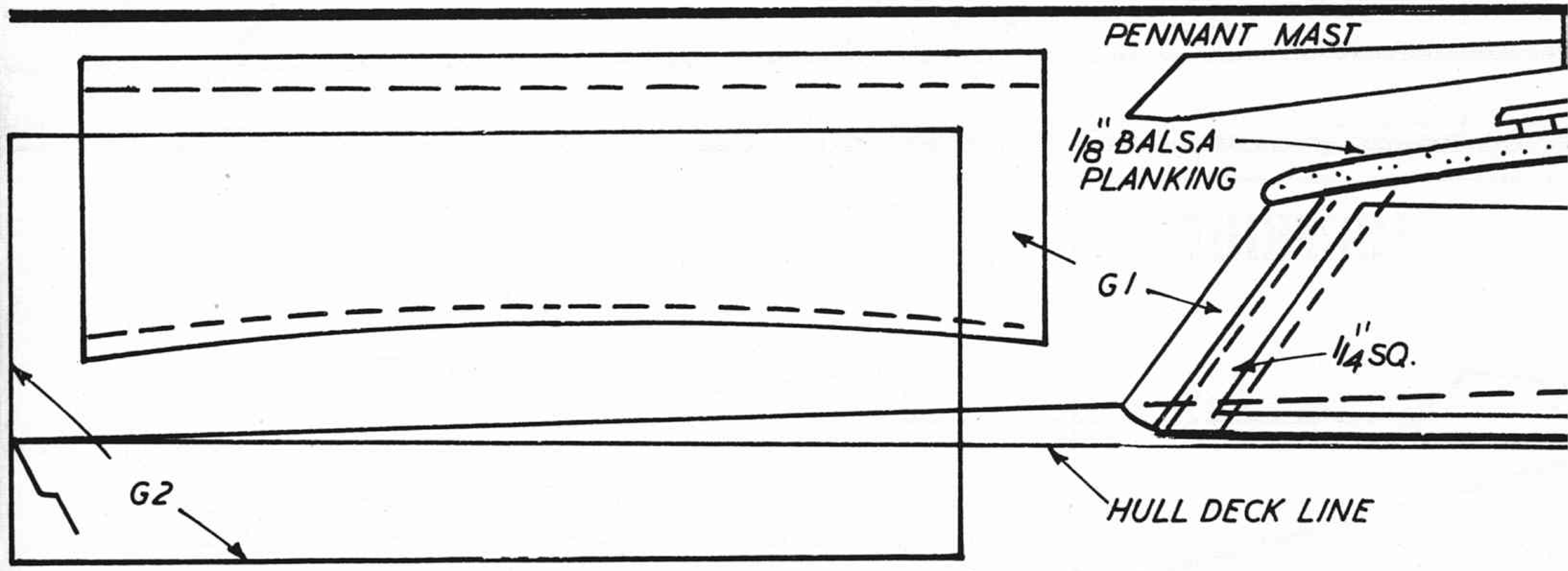
PHASE 3 meccano magazine March '66

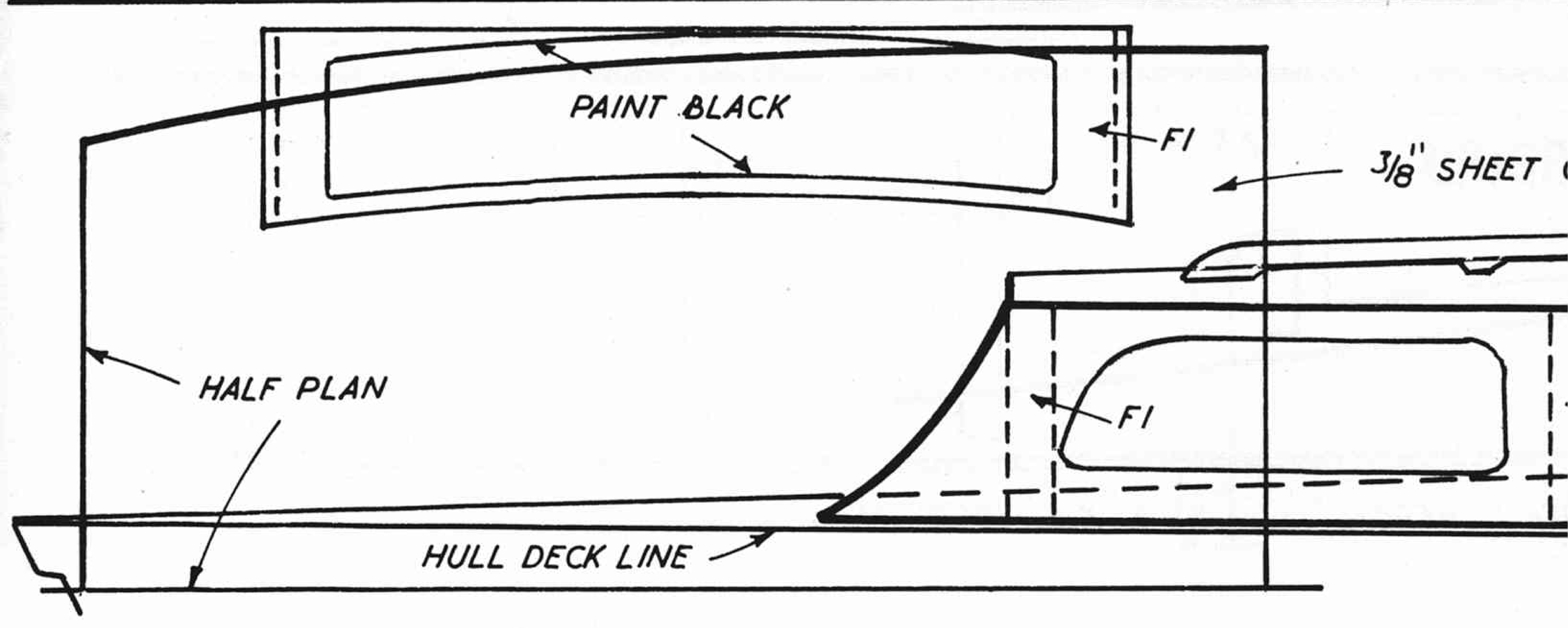
RANGER & RANGER TROPICAL
R1
CABIN ROOF 1/4" SHEET
5 1/2" LONG 1/16" DOWEL
GRAB HANDLE 1/8" SHEET
CELLULOID WINDSHIELD
PAINT SILVER
R2
R3
R4
HALF PLAN OF AFT CABIN ROOF 3/16" SHEET
DECK EXTENSION 3/8" SHEET
3/16" SHEET SCOOP
1/4" SQ. STRIP
RANGER SIDE
RANGER TROPICAL SIDE
HULL DECK LINE
COLOUR BAND

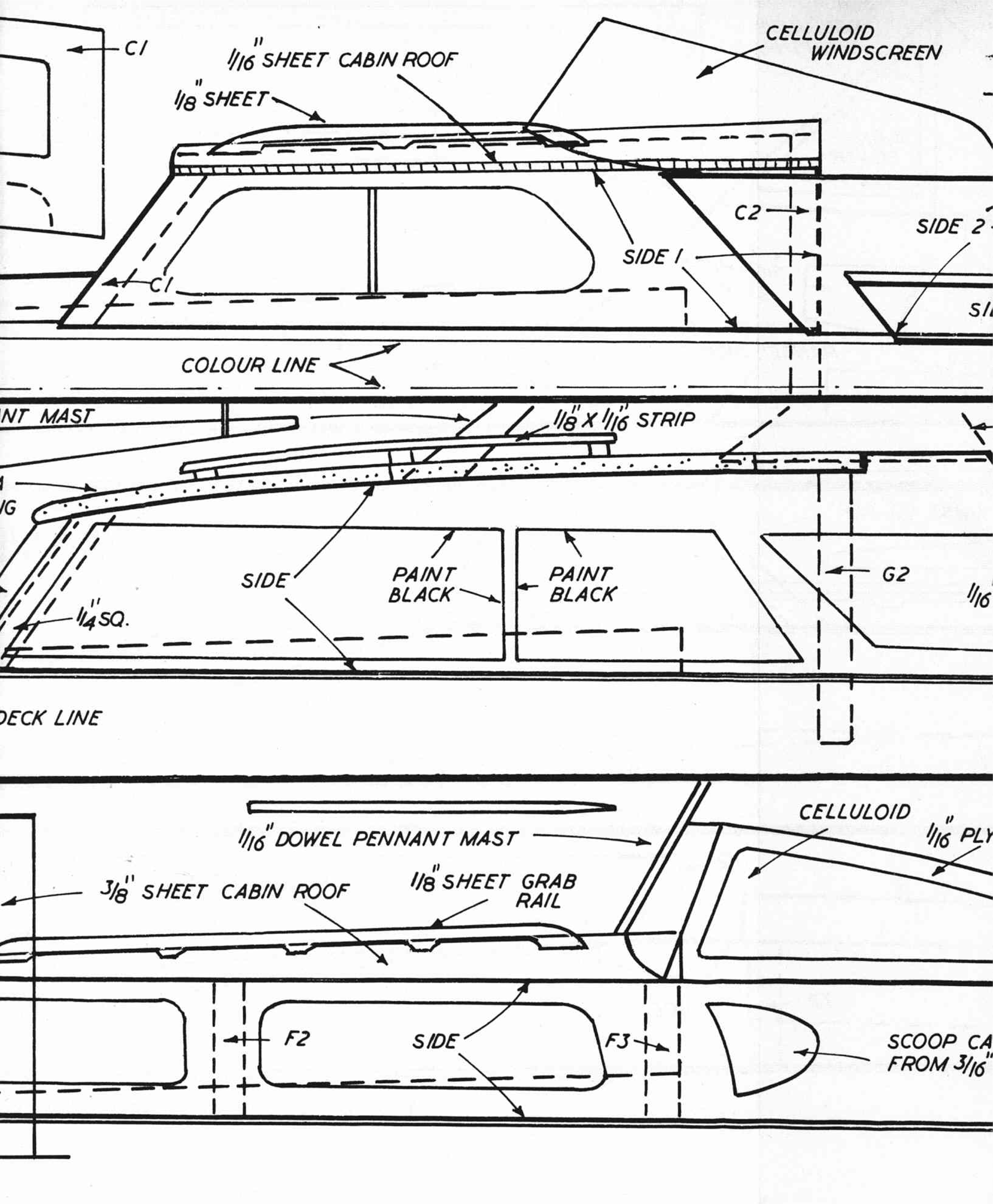
SURFRIDER
3/16" SHEET
COLOUR OUTLINE
S1
CABIN TOP 8 1/2" X 5 1/2" X 1/4"
GRAB RAIL 1/8" SHEET
PENNANT MAST 1/16" PLY
CELLULOID WINDSHIELD
S2
S3
3 5/8" DEEP
HATCH
SIDE
HULL DECK LINE

THUNDERBIRD
T1
T2
CABIN TOP 5 1/2" X 5 1/2" X 3/8"
SIDE
1/2" X 1/4"
3/16" SQ.
HULL DECK LINE
CUT AWAY DECK BACK TO HERE
1/2" X 1/4" STRIP UNDER DECK

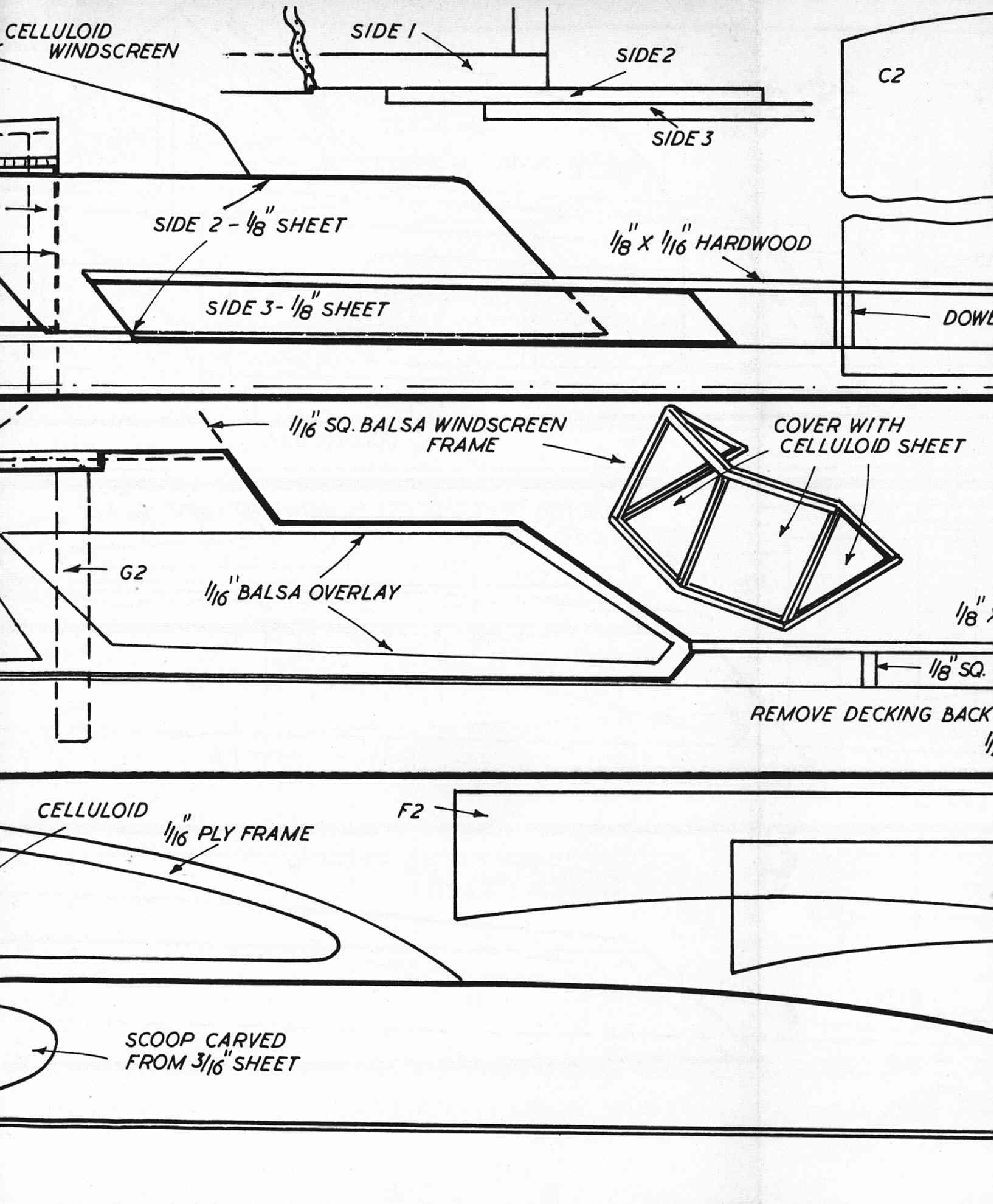

C1
HALF PATTERN
1½" BLOCK
C1
HULL DECK LINE


PENNANT MAST
1/8" BALSA PLANKING
G1
1¼" SQ.
G2
HULL DECK LINE

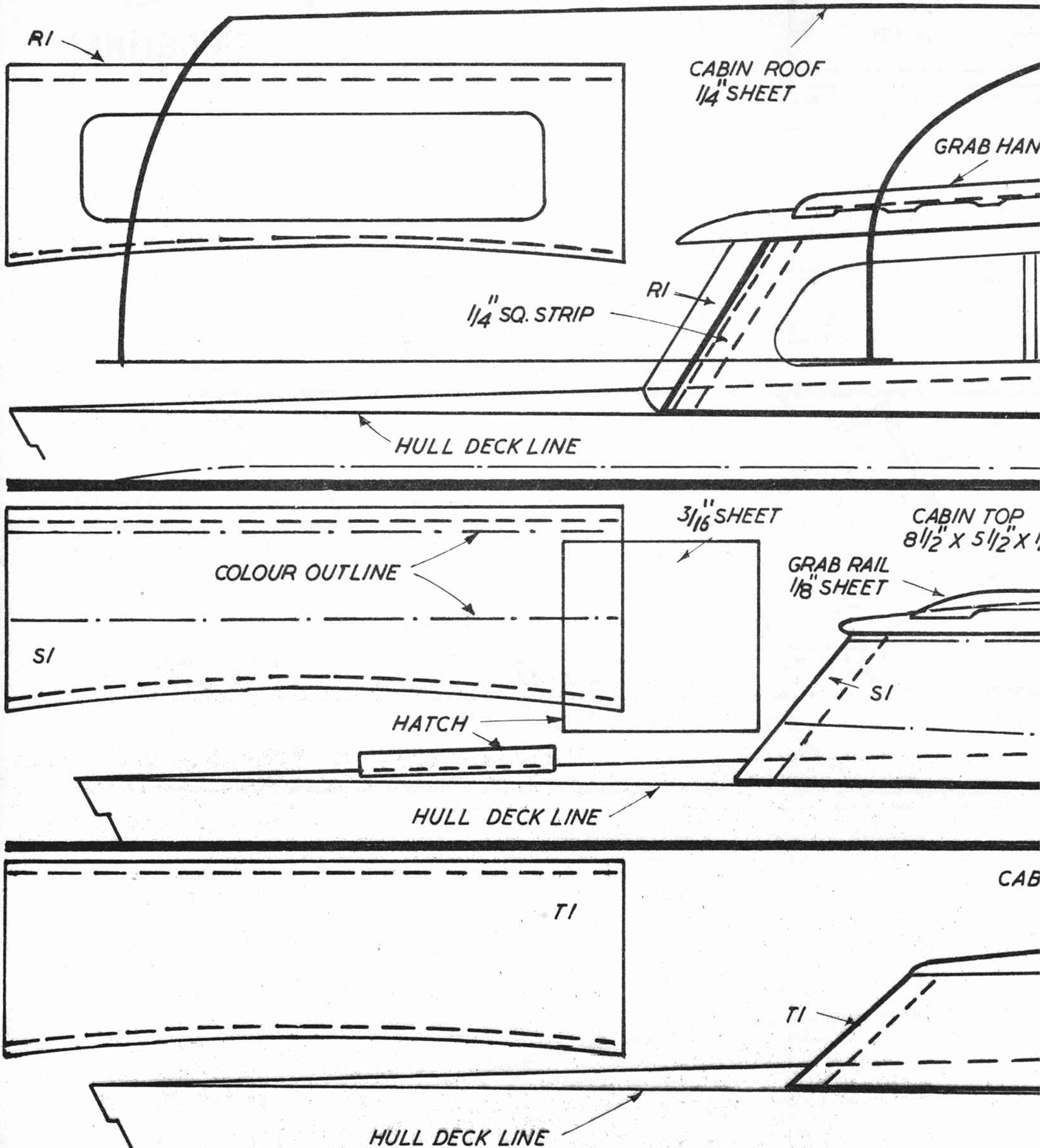

PAINT BLACK
F1
3/8" SHEET
HALF PLAN
F1
HULL DECK LINE



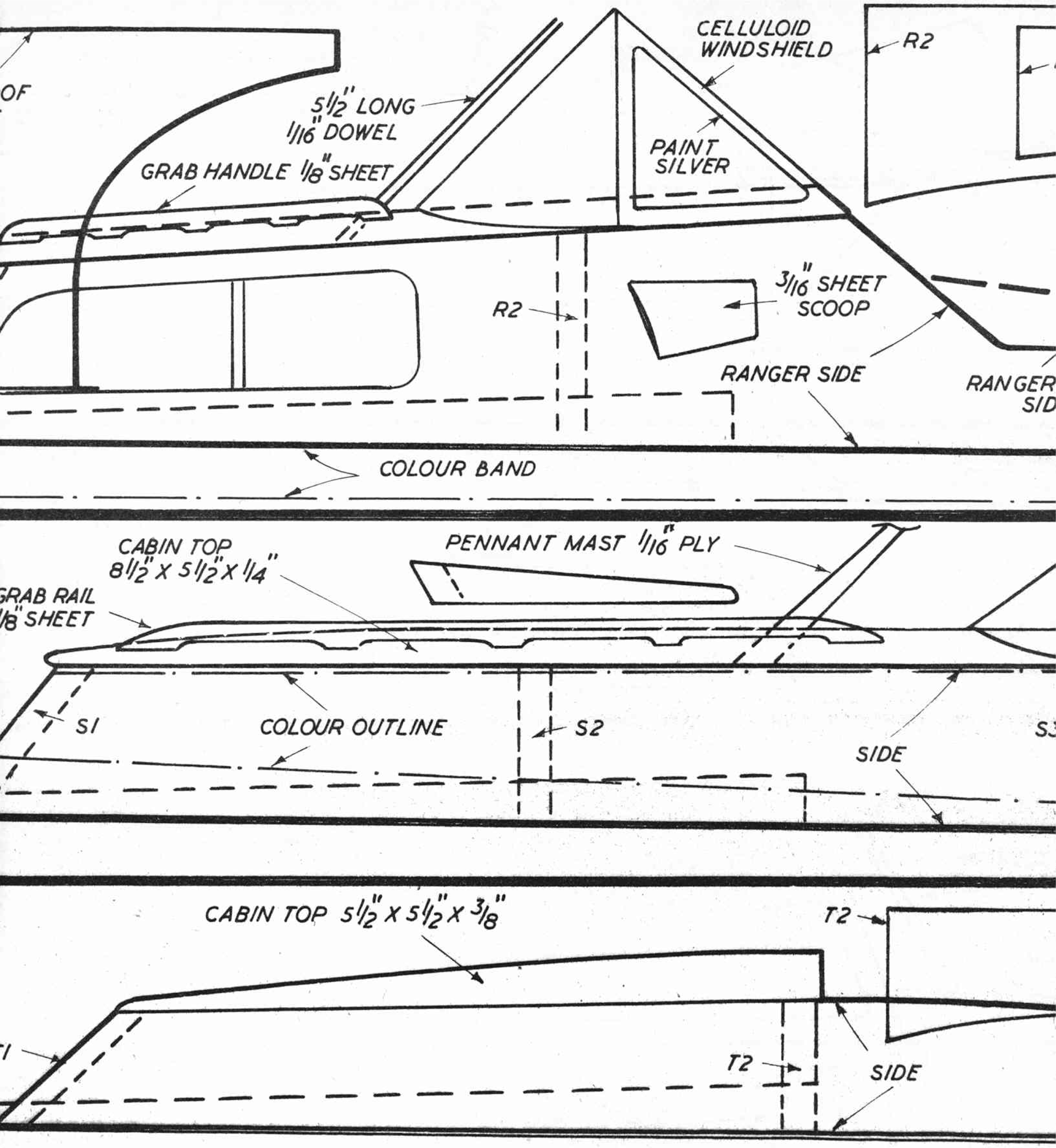
C1
1/16" SHEET CABIN ROOF
CELLULOID WINDSCREEN
1/8" SHEET
C2
SIDE 2
SIDE 1
C1
COLOUR LINE
NT MAST
1/8" X 1/16" STRIP
SIDE
PAINT BLACK
PAINT BLACK
G2
1/4" SQ.
DECK LINE
CELLULOID
1/16" DOWEL PENNANT MAST
1/16" PLY
3/8" SHEET CABIN ROOF
1/8" SHEET GRAB RAIL
F2
SIDE
F3
SCOOP CA
FROM 3/16"


CELLULOID WINDSCREEN
SIDE 1
SIDE 2
SIDE 3
C2
SIDE 2 - 1/8" SHEET
1/8" X 1/16" HARDWOOD
SIDE 3- 1/8" SHEET
1/16" SQ. BALSA WINDSCREEN FRAME
COVER WITH CELLULOID SHEET
G2
1/16" BALSA OVERLAY
1/8" SQ.
REMOVE DECKING BACK
CELLULOID
1/16" PLY FRAME
F2
SCOOP CARVED FROM 3/16" SHEET

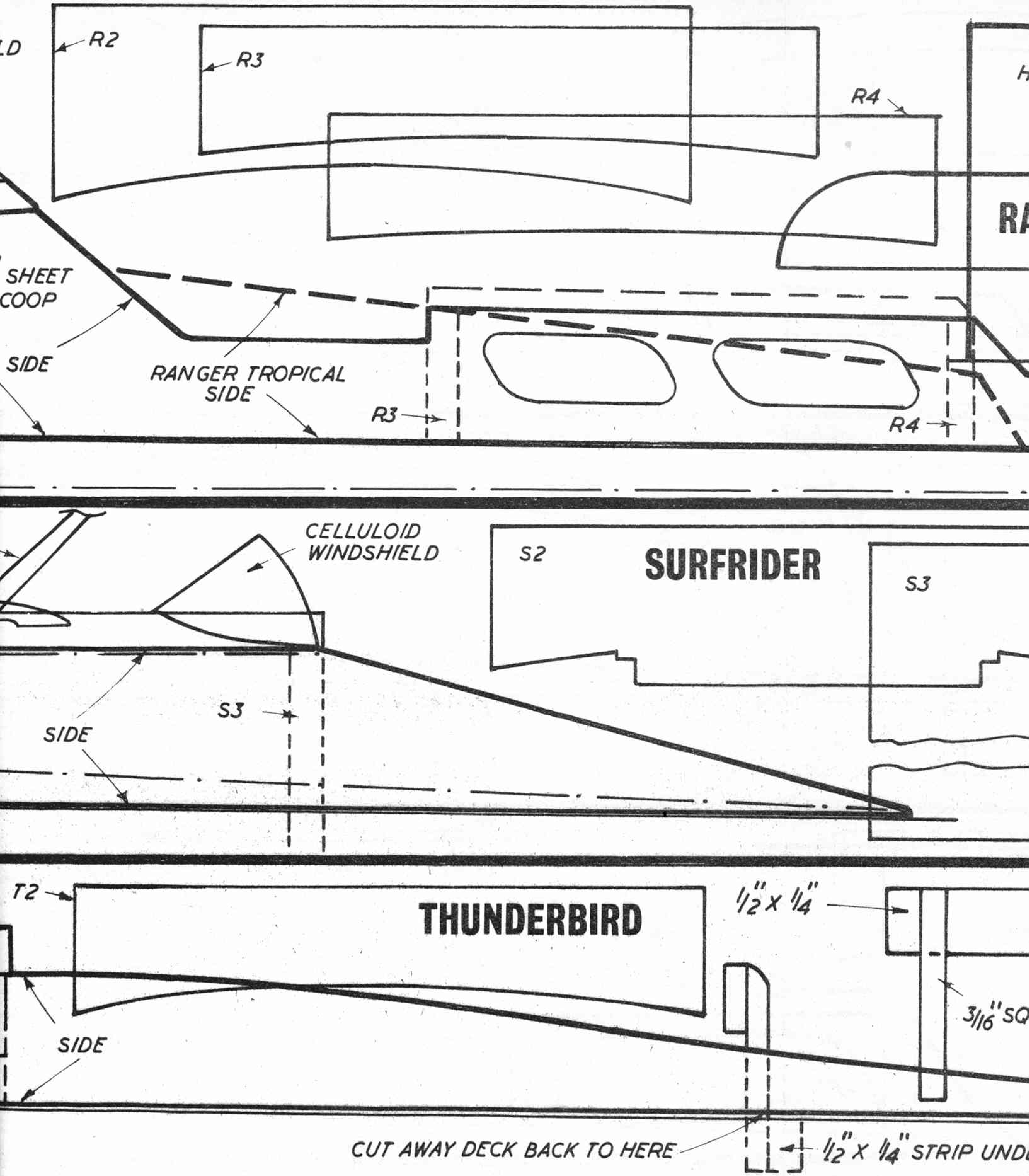

CHRISTINA
C2
4" DEEP
OOD
DOWEL
CORONET
COVER WITH
CELLULOID SHEET
PROJECT '66
PHASE 3 meccano magazine March '66
© Thomas Skinner & Co. (Publishers) Ltd.
1/8" X 1/16" HARDWOOD RAIL
1/8" SQ. BALSA
EMOVE DECKING BACK TO HERE
1/2" X 1/4" BALSA
F3
HUNTRESS



R1
CABIN ROOF
1/4" SHEET
R1
1/4" SQ. STRIP
HULL DECK LINE
3/16" SHEET
CABIN TOP
8 1/2" X 5 1/2" X
COLOUR OUTLINE
GRAB RAIL
1/8" SHEET
S1
S1
HATCH
HULL DECK LINE
T1
T1
HULL DECK LINE



OF
5 1/2" LONG
1/16" DOWEL
GRAB HANDLE 1/8" SHEET
CELLULOID
WINDSHIELD
PAINT
SILVER
R2
R2
3/16" SHEET
SCOOP
RANGER SIDE
RANGER
SID
COLOUR BAND
CABIN TOP
8 1/2" X 5 1/2" X 1/4"
PENNANT MAST 1/16" PLY
GRAB RAIL
1/8" SHEET
S1
COLOUR OUTLINE
S2
S3
SIDE
CABIN TOP 5 1/2" X 5 1/2" X 3/8"
T2
T1
T2
SIDE



R2
R3
R4
SHEET
COOP
SIDE
RANGER TROPICAL
SIDE
R3
R4
CELLULOID
WINDSHIELD
S2
SURFRIDER
S3
S3
SIDE
T2
THUNDERBIRD
1/2" X 1/4"
SIDE
3/16" SQ
CUT AWAY DECK BACK TO HERE
1/2" X 1/4" STRIP UND


HALF PLAN OF AFT CABIN ROOF
3/16" SHEET
R4
RANGER & RANGER TROPICAL
DECK EXTENSION 3/8" SHEET
R4
ER
S3
3 5/8" DEEP
1/4"
3/16" SQ.
1/2" X 1/4" STRIP UNDER DECK