VOL. XLVII. No.8 AUGUST 1962

MECCANO MAGAZINE

1/3

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HORNBY SPEED BOATS

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With separate fittings which include mast handrails and searchlight. The prototype is used on R.A.F. bombing ranges to keep straying vessels away from the danger zone. Length 10 in.
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Model No. 3
Twin Cockpit River Launch
Fashioned on the type of pleasure launch seen in large numbers on British rivers in summertime. Length $10\frac{3}{4}$ in. U.K. Price **18/6**

Model No. 4
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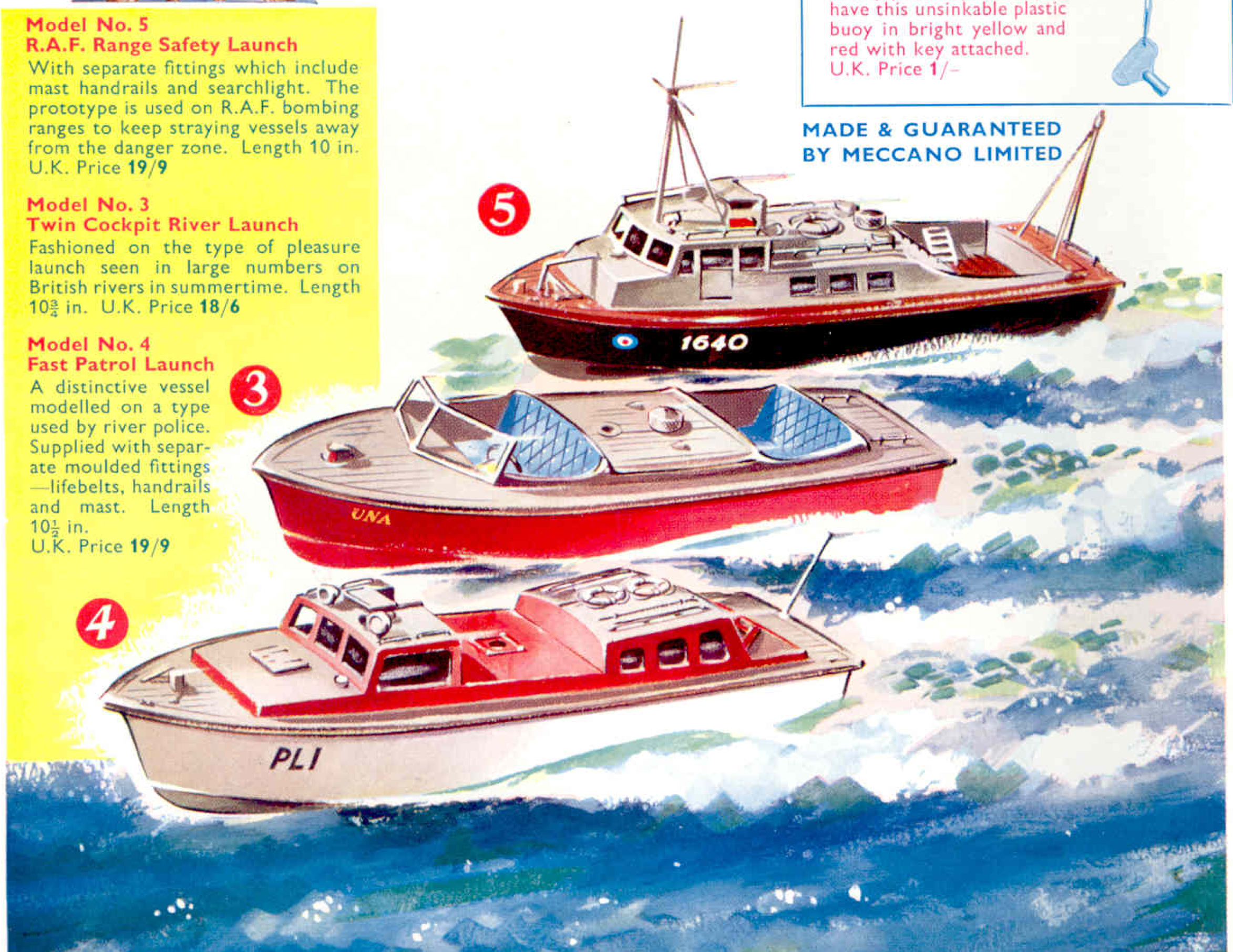
A distinctive vessel modelled on a type used by river police. Supplied with separate moulded fittings —lifebelts, handrails and mast. Length $10\frac{1}{2}$ in.
U.K. Price **19/9**



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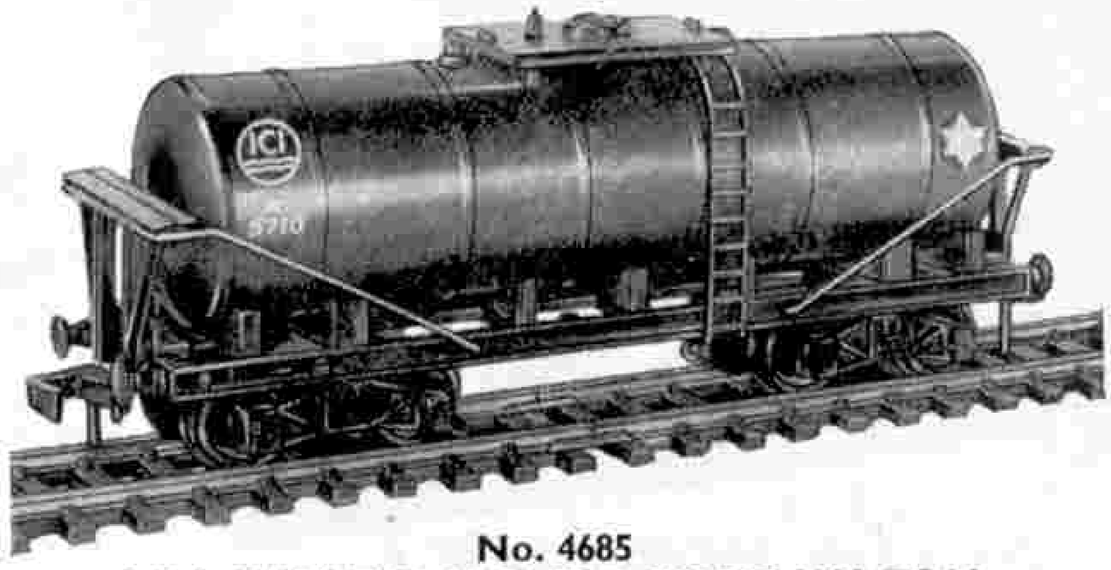

No. 4685
I.C.I. CAUSTIC LIQUOR BOGIE WAGON

The first bogie tank wagon in Hornby-Dublo, representing a high-capacity vehicle for carrying caustic liquor. The accurately-modelled die-cast underframe shows "daylight" below the moulded tank, which is attractively finished in I.C.I. "Transport Blue" and is complete with the owner's emblems and other markings.
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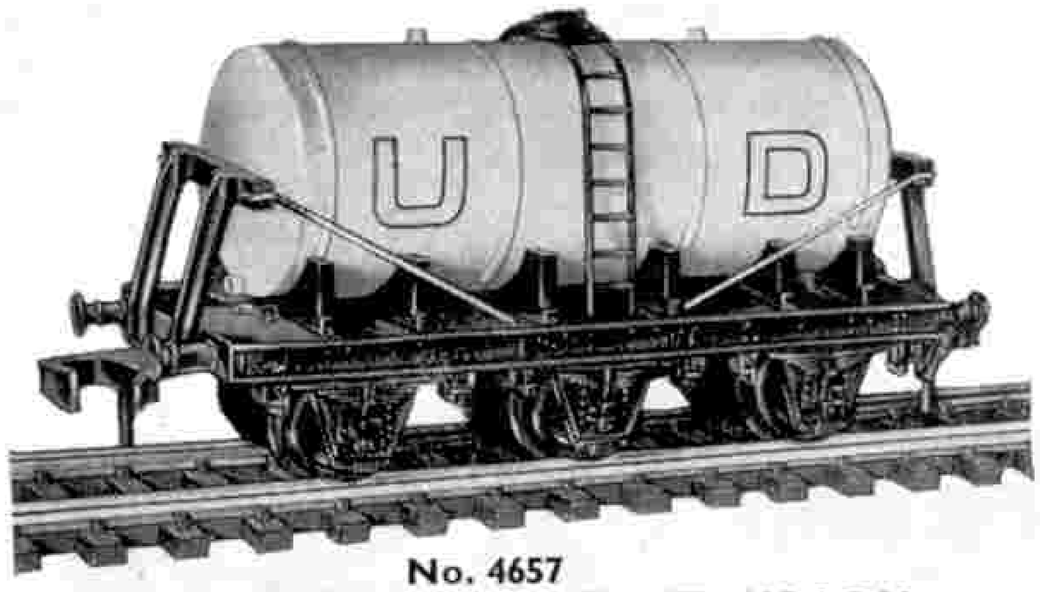
No. 4658 "PRESTWIN" SILO WAGON

The No. 4658 "Prestwin" Silo Wagon reproduces a special-purpose wagon of unusual shape for carrying sand and other powdery loads. Details such as fillers, pipes and valves are modelled, as well as the catwalk and ladders. The die-cast base has dummy "cut-out" brake gear, and brake cylinder.
Length $3\frac{5}{8}$ in. U.K. Price **8/6**



No. 4657
UNITED DAIRIES MILK TANK WAGON

The No. 4657 United Dairies Milk Tank Wagon is the first six-wheeled item of freight rolling stock in Hornby-Dublo. With its neat, moulded tank and die-cast base, it represents an up-to-date vehicle of large capacity for the rail transport of milk in bulk.
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The brown finish of the No. 4656 16-ton Mineral Wagon—a welcome variation of the No. 4655 Mineral Wagon familiar in grey—shows that the vehicle is based on the many British Railways mineral wagons fitted for power braking. Moulded bodywork, die-cast base with "cut-out" brake gear, nylon wheels.
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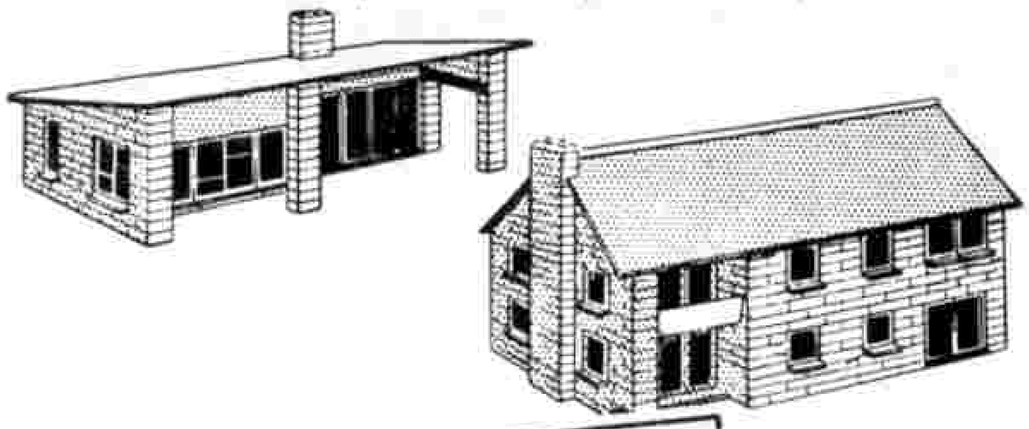

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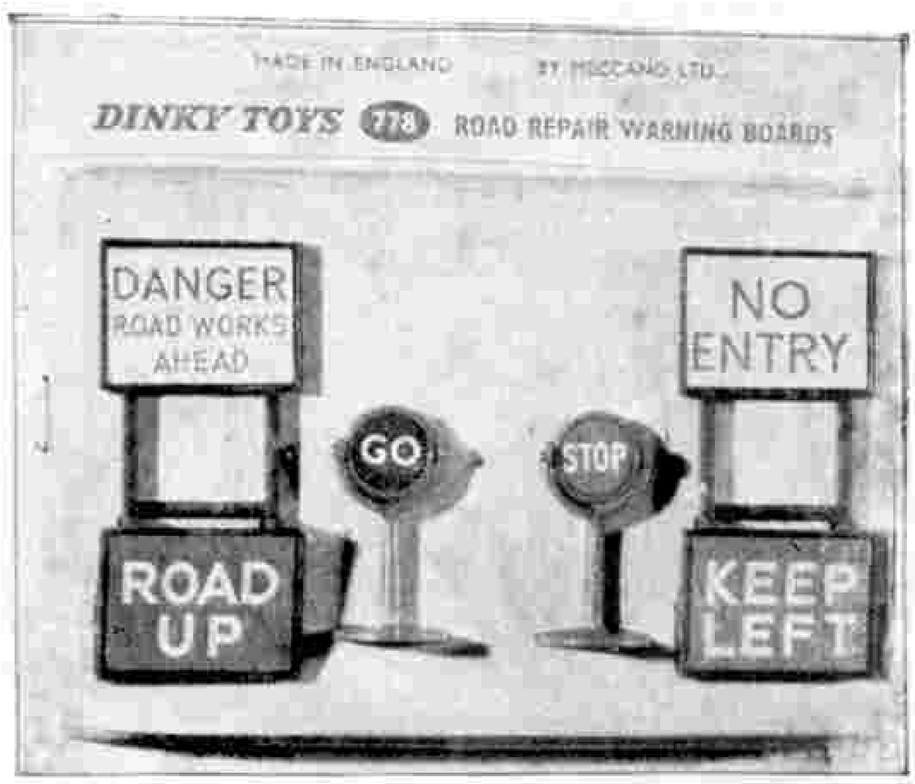
NEW . . .



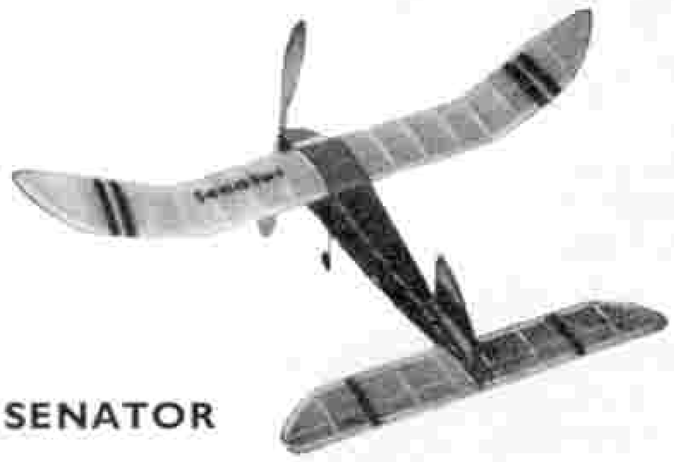
DINKY TOYS No. 778
ROAD REPAIR WARNING BOARDS

This authentic set is intended for use with the Road Maintenance Personnel which we introduced in May. It consists of two swivel Stop/Go signs, a "No Entry" sign, a "Road Up" sign, a "Keep Left" sign and a "Danger, Road Works Ahead" sign. All are finished in the correct colours and greatly add to a layout. U.K. Price **2/11**

DINKY TOYS

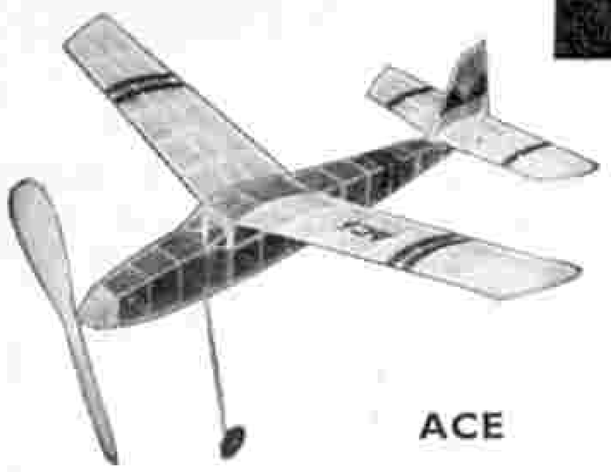
MADE BY MECCANO LIMITED

KEILKRAFT RUBBER DRIVEN MODELS



SENATOR

Novel contest model which is capable of a fine performance. Features a single leg undercarriage. Wingspan 32 in. **8/5**



ACE

Sleek cabin model. Construction is very simple, and the number of cut-out sheet parts have been kept to a minimum. Wingspan 30 in. **7/4**

AJAX

A well established K-K favourite. Kit contains clearly printed sheet, propeller, plastic wheels, tissue, celluloid, wire, etc. Wingspan 30 in. **8/11**

COMPETITOR

The pleasing lines of this model have made it one of the most popular in the K-K range. Performance is outstanding. Wingspan 32 in. **10/6**

FOR INEXPENSIVE MODEL FLYING

In the years prior to the war, when model engines were the exception rather than the rule—and the model diesel was as yet unknown—rubber power was the order of the day.

Many were the outstanding flights made by these models, and still today rubber power can give the modeller hours of exciting and inexpensive flying.

These Keilkraft models have been designed by experts for easy construction and top performance—with all of them you can have lots of fun.

PIXIE

An attractive semi-scale design with realistic cabin, knock-off wings and plastic propeller. A very interesting model to build. Wingspan 23 in. **6/5**

ELF

The smallest and lowest priced rubber model in the Keilkraft range. A neat little model that is a pleasure to build and fly. Wingspan 16 in. **4/6**

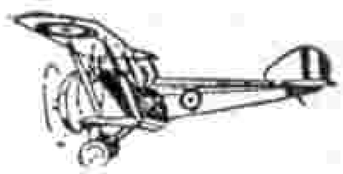
GEMINI

Beginners duration model with fuselage parts, tailplane and fins, in pre-cut pre-decorated sheet balsa. Wingspan 22 in. **8/11**

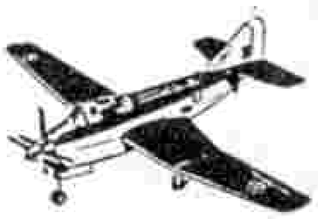
KEILKRAFT JUNIOR FLYING SCALE SERIES

RUBBER POWERED. AVERAGE SPAN 20 in.

Lysander



Sopwith Camel

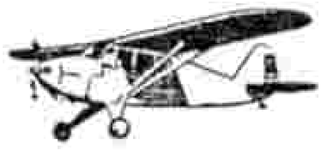


Fairey Gannet

Auster Arrow
Beechcraft Bonanza
Cessna 140
D.H. Chipmunk
Erco Ercoupe
Fairey Gannet
Fairey Junior
Messerschmitt M.E. 109
Focke-Wulf 190
Spitfire
Hawker Hurricane
Ju 87b Stuka
Luscombe Silvaire
Lysander
Globe Swift
Mustang
Nieuport (1914–1918)
S.E.5 (1914–1918)
Sopwith Camel (1914–1918)
Fokker D-8 (1914–1918)
Percival Provost
Piper Family Cruiser
Piper Super Cruiser
Stinson Flying Station Wagon

ALL 4/6 EACH
(Except Stuka 4/10)

Spitfire



Piper Family Cruiser

Percival Provost

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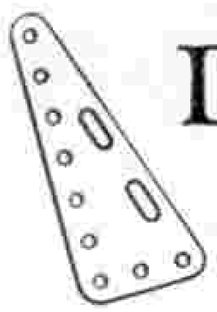

DEALERS WHO SPECIALISE IN MECCANO SPARE PARTS

Listed below are some of the dealers who sell Meccano accessories and spare parts. This is intended to aid enthusiasts—and there are many of them—who are constantly requiring additional spare parts for their Sets. All dealers are, of course, able to order Meccano spare parts for their customers, but those listed here are among our spare part specialists.

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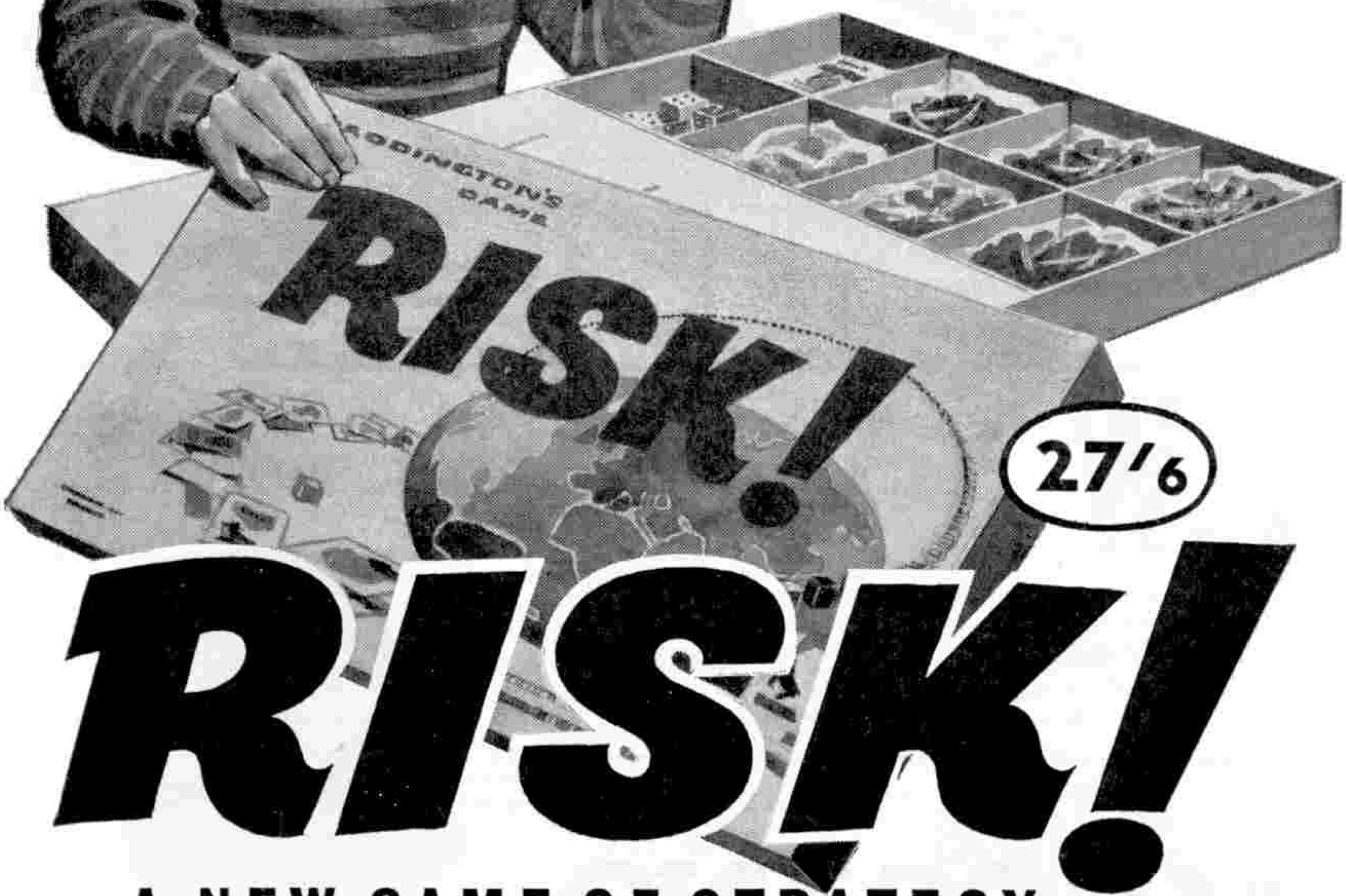


27/6

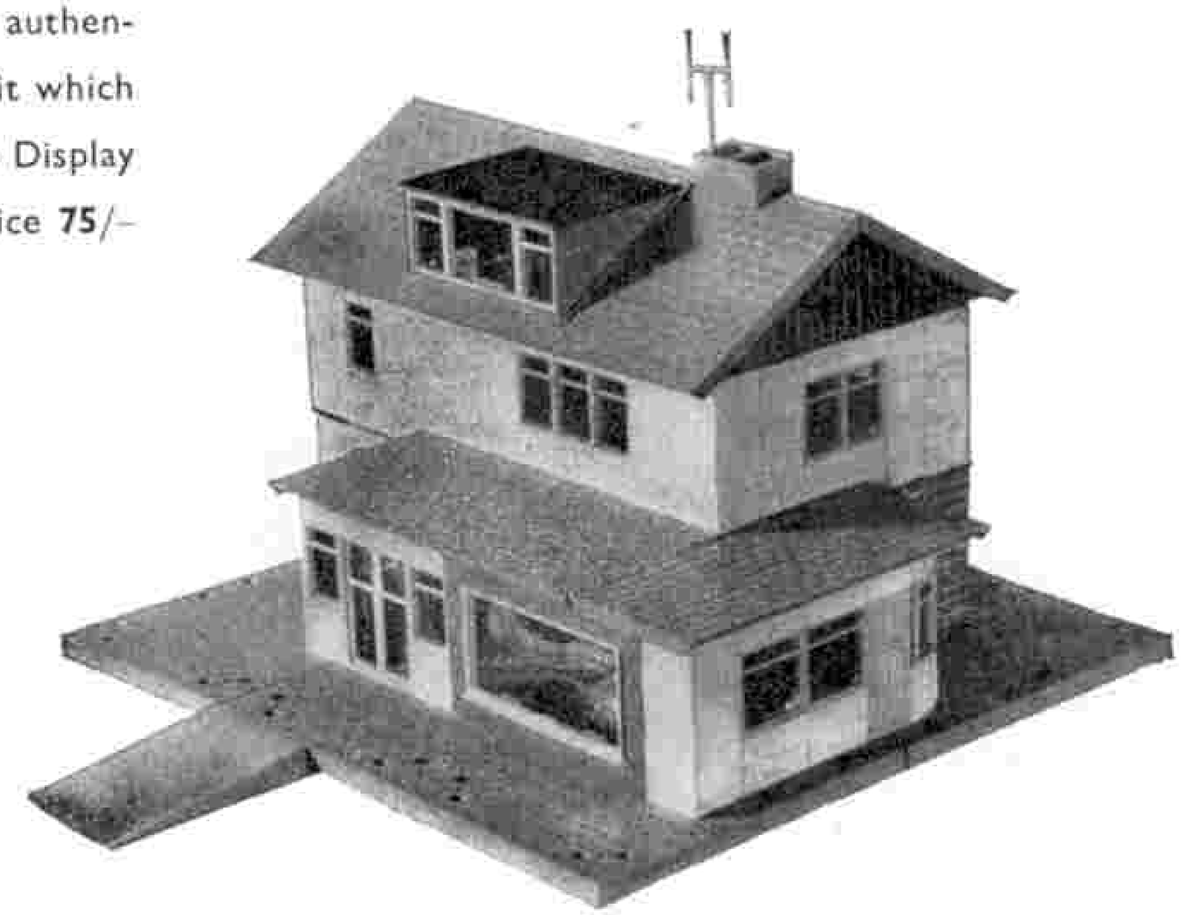
RISK!

A NEW GAME OF STRATEGY

BY WADDINGTONS MAKERS OF THE FAMOUS **'MONOPOLY'**

NEW . . . BAYKO OUTFIT No. 15

Owners of this new and exciting Outfit can now build bigger and better models than previously and can add to their authenticity by using the new parts packed with the Outfit which range from Pantile Roofs and Dormer Windows to Display Shelves and a Shop Window. U.K. Price **75/-**



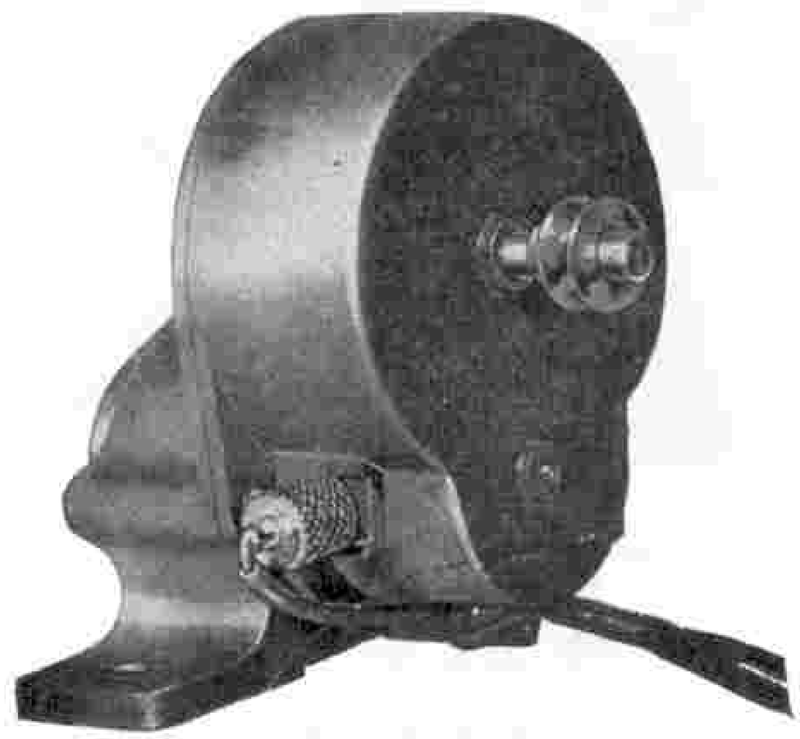
BAYKO ACCESSORY OUTFIT No. 14C
This Outfit by itself is not meant for the construction of models, but is designed to convert the existing Outfit No. 14 into the new Outfit No. 15. It contains all the new parts included in Outfit No. 15 besides the necessary existing ones.
U.K. Price **34/6**

BAYKO

NEW . . . MECCANO ELECTRIC MOTOR

This most economical but amazingly powerful motor—housed in a bright red moulded case—is battery operated and has a rating of $4\frac{1}{2}$ to 12 volts D.C. When used with batteries such as Exide H30 (or Ever Ready 126) a suitable Battery Controller will provide speed control both forward and reverse. It may also be run from a 6-volt accumulator.

The EMEBO Motor will operate models of suitable type made from Meccano Outfits up to No. 6. U.K. Price **19/6**



MECCANO

MADE BY MECCANO LIMITED

MECCANO MAGAZINE

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Asst. Editor:
ERNEST MILLER

British Railways' Car Park Robot

WE have long been in the age of the automatic brain, yet its development in ordinary everyday life is unceasing. Two examples are given in this month's *M.M.* One bears on the picture illustrated above, which I will refer to later; the other relates to a recent exhibition at Olympia in which one of the latest types of computers gave proof of its complete infallibility in a display linked with a Hornby-Dublo shunting yard. You can read all about this unusual event on pages 304–306 of this issue. Returning to our Editorial picture, this shows a railway robot just introduced at Harlow New Town. It runs a station car park on the "pay as you leave" principle, and needs no assistance from attendants. As a car enters the parking area its front wheels pass over a treadle. This sends a message to the robot's brain with the result that a timber arm barring the entrance is lifted, and allows the motorist to park. No money is required at this stage. As the car passes over a second treadle, just beyond the entrance, down comes the barrier. When the driver goes to collect his vehicle the exit is barred by another arm which can only be raised by inserting the car parking fee of 1/6d. into a slot. Any combination of coins to the total parking fee will raise the barrier. Alternatively, if you are a season ticket holder you are provided with a coded card key, made of laminated plastic, which will free the barrier. Insertion of the card operates a coded lock which can be set to operate to twelve different codes, each requiring the use of the appropriate card key. The code is changed monthly when new keys are issued and the old ones collected.

In conclusion, by the time you read these notes I hope to have been among the first to cross the River Dee on the new Hovercraft service between Rhyl and Wallasey. If plans work out, I will describe the journey in a subsequent issue of the *M.M.*

THE EDITOR

Next Month: CONQUEROR OF GAPING GILL

THIS MONTH'S CONTENTS INCLUDE—

	Page
MOUNTAIN RESCUE BY MOTOR-CYCLE .. .. .. By Anthony Greenbank	302
THE NEW FORTH BRIDGE ..	307
THE GLASGOW SUBWAY .. By Colin H. MacKay	310
TOTEM POLES .. .. .. By H. I. O'Hara	322
NEW MECCANO MOTOR ..	324
HORNBY-DUBLO LAYOUTS ..	330
PHOTOGRAPHIC NOTES	338

OUR FRONT COVER

Traction engine rallies have become tremendously popular with enthusiasts of all age groups. Transporting engines to these events is a costly and somewhat difficult business, particularly on the crowded roads of today. Some of the larger showman's engines weigh approximately seventeen tons, and if travelling under their own steam need to take on water and coal at fairly frequent intervals. A long journey may well take two or three days. For this reason many owners prefer to use low-loaders or similar vehicles, etc. to convey their machines to the various events. Our cover shows a showman's tractor about to leave a rally field at Appleford (Berks.) for Dorset, some 90 miles away.

MOUNTAIN RESCUE BY MOTOR-CYCLE

By
ANTHONY
GREENBANK

A mountain rescue stretcher party seen at practice in the Eskdale School grounds. This is a rehearsal—but it could be the real thing with a motor-cycle leading the rescuers on their errand of mercy.

ALTHOUGH mountain rescue by aeroplane and helicopter is now taken for granted in the Alps, it was only in the face of controversy that Herman Geiger of Sion, Switzerland, first began aiding stranded climbers with his 150 h.p. Piper aircraft. Similar arguments spread when the idea was presented of a motor-cycle for rescue purposes on mountains in Britain.

"Presented" is an appropriate word, for it was the famous wartime fighter pilot, Group Captain Douglas Bader, who was presented with a 350 c.c. GC3 Matchless trials-equipped motor-cycle by the Motor-Cycle Manufacturers' Association at Earls Court in 1960. It was to mark the association's golden jubilee, and Group Captain Bader accepted it on behalf of the Outward Bound Trust.

Since then, this specialist machine —registration number 967 BGW— has been put through its paces at the Eskdale Outward Bound Mountain School in Cumberland. Never before has a new piece of mountain rescue equipment taken such a hammering from the dozen or so climbing instructors!

This rigorous testing has provided invaluable experience in handling an extremely tough, versatile and speedy mount. Happily, the need to use it in a real life-situation has not yet arisen, but as more and more walkers and climbers are attracted to the 3,210 ft. high Scafell Pike— and its surrounding peaks—so it could make its first life-saving run any time this year.

The Eskdale adventure school lies directly below the Scafell massif, the highest and most dangerous in the country. Consequently, the school is one of the main mountain rescue posts in the Lake District. Almost 100 boys join the instructors in forming a rescue team which is on call at any time of day or night.

Until now, the rescue team has always used a long-wheelbase Land Rover for carrying the advance party with a stretcher. It is ideal transport for taking to the turf floor of the upper valleys; but the point is soon reached where four wheels can no longer dodge and bounce between boulders, ruts, bog and stony track a few feet wide.

SPECIALLY DESIGNED

A trials motor-cycle is designed and constructed for such rough going. Its engine has a high clearance from the ground, and so have the footrests; the exhaust pipe is swept upwards to clear the level of mountain streams and marshes. The tyres have a special tread which grips the bed of the muddiest gully, and a very low gear ratio means that the rider, standing on the footrests, can pilot the front wheel up a rock-dotted hillside at walking pace.

The mudguards are placed well clear of the tyres, so that thick mud cannot jam in between and foul the wheels. Some models have refinements such as rubber number plates which prevent the rider cutting his legs on sharp edges if he stalls and falls off.

Such motor-cycles are used in the week-end sport of trials riding in which riders are timed and observed up severe mountainside sections in the Highlands, the Yorkshire Dales and the Peak District. Should a competitor stall, foot the ground or drop his mount, he is penalised.

Such evidence as this that steep hillsides could be climbed on two wheels did not convince the sceptics. "What good can one rider do, anyway?" they said. Yet, this is the whole point of using a motor-cycle in mountain rescue work.

One man riding carefully and quickly can reach an injured climber in a third of the time it takes for a party of rescuers to walk the distance. By reaching the casualty so early, the rider stands a good chance of being able to ward off the effects of

exposure and shock. These two conditions can kill a person lying on an exposed hillside at, say, 3,000 feet more readily than actual injuries.

By giving reassurance, providing a warm drink, building a shelter and keeping the injured or exhausted person as warm as possible, the dangers of shock, panic and fatigue are lessened. Meanwhile, of course, the stretcher party have already left the Land Rover and are footing it at top speed towards the site of the accident. The rider can help them too—by firing rockets as important "signposts."

There are still further arguments against a mountaineering motor-cyclist, however. One is that a lone rider could lose his machine on very steep ground, especially if hampered by a bulky rescue rucksack; another is that although well-drained limestone hills (like those in the Peak District) are fine for trials riding, the Lakeland slopes are far too wet, steep, rocky and dangerous. The answer to the first contention is that a lightweight first-aid box is attached to the machine's rear mudguard. It contains essential equipment, including morphia, a pain-killing drug normally used by the medical profession but made available to experienced mountain rescue workers.

The picture on the left shows the author of this article, when instructing at Eskdale, mounting a grassy spur on specialist machine 967BGW. A local tarn forms part of the background.

Below: Eskdale boys practice lowering a companion down a rock face in Eskdale. All boys take part in this training during a month's course.

As to impossible terrain for our St. Bernard-on-wheels, the Scafell range is certainly the toughest proving ground that could have been chosen. Great ravines seam the slopes, often enclosing thundering waterfalls and deep pools. A barrier of great cliffs surrounds Scafell for two-thirds of the way, while Scafell Pike throws down huge scree fans into hidden, hanging valleys. There is a plateau of marshland in upper Eskdale below the final 1,000 feet of the skyline. But, as the school is situated on the lower slopes of this "Roof of England", there is ample scope to survey the mountains in advance for the best routes to different points on the hillside. Many practice runs have been made on the local bracken and grass tracks, and the best alternative sections have been noted. These routes will form a safe passage for 967 BGW up to the 2,000 feet contour; some of them go higher.

What are the requirements for surveying motor-cycle routes up mountains? The first is a good knowledge of the narrow valley roads and passes which in places are no more than an open strip of tarmac and grit at a one-in-three gradient. It is also essential to know the main, easy spurs which form a clearway of turf away from the road. These can be very steep, but so long as their rocks and outcrops are well scattered the rider can rocket up such a natural ramp at full bore. Eventually, however, cliffs and boulder slopes dictate a change of course. The new course is likely to be along a path or track. Deep ruts, awkward rock steps, stream courses, narrow bends and mud slopes can all cause the rider to dismount and heave his machine—running in bottom gear—over the obstacles. Once past the difficulties, he can jump back on to the foot rests and continue to "trickle" the bike over the atrocious surface.

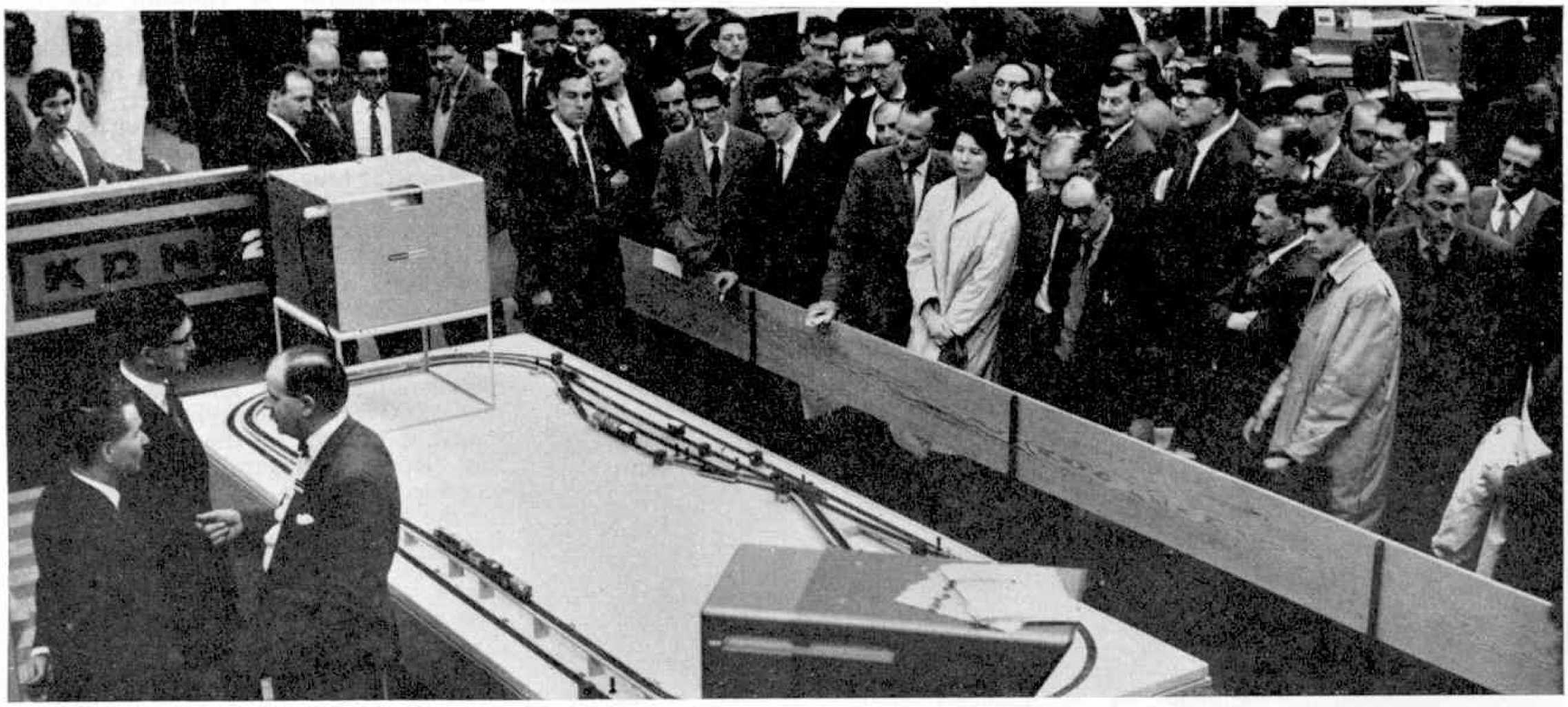
RISE TO THE SKYLINE

Sometimes, there is a large sponge of cotton-grass bog ahead. This can prove a stopper, but there will often be a way up a shallow stream nearby. At this height, near its source, the bed will tend to be fairly level, giving the rider the chance to ease his mount in and out of the water whenever necessary.

Above marsh-level comes the final steep 1,000 ft. rise to the skyline. Soon, closely grouped rocks are showering sparks from the footrests, and the rescue man is forced to leave the motor-cycle leaning against a boulder. But he has achieved his purpose in gaining height as quickly as possible. In an authentic rescue, he will now take the first-aid box and scramble up to the casualty, only a few minutes away.

After the arrival of the rescue team with a Thomas stretcher and all the other tackle needed, he starts the (*Cont. on page 339*)

HORNBY-DUBLO SHARES OLYMPIA TRIUMPH



A general view of the English Electric Company's stand showing clearly the outer track of the Hornby-Dublo layout, the raised inside portion (which is being traversed by the Type 5 Deltic coupled to four wagons) and the three sidings in which the trucks were marshalled. Several of the detectors can also be seen.

£25,000 Computer Controls "Any Order" Shunt Sequence

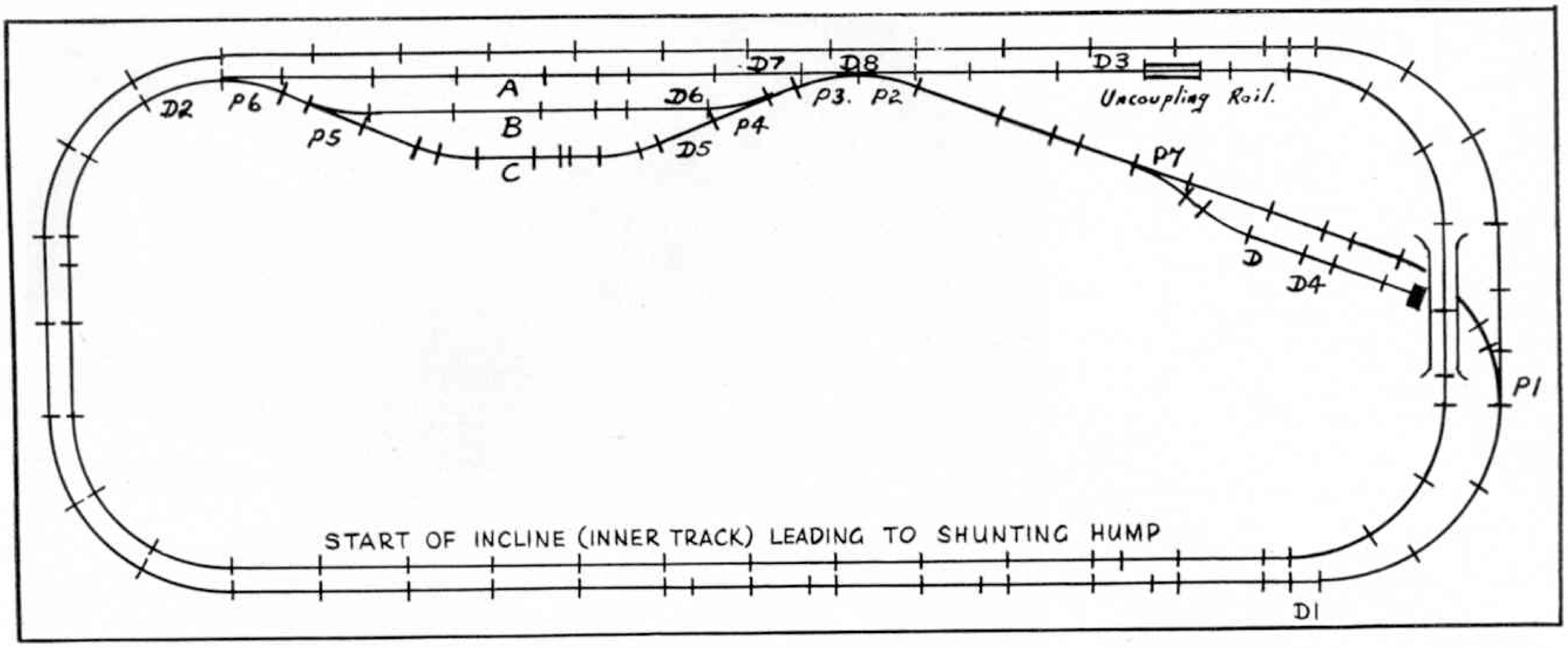
A FEW weeks ago, certain items of Hornby-Dublo railway equipment from the works of Meccano Limited and a shining new £25,000 computer from the factory of the English Electric Company Limited at Kidsgrove in Staffordshire were transported to London. There, in the six days from May 28 to June 2 they became stars at Olympia—showplace of the metropolis.

Linked together they formed a perfect partnership in a unique demonstration that fascinated thousands of visitors to the Instruments, Electronics and Automation Exhibition. The miniature Hornby rolling stock which is known in homes the world over, which can, in fact, almost be called "domesticated", became at Olympia the outward and visible manifestation of the incredible, almost uncanny, powers of the automatic brain contained within one of Britain's latest computers. On the last day of the exhibition I was invited to join the English Electric Company's officials on their attractive stand at Olympia to see for myself the highly-diverting, yet scientifically impressive, display which had attracted enthusiastic crowds throughout the length of the show.

THE EDITOR reports on a visit to the I.E.A. Exhibition

Some weeks before the exhibition itself the backroom boys of the English Electric Company's Computer Division at Kidsgrove visited the headquarters of Meccano Limited with a plan. At first it sounded incredible, but with the assistance of the highly-skilled staff in the Laboratory and Model Room at Binns Road the idea soon began to take shape. Basically it was to link a Hornby-Dublo Locomotive and Rolling Stock with the new KDN2 computer in such a way that orders given directly to the computer would be carried out in perfect sequence. It was also arranged that if, for any reason, the orders could not be carried out the computer would record

Another view of the display at Olympia showing the computer press-button control (extreme left).



A diagrammatic view of the special layout made for the Olympia demonstration. All Points are designated P1, P2, P3, etc., detectors are numbered D1 to D8 and the three sidings used for the assembly of trucks are labelled A, B and C.

this through an electric typewriter and its message would be relayed to the watching public through two closed-circuit television screens. It was decided that the most effective demonstration that could be provided would be to arrange a layout by means of which various numbered trucks could be automatically shunted in any nominated sequence simply through giving instructions to the computer and leaving it to carry them out.

The requirements of the English Electric Company meant that the goods provided by Meccano Limited had to run continuously from nine in the morning until six at night for the six days of the exhibition, that the points provided would have to be switched hundreds of times in every day, that rolling stock would virtually not cease from rolling from morning till night and that the Type 5 Deltic chosen as the locomotive in charge would likewise be employed almost unceasingly.

These were tremendous demands to make; in the event, the Hornby-Dublo equipment justified to the full the confidence placed in it.

The computer used was the new KDN2 small-scale general purpose digital computer with its related printer and keyboard and the other major ingredient was the Hornby-Dublo layout board, measuring 12 feet 6 inches × 5 feet, fitted with electrically-operated points and a series of precisely placed photo-electric cells and light sources (see diagram).

The layout itself consisted of two tracks, the outer one being the main line. The inner track comprised three sidings, A, B and C and a gradient section with an Uncoupling Rail at the hump. The inner track formed a hump marshalling yard. The rolling stock consisted of one Co–Co Diesel Locomotive for main line working and sorting and one Diesel Shunter—which was to steal the show at times, and was soon affectionately known as "Charlie"—for emergency use in the sidings. The rolling stock consisted of eight trucks numbered 1 to 8.

On request from spectators, or from those operating the board, the computer was asked to select three, four or five trucks out of the eight numbered wagons and make up a train with the vehicles in a *given* order. All that was then necessary was to press buttons bearing the appropriate numbers on the digital computer. From that point, the computer took over completely. All unwanted trucks at the end of any cycle of operations were left on siding C.

The computer remembered at all times where the trucks were on the layout and this information was fed to it by the use of eight photo-electric cells at various points on the layout. You will find them marked

The KDN2 computer undergoing tests at the Kidsgrove Works of the English Electric Data Processing and Control Systems Division.

on the diagram D1, D2, D3, etc. Here, I should point out that the instructions which a computer receives are stored in "words". The "mechanical memory" in the case of the KDN2 computer is able to store 4,096 "words" so that a huge range of requirements can be catered for.

All the computer required to know before shunting began each morning was the position of the trucks on the layout before it started its day's work. Once the starting sequence was within its "memory box" then any requests made through the keyboard were carried out faithfully and precisely, with no hint of mix-ups such as might be perpetrated by a human being who was being pestered with questions and becoming a little distressed through the never-ending demand on his knowledge.

One of the integral parts of the programme performed by the computer was the "logic sequence" on which the computer's actions were based. For example, if a request were made for the train to perform a certain operation, what would be the reasons why it could do this, or the reasons why it could not, with further consequential sub-divisions of pros and cons in either direction.

If at any time the computer came up against a failure or a fault which was not covered by its logic it printed out a message to the operator informing him of the nature of that fault, and this appeared on the closed-circuit television screens so that those watching the display would know precisely why the correct sequence was not being followed.

The main track voltage for this unique display board was 10.5 volts d.c., and where it was necessary to reduce locomotive speed the voltage was reduced to eight or six volts. If it was necessary to increase speed, certain resistances on the track were switched out.

The sequence of operations was as follows: A train load, normally consisting of five trucks, ran round the outer main line in a clockwise direction until a request was made through the computer keyboard

for a different make-up of trucks. On passing the detector D1 the train was brought to a standstill. The points P1 and P2 were re-set and points P3 to P6 were all set for siding C if the required train needed the spare trucks from that siding. The locomotive then reversed and pushed the wagons on to the inner track and through siding C, if this was necessary; otherwise it travelled through siding A. The train then continued around the inner track until it approached the Uncoupling Rail, where it reduced speed. During this time points P1 and P2 were re-set to straight and points P3 to P6 were set to the correct siding for the first truck to be uncoupled. A signal from detector D3, as the uncoupled truck rolled past it down the hump, stopped the train to prevent a further truck from uncoupling. The uncoupled truck was then recorded as it passed detector D8; if it did not pass this point the computer recorded that it was stranded on the ramp between detectors D3 and D8 and the operator's attention was required. On entering its appropriate siding, the truck passed one of the detectors D5, D6 or D7, the signal from the appropriate detector starting the train again for the uncoupling of the next wagon. Points P3 to P6 were set automatically by the computer for each arriving truck. Siding *A* was for wanted trucks which were in their correct order; Siding *B* for wanted trucks which were as yet in incorrect order and Siding *C* for trucks not required in that particular sorting sequence. The uncoupling process continued until all trucks had entered one or other of the sidings. The Diesel Co–Co then descended the gradient and entered either siding A, if all the required trucks were already in it, or siding B if this contained wanted trucks in the wrong order. In the latter case it pushed the trucks round again to the Uncoupling Rail where further sorting took place. This process continued until all the required trucks were in siding A *in the right order*.

If at any time a truck did not arrive at detectors D5 to D7 within a specified time after passing D8, the computer stopped further uncoupling and operated points P2 and P7, bringing out the Diesel Shunter from siding D.

This was the moment that many spectators waited for—the sight of the small shunter eagerly coming along to push the lagging truck past the detectors into the siding. A modification to the front of the Diesel Shunter ensured that it was able to return to its own siding without coupling itself to the erring truck.

Only very occasionally did a truck fail to arrive at the detectors, but to satisfy the curiosity of the spectators, and to ensure that the computer could not be "foxed", the operators sometimes deliberately stopped a truck short of the appropriate detector so that the Diesel Shunter had to come out searching for it and shepherd it to its appointed place.

Always, as it returned to its own siding, the Diesel Shunter seemed in imminent danger of colliding with a buffer stop at the end, but always as it passed detector D4 it came meticulously to a halt with a matter of an inch or two to spare! On receipt of the signal to the effect that the Diesel Shunter had completed its task and was resting on the branch line, the uncoupling procedure continued.

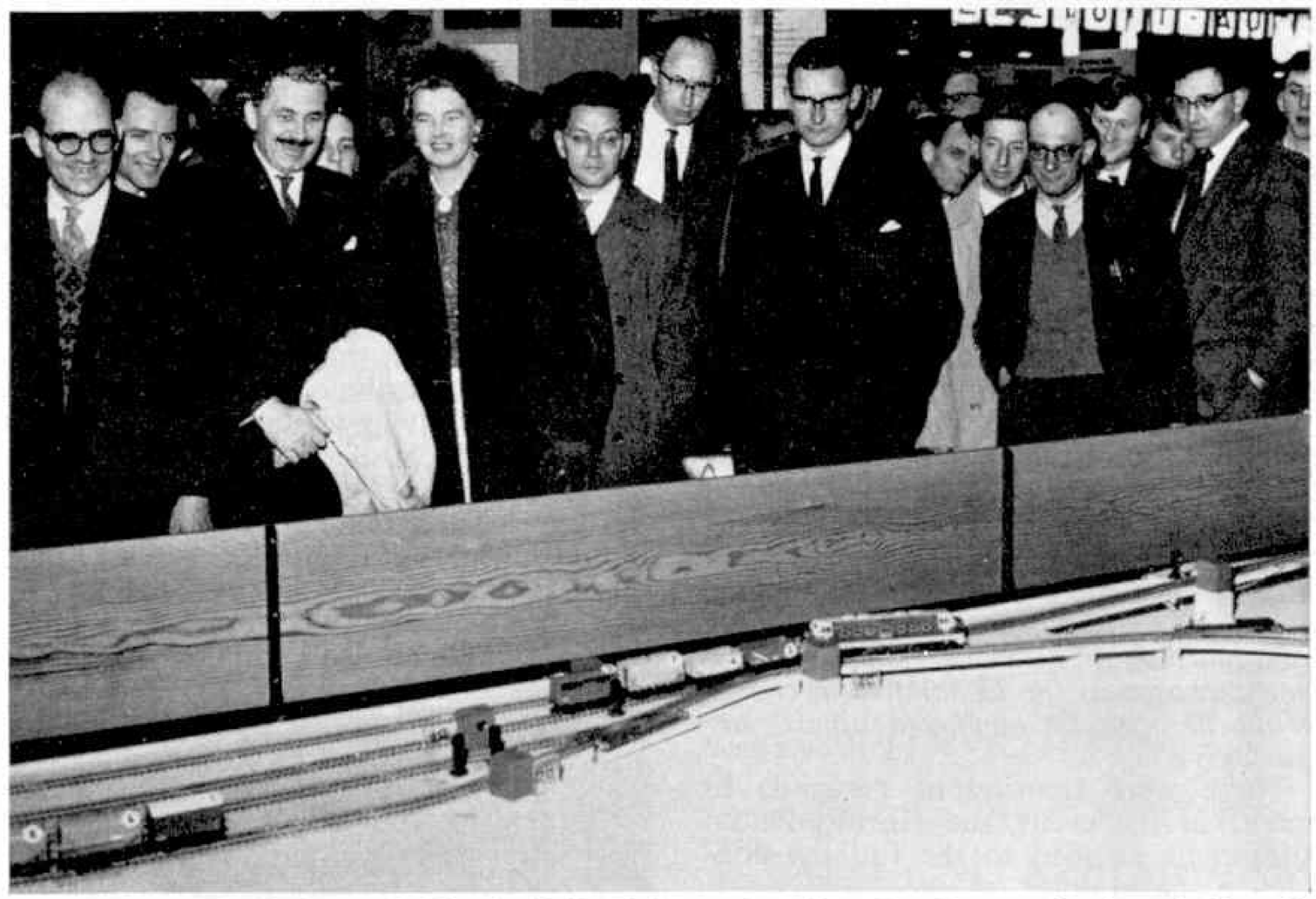
When the train was (*Cont. on p. 339*)

Here are some details about the Olympia display which will interest all Hornby-Dublo enthusiasts:

SORTING PROGRAMMES	
Daily average	80
Peak day	124
POINTS CHANGES	
Daily average	800–900
Peak day	1,200–1,300
COUPLING OPERATIONS	
Daily average	700
Peak day	1,000
UNCOUPLING OPERATIONS	
Daily average	1,000
Peak day	1,400

Total stops and starts by Deltic locomotive: Daily average 1,100, peak day 1,500.

The crowd watch in amazement as the Type 5 Deltic marshals the trucks in a stipulated sequence. The Locomotive (right) has just released one of the trucks down the incline leading to the sidings.



Amusement and fascination as the Hornby-Dublo Train completes its task and sets out for the main line with the trucks marshalled as instructed. All the photographs illustrating this article appear by courtesy of the English Electric Company Limited.

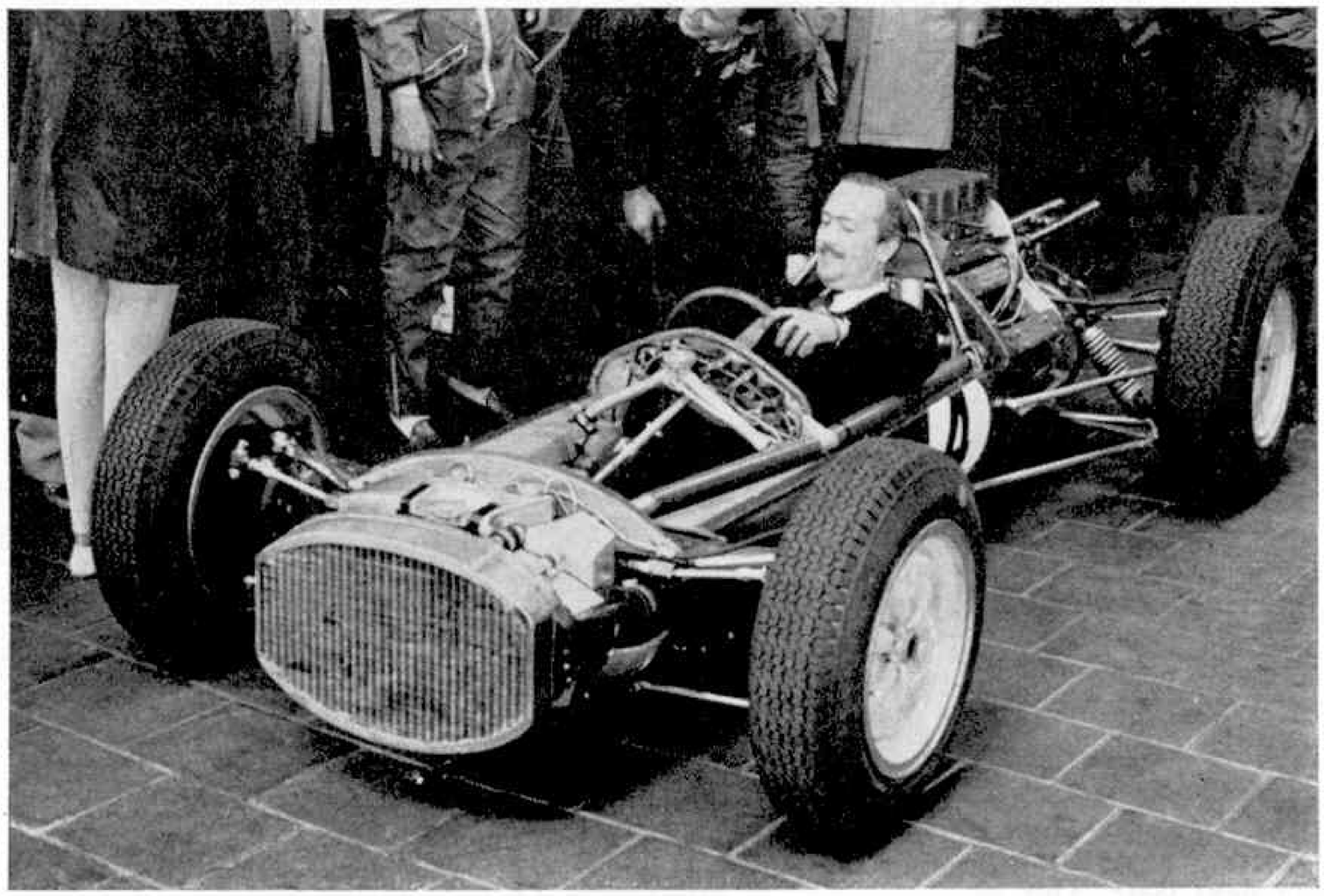
NEW FORTH BRIDGE

Work goes steadily ahead on the new Forth Bridge, which will be the fourth largest suspension bridge in the world and is being built with the approach roads at an estimated cost of about £17,000,000. The cables of the 3,300-foot long central span, seen clearly in these photographs, are well advanced and it is hoped that the bridge will be finished towards the end of next year. Our pictures show the "spinners" at work laying the suspension cables, one of the most intricate parts of the building process. The bridge will carry two 24 ft. roadways, two 9 ft. wide cycle tracks and two 6 ft. wide footpaths.

Top: High above Queensferry "spinners" are seen at work tensioning the cables 550 feet up. Left: In this unusual view the men at work on the bridge appear like human flies in the trough of the bridge's enormous span. Below: The business end of the bridge where the suspension cables are anchored, showing the world-famous railway bridge in the background. Pictures by courtesy of Keystone Press Agency Ltd.

ROAD AND TRACK

New Lotus Challenge in Formula One



Colin Chapman in the cockpit of the Lotus 25. Photograph by Geoffrey Goddard, by courtesy of "Motor Racing".

THE opening rounds of this year's Drivers' World Championship were won by three different drivers in three different Grand Prix cars—an indication of the fierce struggle going on in Formula One racing today, where no one marque yet reigns supreme. The season opened with Graham Hill's BRM win at Zandvoort, round two went to Bruce McLaren in the new Cooper at Monte Carlo, then came the Belgian Grand Prix over the fastest course in Europe, a great triumph for Jimmy Clark in the revolutionary new Lotus 25, at the fantastic average of 131.89 m.p.h.

Colin Chapman's remarkable Lotus may well set a new trend in Formula One design, just as the rear-engined Cooper did four years ago. Instead of a conventional chassis frame of small-diameter tubes, favoured by every other Grand Prix constructor, the new Lotus uses fuel tank casings, one on each side of the car, as main stiffening members. They are joined by an under-tray, also in light alloy, ex-

By
JERRY AMES

tending the entire length of the car with front suspension bolted to one end and the engine at the rear.

This monocoque design provides a rigid structure of great strength and saves something like 50 lbs. in weight, which gives a useful advantage both in acceleration and maximum speed.

In its first two races the clutch operating mechanism failed, but if this has been successfully overcome, as would appear from the Belgian Grand Prix results at Spa, the new Lotus in the hands of Jimmy Clark may well go on to take the Grand Prix Constructors' World Championship. Once in the lead, this combination seems virtually unassailable.

Although Colin Chapman has a brilliant idea, he is still dependent on engines and both British V–8s are, as yet, a trifle on the fragile side. The BRM V–8 has suffered oiling problems which, incidentally, cost Graham Hill the Monaco Grand Prix; he retired with a damaged engine when leading seven laps from the end.

When engine designs are comparatively new and still under development, as in the present 1½-litre Formula, it is often difficult for engineers to decide whether to reduce revs in order to achieve greater reliability or gamble on more performance and leave their rivals behind.

Smarting under defeat from a lack of power last year, British teams have gambled on more power, a policy that has paid off handsomely, while Enzo Ferrari refused to sacrifice reliability for performance.

His cars, still with inferior handling to BRM, Cooper or Lotus, are always in the background waiting for the British teams to blow one another up and although his leading driver, World Champion Phil Hill, is showing improved form, works Ferraris are just not fast enough to threaten BRM, Cooper or Lotus.

Porsche seem to be getting cold feet and are talking about withdrawing from Formula One. Already they have missed Spa and they withdrew their flat eight from

The Maserati 3500 G.T. which will go from 0 to 100 m.p.h. in fourteen seconds and has a maximum speed of over 140 miles an hour.

Racing Personalities

DAN GURNEY

This picture of Dan Gurney, by Geoffrey Goddard, appears by courtesy of "Motor Racing".

ALTHOUGH lanky U.S. driver Dan Gurney lives in Britain during the Grand Prix season, and was formerly a member of the BRM team, little is known about him by the average enthusiast in this country. At Continental races his name is not only well known, but highly respected, for Dan has a way of taming the fiercest racing cars and a knack of bringing them home against tough opposition.

Dan Gurney is a good sportsman with a dry sense of humour and a pleasant Southern drawl to match, but he has not yet had that lucky break so essential in big time racing. He shrugs this off in typical Gurney fashion by saying that maybe he picks the right cars at the wrong moment.

Last year he left BRM to join Porsche, teaming up with Jo Bonnier, but the pair had to make do with older four-cylinder engines because the new flat eight was not ready. Even so, Dan was able to provide the most dramatic finish of the year. It happened in the last lap of the French Grand Prix at Rheims—on the final straight—with Gurney in the lead, hunched up in the Porsche, urging his mount on to take the chequered flag. He was hotly pursued by the Ferrari of new boy Baghetti, who was almost nudging his tail. At the very last moment, the Italian cunningly whipped out and got the Ferrari's nose in front to finish one-tenth second ahead of Gurney, amid thunderous applause from every man, woman and boy present.

Dan, one of the first to congratulate the young Italian, could not help admiring his neat bit of strategy.

The year 1962 has been an unfortunate one for Porsche and Gurney. The flat eight materialised, but still needs shaking down, although at Zandvoort Dan made it go like a scalded cat and was among the leaders until his gear lever snapped. Only one flat eight was available for Monaco, but it was given to Dan Gurney, officially the number two driver. Sadly, he was involved in the big shunt at the first corner and that was that. Porsche missed the Belgian Grand Prix at Spa, preferring to concentrate on preparing two good cars for the British Grand Prix at Aintree.

Although he began his American racing career back in 1955 with a Triumph TR.2, Dan Gurney soon had ambitions for more power, so he graduated through Porsche to V–12 Ferrari, finally ending up with the big 4.9 Ferrari—a hairy monster if ever there was one. On more than one occasion it gave him quite a moment; but it was a useful training machine which taught him how to control an immense amount of power—training that still stands him in good stead.

In 1959 Ferrari gave him a chance in their team, being impressed by Gurney's ability to keep his car on the road, an essential quality in all Grand Prix drivers. In his first Formula One race, the French Grand Prix, he was forced to retire when lying sixth, but two weeks later took his Ferrari into second place in the German Grand Prix, at Avus, behind Tony Brooks. He came third in the Portuguese Grand Prix and fourth in the Italian Grand Prix at Monza.

Le Mans at the eleventh hour. This stems largely from criticism in the German Press because the new flat eight did not immediately turn out to be a world-beater like the Mercedes-Benz of a few years ago. The situation has not been helped by changes among top executives. Porsche should take a lesson from British engineers whose courage and tenacity has once more placed our cars firmly in the winning groove. All this talk is unsettling to their drivers Jo Bonnier and Dan Gurney, and to racing manager Huske von Hanstein. They cannot give of their best while such defeatist gloom spreads through the firm.

* * * *

The Le Mans 24-hour race produced an extremely interesting new British car, the 4-litre prototype Aston Martin, heralding the return of the Feltham firm to racing with the most potent car it has built yet. Its highly-tuned 3,996 c.c. twin overhead camshaft engine with three big double choke Weber carburettors, pushes out 345 b.h.p. at 6,000 r.p.m. Its calculated speed is over 180 m.p.h. Colin Chapman, with an eye on the Index of Performance, which is calculated on engine size and distance covered, had entered a very hot Lotus 23, powered by a 997 c.c. engine of Ford Anglia origin, but much modified and fitted with twin overhead camshafts; it was said to be reaching a speed of 140 m.p.h.

During the scrutineering the French moved heaven and earth to get this Lotus excluded from its class, dominated as usual by French cars. They succeeded, for the speed of the new Lotus would otherwise have made their cars look a bit ridiculous this year.

* * * *

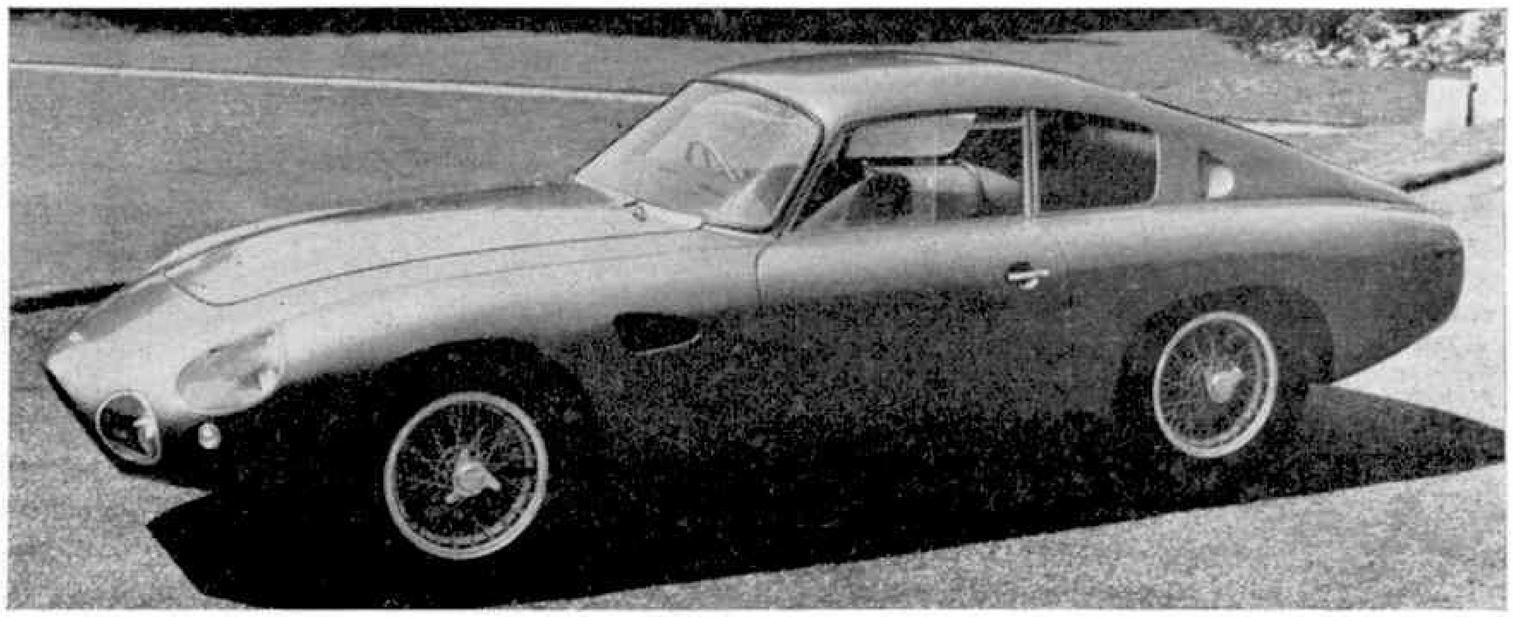
One or two friends who run family saloons have recently been grumbling about poor servicing, and with good cause. Cars are returned with engines running unevenly, stemming from faults like badly-adjusted tappets, plugs and ignition; as for carburettors, not one mechanic in a hundred seems to have the knack of correctly adjusting and tuning them, a fault several big garage owners have ruefully admitted to me.

Not long ago, I sent my Mini-Minor to the local agent for its periodic servicing. Unfortunately I asked to have some dirt removed from the fuel line. When it came back the mixture was far too rich and the "Anvil Chorus" from pinking had to be heard to be believed. Naturally, I took the matter up with the managing director and was staggered when I was told the engine needed de-carbonising. When I pointed out that the experimental department at Cowley had taken the head off less than 2,000 miles back, decarbonised it and ground in the valves, that really put the cat among the pigeons.

I suggested the mechanic might try retarding the ignition, when of course, a good deal of the performance came back, but he could not get the carburation right because he would try and tune by the book, whereas each engine is as individual as you or I.

Goodwood commentator James Tilling came up (*Continued on page 339*)

The new 4-litre six-cylinder prototype Aston Martin which was driven at Le Mans by Graham Hill and Ritchie Ginther.



This survey of the 6½-mile circuit which carries thousands of passengers daily beneath the streets of Glasgow was written for the "Meccano Magazine" by

COLIN H. MACKAY

THE *Subway*—officially the Underground—is the name of the continuous self-contained Tube railway which serves the City of Glasgow. The whole of the line is situated underground, 155 feet below the surface at its deepest point, at Glasgow Street, and only seven feet below at its shallowest, between Kinning Park and Cessnock Stations. It is a busy system, with

The Glasgow Subway

fifteen island platform stations, on a six and a half mile circuit, and is proud of its safety record. The railway is owned by Glasgow Corporation, although, as with most of the early London Underground system, it was tunnelled by private enterprise.

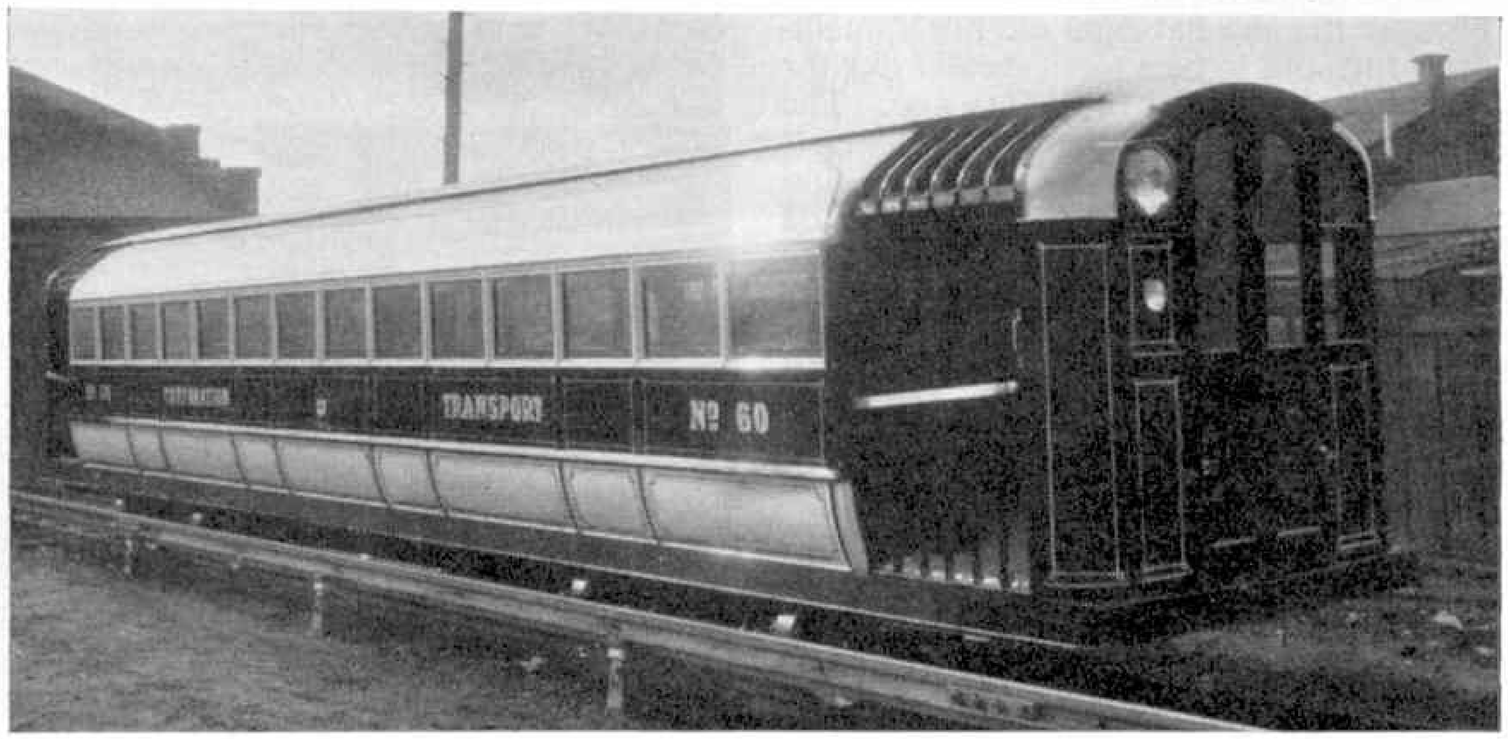
At the same time as the City and South London Railway, the first "Tube" in the world, was being built, the Glasgow Subway Railway Company was obtaining Parliamentary powers to construct a Tube railway. Although the company ran into debt to the tune of one and a quarter million pounds, it performed an invaluable service for Scotland's chief city of commerce by joining North Glasgow with South Glasgow, its tracks passing under the River Clyde at two points.

The Subway, which is 66 years old in December this year, is composed simply of two four-feet gauge continuous tracks in tubes eleven feet in diameter, running a few feet away from one another. On a given journey one uses only half the circuit at the very most, which is just over three miles, and the tracks run in the areas comprising the whole of Western Central Glasgow.

When the Subway was opened on December 14, 1896, continuous moving cables on each circuit provided the motive power. Each train consisted of two cars, and the front car housed the gripper-apparatus to attach the train to the cable. The rear vehicles were four-wheeled trailers, shorter than the front ones. It was soon realised that this formation was inadequate for traffic and, about 1900, all the four-wheeled trailers were lengthened and placed on well-sprung bogies. But the cable system was to remain for many years to come as the sole motive power.

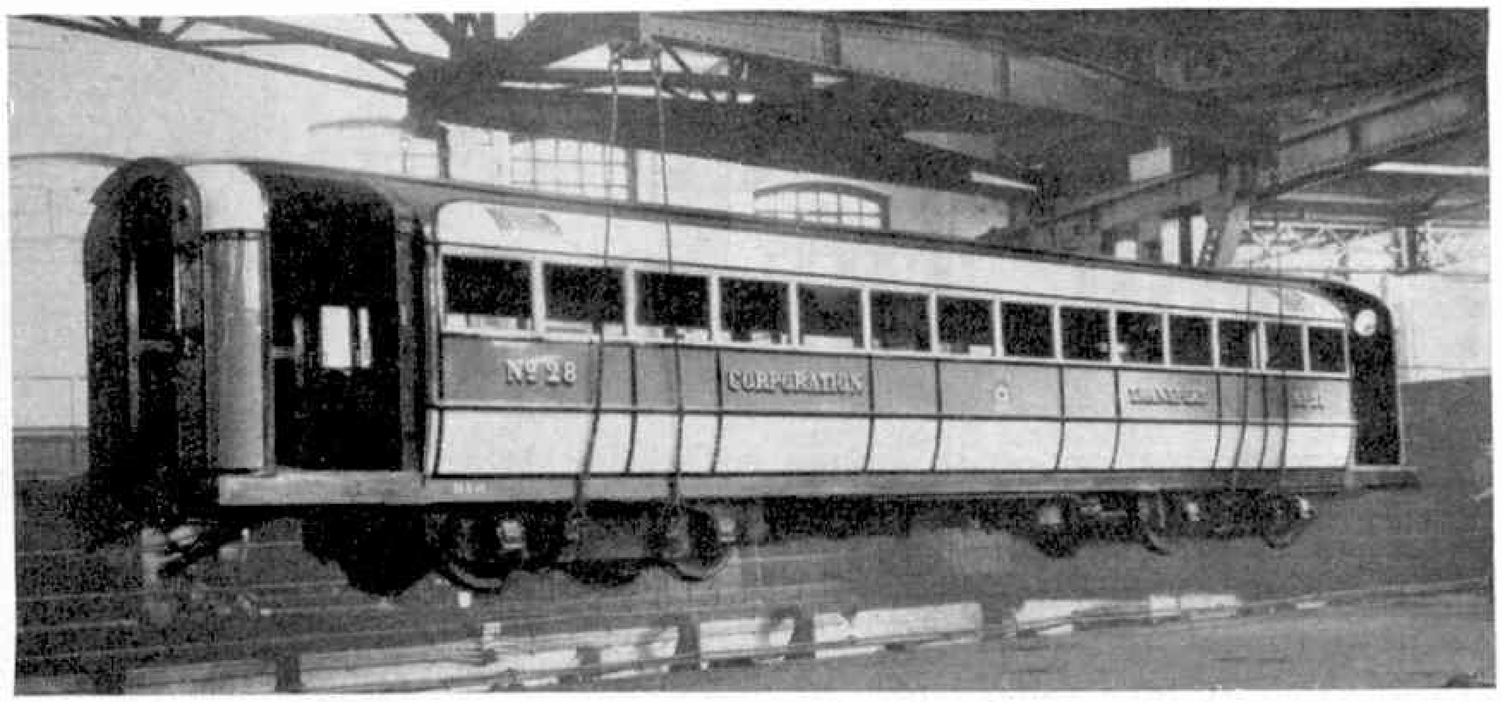
In 1923, the Subway was bought from the company by Glasgow Corporation for £381,589. The name was changed by the Corporation from Subway to *Underground*, which is still the official, though rarely used, title. Up to this point, the system had a chequered career, and, even after its change of owners, failed to make a profit for many years. Those expecting the Corporation immediately to modernise, extend, and generally cater for the development of the Subway as a valuable mode of transport were to be bitterly disappointed, for the Corporation were

Subway car No. 60, with the driving end facing the camera, on the surface track used for testing purposes at Govan Car Shed.



Subway trains (top picture) in the two-colour livery which was formerly standard, in a typical Glasgow underground island platform setting at St. Enoch Station. With the exception of the lower left picture on the opposite page, all the illustrations to this article appear by courtesy of Glasgow Corporation Transport Department.

Car No. 28 suspended above the pit at Govan through which rolling stock is passed to the underground tunnels.



engaged in their world-famous promotion of the tramcar as the premier method of local transport. However, following modern practice they electrified the Subway during the years 1933–5, thus getting rid of two big bugbears—the relatively slow speed, and the unfortunately high frequency of breakdowns.

* * * *

Now that the Subway was electrified on the conductor rail system, and with its name changed, the Glasgow public realised its importance as a speedy form of city transport and people began to use it more. One of its greatest advertisements was the long and gradual electrification scheme, the progress of which could be seen by all its passengers, for the installation of plant for electrification was carried out while the cable system was still in use. When the outer circuit conversion was complete, that circuit was closed to the public while staff were taught how to drive electric trains. Meanwhile the inner circuit, still cable-hauled, carried all passengers.

In 1938, Copland Road Station was modernised for the Empire Exhibition held in the nearby Bellahouston Park. Modernisation was, however, limited to surface level, the result being the provision of extra entrances and exits, the development of the largest ticket-hall on the Subway, and the use of delicate pastel blue tiling. The commodious Copland Road Station is admirably suited for handling the big crowds from football matches such as Glasgow Rangers v. Glasgow Celtic at Rangers' home ground, Ibrox Stadium.

With the advent of the second world war, Glasgow, like all other cities of comparable size, was laid open to the hazards and extreme dangers of aerial attack. On August 18, 1940, a German pilot, no doubt seeking to release his bomb-load on the docks at Partick, missed the target. The bombs fell instead on a bowling green, 50 yards south of Merkland Street Underground Station, and penetrated to the two Tube tunnels below. They burst in both ironwork tunnels and totally disrupted the Glasgow Underground's services on inner and outer circuits until January 27, 1941. Both tunnels were reconstructed, partly in ironwork, partly in reinforced brickwork. The sudden stretch of this brickwork can be seen to this day in both of the tunnels between Merkland Street and Govan Cross.

* * * *

Because blackout restrictions did not apply on the Subway, which at no time comes above ground, and because of the security people felt while underground during the Clydebank blitz and the frequent raids on the Glasgow Docks, the Subway enjoyed even more popularity by the time peace came than ever before. In May 1948 plans for electrification of many Glasgow suburban railways, the most comprehensive railway network in the area outside London, and the tunnelling of new underground railways, were drawn up by Mr. E. R. L. Fitzpayne, Glasgow Corporation Transport Manager. His plans were, however, rejected, presumably on account of prohibitive cost. Yet Glasgow, with the slowest flow of traffic in any area in Great Britain, desperately needs the vital help of railways like the Subway.

The Subway was ready to stride ahead with modernisation; it was popular, and it had asserted its importance in the transport field, but unfortunately, the Corporation, previously occupied with development of the trams, were now fully engaged in a mammoth task which was destined to take well over a decade—that of replacing Glasgow's huge tram fleet with a bus fleet of equal size. This was no mean task, when you think that Glasgow Corporation's transport is obliged to serve almost seventy square miles of the densest conurbation in the country! So the Subway was, once more, pushed into the proverbial background.

* * * *

However, as an important part of the Corporation transport system, the Underground stands on its own feet. It handles 80,000 passengers a day, and carries out its own repairs at Govan Car Shed. This establishment is at surface level, 100 yards south of Govan Cross Station, busiest on the circle with 24,000 passengers daily. From the Station there is access to the Corporation Underground and bus offices, eight Corporation bus termini, and through bus and trolleybus routes using

(*Continued on page 339*)

Below: A typical interior view of a subway car. Left: Preparing transfers for lettering a subway car after overhaul and painting. The latter photograph appears by courtesy of the "Weekly Scotsman".

ALL-CANADIAN TRAINER FOR THE R.C.A.F.

AIR NEWS

By

John W. R. Taylor

THE top illustration on this page is the first to show Canadair's little CL–41A jet pilot trainer flying in the maple leaf markings of the Royal Canadian Air Force. The aircraft in the picture is a prototype, retaining its civil registration CF–LTW–X, but the manufacture of 190 CL–41A's for the R.C.A.F. has already started at Montreal and the first of these is scheduled to fly in August 1963.

Choice of the CL–41A, against strong competition from foreign trainers, will be a big help to Canada's aircraft industry. The prototypes are each powered by a 2,400 lb.-thrust Pratt & Whitney JT12A–5 turbojet, imported from the United States, but production machines will have a 2,850 lb.-thrust General Electric CJ610–1B turbojet, built under licence by Orenda Engines at Malton, Ontario. This will give them a top speed of 486 m.p.h. in addition to very fine handling qualities at low speed.

BAGS OF BAGGAGE

One of the irritations of air travel is that usually, having travelled at high speed from one airport to another, passengers are kept waiting while their baggage is unloaded and brought over to the Customs area. This no longer happens at Los Angeles, where the bags actually beat the passengers to the terminal.

Secret of the suitcase speed-up is a new conveyor belt system, which delivers luggage from arriving jet-liners at the rate of 40 bags a minute. The luggage travels on 40 separate belts at a speed of about 400 feet a minute, which is faster than the passengers can walk.

Like Britain's Jet Provost, the CL–41A is a side-by-side two-seater. Its best recognition feature is the T-tail, similar to that of the Lockheed F–104 Starfighter which Canadair is building for the R.C.A.F. Nor will this be the only link between the two aircraft, for a new version of the trainer, designated CL–41R, will have a long, pointed nose, like that of the Starfighter, and containing the same radar. Further electronic equipment will be carried in two packages on the sides of the rear fuselage, enabling the CL–41R to train pilots in the use of all the advanced navigation and combat systems fitted to the Starfighter.

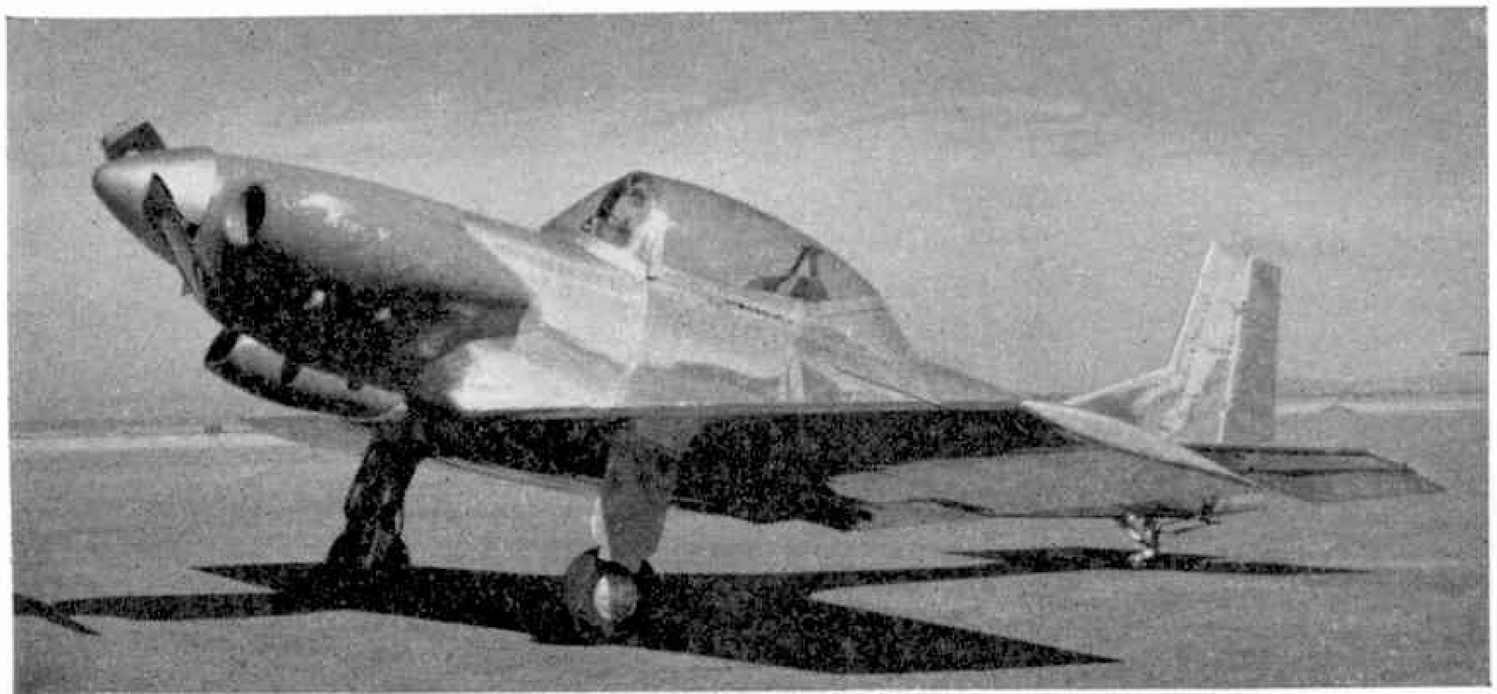
A prototype CL–41R should have flown by the time this issue of the *M.M.* is published.

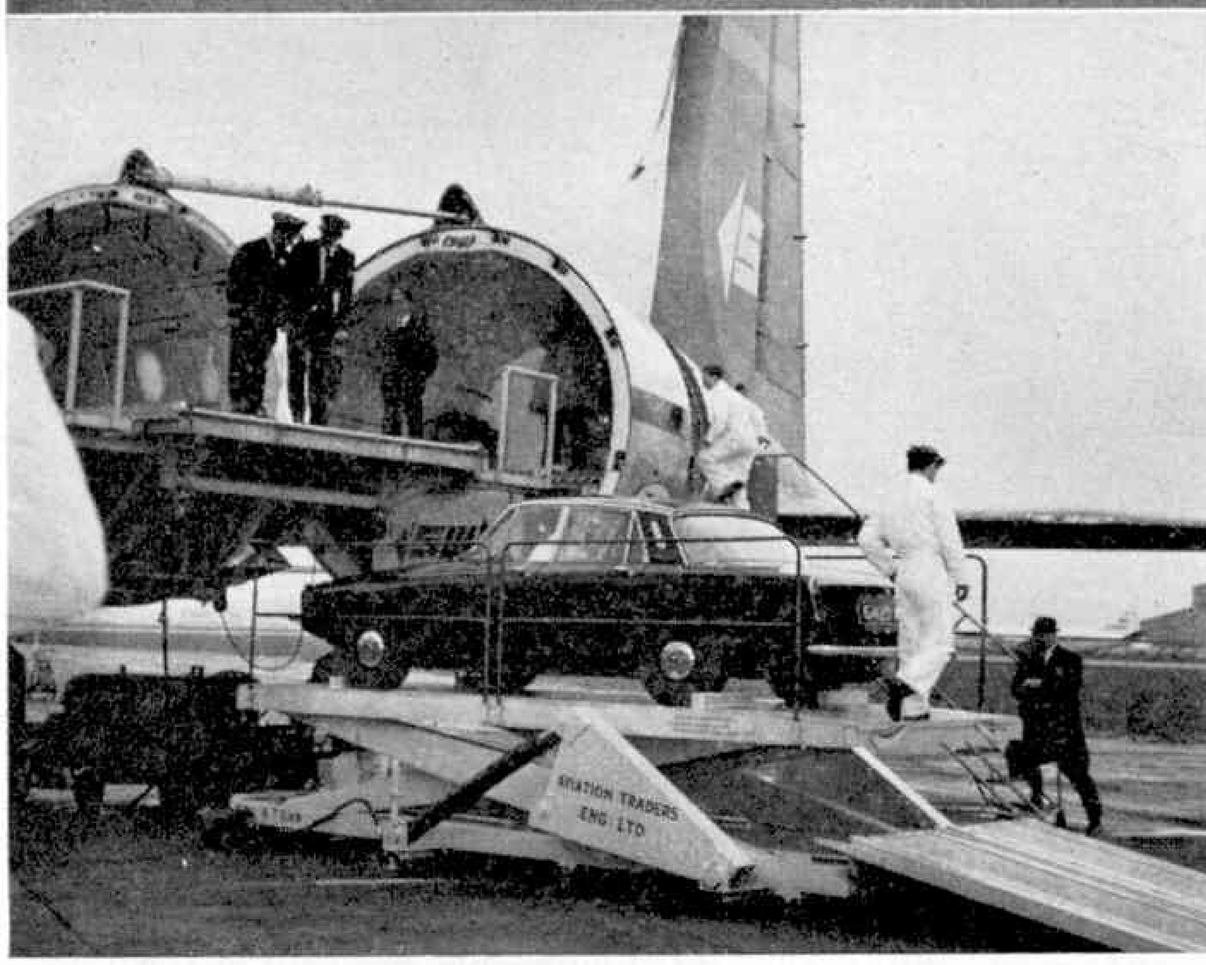
TRAINER SHOWS ITS TEETH

The CL–41A is not the only jet trainer which has flown recently in new markings. The illustration at the foot of the page shows one of the Hunting Jet Provost T.Mk.51's supplied to the Kuwait Air Force, and is of special interest as the aircraft is carrying a hefty load of rockets and 25-lb. bombs under its wings. There is also a machine-gun in the bottom of each engine air intake.

When fitted with armament in this way, the Jet Provost can be used for both flying

Top right: The Canadair CL–41A in the markings of the Royal Canadian Air Force. Stalling speed of this jet trainer is only 80 m.p.h. Below: Unusual markings and armament are a feature of this Hunting Jet Provost. Although it is employed more usually as a basic trainer, this version of the aircraft, in service with the Kuwait Air Force, carries rockets and bombs for internal security duties.





The Linn Mini-Mustang (above) is a tiny U.S. home-built machine. Photograph by courtesy of John W. Underwood.

Being loaded on to a Canadair Forty-Four at London Airport is the Rover turbine-powered T4 saloon car (see "Jet-Powered Cargo".)

and weapon training. Smaller countries which have to contend with occasional trouble from rebellious tribesmen can also avoid the expense of buying fighters and bombers by using their armed Jet Provosts for internal security duties. A 25-lb. bomb may seem tiny in a nuclear age, but 20-lb. bombs of far less efficient design were used to destroy huge airship sheds, and the Zeppelins they contained, in the 1914–18 War.

DEADLY LOAD

According to Blackburn's house magazine, *The Courier*, the Buccaneer strike aircraft caused quite a surprise when it arrived at Hanover Airport for this year's German Air Show. Here, in gleaming white coat, was Britain's latest high-speed, low-level atom-bomber, and a crowd of people ran over to inspect it as it taxied to the dispersal area.

Jets screaming, it halted. Then its massive weapon-bay door rolled open and the faces of the onlookers registered amazement when they saw the line of "weapons" inside. From end to end, fastened in place with white tape, were three suitcases, two parachute bags, a parcel of sales brochures, a spare pair of sports trousers and a sponge bag!

MIGHTY MIDGET

The upper illustration on this page shows one of the neatest little home-built aeroplanes that has yet flown. Named the Mini-Mustang, it was designed and built by Mr. Charles A. Linn, who is a machinist at Edwards Air Force Base, California. Construction is all-metal and it is powered by a 125 h.p. Lycoming 0–290–G engine which was once fitted in an Air Force ground power unit.

Span of the Mini-Mustang is 16 feet and it has an empty weight of only 519 lb. The quality of workmanship is shown by the fact that it is fitted with a manually-operated retractable undercarriage, flaps, hydraulic brakes and elevator trim-tab, in spite of its small size. It cruises at about 180 m.p.h. and Mr. Linn expects it to have a top speed of 225 m.p.h. and rate of climb of 2,200 feet a minute, which is pretty remarkable with so small an engine.

JET-POWERED CARGO

A Canadair Forty-Four turboprop freighter of Seaboard World Airlines flew to New York in April carrying two of the most unusual and advanced cars in the world. They consisted of the Rover JET 1 of 1950, the first passenger car ever powered by a gas-turbine engine, and Rover's latest prototype, the turbine-powered T4 saloon.

As can be seen from the photograph below recording this event, loading the cars presented no problems, thanks to the Forty-Four's unique swing tail.

PLASTIC JET ENGINES

Knowing the intense heat that is produced inside a jet engine, it comes as a surprise to learn that many parts of the new Rolls–Royce RB.162 turbojet are made of plastics. However, the plastics industry has made such tremendous progress in the past few years that there is little reason why we should not see all-plastic aeroplanes, with all-plastic jet engines, in a few years' time.

The RB.162 has been designed as a low-cost and mechanically simple lift unit for vertical take-off aircraft on the lines of the Short SC.1. It has a thrust of 4,400 lb., yet measures only 25 inches in diameter and 51 inches in length. It weighs only 275 lb., giving a thrust-to-weight ratio of 16:1—the highest ever achieved by any jet engine manufacturer.

In this engine, the axial compressor blades and casing are of plastic. Although the use of this material helps to make the RB.162 so light in weight, it was chosen primarily to reduce costs, which are being shared by Britain, France and West Germany. The first use of the RB.162 will be in the Mirage III–V, the vertical take-off version of the superb French Dassault Mirage fighter, in which eight lift units will be mounted vertically in two banks of four in each side of the fuselage.

FIRE-FIGHTING MISSILE

Last year, seven pilots and officers of the U.S. Forest Service lost their lives while engaged in air attack on forest fires. For that reason, the U.S. Department of Agriculture has high hopes for a new technique which involves using a radio-controlled glide-bomb missile to drop fire-retardant chemicals on fires.

First tested in June, the missile is launched from an aeroplane at heights up to 3,000 feet, above the heavy air bumps caused by a fire and usually above the smoke. It is guided to the target area by radio and is rigged to drop its 100-gallon load of chemicals before hitting the ground. If further tests are successful, this new method of attack might in time replace the direct "bombing" of fires by conventional tanker 'planes. Such operations are dangerous in daylight because the tankers must fly at low altitudes over rough country and through smoke. At night, or when there are strong winds, they are impossible.

A LUVERLY BUNCH OF . . .

Chance Vought's Crusader normally looks one of the neatest fighters in the air, but this may change if tests now underway show that it can be used for attack as well as for interception duties. In these tests, it is proving its ability to carry a huge variety of weapons and is fitted for the first time with (*Continued on page 327*)

● *Sailing is everybody's hobby these days, but how many people who use our rivers and the sea itself for this fine sport realise the problems which face the boat-builder and designer? In this article, the author tells you all about . . .*

THE SHAPE OF BOATS

The ocean racing yawl "Marabu" (length overall 57.7 feet; load waterline 39 feet). Note the distance between the wave crests, which must be about 36 feet. This means she is travelling at a speed/length ratio of about 1.1, or about 7½ knots. She is, in fact, sailing on more than her load waterline.

CONSIDERING that they all do much the same thing, boats have a surprising number of shapes. If you have never thought about it, just count up the different types you see next time you have a chance to wander around a small harbour. You are bound to find some yachts there—perhaps long, low elegant racing yachts, or offshore racers which are more compact and wider in the beam with almost vertical ends.

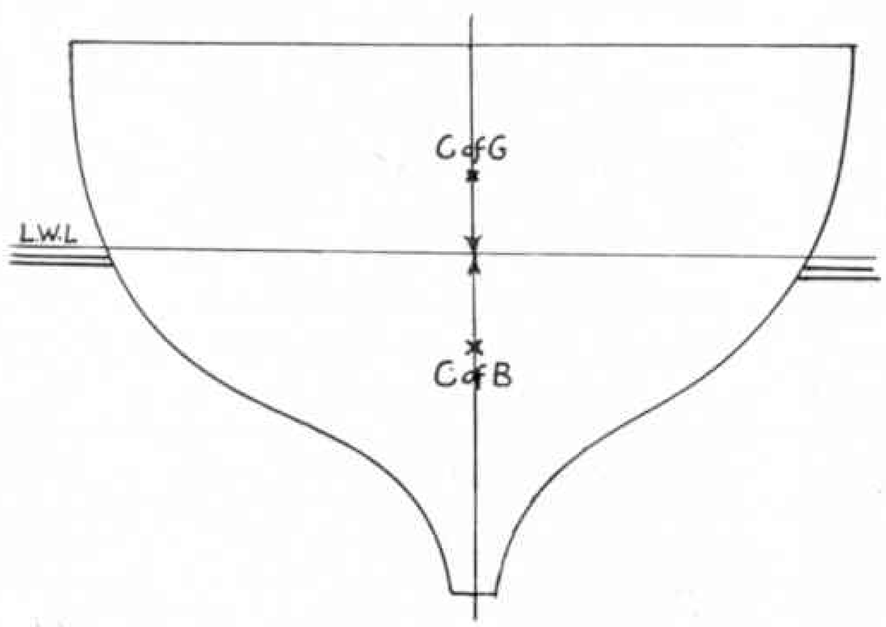
You will see racing dinghies fine at the bow and broad at the stern and probably a catamaran or two as well. Then you may see the older style of motor yacht, looking more like a tea clipper without masts, or the newer type with blunt bows and much the same beam throughout the length. And, of course, there will be runabouts with their flared bows and dead flat after-sections. You will even find a difference between pram and stem dinghies, and if you look around inland waterways you will see long narrow punts and canoes, skiffs and racing craft of all shapes and sizes. Just why all these boats are of different shapes will not be obvious to you until you know something about the way in which a boat moves through the water.

By
P. G. FRANCIS

To begin with, water is solid stuff! If for instance, you row a small dinghy weighing about a quarter of a ton with, say, four people on board, you will have levered about 120 tons of water out of the way by the time you have rowed a mile. Water doesn't like being pushed and the faster you try to do this the more it resists. If you row twice as hard you will not travel twice as quickly, and the faster you go the more important it is to have a shape that goes through the water easily.

You can have a blunt bow on a barge, which does not travel very quickly, but not on a racing yacht. You can see from this that if you wanted to build a fast boat the first thing would be to make it as light

Figure 1. The hull of a boat at rest. The centre of gravity is immediately over the centre of buoyancy. The letters L.W.L. in this diagram and in figures 2 and 3 denote the load waterline.



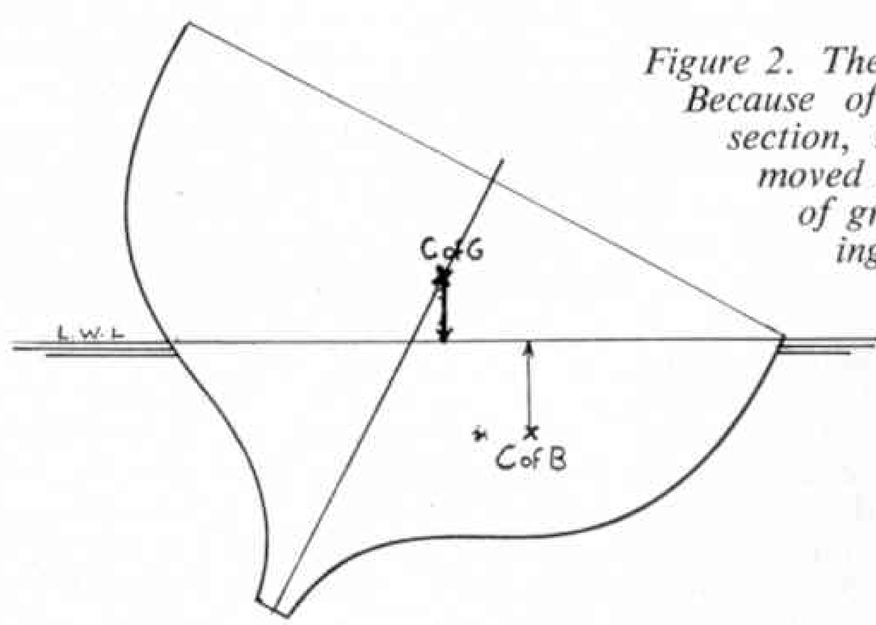


Figure 2. The hull of a boat well heeled. Because of the shape of the cross-section, the centre of buoyancy has moved further out than the centre of gravity and is therefore levering the boat back upright. The higher the centre of gravity, the less leverage the centre of buoyancy will have.

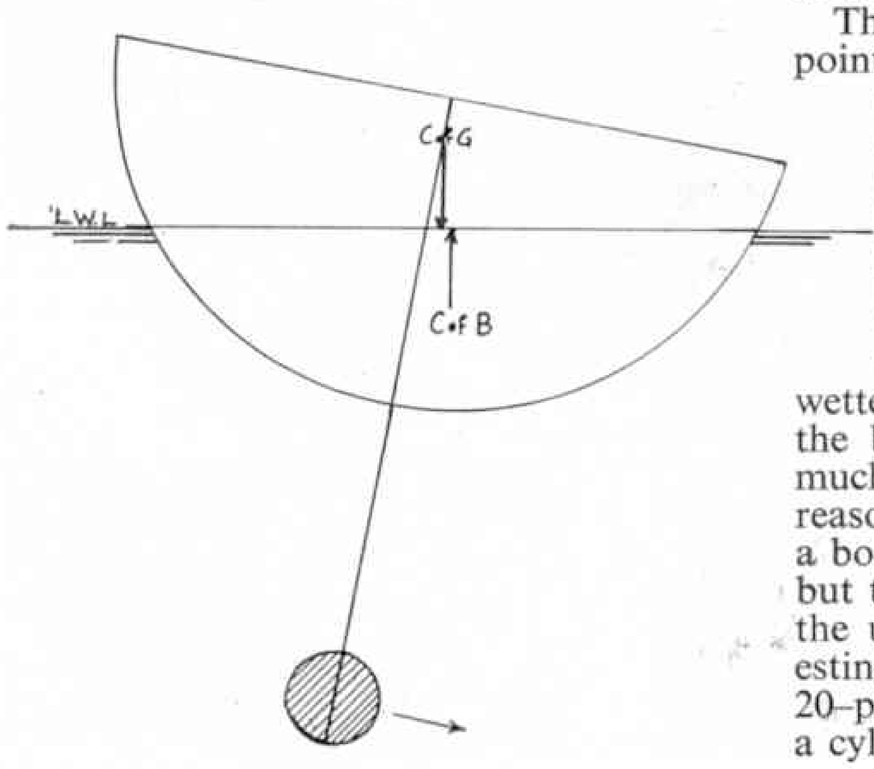
The yawl "Chouette" reefed down sailing on a slightly higher speed/length ratio than "Marabu"—probably about 1.3 or 1.4. Since she is 27.75 feet overall and 21 foot on the waterline this gives a speed of something like 6 knots. Note that in this case the wave crest is just abaft the transom. In this picture and that on the preceding page you can clearly see how the wake at these speeds leaves a great trough amidships, so that the boat is supported more at bow and stern. If there were not enough buoyancy at the ends the boat would be swamped by its own wake.

as possible, since you would not want to use your power pushing more water out of the way than you could possibly help. But when it comes to deciding the shape of a boat, many things must be taken into account—wave resistance, skin friction, available power, ability in certain conditions, etc.—all of which means that yacht design is as much a science as an art.

The most important thing is what is known as wave making resistance. The underwater shape must be designed to reduce this as much as possible. As the boat goes faster, the pressure of water builds up and a great increase in power is needed for a small increase in speed. Eventually, the boat will ride on its own bow and stern wave and unless it is designed with a broad transom to ride these conditions the stern will sink and drag, making it impossible to go any faster. This happens at about $1.5 \times \sqrt{\text{length}}$. This means that an ordinary 16 ft. boat has a speed limit of about 6 knots, or 7½ knots for a 25-footer, but it would be uneconomical to drive them at these speeds. This is known as the speed/length ratio and is very important because it is the only way of comparing boats of different sizes. If the Queen Mary (length 1,004 feet) could be driven at a ratio of 1.5 she would be capable of 50 knots instead of her normal 30.

If you are trying to go as fast as possible without much power then you will need a boat as long and light as practical. All racing boats which are rowed or paddled come into this class. A single racing scull is about 26 feet long and capable of about 8½ knots. This is a speed/length ratio of 1.65 but these shells are so light that their wave-making resistance is very small. A 16 ft. racing kayak will do about 7 knots. These are extreme shapes, of course; a touring canoe of the same length could not be driven at this speed because it is heavier and beamier which, among other things, gives it more wetted area.

Figure 3. This is the sort of cross-section one finds in racing yachts. The stability of this hull is negligible but, by adding a weighted keel (shaded circle) it can be stabilized. The more the hull heels, the greater leverage the keel will exert.



This business of wetted area is the next point to consider. Every square inch of the boat under water is helping to slow the boat down, simply because of friction. A smooth, shiny surface helps to reduce this, so when you see men polishing the bottoms of their boats before a race you will know the reason why. But the important thing is obviously to reduce this wetted area—in other words the area of the boat in contact with the water—as much as possible. This is just another reason for making the boat light, since a boat displaces its own weight in water, but there is a great deal we can do with the underwater shape. Here is an interesting experiment for you. Take an empty 20-packet of cigarettes and round it into a cylindrical shape. You will find that it will hold 21 cigarettes. In other words, it is taking a greater weight for the same surface area or, putting it the other way round, you would need a smaller surface area in a cylindrical shape than in any other shape to carry the same weight.

To get the last ounce of speed, racing sculls and kayaks have almost semi-circular sections, but unfortunately there is a snag in that a semi-circular section is highly unstable as you will soon find out if you try to paddle a racing kayak. You will probably end up with your head under water!

So we come to the problem of stability. Assuming that you do not want your boat to capsize, there are two ways of obtaining stability—either you can have an unstable hull, to which you add a deep keel with a weight on the end to hold it upright (like a pendulum), or you can put more beam into your hull so that, as the boat heels, the stability increases. To be technical, the centre of buoyancy moves away from the centre of gravity, so levering the boat back upright (see Figure 2). The first is inconvenient but, in principle, it is used on yachts because you also need a large

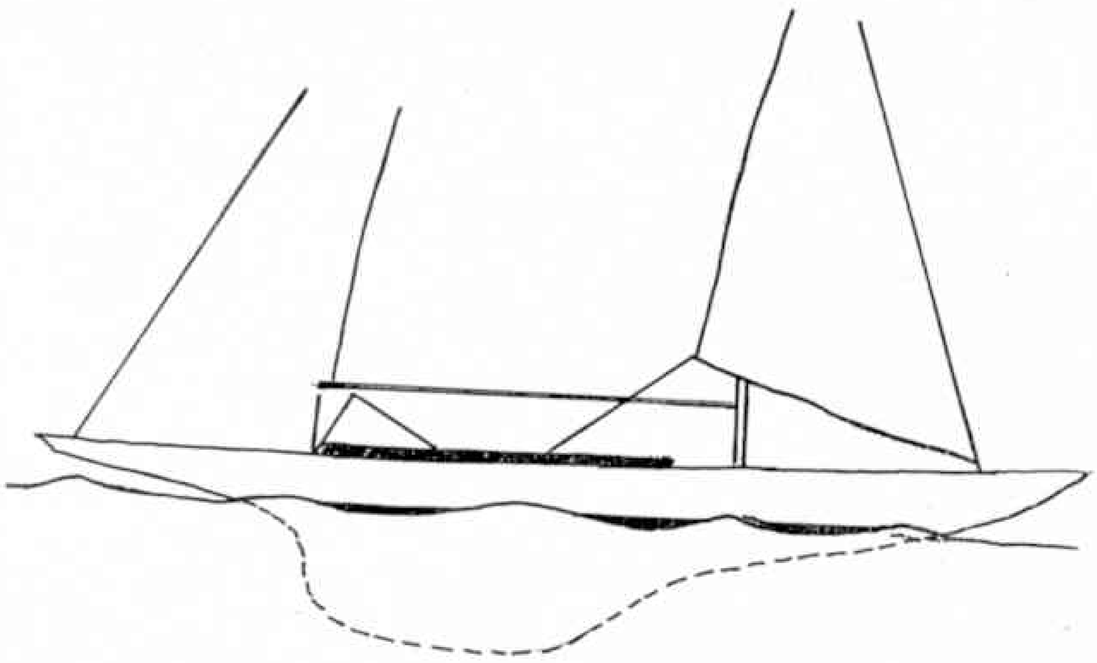


Figure 4. Profile of a 5.5 metre (22 foot) yacht on the waterline. With three wavelengths she is travelling at a speed/length ratio of about 0.75, giving her a speed of about 3½ knots. (0.75 $\sqrt[2]{\text{L.W.L.}}$)

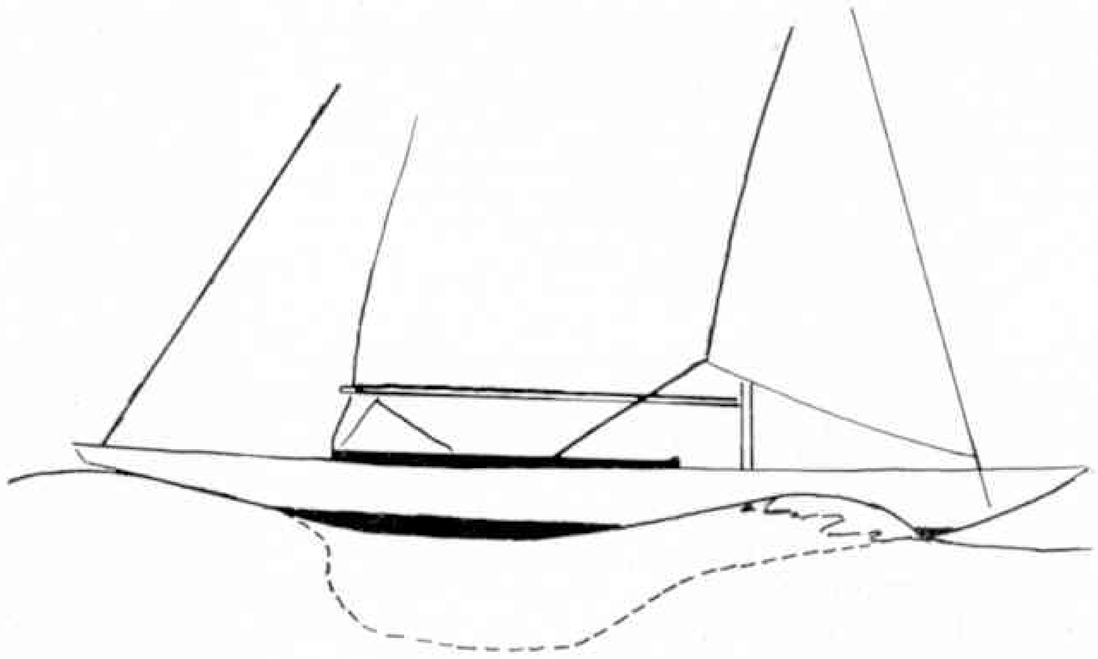


Figure 5. Profile of the same yacht now travelling at 1.5 $\sqrt[2]{\text{L.W.L.}}$ i.e., 7 knots. Note the lack of support amidships and how the weight is now carried by the overhanging stern section.

lateral area to counteract the tendency of a yacht to be blown sideways by the wind, instead of forwards. Thus you will kill two birds with one stone although in shallow waters such as the East Coast, where there is always the risk of running aground, many of the yachts have centre boards instead.

Sailing dinghies also often have centreboards and Thames barges carried what were known as leeboards, which were fixed to the outside of the hull to avoid taking up precious cargo space. But in all these cases the centreboards are unballasted and so do nothing for the boat's stability; they merely help to prevent the boat moving sideways. Stability has to be found in some other way. Thames barges, for instance, are almost rectangular in cross-section being quite flat-bottomed. This makes them extremely stable, but even these vessels while racing, and carrying no ballast at all, have been known to capsize.

So far, we have seen that if you want speed with minimum power you will have to build a light, long boat with very sharp ends that disturb the water as little as possible. All racing keel yachts are variations on this basic idea. Supposing, though, you are not bothered so much about speed but want ability to carry heavy loads, or require comfort with none of the pendulum motion of the racing boat. Well, to carry a lot of weight for your length you will have to sacrifice those fine ends and build a much chunkier hull to find space for the cargo. Canal barges and lighters, for instance, have practically the same beam along their entire length. Tugs, too, are very tubby, but the reason in their case is to prevent the bow or stern running under as they take up a tow (tugs have capsized by being dragged sideways). If you want comfort you will also need a rather plumper boat. A fuller bow will give more buoyancy forwards and you can ride over the waves better instead of plunging through them, but you can carry even this too far. The Dutch sailing barges have a lot of buoyancy forward, so much so that they crash down on each wave and rattle every bone in your body. You will usually find that offshore sailing boats, even racing types, are a good deal fuller at bow and stern than types such as the 12–metre class which are used for "round the-buoys" racing.

Up to now, we have not considered boats that will go faster than the speed/length ratio of 1.5. Of course, there are plenty of them, the simplest being the runabout. What you have to remember is that to go fast a boat needs a lot of expensive power besides being built for the job, and if it is the right shape for high speeds it is the wrong shape for low ones. This is why the majority of boats simply are not designed for these speeds. Because of their high power and low weight they can break through the wave resistance barrier so that they leave their stern wave behind them instead of dragging it at the transom. Racing dinghies do this when they "plane". As the boat goes faster, still another force comes in known as dynamic lift. When this happens, the water is so solid that it pushes the boat up out of the water and to get the best out of this lift the bottom of the boat must be nearly flat. This reduces our two enemies, wetted area and wave-making resistance, and so we go faster still. In this situation there is almost no limit to the speed that can be achieved provided there is enough power. The faster one goes the greater the dynamic lift until, with a fast hydroplane, only a few square inches of the boat are actually on the water. At 40 knots, a water skier could ski on his bare

(*Continued on page 339*)

Two power boats travelling at upwards of 20 knots. You can see from the painted waterline how much each boat has lifted out of the water. Notice the full, flat transom and the way the boats appear to be running in a groove. Wave lengths are not well defined partly because there is so little of the boat in the water, but you can see how the water begins to fall back into place about one boat's length behind.

MECCANO DISPLAY AT STOCKHOLM FAIR

Of General Interest

THE British Exhibition held in Stockholm from May 18 until June 3 was the biggest British Trade Fair ever to be held overseas. It was officially opened in the presence of King Gustav and Queen Louise of Sweden by the Swedish Prime Minister, Mr. Tage Erlander, supported by the President of the British Board of Trade, Mr. Frederick Erroll.

Most prominent of the visitors to the exhibition was Princess Alexandra, who took a keen interest in the various items on display. In all, something in the region of 300,000 people patronised the display, paying an admission charge of 5 kroner (about 6/8d.) per head.

Meccano Limited were among the exhibitors and the stand attracted particularly heavy crowds. A full range of the company's products was on show, with an interesting centrepiece of a Meccano suspension bridge with moving Dinky Toys traffic on the roadway. Combined with this model was a double track Hornby-Dublo Train layout and there were various working models in Meccano, one of which, a horse with jockey, brought many smiles. Although some 15,000 catalogues and other items of printed matter were available the demand was so great that rationing had to be imposed.

The picture at the top of the page shows Queen Louise admiring the Meccano stand. On her left is Mr. Norman Craig, Sales Director of Meccano Limited. In the lower picture Princess Alexandra is seen at the exhibition. Just behind her, and to her left, is Mr. T. Gee, Export Office Manager, Meccano Limited.

During the period of the fair important department stores and many shops in Stockholm had special displays of British products.

Mr. Harry Barlow, proprietor of Southport's lakeside miniature railway, is seen above with the locomotive which he has built at his lakeside works for Butlin's camp at Skegness. It is diesel driven. With the locomotive are six coaches to seat 72 people.

RAILWAY NOTES

Contributed by R. A. H. Weight

Midland Running, Past And Present

ONE of the first personally-logged express runs of which I still have skeleton timing detail was on the former Midland Railway main line from Leicester to St. Pancras. It was recorded more than 50 years ago—when I was a junior member of the District Traffic Superintendent's staff—in what is now the up *Thames–Clyde Express* from Glasgow, Carlisle and Leeds, then due in London at 6.30 p.m. The load, "nine-on" including a small luggage van, weighed 229 tons tare and was composed of M.R.-type corridor coaches and dining cars, owned and operated jointly with the Glasgow and South Western Railway which, like the Midland, became part of the L.M.S. group in 1923. These vehicles were very comfortable, although shorter and a good deal lighter in weight than those used at present.

A non-corridor slip carriage was attached in rear at Leicester and detached at speed as we approached Kettering, 27 miles further on. So from Leicester the tare load without passengers, etc. was 251 tons. Regulations of the period on that rather steeply-graded route provided for an assisting locomotive on the fast-timed trains for anything over 240 tons even if the train engine were a Class 4 Compound 4–4–0. The No. 1000 Class Compounds were then, and for a long while afterwards, the most powerful passenger engines on that system. Actually, we were hauled by Nos. 618, 652, two 4–2–2 "Single-Wheelers" (or "Spinners" as they were often called), with only one large driving wheel on each side, bogie wheels in front and a pair of carrying wheels behind. With cylinders and valve gear between the frames, beneath the smoke-box and boiler, and no coupling rods, they appeared to glide along without any visible mechanical motion, when viewed from some distance at the lineside or on a platform, although there could be a fierce blast from their chimneys. They did well with light trains, but were gradually withdrawn. One is preserved in the old-time crimson lake livery.

On my run the two little engines had a clear road, and covered the 99 miles in 108 minutes, regaining six minutes of a late start. The present timing with heavier load and a stop at Kettering, intended for Jubilee or other 4–6–0 locomotives, is 109 minutes, including a recovery margin.

I have described in these notes during the past ten years a number of stout efforts by Class 5 mixed traffic, Jubilee and Royal Scot 4–6–0s, also mentioning some high speed work by a Britannia 4–6–2, on various fast trains on Midland routes. During 1961 and since, however, steam traction has been largely displaced on

In the picture above, by Derek Cross, B.R. Standard 4–6–0 No. 73168 is storming up the Lickey Incline with assistance in rear. Our heading illustration this month shows No. 45562 "Alberta" ready to leave St. Pancras with a sleeping car train. Photograph by A. A. Sellman.

Peak Class diesel No. D62 heads "The Robin Hood" through Mill Hill. This picture and the two photographs on the opposite page are by J. A. Fleming.

such duties by the Type 4 Peak class 2,500 h.p. B.R–Sulzer diesel-electric locomotives, and it is probable that a considerable speeding up will soon be effected, with faster and more frequent St. Pancras–Manchester ordinary services among other improvements.

Last autumn, No. D95 on the 6.30 p.m. St. Pancras–Derby express with a total load about 330 tons, logged by Mr. D. S. M. Barrie, M.B.E., had to make a severe repair slowing soon after starting, at Hendon, but then sped away to some purpose! For more than 50 miles, between Elstree and Wellingborough, 75 m.p.h. was averaged, with a maxima around 88, and what would have been regarded with steam traction as the astonishing minimum of 62½ m.p.h. at the top of the 1 in 119 Sharnbrook Bank, north of Bedford. Although there were some spells of coasting and easing, the 72 miles to Kettering stop took less than 72 minutes so time was well in hand, as it was again on to Leicester over Desborough and Kibworth gradients.

On another northbound run reported, No. D71, hauling an additional coach and taking full power, passed Sharnbrook Summit at 70 m.p.h. and proceeded to gain on most of the scheduled stages forward to Manchester, chiefly by dint of rapid starts and good climbing. But, as with other types of big diesel, there have been temporary failures and "teething troubles."

The power of the self-contained diesel engines and traction motors propelling the luxurious multiple-unit *Midland Pullman* is even greater for the load concerned and on one trip, as I reported in the November 1961 *M.M.*, we swept over Sharnbrook at 74 m.p.h. and other similar summits at more than 70; easily attained 90 running downhill and on level track, and averaged 77 m.p.h. over a considerably undulating course along 107 miles south of Derby. I have, indeed, seen tremendous developments in railway operating as in so much else!

The *Robin Hood* Nottingham–London express, calling at several principal main line stations on its return northbound journey, has appropriately been hauled on many occasions by Type 4 diesel, No. D100, named *Sherwood Forester*.

GREAT CENTRAL LINE

A one-time rival express service between London (Marylebone)–Leicester (Central) – Nottingham (Victoria) – Sheffield (Victoria) was originated by the Great Central Railway, which formed part of the L.N.E.R. from 1923 to 1948. This route is now for the most part contained within the L.M.R. orbit, but is little used for regular long-distance travel, although the three daytime through trains serving principal stations feature some smart timings and lively performance.

Varied locomotive classes recently in evidence have included B1, L.M.R. and B.R. Standard 4–6–0s; Britannia Pacifics (which are working around the country from the Carlisle and Birmingham areas, and from March and Immingham (Grimsby) Depots, etc.), V2 2–6–2s, ex-L.N.E.R. and G.W.R. mixed traffic 4–6–0s at Leicester, large freight engines and so on.

On one trip recorded by Norman Harvey, the 5.15 p.m. Nottingham–Marylebone, a six-coach train headed by B.R. class 5 4–6–0 No. 73034, almost kept the tight 11-minute allowance from Loughborough to Leicester, nearly ten miles, with a maximum of 78 m.p.h., and attained 80 while running from Lutterworth to Rugby, six and three-quarter miles in eight minutes, start to stop. Thus time was gained, as it was also between Leicester and Lutterworth, Rugby and Woodford Halse and onwards to Brackley. On another occasion the 12.25 p.m. from Marylebone, after slowing considerably between Harrow-on-the-Hill and Rickmansworth, where widening and rebuilding work has just been completed, made a vigorous climb at 38–41 m.p.h. up to Amersham through the Chiltern woodlands quite in old-time express style, although the train is generously timed as far as Aylesbury. L.M.R. Class 5 No. 45444 was the engine, with "eight-on".

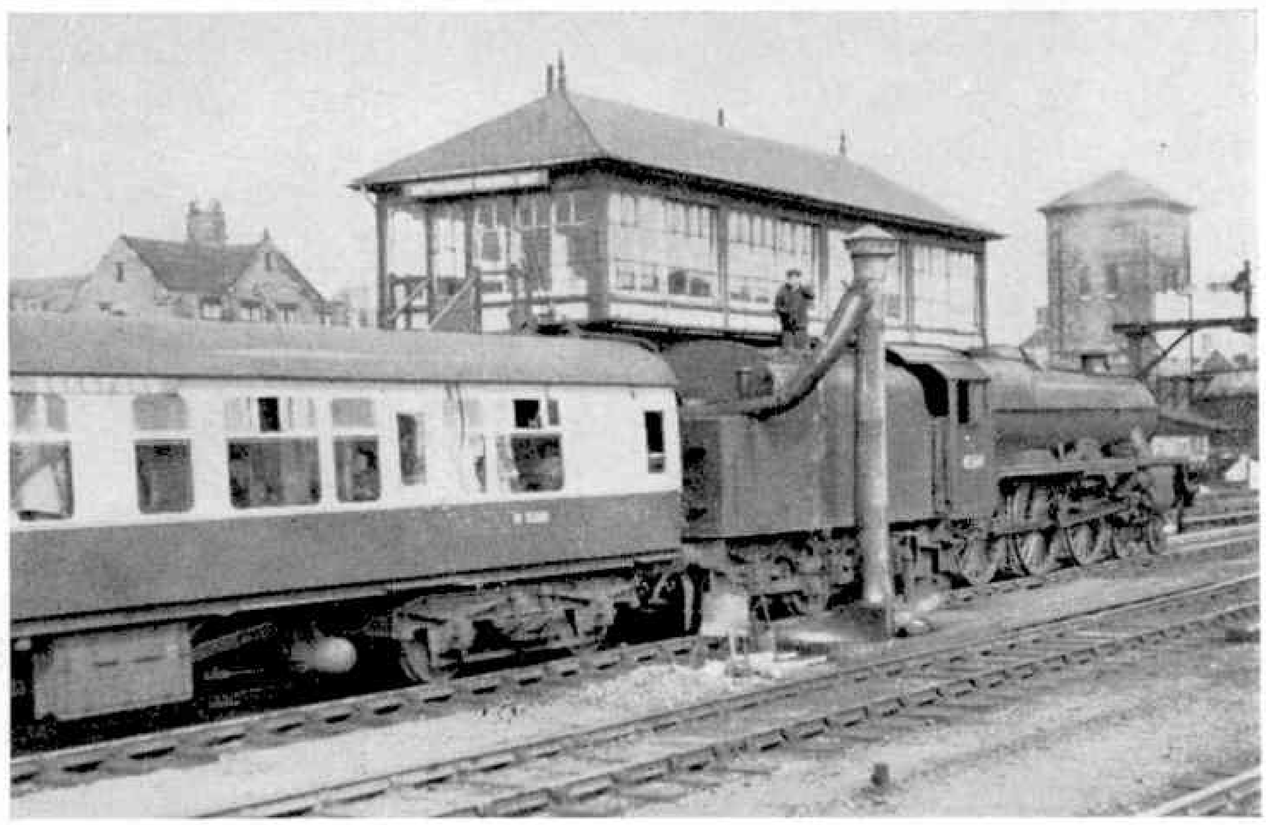
LOCOMOTIVE NEWS

Several new and experimental or prototype diesel locomotives have recently been operating in main line service. Following trials on the Western Region, including successful haulage of big trains up the 1 in 37¾ Lickey Incline south of Birmingham, the Brush *Falcon* Co:Co 2,800 h.p., No. D0280 has more recently been running the fast *Master Cutler* and other Sheffield–King's Cross Pullman expresses with ease.

The white-painted No. D0260, *Lion*, which also has electric transmission, and is the product of the Birmingham Railway Carriage and Wagon Company, began trial running with Wolverhampton–Birmingham–Paddington expresses during May. The Beyer–Peacock (Hymek) type-3 diesel-hydraulic locomotives now entering service, numbered in the D7032 series, have taken over a number of the W.R. South Wales–London fast passenger train workings.

The S.R. electro-diesels to be numbered E6001–6, all of which are expected in service shortly, have also been taking part in extensive trials and test runs both singly and coupled with diesel or electric locomotives and multiple-unit sets. They can run as diesel-electric units hauling passenger or freight trains along unelectrified lines, or as electric locomotives taking current from the third rail.

At a military and civic ceremony in June at Waverley Station, Edinburgh, the Type 5 Deltic diesel-electric locomotive No. D9000 was (*Continued on page 339*)

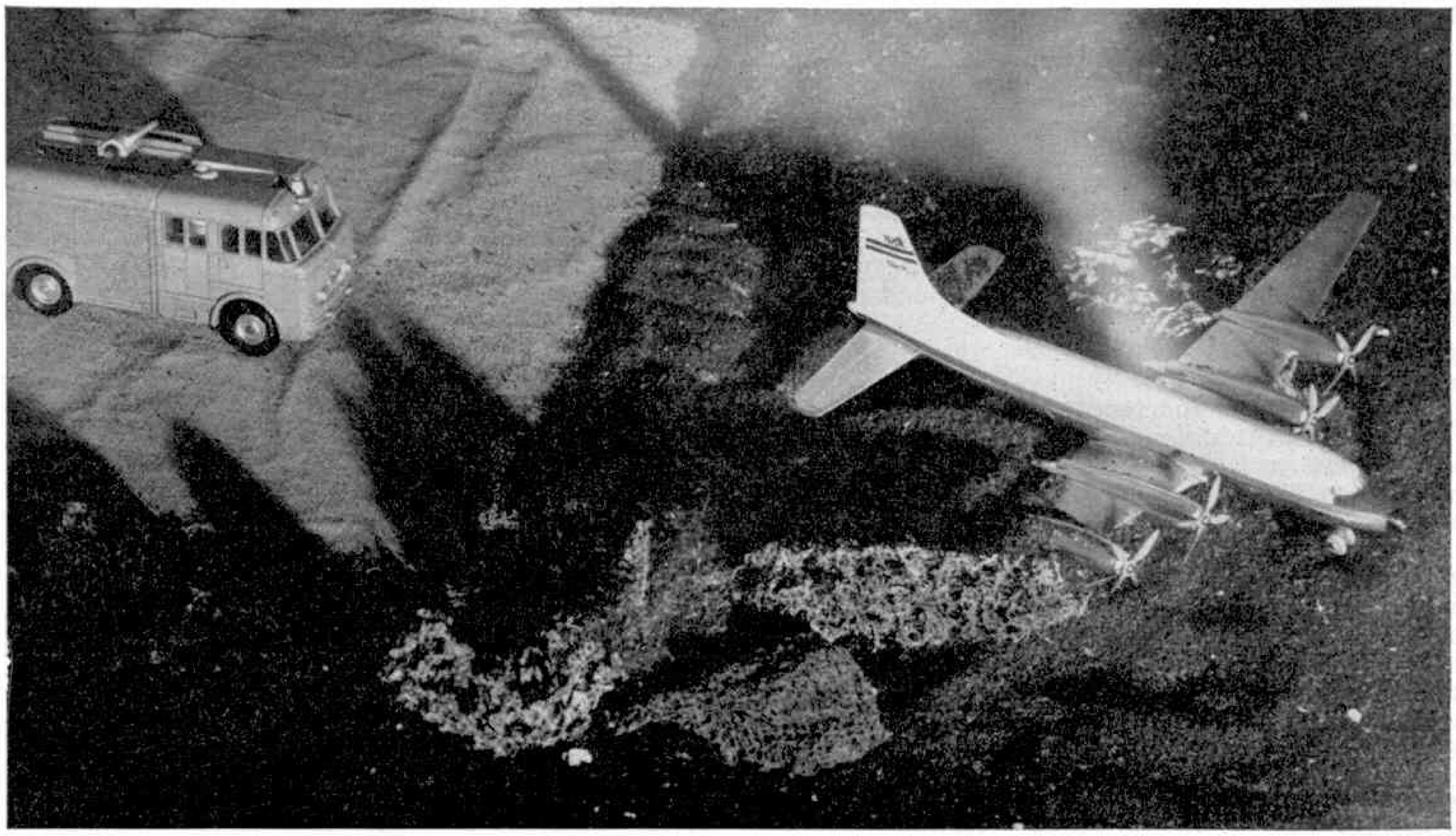


Above: "The Palatine" comes curving through Ambergate, headed by Britannia 4–6–2 No. 70017, "Arrow".

Right: Jubilee No. 45614 "Leeward Islands", on an up express from Bradford, taking water at Nottingham.

AIRPORT FIRE TENDER HAS FLASHING LIGHT

Dinky Toys News



NEAT NEW FORD CAPRI: ROAD SIGNS SET

BY THE TOYMAN

AUGUST is the one month of the year which I always associate with the height of summer. Of course, I realise that Midsummer's Day was June 24, but August seems to me—and I am sure it does to many others—to be the warmest and sunniest month of them all and the true climax of the British summer. Unfortunately, the hot sun increases the risk of fire as brigades all over the country can testify and its danger applies also, in a degree, to airport perimeters where grass fires tend to start more easily than under normal circumstances.

It is not unappropriate, therefore, that this month should see the release of the Dinky Toys Airport Fire Tender (No. 276) which can be seen illustrated in the scene above and on the back cover of this month's issue.

The outstanding feature of this fire tender is that it creates a new standard in Dinky Toys by introducing an actual flashing light, which gives a wonderfully authentic touch to the model. In previous models we have had simulated warning lights of one kind or another, but this is the first time that a Dinky Toys model has been fitted with a real light and very effective it is, too.

An airliner has crash landed just beyond an airport runway (top picture) and the airport fire tender, always at hand for such occurrences, races to the scene. On the roof of the fire tender can be seen the bell, the flashing light device (centre) and the foam gun. Right: A build-up for any Dinky Toys layout is this excellent set of Road Signs, now available.

Outside the main Ford dealers are two models of the Ford Capri (left), a Ford Anglia and (extreme right) a Ford Fairlane. The clean-cut lines of the Capri, latest addition to the Dinky Toys range, are clearly seen in the close-up picture above.

The Airport Fire Tender itself is modelled on the already popular Dinky Toys Fire Engine No. 259, being effectively modified to carry the flashing light device and an imitation gun-type foam extinguisher in the centre of the roof. In all, the model has a replica of a bell over the driver's cab, then the flashing light and just behind the light itself the foam extinguisher, giving it a most businesslike look. The model is finished in bright red and the warning light is amber.

The flashing mechanism itself is operated through a cam on the rear axle which makes and breaks an electrical circuit as it turns. The bulb is powered by a Vidor V.0036 1½-volt Pencilight battery, or equivalent, and the battery will be sold separately from the model so that there will be no chance of battery wastage while the model is in stock. Full instructions on how to fit the battery into the vehicle are provided with the fire tender itself.

In addition to the lighting device, which is another first for Dinky Toys, this exciting model is fitted with suspension, windows and fingertip steering. In a neat panel at the rear of the vehicle on either side are the words "Airport Fire Control".

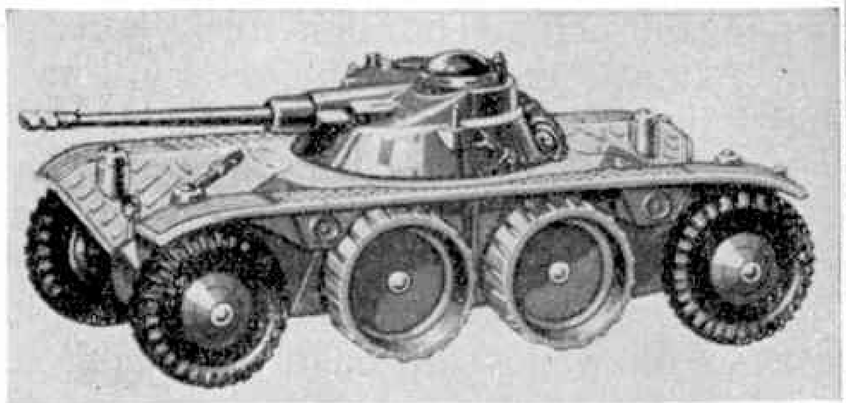
To those who purchase this latest model and fit the small battery which operates the lighting device let me offer the suggestion that they should be very careful to see, when putting the model away, that the light is not left on, otherwise wastage of the battery will result.

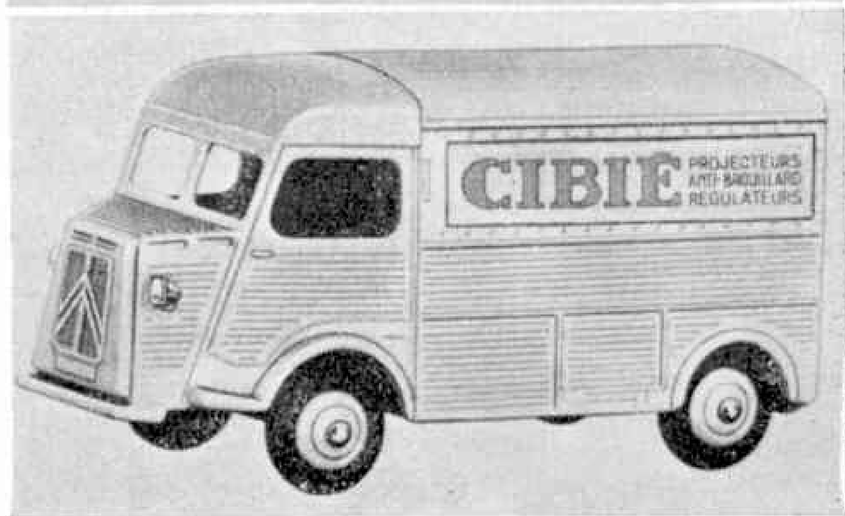
There are two other releases about which I want to talk to you this month, the first of which is a magnificent little model of that highly popular car the Ford Capri. No. 143 in the list, it is fitted with all the Dinky Toys extras—fingertip steering, windows, seats, steering wheel and suspension and is finished in a striking colour scheme of turquoise and white, which is an authentic finish.

Its sleek and attractive lines are clearly seen in the pictures at the top of this page. Although a two-door coupé, the car can seat four. Manufactured by the Ford Motor Co. Ltd., of Dagenham, the prototype is powered by a four-cylinder overhead valve engine of 1,340 c.c. which develops a brake horse power of 56.5. The car is fitted with four forward gears and one reverse, operated either by column or floor change as required. In common with most new Fords it is equipped with four headlights arranged in pairs. Dimensions of the actual vehicle are: Length 14 feet 2¾ inches; width 5 feet 5¼ inches; height 4 feet 4 inches; wheelbase 8 feet 3 inches. The side windows and rear quarter lights are retractable.

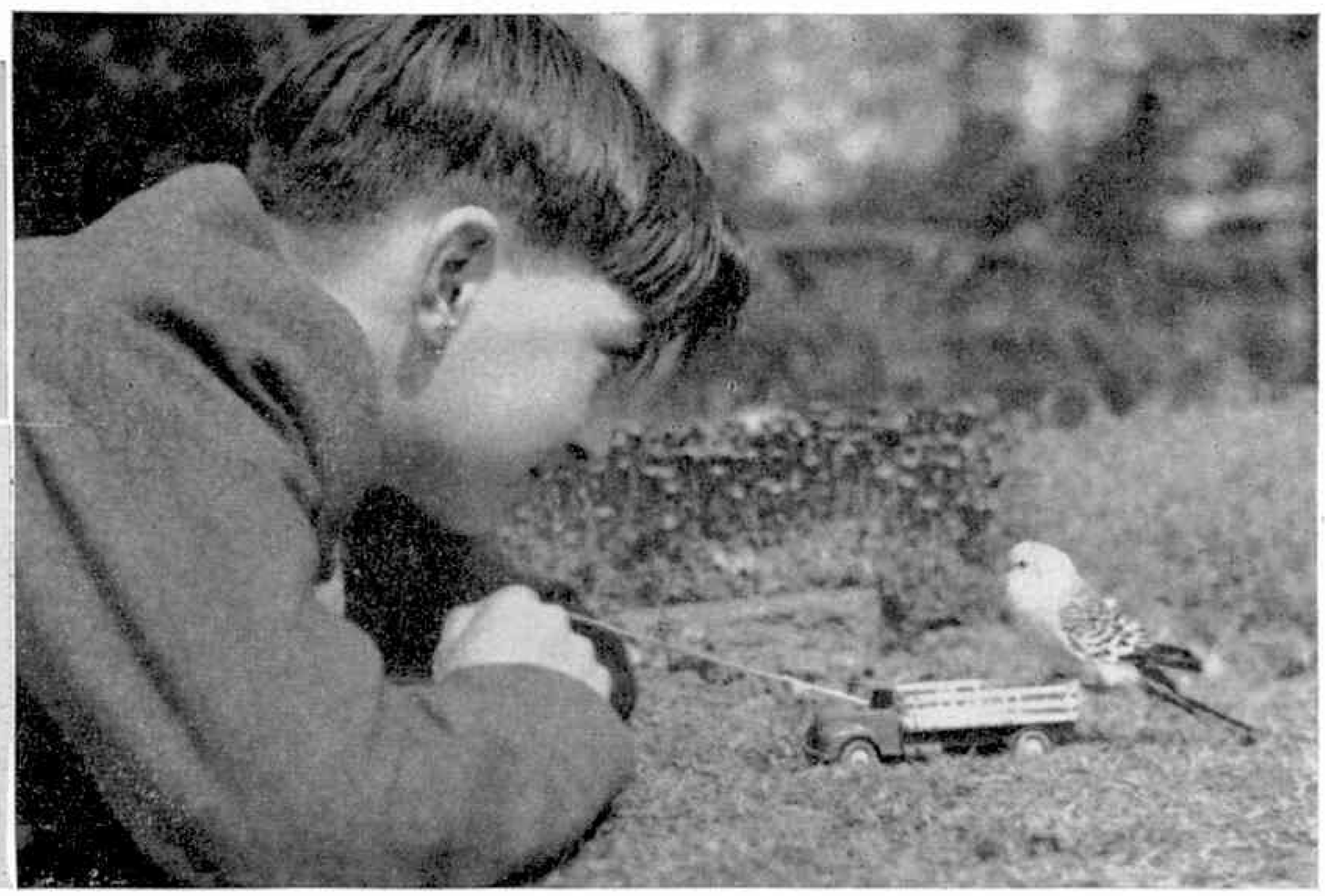
Now let me pass on to our third release this month which is (*Cont. on page 340*)

Two more Dinky Toys models from Meccano (France) referred to in this month's notes are the Panhard Armoured Car (below) and the Citroen Delivery Van (bottom picture).





From Ellesmere, in Shropshire, comes this picture of Dinky Toys enthusiast Christopher Wilson with Jimmy, his pet budgerigar, whom he has trained to ride round on his Leyland Comet Lorry.



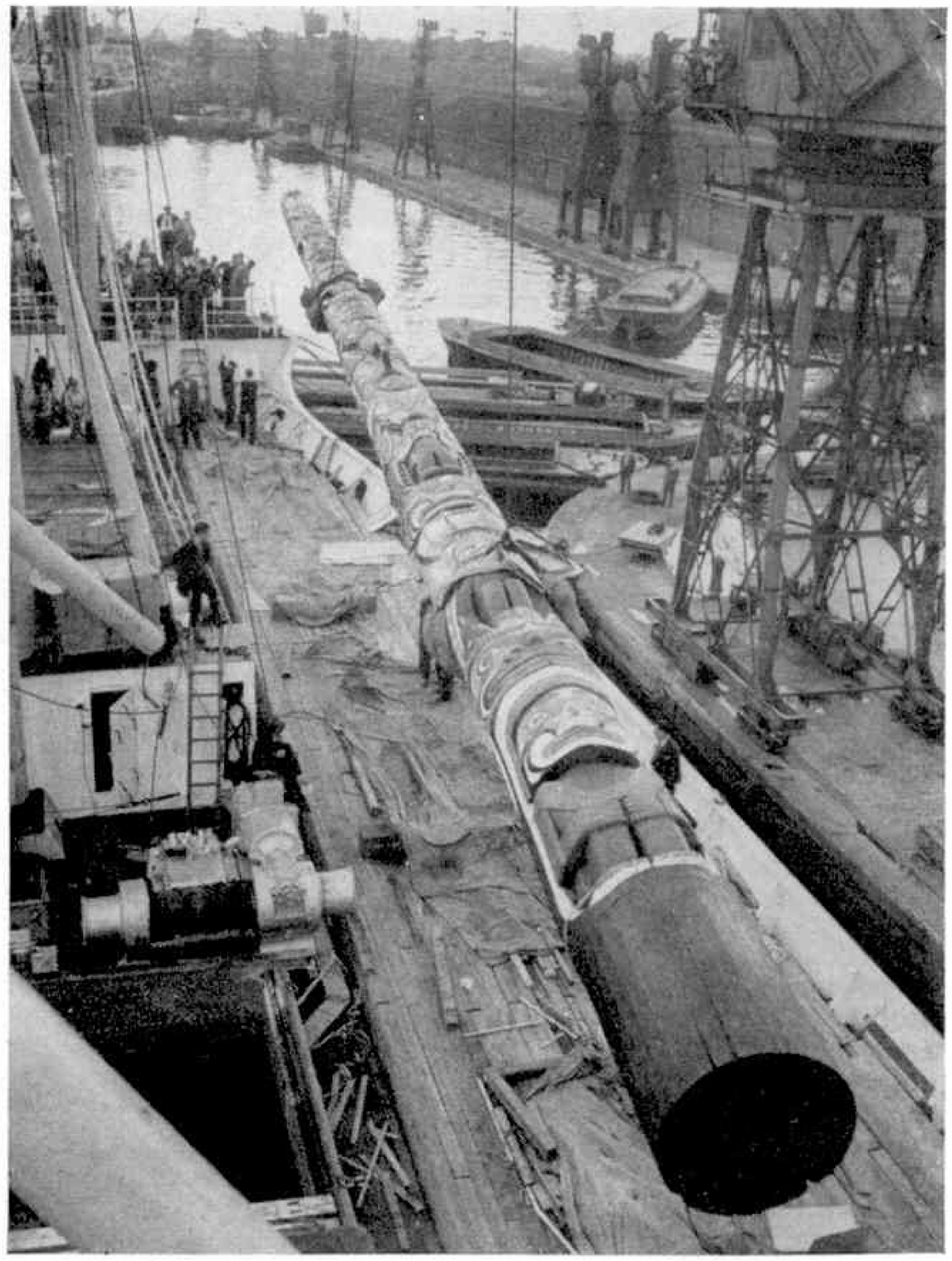
REVIVING AN ART FORM FROM THE PAST

TOTEM POLES

THE ancient art of making totem poles, which became almost extinct some years ago, is now experiencing a revival owing to an extensive scheme of restoration and reproduction planned by the Government of British Columbia.

These intricately-carved and gaily-painted poles, some of which are more than 50 feet high, are peculiar to the Canadian province of British Columbia, and are survivals of an art form existing nowhere else in the world.

By H. I. O'HARA



A totem pole being unloaded at London Docks prior to its transportation by lorry to Windsor Great Park.

Although wood carving was always an integral part of the primitive culture of Indian tribes living between the Pacific Ocean and the mountain ranges of Canada, it was not until the coming of the White Man—who sold improved cutting tools and commercial paints to the craftsmen—that the carving and decoration of totems reached its peak.

Before that time, crude knives and adzes were used for the laborious task of carving the giant red cedar trees from which totems are made. Primitive pigments were originally produced from crushed minerals—iron ore for red, copper ore for blue-green and coal for black—and mixed together with salmon roe, the paint being applied with brushes made of porcupine hair. White paint was made from the burnt shells of clams.

Because, through the centuries, totem poles fell down and decayed rapidly if left in their original positions, few survived to be a hundred years old. Now, however, the introduction of modern methods for treating the wood ensures the preservation for posterity of these examples of one of the world's strangest native crafts.

To understand the meaning and symbolism of the animals and faces depicted on the totems one would have to be an expert in Indian folklore and mythology. Even in ancient times the only person fully aware of their true meaning was the owner of a particular totem. The erection of a new pole was always accompanied by a native feast or "potlach" at which the chief of the tribe would explain its mysteries to selected members of the clan who had been invited for the occasion.

Animals Predominate

According to tribal beliefs and legends, each clan was derived from an animal ancestor, after whom the clan was named and to whom they paid reverent homage. For this reason, animal sculpture predominates in totems, although an occasional human face is shown as symbol of the belief that early animal ancestors sometimes took human form.

Because of this close identification with the wild life around them the Indians used such emblems as the Bear, Wolf, Frog, Raven, Whale, Beaver and the all-embracing Thunder Bird, as constantly recurring themes for totem pole carvings.

So popular has the Thunder Bird emblem become even in modern times that it even appears on number plates of cars in British Columbia, although its original meaning is supposed to denote an all-powerful Creator God, whose outstretched wings spread over the summit of a totem symbolised protection for his people.

Legend has it that the Indians believed that thunder and lightning were caused by the flapping of the Thunder Bird's wings, with flashing light from its eyes when the god had been aroused to anger.

Totems can generally be classified as falling into one of three different categories, although the variety of carved emblems used is bewildering in number.

The Owner's Crest

House frontal poles were usually the property of wealthy Indians and depicted the crest of their owner. They were placed on either side of the entrance to the house or other dwelling place.

Mortuary poles, as their name suggests, were erected in areas reserved as burial grounds, and a section in the top of the pole was hollowed out to conceal the coffin.

Heraldic poles, on the other hand, usually stood free of any buildings, displaying the crest of an ancestor. A striking example of a modern heraldic pole is the 100-foot totem presented to the Queen to mark the centenary celebrations of British Columbia, in 1958. A unique feature of this totem is that it is surmounted by the hat of a chief bearing four rings—symbolic of authority and greatness.

Made from the single log of a 600-years-old Canadian red cedar, it was carved by Chief Mungo Martin, a member of the famous Kwakiutal tribe, one of the last surviving experts on traditional carving and Indian folklore. At the present time he is in charge of a number of young Indian trainees who are working on the restoration and reproduction of totems in the open air "Thunder Bird" park set up, in 1940, in Victoria, the capital of British Columbia.

Below: The Queen Mother unveils the plaque on the totem pole erected in Windsor Great Park. Left: How the 100-foot totem pole was hoisted into position.

Transported in one piece from its home in Vancouver, the Royal Totem arrived by ship at the London Docks. There, it was transferred to an articulated lorry for the last stage of its journey to Windsor Great Park.

Situated at the top of the eastern arm of Virginia Water, this giant totem stands proudly erect at the foot of a ridge of Canadian trees planted during the first world war by the Canadian Forestry Corps, who were stationed there at the time.

TWO NEW BOOKS

"Young photographers must experiment all the time . . ." This excellent advice was given by Lord Snowdon in a recent speech, extracts of which appear in the foreword of a new illustrated booklet *Any Time is Camera Time* (Fountain Press Limited, price 2/6). Certainly, photographers in search of ideas for new things to photograph will find this booklet most helpful. Suitable subjects for each month of the year are dealt with in twelve short sections and useful "hints and tips" given to help photographers get the best possible results with any kind of camera—at any time.

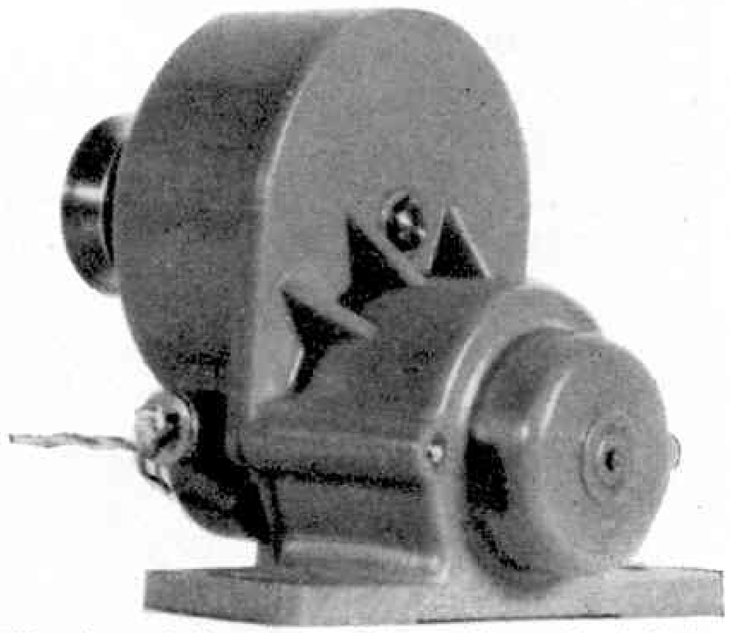
The March section dealing with Home Movies is a "must" for anyone thinking of having a try at this most fascinating branch of photography. The winter month sections, too, are well worth reading. **C.J.S.**

* * * *

All animal-lovers will relish Josephine Hunter's book *Pets* (Arco Handybook series, 12/6). There comes a time in the lives of all parents when they have to face up to the demand for a household pet of some sort. The author weighs up pros and cons and gives valuable hints on a variety of pets and how to keep them. Monkeys, rats, budgerigars, hamsters, ferrets, flying squirrels, kinkajous, mynah birds, rabbits, reptiles and tortoises are just a few of the creatures dealt with. Miss Hunter's warm affection for the entire animal world is reflected in the pages of an enchantingly-written book.

NEW MECCANO BATTERY-DRIVEN MOTOR

The Emebo—A Compact Job With Amazing Power



This view of the Emebo Motor shows the ½ inch Pulley, which can be removed and replaced by a different-sized Pulley, Meccano Gear or Sprocket Wheel.

MECCANO enthusiasts everywhere will welcome the news that a fine new Electric Motor is now appearing in the shops. Known as the Emebo, it will strengthen the existing range of Meccano Clockwork and Electric Motors and should prove of great value to the keen modeller.

The new motor has a rating of 4–12 volts D.C. and has been designed to operate from dry batteries such as Exide H30 or Ever Ready 126 or, indeed, a 6-volt accumulator. If it is operated from batteries, a variable voltage can be obtained by using a suitable battery controller which will provide speed control both forward and reverse.

Although the unit is quite small and compact it develops amazing power and is quite capable of driving models built from Outfits up to No. 6 or even larger.

Moulded in an attractive red plastic the *Emebo* Motor is fitted with a removable ½ inch pulley and grub screw and is provided with three different lengths of Driving Band. It is 2½ inches high and its overall width is 2⅜ inches.

On this page we show the *Emebo* Motor separately and (bottom picture) fitted to a Forge Crane, built from Outfit No. 6, which is illustrated in the new-style Meccano Model Book for Outfits 4/5/6.

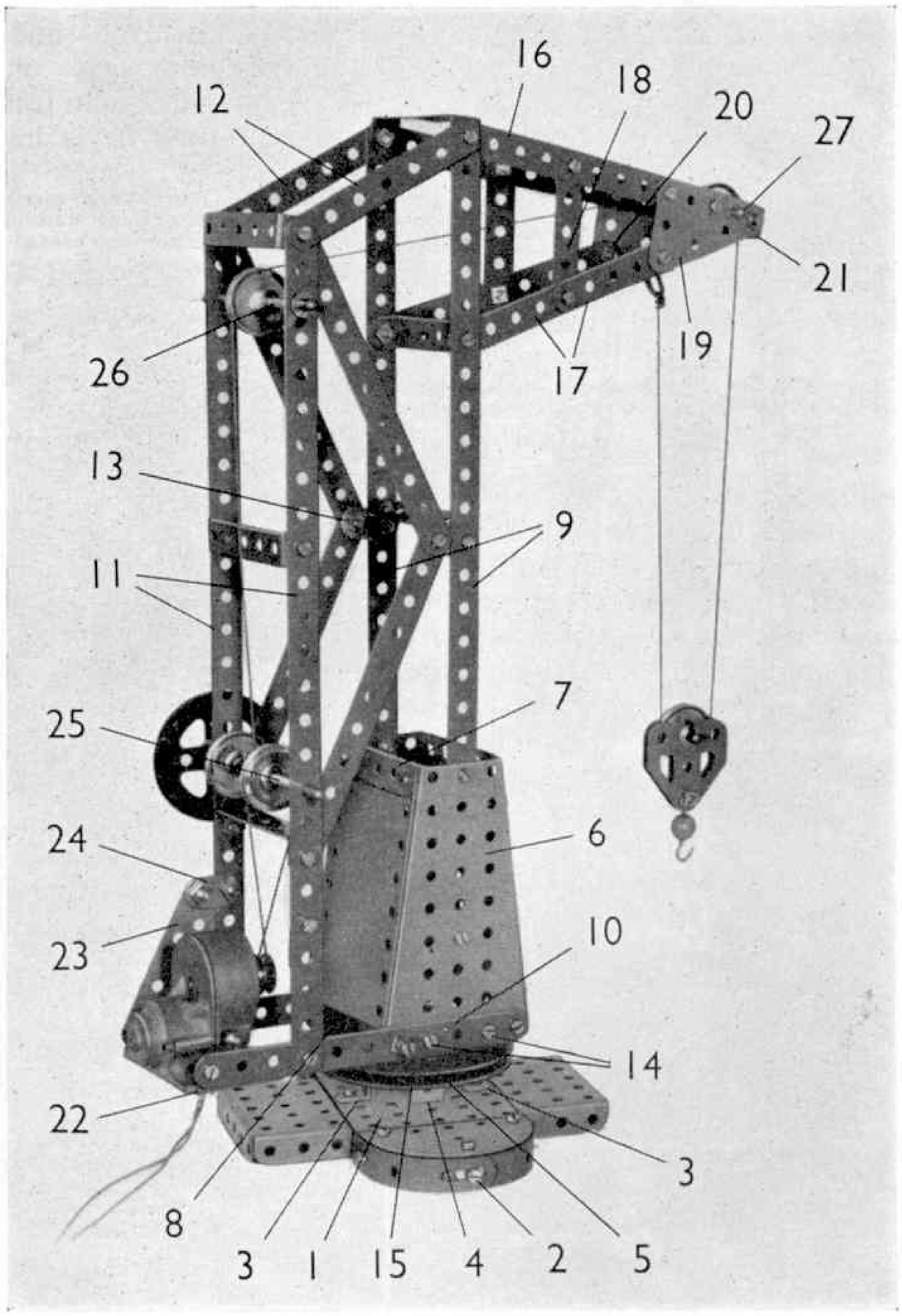
The base of the model is a 5½″ × 2½″ Flanged Plate across which a 4½″ × 2½″ Flat Plate 1 is bolted at right angles. This is extended at each end by a Semi-Circular Plate at the same time bolting in two Angle Brackets. Two Formed Slotted Strips are bolted to these Angle Brackets and to the Angle Bracket held by Bolt 2. Two Reversed Angle Brackets 3 and two Double Brackets 4 are fixed to the centre of the base and 3″ Pulley 5 is bolted to their other lugs.

By "SPANNER"

The tower is built up from two Flanged Sector Plates 6 joined by two 4½″ × 2½″ Flexible Plates edged by 2½″ Strips 7 and 8. Two 12½″ Strips 9 and two 5½″ Strips 10 are bolted to the Sector Plates, and to the Strips 10 a further two 12½″ Strips 11 are fixed. Each pair of 12½″ Strips is connected by three 2½″ × ½″ Double Angle Strips as shown and a strengthening lattice-work is given to each side by two 5½″ Strips, a 3½″ Strip 12 and a Fishplate 13. A Trunnion is fixed to each of the Sector Plates 6 by Bolts 14 and to these is bolted a further 3″ Pulley 15. The tower is connected to the base by a 2″ Rod pushed through the 3″ Pulleys and fixed by a 1″ Pulley with Boss beneath the base and a Collar in the tower.

Each side of the jib is made up from a 5½″ Strip 16, two 2½″ Strips 17, a further 2½″ Strip 18 and a 2½″ × 1½″ Triangular Flexible Plate 19. They are joined by a 1½″ × ½″ Double Angle Strip 20 and a 1″ × ½″ Double Bracket 21. The load hook is made from two Flat Trunnions with a 1″ Rod, carrying a 1″ Pulley without Boss, journalled in them, and with a small Loaded Hook bolted at their apex.

A 2½″ × 1½″ Flanged Plate 22 is bolted between Strips 10 to form a bed for the *Emebo* Motor and this is strengthened by two 2½″ × 1½″ Triangular Flexible Plates 23 joined by Fishplates 24 to Strips 11. In the illustration one has been removed to show the Motor. Two 3½″ Rods 25 and 26 are journalled in Strips 11, 25 carrying two 1″ Pulleys with Boss, and held in place by a 2″ Pulley, and 26 carrying one 1″ Pulley with Boss (*Cont. on page 327*)



SPANNER'S SPECIAL SECTION FOR JUNIORS

AN ENGINEERS' MILLING MACHINE

MANY young model-builders will be familiar with some of the many wonderful machines used by engineers for cutting and shaping metal, such as lathes, planers, and drilling machines, but there are many other varieties of machines that will perhaps not be so well known to youngsters, and one of the most important is the milling machine. There is a wide variety of these machines, some of which are highly specialised, and we have chosen a basic type as the subject for the model shown in our illustration.

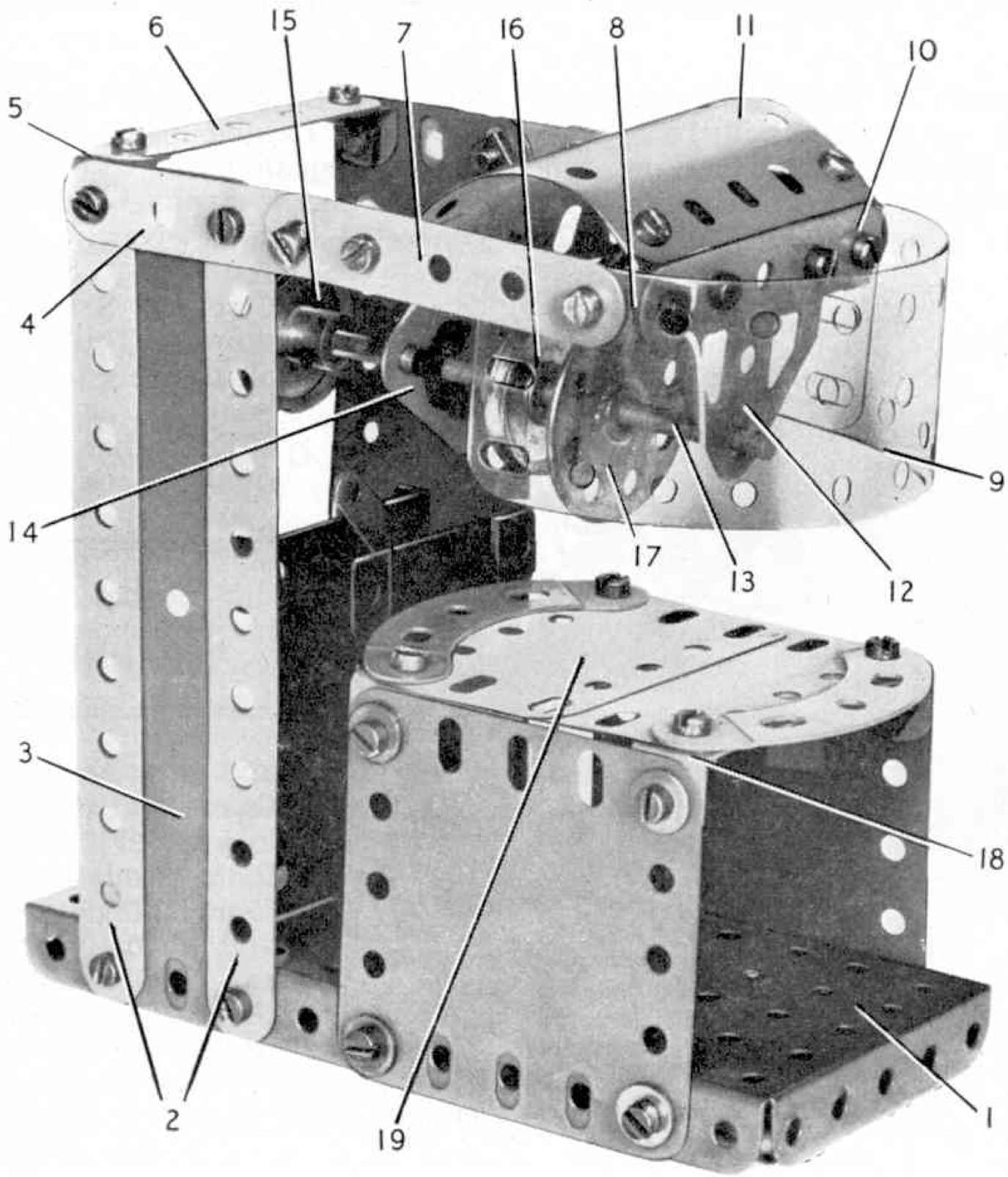
Milling is a method of giving specific shape or form to metal by cutting with relatively slowly revolving tools, known as milling cutters.

The model Milling Machine is built up on a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 1. Two $5\frac{1}{2}''$ Strips 2 and a $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate 3 are bolted to the base on both sides. They are joined at the top by a $2\frac{1}{2}''$ Strip 4, at the same time bolting in a $\frac{1}{2}''$ Angle Bracket 5. The two sides are then joined by a $2\frac{1}{2}''$ Strip 6. The Strips 4 are extended by $2\frac{1}{2}''$ Strips 7, at the same time bolting in a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Transparent Plastic Plate and an Angle Bracket 8. A $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Transparent Plastic Plate 9 is also bolted between the two sides. A $2\frac{1}{2}''$ Strip 10 is then bolted between the Angle Brackets 8 and fixed to this by Obtuse Angle Brackets is a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Curved Plate 11. A Flat Trunnion 12 is also bolted to the Strip 10 and this holds a $3\frac{1}{2}''$ Rod 13 which is also journalled through a Flat Trunnion 14, fixed to the side by Angle Brackets.

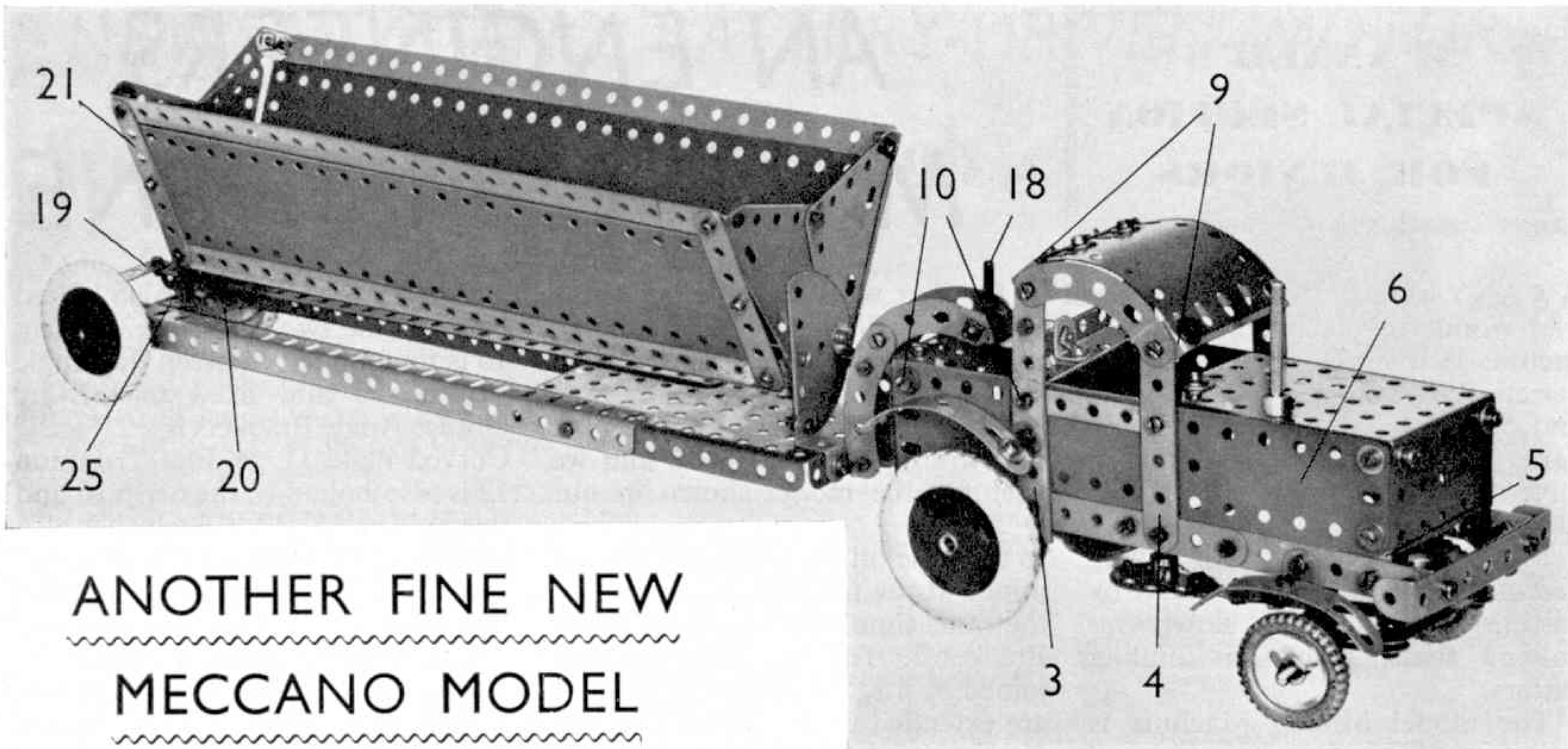
The Rod is held in place by Spring Clips and on it are fixed two 1″ Pulleys with boss 15 and 16 and an eight-holed Bush Wheel 17. A Driving Band is taken from the *Magic* Motor, which is bolted to the base by an Angle Bracket, to the Pulley 15. The drilling table is formed by bolting two $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates to the Flanged Plate 1. These are joined at the top by $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 18. To the Double Angle Strips are fixed two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates 19 and two Stepped Curved Strips.

EASY MODEL-BUILDING

Parts required: 4 of No. 2; 6 of No. 5; 7 of No. 12; 2 of No. 12c; 1 of No. 16; 2 of No. 22; 1 of No. 24; 2 of No. 35; 42 of No. 37a; 42 of No. 37b; 8 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 126a; 1 of No. 186; 2 of No. 188; 2 of No. 189; 2 of No. 190; 2 of No. 193; 2 of No. 193d; 1 of No. 200; 1 *Magic* Motor.



On the left is seen the completed model of an Engineers' Milling Machine described on this page. It is driven by a Meccano *Magic* Motor.



ANOTHER FINE NEW

MECCANO MODEL

A 26-Ton Side Dumper

THIS model of a large capacity Side Dumper consists of two units, a tractor and a dumper trailer. The tractor is built as follows: two $5\frac{1}{2}''$ Strips 1 are bolted together to form an 8″ compound strip and to this is bolted a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 2, at the same time bolting in place a compound 4″ strip 3, made up from two $2\frac{1}{2}''$ Strips, a 3″ Strip 4 and a Fishplate 5. A $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate 6 is bolted to the Fishplate 5 and to both the Strips 3 and 4. Strips 3 and 4 are connected by a $2\frac{1}{2}''$ Narrow Strip and a $2\frac{1}{2}''$ Stepped Curved Strip as shown. This completes one side of the body.

The other side is similarly constructed

By "SPANNER"

and they are joined together at the front by a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate and a $2\frac{1}{2}''$ Double Angle Strip 7, and at the rear by two $2\frac{1}{2}''$ Double Angle Strips 8 to which a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate is bolted. They are also joined by two $2\frac{1}{2}''$ Double Angle Strips 9, and the cab roof is a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Curved Plate

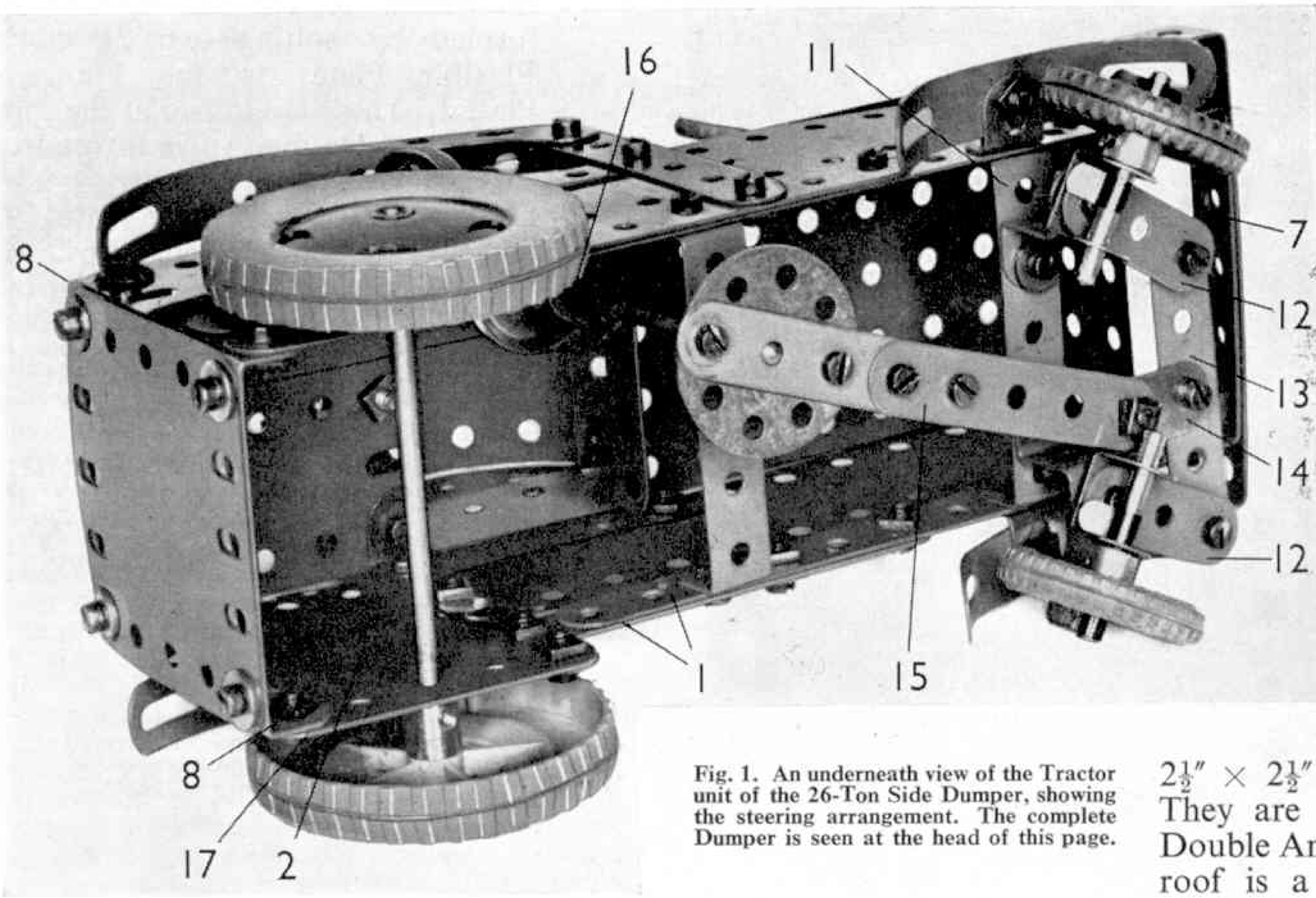


Fig. 1. An underneath view of the Tractor unit of the 26-Ton Side Dumper, showing the steering arrangement. The complete Dumper is seen at the head of this page.

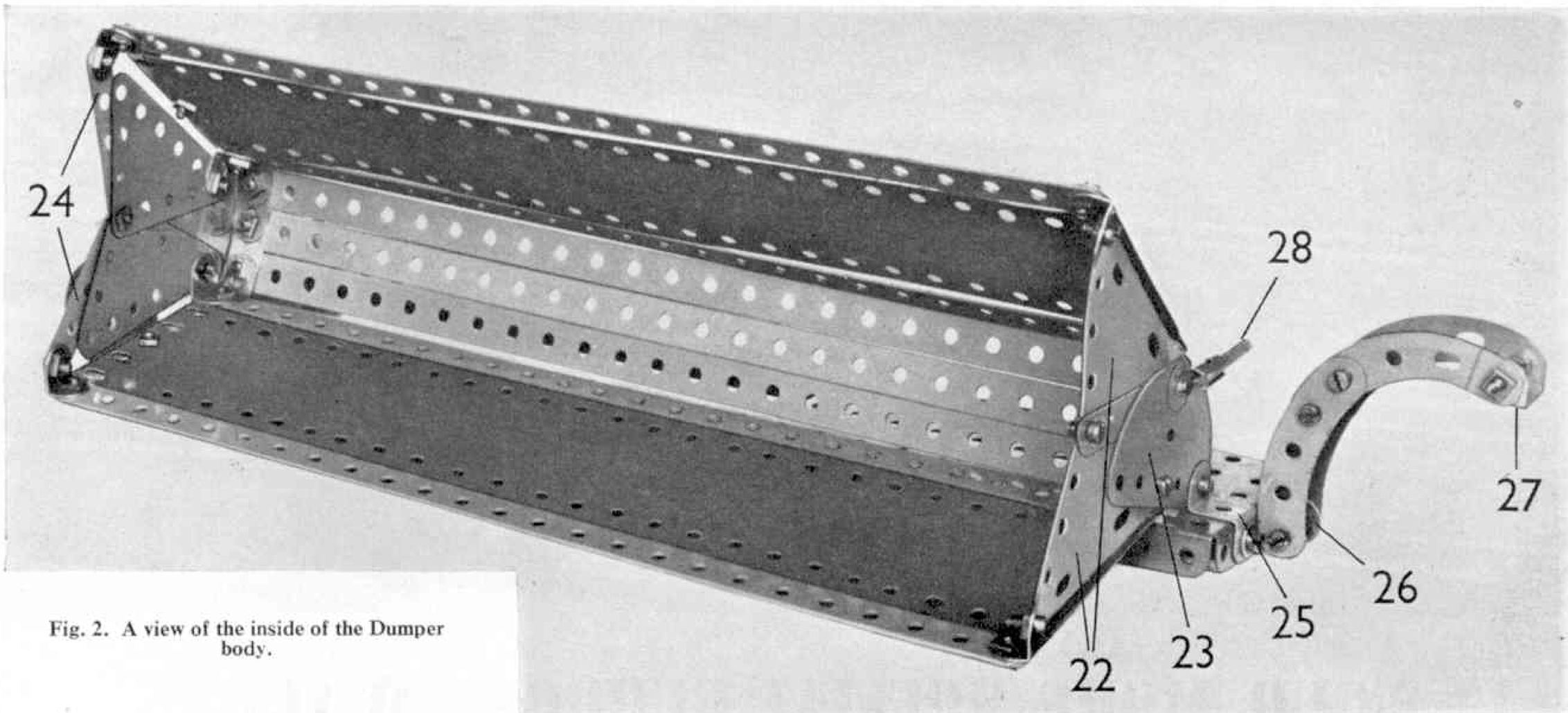


Fig. 2. A view of the inside of the Dumper body.

joined to the rear Double Angle Strip by two Obtuse Angle Brackets.

The top of the bonnet is a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, and the top of the boot is made up from two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates fixed in place by Angle Brackets held by bolts 10 and the corresponding bolts on the opposite side. The lower sill of the cab's rear window is a $2\frac{1}{2}''$ Narrow Strip fixed to an Angle Bracket bolted to the $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates.

The front axles are two $1\frac{1}{2}''$ Rods journalled in Double Brackets each lock-nutted to a Reversed Angle Bracket bolted to a Double Angle Strip 11 joining the sides of the tractor. Two $1\frac{1}{2}''$ Strips 12 are also bolted to the Double Bracket and to these is lock-nutted a $2\frac{1}{2}''$ Strip 13. A Fishplate 14 is fixed to Strip 13, and through its elongated hole a compound 4″ strip 15, consisting of two $2\frac{1}{2}''$ Strips overlapped, is lock-nutted. The axles are held in place by Spring Clips and each of the front wheels is a 1″ Pulley with tyre.

The other end of strip 15 is bolted to an 8-hole Bush Wheel fixed on a $3\frac{1}{2}''$ Rod, which passes through a $2\frac{1}{2}''$ Double Angle Strip and a Fishplate 16 bolted to the Flanged Plate forming the top of the bonnet, to form the steering column. The steering wheel is a 1″ Pulley with Boss.

The rear wheel assembly consists of two $2\frac{1}{2}''$ Road Wheels fixed on a $3\frac{1}{2}''$ Rod journalled in the Plates 2 and the $2\frac{1}{2}''$ Strips 17 that edge Plates 2. Each mud-guard is a $2\frac{1}{2}''$ Formed Slotted Strip fixed to the body by an Angle Bracket, as shown in the illustrations. The towing hook for the trailer is a Long Threaded Pin 18, and the exhaust pipe is represented by a 2″ Rod held in the bonnet by Collars. The bumper is a $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip bolted to Double Angle Strip 7.

THE DUMPER TRAILER

The chassis of the trailer consists of two $12\frac{1}{2}''$ Angle Girders extended at the front by a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate. They are connected at the rear by a $2\frac{1}{2}''$ Strip 19 and a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 20.

Each side of the dumper is built up from two $12\frac{1}{2}''$ Strips and two $3\frac{1}{2}''$ Strips 21, the resulting frame being filled by a $12\frac{1}{2}'' \times 2\frac{1}{2}''$ Strip Plate. The sides are joined at the front by two $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Triangular Flexible Plates 22 and a Semi-Circular Plate 23, Angle Brackets being used at each corner. They are joined at the rear by two $2\frac{1}{2}''$ Strips 24, two $2\frac{1}{2}'' \times 2''$ Triangular Flexible Plates and a Semi-Circular Plate. The bottom is filled in by three $12\frac{1}{2}''$ Strips connected to the sides by two Fishplates and two Angle Brackets at each end.

The tipping action is obtained by pivoting the dumper on lock-nutted bolts, passed through the end holes of the Semi-Circular Plates, to Reversed Angle Brackets 25, bolted as shown.

Finally, the connecting arm between the tractor and the trailer is built up from two $2\frac{1}{2}''$ Stepped Curved Strips and two $2\frac{1}{2}''$ Curved Strips arranged as shown and joined by Double Brackets 26 and 27. Bracket 26 is bolted to the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate and Bracket 27 is fitted on to Threaded Pin 18. The wheels are two $2\frac{1}{2}''$ Road Wheels on a $3\frac{1}{2}''$ Rod. The dumper is held upright by a 1″ Rod 28 fixed in a Rod and Strip Connector bolted to the Semi-Circular Plate.

Parts required to build the 26-Ton Side Dumper: 7 of No. 1; 4 of No. 2; 4 of No. 3; 2 of No. 4; 12 of No. 5; 2 of No. 6a; 2 of No. 8; 8 of No. 10; 4 of No. 11; 17 of No. 12; 6 of No. 12c; 3 of No. 16; 1 of No. 17; 2 of No. 18a; 1 of No. 18b; 3 of No. 22; 1 of No. 24; 4 of No. 35; 131 of No. 37a; 119 of No. 37b; 25 of No. 38; 8 of No. 48a; 1 of No. 48b; 1 of No. 51; 1 of No. 52; 1 of No. 53; 2 of No. 59; 2 of No. 90; 4 of No. 90a; 4 of No. 111c; 1 of No. 115a; 4 of No. 125; 2 of No. 142c; 4 of No. 187; 2 of No. 188; 2 of No. 189; 3 of No. 190; 2 of No. 193; 2 of No. 197; 1 of No. 200; 1 of No. 212; 2 of No. 214; 4 of No. 215; 2 of No. 222; 2 of No. 223; 3 of No. 235.

New Meccano Battery Driven Motor—

(*Continued from page 324*)

and held in place by Spring Clips. The hoisting cord is wrapped around Rod 25, passes over the Pulley on Rod 26, over a 1″ Pulley without Boss on a $1\frac{1}{2}''$ Rod 27 in the jib, around the 1″ Pulley in the load hook and is tied to an Angle Bracket bolted to Double Angle Strip 20. The Rod 27 is held by Spring Clips. Power is transferred to Rod 25 by a driving cord from the Pulley on the Motor to one of the Pulleys on Rod 25.

Air News—(*Continued from page 313*)

pylons for underwing loads.

As an attack fighter, the Crusader would carry bomb loads ranging from two 2,000-pounders to twelve 250-pounders, two Bullpup guided missiles or 24 Zuni air-to-ground rockets in two clusters of three four-rocket tanks. It would retain its normal armament of four 20 mm. cannon and either four Sidewinder missiles or eight Zunis on the fuselage pylons.

FOUR MORE SPECIAL-PURPOSE WAGONS

Adding Variety To Your Layout

WE have four new Hornby-Dublo Wagons to talk about this month and although these are of quite diverse character, thus adding to the variety you can bring to your layout, all represent special-purpose types likely to be found composing complete trains. Many such trains operate in a regular manner, carrying their loads, often daily, from one point to another, and as a rule returning empty in the opposite direction.

In New Form

I know that owing to space restrictions many of you would not be able to accommodate complete trains of any one kind of wagon on your layouts, but there is no reason why you should not use single examples of any of the new Wagons in a suitable way on your own railways. Let us see what these Wagons are like; how they can be used in Hornby-Dublo will be dealt with in a later talk.

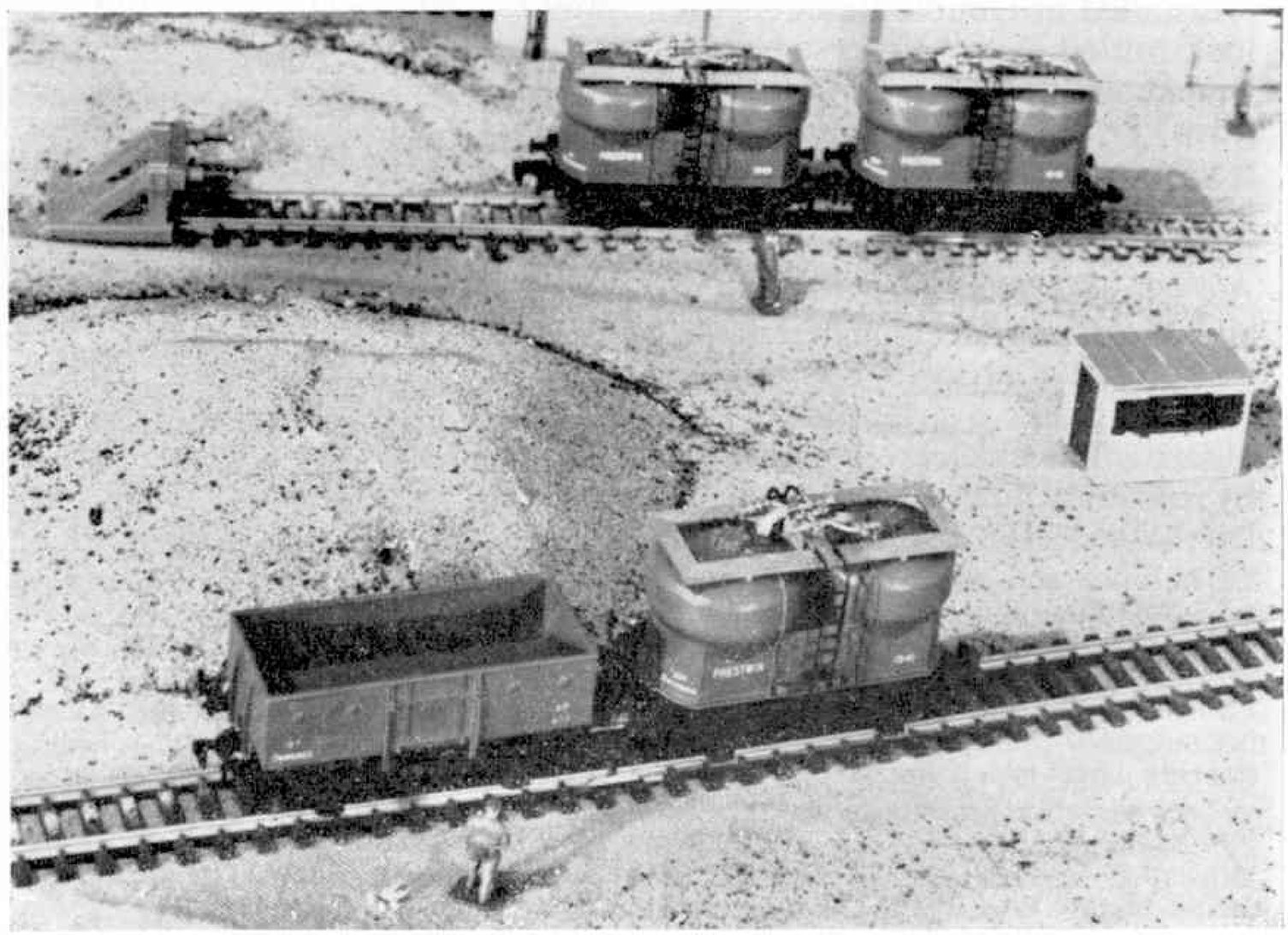
Taking the Wagons in the order of their catalogue numbers, we begin with No. 4656 16-ton Mineral Wagon. With its bodywork finished in bauxite brown, this makes a welcome variation of a wagon type already well-known in the Hornby-Dublo system, the No. 4655 Mineral Wagon finished in grey. In this new form it represents one of the many 16-ton mineral wagons, in service on British Railways, that have been fitted for power braking.

An interesting detail is the appearance on the Mineral Wagon, in its new finish, of a different number from that used on the grey one. The usual diagonal stripe, which in real practice denotes an end-door vehicle, and the sort of "V"-sign that similarly indicates one with bottom doors, appear on each side. This vehicle in Hornby-Dublo should certainly give a boost to the coal and mineral traffic handled on many layouts.

HORNBY RAILWAY COMPANY

By The Secretary

The No. 4657 United Dairies Milk



In the picture at the top of the page, a fast journey is assured for the No. 4657 United Dairies Milk Tank Wagon by its attachment to a Hornby-Dublo express passenger train. Right: The special features, including much characteristic "on-top" detail, of the new No. 4658 "Prestwin" Silo Wagon are well illustrated here.

Tank Wagon is the first vehicle to cater for milk traffic in Hornby-Dublo and is also the first piece of freight rolling stock in the range to run on six wheels. From this you will realise that the new model represents an up-to-date tank wagon of large capacity, as used for the transport by rail of milk in bulk.

The tank itself is a neat moulding, clean in outline, with domed ends, with the barrel of the tank carrying four strengthening bands or strips. Centrally on top is the filler cap, which can be reached by means of ladders on each side. There are two vents on the tank top, and at the bottom of each end is a representation of the fittings used for discharging purposes and for the steam cleaning processes that all milk tanks have to undergo after they have been emptied. The tank is well braced by the usual end-frames and diagonals and is well supported on a series of cross-members built up from the underframe.

A Wealth of Detail

The base of this new Hornby-Dublo introduction is die-cast, with extremely accurate detail in the solebars and axle guards. The long springs characteristic of this type of vehicle, with their "J" hangers and the axleboxes below them are particularly well represented. The wheels are of the familiar nylon disc type running in axle brackets and those of the end pairs of wheels incorporate representations of clasp-type brake blocks, for the real tank wagons are fitted with vacuum brakes and can be run in the fastest freight, or even express passenger train, formations. The base includes a representation of the vacuum cylinder and at the right hand corner of each side the short lever for hand application of the brake is modelled.

With the development in recent times of various special vehicles for particular kinds of traffic by rail and road, some novel shapes have been imparted to the rolling stock concerned. An interesting example is represented by the Hornby-Dublo No. 4658 *Prestwin* Silo Wagon, which follows closely the lines of an extremely interesting type of wagon developed specially for the conveyance in bulk of amorphous or powdery substances such as sand, and various chemicals used in industrial and other processes.

The actual *Prestwin* consists of two more or less cone-shaped containers or silos, mounted on a supporting structure built up on a wagon underframe.

The shape of the lower part of each silo is conical in order to encourage discharge of the load when this is required, but to help matters in this direction there are also arrangements for the application of air pressure to make the operation certain and speedy. Pressurised vehicles of various kinds are in use on our railways nowadays and the Hornby-Dublo Bulk Salt and Bulk Cement Wagons already represent two of these types.

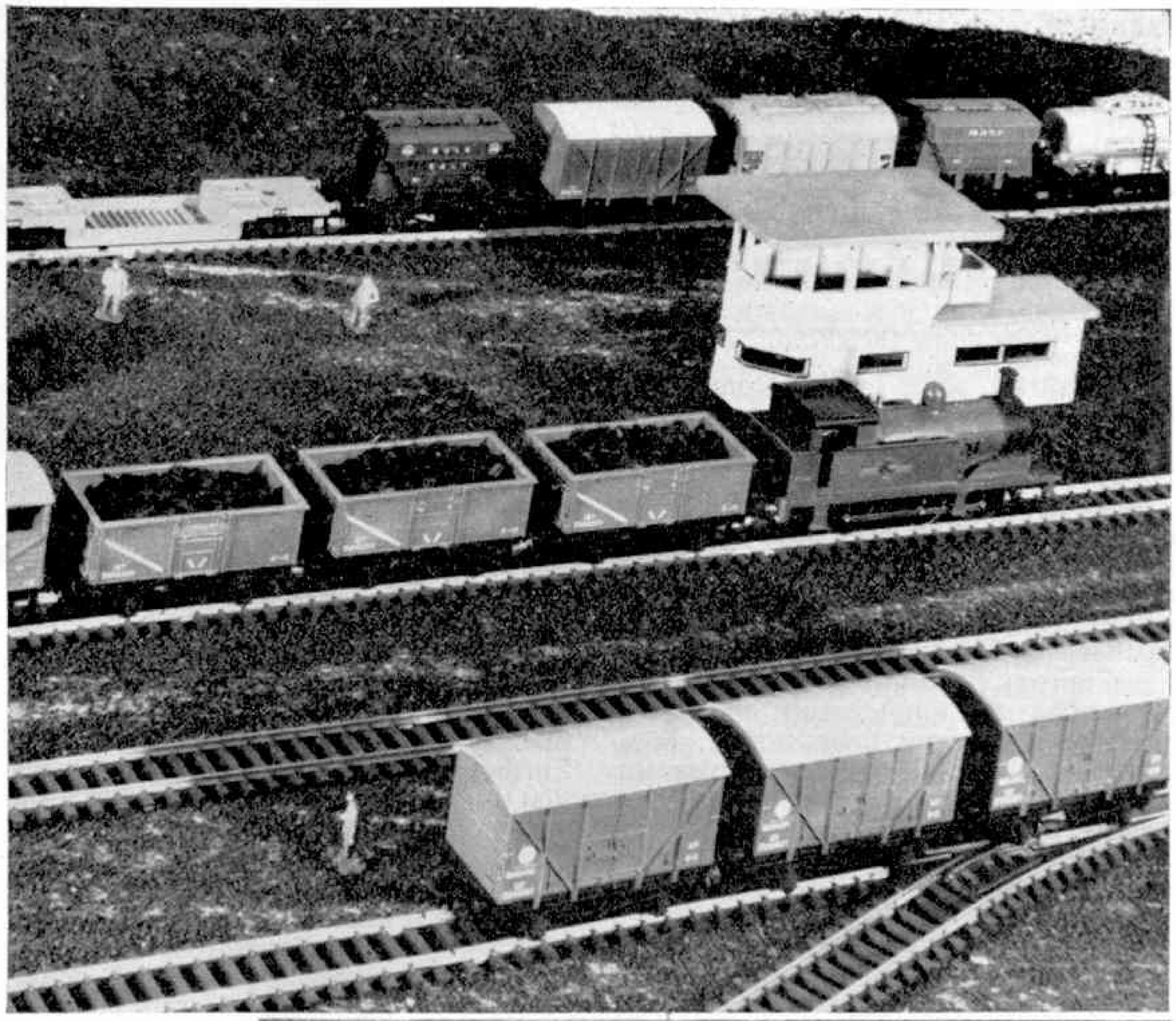
The moulded bodywork of the Hornby-Dublo Silo Wagon is extremely attractive and well detailed. Apart from the "on-top" features already mentioned, the pipes, unions, control valves and gauges relating to the pressure-discharge system are modelled, and the vehicle as a whole shares the unusual character of the prototype. The die-cast base is complete with dummy-brake gear of the "cut-out" variety, a cylinder and representations of the axle-boxes and springs.

The livery follows the usual B.R. standards for vacuum brake-fitted stock, bodywork being coloured in bauxite with white lettering, including the code name *Prestwin*. The catwalk is moulded to represent the chequered plating often used for such parts. Together with the pipes and their associated details this is finished in aluminium.

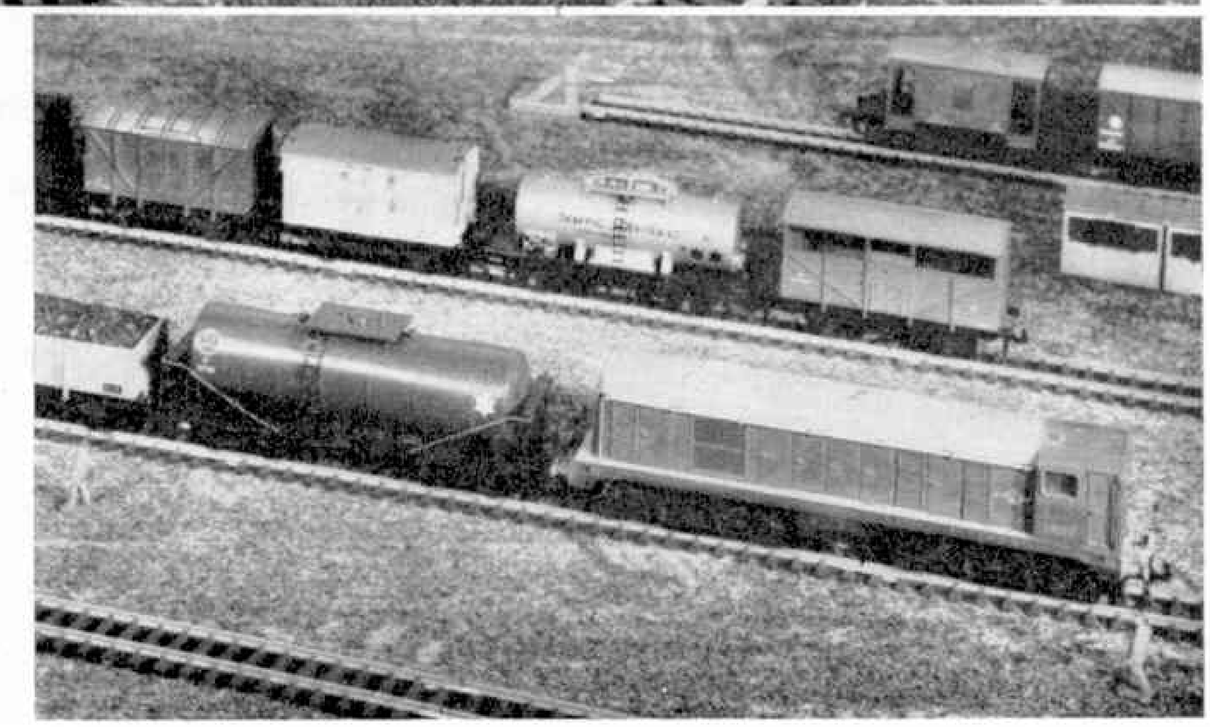
The No. 4685 Caustic Liquor Tank Wagon strikes a new note in Hornby-Dublo freight rolling stock, being the first tank wagon in Hornby-Dublo to be mounted on bogies. It represents a high-capacity vehicle operated in all parts of British Railways by the I.C.I. organisation for the transport of caustic soda liquor as used in many industrial chemical processes. The tank itself is an attractive moulding, with the clean, smooth lines characteristic of modern tank construction. On top of the tank is the usual small landing or deck surrounding the filler.

Access to the landing is by means of ladders reaching up on each side from the underframe. The latter, a one-piece die-casting of remarkable accuracy, reproduces extremely well the open-work character of the real thing, there being no "floor", as such, and it really is fascinating to be able to see through the underframe to

(*Continued on page 340*)



Several No. 4656 Mineral Wagons in brown livery are included in the freight train in the centre of the picture above. The wagons are loaded with No. 791 Imitation Coal.



This Bo-Bo Diesel is ready to move off with a train including a No. 4685 Caustic Liquor Bogie Wagon. Interesting notes on this new vehicle appear in this article.

M.M. READERS AND THEIR RAILWAYS

I HAVE some good pictures for you this month, and of these two are of special interest because they show not only Hornby-Dublo layouts, but their enthusiastic owners as well. As I have said before, it is always nice to know what our correspondents look like, so perhaps those of you who are thinking of getting some photographs taken of your railways, to send to me, will try to include one showing yourselves in charge of operations.

MONTHLY FEATURE BY LAYOUT MAN

Philip (left) and Michael Mothershaw, of Cheadle, busy with their Hornby-Dublo layout described on this page. Both Three-Rail and Two-Rail circuits are laid down on the one layout board. Each is independent, but both form part of the complete railway.

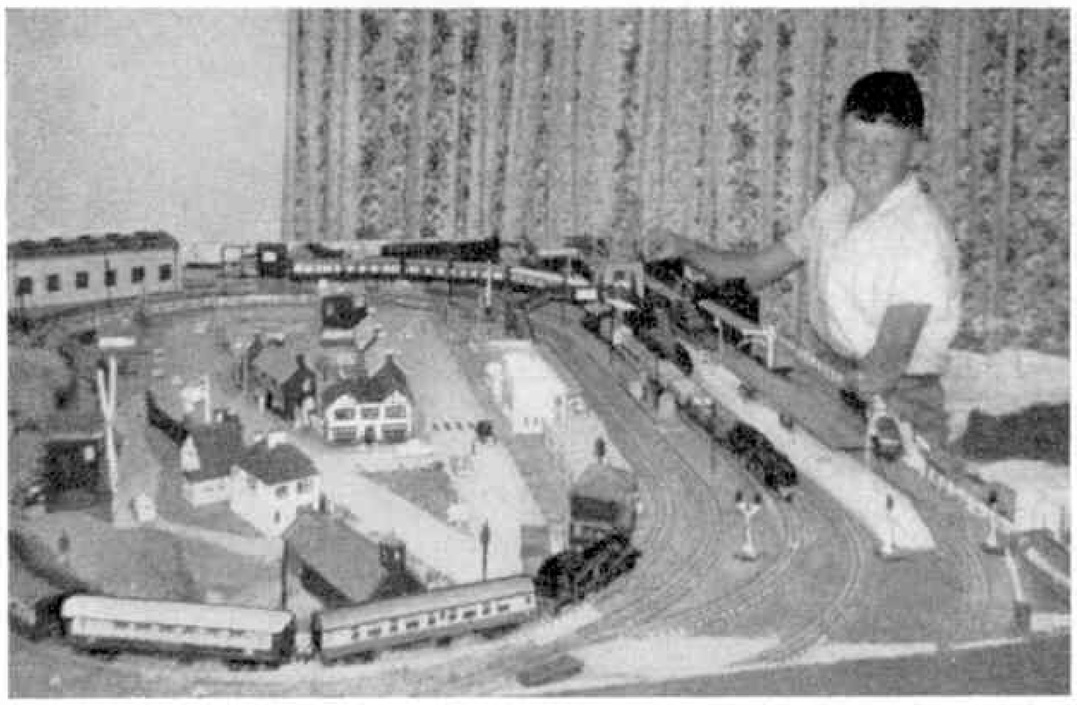
By contrast, some time ago one of our Hornby-Dublo friends sent in a picture of himself, but not of his railway, so perhaps if he reads this he may decide to do something about it!

It seems clear that the youthful miniature railwaymen and *M.M.* readers who appear in some of the layout pictures I see spend many of their happiest hours in running their railways. This certainly is the case with the two enthusiasts in the picture here, who are Philip and Michael Mothershaw, of Cheadle, Cheshire. I know that their railway is quite a household institution, and in forwarding the photograph and some notes on the layout their mother, Mrs. Hilda Mothershaw, expresses pleasant surprise at the scope provided even by a small layout for keen miniature railway owners to develop their own ideas and to use their minds and hands in so many different ways.

It can be well understood that the question "*What Shall We Do?*" is one that is never heard from these boys. Furthermore, our correspondent remarks that the railway very often keeps grown-up visitors quiet, too!

It is clear there has been a good deal of parental co-operation in the development of the line, for the track is mounted on the back of a disused wardrobe laid face downwards on the floor, a much better job for this piece of furniture than its former one of holding "clothes and moth-balls", so the Mothershaws think. In this way, the reasonably generous space of six feet by four feet six inches is available for track development. The fullest advantage is taken of this as, although the railway is a permanent affair, the track layout is changed from time to time and lineside arrangements are modified to suit, for Philip and Michael are constantly making fresh tracks and forming lineside hills and other features. Good use is made of lichen, miniature trees and so on, while an old mirror has been pressed into use—with suitable surroundings added of course—to represent a boating lake.

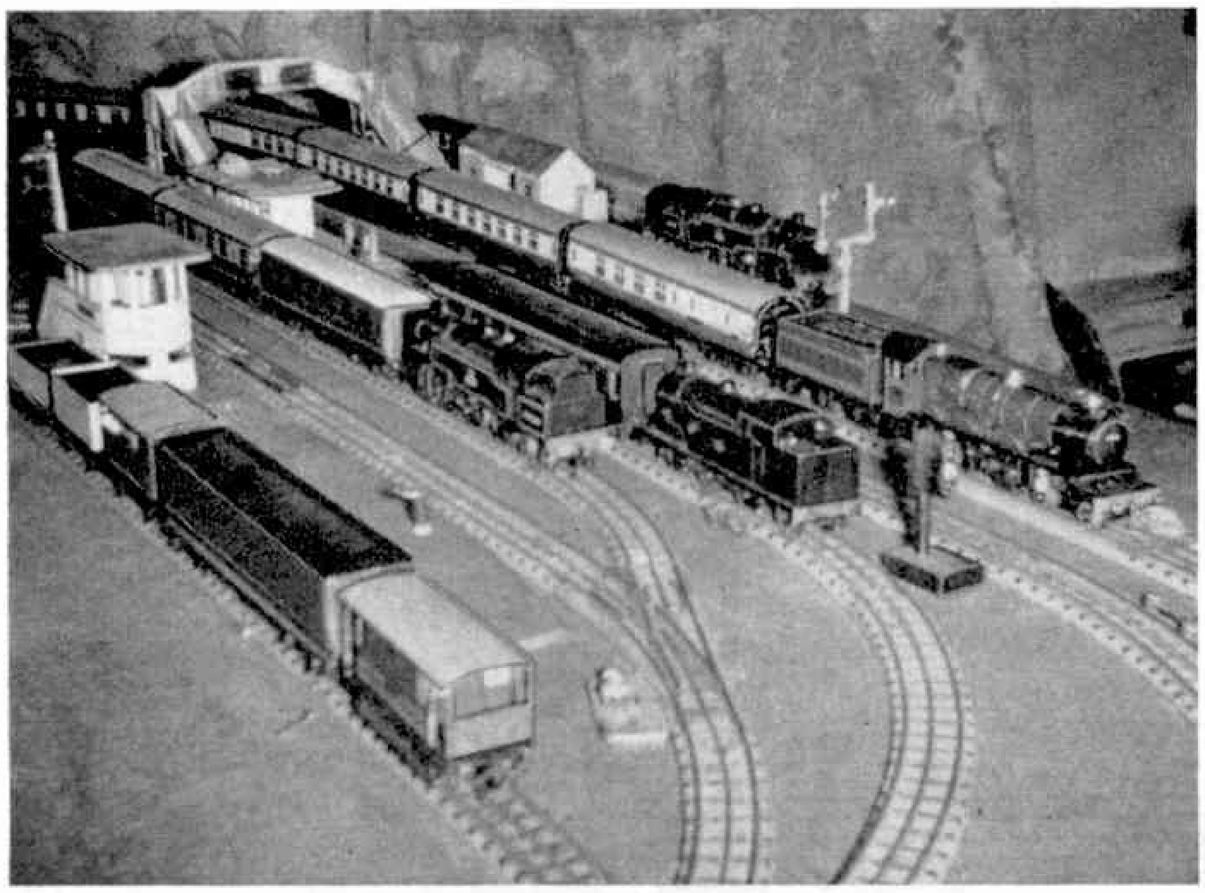
A point of special interest is that the railway really consists of two separate layouts, one Three-Rail and the other Two-Rail. The two systems run side by side as it were but, of course, are not joined together. A varied selection of locomotives and rolling stock provides for the rail traffic, while good use is made of Dublo Dinky Toys and other suitable vehicles, such as the Double Deck Bus, on the neat road system that is an essential feature of the layout as a whole.



Brian Colbert, of Southern Rhodesia, having a happy time with his Hornby-Dublo Three-Rail layout. Since the photograph was taken a road overbridge has been added in place of the crossing in the foreground.

* * * *

Our next picture has come from Southern Rhodesia, and in it Brian Colbert, of Salisbury, is operating a fine



Here is part of the railway of Arthur Bassett, of Leicester, on which a fine variety of trains and motive power is on show.

Three-Rail system laid out on a baseboard six feet six inches by four feet six inches. Actually the illustration shows the railway as it was before a recent removal, but the basic scheme of the system is still much the same.

The general style of the railway will be evident from the illustration and the system is well laid out for continuous running. A well-developed station is the centre of operations, there being four running tracks between the platform faces. Non-stop trains use the two centre tracks, while those requiring to call at the station use the outer ones alongside the platforms. One platform is an island, the outer face of which is served by a track leading on to a dead-end siding and goods depot. There are several other siding tracks in this part of the system, including an additional one put in since the installation of the layout in its new home. The whole forms a very effective yard for marshalling purposes. At one end of the layout is an engine shed served by a track branching off from the outer end of the line.

On the opposite side of the layout from the station is a tunnel, and hereabouts the scenic side of the system has been considerably developed. Not only scenery, but lineside buildings and other features, are in evidence and the general effect is most pleasing. Passenger and freight traffic are provided for by numerous Hornby-Dublo vehicles of all kinds, and particular importance is attached to T.P.O. operation. The stock in use includes many of the latest Corridor Coaches in the Hornby-Dublo range and there is a considerable number of freight Wagons and Vans to which additions are frequently made.

Traffic is worked by four locomotives, long-distance trains being generally taken by the original engine with which the system was begun some four years ago. This is the 4–6–2 *Sir Nigel Gresley*, the present-day counterpart of which is familiar to you all as *Mallard*. Two 2–6–4 Tank Locomotives and a Bo–Bo Diesel make a competent trio for working heavy local passenger or freight traffic as required.

Convenience in operation has been studied and of the eleven Points included in the system, five are Electrically-Operated. Similarly, while some Signals are operated by hand, others of the Colour Light type are remotely controlled.

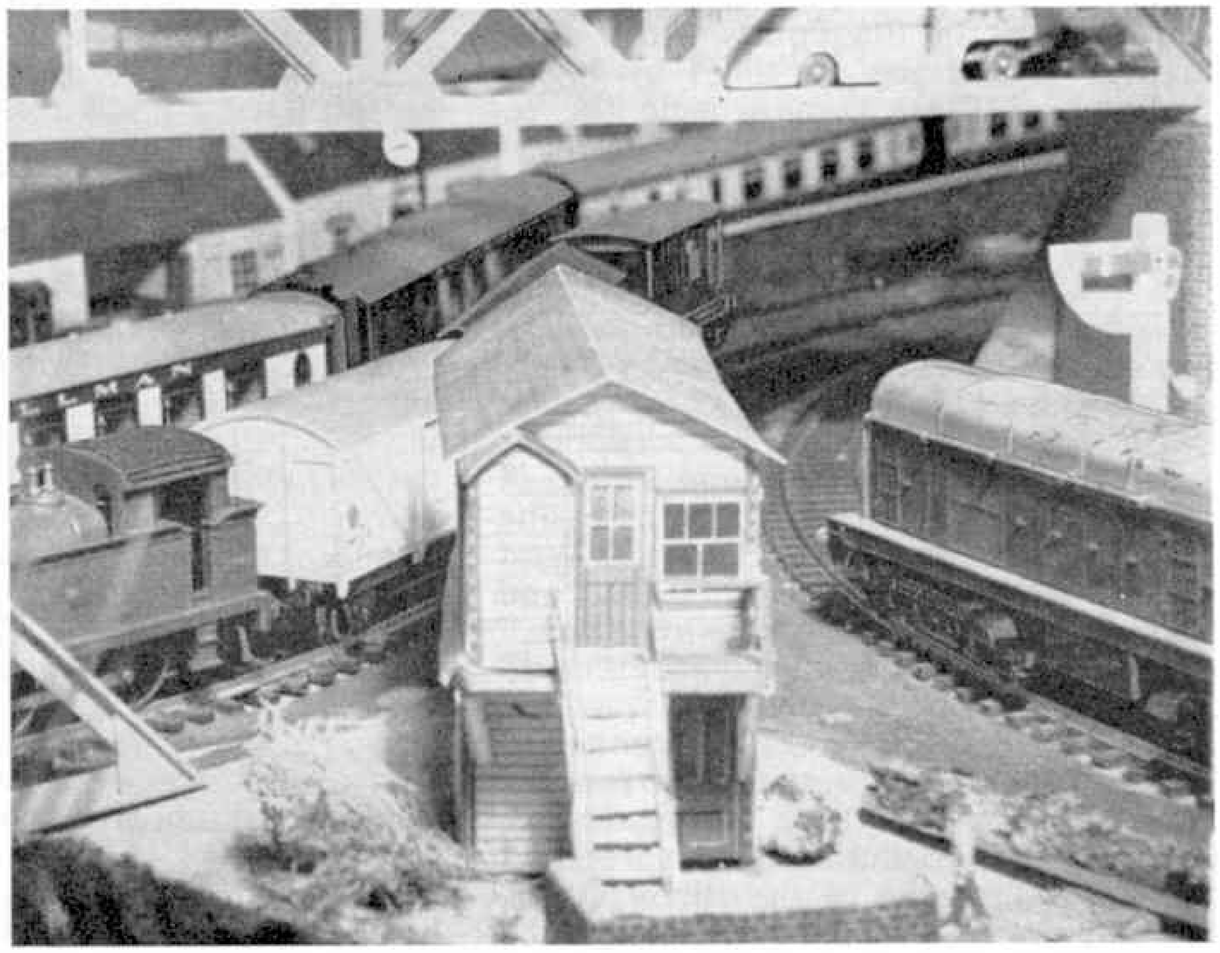
DOUBLE TRACK TWO-RAIL SCHEME

IN our monthly series of Two-Rail track formations we have now reached the stage of advancement to double track. The layout shown in the diagram overleaf is designed for the simultaneous operation of two trains, each on its own separate track, and to accomplish this the use of two power control units or their equivalent is necessary. The layout includes several sidings so that shunting operations can be performed, and it will fit on a baseboard measuring six feet six inches by three feet nine inches.

By LINESMAN

With a double track the "rule of the road" can be adhered to in that trains on the outer track run clockwise, while those on the inner track travel anti-clockwise. Two sets of Points forming crossovers allow trains to pass from one track to the other, but when this operation is carried out the receiving track must be clear of another train, and the knob or handle of the relative controller pre-set to approximately the same speed position as that of the first one. Any attempt to superimpose a second train on a track already occupied will lead to a temporary interruption of traffic, and further movement may not be possible until the situation has been righted.

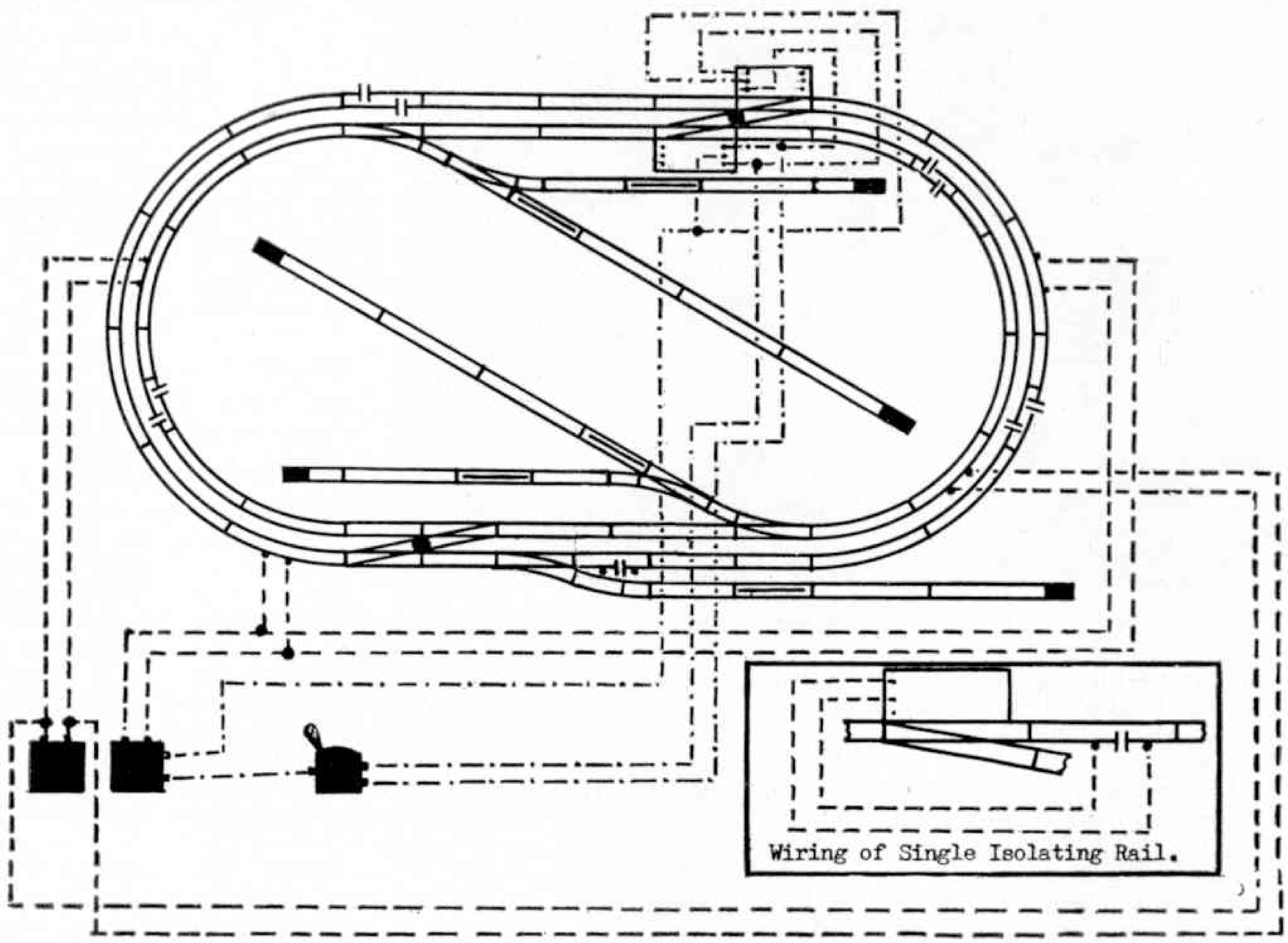
The two sets of Points forming the Crossover on the upper stretch of track are Electrically-Operated, as they are not within easy reach of the operator. Both are connected to one No. 1614 Switch as



A busy spot on the Two-Rail layout of S. F. Page, with Pullman and freight trains running on adjacent tracks during the press of summer traffic.

ITEMS REQUIRED

8 Curved Rails .. 2710
9 Curved Rails Large Radius 2719
2 Curved Terminal Rails with Suppressor .. 2714
2 Curved Terminal Rails with Suppressor, Large Radius .. 2721
3 Curved Half Rails.. 2711
5 Curved Quarter Rails 2712
2 Curved Double Isolating Half Rails 2740
1 Curved Half Rail, Large Radius .. 2722
1 Curved Double Isolating Half Rail, Large Radius .. 2743
16 Straight Rails .. 2701
2 Straight One-Third Rails 2703
1 Straight Single Isolating Two-Thirds Rail 2738
9 Straight Two-Thirds Rails 2702
1 Straight Double Isolating Two-Thirds Rail 2739
5 Uncoupling Rails .. 2745
3 Right Hand Switch Points 2728
4 Left Hand Switch Points 2729
2 Left Hand Points Electrically-Operated 2732
1 Switch 1614
5 Buffer Stops .. 2450
2 Power Control Units



you will see on referring to the diagram, on which the wiring has been indicated. As a matter of fact, all the Points can be Electrically-Operated if desired, each of those serving the sidings then having its own No. 1614 Switch. The Uncoupling Rails, likewise, can be of the Electrically-Operated kind controlled by their press-button Switches.

In order to make this layout operate satisfactorily it will be necessary to remove carefully the metal Fishplates from the curved arms of the Points which form crossovers and replace them by Nylon Fishplates. These then provide the required insulating gaps between the Points connecting the two main tracks. The exact positions for these Fishplates are indicated by black dots on the diagram shown above.

Those owners who have had their Points for some length of time can obtain Nylon Fishplates from their Meccano Dealer, or direct from this office. They are now being packed with all Points in current production, however. The price of these items separately is 1d. each, plus postage. A minimum of two is needed where two Points adjoin, four in all being required on this particular layout.

The Single Isolating Rail on the lower track is wired through the Points serving the lower siding. A train can be held in the isolating section formed between this and the Curved Half Double Isolating Rail to the right of it, while another train draws out of the siding and moves along the main line clear of the Points and then reverses over the crossover in order to gain the inner track. After the Points have been reset the train can proceed, the action of so doing having energised the isolating section again. The wiring for the Single Isolating Rail is shown beneath the diagram of the layout.

NEW BOOKS ABOUT RAILWAYS

Railway Race to the North by O. S. Nock, B.Sc. (Ian Allan, price 6/–), is a paperback reproduction at a popular price of a previous fully-bound edition of the same work. It recalls the increasing competition between East Coast and West Coast Routes between London and Scotland that led to the railway "races," first to Edinburgh in 1888, and then to Aberdeen, in 1895.

Policies and personalities connected with the respective routes, the running records achieved and the various classes of locomotive involved are dealt with in a fascinating account of the stirring days, and nights, of "the Eighty-Eight" and the "the Ninety-Five". An appendix covers an examination of L.N.W.R. engine working in the 1895 contest, and gives details of the special traffic circulars issued in connection with the same "race" by the respective Superintendents of the Line of the Great Northern and the North Eastern Railways.

Production and illustrations, many of the latter from original photographs, are first-class and many enthusiasts, particularly the younger ones, will welcome this simplified edition at a very reasonable price.

* * * *

British Railways Today and Tomorrow by G. Freeman Allen (Ian Allan, price 30/–) now reaches its third edition, which has become necessary within a comparatively small space of time owing to the rapid changes that have been taking place on our railways since the previous editions of 1959 and 1960. The book covers a wide field. It considers generally our railways as they are today and as they may be in the future, the various types of motive power and the running of passenger and freight trains. The control system, motive power organisation, signalling and track maintenance are also dealt with.

The book is well illustrated, has a useful index, and can be recommended to those who wish to be as up-to-date as possible in their railway knowledge. A striking frontispiece in colour shows a Type 5 Deltic diesel.

WITH THE SECRETARY

Club and Branch News

CLUB NOTES

NORTH END (PORTSMOUTH) M.C.—The Summer Fair organised by the Club and its associated H.R.C. Branch, and opened last month, will continue until September 30. The Fair is open on Monday, Tuesday and Wednesday evenings from seven until ten, and the prices of admission are: Adults, 6d. Children, 3d; *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

SHEBBEAR COLLEGE (BEAWORTHY) M.C.—A new boy, G. M. Thorne, has been enrolled. Two Meccano models under construction by respective groups of members are a tipping lorry fitted with reversing gear and two-speed gear-box and driven by a motor, and a tractor. *Secretary:* M. R. J. Kent, Shebbear College, Beaworthy, N. Devon.

AUSTRALIA

MAYLANDS M.C.—The new Clubroom has been completed, and during the school holidays the Leader and members who have not been away have been busy moving in Club furniture, the library and the substantial stock of Meccano Parts, etc. A party to which boys who have been members of the Club during the past year were invited was held in the new Clubroom. Each member brought a plate of "eats" and some of the mothers were there to prepare the meal, after which games, including table tennis, were played.

Another school activity was a cycle run to National Park. The six boys who went on this outing took with them cut lunches from home, and at lunch time the Leader boiled a billy of Milo for drinks. Every boy enjoyed himself, and all are looking forward to the next outing. *Secretary:* Trevor Criddle, 17 Kenilworth Street, Maylands, Western Australia.

NEW ZEALAND

ST. JOHN'S (ROSLYN) M.C.—C. Benfield has rejoined the Club. At one meeting the Secretary, M. J. Salinger, gave a talk on *Gear-boxes and Clutches*. During a recent model-building evening members were set the task of constructing a model from the Club's Meccano Outfit for a forthcoming Exhibition. A new library system has been introduced. A "tea and film" evening was greatly enjoyed. It began with a film about a native who wanted to become a farmer and achieved his ambition, and after tea members watched a film about a big beef ranch in Argentina.

During the past three years the Club has annually arranged an Exhibition in aid of C.O.R.S.O. (Council of Organisations for Relief Service Overseas). This year the Exhibition was held on the afternoon of Saturday, June 23, in St John's Hall, and the many visitors included Miss Steele, Secretary of the Dunedin Branch of C.O.R.S.O., who expressed her gratitude for the Club's efforts in helping the fund. This year's Exhibition doubled previous efforts by raising £9 2s. 9d. The charge for admission was 1/–, and the tickets were distributed at the door by a Meccano Automatic Ticket-Issuing Machine constructed by Jimmy Salinger from the instructions and illustrations given in the April 1962 *M.M.*

John Williams built an "exploding" destroyer, and for 3d. a time visitors could have three shots at it with torpedoes and if they destroyed it they received a shilling. Needless to say it proved very profitable, and raised 11/9d. There was a splendid array of Meccano models, which covered a wide range of subjects. Other items of interest were two Hornby-Dublo layouts in operation, Dinky Toys, model aircraft, speed boats and yachts. *Secretary:* M. J. Salinger, 8 Maheno Street, Dunottar, Dunedin, New Zealand.

During Easter Week this year the Woodley Church of England School Meccano Club visited the Model Railway Exhibition in London. In this picture members of the Club are seen watching the extensive model tramway layout. Mr. H. W. Mason, Leader of the Club, is on the left. In the centre is the Rev. H. W. H. Wilkinson, B.Sc., Vicar of Woodley Parish Church (Saint John the Evangelist), who is a keen supporter and friend of the Club.

BRANCH NEWS

NORTH END (PORTSMOUTH)—A block of shops has been added to the scenery of the Three-Rail layout and a motorway laid down on the first section of the new layout. Additions during the month to Mr. Enfield's old layout have included a Civic Centre, fire station, farm and a railway goods platform. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

AVIARY MODEL RAILWAY CLUB (LEEDS)—Now that the two circuits have been completed and the wiring fixed up, several meetings have been devoted to track operations, which give the lads a break from modelling and are always greatly enjoyed. At one meeting a quiz was held and it proved both informative and good fun. The pea-in-the-jar competition was a success and the money received benefited the Club funds. *Under-Secretary:* Mr. Ian Witham, 69 Salisbury Road, Leeds 12.

TWICKENHAM AND DISTRICT MODEL RAILWAY CLUB

In the June *M.M.* announcement of the Incorporation of this Club as a Hornby Railway Company Branch, Mr. J. D. Christie was given as the Chairman. I now learn that he is the Club's Honorary Treasurer, and that the Chairman is Mr. G. Burt, of 9 Alton Gardens, Whitton, Middlesex, to whom any enquiries about the Branch should be addressed.

BARGAIN Q.E. DISCOUNT APPROVALS

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FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 337

For Stamp Enthusiasts

Our Own Stamps

By F. E. Metcalfe

WITHOUT a doubt, a few attractive stamps issued by a given country, particularly if they also result in a few varieties in the way of different perforations or new shades, do encourage collectors to consider other stamps of the same country. That is precisely what has happened to our own British stamps.

Looking back a few years, one recollects that while many collectors in the Commonwealth and the U.S.A. collected British Colonial stamps, quite a number, especially here at home, did not bother at all about our own stamps. If you asked them why this was so, you were told that the stamps were too dull for words, and only suitable for those advanced philatelists who are more concerned in retouches, etc. than in the designs of the stamps themselves. I remember once having quite a fierce argument with a young collector who opened a catalogue to clinch his point about dullness, and as he turned over the pages devoted to British stamps remarked, "Now who could be interested in that mouldy lot". I had to admit that there was much in what he claimed.

All enthusiasts will remember the watermark changes, etc. which British stamps have undergone during the present reign, to be topped by the three special issues which appeared last August and September. Well, all this has certainly brought about a big change in the popularity of our own stamps, and whereas there was a time when Britain's stamps were very rarely mentioned in the letters I received, now they are referred to more than the issues of any other country. So I think it is about time I dealt with them at some length, especially as they do undoubtedly present problems to many young collectors who want to take them up. I will start by referring to a letter which reached me recently, for it contained the kernel of what troubles so many would-be collectors.

My correspondent, who lives in Birmingham, wrote, "I have been very interested for some time in British stamps, so when those nice picture stamps came out I wanted to have them, and a lot more British stamps. My father bought me a catalogue so that I could do this, but I don't know where to start, as the prices of some of the rather horrid early stamps are too high for me, even if I wanted to collect them—but I don't. I want to start collecting the brighter stamps, and would like your opinion as to where I can start."

Well, I fully agree with this correspondent. As I have already said, our early stamps *are* a dull looking lot by modern standards, and good copies (only very unwise collectors go in for stamps which are *not* in good condition, except in special circumstances) even in all their dullness,

are often very expensive. Fortunately, Great Britain, in the hundred and twenty-odd years that she has been issuing stamps has, in spite of a conservative policy by our Post Office, issued an awful lot, and as many of them were used in great numbers it is possible to fill page after page of one's album with stamps which, at the most, have only cost coppers.

Of course, an easy way of getting together a small collection of British stamps which boast bright designs is to stick to the commemoratives, and here let me say that while up to the present we have not had very many of these special issues, the three sets issued a few months ago are surely a pointer to what we are likely to get in future. In other words, there may be plenty more as time goes on. In the meantime, these commemoratives can be nicely mounted and written up.

Such a collection would hardly satisfy the enthusiast who wants to take up stamps really seriously, so we must consider a wider field, and here I am going to make one or two suggestions which I think will satisfy the average beginner. First of all, under no circumstances must you be tempted by heavily cancelled or damaged stamps, just because they are low in price —I won't say cheap, because a poor copy can never be that. Next, I am going to suggest that you go in for used stamps only, as fine mint copies are generally much more expensive, and to put up any kind of a show of British stamps mint copies would cost much more than most of us could afford.

Now for the album—my own choice would be one of the loose-leaf, spring back type, with plain leaves. There are albums which have spaces marked for each individual British stamp, but I am against printed albums. In my view, no matter how good a collection you may have, or how much money the stamps may have cost you, they lack individuality mounted in a printed album: one collection is merely like another. No, buy a plain album and take pains with the setting up of your stamps. It is surprising what little practice is necessary for one to become quite a dab hand at hand-printing, and how nice it is when you have learned to be able to do such a job. Then you are on the way to making a collection which bears the stamp of your own individuality.

Since I do not think British special issues alone will be enough to "keep you knitting", I suggest you start with the first and only issue of King Edward VIII—you know that little set, with just the king's head unadorned. That was his own choice, and I have often wondered what kind of stamps we would have had if he had remained on the Throne. We certainly would not have had the over-elaboration of design which has marred so many British stamps.

This little "KEVIII" issue will look quite nice at the head of the first page. Then we come to the issues of the late King George VI, to be followed by those of the present Reign. If this is going to be too much for you, then just tackle the "QEII" issues, and with the "graphite" and "phosphor"-lined stamps and the changes in watermark (two), you will find even this range anything but dull. In fact, these are the stamps which have provided the publicity for British stamps, and this factor has increased their popularity.

I am afraid that, to do our stamps justice, you will need more than a simplified catalogue (so useful for collectors who cover a wide field), but there is the Commonwealth QEII Catalogue, which will supply all the data. Yes, I can recommend our own stamps (used) for cheapness and great fun. Just one more point—keep the special stamps mounted by themselves and do not mix them up with the definitive issues. They look so much better that way.

BOOK REVIEW

Collecting foreign stamps and writing them up in an album is a delightful way of learning about countries and their peoples. *Stamp Collecting* by Kenneth F. Chapman (Arco Handybook series, price 12/6), explains the things one needs to know in starting the hobby, how to spend your money wisely, general and specialised collecting, and how to make money from stamps. There are details of the most important of the national philatelic organisations in Great Britain. There are useful chapters on stamp catalogues and other philatelic literature, and an appendix explains the many technical terms the young enthusiast will encounter in pursuing his hobby. There are eight full pages of half-tone reproductions of stamps.

Stamp Gossip

"Anti-Malaria" Stamps

I HAVE not had much to say about these stamps, as although the cause behind them may be all right, and many countries are taking part, I am just a bit doubtful whether the fund to help stamp out malaria will benefit quite as much as those who buy the stamps anticipate, or that it is quite right that stamp collectors should be called upon so often—as they are—to "foot the bill" in this way. Of course, you might say that no one need buy such stamps if they don't want to. But those who are behind a lot of these issues know quite well that the philatelist has one weakness . . . that if a collector goes in for certain countries, as he must if he wants to collect at all, he will desire to have everything which is issued by those countries.

Anyhow, at the time of writing most of the "Anti-Malaria" stamps issued by countries within the British Commonwealth are freely available, as are many of those issued by outside countries, and you cannot go far wrong by buying any of these, providing you do not pay fancy prices. But leave severely alone those stamps which have gone up a lot.

CARIBBEAN PEARL

Recently, a very regular reader of these notes asked why I never mentioned the stamps of Cuba, and he wanted to know what was doing in the way of new stamps for the "Pearl of the Caribbean" as he termed that country; or is it that they are too busy with other matters to bother about stamps? Well, I had to tell him that with so many stamps coming out from so many countries it was almost impossible to refer to all regularly in the *M.M.* Still, it is true that not much has been written about Cuba's stamps, which until the dust-up were at least very popular in the U.S.A. and with many British collectors. But however busy Cuba may be with other matters, postage stamps are getting more than their fair share of attention, for new and quite attractive little sets are appearing frequently. I hope that Cuba is not going to overdo it, as too many sets, far from adding to the philatelic popularity of a country, do harm in the long run—from the purely stamp-collecting point of view. In the meantime, Cuban stamps remain quite popular in Great Britain, and particularly so on the Continent and in South America. With these few comments I hope my correspondent will not feel any longer that the "Caribbean Pearl" is being entirely left out.

A SCARCE VARIETY

Perhaps because some stamps with printing errors are quite valuable, collectors are generally very keen to get hold of them. Illustrated here is one which, if you are lucky enough to obtain a copy, you could sell at a price that would cover the cost of a nice holiday. Many collectors will have copies of the recently-issued 30c. stamp of Tanganyika. Now take a look at the inscription, which normally reads UHURU 1961. If your copy is like that then pass on, for all you have got is a normal stamp, but if you are very, very lucky your stamp may have the last 1 of 1961 missing—in which case you might contemplate a nice little holiday in Spain, or Italy, on what you will get for your stamp. How much will you get for it? Well, anything up to £100 for a mint copy, I imagine, for when the Crown Agents heard of the error they at once cabled Tanganyika for the sheets bearing a copy of the variety to be withdrawn. The head post office in Dar es Salaam tried to get in touch with the various sub post offices up and down the country (the stamps had already been distributed) to give them the withdrawal order. But some post offices do not have a telephone, so a few of the varieties got out and are about somewhere. In fact, I understand one or two have been unearthed already.

THE WIND OF CHANGE

It is quite exciting to be collecting British Commonwealth new issues these days, for they reflect so strongly the political wind of change which is sweeping throughout not only the Commonwealth but the rest of the world as well. A country which will be celebrating its change of status in the month when these notes appear, "telling it with stamps" as it were, is Jamaica. All values from ½d. to £1, with the exception of the 2d., 4d., 1/6 and 5/–, will be overprinted "INDEPEN-

(*Continued on next page*)

By E. W. Argyle

Locomotives On Stamps

FINLAND'S first railway line, Helsinki–Hameenlinna, was opened experimentally on January 31, 1862. In addition to the locomotive the opening train consisted of one passenger coach and a few freight wagons loaded with iron goods. The 108 km. journey to Hameenlinna, with five stops varying from ten to 30 minutes, took four hours and 40 minutes, but the return journey took ten minutes less. The first Finnish locomotive, "Ilmarinen", shown on the stamp illustrated, was built by Peto, Brassey and Betts, at Canada Works, Birkenhead. It opened the Helsinki–Hameenlinna line to regular traffic on March 17, 1862.

The arrival of the first passenger train from Nice to Monaco, on October 19, 1868, is pictured on the Monaco stamp shown above. The station buildings were of wooden construction. On the opening day 364 passengers were carried from Nice to Monaco and Prince Charles III of Monaco performed the inauguration ceremony. The locomotive was of the type in general use by the Compagnie Paris–Lyon–Mediterranée at that time.

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FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 334

Stamp Gossip—(*Cont. from previous page*)

DENCE 1962". In addition four values which will not be overprinted will be dropped and replaced by a special "Independence" issue. As there will be a "Games" issue at about the same time,

Jamaica is certainly going to make itself felt among the millions of stamp collectors throughout the world. But let us hope that this is just a spasm, and that we are not going to get new Jamaican stamps every few weeks. We can't afford that, can we?

THE TIP OF THE MONTH

I have a feeling that these stamps which Jamaica is to overprint to mark her independence may be well worth taking up, mint when they just come out—if you collect that way—or used as soon as they come round. Do not forget that Jamaica uses a lot of stamps, and that for the time being used copies should not be difficult to come by. Good hunting!

(*Cont. from col. 3*) Thames Valley ran a summer service with open-toppers along the banks of that river between Reading and Windsor. Maidstone and District run open vehicles at Sheerness.

What of the future? There are straws in the wind that the era of the open-topper may be drawing to a close. What are your views about these vehicles? Write and tell me. The address is: 75 Broomfield Avenue, Worthing, Sussex. Remember, if you want a reply, you must enclose a stamped addressed envelope.

BREEZY ALOFT!

CALLING ALL BUS SPOTTERS by DAVID KAYE

AUGUST is, or at least should be, just the time of year for getting plenty of fresh air into your lungs on top of an open decker at the seaside. In the post-war epoch the popularity of this type of vehicle has increased enormously, and most resorts now boast of their fleets of seasonable open toppers. At least three operators have given their vehicles names. The modern Leyland "Atlanteans" run by Devon General along the Torbay coastline have the names of famous Sea Dogs who are connected with the West Country; for example, DL 926 is *Sir Francis Drake* and DL 933 *Sir Walter Raleigh.*

The small daughter of a former General Manager of Eastbourne Corporation Transport Department was a Lewis Carroll fan, and this resulted in that operator's open-toppers bearing such titles as *White Rabbit* and *White Knight*, although with the latest batch of three (Nos. 13, 14 and 16) this practice seems to have been abandoned. Thomas Bros. of Port Talbot have *The Margam Belle* (OD 7497) and *The Afan Belle* (CAP 205).

Although the majority of open-toppers are normal vehicles, which have been converted in their old age, some operators are now taking delivery of brand new open-toppers, which have been supplied with a detachable roof, so that they can revert to ordinary town services in winter. The latest batch of these dual-purpose buses consists of four Bristol FS6Gs delivered to Bristol Omnibus Company for use at Weston-super-Mare (8576–9, 866–9 NHT). Brighton, Hove and District have in the past three years received eight such vehicles (Nos. 1–3/9–11/21 and 22), while the nine "Sea Dog" Atlanteans of Devon General were new last season.

* * * *

When it comes to converting old buses, this may take the form of a drastic rebuilding, such as happened with the Hants and Dorset Bristol K5Gs which ply for hire between Gosport and Lee-on-Solent and in the Sandbanks area between Bournemouth and Poole. These were given a fully-fronted style and could hardly be recognised when compared with their former appearance. Some operators such as Southdown, East Kent and Bournemouth decided to alter their wartime Guy "Arabs" with their utility bodies into pleasant summer buses. In recent years, wind shields have been added so that passengers can enjoy the fresh air without having their hair blown out of order and the discomfort of streaming eyes. Some of these vehicles are nearly 30 years old; for instance, Gosport and Fareham A.E.C. "Regent" I No. 19 (JO 5043), which started off with the City of Oxford Motor Services, was born in 1932, while Thomas Bros. "Regent" OD 7497 (ex-Devon General) began life a year later. Portsmouth's four Leyland TD 4s Nos. 5–8 still have their original 1935 English Electric bodies.

In many cases the open-toppers have been acquired from another operator. This is particularly true with B.T.C. firms. Hence Southern-Western National 3821–4 were acquired from the Bristol Omnibus Company, as were Brighton, Hove and District's 989–995 and Southern Vectis 904/5. Brighton, Hove and District, on the other hand, have exported open-toppers to Thomas Bros., Thames Valley, Eastern National and Southern Vectis. Southend obtained three ex-Birmingham City Daimlers (242/4/5).

So far, we have dealt with the orthodox double decker, but there are other varieties of "open" vehicles to be found around these shores. At Hastings, Maidstone and District run OR 1–3, A.E.C. "Regal" II single deckers with open 35-seat Beadle bodies, while Lytham St. Annes possess a Leyland LT7e (29, ATC 728) with an open Burlingham 32-seat body. In Lancashire also are Blackpool's "Cheetahs" Nos. 19–24, which have 34-seat open Burlingham bodies. Mention must be made, too, of Southport's fleet of eight 24-seat Bedford QLs, which run the Shore and Promenade routes. The only open top trolleybuses in the world are Bournemouth's 200–202 (Sunbeams of 1935 vintage).

* * * *

If you want to ride on an open top tram you can do so at Eastbourne with its small gauge line, which is 24 inches and not 15 inches as stated in my notes about this splendid modern tramway in the May *M.M.* Blackpool has twelve English Electric single deckers, known as "boats", which are open to the sky. They are numbers 225–236.

Margate, Clacton, Worthing, Southsea, Bournemouth, Blackpool—yes, we would expect to find open vehicles at such well-known resorts, but it perhaps comes as a surprise to discover that Southampton run two wartime Guy "Arabs" (Nos. 33/5 DTR 460/2) on fine Sunday afternoons on a circular tour of the "Gateway to the Empire". Plymouth has its solitary Leyland PD 2/12 No. 58 (MCO 658) for route 38 along the shore of The Sound, and until recently (*Cont. in col. 1*)

SPECIALLY FOR PHOTOGRAPHERS

Exciting Action Pictures

A small racing motor boat, or hydroplane, cornering at speed. Although a slow shutter speed was used and the subject came out blurred, a good impression of speed has been created.

THERE are innumerable kinds of boats and there are just as many different ways of photographing them. All boats, however, have this in common—they make wonderful pictures and can be captured easily with the simplest of cameras.

This is holiday time and visits to the seaside provide plenty of opportunities to photograph craft of many kinds. The seaside, however, has its traps for the unwary. Sand and sea reflect a great deal of light and bright blue skies really *are* bright. This means that exposures must be kept short or your negatives will be very over-exposed. Give at least half the exposure you would usually give to a landscape.

* * * *

The best pictures of ships and the sea are taken when the sun is shining. That flat, grey look of the sea on a dull day looks even flatter and greyer in a photograph. If you possibly can, choose a sunny day and use a medium speed film. It is a good idea, too, to use a pale yellow or pale green filter over your lens. An inexpensive filter of this kind, suitable for most cameras, can be obtained from your photographic dealer. This filter will not only make the bright blue sky look darker and more attractive in your pictures, and help to show up clouds, but will also protect your lens from harmful salt water spray.

By

H. G. FORSYTHE

Incidentally, if salt water does get on to your lens, do clean it off as soon as possible, very carefully using a very soft, fluff-free piece of cloth—a very old, thoroughly clean handkerchief is ideal for the job. Remember, too, that sand is absolutely ruinous to cameras, so do keep your camera well protected all the time you are on the beach.

Yachts and ocean liners sailing past; fishing boats coming into harbour, or people just "messing about in boats"—these are all possible subjects for your camera. The main thing is, as always, *think before you shoot*. Make sure your subject is properly framed in the viewfinder and especially that it is not too far away. A big ship, sailing majestically out to sea, can easily end up in your picture as a tiny dot surrounded by lots and lots of water.

* * * *

Fast motor boats make especially exciting pictures. Of course, you need to be fairly close to your subject and, at the seaside, it is often possible to take such shots from the end of the pier or from another boat. The Meccano Sports Viewfinder described last month is ideal for use in this way.

Motor boat racing is a sport rapidly gaining in popularity and race meetings are held both at the seaside and on lakes and rivers inland. These meetings are very exciting to watch and photograph. Taking effective action pictures of fast-moving boats, even with a slow shutter speed, is easy if you "pan" your camera. Last year (July *M.M.*) I described how panning could be used to take action pictures of speeding cars. Next month we shall talk about panning again and an even faster subject—jet air liners.

"Messing about in boats." An attractive seaside picture made even more interesting by the sparkling sunlight on the water. Don't be afraid to take pictures against the light like this sometimes, provided that you shade your lens so that the sunlight does not fall directly on it.

Mountain Rescue by Motor Cycle—

(*Continued from page 303*)

descent. This is much harder than the climb, but it is just as necessary to make it without delay. He has to tell the ambulance men where to wait, and the estimated time of arrival of the stretcher party. If helpers are needed to carry the stretcher, he will probably have to arrange this, too.

In my article I have described a possible rescue of the future. It could take place on Scafell or another Lakeland mountain. But wherever the accident happens, the chances are that the trials motor-cycle will be as successful in helping to save life as is Herman Geiger's Piper aircraft.

The Shape of Boats—

(*Continued from page 316*)

feet. Indeed, experts do so, but it's hard on the feet!

There is still a lot of research to be done on really fast boats before they can face a normal sea. We can probably look forward to some strange shapes in the future. Only in recent years have hydrofoil craft come into general use. In these, the whole hull is lifted several feet clear of the water by skis on stilts below the boat. They are used a lot in the Mediterranean—a regular passenger service runs across the Bay of Naples, averaging about 40 knots. The time may not be so far distant when you will see them on regular runs across the Channel, cutting present crossing times by at least half.

There is still a lot to be learned about seaworthiness, too. Fifty years ago they thought a good heavy boat was the only thing for heavy weather but the history of ocean racing since then shows that a light-weight boat is better able to stand up to being thrown around without damage. Modern yachts can also be kept sailing in a gale where those of 50 years ago would have to lie to. This is because they set more efficient sails and have more free board, giving more buoyancy when well heeled. Don't imagine that a boat is unseaworthy simply because it is small; the Atlantic has been crossed in all sorts of craft—small dinghies, rowing boats and even folding canoes. The question is not so much the boat as whether the crew can take the punishment.

Hornby-Dublo Shares Olympia Triumph—

(*Continued from page 306*)

finally made up in siding A, with all the wagons in their designated order, the Co–Co Diesel Locomotive entered the siding, coupled up the wagons and passed through points P2, P7 and P1 to the main line. As the train was leaving siding A the trucks were counted by the detector D8. If, through some failure in coupling, the number of trucks was incorrect the train stopped and reversed into the siding to find the missing truck or trucks and couple up with them. If there was a coupling failure a second time, the train stopped and the computer printed out a message informing those watching that the count was incorrect, and that the operator's assistance was needed to complete the train. Only when the operation was completed exactly to the instructions given by the computer did the train return to the main line. There it continued to run until a further request was made from the operator's keyboard.

There was a mystic fascination about watching the wizardry of the computer in these operations, and the demands of an almost incredulous public were virtually unceasing. Only the Diesel Shunter—and this was a great tribute both to the craftsmen of Meccano Limited and the engineers of the English Electric Company's Kidsgrove Works—had its restful moments. But whenever it was called upon there was a buzz of amusement and expectancy from those who were watching, and "Charlie" was indeed Olympia's favourite by the end of the exhibition.

The demonstration showed in the clearest possible way how control by a computer such as the KDN2 is the answer to a wide variety of industrial data processing problems. In operation, every item of information received was infallibly registered in the computer's main store, and the course of action decided in accordance with the instructions given through the keyboard.

All in all, it was a display I would not have missed for the world.

Road and Track—(*Cont. from page 309*)

with the answer. He runs a small firm in Kensington employing only a few mechanics, but they are all hand-picked specialists. One is certainly an artist at tuning carburettors. Since he ran his knowledgeable fingers over my Mini it goes like a bomb, while fuel consumption has improved because the engine is running efficiently.

One of the most unusual cars I have driven recently is the 3,500 GT Maserati four-seater coupé—unusual because it has a five-speed gear box and Luc petrol injection. I found the beautifully-made Maserati an easy car to handle, in spite of its 245 b.h.p. at 5,500 r.p.m. The powerful 3,485 c.c. six-cylinder engine is wonderfully smooth and provides acceleration equalled by few other closed cars; it will go from standstill to 100 m.p.h. in 14 seconds, can attain 100 m.p.h. in third, 120 m.p.h. in fourth and 140 m.p.h. in fifth. In every way it is a fascinating car.

A new model that impressed is the Triumph Vitesse with six-cylinder 1.6 litre engine featuring very large bearings. Chassis and body closely follow the Triumph Herald with all-independent suspension, four-speed gear box and extremely powerful Girling brakes with self-adjusting discs at the front. Its six-cylinder engine lifts the Vitesse out of the touring class, giving it a lively performance and a top speed of 90 m.p.h. Acceleration is pretty good; it will go from 0 to 50 m.p.h. in 11 seconds and to 60 m.p.h. in 17 seconds. The floor gear change has an excellent synchromesh on the upper three ratios; speeds in the lower gears were 30, 60 and 76 m.p.h.

Glasgow Subway—(*Cont. from page 311*)

the A.8. Vehicles from the railway below are passed up to the works through a pit by means of a crane and are returned to service in the same manner. A length of track at normal surface level is used for testing purposes, and on this the car shown in the bottom picture on page 310 is standing.

The Underground operates a three-minute service on either circuit, with a four-minute service on Sundays. A two-minute service is maintained in rush hours and all day long on Saturdays. The Subway is open from 6.0 a.m. until 11.30 p.m.

The whole fleet of 50 all-red cars, formerly red and cream, is overhauled in the surface sheds every ten days. Of these 50 cars, only 40 run at the one time, on twenty trains, ten on the outer, or clockwise, circuit and ten on the inner, or anti-clockwise, circuit. Their nightly maintenance is carried out in the tunnels. The ten trains on each circuit are marshalled together end-on. End doors on the cars are removed, so that the men can pass readily from one train to another, without having to get down out of one and then get up into the next.

The average distance between each station is less than half-a-mile, yet the trains manage to attain the high average running speed of 19.12 miles an hour. The Subway cars have 44 seats each, with standing room for a further 40 people.

Yet, despite the frequency and speed of the trains—700 pass through each station daily—there has never been a fatal crash on the Glasgow Underground. This is due to many safety factors. Not least of these is the excellent signalling system, and such safety devices as the trip-cock mechanism—which applies the brakes should a train pass a signal light at danger—the use of fire-proof floor-boards, and so on.

Railway Notes—(*Continued from page 319*)

named *Royal Scots Grey*, before successfully working the first southbound six-hour *Flying Scotsman* to King's Cross on the occasion of that famous train's centenary.

In the old days the journey took ten and a half hours under rather primitive conditions. It was not quite so direct as now and included a stop of half-an-hour for lunch at York Station, which was very different then from the vast traffic centre of the present day.

LAST MONTH'S COVER

In last month's Editorial page paragraph "Our Front Cover" it was stated that the cover showed the Torbay Express approaching Torquay. Several readers were quick to point out that the picture showed the train approaching Kingswear.

Dinky Toys News—

(*Continued from page 321*)

an addition to the range of Dinky Toys that will appeal particularly to all those enthusiasts who build up actual layouts. It is a set of road repair warning boards (Dinky Toys No. 778) and you see it at the foot of page 320. It is complementary to the already existing set of Road Maintenance Personnel (Dinky Toys No. 010) and consists of two rotating "Stop/Go" signs, one "Danger. Road Works Ahead" sign, one "No Entry" sign, one "Road Up" sign and one "Keep Left" sign. Each board is finished in the correct colour, and in the case of the "Stop/Go" signs the word "Go" is in white on a green background with the word "Stop" in white on a red background. This new set enormously increases the authenticity of a layout.

You will remember that last month I told you that twelve additional models from the factory of Meccano (France) Ltd., at Bobigny, were now on the market in this country, and I described some of them in these Notes. This month, I want to mention details of two more of these intriguing French models, both of which are illustrated on page 321. Firstly, we have the Panhard Armoured Car (Dinky Toys No. 815) which is a realistic miniature and makes an excellent companion for the AMX 13-Ton Tank and the Brockway Military Truck mentioned last month. The gun turret rotates through 360 degrees. Secondly, there is the Citroen Delivery Van (Dinky Toys No. 561) which carries a sliding door on the right hand side which, it must be remembered, is the near-side in France, so that it can be loaded and unloaded without interfering with traffic. On each side of the vehicle is an advertisement for the French firm Cibié.

Finally, a few words about prototypes of the Peugeot and the Renault Pick-up which were illustrated in a country scene on page 282 of the July *M.M.* The Peugeot has a four-cylinder overhead valve engine and a volume of 1,618 c.c., whereas the engine in the Renault is only of 845 c.c. It, too, is a four-cylinder job. The drive in the Renault is to the front wheels while the Peugeot has the more normal rear wheel drive.

More Special-Purpose Wagons—

(*Continued from page 329*)

the track beneath. Solebars and cross members, the latter also forming tank supports or saddles, are very well modelled, the channel section and details of the solebars being particularly effective. The end-frames, which in the real thing keep the tank from movement lengthways, are neat mouldings correctly braced to the underframe by the usual diagonals.

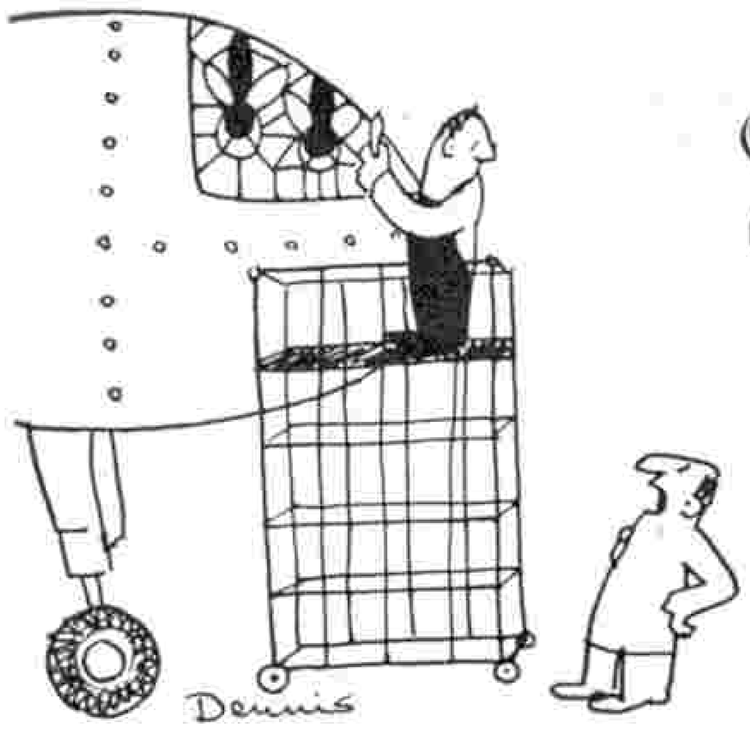
The tank is finished in the familiar I.C.I. "Transport Blue". Its realistic appearance is completed by the display on each side of the familiar I.C.I. emblem, with the fleet number of the vehicle and the striking star design which shows the wagon can be run in fast, but not fully-fitted, freight trains.

Fireside Fun

Macdougall 'phoned a doctor and breathlessly reported that his baby had swallowed a sixpence.

"I'll be right over," said the doctor. "How old is it?"

Replied the Scot, "1894".



"I said landing lights, not leaded lights!"

"My son went abroad ten years ago to make his fortune."

"And what is he worth now?"

"I don't know for sure. But the police are offering £500 for information about him."

* * * *

New shorthand-typist: Now, Mr. Jones, what did you say between 'Dear Sir' and 'Sincerely yours'?

"It must be yours sir—it's the only one left."

"Have you thought about holidays yet?"

Lady: I've brought this fish back that I bought from you this morning.

Fishmonger: What is the matter with it, madam?

Lady: Probably "long time no sea"!

* * * *

"And what did the landlady do when she found you had left the light on for three days?"

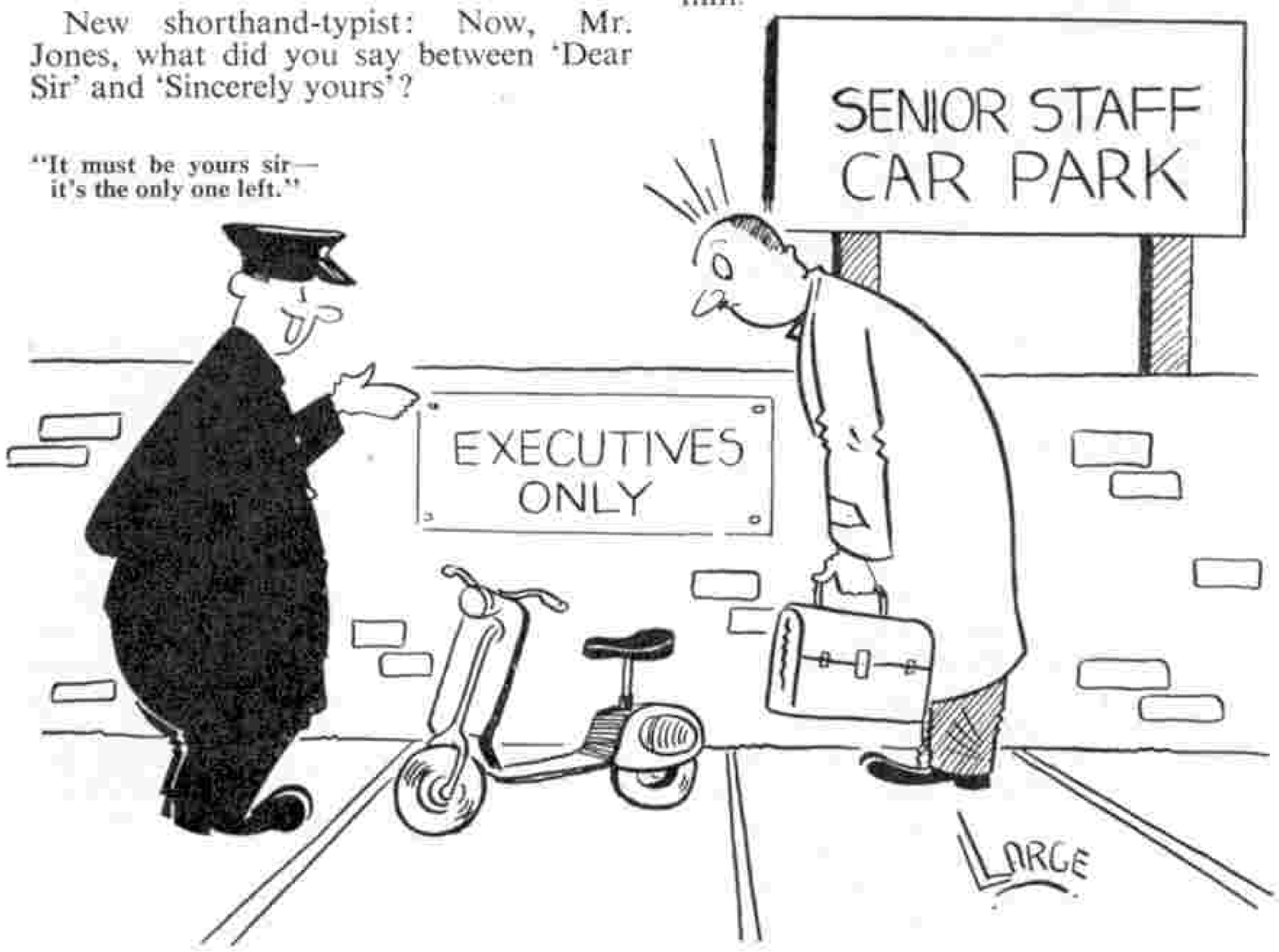
"She turned us both out."

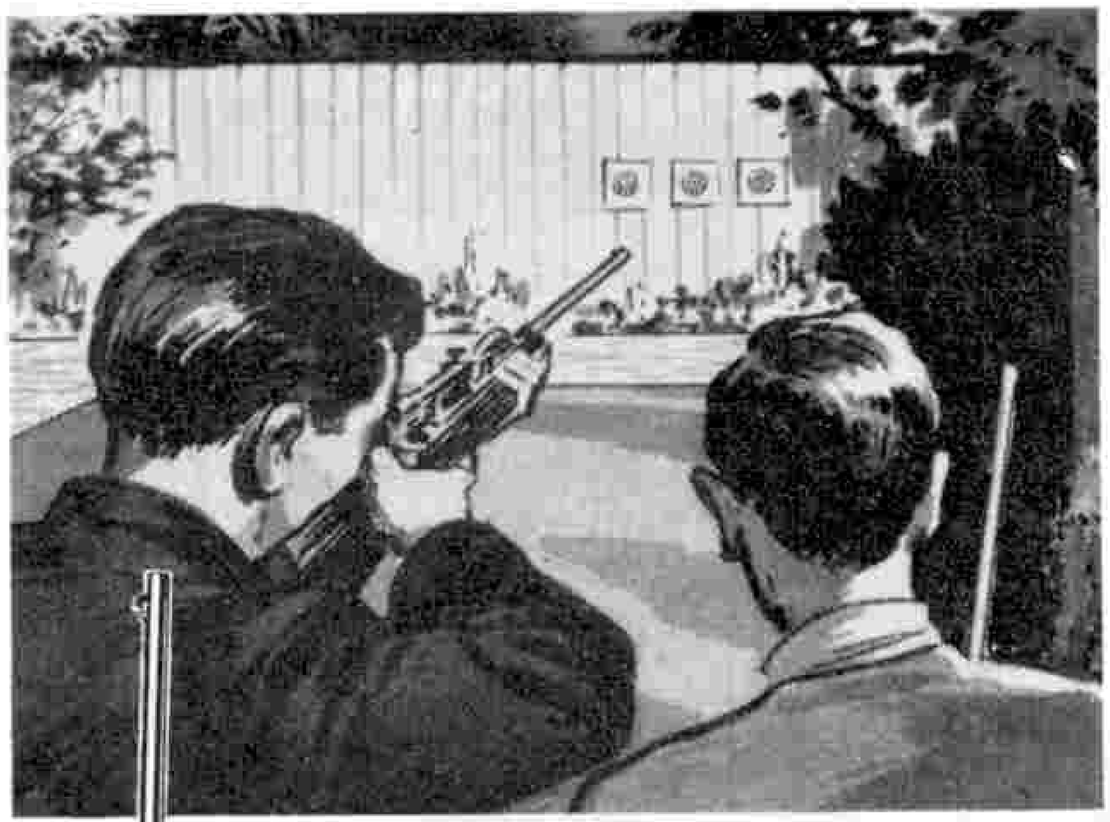
* * * *

Peter: My uncle disappeared while he was on a hunting trip.

Paul: What happened to him?

Peter: Something he disagreed with ate him.





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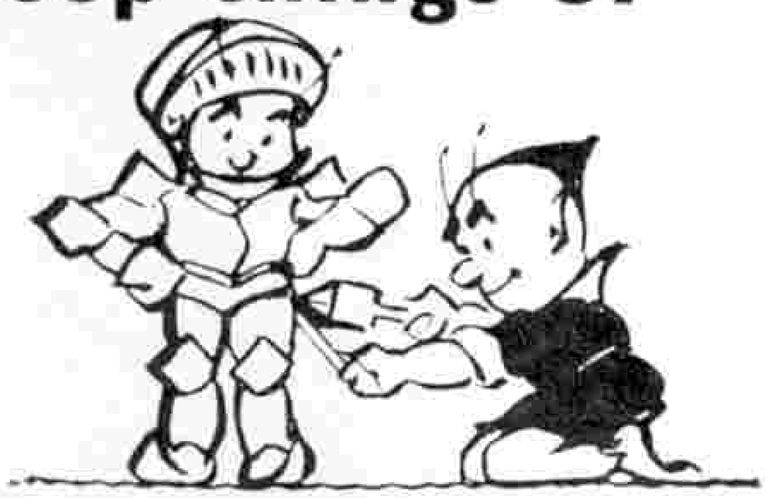

(b) keep things DOWN

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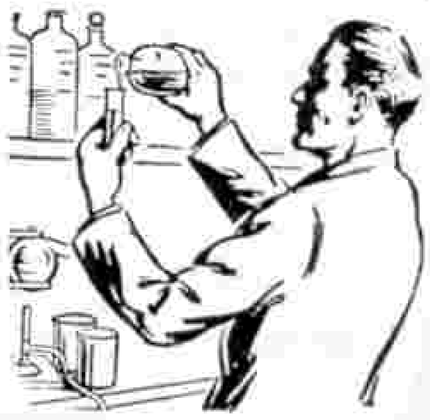

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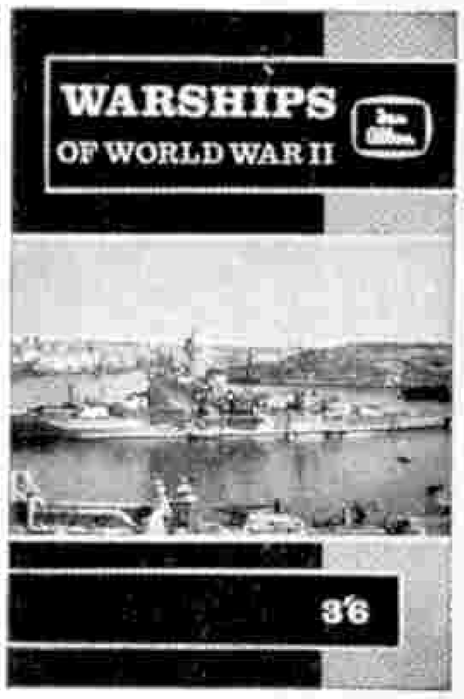

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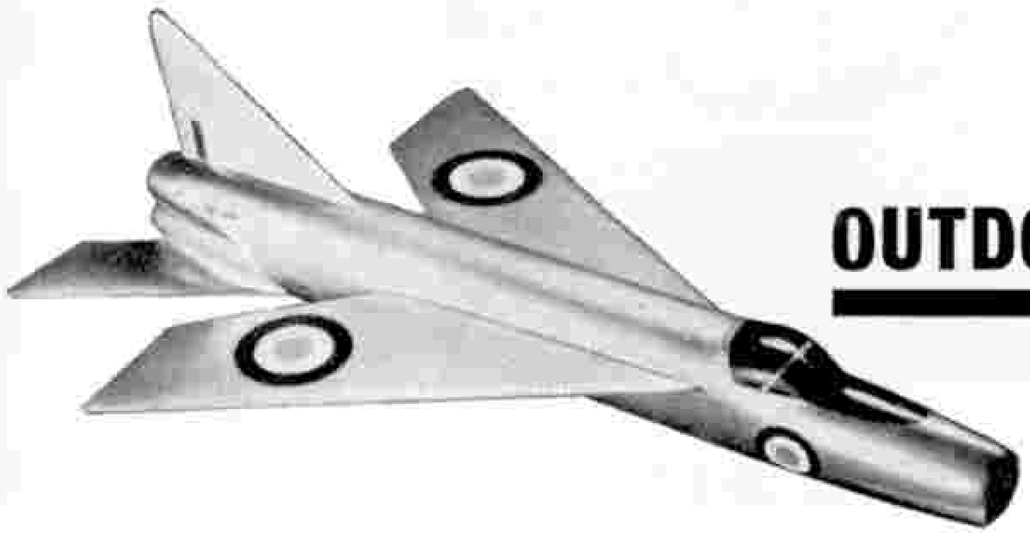

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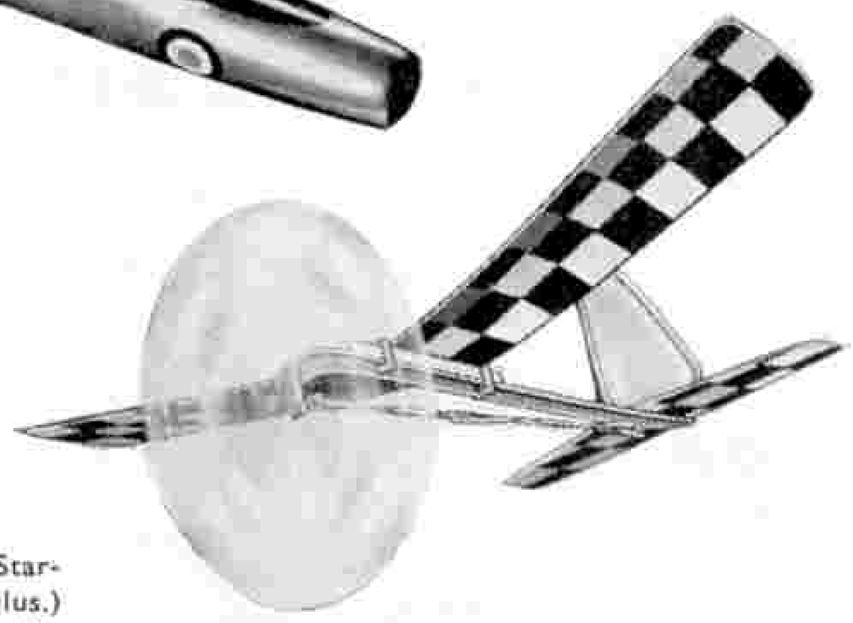

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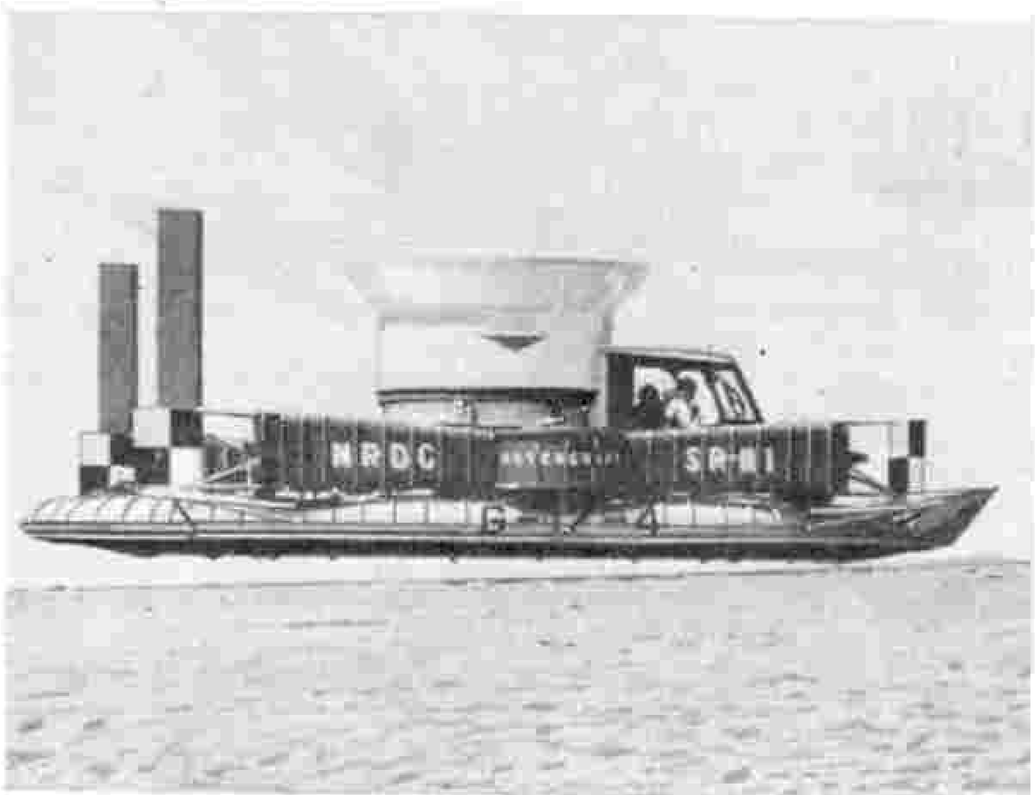

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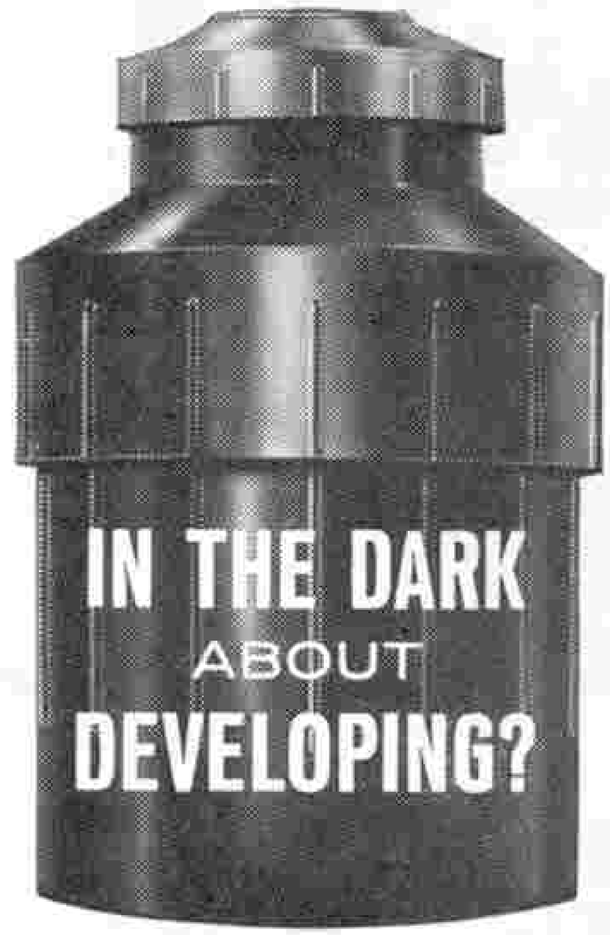

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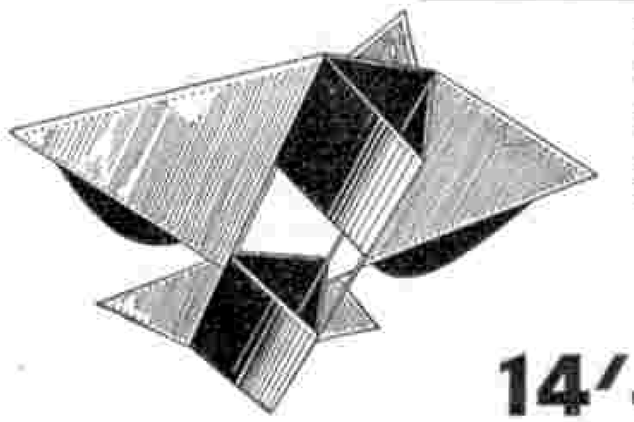

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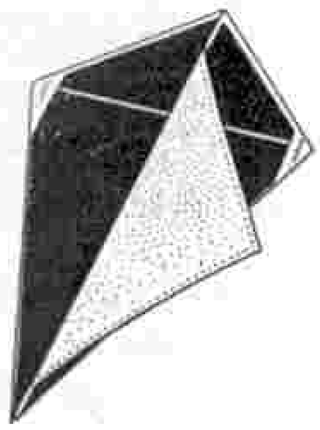

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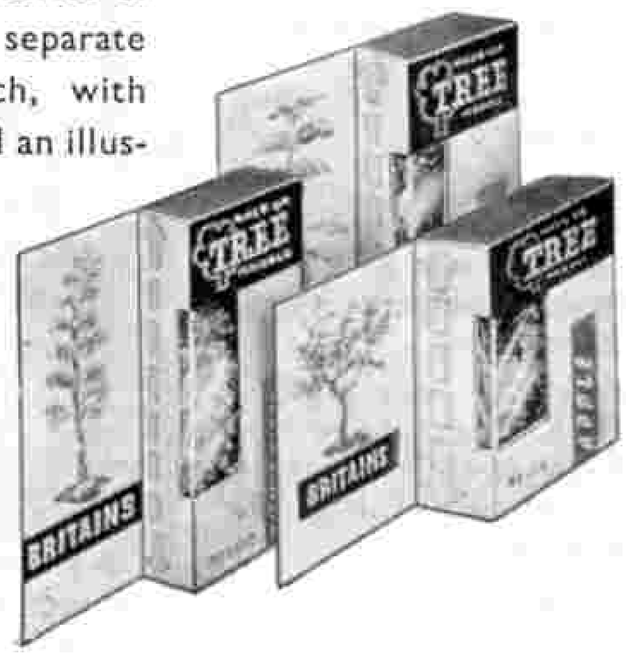

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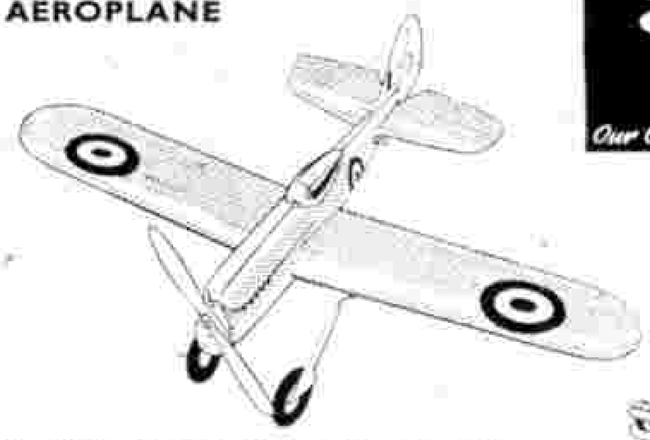

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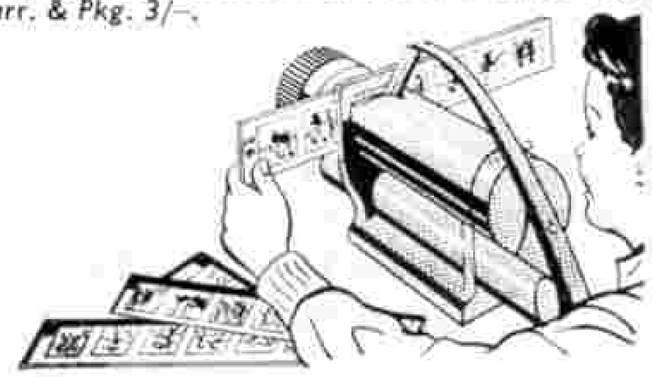

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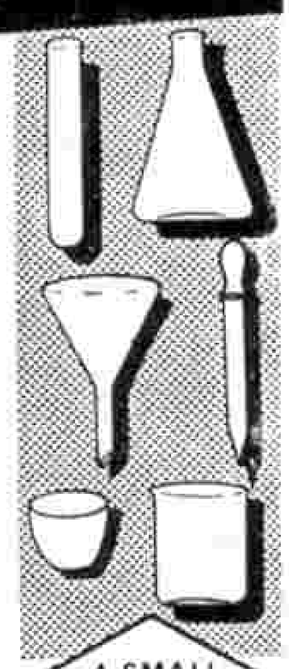

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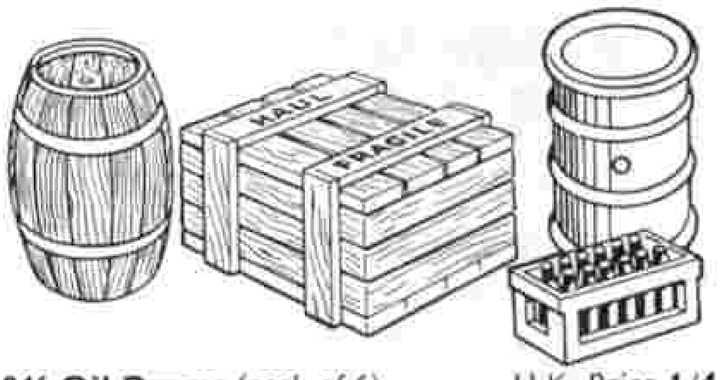

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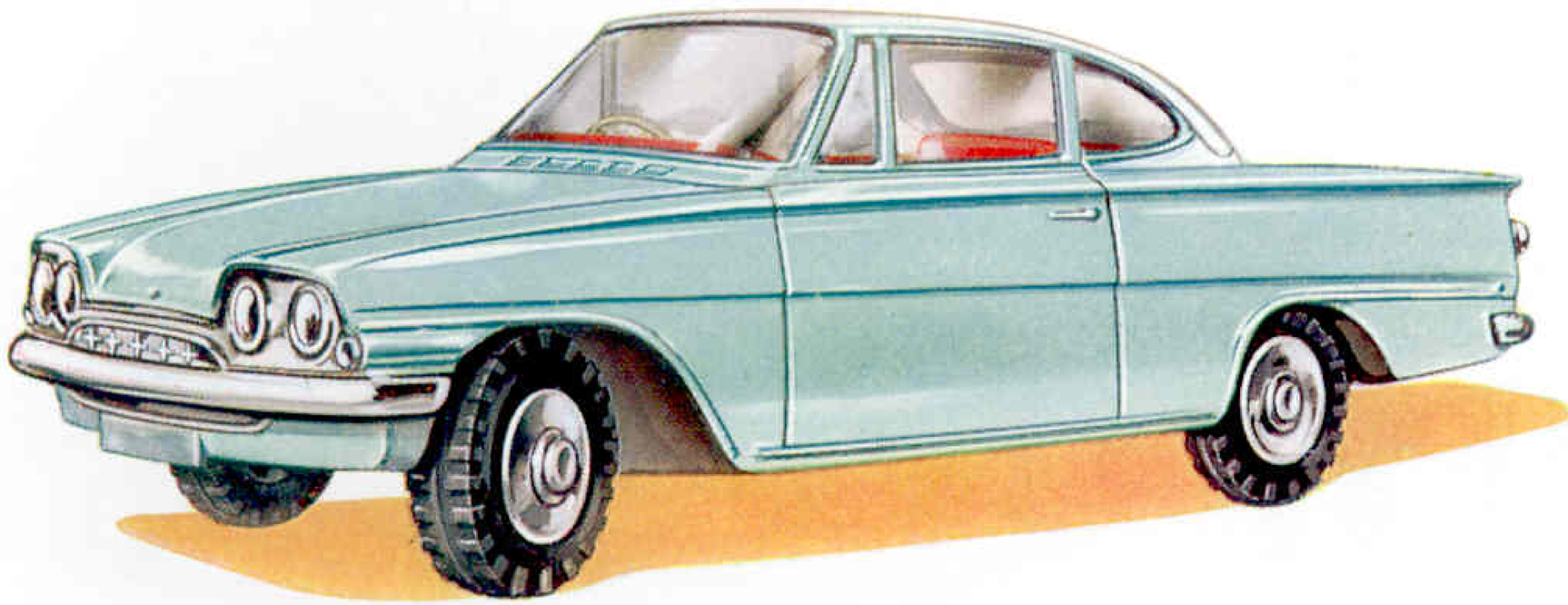

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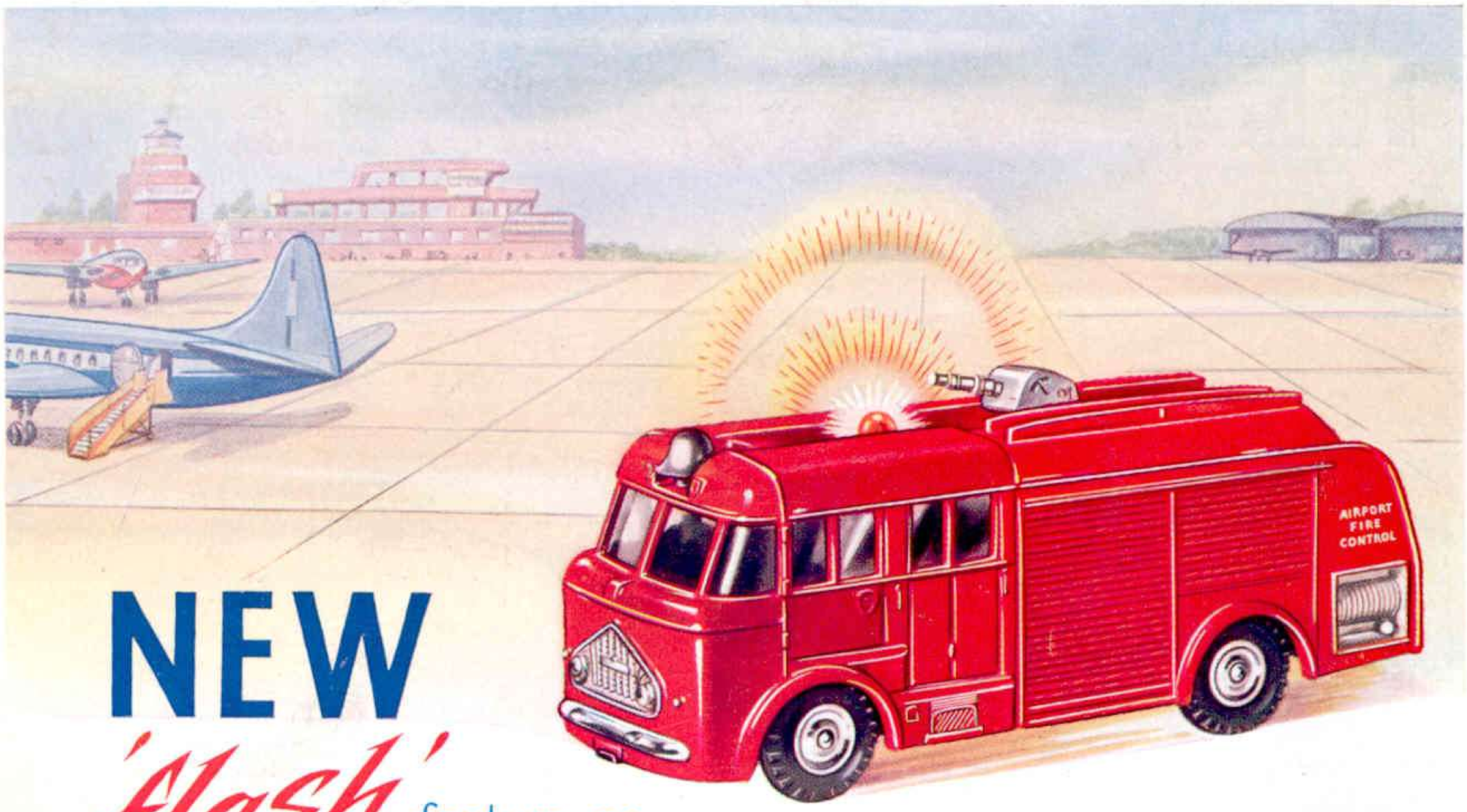

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