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NOVEMBER 1970

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MECCANO® Magazine

NOVEMBER 1970 VOLUME 55 NUMBER 11

Meccano Magazine, founded 1916.

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MAP **HOBBY MAGAZINE**

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FRONT COVER

Rather a rare ' Whirlybird ' occupies our cover space this month. The helicopter in question is a BEKK 47G SIOUX AH Mk. 1. and is one of only 7 now in operational use by the Royal Marines.

This particular example is flown by the Air Troup 41 Command Unit based at Roborough near Plymouth and was photographed last May by the Editor about to embark on an early morning routine flight.

NEXT MONTH

As always we have a wide variety of top-line features on hand for inclusion in our December issue, particularly for the Meccano enthusiasts. We kick off with Part 11 of ' Meet the Cup Winner,' a descriptive feature on the prize winning model featured at this year's Model Engineer Exhibition. For younger modellers, we present a delightful little Flat-bed lorry built from a new No. 5 outfit. And to keep all modellers happy, are the regular Meccano features such as " Among the Model Builders " and the final instalment of " Meccano Constructors Guide."

Turning to the rest of the issue (in addition to the regular favourites such as " Air News," " Stamps " and " Battle " etc.) we offer a variety of selected material covering such subjects as " Cardboard and paper manufacturing," " Special paints used to cover the hulls of the boats and ships of today " and for railway fans, a descriptive article on a " New Cornish Railway."

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Publishers of Aeromodeller, Model Boats, Model Cars, Model Engineer, Radio Control Models, Model Railway News, Scale Models.

CONTENTS

ON THE EDITOR'S DESK 585
News and Views by the Editor

WANTED—AN UNPICKABLE LOCK 586
E. V. Malone describes one of the most individual trades

STAMPS 589
The Universal Postal Union

CONTEST '70 590
Results of the last Meccano Model-building competition

AMONG THE MODEL BUILDERS 592
Readers' Meccano ideas

BATTLE 594
Part XXXI—More about maps

DINKY TOY NEWS 596
The latest from Binns Road

THE ICE PATROL 598
The story of H.M.S. Endurance

MEET THE CUP WINNER 600
Spanner describes a Cup-winning traction engine

AIR NEWS 602
John W. R. Taylor on Aviation

MECCANO CONSTRUCTORS' GUIDE 604
Part 22: Further vehicle mechanisms

HAVE YOU SEEN ? 608
The latest products reviewed

CAR OUTLINE COMPETITION 609
Your chance to win a Dinky car

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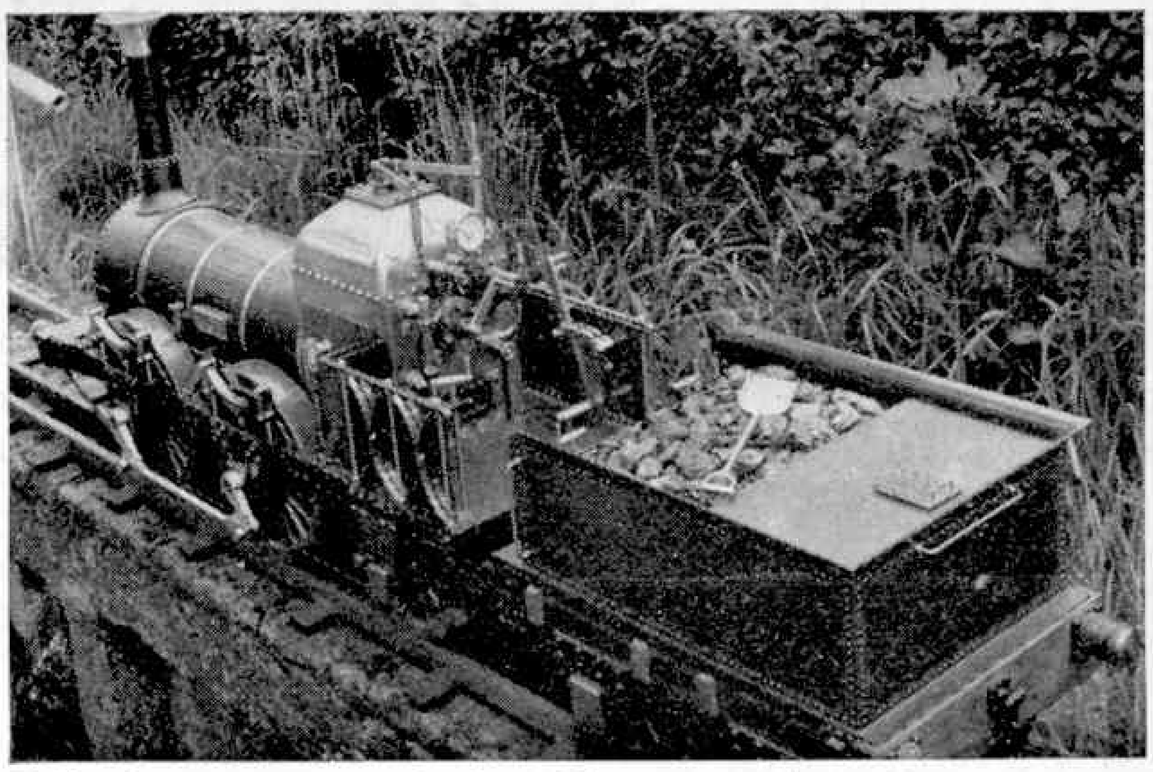
NOVEMBER ISSUE ON SALE OCTOBER 9 PRICE 3/-

Up from the deep, salvage of the remarkable two man submarines from their scuttled positions at Wilhelmshaven, Germany, gives SCALE MODELS the opportunity of producing measured from life scale drawings of this little known but amazing weapon which lends itself so readily to modelling. Russian Insignia for Armoured Fighting Vehicles, the Brabham BT 33 racing car, Figure review, full report on the World Flying Scale Model Championships. Latest kits and books plus many other features, including scale drawings of the Potex 25 biplane are in this November issue.

Scale Models



Full description of the Championship Cup winner at the 1969 M.E. Exhibition—Mr. Saxby's 5 in. gauge *Lion*. Conrad Milster of New York writes about "Camelbacks" and other early American locomotives. There are more details for those interested in model electric locomotives, and Martin Evans describes the cylinders for his 5 in. gauge Midland "Single."

Model Engineer

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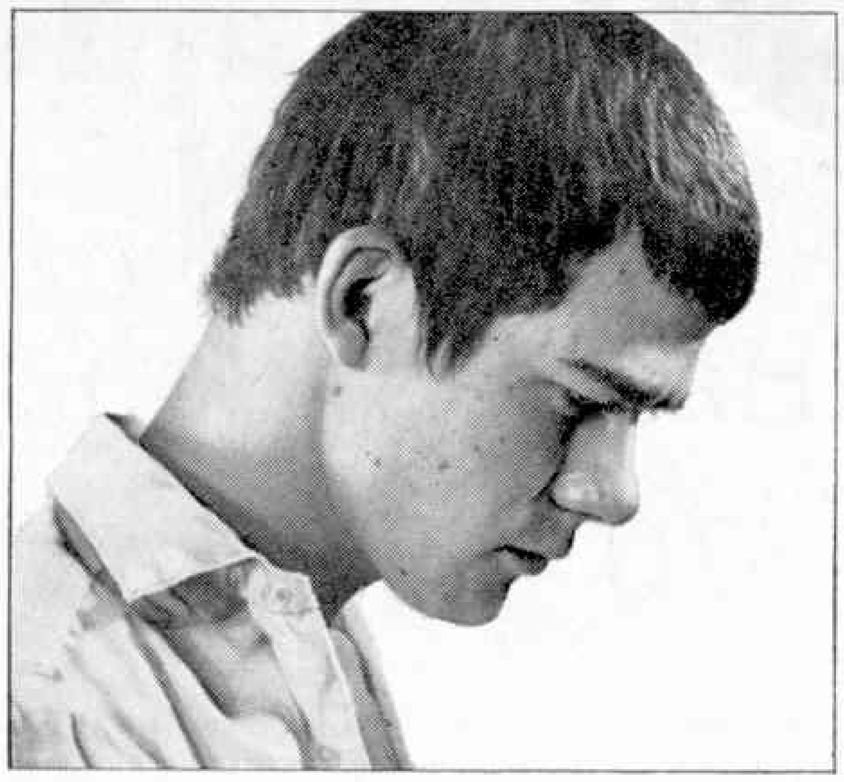
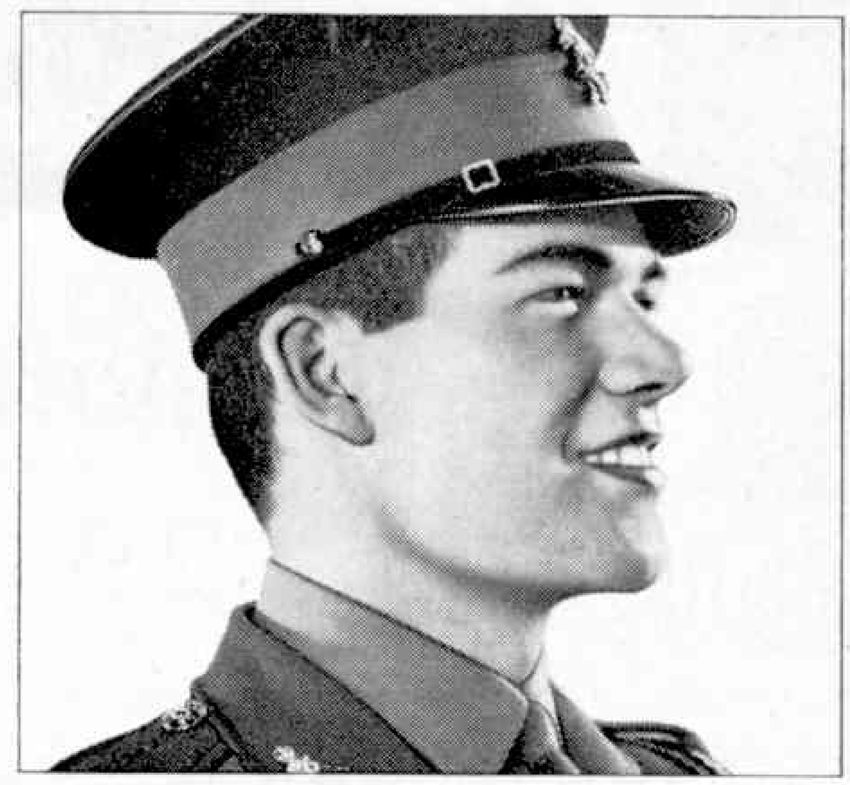


Age	*15*
Education	*County Secondary Boys' School*
Educational Qualifications	*Nil*
Status	*School leaver*
Career Prospects	*Uncertain*
Sporting Interests	*Athletics – Rugby*
Hobbies	*Gliding*
Other Activities	*Nothing special*
Travel Prospects	*Occasional package deal holiday*
Holidays	*2 or 3 weeks*
Personality	*A little shy and immature*



Age	*18*
Education	*County Secondary Boys' School and Army Apprentices' College*
Educational Qualifications	*'O' levels in English Language and Geometrical and Mechanical Drawing. Ordinary National Certificate Grade I. Now taking Grade II*
Status	*Apprentice Aircraft Technician with rank of Company Sergeant-Major. (Is well on his way to standard recognised by Trades Union)*
Career Prospects	*Excellent. As a highly trained Aircraft Technician a fine career is ahead of him, either in the Army or in civilian life*
Sporting Interests	*Athletics. Rugby. Basketball – at which he has represented the college*
Hobbies	*Free-fall parachuting. Sub Aqua*
Other Activities	*Adventure training weekends on Dartmoor and Brecon Beacon*
Travel Prospects	*Germany; Norway; France; Cyprus; Malta; Gibraltar.*
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NEW ! A demonstration of steam ploughing by model traction engines (even better than when shown on TV !). The ECRA Championship car circuit (a little tight for room last year) moves into a larger hall. Longer track, more spectator space. Jack Thin and Dick Smith welcome you again.

Other new attractions will include model soldiers, guns, dioramas. Display of woodwork and craft items. Demonstrations of various kinds. Small lecture theatre for film shows, model subject talks.

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Full model trade support with well stocked stands. Stands have been taken by Beatties of London, Model Hobby Consortium, Myfords Ltd., Graham Farish Group Sales Ltd., The Turntable, Kennions, Traction Engine Enterprises, Wall Models, Historex, Mainstream Productions Ltd., Plaistow Pictorial, with others to follow . . .

SOUVENIR GUIDE

Another CHRISTMAS EXTRA issue of *Model Engineer* will be coming out 2nd Friday in December with entries, trade stands, articles galore to assist the visitor and solace the stay-at-home.

FEATURES

RADIO CONTROL POOL
CAR RACING CIRCUIT
MODEL STEAM PLOUGHING
PASSENGER RAILWAY
MODEL TANK OBSTACLE COURSE
MODEL STEAM THRESHING
ELECTRIC POWERED AIRCRAFT

PARTIES

Many clubs will be organising parties to come. We shall be very happy to welcome them, give them reduced price bookings, also book up party lunches, teas or other meals well in advance.

Single and small number pre-booking tickets are available from these offices at Adult 4s. 6d. and Child 2s. 6d. Parties of more than ten: Adults 4s., Child 2s. Admission at the Pay-box is: Adults 5s., Child 3s. Any youngster at school is a child. Under five, admission free accompanied by an adult. Teachers i/c parties free—one per 10 in party.

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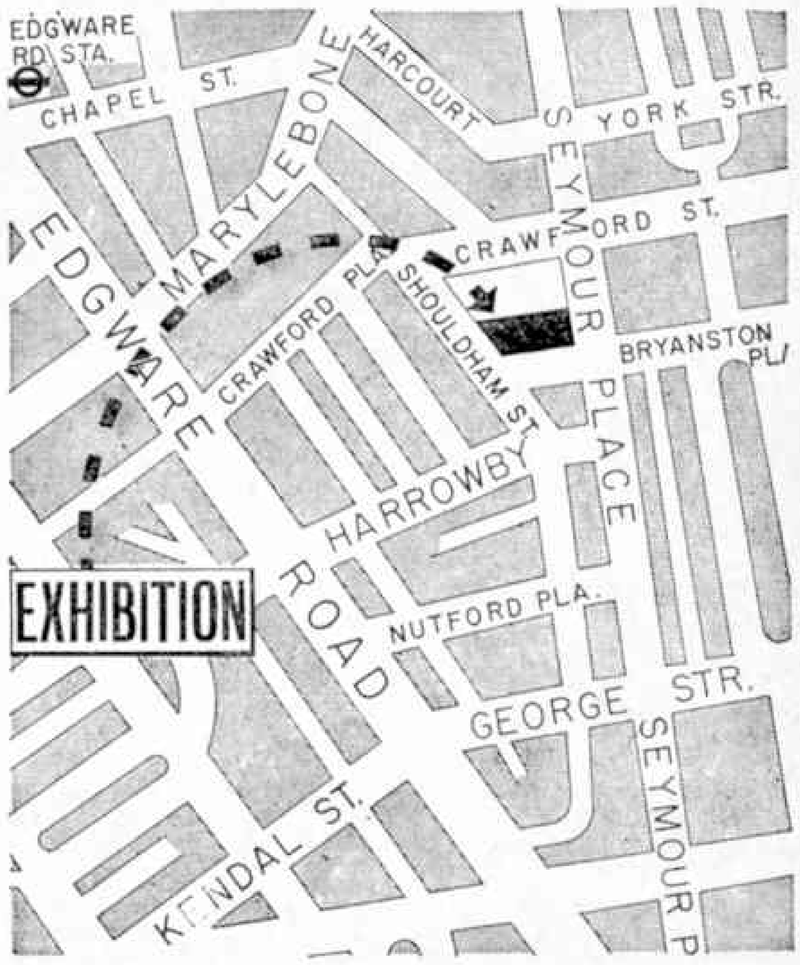

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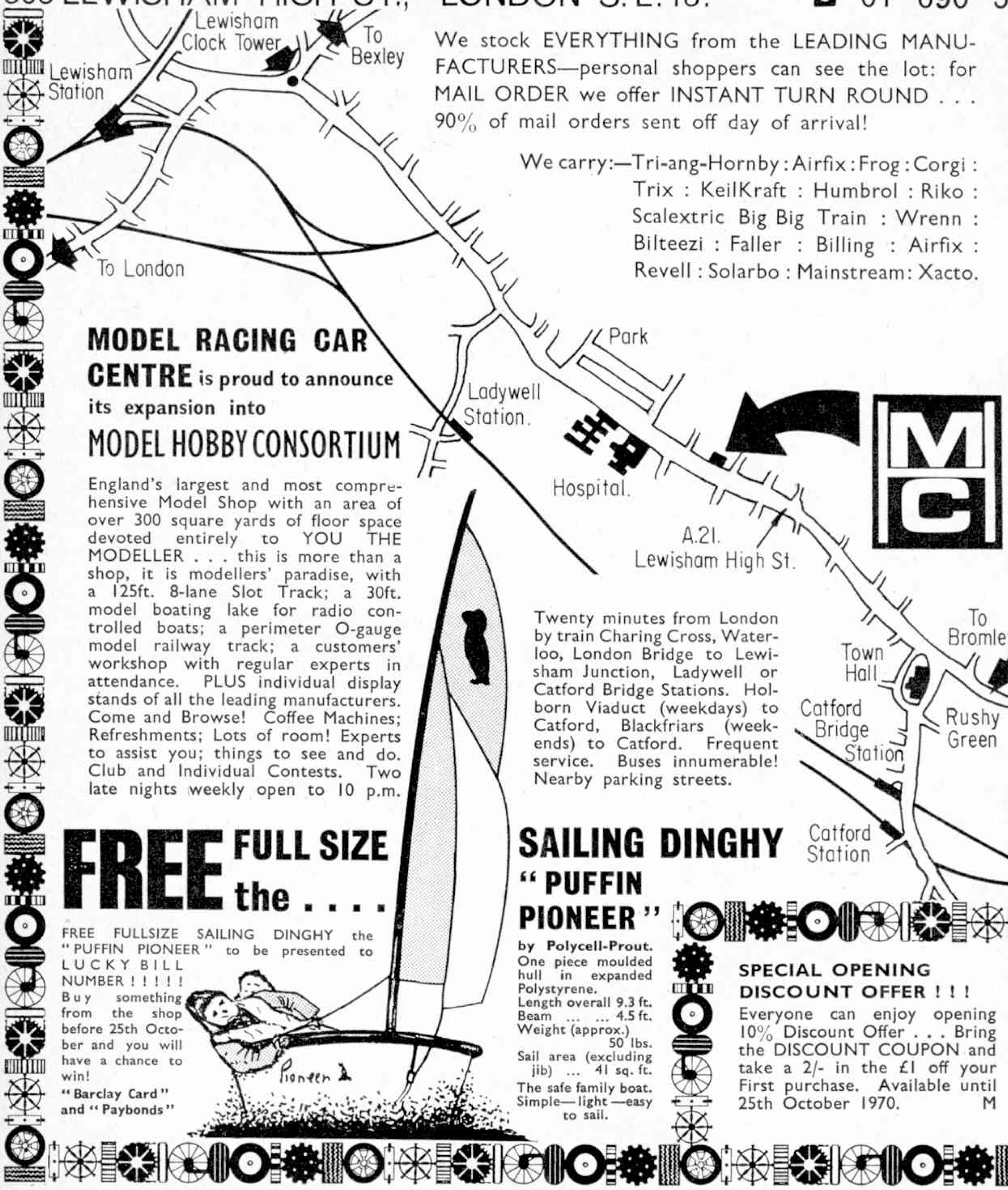

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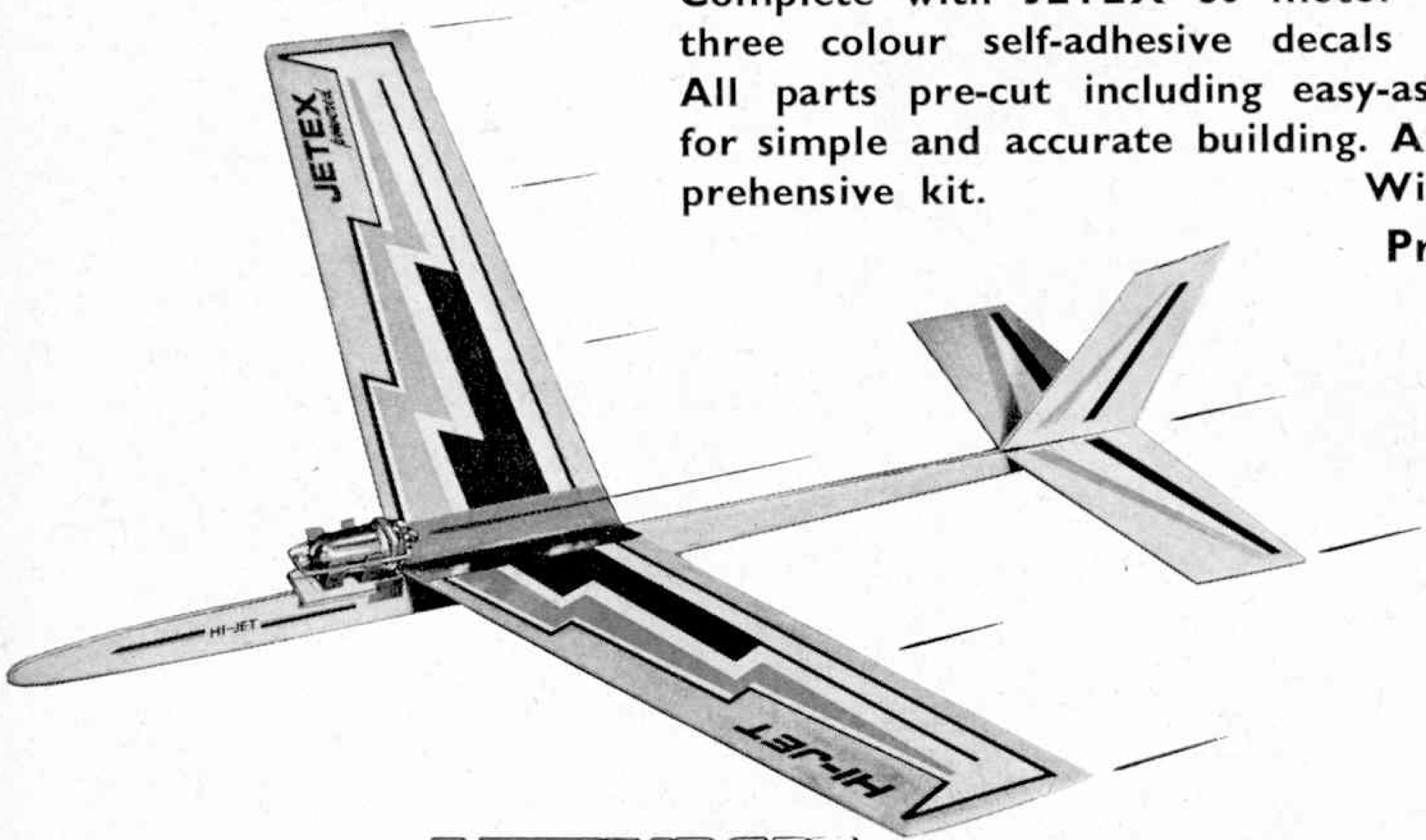

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ON THE EDITOR'S DESK

Many readers may be surprised to learn that plans for our December issue of the magazine are well under way as I write this in the middle of September ! I must confess that trying to work up the Christmas spirit whilst still sitting in warm sunshine requires quite an effort and a fair amount of concentration. However, this is the way things are run in the magazine field, and with thoughts of Christmas and the New Year not too far away, I thought it would be a good time to inform you that once again the Model Engineer Exhibition is fast approaching.

The venue for this year's Exhibition is once again the Seymour Hall, very centrally located in London and within easy reach of all the Main Line Stations for those intending to visit us from out of Town. We are making a special effort this year to provide more features that visitors can watch and participate in—some which we have had before and some which are brand spanking new.

Round the Pole Model Aircraft, possibly the most intriguing feature of any model exhibition will be in evidence again this year for the third time, with a lot of new aircraft and all the latest developments in this field. For model car enthusiasts, we have once again a giant size racing track sponsored by the Electric Car Racing Association, and we are informed that this year's track will be installed in a larger hall in order to give more room to both competitors and spectators alike.

The Boating Lake for radio controlled models which made its debut at our last Exhibition will also be back again and this year a larger variety of models to watch and have a go at will be provided. I hear that *Mainstream Ltd.* will be providing a variety of electrically powered models fitted with both single channel and multi channel outfits and we believe that they will also be featuring a tiny 12 in. long Hydroplane with a pretty impressive performance.

At last year's Exhibition, it soon became apparent that many of our visitors were intrigued with a model radio controlled tank (which was kindly loaned to us to let visitors use) and so this year, arrangements have been made for a large number of working model tanks as an additional feature.

Three obstacle courses for remotely controlled tanks are at present under construction here at M.A.P., using the superbly detailed Tamiya Tanks of 1/25th scale which are kindly being supplied by *Richard Kohnstam Limited.* The object of the exercise is to " race " a model tank across a hazardous course/battle field against two others on similar courses, by operating two upright levers, one controlling each track. Strategically placed hazards such as derelict armoured vehicles, shell shattered houses and a narrow Bailey Bridge will ensure that tank drivers have to use cool judgement and a reasonable amount of skill to get to the end of the course first. There are a few other hazards and troubles to be encountered but these must remain secret for the moment, but will provide some very nasty surprises for those that come to the Exhibition and have a go.

Still on a tank theme, Mainstream Productions Limited of Stockport in Cheshire are providing three tanks, once again super detailed Tamiyas but these will be radio controlled with the brand new Mainstream single channel outfit operating Aurton Servos.

On display also will be just about every type of model from aircraft to trains plus, of course, most of the country's leading Model Shops and Suppliers, etc.

I am certain that this year's Exhibition is going to be the best one yet so why not make an effort to come along some time between the 29th December to the 9th January 1971 ? Pay us a visit and see for yourself.

New Super Shop

With an area of over 300 square yards, a remarkable new shop owned by Model Hobby Consortium has now opened in Lewisham High Street, London. From what I hear, it would seem to be something of a modellers paradise with apart from individual display stands from leading manufacturers, it also features a 125 ft. eight-lane slot track, a 30 ft. model boating lake for radio controlled boats and an ' O ' gauge model railway track, a customers work shop and for those who have finished browsing, coffee machines and refreshments. Visitors to the shop who arrive before October 25th will have a chance to win a full size sailing dinghy as a special opening treat. Further details can be found on page 583 of this issue.

More Exhibitions

The South Manchester Models Club are holding their annual Exhibition of models from Friday, 13th November, until the 15th November inclusive in St. Albans Church Hall, Lindsell Road, Broadheath, Altrincham, Cheshire. Admission is adults 2s. and children 1s. and the times of opening are as follows:—

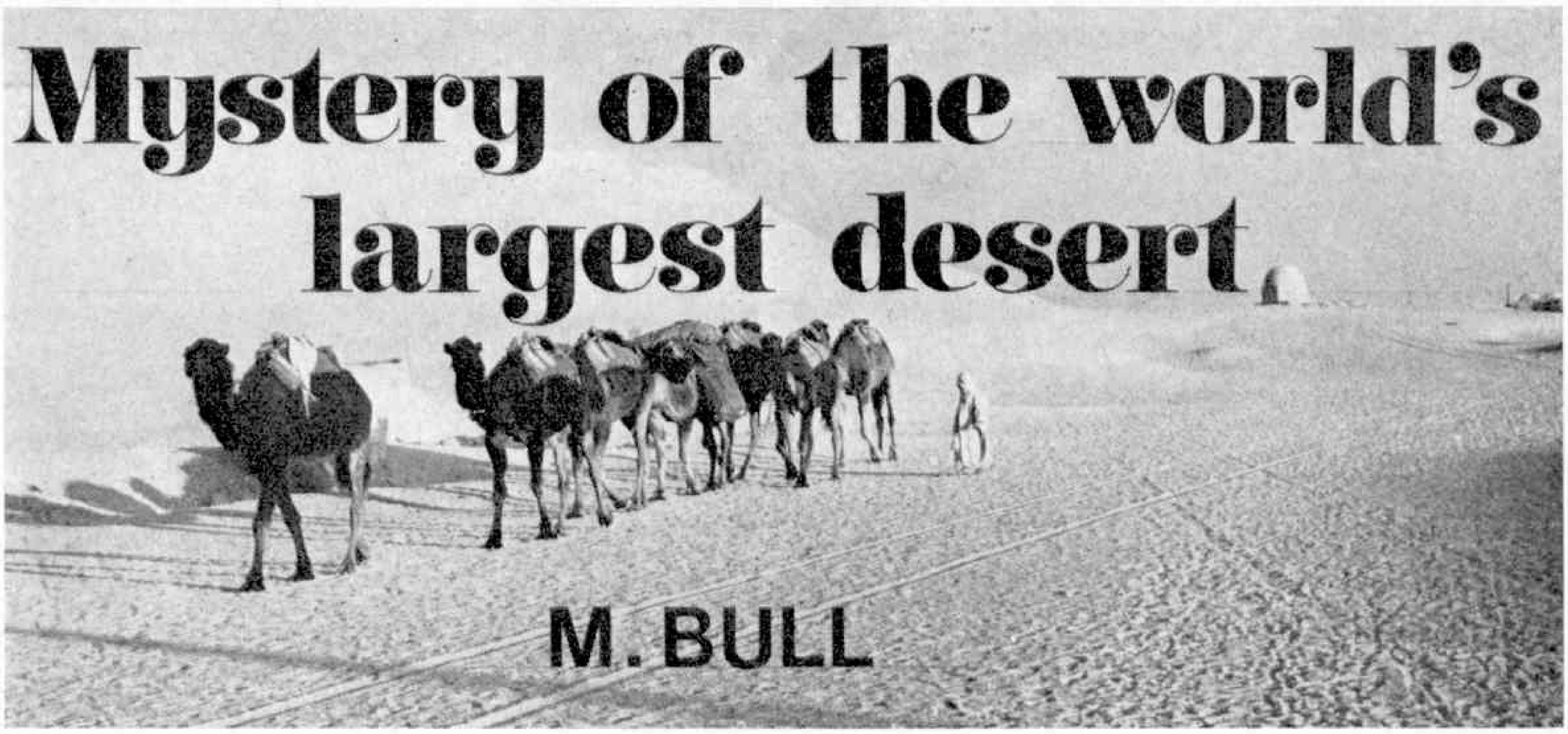
Friday	18.00	until	21.30
Saturday	10.00	,,	21.30
Sunday	11.00	,,	20.30

Models on view will include Railway Layouts in ' N ' OOn3, OO, on the electric side and 3½ in. to 5 in. gauge live steam locomotives operating on a passenger carrying track. Also on show will be model tracks and engines, aircraft, trams and a wide selection of Model Boats. Readers in the Manchester area will probably find this a worthwhile visit and if anyone has any enquiries, they should contact B. Billington, 18 Cholmondeley Avenue, West Timperley, Altrincham, Cheshire.

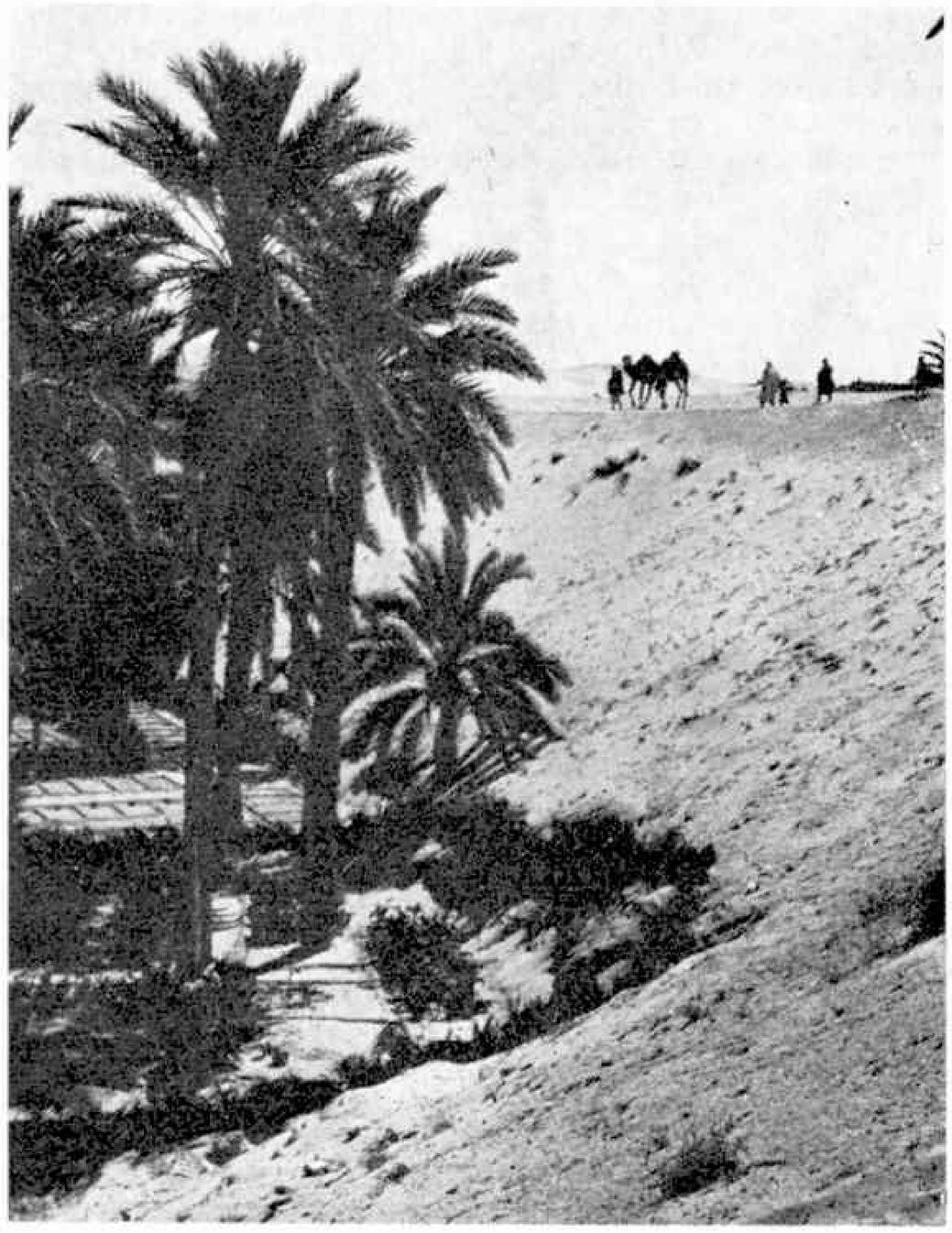
The Norbury and South London Transport Club

The Norbury and South London Transport Club are holding their annual exhibition at the Stanley Halls South Norwood Hall, London, S.E.25, on Saturday, 14th November, from 10.00 hours to 19.30 hours. Admission is adults 2s. 6d. and children 1s. 6d. but tickets bought in advance from Mr. A. G. Eggby, 137 Strathyre Avenue, Norbury, S.W.16, will cost only 1s. Unfortunately, the club didn't send further details on what was going on, but I believe it could be well worth a visit for anyone in the area at a loose end on that day.

Mystery of the world's largest desert



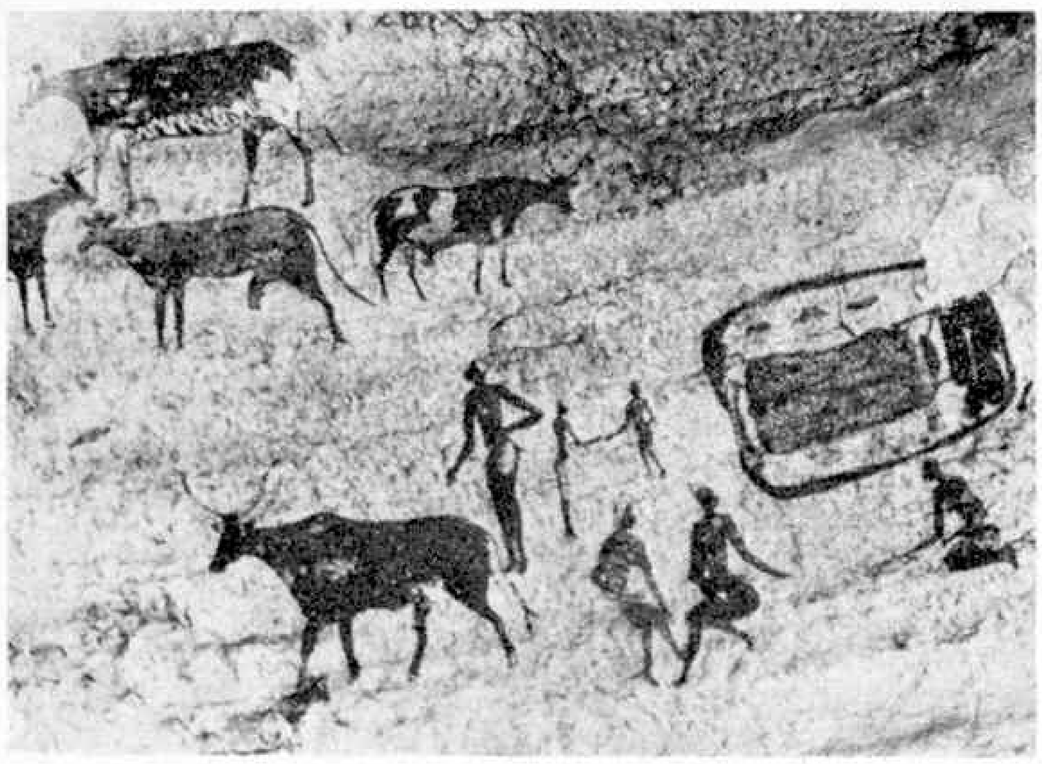
WHY DID THE THREE-AND-A-HALF million square mile Sahara—Sahara in Arabic means wilderness—become desert? The answer may soon be found. Early this year a team of international scientists, members of the Air Mountain Expedition, spent some time there. Their strangest find was a skeleton thought to be a neolithic cow. Their discoveries indicate that the Sahara—covering one-third of Africa—was inhabited some 60,000 years ago, while the extraordinary library of rock paintings discovered this century in the Tassili mountains, shows that there were people with cattle and horses living there only some five to six thousand years ago. Today the only domestic animal is the camel, yet none are shown in these drawings. But among the wild animals drawn so realistically are giraffes, rhinoceros and hippopotami which have long since vanished from that part of the continent.



Professor Rhodes Fairbridge, a geologist of Columbia University, U.S.A., believes that the Sahara was the Earth's south pole some 450 million years ago. If so, it must have gradually tilted on its axis. Proof would be given if the polar regions were found to have been tropical. Over-grazing by the nomads' herds could be another reason for this vast area, spreading from the Atlantic to the Red Sea, becoming desert. Less than two thousand years ago North Africa was wooded. Libya, Tunisia and Algeria were called Rome's granary. Now they have to import cereals. Worse still, the desert is yearly encroaching on the fertile land around it. This trend may gradually become reversed. Geologists, oil-men and scientists have not only discovered oil and natural gas, but great underground water reserves. A British drilling team has found sweet water at a depth of 2,700 ft. beneath Kufra Oasis in south Libya. From the wells they drilled several hundred acres of barren land have been irrigated on which wheat and alfalfa are growing well despite the sun's heat and the occasional sand storm. It was also found that spraying dunes with petroleum prevented them drifting. Moisture and warmth are conserved so that trees can grow. This has been done successfully in several areas.

At Hassi Messaoud, an Algerian oil town several hundred miles within the desert I saw what could be done with water, fertiliser and split cane shelters. Weeping willows, eucalyptus and acacia, flowers and vegetables were growing profusely despite the rugged climate which is so hot in summer that, even with air-conditioning, the oil men are not allowed to keep their families there between May and October.

Heading: Unloaded camels plodding beneath a high sand dune. Left: Traditional oasis complete with palm trees!



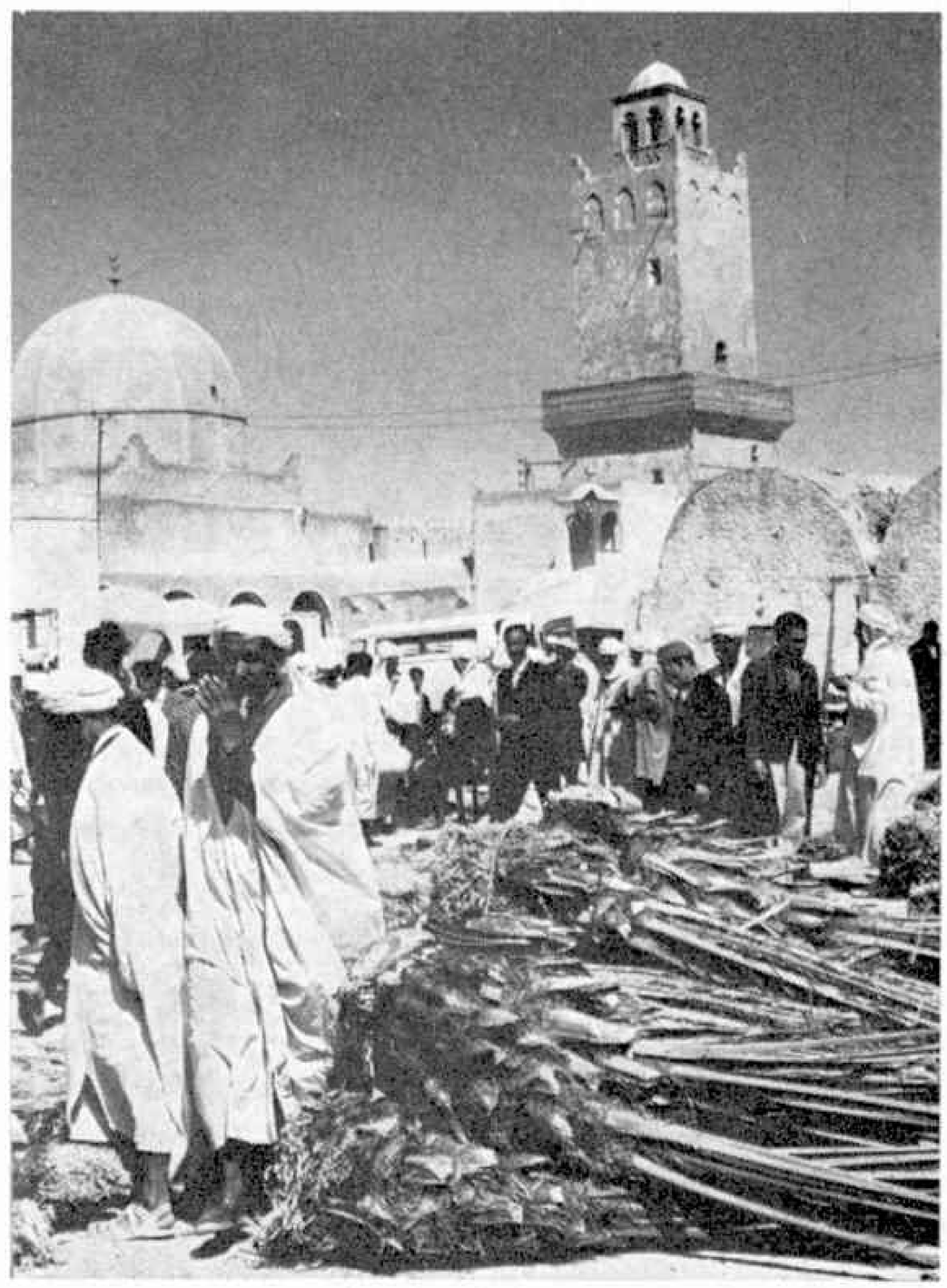
Rock drawings by an unknown people many hundreds of years ago—when the desert provided grazing. . . .

The Sahara isn't a flat expanse of dunes. In the north the chott (large salt pans) are below sea level while the Tibesti and Ahaggar mountains rise to 11,000 ft. and are sometimes snow-capped. Geologists believe that extensive areas were submerged by sea during Cretaceous times. However, the sand found there now isn't of marine origin but has been caused by wind erosion.

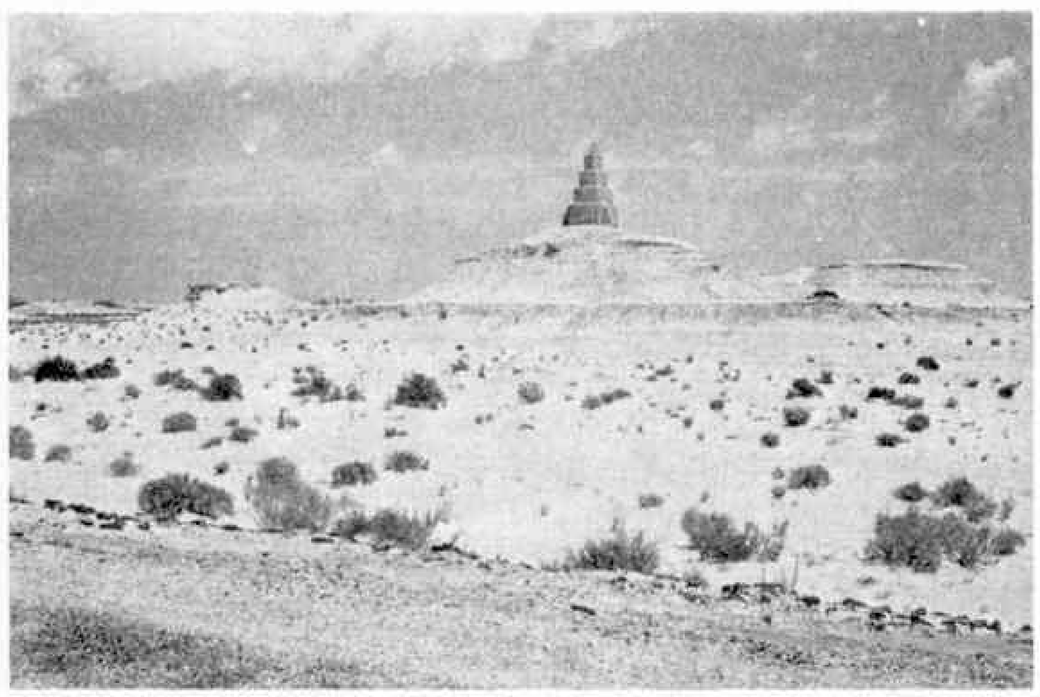
The Sahara has three different kinds of surface; the Erg are basins covered with sand dunes, some of them several hundred feet high; the Reg are plains covered with gravel, pebbles and boulders and the Hammada which are plateaux with bare rock outcrops, deeply eroded gorges and dry wadis (rivers). The Tanesrouf —Land of Thirst—is one of the hottest places on Earth, summer temperatures rising to 136.4 deg. F (58 deg. C), and dropping sharply at night. The reason for this is the ground's rapid loss of heat caused by low air humidity, often less than 10 per cent. Rainfall is erratic, the worst areas only getting a shower once every few years. At Tidikelt it has only rained once in the last decade. But the desert isn't totally devoid of vegetation or animal life. The least moisture and a variety of herbs and small, tough plants spring up to wither as quickly. Permanent vegetation includes the 'betoun' (Atlantic turpentine tree), the tamarisk whose bark is used for dye, and the thorny jujube. It is thought that oleander and tamarisk grew there before palms, which are now considered traditional desert trees. These were probably introduced, along with the camel, by Arab nomads from the Middle East some fifteen centuries ago.

Actually palms need a lot of water under their roots. Although there may be little surface water in many oases, there is plenty not far down. Without this graceful tree few humans could live in the desert. It provides building and fire wood, its fronds are used for thatching, weaving baskets, cord and mats. Its dates are the nomads' staple diet while the heart of the shoots are eaten like celery. Coffee substitute is made from date stones which are also used for fuel. Poor quality dates are fed to goats and camels.

Desert animals include antelopes, gazelle and wild goats but the ostrich is now scarce. There is also the fennec, or small desert fox with very large pointed ears. There are also pests. It is the locusts' breeding-



ground from whence this terrible scourge spreads to the fertile lands around its borders. Modern scientific methods are at last controlling this recurring menace. There is the deadly horned viper and the scorpion, and lizards, flies and ticks. Today three great ethnic groups live there. The mountainous centre is inhabited by the Touareg, the People of the Veil who are also called the Blue Men because they wear dark blue draperies and veils across their faces whose dye



Above: Souk day in the Algerian oasis town of El Oued. Note young date palms for sale—thinking of starting an oasis ?

Left: A gamera, or stone cairn, erected to mark the desert tracks in south Algeria.

Algerian students in their college " quad " in a desert outpost. It can be very cold—hence the heavy *burnous*.

often stains their skin. These veils protect them from wind-blown sand and the glare. They are very tall, proud warriors, these swarthy men, who still wear heavy swords and ride swift camels. The southern desert dwellers are negroid. They are divided into three social ranks; the free men who own palm groves, herds and so on; the Haratin who are tradesmen, and the slaves, for slavery still survives in isolated areas. In the north live the white Arabs. Some are nomads, the rest live in oases.

With the 1956 discovery of huge reserves of oil and natural gas all along the northern part of the Sahara, man has set out to tame the desert. Oases formerly reached by caravan after weeks of travel are now linked to the outside world by regular air services. Good roads have been built across trackless wastes and every year they penetrate further. Now, with United Nations' funds, a project to construct a trans-Sahara highway is being examined. This huge undertaking would cost millions of pounds which would have to be paid by the countries who would benefit most. The highway would link the port of Algiers, and perhaps a Tunisian port also, with towns in the Republics of Mali and Niger and south to Nigeria.

If constructed, the highway would allow raw materials and manufactured goods to flow between the countries of North and Central Africa, until now separated by the great desert barrier. The scientific exploration of the Sahara would be facilitated, for many areas are as yet unsurveyed. Until then, the long caravans of plodding camels will continue to transport goods, chiefly salt and ivory. They used to carry black slaves, gold and materials.

Driving across the Sahara can still be dangerous. The Algerian authorities' booklet " Crossing the Sahara " describes three north/south routes, the only really possible ones. Advice as well as the rules to be observed are given. Motorists must report to the authorities before starting and can only go if their vehicle and equipment are adequate. Then they must check in and out of each outpost. On some tracks motorists ' go at their peril ' and would have to pay for being rescued. On others, vehicles must go in convoy. A basic rule of desert travel is never to leave one's vehicle, even to get help. A car is easier seen from the air or from a distance than a person, that is provided someone knows of your journey. Otherwise thirst and sunstroke quickly kill the imprudent. But with a tough 4 wheel vehicle properly equipped, crossing the Sahara isn't very difficult. *See Sahara Safari in last month's issue.*

There is still another way. By sand yacht. This was done last year by 12 yachts taking part in the Weekend Telegraph sponsored rally which met with all kinds of adventures before finally, and triumphantly, making it. However, the great Sahara isn't conquered yet. It still offers many challenges to the scientist and the traveller.

WANTED—AN UNPICKABLE LOCK

by E. V. Malone

ONE OF THE MOST INDIVIDUAL of all trades is that of the locksmith. Apprenticeship is for seven years, but no one is considered qualified without another ten or twelve years' experience. This is not surprising when it is realised that the famous Bramah lock, a pioneer in the field, had some millions of secret combinations.

Joseph Bramah, one of the greatest names in the history of locksmiths, was an inventive genius. He was born at Stainborough, in Yorkshire, on April 13, 1748. Intending to become a farmer, the *fortunate* accident of a broken leg sustained at a village fair confined him to the house. The enforced leisure gave his fertile brain an opportunity to travel along other lines. Soon he was inventing anything from a machine to cut quill-pens to an hydraulic press; from a fire engine rotary pump to a screw propeller.

The lock that bears his name was patented in 1784 in answer to an epidemic of London burglaries. Not only had he to make a lock that would defy the cleverest cracksman, he had also to invent first delicate precision tools and machinery to make their manufacture possible. Eventually, he produced a lock that justified his claim that it was " impregnable as the rock of Gibraltar." He offered, indeed, 250 guineas to anyone who could pick or open the masterpiece.

For 56 years it was unpicked and believed to be unpickable. Then after he had been dead nearly 40 years, a young man called Hobbs from America came to the Great Exhibition in 1851 and picked the lock in 16 days, but only with the aid of special tools which had taken him 14 days to perfect. This dispelled the dream of an unpickable lock. A present-day locksmith who has opened well over 1,000 safes declares that, " Anything that's made can be unmade. All that the safemaker sells is time."

Time is what the safe-breaker is lacking, for the longer it takes him to do his job, the greater the risk of capture. Master locksmiths consider that a lock is practically pick-proof if a good workman cannot open it at the workbench in five hours. Crooks do *not* open safes and strong rooms in the short time shown on the screen and in thrillers. They have a kind of sixth sense that gives some hint of the possible internal mechanism of the lock. The thief who works successfully has probably studied that particular kind of lock beforehand or has a copy of it.

It does not follow that the more complex a lock is,

(Continued on page 589)

THE UNIVERSAL POSTAL UNION

by James A. Mackay

ONE OF THE THINGS which we tend to take for granted is the delivery of letters from one country to another. A fair amount of my mail comes from outlandish, faraway places, from the South Pacific and the Himalayas, from central Africa and Saudi Arabia. My correspondents know that, once they have put the correct amount of postage in stamps on their letters they will eventually arrive safely at their destination without further trouble, and without my having to pay anything extra on receipt. This state of affairs, however, is relatively modern. A century ago a letter from a South American country to England, for example, would have borne stamps of that country which would have prepaid the postage merely to the nearest seaport. There British stamps would have had to be added at a British Packet Agency and then the letter could be carried across the Atlantic to Britain. Envelopes bearing the stamps of more than one country, known to collectors as " combination covers ", are highly prized nowadays, but they must have been a bit of a headache to the senders and recipients of letters. Various countries arranged eleborate postal treaties with each other, agreeing to handle mail addressed to each other, and gradually a system of international mail handling was established.

The first man to envisage a postal system embracing the whole world was an American, Montgomery Blair, who acted as chairman at a postal conference held in Paris in 1863. The centenary of this important meeting was celebrated by stamps issued by several countries including Britain. The United States issued a stamp bearing Mr. Blair's portrait. Blair died before his ideas could be put into practice, but they were adopted by the Postmaster General of Prussia, Dr. Heinrich von Stephan, whose experience in welding together the multitude of postal administrations in the kingdoms, principalities and duchies of the German Empire enabled him to propose a General Postal Union, ten years after Blair's plan. This Union was formally inaugurated in October 1874 at Berne in Switzerland and five years later it changed its name to the Universal Postal Union. In the beginning the Union had only 22 member countries; today almost every country in the world adheres to it and today it has 142 full members covering every part of the globe.

The member countries agree to accept the mail of every other country, a complicated accounting system being adopted to adjust the payments which are due to or from each of the contracting nations. The permanent headquarters of the UPU are in Berne to this day and it is interesting to note that the International Bureau of the Union issues its own stamps, for use on its own correspondence with member countries.

The UPU holds a Postal Congress every five years, a different country acting as host. The first four congresses, held in Paris (1878), Lisbon (1885), Vienna (1891) and Washington (1897) did not produce any philatelic souvenirs, but for the 1900 Congress held in Berne, Switzerland issued a set of three stamps as well as special postal stationery. No stamps appeared for the Rome Congress in 1906 and no further congresses were held till 1920, on account of the First World War. For the Madrid Congress of 1920 Spain issued 12 stamps, while the Stockholm Congress four years later had no fewer than 15. Britain was host to the 1929 Congress and issued a set of five stamps—including a £1 stamp showing St. George and the Dragon. The Tenth Congress, at Cairo in 1934, resulted in fourteen Egyptian stamps, while the last pre-war congress, at Buenos Aires in 1939, resulted in a set of eight from Argentina.

Paris was the venue for the 1947 Congress and France released five stamps. Two years later a special meeting was held at Berne to mark the 75th anniversary of the Union, and Switzerland released a set of three stamps for the occasion. In 1949 almost every country issued stamps in honour of the UPU—about 700 stamps altogether ! More recent congresses have been held at Brussels in 1952 (12 stamps), Ottawa in 1957 (two stamps), Vienna in 1964 (eight stamps) and Tokyo in 1969 (four stamps).

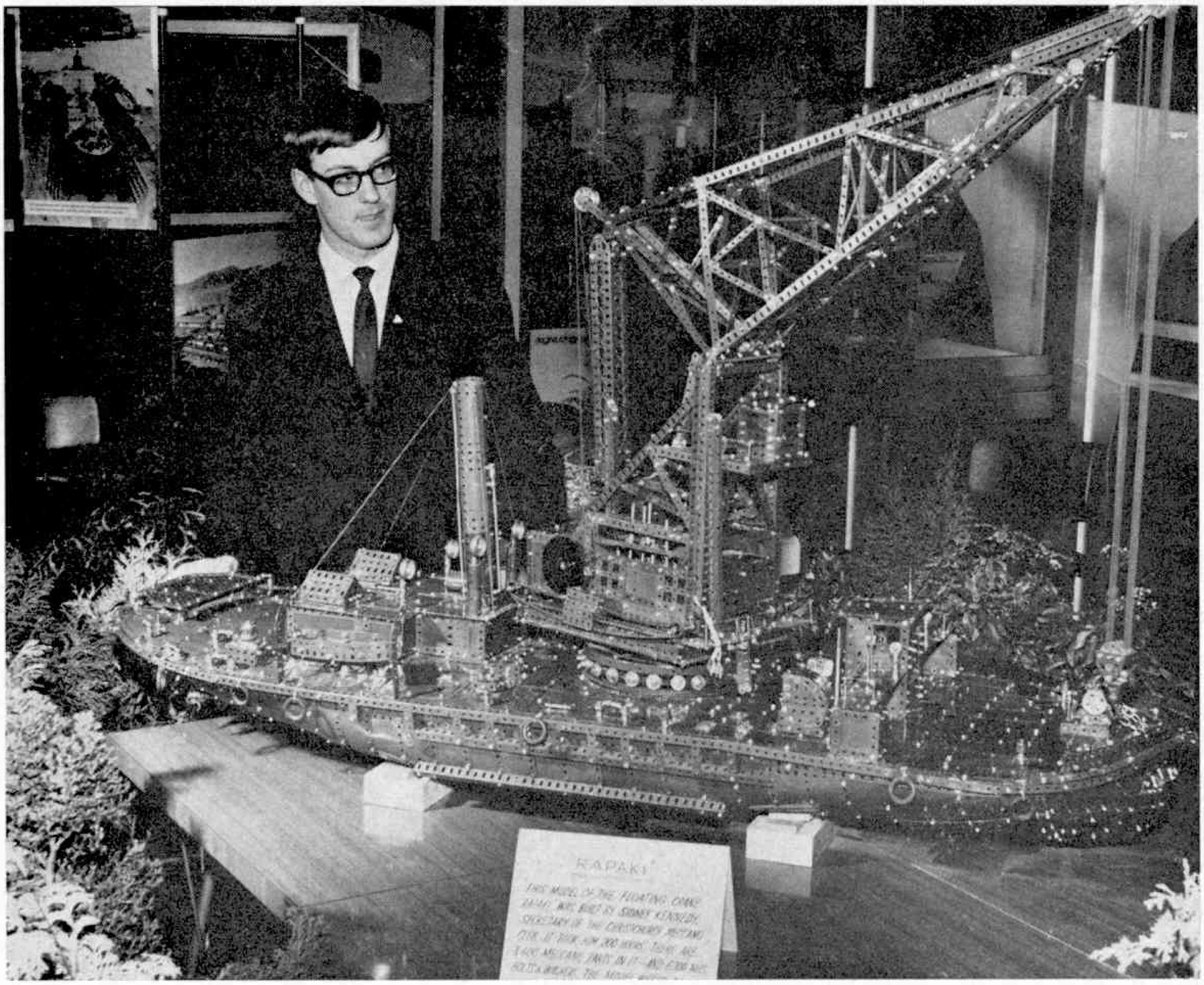
The premises occupied by the International Bureau were felt to be inadequate and a new building was constructed at a cost of 20.5 million Swiss francs. The seven-storey block was opened officially on May 20th of this year and as well as offices contains an exhibition hall, library, philatelic museum and a restaurant. Many countries have issued stamps to commemorate the opening of the new building and a selection of these is illustrated here. With less than four years to go before the Union celebrates its centenary I can predict that there will be an even greater spate of stamp issues in the ensuing period.

WANTED—AN UNPICKABLE LOCK

Continued from page 588

the safer it is. Often the old-fashioned hand-made type requires more ingenuity and patience in picking. There has always been a race for supremacy between locksmiths and lockpickers. But despite some successful attempts that have bountifully enriched the evildoers, the locksmith has always maintained his lead.

Scotland Yard has nearly a ton of picklock implements, booty taken from thieves and suspects.



"Contest '70" Results

by Spanner

First Prize in Section B of " Contest '70 " was won by Mr. Sidney Kennedy of Christchurch, New Zealand with a highly accurate and completely unique model of the Lyttelton Harbour Floating Crane " Rapaki ". Mr. Kennedy is pictured here with his model at an exhibition in Christchurch.

ONCE AGAIN IT IS MY PLEASANT duty to announce the names of the prize-winners in the last Meccano Model-building competition—rather late, I am afraid, but the delay was unfortunately caused by circumstances beyond my control. All winners, however, were notified by letter some time ago and so they, at least, did not have quite so long to wait.

Before listing successful entrants, I would like to report, generally, on the Contest which was both disappointing and pleasing at the same time. The disappointing side lay in the fact that the total number of entries was rather lower than normal, but I suspect that we were to blame for this. The competition was not as well publicised as other competitions have been in the past and, as a result, I am sure that some prospective entrants did not hear about it in time to build a suitable model for entry. Our problem in this particular case was that Magazine space has been in such short supply throughout the year that we have had to concentrate on utilising what space was available for interesting complete Meccano and other articles, at the expense of other things. Never fear, though, we have every intention of continuing to run competitions in the future and you may be sure that these will all be publicised to the full.

Coming to the pleasing side, this undoubtedly lay in the tremendously high standard of modelling evident throughout both Sections of the competition. The majority of entries, with very few exceptions, were themselves up to accepted prize-winning standard—so much so that the judges had to be especially critical in choosing the winners. I know I seem to say something similar after every competition, but all indications are that the models entered get progressively better with each contest. This, of course, makes the judging more difficult, but at the same time, it makes the task far more enjoyable.

A point which I am very pleased to mention is that, for the first time I can remember, all entries were correctly presented, i.e. they were all properly marked up with the name, address and Section letter of the entrant. Also, most entries were accompanied by very comprehensive written outline details of the models and, although these were not a condition of entry, they did help the judges a good deal. Most models submitted were illustrated photographically, but there were some sketches and diagrams, all of which were perfectly clear. Indeed, a great deal of time and trouble had been taken in the majority of cases, all of which created a good impression with the judges.

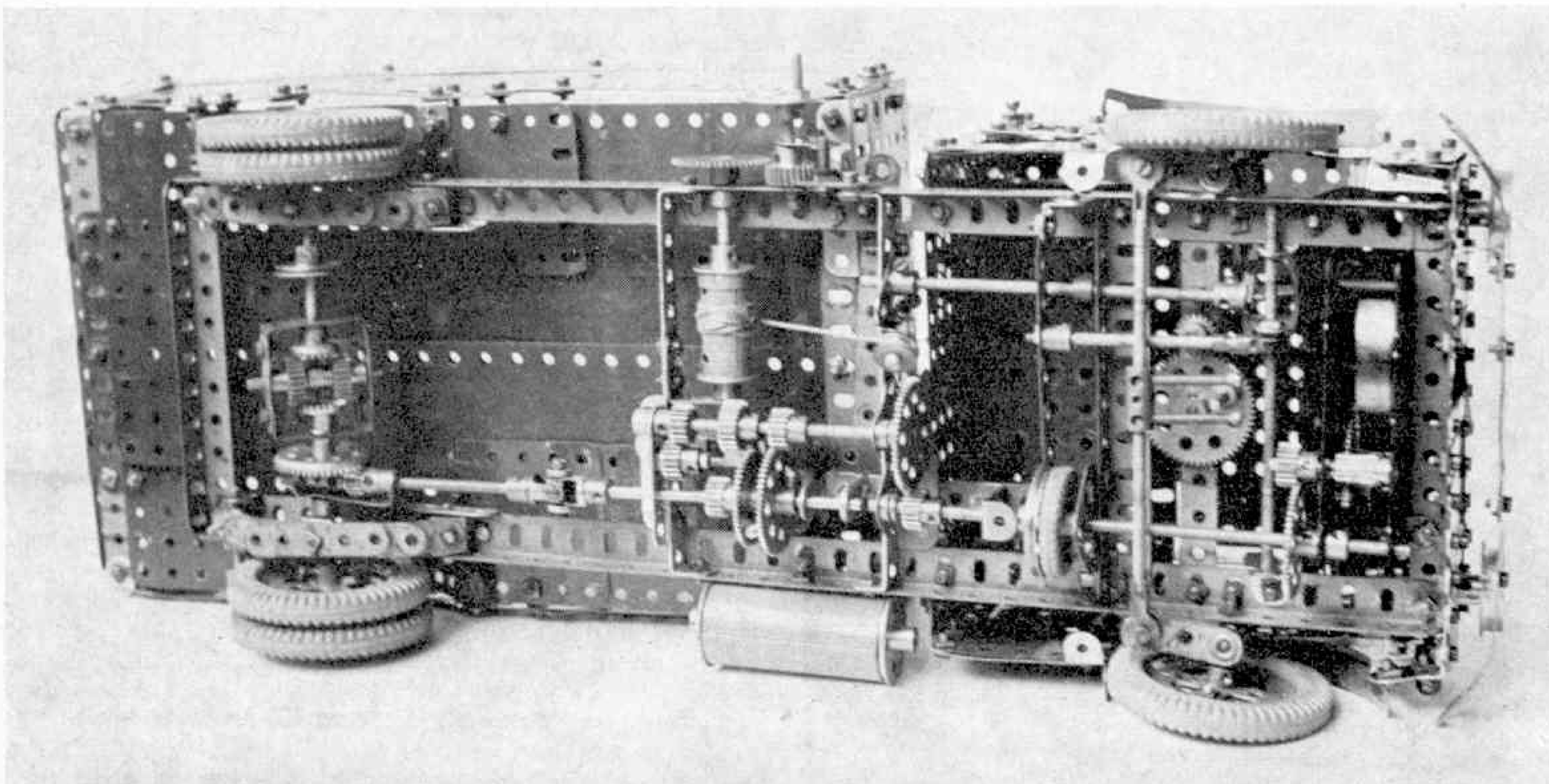
Perhaps most important of all, Meccano "Contest '70" can claim something which I believe to be unique in Meccano competition history. As far as I can trace, it is the first competition we have held in which there has been a joint runner-up in any section.

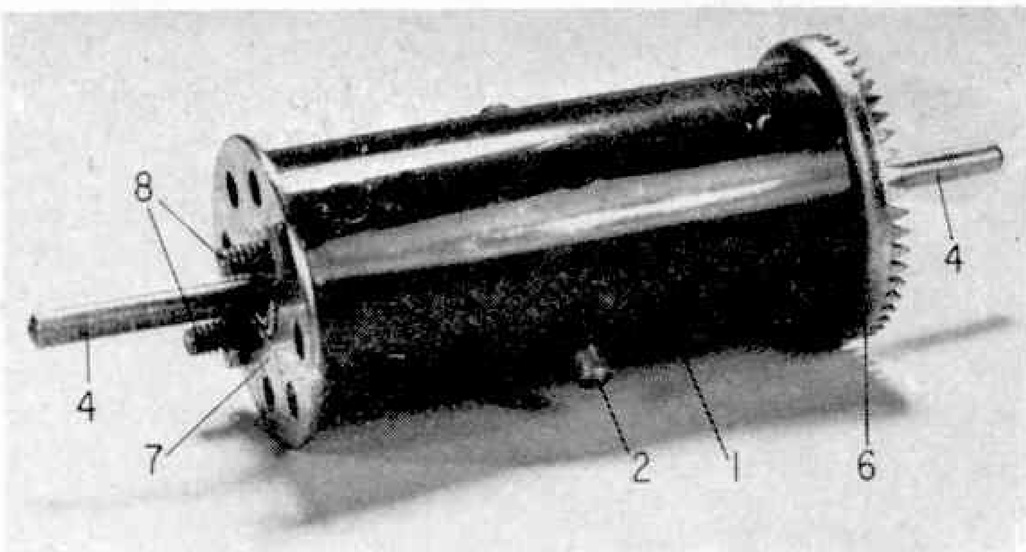
Always in the past, there has been one 1st prize, one 2nd prize, and one 3rd prize, plus a selected number of consolation prizes in each section, but on this occasion the judges decided unanimously to award two third prizes in Section B! The additional winner was Miss Heather Burton of Norwich, Norfolk, with a very good model of the "Britannia" Class Locomotive "Oliver Cromwell". The accompanying illustration of the model indicates that it might well have gained a prize on its own merits but the judges were mainly moved into taking this unprecedented step, not specifically on the model's attributes, but because it was built and submitted by a member of the fair sex! There may have been unsuccessful entries that were technically as good, but the judges take many things into consideration and it is certainly most unusual for a Meccano competition entry to be submitted by a young lady. The judges therefore felt that a special prize was called for, additional to the usual prizes to keep everything fair and equal throughout. I fully agree with them, and my sincere congratulations go out to Miss Burton. Indeed, I congratulate all winners, while at the same time hoping that unsuccessful entrants will not be too disheartened. There is always the next time!

Prize-winners were as follows: Section A: 1st, Reiner Forsati, Cape Town, S. Africa; 2nd, Colin Watts, Sale, Cheshire; 3rd, Neil Pluck, Christchurch, New Zealand. Consolation Prizes: Leslie Huett, Upminster, Essex; Martyn Brown, Leyland, Lancs; Clive Weston, Bradford, Yorkshire; Graham Brown, Leyland, Lancs; Stephen Ashford, Cookham, Berks; John Turton, Ramsey, Hants; Michael Watson, Driffield, E. Yorks; Paul Angel, Hereford, Herts; David Hartland, Taunton, Somerset; Richard McDougal, Pinner, Middlesex.

Section B: 1st, Sidney Kennedy, Christchurch, New Zealand: 2nd, B. Edwards, Kempston, Bedford; Joint 3rd, E. Jenkins, Northfleet, Kent; Miss H. Burton, Norwich, Norfolk. Consolation Prizes: S. Lacey, Hinckley, Leics; Dr. A. Grinnaert, Lens, France; J. Van Raalten De Bili, Holland; Stephen Wilson, Bradford, Yorkshire; Alf Hindmarsh, Lincoln, Lincs; J. Holme, Hemel Hempstead, Herts; Benjamin Walton, Hull, Yorks; F. D. Aria, Via Poona, India; Timothy Ward, Harfield, Bristol; Mr. H. J. Halliday, London, S.E.15.

A detailed model of a "freelance" Heavy-Duty Lorry gained the First Prize in Section A for Reinar Fossati of Cape Town, South Africa. This underside view of the model shows some of the excellent details incorporated.



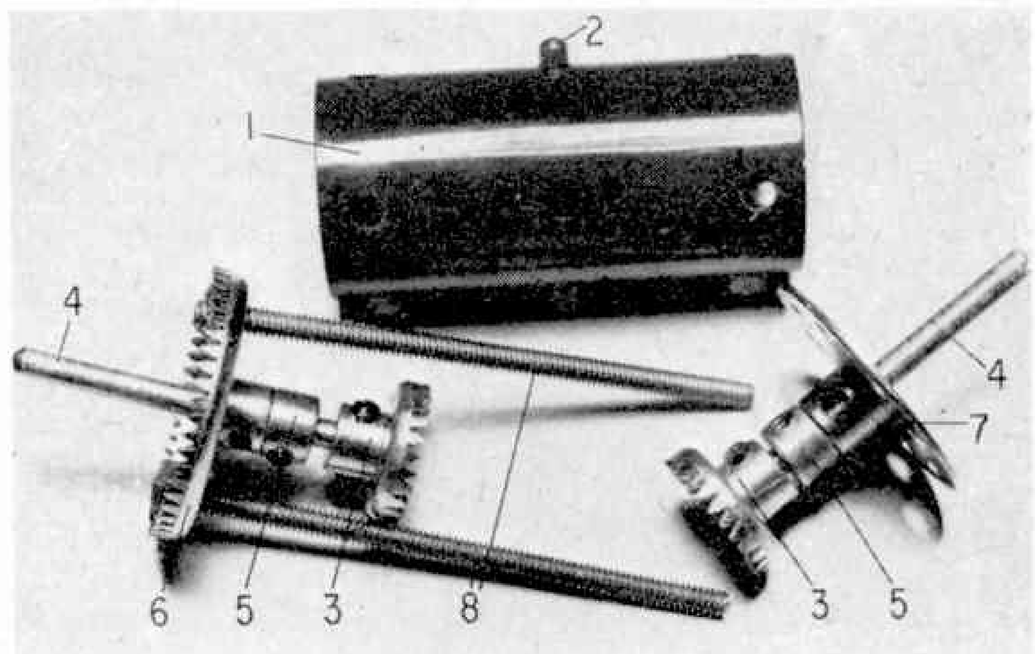


Full credit for this completely enclosed Differential goes to Mr. David Gauld of Dundee, Scotland. Easy to build, it is more realistic in appearance than the standard Meccano construction, yet works equally as well.

The few component parts of Mr. Cauld's Differential. Mounted on Rod 2, inside the Cylinder, are two ½ in. Pinions.

AMONG THE MODEL BUILDERS

with Spanner



Neat Differential

Thanks to the tremendous variety of parts—particularly gears—in the Meccano system, it is possible to build all sorts of interesting mechanisms, many of which can be made tremendously complex and intricate. Complexity aside, though, one of the most useful mechanisms in daily use, is the simple Differential as incorporated in the drive axles of motor vehicles. So frequently is this mechanism, in fact, that a sort of "standard construction" has grown up over the years. This construction has undoubtedly been ideal for its intended purpose, but it has one slight disadvantage in that it is "open", i.e. the component gears are open to view, whereas a commercial differential is fully enclosed.

An enclosed differential is not, of course, essential for most Meccano purposes, but, as the rightful aim of many serious modellers is to reproduce every section of their constructions to as high a degree of accuracy as possible, it is a point that deserves consideration. Mr. David Gauld of Dundee, Scotland, is one modeller who has successfully considered the point, having designed the very neat, totally enclosed Differential illustrated in the accompanying photograph. It is easy to build, effective in operation and beautifully free-running.

The "enclosed" nature of the unit is achieved by a Cylinder 1, in opposite centre holes of which a 1½ in. Rod 2 is journalled. Mounted on this Rod, inside the Cylinder, are two ½ in. Pinions, one fixed and the other loose, each spaced from the side of the Cylinder by a Washer. In mesh with these Pinions, at opposite sides, are two ¾ in. Contrate Wheels 2 and 3, each fixed on the end of a 2 in. Rod 4 which also carries a Collar 5. The end cheeks of the unit are supplied by a 1½ in. Contrate Wheel 6 and an 8-hole Bush Wheel 7 tightly clamped to the ends of the Cylinder by two 3 in. Screwed Rods 8 running between them and fixed in place by Nuts. Rods 4 are journalled, free, in the bosses of the Bush Wheel and Contrate, Collars 5 being so positioned against the inside of the bosses as to keep the ¾ in. Contrates in mesh with the ½ in. Pinions. Drive is taken to Contrate 6. It's simple!

PARTS REQUIRED

2—17	2—26	4—37b	2—80c
1—18a	1—28	2—38	1—216
1—24	2—29	2—59	

Crane Drive Transmission

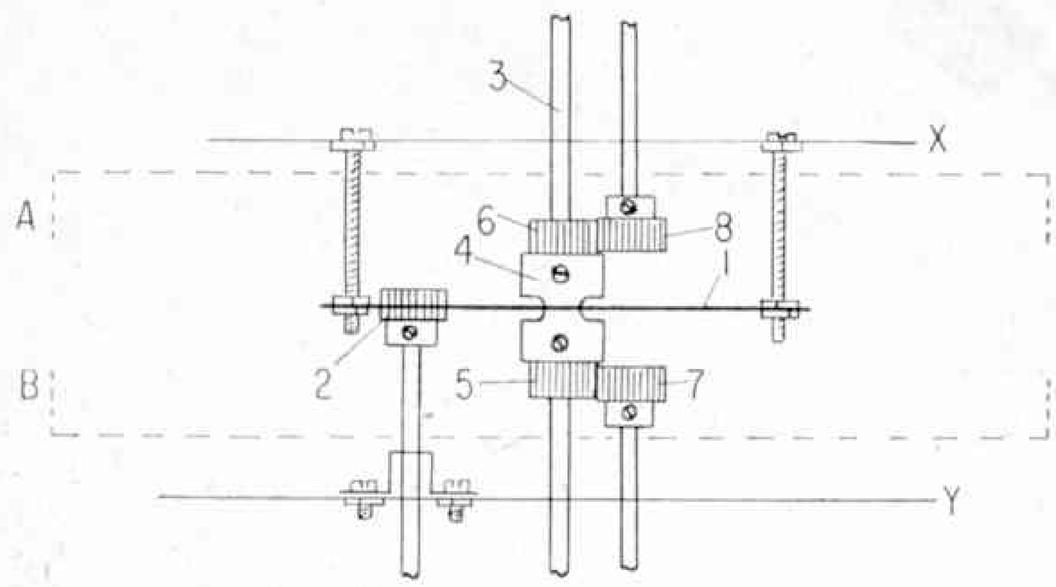
Moving down country from Dundee, Scotland, to Birkenhead, England, we have another very interesting idea; this one, from Mr. Stan Evans of Bevington, Birkenhead, for a method of transmitting a triple drive from a base-mounted gearbox to the swivelling top section of a model such as a dockside or tower crane. It is not the gearbox, itself, but purely the drive transmission system.

In most crane models with a swivelling top section on a fixed base section, the drive for movements such as load hoisting, jib luffing, etc., must be actually housed in the swivelling section of the model as the fact that the section moves normally prohibits the drive from being housed in the fixed base. Mr. Evans' system overcomes the problem by enabling the drive to be transferred from the stationary base to the moving top section, using the method shown in the accompanying diagram (not to scale).

Under operating conditions, the parent model would need to incorporate a roller bearing and it is essential that the "spider" of this bearing have an open centre to accommodate the drive gearing. A suitable spider could be built up from a 5½ in. Circular Girder inside a 7½ in. Circular Strip, the two joined together by 1½ × 1½ in. Double Angle Strips, the lugs of which would serve as journals for the rollers.

Secured by long Bolts or Screwed Rods to the underside of the swivelling section of the crane is a Gear Ring 1, in mesh with which is a ½ in. Pinion 2 on a Rod projecting up from the fixed base section of the crane. This drives the slewing movement of the model.

Coming up through the central pivot point of the model is another Rod 3 which carries the drive for one of the desired top-section movements. Mounted



A diagram of the transmission system developed by Mr. Stan Evans of Prenton, Birkenhead for transferring a triple drive from a base-mounted gearbox to the swivelling top section of models such as Dockside or Tower Cranes. Letters A and B represent the roller race flanges, letter X the underside of the swivelling top section and letter Y the top of the fixed base section.

on this Rod, inside the Gear Ring, is a Socket Coupling 4 in each end of which a ½ in. Pinion is carried, Pinion 5 at the lower end and Pinion 6 at the upper end. This whole assembly is free to turn on the Rod. Meshing with Pinion 5 is another ½ in. Pinion 7 on a Rod bringing the drive from the base source, while a further ½ in. Pinion 8 collects the drive from Pinion 6 and transmits it through suitable linkage to another desired top-section movement. Pinions 6 and 8 operate on the " sun and planet " system so that, no matter how the top section slews, they always remain in mesh. The accompanying diagram is partially " exploded ", but it clearly shows the layout of the gearing and the drive transmission principles involved.

PARTS REQUIRED

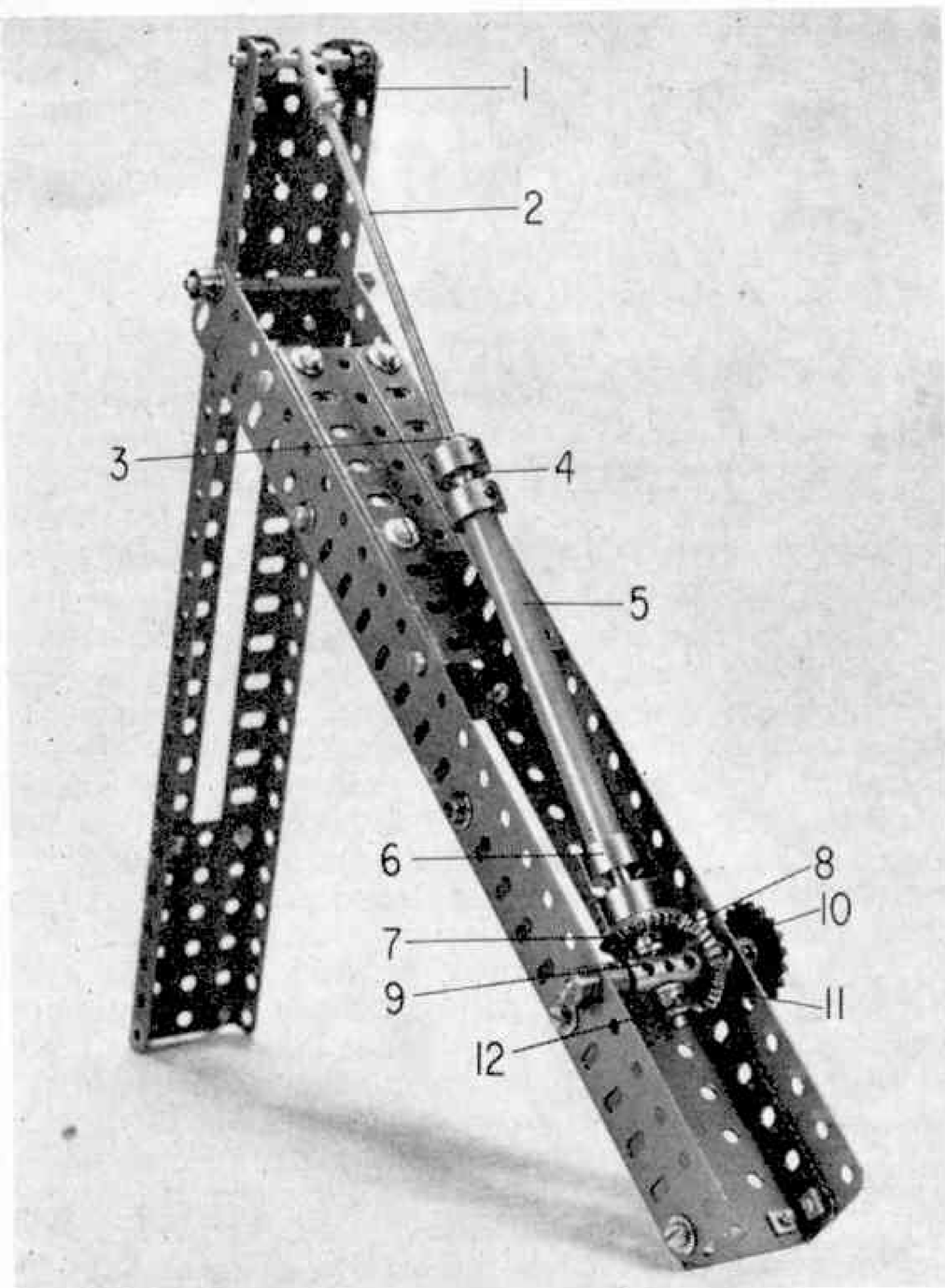
5—26	4—111d	1—171
12—37b		1—180

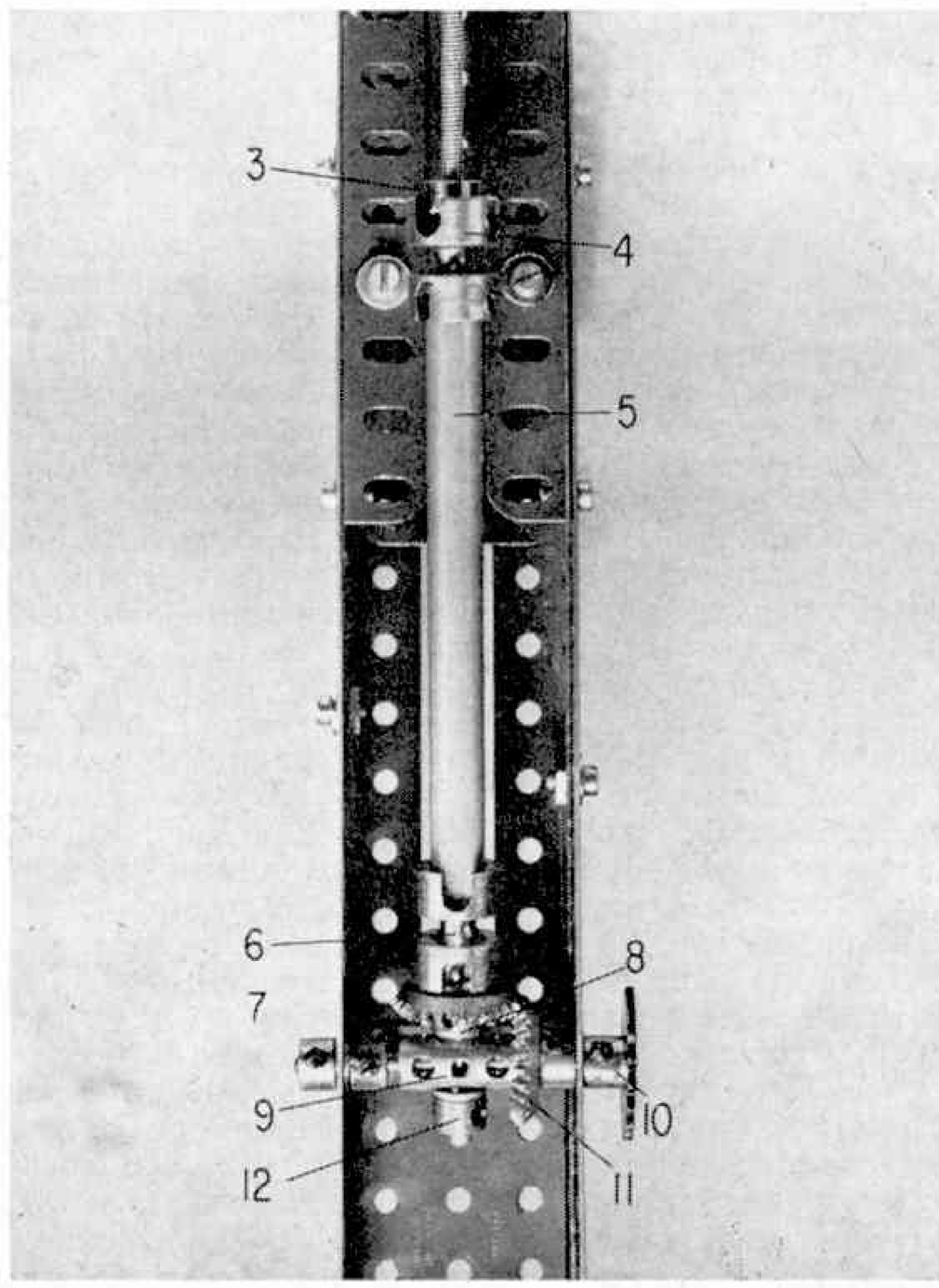
' Hydraulic ' Ram

For our final offering this month we have yet another product from the fertile brain of Mr. Pat Lewis of Formby, Lancs. On this occasion, Pat has come up with a first-class working simulated hydraulic ram: " simulated " because it is not actually hydraulic, but " working " because it operates on the ram principle—and extremely effectively, at that ! Furthermore, it has all the appearances of a hydraulic unit and can be made to operate smoothly and quickly when powered by a motor. The mechanism is ideal for use in advanced models of hydraulic diggers and excavators, etc., and, in fact, Pat has mounted it on a typical digger arm for our purposes. The arm is built up in two sturdy sections from suitable Girders joined by Flat Plates, the main section being pivotally attached to the secondary section six holes from the end of the second section.

(Continued on page 597)

Highly realistic in appearance, but screw-operated, this simulated hydraulic ram for hydraulically-operated Excavator and Digger models was designed by Pat Lewis of Formby, Lancs.





A close-up view of the " ram " showing its uncomplicated, but extremely effective construction.

BATTLE

by Charles Grant

Part XXXI—More About Maps

HAVING ARRIVED AT THE POINT where two opposing forces—the strength of each of which is unknown to the other—are confronted, we now have to set up the situation on the wargame table and proceed from there. Now, a glance at the section of map shown in Part XXX demonstrates that the confrontation took place in the vicinity of the village located in sub-square B.2.1, and this will be the point round which the remainder of the drama unfolds itself.

Before anything else can be done, however, the point concerning the relationship—scale-wise, that is—between map and table must be decided. That is to say, we have to decide just what the actual playing area represents on the map, and how much of the latter will have to be set up on the table. It seems more than likely that some sort of scale will already have been decided upon, and to make the thing as simple as possible, let us say that 1 inch on the map—this being the side of a sub-square, of course, represents a distance of 8 ft. on the table. By a strange coincidence, we find that the table in use is square, each side being 8 ft. in length, so it does not require much thought to see that the area of a single sub-square represents the exact size of the table we have in use. Now, if the contact took place in the exact centre of some particular sub-square, it would be apparent that all we should have to do is to set up on the table the terrain of that sub-square. The event, however, is not always so simple, and, as actually happened in our example, the centre point of the contact was well to the east side of the sub-square in question, so that it would make the action a trifle lop-sided were we to reproduce only that sub-square. What we want, to be fair to all concerned, is to reproduce part of one sub-square, B.2.1, and part of B.2.2. The procedure for carrying this out is not difficult and consists of using a small square of transparent acetate sheet or perspex, cut to the size of the table—that is, 1 inch square—and superimposing this on the map, by the elementary device of sticking a pin through its centre and then on to the point of contact on the map.

So far, so good—when the contact is made, and both players agree, then one sets up on the table the appropriate terrain, hills, woods, rivers, and so on, but with this done, one important thing remains. Here I am deliberately bringing in as many complicating factors as I can—and this one is the question of visibility. One need not at the outset deploy one's hardware on the table for the edification of one's opponent. A 'sighting' certainly has been made but the only troops involved are the advanced parties of either side, and if further forces are in attendance, the two 'generals' might well wish to keep this fact to themselves. The best way to cope with this situation, having determined visibility is by way of a second map, quickly drawn, to represent the area of contact, to wit, the area already laid out on the table. The handiest way of doing this is to have a board of the required size, already 'gridded' in ink or biro, and on this one draws in the details—taken from the table—in pencil (once used, these can be rubbed out and the 'gridded' square used again). Ideally, the grid lines should be ½ in. apart, this representing a 6 in. table grid, although in the illustration, the lines shown are those of a 12 in. grid—the idea being to save the extra lines and make the thing a little less complex.

Once the map is drawn on the gridded board, all that remains is for the players to get cracking. Each notes his map position *before* the move on which contact was made, and again the moves are made alternately, but this time, although the moves are again 'blind', in a manner of speaking, they are actually taking place on the wargame table, and consequently actual table moves—scaled down, naturally—are used. Since we were speaking of reconnaissance groups using armoured cars, then the move would have to be the equivalent of the armoured car road move which, as we know, was 24 in. On what we might call the 'close contact' map this, in the map/table scale of 1 in. = 24 in., would be 2 in. Right, so having decided visibility by the normal throw of the dice, and having determined that it is 30 in., we know that on the 'close contact' map this is in effect 2½ in. So on we go.

Giving LEFT first move, as in the preliminaries, his armoured car moves up from 'x' and reaches a point 2 in. ahead, arriving in square C.7 at a point indicated as 'y'. RIGHT now moves from 'a', his armoured car reaching 'b' at the extreme western edge of G.3. Both references are given by the players as they make the moves, but neither can as yet see the other (the distance for visibility is taken from square to square and if there is any doubt, from centre to centre of the two squares involved).

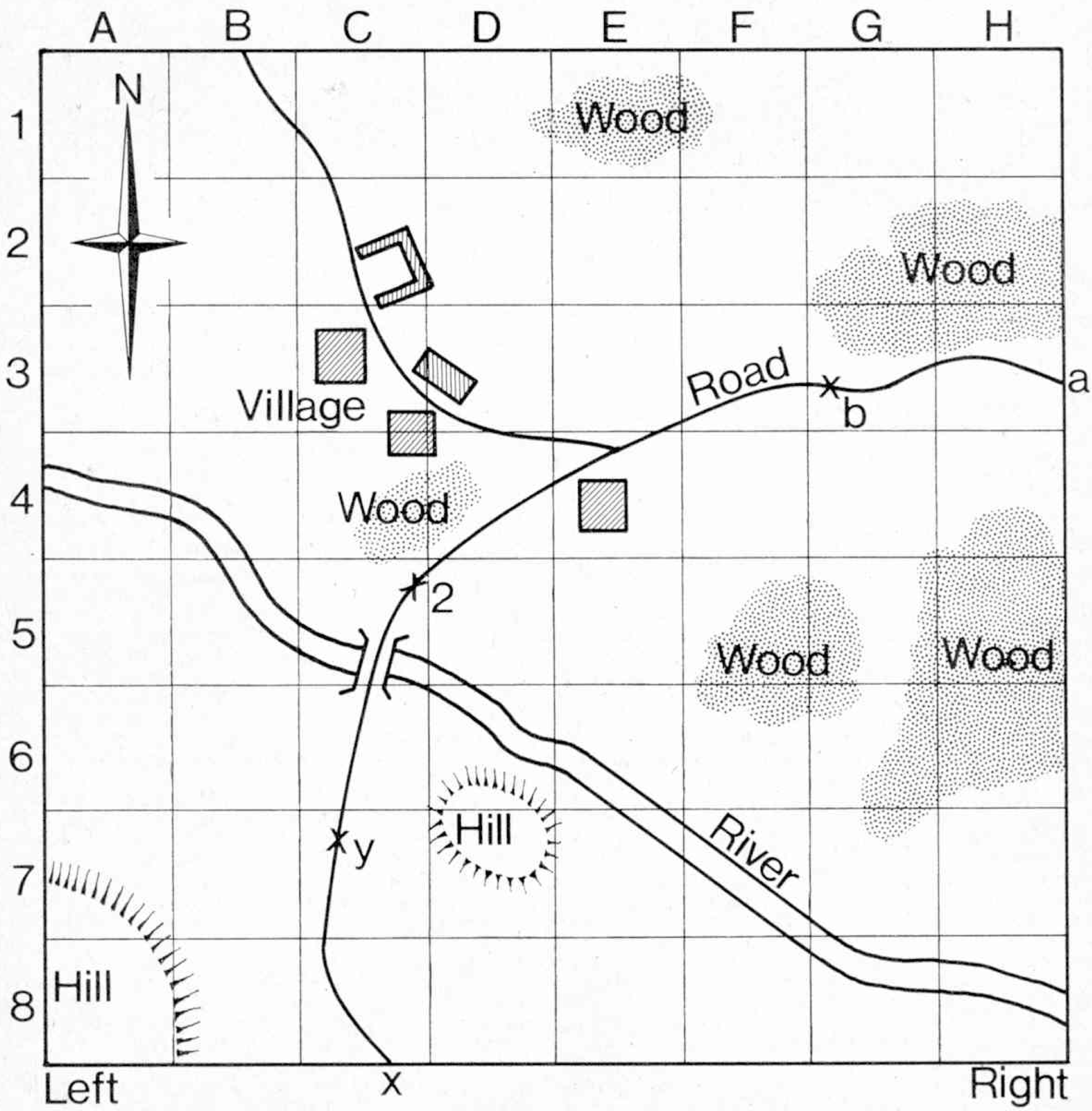
LEFT moves again, another 2 in., this putting him in square C.5, his position being shown as 'z'. Now, from centre of C.5 to the centre of G.3 is less than 2½ in., so obviously they have sighted each other and a declaration of position and strength has to be made by each player. Accordingly, on to the table would go two armoured cars, LEFT's being at 'z' and RIGHT's at position 'a'. From this point the battle may be joined and they can blaze away at each other to their heart's content.

Now, in the example we have just gone through—not too laboriously, it is hoped—there were no follow-up forces, but had there been any on either side, the squares containing them would have to be announced, of course, although naturally not what their composition was, at least, as long as they were out of visibility. So, if, for example, LEFT had a heavy tank or two following up a couple of squares or so behind the armoured car, RIGHT, although getting the grid reference for them, would not know what was in the particular square until they had moved up and been placed on the table, doubtless is gun range of the enemy armoured car.

Now I'm quite sure that the alert reader and student of the military art will have seen the possibilities now open to exploitation, for this use of the table/map is one of the means by which we can achieve tactical surprise on the wargame table. Let us, for example, suppose that the armoured car pushed forward by RIGHT was followed, at a discreet distance, by a tank which, instead of moving forward, took up a hidden position in the edge of the wood in H.3. Following upon the initial confrontation, let us suppose that RIGHT withdraws his armoured car, apparently signifying that discretion is the better part of valour. LEFT, elated at the retreat of his enemy,

follows up, pushing *his* armoured car forward, right into range of RIGHT's tank, which immediately looses off a shot at point blank range, with any luck writing off LEFT's car as a total loss. This naturally gives away the tank's whereabouts, and it has to be placed in position forthwith. All sorts of ploys are readily seen. If RIGHT had arrived at the village first, with infantry, shall we say, he could have filled the houses with riflemen, machine guns, bazookas, and so forth, and generally laid on quite a reception for his opponent. A player needs declare the composition of concealed troops—although he has previously given a map reference for them—only when an actual reconnaissance has been pushed right up to contact, or when the hidden guns or whatever come into action, thus revealing their presence. This applies when they are within visibility, this usually being the case, unless the hidden chap is an artillery F.O.O., when the action would be taken by guns possibly off the table.

All the foregoing has been concerned more or less with the formal procedure as it takes place, with both parties unwilling to concede anything and, for one reason or another, insist on the actually plotting of the moves on the small board. Many times, however, it will be found in practice that it is not necessary to go to such lengths when, for instance, the players are content to have simply a verbal statement of what is taking place. LEFT might say—"Well, I've an armoured car moving along towards the village, what have you got about?" RIGHT might reply to the effect that he, also, has an armoured car near the village, looking around to see what is afoot, but that he does not necessarily propose to do anything violent, for the moment, at least.



DINKY TOY NEWS

New Crime-Fighter & Racer

by Alan Jones

The new Dinky Toy Alfa Romeo Tipo Le Mans, No. 210, is an action-packed model which comes complete with a set of water-slide transfers advertising several well-known " sponsors."

LIGHTS FLASHING, SIREN HOWLING, tyres screeching, the American Police Car hurtles on its way, hot in pursuit of its fleeing quarry. . . .

Regular T.V. viewers and cinema-goers will instantly recognise this scene, found time and time again in any number of U.S. crime thrillers on small and large screen alike. They will have an instant mental picture of the famous crime fighter, steaking along the highway at breakneck speeds, skidding terrifyingly round corners without the driver seeming to bat an eyelid, while we viewers no doubt cringe in anticipation of a spin-out. It's something we've all done.

Although some people might argue, I think it is true to say that the typical American Police Car is one of the most exciting and most feared (by criminals, of course!) cars on the roads, highways and turnpikes of the United States, today. It's fast, extremely manoeuvrable, strong, uncompromising, loud and easily distinguishable. And this is the car Dinky Toys have chosen as the inspiration for their latest model—No. 251 U.S.A. Police Car.

The Police Car has been developed from the Pontiac Parisienne (the first Dinky, you may remember, to ever carry Speedwheels), but this version has its own individual features. In addition to the original plated retractable radio aerials built into the rear wings and controlled by a sliding button in the baseplate, it is equipped with a dummy roof siren in bright plated finish and an imitation red roof light. Although these do not actually work, the effect is highly realistic, and this realism is further increased by moulded interior seats, full glazing, plated wing mirrors and American-style number plates, plus a uniformed " Cop " behind the wheel. Finish is in the authentic colour scheme of white gloss body, white interior and simulated black vinyl roof, with " POLICE " lettering on the front wings and boot lid, or " trunk ", as the Americans call it. All in all this is a good, robust model which should prove to be a valuable addition to the young crime fighter's squad.

New Racer

If the crime fighter is catered for with the Police Car, the young racing enthusiast has an invaluable addition to his " stable " in a new racing car released with the Police Car—No. 210 Alfa Romeo Tipo Le Mans.

In real life Alfa Romeo has always produced cars of quality and distinction and, although their appearances are usually confined to the race track or rally circuit, they have still earned for themselves a truly international reputation in the high performance sports car field. To uphold this tradition to the highest possible degree Alfa Romeo have produced yet another winner in the racing car class, the Tipo Le Mans which, like most other Alfa racers, was developed from the highly successful Tipo Tubolare.

The Le Mans is an extremely unusual, but attractive car, distinctive for its long low shape. Unbelievably, it is only 3 ft. high, at its highest point, while being over 14 ft. long, and this gives great stability. The most distinctive feature of all, however, is its unusual " fins " these carried not only on top of and at the sides of the engine cover, but also at the front of the car ! The fins naturally act as stabilisers and, with its aerodynamic shape and a top speed of 190 m.p.h. (300 K.P.H.), it is easy to see why this Alfa was such a success.

Dinky have successfully captured all the lines of the real thing in the new model and have managed to incorporate all sorts of interesting model features in addition. It comes with a transparent engine cover, which hinges backwards to allow access to a highly-detailed bright-plated engine, and also sports fully opening doors, plated racing-type mirrors, detailed in-

Dinky Toy No. 251 U.S.A. Police Car. Based on the Pontiac Parisienne, this new Dinky has all sorts of additional features.

terior and competition numbers. Speedwheels, the obvious choice for a Dinky Racer are fitted as standard, the wheels, themselves, carrying wide racing tyres at the rear. Finish is in flamboyant red, with gleaming black doors, matt black front panel and a moulded white interior.

A novel touch to add greater realism to the model and to greatly increase the fun for the collector is a sheet of water-slide "advertisement" transfers sold with the Alfa and intended to be added to the model in suitable positions. Most racing and rally cars, these days, are literally plastered with "stickers" advertising the companies or products which sponsor them and now the Dinky Toy collector can provide sponsors for his own model. Five pairs of names are included—Ferodo, Trico, Bosch, Lucas, and Dunlop and the effect they give when added to a model is remarkable. All the names are leaders in their fields and the new Dinky, also, will be a winner all the way!

AMONG THE MODEL BUILDERS *with* SPANNER *(from page 593)*

Journalled in the end of the secondary section is a 2 in. Rod, in the centre of which a Threaded Coupling 1 is fixed, the Rod passing through the end transverse bore of the Coupling. Fixed by a Nut in the threaded longitudinal bore of the Coupling is a 6 in. Screwed Rod 2 on which a Threaded Boss 3 is carried, this Threaded Boss being secured in one end of a Socket Coupling 4. Held in the other end of the Socket is a *Plastic Meccano* 4½ in. Axle Rod 5, on the lower end of which a second Socket Coupling 6 is secured. Fixed in the free end of this Socket Coupling is a ⅞ Bevel Gear 7, in the boss of which a 1½ in. Rod is held. A Spacing Collar 8 is mounted on this Rod, the Rod then being journalled in the centre transverse bore of a Coupling 9 carried on two 1 in. Rods inserted into the ends of the Coupling and mounted in the sides of the main arm section, where one is held in place by Collars and the other by a 1 in. Sprocket Wheel 10 and a ⅞ in. Bevel Gear 11. This Bevel Gear meshes with Bevel Gear 7. The 1½ in. Rod is free to turn in the central bore of Coupling 9, being prevented from sliding out of the bore by a Collar 12.

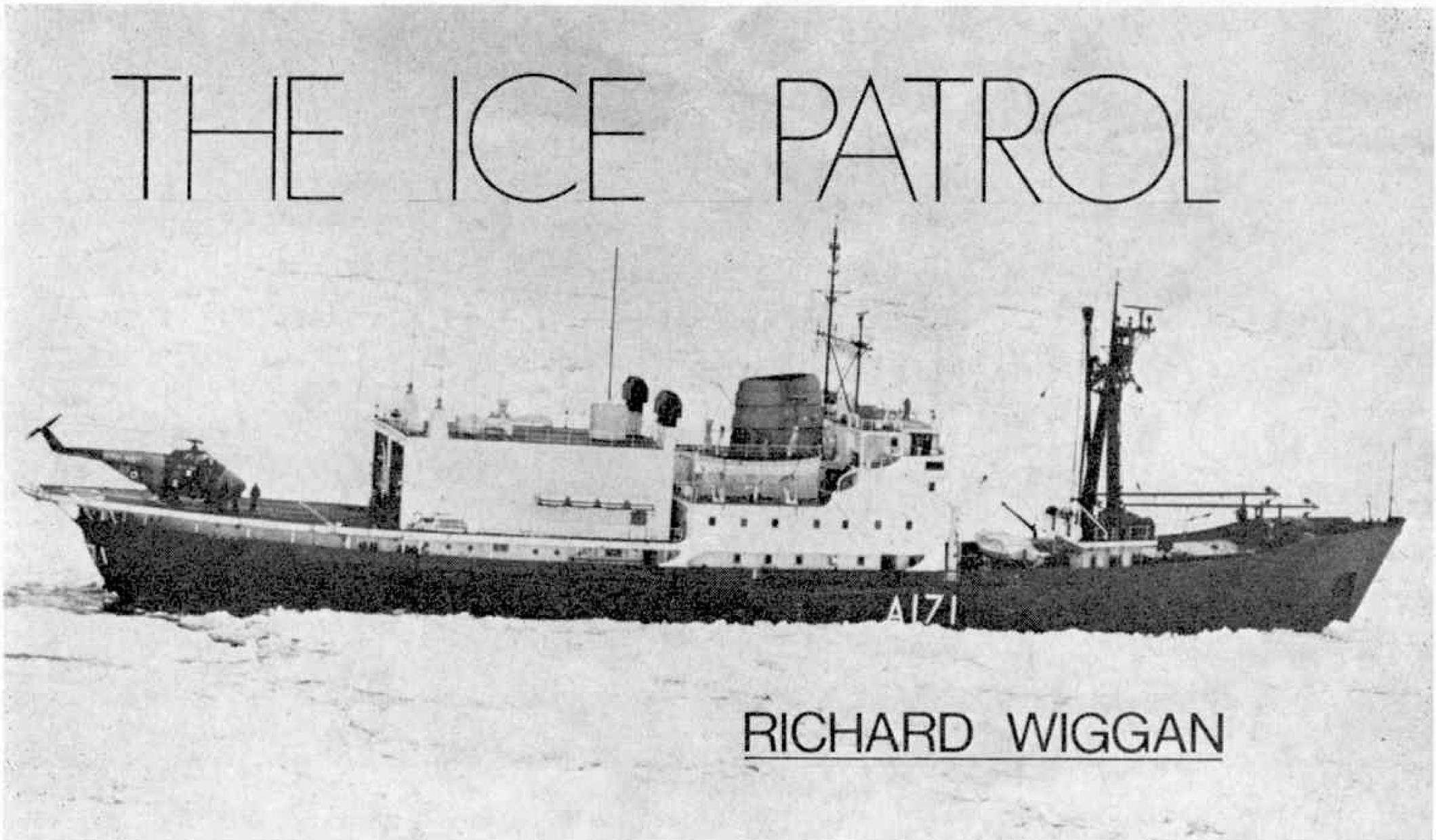
Under the operating conditions, a Chain drive is taken to Sprocket Wheel 10 which, in turn, drives the Bevels and, with them, the Socket Coupling/Plastic Meccano Rod arrangement. As Threaded Boss 3, held in the upper Socket Coupling, revolves, the Screwed Rod is "screwed" up or down, thus providing the ram action. The Screwed Rod, incidentally, fits perfectly inside the hollow centre of the Plastic Meccano Axle which, itself, fits perfectly inside the two Socket Couplings. This, therefore, is another excellent example of how "metal" and Plastic Meccano, together, can be put to very good use.

PARTS REQUIRED
(Excluding Digger Arm)

1—17	1—37b	1—63c	2—171
1—18a	2—38	1—64	1—Plastic Meccano
2—18b	6—59	1—79a	4½ in. Axle Rod
2—30	1—63	1—96	

Don't forget! Any pieces or parts you lack can be bought separately from our model shop advertisers with a big M in their advertisements—there's one in your part of the country. . . .

THE ICE PATROL



RICHARD WIGGAN

WHEN H.M.S. *ENDURANCE* entered Portsmouth dockyard recently for re-fitting, she presented a rather unusual appearance for a ship of the Royal Navy. Watchers noticed that her hull and decks were painted red, with her superstructure white and funnel buff. These are unique colours for a naval ship. But the 3,600 ton *Endurance* is rather unique. She is the Navy's only ice-patrol ship and supports British interests in Antarctic waters. No other British servicemen are in the Antarctic other than perhaps a few men lent by the Army or Royal Air Force to the British Antarctic Survey in a civilian capacity.

Ships operating in the ice have to be specially constructed, and this is true of the *Endurance*. She was built in 1956 as the Anita Dan, one of the ice-strengthened cargo ships of the Danish shipping firm of J. Lauritzen. The Royal Navy bought her in 1967 and she was converted for naval service at Harland and Wolff's yard at Belfast. The main alterations were to fit her with a flight deck and hangar for two Whirlwind helicopters and build extra accommodation and storerooms for her naval crew in three of her four holds. She was also fitted with a lot of specialised equipment for hydrographic surveying. Her single diesel engine gives a maximum speed of 14 knots and she has a long range. Navigating in ice is tricky work, and *Endurance* can be controlled from the crow's nest to give her officers a good view of channels through the ice. Her hull and decks are painted red so that she can be easily spotted at a distance when in the ice, particularly from the air. White, for the superstructure, and buff, for the funnel, are the usual colours of a surveying ship.

Fittingly, the 305 ft. *Endurance* is named after the ship in which the famous explorer Sir Ernest Shackleton sailed for the Antarctic in 1914.

She was trapped by ice in the Weddel Sea in 1915 and finally crushed and sunk. Sir Ernest and his crew went by open boat to Elephant Island, from where he made his epic voyage in one of *Endurance's* open boats, the *James Caird*, to South Georgia. The party, after a remarkable crossing of the island on foot, were able to get help for the men still stranded on Elephant Island, not one of whom was lost. The present-day *Endurance*, re-named by the Hon. Alexandra Shackleton, grand-daughter of Sir Ernest, has three boats named after the boats of the original vessel—*James Caird*, *Stancomb Wills* and *Dudley Docker*.

Men serving in the Antarctic today may not have the same feeling of isolation as in the period when the early explorers, ill-equipped by modern standards, suffered hardship and danger in the quest for knowledge, but the life is still a lonely one. Yet men do volunteer to serve in *Endurance*, which has a company of 12 officers and 106 men. It is Naval custom to send a man to the ship for which he volunteers, if this is possible. If sufficient men of the correct grades do not volunteer, her company is made up by normal drafting. Usually, about three-quarters of the company are volunteers.

Endurance has three jobs in the Antarctic. The first is to provide a British naval presence in the area, as allowed by the Antarctic treaty; secondly, to give help to the British Antarctic Survey; thirdly, to carry out hydrographic surveys as needed by the Hydrographer of the Navy.

Most of *Endurance's* time in the Antarctic is spent on hydrographic duties, which are a little-known but very important aspect of naval work. The Hydrographer of the Navy is the oldest and smallest operational department of the Ministry of Defence (Navy), being founded in 1795. The department produces a world-wide coverage of charts and navigational publications. There are 3,500 British Admiralty charts available, the most accurate in existence and with an incomparable reputation. Though they cost vast

amounts of money to prepare and maintain, they are nevertheless on sale to everyone. Most other nations similarly reciprocate because all maritime nations have a common interest in safe navigation.

Endurance's task in this field is particularly vital for Antarctic waters are still mainly uncharted and a great deal remains to be done. The information obtained is " fed back " to London and her charting work is used by the Hydrographer to produce charts of the Antarctic.

The Ice Patrol is restricted to the British sector of the Antarctic and the local ice conditions confine *Endurance's* coastal work to the west coast of Grahamland. But she does seismic and geophysical work throughout the Scotia Sea.

It is a lonely life for the ship's company, which also includes a small detachment of Royal Marines, but there are compensations. There is that special spirit of comradeship found between men living and working together in unusual conditions. There are also interests outside their normal duties to keep the men occupied. They play football, but instead of on grass it is played on ice. The penguins strutting about also add their own contribution to the life of the Antarctic. There is a chance, too, of a meeting with an icebreaker of the U.S. Coast Guard, which has been made famous through numerous films and stories. There is no close co-operation with the Coast Guard, but if one of their vessels is met with there is the usual cheerful exchange of greetings between those who suddenly find they are not alone in a cold, desolate world.

Ice Patrol duties may not be as exciting or as glamorous as those of some branches of the Royal Navy, but they form an essential part of the whole.

Heading: H.M.S. Endurance shown in close-up in pack ice. Note helicopter on deck aft.

Above left: A shot of the ship making her way through pack ice in comparatively easy conditions.

Above right: H.M.S. Endurance in the Lemaire Channel.

Centre: The ship leaving her anchorage in the Argentine Islands passing the British Base as she approaches Meek Channel.

Right: Three-quarter rear view of H.M.S. Endurance which shows flight deck and helicopter with its stowage hangar.

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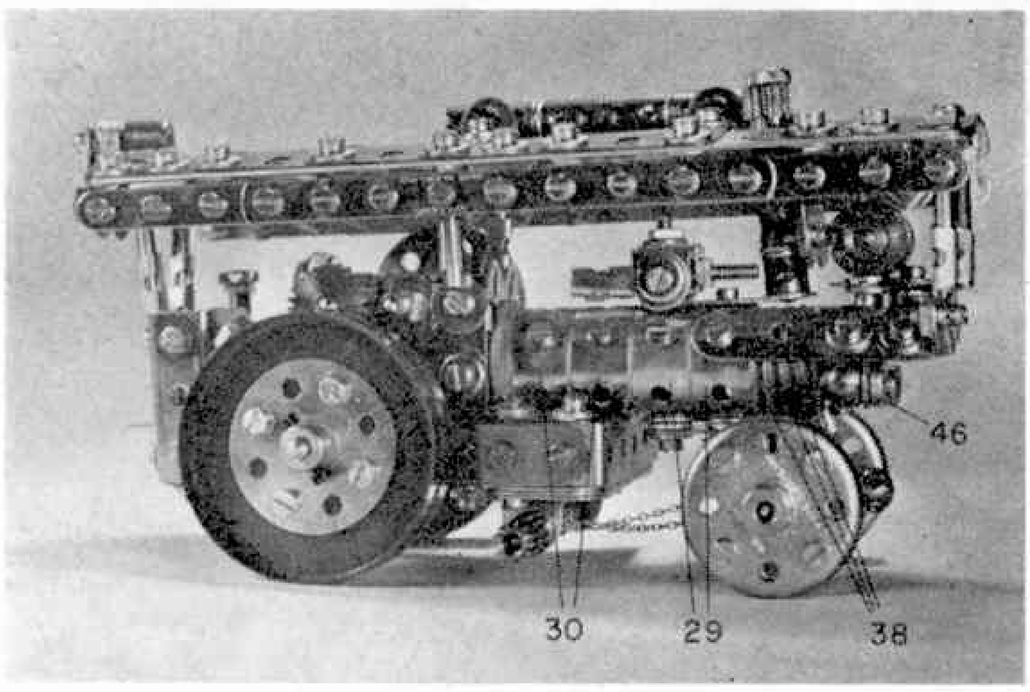


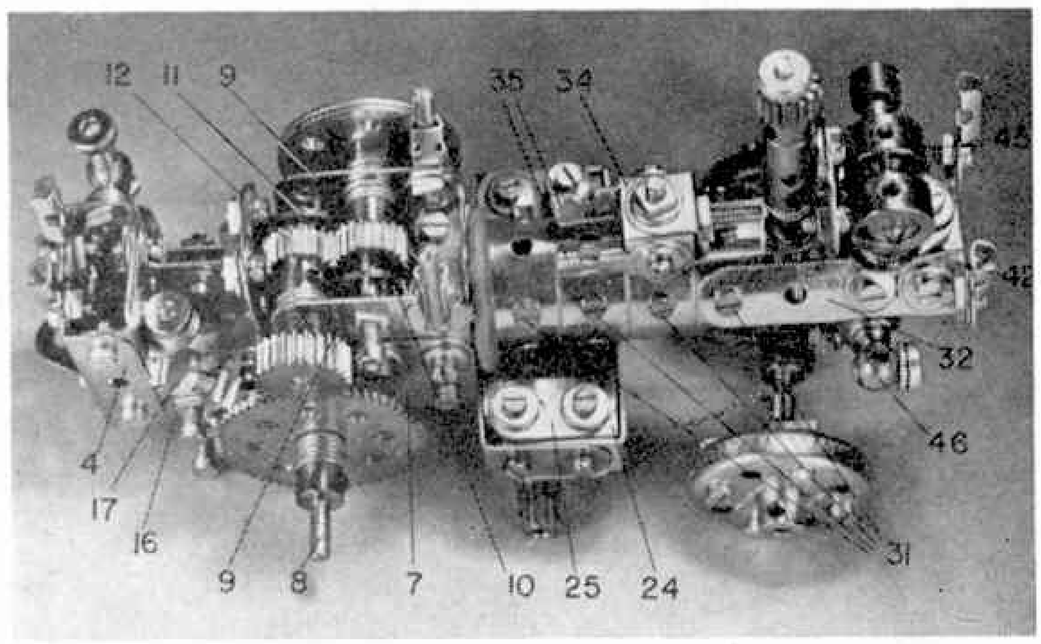
MEET THE CUP WINNER

Here she is at last—the magnificent little Showman's Traction Engine, designed and built by Mr. H. J. Halliday of London, which won the Meccano Cup at this Year's Model Engineer Exhibition.

Spanner describes the magnificent Traction Engine which gained the Meccano Cup at this year's M.E. Exhibition

NEVER LET IT BE SAID that Meccano Magazine does not keep its word ! In the write-up on this year's Model Engineer Exhibition in the April issue we reported that the Meccano Cup was won by veteran modeller H. J. Halliday with an outstanding miniature Traction Engine which, despite its small size, was packed with detail and we promised at the time that we would do our best to feature it in full in a " subsequent edition ". Well, this is that subsequent edition and here follows a full constructional article !

Just before describing the model, however, I would like to extend my personal congratulations to Mr. Halliday for a first-class model. It is only eight inches long, yet is overflowing with realistic detail. When pushed along, various gears and a flywheel spin merrily around and it even includes working steering, although this is controlled, not from the cab, but by a pinion protruding from beneath the belly tank. A very interesting visual effect has been obtained by the liberal use of brass-finished Set Screws which contrast well with the silver-coloured parts. In fact, Set Screws have been used in many cases in place of standard Bolts, their slightly smaller size enabling them to fit into places where the ordinary Bolts might prove a little awkward. When fitting Bolts, by the way, Mr. Halliday stresses the importance of using Washers beneath the heads of all Bolts passing through elongated holes, particularly the holes in the Plastic Plates of the canopy. This is a standard practice which should always be followed.



In this view, the canopy and rear wheels have been removed to show the layout of the gear arrangement in the tender section.

Tender

Dealing first with the construction of the body, or tender, the base of this section is a 3 in. Flat Girder 1 to which two 3 in. Angle Girders 2 are bolted, using their circular holes, the forward securing Bolts also fixing two Fishplates 3 in position through their elongated holes. The free ends of these Fishplates are brought together as shown. Attached to the rear ends of Girders 2 through their circular holes are two Angle Brackets, the heads of the fixing Bolts uppermost. Bolted to the vertical lugs of these Brackets are two $1\frac{1}{2}$ in. Angle Girders 4, the rear securing Bolts also fixing a $1 \times \frac{1}{2}$ in. Angle Bracket 5 and a 1 in. Triangular Plate 6 in position. Note that the apex of this Triangular Plate is bent rearwards at 90 degrees to form a towing lug, while bolted to the free lug of Angle Bracket 5 are two Rod and Strip Connectors spaced from the Bracket and from each other by two Washers in each case. Right-hand Angle Girder 4 is also bolted to nearby Girder 2.

Now fixed through their round holes to the vertical flanges of Angle Girders 2 are two 2 in. Flat Girders 7, these being positioned in the upper limits of the elongated holes of Girders 2. Journalled in the lower third holes of these Girders and in the corresponding holes of Girders 2 is a 4 in. compound rod 8 on which a Collar and a Coupling are mounted between the girders. The compound rod consists of two 2 in. Rods,

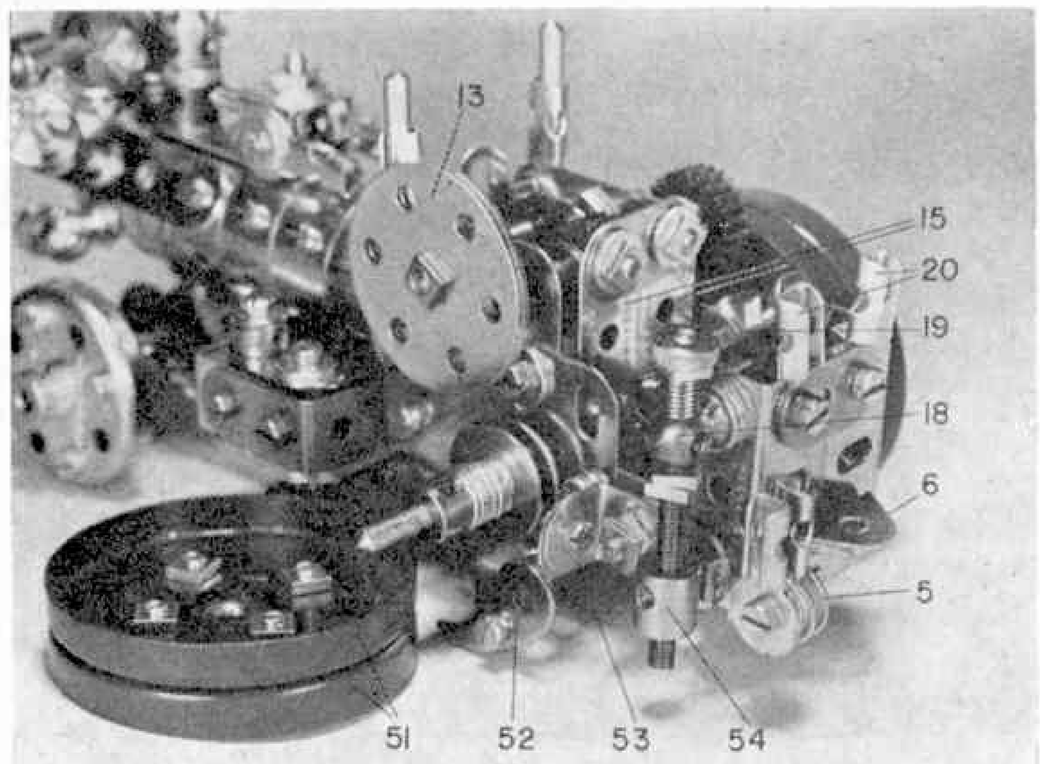
the left-hand Rod passing through the Collar and halfway into the bore of the Coupling, the right-hand Rod taking up the remainder of the Coupling. Note that the $\frac{5}{32}$ in. Grub Screws in both the Collar and Couplings should be replaced with 7/64 in. Grub Screws and that the Rods should be fixed so that they revolve independently.

Flat Girders 7 are each extended upwards by a $1\frac{1}{2}$ in. Flat Girder 9, a $\frac{3}{8}$ in. Bolt being used in the forward right-hand position. Screwed onto this Bolt, but spaced from the Flat Girder by two Washers, is a Threaded Coupling, arranged with its centre transverse bore horizontal. Secured on the centre right-hand fixing Bolt and spaced from the Flat Girder by a Collar, are two Fishplates 10, the circular holes in these Fishplates coinciding with the upper centre hole in Flat Girder 9. Another two Fishplates 11 are similarly fixed to the left-hand Flat Girder, but note that these are mounted at the rear end of the Girder —not in the centre. Journalled in the free holes in these and in the upper rear holes in right-hand Flat Girders 9 is a $1\frac{1}{2}$ in. Rod held in place by a $\frac{1}{2}$ in. Pinion 12, fitted with a 7/64 in. Grub Screw, and a $\frac{3}{4}$ in. Pinion, Pinion 12 being spaced from the Flat Girder 9 is a $1\frac{1}{2}$ in. Rod held in place by a $\frac{1}{2}$ in. with a 60-teeth Gear Wheel fixed on the right-hand section of compound rod 8, while Pinion 12 meshes with a second $\frac{1}{2}$ in. Pinion fixed on a Long Threaded Pin journalled in Fishplates 10 and in the centre hole in left-hand Flat Girder 9. The Pinion is spaced from the Girder by three Washers, another three Washers spacing the "nut" of the Threaded Pin from the Girder. Two 6-hole Wheel Discs 13, one on top of the other, are fixed on the threaded shank of the Pin to serve as a flywheel, whereas the final drive pinion is represented by an electrical Contact Screw 14, held by Nuts in the upper centre hole of right-hand Flat Girder 9.

Two $1 \times \frac{1}{2}$ in. Angle Brackets are next fixed through their short lugs to the horizontal flanges of Angle Girders 2 three holes from the rear end. Secured by Set Screws to the long lugs of these Angle Brackets, but spaced from the lugs by a Washer in each case, are two $1\frac{1}{2}$ in. Strips 15, the upper ends of which are joined by a Fishplate held in place by Set Screws, the heads of which point forward. Strips 15, with their Angle Brackets, should be bent rearwards slightly to ensure that the heads of the Set Screws do not foul Pinion 12 and that the Angle Brackets do not foul the half-shaft bearings.

Now fixed to the vertical flange of right-hand Angle Girder 2, through its second hole, is a Fishplate 16, held in place by two Nuts on the shank of a protruding $\frac{3}{8}$ in. Bolt representing a step. Another $\frac{3}{8}$ in. Bolt is held in the lower hole of the Fishplate to serve the same purpose. A $\frac{1}{2}$ in. Bolt is fixed, shank outwards, in the second hole of left-hand Girder 2 to later serve as the brake pivot, then the steering wheel is represented by an electrical Contact Stud 17 held by Nuts in an Angle Bracket which is bolted at an oblique angle to the upper rear corner of right-hand Flat Girder 7.

At the rear of the tender, a Handrail Support 18 is attached to the top of left-hand Girder 4, being spaced from the Girder by three Washers, at the same time securing an Angle Bracket to the inside of the Girder. Bolted to this Angle Bracket is a vertically-mounted $1\frac{1}{2}$ in. Flat Girder 19, also fixed to the top of right-hand Angle Girder 4 by a $1 \times \frac{1}{2}$ in. Angle Bracket. Bolted to the centre right-hand hole of the Flat Girder is an ordinary Angle Bracket, in the free lug of which

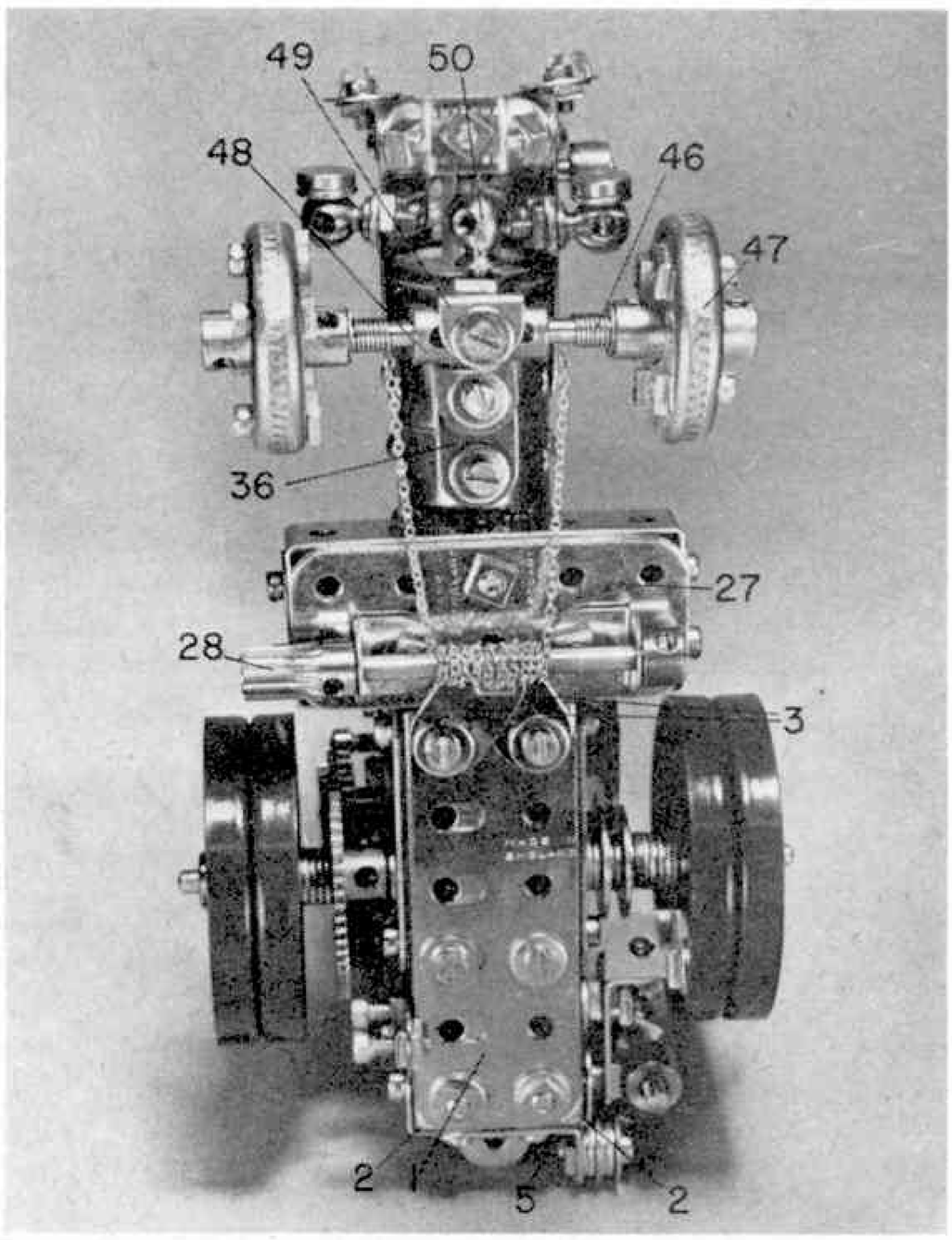


A close-up view of the rear of the body showing the screw-controlled brake fitted to the Traction Engine.

a Bolt, carrying a Washer, is held by an electrical Terminal Nut, this Nut uppermost.

To the tops of the rear flanges of Girders 4, inside, are bolted two Rod and Strip Connectors 20, the securing Bolts fixing two Fishplates to the outside of the Girders, one on top of the other. The Rod and Strip Connectors will later form two of the anchoring points for the canopy.

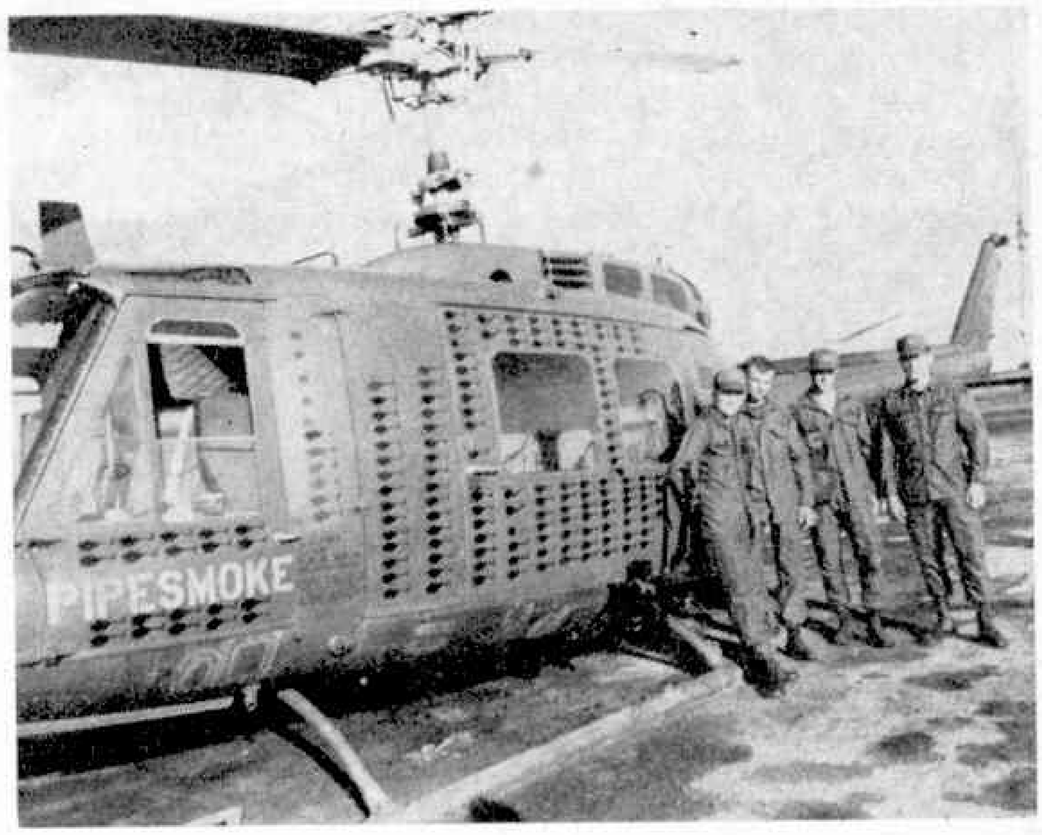
To be continued



An underside view of the model, without the canopy. Note the non-Meccano steering chain supplied by cheap locket chain.

AIR NEWS

by John W. R. Taylor



Bell UH-1H Iroquois helicopter—" the flying crane." The almost countless number of tadpole-like splodges each represent a damaged helicopter that the Iroquois has hauled to safety to be repaired and fly again on their mercy missions.

Evangel's new Bush Transport

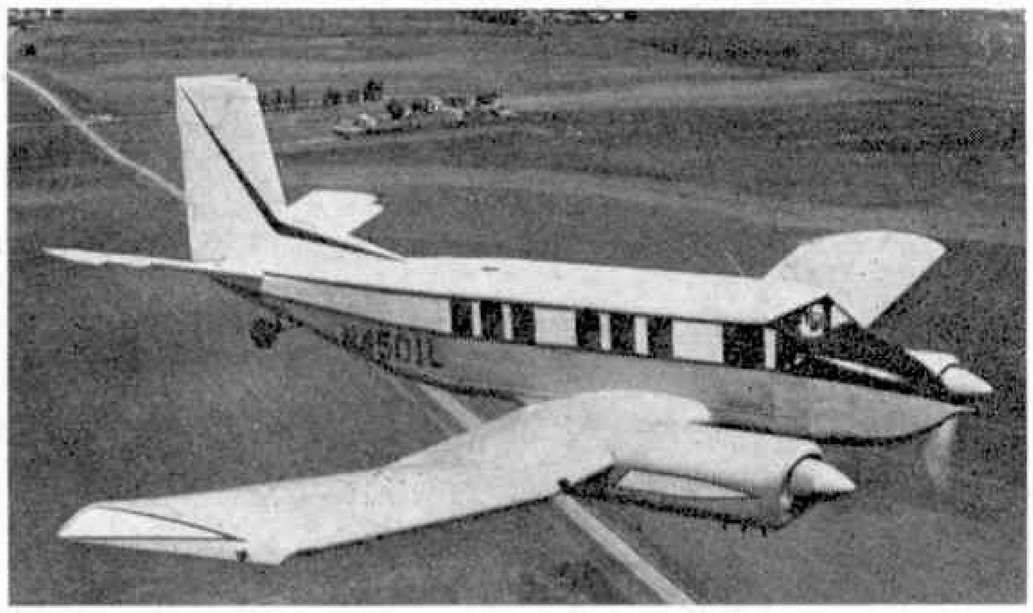
LATEST NAME TO BE ADDED to the list of American manufacturers of STOL (short take-off and landing) transport aircraft is Evangel Aircraft Corporation of Orange City, Iowa. Their Model 4500 light passenger-freighter, illustrated may not be the most handsome machine in its class; but it will take some beating as a vehicle able to haul one-ton loads out of the kind of airstrips used by the world's " bush " operators.

The boxlike fuselage, rectangular wings and square-cut tail surfaces are designed for maximum efficiency and ease of maintenance and repair in places where the usual airport and aircraft factory services may be non-existent. Construction is all-metal, and the heavy dihedral on the outer wings, with conically-cambered tips, should ensure good stability, even in hot, turbulent climates. The engines are well-proven, sturdy. 300 h.p. Lycoming 10-540-K1B5 " flat-sixes ", with fuel injection, driving Hartzell fully-feathering constant-speed propellers.

In addition to the pilot, the Evangel 4500 will carry eight passengers, an equivalent weight of cargo or mixed passenger/freight payloads. Loading is via a large forward-opening door, extending the full depth of the cagin and 3 ft. 9 in. wide, on each side, aft of the wing. Large crates, and the 55-gallon drums of fuel and oil that are in standard use all over the world, can be passed easily through these doorways and stacked into a cargo bay 10 ft. long.

The Evangel 4500 spans 41 ft. 3 in., is 31 ft. 6 in. long and has a maximum take-off weight of 5,500 lb. It can take off in only 500 ft. with a full load and lands in 475 ft. Range is 700 miles, cruising at 175 m.p.h. at 10,000 ft.

Evangel 4500/STOL light passenger freighter—a prosaic name to cover one of the world's remaining " adventure " jobs of bush transport in the wilder parts of the world.



Production is already underway at the rate of one aircraft a month, and the first machine should have been delivered to the Wycliffe Bible Translators in Peru by the time this issue of *Meccano Magazine* is published. Meanwhile, the prototype will have been demonstrated in public for the first time at the Abbotsford International Air Show in British Columbia, Canada, the country which was the home of the sort of bush flying for which the Evangel is so well suited.

Britain's new " Dogfight " Missile

The full-size models of Hawker Siddeley Dynamics' new Taildog missile, illustrated on the right, look deceptively simple. Externally, each consists of a straightforward cylindrical body, rather like a large cigarette, with six rectangular tail-fins at one end and a glass nose over the infra-red homing unit at the other.

In fact, Taildog may prove to be the most lethal air-to-air weapon yet devised anywhere in the world. Combat experience in Vietnam has shown that present-day missiles, like Sidewinder, lack the manoeuvrability to hit a tightly-turning enemy aircraft over short ranges. As a result, missile designers were given the task of devising a weapon that would be efficient over such ranges, to fill the gap between unguided air-to-air rockets and longer-range guided missiles. The United States Air Force asked twelve of America's leading companies to let it have design proposals for such a weapon, under the designation AIM-82A, as soon as possible, as potential armament for its forthcoming McDonnell Douglas F-15 fighter. The U.S. Navy was even more specific, stating that the Agile missile it wanted for its new Grumman F-14 " swing-wing " fighter would have to be effective at ranges as short as 1,000 yards and would need an infra-red guidance system.

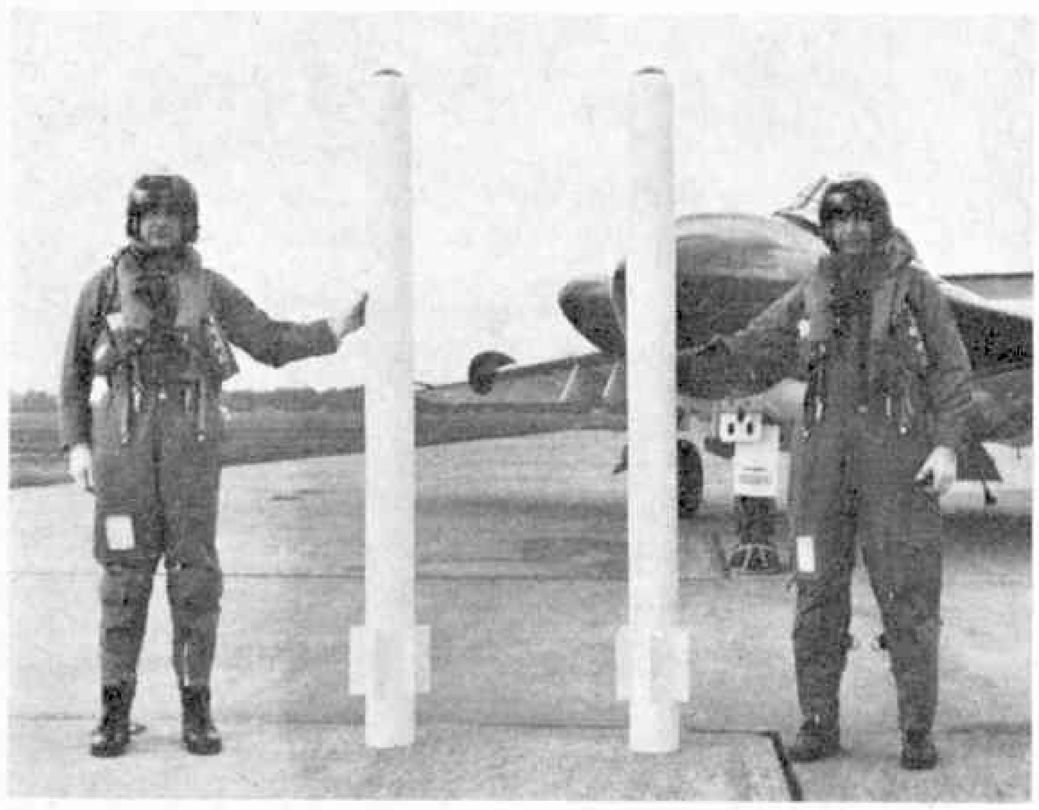
Meanwhile, Hawker Siddeley Dynamics had been making such good progress with Taildog that TRW Systems, one of America's leading missile firms, obtained licence rights to use in its AIM-82A proposal some of the " know-how " that was going into the British weapon. In particular, it is expected to make use of Taildog's control system, under which the missile is steered by deflecting the exhaust gases from its rocket motor instead of by the usual pivoted control surfaces. Controllability is, of course, the key to the effectiveness of a missile that has to catch an evasive target; so there could be no better tribute to the capability of Britain's missile men.

Passengers receive free Treasure Map

A "treasure map" showing points of interest throughout the Hawaiian islands is just one of a whole range of items in a kit which United Air Lines gives to each of its passengers on flights to that colourful part of the Pacific. A "Friendly Skies Savings Guide" tells its readers how to get the most from a holiday in the islands and contains 36 savings certificates, offering price reductions at specified restaurants, night clubs, amusement parks and shops, and special rates for rented cars and surfing lessons.

Another certificate can be used to obtain free use of a Kodak Instamatic camera and colour film. Passengers who take advantage of this simply drop off their exposed films at any Hertz Corporation counter. At the end of their stay, they return the camera and pick up their photographs.

A booklet on Hawaii's history guides those who want culture as well as relaxation in the sun, and there is even a folder entitled "Hawaii for the Malihini" which provides a quick lesson in the language for those who intend to get away from the usual tourist spots.



Not giant cigarettes but Britain's latest air-to-air combat missiles the Hawker Siddeley Dynamics "Taildog."

United Air Lines is, incidentally, the first operator to point out an interesting feature of the new Boeing 747 "jumbo jets". The first-class compartment in the nose of each aircraft is so far forward that passengers actually arrive at their destination ahead of the flight crew. The last time this happened was probably back in the early days of U.S. airline services, when the pilot of the Boeing Model 40 biplane sat in an open cockpit amidships while his four passengers occupied an enclosed cabin in front, between the wings. Model 40s were flown by United Air Lines and its predecessors, including Boeing Air Transport.

Lif-saving "Choppers" in Vietnam

Casualty evacuation helicopters have performed such superb service in Vietnam that more than 81 per cent of all U.S. Army soldiers who have been wounded in action have survived their injuries. This compares with 74 per cent in the Korean War, when "choppers" were first used on a large scale as air ambulances, and 71 per cent in World War II.

On average, it takes only 17 minutes to pick up a wounded man and fly him to a forward aid station. Typical of the near-miracles that this makes possible was the experience of an 18-year-old American who was one of the most severely wounded persons known in medical history. A high-velocity shell had carried away one kidney, several feet of his intestines and half of his pelvis; yet it was possible to save his life after hours of surgery, gallons of blood transfusions and tremendous doses of antibiotics—solely because a helicopter had ferried him speedily to where he could be tended.

Aircraft, as well as men, have been saved by the hundred. Every silhouette drawing on the side of the Bell UH-1H Iroquois in the picture on this page represents a damaged helicopter that it has hauled back to base to be repaired and to fly again.

20 million Passengers

According to the British Airports Authority, its airports at Heathrow, Gatwick, Prestwick and Stansted handled an additional 34,000 take-offs and landings last year—95 more each day then in 1968. The number of passengers passing through the airports increased by nearly two million, to a record 18,145,212, and will almost certainly exceed 20 million for the first time in 1970. Averaging nearly 55,000 people every day, this may sound pretty terrific; yet the B.A.A. expects more than 30 million passengers to pass through Heathrow and Gatwick alone by 1974.

Nearly £1,300 million worth of cargo was handled at the four airports between January and September 1969. The most interesting aspect of this business is that 47 per cent of all cargo still travelled on passenger aircraft rather than in specialised freighters. Although this reflects mainly the fact that shippers like to take advantage of the greater frequency of passenger flights, the proportion is hardly likely to change in a "jumbo" age, as each Boeing 747 can carry as much cargo as an all-freight Boeing 707 in addition to the average number of passengers that it carries across the Atlantic.

Flashback to 1929 the Boeing 40B-4 a four-place passenger cabin and mail carrying aircraft. . . . Fashion seems to have made the dresses at least all the rage again !

Meccano Constructors Guide

by B. N. Love

Part II
Further Vehicle Mechanisms

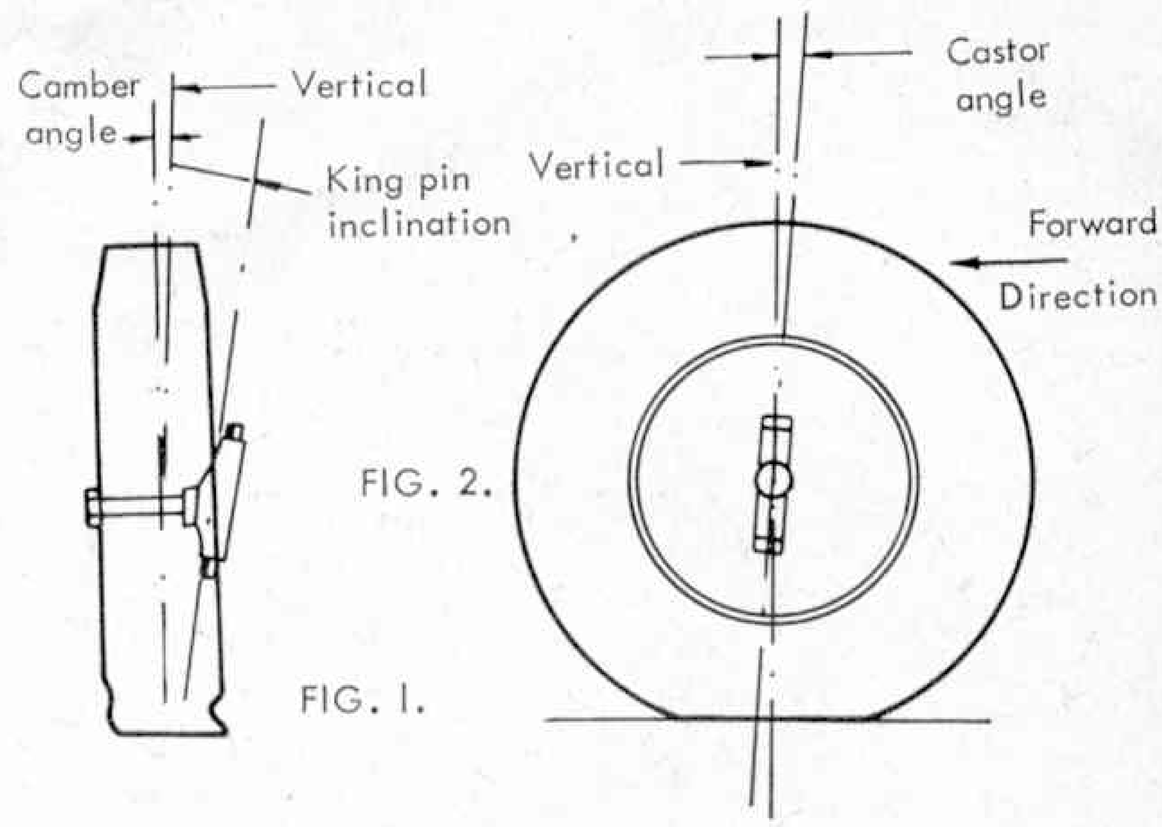


FIG. 1.

FIG. 2.

EFFICIENT STEERING ON MODERN high-speed vehicles demands careful attention to 'Steering Geometry' in the design stages to ensure minimum tyre wear, good road holding and cornering properties and the least driver fatigue. The parallel arm steering common to most vehicles has been demonstrated in Meccano parts on many occasions but the combination of those features required for accurate reproduction is not easily achieved with the standard parts at the disposal of the Constructor if he is to keep his models within reasonable scale size, viz a viz prototypes.

Fig. 1 shows what is known as Camber Angle on a front wheel in which the centre line vertically through the tyre is set at an angle to the King Pin. The first advantage of this is that the centre point of contact of the tyre section on the ground will coincide with the turning axis of the King Pin, or nearly so, which means that the wheel is steered, in the stationary position, almost on a single spot instead of through a wide arc which would produce steering 'drag' and driver fatigue. At the same time, tyre wear is reduced as the geometry involved reduces 'scrubbing' of the tyre tread.

Fig. 2 shows another important aspect of front wheel mounting known as Castor Angle. A glance at a four-wheeled porter's trolley on a railway station will quickly show that all four wheels are castored, i.e. fitted in forks with a pronounced trailing effect. This ensures that an initial push or pull on the trolley will align the wheel directions to that of the line of effort. The slight tilt to rear of the King Pin shown in Fig. 2 is sufficient to provide castor action in the steering geometry so that, after cornering, the car will tend to straighten up, the steerig wheel returning to central position without effort on the part of the driver.

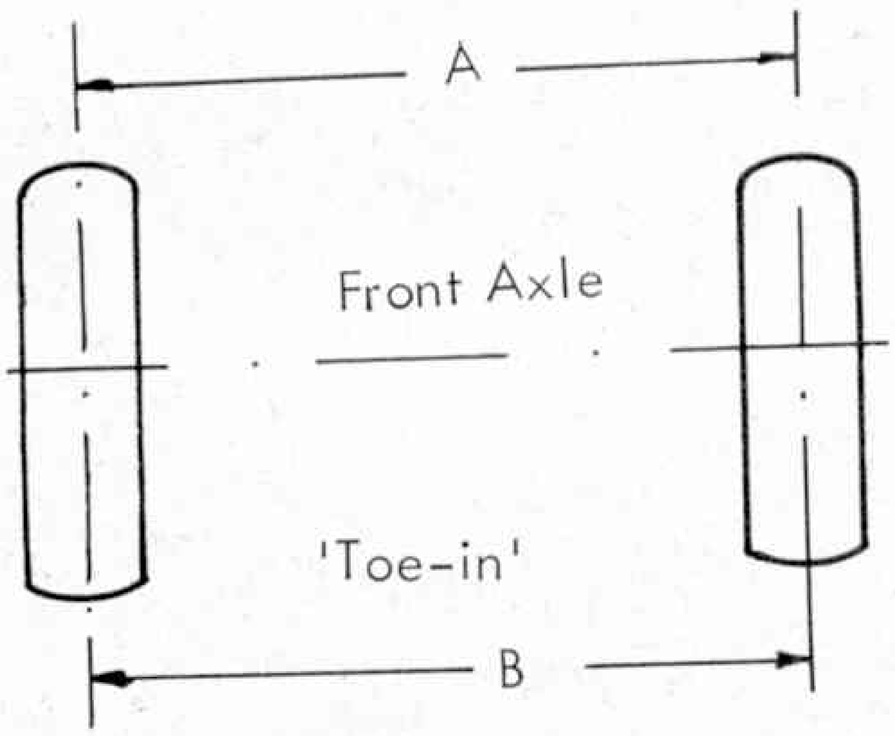


FIG. 3. Dimension A is less than B

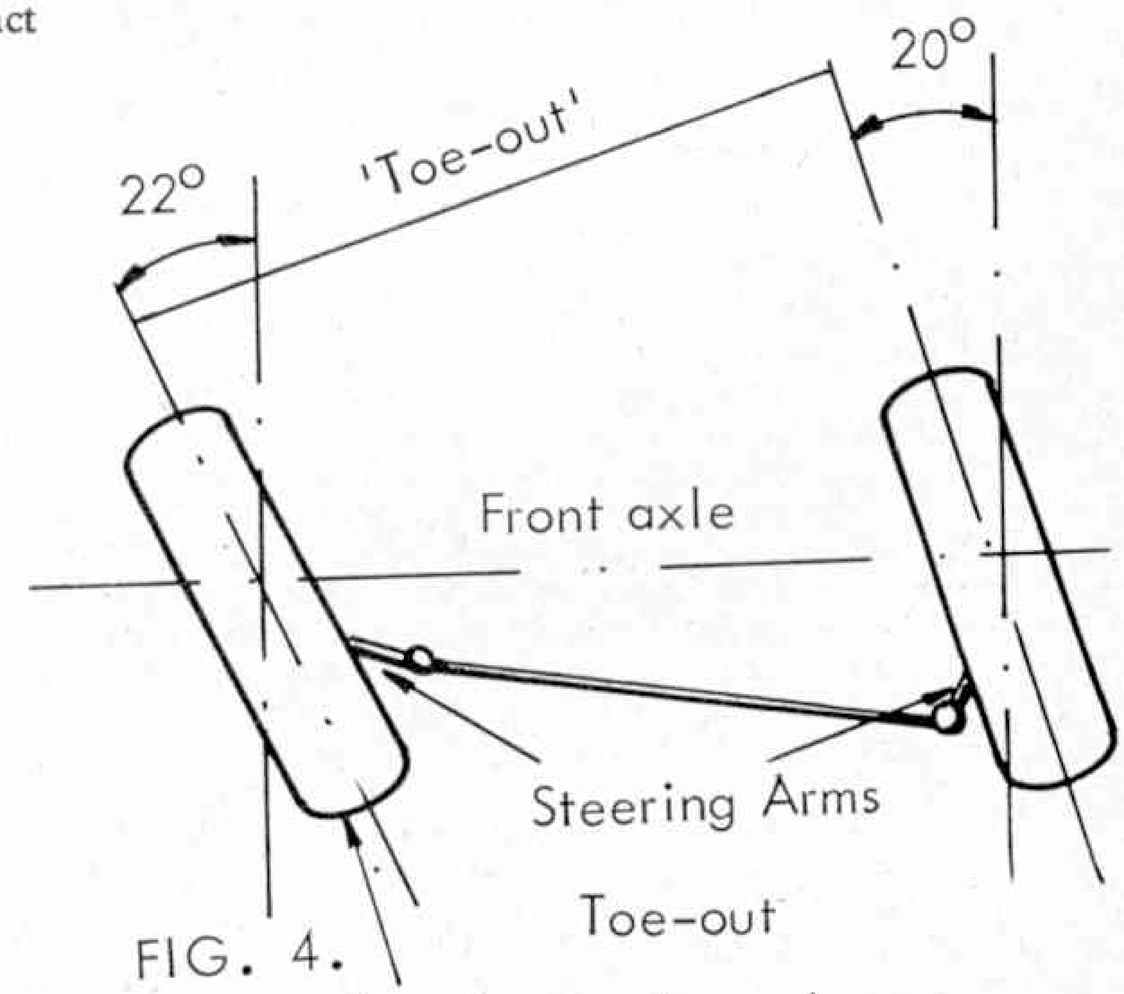
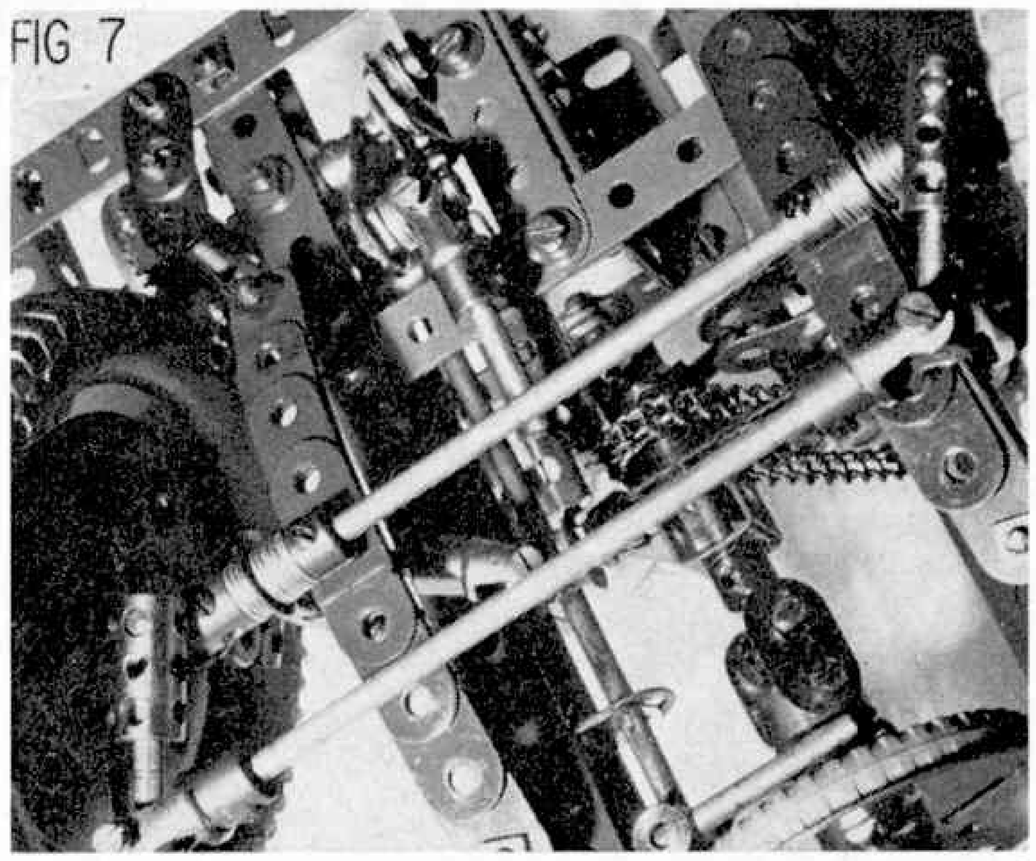


FIG. 4. Wheels turn through different angles when cornering.

Steering linkage comprising track-rod, steering arm, drag link and drop arm.



It is sometimes mistakenly thought that this self centring of the steering wheel is caused by splaying open the front wheels slightly to produce the same effect. On the contrary, in the stationary position, the front wheels of a vehicle have a very slight inclination towards each other rather than being splayed apart. This feature is known as 'toe-in' and, although such an adjustment is measured in fractions of an inch, it is sufficient to provide a counter against the tendency of the front wheels to splay apart under normal travelling conditions and thus prevents unwanted strains on the steering mechanisms and links.

It may be confusing at this stage to point out that once the steering wheel is turned, the front wheels will immediately start to 'toe-out'. Fig. 3 shows the 'toe-in' alignment and Fig. 4 shows the 'toe-out' condition when cornering. It will be noticed from Fig. 4 that the inside wheel, when cornering, is turned through a sharper angle than that of the outside wheel. The reason for this is that the front wheels of a car will complete two turning circles in a full turn, one circle being inside the other. Fig. 5 illustrates this and shows why the wheel describing the smaller circle requires a greater angle of turn. This is achieved by setting the steering arms of the front wheels at a pre-determined angle, as shown in Fig. 4.

Meccano steering hub capable of 'castor' angle adjustment.

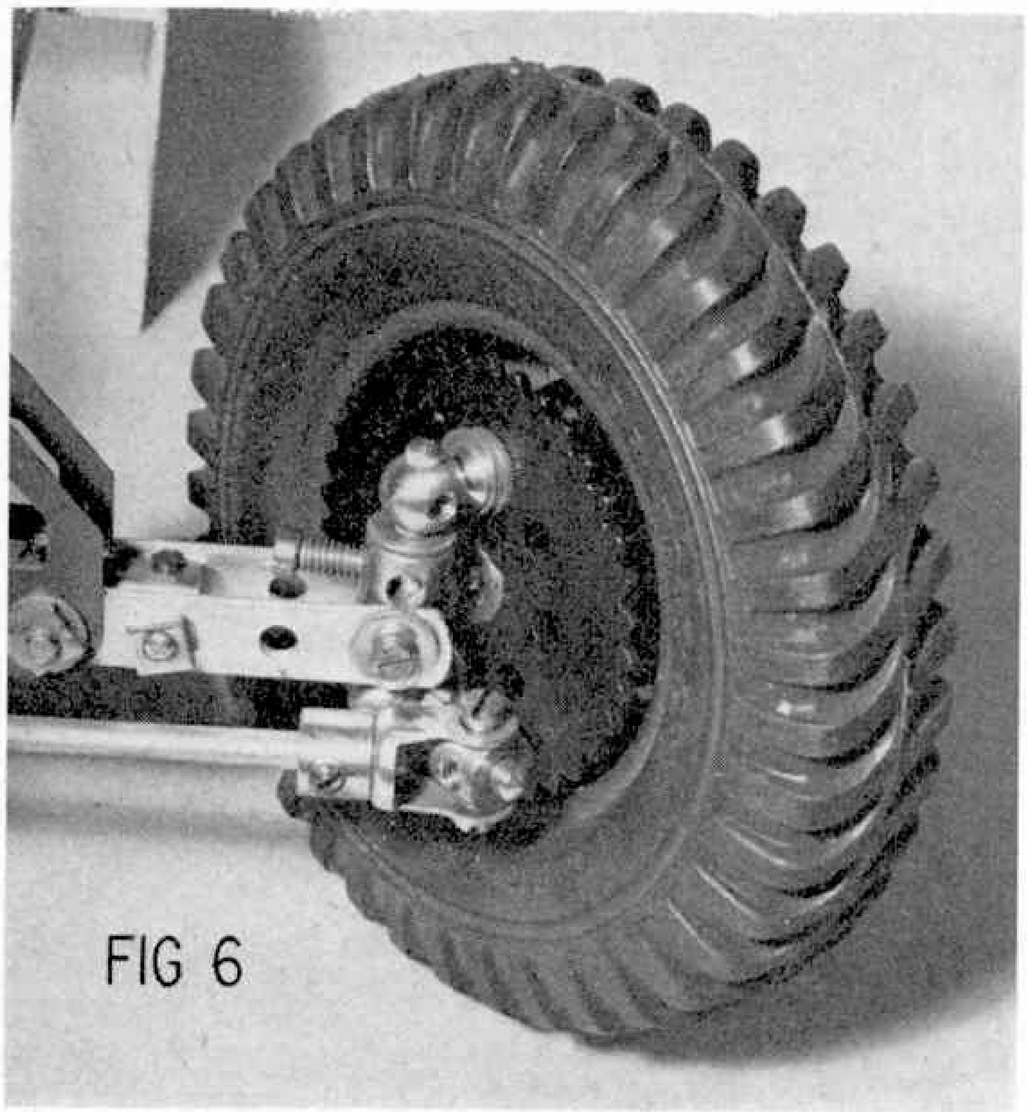


Fig. 6 shows a method of making a steering hub in Meccano parts. The hub flange is a 2 in. dia. Sprocket Wheel fitted with a pair of Handrail Supports. These carry a $1\frac{1}{2}$ in. Axle Rod to act as the King Pin which is journalled in a Short Coupling attached to the extreme end of the axle. By packing out the top Handrail Support with Electrical Brass Washers, camber angle can be achieved. The $1\frac{1}{2}$ in. Axle Rod must be free to pivot in the Short Coupling which is secured to double thickness Narrow Strips by Set Screws packed with a Washer to prevent the shank of the Set Screw from binding with the Axle Rod forming the King Pin. The lower Handrail Support is fitted with a short Threaded Pin in its tapped hole and the shank

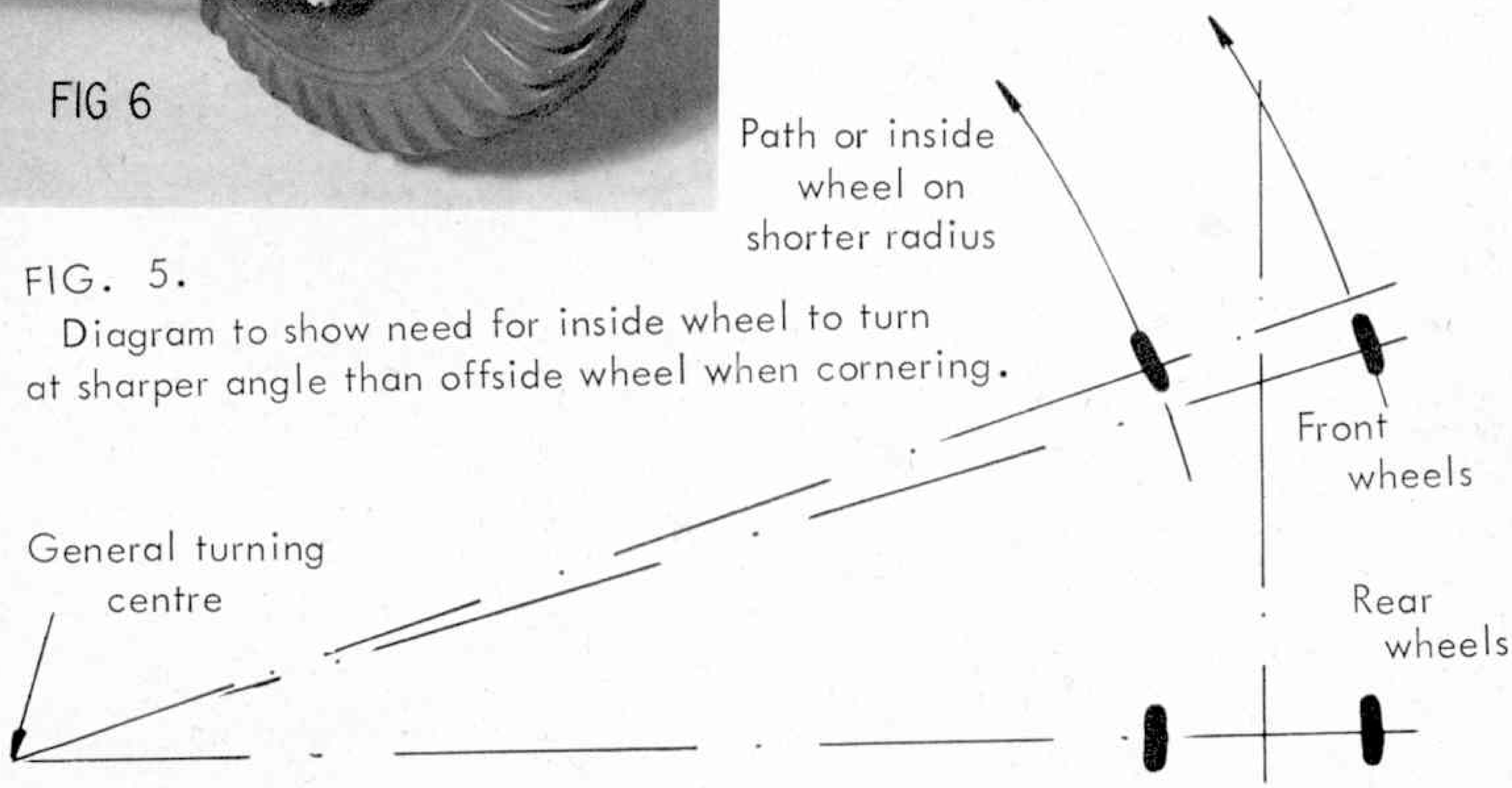
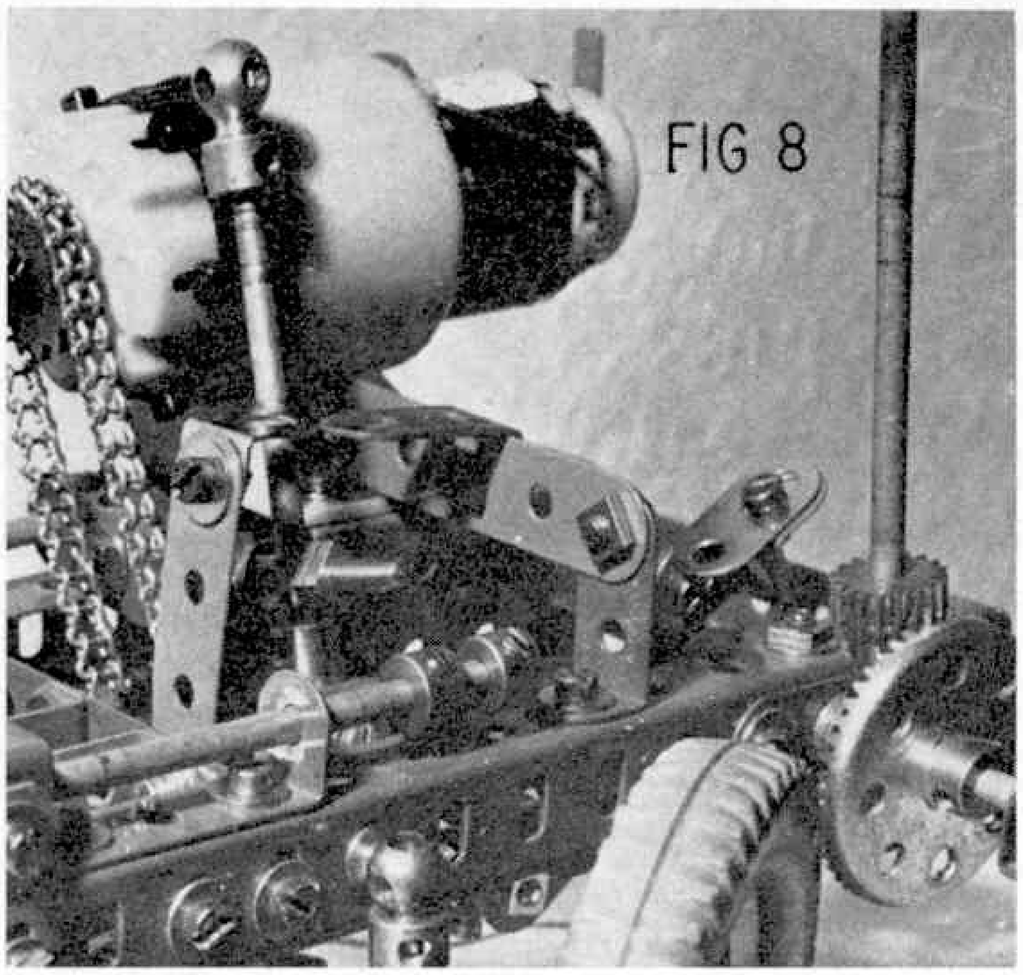


FIG. 5.
Diagram to show need for inside wheel to turn at sharper angle than offside wheel when cornering.



Forward-mounted steering column suitable for model buses, etc.

of the pin forms the steering arm to which the track rod is attached by a swivel Bearing. This arrangement gives a wide angle turning 'lock' and compact swivel joints. The angle of the Short Coupling forming the King Pin journal may be adjusted as follows: Fig. 6 shows a long-shank Bolt screwed into the upper tapped hole of the Coupling to indicate its alignment. By replacing this Bolt with a Screwed Rod and securing the inner end of the Rod near the axle centre by means of a Threaded Boss, Coupling, etc., a small degree of 'positive' or 'negative' tilt can be set on the King Pin and locked by nuts to a rigid setting. The spinning wheel hub carrying the tyre is simply a Boiler End fitted internally and/or externally with Bush Wheels to centre it, the tyre being a neat push fit on to the Boiler End.

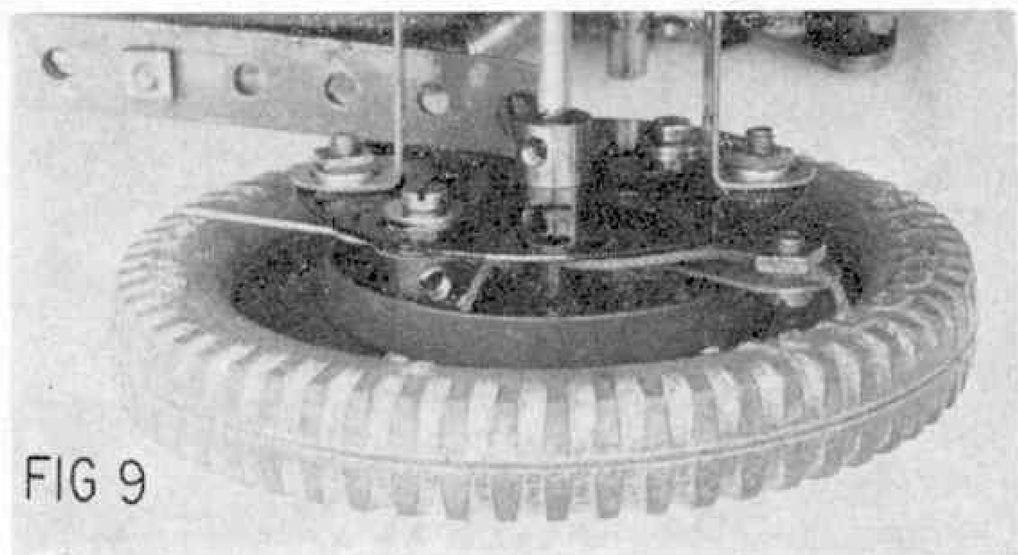
A further system of track rod connection is shown in Fig. 7 where Couplings are employed at the lower end of the King Pins. These may be set at an appropriate angle for 'toe-out' (see Fig. 4) to give the correct turning geometry. In this arrangement, the steering arm linked to the steering column is carried at the top of the King Pin on the off-side of the chassis and runs between the elliptical springs and chassis member above. The steering arm is fitted with a drag link making use of Collars, Rod and Strip Connectors and Swivel Bearings to join up with a Crank acting as the drop arm from the steering gear. A further view of the steering column gearing is shown in Fig. 8 where it is seen mounted almost at the front of the chassis, typical of modern bus steering, the 19-teeth Pinion giving a reduction drive to the drop arm. The 19-teeth Pinion can be replaced by a 15-teeth or even a 13-teeth Pinion from the Meccano Clockwork Motor if a lower reduction is required between the steering column and the Contrate Wheel which operates the drop arm Crank.

Braking systems can be incorporated in Meccano vehicles by utilising Wheel Flanges or Boiler Ends as brake drums. Fig. 9 shows a simple internal expanding brake in which the bosses of two Cranks slide outwards in the slots of a Faceplate attached to the rear springs. A 2½ in. Perforated Strip forms the brake lever and the Crank arms are pivotted on lock-nutted bolts attached to the brake lever in such a way that a forward movement of the brake lever drives the Crank bosses outwards to bind against the inside of the Wheel Flange. These bosses are sprung inwards for return motion by a short Rubber Driving Band linking them together.

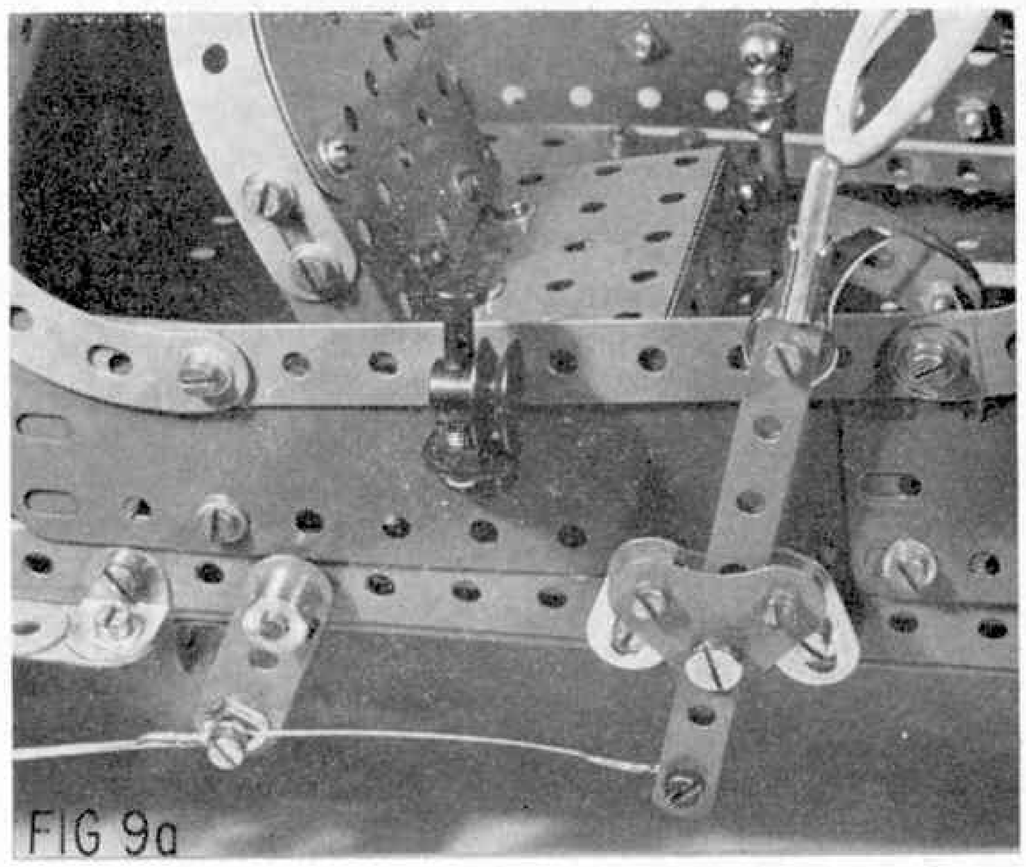
More positive braking action can be achieved by making brake shoes from several thicknesses of Pawls without bosses, Part No. 147c. If these are locked on to a short Screwed Rod pivotting in the boss of a Threaded Crank attached to the wheel hub, a strong braking effect may be transmitted to the Pawls by an external lever. It is even possible to make fibre brake shoes by using 1½ in. Insulating Perforated Strips bolted together or pivotted in stacks on Pivot Bolts inside the brake drums.

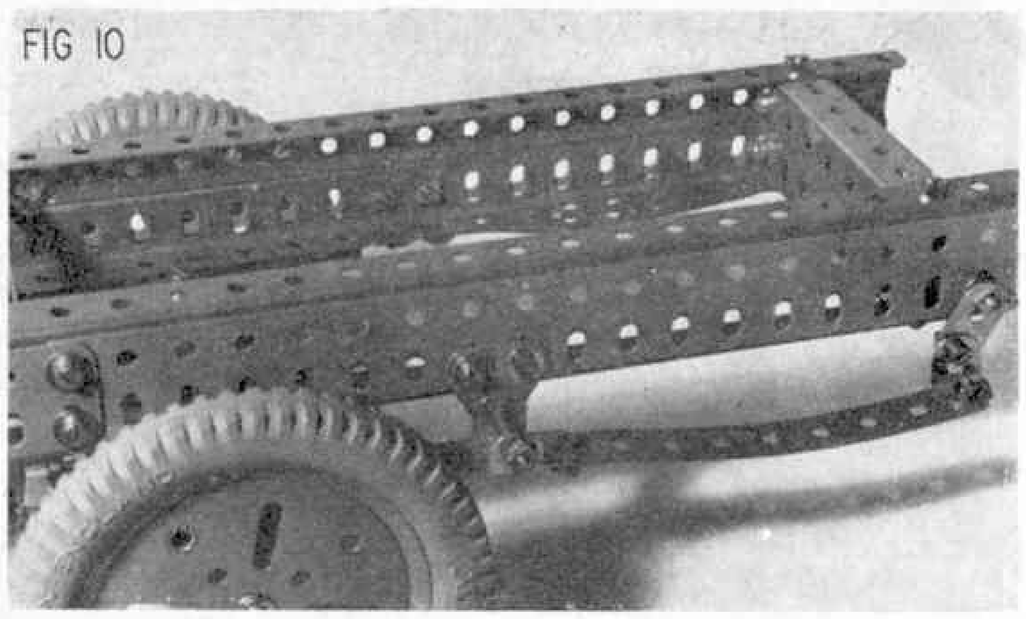
Simple brake cables may be formed from Loom Healds, Part No. 101, as shown in Fig. 9a and these are strong enough to provide considerable braking effort. A flexible brake cable can be made up from Meccano Spring Cord, Part No. 58, and for demonstration purposes, Electrical Tinned Copper Wire may be used running down the centre of the Spring Cord which would be anchored in Collars at either end of the brake line. Copper wire stretches quite easily how-

Simple internal expanding brake suitable for demonstration purposes.

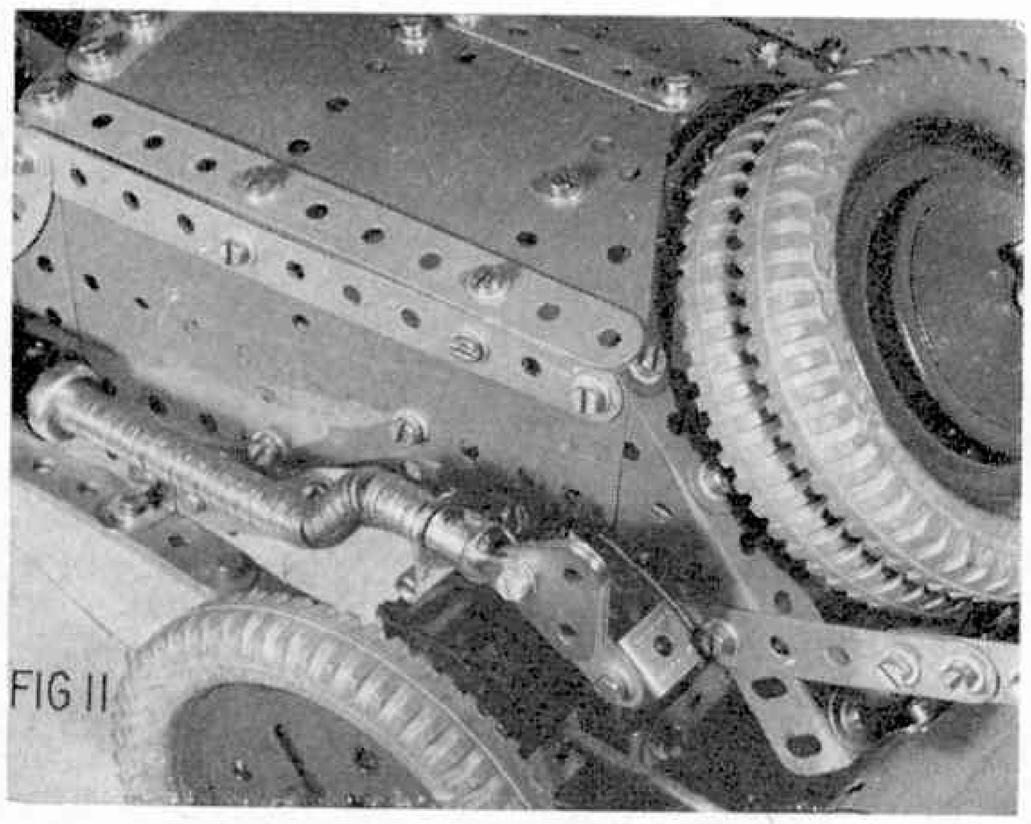


Hand brake lever suitable for operating vehicle brakes employing wire Loom Healds as brake cables. The Crank transmits identical braking effort to the far side of the chassis.





Lorry models should be provided with substantial chassis members as shown in the illustration.



' Tail-end ' modelling of an early type sports car. Note twin spare wheels and tapered faring at rear of luggage boot.

ever and steel wire is preferable—that used in stringed instruments being ideal for the purpose.

Chassis construction for commercial vehicles should be rugged as in the prototypes and Fig. 10 shows one made up in channel girders with skeleton arrangement of leaf springs to indicate wheel spacing at the rear of a heavy duty lorry. Once the wheel arrangement is satisfactory, the leaf springs may be reinforced with additional Perforated Strips or built up from Narrow Strips to give a more pleasing scale.

If leaf springs are employed in Meccano models, they should be compatible with the size of the vehicle as far as possible and care should be taken to support the springs at their ends by well-designed shackles which will keep them aligned but will also permit them to bend under load. Our roads are well used by large vehicles and the observant constructor will note how the springs vary according to size and class of vehicle, many of the heavy commercial vehicles having their springs exposed below a fairly open structure of the chassis.

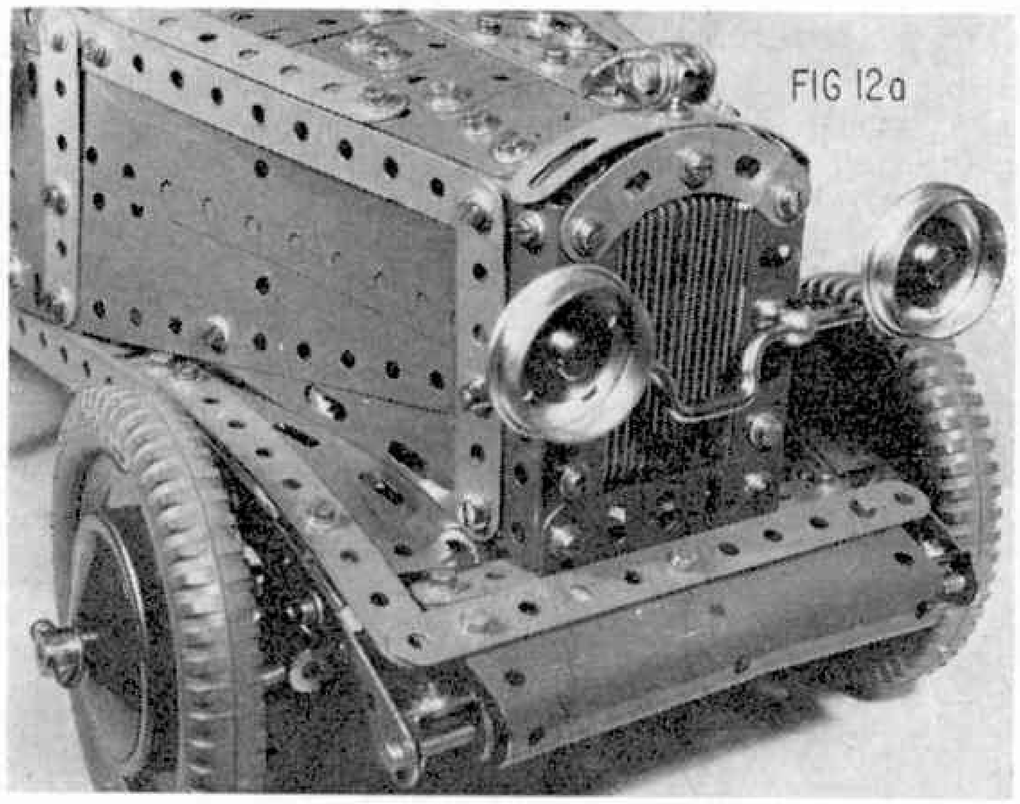
One type of popular spring which works well in Meccano vehicles is the cantilever spring. This is an ' upside down ' spring which has its forward end and its centre secured to the chassis and its trailing end is attached to the rear axle as shown in Fig. 11.

Considerable detail can be modelled into Meccano motor cars and lorries, by the careful selection and use of parts. Fig. 11 shows a neat construction of a heavy ' sporty ' type exhaust system using a large number of Washers on Axle Rods and Crank Handles, a ' fishtail ' being supplied by three 1 in. Triangular Plates locked in an End Bearing.

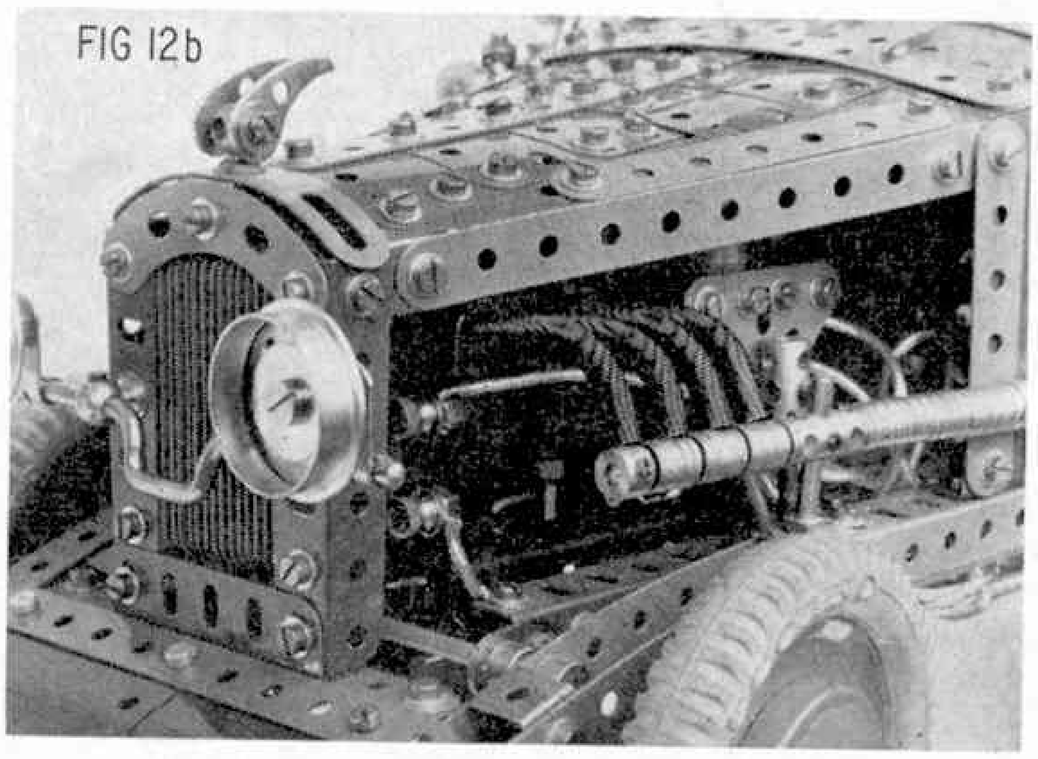
Figs. 12a and 12b show how fairings can be moulded from triangular and rectangular Flexible Plates and how a badge bar with large headlamps can set off a stylish radiator. Constructors who favour the Bentley/Bugatti/Aston Martin vintage models will appreciate the difficulties in modelling details. Fig. 12b shows an unorthodox use of Tension Springs in providing flexible feed-out pipes from the exhaust manifold to the main exhaust line. The E15R Motor used in the model shown has base flanges with slotted holes. The small twisted loops at the ends of standard Tension Springs, as supplied, lock into the slots with a simple twist and no other form of securing is required.

Next month's article will deal with Electrical Parts in the Meccano System and this will conclude the Constructors' Guide Series.

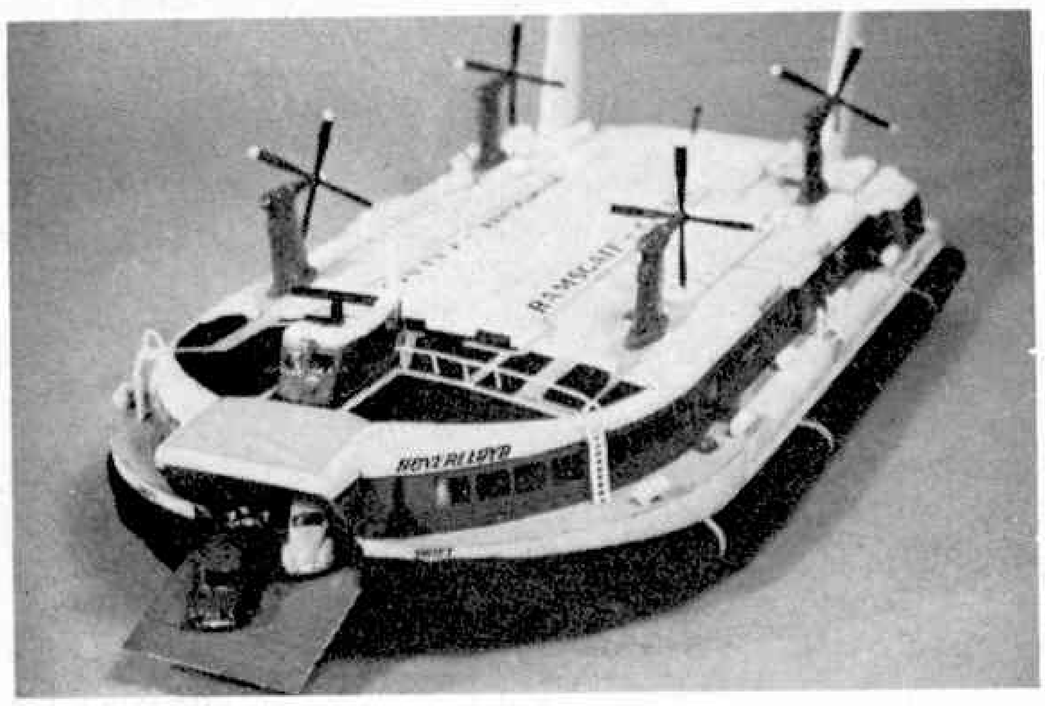
An example of ' vintage ' bodywork on a veteran chassis utilising Flexible Plates to model body contours and various parts in unorthodox applications.



' Open-sided ' exhaust details making good use of Meccano Tension Springs in an unusual manner.



HAVE YOU SEEN ?

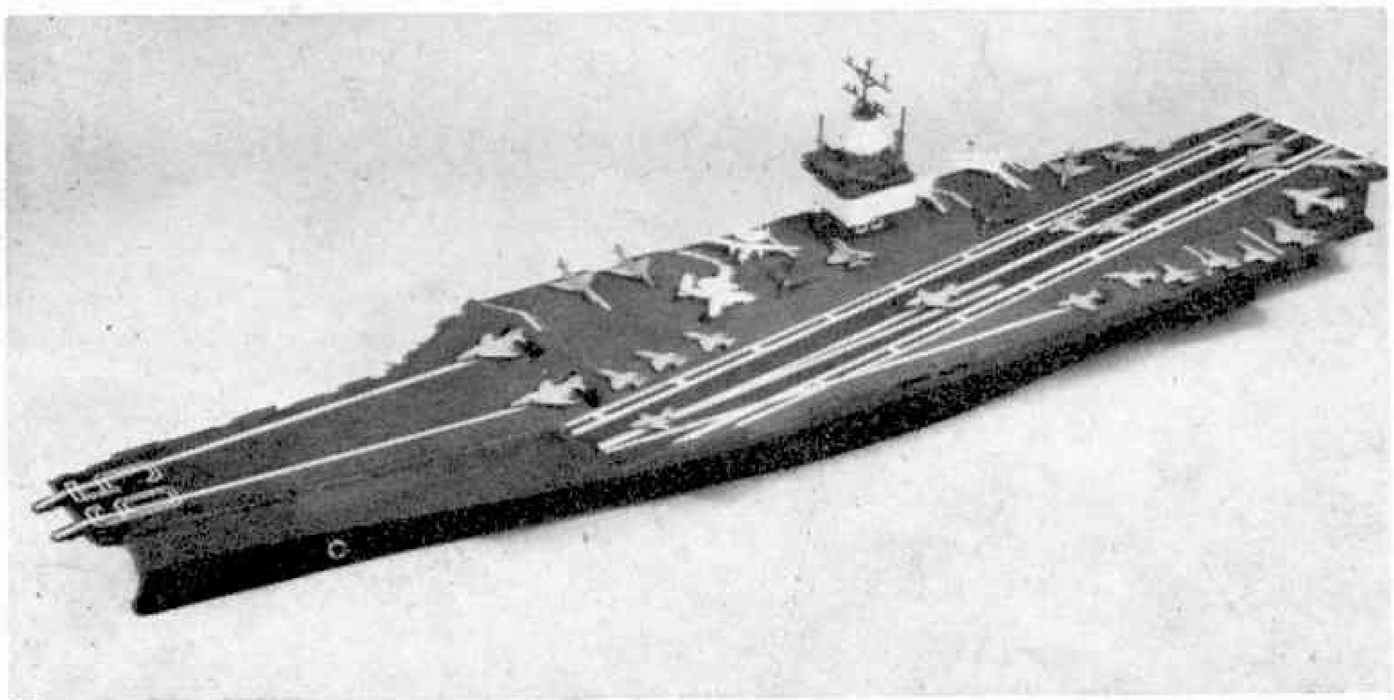


Airfix Hovercraft

Briefly mentioned last month was the new model Hovercraft from Airfix. Our sample has now been completed and builds up into what must be the most impressive Hovercraft kit ever to appear in plastic form. It is of course a model of the S.R.N. 4 Hovercraft which is currently doing the Ramsgate/Calais run, as no doubt many of you will know. We think this one will prove very popular of this rather unusual subject for a plastic kit, and with its wealth of detail will give constructors a good idea of how the latest hovercraft are made. Detailing is excellent, even down to the inclusion of four model cars, which are easily identified as Volkswagens and Vauxhalls. Price of this beauty is 24/6d.

Revell Aircraft Carrier Models

Also received recently from Revell are two 1/720 scale models. The first is a model of the USS Essex, a Second World War vessel which saw action at Okinawa. Our builder found it a pleasant and easy model to construct and the instructions were both clear and easy to follow. Ten small models of World War two aircraft fighters are included for fixing to the deck which nicely rounds off this attractive little model.



The second carrier is a model of the largest Naval ship ever built, and the model rather dwarfs the U.S.S. Essex, as it is getting on for twice its size. A novel feature of this kit is the fact that the hull can be separated at the water-line so the model can be mounted on a scenic base.

Once again our builder found it an easy model to build, although the painting details were hard to follow, necessitating great use to be made of the colour picture on the box. When completed the model is certainly very handsome, and contains no less than 30 model aircraft to accompany it.

Price of this one is yet to be announced.

Carrier illustrated is U.S.S. Forrestal.

New Monogram Car Kit

New from Monogram comes yet another 1/24th scale model kit described on the box as " Son of Ford ". In true Monogram style it is very well moulded and includes as usual a wealth of chromium plated parts. The orange plastic body shell needs no painting, thus removing perhaps the most difficult part of model kit construction. Price is yet to be announced, but should be in the region of 17/-.

Matchbox Release

This month's latest release from MATCHBOX takes the form of a new " Superfast " model of the American Freeman Inter-City Commuter Car. Finished in metallic purple with a contrasting-yellow flash down either side it is certainly a most attractive little vehicle. Interior detailing is complete with seats, dash and steering wheel and is finished in white. A final touch is the inclusion of free rolling " Superfast " wheels.

car outline COMPETITION

50 Dinky Toy Models to be Won!

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The first 50 correct entries received will be sent a model of the vehicle illustrated.

The vehicle illustrated is .....

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Name..... Age.....

Address.....

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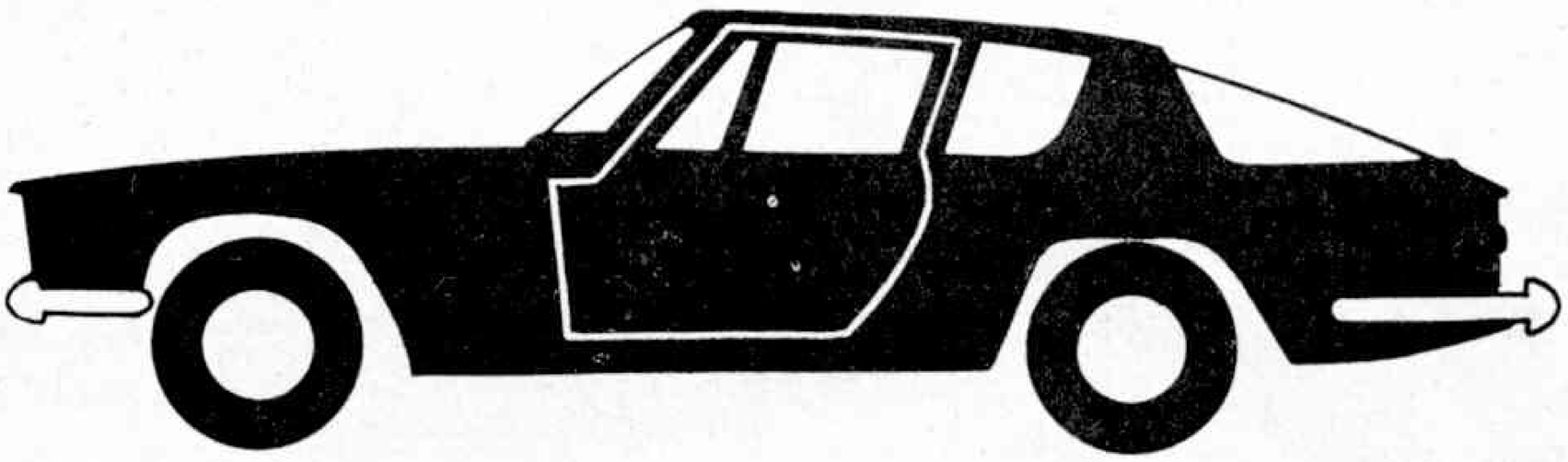

DINKY TOY WINNERS!

Below is a list of the winners who correctly identified last month's silhouette and were the first to send their entries to the *Meccano Magazine* Office. To those of you whose entries were wrong, or didn't perhaps get them off to us quickly enough, don't despair, but have another try this month. The last month's car was, of course, a Lamborghini Marzal.

Winners.

F. Gerin, France; J. Kinchen, Havant; G. Lyall, Grimsby; D. Lewis, Luton; S. Littleworth, Luton; L. Glover, Yorks.; J. Wells, Crewe; D. Hatcher, Bedford; G. Saunders, Southampton; P. Glynn, Birmingham; M. Bird, Birmingham; A. Langham, Fife; A. Burton, Stoke on Trent; J. Blatch, Sussex; C. Mayor, Yorks.; M. Tinker, Maidenhead; J. Porter, Rochester; M. Wilson, Beaconsfield; T. Franklin, Brighton; S. Littlejohn, London; A. Drake, Cambridge; D. Whiley, Norwich; D. Southgate, Herts.; N. Tamblin, East Lothian; R. Thomas, Boston; A. Monteath, Haslemere; P. Slinger, Lancs.; S. Jeffcoat, Birmingham; C. Edgley, High Wycombe; T. Baldwin, Devon; R. Peatman, Cambridge; J. Harrison, Sussex; P. Thompson, Leeds; S. Finch, Ipswich; S. Rowsell, Newport; A. Robertson, Ipswich; D. Snuggs, Hants.; P. Northway, Fife; P. Courlton, Ashford; P. Sims, Southampton; W. Vevers, Midlothian; G. Rahani, Perthshire; M. Gibson, Oxford; A. Carter, Leicester; S. Kimberley, Staffs.; R. Levy, Manchester; N. Boot, Herts.; J. Allen, Maidenhead; T. Dodsley, Nottingham; I. Hobday, Oxon.

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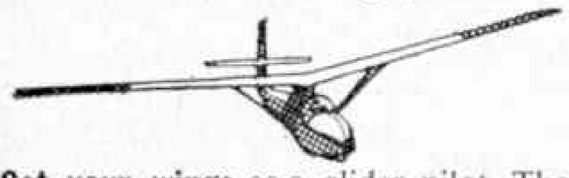

Get your wings as a glider pilot. The ATC has 160 gliders, in 28 different gliding schools.

Learn about flying. You could even get a flying Scholarship of 30 hours flying training (including 10 hours solo) with a Civil Flying School.

Learn to shoot — .22 as well as .303. There is a Cadets' Bisley every year.

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To Squadron Leader M. R. Burroughs, RAF, Headquarters Air Cadets (703ZX1), Royal Air Force, Brampton, Huntingdon.

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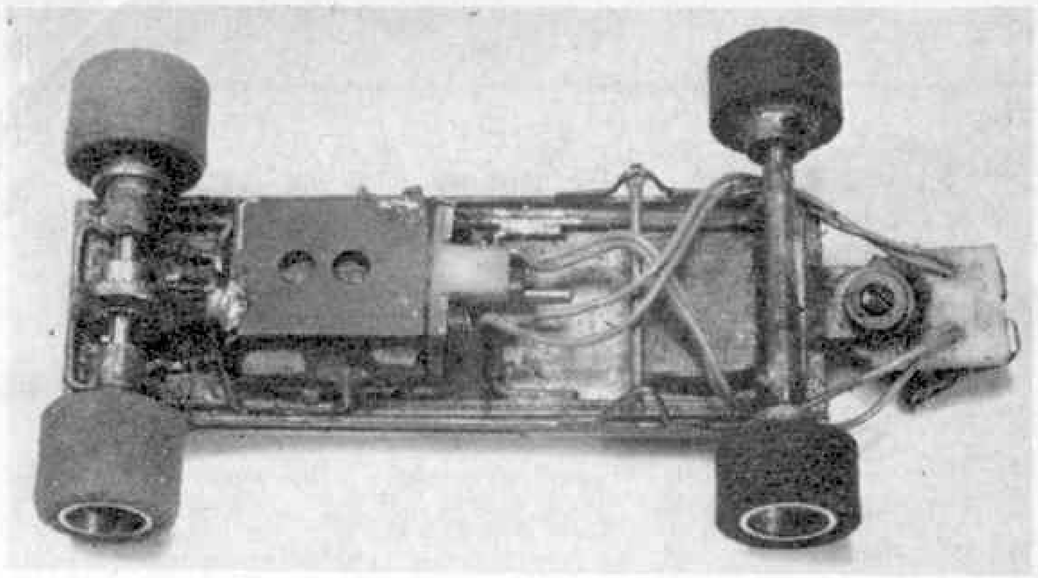

The chassis illustrated above by Midlands ace Phil Enos is just one of many exciting constructional features in the November issue of **Model Cars.** Added to this are a full photo report of the Tottenham Open Meeting, 1/32nd scale plans for the Chaparral 2J and an article on setting up and driving by Stuart Wyatt.

Collectors have a feature on building a 'B' type bus in plastic and there are the usual Collectors' Corner and Autominology columns. A feature on silver soldering and one or two surprises are just part of our not-to-be-missed November number.

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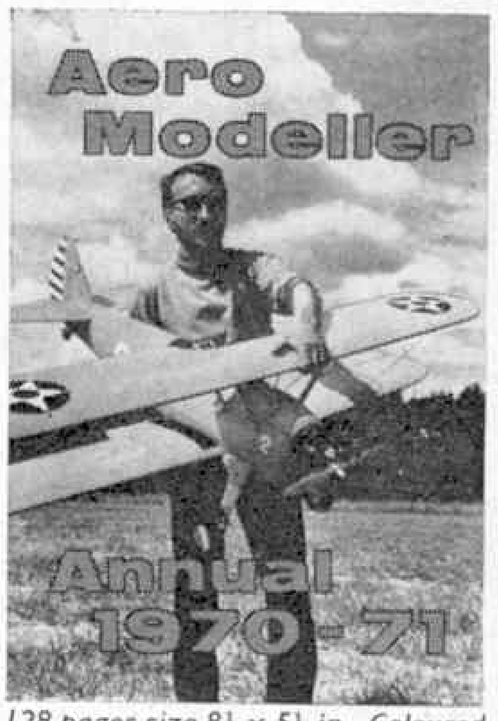

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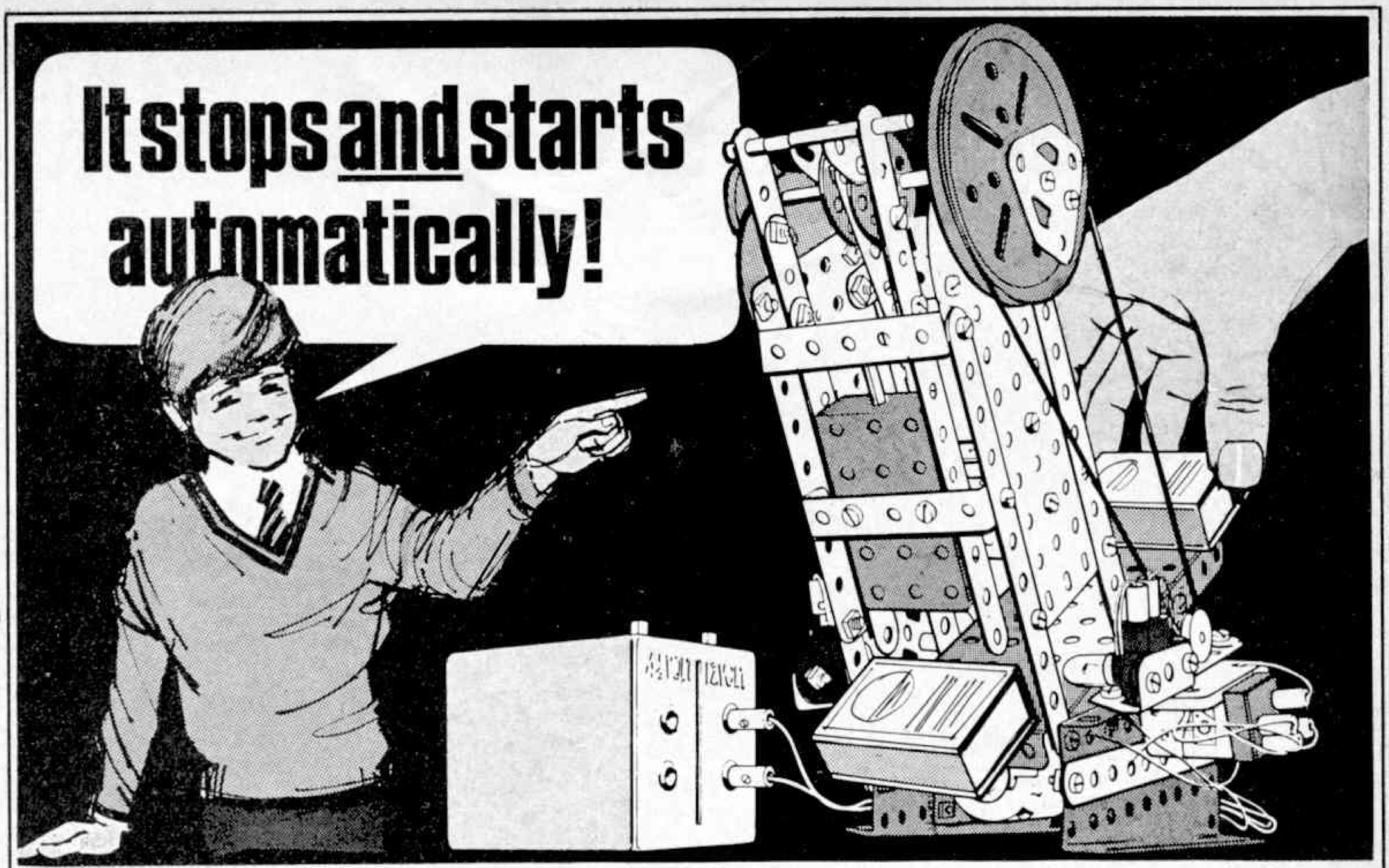

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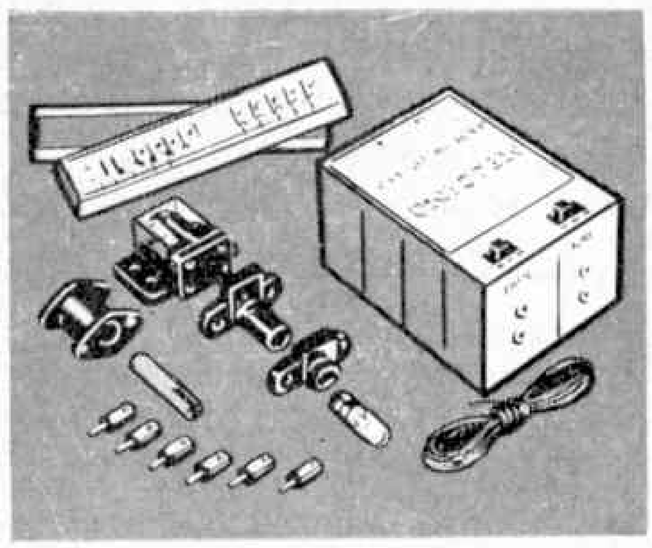

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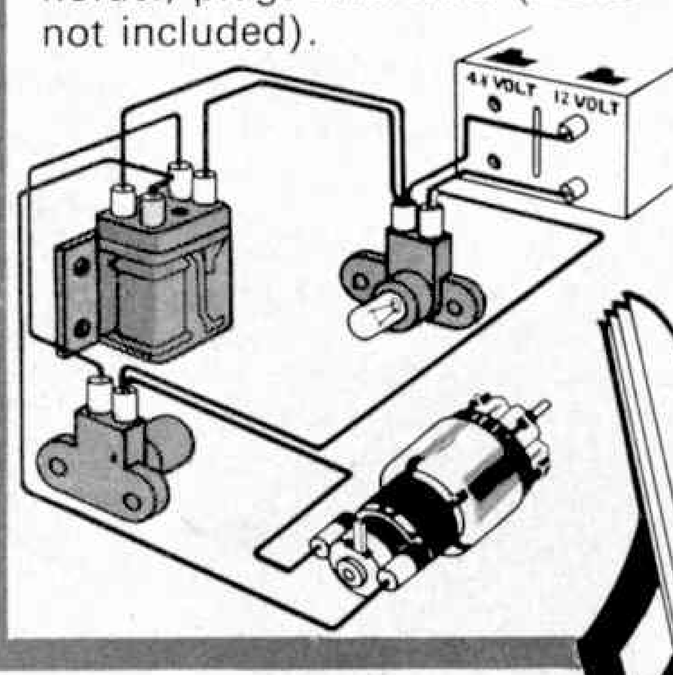

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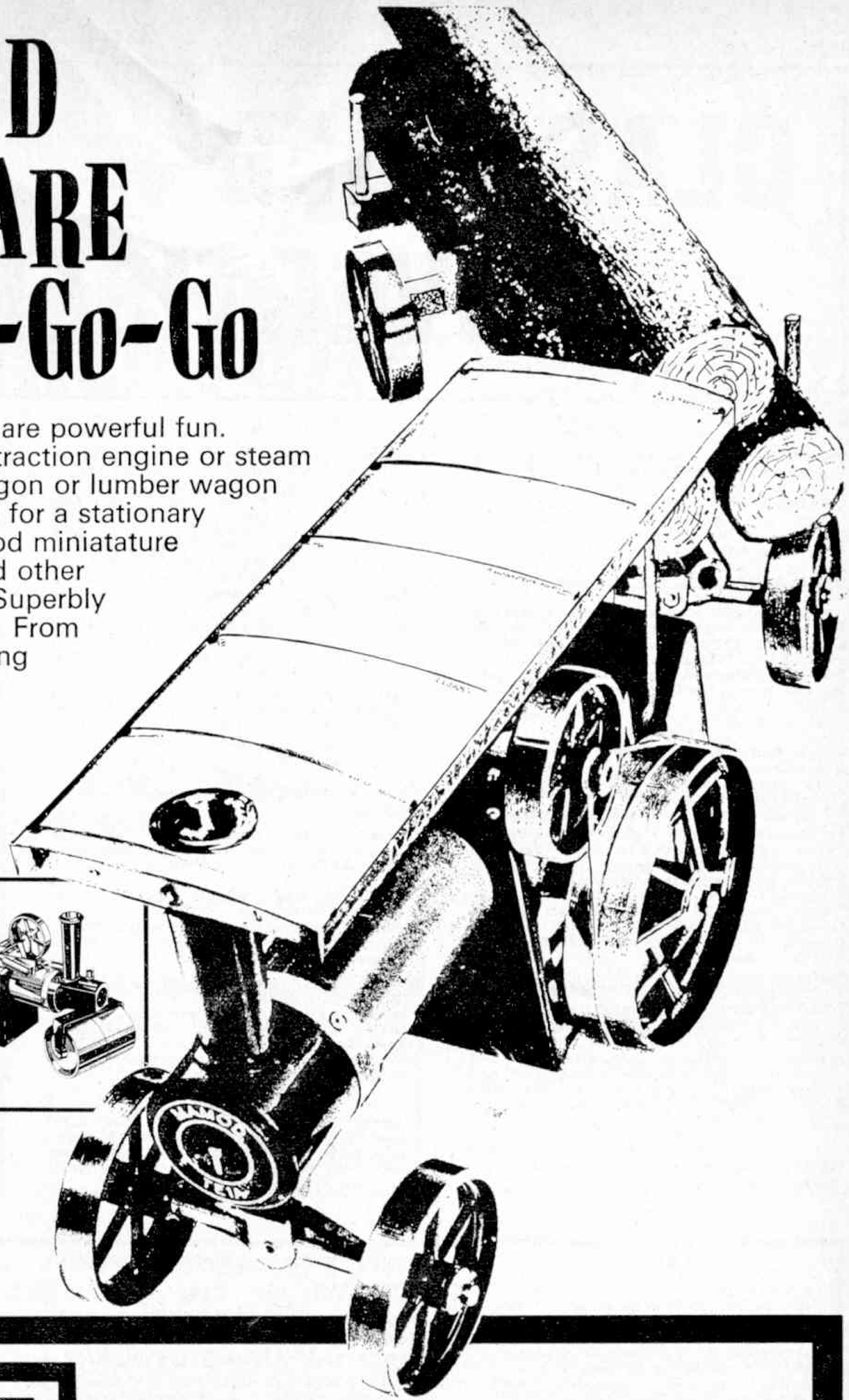

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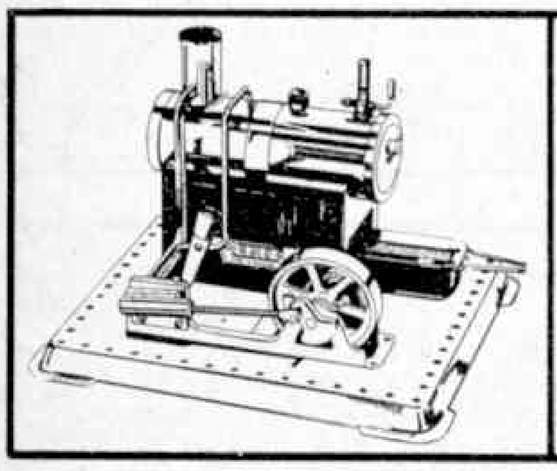

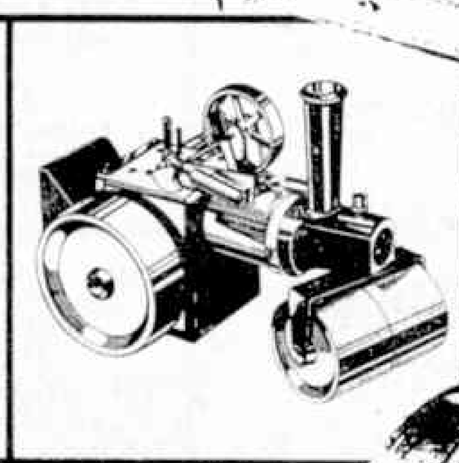

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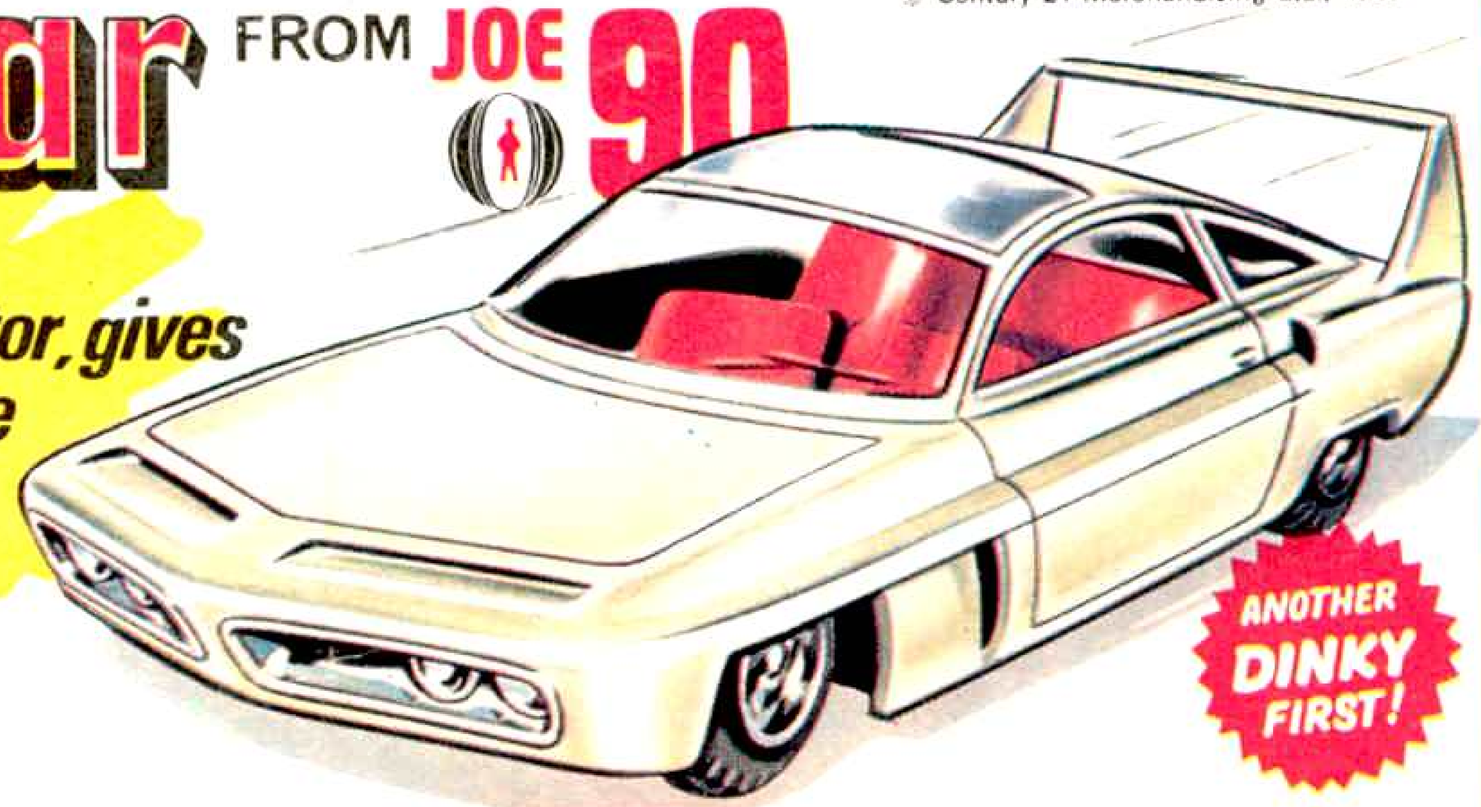

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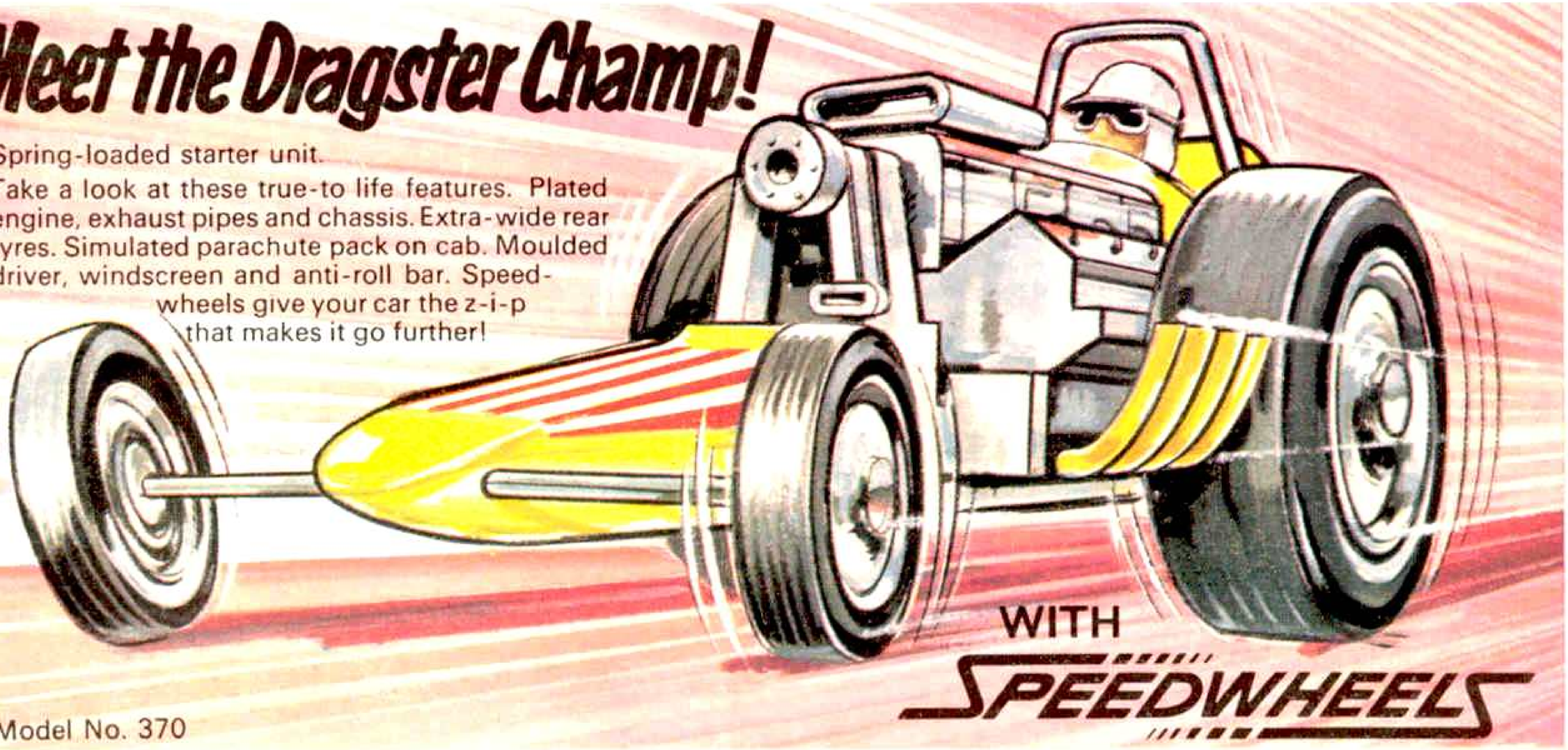

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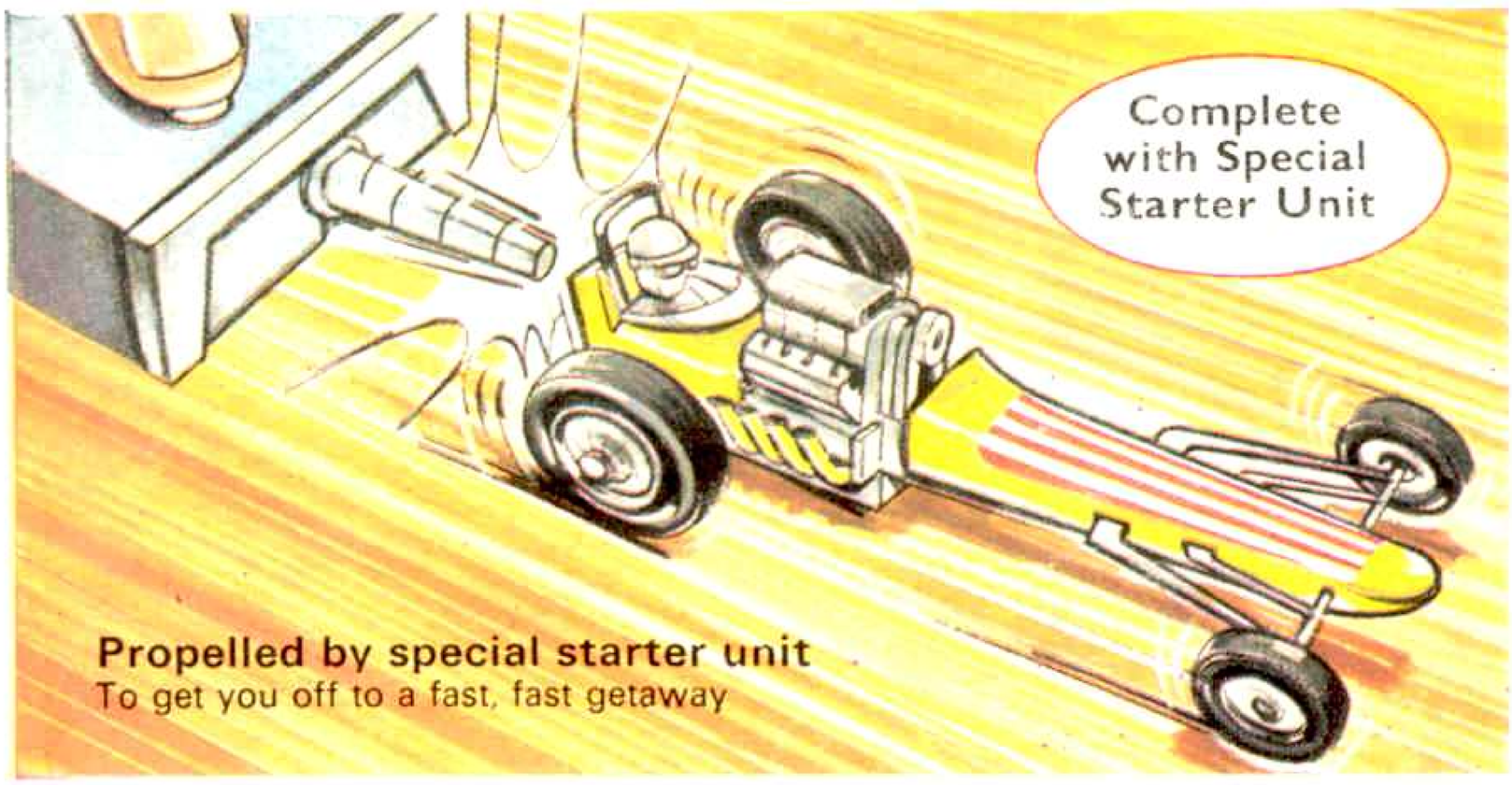

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