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OCTOBER 1972

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MECCANO® Magazine

OCTOBER 1972 VOLUME 57 NUMBER 10

Meccano Magazine, founded 1916

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FRONT COVER

The Duke of Edinburgh arrives at Hendon in a helicopter of the Queen's Flight to have a look at progress on the R.A.F. Museum, which will be officially opened by Her Majesty the Queen on November 15. First public day will be November 17. *(Photo Leslie Hunt).*

NEXT MONTH

Articles on the Inland Waterways, tree transplanting, and sand-blasting are three of next month's features.

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CONTENTS

ON THE EDITOR'S DESK 477
Including the Globetrotter winner

POLLUTION OF WATER 478
Steps which are being taken

A "COURIS THING" 481
Windmills

AMONG THE MODEL BUILDERS 484
Mechanisms in Meccano

MECCANO PARTS 486
Part 9—Rigid curved parts

SIX OF THE BEST 488
The R.A.F. Museum

TUNISIAN CAMEL MARKET 490
A unique market at Sousse

TRINITY HOUSE 491
Keeping an eye on sea safety

SWINGING MONEY 493
Bank signs tell a tale

CEILING CREEPERS 494
Two amusing models

RIVET-MAKING MACHINE 496
Part 2 of an interesting design

DINKY MILLIONS 498
Dinky Toy news

YOUR FRIENDLY STATION 500
Local radio

BRIDGE DESIGN 502
Part 9—Modern suspension bridges

WEST COUNTRY INVENTOR 503
The atmospheric engine and others

AIR NEWS 504
Aviation developments

NEW LAMPS FOR OLD 506
History of artificial light

MEDICINAL PLANTS ON STAMPS 508
Unusual subjects

HAVE YOU SEEN? 509
Some new items in the shops

LAST POCKET MECCANO OF 1971 512
Three designs from last year's entry

ALL RIGHT – IF YOU'RE LEFT HANDED 514

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165 MECCANO CONSTRUCTORS' GUIDE

Bert Love, whose name will be familiar to readers of Meccano Magazine, provides a wealth of useful information and ideas for both beginner and expert constructor alike in this fine new work which represents an edited edition of his series of 12 articles in Meccano Magazine. Chapter headings include Basic Construction, Pulleys, Sprockets and Gears, Basic Cranes, Winding Gear, Rotating Superstructures, Movement on Rails, Traction Engines, Crawler Tracks, Vehicle Mechanics and Electrical Circuits for Motors and Lights, covering in detail every possible use and application of this versatile medium.

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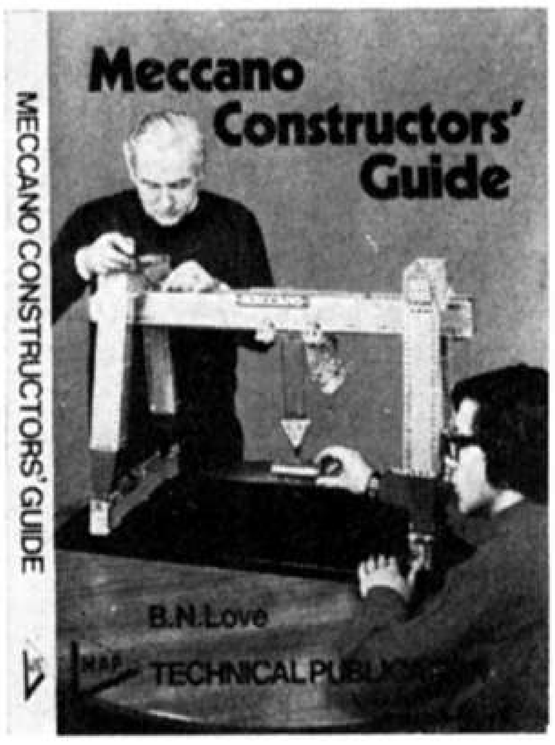

167 A GUIDE TO MILITARY MUSEUMS

In this beautifully produced 64-page reference, author Terence Wise (well-known for his articles on subjects military and the series 'Museums Visited' in *Military Modelling* magazine) takes the researcher and military enthusiast on a very comprehensive survey of 150 Military Museums throughout the British Isles. A brief description of exhibits, places of interest nearby, entrance fees and directions to each museum are provided, together with details of the Curators and their telephone numbers plus a big fold-out map showing museum sites, castles, battlefields and forts, etc.

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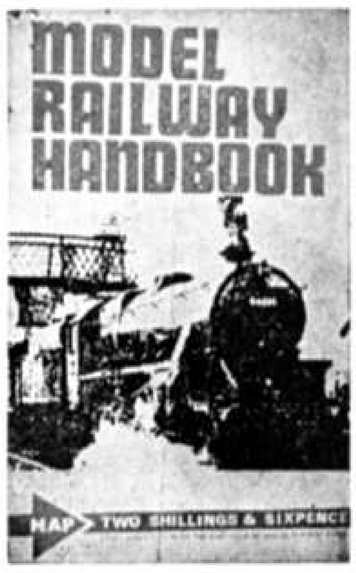

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MAP

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The Birthday Present

Exactly one year after the deHavilland aircraft organisation came of age, September 25th 1942, four of their then unknown Mosquitos from 105 Squadron, gave Norway a birthday present.

Led by Squadron Leader D. A. G. Parry, D.S.O., D.F.C., the Mosquitos left Leuchars in Scotland bound for the Gestapo Headquarters in Oslo. Their mission was threefold. First: to disrupt a rally due to be held there and which would be attended by Vidkun Quisling. Secondly: to destroy as many documents, traitors, collaborators and Gestapo personnel as possible. Thirdly, and perhaps most important of all: to give a much needed boost to Norwegian resistance morale.

There was a further reason why Mosquitos were chosen for this particular raid. The low level day bombing attacks employed by the Mosquito Squadrons had not, until this point in time, yielded many spectacular successes. Its whole future as a day bomber was therefore being hotly criticised at top defence command levels. The Oslo raid helped to swing opinions over towards the Mosquito's retention in the role for which it had been specifically designed.

The Mosquitos flew at sea level, in order to deceive enemy radar, and were given to expect full cloud cover at 2,000 feet and no enemy aircraft. Their expectations were not fulfilled. They met with cloudless skies and Focke Wulfe 190's.

Four Mosquitos attacked the target in pairs, Squadron Leader Parry and Pilot Officer Rowlands leading. They flew over Oslo at rooftop height towards the headquarters – easily discernible due to the large dome and Nazi flag surmounting the building. One enemy aircraft engaged the leaders and two more 190's dived hard on the second pair. Flt. Sgt. Carter's aircraft had fallen slightly behind and was hit badly – with a FW 190 on his tail and one engine blazing, he turned towards Sweden, only to crash in a lake – his aircraft was subsequently salvaged by the Germans. The others bombed the target with an accuracy which captured the imagination of both the Norwegians and the British.

At least 4 bombs entered the roof of the Gestapo buildings before the 3 remaining Mosquitos turned and streaked home along the valleys of Norway. The pace was fantastic; and indicated air speed of 330 mph; with the Mosquitos steadily drawing away from the fighters. One of the chasing 190's crashed near Oslo and the pilot was killed. At the time rumours circulated that it had been shot down by a Mosquito – an impossibility since these Mosquitos did not carry any armament and were originally designed to rely on speed as their main defence. Subsequently, the crash was attributed to either the Mosquito's slip stream forcing the fighter out of control or the effect of the bomb blasts over the Gestapo HQ.

The three remaining Mosquitos returned safely to England, the total 1,100 mile journey having taken 4¾ hours; and the following day the 6 a.m. news carried details of the raid and told the British Public that they had a new light bomber. At 22 years of age deHavilland had given the Germans a birthday present it would be hard to live down, and the British, one which they would never forget: The Mosquito.

Revell's new 1/32 scale model of the Mosquito IVb Series 2 "GBE" is a faithful reproduction of an aircraft attached to the famous 105 Squadron that carried out the above raid. With a wingspan of over 20 inches and details such as removable cowling displaying a Rolls Royce Merlin engine, detailed cockpit interior and movable wheels and propellers, it cannot fail to take pride of place in any model collection.

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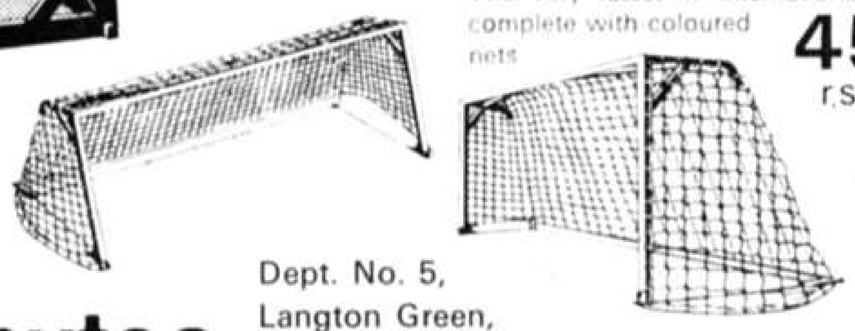

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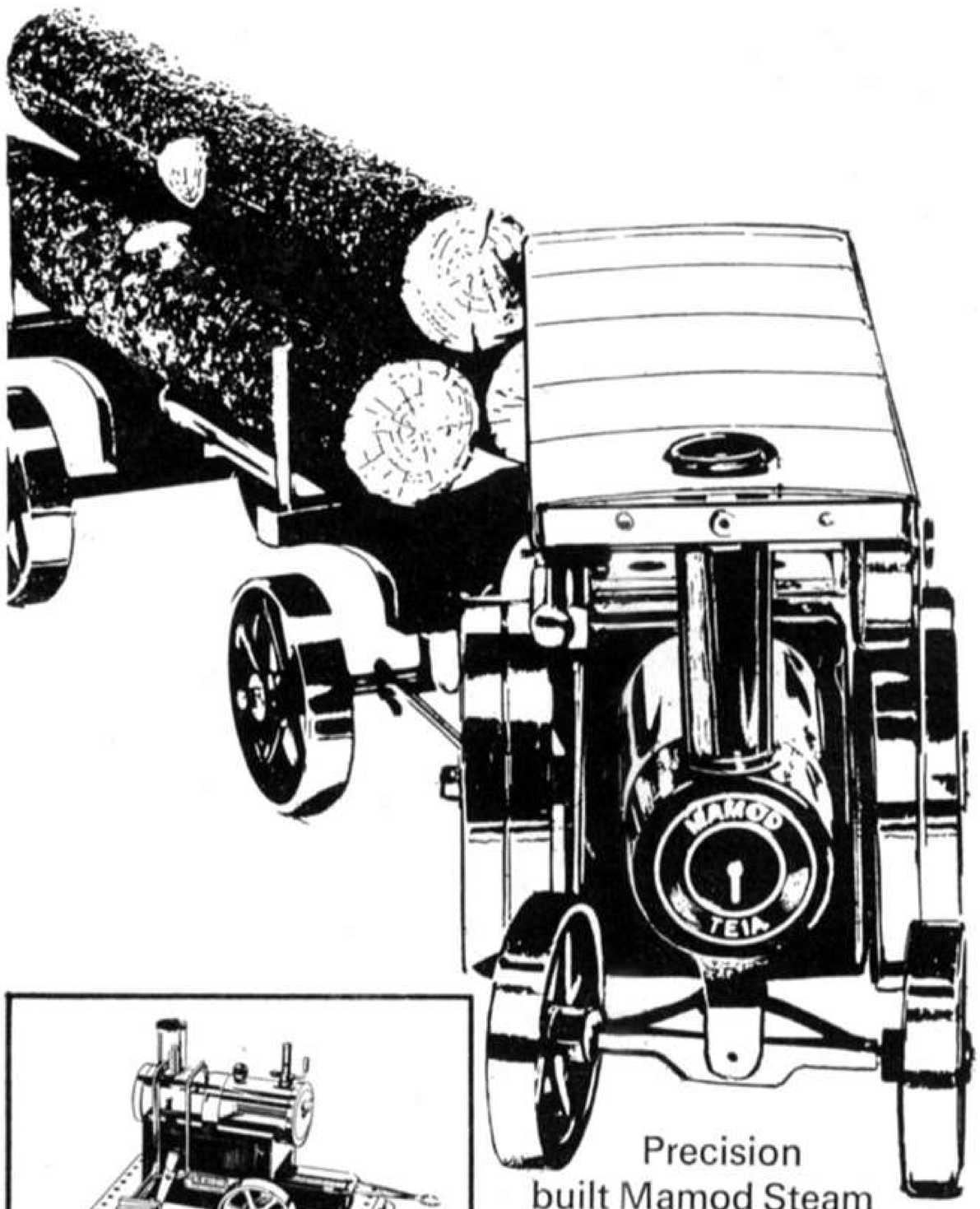

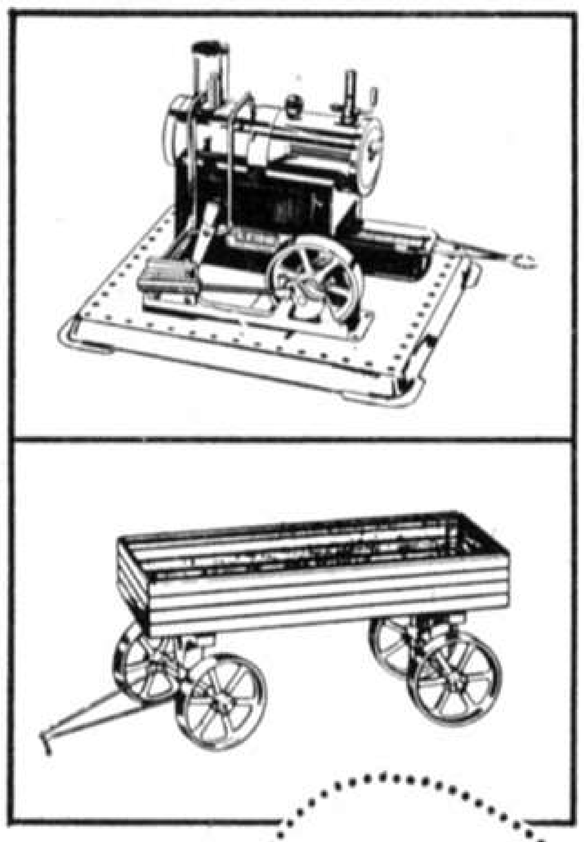

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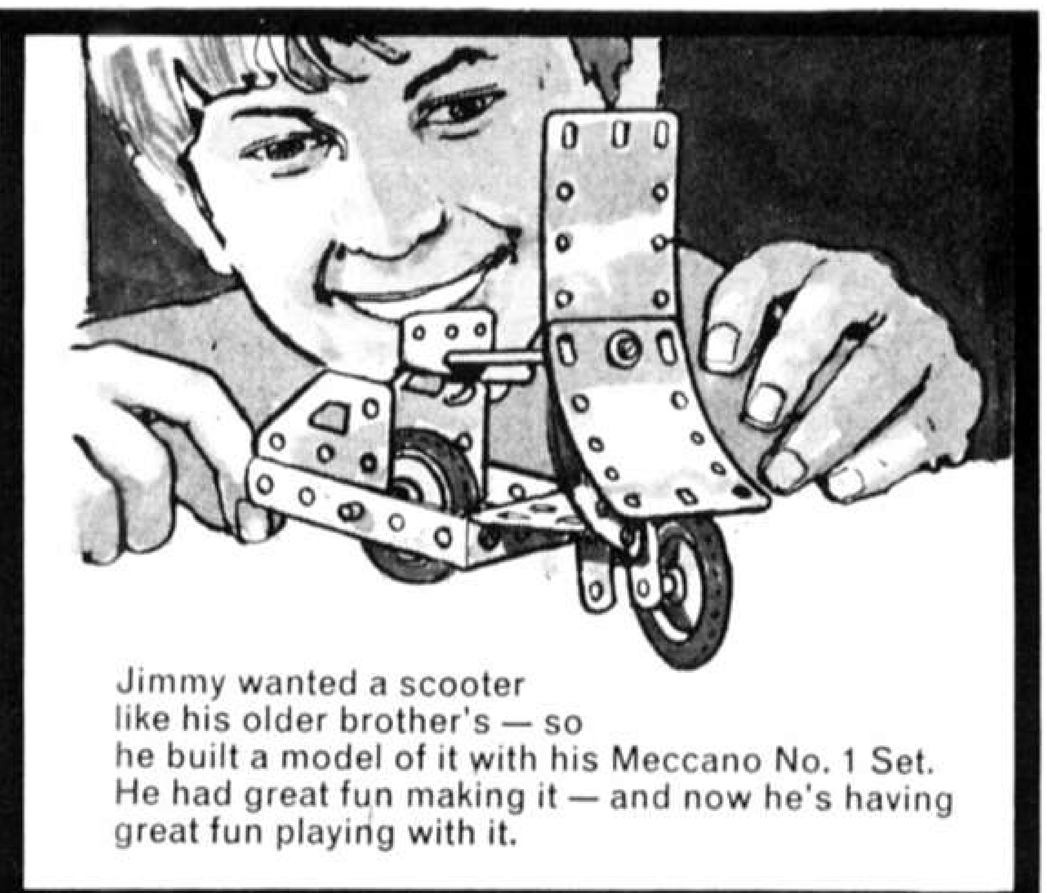
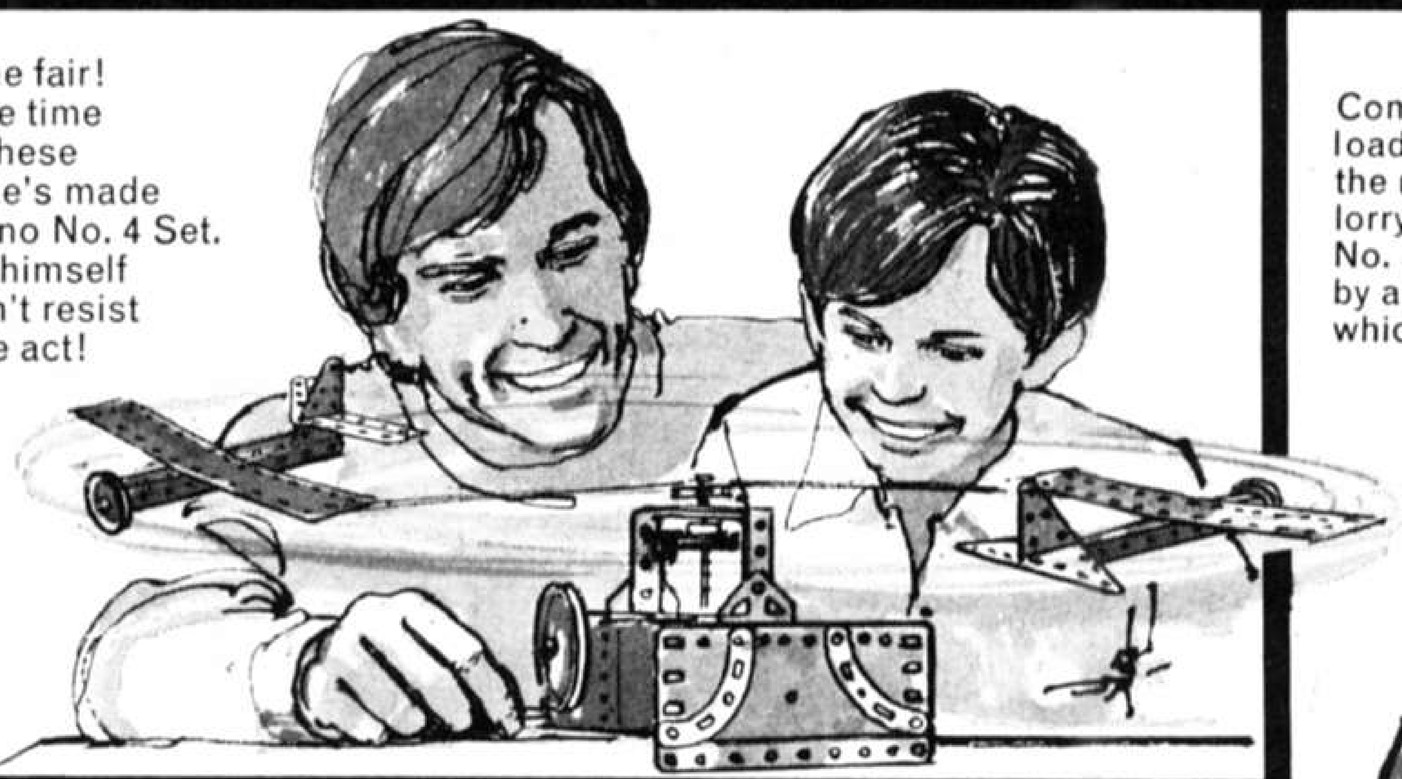
Lift it up and take it away! Tim's busy loading and unloading an important cargo with the crane he's made from his Meccano No. 2 Set. This week he's a crane driver, next week he's going to be driving a bulldozer on a building site!



Jimmy wanted a scooter like his older brother's — so he built a model of it with his Meccano No. 1 Set. He had great fun making it — and now he's having great fun playing with it.

All the fun of the fair! Bill is having the time of his life with these two jet planes he's made from his Meccano No. 4 Set. Dad's enjoying himself too — he couldn't resist getting in on the act!



Come on, Tim — hurry up with that load! John can't wait to get on the road with this heavy goods lorry he's made with his Meccano No. 5 Set. The lorry is powered by a Meccano No. 1 clockwork motor, which John bought as an extra.

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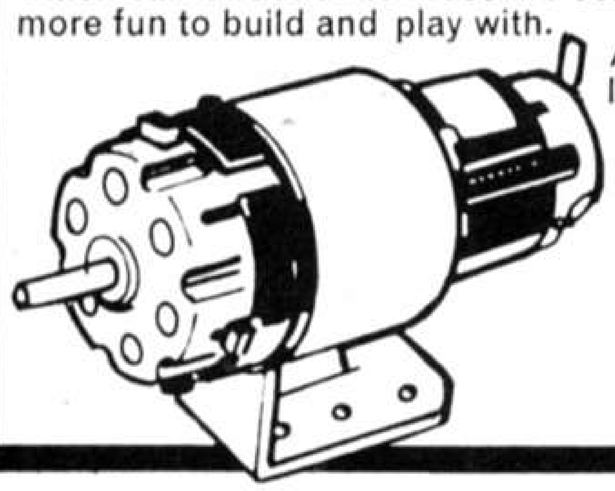

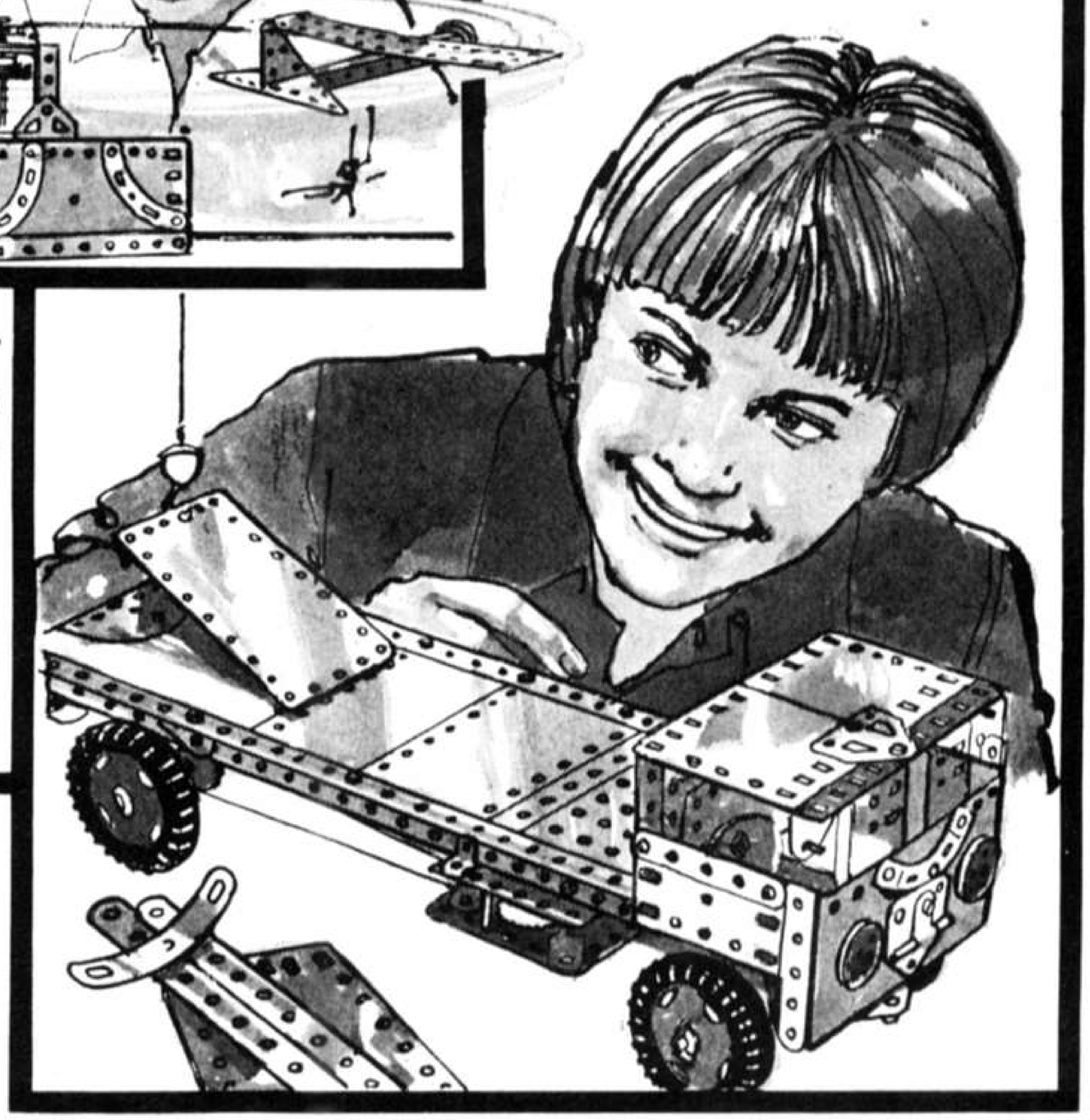

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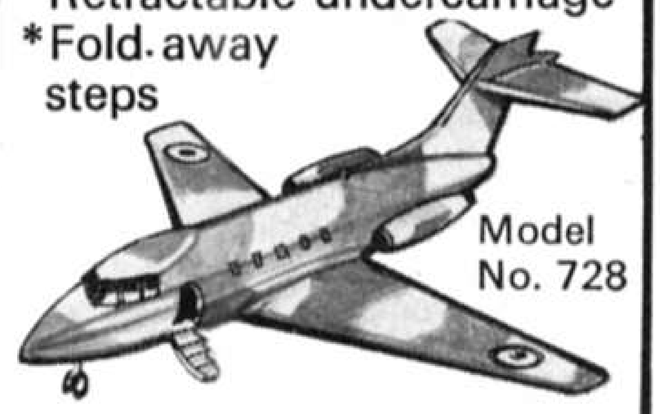

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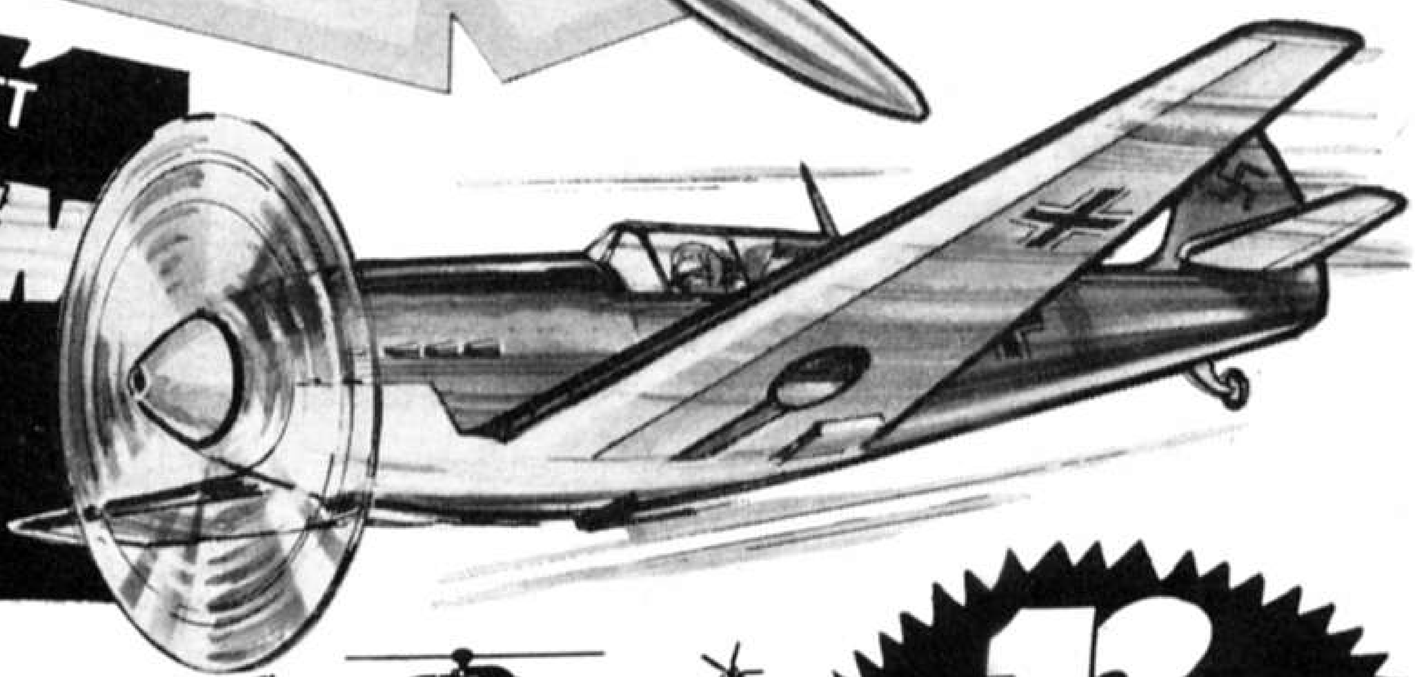


717 Boeing 737

715 Beechcraft C55 Baron

722 Hawker Harrier Jump Jet

724 Sea King Helicopter

719 Spitfire Mk. II

721 Junkers JU87b Stuka

725 F-4K Phantom II

723 Hawker Siddeley Executive Jet

710 Beechcraft S35 Bonanza

726 Messerschmitt Bf109E

712 U.S. Army T-42A

728 RAF Dominie

12 BIG PLANES IN THE DINKY RANGE

Tropospheric Scatter

Voice and data transmissions for telemetry and control systems for four oil rigs in the B.P. Forties Field in the North Sea will be carried over a "tropospheric scatter" radio link bridging the 110 miles between the oil platforms and the shore terminal near Aberdeen. This is the first time that this advanced system has been used in connection with oil production in Europe, and the £350,000 contract was won by Marconi Communication Systems Ltd. against Japanese and American competition.

The system is remarkable for the number of channels operable on a single frequency—132 in this installation. Two 30 ft. dish aerials on the shore station and two 15 ft. dishes on each of the two of the four platforms will give main and standby links. The conversations etc. pass between the platforms by conventional microwave radio paths. The whole equipment is designed to operate unattended over long periods.

Quite a Wrench

It is eighty years since a patent was granted to Swedish engineer J. P. Johannson for the first adjustable spanner (or wrench), which obviated the necessity for engineers to carry an enormous set of non-adjustable tools around. Johannson started the Bahco Tool Works, which is now one of Europe's top tool manufacturers but still makes more adjustable wrenches than anything else—some 2½ million each year. The fifty millionth Bahco wrench was made a few weeks ago, which is a pretty mind-boggling thought.

Steam

The Great Western Society's locomotive depot, at Didcot, is open to the public on Saturdays (1400 to 1800) and Sundays (1100 to 1700), and has some fine steam locomotives and rolling stock on view. At least one engine will be in steam over the Bank Holiday weekend and on October 7th and 8th, and several engine and other attractions on the main "open days" on September 16th and 17th.

A special train hauled by No. 6998 *Burton Agnes Hall* (the first public tour by this engine since purchase in 1966) will leave Paddington on Oct. 1st for Tyseley Open Day, stopping at several stations on the way. Send a foolscap s.a.e. to Steamtrip, 80 Lambourne Drive, Cox Green, Maidenhead, Berks., for details.

Driver Comfort

Measures to improve driver comfort and hence reduce fatigue and increase safety are being taken by heavy lorry manufacturers. The latest Guy 16 to 32 ton vehicles will be fitted with suspension seats adjustable by the driver to suit his driving position and weight and the vehicle's suspension characteristics. Noise also is getting a great deal of attention with more efficient engine insulation, cab sound-proofing, and re-siting of noise-producers like the air intake and filter. We are all in favour of such measures; we hope, too, that efforts are also being made to reduce emitted noise for the improvement of the environment for those *outside* the cab, since the thunder of the average large vehicle is still one of the louder noises most people suffer!

Exhibition

Ilford and West Essex Model Railway Club's 17th Annual Exhibition will be on at Ilford Town Hall, Thurs., Oct. 26th–Sat., Oct. 28 (3–9 Thurs. and Fri., 10–9 Sat.). Ten model railway layouts, live steam passenger track, tram layout, exhibits and trade stands, films, refreshments etc. Adults 15p., Children 10p.

GLOBE-TROTTER WINNER

Globe-Trotter Winner

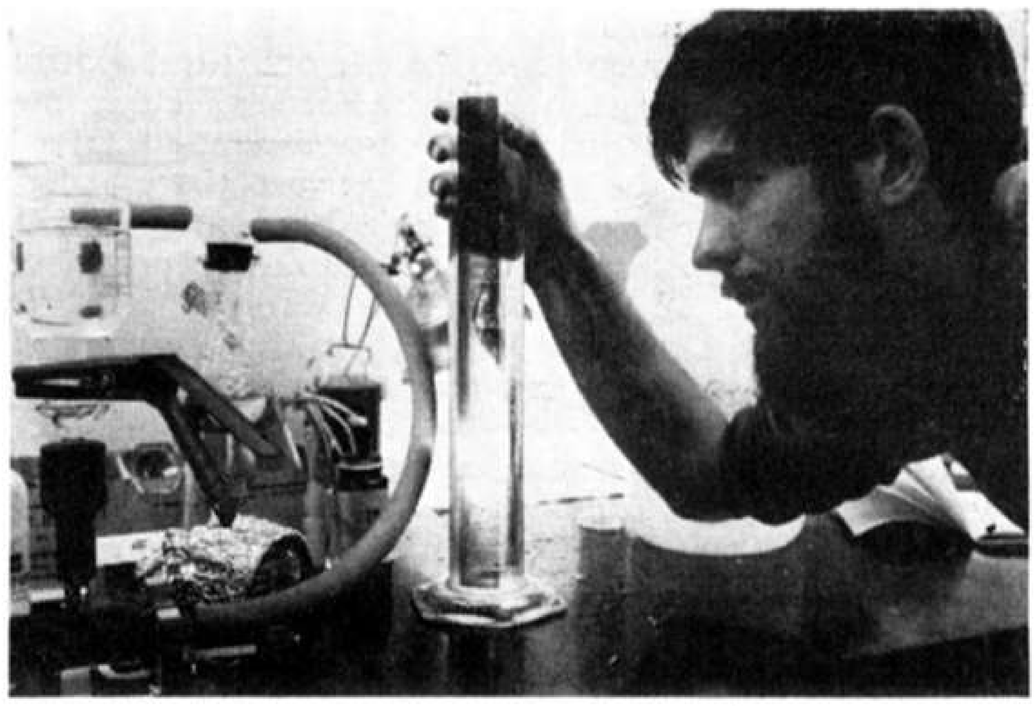
On the Entry Forms for the Meccano Globe-Trotter Competition, which closed at the end of June, it was stated that the contest winner would be announced in the September issue of Meccano Magazine. Unfortunately, however, circumstances did not permit the judging to be held in time for the announcement to make that issue, but we are pleased to report that the result is now available. By a unanimous choice the judges have selected Mark Knowles of Laverstock, Salisbury, Wilts., as overall winner with a magnificent reproduction of an early American Steam Locomotive preserved at Disney World in Florida, U.S.A. Mark's Meccano version captures all the distinctive lines of the original, but the judges were really confirmed in their decision by the fact that the model is a genuine live-steam locomotive, powered by the Meccano Steam Engine. It really works and we hope to feature the model with full constructional details in a future issue of Meccano Magazine.

For his prize, Mark, with his father, will be flown out to Florida in a B.O.A.C. Jumbo Jet later in the year for a holiday (at Meccano's expense), during which he will visit Disney World and see the original loco "in the flesh". At the time of writing, it is planned that he will take his model with him and we hope to bring you a photograph of the two locos together in due course.

The winning entry in the Competition was chosen by a distinguished panel of judges consisting of Sir Alec Issigonis, designer of the Morris Minor and Mini cars and now Design Consultant to British Leyland, Mr. Michael Riddle, Midlands Passenger Manager for B.O.A.C., Mr. H. J. Fallmann, Managing Director of Meccano (1971) Ltd. and Mr. Frank Casey, Managing Director of Brunnings Advertising and Marketing (Liverpool) Ltd. The runners-up in the Competition have also been chosen and each receive a No. 5 Meccano Set as a consolation prize.

Pollution of Water

An important topical subject looked at by Donald S. Fraser



POLLUTION, pollution, pollution. Everywhere. That is the cry in this contagion-conscious age. And not only here in Britain, for it is the same the whole world over from the Arctic to the southern seas, where this menace is seriously taking control of our environment. Land, seas, rivers and lakes, and even the air we breathe, are all being severely affected and shaking us out of our usual complacency with the tremendous problems which now threaten our very existence.

Something must, and is, being done to halt this dangerous advance before it is too late. Now, it is killing a multitude of life—people, animals and plant life—as it creeps insidiously into our everyday existence. Many of our rivers and lakes are filled with detergents and noxious chemicals from industrial wastes; our seas are being subjected to raw sewage and oil spillage; fumes from motor vehicles and factory chimneys affect our lungs with carbon monoxide and other toxic chemicals, while household garbage and refuse is creating mountains of indestructible waste ideal for breeding germs. These are but a few of the problems which are confronting us here at home and abroad today, where pollution is rampant.

The examination of pollution generally is a vast subject. In this instance we are considering what is happening to our sea and water supplies. One thing is sure, however, many of our problems have been caused by the consequences of technological innovation. We have been prepared to accept these advanced scientific improvements but were not, apparently, ready to adjust ourselves accordingly. This is especially true as regards all water, as more than a quarter of the surveyed 20,000 miles of Britain's rivers, and almost half of the country's 1,500 miles of canals, are officially polluted. Not forgetting that all our tidal waters, estuaries and seas around our coasts are being treated as open drains and dumping places. Plankton, for instance, the basic ingredient of all sea life, is being contaminated with D.D.T. All these things constitute hazards to fish life which show traces of deadly cadmium, cyanuric chloride and nerve-poisoning methyl mercury in their stomachs.

The breadth and scope of the damage being done to Britain's waters shatters all precedents. However, much is now being done to correct this deadly situation. The Department of Environment, in a recent statement, has announced plans to clarify conditions in most of the worst troubled areas. A watchdog Royal Commission on Pollution has been formed to focus attention where it is most needed. Also, a group of scientists have endorsed an independent programme, "Blueprint for Survival", which aims to slow up the technological advancement, of things as they have been going, before it is too late to check pollution's advance. These are but a few of the interested participants trying to provide a concrete basis to meet better water-qualifying objectives, among which will be an immediate reduction of the phosphorus content in detergents, the prompt implementation of vigorous programmes to treat municipal and industrial waste, and to deal with the problems caused by oil spills, mercury, radioactive substances and other hazardous material entering our waters.

The Department of Environment is to proceed with a £700,000,000 five-year clean-up of Britain's rivers, a provisional international agreement has been arranged to clean up the North Sea, a £30,000,000 programme to salvage the Tyne area—one of the worst affected, where every day 40,000,000 gallons of untreated effluent pour into the river, plus the waste of 900,000 people—also the River Severn and Bristol Channel, which now harbours the waste of 1,100,000 people—40 per cent of the population of Wales—that is poured daily into these waters. With conditions such as these, urgent action is required to prevent our waters from further accelerated eutrophication.

One of the most successful programmes to combat water pollution is taking place in the North American Great Lakes, situated between Canada and the United States, under the direction of an International Joint Commission. This vast inland sea area, covering some 100,000 square miles, has been very seriously affected.

Water, without which we would be unable to survive, is receiving considerable attention on the Canadian side

Top, Bob Collins of the Fisheries Research Board works on plankton filtration aboard the research vessel M.V. *Martin Karlson*. Left, initial process work in one of the small laboratories on board the *Martin Karlson*. More detailed secondary tests will later be made ashore.

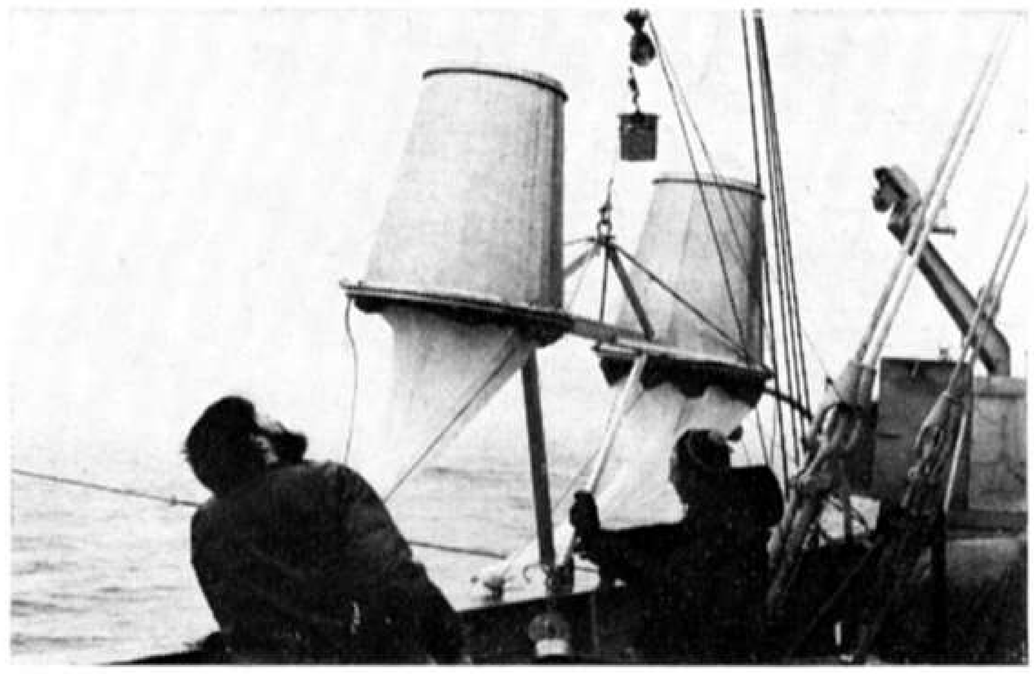
of the Great Lakes. Even though this nation contains one-third of the entire world's fresh water supply, a big scientific assault has been under way for some time to clean up and protect her inland fresh water interests. The Canadian Fisheries Research Board, in conjunction with two other Canadian Government departments, aided by academic and industrial agencies and institutions, have formed the Canada Centre for Inland Waters, which investigates scientifically all problems pertaining to fresh water pollution. This organization will be a permanent one from now on.

As the land-locked voices of social conscience cry ever louder, this group of skilled and dedicated scientists is actively pursuing its vital business in the endangered waters of the Great Lakes with increasing vigour. These men and women, with origins in a score of other countries, including the U.S.A., Egypt and Germany, are experts in such disciplines as limnogeology and water quality, and have been gathered together in this daring, carefully-planned assault at arresting the misuse of Canada's most valuable mineral—fresh water.

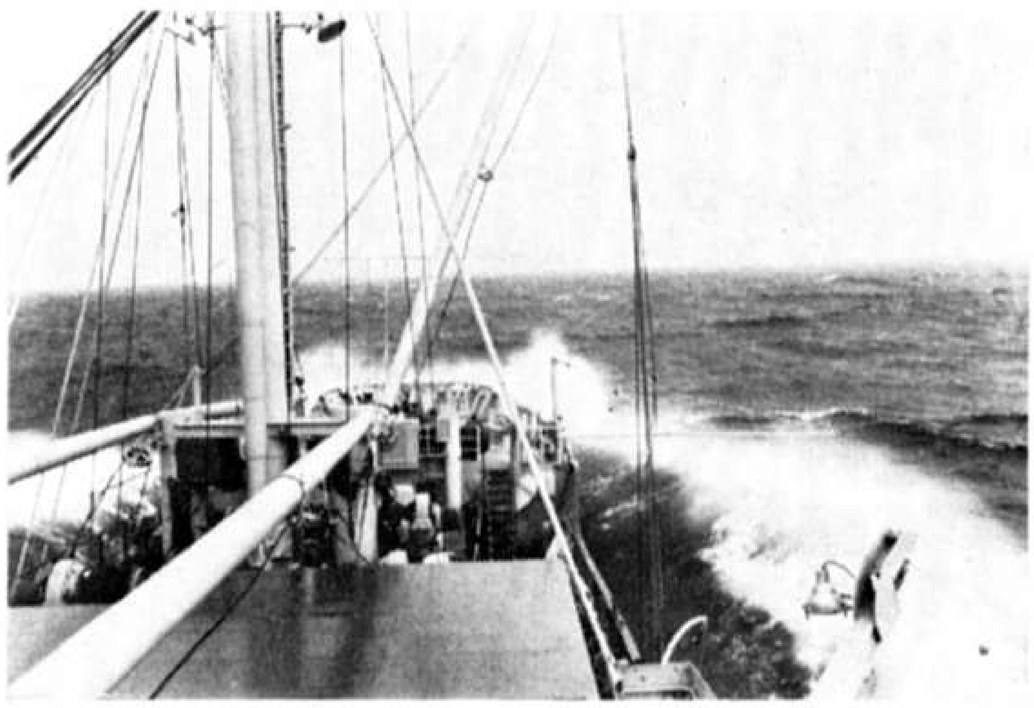
Their task is to study fresh water by probing its physical, biological and chemical properties, and economic and engineering aspects. The effects of floods and droughts are also studied as practical solutions to current pollution problems. All these avenues of research are being studied with the outside help of many agencies and institutions.

The staff of 150, soon to increase to 300, will eventually number 1,000 when they move into permanent quarters, a $23,500,000 government building complex, at a later date. At present, the Centre's offices and laboratories are contained in a collection of interconnected caravans near Hamilton, Ontario, and their work forms the most promising bulwark against the threatening spectre of total ecological pollution in Canada.

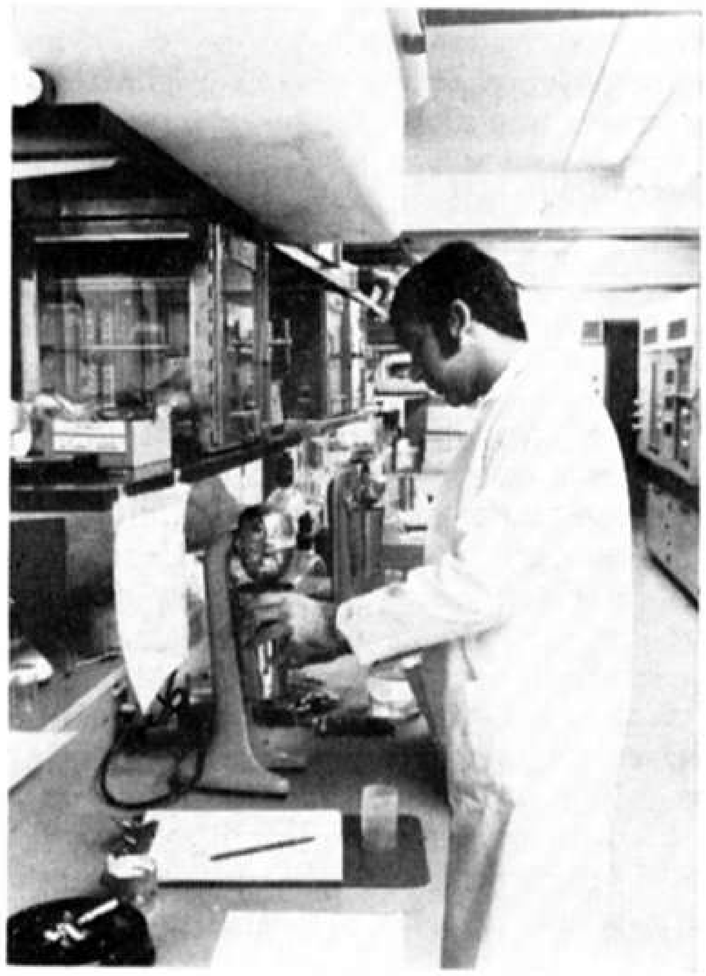
The choice of location for this unique research group has placed them in the geographical middle of the largest treasury of fresh water in earth. Contained in the great Lakes (shared by Canada and the United States as part of a common boundary and a world-renowned waterway

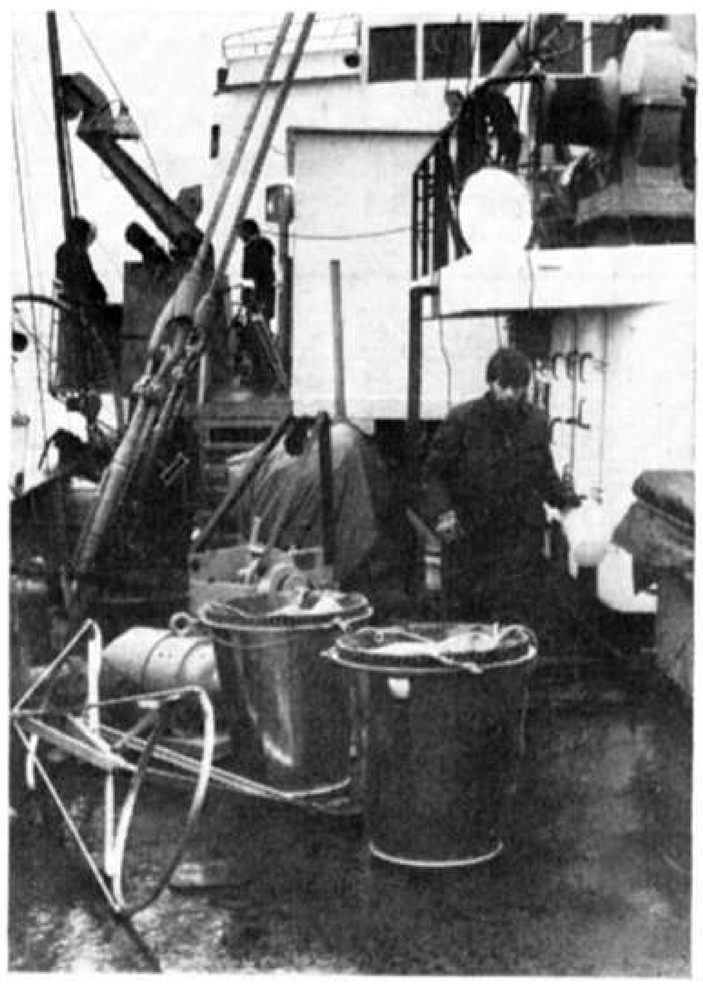


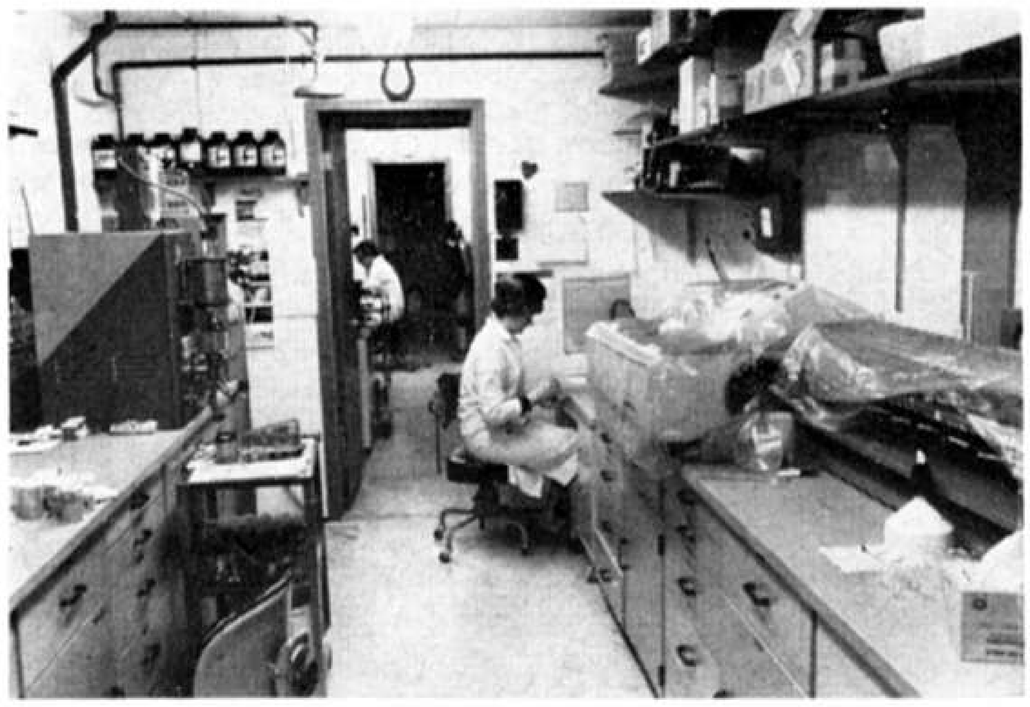
Above, Plankton sampling nets are prepared for a haul in Lake Ontario. Below, winter scientific cruises on the lakes can produce their share of bad weather, as this picture of seas breaking over the bow of the *Martin Karlsen* indicates.



Below left, work going on in the Sedimentation laboratory of the shore facilities of the Canada Centre for Inland Waters. Centre, scene on deck of M.V. *Martin Karlsen* at one of the scientific stations in the middle of Lake Ontario. Right, a *Knudsen* reversing water bottle, for obtaining temperatures and water samples is lowered into Lake Ontario while a secchi disc for measuring the transparency of the water is slowly sunk down until it disappears from view. A string of several water bottles are usually lowered on the same wire to get water samples at varying levels. When in position a brass weight or *messenger* is slid down the wire which triggers the open ends of the bottles and traps a sample of water in each at its particular level. The bottles also swing into an upside down position in order to lock the thermometer readings.







Top left, view of the temporary offices and laboratories of the Canada Centre for Inland Waters. Centre, part of the Organic Geochemistry laboratory at the Centre. Bottom, work in the Data Processing section which is linked to McMaster University's computer facilities.

for shipping, fisheries and recreation) is enough water to cover all of Canada's provinces and two territories (the Northwest Territories and the Yukon) to a depth of eight feet. Depending on this water are many great cities and agriculture lands containing 40,000,000 people. This huge industrial area is likely to become, in 30 years time, part of the greatest megapolis in the world—stretching from Duluth, Minnesota, U.S.A. past Chicago, Detroit, Toronto, Montreal to Quebec City—1,000 miles of densely-populated regions depending on plentiful fresh water.

Not only concerned with the Great Lakes region, the Canada Centre for Inland Waters carries out research in other inland waters and is engaged in limnological research across the nation to British Columbia.

But the big current enquiry is in the Great Lakes and from their headquarters daily, their vessels criss-cross these big inland seas on their continuing task of collecting scientific data. A year round job, the ships and boats regularly visit predetermined sampling spots, take water samples, specimens of the lake bottom, cores of the underlying lake bed, the organic materials floating in the water and make a variety of probes into the properties of the lakes.

In summer, much of the work is carried out in pleasant conditions, but in winter, when the observations must be continued, the 24-hour exercises are often made during trying days of rain, snow and sleet, amid rough seas pushed high by the heavy winds of cold, dense air. And often, ice conditions in the lakes are a peril with which they must contend. For the scientists and technicians, this work on deck is followed by lengthy scientific analysis in a pitching and tossing laboratory built in the holds of a chartered sealing vessel. Later, on shore, the samples are thoroughly studied in a more detailed manner by the staff of the Centre's many laboratories.

As the months pass by and several years of exact study are accumulated on water-qualifying methods, an intricate pattern of cause and effect will emerge and form a basis of action which will assuredly bring a new and purer era than that existing today.

For a change, the backroom boffin boys may be tackling a somewhat negative problem, for them, but we can rest assured that their answers will be of a positive nature to ensure a cleaner and purer water supply for all mankind.

SWINGING MONEY (*continued from page* 493)

of Westminster. The waves represented the Thames, so strongly connected with London. The bank was once called the London and County Bank so this sign was appropriate.

The Midland Bank, as its name suggests, had its origins in Birmingham. Its coat of arms, granted in 1952, combines the red cross and sword taken from the City of London's arms, with quarterings from Birmingham City's arms. Gold coins are guarded by a griffin while a dragon from London's arms also helps.

Bexants or coins of gold appeared too in the National Provincial Bank's sign, before amalgamation with the Westminster. It may seem odd to see an urn in a bank sign but "The Flower Pot Inn" once stood where the head offices are today, so an urn recalled this inn. Squirrels suggest saving. The Bishop's Gate connected the bank with that part of the City too.

One of the oldest Banks, dating from 1692 (and even earlier, some think), is Coutts and Co. Then, John Campbell traded at the sign of the "Three Crowns" next to the Globe Tavern. Today Charing Cross station stands where once business men met, but the banking firm have retained the three crowns in their sign—a fitting one, as they are the Royal Bankers.

There is no necessity to have signs swinging outside our banks nowadays. We can nearly all read, sign our name on cheques and count our coins. Fortunately our bankers retain these picturesque direction finders, retaining with them a touch of romance and history in the world of finance.

The Mill she is built of wood, iron and stone,
Therefor' she cannot go aloan
Therefor' to make the mill to go,
The wind from some part she must blow . . .

THE reader who cares for the older England so fast passing away before our eyes finds a melancholy pleasure in such lines as these. For the windmill in a remarkable degree instances the way in which mechanical and wholly utilitarian devices of a past age not only did not jar with natural surroundings but, in fact, added an individual charm to the landscape.

Age and decay have so shorn the English countryside of its windmills that of the 10,000 which stood in their heyday to grind "by God's fair air" only the remains of probably 1,500—precision is impossible because the decline of the windmill has been so rapid this century, and is continuing—can be seen today, and of these only about a dozen are still working.

"A Couris Thing"

Some interesting facts of Windmills discussed by D. England

The oldest mill in the country still grinding corn is the post mill at Outwood, near Redhill, Surrey. It was built in 1665, and about twenty years back it was extensively renovated. Further work has been carried out since, with the assistance of official grants, to ensure its preservation. Members of a notable milling family, the Jupps, have worked there for over two centuries. According to tradition men watched the ravages of the Great Fire of London from the top of this mill the year following its erection.

Until the early sixties there was a second mill close by. This was a tower mill, but it collapsed one night during a gale. Alas! that too often has been the fate of our windmills. Except for those which have been saved by action on the part of county councils or by practical enthusiasts, England's windmills are derelict, armless, half-ruined and crumbling into decay. A few more may be reconditioned and preserved as historical monuments, but for the majority the only record will be in a number of monographs that have been affectionately compiled for the windmills of several English counties.

The picture was far different not so many years ago. Old people can recall the time when from the Sussex Downs the sails of as many as thirty mills could be seen whirling at the same time on a fresh autumn morning. And from his platform at "Old Crome's" mill, Mousehold Heath, on the outskirts of Norwich, the miller could count a dozen other mills grinding simultaneously with his own. That great East Anglian artist, John Constable, always kept a model windmill in his studio from which to correct his sketches for painting.

Just on a century and a half ago, travelling towards Ipswich, and not so many miles from what was to become known as the "Constable Country", William Cobbett was impressed by the majesty of these working mills. In his "Rural Rides" he commented that "the

The windmill at Stock is shown in the top photograph. On the right is Barham Mill on the high ground between Canterbury and Dover; this was extensively damaged by fire a few years ago.

Polegate Mill near Eastbourne in Sussex

windmills on the hills . . . are so numerous that I counted, whilst standing in one place, no less than seventeen. They are all painted or washed white, the sails are black; it was a fine morning, the wind was brisk, and their twirling together added greatly to the beauty of the scene . . . and . . . appeared to me the most beautiful sight of the kind that I ever beheld."

The mills were picturesque to the eye, but the craft was hard and often hazardous. The unknown writer of some lines discovered many years ago in a Sussex mill clearly knew at first hand the trials and strains of a miller's life.

A windmill is a couris thing,
Completely built by art of man
To grind the corn for man and beast,
That they alike may have a feast.

A windmill has a primitiveness in appearance that entirely belies the genius that went to its construction. It ranks as one of the noblest of man's inventions; and in his classic "Windmills and Millwrighting" Stanley Freese writes eloquently of the skill and self-reliance of the mill wright, and alerts the reader to the complexity of the craft behind the seeming simplicity:

"To be an old millwright (one can say) is easy enough! All you want is a building (which you specially make) capable of meeting and dealing with wind from any quarter. You must, of course, provide space enough within to house the grain, and to feed the grain to the grinding machinery, and to collect the meal, and to make saleable flour, which is to be got away from the mill to the baker, who will make bread of it—good bread, that goes without saying. So you must make a building that will meet the weather and withstand it, that will seek the wind and receive it and take the rotatory power from it; that will house whirling machinery under the miller's exact control. You must find out the most efficient wind motor, and make every part of it yourself—out of trees for the most part; and once your mill is able to stand and to work, it must be safe, long enduring flexible."

Windmills have been called the "windjammers of the land", and the toll of the tempest could be millwreck as well as shipwreck. When money was not to be found for repairs, storm damage spelt doom. In a full gale the miller often had to make a crucial decision between two imminent dangers: having the mill cap and sails torn off or by trying to brake the racing windshaft, setting fire through friction to his whole combustible fabric.

A middle-aged miller related a terrifying experience of this kind he had as a youth: ". . . the whole mill rocked so that the sacks of meal that were standing in the breast were thrown down like paper, but I got to the brake lever somehow and threw all my weight on it, but it hardly seemed to check her. I knew that if the brake was kept on she was bound to catch fire, so I let her off, and round she went, running at such a rate that the corn flew over the top and smoke blinded and suffocated me . . . By this time the light had gone out, but I once more put the brake on, this time jumping up on to the lever and putting my shoulders under the next floor so that I could prise it down with all my strentgh. The sparks were flying out all round the brake as she creaked and groaned under the strain, but it still didn't stop the

Herne Mill in Kent. As a point of interest this mill belonged to the family of a school friend of the Editor and worked regularly during the 1930's.

Another Kentish mill, that of Cranbrook, which dominates this attractive old village

sails; and I doubt whether anything could, had not the hurricane itself subsided as suddenly as it sprang up."

A veteran Norfolk miller of over 80 years of age recalled being told that he was carried into Billingford mill, one of the prettiest ever built, at the age of one. Not many years later, by the time he was twelve, he had to work this same mill: "Sometimes I would sit in the cap and listen to the sails going round. There was music and poetry in the wind, for it speaks a language of its own, sometimes friendly, sometimes fierce and disturbing. Few things can be more inspiring than to mount the highest stairs to look out at midnight (night work was a necessary part of the miller's life) upon the sweeping sails, and to hear the music of the wind in their movements. Few experiences, however, are more fearful than being in a windmill on a wild night with only a candle to lighten the darkness, when keen imagination calls grotesque figures to stand out in all shapes and forms upon the walls".

His father was a lifelong miller of the old school, now long gone, who could prepare the stones for wheat grinding, a real craftsman's job. Men of this calibre were real personalities, characters of many parts talking a language of their own. In his youth (which would be almost a century ago now) he heard them speak of their experiences, and of slow winds, gales, stocks and sails, of French burr and peak stones, and bolting machines as well as steel picks for putting fine cracks in wheat stones. As has been suggested, there was a kinship of character between sails at sea and those on land, and the millers always used the nautical term "to luff" when bringing the sails into the wind. They were mechanically-minded, capable, industrious, independent men who loved their craft, and who successfully met the demands of their age.

There strength was astonishing, and to the very end some millers were scornful of the sack hoist. One Suffolk stalwart declared that it was an encouragement to laziness, and to illustrate the ease of sack humping he ascended his tail ladder with one on his back. Half-way up he stopped to carry on a conversation with his carter before completing the climb. In order to assess the feat properly one ought to bear in mind that a miller's sack is equivalent to two sacks of coal.

An old and hearty miller, well into his eighties, and of no particular physique, related with much gusto how in his early days a party of millers, having nothing particular to do one holiday commenced the usual bragging contest. Two sacks of flour, four hundredweight, were lashed together and a sweepstake arranged, the proceeds to go to the man capable of lifting the two sacks. One man succeeded by a few inches, whereat the teller of the tale demanded long odds for carrying this load. The bets were made and he won by carrying the two sacks quite across the mill.

Dressing the millstones was a skilled and hard job. Hours were long and wages low. A veteran recalled how he had to work from six in the morning until six at night (Saturdays the hours were shorter—they stopped at five!), with only an hour and a half for meals. He well remembered times when he and his master were kept busy until nine p.m., midnight, and even to two in the morning when business was brisk. The over-time rate was fourpence an hour. The dressers used picks made of steel specially tempered for the work of cutting the channels or furrows. The dresser's hands told the tale of his occupation, for the blue streaks on the back of them showed where the flying splinters had got embedded under the skin. Such men had their rounds travelling from mill to mill.

SIX OF THE BEST

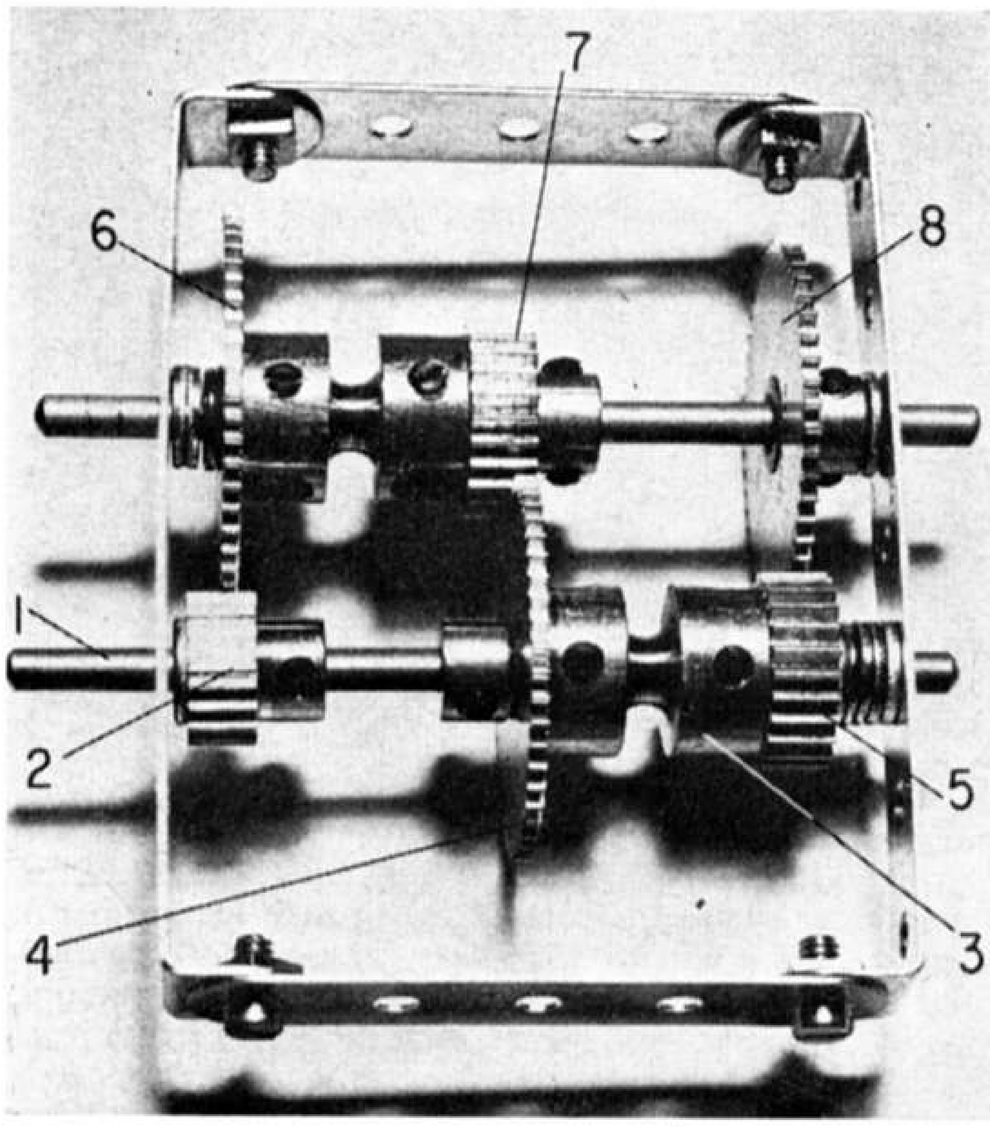
(*continued from page* 489)

Bristol Beaufighter, RD253.
Bristol Belvedere, XG474
Supermarine Spitfire F.24, PK724.
E.E. Co. Canberra P.R.3., WE139.
Sikorsky Hoverfly I, KK995.
Vickers F.B.5, replica 2345/G-ATVP.
Sopwith Triplane, N5912.
S.E.5a, F938.
Vickers Vimy Replica, G-AWAU now F8614.
Tiger Moth (being restored), T6296.
Supermarine Stranraer 920 QN of 5 BR Sqdn. R.C.A.F.
Boulton Paul Defiant, N1671.
Avro Lancaster, R5868.
DH Mosquito, TW117
Supermarine Spitfire I, K9942.
Gloster Meteor Mk. IV Special, EE549.
E.E. Co. P.1B Lightning, XA847.
Blue Steel, unserialled.

Camm Memorial Group
Hawker Cygnet, G-EBMB.
Hawker Hart Trainer, K4972.
Hawker Hurricane I, P2617.
Hawker Tempest V, NV778.
Hawker Hunter, WP185.
Hawker Hart, J9941.
Hawker Hind (Afghan).
Hawker Typhoon, MN235.
Hawker Sea Fury, VX653.

Outside Main Building
Blackburn Beverley, XH124.
Short Sunderland, ML824.

Incorporated in Gallery Displays
Bleriot XXVII.
Fuselage of Bristol F.2B.
Fuselage of Morane-Saulnier Type BB, A301.
Nose portion of Bristol Beaufighter.



A remarkably compact triple-train Reduction Gearbox designed by Mr. Dennis Adams of Nairobi, Kenya.

Among the Model-Builders

with 'Spanner'

I RECENTLY mentioned in these pages that Cranes were among the most popular subjects for Meccano model-builders and this is undoubtedly true. Cranes, however, do not represent the only popular subject as any experienced modeller would take pains to point out. Probably equal in importance are road vehicles—cars, buses, lorries, etc.—and, in fact, because of the very wide variety of different prototypes in existence, there is strong evidence to suggest that such models are even more popular than Cranes.

If this is so, then one of the major reasons for it is that working reproductions of virtually all the mechanical features of the typical motor vehicle chassis can be produced in Meccano. Steering, brakes, gearbox, clutch, differential—all can be made and, indeed, literally scores of different examples have been featured in the M.M. over the years. Despite this large quantity, however, we have never once (to my knowledge) been accused of hammering the subject by readers and it is therefore reasonable to assume that motor chassis mechanisms are of interest to the majority of readers.

This brings me nicely to our first two contributed items this month—a Clutch Unit and appropriate Control Pedal, both designed by Mr. E. R. W. Schoolar of Tunbridge Wells, Kent. Referring to the Clutch, Mr. Schoolar says," I have found that the majority of friction clutches waste much of the available power due to friction in the wrong places and I have made several attempts to reduce this, resulting in this simple compact design. While still an effective friction clutch, it does not waste very much power through unwanted friction when engaged and takes very little power when disengaged."

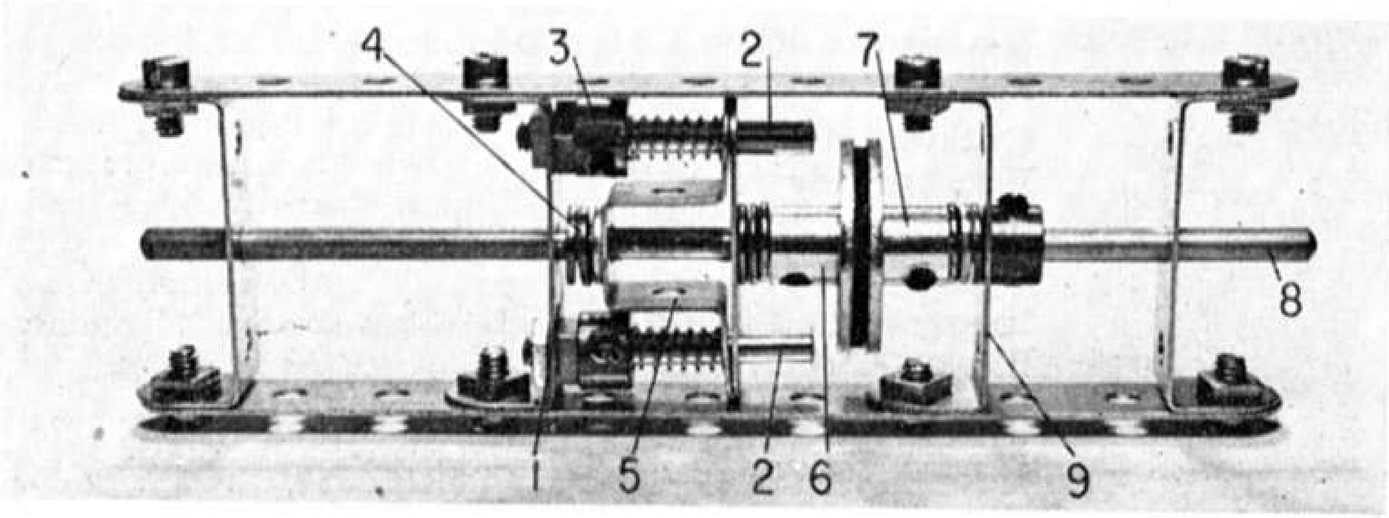
Secured to one of the input shaft supports 1 (represented on our demonstration unit by a $1\frac{1}{2} \times \frac{1}{2}$ in. Double Angle Strip) are two Long Threaded Pins 2, one each side of the shaft. A spacing Collar 3 and a Compression Spring are added to each Pin, while three spacing Washers 4 are added to the centre input shaft, then a Double Bent Strip 5 and a $1\frac{1}{2}$ in. Strip are mounted as shown on both Pins. Further spacing Washers are added to the input shaft, then an electrical 1 in. Bush Wheel 6 is fixed on the shaft, with approximately $\frac{3}{16}$ in. of shaft protruding through the boss of this Bush Wheel. A $2\frac{1}{2}$ in. Driving Band is added to provide the friction "plate", then the protruding Rod end is inserted part-way into the boss of a second electrical 1 in. Bush Wheel 7, fixed on the output shaft 8 which is held by a Collar in mountings supplied in our demonstration unit by further $1\frac{1}{2} \times \frac{1}{2}$ in. Double Angle Strips 9. In operational use, of course, the supports for both the input and output shafts would depend on the construction of the parent model. The two sections of the Clutch should be so arranged that the compression of the Springs allows a movement of approximately $\frac{1}{16}$ in.

PARTS REQUIRED

2—2	8—37a	1—45	2—120b
1—6a	8—37b	4—48	1—186
1—16	9—38	4—59	
1—17	1—38d	2—115a	
Electrical Parts		2—518	

Clutch Pedal

To disengage the drive in the Clutch described above, Double Bent Strip 5 is moved against the pressure of Compression Springs 3 and, as Mr. Schoolar says, this may conveniently be achieved by a simple clutch pedal, built up from a Small Fork Piece 10 attached by a $\frac{1}{2}$ in. Bolt to a suitable vertical support. A Crank 11 is held in the lugs of the Fork Piece by two $\frac{7}{32}$ in. Grub Screws which also secure a 1 in. Rod in the boss of the Crank. Fixed on



A compact and extremely effective Clutch Unit designed by E. R. W. Schoolar of Tunbridge Wells, Kent.

this Rod is a second Small Fork Piece 12, the lugs of which should be located astride the clutch input shaft in the "box" formed by Double Bent Strip 5 and the 1½ in. Strip. When the arm of Crank 11 is pressed down, the clutch is disengaged.

PARTS REQUIRED		
1—18b	1—62	1—111a
1—37a	2—69b	2—116a

Reduction Gearbox

Moving away from motor chassis mechanisms, we come next to a very compact reduction gearbox designed by 15 year-old Dennis Adams of Nairobi in Kenya. I found this particularly interesting as it illustrates extremely well a method of condensing a triple-ratio gear train into a small space by using only two supporting Rods.

Fixed on the input shaft 1 is a ½ in. Pinion 2, while free to revolve on the shaft is a Socket Coupling 3 which carries a 50-teeth Gear Wheel 4 in one end and a ¾ in. Pinion 5 in the other end. A Collar prevents the assembly from sliding on the Rod. A second free-running Socket Coupling, carrying a 57-teeth Gear Wheel 6 and a ¾ in. Pinion 7, is mounted on the output shaft, this assembly also being prevented from sliding by a Collar, while a 50-teeth Gear Wheel 8 is fixed on the shaft. Pinion 2 meshes with Gear 6, Pinion 7 with Gear 4 and Pinion 5 with Gear 8, all these between them giving ratios of 3:1 × 2:1 × 2:1 to result in a total reduction of 12:1. As Dennis points out, however, any combination of suitable Pinions and Gear Wheels could be used to give alternative ratios and the number of gear trains employed could be increased almost indefinitely. A very useful principle, Dennis.

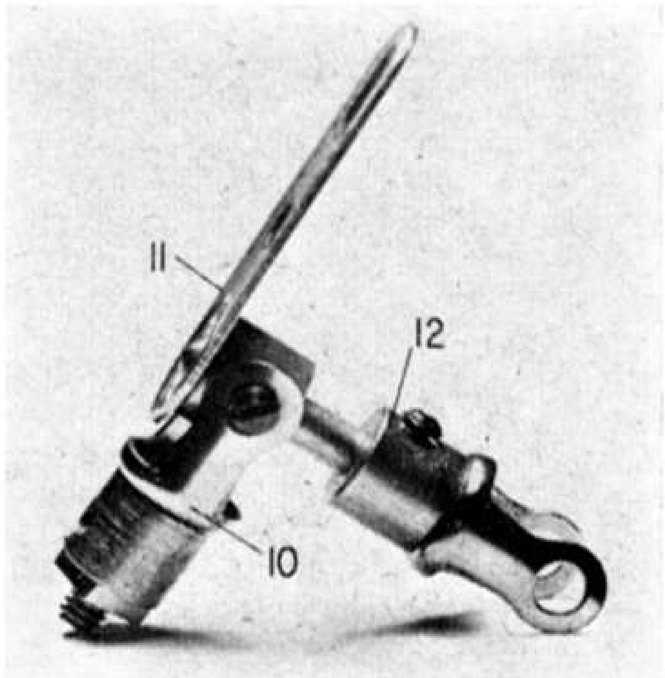
PARTS REQUIRED			
2—5	1—26	4—37a	2—48b
2—16	2—27	4—37b	2—59
2—25	1—27a	10—38	2—171

This simple Clutch Pedal has also been designed by Mr. Schoolar for use with his Clutch Unit.

Heavy-Duty Lorry

I would like to stay with Dennis Adams a little longer, now, to mention the rather appealing heavy-duty Lorry featured in the two accompanying photographs. At the time of writing, it is Dennis's latest construction, being a freelance design based on the Bedford 8-ton lorry with dropside body. The general lines are good and there is plenty of mechanical detail as Dennis's own description makes clear.

"Initial drive", he writes, "is by Sprocket and Chain and Worm reduction gearing from a Motor with Gearbox, set in the 60:1 ratio. The clutch (not visible in the photos) is built from two 1½ in. Contrate Wheels, held together by a Compression Spring, the pressure plate driving a 4 in. Keyway Rod which forms the gearbox input shaft. A ½ in. and a ¾ in. Pinion, held in a Socket Coupling, are free to slide on the shaft, but are obliged to revolve by Keyway Bolts. Gear-selection is by the normal fork arrangement, neutral being held by a spring-loaded pin engaging the groove in a ½ in. Pulley on the selector Rod. When the input gears are in neutral, reverse can be engaged by swinging up an arm on which a 50-teeth Gear is mounted, this Gear meshing constantly with a ¾ in. Pinion on the output shaft. The Gear can also mesh with the ½ in. Pinion on the input shaft to result in a 19:50:25 ratio in reverse. Forward ratios are 1:2 or 1:3, achieved by meshing the above-mentioned Pinions with their respective Gears.



"The working differential is similar to that in the October 1970 M.M. and the differential cage is bolted to working leaf springs. At the other end of the chassis, the steering operates through a 2:1 ratio, with the steering arms being set at an angle to the hubs."

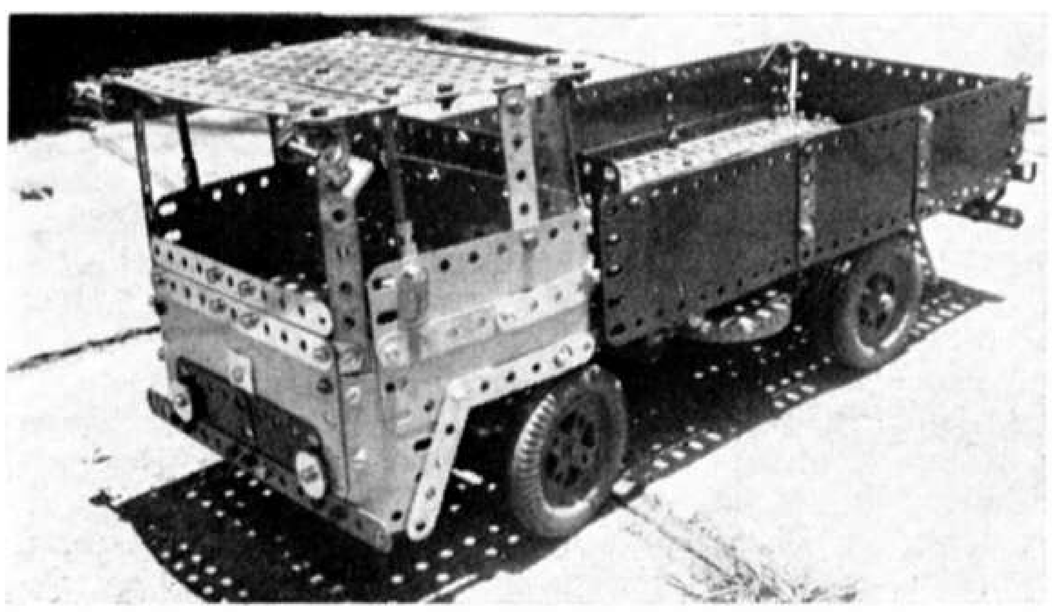
Dennis tells me that his parents persuaded him to send along the details of his model and I am pleased they did so. The model was well worth featuring.

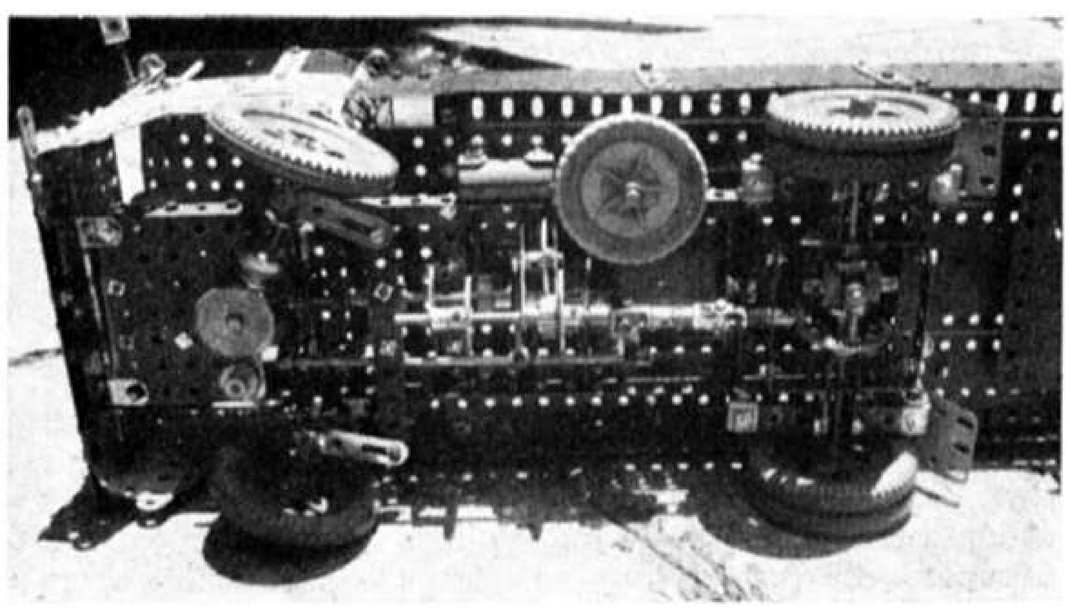
Reaching Awkward Places

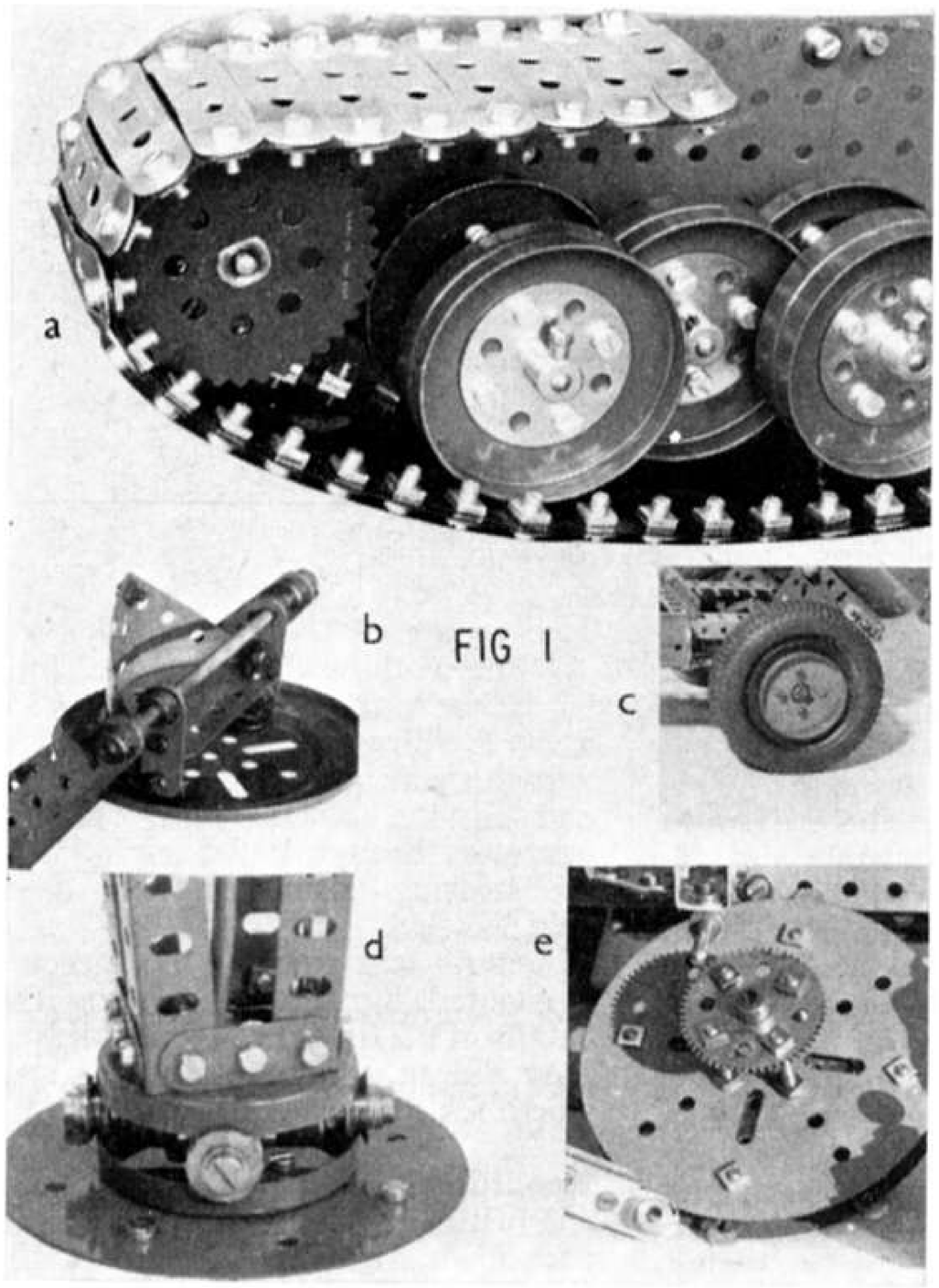
I just have time now to pass on an idea from Mr. Peter Brown of the Stevenage Meccano Club on a way of getting Bolts to difficult spots in models which cannot be easily reached by hand. Simply use the Nut Runner from the Meccano Super Tool Set! Load the Runner with a Bolt, sliding the head of the Bolt under the lips of the open side, with the Bolt shank projecting out through the space between the lips. Fit a Nut in the end of the Runner to hold the Bolt in, then locate the Bolt in its required position. Once in place, add a Nut to the Bolt to hold it in position, then release the Nut from the Runner which will allow the Bolt to come free. It's a remarkably simple idea—yet effective!

My apologies go to Mr. Brown for holding on to his idea for so long.

Mr. Adams of Nairobi is also the builder of this modern-looking "freelance" lorry based on a Bedford 8-tonner.







Meccano Parts and how to use them

Part 10

Rigid Circular Parts

By B. N. Love

Fig. 1a. Wheel Flanges form neat running gear for model tank tracks.
Fig. 1b. The flanged disc of the Ball Thrust Bearing serves as part of a passenger car on a fairground ride.
Fig. 1c. Footstep ring on a lorry wheel provided by a Wheel Flange.
Fig. 1d. Two Wheel Flanges form a strong thrust roller bearing with ½ in. Pulleys.
Fig. 1e. The 4 in. Circular Plate used as a power sprocket on a Crawler Tractor.

As the modeller develops his skill and increases his stocks of Meccano parts, he will come across the various rigid circular pieces in the system. Washers and Wheel Discs come into this category at the small diameter end of the range and the 9½ in. Flanged Ring, which is illustrated in Part 9 of this series, is the largest circular part in the standard list of parts. The smallest of the flanged discs is Part No. 137, Wheel Flange, which is designed to fit over a Face Plate with sufficient clearance to pass over the boss and Set Screw of the Face Plate to simulate a railway wheel. In fact, the clearance hole in the centre of the Wheel Flange is of ½ in. diameter, so it will also fit over the bosses of the larger Sprocket Wheels and the 3½ in. Gear Wheel. Fig. 1c shows a simple application of this part where it is serving as a footstep ring on a lorry wheel. The Wheel Flange can be used as a built-up wheel by bolting it to a Bush Wheel as shown in Fig. 1a, either single or twin flanges being used to provide running gear for a wide-form tank-track reminiscent of the famous German Panther and Tiger tanks. In Fig. 1d we see a further use of this part where it forms a thrust roller bearing with ½ in. Pulleys capable of supporting a large revolving crane superstructure or fairground model. Having a large clearance hole at its centre, the Wheel Flange permits cable entry up through a rotating mast to feed electric motors and lights in control cabins at the top. When bolted to a 4 in. diameter Circular Plate as shown, a strong base is provided and as the Circular Plate is also designed with a ½ in. diameter centre hole, cable entry is obtained through both components illustrated in Fig. 1d. Standard Meccano Sprocket Wheels are available up to 3 in. diameter but this does not limit the dedicated constructor. A special built-up "sprocket" wheel is shown in Fig. 1e and although it has only eight teeth, it is capable of driving the tracks of a model bulldozer of very generous proportions. In this case, two 4 in. diameter Circular Plates, Part No. 146a, are fitted with Narrow Strips sandwiched between them, suitably spaced by Washers. The tips of the Narrow Strips protrude ½ in. all round to engage driving dogs in the form of Angle Brackets bolted to the bulldozer crawler tracks. Slotted holes in the 4 in. plates can be clearly seen, and this permits the attachment of assemblies requiring latitude in spacing. Part No. 146 is a larger edition of Circular Plate No. 146a being 6 in. diameter but it is made in a gauge of steel about twice as thick as the 4 in. version. It, too, has a ½ in. centre hole and is suitable for making the base plates of turntables etc.

One of the "special-purpose" Meccano parts is the 4 in. diameter Ball Thrust Bearing which has useful sub-assemblies. One of these is the flanged disc illustrated in Fig. 1b where it is simply used as an ornamental dished base for a passenger cupola on a fairground ride. However, when these flanged discs are paired up, they become versatile wheels as Figs 2 and 3 illustrate. Fig. 2 shows a neat model of an Experimental Steam Carriage for which a solid single front wheel was required of appropriate scale. This was achieved by mounting two of the flanged discs, Part No. 168a, on Bush Wheels and placing them face-to-face on a short Axle Rod held in a forked steering arm. A second use for a pair of these flanged discs is shown in Fig. 3 where they form a neatly proportioned flywheel on a model Showman's Engine. However, this time the discs are not set face-to-face but are both mounted on the flywheel shaft with their flanges facing inwards. This gives the most suitable rim surface for maintaining a belt drive to the dynamo at the front of the model, but the

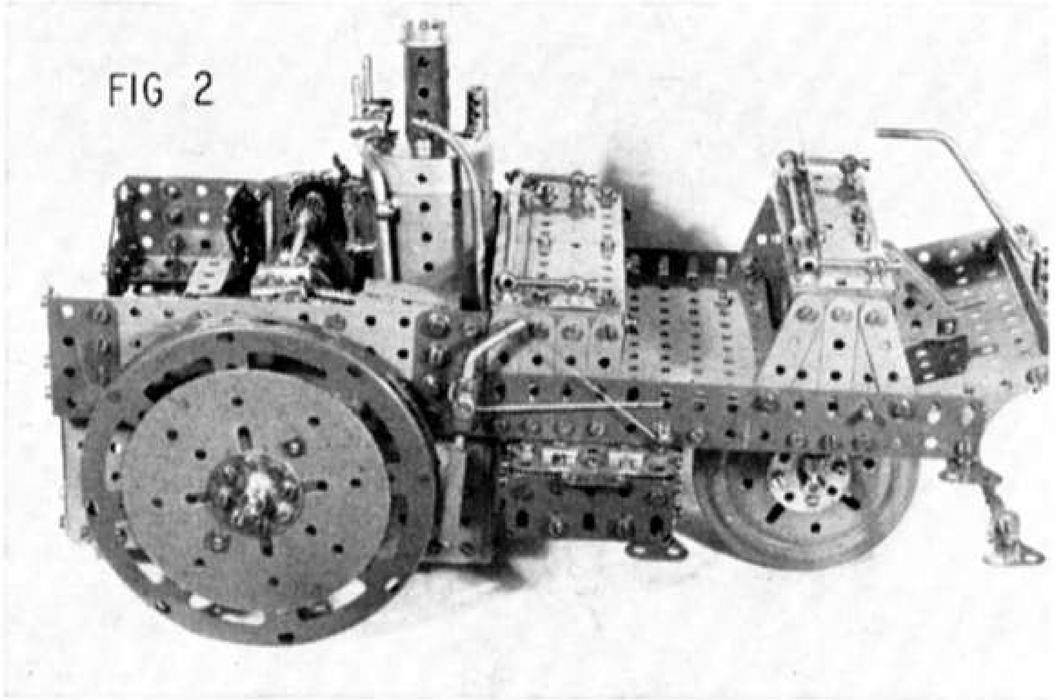


Fig. 2. An Experimental Steam Carriage model makes use of Hub Discs, Circular Plates and flanged discs for scale wheels.

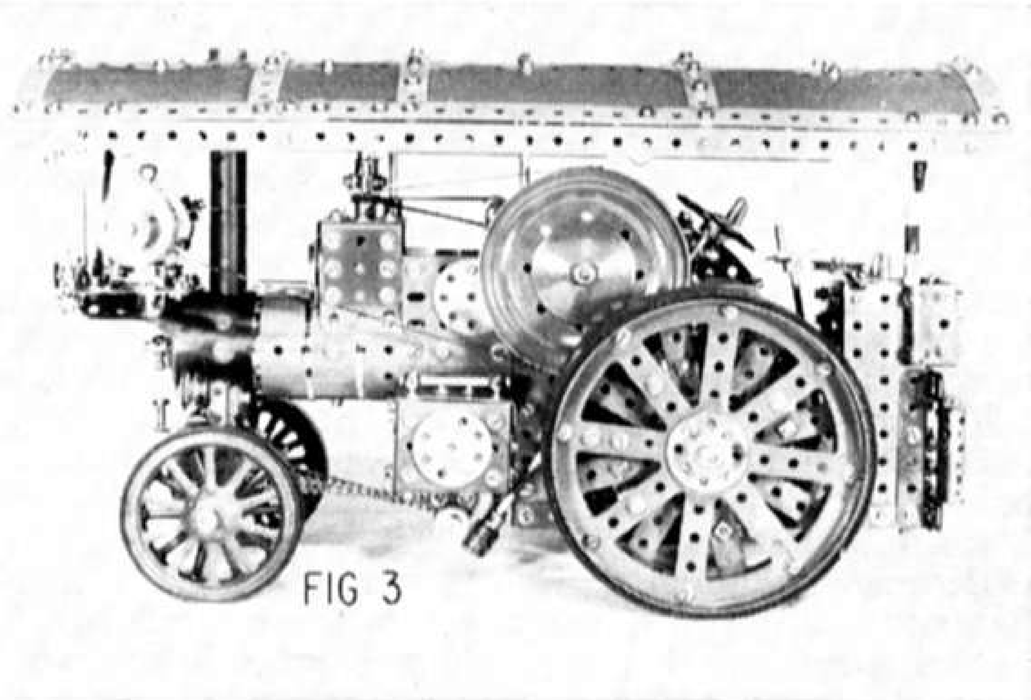
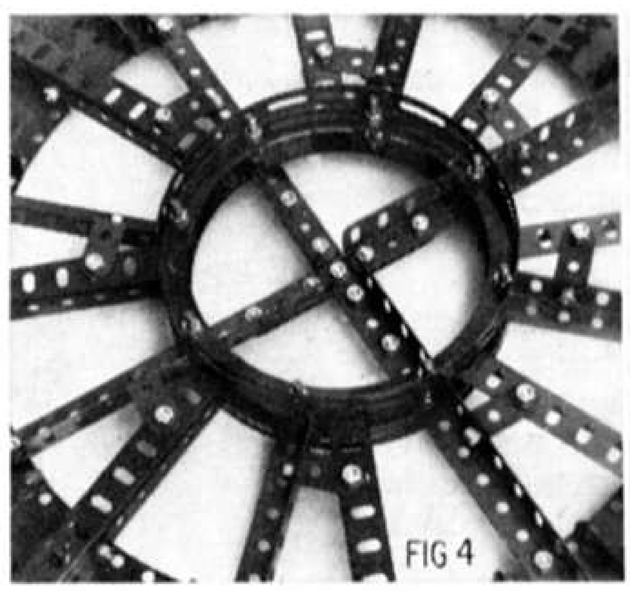


Fig. 3. A Showman's Engine making excellent use of Meccano circular parts for wheels and ornamentation.

setting up of a pair of these discs in this manner requires patience and care for trouble-free running. These latter two illustrations also show a further rigid circular part, i.e. the Hub Disc, Part No. 118. On the Steam Carriage in Fig. 2, the wheel is made from one Hub Disc largely covered in by a 4 in. Circular Plate and held in position by a Bush Wheel bolted to both parts. The Showman's Engine in Fig. 3 uses a pair of Hub Discs, each of which has eight spokes, but by staggering the spokes as shown and securing the Hub Discs together by Reversed Angle Brackets, the "interwoven" pattern, common to most traction engine wheels, is neatly suggested. Note that a similar staggering is given to the twin sets of 3 in. Spoked Wheels at the front of the Showman's Engine to give the multiple spoke effect. Wheel Discs mounted on the steam chest, belly tanks, and rear wheel hubs show the decorative effect of using these smaller circular parts.

Of similar proportions to the Hub Disc is the Circular Girder, Part No. 143. Both are $5\frac{1}{2}$ in. diameter and the Circular Girder may be considered as a Hub Disc with the spokes removed. Although not visible in Fig. 3, a Circular Girder is sandwiched between the two Hub Discs forming the rear wheel of the Showman's Engine. This gives a $1\frac{1}{2}$ in. broad rim to the rear wheel which permits a wide "tyre" to be attached for good scale appearance. Fig. 4 shows a pair of Circular Girders forming the centralising joint of a radial network of Angle Girders forming a large circular base or massive wheel for a fairground ride. A feature of both the Hub Disc and the Circular Girder are the long slots in the flanges of both parts. Basically, these components have eight holes spaced round their circular rims at 45°, but there are occasions when a six point attachment is required, or multiples thereof. The points on a clock dial is one case where an eight spacing is very awkward, but by placing Bolts or Threaded Pins in the slotted holes of the flanges, a twelve point attachment is simple. Finally, the 167b Flanged Ring, (which is actually listed as $9\frac{7}{8}$ in. diameter), is illustrated in Fig. 5. It has two sets of attachment holes, one set of eight in the rim and one set of sixteen in the flange. These can be clearly seen in Fig. 5, and it would appear that there is a convenient 5 hole spacing between the sixteen flange holes. This is not the case however, and the Flexible Plates shown are stood off from the flanges by Washers to increase the radius of attachment to accommodate the five hole spacing shown. As the Flexible Plates have slotted end holes, this helps with the spacing problem. In larger scale traction and showmen's engines, these large Flanged Rings are commonly used for the rear wheel sections but the depth of the rim gives an out of scale appearance. It is better, therefore, from the constructional point of view, to avoid these for traction engine wheels and to build up from Curved Strips. Although Fig. 5 shows the base of a turntable drum, the advanced constructor will see its possibilities as a flywheel for a full size model of a motor car engine!



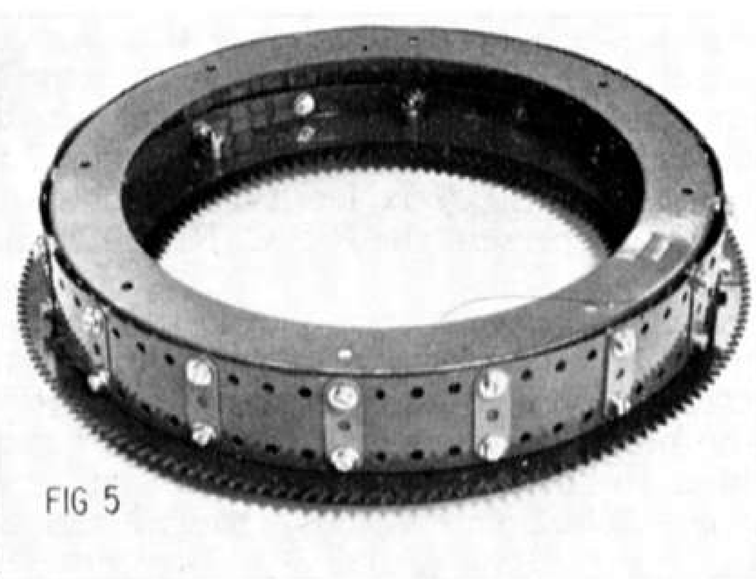
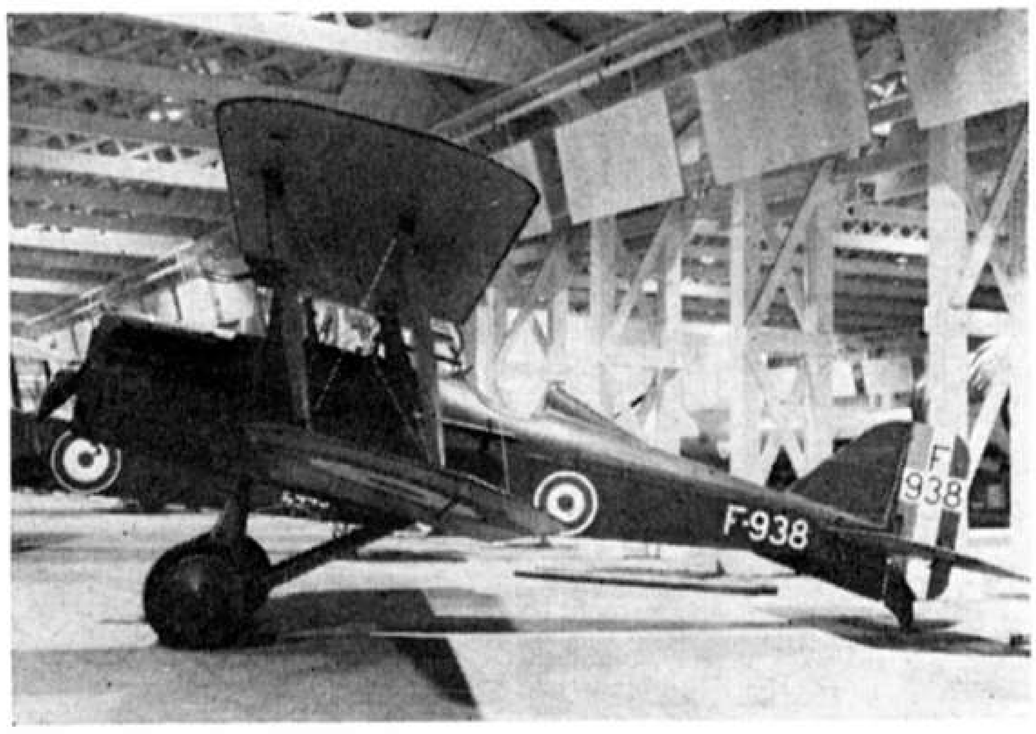


Fig. 4. Right, the Circular Girder as a hub centre. Note elongated slots in the flange for varying attachment points. Fig. 5. Far right, Part 167b large Flanged Ring gives shape and strength to circular bases for turntables and flywheels.

Six of the Best

UNFORTUNATELY for us all, very little was done after the ending of either the 1914–18 war and 1939–45 war to ensure that examples of all the aircraft which had helped keep this country free were preserved for posterity. Thus it is that we no longer have a Hampden, Whitley, Halifax, or Stirling, unless some of the expeditions currently diving around our coasts and off other coasts, manage to salvage sufficient to restore one of these types. However, after many years of hard work, a team led by Dr. John Tanner, M.A., Ph.D., F.R.Hist.S., assisted by Jack Bruce, M.A., F.R.Hist.S., A.R.Se.S., and Ray Lee, has managed to obtain nearly a hundred and twenty magnificent aircraft for the R.A.F. Museum, due to open at Hendon in November.

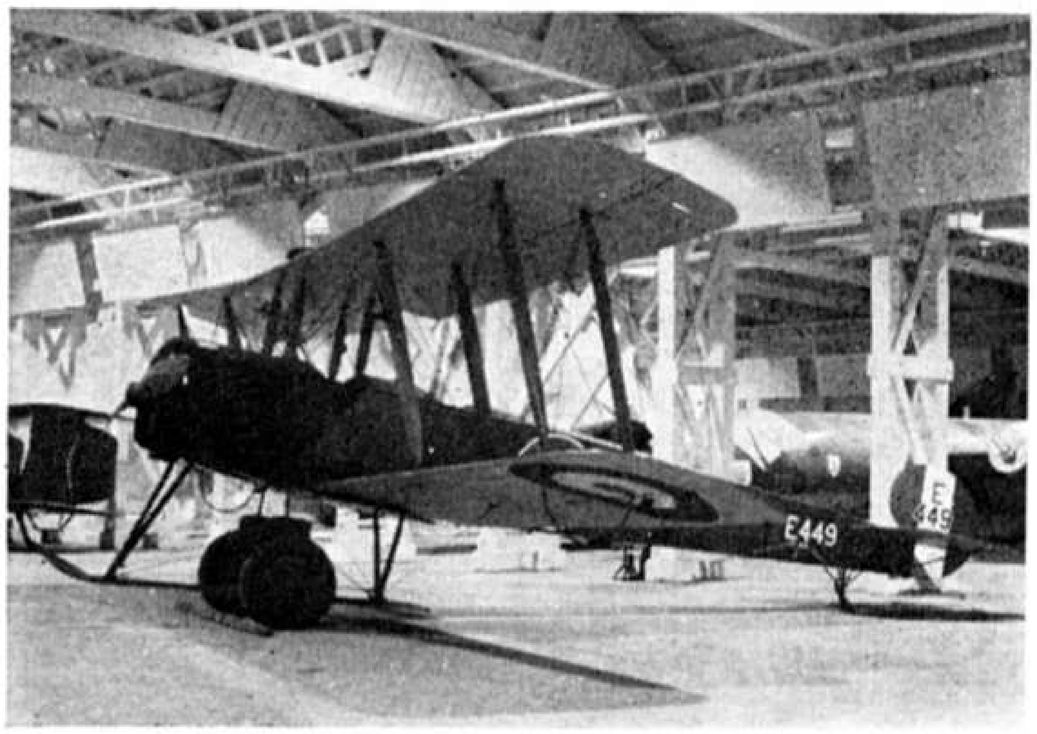
Because unlimited cash is not available and since funds are still urgently required for the museum, it is unlikely that more than about 40 machines will be in the opening display. The others will be stored at major R.A.F. airfields such as Cosford near Wolverhampton, Topcliffe, Yorks, Colerne, Wilts, and St. Athan, Glamorgan (where aircraft are exhibited on Battle of Britain Saturday and sometimes on other days by appointment). Then, if all goes to plan, the Hendon display will be changed after a time for special anniversaries featuring, for example, "famous fighters", including some captured Luftwaffe, Italian, and Japanese aircraft contained in the "stores" mentioned. This has meant that a careful choice has been made for the opening display and I wonder what *your* "Special Six" would be of those likely to be there in November?



Remembering that the R.A.F. flies magnificent missions in peace as well as in war (in emergencies such as floods and earthquakes) it is only right to have a balance of bomber, fighter, transport and coastal aircraft with at least one veteran, representing all the early types, and one trainer. As we have, alas, no example of the Sopwith Snipe in England and as our one Sopwith Pup is with Shuttleworth at Old Warden, Beds, choice for World War I falls between the Sopwith Triplane, Camel, and the Royal Aircraft Factory S.E.5a (Scout Experimental). As the Victoria Crosses of Ball, McCudden, Beauchamp-Proctor and Mannock were gained in the S.E.5/5a, let us take the museum's example, F 938 to represent the R.F.C./R.N.A.S./R.A.F. pilots of World War I.

For the between-wars period it is even more difficult and I hope readers will agree with the choice of the versatile Avro 504K E449, for in this type a great many who became famous in W.W. II made their first flights, either in the R.A.F. during training, or for a joy-ride when Cobham's "Circus" toured the country. The squadrons of the Auxiliary Air Force (formed 1925) relied very much on the trustworthy Avro 504K/N machines and, from 1913 to 1933 (later in some parts of the world) the type saw useful service bridging the gap from war to peace and almost to the threshold of World War II.

For World War II there is such a wide choice that I am opting for examples of both bomber and coastal/fighter, taking the Vickers Wellington (the world's one and only example now remaining, MF628), for who can deny the claims of the "Wimpey" which flew the early raids as our "heavy" until the arrival of the Stirling, Halifax and Lancaster, and then entered Coastal Command, to continue with fine work against the U-boats? Did you know that in addition to the V.C. gained in a Wellington by the late Sgt. J. A. Ward of



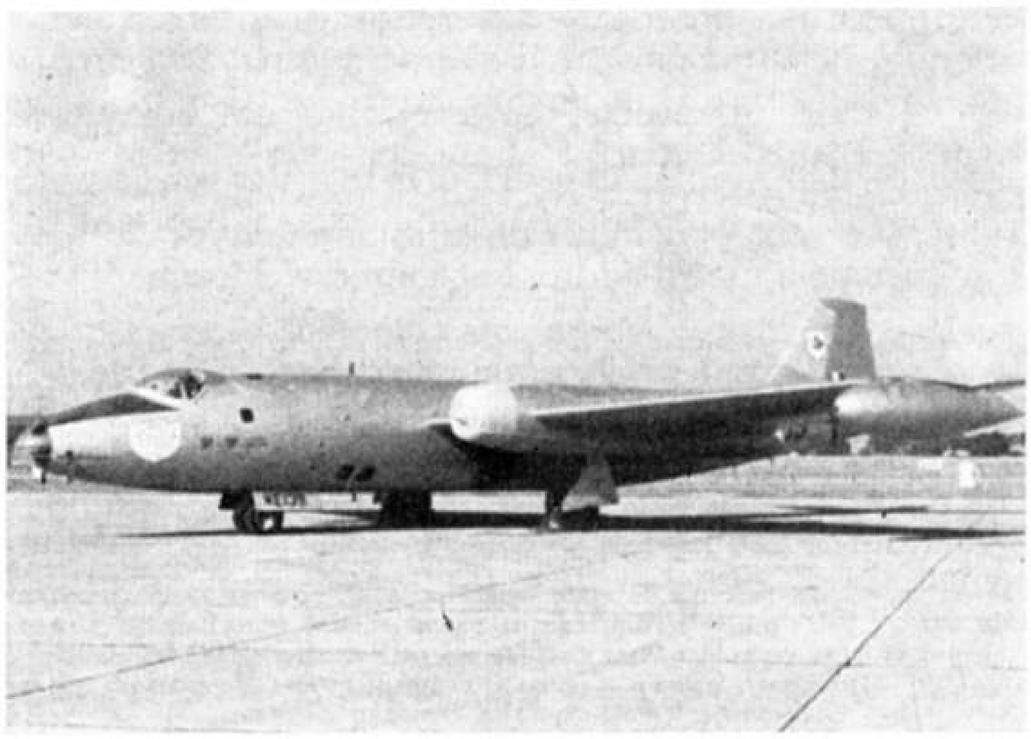
No. 75 (N.Z.) Sqdn., there was a posthumous George Cross gained by Flt. Lt. Roderick Gray, a Canadian flying in No. 172 R.A.F. Sqdn?

My second type representing the 1939–45 war is the Bristol Beaufighter which served as our first successful night-fighter (remember John Cunningham's victories with 604 Sqdn.) then with Coastal Command as a ship-buster (with rockets supplementing cannons and machine-guns) and also in Middle East and Far East (where "The Whispering Death" became a legend against the Japs.) It was in a Beaufighter of 27 Sqdn. in Burma that the only Fighter Command V.C. of W.W. II gained his D.F.C.—only to lose his life as Wg. Cdr. J. B. Nicolson, V.C., D.F.C., flying a Liberator to watch a bombing mission. The museum's Beaufighter is RD253, secured from Portugal, enabling the R.A.F.s other Beaufighter to be donated to the National Museums of Canada.

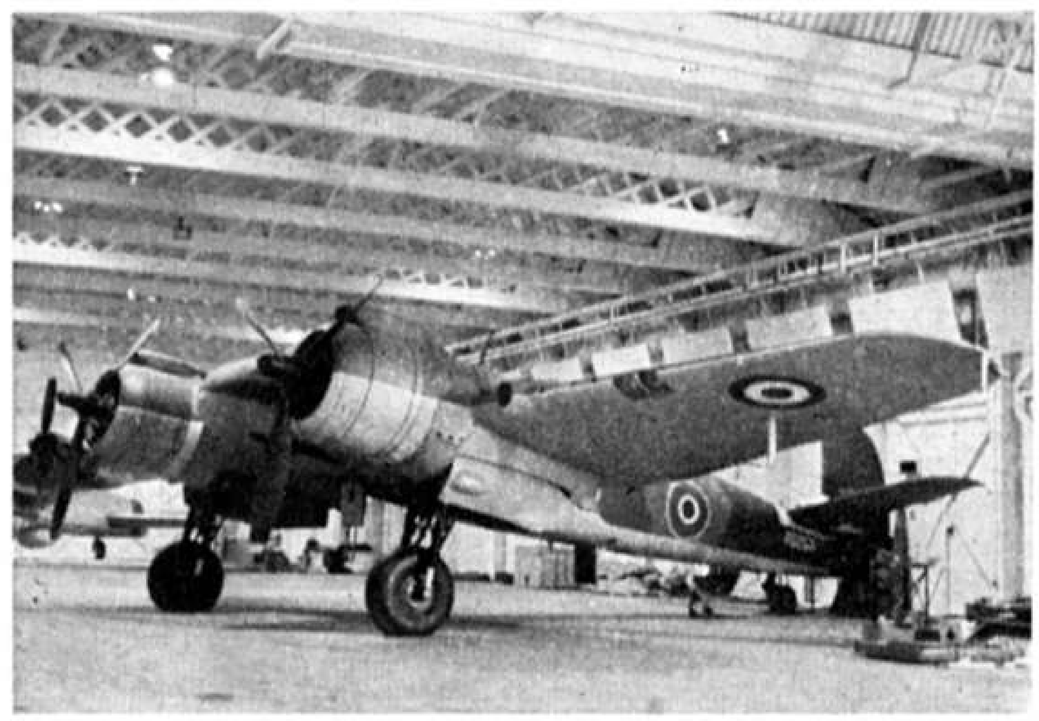
—for the RAF Museum

Leslie Hunt makes his choice of six outstanding aircraft for opening day

Aircraft, clockwise from far left, are Hawker Sea Fury, S.E.5A, WellingtonX, Beaufighter, P.R.3 Canberra and Avro 504K



For post-war years there is a splendid selection because, at long last, the need to preserve examples of each type has penetrated into the heart of officialdom. Many would opt for the Gloster Meteor, first R.A.F. jet aircraft, others for the record-breaking Canberra, or the Hunter, or the Lightning, but I'm going for two very contrasting machines, the Hawker Sea Fury VX653 in the Sydney Camm Memorial Hall, and, yes, for the English Electric (now B.A.C.) Canberra. I was one of many who thought that the Camm Memorial Hall ought to have been established at Hawker Siddeley's Dunsfold airfield and that to have a Fleet Air Arm machine at Hendon was wrong. Now, however, with the R.A.F. taking over the Buccaneer as a low-level striker, and with the R.N.A.S. bases at Lossiemouth (former home of this Sea Fury) and Brawdy becoming R.A.F., one realises how interdependent the services must be in modern times and with the Fleet Air Arm Museum so far away at Yeovilton, Somerset, how so many who can only visit London will be thrilled to see at least one machine which, in Fleet Air Arm hands, operated with distinction over Korea, where the R.A.F.s major contribition was of pilots serving with the R.A.A.F. or U.S.A.F



Of all the post-war machines the Canberra, surely, merits a place in the museum and here we have the winner of the Air Race to New Zealand in 1953, WE139, reminding us also of the famous flights of "Roly" Beamont, later to test-fly both the Lightning and the ill-fated but magnificent TSR.2. There is a small section devoted to record-breaking machines, including the Meteor which established the first post-war speed record and, as time passes, it is possible that the museum authorities will rotate machines now at their stores, bringing other rarities to Hendon to vary the display. For the moment, though, we give the opening listing and trust that all readers will give this great collection the support it deserves:

Main Hall Aircraft
Bleriot XI, unserialled.
Caudron G.III, 3066.
Sopwith Camel, F6314.
Avro 504K, E449.
Gloster Gladiator, K8042.
Westland Lysander, R9125.
Miles Magister, T9707.
Vickers Wellington, MF628.

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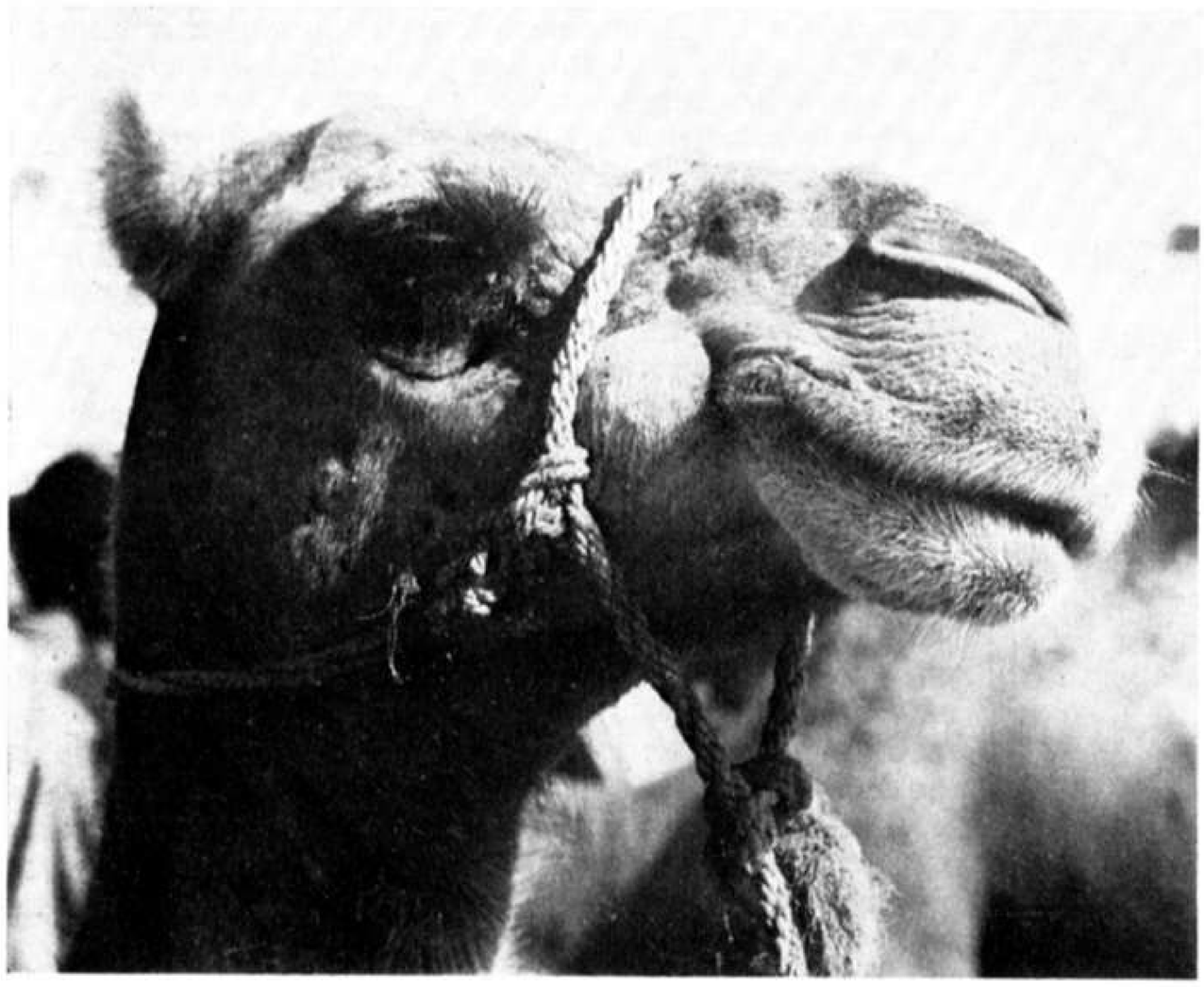


Tunisian Camel Market

An unusual subject by Peter Wilkes

THE word "market" can mean many things to many people. To the rural dweller it conjures up a picture of livestock sales with a white coated auctioneer moving among farmers gathered, as often as not, for gossip rather than business. To those who live in the towns and cities "market" can mean only that conglomeration of stall holders who assemble, at least once a week, to offer a buying public everything from farm fresh butter to the latest in modern fashion. Even a foreign visitor to our shores has an image when "market" is mentioned, and here Petticoat Lane, the "mecca" for all interested in the colourful and picturesque that is London life, comes to mind.

Yet, as fascinating as are our own markets, to anyone fortunate enough to visit the Tunisian town of Sousse and attend its weekly camel market the word can never mean the same again.

Here is a market that is truly unique. A place where the European visitor can not only rub shoulders with Tunisian peasants, engaged in a way of life that has changed little from the days of their fathers and forefathers before them, but mingle among them as they carry out the deals in true Arab fashion, with each seeming to argue longer and louder as on one side the buyer tries to bring down the price and, on the other, the seller continues to praise the quality of that which he is offering, be it a camel or leatherware.

The wind of change, however, has not completely bypassed this colourful Tunisian market for, with typical Arab enterprise, the tourist, to whom the camera is as essential a part of his dress as any item of clothing, has become a useful additional source of income.

Here, the visitor who wants colourful pictures of the local scene is indeed in a photographer's paradise.

No deal is so important that it cannot be interrupted while those participating pose for pictures. No child is too young to stand in front of the camera and no mother too shy to allow herself and baby to be photographed—

Top, the main reason for the market may well look depressed. He never gets paid! Centre, a view of the market at Sousse where if you so wish you can buy your own camel for as little as £50. Bottom, sheep are other important livestock which change hands at the Sousse market.

Below, many local youngsters start their business life as water boys. Right, posing for photographs with tourists forms a remunerative side-line for owners of animals; at least two shillings changes hands for each photograph.

provided of course that the so essential coins change hands first.

Here is a market where the first arrivals, (and in a country with mid-summer temperatures hovering around 100 degrees F, 6.30 a.m. is not an early hour to start dealings) can trade for sheep or camels and, by the end of that very same market, have recovered at least part of the initial outlay from fees as photographic models.

Truly after visiting the Camel Market at Sousse, the word can never quite mean the same again. For where else can you buy a camel for £50, and where else does the market price of animals depend partly on their photographic beauty but, above all, where else can you find a people without greed? Because, after their business at the market is finished, these friendly, likeable peasants of Sousse will gather up their belongings and move off, tempted not by money or pleas, leaving the late arrivals among the tourists to meditate on what they have missed.

Trinity House

The safety and well-being of the seafarer is its aim, says Richard Wiggan

WHICH way in the English Channel? The spate of collisions in what is one of the busiest stretches of waterway in the world recently spotlighted the importance of safety at sea.

Controversy rages about the navigation system operating in the Channel, but whatever happens an organisation closely associated with the safety aspect will continue to be Trinity House.

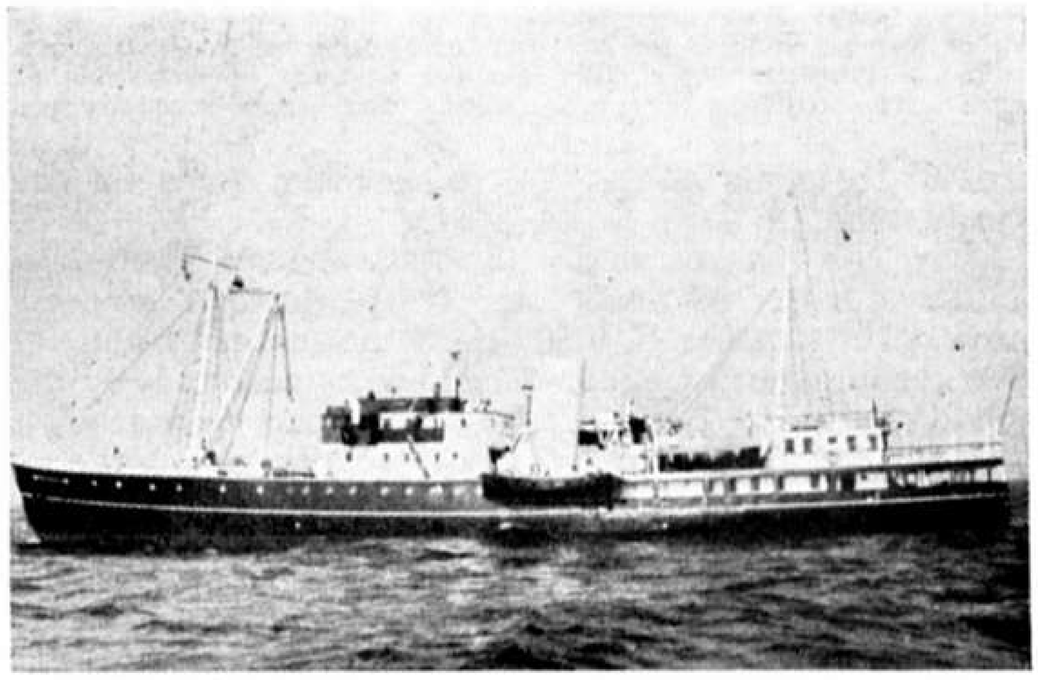
Trinity House swings into operation immediately a collision or other disaster occurs. Wrecks are marked, which is a particularly important task when even experienced mariners who should know better are not averse to treating the Channel with scant regard for safety regulations. The danger of such conduct can be seen from the fact that it takes one-and-a-half to three miles to stop a giant tanker from normal full speed.

Tankers bringing oil to the refineries of Britain; ferries taking holidaymakers and others to and from Britain; freighters, trawlers, cabin cruisers—the Channel is a veritable "motorway" of the sea. If there is a collision and a vessel sinks—as in the case of the tanker *Texaco Caribbean* in January 1971—then the need for shipping being given ample warning of the wreck and for someone to play "policeman" is vitally important.

Trinity House is well fitted for this role, using lighthouse tenders, a special type of vessel between 1,500 to 2,000 gross registered tonnage, for the searching out and marking of wrecks. The same kind of vessel is used for relieving lighthouse and light vessel crews and for maintaining buoys and beacons.

It was in 1514 that Trinity House was granted its first charter as a corporation by Henry VIII. Since then it has grown as a unique organization with one principal aim—the safety and wellbeing of the seafarer. The three main functions are to act as the general lighthouse authority for England and Wales, the Channel Islands and Gibraltar, to be the principal pilotage authority in the United Kingdom and to be a charitable organization for the relief of certain mariners and their dependants who suffer hardship.

The headquarters of the corporation are at Trinity House, Tower Hill, London. The various aspects of



Right, the T.H.V. *Patricia*, built 1938, carries out inspection cruises in summer and buoy work in winter.

the corporation's work are controlled by a board of 10 active elder brethren, consisting of 9 former masters in the Merchant Service and one retired Naval officer, and the secretary.

Lighthouses are, of course, an essential part of Trinity House duties. Great pillars rising from the sea, the lighthouses look what they are—reliable beacons for the safety of the mariner. The lighthouse service is responsible for the maintenance of 89 lighthouses, 34 light vessel stations and more than 600 buoys, of which more than half are lighted.

Some local harbour authorities maintain seamarks within their own port limits, but they regularly come under the scrutiny of Trinity House and the permission of the corporation must be obtained before any changes can be made.

The work of the lighthouse keeper is gradually being superseded in this age of automation. Most lighthouses are electrically operated and are equipped with radio and

radar beacons. Powerful fog signals warn ships during times of poor visibility.

Trinity House has done a great deal of research in recent years into the development of light sources and fog signals. Now the trend is towards automation whereby a group of lighthouses can be operated from a central point. It will probably lead to fewer lighthouse keepers but this, it is stressed, will be very gradual as absolute reliability is essential as the first requirement of a lighthouse.

Money to meet the cost of running the lighthouse service is raised from light dues, levied at all the ports in the United Kingdom and based on the net registered tonnage of the vessel. Customs officers at the ports act as agents for the collection of the dues, which in one recent 12-month period amounted to £6,200,000.

For Trinity House's purposes, the coast of England and Wales is divided into six districts. Each has a buoy depot named after the depot towns—Yarmouth, Harwich, East Cowes, Penzance, Swansea and Holyhead. Each depot town also acts as a base for one or more lighthouse tenders. A superintendent is in charge of each district. It is his duty to see that the aids to navigation in his district are in working order.

The main workshops are at Blackwall, London. Here a staff of mechanics, electricians and other skilled men are engaged on the manufacture, maintenance and repair of service equipment.

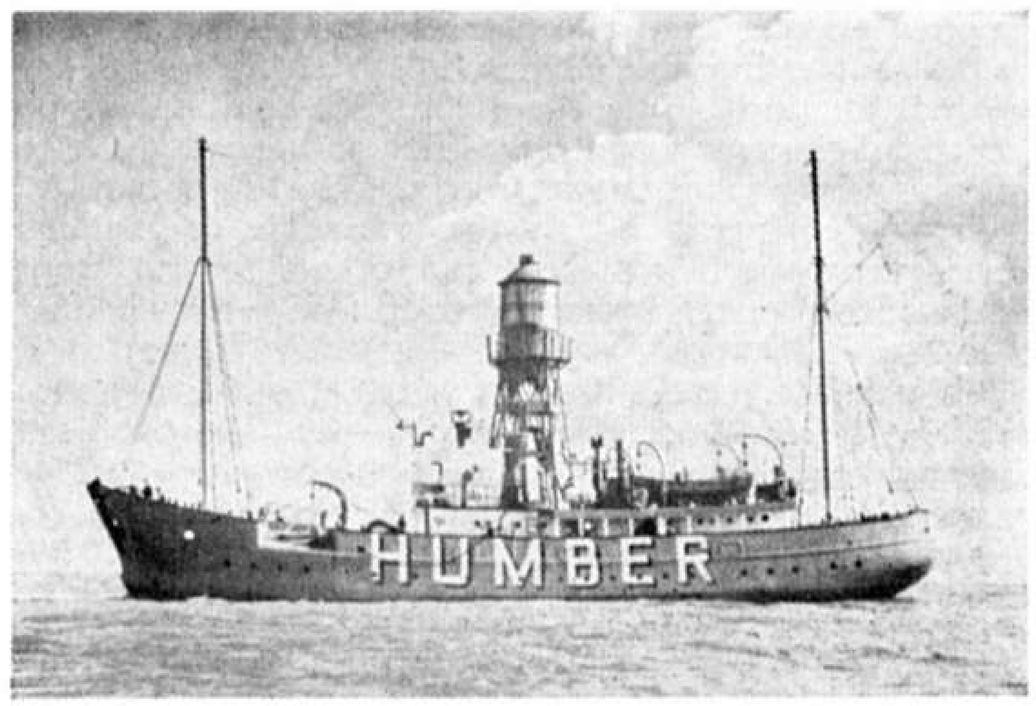
"Pilot coming aboard, sir." How often have you seen such a scene on television or the films? Trinity House, while being the pilotage authority for London and 40 other districts, including Southampton, Milford Haven and Falmouth, does not employ pilots, but licenses them. The service is self-supporting and receives its income from a levy on pilots' earnings, dues paid by vessels for shipping and landing pilots, and from licence fees.

There are about 800 Trinity House pilots, of whom 550 are in the London district. The five main pilot stations are situated at Gravesend, Harwich, Dover, Margate and Sheerness.

The landing and shipping of these men, who have an intimate knowledge of the waters in which for a time the safety of a vessel is in their hands, and where one mistake could lead to disaster, is performed either by fast launches from shore or from pilot cutters at sea.

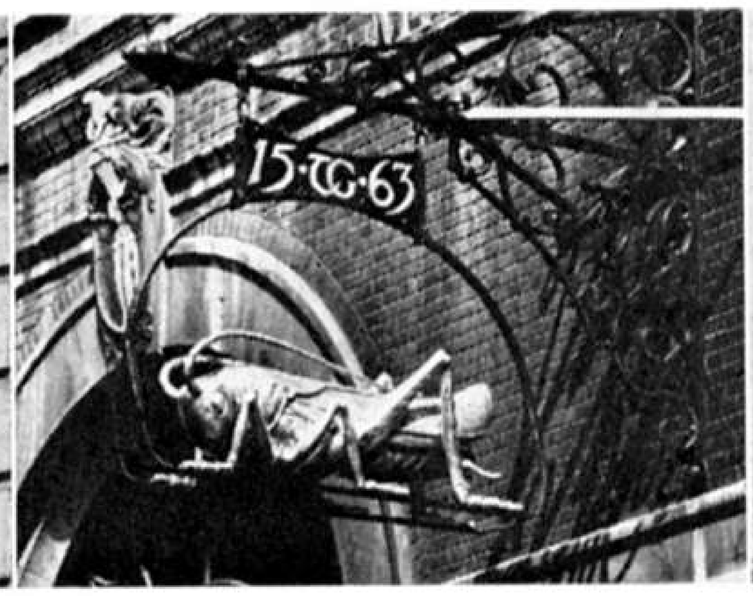
Whether caring for lives at sea, or when a mariner has come ashore and "swallowed the anchor"—Trinity House still has a role to play. They maintain homes for retired officers of the merchant services and their dependants at Walmer, Kent. A hospital specially equipped to care for the needs of old people is attached to the homes. The homes, completed in 1958, are first rate, each pensioner having his own separate house. Several legacies left by former elder brethren and other benefactors of the corporation are also administered by Trinity House.

And so the work of Trinity House goes on around the clock. Should you, this winter, read of yet another collision in the Channel, you can be sure that somewhere out there Trinity House is marking the spot.



Above, congestion in the Channel involves enormous vessels such as the *Texaco Hamburg*

Right, Light Vessel No. 91, built in 1931, is one of five similar craft



Swinging Money

There is a lot of interest above your head, points out Edith Harper

ONE result of the change to decimalised money is that we study the design of our coins more, but how often do we notice other designs and signs to do with money?

Some of these signs have been visible above our heads for hundreds of years. They are the signs that swing outside our Banks. It may seem strange that Banks need signs, but in the days when few could read, nearly all good citizens could see and understand a picture. When City businessmen in 1677 decided to meet at the sign of "The Feathers" in Pope's Head Alley, they knew exactly which house to go to, for the owner Samuel Lee had a design of feathers hung outside his house.

Lee was invaluable to his clients, for he kept a list of the principal City merchants. About the same time, Humphrey Stocks, described as a "Keeper of Running Cashes" had his business premises under the sign of "The Black Horse" in Lombard Street (where No. 53 now stands in that street). The business changed hands and premises but always retained its sign, which has now become world famous as that of Lloyd's Bank, whose head office is in Lombard Street.

Lombard Street has many famous business signs swinging overhead. Today there is no No. 63, but in 1672 it was the house of a haberdasher, Anthony Dansie. His house, at the corner of Birchin Lane, was called the "Cat a' Fiddling". From it Dansie carried on a thriving business. He even exported cheeses and "900 dozen pairs of boots" to Barbados. In August 1902, the Commercial Bank of Scotland adopted the sign as part of their Coronation decorations. There are several "Cat and Fiddle" signs in Britain but only one "Cat a' Fiddling".

As well as horses and cats, the eagle has also spread its wings in Lombard Street for over 300 years. In the late 17th century John Freame owned a business which eventually became Barclay's Bank. He traded at the "House of the Eagle". The Bank retained the sign, incorporating it in 1937 with "The Three Crowns", another business sign in Lombard Street.

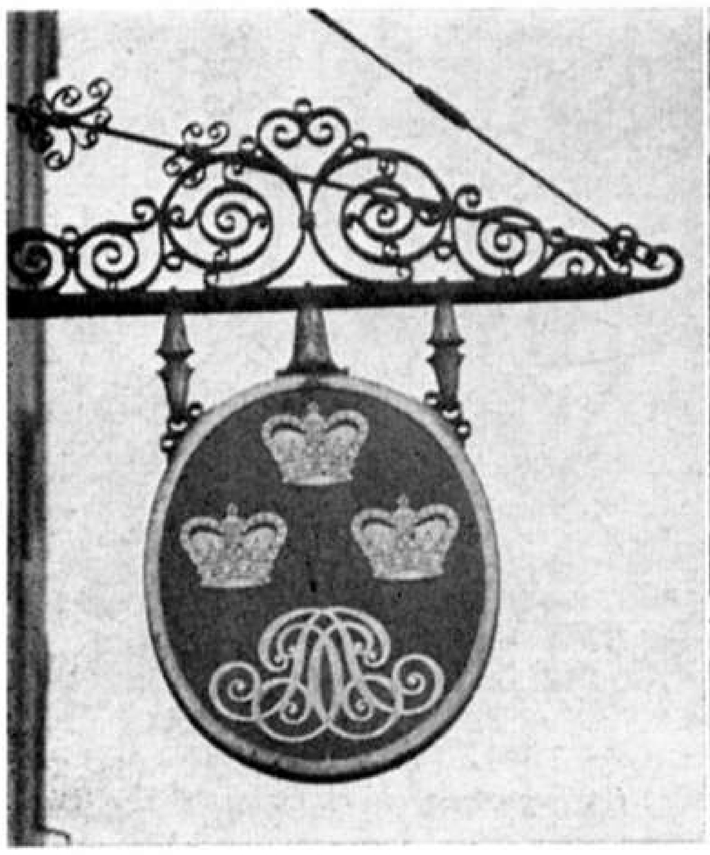
Today Barclay's Bank has acquired Martin's Bank, whose sign had an interesting history. It combined the "liver bird" of Liverpool with the grasshopper of Sir Thomas Gresham, whose sign it was in 1563. The Bank of Liverpool, whose sign incorporated the bird, amalgamated with Martin's Bank in 1918.

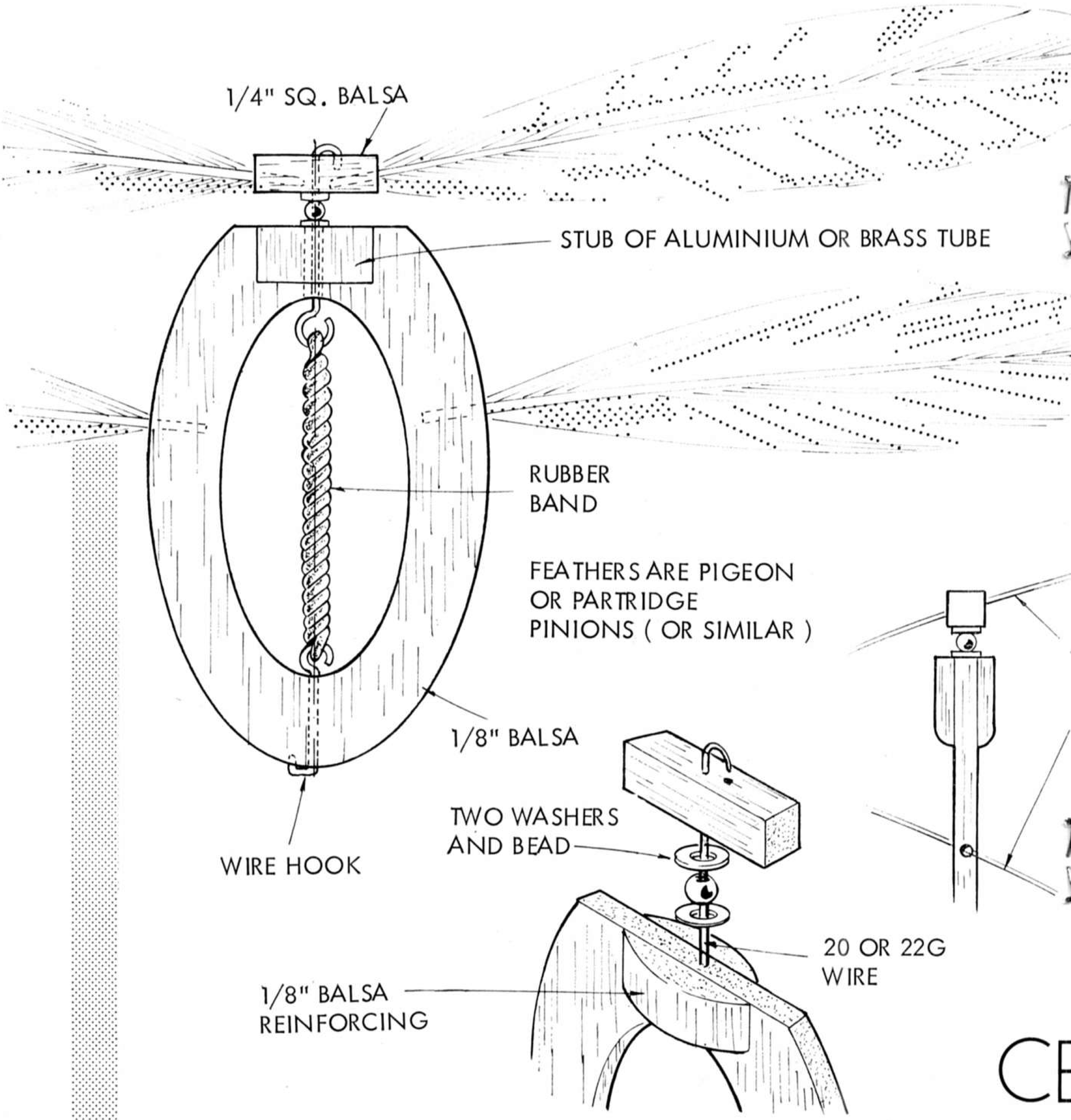
Sir Thomas Gresham was the founder of the Royal Exchange where his golden grasshopper sign can be seen. The bank's sign combining the two made an attractive design.

History could also be read in Westminster Bank's pre-1971 sign. Here the portcullis and roses (part of Henry VII's arms) had come from the arms of the City

(please turn to page 480)

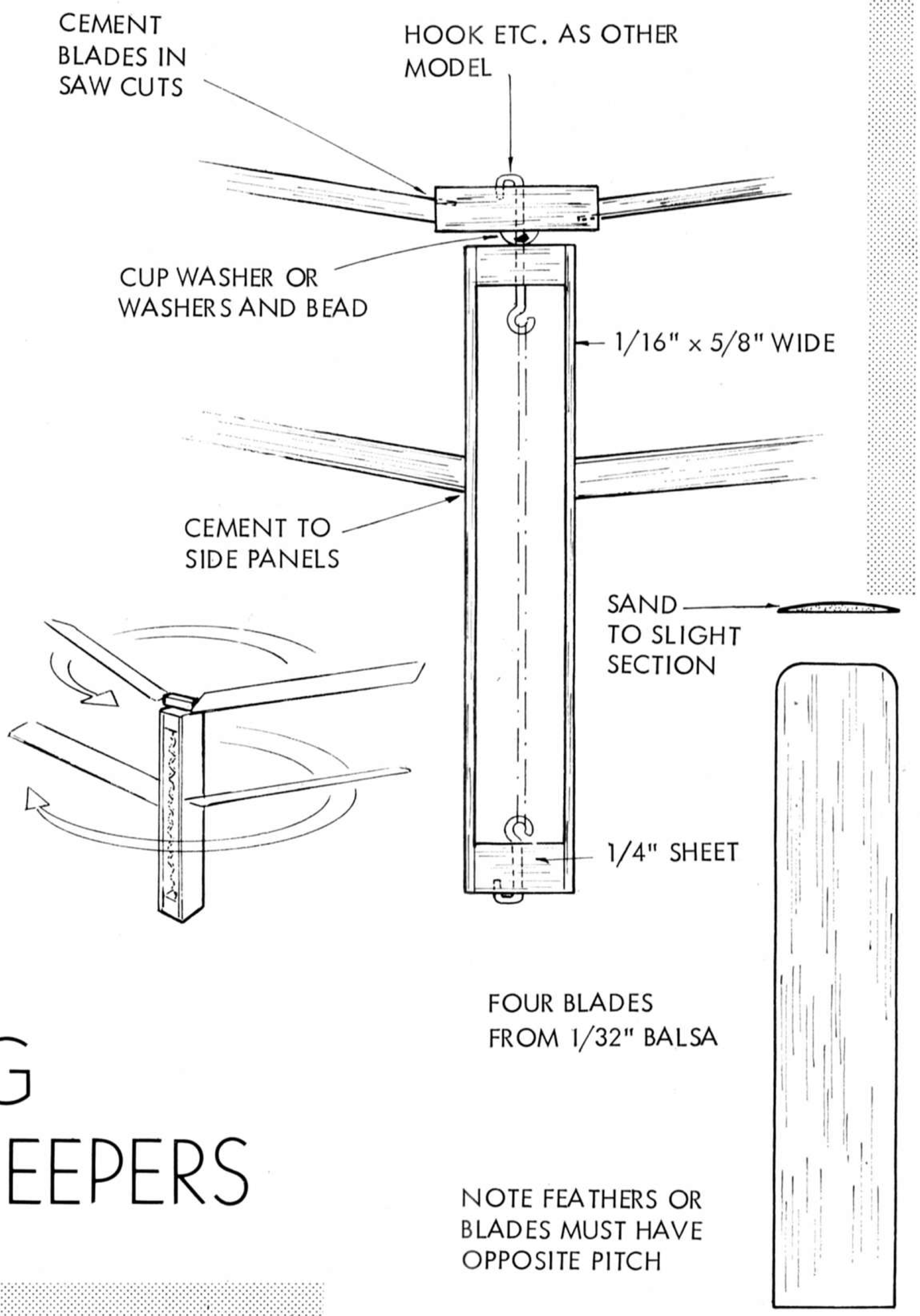
Top pictures show Barclays Bank sign, the Grasshopper and the date which link Martin's Bank and Sir Thomas Gresham, and Lloyd's Bank's black horse, recalling an old business inn. Below, the three crowns of Coutt's Bank is appropriate for a bank with Royal customers. Centre, the white "cat-a-fiddling" of the Commercial Bank of Scotland and Barclays black eagle, which sometimes shows three crowns incorporated from another Lombard Street business house.



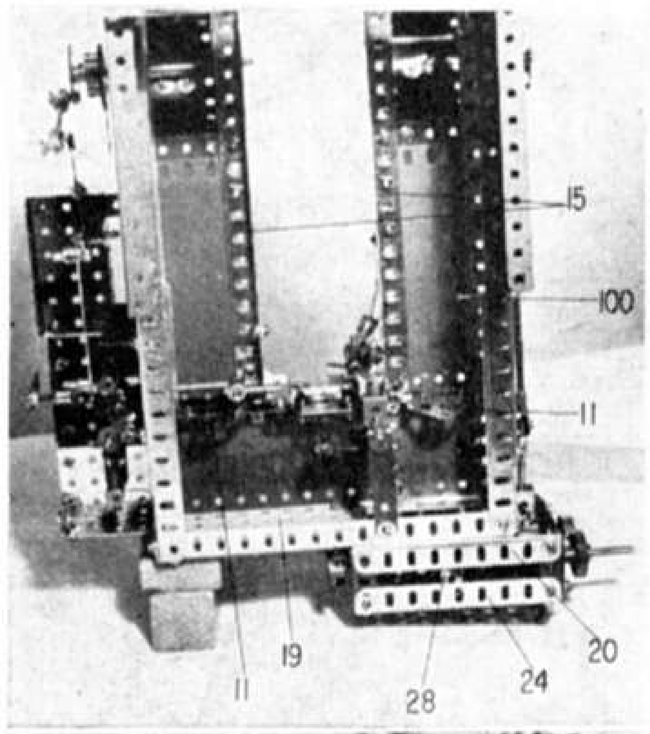


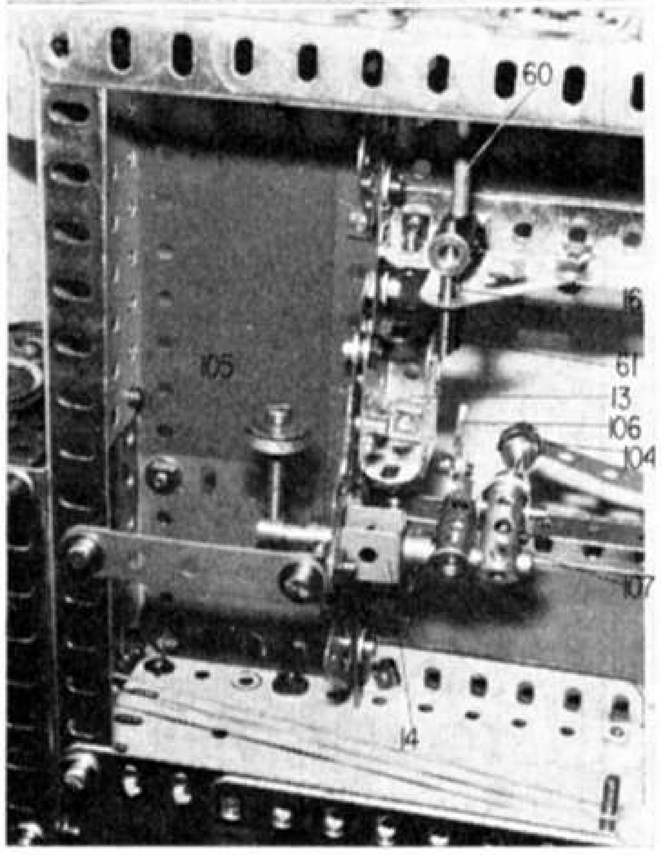
These amusing helicopters take little making. The feathered version is the better, and most butchers will give you four suitable feathers. Cut the frame from $\frac{1}{8}$ in. balsa in two halves and cement together after sanding a groove for the tube in the top joint faces; fit the tube at this time, of course. The hooks etc. need no comment. Drill for the feather quills so that the feathers can be pushed firmly in but remain adjustable—they can be cemented when the positions for best performance are found. Note that the holes are at a slight angle. When wound up and released, the frame rotates in the opposite direction to the rotor, so that the feathers need to have opposite pitch. The rubber should be just strong enough to climb the model 10–12 ft. and then to keep it at that height, and this depends on weight of the balsa and the feathers.

The all-balsa version works very well but will not fly for quite so long and does not have quite the same creepy effect as it flutters round the ceiling.



EILING
CREEPERS





Top, An underside view of the forward part of the main body section, from which the ram has been removed.

Above, the die-block and part of the rivet ejection mechanism in close-up—viewed from beneath.

Below, the left-hand end of the feed roller assembly with the actuating connecting rods removed.

Automatic Rivet-making Machine

Part 2 of an advanced model requiring relatively few parts

By P. Blythe

Toggle Links

The toggle links themselves are next to be built, each flap of the toggle being provided by a $1\frac{1}{2} \times 1\frac{1}{2}$ in. Flat Plate 42. Bolted to the front plate and to one end only of the rear Plate are three $1\frac{1}{2}$ in. Angle Girders, the forward Girder on the front flap carrying on its slotted flange a pair of Angle Brackets adjusted so that their round hole lugs fit neatly within the lugs of Double Angle Strip 40. A $2\frac{1}{2}$ in. Rod 43, held in place by Spring Clips, pivotally attaches the flap to the ram. The two remaining $1\frac{1}{2}$ in. Angle Girders on the toggle flaps each carry a $1\frac{1}{2} \times \frac{1}{2}$ in. Double Angle Strip 44, the lugs of which are pivotally fixed together by a $2\frac{1}{2}$ in. Rod. The lower ends of Strips 33 are slipped on to this Rod and secured in place by Collars. It will be necessary to crank Strips 33 slightly to obtain a good fit.

The rear toggle flap is now attached to the pair of hinges already bolted to Girder 12 of the frame. Two $11\frac{1}{2}$ in. Rods 45 are slid through the end holes of Girders 38 on the ram and are then located in Flat Trunnions 11 inside the frame, the Rods being finally held in place by Spring Clips. The Trunnions may require slight adjustment to ensure that the ram is centrally located and slides freely.

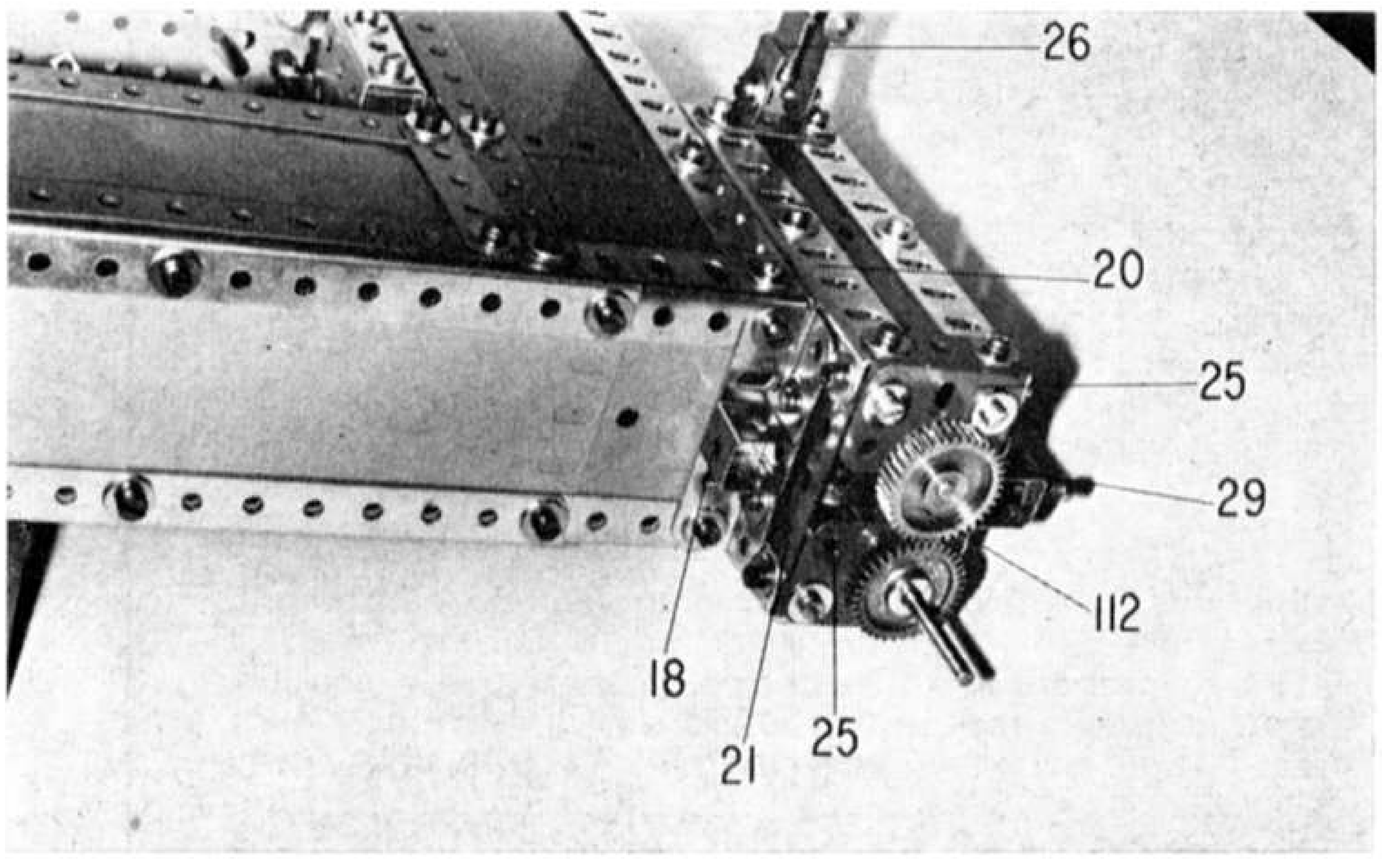
Tool Box Slide

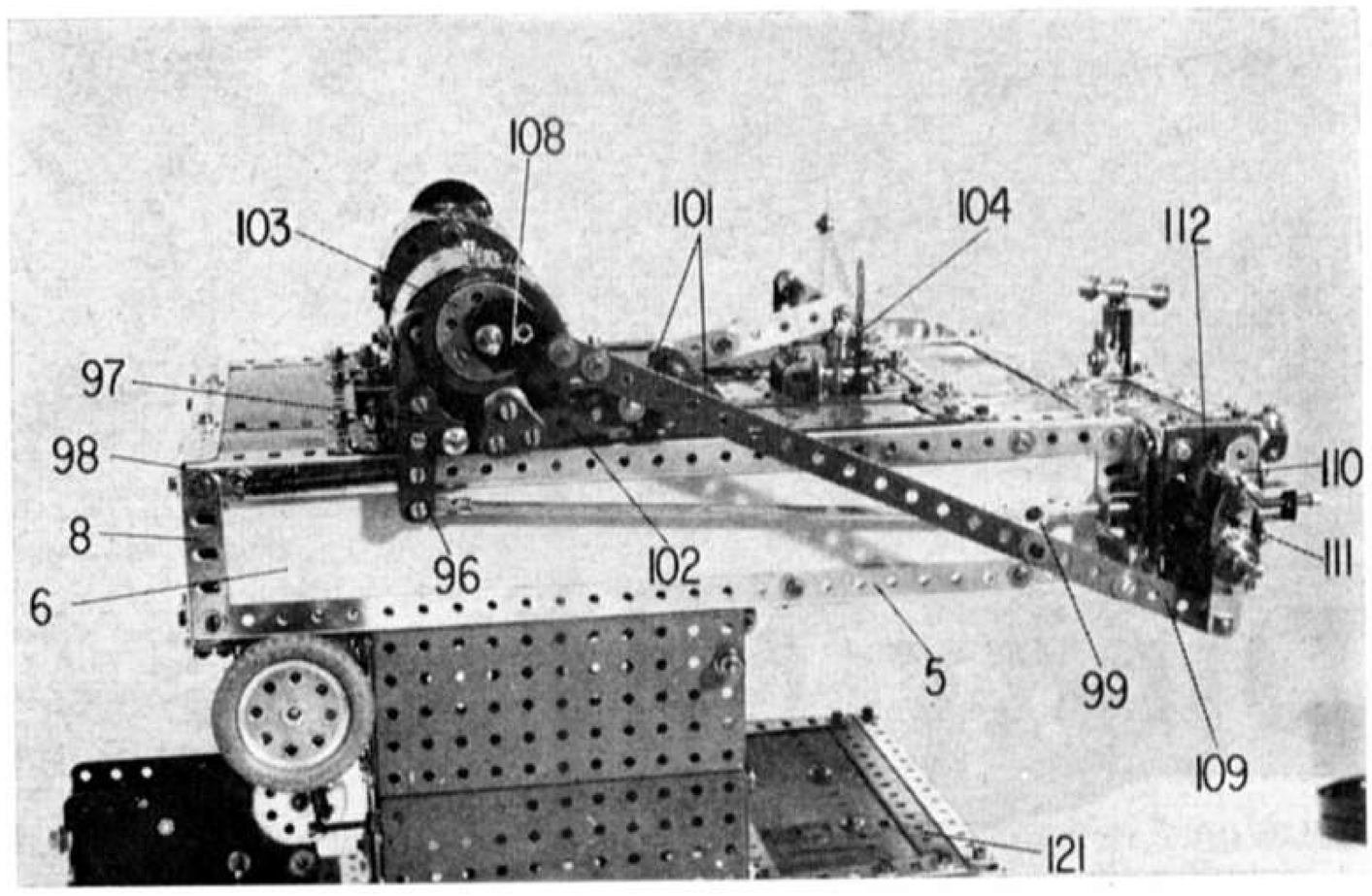
Next in line is the tool box slide, for which the round hole flanges of a pair of $2\frac{1}{2}$ in. Angle Girders are joined together by a $2\frac{1}{2}$ in. Flat Girder 46, the lower pair of Bolts also securing in place a 1 in. Triangular Plate 47—stood off by two pairs of Washers—the third hole of which has a Collar bolted through it to represent the bottom heading tool. A further Triangular Plate 48 with Collar is bolted in a similar manner to the slide, one hole down from the top to serve as the upper heading tool. The $2\frac{1}{2}$ in. long "channel" is enclosed at the top by two Angle Brackets 49 secured by their round holes. To the slotted ends of these Angle Brackets inside the channel is fixed a Coupling with its centre smooth transverse bore vertically disposed and carrying a 4 in. Rod 50 secured firmly by the Grub Screw. This Rod is slid into Coupling 39 fixed on the front of the ram, care being taken to ensure that the tool box assembly can move freely up and down. To the bottom end of the Rod is fitted a Rod Socket 51, carrying a rearwards-facing 2 in. Strip 52.

Lift Mechanism

Coming to the lift mechanism, two $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flanged Plates 53 are bolted (one each side) to the underside of the body to leave five free holes at the rear. An $8\frac{1}{2}$ in. Rod 54 is fitted with a pair of Cranks 55, reinforced with $1\frac{1}{2}$ in. Strips, then two Threaded Pins are screwed into the boss of a Slide Piece 56 and the shanks located in the ends of the Cranks and $1\frac{1}{2}$ in. Strips. Collars secure the Slide Piece assembly in position. The $8\frac{1}{2}$ in. Rod is journalled in the $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flanged Plates, as shown, with the Slide Piece fitted on to a 2 in. Strip 52 fixed to the bottom of the tool slide. The Rod is retained by a Collar on the left-hand side and a Crank—with a Threaded Pin 57 attached to its slotted hole—on the right-hand side.

A $5\frac{1}{2}$ in. Strip 58 is next bolted to a Triple-throw Eccentric 59, which is mounted by the $\frac{3}{4}$ in. stroke boss





A close-up view of the left-hand side of the model with the flywheel removed to show the connecting linkages.

on the right-hand side of the crankshaft. This Strip is secured through its lowest hole on the shank of Threaded Pin 57 by a Collar. If all is well, when the crankshaft is rotated, the ram will move backwards and forwards and the tool slide up and down. It will be necessary to position the Eccentric correctly so that the 2 in. Strip on the tool slide does not strike the 8½ in. cross-shaft.

Wire Cutting Mechanism

Turning, now, to the mechanism which simulates the wire-cutting action, a 4½ in. Rod 60 represents the cutter slide, this being journalled in the right-hand Flat Plate of the body side with the inner end of the Rod sliding in the centre hole of 1½ in. Corner Bracket 16 inside the body. The Rod must be prevented from rotating, but must slide freely from side to side. On the Rod is fitted a Coupling which carries in its lower bore a 1 in. Rod 61, this Rod passing through the lower hole in the Corner Bracket. On the end of Rod 60, where it emerges from the side of the machine, a further Coupling 62, vertically disposed, is secured by its centre traverse bore, a 1½ in. Rod 63 projecting from the lower end of its longitudinal bore.

To the extreme end of Rod 60 is secured a Threaded Coupling 64 mounted by its longitudinal bore and locked by a 1⅛ in. Bolt projecting vertically upwards. Secured by a Nut under the head of this Bolt is a 1½ in. Strip 65 facing "across" the machine, the Bolt passing through its central hole. A Rod and Strip Connector is fitted on the inboard end of the cutter slide-rod to represent the cutter and, when moved from side to side, should just clear the die block.

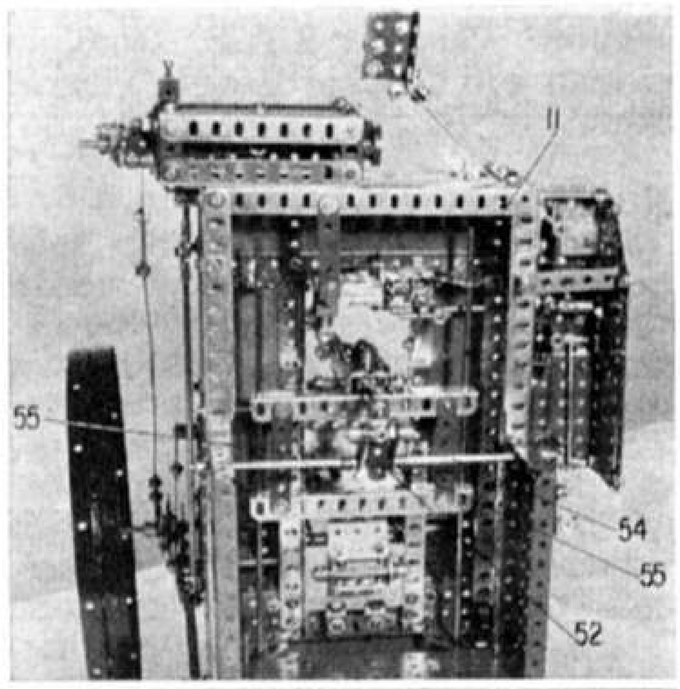
Into the longitudinal tapped bore of Threaded Coupling 64 is screwed a ¾ in. Bolt which is secured by a lock-nut. Also locked, through its end hole, beneath the bolt head, is a 2 in. Strip 66, projecting vertically upwards. Attached by its boss to the upper end of this Strip is an End Bearing 67, the lugs of which carry the "Fiddle Bow"—the device which carries the slug of wire across from the cut-off die to the main forging die. The assembly is made up simply by a 5½ in. Perforated Strip 67, the inboard end of which carries a vertical 2½ in. Strip, fixed by its centre hole. The fixing Bolt also holds a 3½ in. Narrow Strip 68, the free end of which is attached to a 2½ in. Narrow Strip, as shown, to complete the roughly triangular shape of the assembly.

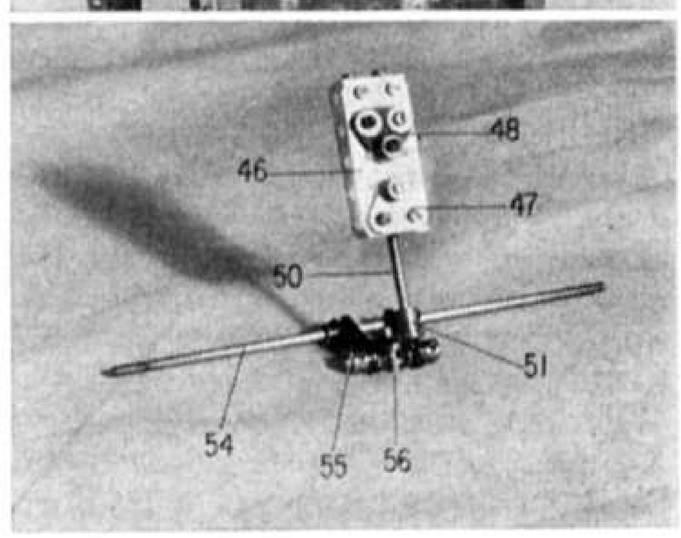
The "Fiddle Bow" guide is provided by a Single Bent Strip 69 fixed by its centre hole to the right-hand side of the ram slideway. A ½ in. Bolt with suitably-placed Washers and lock-nuts, provides the location for the 5½ in. sliding Strip.

A 3 in. Angle Girder 70 is bolted to the side of the frame by its round hole flange, four holes back from the front of the body, with its projecting flange uppermost. To the front end of this Girder, and projecting out to the right to form part of the Cutter Slide housing, is a 2 in. Angle Girder, to the downward-facing slotted flange of which a forward-projecting Girder Bracket 71 is bolted. This is extended further by a second Girder Bracket, the wide flanges being overlapped one hole. These latter parts make up the tool tray, the right-hand side of which is enclosed by a 1½ in. Angle Girder 72, the front fixing Bolt also securing in place an Angle Bracket with its slotted lug facing downwards. Another Girder Bracket 73, attached by its narrow flange, is bolted to the underside of the tool tray to enclose the front of the Cutter Slide housing, the lower right-hand hole of this latter Girder Bracket carrying an Angle Bracket, its free lug facing rearwards.

The top of the Cutter Slide housing is now further enclosed by a pair of 2 in. Strips 74, bolted—one hole apart—to the 3 in. Girder. Moving further back still, another 2 in. Angle Girder 75 is bolted to Girder 70 through its second hole, while bolted in the end hole of Girder 70 is an Angle Bracket, to the slotted lug of which is secured a second rearward-projecting 3 in. Angle Girder 76 which is secured at its rear end to the body by a Double Bracket. (This latter 3 in. Girder is therefore spaced one hole away from the side of the body.) To the horizontal flange of the Girder is bolted a 3 × 1½ in. Flat Plate 77, edged by two 1½ in. Angle Girders and a 3 in. Angle Girder 78.

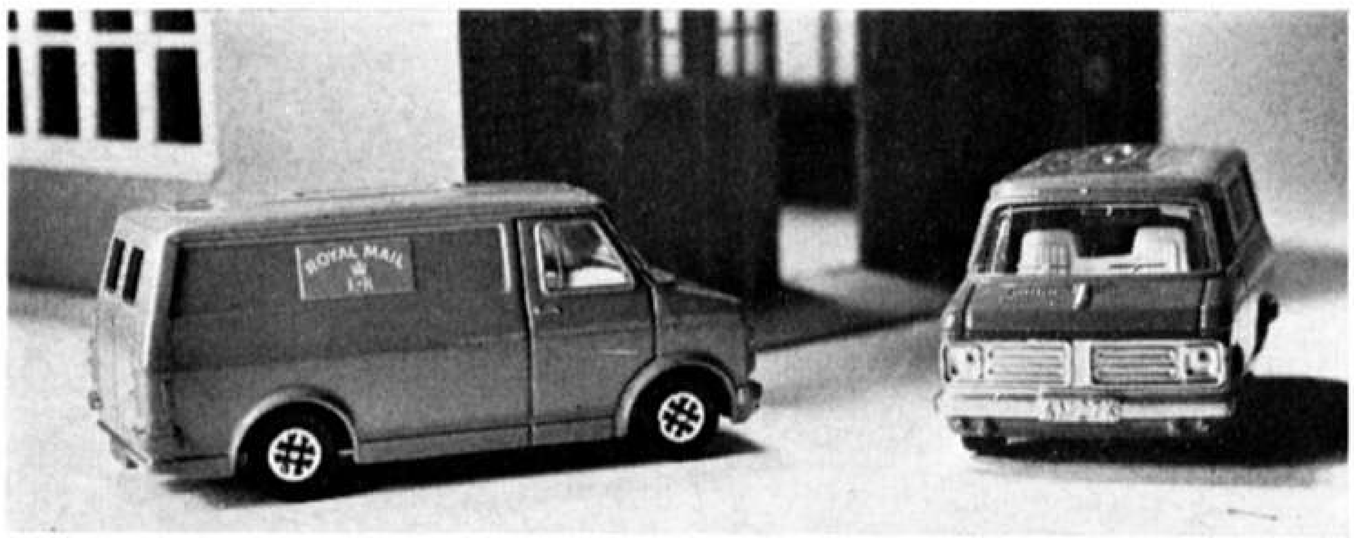
(*continued on page* 499)





Top right, this picture shows the interior of the body assembly, viewed from beneath. It is complete except for the base motor drive.

Right, a close-up view of the tool box slide as it appears removed from the model.



Dinky Millions

Dinky Toy News By Mike Peddie

I'VE often thought that if full-size manufacturers in Britain could turn out their cars, trucks and aircraft with the speed and in the quantities that Meccano in Liverpool turn out Dinky Toys, then the Country would never get into economic difficulties. So far this year I estimate that Meccano have released 15 new "ready-made" Dinky Toys, plus 14 Dinky Kits, which, between them, account for *several million* individual toys on the market!

With this sort of quantity behind them, any company could be forgiven for slowing down a little, but Meccano, for one, doesn't need forgiveness—they're not slowing down. This month sees the appearance of another three new Dinky releases in the shape of a Royal Mail Bedford Van, an R.A.F. Dominie aircraft and a Lunar Roving Vehicle Kit.

Royal Mail Van

Vans, in years gone by, have tended to be rather unattractive "boxy" vehicles, severe in external design and offering near-spartan conditions for the driver, internally. Today, however, the picture is completely different; vans of most makes and types are now modern, stylish vehicles which are, in many cases, close to saloon cars in cab comfort. They have comfortable seating, plush carpeting, car-type dashboards and facias, padded door upholstery and numerous other "luxuries" that one would not normally associate with a van. The body shape also has greatly improved with time, and vans are now up-to-date and pleasing to the eye—something that one could not have truthfully said a few years ago.

Perhaps influenced by this radical change, Dinky have released an excellent reproduction of a Bedford Van in Royal Mail livery, which is a prime example of a modern van. Marketed under Sales No. 410, the new model is a "traditional" die-cast Dinky, rich in fine body detail—doors, door handles, bumpers, grilles, lights, registration plates, and even the name "Bedford" being typical examples of the many features represented on this attractive little model. Appeal is enhanced even further by the inclusion of a white interior seat moulding and dashboard unit, which greatly increases its overall appearance and, naturally, its "lifelikeness" also. The cab windows are glazed and the windscreen sports a representation of windscreen wipers and a rear-view mirror.

Mounted on Speedwheels for fast "push-along" performance, the Bedford is finished in G.P.O. red with silver radiator-grille and has "Royal Mail" labels mounted on the sides. It is produced to 1/48th scale having an overall length of $3\frac{1}{16}$ in. (90 mm.), a width of $1\frac{9}{16}$ in. (39 mm.) and a height of $1\frac{1}{2}$ in. (38 mm.), and it genuinely represents excellent value at the remarkably low price of 32p.

R.A.F. Dominie

Also released with the Bedford Van is another first-class addition to the ever-increasing range of Dinky Toy aircraft—the R.A.F. Dominie, marketed under Sales No. 728. Basically, the Dominie in real life is a Hawker Siddeley HS125 Executive Jet finished in R.A.F. livery and conforming to R.A.F. specifications. As might be expected, of course, it has been somewhat modified and equipped to meet R.A.F. requirements, but it is still easily recognizable as an HS125.

The first Dominie flew in December 1964 and its function was, and still is, as a navigational training aircraft for the R.A.F. Power is supplied by two 3,120 lb.s.t. Bristol Siddeley turbojet engines in "pods" mounted one each side of the rear fuselage section, which gives the aircraft a maximum cruising speed of 472 m.p.h. at 25,000., and long-range cruise speed of 420 m.p.h. at 38,000 feet. The maximum range of the Dominie, with a 1,900 lb. payload, is 1,727 miles at 420 m.p.h. at 38,000 ft., which, for such a small plane is quite outstanding.

Upon reflection, a model Dominie is not really a surprising addition to the Dinky Toy range. Dinky already make the civilian Executive Jet (No. 725) and the Dominie is therefore a natural follow-on to this.

Produced to 1/108th scale, it is a nicely-detailed reproduction capturing the sleek lines of the original aircraft from its streamlined nose and fuselage, through its two rear-mounted engine pods to its swept-back fin and high tailplane. Special Dinky features include fully-glazed amber cockpit and cabin windows, plus an opening cabin door which, like the original, has steps formed in the inside surface so that, when the door is opened by hinging it downwards, it also serves as the access steps. Fitted, in addition, is a working retractable undercarriage, hand-operated and laid out in the correct "tricycle" arrangement.

Despite the design similarities between the Dominie and the HS. 125, there is no danger of the two Dinky Toys being confused: the Dinky Dominie is finished in military camouflage colours of olive green and pale blue on the top surfaces and all-over pale blue on the under surfaces. The final touch is supplied by R.A.F. roundels and tail flashes. With a wing span of almost $5\frac{1}{4}$ in. (132 mm.) and an overall length of $5\frac{1}{4}$ in. (132 mm.) the model sells at a recommended U.K. retail price of 85p.

Lunar Rover Kit

Dinky's final release this month should be to the liking of the do-it-yourself fraternity—being a kit version of the existing Lunar Roving Vehicle—the moon buggy that has already proved very popular as a "ready-made" model.

Dinky Kits have established themselves as a highly successful line, and Meccano are now regularly increasing the range as promised when the Kits were first introduced. At the time of writing the figure stands at fourteen models including the Lunar Rover. The popularity of the Dinky Kits has undoubtedly been greatly influenced by the very competitive price at which they are sold. All the Kits include die-cast components, and if one was to compare Dinky's Kits with other metal kits on the market, the value would immediately be apparent, bearing in mind that they are not aimed at the adult kit enthusiast who might be willing to spend several pounds for one of the specialist advanced kits sometimes found on the "expert's" market.

Apart from the twenty-eight components required to build up into the Lunar Rover, the kit comes complete with two model astronauts, and a sample phial of Humbrol enamel. Identified by No. 1027, it retails at only 69p which represents an excellent buy.

Opposite, left, two views of Dinky Toy No. 410 Bedford Van "Royal Mail" clearly portraying its outstanding realism and impeccable overall finish.

Opposite, right, a close-up rear-quarter view of the Bedford Van clearly showing the wealth of fine, realistic detail present on this good solid Dinky.

Right, up, up and away . . . ! No. 728 R.A.F. Dominie is a valuable addition to the Dinky aircraft range.

Pirate Models

Mention "pirates" to most people and you are likely to conjure up visions of black-bearded, cutlass-swinging demons swarming down from heavily-armed ships to loot and pillage among law-abiding citizens. This image, however, would be totally false if applied to a particular brand of 20th Century pirates to be found in London—Pirate Models, of 6 Manor Hall Drive, London, N.W.4—for this oddly-named Company is in fact in business to assist the public, not to harm it. They specialise in providing spare parts such as radiators, windscreens, wheels, etc. for obsolete models, particularly old and rare Dinky Toys, and, to my knowledge, they are the only organisation in the Country who do so.

All the spare parts available are replica components, newly made, and of special interest is a selection of different-sized tyres—both black and white—reproduced from the early Dinky period when plain, treadless tyres were fitted to models. These could prove particularly valuable as missing tyres probably present by far the biggest problem to serious collectors, intent on renovating old Dinky Toys to their original condition. Further information on available items can be obtained direct from Pirate Models.

RIVETING

(*continued from page* 497)

The free ends of the 2 in. Girders and 2 in. Strips are connected by a 2½ in. Angle Girder, the downward projecting flange of which is extended by a pair of 1½ in. Flat Girders 79.

To the underside of the tool tray is bolted a 1 × 1 in. Angle Bracket 80, spaced one hole away from the side of the body. This carries a 4 in. Rod which slides also in a further 1 × 1 in. Angle Bracket 81 bolted to the 5½ × 2½ in. Flat Plate on the side of the body. As this Rod also must not rotate, it carries towards the forward end a Coupling 82, in the opposite transverse plain bore of which is secured a 1½ in. Rod which also slides in front Angle Bracket 80. Two further Couplings 83 and 84 are secured to the 4 in. Rod, Coupling 83 being mounted by its central transverse bore with its vertical longitudinal bore carrying a downward-projecting 1 in. Rod 85. The rear Coupling is also vertically disposed and carries in its lowest transverse bore a Threaded Pin 86.

This assembly, which slides backwards and forwards, must now drive the cutter slide which moves at 90° to it. To achieve this, the two vertically projecting 1 in. Rods 63 and 85 engage in the slotted holes of a small bell crank 87, made up from a pair of Fishplates secured by their round holes to a Rod Socket. Another 1 in. Rod is fixed to the boss of the Socket, this Rod swivelling freely in a Handrail Support 88 fixed to the lower frame member. To the underside of the 3 × 1½ in. Flat Plate is bolted a 1 × ½ in. Double Bracket 89 which carries a Bell Crank fitted with one arm projecting downwards, the other rearwards. The latter arm is extended a further two holes by a 2½ in. Strip 90, the outer hole of which carries a Pivot Bolt upon which a Coupling 91 swivels freely. A Threaded Pin is secured to the vertical arm of the bell crank, the plain shank carrying a 3½ in. Strip 92 which is retained by a Collar. The forward end of the Strip fits on to Threaded Pin 86, where it is secured by a further Collar. To drive the cutter arm mechanism a Bush Wheel 93 is secured to the end of the right-hand side of the crankshaft. A Coupling is pivotally fixed to the Bush Wheel by a Pivot Bolt, this Coupling then being joined to Coupling 91 by a 3 in. Rod.

Finally, the side of the Cutter Slide housing is enclosed by Flexible Plates, Perforated Strips, and a Flat Girder 94. This side panel is fixed to the side of the frame by a 2½ × ½ in. Double Angle Strip.

(*to be continued*)

Your Friendly Station

Local radio is going to spread. Here's Bristol's story from Michael Farr

AMU 451 H, a white Hillman estate car with a peculiar aerial at the back, is becoming a familiar sight in and around Bristol. It is just one way that local radio—BBC Radio Bristol in this case—keeps the community in touch with what is going on in its own area.

The BBC opened eight local radio stations in 1967 and 1968. They were given two years to prove themselves, and the result can be judged by the fact that the Government then in power agreed the BBC should set up a further 40 stations.

Radio Bristol, the first of the second-generation stations, opened on 4th September 1970. Eleven more followed before the newly-elected Government stopped further BBC development because of its policy of encouraging commercial local radio.

This local station is on the air from 5.00 a.m. to 2.00 a.m. the next morning, and for about nine hours the programmes are locally-produced. For the rest of the day, generally the less-popular listening hours, Radio Bristol broadcasts BBC Radio 1 or 2.

When the second batch of local stations was planned it was intended to broadcast on medium wave and VHF, but so far only the VHF service can be provided. Radio Bristol can also be received on a Rediffusion channel, and medium wave transmission is expected soon.

Radio Bristol operates completely independently of the network programmes, although it often feeds material nation-wide. The Station Manager is free to run the Station more or less as he likes, though a local radio council meets every six weeks to discuss the general running of the Station.

There are twenty-seven full time staff, backed up by freelance contributors and correspondents throughout the area. One of the aims of local radio is to use local talent, and many hundreds of would-be interviewers, disc jockeys and sports commentators have been auditioned since the Station opened. Some of these showed exceptional ability and are now on contract as freelance contributors.

Education is an important aspect of local radio work, and four teachers have been seconded to the Station to help with the education programmes. One interesting series has been the result of co-operation between the various local stations, each of which has produced a half-hour programme about its own area, and then circulated it to other stations.

No two days are exactly alike, but let us take a typical Thursday. One of four Station Assistants is first on the Station before 5.30 a.m., followed closely by the early shift news-man. The Station Assistant (S.A.) spends the first ninety minutes preparing and introducing a record programme including the local fatstock prices, coming events, traffic news and local weather.

The News Production Assistant (P.A.) is checking the teleprinter for overnight messages, and telephones local police, fire and ambulance stations for traffic information, bad weather warnings and any calls that may make a story. A third person has come on the scene by now to introduce "Morning West", a mixture of music, local news and interviews from 7.10 or so through to 9.00.

During the national news at 7.00 the S.A. is ready in Operations Room, the "Morning West" man sits at the controls in Studio One, with the News P.A. across the desk. At about 7.11 the London newsreader says "... and that is the end of the national news". The S.A. opens the "pot" on the control panel to switch on the tape recorder playing the Radio Bristol identification, a special composition by Sidney Sagar based on the morse code "R.B.", and "Morning West" begins. For the Station, the day has started in earnest.

Most mornings there is one regular contribution, and on Thursday this is a consumer's guide to the best buys in supermarkets in the area. There may be a link up by telephone with someone living too far from Bristol to reach the studio by 7.15. Throughout the programme, and throughout the day if necessary, news flashes bring information on traffic hold-ups, weather or police messages.

Top picture shows the radio car which feeds on the spot news into local radio as it happens. Here the author talks about H.M. Submarine *Walrus* as soon as it had tied up. Left, the Calico Pie Programme is quite a riot on a Saturday morning.

At 8.00 split-second timing brings the national news in from London, catching all six "pips". If the first section of "Morning West" overruns by even a second or two, everyone will know because a pip will be lost! An hour later, at the end of the second part of "Morning West", the control panel is switched to receive Radio 2, and the early crew can stop for breakfast.

During the morning Radio Bristol puts out its own women's programme, half an hour for schools and a variety of music or interviews, according to the day of the week. 12.45 is "Time for West to One", fifteen minutes of local news leading up to the national 1 o'clock news, and usually presented by the News Editor. This quarter of an hour programme has built up a particularly high reputation and often scoops the local papers with the morning's stories.

For most of the afternoon Radio Bristol transmits national programmes, with a news bulletin at 3.00. 4.00 sees a return to local production with "Home Run", music, interviews and events on during the evening. 6.00 brings the national news, followed at 6.15 by local news and one or two more local programmes before returning to Radio 1 until close-down, interrupted only by a late local news and any news flashes.

One weekly programme for children deserves a special mention. "Calico Pie" is broadcast between 10.00 and 11.00 each Saturday morning and the main studio is packed with children who are encouraged to contribute to the programme through serials and competitions. Regular visitors include Sam the Mynah Bird and human celebrities from the animal world. By using the Radio Car parts of the programme have been fed in live from inside a submarine and a children's hospital.

Within months of Radio Bristol opening, the country was plunged into a power crisis. The Station won many friends with their power news, warning when lights were likely to go out. During the 1972 power crisis this service was stepped up, with bulletins every hour throughout the day. Many appreciative letters were received, and even a box of chocolates from a grateful listener! Here was one way the local station served the local people. Other achievements to its credit include helping to find two lost children and acting as a marriage bureau when one Bristol man found himself a wife over the air!

Full-time staff for local radio are selected through the normal BBC competitive appointments system. The top jobs—Station Manager, Programme Organiser, News Editor and the administrative or secretarial staff are all normally filled internally. The average station has eight or nine producers and four or five station assistants whose posts are often open to external candidates, and vacancies are then advertised in the Press. Newly recruited staff at these levels are given a training course with the BBC's Local Radio Training Unit in London, with further training on the station itself.

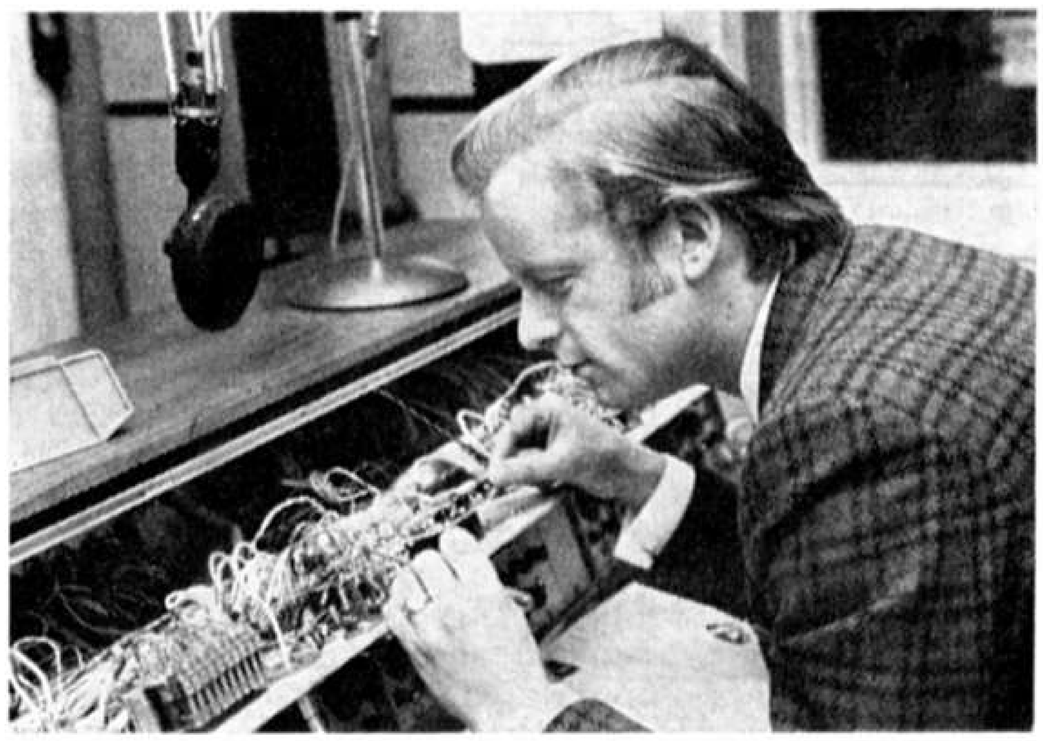
Each station normally has two engineers, both of whom are qualified BBC staff engineers. On a local station they are likely to face a far greater variety of problems than in network BBC radio or television. They may one day be servicing a control panel, the next operating the radio car from an important outside broadcast.

Local radio is produced by local people for their local community. All stations are on the lookout for new talent, and auditions for freelance contributors are held from time to time. If you feel you have something to offer, why not write to the manager of your own local station?

Inside a submarine for a Calico Pie programme

"That is the end of the local news. Now here is some music." One of the newsmen at the main studio control desk.

Below, local radio engineers must be ready to tackle anything —from recording an important outside broadcast with the Radio Car to servicing a control panel.



Design and Construction of Bridges

Part 9 — Modern Suspension Bridges

By Terence Wise

Roebling's great Brooklyn suspension bridge, covered in last month's article, held the record for the worlds' longest span until the building of the Williamsburg bridge, also in New York, in 1903 with a span of 1600 feet. A notable feature here was the depth of the stiffening trusses which were 40 feet. From this time on there was a general reversal in the trend towards deeper stiffening girders and they became ever more slender and graceful.

The development of high tensile steel cables made it possible to build suspension bridges with exceptionally large spans and the sheer inertia of the dead weight of these bridges was so great that the problem of oscillation, discussed last month, was to a large extent overcome. In these new, larger bridges the weight of the traffic passing over them was almost negligible in comparison to the weight of the construction itself, and this added greatly to the ability to reduce the depth of stiffening girders.

In 1926 the Florianopolis suspension bridge, spanning the Atlantic from the mainland of Brazil to the island of Florianopolis, was completed with a main span of 1113 feet 9 inches and an overall length of 2788 feet. The span could not be called exceptional, in view of recent developments, but this bridge became famous for other more important reasons. Florianopolis saw the first use of a new form of stiffening truss, one which was four times as rigid as the conventional pattern yet only used two thirds as much steel.

In this new design the suspension cable replaced the middle half of the top chord of the stiffening truss, thus changing it from the conventional parallel chord truss with an equal depth along its length to a stiffening truss with its maximum depth at each end of the span. Another new feature was the adoption of rocker towers which, by eliminating the bending stresses, saved 20% of the steel needed for the towers and thus enabled the tower piers to be much reduced in size.

High tension heat-treated carbon steel eyebars were used instead of wire for the cables and here again there was a break from the conventional method of construction. Instead of utilising wooden framework and working platforms during erection, an overhead trolley system was used for both eyebar cables and the stiffening trusses. 4,400 tons of steel and 14,500 cubic yards of concrete were used in this bridge, which took three years to build.

Spans of ever increasing length followed in rapid succession, mainly in America, where this type of bridge was most popular. The George Washington Bridge, spanning the Hudson River between Manhattan Island and New Jersey, was opened in 1932 with a total length of 4,760 feet–the world's longest suspension bridge at that time with a length twice as great as any other. Even now, 40 years on, it still rates 4th place in the world's bridges for length. The span over the river itself is 3,500 feet. Each suspension cable contains 26,474 parallel steel wires with a total breaking strain of about 100,000 tons. The total length of wire used in the four cables reaches the staggering length of 115,000 miles.

Just after World War Two the deck of this bridge was widened to take eight lanes of traffic instead of six and during the late Fifties a new six lane deck was built beneath the existing one, making the George Washington Bridge the first 14 lane suspension bridge in the world. It is now used by more than a million vehicles every week.

Africa's largest suspension bridge is the Birchenough Road bridge over the River Sabi in (Southern) Rhodesia, with a clear span of 1080 feet. Completed in 1935 it was at that time the third largest in the world, and rises 300 feet above the river bed.

In 1937 the fantastic Golden Gate bridge at San Francisco was completed for a cost of 32 million dollars. Linking the San Francisco peninsula to North California, this suspension bridge has a main span of 4,200 feet, while each of the side spans is 1,125 feet, giving a total length of 9,217 feet. The deck width is 90 feet, with a high water clearance of 220 feet. The principal suspension cables are 36¼ inches in diameter. Even after 35 years this bridge still rates second in the world for span length, although this will soon be changed.

The Tacoma Narrows bridge, south of Seattle on the west coast of America, was built at Puget Sound in 1940 with a main span of 2,800 feet at a cost of over 6 million dollars. Four months later the main span fell during a 42 mile an hour gale. The stiffening girders had been a mere eight feet in depth. This disaster called a halt to the more and more elegant and long suspension bridges and an intensive study of the problems involved was undertaken. Out of this emerged the fact that suspension bridges could theoretically be built with spans up to 7,000 feet while, now that the special problems of suspension bridges had been thoroughly examined in the light of modern knowledge, it was thought likely that the suspension method would also be used for shorter spans.

In Britain the Forth Road Bridge was begun in 1958 and completed by 1964 with an overall length of 8,250 feet, including the approach viaducts. The centre span 3,300 feet, is at present the 6th largest in the world. The suspension cables consist of 11,618 galvanised high tensile steel wires, just under 2/10ths in diameter, with a strength of 100 tons per square inch. Warren truss

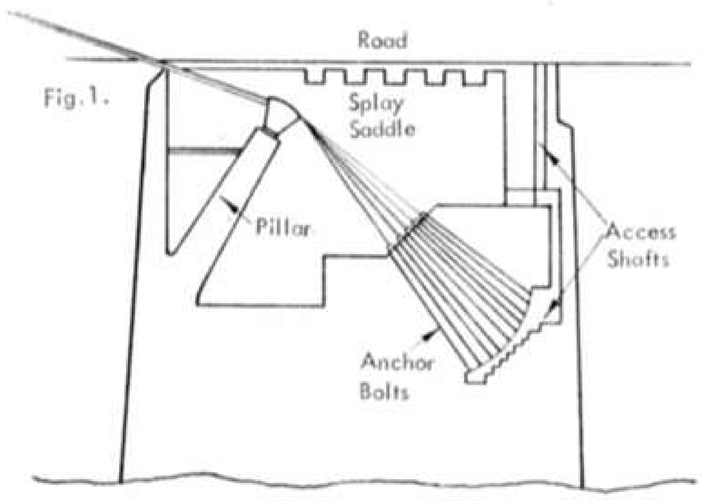


Fig. 1.

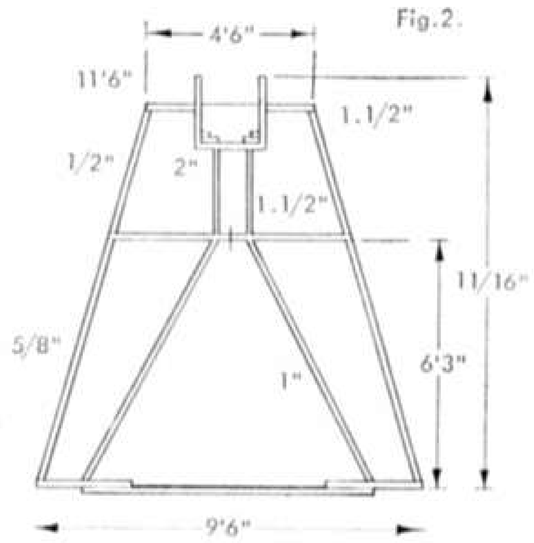


Fig. 2.

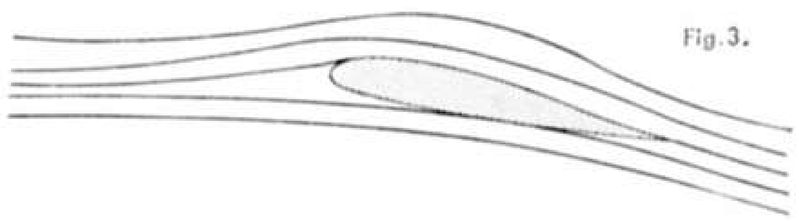


Fig. 3.

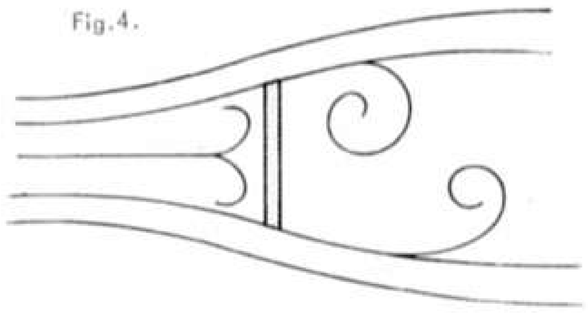


Fig. 4.

girders, 27 feet 6 inches in depth, were used for stiffening and in all some 16,000 tons of steel went into the construction.

The Verrazano Narrows bridge, carrying 12 traffic lanes between Brooklyn and Staten Island, was built between 1959 and 1965 with a span of 4,260 feet, at present the longest span in the world.

Britain's Severn Bridge, 7th in the world, was begun in 1961 and finished in 1966 at a cost of £8 million. It is the lightest for its length and load ever built but what makes it more important is its revolutionary design. Spanning a mile of river, the bridge has a main span of 3,240 feet and side spans of 1,000 feet. Choice of site was difficult and mainly governed by the lack of solid foundations in the area where the bridge was needed—to link up the motorways planned for the area. At the final choice of site the tides are faster than anywhere else in Britain, with a rise and fall of more than 40 feet.

Foundations for the western pier had to be sunk 45 feet below water level but the eastern pier was built on solid rock, only four feet down. The story was repeated with the cable anchorages: on the west shore the anchorage was built on sand after going down 60 feet, while on the east side rock was found after only ten feet. *Fig.* 1 shows the eastern anchorage in cross section.

The piers for the towers stand 45 feet above high water mark, the towers being another 400 feet high. 18,000 miles of high tensile steel wire went into the cables and the 8,320 wires making up each cable have a diameter of 20 inches after compression. *Fig.* 2 is a cross section of the saddle which receives the cable at each tower top.

The break with conventional design came with the bridge deck, and the magic word here is aerodynamics. If wind strikes a bridge horizontally then the deck can be made to act like an aerofoil. The flow across such a deck would be of a streamlined character—*Fig.* 3—and the deck would have a lateral drag effect together with a small vertical lift. Even more important are the effects of the wind against the stiffening girders. *Fig.* 4 shows how these present a vertical barrier to lateral winds and cause eddies. Large eddies leave the top and bottom edges of the plate alternately and so produce regular pulsations in the air forces on the plate. The Severn bridge deck was therefore designed as a continuous shallow welded steel box girder, carefully proportioned to take care of these aerodynamic problems. To help create stability even the steel wires connecting the deck to the cables were not placed vertically as is normal, but inclined to form a series of triangles. This application of aerodynamics to bridge building constitutes as important a step forward as Roebling's invention of the steel wire cable. The deck of the Severn Bridge was assembled on shore in watertight sections, which were then floated out to the required position. Width of the box section is 75 feet, with 105 feet between the outer edges of the cycle and foot ways, which are cantilevered out from this main box.

Suspension bridges of the near future seem well on the way towards that figure of 7,000 feet mentioned earlier. Amongst the bridges lined up for the future are one with a 4,580 foot span over the Humber Estuary, one of 4,600 feet in Tokyo Bay, and one of 5,000 feet in the Messina Straits.

West Country Inventor by Edyth Harper

DEVONSHIRE is famous for fishermen, cream and beautiful scenery, among other things. Few people connect it with the use of steam, yet it was a Devonshire inventor who employed steam in a type of engine known as the atmospheric engine.

When steam-engines were first used they were called fire-engines because fires were needed for heat to raise steam to atmospheric pressure. Once inside an engine, cold water jets condensed the steam. This condensation caused a partial vacuum. Excess atmospheric pressure above the pressure in the partial vacuum, caused the engine to work.

There had been many attempts to harness steam before Thomas Newcomen of Dartmouth put his ideas into practise. A mathematician called Nye had a theory for making steam propel an engine in 1647. By 1665 the Marquis of Worcester invented a system known as "Fire-Waterworks" which could cause a column of water to be pushed 40 ft. into the air by using steam. At the turn of the 17th century a Capt. Savery produced a form of steam engine that was used in Cornwall in the tin mines. Denis Papin of France is said to be the first designer to incorporate a piston into his engine.

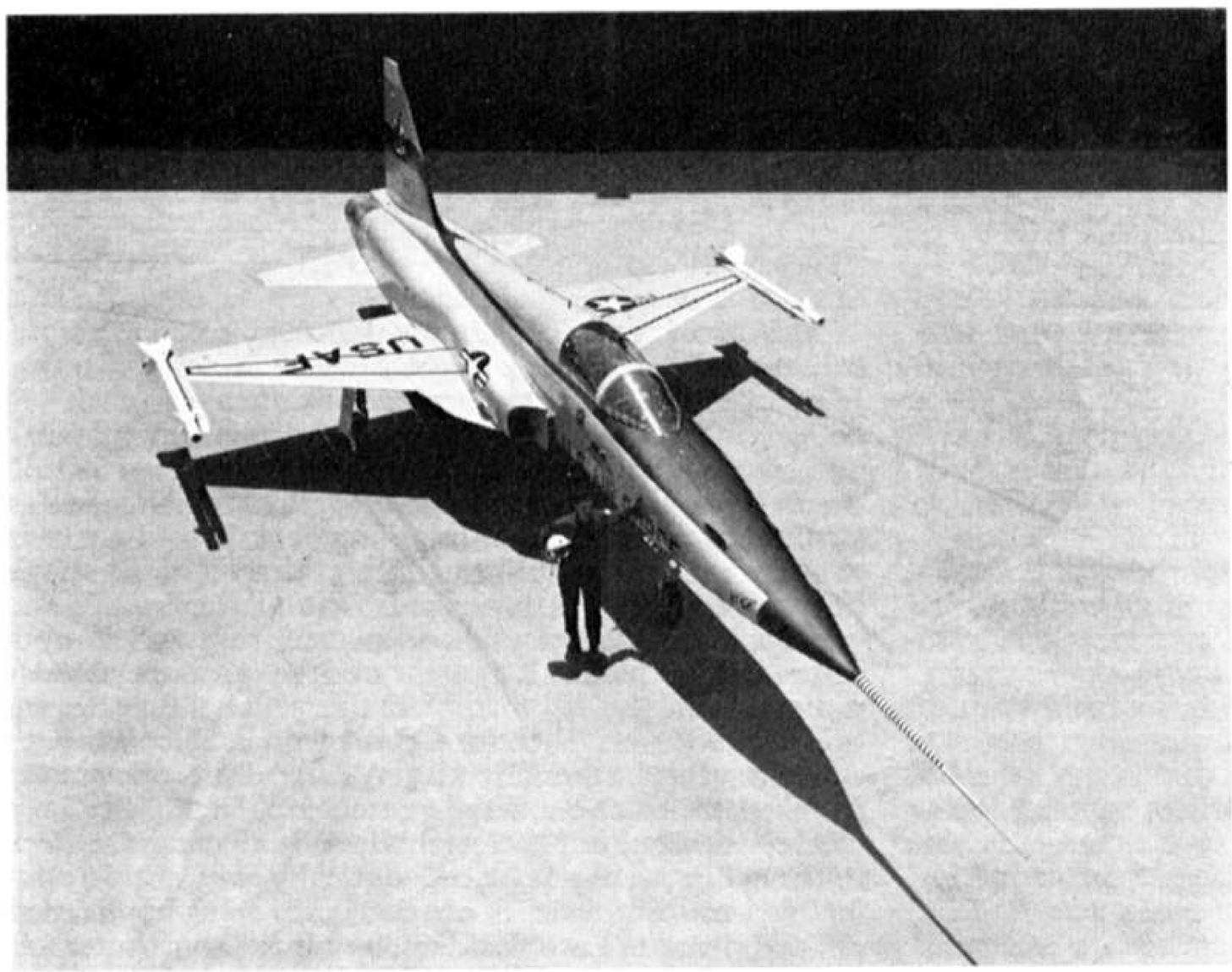
All these men's inventions were known to Newcomen who knew Capt. Savery personally. A native of the West Country, Newcomen was well aware of the problems mining involved. Savory was the manager of a Cornish mine. He, Newcomen and another man called Cawley, a glazier, decided to patent Newcomen's invention—the atmospheric engine.

It proved popular and for 70 years was the most effective device for pumping water out of the mines. In Newcomen's engine a "beam" was used and condensation became instantaneous. The beam moved on an axis. At one end the pump's rod was attached and the other end was fixed to the piston rod. The piston worked in a cylinder over a boiler. A connecting pipe had a stop-cock in it to regulate the steam.

Many things that have benefited mankind have come about by accident. A boy called Humphrey Potter had the task of opening and closing the stop cocks. Humphrey however disliked work. To save himself effort, he thought up an idea by which, with the help of levers and strings, the valves were controlled by the engine.

Newcomen lived until 1729 when he died in London. It is in his own town, however, that a statue was erected. A diagram is carved on a block of stone showing how his atmospheric engine worked and in some old mines, the pumping mechanism can still be seen.

It is a far cry from such a simple invention to the machinery used in mining today but men like Newcomen paved the way for modern techniques. They deserve our thanks for their practical ingenuity.



AIR NEWS

by

John W. R. Taylor

Northrop Unveils the Tiger II

When Northrop first proposed building a lightweight fighter, side-by-side with their new T-38A Talon supersonic basic trainer for the USAF, the idea was not greeted with much enthusiasm. The two types were intended to be similar in design and construction, and each was to be powered by a pair of afterburning General Electric J85 turbojets. Main differences were that the fighter was shown with five pylons under its fuselage and wings, for weapons and external fuel tanks. Its engines were also to be higher-rated than those of the Talon, giving a top speed of 925 mph.

After a slow start, many hundreds of the fighters were eventually ordered for the air forces of fourteen of America's friends and allies, as the single-seat F-5A and two-seat F-5B. Another 220 were built by Canadair for the Canadian Armed Forces and Royal Netherlands Air Force.

In the late 'sixties the USAF began to shop around for a successor to the F-5A and B. Eight of America's leading aircraft manufacturers were invited to submit design studies and cost estimates, with the proviso that the new aircraft should be based on an existing design, to save time and money. This was understandable, the USAF was having a hard fight to obtain the goverment funds needed for its own new combat aircraft. There was not much to spare for machines that would normally be given, free of charge, to even-more-hard-up allies.

Yet the need was real enough. With US forces being withdrawn from overseas, notably in areas like Vietnam, it was important to leave the local people with adequate means of defence.

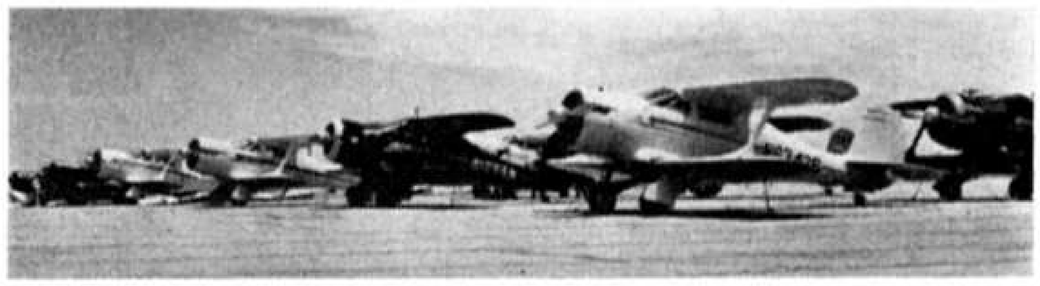
Northrop made the most of the strong position in which the F-5 had put them. While their competitors in the International Fighter Aircraft (IFA) programme could only put forward drawings and models of their proposals, they re-engined an F-5B with two of the 5,000 lb thrust J85-GE-21 turbojets planned for their new aircraft and made more than 140 test flights with this prototype, beginning on 28 March 1969.

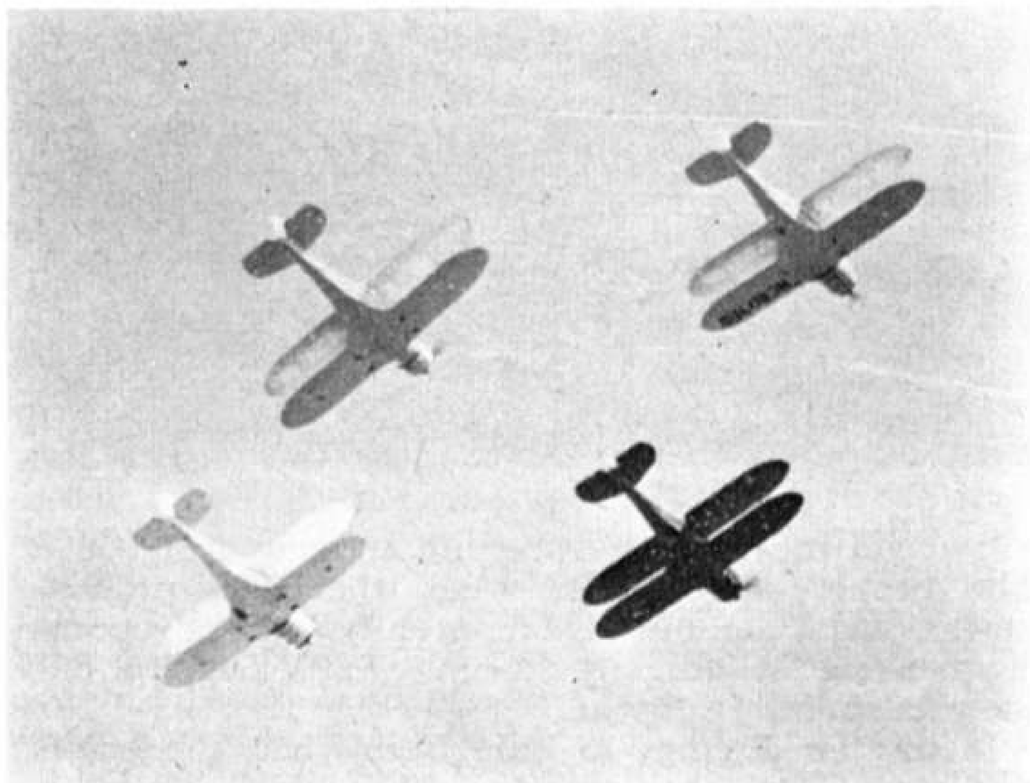
The effort proved very worthwhile. The more powerful engines gave the aircraft a maximum speed of 1,055 mph (Mach 1.6), a ceiling around 50,000 ft and a much improved load-carrying ability, without any loss of the easy-to-fly characteristics that had made the F-5 ideal for use by the pilots of smaller air forces with limited ground facilities.

On 20 November 1970 the USAF announced that Northrop had been chosen to build the IFA and was to receive an initial $21 million contract. Losing no time, the company was able to unveil the prototype of its new fighter, as the F-5E Tiger II, on 23 June this year, well ahead of schedule. Deliveries of production aircraft to the USAF Tactical Training Squadron at Williams Air Force Base, Arizona, will begin next February. By 1974 large numbers of F-5Es for other nations will roll off the assembly lines at Hawthorne, California. Present contracts cover 325 F-5Es; at least another 300 are expected to be needed. Each will cost about £667,000 ($1.6 million), as estimated; but it is already clear that performance will be better than originally promised.

America's allies in southeast Asia, for whom most of the Tiger IIs are intended, will receive an aircraft 48 ft long, with a span of only 26 ft, and weighing a mere 21,818 lb fully loaded. This will include two 20mm cannon mounted in the front fuselage, two wingtip-mounted Sidewinder air-to-air homing missiles, and 7,000 lb. of weapons and fuel tanks under the wings and fuselage. Top speed will be Mach 1.6, service ceiling

Heading and right, the lovely lines of the very small Northrop F5E Tiger II International Fighter disguise a very potent military aeroplane capable of carrying more than 3 tons of weapons etc. beneath its 26 ft. span wings.





Beechcraft Model 17s—known as "Staggerwings" because of their unusual backward stagger—at Beech Field, Wichita, and flying in diamond formation. An astonishing number of these aircraft, between 24 and 40 years old, are still in regular use.

54,000 ft, rate of climb no less than 31,600 ft a minute and range more than 1,600 miles for ferrying.

Manoeuvrability will be even better than that of the F-5A following the installation of manoeuvring flaps on both the leading- and trailing-edges of the wings, plus enlarged wing-root leading-edge extensions. Accuracy of attack on high-speed targets will be improved by new search and range tracking radar and a lead-computing gunsight. Other equipment to ease the pilot's task will include an automatic direction finder and a small air data computer. That so much is packed into such a beautiful little airframe is a great tribute to the skill of Northrop engineers.

Staggerwings Return to Beech

One of the most distinctive shapes of an earlier age in America was the Beechcraft Model 17, known to vintage aircraft enthusiasts as the Staggerwing. It entered production just forty years ago, and a total of 781 had been built when the last one was delivered in 1948. Of these, 425 had gone to the US Army and Navy during the second World War.

Even Beech Aircraft Corporation must have been surprised to learn that no fewer than 126 Staggerwings are still flying in the United States, plus many more overseas; that 63 others are being rebuilt and that 52 are in store or rebuildable. The owners of these classic four/five-seaters are so proud of them that they have formed the Staggerwing Club, which now has 250 members worldwide.

In June of this year they were invited to hold their annual fly-in at Beech Field, Wichita, from where the aircraft had made their first flights. One hundred and twenty Model 17s put in an appearance, and the airfield was soon besieged by enthusiasts of all ages, eager to see the multi-coloured biplanes, with their radial engines and negative-stagger wings (top wing further aft than the bottom one).

To prove that their 200 mph aircraft were still capable of more than just a fly-in, four club members took to the air, made two passes over the field in diamond formation and ended with a spectacular "bomb-burst" at the end of the runway.

Bulldogs to Kenya

Back in October 1970, the Kenya Air Force placed a £100,000 order with Scottish Aviation for five Bulldog 103 trainers to replace their Chipmunks. The aircraft were completed this Summer and it was decided to deliver them to Nairobi in a single consignment.

On 24 July a Canadair CL-44J swing-tail freighter of Cargolux Airlines touched down at Prestwick Airport, taxied over to the Scottish Aviation works and prepared to take on board a truly surprising load. In addition to the five Bulldogs, with wings and tailplanes removed for the journey, the CL-44J "swallowed" all the spares and equipment likely to be needed by the Kenya Air Force and four KAF engineers who had been undergoing training at Prestwick. It delivered the lot in Nairobi next day.

Concorde on the Deck

The Anglo-French Concorde supersonic transport

Right, a Bulldog Model 103 on test before delivery to the Kenya Air Force with, above, one of five such aircraft being loaded as one consignment, including spares and equipment, in a Canadair CL44J.

The first Westland-Aerospatiale Gazelle for the Royal Navy, XW845, on its maiden flight. The three Services have ordered a total of 142 of these five-seaters.

will spend most of its flying life at around 50,000 ft. The people of Toulouse were, therefore, probably startled when the number one prototype made repeated flights along the local airfield runway at a height of only a few feet in May this year.

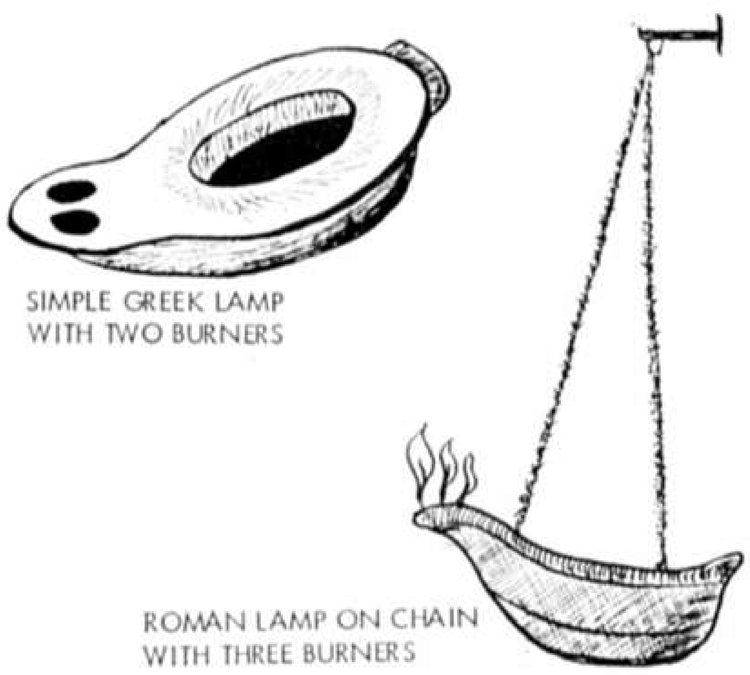
It was no attempt to hide from "ban the boom" protesters. On the contrary, the flights were an essential part of the test programme. Wind tunnel tests can answer many questions about the aerodynamics of a new aeroplane, but there is no substitute for obtaining certain data in flight. So, the very-low-altitude tests were conducted in order to measure precisely the airflow interaction or "ground cushion effect" between the runway surface and Concorde's narrow delta wing at heights just above touch-down.

To ensure precise flying at preselected heights, with no possibility of human piloting reactions, the aircraft was flown "hands-off" by its automatic pilot and automatic landing system, developed by Marconi-Elliott Avionic Systems and its French partner SFENA. Fifteen automatic "landings" were made, with the autopilot set to level off and maintain height, first at 50 ft and then at progressively lower heights down to only 10 ft above the runway. Each run was maintained automatically for up to two kilometres (1¼ miles), demonstrating again how, in airline service, the autopilot will allow pilots to fly the big transport accurately and smoothly by push-button control from take-off to landing.

Helicopters in the News

Helicopters built by Westland and its French partner, Aérospatiale, have been making news recently. The elegant little five-seater illustrated here is the first Gazelle for the Royal Navy (XW845), which flew for the first time on 6 July. Thirty have been ordered for this Service, 99 for the British Army and 13 for the RAF.

In the previous month, the eleven-seat Lynx had set two speed records in its class, by averaging 200 mph over a 15/20km straight course and 197.9 mph over a 100km closed-circuit. Even more spectacular was the height record of 40,815 ft set up by an Aérospatiale SA 315 Lama, as this is higher than any helicopter has ever climbed before.



SIMPLE GREEK LAMP WITH TWO BURNERS

ROMAN LAMP ON CHAIN WITH THREE BURNERS

New Lamps for Old

Man's development of "artificial light"

By Cleland Bean

THE ways in which men have been able to dispel darkness by making use of torches, candles, lamps, lanterns and electric light form a fascinating line of study for the historian and archaeologist.

Nowadays when we take street and house lighting effects for granted it is interesting to note that primitive lamps are associated with people of the early Paleolithic or Stone Age. As might be expected these lamps were rather crude, stone structures, and not until cutting tools had improved did more artistic types make their appearance.

Stone lamps were used in various parts of western Europe, and prehistoric specimens had been common enough among the Eskimoes. Hollowed beach stones were used as lamps by the Aleuts of Alaska, and sometimes these stones also served for cooking purposes. More advanced communities in the eastern countries and along the Mediterranean had quite early made use of shells for ready made lamps in which wicks absorbed oily or fatty solutions.

Visits to local and city museums will show us how lamps have developed through the ages. Fine examples of lamps belonging to the Grecian and Roman periods may be seen in the British Museum. Some interesting forms of stone and shell lamps are on view in the Science Museum, South Kensington.

Those of us who have been to the National Museum of Wales at Cardiff may have noticed examples of lamps made from oyster and whelk shells. In earlier times whelk shells were suspended from suitable wall brackets, and Scottish people, especially those who lived in the Orkneys and Shetlands, described these lights as "buckie" lamps. Buckie is an old Scots name for red whelk.

It was relatively easy for people to remove part of the shell and leave an open hollow portion into which oily materials could readily be poured. The natural shape of these shells provided a firm gripping surface should it be necessary to carry the lamps from one place to another.

Archaeologists can tell us how the old shell lamps provided later designers with ideas for pottery lamps which were open cup-like structures with a lip at one side. When looking at these lamps one is reminded of the shallow evaporating basins which are used in chemical laboratories. Cowrie and conch shells had

been used as lamps by various maritime nations like the Phoenicians, Greeks, Carthaginians, Egyptians, Maltese and Romans.

But once man had begun to make clay and pottery lamps his taste for improvement in design took on new forms. The Greeks were notable in leading the way, and they saw how the addition of a recurved rim to the old saucer-type of lamp would prevent the easy spilling of oil. Convenient handles were also added to their night light containers, and from the sixth century B.C. Greek craftsmen continued to move ahead with fresh improvements.

They were first in the field with lamps which had a bridged nozzle or lip which supported the wick. Such a development led to the closing in process whereby the saucer-type lamps became receptacles which carried a fairly small in-pouring opening for the oil, and a much smaller one for the wick.

Examples of these improved lamp structures will be noted in the British Museum. Indeed if we wish to examine in detail or compare the formation of the Greek lamp from its earliest beginnings an excellent photographic catalogue will show us the step by step changes which cover at least sixteen different sorts. These new designs set the scene for people like the Romans, Parthians and Egyptians who based their own characteristic methods for making lamps on the Grecian models.

The later editions of Greek and Roman lamps are attractive to artists because of their pleasing patterns, scrolls and figures. Many of the Greek lamp makers decorated their works with leaves, floral designs, pebbly markings and curved formations. Some lamps have handles moulded in the shape of the human head, but usually the handles are merely plain lug affairs rather than decorative endpoints.

From an artistic aspect the Romans have left us with an even greater range of decorative lamps, and numbers of these are shaped in the forms of animals and human beings. The dolphin outline was commonly used, and other lamps were moulded as human hands. Some took the outline of human feet, while various specimens were designed in the shape of a bull's head.

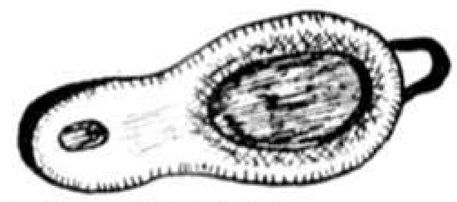
But apart from these queerly shaped lamps it was the surface design on the more usual forms which received attention regarding craftsmanship. As can be imagined the immense area occupied by the Roman Empire lent variety to the work of lamp makers in various countries. Different cultural backgrounds played their part here in places such as Gaul, Britain, Cyprus, Egypt, North Africa, the Greek islands and in Italy itself.

Archaeologists are grateful to the Romans for leaving inscriptions and trade marks on their lamps. By such references it has been easy enough to discover the parts of the Empire in which the various products were made. Some of these trade signs are as distinctive as our present day marks, and numerous lamps have even got the potter's name on them.

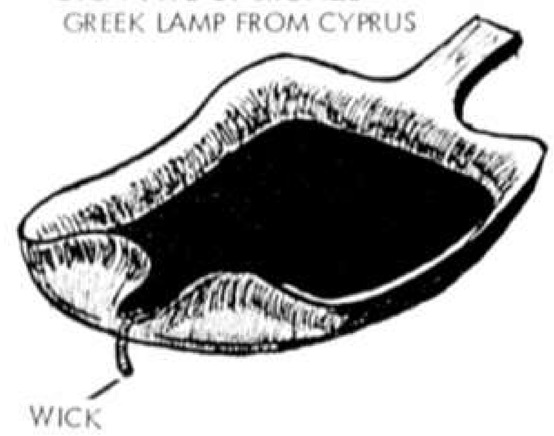
In the Cardiff Museum we will notice lamps which were found at Caerleon, and the inscriptions here show that these date from the first century A.D. The lamps were found at Holt, Denbighshire, and their maker was evidently a man called Sextus.

The Romans liked to cover their lamps with all sorts of designs, figures, gods, animals and scenes from everyday life. Their artists worked carefully at producing pictorial compositions which denoted numerous gods of myth and legend. Hercules, Zeus, Eros, Isis, Ulysses, Pallas Athena and Diana pass before us, while gladiators in combat or horses ready for battle form other pictures.

A wide selection of animal subjects including lions, dogs, dolphins, eagles, deer, rabbits, hares, crocodiles,



GREEK POTTERY LAMP



OPEN TYPE OF BRONZE GREEK LAMP FROM CYPRUS

ROMAN LAMP

oxen, hens, donkeys, bears and boars were also selected. On lamps pictures of lions, dogs and eagles are among the commonest figure studies. Indeed the Romans seem to have been as fond of dogs as British people are to-day. Even among the ruins of Pompeii we can see a floor mosaic adorned with a dog and the words Cave Canem beneath it. ("Beware of the dog".)

At Pompeii types of lanterns as well as lamps have been found. Instead of glass protection shields, these lanterns display horn windows, and in fact the turnip lanterns used by young people at Hallowe'en would give similar lighting effects. Some of the Roman lamps found at Pompeii were designed to hang by chains from ceilings or special wall brackets, others were kept on metal stands.

When the Stone Age gradually gave way to the Bronze Age better designed lamps with greater illuminating power appeared in houses, halls, temples and palaces. Compared with the single or double burners of the pottery lamps the bronze variety had anything from four to fourteen burners. Different examples of these lamps will be noted in the Naples Museum.

Perhaps the Bronze period may conjure up for us some of those stories which are associated with Aladdin's lamp, and we do have numerous specimens of Arabian and Indian lamps in brass and bronze. As with the Greeks and Romans remarkable artistic designs are very much in evidence here, and the makers of course were influenced by their religious backgrounds.

Hindu emblems are much to the fore on Indian lamps, and many of them were used in temples and at shrines. For purely religious purposes Indian lamps were often made in honour of Lakshmi, the goddess of wealth. An Indian festival which takes place at "Divali" is known as the pageant of light, but here again the goddess of Lakshmi is praised.

Quite a familiar shape for Indian lamps is the lotus flower and appropriately enough snake formations also adorn various types. But regarding lamps in general we can say that through the ages most countries have celebrated religious or feast days with grand displays of lights, lanterns and candles etc.

We need only to look at the bright lights of Christmas in our own country to realise how important the discovery of light has been to mankind. But long before the first lamps were constructed men had made use of fires, torches and splinters for ceremonial occasions.

The famous Olympic torch still remains as a symbol of those early times, and we know too that the torch signifies the pathways of wisdom and knowledge which we expect that each generation will follow. Even the word lamp takes its origin from the Greek word "lampas", which means a torch. We can say therefore that the Greeks were the first real lamp makers, for they had begun their light improvement designs in the sixth century B.C.

Stamps

Medicinal Plants on Stamps

By James A. Mackay

SINCE time immemorial people in every part of the world have endeavoured to find ways of getting rid of pains and curing ailments by means of powders, potions and pills of vegetable origin. Instinct, experience and the wisdom handed down from one generation to the next gradually evolved a primitive pharmacopia. It is a far cry from the highly organised pharmaceutical industry of the present day to the witch-doctors, alchemists and herbalists of the past, yet much of their lore, often dismissed as old wives' tales, has proved to be grounded in medical fact. It would be interesting to speculate to what extent traditional unguents and herbal infusions are used to this day in the combat against illness. Even in this era of expanded production of synthetic substances and the increasing emphasis on antibiotics, vegetable extracts and other substances of vegetable origin still represent a significant constituent in pharmacology.

Progress in the preparation of drugs, research into new forms of medicament and technological developments were the principal topics discussed at the International Congress on the History of Pharmacy (*Congressus Internationalis Historiae Pharmaciae*) which was held recently in Prague.

To mark the occasion the Czechoslovak Ministry of Posts and Telecommunications released a series of six stamps highlighting the historical aspects of pharmacy. Each stamp featured a well-known medicinal plant as well as the equipment and apparatus of the medieval apothecary or alchemist. Jaroslav Lukavsky produced the designs which were engraved by Ladislav Jirka, Bedrich Housa and Milos Ondracek.

The 30 haleru stamp shows Coltsfoot (*Tussilago farfara*), a deeply rooted weed whose flowers and leaves yield the popular cough linctus. Its leaves have also been used as a substitute for tobacco. The stamp also shows a group of three medieval drug jars or *albarelli*. Examples of these tin-glazed faience or delft jars, with their quaint and often obscure names of ointments and potions, are now highly prized by collectors of ceramics.

The 60h stamp shows the Dog rose (*Rosa canina*), bright of flower and sweet of scent, whose petals not only yield a valuable rose oil for the preparation of perfumes but whose fruit, the orange or purple hip, has a high vitamin C content. Hip tea and rose-hip syrup have been known to European herbalists for over two thousand years. A jar and a bottle containing these products of the Dog rose are also featured on the stamp.

Adonis vernalis, a member of the crowfoot family, is depicted on the 1 koruna denomination of this series. Its flower contains a substance used for stimulating cardiac activity. A bilateral spoon and an apothecary's hand-balance complete the design of this stamp. Valerian oil, the extract of *Valeriana officinalis* (shown on the 1.20 k stamp), was a traditional remedy in cases of hysteria. When first taken from the soil the root of the valerian has no smell, but on drying it acquires the powerful odour of valerianic acid. In the Middle Ages this smell was regarded as fragrant and pieces of valerian root were placed in clothing as a form of perfume. Nowadays the stench of valerian is considered wellnigh intolerable—which gives some indication of the standards of body hygiene in medieval Europe! Medieval mortars of richly ornamented alabaster and a matching pestle are also shown on the stamp.

The dried roots of the Chicory plant (*Cichorium intybus*) produces a coffee substitute or an additive which gives the coffee bitterness and body. In certain parts of Europe the roots are boiled and eaten with butter, while the leaves are eaten as a salad. This plant is shown on the 1.8k stamp along with medieval crucibles and flasks. An interesting feature of this stamp is the border composed of ancient symbols of alchemy.

The 2.40k stamp depicts the violet-coloured flowers of Henbane (*Hyoscyamus niger*), a plant which has long been cultivated in many parts of the world for medicinal purposes. Both the leaves and seeds have been used as a form of tranquillizer. In parts of southern England dried Henbane leaves were at one time smoked as a remedy for toothache—a dangerous practice which often gave rise to loss of speech or paralysis. The poisonous alkaloid Hyoscyamine is derived from this plant. A grinder, pestle and mortar are also featured on this stamp.

Three First Day envelopes were produced in connection with this series and bore pictorial vignettes featuring medieval furnace and distillation flasks, a pharmaceutical "still life" with an apothecary's balance and mortars, and apothecary's carafes.

This is not the first time that Czechoslovakia has publicised medicinal plants. A set of seven stamps with this theme appeared in 1965 and featured coltsfoot, saffron, poppy, foxglove, arnica, cornflower and dog rose. Of course there have been stamps from many countries (including Britain and the United States) featuring flowers and plants which have medicinal properties but sets of stamps emphasising this aspect of botany have so far been confined to the Iron Curtain countries. Romania (1959), East Germany (1960) and Hungary (1961) have issued notable series in this *genre*.

Have You Seen?

Five new construction kits from Airfix

The new Airfix construction kit of the Sheridan Tank has a fully-rotating turret and flexible tracks. The OO scale model has been produced in green polystyrene to match the colour of this armoured reconnaissance vehicle which is currently in service with the U.S. Army. The 61 part kit measures just over 3 in. when completed and the accurately reproduced 152 mm combined gun and guided missile launcher can be elevated to various firing positions. The Sheridan is the only tank in the world which fires Shillelagh guided missiles as well as conventional shells and its other armaments include two machine guns, a .50 and a 7.62 mm—the latter can be fully rotated on the model. The hull detail includes air cooler louvres, digging-out equipment, driver's hatch which can be opened and closed and on the turret itself, modellers will notice the intricate detail of the eight smoke dischargers, infra-red equipment attached to the mantlet, searchlight and periscope.

The flexible tracks can be joined by heat sealing after being fixed into place with pins. The sealing is best undertaken with the heated end of a screwdriver (with wooden handle) or, as an alternative, the tracks can be reinforced with a few stitches of terylene thread or even jointed with a staple. The kit retails at 25p.

When completed the new Airfix kit of the Hawker Hurricane has an overall length of 5¼ in. and a wingspan of 6½ in.

The airframe detail is impressive and the undercarriage can be modelled in the open or retracted position. The kit can be modelled in one of three alternative Marks and optional extras such as rockets, guns and drop tanks are included. Two landing lights are mounted on the leading edge of the wings and communications antennae, engine exhausts and tail plane are fully-detailed.

The Hawker Hurricane was one of the most famous World War II R.A.F. fighters and 36 squadrons operated this type of aircraft. In addition to the early Mark I other versions included the Mark IIB "Hurribomber", the IIC with 20 mm wing cannon and the Mark IV with rockets. Some 14,553 Hurricanes of all Marks were built and the Mark 2B was powered by a Rolls Royce Merlin XX engine giving a maximum speed of 339 m.p.h. at 22,000 feet with a range of 470 miles.

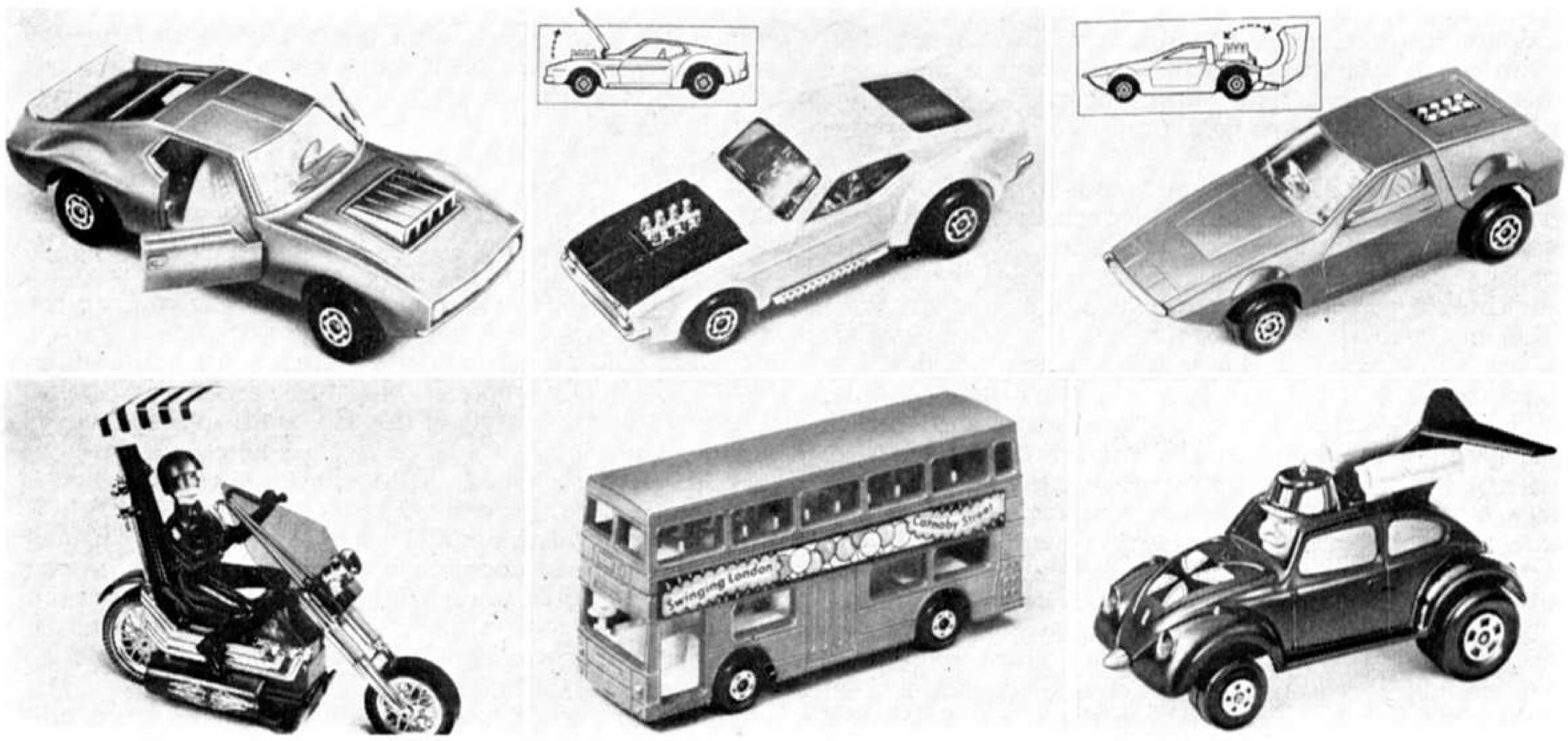
Transfers are provided in the kit for two variants, the Mark I "Battle of Britain" aircraft, coded RF-C of No. 303 Sqn. and a Mark IIB Bomber coded AE-K of 402 Sqn. The instruction leaflet contained in the kit gives precise instructions on how to model each of the three particular Marks with full painting instructions, retailing at 25p.

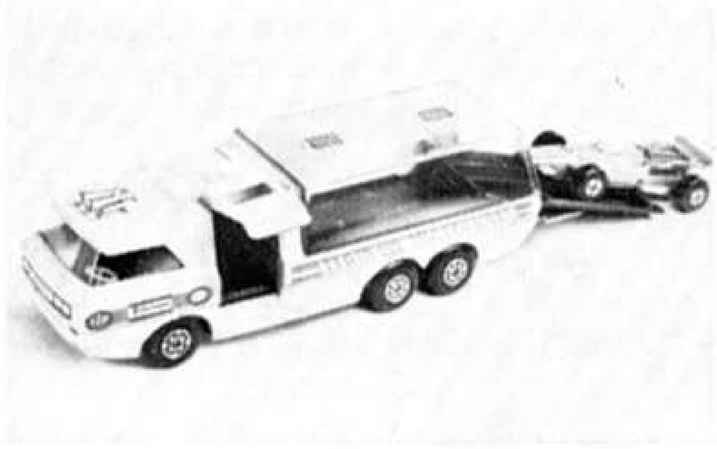
British Leyland's Morris Marina 1.8 TC is a brand new addition to the Airfix range of saloon cars. The 88 part kit which is produced in white polystyrene includes a fully detailed engine under a removable bonnet. Both the body and chassis are pre-moulded and modellers will notice that Airfix designers have paid particular attention to the transmission and suspension systems. Front and rear windscreens, side windows and light fittings are supplied in pre-formed transparent plastic.

The completed model which is 5 in. long incorporates all the fine detail which modellers expect and windscreen wipers and washers, door handles, radiator grille, registration plates, lights and air louvres are all represented in detail. The kit retails at 25p.

The Super Mystere B2 was the first production aircraft in Western Europe to attain supersonic speed in level flight. It was designed as a single seater interceptor and tactical strike fighter. The 53 part Airfix kit

New Matchbox Items. Top row—left to right, the AMX Javelin, Boss Mustang and the Tanzana, Bottom row, one of the new "Screamin' Demons", the Londoner Bus, and the rather comic Flying Bug.





in silver polystyrene includes an undercarriage which can be modelled in the operational or retracted position and rocket pods and long-range tanks are provided. The aircraft's air brakes, which are positioned immediately behind the wings on the rear fuselage, can be modelled in the landing or take-off position and the exact assembly sequence is shown on the instruction leaflet. The jet intakes and exhaust, airframe detail and undercarriage mechanism are well defined and a completed model with a wingspan of 5¾ in. and length of 8 in. can be fixed onto a display stand. All in all 180 Super Mysteres were built and 156 equipped three wings of the French Air Force and the remaining 24 were bought by Israel. The aircraft has a maximum speed of 743 m.p.h. at 38,000 feet and a ceiling of 55,750 feet. The armament consisted of two 30 mm cannons and fifty-five air-to-air rockets in a fuselage pack.

Transfers and full painting instructions for both French and Israeli livery are provided in the kit, which retails at 35p.

On the 24th April 1961 a 17th century Swedish warship broke surface in Stockholm harbour after 333 years on the seabed. Following a period in dry dock the Wasa was towed on a special platform to a more permanent site where restoration work was begun and the ship was opened for public viewing.

During the last eleven months Airfix designers and draughtsmen have been working in close co-operation with the Wasa Museum in Stockholm to ensure that complete authenticity has been achieved with this new 227 part kit.

The hull has been moulded in two sections which are first cemented together before the ornate stern section and main deck are positioned. Hours of painstaking work by restorers in Stockholm have been more than rewarded by the magnificent engravings which were revealed on the ship's stern board. These show elaborate coats of arms and figures against decorative backgrounds.

The model is 19 in. long and stands nearly 15 in. high on its display stand. The main deck detail includes a longboat, capstan, hatches, 15 cannons and other ancillary equipment. The 1,400 ton Wasa was one of four ships constructed on the orders of King Gustav II Adolf of Sweden and was fitted out with a total of 64 bronze cannons. All the gun ports have covers and these should be cemented in the open (firing) position.

The sails for the bowsprit, fore, main and mizzen masts are pre-formed as are the ratlines which have to be cemented to the dead eyes before being attached to the sides of the bows. Modellers can position the ship's lantern on the poop deck which is emblazoned with highly decorative engraving. The mizzen and bowsprit both carry single fighting tops which can be decorated with Wasa livery while both the main and fore masts carry two fighting tops apiece. The Wasa was equipped with four large anchors and on the Airfix model these should be fixed to the catheads on the bows of the ship.

Black cotton can be used to complete the rigging and five Wasa flags can be cut out and fixed into position on the masts.

The Wasa carried a complement of 133 sailors and 300 soldiers and disaster came on August 10th 1628 in Stockholm harbour at the beginning of her maiden voyage. During a heavy squall the ship heeled over to port and as the list increased, water poured into the lower gun ports and the mighty warship sank. It was not until 1954 that work began to locate her whereabouts and some five years later the Wasa was gently lifted from the seabed by a series of cables passed beneath her hull and supported on the surface by pontoons. Once in shallow water she was brought gradually to the surface in April 1961. The ship originally carried 13,000 sq. ft. of canvas and the Wasa's dimensions were: length 230 ft. including bowsprit, beam 38 ft. 4 in., height 170 ft. with a draught of 15 ft. 5 in.

The display stand carries the title Royal Ship Wasa 1628 and full painting instructions are included in the kit.

Five new Matchbox Superfast cars

No. 9 the AMX Javelin is sprayed in a metallic lime green which is complemented by the detailed yellow interior. An extra large air scoop adorns the bonnet of the Javelin and the extra wide Superfast wheels are housed within the flared wheel arches.

Making a flying entrance into the "MATCHBOX" range is the new No. 11—Flying Bug. This is a fantasy model designed around the traditional Volkswagen "Beetle" shape. A cut away roof allows the driver, strongly resembling a Prussian General, to keep his eyes on the road. Mounted on the top of the Flying Bug are two yellow jet engines and a tail-plane for greater stability at high speed. Further details on this fun car are the metallic red finish, the smoke grey windows and the sticker on the bonnet. Wheels are dragster style speed slicks.

Keeping up to date with the latest in London bus designs is the new "MATCHBOX" No. 17—"The Londoner". Naturally, the new model is sprayed in the familiar bright red finish that is famous throughout the world. The shape of the Londoner is a lot squarer than previous London buses and other new features are the doors at the front and middle of the vehicle.

Latest high performance model to enter the "MATCHBOX" range is No. 44—the Boss Mustang. The low lean body style of this GT is finished in a citrus yellow and incorporates a rear spoiler for greater stability at high speed. The windows are tinted in a subdued orange through which can be seen the chromiumed interior of the model. Giving the Boss Mustang a real high speed appearance is the matt black bonnet which can be lifted to reveal the shining V-8 power unit.

A bright orange tapered body makes the No. 53 Tanzara instantly recognisable. The body line has been aerodynamically designed for faster running. The windows of the Tanzara are tinted a pale green and

through them can be seen the detailed chromiumed interior of seats and dashboard. The engine is situated behind the driver and may be examined in closer detail by raising the engine compartment.

These models retail at 16p each.

Three new King Size Matchbox vehicles

Following their sponsorship of Team Surtees and the introduction of two Speed Kings Grand Prix cars, "MATCHBOX" is continuing its motor racing connections with the release of a Racing Car Transporter. The bodywork of this big value model is in yellow with a see-through rear compartment housing a "MATCHBOX" Series Formula 1 Racing Car. The rear door of the transporter can be lowered and the car unloaded on the movable ramp. Other action features of this model are the top hinged doors which open to reveal the workshop compartment.

The K.7 Transporter retails at 85p.

The new No. K-36 Bandolero is a wild fantasy model with super child appeal.

The bodywork of this fun car is sprayed in a metallic turquoise and incorporates a spoiler for greater stability at high speed. Entrance to the car is gained by the front-hinged door/windscreen. The interior of this model is finished in white. The power for this mighty track eater is supplied from two rear mounted V-8's with super sized air scoops.

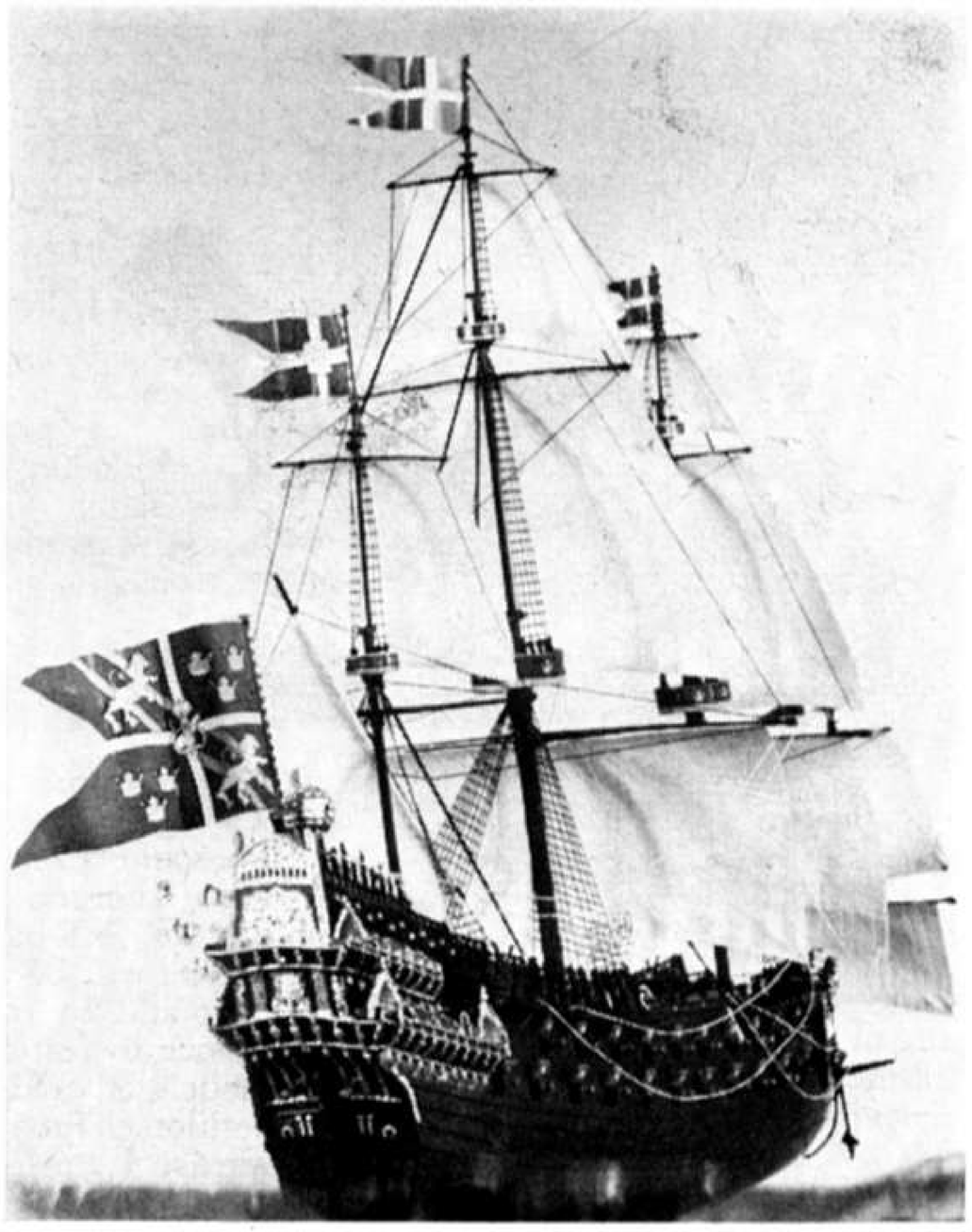
The new K-33 comes in the instantly recognisable shape of the Citroen SM. The bodywork of this classic French motoring shape is sprayed in metallic maroon. The windows of the model are tinted a pale blue and the detailed interior is finished in yellow. The rear window is heated. Features are opening doors and a towing hook. Both the Bandolero and Citroen retail at 44p.

Matchbox Scream "N" Demons

"MATCHBOX" are continuing the diversification of their product range with the introduction of a range of motorbikes called Scream 'n Demons.

There are six super stunting bikes, each with different names and different designs. Each one, however, is battery powered and when set in action lets out a mean, mean sound.

The position of the handlebars can be altered for the bike to run either in a straight line or to perform stunt



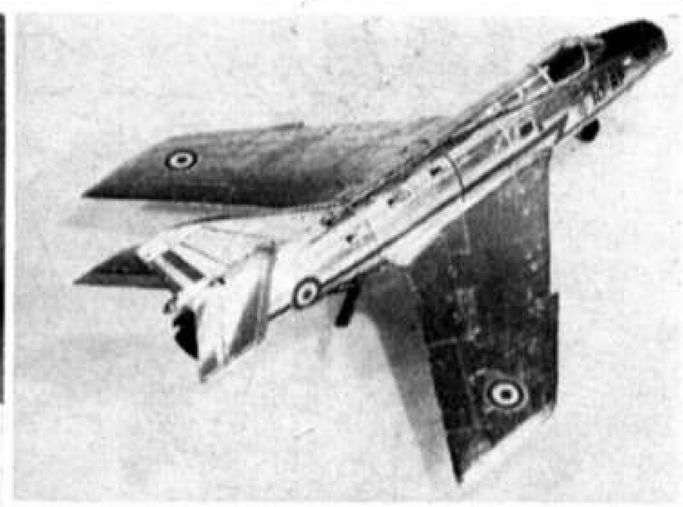
skids. The rider has movable joints in his arms and legs and he can be made to ride the bike in a number of positions.

Every Scream 'n Demon is sold complete with its own jump ramp in the box. These wild choppers will jump the ramps, remain upright and continue to run.

Scream 'n Demon bikes are sure to be big sellers at £1.75 each. Watch out too for Scream 'n Demon sets soon to be introduced.

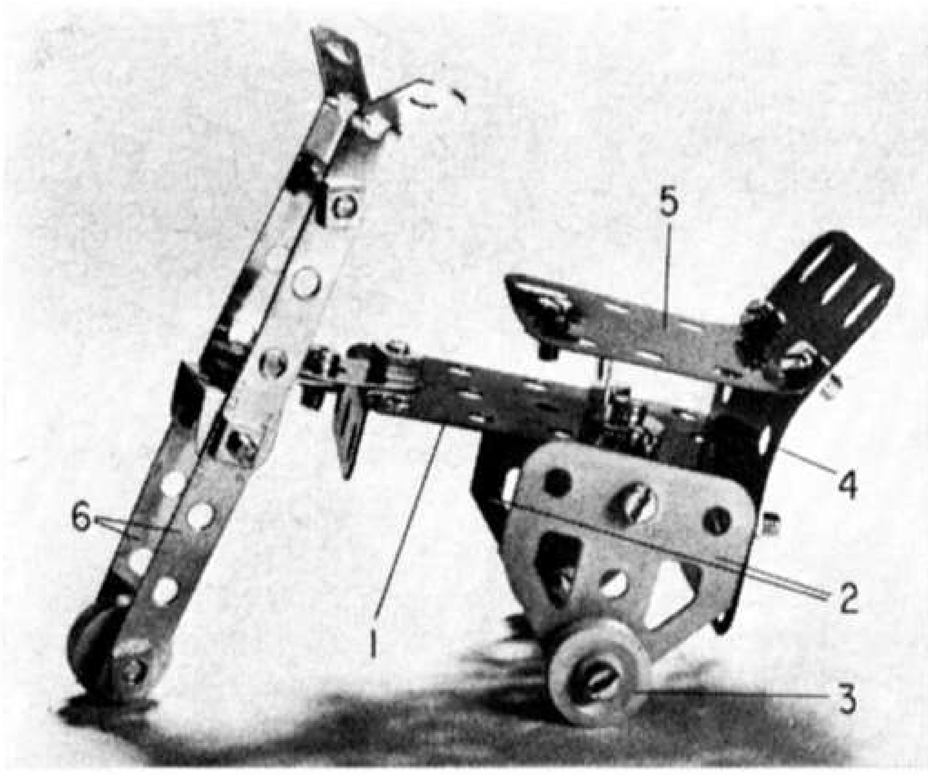
Bikes: Big Buzzard, Doom Buggy, Dirty Devil, Lunatic Fringe, Crazy Horse, Tiger Shark.

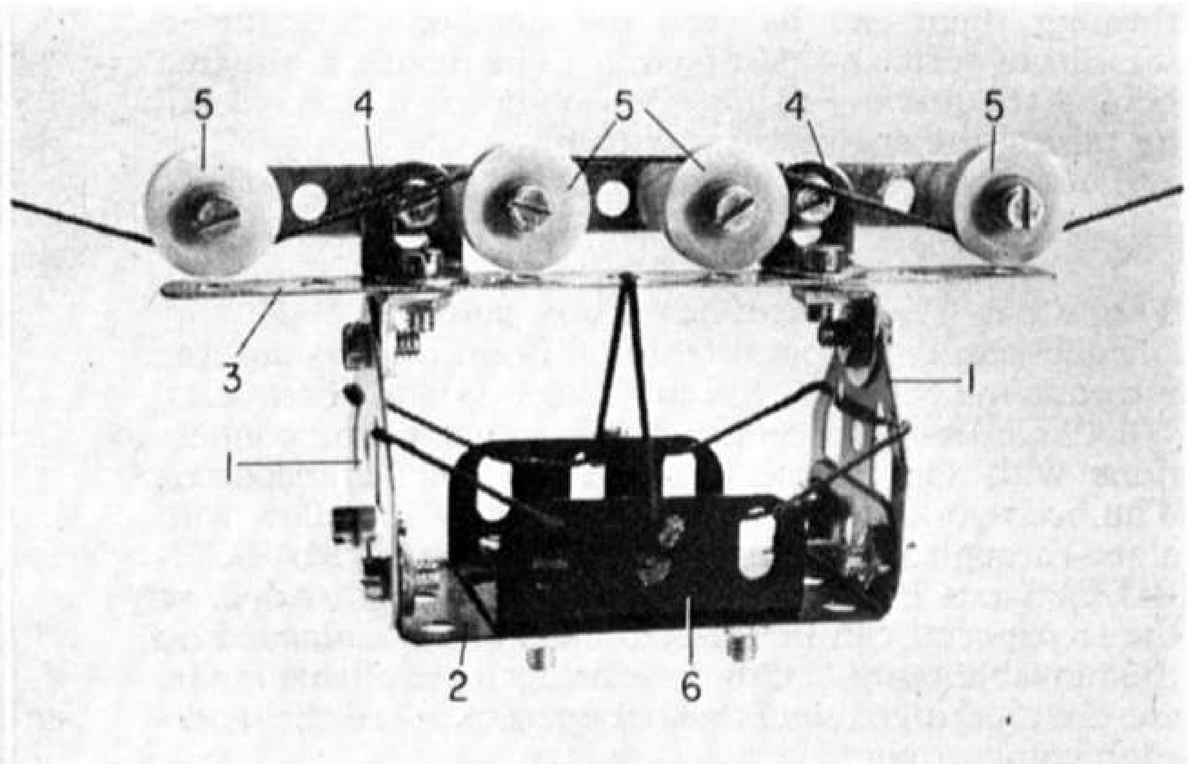
Sets: Dare Devil Dragout (£4.90), Dare Devil Challenge (£5.80).



Opposite page, left to right, more Matchbox items in the Speed King range, the Bandolero, the Racing Transporter and Citroen SM.

Above, Airfix's superb model of the Wasa. Right, more Airfix new releases, the Morris Marina in 1/32 scale, the Super Mystere jet fighter, the Sheridan tank, and the Hawker Hurricane.





Above left, first of the final three models from last year's Pocket Meccano Competition is this Moon Cycle, designed by Richard Taylor of Liversedge, Yorkshire.

Above, C. J. Barling of Bromley, Kent, deserves full credit for this little Cable Car which includes an interesting braking system.

The Last from Pocket Meccano 1971

by 'Spanner'

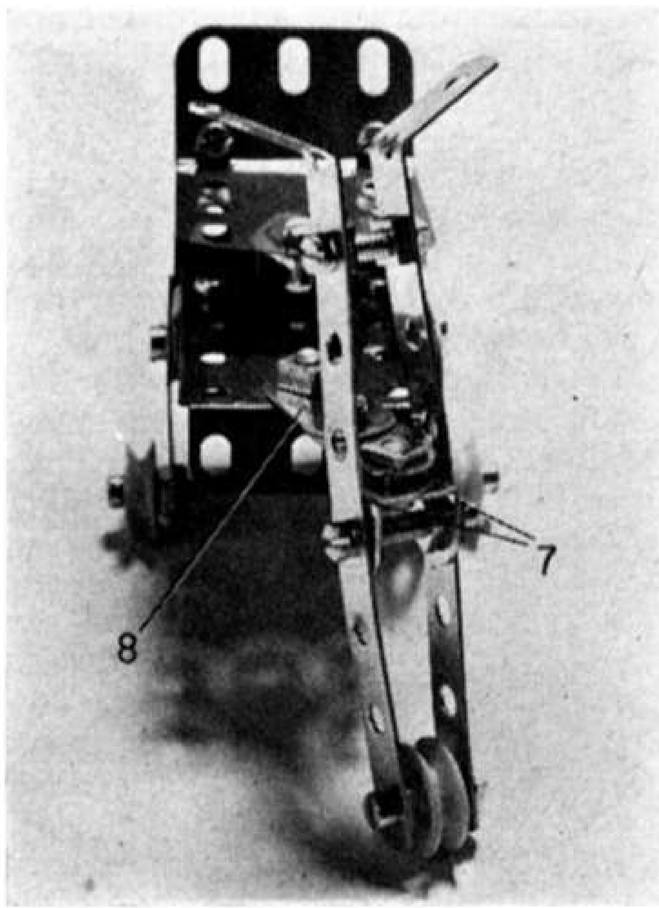
BY the time this issue of the M.M. goes to press, the 1972 Pocket Meccano Competition, which has been running over the past few months, will have just closed. The results will be available before very long and so this is really my last chance to feature some more of the models entered in last year's Competition. From next month onwards, I must concentrate on the new contest models—as is only right—therefore I finish off the "old" now with three presentations which I, personally, find fascinating. All three, are, of necessity, very simple in design, but, without exception, they all show great ingenuity, as a glance at the accompanying illustrations will show.

Moon cycle

First in line is a little tricycle model of unusual design which has been entitled "Moon Cycle" by its inventor, 8 years-old Richard Taylor of Liversedge, Yorkshire. Richard was actually aged 7 when he designed the model and I think that this fact is enough to earn him special praise for his skill. I know I couldn't have done it at 7!

Attached by Angle Brackets to a $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flanged Plate 1 are two Flat Trunnions 2, in the apex hole of each of which a $\frac{1}{2}$ in. Bolt is held by two Nuts, a $\frac{1}{2}$ in. Pulley 3 revolving freely on the Bolt shank to serve as one of the rear wheels. A $2\frac{1}{2} \times 1\frac{1}{2}$ in. Plastic Plate 4 is then bolted to the rear end flange of Plate 1, the securing Bolts passing through the second holes up of the Plastic Plate. Another $2\frac{1}{2} \times 1\frac{1}{2}$ in. Plastic Plate 5 is bolted to the upper section of Plate 4, this being curved to shape to form the seat and attached at its forward end to a $\frac{1}{2}$ in. Reversed Angle Bracket bolted to Plate 1.

The front fork assembly is built up from two $4\frac{1}{2}$ in. Narrow Strips 6 connected together through their fourth holes up by two Angle Brackets 7 arranged to form a double bracket and held in place by three Nuts on a $\frac{3}{4}$ in. Bolt. The ordinary Bolt securing the horizontal lugs of the Angle Brackets together also tightly holds a Fishplate in place, this being extended by a further Fishplate 8 which is lock-nutted to the front row centre hole of Flanged Plate 1. The lower ends of Strips 6 are connected by a $\frac{1}{2}$ in. Bolt and Nuts, a $\frac{1}{2}$ in. Pulley being carried on the Bolt shank to serve as the front wheel. A second $\frac{1}{2}$ in. Bolt, with Nuts, further connects the Strips together through their third holes from the upper ends, then, finally, the top half-inch of each Strip is bent outwards to form the handlebars and complete the model.



A front view of the Moon Cycle showing assembly of the front forks.

PARTS REQUIRED

2—10	28—37a	1—111	2—126a
4—12	13—37b	4—111a	2—194
3—23	1—51	1—125	2—235d

Cable Car

Master C. J. Barling of Bromley, Kent is the designer of our second offering, which goes under the title of "Cable Car". Several good Cable Cars were actually entered in

the Competition, but I found this example especially interesting because of a built-in braking system it incorporates.

Two Flat Trunnions 1 are bolted, one to each end flange of a 2½ × 1½ in. Flanged Plate 2, while an Angle Bracket is secured to the apex of each Trunnion. The horizontal lugs of these Angle Brackets are connected by a 4½ in. Narrow Strip 3, the securing Bolts also fixing two further Angle Brackets 4 in position. A second 4½ in. Narrow Strip is bolted to the vertical lugs of these Angle Brackets, four ½ in. Bolts, each carrying a ½ in. Pulley 5, being locked by Nuts in the first, fourth, sixth and ninth holes of this Strip. A 2½ × 1½ in. Plastic Plate 6, bent to the shape shown, is bolted to the top of Flanged Plate 1, then a short length of Cord is threaded as shown between this Plate, Flat Trunnions 1 and Narrow Strip 3 to represent bracing stanchions.

The braking system mentioned earlier is achieved by the manner of threading the Car's supporting cable around Pulleys 5. Instead of simply running the cable beneath the Pulleys, it should be passed under the first Pulley, over the two centre Pulleys and under the last Pulley. If this is done, tightening the supporting cable will cause the Car to stop, while loosening it slightly will allow the Car to run along the cable. This effect can best be seen if the supporting cable is held in the hands for demonstration purposes.

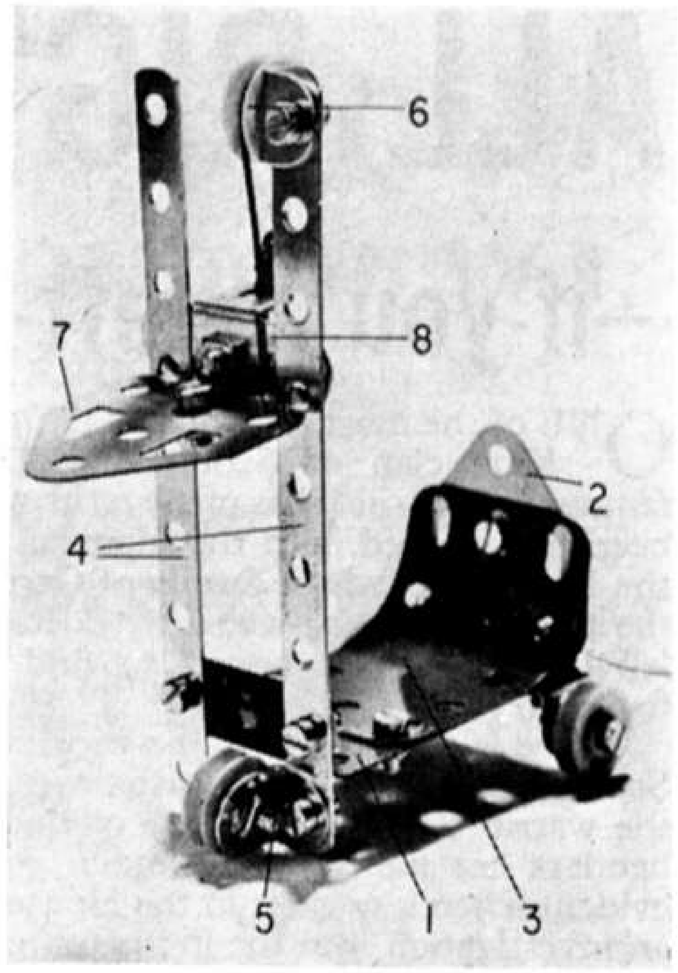
PARTS REQUIRED

4—12	14—37b	4—111a
4—23	1—40	2—126a
22—37a	1—51	1—194
		2—235d

Fork Lift Truck

Last, but by no means least, we have a very appealing Fork Lift Truck designed by Mark Johnson of Gatley, Cheadle, Cheshire. I think Mark has made an excellent job of it as the model actually includes a working lift device which, although simple, is remarkably effective in operation.

A working Fork Lift Truck designed by Mark Johnson of Gatley, Cheadle, Cheshire—a very appealing model.



The chassis consists of a 2½ × 1½ in. Flanged Plate 1, to the rear corners of which two Angle Brackets are bolted. Locked by Nuts in the spare lug of each of these Brackets is a ½ in. Bolt, on the shank of which a ½ in. Pulley is mounted to serve as one or other of the rear wheels. Bolted to the rear flange of Plate 1 is a Flat Trunnion 2, a 2½ × 1½ in. Plastic Plate 3 being curved to a seat shape and bolted to both this Trunnion and the Flanged Plate.

Two 4½ in. Narrow Strips 4 are next bolted to the forward flange of Plate 1, the securing Bolts passing through the second holes up of the Strips and the end holes in the Plate flange. An Angle Bracket 5 is fixed to the lower end of the left-hand Strip, a ½ in. Bolt, carrying a ½ in. Pulley, being locked by Nuts in the spare lug of this Angle Bracket. Another Angle Bracket is fixed to the upper end of the same Strip and, again, a ½ in. Bolt carrying a ½ in. Pulley 6 is locked by Nuts in its spare lug.

Narrow Strips 4, of course, act as runners for the actual lifting platform which is easily built up from a Flat Trunnion 7 bolted to the slotted hole lug of a ½ in. Reversed Angle Bracket. Bolted to the centre lug of the same Bracket are two Fishplates 8, these being positioned on one side of the Narrow Strips, while the Flat Trunnion is positioned on the other side. Using the slotted hole in the Reversed Angle Bracket, the position of the Trunnion should be adjusted to obtain the minimum "play" between the platform assembly and the Narrow Strips. A length of Cord is then tied to the spare lug of the Reversed Angle Bracket, is brought up and over Pulley 6, then is brought down and threaded through the hole in the same Bracket lug. From there it is threaded through the second row centre hole of Flanged Plate 1, being taken rearwards and threaded through the end row centre hole of the Flanged Plate to be finally brought out through the centre base hole of Flat Trunnion 2. Needless to say, when the Cord is pulled, the lift platform should rise.

PARTS REQUIRED

2—10	19—37a	1—51	2—126a
4—12	11—37b	4—111a	1—194
4—23	1—40	1—125	2—235d

Meccano Exhibition

A Meccano and Model Railway Exhibition will take place at Henley-on-Thames Town Hall, on Saturday, September 2nd, 1972. The Exhibition will be open all day, from at least 10 a.m. until 6 p.m. and possibly later. All Meccano model makers are invited to take part and display their work—the stage and 100 feet of tabling must be covered! It is hoped that members of the Midlands Meccano Guild, Holy Trinity, and Stevenage Meccano Clubs will also take this opportunity to publicise the Meccano hobby.

To help provide a balance, and make for a real family occasion, several large model railway layouts in OO and N gauges will be in operation, British Rail will be showing films, and there will be static displays of vintage and veteran Hornby Trains and Dinky Toys.

ALL RIGHT *(continued from page 514)*

children are often ambidextrous, and that examples of true left-handedness have been suppressed by early training. Ambidexterity can be cultivated. One of the most eminent surgeons of this century, Sir Arbuthnot Lane, taught himself to operate with either hand in order to save time and consequently shock to the patient. Lord Baden-Powell, founder of Scouting, trained himself to be equally efficient with either hand as part of the movement's motto, "Be Prepared".

To conclude with an extraordinary example of such skill. The great virtuoso and composer of last century, Franz Liszt, "Wizard of the Piano", having been repeatedly pressed on one occasion at some social function to play, at last went to the keyboard. But he stood with his back to the instrument and played with his hands behind him and inverted—a phenomenal feat

ALL RIGHT

—if you're left-handed!

ONE of the most fabulous of all fighting families is the Kerr clan of Scotland. Its members are also famous for the fact that many of its notable warriors have been left-handed. In the interests of medical research the Kerr clan and the family of Carr (English version of the name) are to be asked by doctors whether they are left-handed. It is hoped to find out if the trait is hereditary.

There is a legend that the medieval Kerrs built their Scottish castles with turrets the wrong way round to help the warriors in their defence of them. Nowadays left-handers are not given so much consideration, as was evident when a speaker in the House of Commons urged an investigation into the increases in productivity which could be achieved by introducing left-handed working arrangements for left-handed people.

The Government spokesman, from the Department of Employment and Productivity, was not at all sympathetic. His information was that most left-handed people satisfactorily adapt themselves to existing machinery and plant lay-out, and there is no evidence that their problems are a sufficient obstacle to increased productivity to justify any inquiry.

So that's that; but whatever the Government speaker said does not alter the fact that this is a right-handed, and often inconvenient world for left-handed people. I know, for I happen to be one. Are you? If you are we are not alone, because there are 200 million "sinistrals"—the more scientific word for left-handers—out of the world's total population of 3,500,000,000. About five per cent.

Unfortunately a hard, competitive world does not cater for a minority. Work benches and carpentry tools, for instance, are made for right-handers. So are hockey sticks, tin openers, scissors, rifles and other paraphernalia of a dextral (right-handed) world. There has been one small reform: American banks now issue left-handed cheque books with the stubs and binding on the right.

The trouble is that few mere males stand up for themselves. Left-handed ladies are much more forthright about their plight, and they have been making plaints to the manufacturers. They say designers don't give enough thought to the convenience of sinistrals. For example, they assert there is no way round the problem of the soup ladle with the lip on the wrong side; and complain that the handles of wall tin openers always have to be operated with the weaker hand.

I have never been able to write or draw well because my left hand was tied behind my back in the infant school to compel me to use the right. In those days left-handedness was firmly discouraged as soon as it made its appearance. "I had so much knocked out of me with a ruler at primary school that I'm almost ambidextrous now" is a typical comment. This attitude is discredited by psychologists and out of fashion in modern education. The "British Medical Journal" summed up the matter in these words: "If the child is predominantly left-handed he should be allowed to continue so".

Since children are now allowed much more freedom it is expected that the number of sinistrals is certain to grow. In the United States a physiologist said that up to 30 per cent of babies might be left-handed if left to their own devices. This seems very high, but there is no question that most parents encourage their children to be right-handed. In Britain research showed that among six thousand children six to seven per cent exhibited left-handedness and another two per cent had at some time been sinistral in certain ways.

Doctors won't agree that left-handedness is entirely hereditary; but it is obvious that in some families the incidence is high. Left-handedness is almost common in some families and appears more often in twins than among children born singly. It is higher among boys than girls and this has been put down to the male's greater resistance to efforts to make him conform to normal practice. It is possible, too, in so-called "left-handed families" that children copy the habits of their parents.

Mothers in particular are sometimes worried over left-handedness in a child, and have doubts as to the wisest way of dealing with it. One assertion often heard is that a change over to right-handedness causes stuttering. It is difficult to discover any grounds for this, except that the danger lies in the method used to bring about the change. Lack of understanding and brusqueness can bring about emotional strain.

There must, however, be a connection where stammering does supervene. Doctors, as mentioned, and psychologists as well, believe it is better to refrain from making a change unless it is absolutely necessary. One finds it very hard to visualize any reason for this.

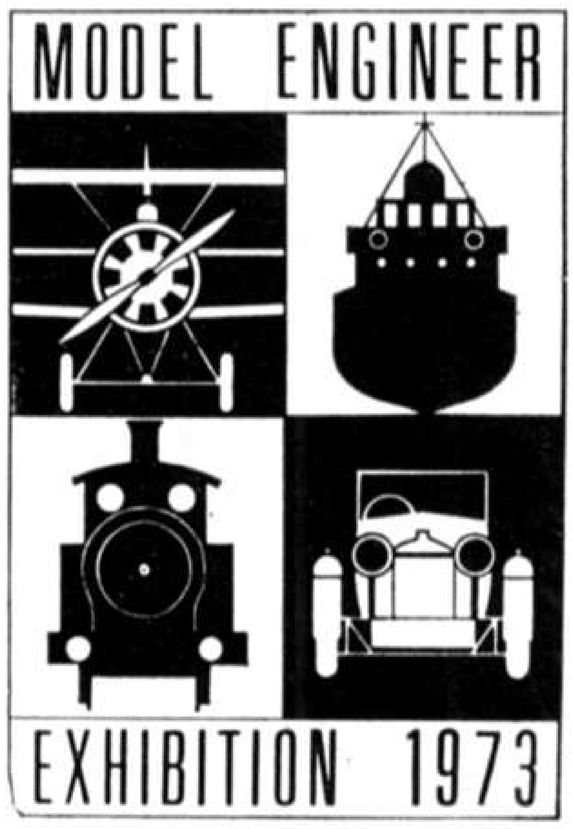
Is a sinistral more likely to be either a genius or a rogue or a mental defective than his right-handed brother? The quick answer to these questions is that the left-handed person is no better and no worse than "normal" people. By far the greater number of left-handers are perfectly conventional in every other aspect of the functioning of their body. Left-handed children are just as intelligent as their right-handed compatriots; they are no clumsier, and are equally clever at handicrafts and sport, although as has been pointed out, in some respects they are handicapped because few implements and utensils are specifically designed for left-handed persons.

A number of sinistrals were of superior intellect. That immortal genius Leonardo da Vinci—painter, sculptor, inventor, engineer, architect, writer of prose and verse—used his left hand predominantly. He may have had his right hand crippled in an affray, as he is quoted as remarking that he "thanked God for having escaped from murderers with only one hand dislocated". The great German painter Hans Holbein, the Younger, was also left-handed, and in our own time so are Peter Scott, the bird painter, and Ronald Searle the humorist.

There is some evidence that Alexander the Great was a sinistral, and so were Cicero the Roman orator and philosopher, and Charlemagne, Emperor of the West. Another left-hander was Dr. John Dee, Queen Elizabeth I's remarkable astrologer who coined the phrase "The British Empire". Left-handedness certainly did not adversely affect the careers of Charlie Chaplin and Judy Garland in the world of entertainment. Sport such as tennis usually has sinistrals at or near the top, but perhaps the most remarkable example is English county cricket, where one in five batsmen is left-handed, and there is a slightly higher proportion among the bowlers.

The lower animals are said to be ambidextrous, and the trait of left-handedness and other asymmetrical features appear to be curiously limited to the human species. However, there is no question that young

(continued on previous page)



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WHAT WILL BE ON DISPLAY

Last year's OPEN PLAN arrangement of the MAIN HALL was so widely praised that we are continuing this general scheme with even better access and viewing, whilst retaining the concourse round the WINNERS PODIUM – (This year we hope winners will fit this stand!) A slight change in S.M.E.E. WORKSHOP will allow spectators better viewing without blocking a door. "Bill" Carter will again be in charge of the S.M.E.E. PASSENGER RAILWAY with non-stop service during opening hours for young and old. The team of experts from the Society will be providing practical work and advice to visitors.

LARGE FLYING CIRCLE – balcony to balcony – again in operation with even more exciting and expert models, and operators. All-electric models that do most of the things that i.c. powered control line models do. It gets better every year.

TRADE STANDS – We have slightly increased numbers this year in view of increasing demand from exhibitors. These are in MAIN HALL; a few smaller, DEMONSTRATION STANDS in BRYANSTON ROOM will show construction techniques and use of tools.

Introduction of a MODEL ENGINEER WORKSHOP manned by the S.M.E.E. last year proved immensely popular and will be increased in size and scope, again with experts from S.M.E.E. in charge and assisted by M.E. consultants. Working models under compressed air will also be on show.

BRYANSTON ROOM will again be a CLUBMEN'S CORNER with stands manned by the principal governing bodies, plus club unit demonstrations, and some space for trade demonstrations. Popular CLOCK CORNER will we trust again be filled with exhibits and experts in attendance.

LECTURE HALL will house the clubs connected with MILITARIA – British Model Soldiers Society, International Plastic Modellers' Society etc. – and also display the entries in the MODEL SOLDIER classes, including new Special Air Service Trophy entries.

COMMITTEE ROOM will provide regular 50-seat sessions for BATTLE GAMES on announced themes with expert commentary. Advance booking by ticket at the exhibition.

BOATING MARINA. Following last year's successful launch of this feature some improvements will be made to spectator accommodation Timed sessions will be held. TRADE DEMONSTRATIONS of RADIO CONTROLLED BOATS will be welcomed (please let us hear early) which will be varied with CLUB EVENTS (mainly in evenings) and STAFF EXHIBITS. There will be no selling at the poolside, but demonstrations can be announced and suitable display cards shown advising visitors where products obtainable and information given. Club features or displays specially invited – drop us a line!

GALLERIES provide sitting out space for several hundred persons, and offer best view of model aircraft flying. There will also be club exhibits displayed and entries in our BOY'S EXHIBITION.

SOUVENIR GUIDE

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

PRIZE POOL ALLOCATION

Classes attracting six or more entries will enjoy prizes to value of 1st £5; 2nd £3; 3rd £1. With over 12 entries 1st £7; 2nd £4; 3rd £2; 4th £1. Classes under six will have 1st & 2nd only, or at discretion of the judges may be combined with other classes.

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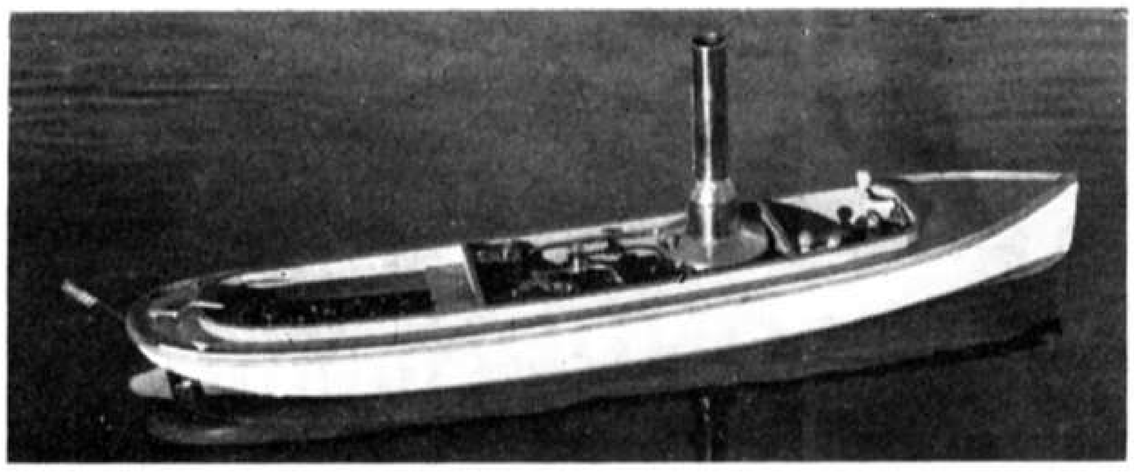

A slightly enlarged (more pages) August issue carries a variety of material. For yachtsmen there are the Marblehead Championships and a new M design, plus choice of class for beginners. Scale modellers have tugs in wartime, open steam launches, a Russian battleship, and a Belgian merchant ship, all with drawings. Competition-wise there are electric articles, an incredible toolbox, regatta reports, and MPBA notes. Also shroud and deadeye spacing, models in Toronto, readers' letters on radio trouble, etc., etc.

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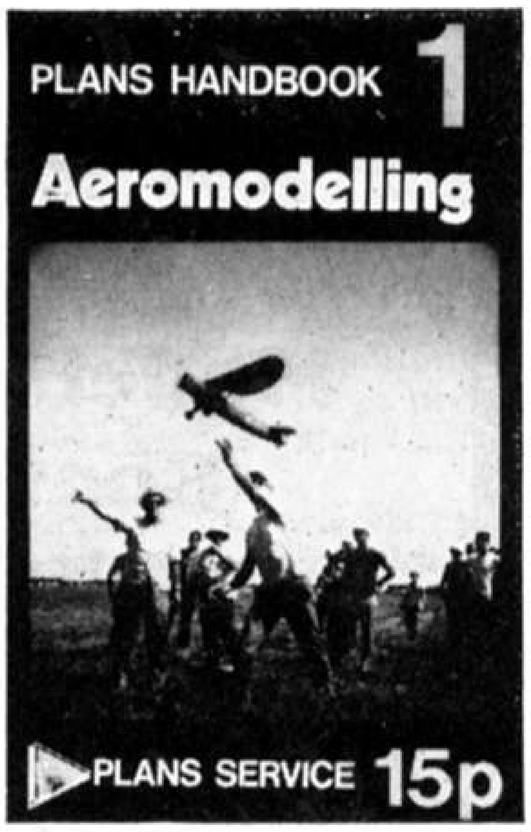

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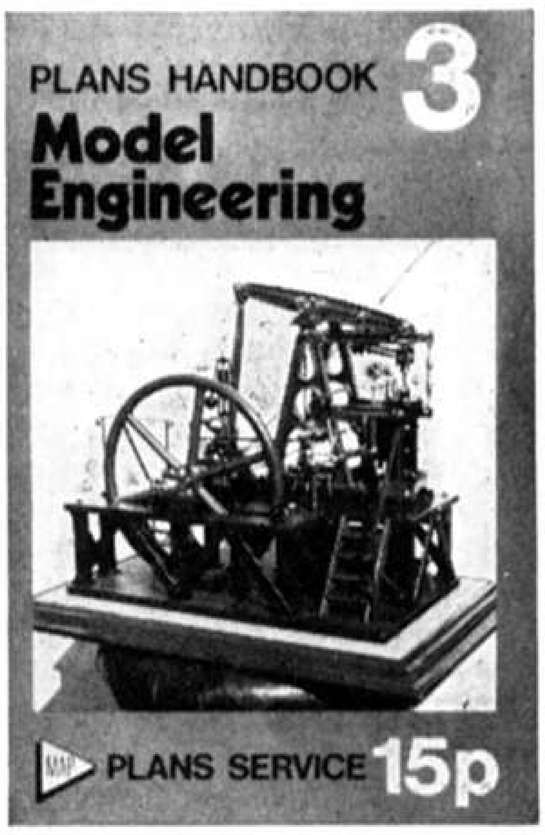

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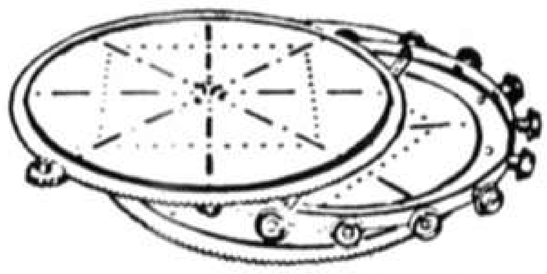

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