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MARCH 1971

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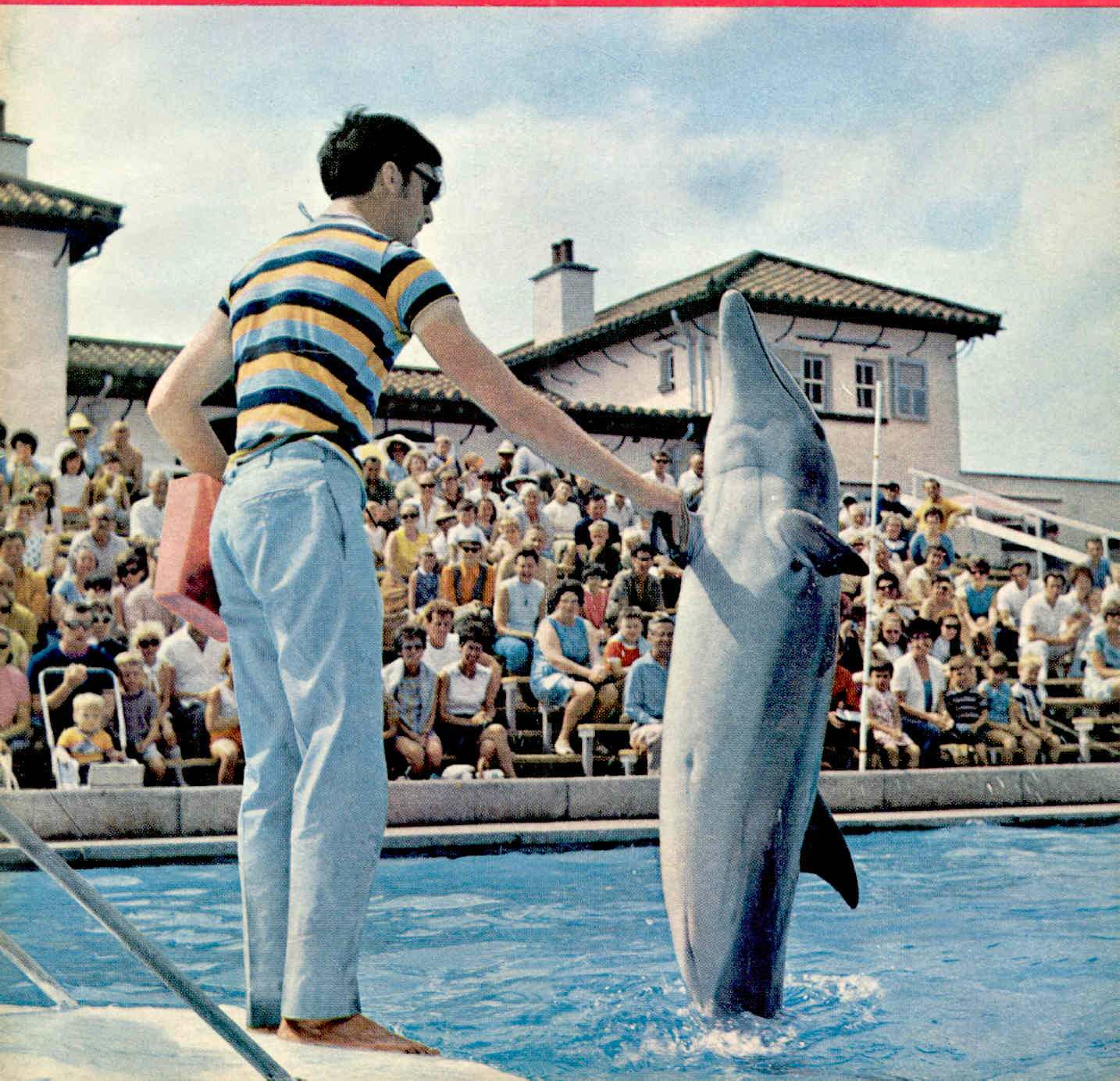

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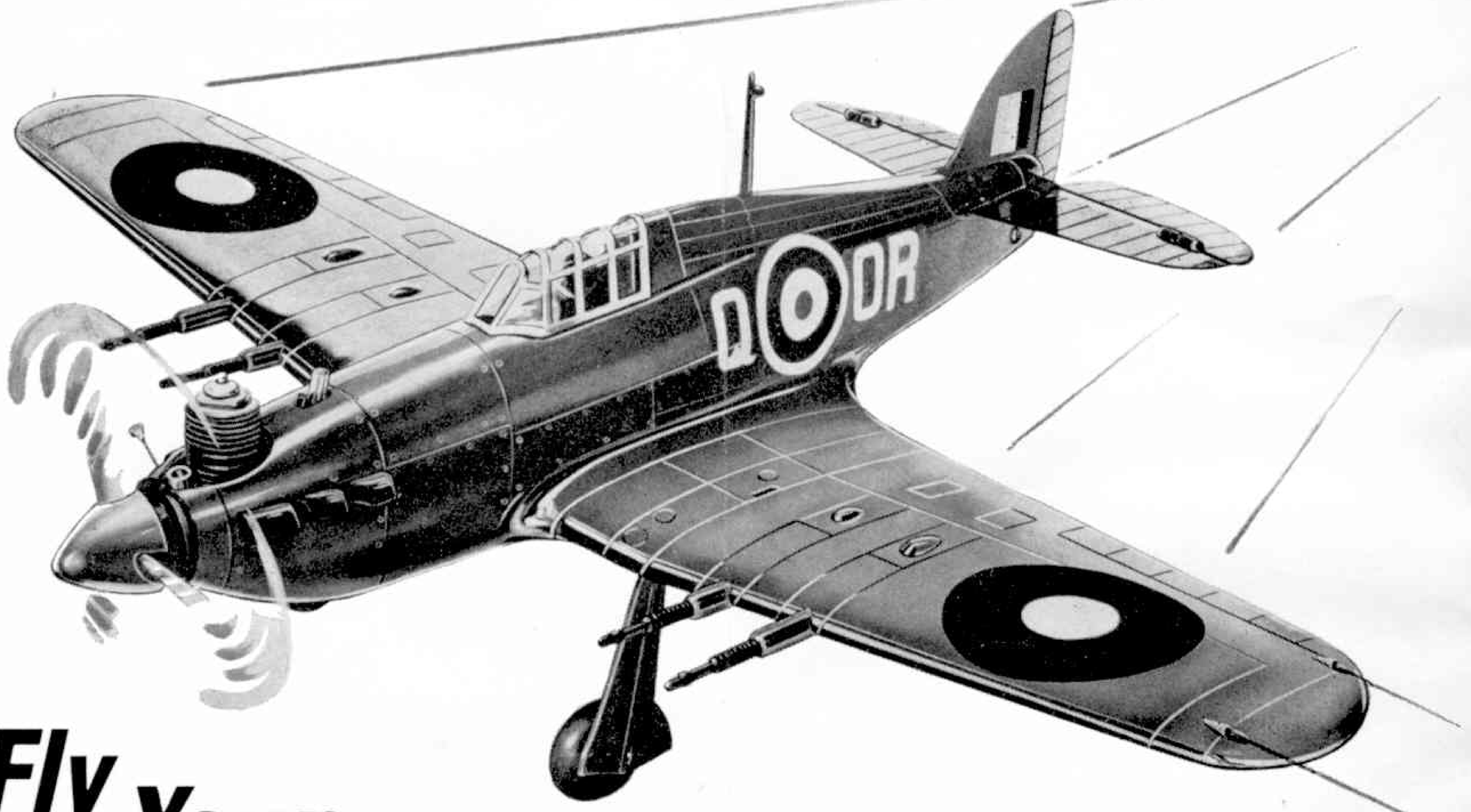

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FRONT COVER

A dolphin shakes " hands " with one of the staff of a dolphinarium at Scarborough, to the delight of spectators. Since the article on page 116 on these fascinating and attractive creatures was written, it has been revealed that the U.S. Navy has succeeded in training several of them for various underwater activities, and they are in fact in service off the coast of Viet-Nam.

NEXT MONTH

Another bumper batch of articles on various interesting subjects will be appearing in our April issue. Sample subjects are amateur telescopes, the Cheltenham Flyer, models at the Model Engineer Exhibition, and maybe one or two surprises. Regular Meccano builders will be having their quota, and regular features will naturally be there in force.

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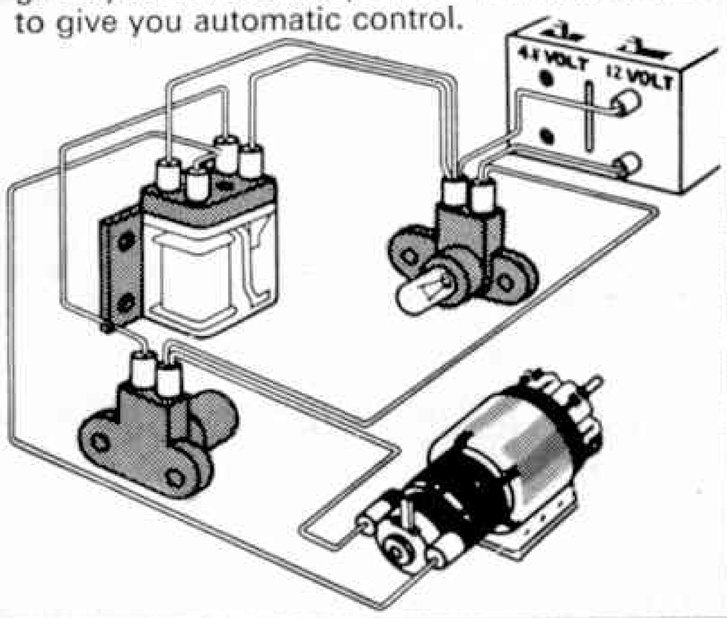

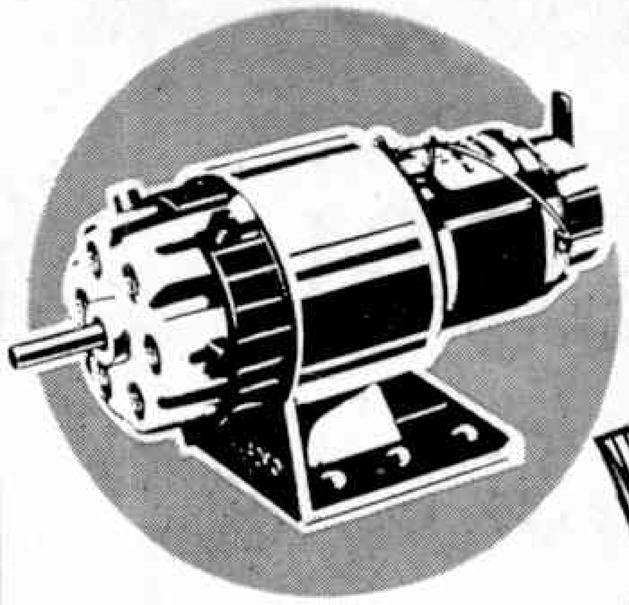

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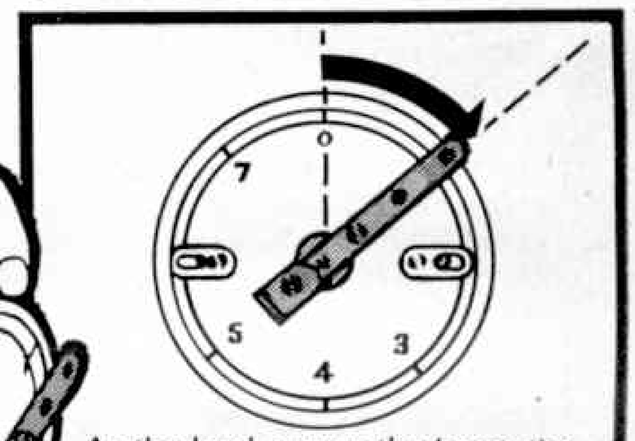
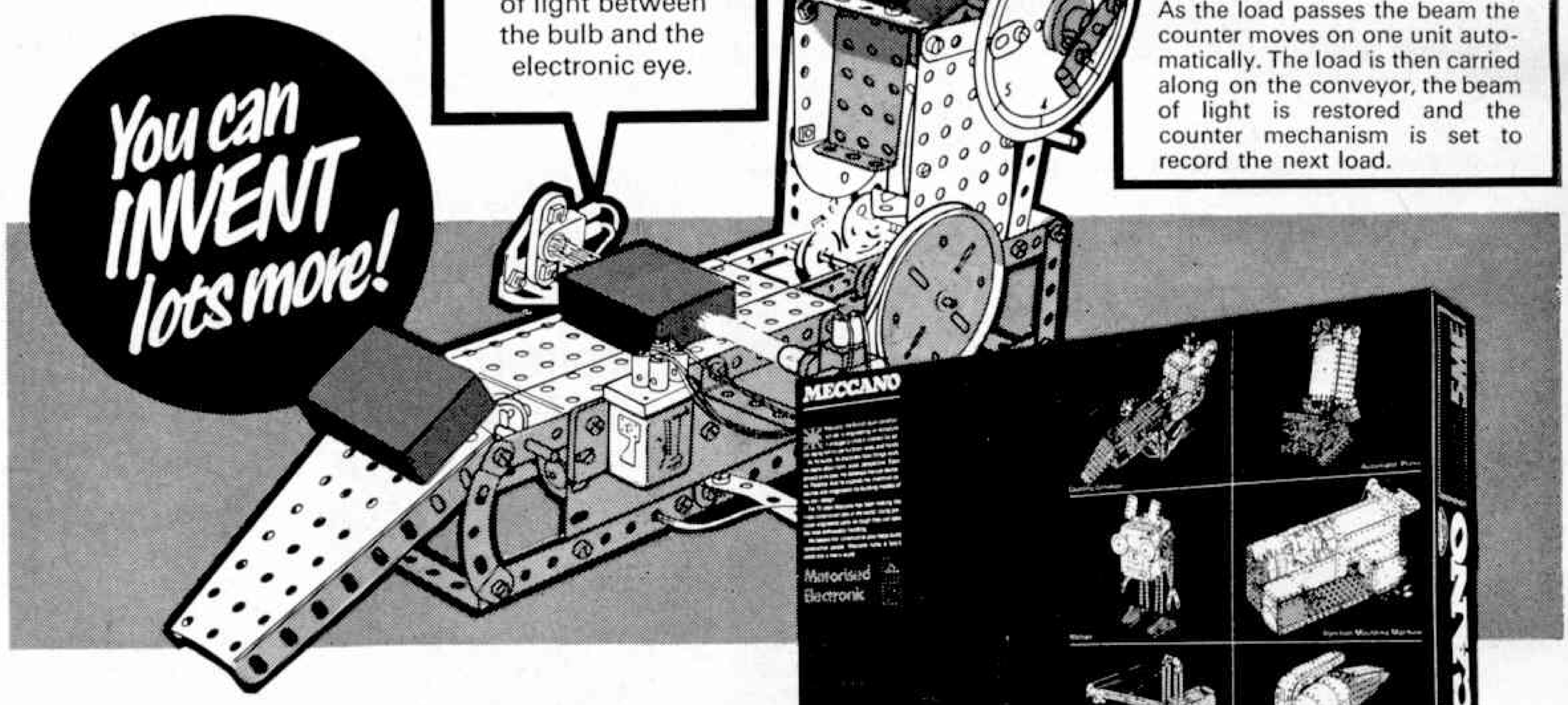


As the load passes the beam the counter moves on one unit automatically. The load is then carried along on the conveyor, the beam of light is restored and the counter mechanism is set to record the next load.



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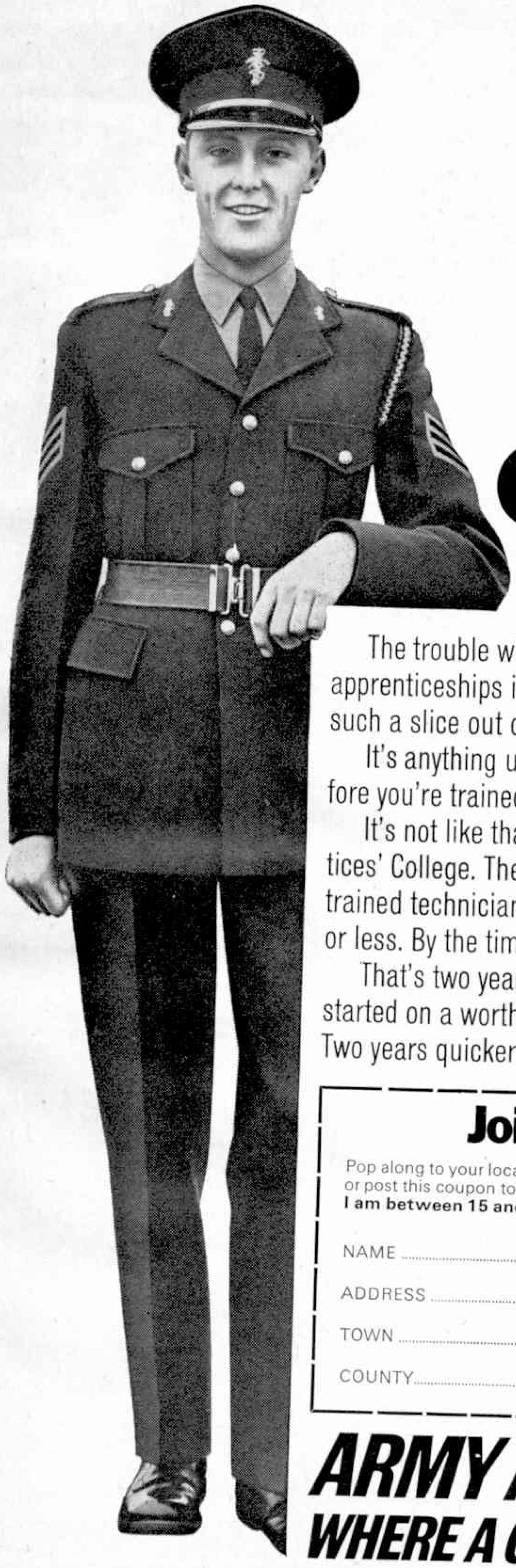

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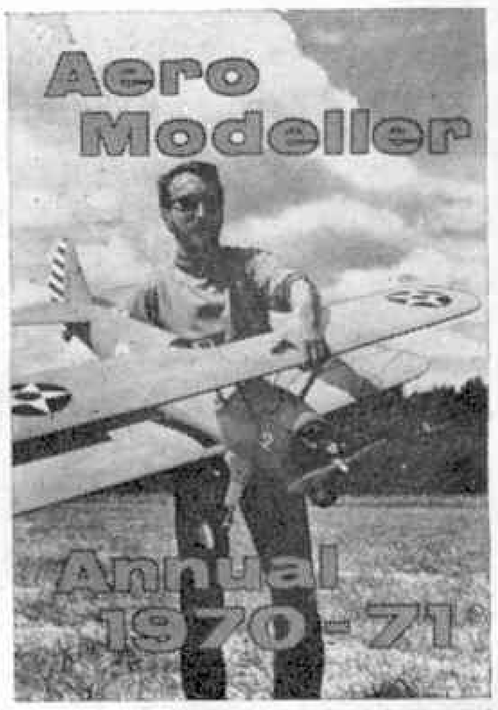

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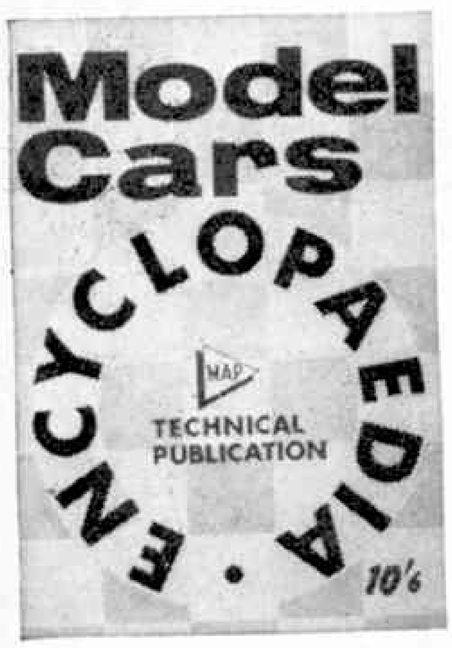

23 MODEL CARS ENCYCLOPAEDIA

This Electric Model Car Racing Encyclopaedia brings together a wealth of information for the benefit of expert and beginner alike, conveniently arranged in A-Z form. It is an attempt to assemble in one place quite a lot of information about electric model car racing in simple alphabetical form where it will be readily available for reference, ranging from Ackerman steering through Drivers and Driving to Pay Circuits and on to Worms and Zinc Spraying.

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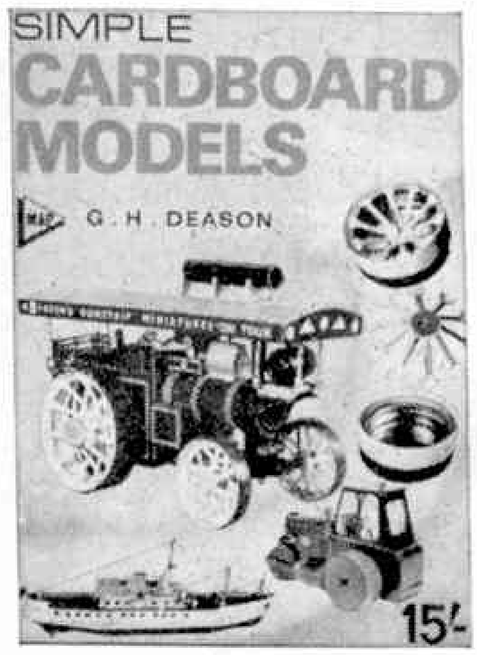

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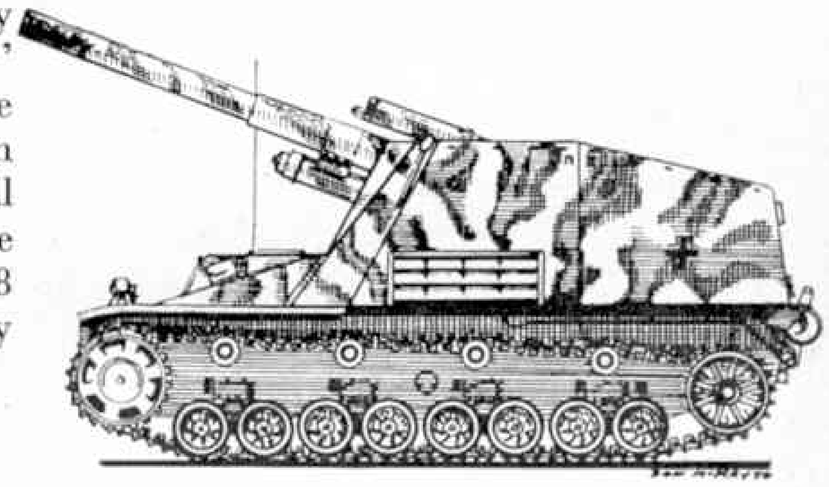
Issue number two of our exciting new title for military enthusiasts looks all-set to consolidate the overwhelming success enjoyed by recently published issue number one.

Top-line features scheduled for February edition include an intriguing article on modelling Japanese Samurai which contains many illustrations of some really superb figures, the arrival in our pages of wargamer Charles Grant who, as a starter to a regular monthly spot, describes "*New Look Ancients.*" The Scottish United Services Museum in Edinburgh is described, also the I.P.M.S. Champs and the '*M.E.*' Exhibition.

"*Figure Review*" deals with Lamming Miniatures and there'll be more Royal Flying Corps markings for modellers who like to get things exactly right. Something of an exclusive—and a feature of which we're particularly proud—is "*The Historex Story*" which, for the first time, shows the processes involved in the production of these French figures. Then there'll be Self Propelled Artillery Plans, the U.S. Medium Tank M60A1 and M8 Greyhound Armoured car and many supporting features.



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M.E. Exhibition

We are just getting our breath back from the 40th Model Engineer Exhibition, which was a resounding success, with more than 5,000 people over our previous highest attendance. Crowds watched the steam ploughing, steam threshing, electric R.T.P. aircraft, and radio controlled cars and boats, or had a go on the slot cars or the live steam trains, but the biggest crowds always seemed to be swarming round the three tank courses manned by, among other people, the Editor and also contributor Charles Grant. We were going to keep a count on how many people had a go, but eventually gave up; it was several hundred a day and, for youngsters particularly, it was clearly the most popular stand in the show. The three tracks, still working, have now been passed on to three big model firms, so who knows, you may have a chance to try one locally.

Next month we will include some pictures of some of the fabulous models at the Exhibition, and because of the immense number of questions, we shall be running an article soon on how to build and fly electric round-the-pole aircraft.

Novel competition

An unusual competition which will intrigue many of our ingenious readers is announced by the Biro/Bic company. The idea is to encourage creativity in what would otherwise be discarded items, viz. used Bic pens. Eligible pens are the two types of "stick" pen, the fine point, yellow-barrelled or the medium point, transparent-barrelled. Any part or parts of the pens may be used, and any number can be built into a model. There will be two categories, Senior and Junior, the latter for under 16-year-olds. Heat moulding will be allowed in the Senior class, but not in the Junior.

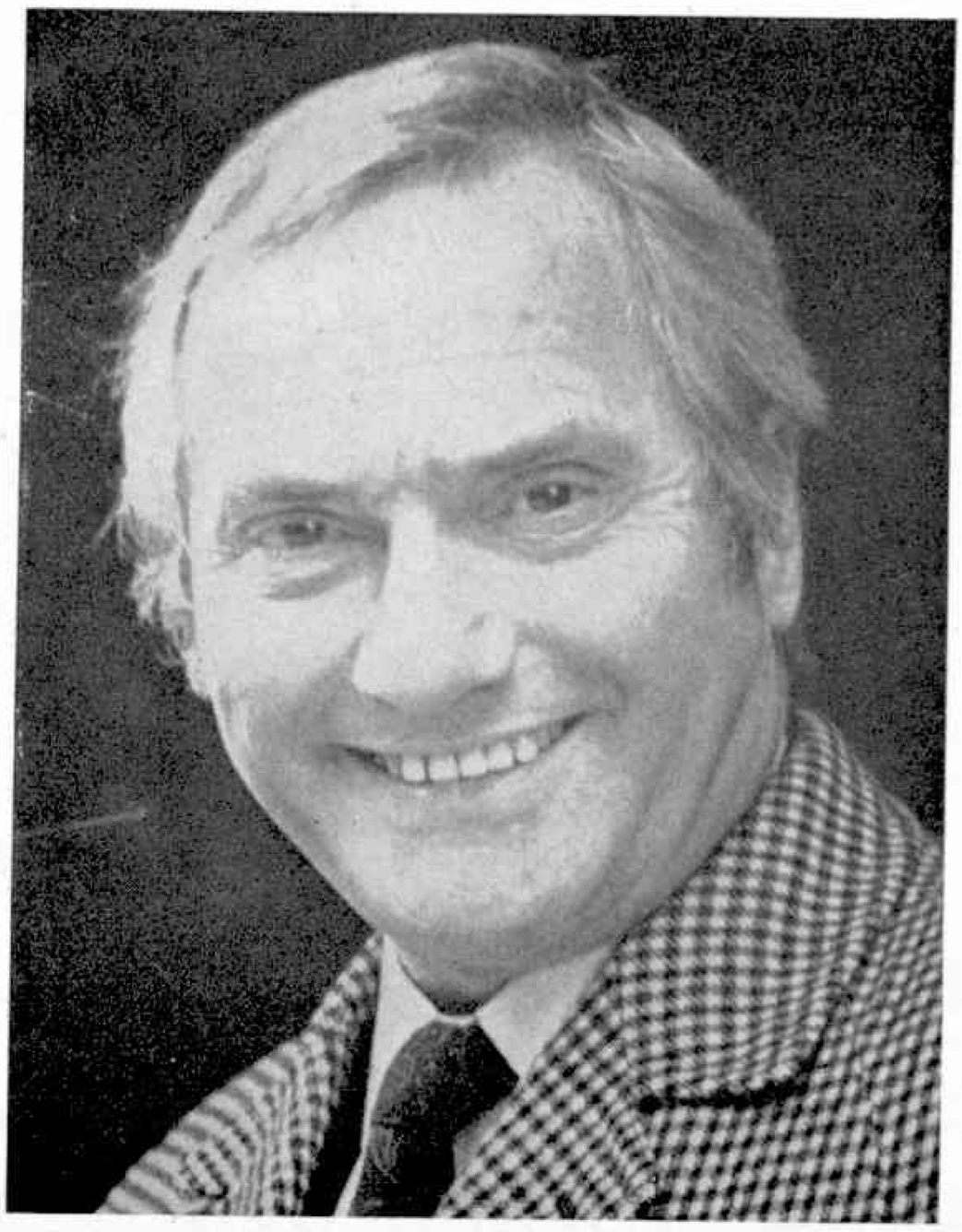
Prizes of £25, £15 and £10, plus consolation prizes, will be awarded at three-monthly intervals, and prize-winners will be eligible for the National Championship, judged at the end of the year and bringing the prize-money up to £250 plus a Championship Trophy. Full details will be found in the Company's advertisements in the March issues of all M.A.P. journals, and we suggest that you start collecting discarded pens now. One pen is sold each year for every man, woman and child in the U.K., plus several million more, so there are a lot of pens to be found. Perhaps you know someone in a large office who would help collect; you may make a model from only nine or ten pens, but if two models tie for a prize, that containing the greater number of pens will have the advantage.

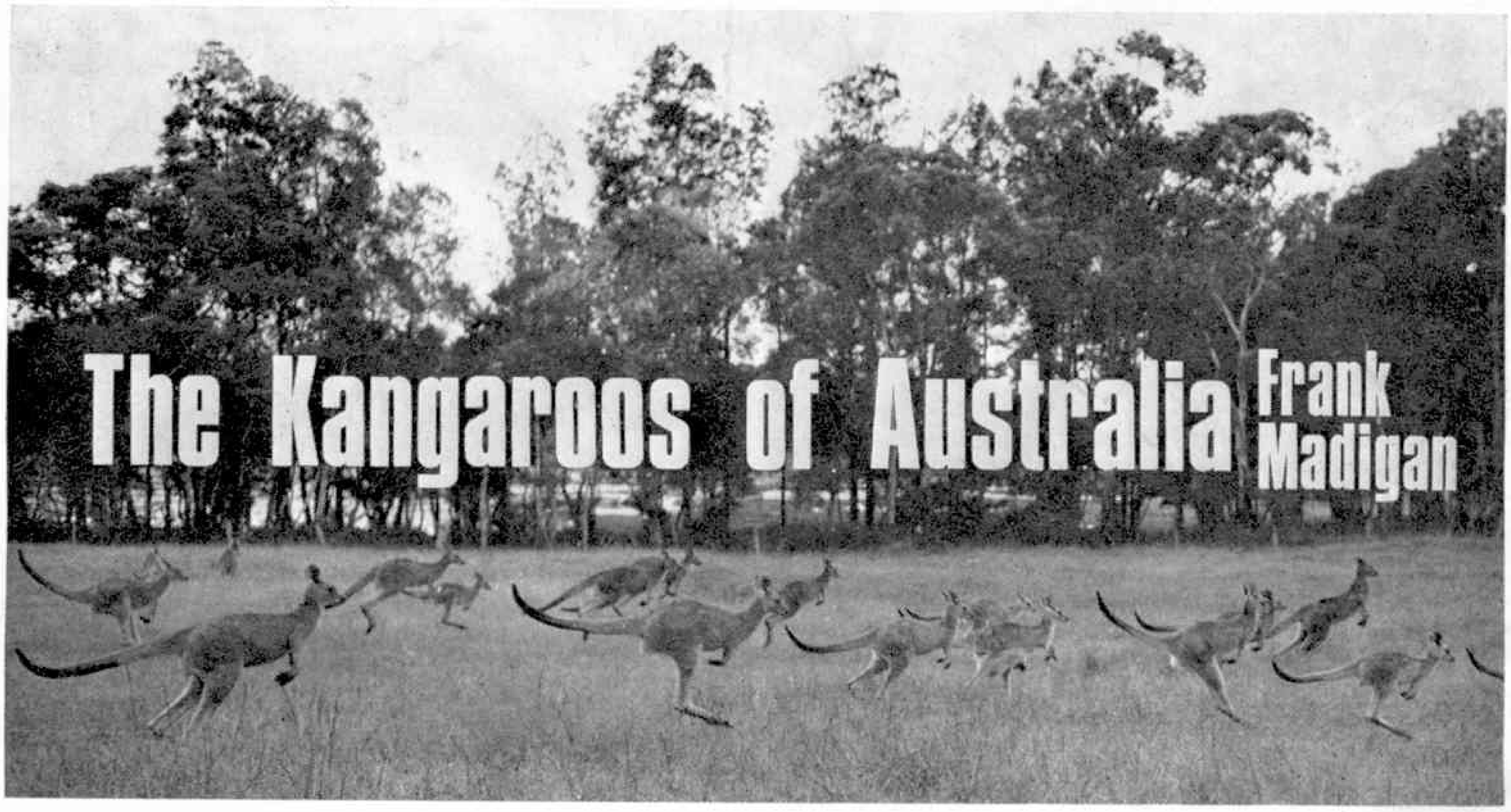
Early experiments indicate quite a range of possibilities, and we hope to show pictures of some editorial staff efforts, as well as future winners, to inspire other builders. We are sure that many readers will find this competition a challenge that will appeal to their fancies. By the way, only Bic pens may be used, plus a limited number of accessories as specified.

New contributor

Unlike the competition mentioned above there are no prizes for guessing whose photograph is reproduced below! It is of course one of television's best-known comedians, Dick Emery, and next month he will be starting a regular series in this magazine, reviewing specially selected plastic construction kits! I'm sure that you had no idea that Dick is a very experienced model kit constructor, I certainly didn't, and furthermore he has a fine collection of aircraft, cars, boats and motorcycles crowding the shelves of his London home.

Each month Dick will construct, photograph and describe one of the more interesting current kits on the market that he will be adding to his collection and I for one am looking forward to next month's opening feature. The subject chosen for his first review will be the new Frog Boeing 347E Stratojet —aircraft fans watch out!





The Kangaroos of Australia

Frank Madigan

OF ALL THE WILD ANIMALS OF THE FORESTS, jungles, veldts, scrublands, prairies and rocky outcrops throughout the world, the most fascinating is the kangaroo of Australia.

Undoubtedly, of all the fifty odd different varieties, the grey is the king. The record measurements of a kangaroo's skin from nose to tail is held by a grey 'boomer', as old male 'roos are called, which was said to have been nine feet seven inches overall.

But the grey kangaroo is only one member of the kangaroo family named 'Macropodidae'; these make up the second great division of the herbivorous marsupials, which includes the rat-kangaroo, wallabies, wallaroos and red plain kangaroos, as well as the grey forester ones. Their name derived from the word 'Macropus', which was applied to the Great Grey Kangaroo in 1790, because of his long hind-feet. An apt name often used is 'Big Feet'.

A dumpy and stocky Wallaroo's doe with a 'joey' in her pouch.

Naturalists are convinced that the ancestors of the kangaroos lived in trees. Small creatures at first, they used hopping as a means of moving at speed among rocks and tussocky grass.

Possibly they developed the power to make erratic leaps, and travelling at forty miles an hour some kangaroos register leaps of forty feet, to make it more difficult for their natural enemies to prey on them. This hopping action led to marked development of their hind limbs, and the loss of the possum-like great toe with which they were equipped, when they lived in trees. The tail also changed, losing its power to grip, and it became simply a balancing agent.

Today, there are kangaroos as small as rabbits, and others as large as a 200 pound man. Most of the kangaroo family stayed on the ground, but there are some which, after being earth-bound for centuries, during which time they evolved a kangaroo-like appearance, returned to the trees.

Marsupials have developed in Australia, because of that country's isolation from Asia, which according to scientists took place some fifty million years ago. Not having higher mammals to contend with, the marsupials evolved various ways of living according to their natural habitat, whether it was the forest, desert or on the plain.

Although kangaroos can grow to the size of a man, and even larger, when they are born the joeys measure only one inch. They are born in the manner normal among mammals and, after birth, the tiny creatures climb up to the pouch through their mother's fur.

Unlike the human being, the male kangaroo continues to grow in old age, and generally lives for fifteen years. Today there are no giant kangaroos, but fossil remains reveal that these monsters did in fact once dwell in this country. According to scientists the

giant marsupials were Diprotodon and Nototherium, and grew to be as large as a rhinoceros.

According to a well known naturalist, Charles Barrett, F.R.Z.S., the Giant Red Kangaroo and the Great Grey or Forester Kangaroo are the biggest of the species, and both kinds may reach a height of nine feet. These grey and red kangaroos make incredible leaps, and a jump of twenty-six feet is quite usual, when an animal is at full stretch.

The kangaroo can change its course very abruptly when necessary, by just relaxing one leg and stiffening the other. This helps him to outwit his enemies.

The most dangerous kangaroo is the wallaroo. The old males are such determined fighters that it is dangerous to aproach them. Its forearms being very thick are used to grip and hold a struggling adversary. Sturdy and stubborn, this species is more cunning at seeking cover than his other relations, and much more troublesome in captivity. He favours hard, rocky outcrops and hilly country, where there is a little timber.

The tree-kangaroo is an incredible animal. It is, in fact, very different indeed from all other types of kangaroos, being found in the mountainous regions of the Tableland in north-eastern Queensland. There it lives in creeper-festooned jungle, sleeping in the trees, although it does not live in them exclusively.

This creature is by no means agile on the ground. On the contrary, he is clumsy and awkward, and he makes only hops that are very short. Nevertheless, in the trees he is capable of almost incredible feats. He moves from branch to branch and tree to tree as easily as any Tarzan, and it is among the trees that he indulges his great leaps.

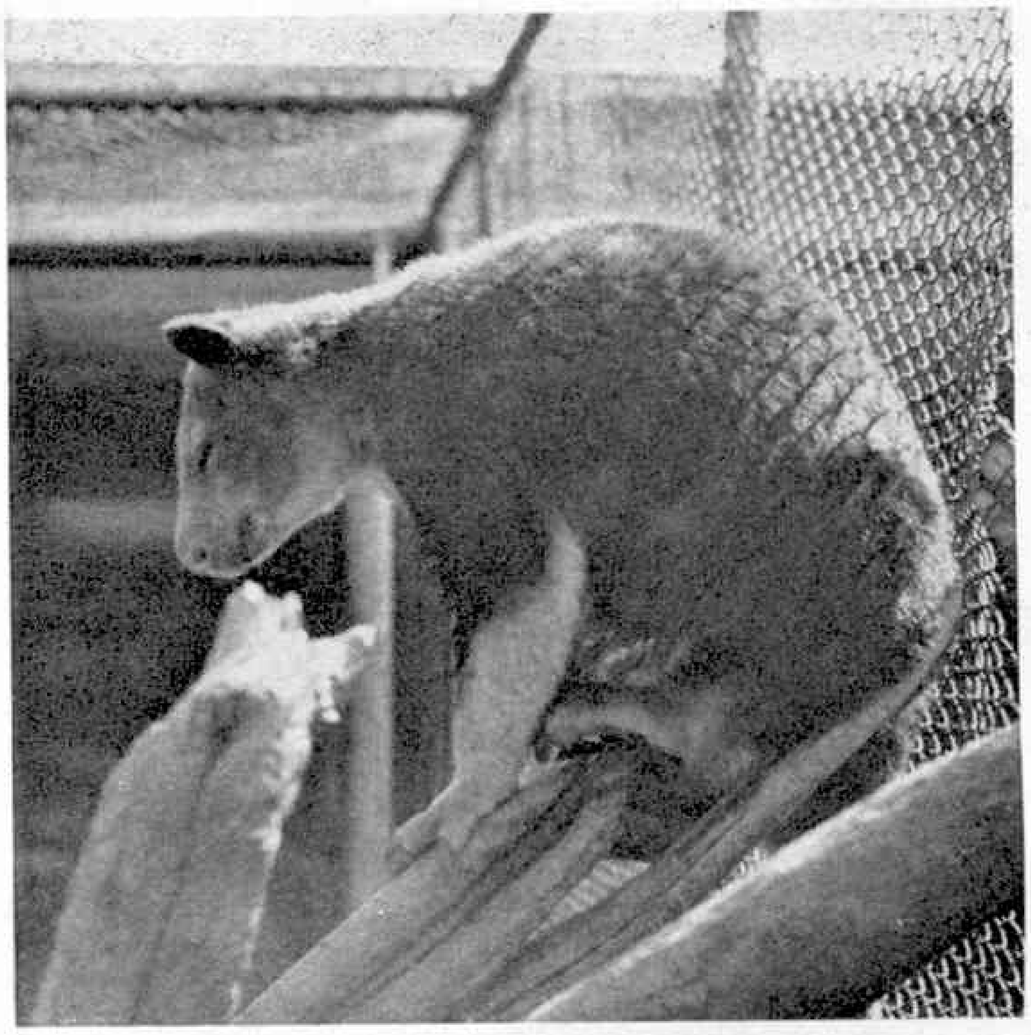
He can launch himself from one tree to land safely in the branches of another thirty feet away. And his downward leaps are even more sensational. He has been seen to jump from a height of sixty feet, and seems to take downward jumps of forty feet as a matter of course.

For these performances, of course, he is well equipped. His back feet are long, displaying strong sharp claws, as well as a roughened skin, which prevents him from slipping when leaping or landing. His tail also is an asset in his jumping, as it is long, thick furred, and can be stiffened when necessary, acting as a balancer.

There are two species of Tree-kangaroos—the Lumholtz's and the Dusky or Bennett's in Australia, although in the thick jungles of New Guinea, there are many varieties of tree-kangaroos. Naturalists think that the species in Australia have come from New Guinea via Cape York, Queensland.

In addition to the large kangaroos, and the tree-kangaroos, there are much smaller ones such as wallabies and rat-kangaroos. The difference between a wallaby and a kangaroo is fundamentally very small, although the former range in size from that of the small hare-wallabies, while kangaroos reach giant proportions in comparison. The estimate of size is usually based upon the length of the hind foot measuring six inches, while large wallabies or small kangaroos have a range from 6½ in. to 10 in. Then the true kangaroo has a fully-grown hind-foot, which always exceeds the length of 10 in.

To many naturalists the wallaby or small kangaroo is the most interesting specie of all the 'Big Feet' marsupials, because of the varieties of hoppers in this classification. The first of such ever recorded by a European was a Dama Wallaby mentioned in the log book of a Dutch Captain named Pelsart, who skippered

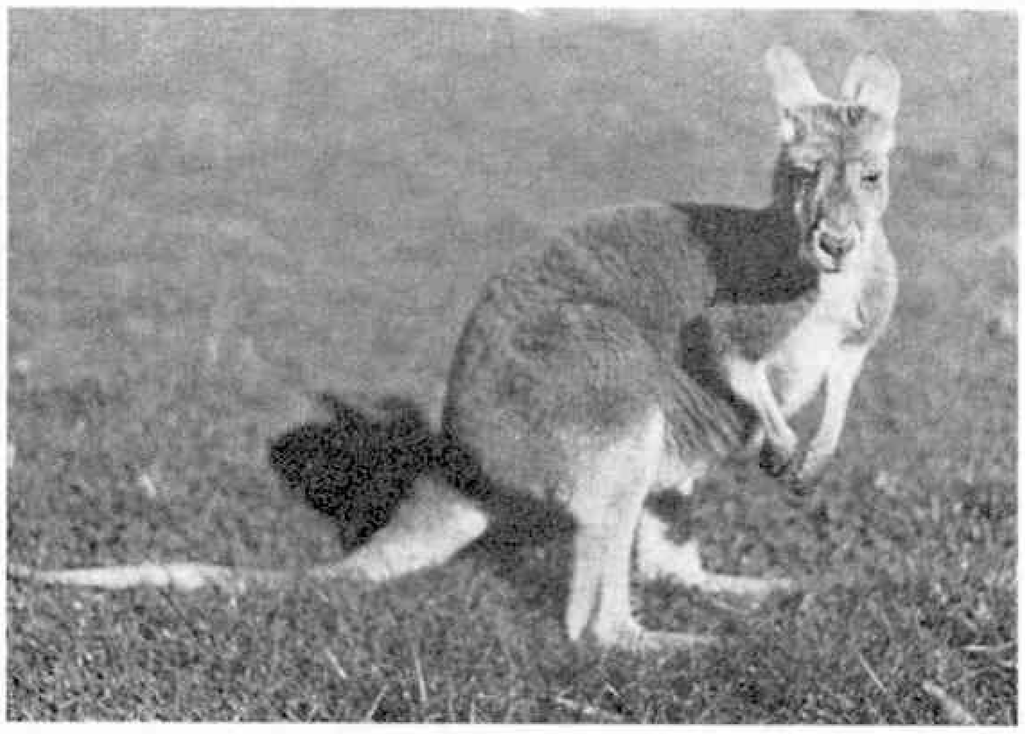


A tree kangaroo showing the long tapered tail.

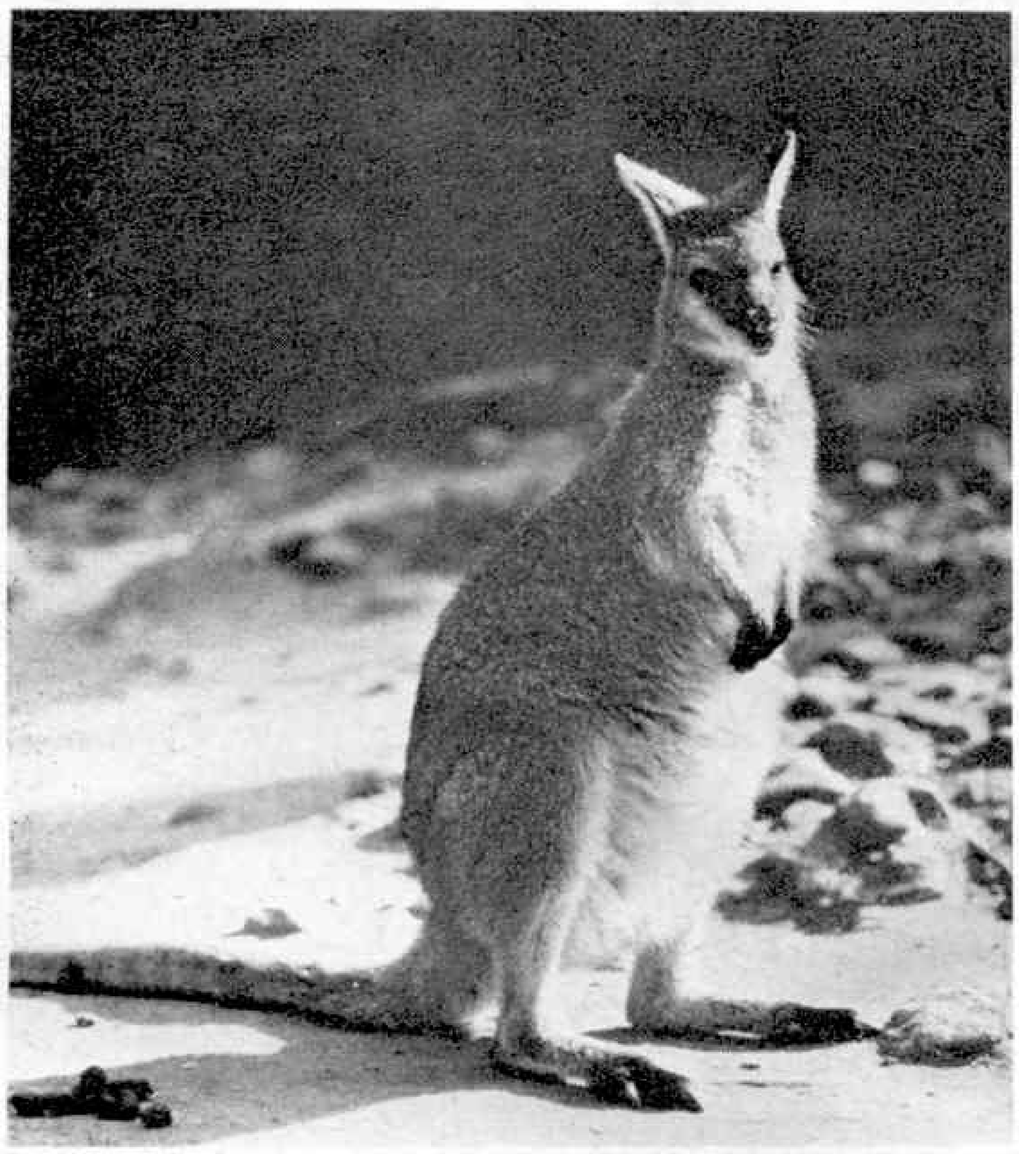
the "Batavia", which was wrecked on Houtman's Abrolhos off the Western Australian coast in the year 1629. He said:

> "We found in these islands large numbers of a species of cats, which are very strange creatures; they are about the size of a hare, and their head resembles that of a civet cat; the forepaws are very short, about the length of a finger on which the animal has five small nails, resembling those of a monkey's forepaws. Its two hindlegs on the contrary are upwards of half an ell in length, and it walks on these only on the flat of the heavy part of the leg, so that it does not run fast. Its tail is very long, like that of a long-tailed monkey."

The most famous wallaby is undoubtedly the one sighted by Captain Cook in June, 1770, when his ship the "Endeavour" was beached at the mouth of a river later named after the ship in North Queensland. On an excursion ashore he reported on it, and it has since been definitely identified as a Whip-tail Wallaby, so called because of contrasted colour markings, especially the facial ones, once plentiful in the open coastal



An alert, red, plain kangaroo.



Rock wallabies are found in the rocky ranges throughout Australia. They are extremely agile, making daring leaps among the rocks using their fore-limbs.

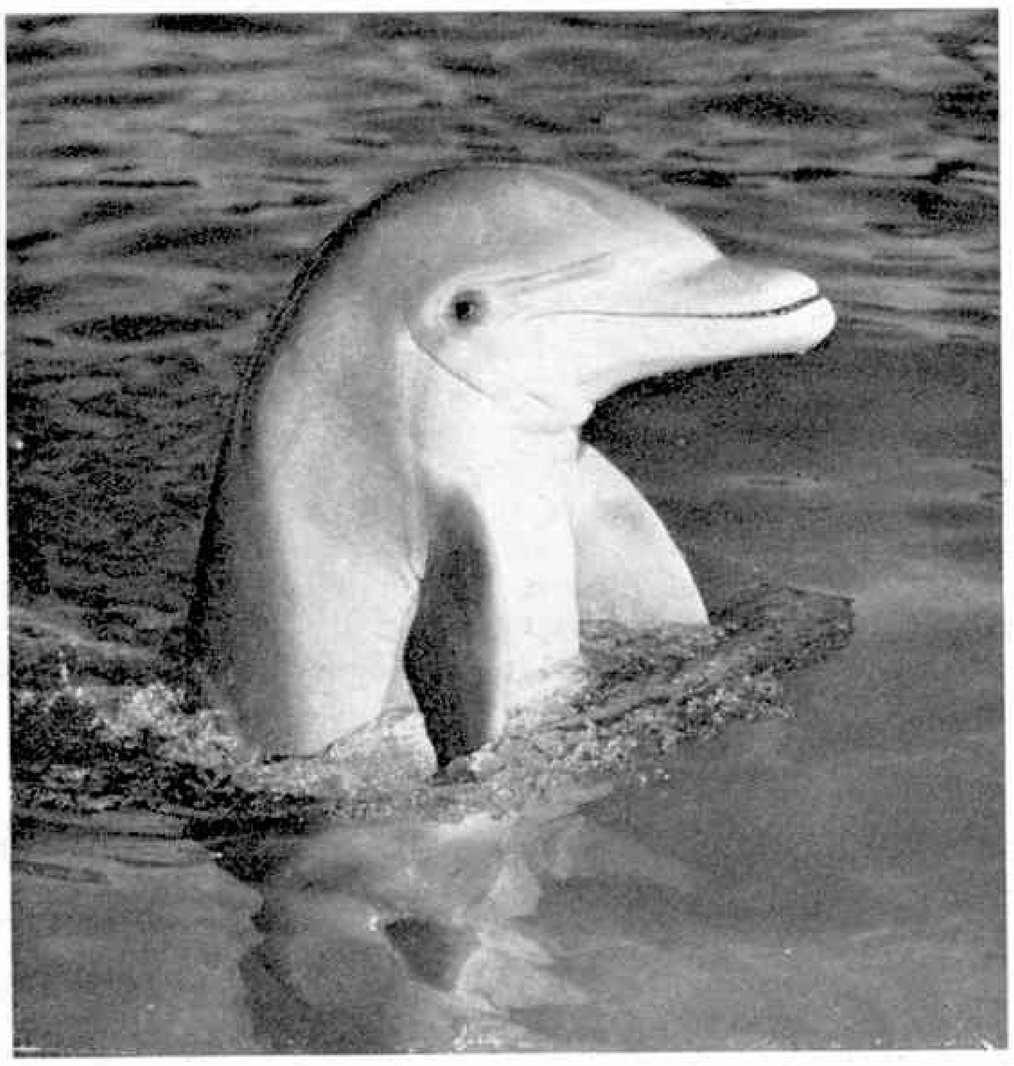
ranges north of Sydney and in Southern Queensland.

The eight distinct species of wallabies in the Whip-tail classification of 'Big-feet' measuring 6½ in. to 10 in., constitute some of the most beautiful, graceful and richly coloured members of the kangaroo family.

As well as the two Whip-tail, there is the Swamp, Brush, Black-striped, Toolache, Black-gloved and the Sandy Wallaby.

The smallest members of the family of Macropodidae are the Rat-kangaroos, sub-family Potoroinae. Their habitat is practically the whole of the Australian continent, except perhaps the extreme far north and north-west. They dwell in grass nests or small burrows.

Once there was an abundance of these creatures in Australia, but the fox has reduced their numbers drastically. The rat-kangaroos were named after the men who discovered them, such as the Gilbert, Rufous, Lesueur and Goumard, and also there are the Tasmanian, Desert, Broad-faced, Long-nosed and Brush-tailed. The most interesting is undoubtedly the Tasmanian Rat-kangaroo, which is grey in colouring, and is known for the fact that it brings materials to build grassy nests in sheltered depressions.



LOWESTOFT'S LUCKY DOLPHIN

by E. R. YARHAM

THE OTHER DAY LOWESTOFT FISH MARKET WORKERS were astonished when a long-shore fishing boat landed a large dolphin. It was the first live dolphin to be landed since the last war and, fortunately for it, as there was no buyer it was returned to the sea. For a moment or two it appeared dazed, but was soon spurting in sporting dolphin-like manner, perhaps as a sign of its appreciation of restored freedom.

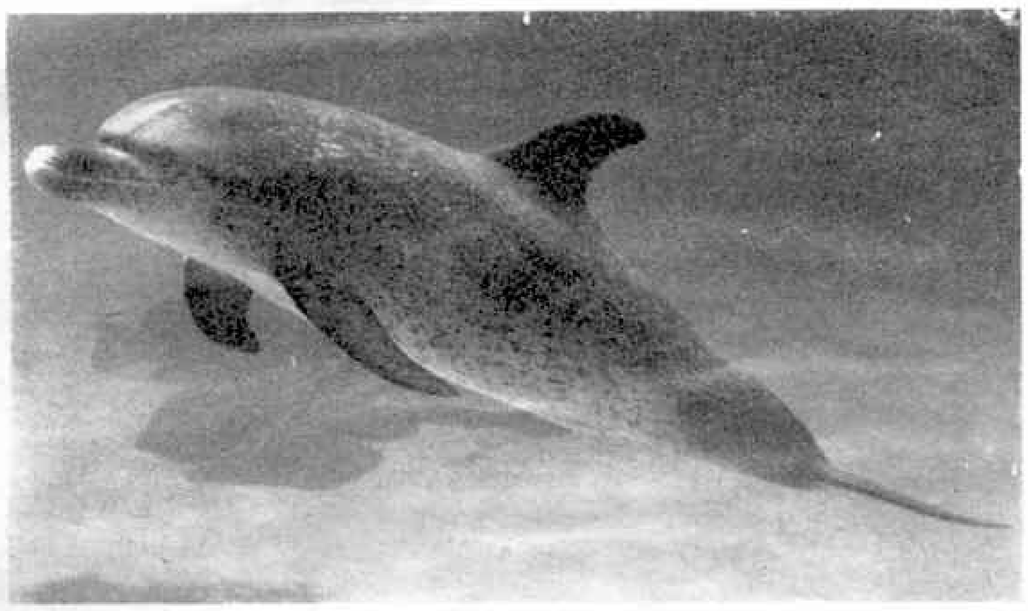
Not an absurd theory, since there is no doubt that dolphins are capable of a wide range of emotions. They have the largest brain of all animals. Dr. John Lilly, of the Communications Research Institute, at St. Thomas (Virgin Islands in the Caribbean), found that the average dolphin's brain weighs 3.7 lb. That of an eleven-stone man weighs 3.1 lb. Dr. Lilly's researches suggest that these animals may, indeed, approach man in the flexibility of their "language."

It was suggested above that Lowestoft's dolphin was lucky nobody fancied it. This would not have been the case in the Middle Ages, when whale, porpoise and dolphin meat was favourite fare. There is record of some even being on the menu at coronation banquets. Dame Dorothy, wife of Sir Thomas Browne, the famous physician and metaphysical writer of Norwich, served King Charles II with a dish of dolphin steaks on the occasion of a royal visit to the city in 1671, when the monarch knighted her husband.

Local naturalist societies log dolphin strandings for their own reports, and a national record is kept by the

British Museum of Natural History. The most spectacular grounding on the East Coast took place in March 1968. Dolphins are gregarious, sometimes moving in schools comprising hundreds of individuals, and at the time stated nine were strewn along a mile of beach at Blakeney Point. It seems likely that they moved close to land to escape the high seas rather than to feed as their stomachs were empty. They were left stranded on the sandbanks by the falling tide. The average length was 10 ft., and they were white-beaked dolphins. This stranding was, in fact, the largest for anywhere in Britain.

A few days later another one, an eight-foot specimen, was cast ashore at Cromer. All " landings ' of cetacea have to be notified to the Receiver of Wrecks and the Natural History Museum, and the carcases cannot be disposed of before permission is given. In the case of the Blakeney " wrecks " one head went to London, another to the Castle Museum (Norwich), and a complete specimen was seen on TV—after customs clearance had been obtained ! The rest were buried in a local rubbish tip, except for one which was pushed out to sea when it showed signs of life. This may have been the one which stranded at Cromer, and which was buried by the U.D.C.

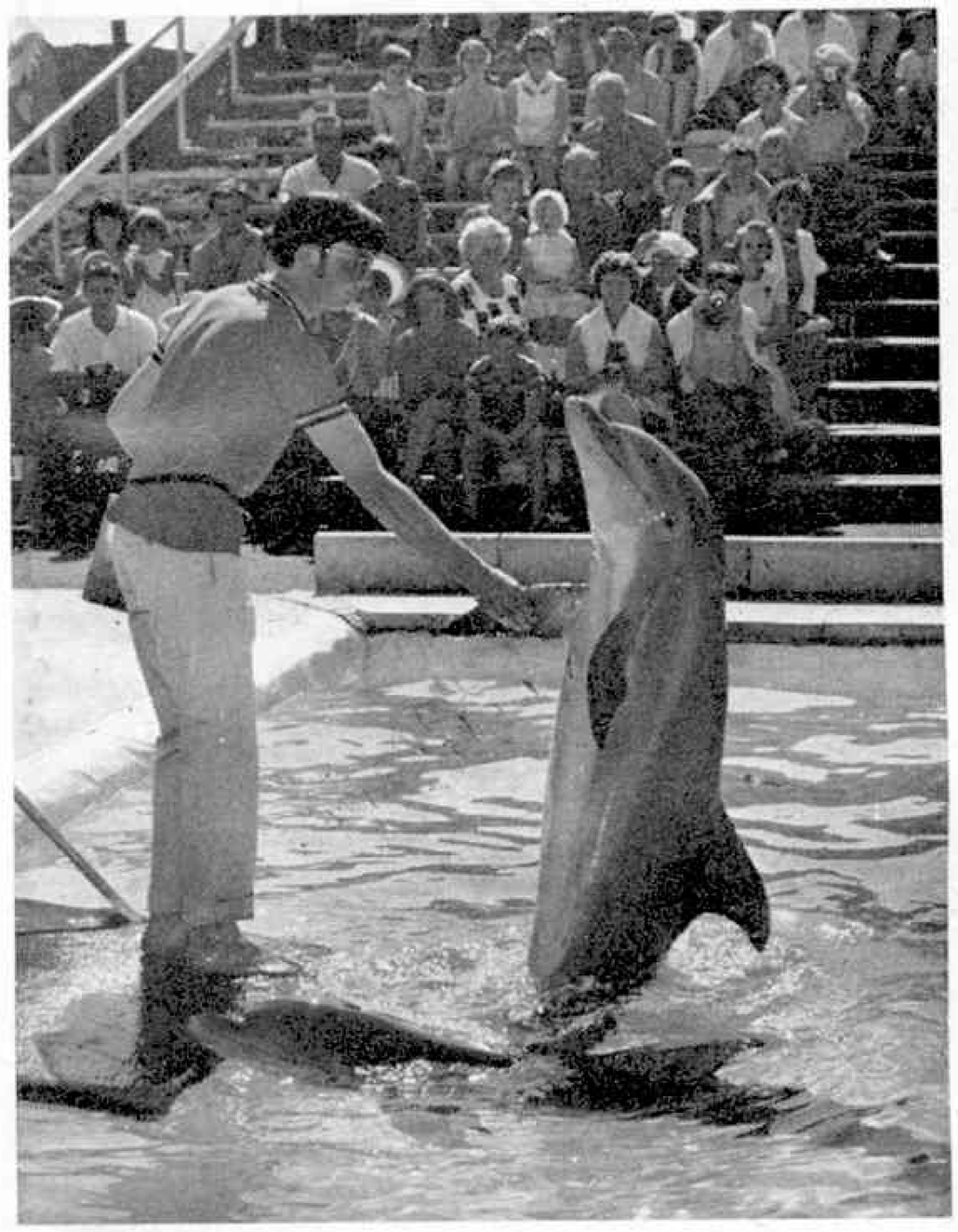


Capable of speeds in excess of twenty knots, the dolphin is a powerful and athletic creature under water.

A year or two back a small school of dolphins was daring enough to penetrate far up the Thames, where they disported themselves before County Hall. The most recent visitor, in January, went even further up-river. It spent a week-end swimming upstream, and an R.S.P.C.A. inspector who went out in a launch at Richmond pronounced that the immigrant was " in good health." After this brief call the dolphin turned and headed back to sea. Possibly with the reduction of the pollution of the Thames such visits may become more frequent.

Several species of dolphin visit the shores of these islands. The most numerous is the bottle-nosed dolphin, which grows to a length of about 12 ft., and it has from 20-25 pairs of teeth in the upper and lower jaws. In passing it may be said that there is no recorded instance of a dolphin attacking a man, although it could remove a limb with a single bite. On the contrary there are many tales, beginning with the Greeks, of the dolphin's friendliness to man.

The bottle-nosed dolphin is restricted chiefly to the south and west. It approaches our shores in the early months of the year and, up till June stranded specimens are restricted to the beaches of Devon and Cornwall. Later come records from Dorset, Sussex and Kent, and by September the dolphins have

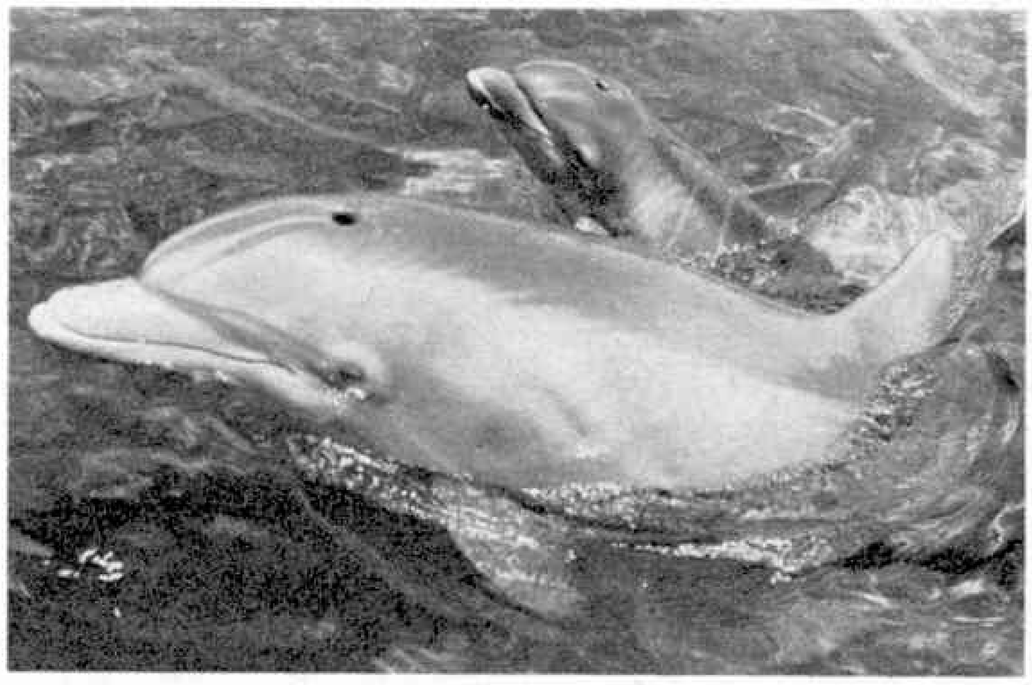


Intelligence and friendliness towards man are clearly shown in this photograph. Note the second dolphin resting his head on the jetty !

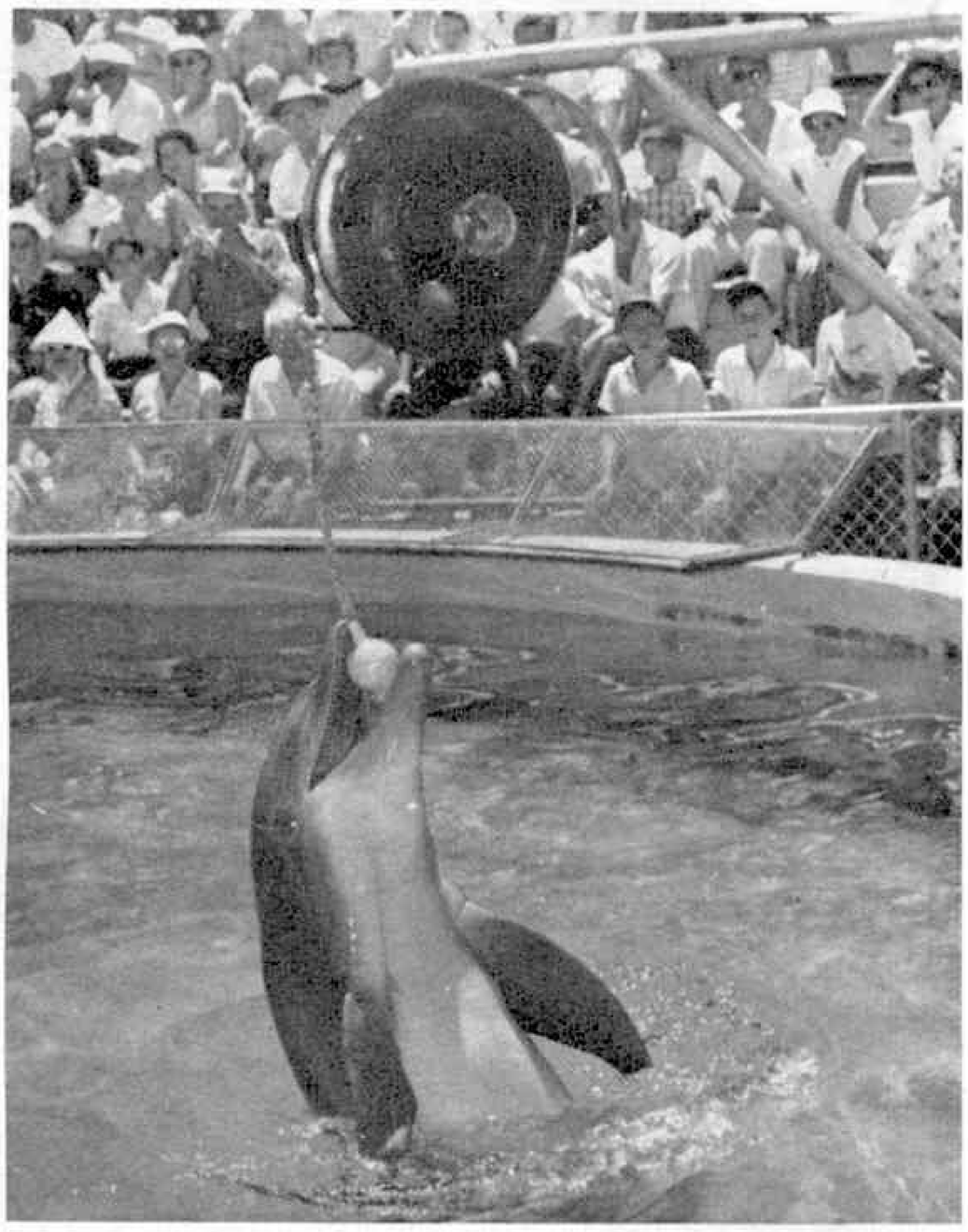
migrated into the southern North Sea and strandings are reported from Essex. So there is a fairly definite migration from west to east as the year advances.

The common dolphin is almost as frequent a visitor as the bottle-nosed. It is smaller, being from seven to eight feet long, and has a longer beak. The common dolphin has 40-50 pairs of teeth, a greater number than in any other British species. The normal distribution of the common dolphin is similar to that of the bottle-nosed dolphin, and this probably indicates a similar route in approaching and leaving these islands.

The common dolphin is not usually found in the North Sea, but some years ago a large school was seen off the north-east coast of Scotland. This was



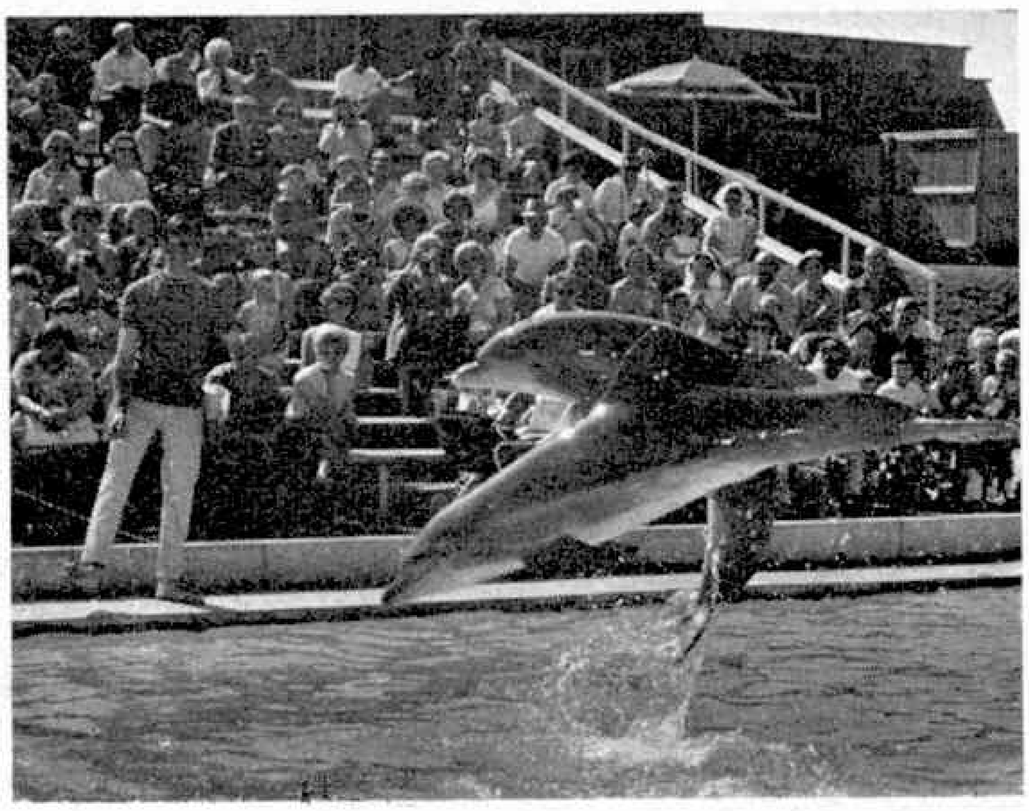
Bottlenose Dolphins (mother and baby) *Tursiops Truncatus.*



This photograph taken in Florida shows a trained Dolphin ringing for a meal.

exceptional, and the sighting was linked with an abnormally large amount of water in the North Sea at the time.

Next come the white-beaked dolphins (the species which grounded at Blakeney) and the rarer white-sided dolphins. Their distribution along our coasts is more or less complementary to that of the two species already described. They occur abundantly further north, and invade the North Sea and the waters surrounding the Hebrides with moderate frequency. Their names indicate the characteristics which serve best to identify them.



Upon hearing a whistle from the keeper, two Dolphins leap from the water in response.

Mention has been made of the gregarious character of the dolphin, and sometimes the schools consist of incredible numbers. I remember reading this in a book by Commander R. Langton-Jones, R.N., who was serving in the Bahamas: "One day I was lucky enough to come across perhaps the greatest gathering of dolphins that anyone has ever had the good fortune to observe. For miles around, the sea was black with them, and judging by their numbers leaping into the air at one and the same time, they must have been congregated there in tens of thousands. It was certainly a wonderful sight."

I found it hard to credit this, but the Commander's veracity was vindicated by a report from Moscow which I heard broadcast in November 1967. This news item said that a Soviet fishing vessel off Spitzbergen found itself surrounded by tens of thousands of dolphins. The launch, although severely rocked, survived its strange experience.

Nothing that man has yet invented can compete with the dolphin in its native habitat. It excels the submarine in at least eight ways: propulsion, manoeuvrability, sonar target, sonar interpretation, turbulence detection, olefaction, orientation and navigation. The dolphin's beautifully streamlined body enables it to swim at great speed. The Royal Navy has been conducting researches with dolphins on echo-location, hearing and laminar flow, which enables them to move so quickly and almost effortlessly through the water.

Speeds of 24 knots have been logged, and the dolphin uses this velocity when in chase of one of its favourite foods, flying fishes. It frequently thrusts its head and shoulders clear of the water to seize them. And it will follow under water the curving shadow of a fish flying above with astonishing speed, ready to seize it when it descends. At the same time it is possible that most of the flying fishes captured by the dolphin are those that by some mischance were slow in gaining the air, or ones that did not make a perfect flight.

Unlike the helpless human baby, a young dolphin is perfectly fitted to its environment from its birth. It can swim to the surface to breathe within seconds of being born, and from that moment swims alongside the parent, easily keeping up with her if she senses danger. At a week old the youngster can do 12 knots, and it can see and hear well from birth.

Dolphinariums are becoming popular as zoos. The Greater London Council's Thames Action Committee has been considering proposals for one close to the "Cutty Sark" and "Gipsy Moth IV" berths, at Greenwich. The dolphins are favourites in American marinelands. There one can see them leap fifteen feet into the air or pluck a cigarette from between the lips of their trainer, while some cavort around the pool bearing pretty maidens on their backs, and others haul a surfboard with a dog at the helm. They shoot at baskets, catch football passes, pitch and field baseballs, put out fires, play drums, whistle approximations of tunes.

In their own lives they respond to each others' distress calls, they rally round a mother in labour, and they co-operate with each other in games. Because of their intelligence, their tolerance of training, their lack of desire to escape, and their friendliness to man, and the fact that they are not subject to caisson disease—which hits divers who surface too quickly—the suggestion has been made that they could be used as underwater messengers.

IRELAND'S BURIED WEALTH

Trevor Holloway takes a look at the Irish Peat Industry, and describes how this strange substance is harvested . . . . . .

MANY PEOPLE PROBABLY STILL THINK OF peat, or turf as the Irish call it, mainly as a low-grade fuel, laboriously harvested with shovels and back-breaking toil. It still is—in a few places—but the modern peat industry is now highly mechanised.

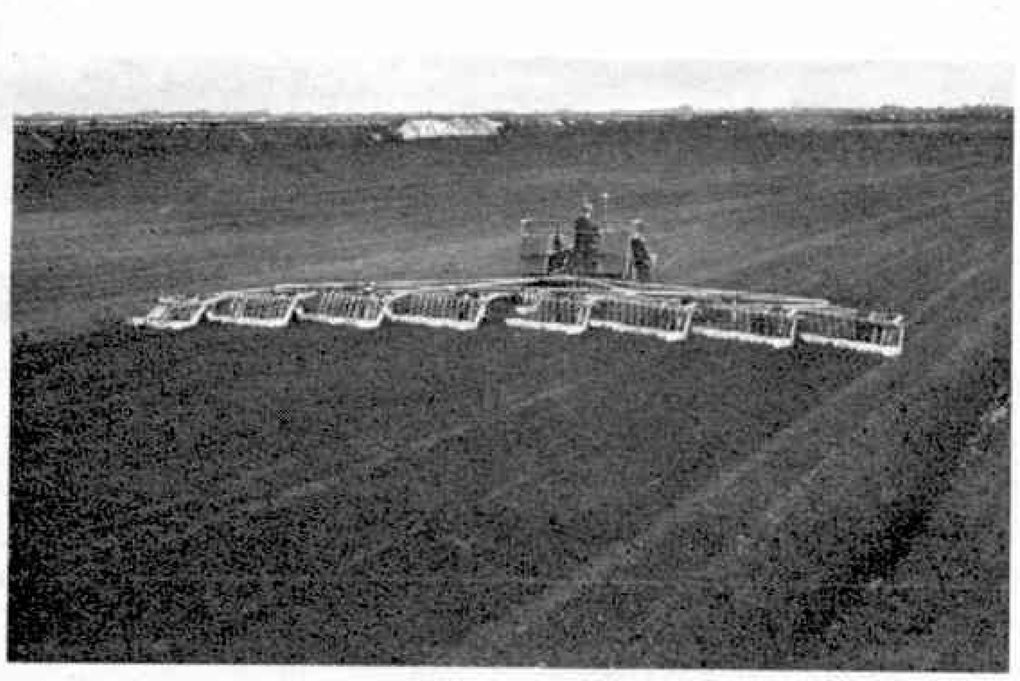
Gone are the days when peat was mainly destined for the domestic hearth. In recent times it has blossomed out as an excellent soil conditioner, as a propagating material for seeds and cuttings, as a deep litter for poultry, a useful packing material for early potatoes and as a fuel for power stations.

A new role for this once humble material is in the production of activated carbon, used in the preparation of various chemicals which require a high standard of purity. It is widely used in industry and in the manufacture of food and drugs.

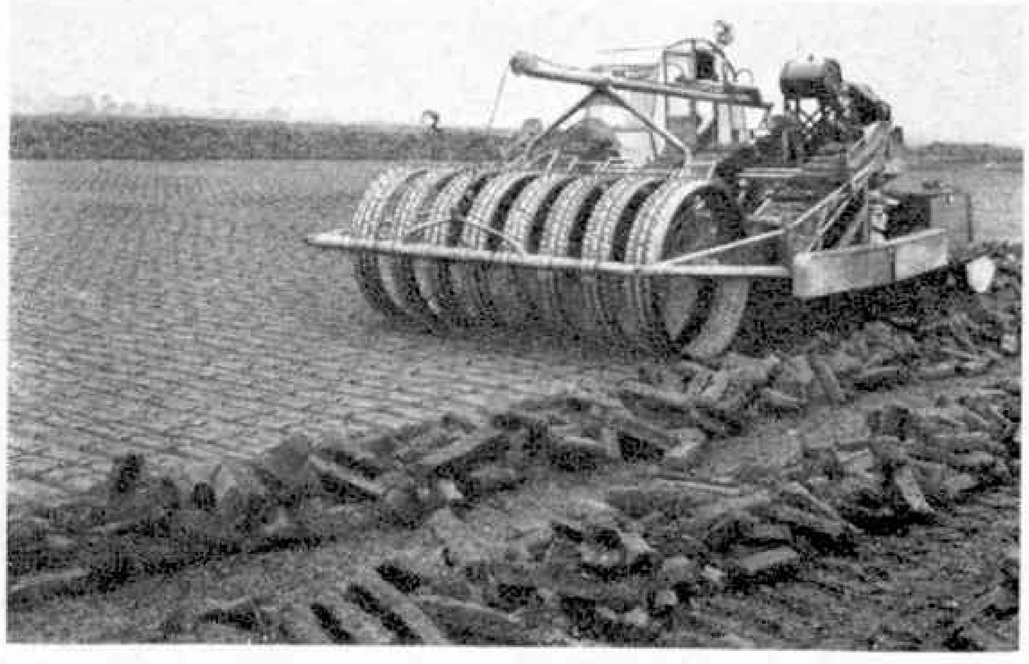
For over 250 years the Irish had tried to find ways and means of turning their boglands to good account, but early efforts at producing peat on a sound commercial basis all ended in frustration and failure.

In 1933 a special committee was set up by the Department of Industry and Commerce to examine the problem afresh. The outcome was the foundation of the present Bord na Móna, or Irish Peat Development Authority. It was backed by Government grants and given wide powers to develop the industry along modern lines.

It was obvious from the outset that intensive mechanisation was imperative. Experts were sent to Russia and Germany to study latest methods and machinery. Since then, the Authority's own design engineers have been gradually developing a wide range of bog machines to suit Irish conditions. Normal contractor's plant is designed for ground pressures varying from 4 lb. to 10 lb. per square inch, but undrained Irish peat bogs are so soft that a bearing pressure of only



An eight-unit tractor-drawn spoon harrow turns the milled peat lying on the bog surface to speed up drying.



After a preliminary period of drying, sod peat is gathered up by this eight-spiked wheel machine and piled into long ridges, called windrows, for a further period of drying.

1 lb. per square inch is necessary to prevent machines sinking.

The illustrations give a good idea of some of the giant machines now in operation. One machine in particular—a sod peat collector designed by the Authority's own engineers—has an overall width of 105 metres and must be one of the widest machines in Europe. Another new machine with a crew of three now does the work of an earlier model requiring a crew of twenty-one. Rail-laying can now be done by a crew of three instead of twelve; and improved mechanis-

This ingeniously designed sod peat loader makes short work of transferring sods from the stockpile into light railway trucks.

ation has reduced bagger crews from eight to two men per shift.

Today the Authority owns over 130,000 acres of bogland and employs on average a labour force of about 5,000. Eight model villages have been built to house workers and their families and educational and other facilities have been specially provided.

The majority of Ireland's peat bogs are within areas that were once glaciated because that is where most undrained depressions appropriate for bogs are found. At one time, boglands covered one-seventh of the surface of Ireland. The bogs that remain today are of two types—the raised, or high bogs of the central plain, and the blanket bogs of the west and Wicklow Mountains regions.

Blanket bogs have an average depth of 8 ft. and raised bogs 20 ft. In the blanket bogs, the quality

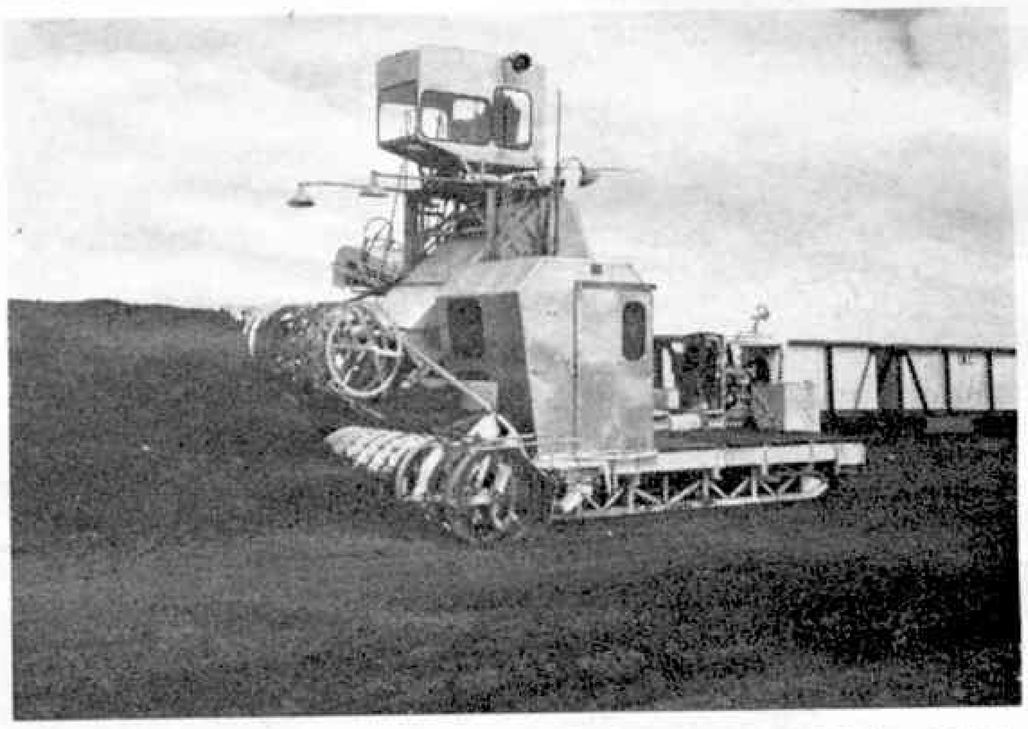
Milled peat is obtained by scraping the surface of the bog to a depth of about half an inch. The above photograph shows a three unit milling machine in action drawn by a crawler tractor. The loose peat is left on the surface to dry.

A close-up view of a milled peat harvester, a long reach machine which collects peat from the windrows and transfers it to the stockpile.

of the peat tends to be more uniform from top to bottom, while in the deep bogs the poor unhumified peat lies in the top layers.

Peat is harvested in three main forms—sod, milled and moss. In general, the purpose of all peat-winning methods is to remove water from the raw peat by drainage and by natural drying, which means that harvesting can only be done during the spring and summer. Wet weather reduces output drastically. Many attempts have been made to de-water raw peat by artificial methods so that all-the-year-round production would be possible, but so far all attempts have been economic failures.

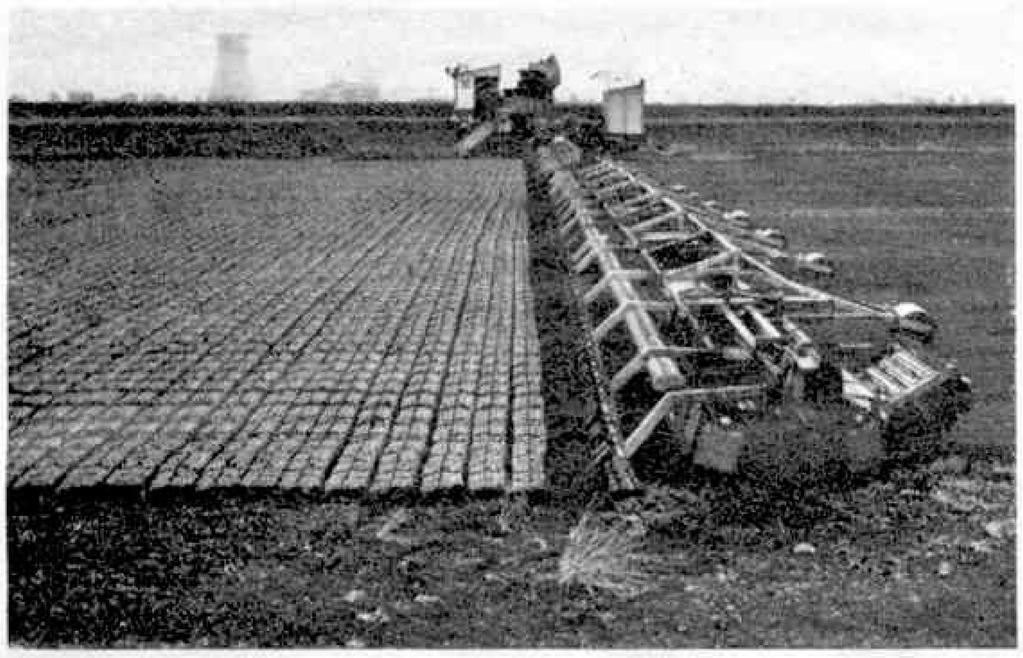
A big advance, however, has been made in the winter storage of stocks. Over twelve million square yards of polythene film are now used annually for covering ricks and stockpiles. Not only does this keep the peat dry, but as the film excludes oxygen it greatly reduces the risks of stocks overheating and being destroyed by fire, a cause of much concern in the past.



The Board's own engineers have designed many of the highly efficient machines now in use. Here is a high capacity milled peat loader transferring peat from the stockpile to rail wagons.

Much preliminary work has to be done before a bog can be brought into production. For example, the draining of one of Ireland's largest bogs, the Derrygreeagh Bog, necessitated the laying of 3,000 miles of drains, and each drain had to be deepened five or six times before the network was complete. The rail system for this particular bog included bridges, cuttings, level crossings and over 80 miles of track.

Sod peat, widely used in the furnaces of Ireland's electricity generating stations, and as a fuel for in-

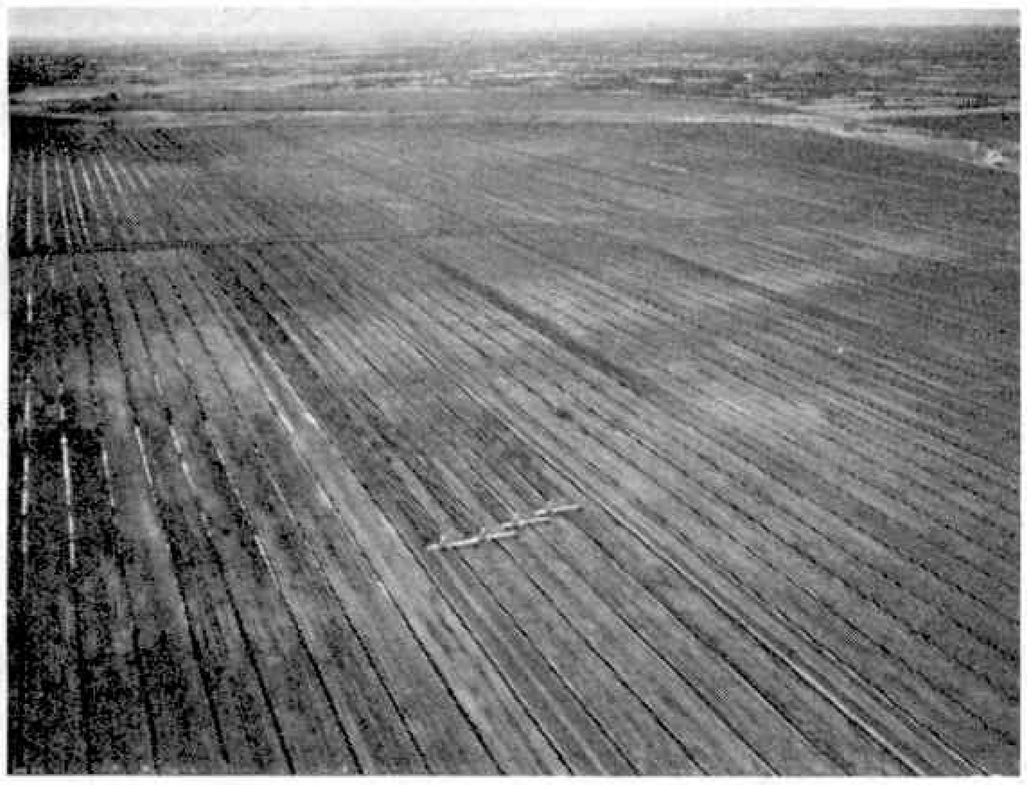


The peat is cut by this giant excavator from 12 ft. deep trenches.

dustrial and domestic purposes, is harvested from thirteen of the Authority's bogs. It is cut by a giant excavator from a 12 ft. deep trench, passes through a mixer to give uniform grade, and is fed to a long-reach spreader attachment which delivers sods in neat rows on the surface of the bog where they will lie for up to six weeks to dry.

At the end of this period, along comes another giant machine having eight large spiked wheels which pick up the sods and dump them in ridges, called windrows, where they will remain for up to a month for further drying before being loaded into specially designed rail trucks and taken away for storage in ricks.

Milled peat, much of which is compressed into briquettes or supplied loose to power stations, is harvested in an entirely different manner. Instead of being cut from a trench, machines drawn by tractors scrape the bog surface to a depth of half-an-inch, leaving behind a loose layer of powdered peat. This is left to dry, after which it is scraped into ridges by



An aerial view of a milled peat bog in Co. Westmeath.

angle-dozers and later transferred to storage fields to await collection by rail wagons. During a season, which may last about four months, this harvesting cycle may be repeated as many as sixteen times, which means that about eight inches of the bog surface are removed each year.

Moss peat, or 'white peat', as it is sometimes called, is a product made from the light upper layers of certain deep midland bogs. These layers are composed of sphagnum peat of low humification. After processing, the resulting product is widely used as a soil conditioner in horticulture, in mushroom culture, and also as a litter for poultry and a bedding for farm animals.

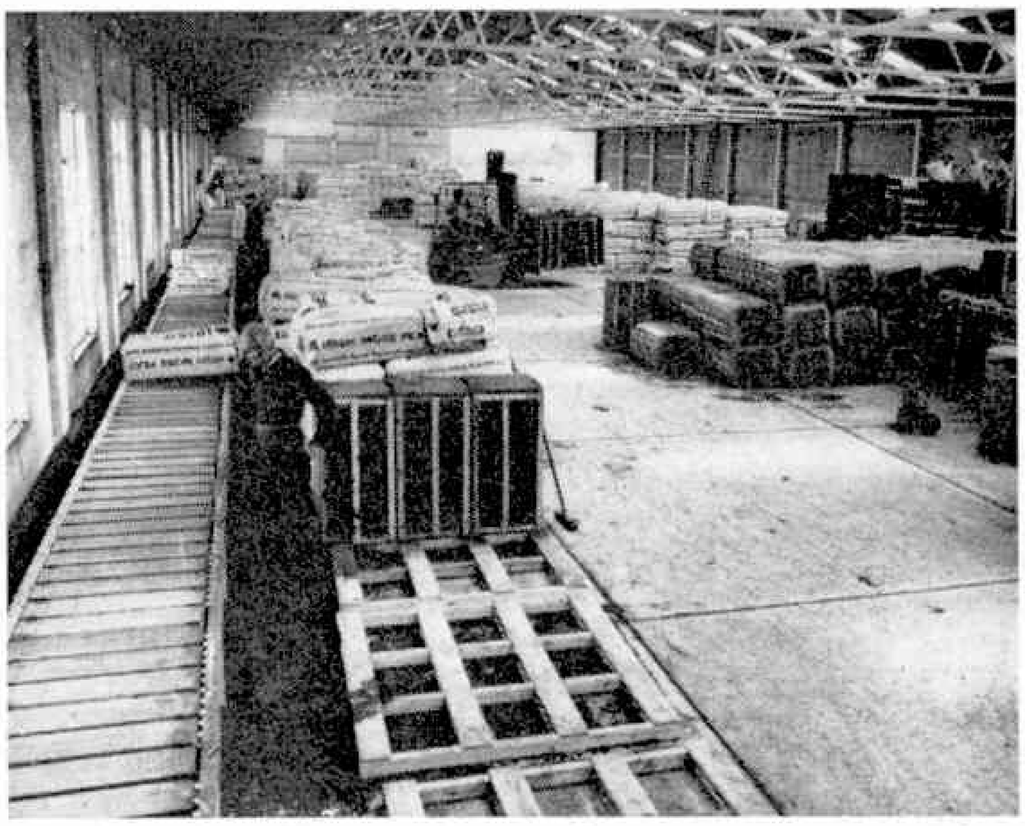
In the factory, the sods of moss peat are granulated and screened into different grades and compressed into bales. It is also blended with specially graded sand and nutrients to form a complete growing medium ready for immediate use as seed or potting compost. Moss peat is an up-and-coming export, the main

A vast stockpile of Irish moss peat awaiting transport to the factory for processing and baling.

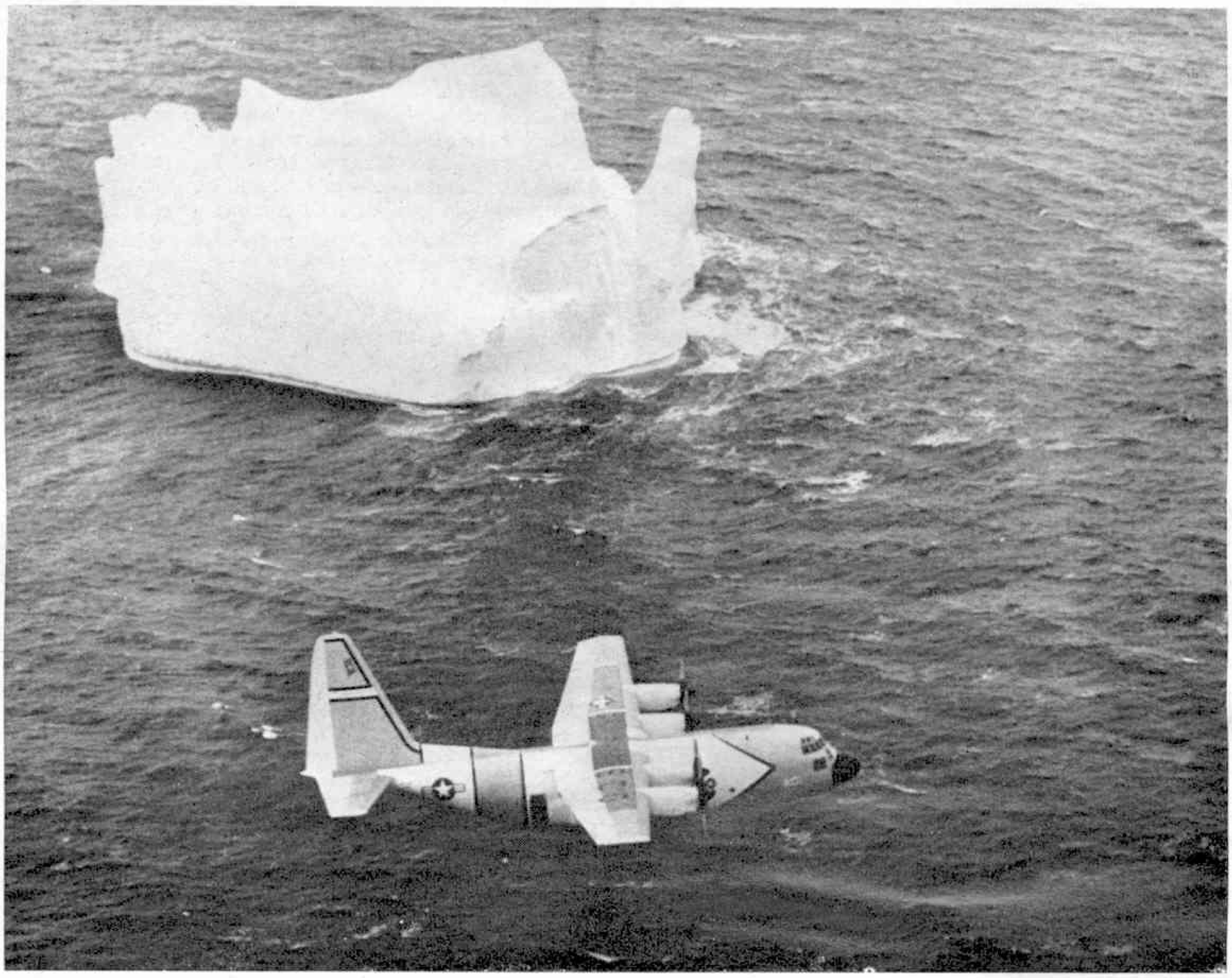
markets being Britain, the Channel Islands, U.S.A., Canary Islands, West Indies and a number of Mediterranean countries.

The overall life expectancy of the bog areas at present worked by the Authority is 35 years. Research is already in hand to find the best methods for reclaiming cut-away bogs for afforestation and agricultural purposes. Indeed, one such bog has already been planted with young trees.

The Irish peat industry has made the past serve the present and now it is planning to make it serve the future. A layer of peat of sufficient depth will be left on the floor of each worked-out bog to enable new growth to rise up from the remains of vegetation which flourished countless thousands of years ago.



Moss peat has many valuable uses in agriculture and horticulture. It is sold in compressed bales and shipped to many countries.



Dwarfed by the ice. This picture is evidence of the danger faced by aircraft flying in the ice regions. Official *U.S. Coast Guard photograph.*

THE U.S. COAST GUARD

by Richard Wiggan

WHEN THE TITANIC SANK in the North Atlantic almost 60 years ago after striking an iceberg, it spotlighted one of the hazards of trans-Atlantic navigation and led to the U.S. Coast Guard taking on a special job—patrol of the ice zone.

It was on April 14, 1912, that the liner Titanic, making its maiden voyage and regarded as "unsinkable", was sliced open on the starboard side by an iceberg. The story of the sinking has been told and retold many times in books and articles and on film.

Some of the best-known personalities in Europe and America were on board. The night that began with dining and dancing ended in horror as the great ship settled lower and lower in the water, until, after rearing for her final plunge, she slid beneath the surface, taking with her 1,500 passengers and crew.

There followed an outcry for something to be done to combat the ice menace. Arctic ice every spring and summer drifts southward into the North Atlantic and presents a danger to shipping. The danger is greatest off Newfoundland, where fog is added to the cluster of icebergs, the amount of shipping and the presence of fishing vessels scattered over the Grand Banks.

Before 1912, nothing had been done towards setting up any system of guarding against the menace from ice in the shipping lanes in the vicinity of the Grand Banks. The Titanic tragedy changed all that. Throughout the rest of the dangerous periods of 1912 following the sinking, two U.S. Navy scout cruisers acted as "watchdogs" in the ice regions. In the 1913 season, the patrol was undertaken by the Treasury Department and performed by two Coast Guard cutters. That same year, in London, the International Conference on the Safety of Life at Sea went into the subject of patrolling the ice regions. The convention signed in January, 1914, by the representatives of the various maritime powers provided for the setting up of an ice-patrol service, consisting of two vessels, which should patrol the ice areas during the danger season and attempt to keep the trans-Atlantic lanes clear of derelicts during the remainder of the year.

The United States was invited to be responsible for the service, the cost to be met by the 13 powers concerned. The President accordingly ordered that the (then) Revenue Cutter Service start the International Ice Observation and Ice Patrol Service. Ever since then, with the exception of the war years, a patrol has been carried out by the Coast Guard.

Ice seasons vary from year to year in length, starting date, and in duration, but generally they run from mid-March to mid-July. These days, of course, aircraft as well as ships are used for ice patrol work. Watch during the season is kept by Coast Guard aircraft in the region of the Grand Banks and adjoining waters. The reconnaissance flights search out an area of more than 33,000 square miles. Information regarding the position of icebergs and sea ice is received by the International Ice Patrol headquarters at Governors Island, New York, from several sources, chiefly the Ice Patrol ice reconnaissance detachment, merchant ships which sail in the area and commercial flights.

Icebergs may make a charming picture viewed on film, but what they mean in terms of danger to shipping can be judged from the fact that Greenland icebergs often reach 200 to 300 feet above the surface and 1,500 feet in length and breadth. Such an iceberg may represent 1½ million tons of ice. Icebergs bigger than this, though common in the Antarctic, are rare in the North Atlantic. The highest iceberg ever reliably recorded was in 1957 by the Coast Guard icebreaker Eastwind, at 550 feet above water level.

Yet in spite of the great bulk above the surface, about 80 per cent of the mass of an iceberg is below the water. An Arctic iceberg with a depth below the water greater than 600 feet has never been reported. To try to destroy such masses is a big task, but the Coast Guard has experimented with means of speeding up the melting of icebergs. Gunfire, mines, depth charges and bombing are all methods that have been tried. But the use of explosives is a difficult operation. There is the difficulty of boarding an iceberg, while calculations show that 1,900 tons of TNT are needed for the break-up of an average-sized iceberg. Natural melting and deterioration of an iceberg still remain the most practical consideration. In the near-freezing temperatures of Arctic seas, an iceberg can last indefinitely, though once it reaches the shipping lanes, where the Gulf Stream effects may result in sea temperatures higher than 60 degrees F., an iceberg will break up within a very short time.

Apart from icebergs, there are also what are known as "growlers". These are low-lying pieces of glacial ice not as big as icebergs. The presence of several growlers and of smaller pieces of detached ice is an indication that an iceberg is in the area. By this means, icebergs have been discovered in thick fog. The presence of an iceberg has no marked effect upon the temperature of the surrounding water, and so sudden changes in the temperature of the sea do not necessarily mean there is ice close by.

A vital part of keeping a watch on the ice is the oceanographic work carried out by the Coast Guard. It is not glamorous work. Many days are spent measuring the temperatures and salinities of the ocean depths to compute the density structure of the sea. Ice Patrol planes and ships can tell where an iceberg is today, but the oceanographer's chart tells where it will be later. Ice Patrol oceanographic ships have mapped thousands of miles of ocean currents and traced iceberg drifts back to their Arctic origin. The results of such work have also been of great value to scientists studying the fisheries' resources of the North-West Atlantic.

At first glance, there may seem little connection between tracking icebergs and space technology. But there is, for space technology is helping the oceanographer, and in future satellites, using special equipment, will detect and track floating ice.

Of more immediate importance are the ice reports flowing into Ice Patrol headquarters. These are plotted and a prediction of ice drift is made using wind information provided by the Fleet Numerical Weather Centre, Monterey, California, and ocean current data obtained by a Coast Guard ship that makes oceanographic surveys of the Grand Banks during the ice season.

Twice each day, patrol headquarters send out a message giving the limits of all known ice and indicating predicted positions of icebergs that might affect shipping. The messages are broadcast by Coast Guard Radio Station, Boston, U.S. Naval Radio Station, Washington, the Canadian Coastal Radio Station, St. John's, and Canadian Maritime Radio Station, Mill Cove. Special requests for ice information are answered by the International Ice Patrol office on Governors Island at any time and special safety broadcasts are made whenever necessary.

From 1946, for about 25 years, the Ice Patrol aircraft operated from the U.S. Naval Station at Argentia, Newfoundland. But from May, 1970, due to the phase down of the naval station at Argentia, permission was granted by the Canadian Government for the patrol aircraft to operate from the Canadian Forces base at Summerside, Prince Edward Island. Lockheed Hercules HC-130B aircraft are used. The information obtained by the ice reconnaissance detachment is the chief source of data on conditions in the area of the Grand Banks.

And so by keeping ceaseless vigil, the U.S. Coast Guard ensures that never again will there be another tragedy like that of the Titanic.

GREAT MECCANO COMP !

£££'s TO BE WON . . . . MECCANO SETS TO BE WON !
MECCANO PARTS TO BE WON

Remember ! The very latest in our regular series of annual Meccano model-building competitions is now well under way. If you haven't yet started designing your model, though, don't worry. There's still time to enter, but, before rushing to the drawing board, remember that, this year, the contest rules are different. IT MUST BE POSSIBLE TO BUILD ALL MODELS WITH THE CONTENTS OF A CURRENT STANDARD MECCANO SET BETWEEN 1 AND 7.

We are aware that this rule may upset a few readers, but we believe that, for this contest at least, it has certain advantages. It will, for instance, give an equal chance of success to those younger modellers who only have a single Meccano Set to work from; those who have not had a chance to build up a whole supply of useful extra parts. Equally important, it will present a greater challenge to those lucky modellers who do own a huge stock of parts and who can consequently build highly detailed and complex constructions. We all know it's harder to build a model from a specified number of parts than from an unlimited stock !

PRIZES GALORE !

As usual, entrants will be split into two Sections, A and B, Section A being for entrants under 14 years of age on the competition closing date and Section B for entrants aged 14 or over on that date. Each Section will, in turn, be split into ten sub-sections numbered from 1 to 10, the sub-section number depending on the Standard Meccano Set with which the submitted model is built. Three prizes will be awarded in each sub-section, with sub-sections 3, 4 and 5 being given priority and receiving the higher prizes. First prize in each sub-section will be in cash, second prize will be a Meccano Set and third prize will be a selection of Meccano Parts, the Parts to be chosen by the winner, himself.

In section A, the first prize in sub-sections 3, 4 and 5 is £5 cash, the second prize being a No. 4 or equivalent-value Meccano Set and the third prize £1.50 worth of Meccano Parts. Winners in sub-sections 1, 2, 6 and 7 will receive £4 in cash, the second prize being a No. 3 or equivalent-value Meccano Set and the third prize being £1 worth of Meccano Parts.

In Section B, the first prize in sub-sections 3, 4 and 5 is £7 in cash, with a No. 5 or equivalent-value Meccano Set as second prize and £2 worth of Meccano Parts as third prize. Winners in sub-sections 1, 2, 6 and 7 will receive £6 in cash, the second prize being a 3M or equivalent-value Meccano Set and the third prize being £1.50 worth of Meccano Parts.

HOW TO ENTER

Any number of entries can be submitted for the competition, *provided each model can be built with the contents of a current standard Meccano Set between 1 and 7*, and different entries can fall into different sub-sections. Any kind of model is eligible for entry, unless taken direct from a Meccano Manual, and all will be judged on their individual merits. The models, however, must be your own, unaided work.

Once you have built your model, obtain a good photograph of it, or, failing this, a reasonably detailed sketch. It is also advisable to include a short description of the main features of the model with your entry, mentioning any points of interest you would like brought to the attention of the judges, but the actual model, itself, must not be sent. A list of Sales Numbers and quantities of the Meccano Parts used in the model will also be required.

In entering the Contest, write your name and address on the back of each photograph or drawing, together with the letter A or B, depending on the age Section in which you qualify, followed by the number 1 to 7, according to the Meccano Set with which the model can be built, and forward to: Model-Building Contest, Meccano Magazine, Binns Road, Liverpool L13 1DA. *The competition closes on March 31st for competitors in the U.K. and Ireland and one month later, on April 30th, for overseas competitors.*

Prize-winning entries become the property of Meccano Tri-ang Ltd., but unsuccessful entries will be returned if accompanied by a suitable stamped-addressed envelope or, in the case of overseas entries, a self-addressed envelope and the appropriate International Reply Coupons. Entries can be accepted only on the understanding that Meccano Magazine will not be held responsible for any entry damaged or lost and that the judges' decisions are final. No correspondence relating to unsuccessful entries can be considered.

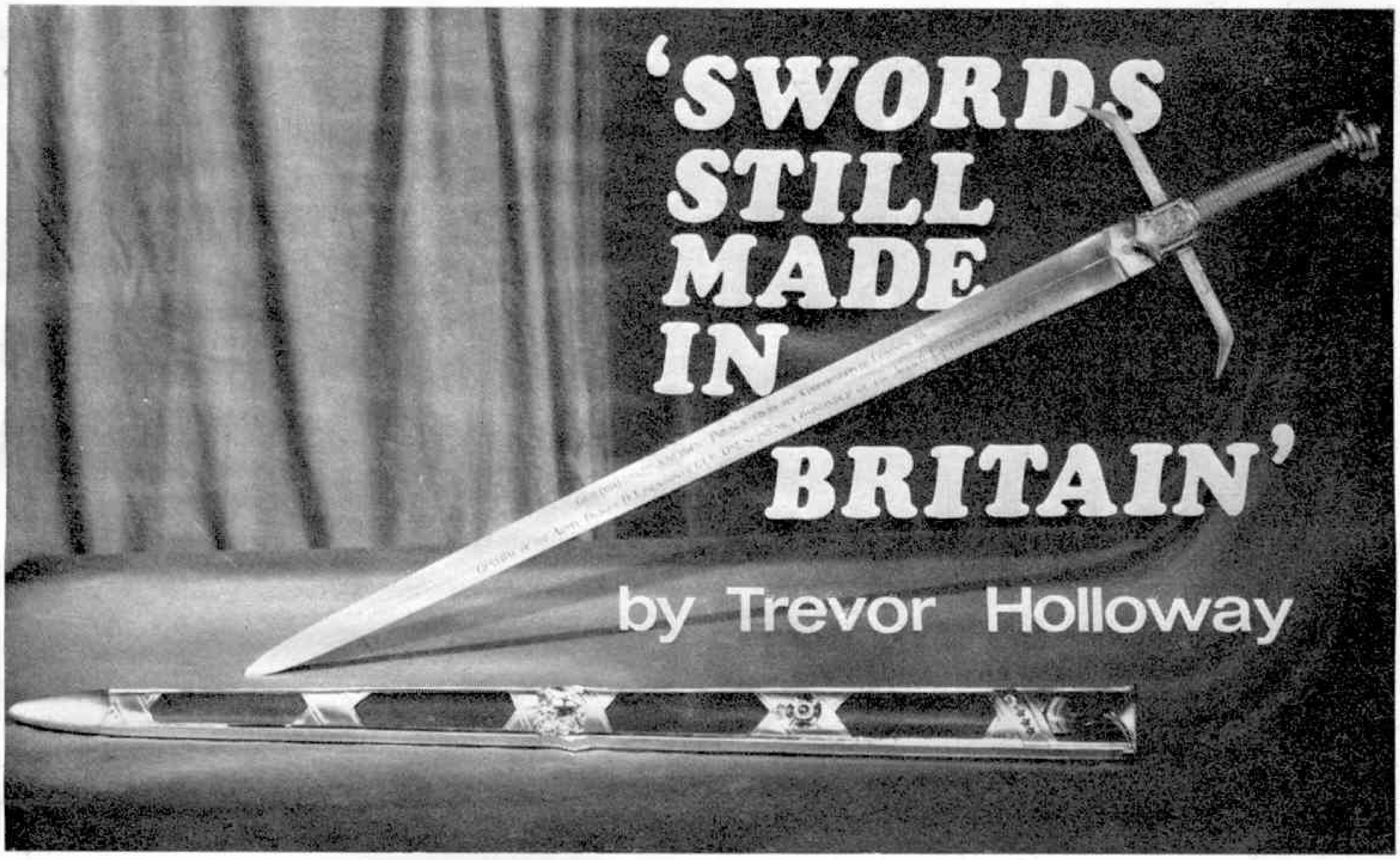
SET CONTENTS LISTS

To aid prospective entrants who are unsure of the contents of the various current Meccano Sets, we will be pleased to supply a Set Contents List upon request. Simply send a stamped-addressed envelope or appropriate International Reply Coupons to: Meccano Magazine, Northern Office, Dept. SCL, Binns Road, Liverpool L13 1DA.

SPECIAL BONUS

As a special bonus we are prepared to feature suitable interesting model entries in Meccano Magazine in due course, provided that sufficient details of the models can be supplied by the builders to enable full constructional articles to be prepared. The necessary information would not be required until after the competition has closed, therefore, if you are interested in seeing your model featured in full, it is advisable to either keep the original model built up, or to at least keep sufficient constructional notes to enable the model to be re-built at a later date.

Models chosen for inclusion in the Magazine will not necessarily be drawn from prize-winners only. Usable unsuccessful entries will also be considered and the builders of all models used, whether prize-winners or not, will receive a publication fee, calculated at our standard rates. The builders of models in which we are interested will be contacted shortly after the competition closes and, if they subsequently wish to have their models featured and are able to supply the original model, or sufficient re-building information, we will be delighted to hear from them. Final decisions on publication, however, can not be taken until we have been able to see or rebuild the models. We will, ourselves, prepare the final features.



IT MAY COME AS A SURPRISE to some readers to learn that even in this atomic age the sword-smith still plies his ancient craft in Britain. At the East Acton works of Wilkinson Sword Ltd., over 12,000 craftsman-made swords are manufactured every year and some 80 per cent of them are despatched to many countries overseas.

Founded in 1772, the company have been making swords for nearly two hundred years. Today, the firm supplies swords to every regiment of the British Army and of the armies in the Commonwealth; also to the Royal Navy and to the Royal Air Force. Actually, the company have the distinction of being the only firm in the U.K. able to design and produce ceremonial swords to individual orders. Their records on patterns and government specifications go back for more than one-and-a-half centuries and the firm can still supply swords from many of these designs.

The sword has been the symbol of war, the badge of honour and the courage among fighting men since the days when bronze and iron were first hammered into shape. The right to carry a sword has almost always been a mark of rank and today, when most of its usefulness has departed, the sword remains part of the dress uniform of army and navy officers in most countries throughout the world.

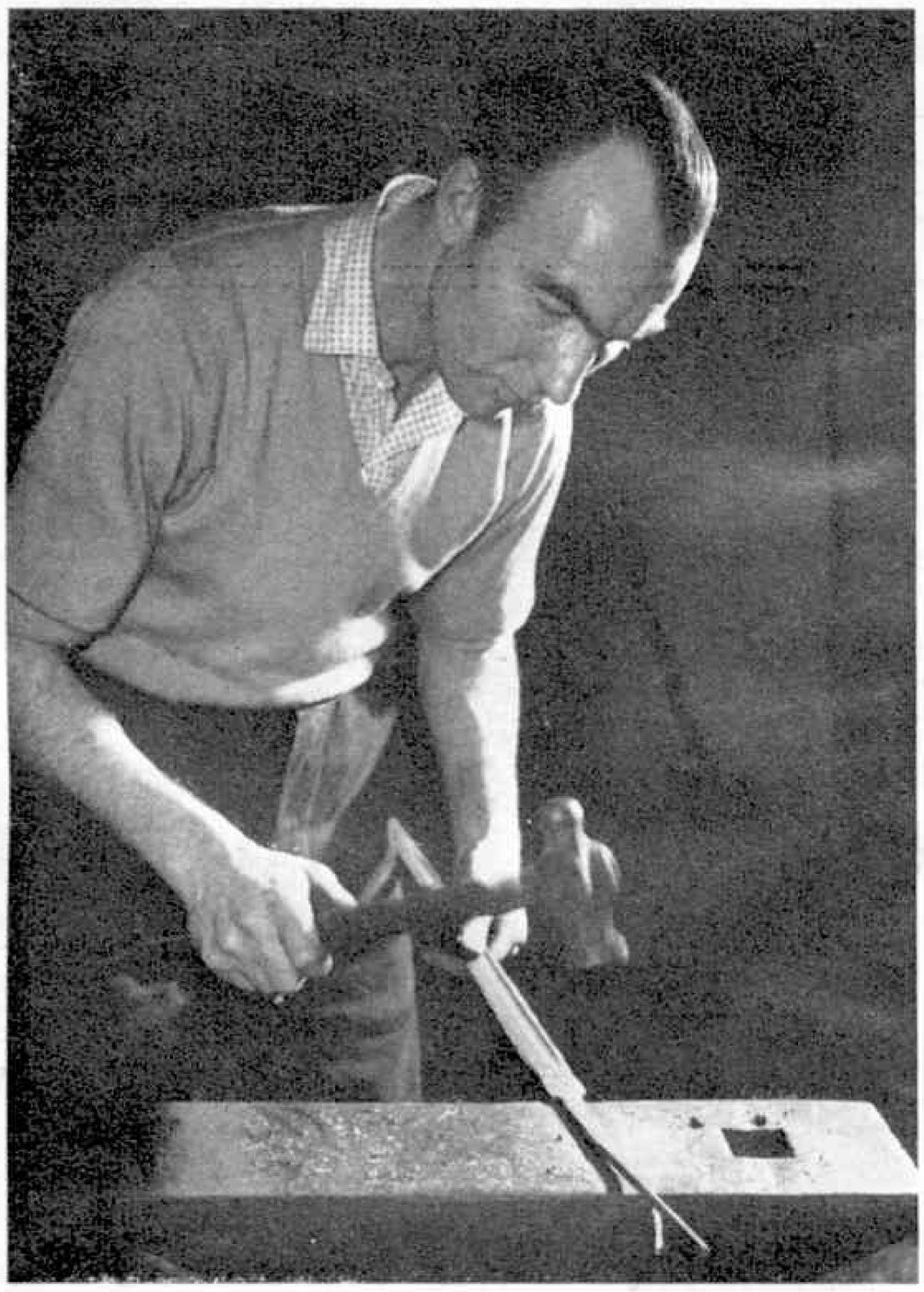
In the days of chivalry, as today, knighthood was conferred by the flat of the sword laid on the shoulder; in many lands, kissing the ruler's sword was a token of homage. When a general surrendered his sword, he admitted complete defeat; and to have his sword broken by his superior officer was the worst degradation that could come to a disloyal or cowardly soldier.

The sword's ancestor was probably the stone dagger of the cave man. Among the earliest historical blades were the leaf-shaped sword of the Greeks and the long, thin Assyrian sword. The heavy two-handed sword of the Middle Ages was abandoned as soon as the invention of fire-arms destroyed the usefulness of shields and armour. In its place grew up the sabre, the rapier and the small-sword, and with these lighter blades swordsmanship became a fine art.

In Europe, during the 17th and 18th centuries, it became the custom for all men, even civilians, to carry swords, and quarrels were usually settled on the spot with cold steel !

Various races and people have had special swords and daggers associated with their names throughout history—for example, the curved talwar of India, the sickle-shaped kukri of the Gurkhas, the delicate katana

The standard service blade commences as a bar of steel which is heated and drawn out through mechanical hammers. Handles are shaped in the same way.



After the mechanical hammer has done its work, the sword craftsman completes the shaping of the blade by hand.

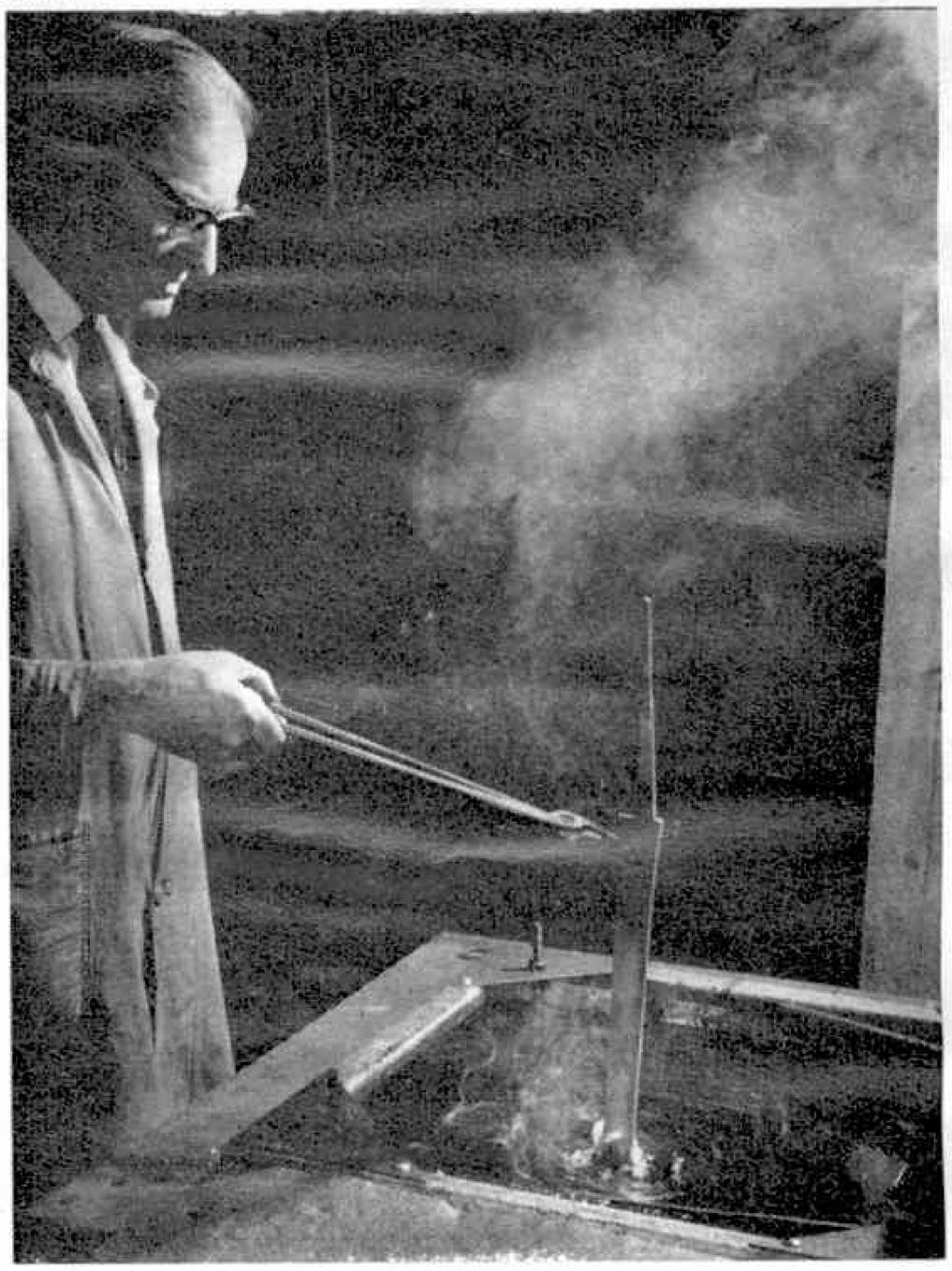
of the Japanese, the Malay kris with its wriggling blade, and the heavy-pointed machette of tropical America.

Sword-making was considered to be one of the most honourable of trades. The cities of Damascus, in Syria, and Toledo, in Spain, owed much of their reputation to the skill of their swordsmiths.

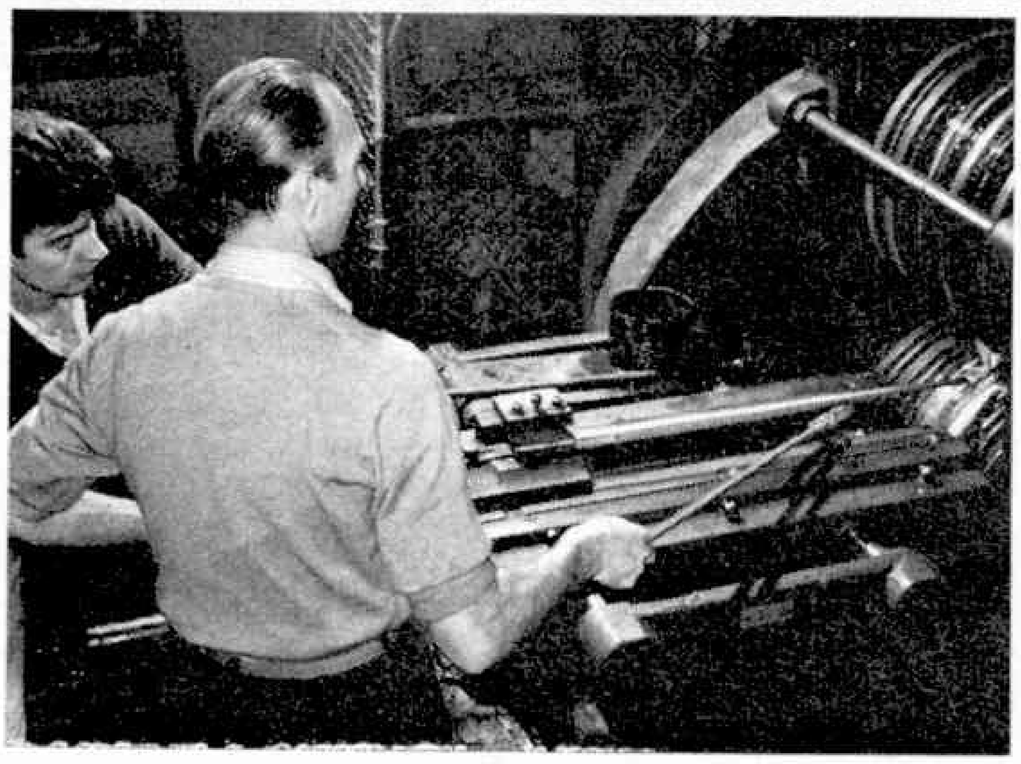
Before the invention of fire-arms, the sword was the principal weapon of the fighting man. Today, of course, the swords made at Wilkinson's unique works at Acton are for dress, ceremonial and presentation purposes. Even so, they still have all the qualities demanded of a weapon intended for attack or defence.

The standard Service blade commences as a bar of steel 12 in. long by $\frac{5}{8}$ in. wide by 1 in. thick. This is heated and drawn out through mechanical hammers until it measures 24 in. by $\frac{3}{4}$ in. by $\frac{1}{2}$ in. It is then reheated and passed through shaped rollers from which it emerges roughly correct in length and shape of the required blade. After the mechanical hammer has done its work, the sword craftsman completes the shaping of the blade by hand. Grinding is done amid a cascade of sparks on a large stone wheel.

The blade now passes to the hardening shop where it is heated and immersed in a bath of whale oil. The density and softness of the oil slows the cooling process and has a soothing effect on the steel, preventing it from crystallising. Later, blades are tempered in molten lead.



To harden them, sword blades are heated and immersed in a bath of whale oil. The density and softness of the oil slows the cooling process and has a soothing effect on the steel, preventing it from crystallising. Later, blades are tempered in molten lead.



Blades are heated and passed through these rollers which shape and draw the blades out to their correct length.

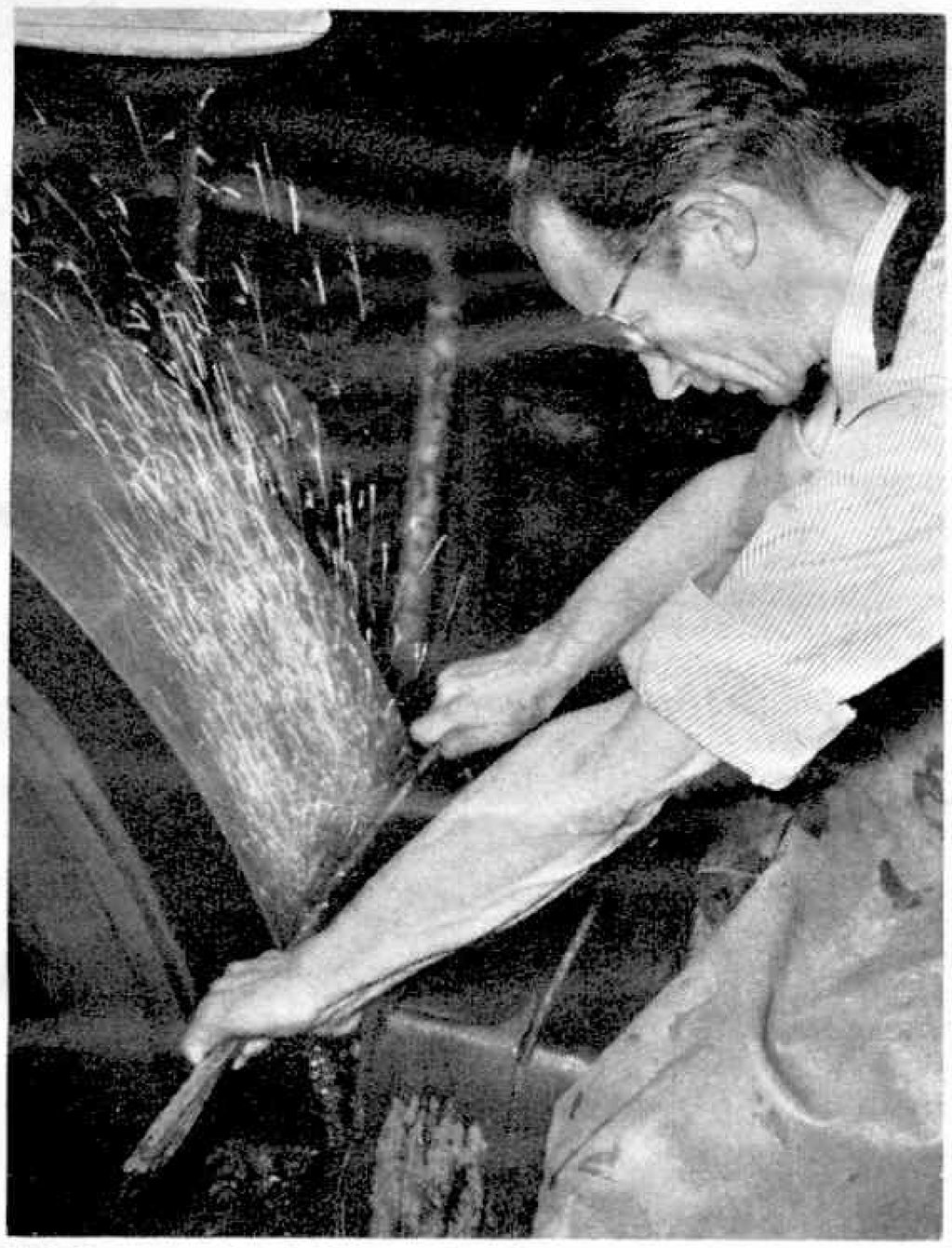
The testing of blades is carried out by craftsmen of long experience. In one test, to check that the steel is flawless, the blade is firmly struck against a heavy bar of iron—twice on the back and twice on the front edge. In another test, the blade must prove capable of bending 5 in. out of true each way and returning to the straight to check the temper. The final stage in the processing of the blade is polishing and embossing with the required pattern and insignia.

Manufacture of the hilt depends very much on the type of sword being made. The component parts are either cased in gilding metal or stamped out of brass or steel sheet. These parts are then hand-finished and chased before passing on to the plating shop where they are plated with gold, silver, nickel or rhodium (a silvery metallic element) according to the customer's requirements.

Scabbards are of steel, leather or wood, covered with

leather or velvet. Metal scabbards are formed up by hand on steel mandrels from sheet steel and, after brazing, the joints are ground and polished, or plated as required. Wooden scabbard bodies are made by skilled cabinet makers to fit the blade of the individual sword; the leather or velvet covering them is then sewn onto this body by hand. Leather scabbards are hand-sewn over steel mandrels and then oven-baked to harden them.

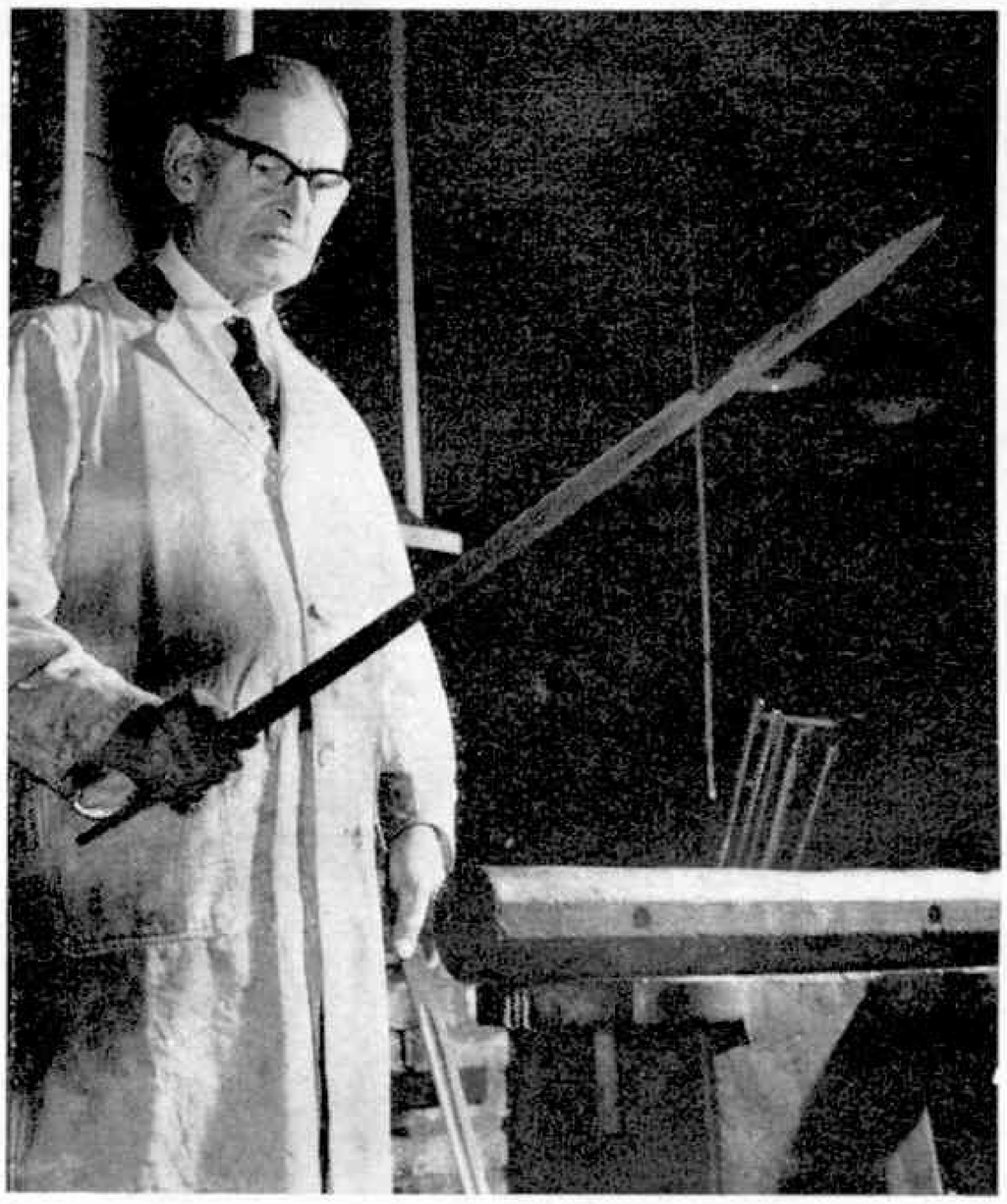
The variety of patterns in swords is perhaps the main feature which has prevented the craft from dying under the pressure of more modern methods. Each and every country has different designs from the others, no two regiments have identical swords, and customers often require special embossing on the blades of their names, ranks, etc.



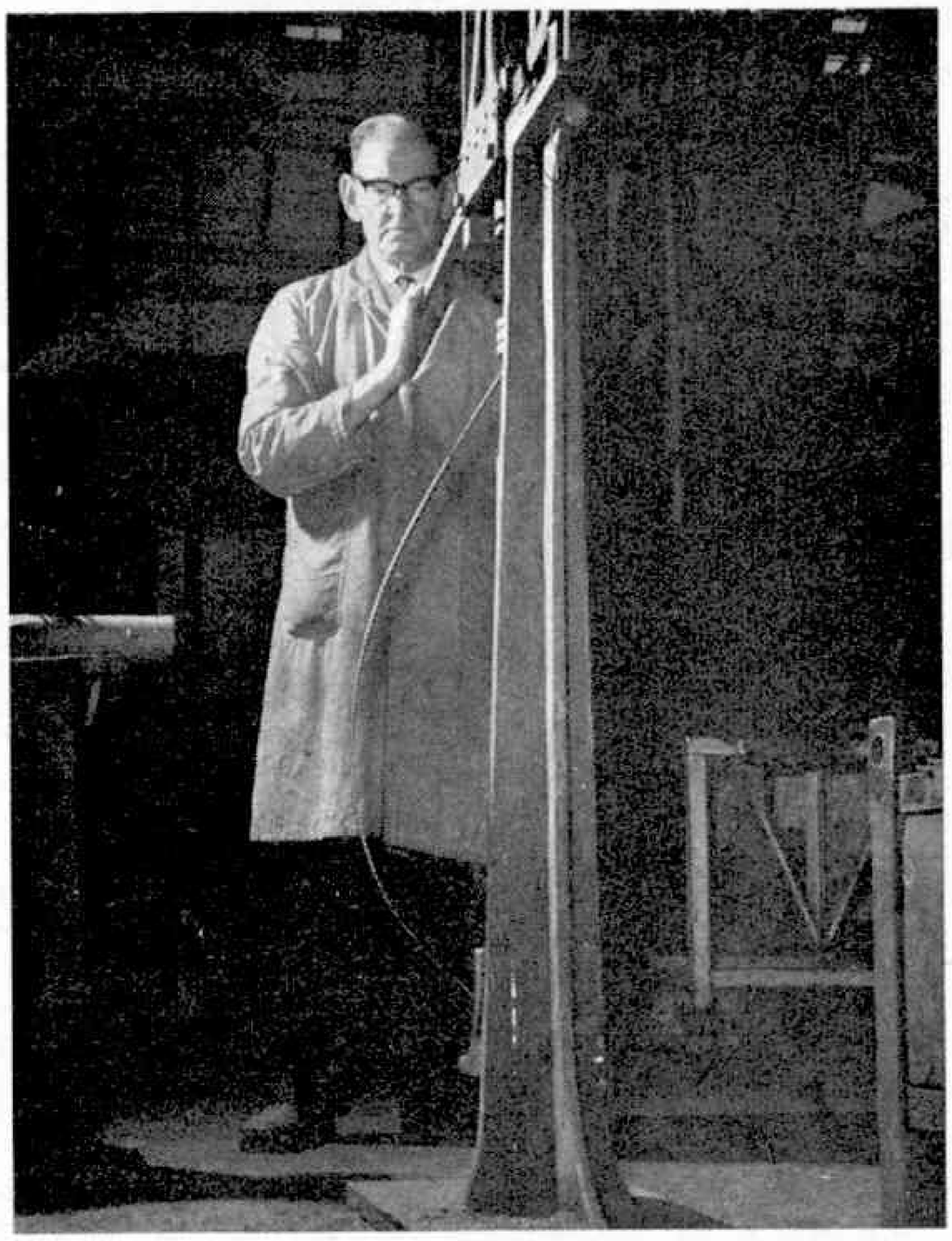
Grinding sword blades at the Acton sword department of Wilkinson Sword. The company supplies swords to every regiment of the British Army and of the Armies in the Commonwealth; to the Royal Navy and the Royal Air Force.

A number of special commemorative swords have recently been made by the Company. For example, a presentation replica of the sword worn by Captain James Cook, R.N., on landing at Botany Bay in 1770, was presented by the Wilkinson Sword Company to the State of New South Wales on the occasion of the re-enactment of the original landing that formed part of the Captain Cook Bi-Centenary Celebration held in April, 1970. The sword is a naval, hanger-type of the period, and the pattern is an exact copy of the original Captain Cook sword which was borrowed for the purpose from the Glenbow Institute of Calgary, Canada, where it is permanently housed.

When Senator Leverett Saltonstall, from the Commonwealth of Massachusetts, formally opened the Mayflower 70 celebrations at Plymouth last May (1970), he was handed a special presentation sword by the Lord Mayor of Plymouth. This sword, made



Blades are tested by being firmly struck against an iron bar, twice on the back and twice on the front edge.



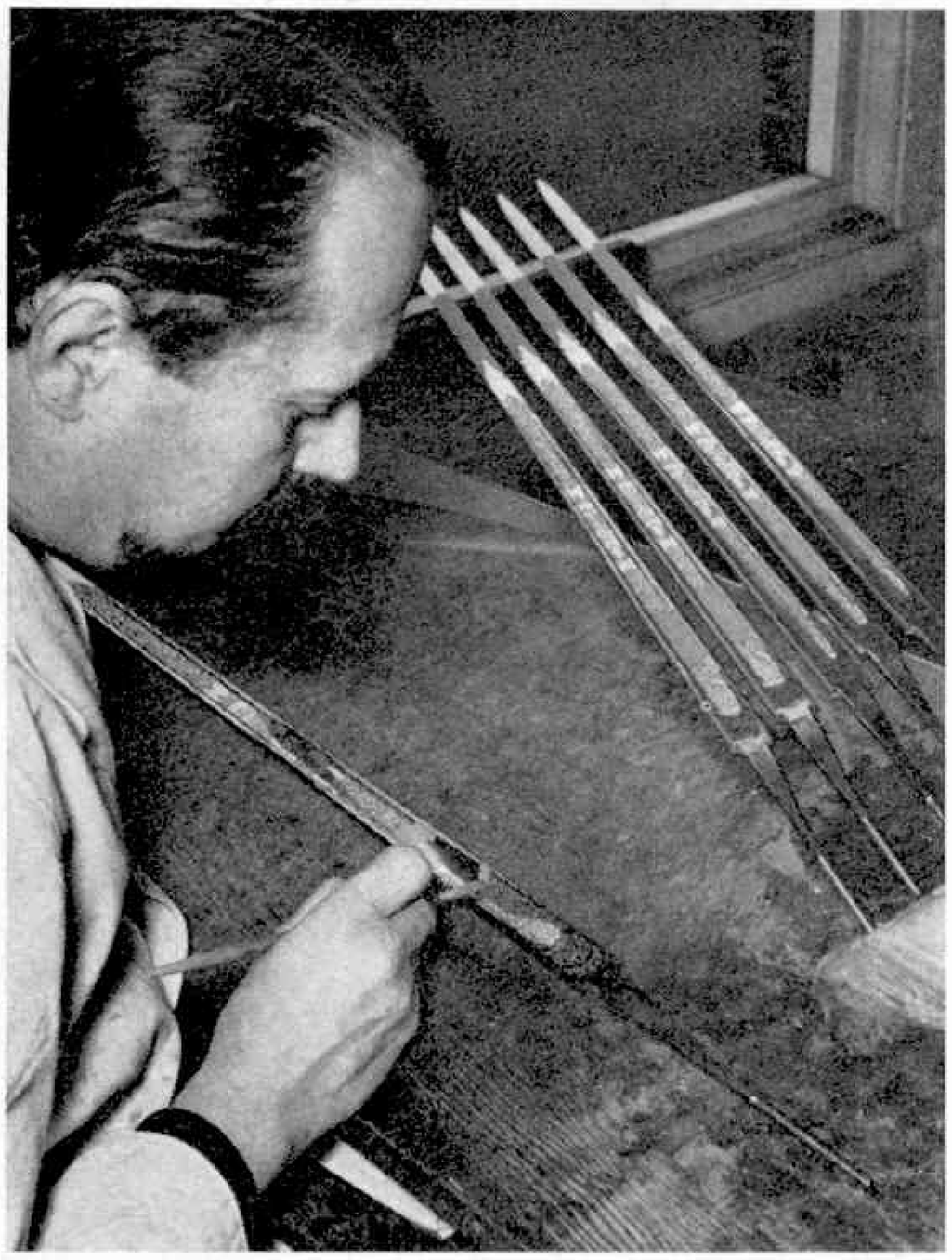
Each sword blade must bend five inches out of true and return to the straight without the slightest flaw.

by Wilkinson Sword Ltd., was a gift from the City of Plymouth to commemorate the close links that have existed since the sailing of the *Mayflower* in 1620.

It is a civic, or state sword, of the crusader type and was specially designed and hand-forged for the occasion. It has a heavily gold plated cross piece and the grip is of polished mahogany. The scabbard and mounts are also gold plated. The sword measures more than 4 ft. overall.

Another fine piece of craftsmanship was a special ceremonial sword commissioned by the British Steel Corporation for presentation to the City of Cardiff to commemorate the Investiture of His Royal Highness the Prince of Wales.

All metal fittings are heavily gold plated and the sword has a balled grip covered in green leather and bound with gold plated wire. The inscription is in Welsh on one side of the blade and in English on the other, and both are contained in a panel embellishment with a motif of daffodils entwined with leeks. On each



Final stage in the manufacture of sword-blades is polishing and embossing with the required pattern and insignia. This artist has transferred a wax transfer of the pattern and is painting out the area not to be touched by acid.

side of the hilt is a large enamel of the City of Cardiff coat of arms, and on the scabbard—which is covered in green velvet—is an enamel of the Welsh dragon.

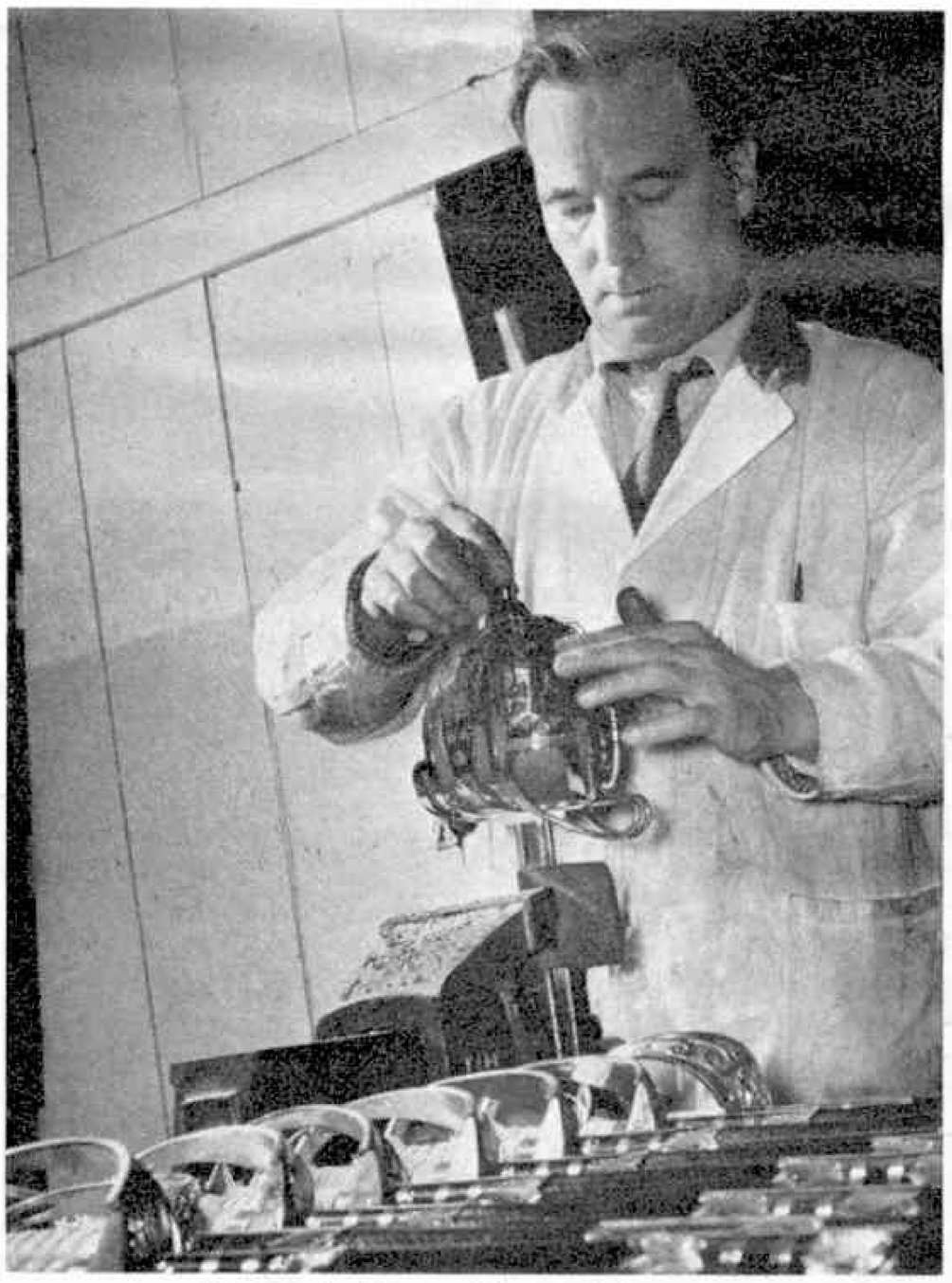
More recently, Wilkinson Sword Ltd. designed a special Battle of Britain Victory sword to commemorate the Royal Air Force's great victory in the summer of 1940. A limited number of these swords have been made for sale and the first of the series was presented by the company to the Royal Air Force.

The pommel takes the form of a victor's garland, surrounding on one side a portrait of the late Sir Winston Churchill and on the other the Royal Air Force insignia, together with the words: "Their Finest

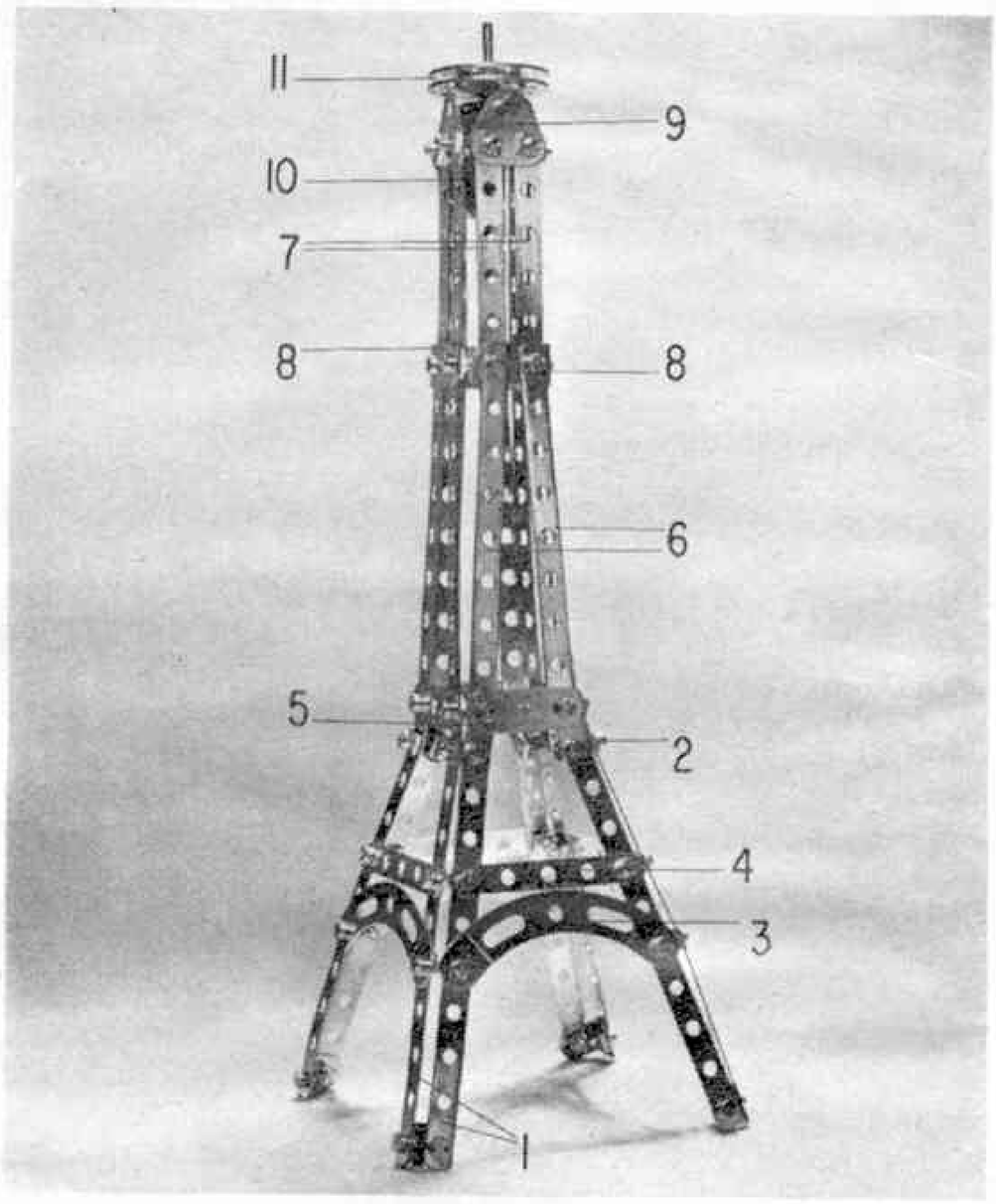
Molten brass being poured into sand moulds to cast hilt components.

Hour". On one side of the blade is shown a group of R.A.F. personnel to represent the essential teamwork which was the key to success. On the reverse of the blade is depicted a symbolic Battle of Britain airfield scene of pilots running towards their Hurricanes with Spitfires flying overhead.

Versions of these swords with solid gold or solid silver crossguard and pommel will be made to order for special purposes; normal versions will be gold or silver plated or in bronze, as required. The total number of these swords that will be forged will be restricted and each sword will bear its individual serial number so that they are likely to become collector's items in the years to come.



Fitting the basket hilt to a Claymore.



Full credit for this simplicity model Eiffel Tower goes to Mr. Roger Le Rolland of Stoke-on-Trent, Staffs.

TOWER AND TRAM

Spanner describes two 'Simplicity' models designed and built by Meccano Mag. reader Roger Le Rolland

I DON'T SUPPOSE many readers have given it much thought, but preparing the Meccano model-building section of *Meccano Magazine* can be a bit conscience-troubling. In the course of the job I receive details of many different types of models of all shapes and sizes and it is only reasonable to expect that some of these are bound to appeal to my own particular tastes more than others. When choosing models for inclusion in the Magazine, I do, of course, try to be absolutely fair, ignoring my own preferences and choosing the models on their individual merits, but there are times when I wonder if my own tastes have coloured my choice.

Having mentioned all this I now feature two models which I openly admit appeal greatly to me, personally. On this occasion, however, I feature them with a clear conscience because they come under the "simplicity" heading and it so happens that just about every Meccano modeller living likes simplicity models just as much as I do. (Admit it! Don't YOU like 'em?) and that gives me the best excuse possible. The models in question are a 1 ft. Eiffel Tower and a delightful little Tram, both designed and built by Roger Le Rolland of Stoke-on-Trent, Staffs—a modeller whose work has appeared in these pages before now.

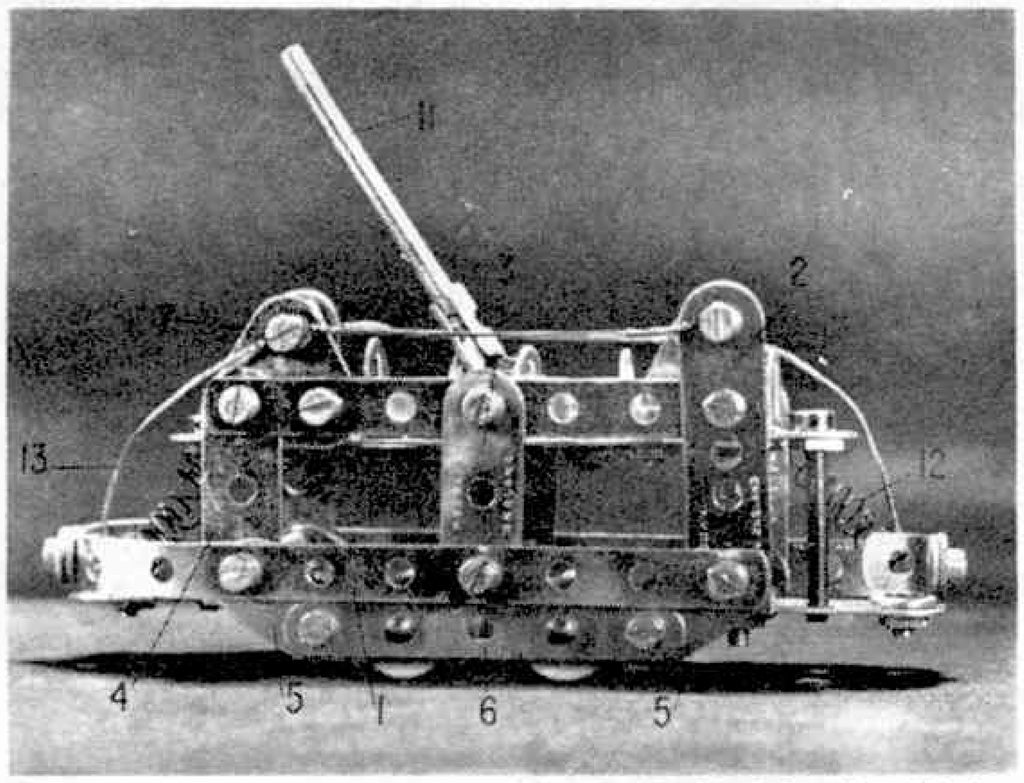
Eiffel Tower

Construction of the Eiffel Tower can be seen to a large extent in the accompanying illustration. Each "leg" in the lower section consists of two $5\frac{1}{2}$ in. Narrow Strips 1, connected together, at their lower ends, by an Angle Bracket and, through the second holes from their upper ends, by a Threaded Boss, one securing Bolt in the latter case being screwed into the longitudinal bore of the Threaded Boss and the other being screwed into one transverse bore of the Boss. Note that the Bolt screwed into the transverse bore, numbered 2 in the illustration, is fitted with a Nut to fix the Strip against the Boss. Narrow Strips 1 at each side are connected together by a 3 in. Stepped Curved Strip 3, a $2\frac{1}{2}$ in. Narrow Strip 4 and a $1\frac{1}{2}$ in. Strip 5, the last at the top ends of the Strips, the securing Bolts fixing $4\frac{1}{2}$ in. Narrow Strips 6 in position to extend the legs. These Strips are themselves extended by 3 in. Narow Strips 7, the securing Bolts fixing three 1×1 in. Angle Brackets 8 in place, as shown.

Bolted to the upper ends of Narrow Strips 7 at three of the four sides is a 1 in. Triangular Plate 9, pointing upwards, the fourth side being fitted with two overlapping 1 in. Triangular Plates 10, one pointing upwards and the other pointing downwards. Locked by Nuts in the apex hole of the upward-pointing Triangular Plate and in the corresponding hole in the opposite Plate is a $1\frac{1}{8}$ in. Bolt, in the centre of which a Collar is securely held by Nuts. Screwed into one transverse tapped bore of this Collar is a 1 in. Screwed Rod on which two 8-hole Wheel Discs 11, separated by three $\frac{3}{4}$ in. Washers, are held by Nuts.

Held by Nuts in the apex hole of downward-pointing Triangular Plate 10 is a Pivot Bolt, on which a $\frac{1}{2}$ in. loose Pulley is mounted. This Pulley, however, is unnecessary if the Tower is to be built as illustrated, but has been included for the benefit of modellers wishing to fit small working lifts to the Tower. Mr. Le Rolland suggests that the way to achieve this is to mount the Tower by means of Angle Brackets on a $5\frac{1}{2} \times 5\frac{1}{2} \times 2\frac{1}{2}$ in. "plinth", the top of which consists of a $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flat Plate and a $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flanged Plate, arranged with a $\frac{1}{2}$ in. gap between them. These Plates are attached by $2\frac{1}{2}$ in. Angle Girders to the sides of the plinth, which are built up from $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plates and/or Flat Plates, joined at the corners by further $2\frac{1}{2}$ in. Angle Girders.

A Meccano 3-12 volt D.C. Motor with 6-ratio



Another simplicity model from Mr. Le Rolland is this old-time Tram which, despite its size, captures the true atmosphere of its subject.

Gearbox is bolted to the underside of the top Flat Plate, a ½ in. Pulley on its output shaft coinciding with the gap between this Plate and the Flanged Plate. A loop of Cord running between this Pulley and the Pulley at the top of the Tower provides the lift cables, while the lifts, themselves, could be supplied by Fishplates or Double Brackets. To obtain the best results, the Gearbox should be set in the 60 : 1 ratio and, of course, the appropriate side of the plinth must be left open to allow access to the motor control lever.

PARTS REQUIRED

4—6a	1—82
4—12	4—89a
3—12a	4—111
2—24a	1—111d
3—38d	4—235
64—37a	8—235a
56—37b	8—235d
5—59	8—235f
5—77	

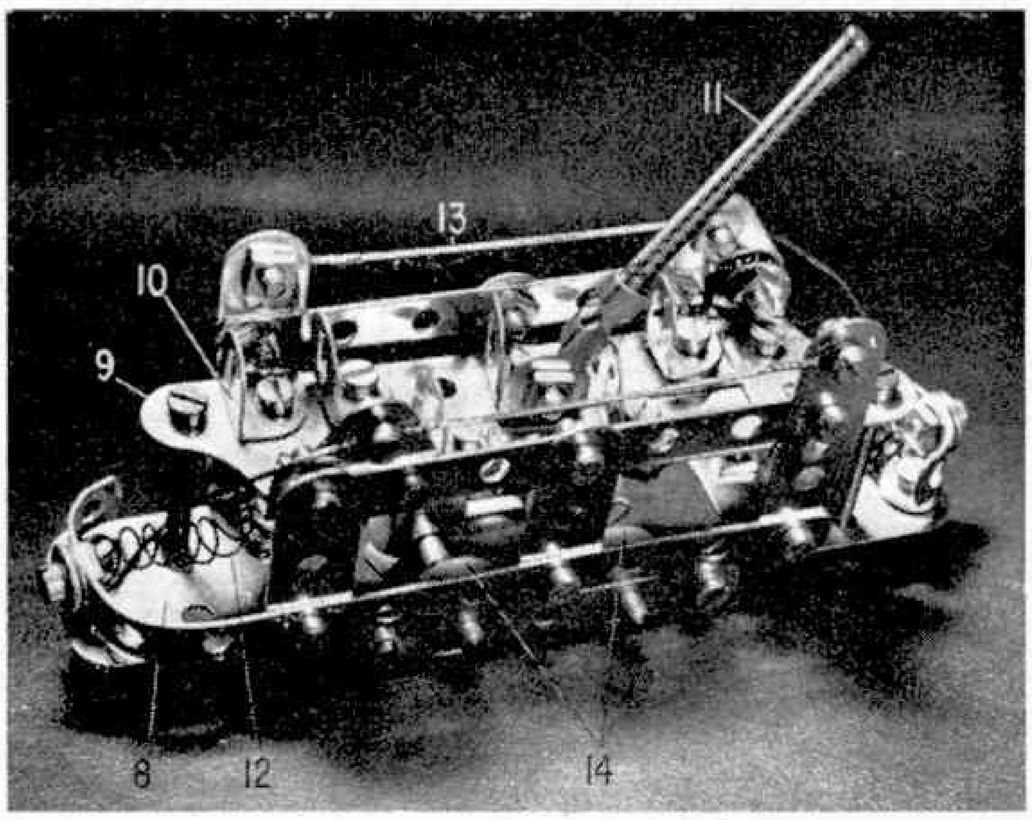
Tram

Very much smaller, yet even more detailed than the Eiffel Tower is Mr. Le Rolland's Tram, which has the extra advantage of being designed to run on OO-gauge model railway track. Although not based on any specific prototype, it none-the-less captures the "feel" of the subject: a subject which holds the interest of an enormous number of people of all ages. Both sides of the model are similarly built, each consisting of a 5½ in. Narrow Strip 1, to which a 2 in. Strip 2 and two 1½ in. Strips 3 and 4 are bolted, the securing Bolts in the cases of Strips 2 and 4 each also holding an Angle Bracket and a Fishplate 5 in position. Fishplates 5 are angled as shown and connected by a 2½ in. Narrow Strip 6. The upper ends of Strips 3 and 4 are connected together and to the second hole of Strip 2 by a 3½ in. Narrow Strip, the securing Bolt in the case of Strip 4 holding an Angle Bracket and a 1 in. Triangular Plate 7 in position and the securing Bolt in the case of Strip 2 holding just an Angle Bracket in place. Note that this Angle Bracket at one side is a ½ × ½ in. Bracket, while at the other side it is a 1 × ½ in. Bracket fixed by its short lug.

Now bolted to the Angle Brackets at the lower ends of Strips 2 and 4 are two 1½ in. Flat Girders 8, serving as the platforms at each end of the tram. Once in position, the protruding ends of Narrow Strips 1 are curved round as shown, the second hole in each case being fitted with a Bolt, carrying two Washers to represent a headlamp. Bolted to the Angle Brackets at the upper ends of Strips 2 and 4 are two 3½ in. Strips forming the upper deck, the securing Bolts fixing in place at each end a 1 in. Corner Bracket 9 and an Angle Bracket 10. Five further Angle Brackets are bolted to the Strips in staggered positions to represent seats, these Angle Brackets each being spaced from the Strips by a Washer. The trolley pole is a Flexible Coupling Unit 11 held in a Rod and Strip Connector bolted to an Angle Bracket which is, in turn, bolted to one of the 3½ in. Strips.

Coming to the stairs and handrails, Mr. Le Rolland has used a good deal of clever imagination, here. Both sets of stairs are supplied by one (old) Tension Spring, cut into two halves and with the coils opened out somewhat. One end of each resulting length 12 is bolted to the upper end of Strip 4, the other end being bolted to Flat Girder 8. Each handrail, on the other hand, is ingeniously supplied by a Heald for Loom 13, one end of which is secured by the same Bolt fixing spring 12 to the Flat Girder. The Heald is then curved round and up, its centre being bolted to the apex of Triangular Plate 7, the remaining section being attached straight to the upper end of Strip 2, as shown. The vertically-mounted main platform bar is supplied by a 1⅛ in. Bolt, held by a Nut in Corner Bracket 10 and projecting down through a hole in the Flat Girder.

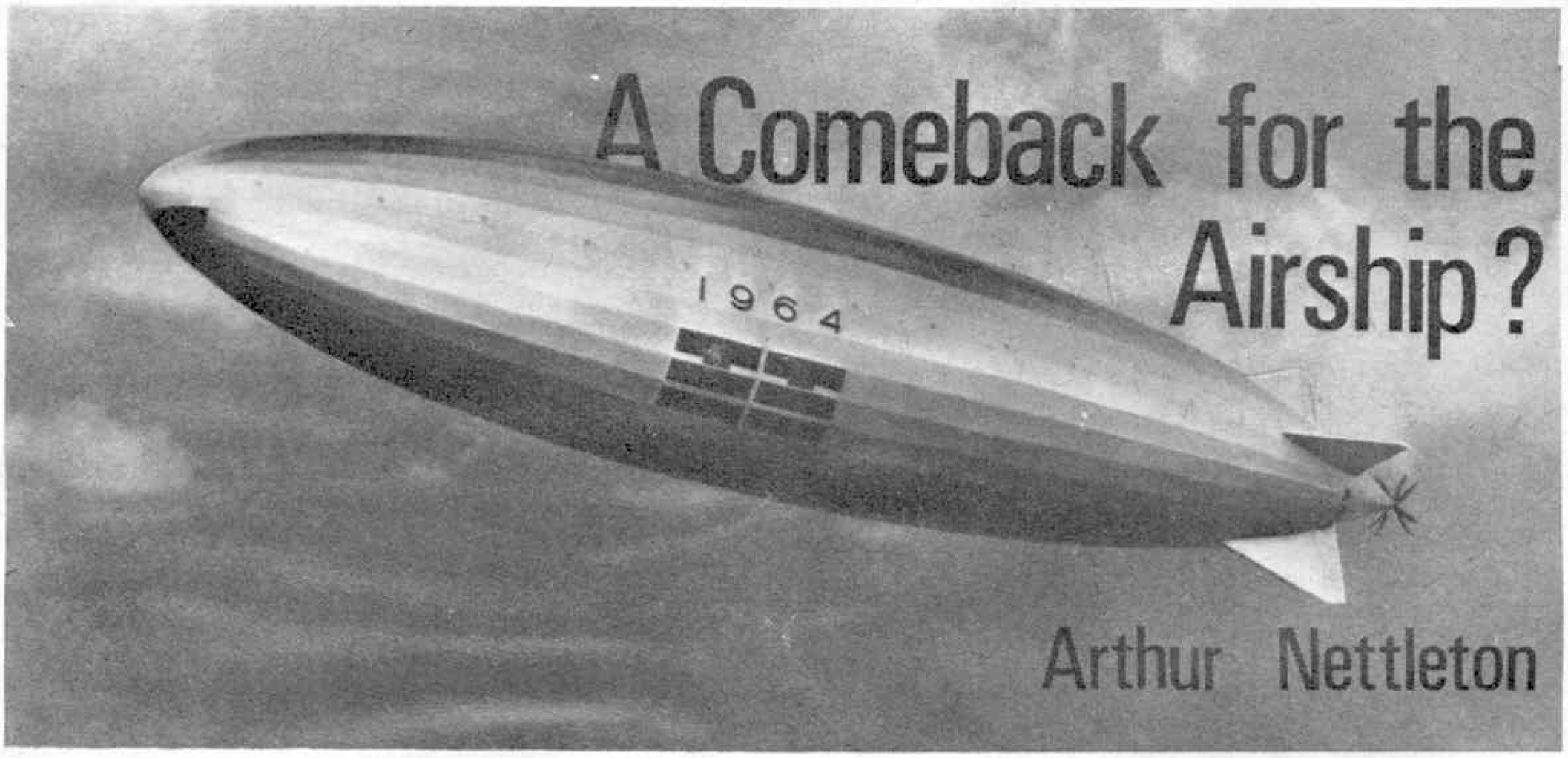
This leaves only the four wheels to be added, each of these being supplied by a ½ in. Pulley without boss 14 held by a Cord Anchoring Spring on one of two 1½ in. Rods journalled in Narrow Strips 6. Each Pulley is spaced from the adjacent Narrow Strip by a Washer.



A general side view of the Tram showing the few parts that are needed to build up the main bodywork of the model.

PARTS REQUIRED

2—3 ⬚	46—37a	2—133a
2—6	42—37b	1—175
4—6a	8—88	4—176
4—10	2—77	1—212
1—11a	1—43	2—235
15—12	2—101	2—235b
2—18a	2—103h	2—235f
4—23	2—111d	



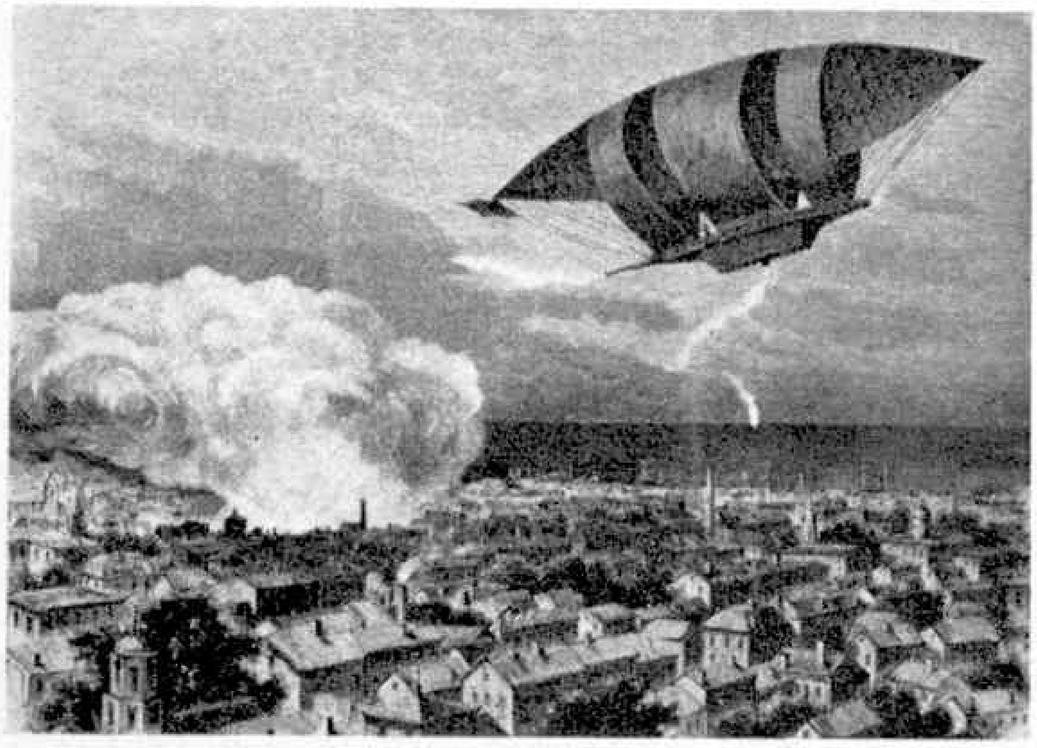
Above: The cargo-carrying airship envisaged for tomorrow would not differ much in appearance from the airship of the 1930's, but would be driven by nuclear-powered engines.

Below: As this artist's impression shows, airships were used for aerial bombardment as long ago as 1885.

Meccano Magazine has always held an interest in the development of airships and in 1927 ran a series of nine articles on this very subject. Now over 40 years later, Arthur Nettleton traces the history and future prospects of this form of flight . . . . . .

COULD THE AIRSHIP STAGE A COMEBACK? In these days of faster-than-sound aircraft, the idea of reviving the cumbersome gas-filled cigar-shaped bags that made their way across the skies more than forty years ago may seem to have little chance of success.

Yet a number of authorities believe that such a revival could be worthwhile, and its possibilities are being closely investigated. Russia and the U.S.A., in particular, are examining the situation. Germany, with long experience of airships, is also considering the possibilities of their having a future role.

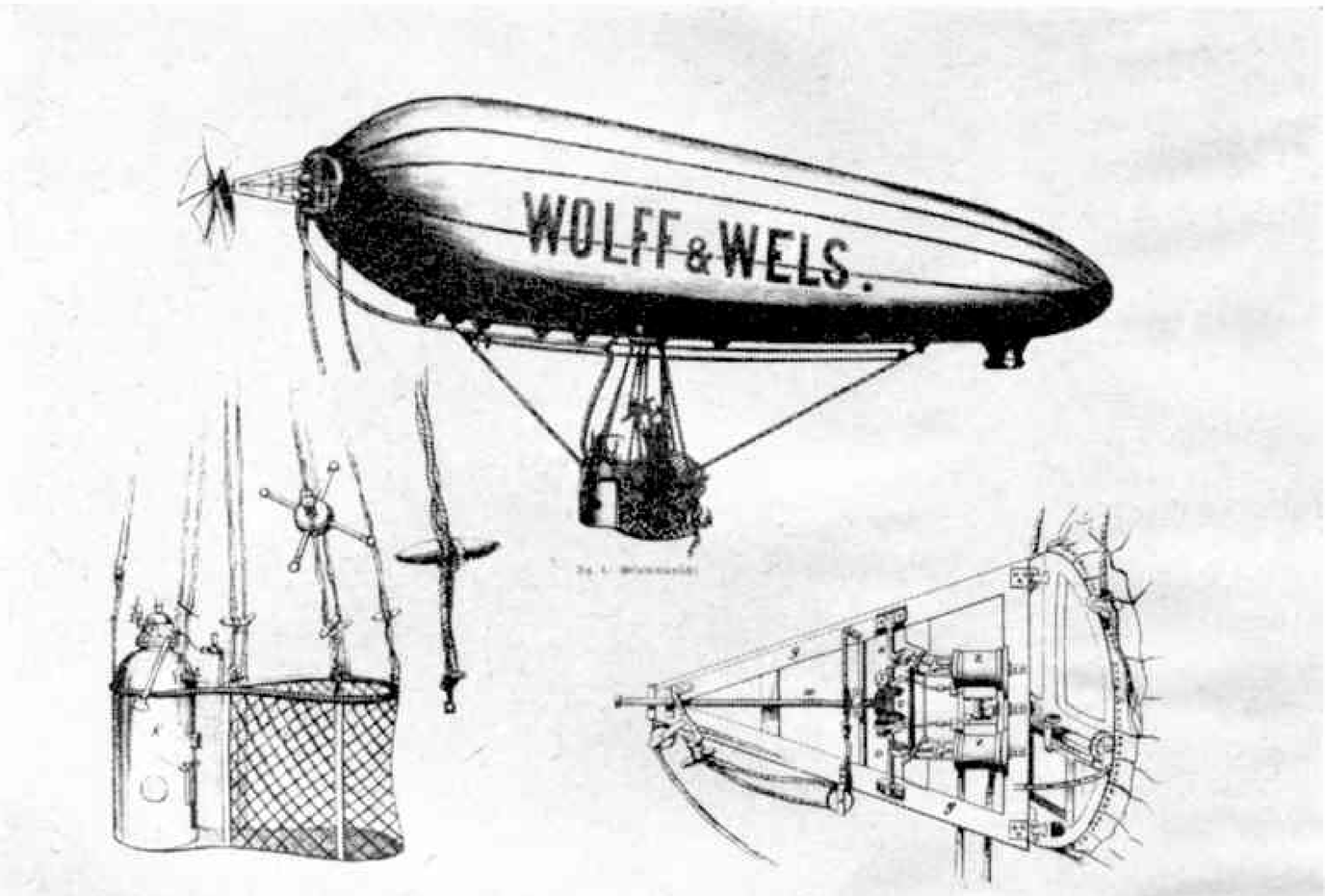


The main era of the "Cunarders of the Skies," as they have been called, covered the late 1920's and the early 1930's. Although according to some accounts the Chinese had passenger-carrying balloons as long ago as 1306, and succeeded in taking them along prescribed routes, the first truly navigable one was built in 1852 by the French engineer Henri Giffard.

Only 144 ft. long, it was propelled by a 3 h.p. steam engine and flew from Paris to Trappes. But a bigger one which he constructed later crashed on its trial trip, and his hope of building a 1,970 ft. craft powered by a thirty-ton engine and capable of flying at 40 m.p.h. came to nothing.

Nevertheless, nearly 1,000 airships have since been launched, with varying degrees of success. The first Zeppelin, named after its designer, Count F. von Zeppelin, was built in 1900, had a length of 420 ft., a diameter of 38 ft., and was powered by two 16 h.p. internal combustion engines.

Its newest feature was the aluminium framework inside the 400,000 cubic ft. linen and silk gasbag. The envelopes supporting earlier airships had no such framework.



A forerunner of the Zeppelin was fitted with a propeller, like that of an aeroplane, and a cylinder of compressed gas was carried in the basket for controlling height by altering the pressure in the cigar-shaped envelope.

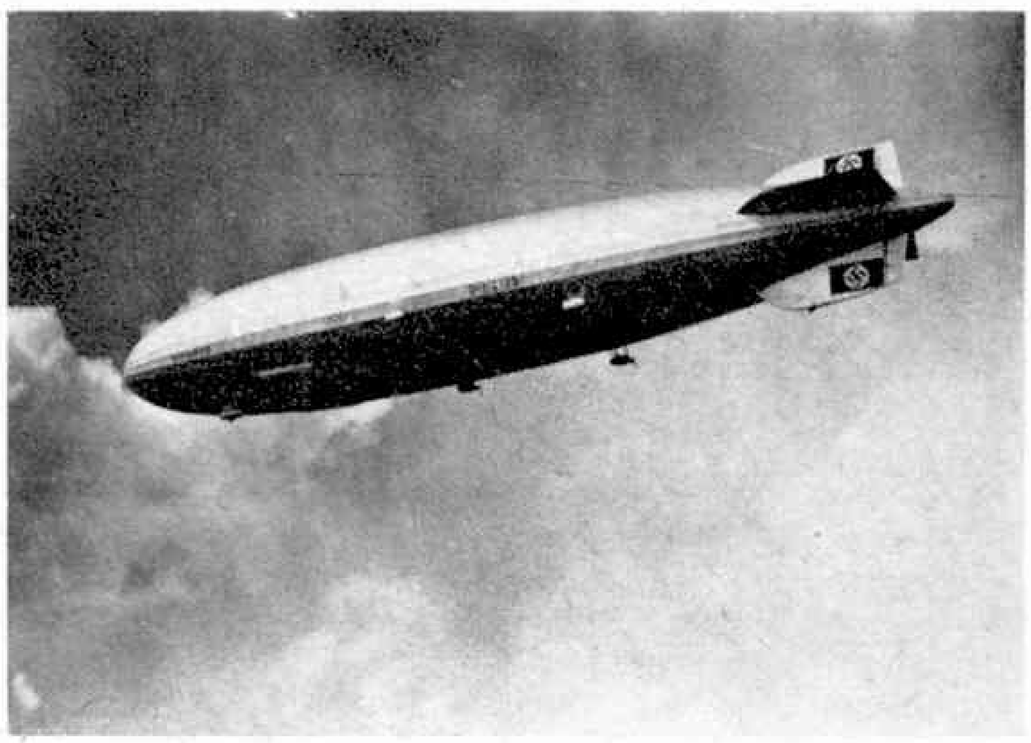
That pioneer Zeppelin was sufficiently successful for a second one to be built, and although this suffered a number of mishaps a third German airship launched in 1906 performed so well that the Count received royal patronage and orders were given for the construction of a whole fleet of these craft.

In fact, between the beginning of 1910 and the outbreak of the first World War in August, 1914, German airships flew more than 100,000 miles and carried 17,000 passengers !

Britain's main contribution to the development of airships was the building of the R-34, the R-100, and the R-101. America flew the Los Angeles, and Italy built one called the Norge.

The extent to which airships were used forty years ago is often singularly forgotten today. This type of air transport, and not the aeroplane, originated the aerial crossing of the Atlantic, commercial airship services being operated between the Old and the New Worlds long before it was considered practical to fly aeroplanes regularly on that long-distance route.

The challenge presented to the Trans-Atlantic liner services by airships was regarded seriously, especially after the R-34 became the first aircraft of any type to cross both ways and the R-100 had flown from Britain to Montreal in less than eighty hours.



The Hindenberg, one of the most famous Zeppelins. She perished in flames whilst landing at Lakehurst, U.S.A.

The Hindenberg, the biggest and most luxurious aircraft ever to take to the skies, cut the time for the Atlantic crossing to only 50-60 hours.

The North Polar wastes were explored by the Norge, and the Graf Zeppelin made a remarkable flight right round the globe, as well as having a commercial career that made her the first aircraft to log more than 1,000,000 miles of flying. She, too, flew over the North Pole, and she made several successful trips to South America.

The growing interest in airships as a useful means of transport rapidly declined, however, when tragedy overtook a number of them. The British-built R-101 crashed in France on her initial flight to India, and the Hindenberg perished in flames while landing at Lakehurst in the U.S.A.

The biggest factor in the eclipse of lighter-than-air craft was a shortage of non-inflammable helium. As a result of this shortage and the cost of the gas, the envelopes had to be filled with inflammable hydrogen, creating a high fire hazard.

Today, helium is much more readily available and far less costly, being obtainable as a by-product of the tapping of natural gas.

A further reason for taking a fresh look at airships is that the rigid framework can now be made stronger yet lighter than was dreamed possible in the 1930's. Produced from carbon fibre (a metal substitute developed by the British car industry) the interior structure supporting the fabric of the envelope would be a big advancement on the old type of framework.

An even more influential innovation envisaged is to replace the petrol engine by one using atomic energy to propel the ship. These modern engines not only deliver 100 times the power of a petrol engine but have only a fraction of the weight.

Plans have already been put forward in America for a nuclear-driven airship capable of carrying 400 passengers across the Atlantic in 40 hours or less. Twin propellers at the stern would rotate in different directions, and three engines with a total output equivalent to 6,000 h.p. would give the craft a maximum speed of 150 kilometres per hour.

There would be no gondola hanging underneath,

the passengers and crew being accommodated inside the envelope. Lounges, cafes, viewing-decks, and other amenities would be provided beneath a transparent-roofed section.

Research into the problems involved in building such an airship has been undertaken by expert engineers at Boston University, Mass., and a scale model has been made of a nuclear-powered one designed there.

Russia has a special department of the Academy of Sciences to examine airship development, and Germany has more than one scheme of that kind under consideration.

One of the German ideas is to build an airship driven by turbo-prop engines and capable of carrying five tons of mail, as well as 450 passengers and their luggage. A dance hall, bar, reading lounge, music room, and nursery are just some of the amenities that would be incorporated.

The craft could be described as a flying counterpart of a cruise liner, yet giving an even steadier journey.

A still more engaging project has been put forward by a Berlin engineer. He has designed an airship to accommodate 850 passengers and 130 tons of freight! Although the estimated cost of construction is at least 150 million pounds, economists believe that even at the low fare of 6d. per mile the outlay would be recovered in two years of service.

Some airship designers are abandoning the conventional idea that lighter-than-air craft should necessarily have only a single cigar-shaped envelope. A prototype airship with three hulls has been flown successfully in America.

The Aereon, as it is called, has been built for evaluation purposes, but its designers claim that a full-sized dirigible of the same type could lift and carry cargo weighing some 3,000,000 lb.

The 40,000 cubic ft. Aereon, with an overall length of 86 feet, is 53 ft. wide and 18 ft. high. Uninflated she weighs only 2,700 lb. Inflated the ship is actually a big, buoyant flying wing.

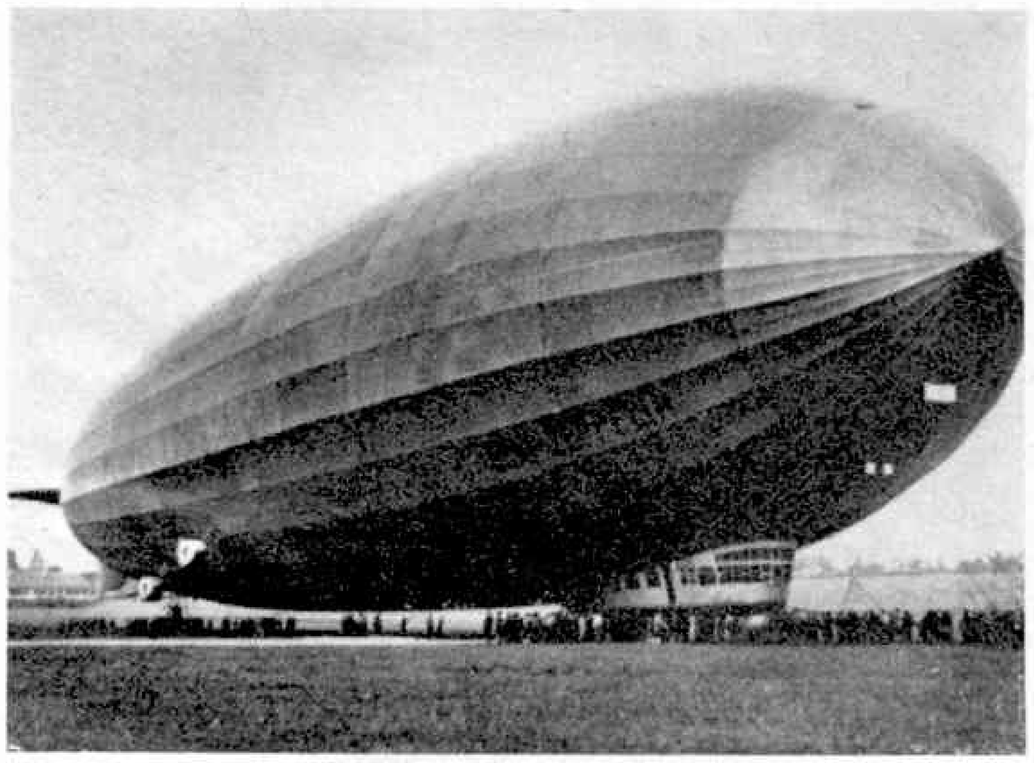
One advantage of the triple hull design is that it enables concentrated heavy loads to be lifted without dangerously distorting the airship—a risk besetting the more conventional type. The frame of the Aereon has also been made in such a way that the stresses are distributed in a new way and oppose one another, and the three hulls can be pressurised to add substantially more strength.

Propulsion comes from a two-bladed helicopter-type rotor, 21 ft. in diameter, on a horizontal axis at the stern of the middle hull. Heat resulting from cooling the engine warms the helium in the envelopes and provides controlled lift without using disposable ballast.

This is believed to be the first time that such controlled lift has been built into an airship. All previous ones have used sand or water as ballast to control climb and descent.

The Aereon is also the first airship to carry its own mooring mast—a 20 ft. retractable strut carrying the front landing wheel. The mast can be anchored to a simple "tie down", and the ability of the shaft to retract gives the Aereon a controllable angle of approach or take-off, as well as a crouching nose-down position to ensure hugging the ground for mooring and "weather-cocking" without "kiting."

The greatest attraction of the airship, as a feature of the modern aviation world, lies more in its uses for freight carrying than for passenger transport, though



One of the most successful airships ever made, the Graf Zeppelin. She made a memorable flight round the world in 1929.

its importance in the latter field should not be underestimated.

Dirigibles would enable great stores of raw materials to be lifted from isolated areas in South America, Australia, Africa, the Far East, and the Middle East, without the need to build large airports and overland transport facilities costing millions of pounds.

Giant airships would be ideal for transporting unwieldy weighty cargoes such as rocket stages for

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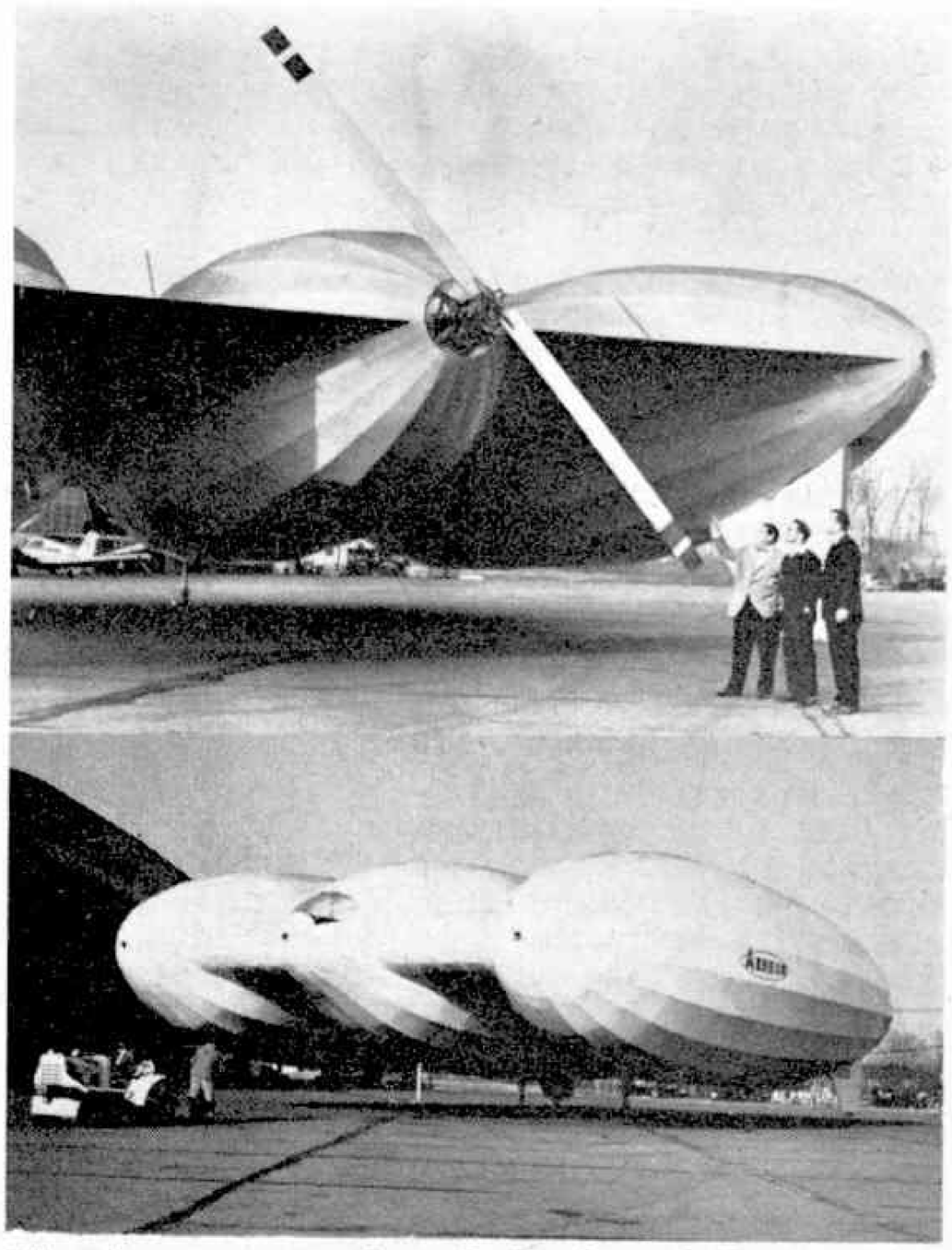
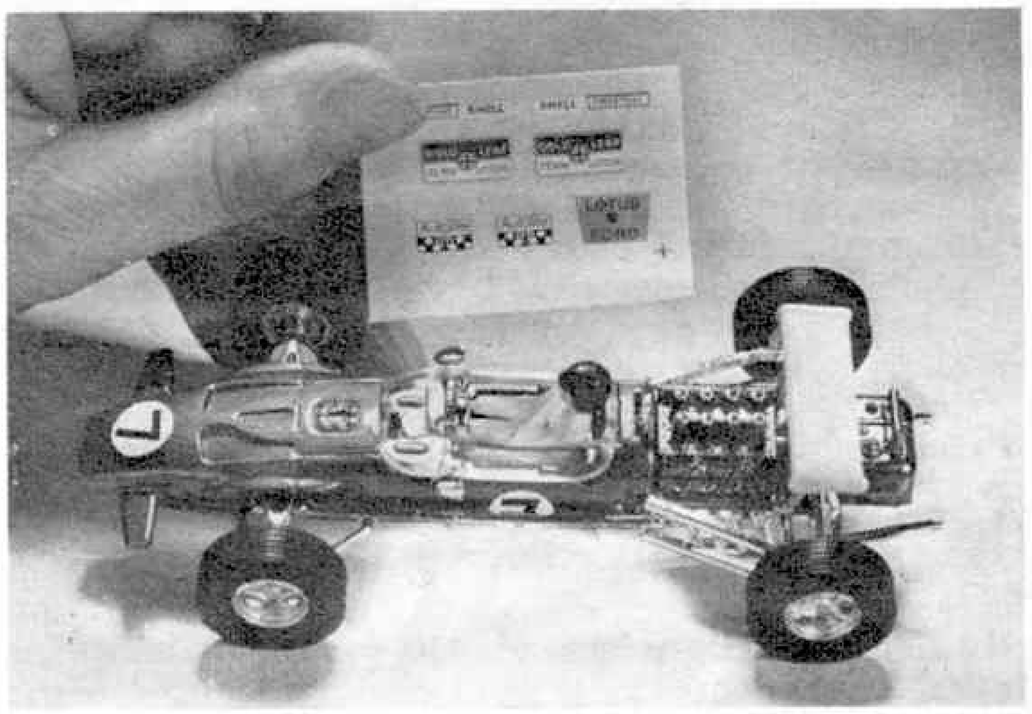


The Aeron, an experimental American airship of unique design. Its sponsors believe that larger dirigibles of the same type could successfully handle far bigger and heavier cargoes than aeroplanes can carry. Heat from the engine which drives the rotor of the Aeron is used to control the temperature of the helium in the three hulls, thus enabling lift to be controlled without using ballast.

DINKY TOY NEWS

by Chris Jelley and Allan Jones



The new Dinky Toy Lotus F1, Sales No. 225, comes complete with a set of water-slides 'Sponsor' transfers which can be added to the model by the owner.

THE FABULOUS FOUR

ONE THING THAT CAN NEVER be said about Meccano Tri-ang Ltd. is that they neglect the Dinky Toy collector! Very few months ever go by without the company introducing at least one and usually two new models, but this month they have really smashed into the news by releasing no less than four new Dinkys—and four fabulous Dinkys, at that! All four are top-quality reproductions, packed with play-value and they cover such a wide range of subjects that there is something for everyone.

With four models to cover, it's difficult to decide where to start, so we thought we would begin with the most recent introduction in real life—the Range Rover. Most readers will know of and, if you're anything like us, will openly admire that famous British cross-country vehicle, the Land Rover. Well, the Range Rover is a brand new vehicle from the same manufacturers, but it is far in advance of anything yet produced. British Leyland, in fact, don't go far wrong when they describe it as four cars in one!

To begin with, it is a luxury job, containing internal appointments and comfort usually found in cars costing twice the price. Secondly it qualifies as a performance car, having a 3,528 c.c., V-8 engine which gives it a top speed of around 100 m.p.h. Thirdly, it is an estate car with the typical estate car shape and a rear seat which folds down to leave a large luggage area capable of carrying loads up to 1,200 lb. and, fourthly, it is still a true cross-country car. With a chassis as strong as the Land Rover's, it is fitted with a permanent 4-wheel drive system which will carry it almost anywhere and it incorporates a sturdy suspension system, combined with an automatic ride-levelling device which results in an unbeatably smooth ride cross-country, laden or unladen. Like the Land Rover, also, the problems of rot resulting from "dirty" work are kept to an absolute minimum by a painted chassis and aluminium body panels. Four cars in one is a good description!

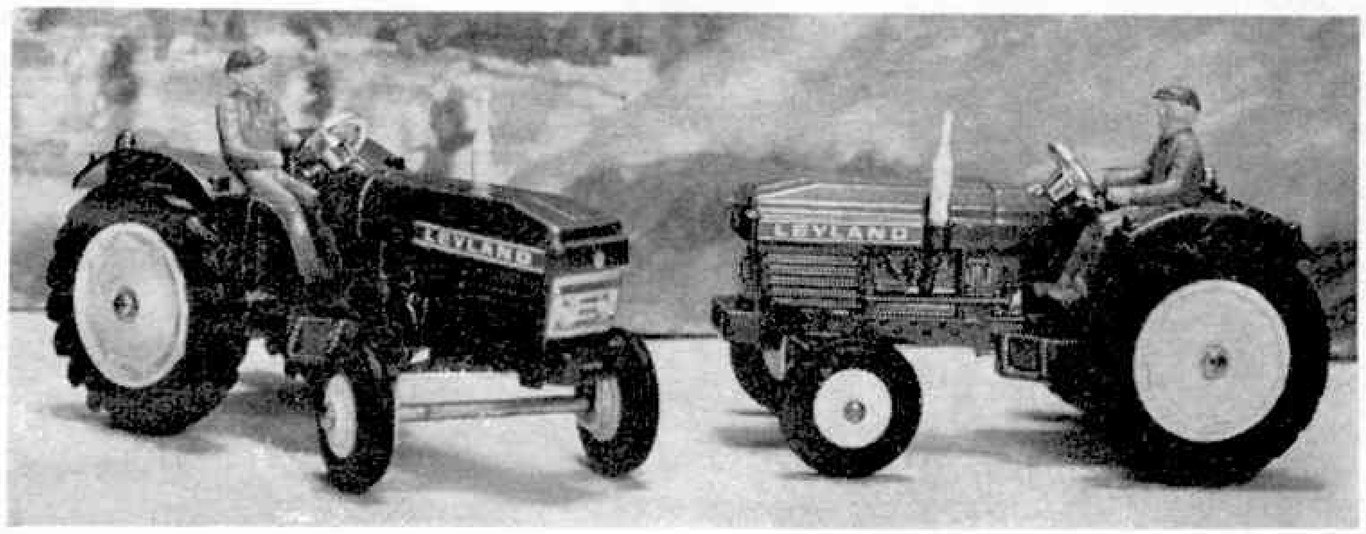
With all these attributes, the real car stands every chance of becoming a roaring success. The Dinky Toy, No. 192, WILL be a roaring success for it not only accurately reproduces all the unusual lines of the original, it is also packed with action features: opening bonnet covering a detailed V-8 engine, two wide-opening doors at the sides and an opening two-part tailgate at the rear. One half of the tailgate opens upwards, while the other half drops downwards, both allowing access to a fully-detailed interior complete with windows, seats, steering wheel and a luggage platform between the rear seat and the tailgate. The backs of the front seats tip forward.

External features include jewelled headlamps and number plates, while Speedwheels are fitted as standard to reproduce the high-speed characteristics of the real car. Our review sample is finished in a flamboyant bronze gloss with bright-plated baseplate and radiator-grille and pale blue interior fittings. One final point of interest, incidentally, is that the Dinky Range Rover carries the steering wheel on the left—presumably it represents the export version!

Racetrack beauty

Moving on from an all-purpose vehicle, we come to a car which can only be called "specialised"—The Lotus F1 Racing Car. The outstanding combination of Lotus and Ford has brought many an outstanding

Dinkies new Range Rover No. 192, is a feature-packed model which captures all the lines of the real Range Rover.



Of particular interest to collectors of model agricultural equipment will be this farm tractor from Dinky, based on the Leyland 384—the biggest unit in the new Leyland Tractor range.

success on the motor racing circuits of the world and the partnership of Lotus and Ford craftsmanship has now been brought down to 1/32nd scale in the Dinky Toy Lotus F1, Sales No. 225. Based on a Ford-powered Formula 1 Lotus, this model is the largest and most sophisticated racer ever to come from the Dinky stable. The increased scale of 1 : 32 has resulted in a model length of 5 inches and a general size allowing a wealth of special features to be included, such as a detailed engine, twin exhaust pipes and flexible suspension arms, plus a radiator pipe running along the left-hand side of the body, a steering wheel, a roll bar behind the cockpit and two racing-type wing mirrors, carried one each side of the cockpit. All these items are bright-plated to really stand out, the engine casting having a thin coating of blue over the plating, making it easily identified. The cockpit, itself, carries a moulded driver in full racing kit. Wide-face racing tyres are fitted front and rear, with the final touch of realism being provided by a yellow aerofoil stabiliser mounted above the engine.

Our review model has a deep flamboyant red finish to the body, with a white baseplate, and came ready marked-up with racing numbers. Included with it, however, is a sheet of water-slide transfers for self-mounting: two "Firestone Shell" decals, two "Gold Leaf Team Lotus", two "Autolite" and a "Lotus Ford", all in the correct colours and styling. With the transfers in place, the finished model is a winner !

Farm Tractor

New model number three will appeal particularly to all collectors of agricultural equipment being a farm tractor, based on the Leyland 384—yet another product of the massive British Leyland organisation. In real life, the 384 is big; big in power, performance and reliability and is, in fact, the largest in the new Leyland tractor range. Power is supplied by an enormous 4-cylinder, direct-injection diesel engine of 3.8 litre capacity which develops a power output of 70 b.h.p. at 2,200 r.p.m. Transmission is, of course, to the rear wheels, but via a versatile gearbox giving no less than ten forward speeds and two reverse. At the rear, a power take-off point is provided for supplying drive to accessories and this, itself, is capable of giving a maximum output of 62 h.p.—which is some considerable power.

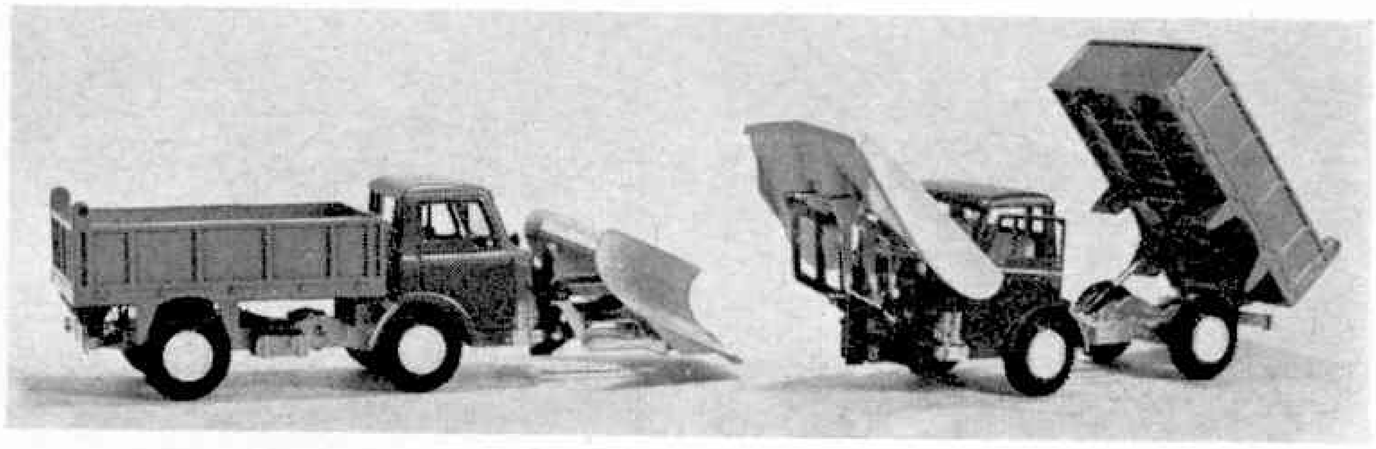
Typically modern in appearance, the 384 has a shape which is faithfully reproduced in the new Dinky tractor, Sales No. 308, and the model's body casting also incorporates intricate engine detail, driver's seat and large rear mudguards. In the driver's seat is an overalled driver sitting solidly behind a large bright-plated steering wheel. Although not controlled by the steering wheel, the front wheels can be moved by hand to increase the play-value and, at the rear, instead of a representation of the power take-off equipment, a more-useful (from a model's point of view) towing hook is provided to take Dinky Toy agricultural accessories such as the Manure Spreader and Harvest Trailer, etc. All in all—a delightful model in a range which has always proved highly popular.

Snow Plough

Finally, we have Dinky Toy No. 439, Ford D800 Snow Plough and Tipper Truck. Appearing at just the right time of year, this model, we understand, is the result of numerous customer requests which have come in volume, not only from collectors in Britain, but also from abroad, particularly from those countries which have a high snowfall, such as Switzerland and the Scandinavian countries. It consists of Dinky's Ford D800 Tipper Truck, fitted at the front with a large, V-shaped ploughing blade which can be raised for travel and lowered for ploughing operations. Raising and lowering is hand-operated, controlled by a simulated hydraulic ram running between the blade and its mounting frame.

In the case of the parent lorry, the cab is fitted with two wide-opening doors, windscreen, seats and steering wheel, while the load body has an opening tailgate. Movement of the load body is, again, hand-operated, controlled by a simulated hydraulic ram running between the chassis and body. Our review model carries a colour-scheme of blue cab and orange load body on a silver chassis, with the ploughing blade yellow.

Although not a "beautiful" model as far as looks are concerned, the Snow Plough, by its very nature, offers tremendous play-value for youngsters and should therefore prove a consistent top-seller. It certainly makes an excellent partner in a wide-ranging quartet of really interesting new Dinky Toys.



The result of numerous requests from collectors all over the world, the Dinky Ford D800 Snow Plough and Tipper Truck should prove a top-selling model.

AIR NEWS

by

John W. R. Taylor

Sweden's neighbours buy Saab

News that the Finnish government has ordered a squadron of Saab J35XS Draken all-weather fighters for the country's defence forces represents a major success for Sweden's aircraft industry. Since 1963, the Finnish Air Force has bought much of its equipment from the Soviet Union. Three day fighter squadrons fly Russian-built MiG-21Fs. Also in service are MiG-21UTI and MiG-15UTI two-seat trainers, Ilyushin I1-28 target tugs and Mi-1 and Mi-4 helicopters.

Only remaining combat type of Western design in the Finnish Air Force is the Hawker Siddeley Gnat lightweight fighter, which continues to equip a single squadron. It is this unit which will receive twelve new Drakens in 1974-75. Before then, the Finnish Air Force will lease a number of used Drakens on which to begin the operational training of its pilots and ground crews.

An important part of the deal is that the J35XS aircraft will be assembled in Finland by the state-owned company Valmet Oy, at Tampere. This will keep down the total cost of the programme to about £20 million, of which about 40 per cent will be offset by additional orders placed by Sweden with the Finnish industry.

The Finnish J35XS (Export Suomi = Finland) Drakens will be armed primarily as interceptors. In other respects they will be similar to the 40 Saab-35XD (Export Denmark) attack/reconnaissance fighters which are being supplied to the Royal Danish Air Force, together with six Saab-35XT (Export Trainer) two-seaters. These aircraft are powered by a Swedish-built Rolls-Royce Avon 300-series engine, developing 17,650 lb. thrust with afterburning and giving them a maximum speed of Mach 2 at height.

The Saab 35XD (F-35) single seat fighter of the Royal Danish Air Force.

Even with a typical maximum weapon load of nine 1,000 lb. bombs, the Saab-35XD will take off in only 1,345 yards. This helps to make it attractive in countries that cannot afford, or do not want to build large military airfields.

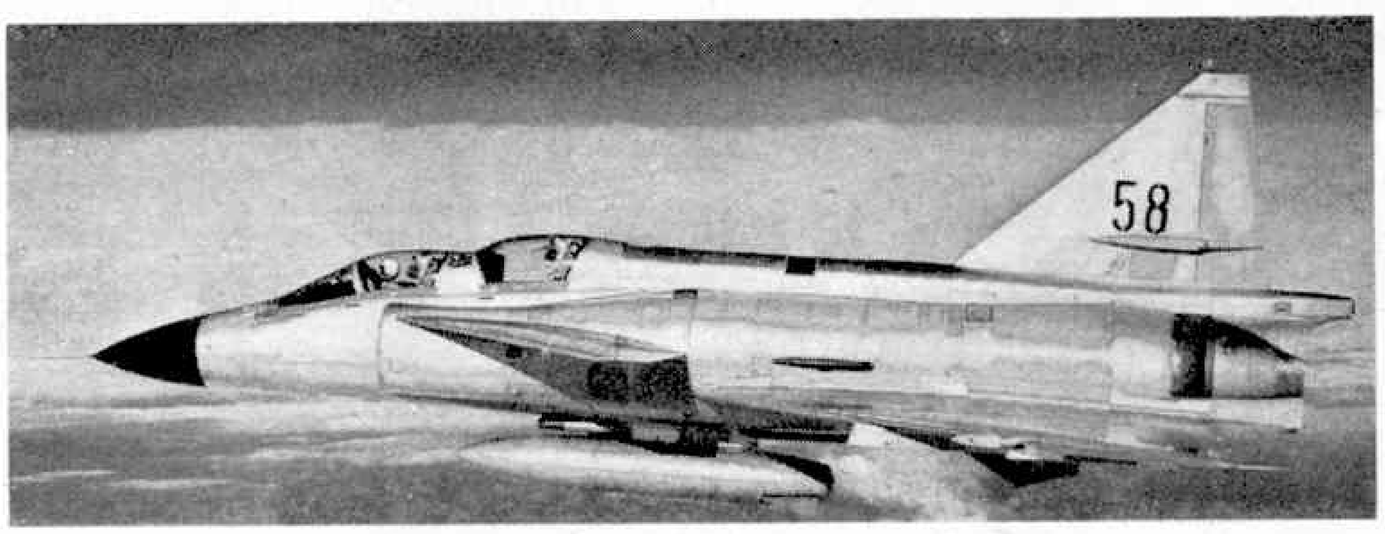
Further news from Saab is that the prototype of the SK 37 tandem two-seat training version of the Viggen has been flying since July 2, 1970. As can be seen in the illustration below, the second cockpit is behind the normal one, taking the place of some electronics and a fuel tank. It is raised, and fitted with a periscope, to give the occupant the best possible forward view.

The SK 37 carries much the same equipment and weapons as the AJ 37 single-seat all-weather attack version of the Viggen, of which production models are now leaving the Saab assembly lines at Linköping.

Moving House

The need for new low-cost houses in the United States has become so critical that the nation's Department of Housing and Urban Development has launched "Operation Breakthrough" in an attempt to solve the problem by modern production techniques. As its contribution to the project, Sikorsky Aircraft demonstrated recently how its S-64E Skycrane helicopter could be used to transport mass-produced dwellings from assembly line to homesite.

The house used in the tests was built by Utility Services Inc. of Decatur, Georgia. Measuring 28 ft. by 44 ft., it is made of the most modern lightweight materials and is sold at a fixed price complete with



The Prototype Saab SK37 two seat trainer, the seventh and last prototype of the Viggen.

A Sikorsky aircraft demonstrates how its S-64E Skycrane helicopter can transport homes from the assembly line to homesite.

all fixtures, appliances, carpeting, furniture, curtains and air-conditioning already installed.

Who likes crowds ?

Although it has had the first of its Boeing 747 " Jumbo Jets " at Heathrow since the Spring of last year, BOAC had still not started to operate them by the beginning of 1971 as its pilots have refused to fly the " Jumbos " until they receive an impossibly-large pay-rise. Far from sitting back and letting other airlines benefit from this, the Corporation's advertising staff have done their best to profit from the setback.

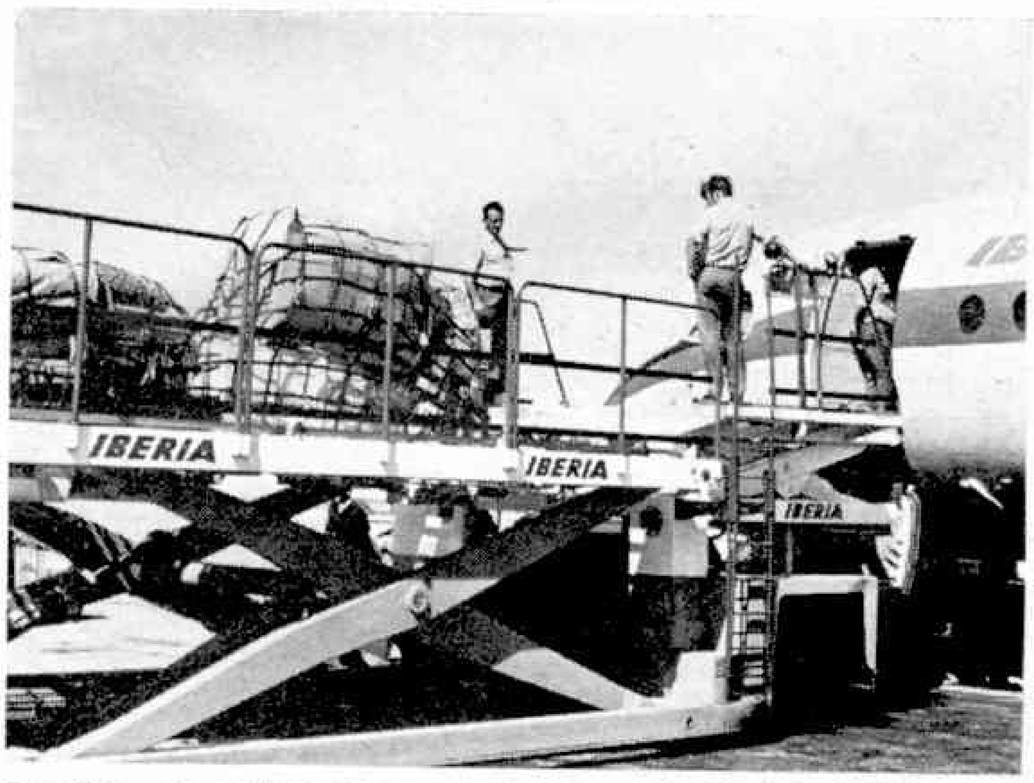
While its standard-size VC10s fly alongside the 747s of its competitors, BOAC advertisements in American newspapers have proclaimed " Good news for people who don't like crowds." Adding that " Not everyone wants to run with the herd.", the ads offer the choice of flying across the Atlantic with " over 350 other people on that other plane. Or taking BOAC's exclusive, more personal VC10." Benefits of the smaller aircraft, according to the BOAC publicity people, include standing in a short queue when boarding and getting one's luggage more quickly on arrival. The noise generated in the 747's big cabins before lunch was described in one London newspaper as being rather as if a hundred people were having a cocktail party in a gymnasium !

It will be interesting to read BOAC's advertisements when its 747's eventually enter service.

Iberia's busy Fellowships

Three Fokker F.28 Fellowship jet-liners which the Spanish airline Iberia bought from the Dutch manufacturer in April-August 1970 have been setting some impressive records for high utilisation. By early Autumn of 1970, the 530 m.p.h. jets had logged more than 3,000 flying hours, averaging eleven hours in the air every day.

One of the reasons for the F.28s' busy life is that they are used for aircrew training as well as normal freight transport. With an expected requirement for 400 new pilots during the next five years, Iberia had the aircraft built with a special cockpit layout for four persons. During taxi-ing, take-off, approach and landing on a typical freighting/training flight, the instructor occupies one of the front seats. In flight, however, once the trainee pilots have reached an advanced level, the instructor leaves the cockpit and installs himself in the main cabin at the " Flying Service " observer station. This is situated in place of the normal galley and includes an instrument panel, a table, a loudspeaker, earphones and a microphone enabling the instructor to monitor every detail of the flight without being physically present on the flight deck.



Loading of palletized cargo in one of Iberia's Fellowships through the standard passenger door.

The student acting as third pilot, apart from being available for navigational exercises, is also responsible for compiling weight and load sheets, flight plan calculations and other work concerning the operation and safety of the flight. On the ground, one of the students handles briefing and debriefing, while another supervises refuelling and cargo loading. This ensures the widest possible range of experience before the students (most of whom are former Spanish Air Force personnel) qualify as third, second or first pilot on scheduled operations.

Powered by two Rolls-Royce Spey Mk. 555-15 turbofans, each giving 9,850 lb. thrust, the F.28 will carry 14,500 lb. of payload in its basic form. The cabin accommodates twelve pre-loaded cargo pallets and embodies a Brownline pallet loading system, comprising a loading platform, a ball-mat on the floor by the door and a set of roller-conveyor tracks to speed positioning of the pallets in the cabin.

One of the 530 m.p.h. Iberia Fokker F28 Fellowship jet-liners in flight.

MECCANO ENTHUSIASTS SHOW THE FLAG

A report on Two Senior Meccano Exhibitions by Bert Love

ON SATURDAY SEPTEMBER 19th IN THE HEADQUARTERS of the local Scout Group in Hurstpierpoint, Near Brighton, Sussex, the wide appeal of Meccano modelling across the years was well illustrated at a unique exhibition of Meccano history presented by Peter Matthews, a senior Meccano collector, modeller and historian. Mr. Matthews had placed his entire collection of Meccano Sets and literature, dating back to the beginning of the century, on public display throughout the glorious sunny day on which the exhibition was held. Many rare and valuable items were on show to trace the development of Meccano from Frank Hornby's system of mechanical construction in 1900—a crude handful of punched metal strips, wheel and axles known as Mechanics Made Easy—to the sophisticated Space Age Meccano with its electronic control components of the 70's. Visitors of all ages crowded through the doors to be led on a historical journey throughout the development of Meccano and they were entertained by the largest collection of working models ever to be assembled as representative of the many periods of the products of Meccano Ltd. All exhibits were original and beautifully preserved and in full working order—a tribute to the design qualities of the basic system and to the

Fig. 1 : A decade ago—some of the models and outfits of the last red-and-green period on show at the Meccano Exhibition organised by Mr. Peter Matthews and held in the Hurstpierpoint, Sussex, Scout Headquarters.

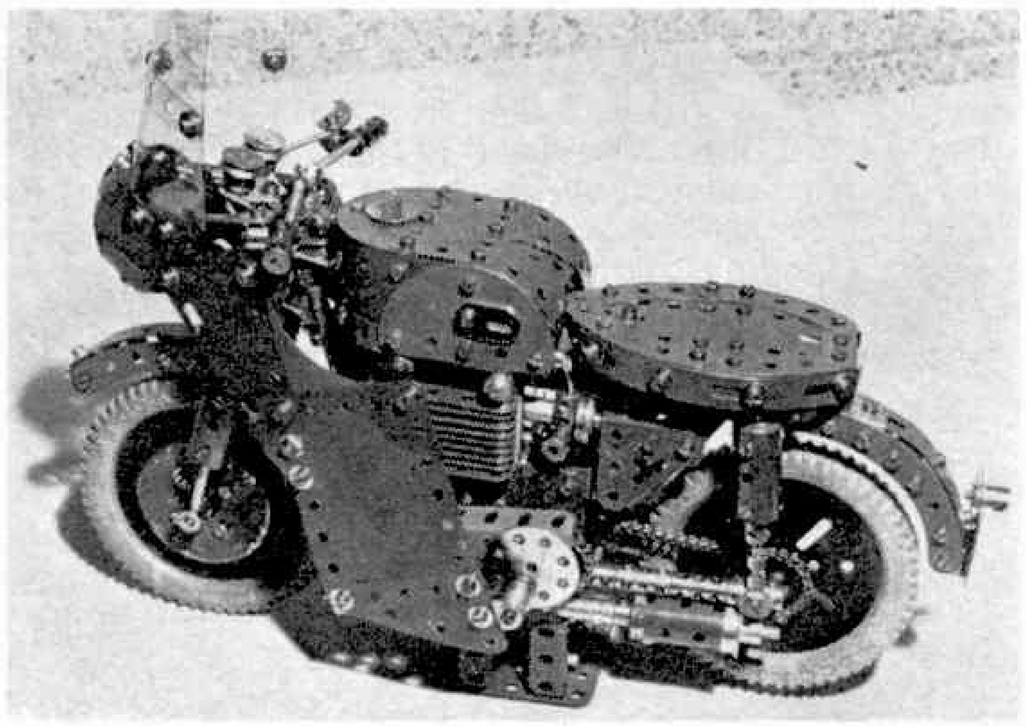


Fig. 3 : Realism in miniature ! Fine-detail modelling by Brian Edwards of Bedford on this modern Motor Cycle displayed at the last meeting of the Midlands Meccano Guild.

Fig. 2 : Final stall at the Hurstpierpoint Exhibition showing the new Space Age Meccano Sets and models.

quality of craftsmanship spanning more than half a century.

"Spanner" very kindly gave up his Saturday to visit the exhibition (with which he was delighted!) and to compliment the organisers on the excellent show. Half a dozen members of the Midlands Meccano Guild attended in support, with working models and exhibits to fill up an occasional historical gap and to assist with the erection and dismantling of the stalls. A small charge was made for entrance in aid of the Scouts' funds and the visitors obviously thought it very worthwhile. The exhibition stalls were arranged in colourful sequence to illustrate the changes in style and presentation of the various outfits and colour schemes over the 70-year period and many a fond memory was stirred among the older generations who were completely absorbed by the pleasant nostalgia. A tremendous amount of hard work and leisure time was put into the launching of this exhibition, principally by Peter Matthews who is to be congratulated on his very fine effort.

Seventh Meeting of the Midlands Meccano Guild

Immediately following the Hurstpierpoint exhibition, the Midlands Meccano Guild held the seventh of their twice-yearly meetings at Stratford-on-Avon on Saturday, September 26, 1970. Some 45 members and new applicants travelled from all over the U.K. to attend the meeting, James and Alan Grady coming all the way by train from Dundee to show some of their novel miniature mechanisms. Once again the models

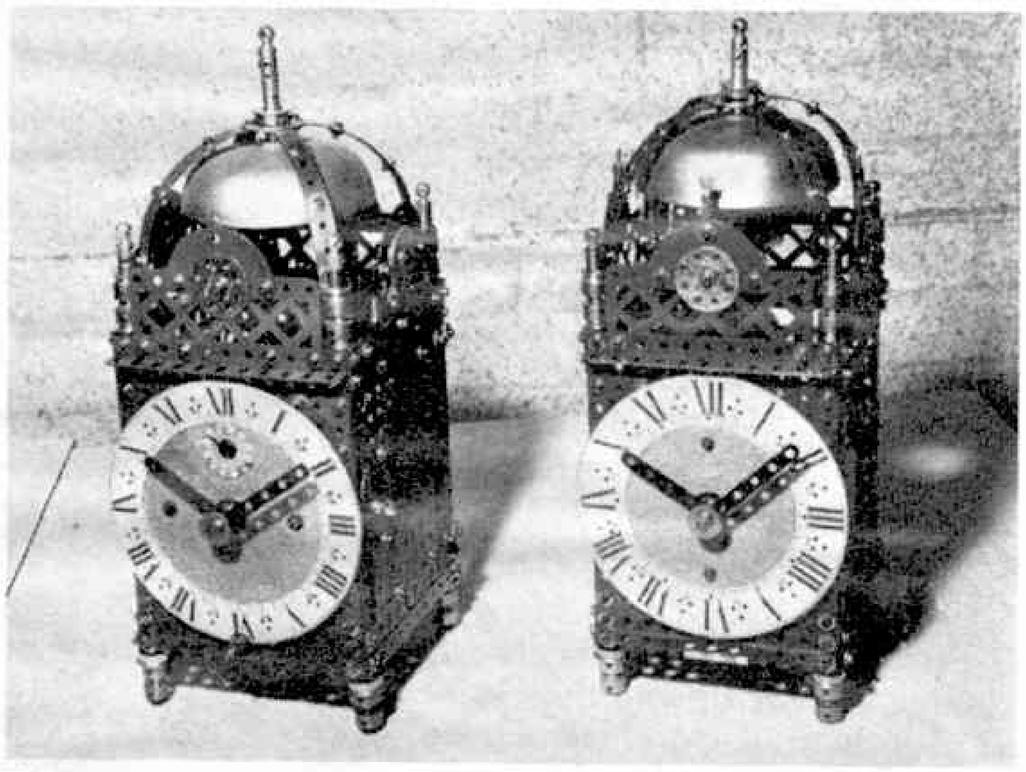


Fig. 4 : A beautiful pair of matched Cromwell Bracket Clocks by Pat Briggs. One Clock is driven by weights and the other by the current Meccano Clockwork Motor. Both timepieces have accurate movements made from standard Meccano parts.

on display were of a very high standard and ranged from finely-detailed replicas which could be held in the palm of the hand up to "King-sized" models which required two men to carry them into the hall!

Brian Edwards produced the beautifully-detailed motor cycle illustrated in Fig. 3. Complete with working telescopic sprung forks and transmission, and powered, believe it or not, by a vertically-mounted Motor with 6-ratio Gearbox, the model is a masterpiece of compact construction. Pat Briggs, an established expert in the clock field, showed a beautiful pair of matched Cromwellian bracket clocks, one weight-driven and one driven by the current Meccano Clockwork Motor. Both keep excellent time and their clock movements are constructed entirely from standard parts. The clocks are shown in Fig. 4 and later on they will

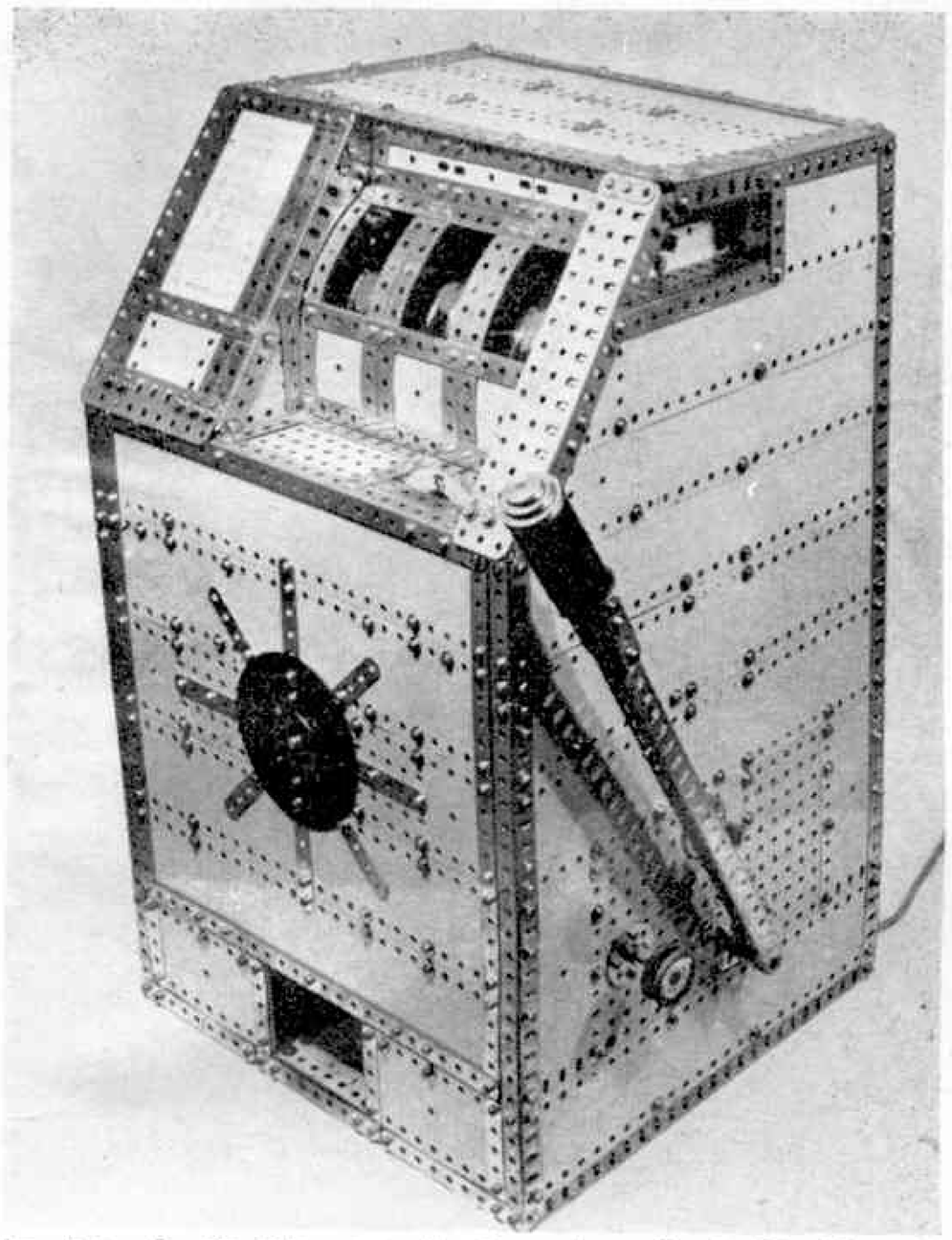


Fig. 5 : A life-like reproduction of a Fruit Machine—for amusement purposes only—built by Phil Ashworth. The mechanism is cleverly programmed with random selection.

be featured by the British Horological Society's journal.

A popular range of working models was provided by the membership as a whole and showed a remarkable quality of construction and originality. For example, a most sophisticated electro/mechanical control device was built into a realistic working model of a friut machine, illustrated in Fig. 5. This machine, built by Phil Ashworth, is for amusement only and is operated by the now obsolete penny coin or similar metal disc. It is a most instructive model to build and details for its construction are available (see footnote). The ever-popular models exploiting crane mechanisms were in evidence, two of which are illustrated in Fig.

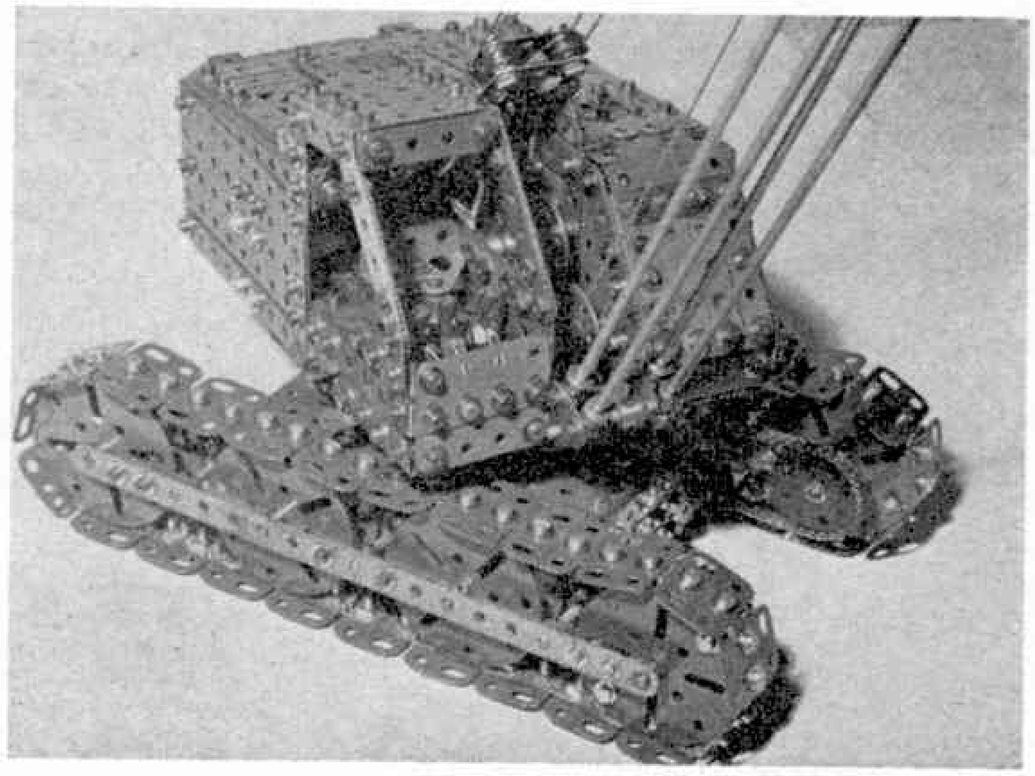


Fig. 6 : Simplicity with realism. A working Crawler High Jib Crane by Stephen Sarawin.

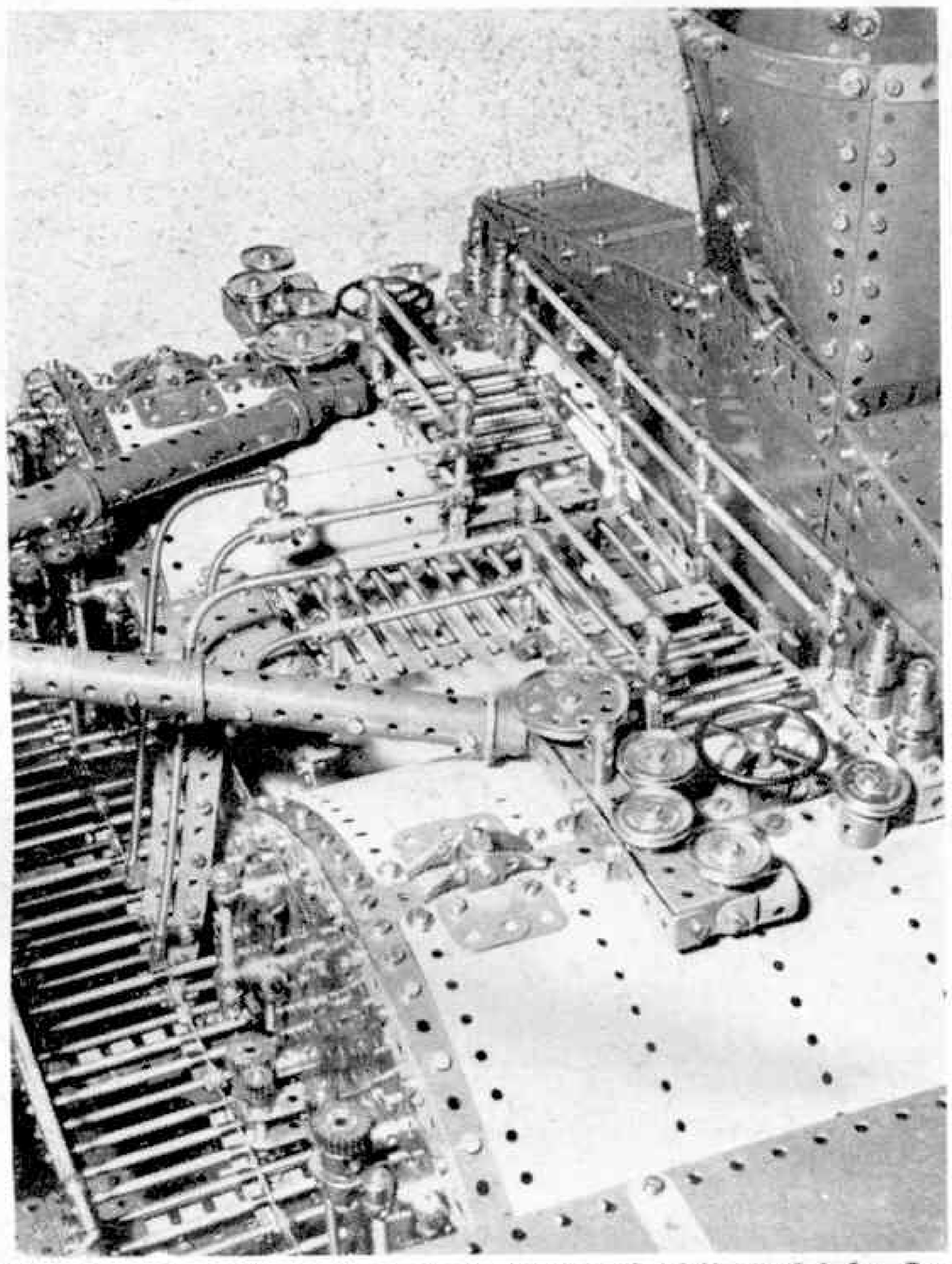


Fig. 8 : A small section of a " King-sized " model by Len Wright of Hull. The illustration shows the stern ends of the massive twin Scotch-type drum boilers with simulated main steam-valve gear feeding a 3-cylinder triple expansion vertical marine engine.

6 and Fig. 7. The first shows a neat 'economy' construction by Stephen Sarawyn of a high-jib crawler crane, remarkable for its simple, but effective track system and its elegant slim jib construction. The outlines of the larger model in Fig. 7 will be familiar to a host of Meccano enthusiasts. This is Bob Faulkner's very much-improved design of the Giant Block-setting Crane which is well detailed and fitted with an extensive gear-box providing all crane movements from a single motor.

The two King-sized models referred to were a Foden lorry-mounted crane and a triple expansion marine engine with twin Scotch-type boilers. The former model was designed by Eric Taylor, who built the model over a period of several months, and was exhibited by Dennis Perkins, who completed some of the mechanical adjustments and modification for demonstration purposes. With a chassis over five feet long and some 10 in. wide, the crane was a beautiful model of its full-scale prototype. Mounted on no less than twelve 6 in. dia. tyres, the model had a jack-knife jib-head for road travelling with jib extensions available to give very high lift performance. The transmission was fitted with a heavy-duty clutch and four-speed gearbox plus reverse, a second transfer box giving a total of ten-gear performance. Adequate power was supplied through a 12 volt plastic-cased motor some $2\frac{1}{2}$ in. in diameter.

Fig. 8 shows a small portion of the second giant model. The illustration shows the main steam valves and controls mounted on the rear section of the twin Scotch drum boilers coupled to a three-cylinder triple expansion vertical marine engine. Len Wright, a retired marine engineer was responsible for this remarkable model. Some six feet long, three feet wide and two feet tall, the model was sheer poetry in motion! Valve slides, eccentrics, piston rods, pump drives moved with well-ordered precision in perfect replica of the prototype and every conceivable detail of the original fittings were faithfully reproduced on the model and it is hoped to show this model again at another Guild Meeting.

Another beautifully-detailed, but smaller steam engine was modelled by David Whitmore. This was based on a 19th century winding engine with twin cylinders horizontally positioned and link motion valve gear mounted vertically. Stephen Lacey showed a working fairground roller coaster and Ernie Chandler made an excellent half-scale model of a self-propelled bowling green mowing machine complete with trailing driver's seat and split roller. Other excellent models, too many to describe in the space of this article, were also displayed and eight hours of exhibition time was still not sufficient for Guild members to absorb the feast of Meccano features included.

The Guild prepare photographs and building instructions of some of their outstanding models of which the following are available :—

1. Giant Level Luffing Crane by E. K. Taylor.
2. Heavy Duty Crawler Tractor by E. K. Taylor.
3. Automated Rotawheels by Phil Ashworth.
4. Giant Block-setting Crane by B. N. Love.
5. Meccano Fruit Machine by Phil Ashworth.

Further details of how to order this material may be obtained by writing to the Guild Secretary, B. N. Love, 61 Southam Road, Hall Green, Birmingham, 28. A stamped addressed envelope should be enclosed (approx. 9 in. × 4 in.). Overseas readers need send only an International Reply Coupon.

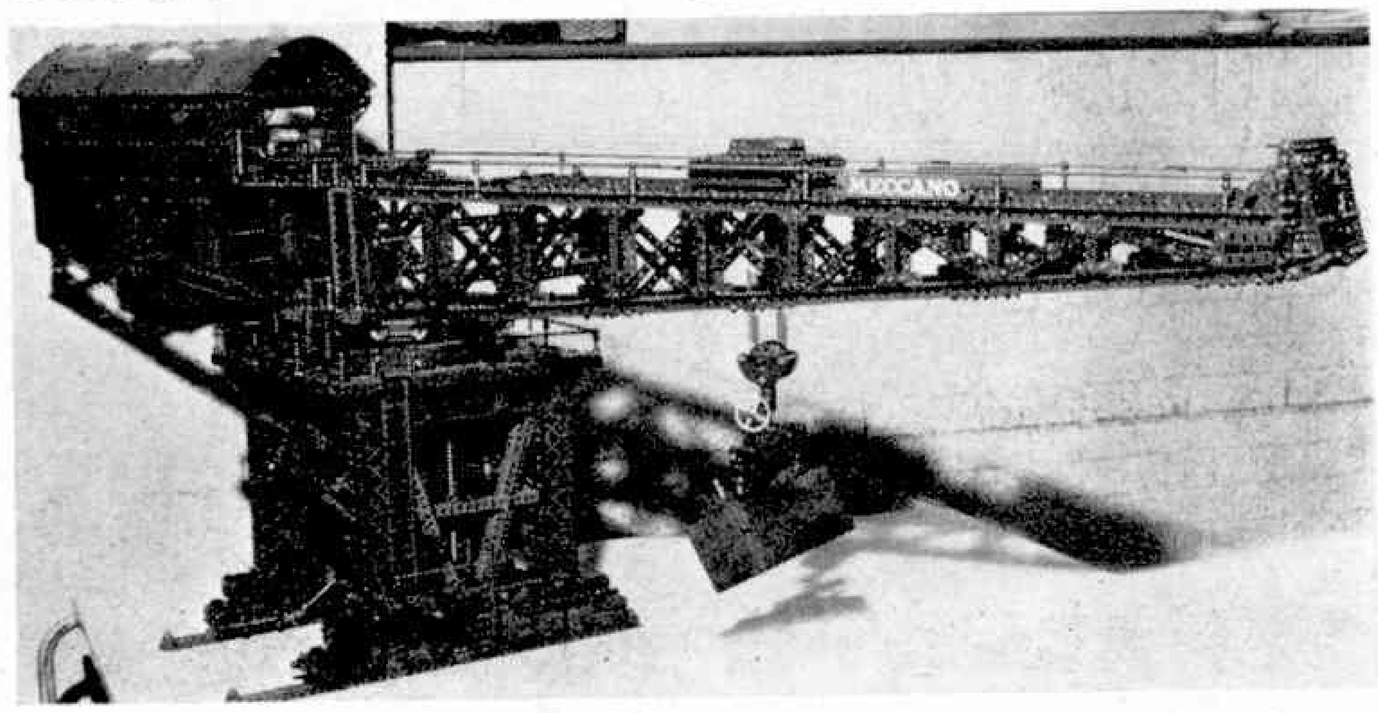


Fig. 7 : Return of an old favourite—Bob Faulkner's improved version of the famous Meccano Giant Block-setting Crane.

'HE BROUGHT LIGHT TO MILLIONS'

Peter M. Smith tells the life story of Louis Braille whose alphabet for the blind has been universally adopted and in use now for over 120 years

IN THE VILLAGE OF COUPVRAY, some forty miles from Paris, three year old Louis played happily in his father's harness shop. When his father went out for a few moments, the youngster decided he would be like his father and picked up an awl. As he punched the tough leather, the awl slipped—into his eye. There was a scream of agony and, as blood poured out, two grubby fists instinctively rubbed the eyes. The damage was done, both eyes were infected, and the corneas irreparably damaged. Nothing that his parents or surgeons could do could halt the tragic course of events, and within a few weeks Louis Braille was completely blind.

Fortunately, the boy was not daunted. He took an active part in village life, and the local curé, the Abbe Jaques Pallvy, showed him how to distinguish plants by their touch and smell, and how to recognise birds by their sounds. Even in his father's workshop, he made himself useful by making fringes for the harnesses.

Once at school, he had to memorise every word he heard, but this did not stop him from making excellent progress. At this stage, his father tried to help him by driving round headed upholsterers' nails into blocks of wood to form letters and words, and examples of this can be seen today in the museum at Coupvray. Such was his progress at the village school, that the local teacher Antoine Becheret persuaded his parents to send him to the National Institute for the Young Blind in Paris. Consequently, the blind boy left his native village on February 15th 1816, on what was to become his first step to fame.

At this time, the Institute used the method produced by its founder, Valentin Hauy, who has been described as the Father and Apostle of the Blind. Hauy stuck three inch high cloth letters on to paper, and Braille took to this method immediately. By the end of a year, the country boy had swept the board, and mastered every subject. One of his teachers, Pignier, wrote that he was "possessed of a lively intelligence", and that his essays, "whether literary or scientific, were models of exact thinking."

In March, 1950, the delegates to the International Braille conference visited Braille's birthplace at Coupvray and they are seen here in front of the monument erected to his memory.

About this time, a French artillery officer, Charles Barbier de la Serre, introduced a system called "Night Writing." This was a system of raised dots and dashes on cardboard strips, which enabled soldiers to communicate with each other during night manoeuvres. Barbier took his system to the Institute for a demonstration, and Braille became keenly interested in it.

Although he was only twelve years old, Braille was intelligent enough to realise that Hauy's embossed writing was too slow to follow, and Barbier's system too complicated, with twelve dots to each letter, to decipher. But his enthusiasm had been fired, and whilst his days were taken up with ordinary schoolwork, he spent his evenings experimenting to improve the two systems.

Finding a solution became almost an obsession, and after a year's intense work, he had devised a system of sixty three possible combinations, including not only the letter of the alphabet, but mathematical signs, punctuation marks, and French accents. The real improvement above other systems was that each symbol, known as a Braille Cell, was the right size for a blind person's fingertips. Surprisingly, when Braille had achieved this ambition, he was only fifteen years old. For the blind, this was the beginning of a new age. The blind would now "take notes in form, do spelling exercises, write essays, and record their thoughts and feelings." Although he revised the system twice before he died, it has remained basically the same as his original one.

Besides producing the Braille system, Louis was also an accomplished musician. Before he was nineteen, he was well known as one of the best church organists in Paris, being the official organist at three churches, and had a high reputation for playing the violin and cello.

In 1838, the famous French poet, Lamartine, visited the Blind Institute, and was shocked at the conditions he found, describing the building as "cramped and insanitary." Later, in an impassioned speech to the Chamber of Deputies, he said, "Never will public money have been better spent, than in restoring to their dignity as human beings, those whom Nature has shorn of this most precious of our senses." So impressed were his fellow members that the Chamber authorised a new building for the Institute.

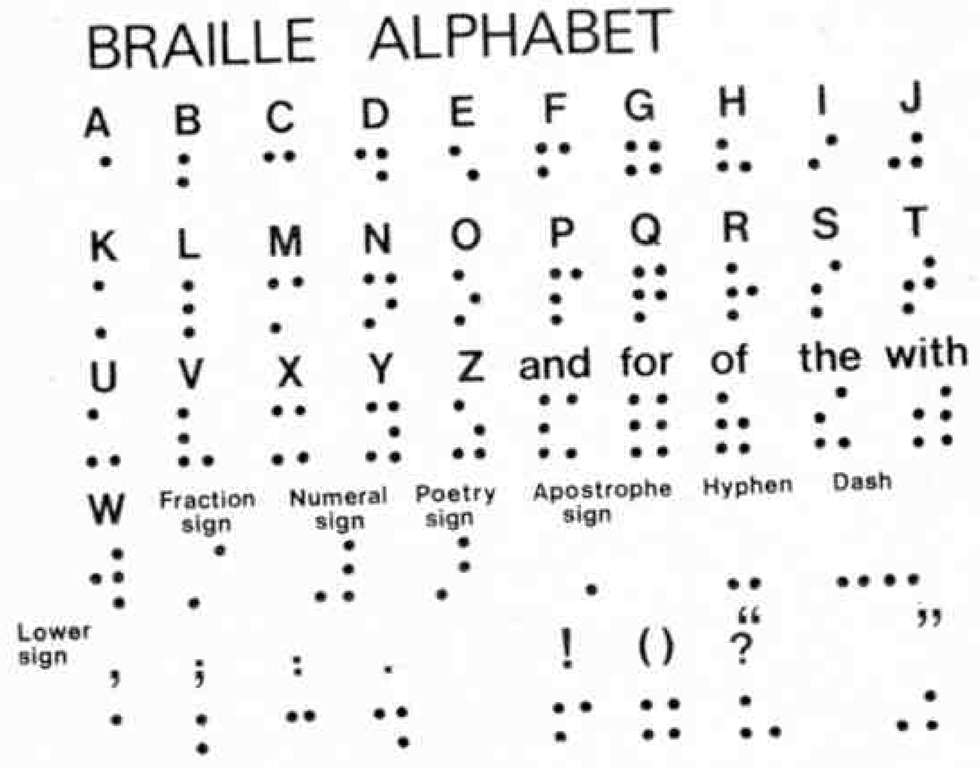
When the new Institute was opened on 11th November 1843, at 56 Boulevard des Invalides, it had a new Principal, Monsieur Dufau. Unfortunately, he was not fully convinced that Braille's method was either the best or most useful, and at this stage, Hauy's was the only method officially recognised. Unofficially though, many believed in Braille's method, and boys at the Institute risked being thrashed by learning Braille's method in secret.

His last years were essentially a fight against petty jealousies and bureaucracy, to gain official recognition for his system, and his failure to get this was his greatest disappointment.

Throughout his life, besides his blindness, he had been dogged by other illnesses, particularly tuberculosis, which in those days was a killer disease, but he often worked through serious bouts of this ailment, caring little for his own health.

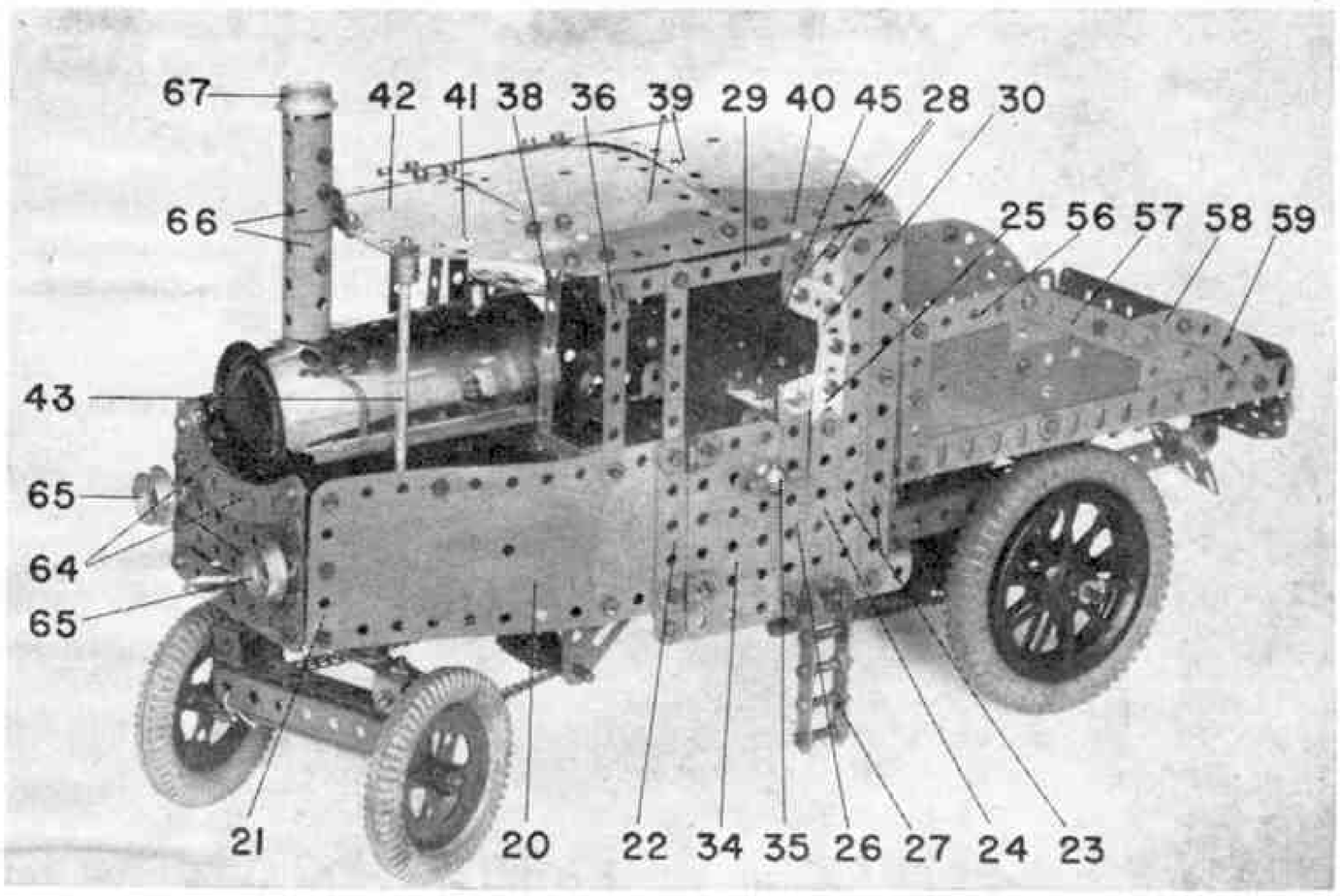
It was after one such bout that he collapsed, and was admitted to hospital in December 1851. There, he made his will, remembering everyone who had helped him, the young boy who had guided him around Coupvray in the early days of his blindness, his night nurse, and even the servant who had cleaned his room. Within a month, he had died, and on January 9th 1852 his body was laid to rest in the cemetery of his native village of Coupvray.

Then, a century later, his remains were exhumed and placed in a padded coffin. His hands, however, were kept in a sealed urn at Coupvray. The coffin was taken to Paris, and the saddler's son from Coupvray received France's highest honour, when his bones were laid to rest in the Pantheon amongst his nation's greatest men.



For reasons of reproduction, the raised dots of the Braille System are shown above in black.

LIVE STEAM WAGON described by Spanner



All the sounds, smells and thrills of live steam are re-created with this working model of a 1929 Foden Steam Wagon . . .

NEVER IN MY CAREER WITH MECCANO MAGAZINE have I hidden my distinct liking for steam-powered traction. The clankings and hissings of steam locomotives and traction engines; the dense clouds of dark smoke and white water vapour; the sweet smell of hot oil; the grimy, but somehow friendly appearance of the crew as they bustle about tending to their various tasks—all these are things I have loved, but which have now virtually passed into history. No longer can the heart thrill to the sight of a mighty steam locomotive streaking through the countryside with a long streamer of smoke trailing out behind; gone are the days when the approach of the travelling fair was heralded by the sight and sound of the Showman's Traction Engine; no more can be heard the rumblings and chuffings of the old steam wagon as it carried its load down the highways and byways of the land. The world has advanced to better things—or so the experts tell us, even if there are many people who would disagree with them.

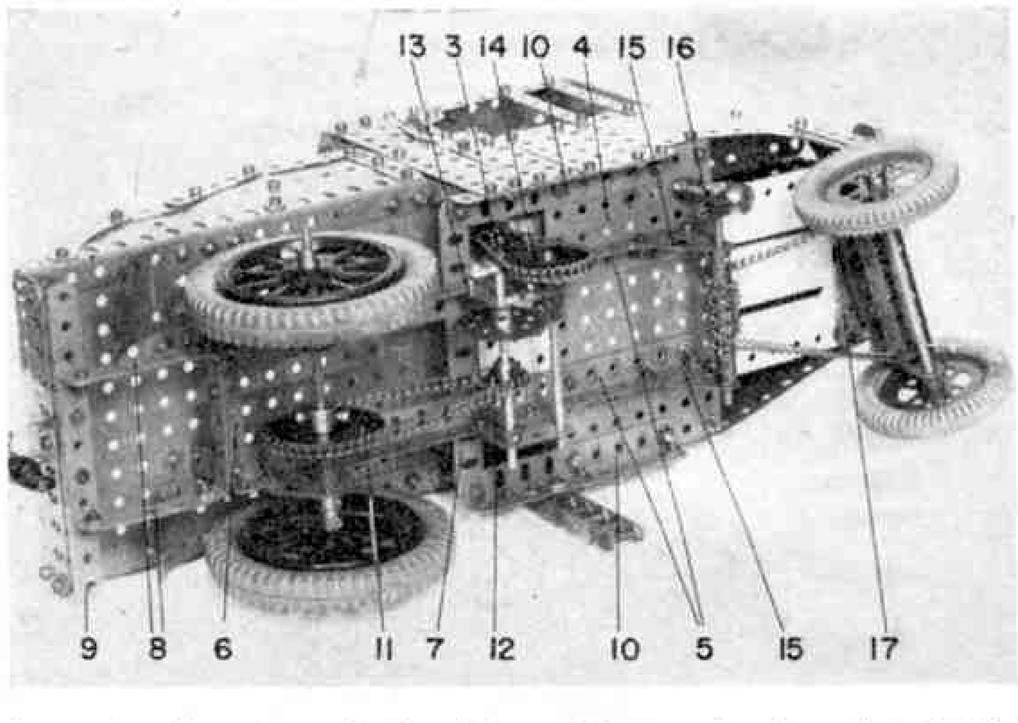
Whether or not the modern forms of motive power are improvements on steam traction, the fact still remains that there are vast numbers of normal, everyday people who regard the passing of steam power with a great deal of sorrow, but there is nothing they can do about it. We in the Meccano hobby, however, are fortunate in that, although we cannot, ourselves, do anything about the passing of steam, we can at least capture a little of its romance, not only by reproducing the old equipment in model form, but also by actually driving the models with a miniature, yet none-the-less real live-steam power unit, the Meccano Steam Engine. As everybody familiar with Meccano products knows, this is a genuine steam engine in which water is heated by a methylated spirits burner to produce steam, this steam driving a piston which, in turn, drives a crankshaft.

We have featured at least two steam-powered models in the M.M. in the last couple of years and both these were very well received. Now we present a third example which steam addicts will recognise as being based on a Foden Steam Wagon of 1929 vintage, and I have no doubt that it will be equally well-received. The original model worked extremely successfully and proved to be remarkably powerful for its size and weight. In fact, I do not hesitate to class it among the most powerful steam-driven Meccano models I have ever tried out.

Engine and Chassis

As has been mentioned on past occasions, one of the great advantages of a Meccano Steam Engine over other power units is the fact that its design enables it to be used, not only as a power unit, but also as a very strong structural part of any model into which it is built. In this model, for example, in addition to supplying the motive power, it also serves as part of the chassis, thus reducing the number of parts required to complete the model. Before starting work on the model itself, however, it is advisable to fit the gearing to the Engine while there is still plenty of room to work. Journalled in the Engine sideplates is a 3 in. Rod held in place by a 60-teeth Gear 1 and a ½ in. Pinion 2, the former inside the sideplates and the latter outside the plates, on the left-hand end of the Rod. Gear 1 meshes with the $\frac{7}{16}$ in. Pinion on the Engine crankshaft, while Pinion 2 meshes with a 57-teeth Gear fixed on the end of a 3½ in. Rod, also journalled in the Engine sideplates. A ¾ in. Sprocket Wheel 3 is fixed on the right-hand end of this Rod.

Assembly of the model, proper, can now begin. Bolted transversely across the underside of the Steam Engine's base-plate is a 5½ × 3½ in. Flat Plate 4, the forward row of holes in the Plate coinciding with the

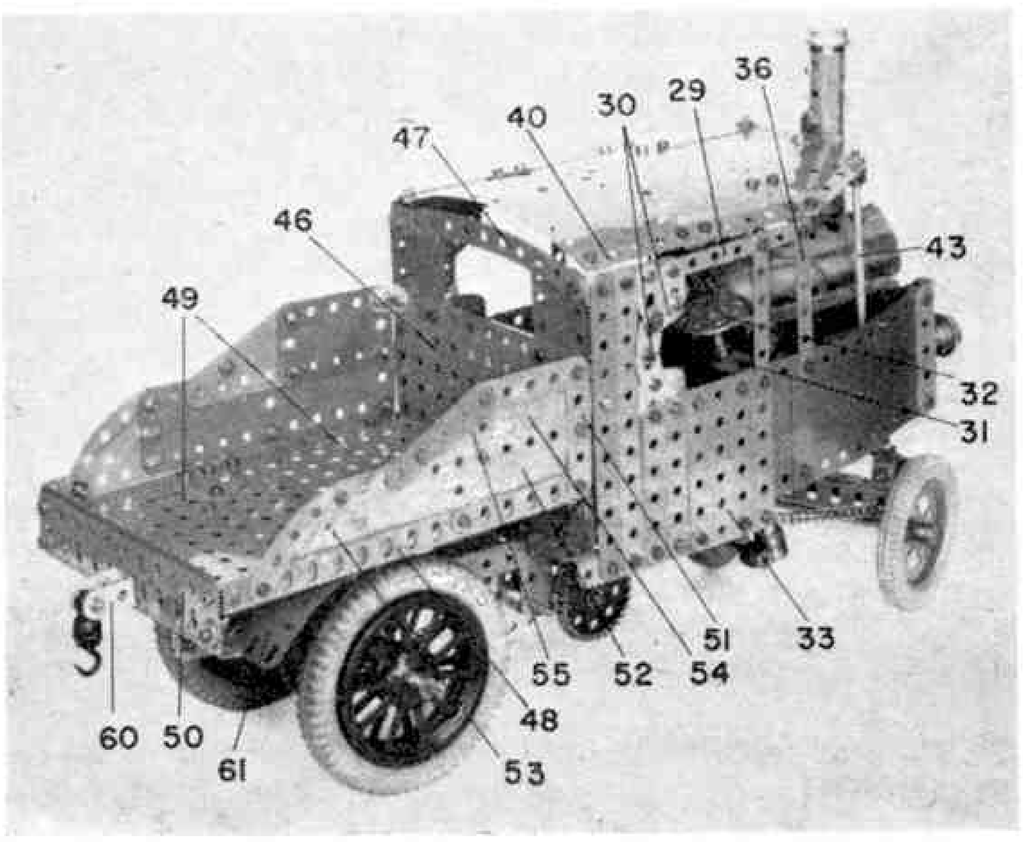


An underside view of the Steam Wagon showing the sturdy construction of the chassis and the drive system to the rear wheels.

rear corner holes in the *wide* section of the Engine's baseplate and the forward securing Bolts fixing two 1½ in. Angle Girders to the top of the forward edge of the Flat Plate, one at each side. Bolted to the underside of the Flat Plate, in turn, are two 9½ in. Angle Girders 5, separated by a distance of three clear holes and protruding rearwards a distance of ten holes beyond the end of the Engine baseplate. These Girders are connected, at the rear, by a 2½ in. Angle Girder 6, spare flange pointing downwards, and, through their tenth holes, by a 5½ in. Angle Girder 7, spare flange pointing upwards. Note that the bolts securing Girder 6 to Girders 5 also hold two 1 × ½ in. Reversed Angle Brackets in place. Bolted to the spare flange of Girder 6 is a 2½ × ½ in. Double Angle Strip, the lugs of which are extended by two 2½ in. Strips 8, the ends of which are themselves connected by another 2½ × ½ in. Double Angle Strip, back uppermost, to which a 5½ in. Angle Girder 9 is fixed. The ends of Girder 7 are connected to Flat Plate 4 by two 4½ in. Angle Girders 10.

Now bolted towards the rear ends of Girders 5, through their second and fourth holes, are two Flat Trunnions, in the apex holes of which a 6½ in. Rod, carrying a 2 in. Sprocket Wheel 11, is held by Collars. Mounted on the ends of this Rod are the rear wheels,

Construction of the load body fitted to the model is perfectly straight-forward as this general rear view of the Steam Wagon clearly shows.



each of which consists of a 3 in. Motor Tyre trapped between two 3 in. Spoked Wheels. Sprocket Wheel 11 is connected by Chain to a ¾ in. Sprocket Wheel 12 on a 3½ in. Rod, held by a Collar and a 60-teeth Gear Wheel 13 in the lower rear corner holes of two 1½ × 1½ in. Flat Plates bolted to Angle Girders 5. Gear 13 meshes with a $\frac{7}{16}$ in. Pinion fixed on another 3½ in. Rod, journalled in the lower front corner holes of the same Flat Plates. Also fixed on this Rod is a 1½ in. Sprocket Wheel 14 which is connected by Chain to Sprocket Wheel 3 in the Steam Engine.

Two 1½ in. Corner Brackets 15 are next bolted to the forward ends of Girders 5, the lower corner holes in these providing the bearings for a 4 in. Rod on which three Couplings are fixed to provide the steering drum. A $\frac{7}{16}$ in. Pinion 16 is mounted on the right-hand end of the Rod.

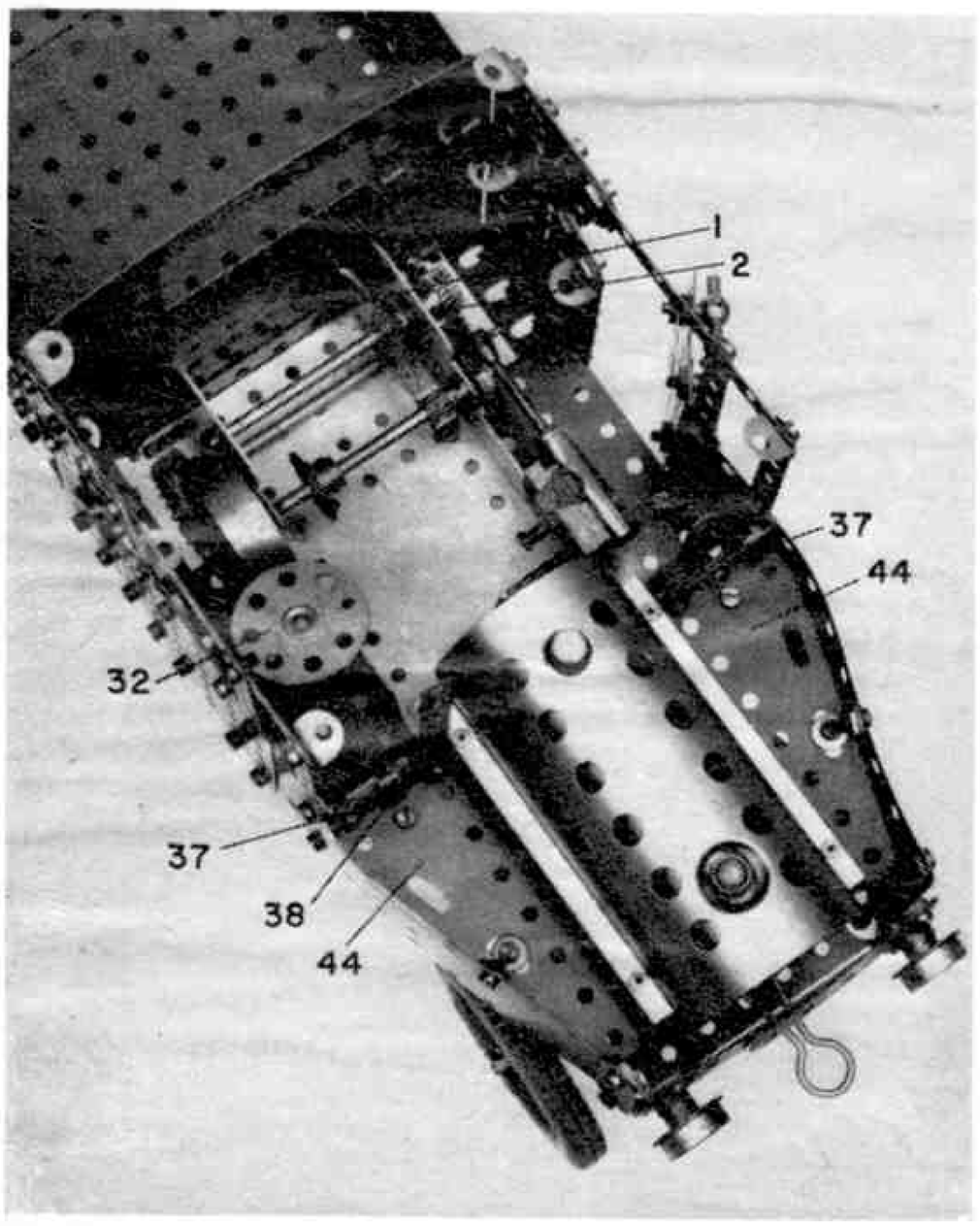
In building the front axle assembly, two 3½ in. Strips 17, placed one on top of the other for strength, are fixed to the underside of the Engine baseplate, through its third holes from the front, the Strips being spaced from the baseplate by a Collar on the Shank of each securing ½ in. Bolt. Lock-nutted to the centre of the Strips is a small leaf spring, built up from one 3½ in. and two 2½ in. Strips, curved to shape, and please note that there are two Nuts on the shank of the securing ½ in. Bolt between the spring and the Strips to provide extra spacing. Fixed to the ends of the springs are two downward-pointing Double Brackets which are secured by ¾ in. Bolts to two further Double Brackets, bolted to a 3½ in. "U"-section girder 18, the securing Bolts also fixing two 1 × 1 in. Angle Brackets 19 in position at the ends of the girder, as shown. The "U"-section girder is built up from two 3½ in. Angle Girders. A length of Sprocket Chain is secured to one end of this girder, is passed several times around the steering drum, previously mentioned, and is then secured to the opposite end of the same girder. Journalled in the end holes in the free lugs of Angle Brackets 19 is a 5 in. Rod, serving as the front of axle. Two free-running 2 in. Pulleys, fitted with Motor Tyres, are held on the ends of the Rod by Collars.

Bonnet and Cab

At the front of the model, each side of the bonnet is similarly built. An Angle Bracket is bolted to the forward corner of the Engine baseplate, another Angle Bracket being bolted to the end of the 1½ in. Angle Girder situated on top of the forward edge of Flat Plate 4. Bolted to these Angle Brackets is a shaped 5½ × 2½ in. Flexible Plate 20, overlayed at the front end by a 2½ in. Strip 21 and, at the rear end, by a 3 in. Strip 22, the latter projecting one hole downward beneath the edge of the Plate to be bolted to Girder 10. Also bolted to Girder 10, in the positions shown, are two 5½ in. Strips 23, a 3 in. Strip 24, extended by a Fishplate 25, and a 3½ in. Strip 26. Note the Bolt securing left-hand Strip 24 also holds the cab access ladder 27 in place, this consisting of Double Bracket, to the lugs of which two 2½ in. Narrow Strips, connected by four ¾ in. Bolts, are fixed. The upper ends of Strips 23 are connected by a 2 in. Strip, to the protruding end of which two Fishplates 28 and 3½ in. Narrow Strip 29 are bolted, the latter projecting horizontally forward. The forward Fishplate is joined to Fishplate 25 and Strip 26 by four further Fishplates 30, arranged in a curve, as shown, to provide the cut-away shape of the cab side window.

At both sides of the model, Narrow Strip 29 is

connected to Strip 21 by a 2½ in. Narrow Strip, the lower securing Bolt, at the right-hand side only, also holding a 2½ in. Strip and a 1 × ½ in. Angle Bracket 31 in place. The 2½ in. Strip is bolted to Strip 26, while held by a Collar in the end hole in the free lug of the Angle Bracket is a 5 in. Rod, the lower end of which protrudes through a hole in Flat Plate 4. An 8-hole Bush Wheel 32 is fixed on the top end of the Rod to represent the steering wheel, whereas a Worm on the lower end of the Rod is meshed with Pinion 15 to complete the steering linkage. A 3 × 1½ in. Flat Plate 33 is bolted between Angle Girder 22 and the 2½ in. Strip joining Strips 21 and 26. This Strip is omitted on the left-hand side of the model, but a 3 × 1½ in. Flat Plate 34 is added, being attached to Strip 21 by two Hinges to serve as the cab door. A door catch is provided by a Fishplate, held by Nuts on the shank of a Handrail Support 35 loosely attached to the Flat Plate. A 1 in. Rod is fixed in the head of the Handrail Support to serve as the handle.



In this top view of the cab, the roof and seat have been removed to show the initial reduction gearing fitted to the Meccano Steam Engine.

A 3 in. Narrow Strip 36 is now bolted between the end of each Narrow Strip 29 and Flexible Plate 20, the lower securing Bolt also fixing an Angle Bracket to the inside of the Plate. Secured to the free lug of this Bracket is a 1½ in. Strip 37, positioned horizontally, to the inside end of which a vertical 3 in. Narrow Strip 38 is bolted. The cab roof is then built up from two curved 5½ × 2½ in. Flexible Plates 39, connected at the ends by two 5 in. compound strips 40, extended one hole forward by Fishplates. Bolted to these Fishplates are two 2½ × 1½ in. Triangular Flexible Plates 41, joined by a 3½ × 2½ in. Flexible Plate 42. Each compound strip consists of two 3 in. Strips overlapped two holes. The completed roof is attached to the cab sides by Obtuse Angle Brackets, with two imitation forward stays each being provided by a 3 in. Rod 43 fixed in a Rod Socket secured in the front corner hole of Triangular Flexible Plate 41. The lower end of the Rod projects through one of the holes in a 3½ × 1½ in. Triangular Flexible Plate 44, attached by Angle Brackets to Flexible Plate 20 and Strip 37.

Inside the cab, a seat is provided by two 2 in. Strips joined by two 5½ in. Strips and a 5½ × 1½ in. Flexible Plate 45, one of the Strips being positioned under the forward edge of the Flexible Plate, the whole assembly being attached to the cab sides by Angle Brackets. The back of the cab is enclosed by a 5½ × 3½ in. Flat Plate 46, bolted to the vertical flange of Angle Girder 7. This Flat Plate is extended three holes upwards at each end by two 2½ × 1½ in. Flexible Plates, joined at the top by a 5½ in. Curved Strip 47, the securing Bolts holding Angle Brackets in place, the free lugs of these Brackets being bolted to the cab sides.

Load body

Situated behind the cab is the comparatively small load body peculiar to this type of vehicle and construction, here, is perfectly straightforward. Two 7½ in. Angle Girders 48 are connected together at each end by a 5½ in. Angle Girder, the intervening space being enclosed by two 5½ × 3½ in. Flat Plates 49, the rearmost Plate being bolted to the spare lugs of the Angle Brackets joining Girders 6 to Girders 5. Note that the spare flange of the rear 5½ in. Girder points upwards, while that of the front Girder points down, the latter being bolted through the second row of holes up in Flat Plate 46. The rear Girder is connected to Angle Girder 9 by a 5½ in. Flat Girder 50.

Each side of the load body consists of a 2½ in. Strip 51, a 5½ × 1½ in. Flexible Plate 52 and a 2½ × 1½ in. Triangular Flexible Plate 53, all bolted to the vertical flange of Angle Girder 48. Flexible Plate 52 is extended upwards by a 2½ × 1½ in. Flexible Plate 54 and another 2½ × 1½ in. Triangular Flexible Plate 55, the complete assembly then being edged along the top by a 2½ in. Strip 56, a 3 in. Strip 57, a 1½ in. Strip 58 and a 2½ in. Curved Strip 59. The upper front corner of each side is attached to the back of the cab by Angle Brackets. At the very back, a simple towing hook is provided by a Loaded Hook mounted, loose, on a ¾ in. Bolt, held by Nuts in the lugs of a 1 × ½ in. Double Bracket 60. Equally simple are the two rear mudguards, each of which consists of a 2½ × 1½ in. Flexible Plate 61, curved to shape and bolted to the underside of rear Flat Plate 49.

A " radiator-grille " for the model—hinged to allow access to the firebox of the Steam Engine—is next built up from two vertical 2½ in. Strips connected together, in order from their lower ends, by a 3½ in. Strip 62, a 3½ in. Narrow Strip 63 and two further 3½ in. Strips, two 2½ in. Curved Strips 64 being bolted, as shown, to the top of the vertical Strips. Note that the Bolts securing right-hand Curved Strip 64 and the right-hand end of Strip 62 to the right-hand vertical Strip also hold two Hinges in position, these Hinges being bolted to right-hand Flexible Plate 20. Note, also, that ½ in. Bolts are used to fix the centre 3½ in. Strip in place, these Bolts also securing two ¾ in. Flanged Wheels 65 in position to serve as headlamps.

When the above assembly has been completed, it will be noticed that a small gap remains between Strip 62 and Narrow Strip 63. This gap is vital, as the handle of the Steam Engine's burner protrudes through it when the radiator-grille is " closed ". The grille is kept closed, by the way, by the shank of the Bolt securing left-hand Flanged Wheel 65 engaging with

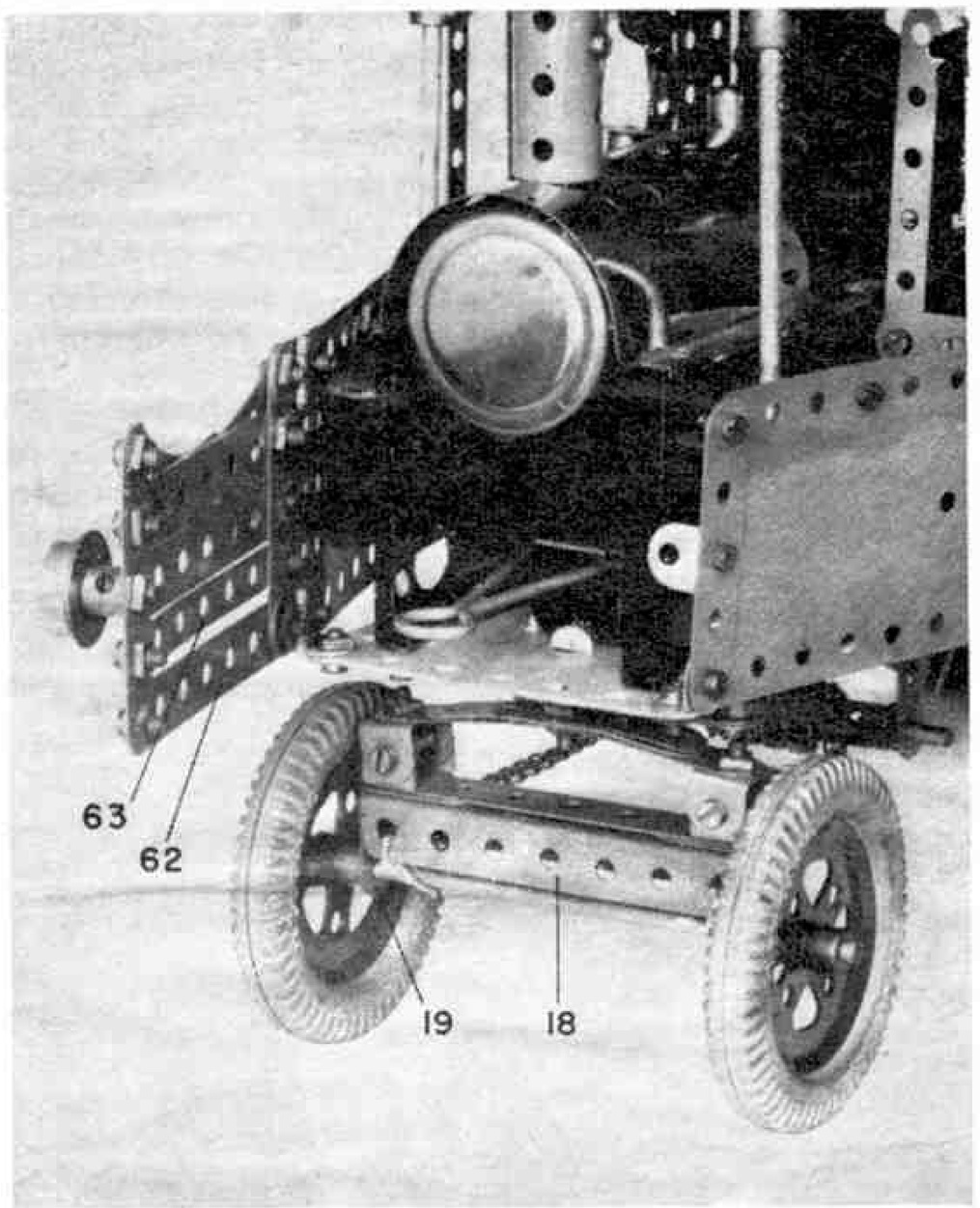
PARTS REQUIRED

6—2	1—18b	2—96a
9—3	4—19a	1—103
10—4	2—20a	7—111
12—5	3—20b	6—111a
4—6	1—24	4—114
5—6a	1—26	2—124
2—8a	2—26c	2—126a
2—8b	1—27a	2—133
4—9	2—27d	1—136
2—9a	1—32	2—142a
2—9b	218—37a	2—142b
1—9d	198—37b	2—163
2—9f	24—38	1—164
19—10	2—48a	2—179
5—11	4—52a	6—188
1—11a	1—57c	3—189
22—12	10—59	1—190a
3—12a	3—63	4—192
4—12c	2—73	6—221
1—14	2—74	2—224
2—15	1—89	3—235
1—15b	4—90	6—235a
5—16	1—94	3—235b
1—16a	1—95	1—Meccano Steam Engine
1—16b	1—95a	

the round hole in the spare lug of an Angle Bracket bolted to left-hand Plate 20.

Last of all a chimney is built up from two Sleeve Pieces 66 joined together by a 2½ in. Narrow Strip bolted down the inside of the Sleeve Pieces. Fixed in the upper Sleeve Piece is a Chimney Adaptor, to which a ¾ in. Flanged Wheel 67 is secured by a ½ in. Bolt, while held by a Nut in the lowest hole in the uppper Sleeve Piece is an ordinary Bolt, shank outwards. The chimney fits over the combined filler cap safety valve of the Steam Engine, the protruding shank of the above ordinary Bolt being secured to an Angle Bracket bolted to the forward edge of the cab roof. Thus, by simply undoing the fixing Nut, the chimney can easily be removed to allow the boiler of the Steam Engine to be filled.

This completes the model, but I leave you with a final word of warning. Because the Meccano Steam Engine is a live-steam unit, fired by a methylated spirits burner, it naturally gets extremely hot and must therefore be treated with great respect. Never touch any part of the boiler or firebox while the Engine is in use otherwise you may receive a very nasty burn. I know—I've burned myself before now !



A close-up view of the front of the model with the radiator-grille hinged open to allow access to the Steam Engine burner. The cord tied to the front axle beam serves to fix the steering chain in place.

CONTINUED FROM PAGE 133

space craft. There is, indeed, an immediate place for dirigibles in the U.S. missile programme, too.

Many components for the Saturn rocket, for instance, are now built on the West Coast of the U.S. and moved by barge down the Pacific to go through the Panama Canal.

From the further end of that artificial waterway they are carried up the Atlantic to the Gulf of Mexico, and transported up the Mississippi and Tennessee Rivers to Huntsville, Alabama, for assembly, before being barged again down the river, taken through the Gulf, and carried up the Atlantic to Cape Canaveral.

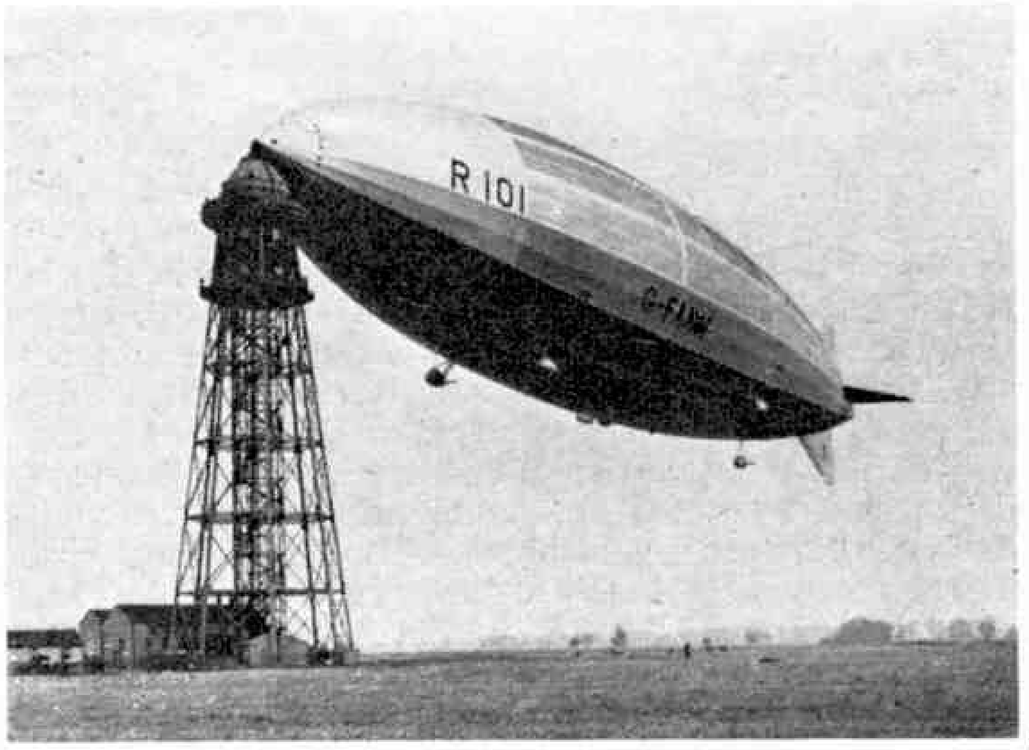
Large airships could reduce the distance—and the cost—of the journey dramatically.

Airship enthusiasts also point out that this type of transport could ferry tons of supplies quickly into areas devastated by floods, earthquakes, volcanic eruptions, and other disasters threatening thousands of lives. The death toll in such calamities is often greatly increased because medical aids and food cannot reach the scene soon enough.

Nor would a revival of airships be entirely unwelcomed by the aeroplane services. The world's leading airports are no longer big enough to cope with the growing aircraft traffic, and take-off and landing has often to be delayed as a result of the congestion.

If a good slice of the air cargoes went by airships, airports would be freer to handle passenger traffic, and much of the frustration experienced by aeroplane travellers would be avoided.

The future of the airship is considered in some quarters to be so rosy that an Association of Airship Travel was formed as long ago as 1963. Its members believe that before long the huge silver cigars will once again be in the air, fulfilling a useful role even in this jet-travel age.



The ill-fated R-101, which crashed in France whilst on a trip to India. The disaster was a deciding factor in the decline of the airship.

TRAFFIC SAFETY ON STAMPS

by James A. Mackay

WHEN KARL BENZ AND GOTTLIEB DAIMLER invented their internal combustion engines and put the first horseless carriages on the road eighty years ago they little realised that they were giving the world one of its most lethal weapons. The total of dead and maimed and injured from road accidents since 1890 all over the world would run into millions rather than thousands, not to mention the enormous cost of damage done to transport and property. Consequently governments now give a great deal of attention to ways of reducing the volume and seriousness of road accidents, by imposing maximum speed limits, by insisting on driving tests, by breath-alyser tests and vehicle checks, and by educating the public, particularly children, on road safety.

Advertising is the obvious method used to bring home to the public the hazards of the roads and growing use has been made in recent years of roadside posters, not to mention publicity campaigns in the press, and on radio and television. Another method which has been used by relatively few countries so far is propaganda by means of postage stamps and postmarks.

The use of stamps for this purpose is a relatively recent one. The first country to issue a stamp for road safety was West Germany which produced a very lurid 20 pfennigs stamp in 1953 showing a mother weeping over a small boy who had just been killed in a road accident. The international road-sign for Halt appeared in the background. East Germany produced a series of four stamps in 1966, each of which featured a different situation on the roads, with an appropriate instruction. The 10pf stamp for example showed road signs indicating pedestrians or children crossing, with the injunction to keep your eyes open for pedestrian traffic. The 15pf showed a child on a scooter crossing in front of a car, the 25pf depicted a cyclist giving a hand signal, while the 50pf stamp pointed a moral by featuring a motor-cyclist, a glass of beer and an ambulance ! A similar series was produced in 1969 and featured a pedestrian crossing, traffic lights, a level-crossing and a motor vehicle overtaking another.

In 1952 the United States, the most motorised country in the world, celebrated the fiftieth anniversary of the American Automobile Association by releasing a 3 cents stamps showing cars of 1902 and 1952. In the corner of the design, however, was shown an AAA patrolman guiding a boy and a girl across a busy road. Though not actually aimed at road safety this stamp may be considered as relevant to a collection with a traffic theme. Similarly a 6 cents stamp of 1968 inscribed ' Law and Order ' featured a policeman taking a small boy by the hand—presumably ' the friendly neighbourhood cop ' helping the boy across a busy street.

New Zealand issued a 3d. stamp in 1964 as part of a road safety campaign. With the slogan KEEP OUR ROADS SAFE it featured a road map of the country and a car steering wheel. I should add that, with over 50,000 miles of good roads serving a population of under three millions, New Zealand offers some of the best and least troublesome driving I have ever experienced. Switzerland issued a 20c stamp in 1956 to publicise road safety and depicted two children crossing a road. The following year Italy had a 25 lire stamp featuring traffic lights at a crossroads with the slogan ' Prudenza sulla strada ' (wisdom on the street). Hungary issued three triangular stamps in 1964 to promote road safety and showed a pedestrian crossing (20 filler) a child with a ball running into the street (60 filler) and a woman and child waiting to cross the road (1 forint).

The Persian Gulf sheikhdom of Kuwait is the only country which has issued stamps on a regular basis. Since 1967 a set has appeared each year to mark Traffic Day. The first pair showed a policeman guiding schoolchildren at a zebra crossing—complete with British-style Belisha beacon. A symbolic design showing a pedestrian crossing was the subject of three stamps in 1968 while traffic motor-cyclists and road signs were featured in 1969 and 1970. A traffic warden and young children appeared on a Dutch stamp of 1959 in the annual Child Welfare series and a road safety patrol was shown on a 50 ore stamp issued recently by Denmark. Traffic policemen on points duty have appeared on stamps of Papua-New Guinea (1961) and Jamaica (1967) while two stamps issued by Pakistan in 1961 featured the police badge and emblems of traffic control.

The latest stamps in this theme were issued by Cuba in November 1970 to mark Traffic Week. The 3 cents shows a zebra standing on a pedestrian crossing, while the 9 cents stamp shows the bear ' Prudencio ' (wisdom) used in road safety cartoons and posters. Both stamps feature international road signs in the background.

Many countries, including Britain, use road safety slogans on postmarks and quite a collection of these can be formed. Occasionally these postmarks have caused unintentional humour, when used to cancel certain stamps. Italy's slogan warning of death on the roads, for example, appeared in 1968 cancelling stamps marking a cycling championship. Rhodesia had a slogan aimed at drunken driving—' One for the Road means One for the Grave '. This was a very apt slogan, but unfortunately it was used at a time when the stamp most used in Rhodesian was the threepenny featuring the grave of Cecil Rhodes in the Matopo Hills. The postmark thus appeared to give offence to Rhodesia's national hero and was therefore withdrawn very hurriedly. Examples of this postmark, especially if cancelling the Rhodes' grave stamp, are now highly sought after by collectors.

New Corgi Models

Once again this month we start off with yet another three releases from the enterprising die-cast company of Corgitoys; two new cars and a space vehicle. The first car only just falls into this category and is in fact a rather nice model of a Beach Buggy.

Based of course on a Volkswagon engine/chassis unit this particular model is finished in bright red with a 'flower-power' transfer on the bonnet.

Interior detailing (metal roll-over bar, black plastic 'bucket' seats and complete floor trim plus a gold steering wheel) is tidy and neat. A windscreen is naturally fitted and the model has a white, removable hood with moulded-in stays which hold a pair of maroon water skis (removable of course). Under body detailing is of course limited on a sparse vehicle such as this, but nevertheless Corgi have brightened things up by giving a chromium plated chassis unit and detailed rear engine unit (also plated). The model is fitted with attractive black and bright metal 'Whizz-wheels' and retails at 6/6d.

Two of the splendid new releases from 'Corgi'. Right is the Porche, and on the far right the colourful Beach Buggy.

The second car—this time a fully fledged racing type—is of a Porche 917 and one of the smartest die-casts on the market at present. Finished in what is best described as 'Ferrari red' this beauty has a hinged rear section which when raised reveals a chromed engine unit. Also chromed (rather strangely) is the complete cockpit unit including the seats which doesn't look as bad as it might sound when viewed through the blue tinted windows.

Other details include chromed headlights and exhausts (the former behind blue-tinted lenses) and racing numerals on the bonnet and both doors. As with the 'Buggy', this one is also fitted with Whizzwheels and retails at 8/6d.

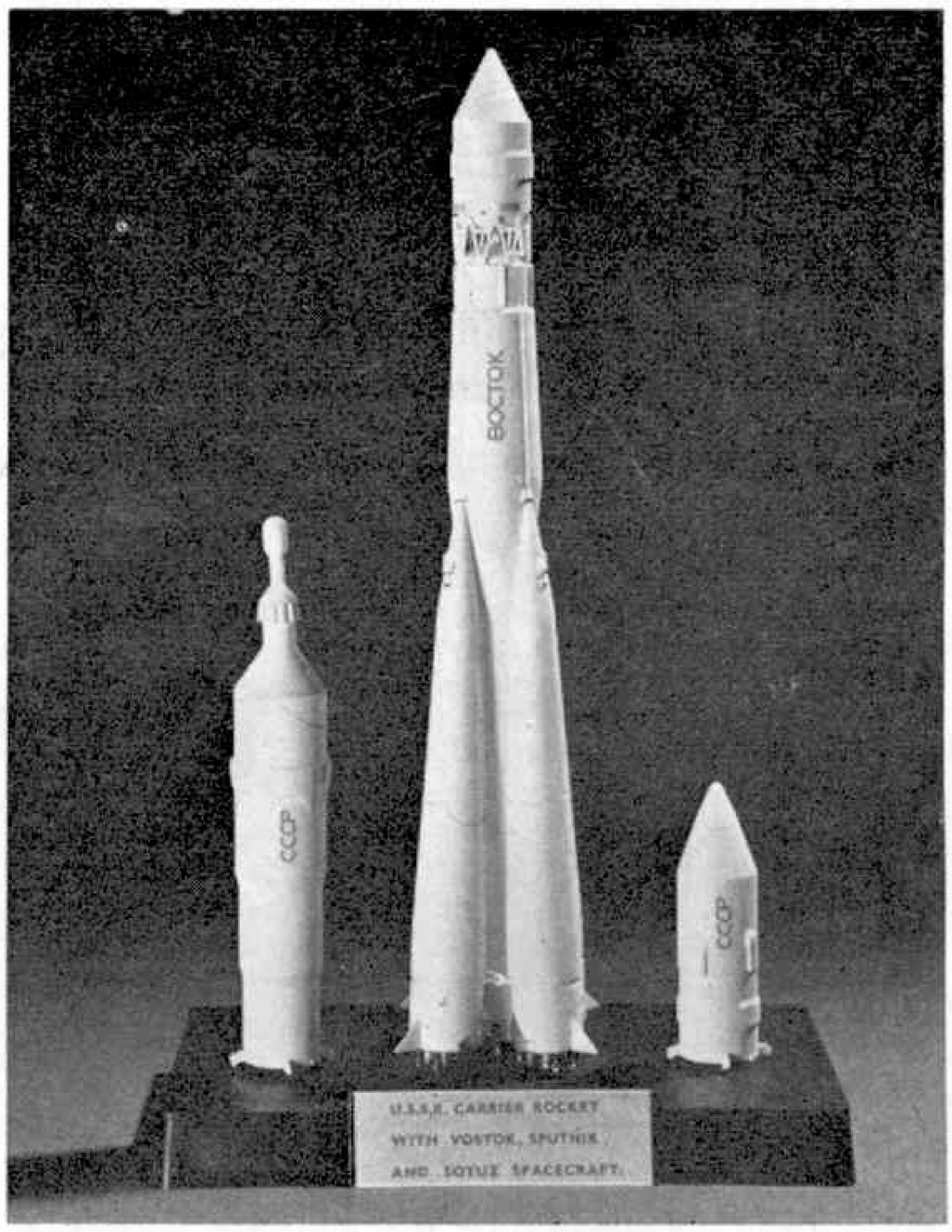
The third model, the 'Lunar Bug' is rather more in the 'Corgi-Major' class than the two cars and therefore is of course pretty large; over 5 inches long by 4½ wide in fact. The 'Lunar Bug' takes the form of a futuristic lunar transport vehicle with a large cargo hold, access to which is obtained by opening a large rear door. Other moving parts include a pair of short stubby wings which swing out on either side and wheel supporting legs which can be swivelled into various positions.

The model is finished in white and red enamel with interior cab detailing in blue. The wheels and supporting arms are chromium plated. Priced at 17/- this model is really aimed at the younger boy and represents fair value for money.

HAVE YOU SEEN ?

Airfix Vostok Rocket

From Airfix comes a new 103 part plastic construc-



tion kit of the launcher rocket (which has so far been the launch vehicle for all the Russian spacecraft), the Soyuz spacecraft, Sputnik and Vostok.

The Sputnik model stands 1½ in. high and is a model

of Sputnik 111, a cone-shaped laboratory which included a ton of scientific instruments and communications equipment.

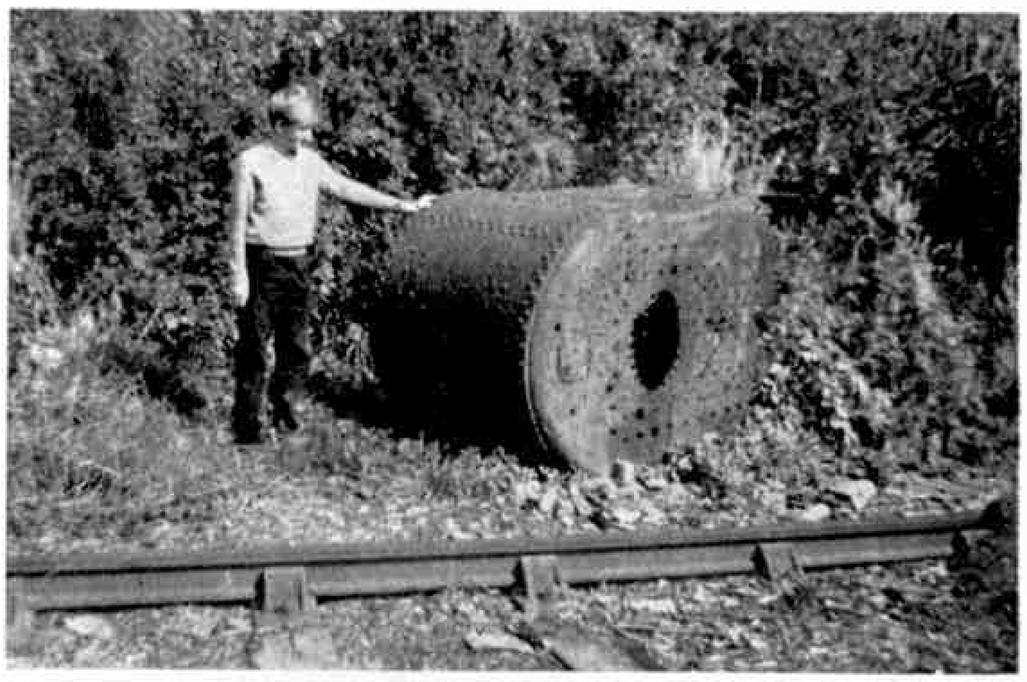
Next comes a finely-moulded model of Vostok 1 which includes a cosmonauts' capsule, communications antennae, steering engines and a detachable, pointed rocket nose fairing with cosmonauts' observation port. Airfix have paid careful attention to the exterior appearance of the Vostok 1 model and have meticulously reproduced the instrument section, oxygen and air containers and radio and telemetry equipment.

The model of the Russian Soyuz spacecraft stands 5 in. high and includes accurately shaped launch escape tower, cosmonauts' capsule and steering motors. The interior of the spacecraft comprises a spherical laboratory and rest compartment in the nose of the re-entry capsule which adjoins an equipment section. Modellers can separate the re-entry capsule from the laboratory and equipment section. Following the disaster of the first Soyuz flight the Russians launched Soyuz 11 and 111 and a manually controlled rendezvous was undertaken by Beregovoi piloting Soyuz 111.

The three spacecraft, Sputnik, Vostock and Soyuz can be placed on top of the standard launcher rocket which is the same scale as the Airfix Apollo Saturn 5 and makes an interesting comparison in size since the Apollo Saturn 5 model stands 31 in. and the model of the latest Soyuz spacecraft on top of the carrier rocket measures a mere 12¾ in. high. The price of this well detailed 4 part kit is 11/6d.

CENTURY OLD RAILWAY RELIC

described by Richard Angove



THE RUSTING FIREBOX PICTURED HERE is that of "Caradon" and probably all that remains of the long-forgotten Liskeard and Caradon railway in Cornwall.

Built on granite blocks, this standard-gauge line, opened during the hey-day of Cornish mining in the 1840s, was a copper and granite carrying branch serving the then-rich Caradon mines and neighbouring stone quarries in the high, wind-swept hills of mid-Cornwall.

The picturesque village of Moorswater, near Liskeard, was the terminal from which the empty wagons were horse-drawn to the loading area and gravity-propelled down under the control of brakesmen; their loads were transferred to barges at Moorswater where the canal took them to Looe for shipment.

Three locomotives named "Caradon" "Kilman" and "Cheesewring" were purchased in the 1860s and housed at Moorswater. "Caradon" was the first of the three.

The line was later connected to the Liskeard-Looe branch and worked by the G.W.R. from 1909. With the decline in mineral traffic the Moorswater-Caradon section was abandoned during the first war but the engine sheds remained at the site of the photograph until recently.

In the background is Moorswater viaduct, 318 yards long and 147 feet high, which is one of 40 such structures carrying the Paddington-Penzance main line through Cornwall.

Mr. John Chaston who still lives at Liskeard recalls that his father once drove "Caradon" which was supplied new in 1862. Her firebox was renewed in 1878, and this is believed to be the original box.

Despite flangeless driving wheels to assist rounding the sharp curves on the route, derailments were frequent and crews often walked home leaving the derailed engine until help was available to rerail her.

It was never a passenger-carrying railway although parties were in fact conveyed on Sunday School and other outings to the popular Cheesewring area, still a favourite morland mecca for summer tourists.

Ancient photographs portraying these events show the occupants of the open trucks carrying umbrellas and parcels, which were the "paid" luggage necessary to obtain a free pass to comply with the legal requirements of the time.

Isolated overgrown granite sleepers can still be found at some points along the route of this historic line.

1970 INDICES

Readers who like to keep their year's copies neatly catalogued will be interested to know that the 1970 Meccano Magazine Index is now available from these offices, price 1/6d. including postage. Subscribers to the magazine will, of course, receive theirs free with the April, 1971 issue.

car outline COMPETITION

50 Dinky Toy Models to be Won!

Fill in the form opposite and simply send it in to *Meccano Magazine*, Comp', 13-35 Bridge Street, Hemel Hempstead, Herts., marked "Car Outline Competition" *or* if you don't want to cut your magazine just jot down your answer on a postcard and *don't* forget your address !

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

The vehicle illustrated is.....

.....

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

Address.....

.....

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 Ford Mercury Cougar.

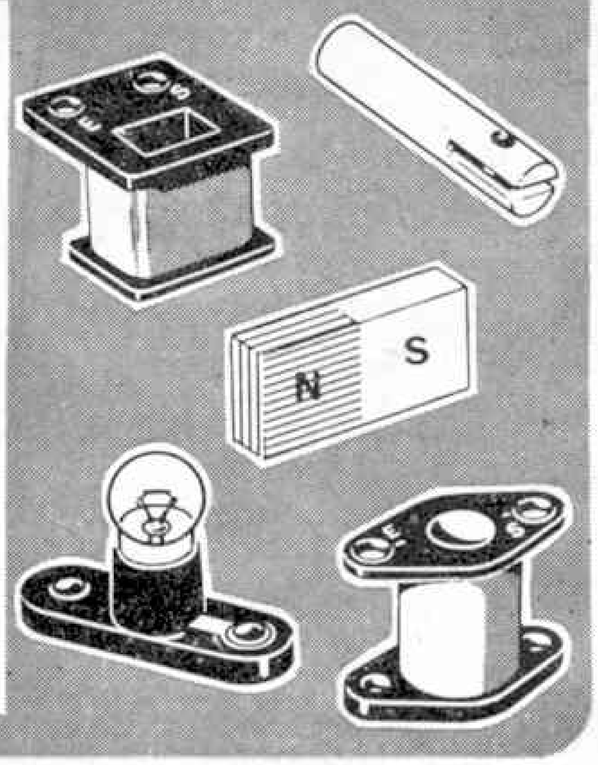
M. Aggleton, Richmond, Surrey. E. Ainscow, Cumberland. P. Allen, Stamford, Lincs. N. Ashby, Horley, Surrey. C. Avis, Great Baddow, Essex. G. Aylott, Maidstone, Kent. A. Barlow, Bingley, Yorks. C. Berry, Bingham, Notts. M. Botta, Bedford. P. Colborne, Gosport, Hants. K. Cowley, Sheffield. S. Cross, Ipswich. P. Fisher, Cannock, Staffs. R. Foster, Ottery St. Mary, Devon. N. Gilbert, Leicester, M. Gilbert, Newark, Notts. D. Glasson, Camborne, Cornwall. J. Guest, Axminster, Devon. N. Harding, Congleton, Cheshire. P. Hill, Tyldesley, Lancs. A. Hobbs, Walton-on-Thames, Surrey. I. Johnson, Hayes, Middx. R. Keddie, Fife, Scotland. R. Levy, Nothenden, Manchester 22. P. Lowe, Grimsby, Lincs. A. Lyddon, Nottingham. K. Marshall, Stockport, Cheshire. D. Martin, Hatch End, Middx. N. Mason, Caerms, N. Wales. N. May, Brough, E. Yorks. C. Medway, Montlucen, France. A. Mills, Salford 7, Lancs. J. Mothersole, Blackburn, Lancs. I. Neat, Chatham, Kent. W. Newdick, Ipswich. A. Parsons, Upminster, Essex. S. Pickering, Welwyn Garden City, Herts. M. Rose, Wolverhampton. S. Salmon, Winchester, Hants. N. Sanderson, Cowfold, Sussex. P. Sims, Southampton. M. Stamp, Reading, Berks. D. Stephens, Haywards Heath, Sussex. M. Strohm, Southend-on-Sea, Essex. A. Tinkler, Stratford-upon-Avon, Warks. C. Tydeman, Ipswich. W. Vevers, Musselburgh, Midlothian. S. Webb, Maidstone, Kent. P. Wensley, Bridgewater, Somerset. A. Whiteman, Nottingham.

NEW MECCANO 4EL

LOOK WHAT YOU GET WITH THE NEW 4EL SET-

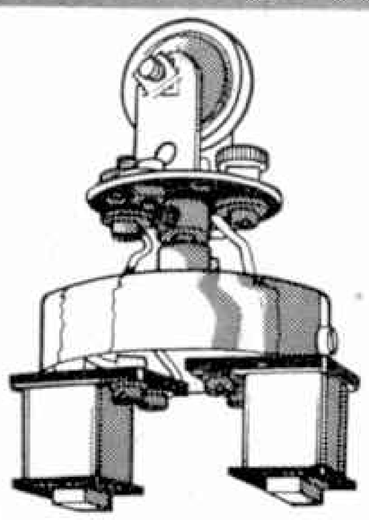
REAL ELECTRICAL PARTS FOR AUTHENTIC ELECTRICAL ENGINEERING

Meccano 4EL makes models with authentic electrical circuits to operate them. Models that work through the power of electricity and magnetism, with specially developed Meccano electrical parts; rectangular coils, magnet holder, lamp holder, flat commutator, cylindrical coils, P.V.C. sleeving, coil of connecting wire, and lots more to make exciting NEW models:-



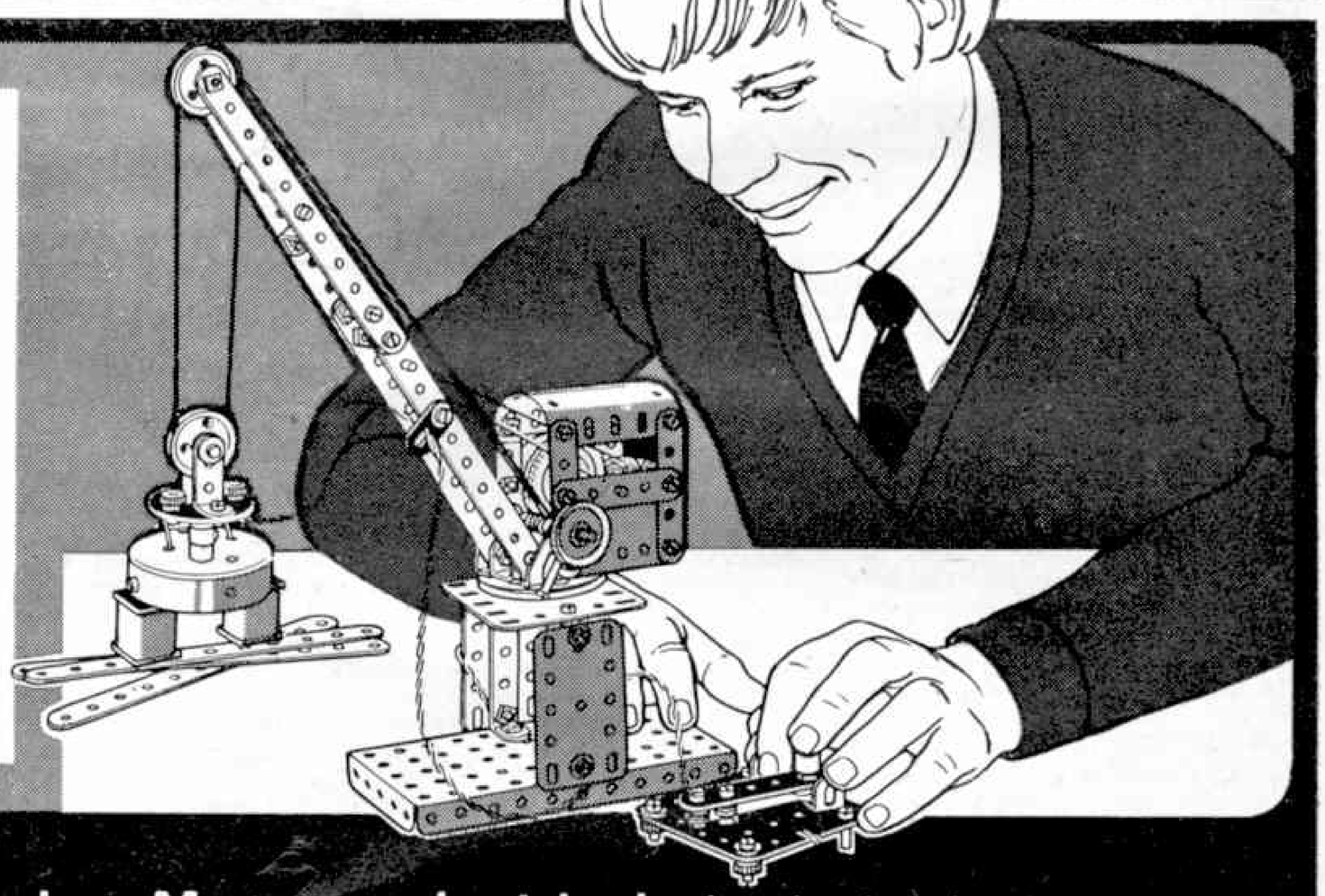
Telegraph Receiver with Bell and Morse Key

Everything you need to make this morse tapper for messages in morse code is in the Set – and it's simple to make if you follow the step-by-step working drawings. By making your own working models with Meccano you can see just what makes real machines work.



Electro-Magnet

Really powerful and efficient— and you control it by a switch that can also be made with this Set.



See how Meccano electrical components make real-action models - like this crane with electro-magnetic grab

Lower the grab over the load to be lifted and switch on the current through the Meccano-made hand switch. A magnetic field is set up in the grab and the load is picked up. Lift the load clear of the ground, swing the crane around and lower. To release the load, simply switch off the current.

Meccano 4EL gives you 275 parts, including a complete No. 4 Meccano Set and a variety of Meccano-tested electrical parts to make lots more fascinating electrical models; packed in a special two-tier pack— electrical components in one tray, Meccano parts in the lower tray.

MECCANO

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PRIVATE: Minimum 18 words 6s. and 4d. per word for each subsequent word.

TRADE: Minimum 18 words 12s. and 8d. per word for each subsequent word.

Box numbers count as six words when costing the advertisement. When addresses are included these are chargeable at the same rate (4d. or 8d.) per word as the remainer of the advertisement. Copy and box number replies should be sent to the Classified Advertisement Department, MECCANO Magazine, 13-35 Bridge Street, Hemel Hempstead, Herts. Latest copy date for insertion in the April issue, February 4th.

WANTED

Wanted for Cash. M.M. 10/12.28, M.M. 1924 year books of new models. 'K' type oil can. Parts 152, 172, 141, 66, 67. Manuals for years 1901-1939. H.V. motors, transformers, rheostats, etc. Any other pre-war Meccano item. All the above in usable condition. State if offer wanted or give price required.—M. J. Lub, P.O. Box 62198, Marshalltown, Transvaal, South Africa. M

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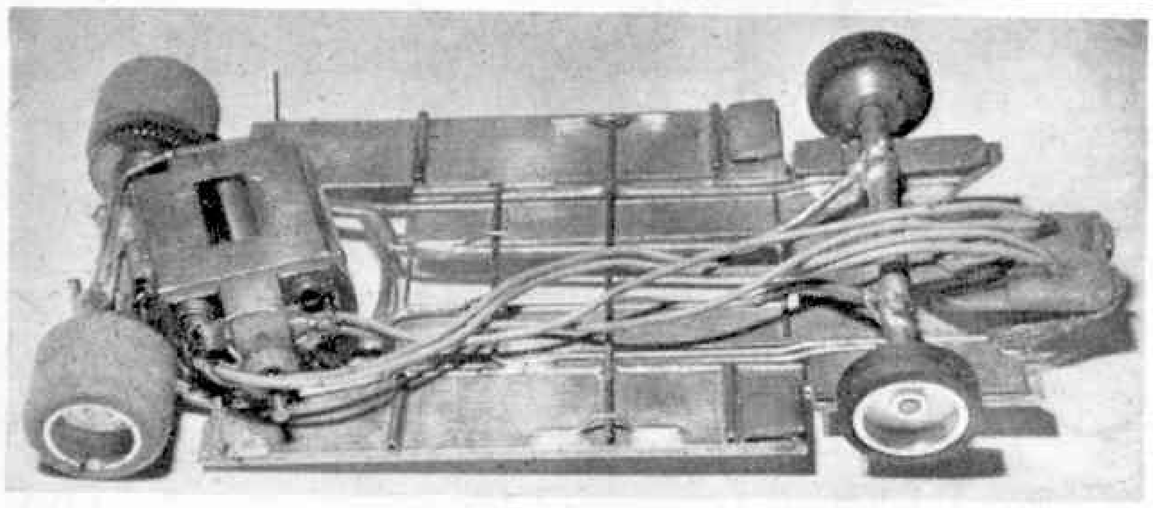

Just a few of the exciting features on schedule for the March 1971 issue of Model Cars are an intriguing model steam car—the Locomobile of 1897—and a new range of die-cast kits of hard-to-collect prototypes in 1/43rd scale. Then there's a top class chassis construction feature with plans, from North London's Ian Fisher together with M.E. Exhibition racing reports and photographs.

Add to this a feature on the construction of R/C Cars from kits—Heath, Associated, Mardave and Dynamic—and this month's scale car plans (Alfa Romeo T 33/3) from Roger Taylor and John Wood plus all the regular features—and a few still in the planning stage—and we think you'll agree that March's issue maintains a high standard already set for '71.

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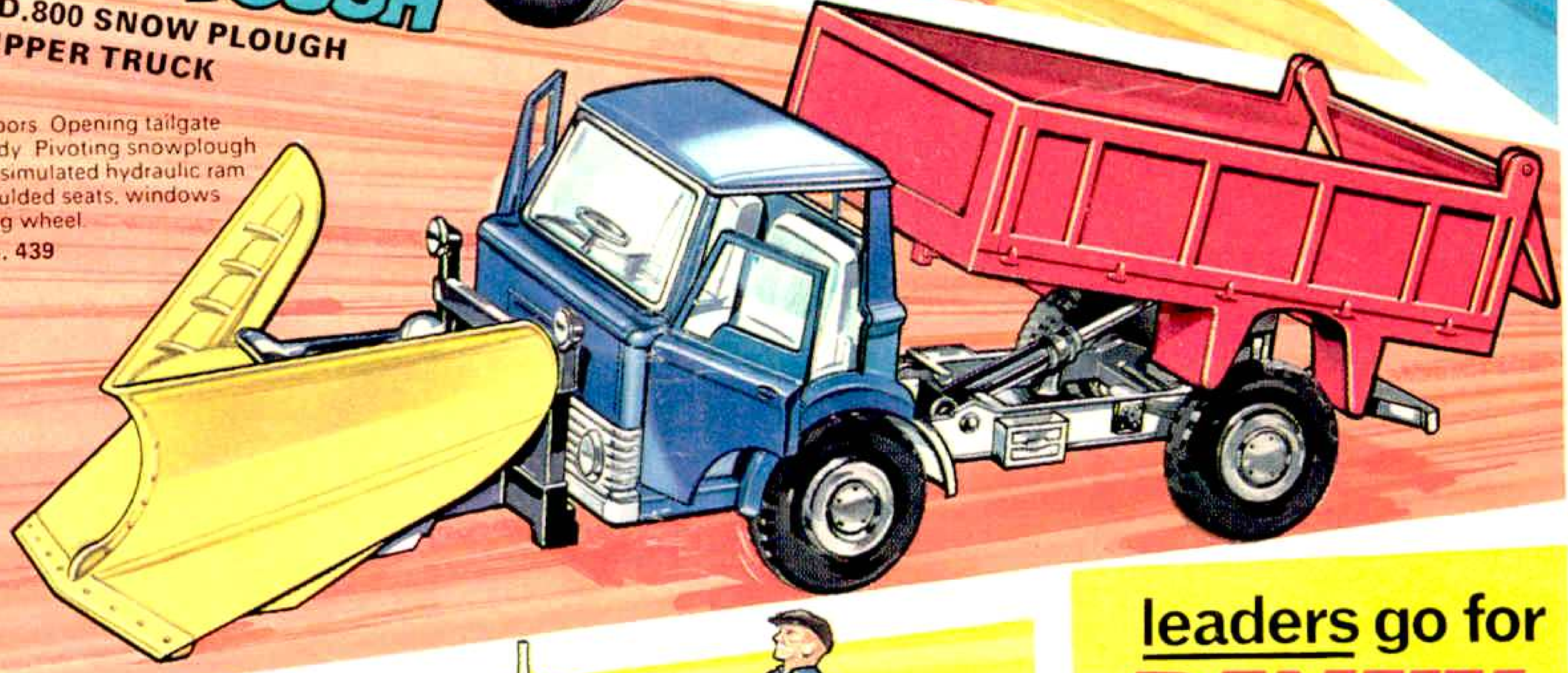

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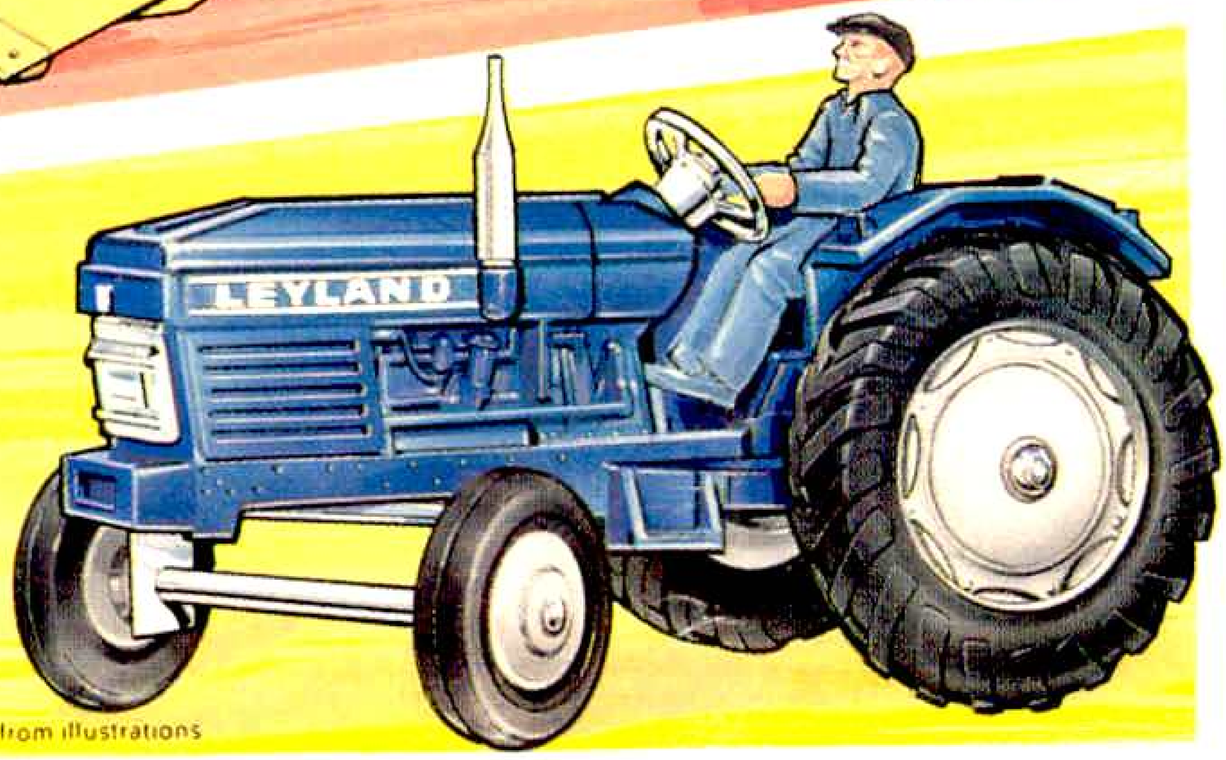

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