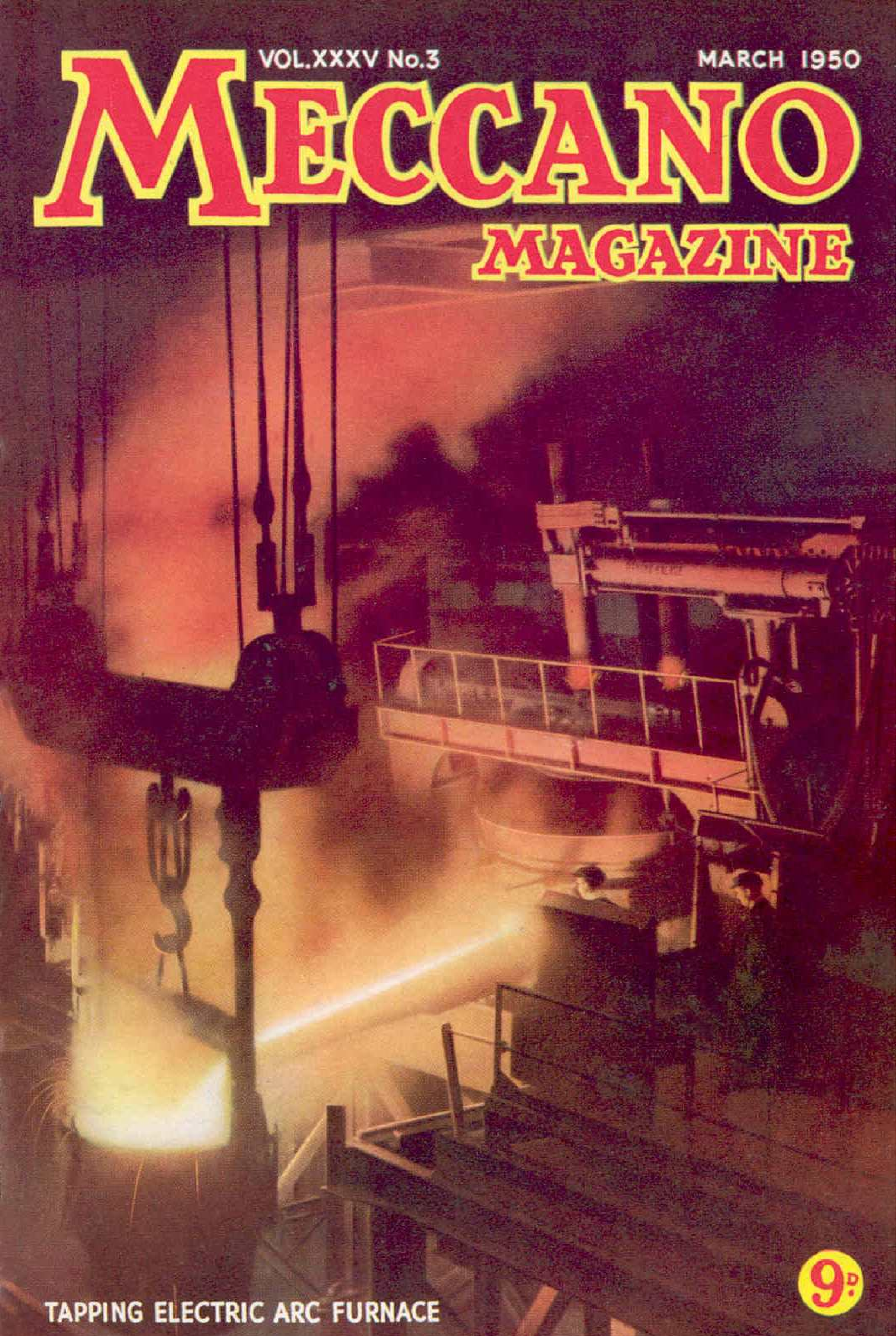
VOL. XXXV No. 3 MARCH 1950

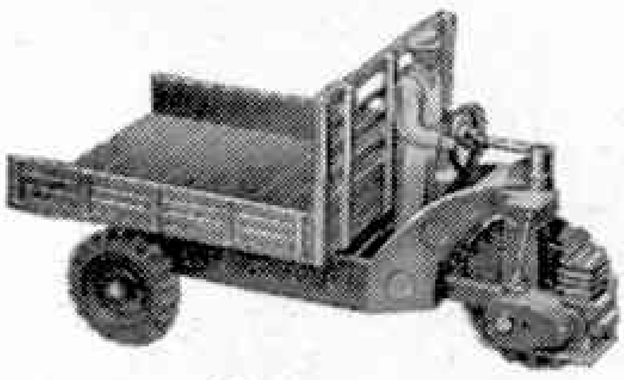
# MECCANO MAGAZINE



TAPPING ELECTRIC ARC FURNACE

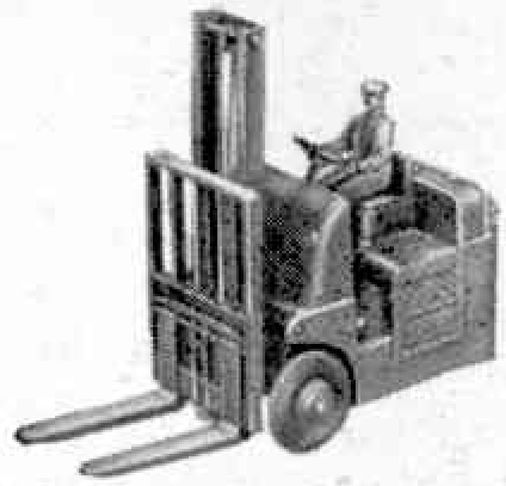
9D.

# DINKY TOYS



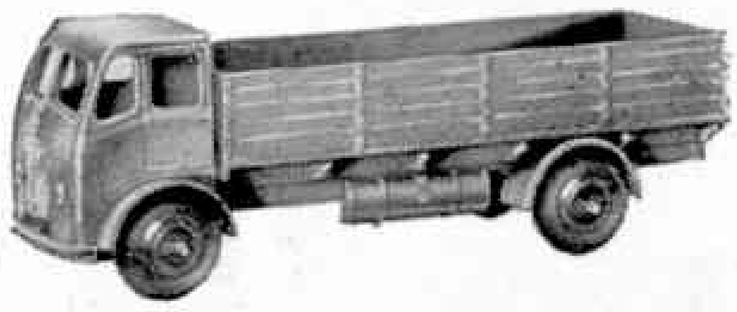
**Motocart**
**No. 27g**
Low loading three-wheeled truck. Tipping high-fronted body
Price **4/6** each

**Daimler Ambulance**
**No. 30h**
A beautiful model finished in cream with red wheels and the Red Cross on each side.
**Price 3/3 each**



**Coventry Climax Fork Lift Truck, No. 14c**
The loading carriage is raised by turning a handle
Price **6/3** each

**Estate Car**
**No. 27f**
An attractive miniature of this popular general purpose vehicle
Price **2/10** each



**Forward Control Lorry**
**No. 25r**
Price **2/-** each

**4-wheel Hand Truck**
**No. 105c**
Price **2/-** each

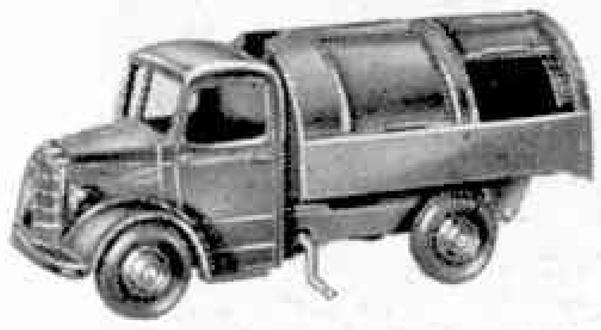
**B.E.V. Electric Truck**
**No. 14a**
Price **2/3** each

**Ford "Fordor" Sedan**
**No. 139a**
Price **2/6** each

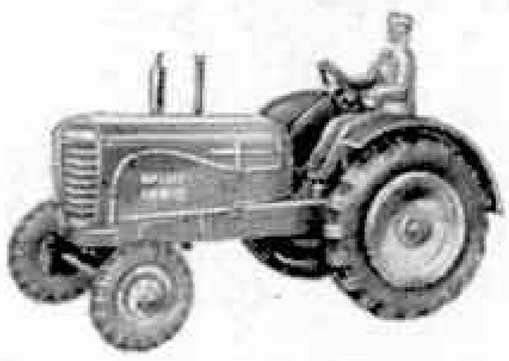
**Loud Speaker Van**
**No. 34c**
Price **1/6** each

**The Standard "Vanguard" Saloon, No. 40e**
Price **1/11** each

**Austin "Devon" Saloon**
**Dinky Toys No. 40d**
Price **1/11** each

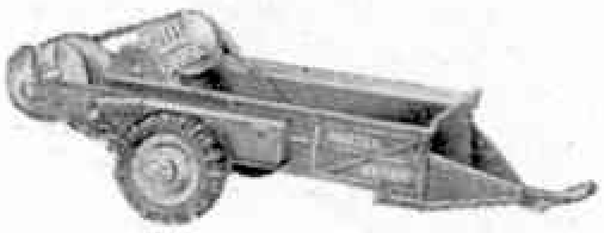


**Bedford Refuse Wagon**
**No. 25v**
Tipping mechanism, sliding covers, opening rear door
Price **5/6** each



**Massey-Harris Tractor**
**No. 27a**
Price **3/6** each

**Harvest Trailer**
**No. 27b**
Price **3/3** each



**Massey-Harris Manure Spreader, No. 27c**
Price **3/11** each

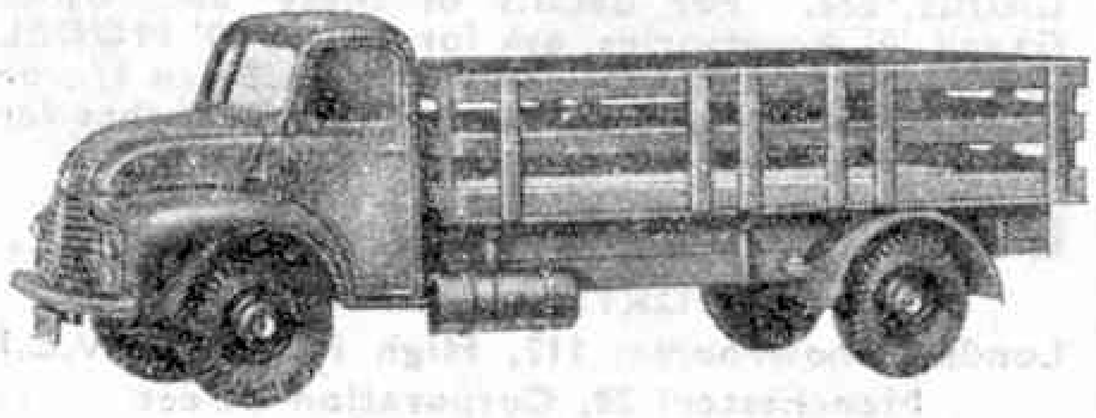
*THE ABOVE PRICES INCLUDE PURCHASE TAX*

**MADE IN ENGLAND BY MECCANO LIMITED**

# SUPERTOYS

**Dinky Supertoys No. 571**
**Coles Mobile Crane**
Hoisting, jib-raising and slewing movements
Price **9/11** each

**Dinky Supertoys No. 562 Dumper Truck**
Adjustable front wheels, tipping bucket, reversible driving seat
Price **6/6** each



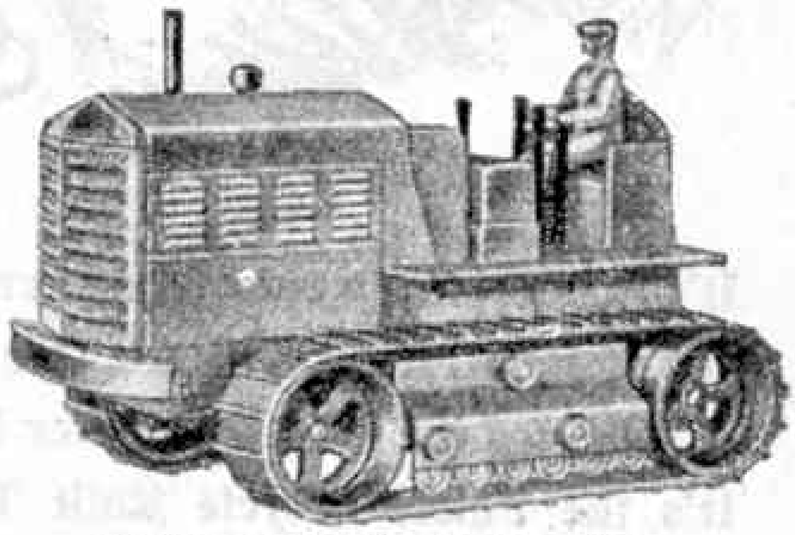
**Dinky Supertoys No. 531**
**Leyland 'Comet' Lorry**
Price **5/-** each

**Dinky Supertoys No. 514**
**Guy Van**
Large capacity van body, with opening double doors at rear
Price **5/11** each

**Dinky Supertoys**
**No. 751**
**Lawn Mower**
Price **5/6** each

**Dinky Supertoys No. 504**
**Foden 14-ton Tanker**
Price **9/-** each

**Dinky Supertoys No. 511**
**Guy 4-ton Lorry**
Price **4/9** each



**Dinky Supertoys No. 563**
**Heavy Tractor**
Price **6/3** each

*ALL PRICES INCLUDE PURCHASE TAX*

**MADE IN ENGLAND BY MECCANO LIMITED**

**Next Month:** "A MECHANICAL MAN AND HIS DOG." By M. Lorant

# MECCANO MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

Vol. XXXV
No. 3
March 1950

## With the Editor

### Names for Passenger Engines

It came as a relief to railway enthusiasts to learn that British Railways decided to continue the practice of naming suitable locomotives. Recently the Executive gave names to nearly 70 express passenger engines built or to be built under current programmes for the Western, Eastern, North-Eastern and Scottish Regions. All these engines are of pre-nationalisation types, as the first British Railways standard locomotives are not due until 1951.

In the Western Region ten "Castle" Class 4–6–0s, 7028–7037, are named, and also ten "Manor" Class 4–6–0s, 7820–7829. In the Eastern, North-Eastern and Scottish Regions, 48 names are allocated to Class A1 4–6–2 locomotives, 60115–60162. Many of these engines, built at Doncaster and Darlington, work into or out of the Scottish Region and accordingly are given names of Scottish origin.

Among the locomotives we find thirteen carrying the names of well-known race-horses, three Derby winners, two St. Leger winners and eight Doncaster Cup winners. Six commemorate famous Locomotive Engineers associated with Doncaster or Darlington Works. Archibald Sturrock was at Doncaster Works when it began operations, and laid the foundation of G.N.R. locomotive practice. Patrick Stirling, who succeeded Sturrock, is best remembered for his famous 4–2–2 "8-footers" which hauled the principal expresses into and out of King's Cross for some 25 years. H. A. Ivatt was the first to use the "Atlantic" type of engine in this country. Edward Fletcher, who helped to build the "*Rocket*" under George Stephenson, controlled North Eastern Railway locomotive matters for many years. Wilson Worsdell introduced the first English 4–6–0 express locomotives. Sir Vincent Raven applied three-cylinder propulsion to several locomotive classes.

Coming now to the Scottish names, one group, including cities and saints, is a revival of names formerly carried by locomotives of the North British Railway. One engine is named "*Sir Walter Scott*," and from the Waverley Novels we get many familiar names. Some of these duplicate those of the ex-L.N.E.R. "Scott" class, but these locomotives are obsolescent.

A list of these named locomotives appears on page 114.

### This Month's Contents

# Electricity from the Wind

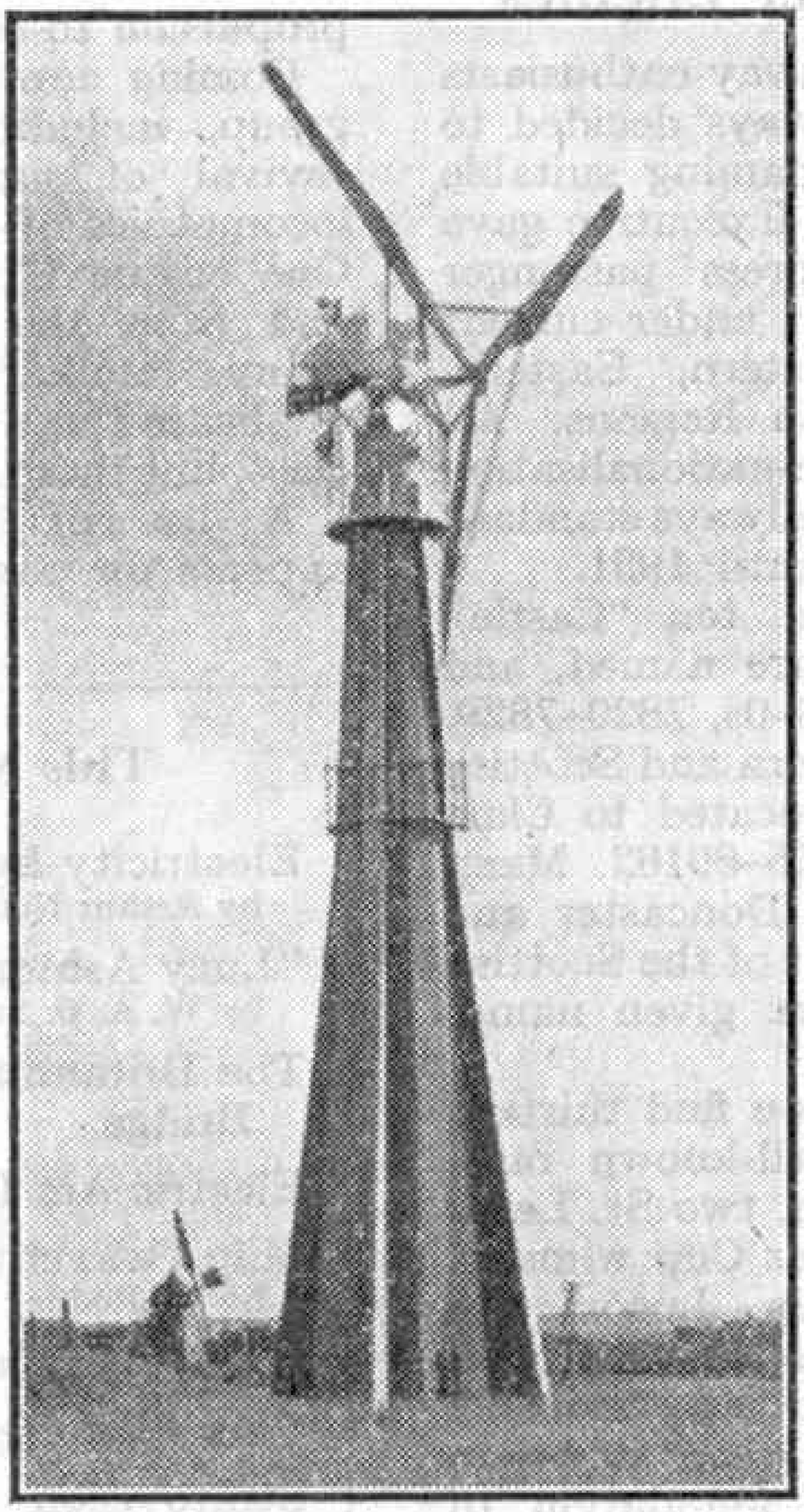
By Arthur Nettleton

HARNESSING the wind is nothing new. Centuries ago windmills up and down Britain were grinding corn, and some such mills still operate. The earliest reference to this method of obtaining power is in a 12th-century document, and a windmill built in 1665 continues to turn at Outwood, Surrey. To-day there is also a movement to preserve such structures. Several that were out of use and becoming derelict were set working again during the war years to save coal and thus help the war effort.

This concern for our old windmills has since increased rather than abated, and it seems likely that even more attention will be given to it in the immediate future. But far bigger schemes to put the wind to work are now being promoted. For several years electrical engineers have had in mind the idea of building gigantic aero-generators or wind turbines, to be linked to the grid system to help to run factories and supply light and heat to our homes.

Small wind turbines are already a well-established feature in some country districts, both here and abroad. Some of them run dynamos and provide current for farmsteads and farm machinery. Others operate pumping mechanism, either to fill reservoirs or to drain land or mines. But these windmills are miniatures in comparison with the monsters envisaged for to-morrow. The small-scale windmill erected to supply current only locally generates about 2 kW. In some countries, notably Denmark and Russia, aero-generators with an output of 70 kW. are in operation. As far back as 1931, after 10 years' research, Soviet engineers built a wind turbine, near Yalta, that had an output of 75 kW. in a 50 m.p.h. wind. During the war Denmark had over 80 wind-driven units, some with a rating of 50 kilowatts, supplying electricity to small communities. In that country research into wind turbine problems has been continuous since 1891, when an experimental station was set up at Askov.

Compare these figures with those for the latest projects for Britain. The windmills which scientists hope shortly to have in operation are expected to generate 2,000 kW. And ultimately even larger ones will be erected. It is estimated that one of these aero-generators alone will save 3,000 tons of coal and oil fuel annually, and that when the wind is fully harnessed by a series of such windmills the total yearly saving will be 2,000,000 tons.

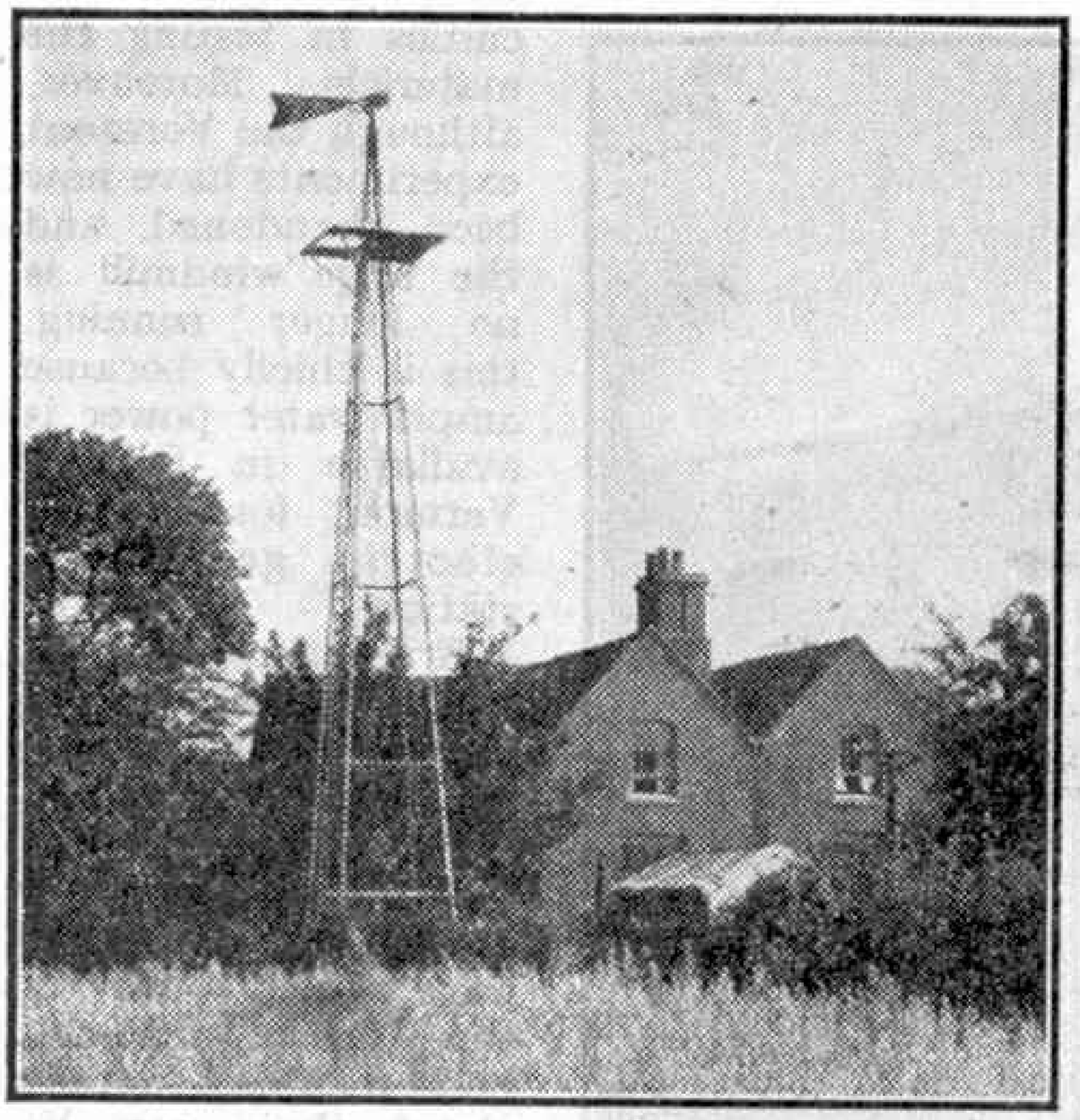


A modern aero-generator with propeller blades. An old-fashioned windmill in the background offers an interesting contrast.

Why not build still more of these wind-driven turbines and get all our electricity by this means? Attractive though this proposal seems, there are some snags. Wind velocities vary, and the output must be fed into a grid system where the total amount of current can be adjusted to the needs of the moment. In other words, diesel or coal-driven turbines must be available to take over the job if the wind drops.

No satisfactory method of storing large blocks of electricity against a "rainy day" has yet been devised. Small quantities can be stored, but it is impracticable to do this on the large scale needed for industrial and domestic consumption.

Further, ideal sites for big wind turbines are comparatively few. Selection of the sites where these gigantic aero-generators could be built in Britain has entailed long and painstaking research.



**Wind turbines are already solving the power problem in isolated places, and are easily erected.**

The moods and habits of the wind at various places have had to be recorded for several years, and the resulting statistics are only now yielding the data which the electrical engineers require. Meteorological Office records have had to be tabulated and examined, and this work has had to be followed by practical tests on a number of sites.

Eight meteorological stations have been chosen for detailed consideration of their wind-velocity records. These stations are at Plymouth, Butt of Lewis, Cranwell, St. Ann's Head (South Wales), Birmingham, Catterick, Leicester and South Shields. Other stations which have figured in this research are in the Orkneys and Shetlands, and at Aberdeen, Edinburgh, Abbotsinch, Paisley, Eskdalemuir, and Balmakewan.

The investigations revealed that the best sites for the proposed gigantic wind turbines are on the west coast of Scotland, in the Orkneys and Shetlands, and on the south-west tip of England. A strong, reasonably steady wind can be relied upon to turn the aero-generators in those parts of Britain.

The next step was to send out a team of "wind prospectors" to one of these sites, and Pomona, in the Orkneys, was chosen for the purpose. The team stayed in this windswept spot for eight months, making detailed notes of the strength, direction and duration of the gusts. The first big step towards bringing the long-term plans to fruition was the laying of power lines, early in the summer of 1949, from Kirkwall power station to a site suitable for the erection of a 100-ft. high aero-generator.

Meanwhile electrical engineers were busy designing this new-style British windmill. Its inventors abandoned the lattice sails common to ordinary windmills. Lessons learned in aircraft construction during the war, and in the design of wind turbines abroad both before and since that time, have revealed that for generating electricity it is better to employ propellers similar to those used on aeroplanes. The advantages include absence of back-pressure on the blades moving against the wind, forward pressure on all the blades simultaneously, and the fact that the speed can be much higher than wind speed.

**Windmill sails are cumbersome and less efficient than the streamlined blades of a modern aero-generator. This old windmill is at Thornton-le-Fylde, Lancashire.**

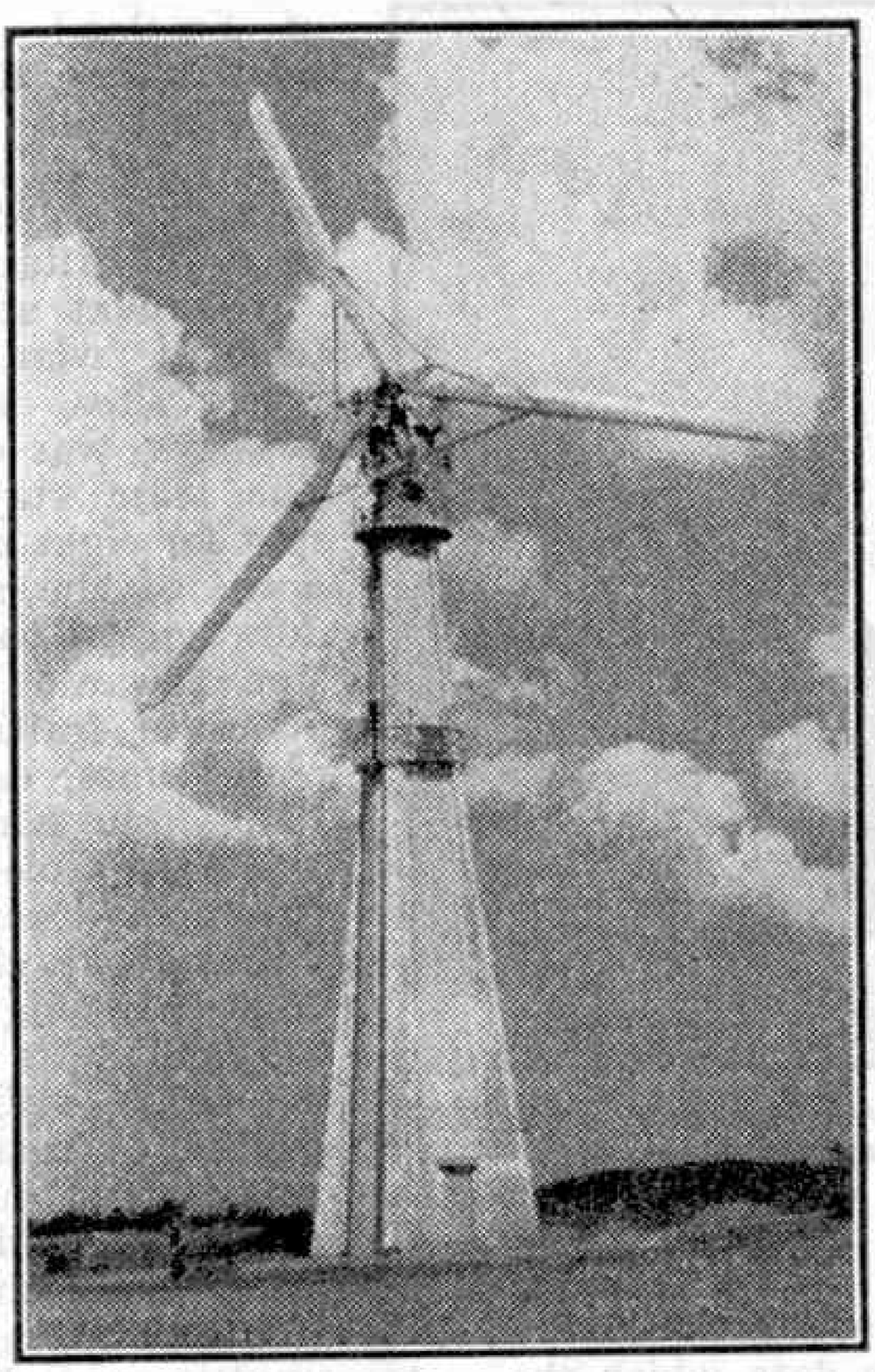
The propeller type of wind turbine, indeed, has already proved to be the most efficient for small-scale generation, and is likely to be so for large-scale generation. Its high speed is of special value, since it would otherwise be necessary to gear the propeller to the high speed needed by the generator. A minor drawback is that the blades must always face the wind if they are to work efficiently. This requirement can be easily met, however, by setting them on a vertical axis, thus enabling them to swivel

round when the wind veers.

It is thought that a network of such windmills, each much larger than any hitherto built in Britain, will be invaluable not only in providing the extra current needed for the expansion of industry, but also in saving fuel. Wind turbines can be built more quickly than the present type of plant, and they would enable some of the latter to be rested periodically for a much-needed overhaul.

The aero-generator towers will be built in the form of pylons, 100 ft. high, and will be set facing the wind at points about 500 ft. above sea level.

Much has been learned by British electrical engineers about wind turbine design and operation from the experiences of other nations, especially the United States, where a large-scale aero-generator for commercial purposes was built in 1941. This colossal windmill, near Rutland, Vermont, produced 1,250 kW. at a wind velocity of 70 m.p.h. and ran successfully until the summer of 1945. One of the propeller blades then broke, but this failure was attributed mainly to wartime difficulties in testing the materials. Moreover, although the Vermont experiments have now been abandoned, and the huge windmill is no longer running, this is chiefly because ample water power is available in Central Vermont for running electric generating stations.



**A three-blade wind turbine such as this can attain a very high speed and is particularly suitable for generating electric power.**

Russia began research on aero-generation as far back as 1920. The latest report is that several units, each with an output of 5,000 kW., have been built in the U.S.S.R., although no reliable details about these can be obtained.

While Britain cannot claim to have pioneered this branch of electrical engineering, its potentialities are now being examined with increasing enthusiasm. Experts state that a network of wind turbines, big enough and numerous enough to make the project really worth while, could be operating five years hence. This is a development that our ancestors never envisaged when they built their comparatively primitive windmills for grinding corn. Besides the material benefits, it would ally the ancient and the modern in a most striking way.

## Bigger and Better Worms

When we see a bird eat a wriggling worm we feel quite pleased to let it enjoy what to us would be a repulsive meal. Yet the natives of some South Sea Islands thoroughly enjoy a feast of raw or baked worms, which they eat in large numbers. The worm they delight in is not the familiar earthworm, but a relative of the sea centipede, a remarkable worm that actually eats other small organisms, which it grabs in powerful jaws.

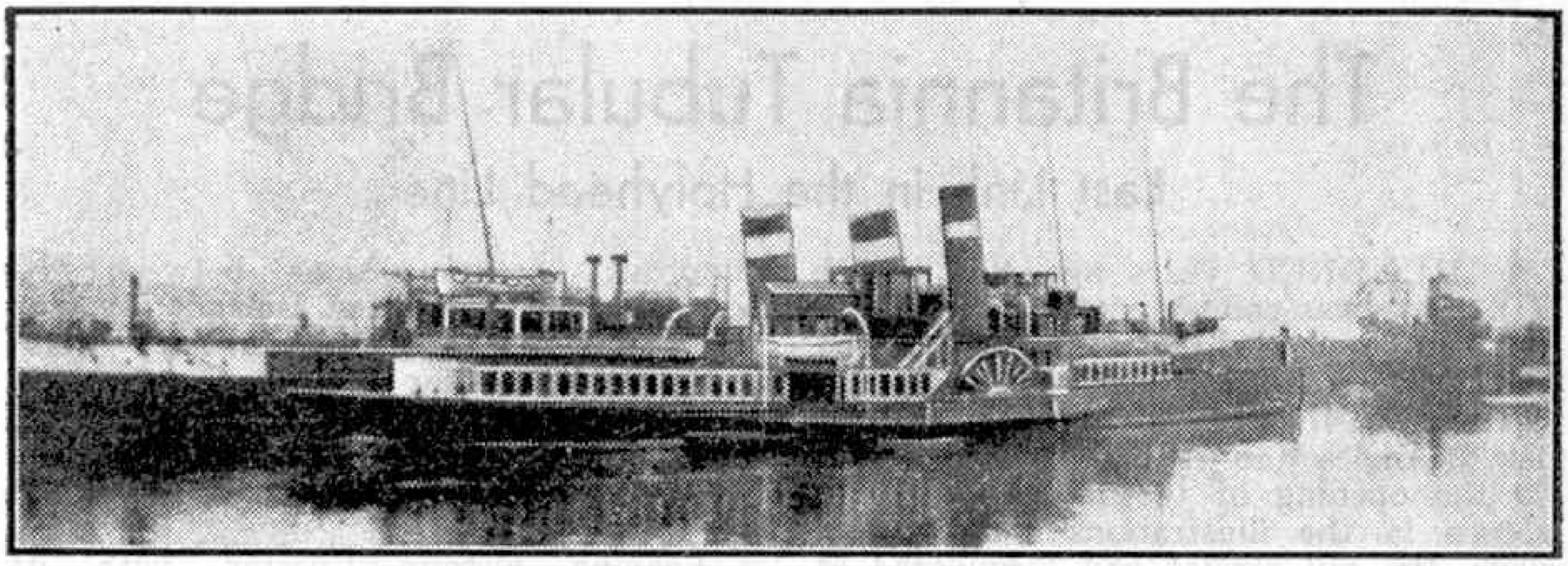
There are indeed many strange worms in the world, and perhaps of all of these the most remarkable is the one that lives on snow fields and glaciers of the mountainous region between Alaska and Mt. Rainier, in the United States. These icy wastes seem a curious home for such a soft bodied creature.

The ordinary earthworm is interesting and indeed very useful, for it churns up the earth, lets air into it and carries down bits of leaves and plants, actions that make the ground more fertile. It is a ceaseless worker that well deserves to be called a living plough. Darwin estimated that there are over 50,000 earthworms in an average acre of garden soil, and that they bring about 10 tons of soil to the surface every year. Distributed over the surface this soil represents a layer an inch deep in five years.

Clearly worms are creatures that we should cherish. This is well known to African tribes, who carefully select areas where there are abundant signs of earthworms on which to plant their crops. Their burrowing allies are bigger than the earthworms of Great Britain and presumably better, for some of them grow a yard in length and are as thick as a man's finger. Even this is not a record, for in Australia there is a worm that attains a length of 6 ft.

Soil seems a queer diet, even for a worm, but it is only eaten for the organic material it contains, and the worm then gets rid of the soil itself. The lugworm of the seashore eats sand for the same purpose.

How does a worm crawl? On each of its segments it has a few tiny bristles, and their scale-like points give it a hold on the ground. Worms also dig the points of the bristles into the side of their burrows when a bird tries to pull them out, a proceeding that often resolves itself into a real tug-of-war, which the worm usually loses. The bristles can be felt distinctly when a worm is drawn across the hand.



"Lucy Ashton" in Bowling Harbour.

# "Lucy Ashton's" Career

## Oldest Clyde Paddle Steamer leaves Active Service

By W. A. C. Smith

THE Clyde paddler "*Lucy Ashton*," the oldest British Railways steamer, was sold in December last after being laid up in Bowling Harbour since September 1948. She was to be broken up by Metal Industries Ltd. at the wartime-built port of Faslane in the Gareloch.

This popular veteran was 61 years old at the time of her sale. She was built in 1888 for the North British Steam Packet Co., a subsidiary of the North British Railway, at the now defunct Rutherglen yard of Thomas Seath and Co., and had a length of 190 ft., a breadth of 21 ft. and a speed of 16 knots. Her passenger-carrying capacity was 900. She was the last of the Clyde's Victorian paddlers with bridge abaft the funnel and main deck open at the bow. She also showed her years in having no steam steering or steam winches.

During the Second World War "*Lucy Ashton*" became famous by maintaining the L.N.E.R. Clyde service single-handed, for the other Craigendoran steamers were taken over for naval service. When she celebrated her Diamond Jubilee in May 1948, an age never before attained by any railway-owned vessel, she had steamed a million and a quarter miles.

A few months earlier she had been the centre of a fierce controversy, which even reached Parliament, when her familiar red, white and black funnel was painted in British Railways standard yellow with black top. From the time of her building until nationalisation the "*Lucy Ashton*" had retained N.B.R. colours, except for three years from 1936 when her hull was painted grey instead of black, and during the war when she was painted sombre grey. Structurally she received little alteration during her long life.

The career of "*Lucy Ashton*" was remarkably free from accident. For many years she operated the Gareloch service, and from 1939 she maintained the Dunoon service. She re-opened the L.N.E.R. service to Rothesay in 1945, but was relegated to the Gourock and Dunoon runs again on the return of the "*Jeanie Deans*" and "*Talisman*" from war service in 1946 and the completion of a new "*Waverley*" in 1947.

The photograph reproduced on this page illustrates almost 50 years of development in paddle steamer design, as with the "*Lucy Ashton*," the smallest Clyde paddler and the last of those built in Victorian days, it shows the "*Jeanie Deans*," which is the largest paddle steamer on the Clyde and was the first of the fleet of modern paddlers. This vessel has a length of 250 ft. and a speed of 18½ knots. She was built by the L.N.E.R. in 1931 to compete with the L.M.S. turbine steamers. Only paddle steamers can use Craigendoran Pier, as the water there is shallow.

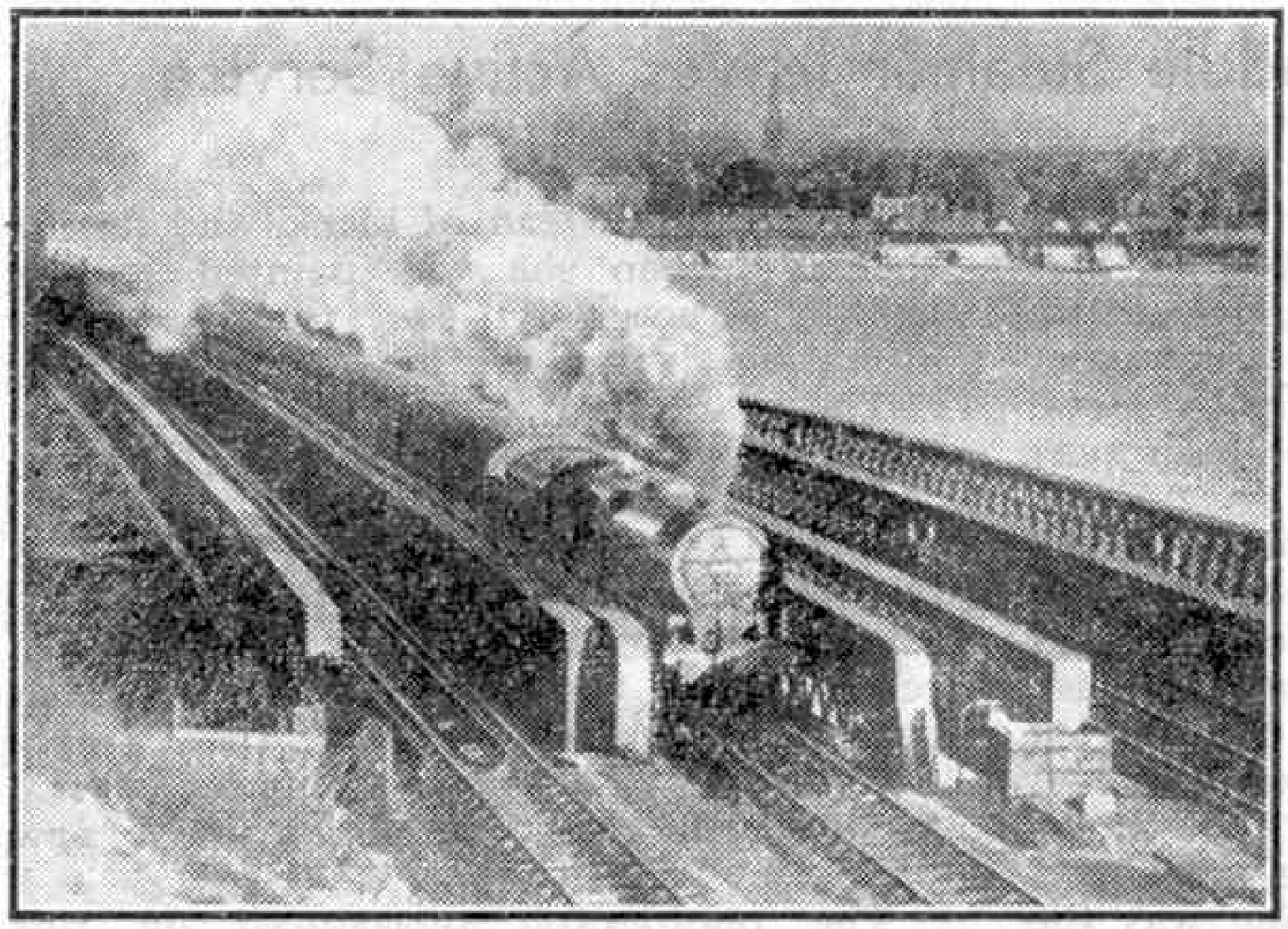
In January the hull of the "*Lucy Ashton*," all that remained of her in the breaker's yard, was purchased by the British Shipbuilding Research Association and is to be used on the Clyde this summer for experiments in hull resistance.

Several relics of the veteran have been presented to Glasgow and other interested centres.

# The Britannia Tubular Bridge

## Last Link in the Holyhead Line

A HUNDRED years ago this month there was completed the final link in rail communication between London and Holyhead. This link was provided by the Britannia Tubular Bridge, connecting the Isle of Anglesey to the mainland. Previous to the opening of the bridge, which is shown in the illustrations on the next page, the rail service had terminated at Bangor and traffic was conveyed by road to Llanfair, whence the rail journey to Holyhead was completed.



**The "Irish Mail" in charge of a "Royal Scot" makes its way over the Dee Bridge at Chester. This and the upper illustration on the next page are from British Railways photographs.**

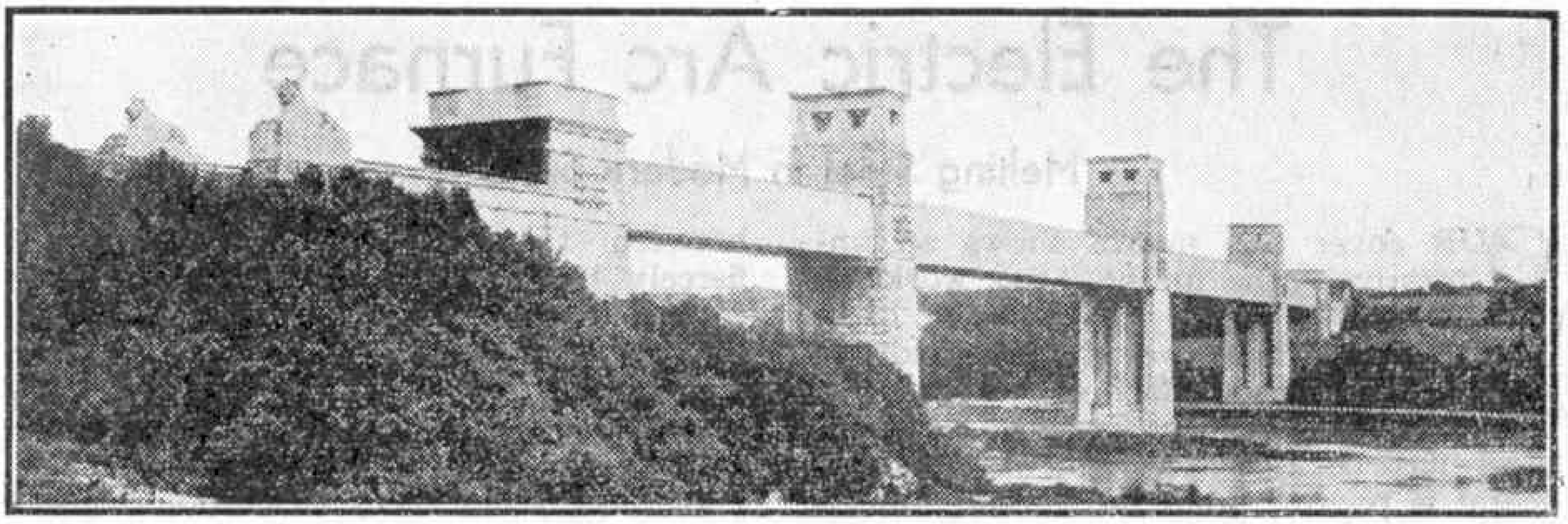
The completion of the Britannia Bridge was therefore the climax of the construction of the Chester and Holyhead Railway, which later was to form an important part of the L.N.W.R. and then the L.M.S. To-day, as part of the London Midland Region of British Railways, this section still maintains its character as the Royal Mail route to Ireland, and the "*Irish Mail*" rumbles across the century-old bridge, the building of which was a remarkable engineering achievement for the time.

Very closely associated with the Chester and Holyhead line was the Chester and Crewe Railway, authorised in 1837 and opened in 1840. At the instance of this company George Stephenson surveyed a line between Chester and Holyhead. Various schemes had been considered to improve communications between the capitals of England and Ireland. In 1839 the Government and Admiralty Commissions set up for the purpose, reported in favour of the route via Holyhead, so in 1844, the Chester and Holyhead Railway Company was formed and work began in 1845.

Leaving historic Chester, with its associations with Roman times, through a four-track tunnel, the railway crosses the Dee Bridge shown on this page. It skirts the sandy shores of the Dee Estuary and for a considerable distance runs along the sea coast. In fact, some 26 miles of the route are laid along sea wall, open to tide and wind, the exposed nature of the location giving engineers in charge some anxious times in rough weather and requiring the maintenance of various sea defence works. An inland course is followed across the Great Orme peninsula between Llandudno Junction and the River Conway. The latter is spanned by the Conway Tubular Bridge, the massive abutments of which are made to match the architecture of the ancient castle nearby, and the railway enters Conway station through a castellated arch of the same architectural character.

On the next stretch, the permanent way is never really far from the sea, piercing the mountain headland of Penmaenmawr. Here special covered ways or avalanche tunnels protect the line, passing close under the steep face of the mountain, from falling rocks. Special sea works were necessary here and at one stage Robert Stephenson, who engineered the line, came near defeat when the sea damaged his defences as fast as he built them. Open viaduct had to be substituted for sea wall at one point and the whole of the works here occupied three years.

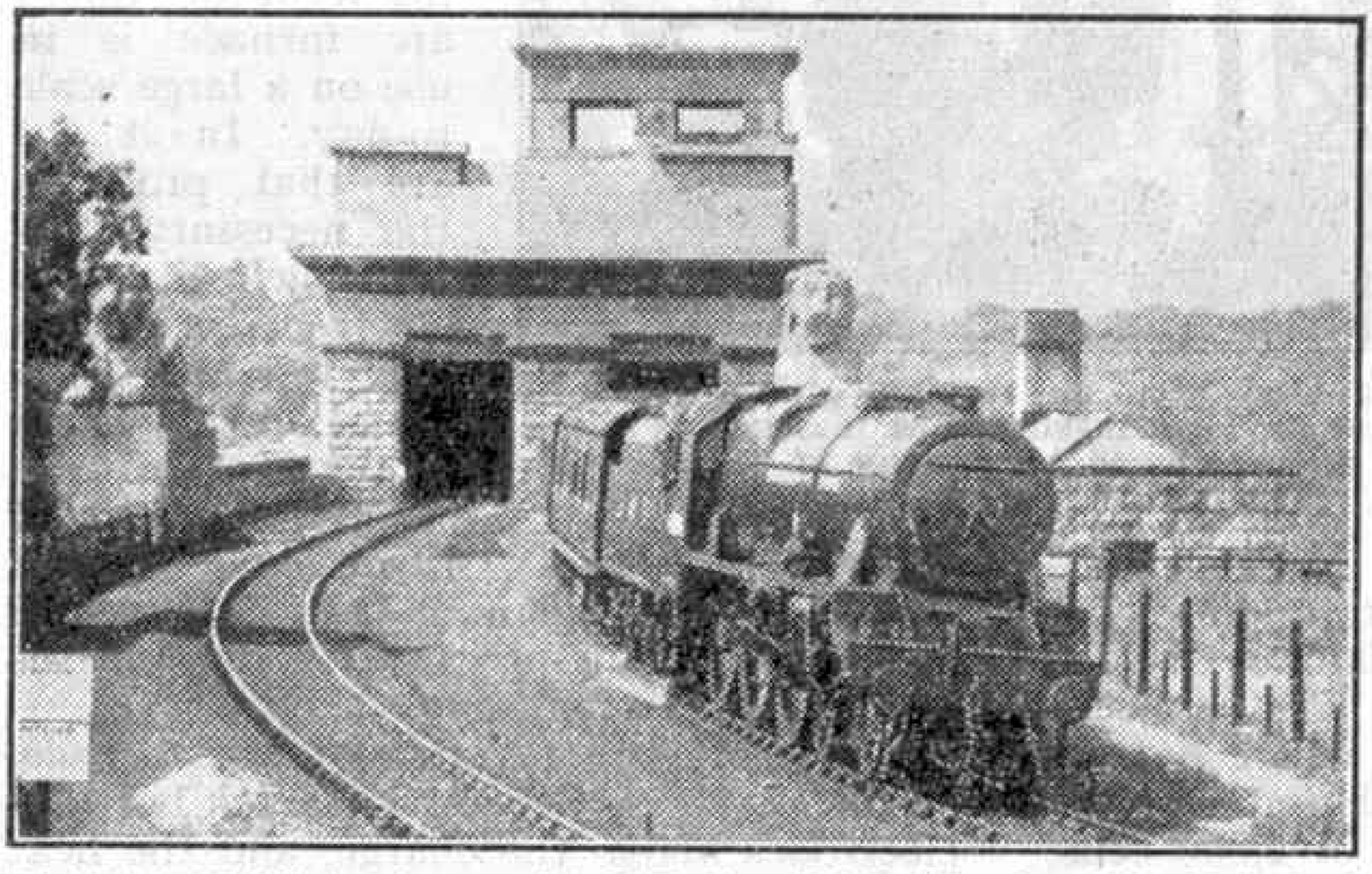
After Aber, with its water troughs, and the viaduct over the river Ogwen the line reaches Bangor, a traffic centre of



**Robert Stephenson's Britannia Tubular Bridge, completed in 1850, linking Anglesey with the mainland. The towers, tubular girders and guardian lions are plainly shown.**

importance where the station, which is between two tunnels, still bears some original *"C & H"* monograms of the Chester and Holyhead days. Beyond Menai Bridge station a sharp curve heralds the approach to the echoing tubes of the Britannia Bridge, both ends of which are guarded by pairs of massive lions in stone. Each of these beasts is 25 ft. long and weighs about 30 tons.

There are no remarkable features on the route across Anglesey, traditional haunt of the Druids, but as Holyhead lies on Holyhead Island, tidal water is crossed on an embankment originally provided by Telford for the Holyhead road and widened to accommodate the railway. Such is



**Up "Irish Mail" in charge of L.M.R. No. 46166 "London Rifle Brigade," leaving the Britannia Tubular Bridge. Photograph by W. S. Garth.**

the Chester and Holyhead line, famous for its "Irish Mails," now hauled by "Royal Scot" 4–6–0s in place of the pigmy engines of a century ago, and for its happy holiday traffic, its tubular bridges, its pioneer water troughs and its bi-lingual "Caution" notices in English and Welsh.

Holyhead Station and Harbour have seen many developments since the early days and the efficient vessels of modern times ably carry on the traditions of the first steamers provided by the Chester and Holyhead company.

Although interesting and important on its own account, the tubular bridge at Conway is not so imposing as the Britannia Bridge over the Menai Straits. The latter, when viewed from a boat in the Straits, or from some distance away on shore, has a most pleasing aspect. In addition to the abutments the bridge consists of three towers supporting the tubular girders through which the railway runs. The centre tower stands on rocks known as Britannia Island from which the bridge as a whole gets its name. The stonework is carried out in Anglesey marble, except for the guardian lions, which are of limestone.

The twin tubular girders are in four lengths, of which the shoreward pairs are each 230 ft. long and the centre pairs 460 ft. long each. The Britannia tower has a total height of 200 ft. above high water, while the Caernarvonshire and Anglesey towers are each 10 ft. less. The shoreward tubes were erected in position, but the centre tubes had to be built on shore and floated out on pontoons, to be raised a few feet at a time by hydraulic presses.

Robert Stephenson was the designer of this famous bridge, and his name and the year of erection are inscribed on it. He himself drove the last rivet.

# The Electric Arc Furnace

## Melting Steel in Modern Style

OUR cover this month shows an impressive scene in the Atlas works of Thomas Firth and John Brown Ltd., Sheffield, to whom we are indebted for the photograph on which it is based. In it a giant arc furnace is seen in which steel has been melted, and the molten metal is pouring from the furnace into a huge ladle suspended from a crane. In this ladle, still carried by the crane, the molten metal is taken to a row of ingot moulds, each of which is filled in turn through an opening in the base of the ladle, as seen in the lower illustration on the opposite page.

**Pouring steel from an arc furnace into a ladle in readiness for ingot making. The illustrations to this article are reproduced by courtesy of Thomas Firth and John Brown Ltd., Sheffield.**

The production and melting of steel has been carried out in various kinds of furnace since its introduction. In the modern age the necessary heat is provided electrically on a large scale, and one of the most interesting of the various types of electric furnace in use is the one in which the heat is produced by a gigantic arc.

The electric arc was first produced by Sir Humphry Davy, the famous British scientist, almost 150 years ago. In the Royal Institution, London, where he was lecturer on chemistry, Sir Humphry had installed a gigantic battery of 2,000 cells; and in one of his experiments with this he connected carbon rods to the terminals, brought these into contact and then slowly separated them. As soon as the two carbon rods moved apart a brilliant arch of light, or arc as it came to be called, was formed between them. This was intensely brilliant. It was formed by a stream of carbon particles passing between the rods, and these glowed fiercely because of the tremendous heat caused by the passage of current across the space between their ends. As the separation continued, a distance was reached at which the arc could not be maintained, and it was extinguished.

In later years Davy's electric arc was used for lighting purposes, two particular uses being in lamps that for a time were used for street lighting, and in providing the intense and concentrated source of light required in projection lanterns. In 1900 it was applied in the design of a furnace for melting metals, and it is a furnace of this type that is shown on our cover. Its inventor was Héroult, and his form of direct arc furnace is in use on a large scale to-day. In it the arc that produces the necessary heat is struck between electrodes of carbon and the charge of metal on the hearth of the furnace. The usual number of electrodes is three. On our cover two of these electrodes, giant rods of carbon, can be seen projecting upward from the furnace itself in the background.

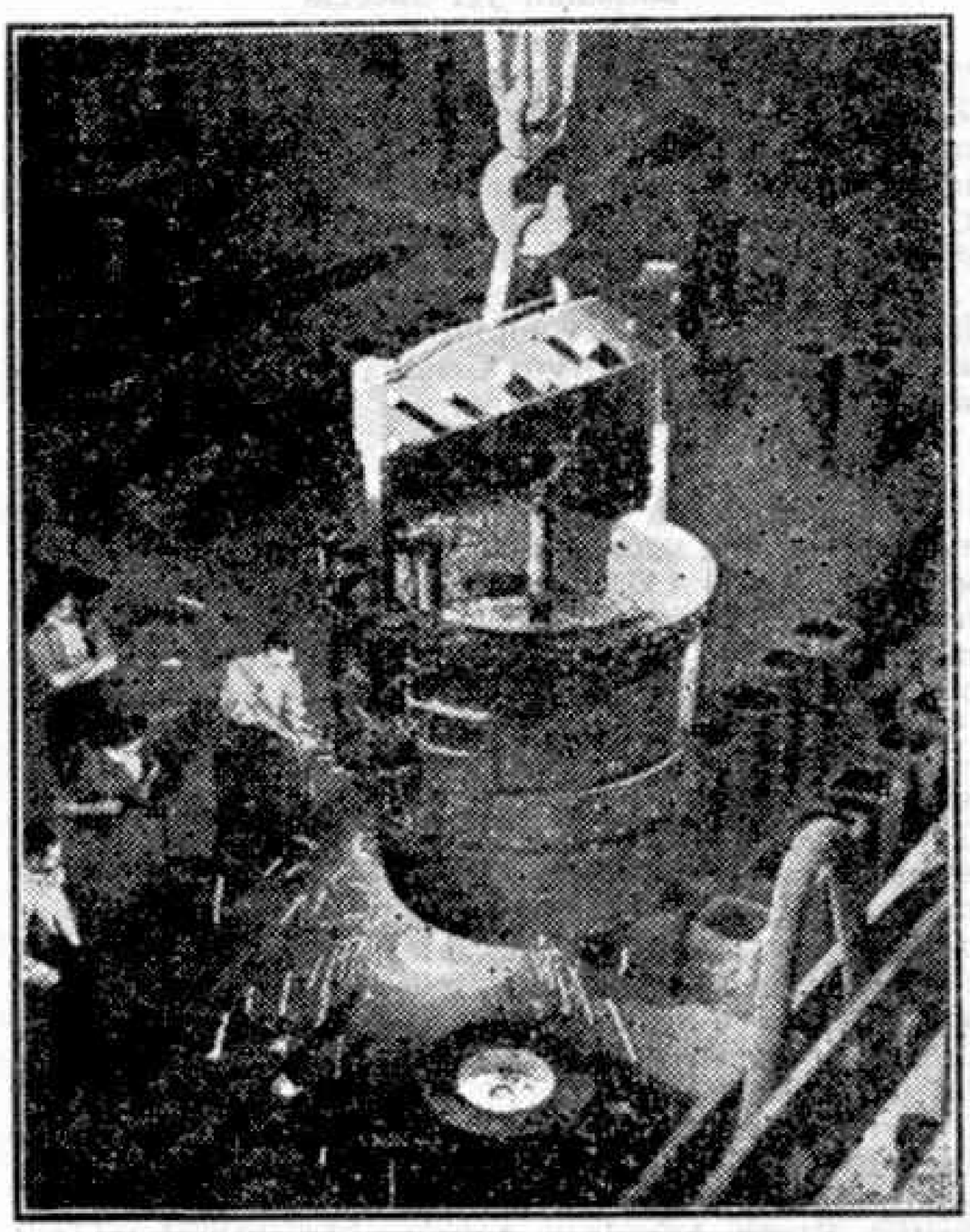
There are other forms of arc furnace. In one of these the arc is struck between electrodes above the charge, and the heat radiated from it melts the metal. In another there is an electrode submerged in the metal and current flows to this electrode through the metal itself, the heat generated by the resistance of the metal to the passage of this current aiding in the melting. The bulk of the "electric" steel of to-day, however, is produced in furnaces of the Héroult type, and these

vary in capacity from one to 30 or more tons.

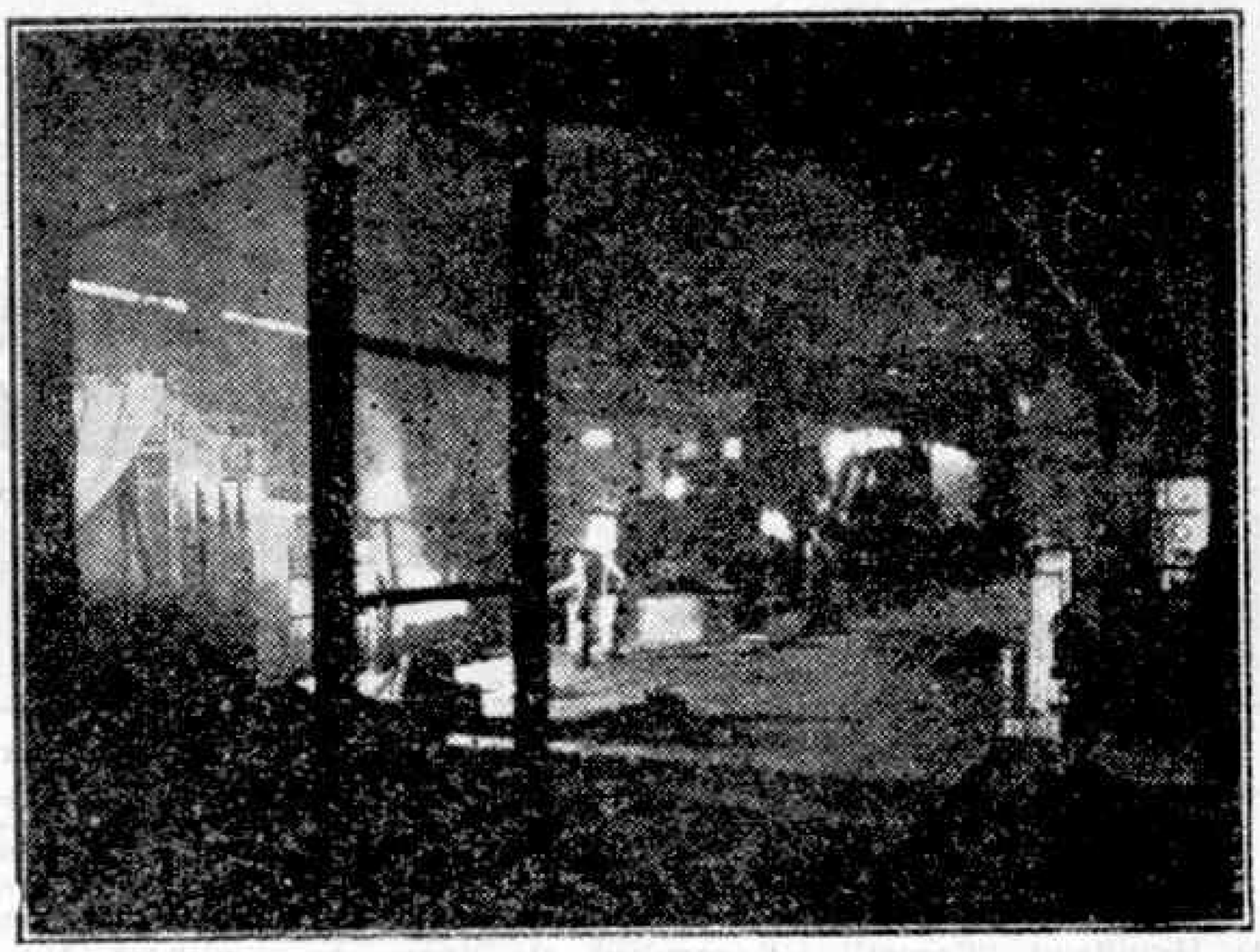
The temperature within the arc of an electric furnace is probably over 3,000 deg. C., but this heat is so rapidly absorbed by the charge that neither the brickwork nor the metal ever approaches this very high temperature. In order to produce it the current carried by the electrodes is enormous, running into thousands of amperes, but the voltage employed is generally only from 100 to 200.

An interesting feature of the modern electric furnace is the method used for controlling the positions of the carbon electrodes. These have to be adjusted continuously in order to keep the currents in the arcs at the definite value required, for if they remained in the same position there would be variations in this current according to the position of the metal.

The furnace seen on our cover is one to which a special automatic method of control is applied for this purpose. Each electrode is fitted with the control. Any increase in the actual current causes a special generator to supply power to a small motor that raises the electrode,



Filling the ingot moulds from a ladle of molten steel. The ladle is suspended from a giant crane.



Electric arc furnaces in the Atlas Works, Sheffield.

while a decrease reverses the output of the generator and so causes the electrode to be lowered. In each case the effect is to bring the current back to its normal value. In addition there is a safety device that causes the electrodes to be raised if there is a failure in the supply of power to the furnace.

This new system gives smooth and rapid control of the furnace currents, especially during the initial melting down period. The generator that plays such an important part in it is of a special type known as a metadyne.

The charge for the arc furnace is normally scrap metal, though pig iron also can be introduced if desired. One special use of the furnace is the melting of large quantities of lathe turnings and similar light scrap, thus economising in the use of valuable metals such as nickel, chromium and molybdenum which they contain

When molten steel of the desired composition has been obtained, the hot ladle is lowered into a pit and the furnace is tilted forward towards it. The metal then runs out through a tap-hole and down a chute in the ladle, this operation being the one shown on our cover. The time required for a complete heat, from charging to tapping, is about 6½ hours on a 10-ton furnace, and such a furnace makes about 20 casts a week.

The arc furnace is playing an important part in British steel production. Last year's target was 15½ million tons, 1⅛ million tons above that for 1948 Both targets were exceeded, that of 1948 by over ¾ million tons, while last year 15,553,000 tons of steel were made.

# Air News

by John W. R. Taylor

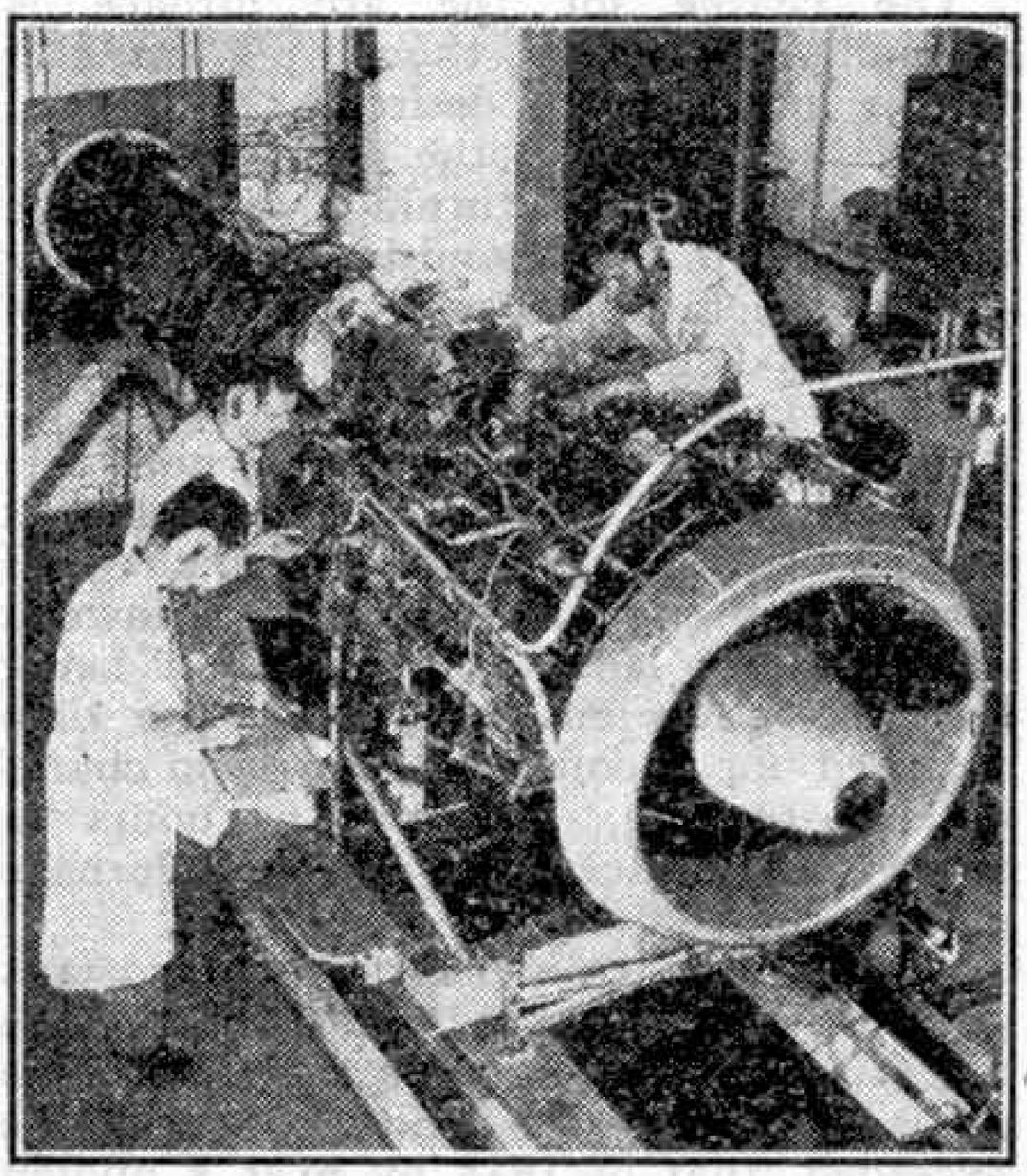
D.H. "Comet" jet-propelled air liner. Photograph by courtesy of de Havilland Enterprise.

### First Dollar Order for "Comet"

Canadian Pacific Airlines, of Montreal, have ordered de Havilland "Comet" jet-propelled air liners, to operate their 6,800-mile North Pacific service between Vancouver and Hong Kong. The initial contract is for two aircraft, equipped as 48-seaters, to go into service in 1952–3, and negotiations are in hand for the delivery of more "Comets" at a later date. This first dollar order for the "Comet" vindicates further Britain's post-war decision to go all out for world leadership in air transport by concentrating on jet air liners, for hitherto C.P.A. have used American or Canadian-built aircraft.

The "Comets" will reduce the time-schedule of the Company's Vancouver-Hong Kong service—more than a quarter of the way round the world—to 20 hrs., including three one-hour halts at Anchorage in Alaska, Shemya in the Aleutians, and Tokyo.

Performance figures released by de Havillands after 150 hrs. of flight testing the prototype "Comet" prove that production aircraft will have no difficulty in maintaining such a schedule. After full allowances have been made for ground running, taxying, take-off, climb, descent, navigational errors, 50 m.p.h. head winds, 30 min. of "stacking" over the destination and 200 miles of diversion flying to an alternative airport, the "Comet" will still be able to fly 36 passengers non-stop on stage lengths of 2,140 miles, or 48 passengers for 1,750 miles, at 490 m.p.h.



The Avro "Orenda" jet engine under test. Photograph by courtesy of A. V. Roe Canada Ltd.

### Improvements at Schiphol

A 6,000 ft. runway strong enough to support aircraft 30 tons heavier than the "Brabazon" has been completed at Schiphol Airport in the Netherlands, on the bed of a dry lake 12 ft. below sea level. Materials used in its construction included 175,000 cu. yds. of sand, 700 tons of stone chippings, 11,000 tons of cement waste, 17,000 tons of bituminous mortar and 165,000 cu. yds. of concrete.

The new runway is the second of several being built as part of a plan to modernise Schiphol. They will conform with the latest American practice, by radiating tangentially from a central terminal area, in contrast with the more conventional triangular runway pattern of London Airport.

### Canadian Jet Success

A secret Canadian jet engine, the Avro Canada "Orenda," has been run continuously for over 750 hrs. with only routine servicing. The test was made at full power, despite the fact that the engine made its first run only 8½ months earlier. It exceeded the equivalent requirements of six major British, American and Canadian official test schedules.

The "Orenda" is believed to be the most powerful jet engine under development in North America, and will be used in Avro Canada's new twin-jet all-weather fighter, the CF-100.

* * * *

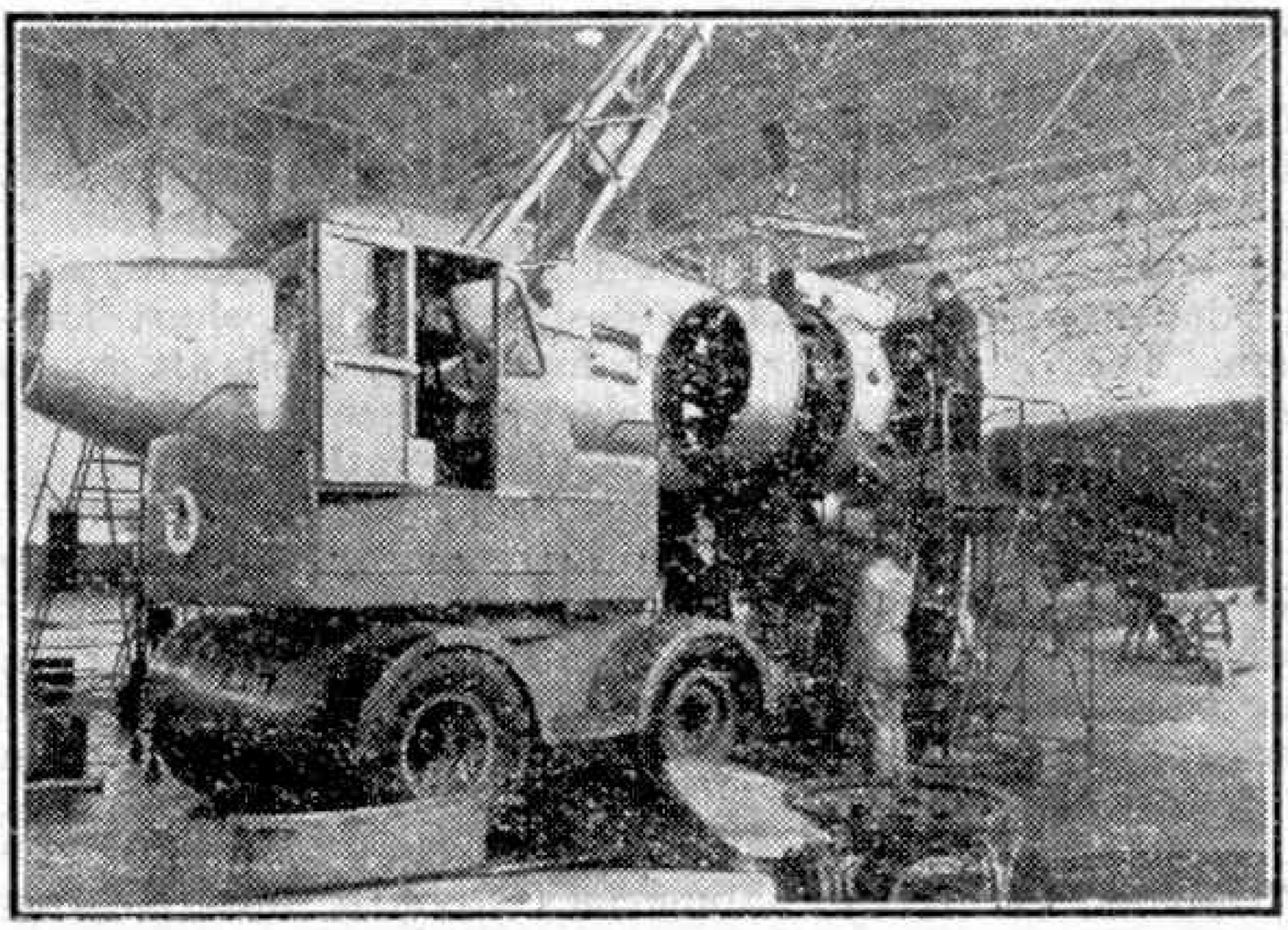
Passengers from every part of the world who have experienced the supreme comfort of flying boat travel will regret B.O.A.C.'s decision to end all their flying boat services from Southampton Water by the middle of this year. The 12 Short "Solents" now operating to South Africa will be replaced by "Hermes" landplanes.

Suspension of all flying boat services is one of the economies decided on by Britain's state-owned Overseas Airways Corporation early in 1949, in an effort to reduce their financial losses. For some time the Corporation have been the only major world airline using flying boats on long international routes, and thus have had to bear the full cost of marine bases along these routes, whereas their competitors have been able to use international airports on payment only of landing fees.

Flying boat enthusiasts can draw some consolation from the fact that B.O.A.C. will take over the three giant Saunders-Roe "Princess" boats ordered by British South American Airways, now amalgamated with B.O.A.C.

### 1,000 Hours Between Overhauls

Bristol "Hercules" engines in two Vickers "Viking" air liners belonging to British European Airways and Airwork Ltd. have achieved 1,000 hours' operation between overhauls, and this figure may soon be approved for all "Hercules" engines fitted to this type of aircraft.



**Ground staff in the B.E.A. workshops at Northolt aerodrome removing a Bristol "Hercules" engine from a Vickers "Viking" air liner after 1,000 hours' operation. Photograph by courtesy of The Bristol Aeroplane Company Ltd.**

The maximum life between overhauls normally approved by the Air Registration Board for this engine is 900 hrs., but permission was granted a short time ago for B.E.A. and Airwork each to run two engines 1,000 hrs. All four engines completed the test with flying colours, and were found to be in excellent condition when stripped for overhaul and for examination by A.R.B. experts.

This 1,000 hrs. period between overhauls is equivalent to more than seven flights round the world without any attention other than routine servicing, plug maintenance, inspection of filters and other minor details. It is a great tribute to the reliability and safety of the "Hercules."

### "Vampires" for Venezuela

The latest country to adopt the de Havilland "Vampire" as its standard defence fighter is Venezuela, right on the doorstep of the American aircraft industry. This brings to 12 the number of countries using this versatile British jet fighter. "Vampires" are already in service with the Royal Air Force and Royal Navy, and in Canada, Australia, India, South Africa, Sweden Switzerland, Norway, France, Italy and Egypt.

### The "Buckaroo"

The little Temco TE-1A two-seat military trainer, shown at the foot of this page, has been named "Buckaroo," after the famous cowboys and bronco-busters of Texas, where it is built.

The "Buckaroo" was developed by the Texas Engineering and Manufacturing Company from their well-known "Swift" personal 'plane, and is one of the neatest little two-seaters in the world. Its wing span is only 29 ft. 4 in., and fully-loaded it weighs little more than ½ ton, yet it carries enough fuel for 435 miles of flying at 150 m.p.h. It is powered by a 145 h.p. Continental engine, which gives it a top speed of 160 m.p.h., and it has inherited the fine manœuvrability of the "Swift," which has been described as "the nearest thing to a personal fighter 'plane."

A further advantage of the "Buckaroo" is that, as it uses many components of the popular "Swift," Temco are able to offer it at less than $12,000 which is extremely cheap for such a high-performance primary trainer.

### Flush Radio Aerials

Flush radio aerials, as pioneered by Lockheed for their "Shooting Star" jet fighter, are listed among the ten major aeronautical advances of 1949 by technicians of the Wright-Patterson Air Force Base, research centre for the U.S. Air Force. They estimate that at top fighter speeds it took 200 h.p. to overcome the drag of old-type aerials, a fact that will be well believed by anyone who can remember the "Christmas-Tree" effect achieved when wartime aircraft were fitted with their full complement of radio and radar aerials.

Lockheed have fitted five separate flush aerial installations on the "Shooting Star," four of which are used also on the TF-80 trainer. They include a radio compass loop antenna in the nose, compass sense aerial moulded into the Plexiglass cockpit cover, and VHF transmitter-receiver and IFF (identification friend or foe) radio aerials in the tail.

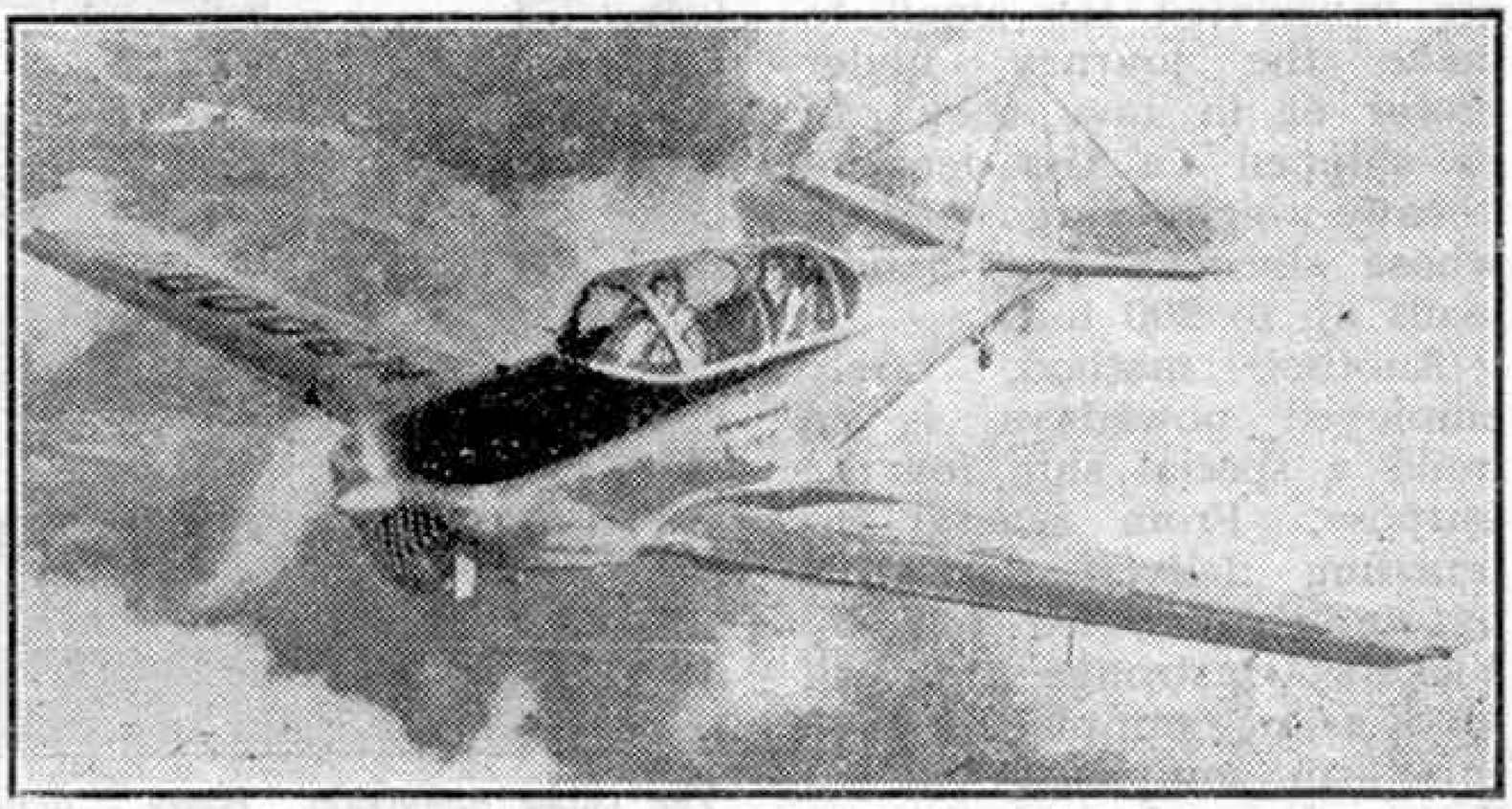
In addition to reducing drag, and consequently increasing aircraft speed, flush aerials are less likely to ice-up or collect static electricity in flight, which results in better reception.

* * * *

A total of 50 officers and N.C.O.s of the Irani Air Force have arrived in Britain for a period of training with Air Service Training Ltd. The majority will take a course in aircraft engineering at Ansty, near Coventry, and the others will be trained as pilots at the Company's flying school at Hamble, near Southampton.

* * * *

The Hawker N7/46 jet fighter, in production for the Royal Navy, has been named "Seahawk."



**The Temco "Buckaroo" military trainer in the air. Photograph by courtesy of Texas Engineering and Manufacturing Co. Inc., U.S.A.**

# Ship Delivering

By Morrys Rodney

THERE are several ways of delivering a ship from her building yard to her owner. Normally, it is simply a matter of handing over after she has completed her trial runs on the measured mile nearest the shipyard. But shipbuilders turn out many diverse types, apart from routine liners and tramps, and their delivery overseas often presents a problem. They are not designed for normal seagoing work, so that an ocean passage covering thousands of miles may be hazardous, or even out of the question.

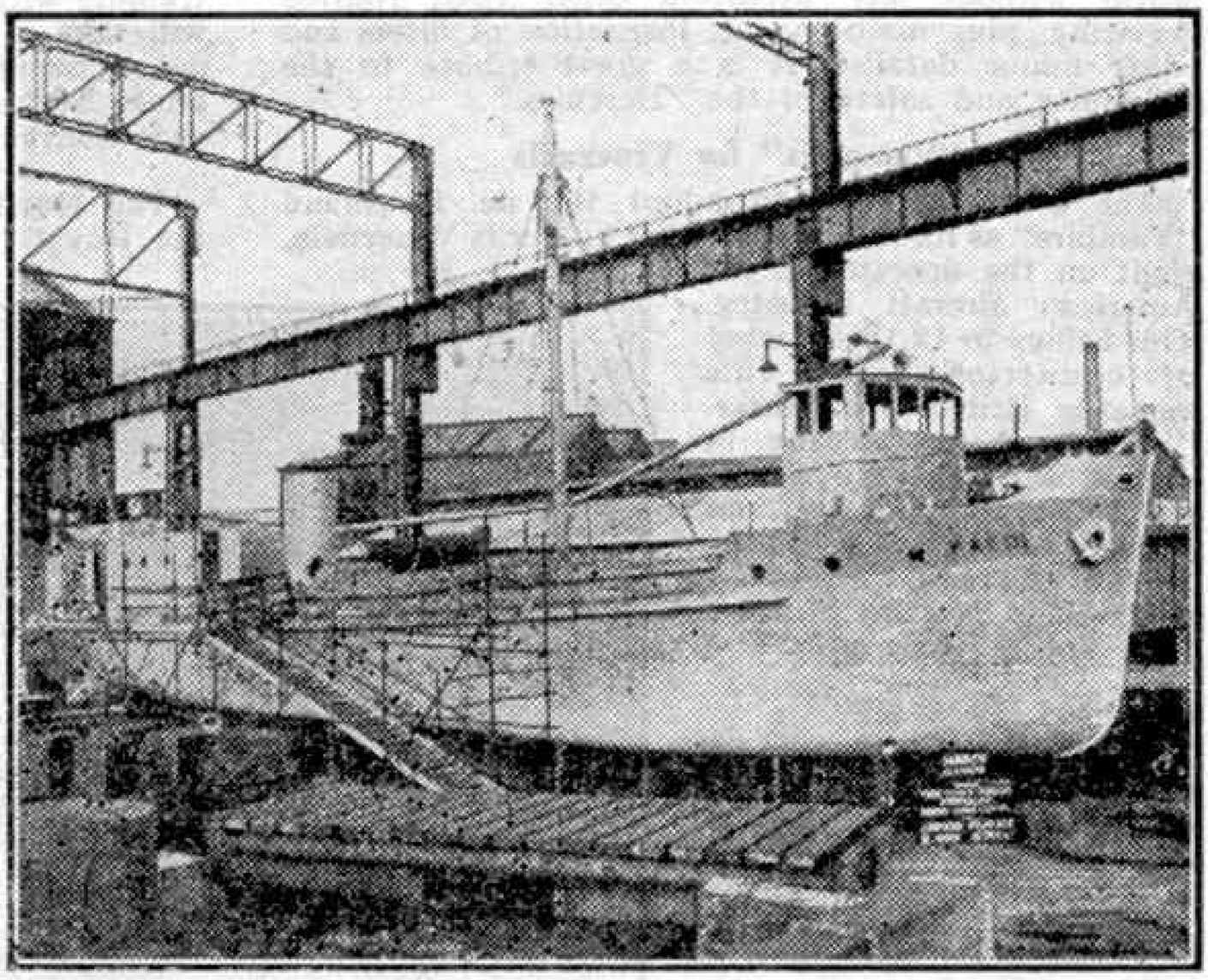
A number of concerns in this country specialise in the business of ship delivering. They undertake to provide a safe passage for small vessels of all kinds. Preparatory work includes building up the bulwarks to give a higher freeboard, providing accommodation for the crew of "runners," and installing extra fresh water tanks, stores and provision rooms. The choice of route is important, for these ships have only restricted bunker capacity, and have to call at refuelling ports on their journey.

Tugs, trawlers and coasters can travel under their own power, but towage is necessary for dredgers, lightships, rock-cutters, floating docks and similar products of the shipyard. Big and highly-powered tugs are engaged on this duty, the same type as are used for salvage work. In some cases, where a tug herself is being delivered abroad, opportunity is taken to put other vessels in tow, either for a leg of the passage and delivery en route, or to go the whole distance. If craft are considered too small to make the journey, under power or in tow, they can be shipped on the deck of "heavy-weight" cargo carriers, whose derricks can handle loads up to 200 tons.

Another method, rarely employed nowadays, is to build a special ship for the purpose. From several interesting deliveries of this nature one carried out by Vickers-Armstrongs Ltd. will serve as an example. In 1908 this firm completed two of the earliest Japanese submarines, boats about 135 ft. long. Building them presented no difficulty, but their delivery to Japan was a problem, which was solved in a very ingenious manner. It was decided to provide them with a carrier for the journey, a cargo ship aptly named *"Transporter."*

This ship had a length of 235 ft., and was specially designed with a short forecastle and her machinery well aft so as to leave a long clear hold free of obstruction. The hatchways, fitted athwartship, extended along the deck. The *"Transporter"* was placed in a dry dock at Liverpool, the port bulwark being removed, together with part of the deck on that side. This, with the hatch coaming out of the way, gave access to the hold below. When water was admitted into the dock it submerged the ship's hull, allowing one of the submarines to float into position above the space made for it.

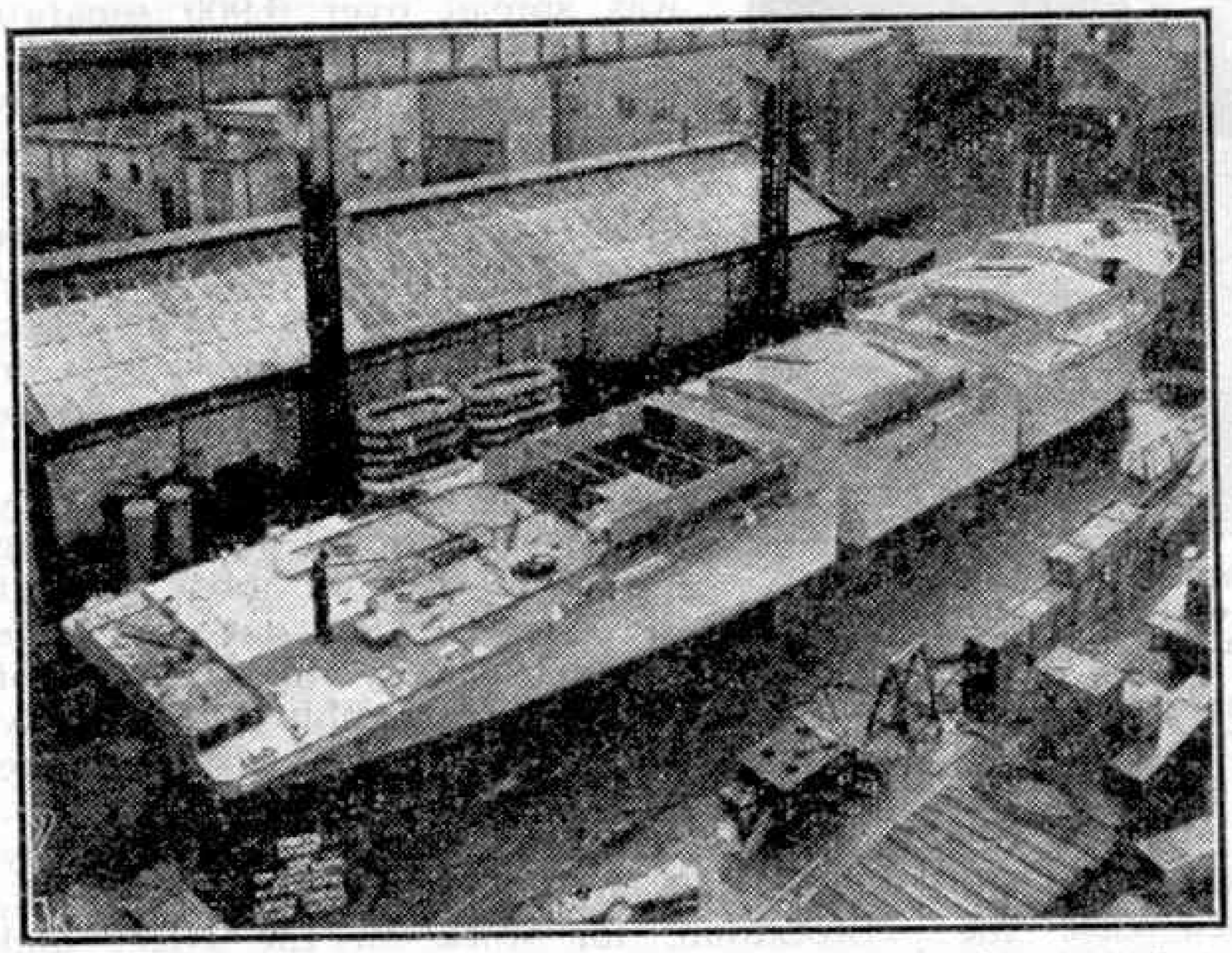
As the water level fell by pumping, the submarine gradually sank into the hold, where it was hauled across to the starboard side and secured on chocks. The procedure was repeated for the second boat, and in the hold the sister vessels looked like a pair of huge cigars. After her hull had been made up again, the *"Transporter"* returned to Barrow for final touches before making the trip to Japan. The submarines were insured for



**The cargo motorship "Kaedi," designed for African river service, completely erected in the Scotstoun shipyard of Yarrow and Co. Ltd., to whom we are indebted for our illustrations.**

£50,000 each for the journey, but there was no mishap and the loading process was successfully reversed.

Shortly before the late war Dutch shipbuilders had a delivery problem of a different kind. They built the yacht



**The hull of the "Kaedi," divided into three sections for convenient shipment, being stripped of deck erections and machinery, stowed in the cases alongside.**

*"Chahsevar"* for the Shah of Persia, which meant a very long passage. The chosen route started with a sea voyage to Leningrad, which was followed by a 2,000-mile trip to the Caspian Sea via lakes, rivers and canals. As the yacht had a draft of over 10 ft. she was much too deep to get through some of the waterways. The builders therefore provided her with a floating dock, drawing less than 5 ft. of water with the *"Chahsevar"* inside. In this carrier, under tow, she completed the journey, although it took more than three months. On arrival in the Caspian she was floated out of the dock and proceeded to the Persian coast under her own power.

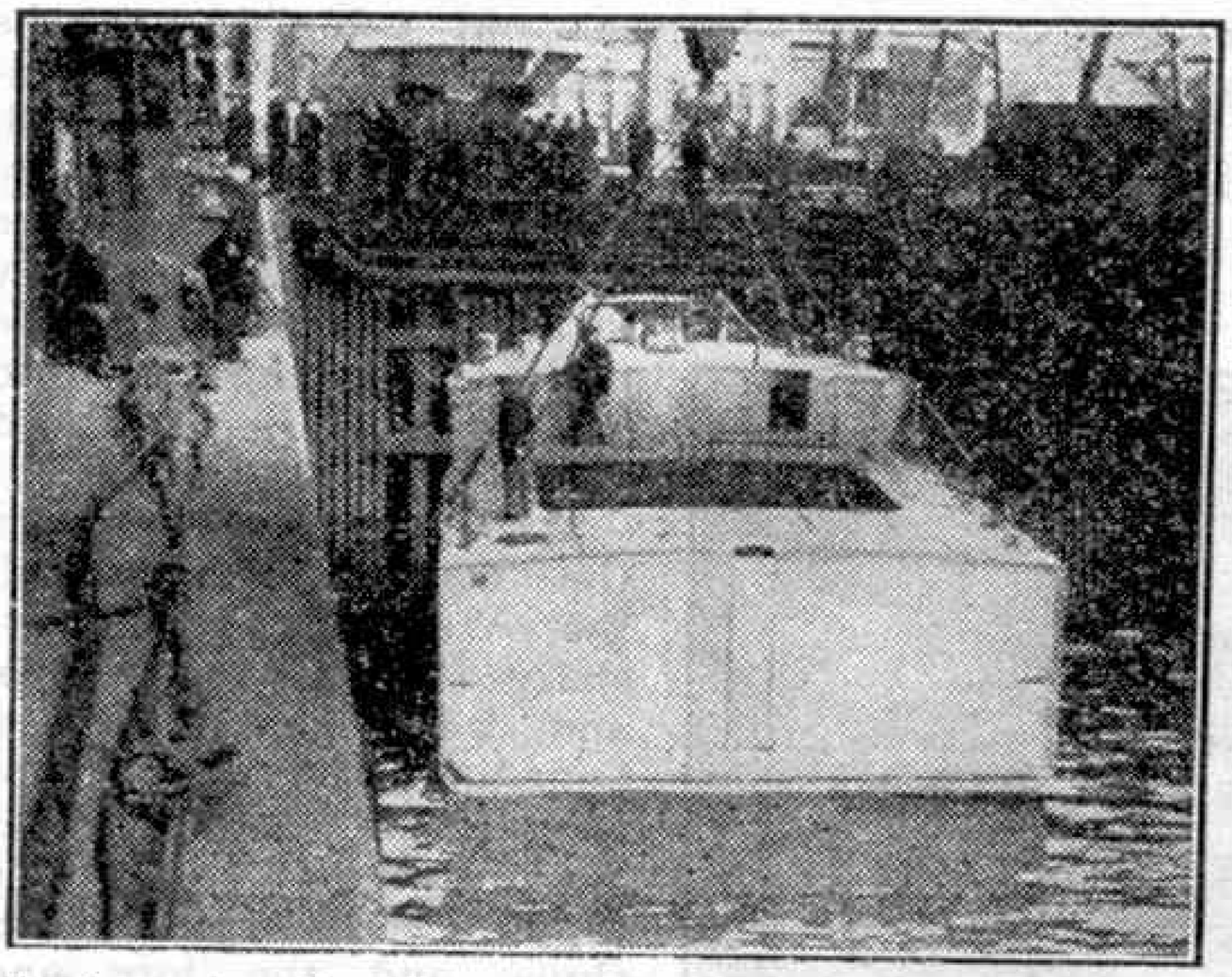
When building ships for service on the Great Lakes of North America, consideration has to be given to the locks of the Welland Canal, through which they must pass from the North Atlantic. The distance between the gates of these locks limits the length of the ship, so that special measures have to be taken when delivering Lakers from yards in this country. Messrs. Swan, Hunter and Wigham Richardson, of Wallsend-on-Tyne, had the Welland Canal obstacle in mind when they built the *"Glenledi"* in 1925. Her designed length was 379 ft. which made her far too long to be sent out complete, as the present Canal had not then been completed. So the middle body of the hull, 144 ft. in length, was built separately from the fore and after parts. These were joined together, to make a temporary fitting, with the middle portion, dismantled into clearly marked parts, placed in the holds as cargo.

In this strange manner the *"Glenledi"* got through the Welland Canal, discharged her novel cargo, and was then put in a Canadian dry dock for completion. The hull was cut in two on ways of the type used for launching ships, and the fore and after parts were dragged apart, care being taken to preserve a true alignment. The middle portion was then assembled in between, a job completed in about six weeks. She was then ready for service on the Lakes.

Two other kinds of ship deliveries remain to be described, perhaps the most interesting of all. First are what are called "knock-down jobs," vessels built in the shipyard and then dismantled into small pieces for shipment overseas as cargo. Scores of small ships have been sent abroad in this way, stowed away in the holds of liners. For instance, H.M.S. *"Sandpiper,"* one of the tiny gunboats employed on Chinese river patrols, was delivered at Shanghai in the form of 440 packages among the cargo of the P. & O. liner *"Chitral."*

But there is far more in knocking-down for reassembly than merely making up the pieces for shipment. The builders have to consider the re-erection of the vessel by unskilled labour, outside their control. Everything is simplified as much as possible, with each part clearly marked. Two colours are always used to distinguish the port from the starboard side pieces. In addition to lettering and numbering each part, the builders supply complete plans to indicate exactly where each piece fits into place. To make absolutely sure there is no mistake, photographs are taken at each stage of pre-erection in the yard and sent out with the parts and instructions.

Another factor shipbuilders bear in



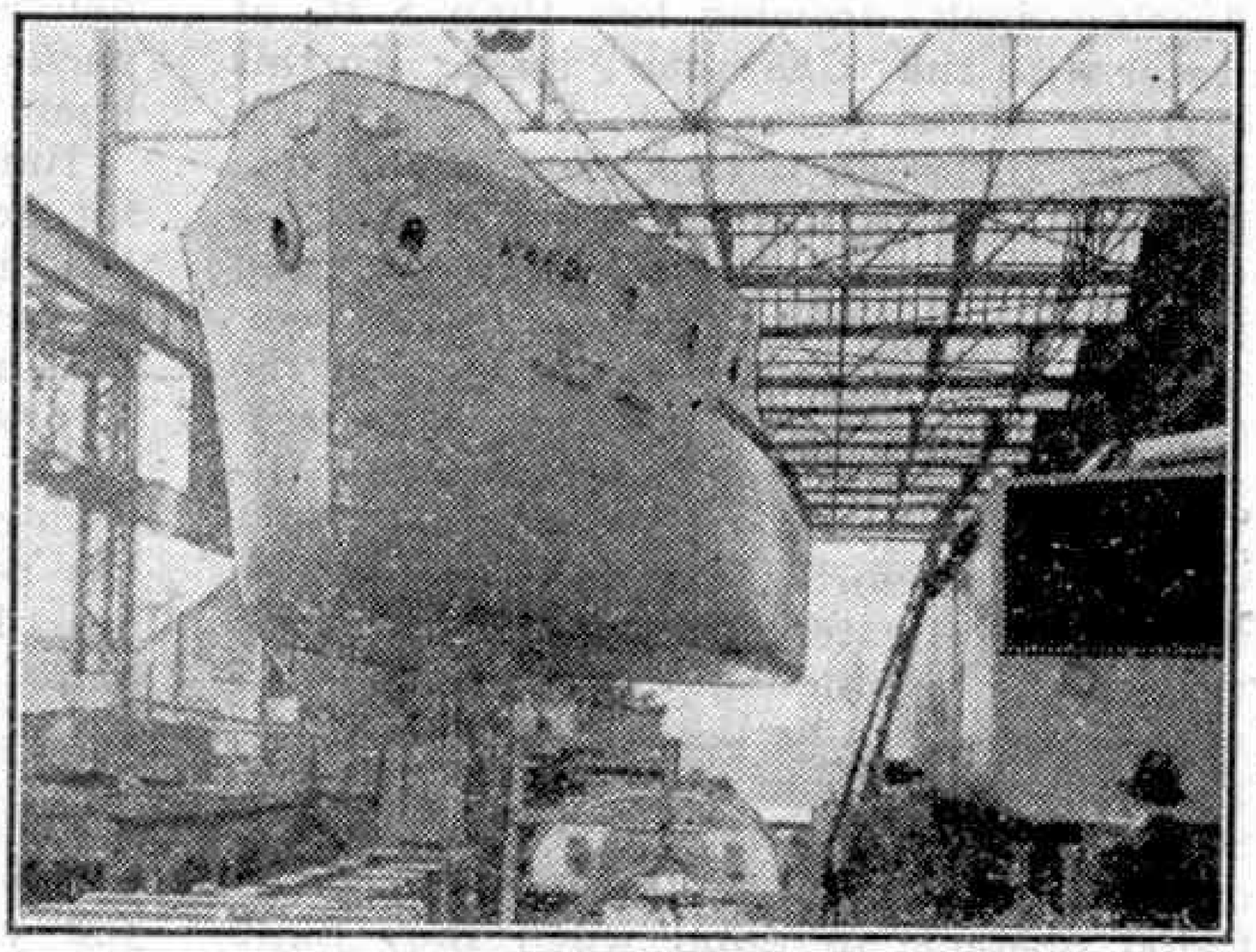
The forward section, dismantled of fittings and made watertight, is being floated from the shipyard on its way to the dock for loading into a liner.

mind is the transport of these pieces to their destination. Vessels of the "knock-down" type often work on inland water service, far from a deep-sea port. There may be a railway leading direct to the point of assembly, in which case the gauge and type of wagon used will decide the size of the pieces. Again, there may only be road vehicles available, and this sets up further limitations. In extreme cases, where parts have to be manhandled for long distances, the smallest possible size is fixed for them.

Two examples may be quoted of this particular problem. One of the first "knock-down jobs" carried out by Alexander Stephen and Sons Ltd., Govan, was a schooner to sail on Lake Titicaca, in Peru, 12,645 ft. above sea level. Every piece of this vessel had to be carried up to the Lake, the highest body of water in the world, on the backs of mules. Their weight was therefore cut down to a maximum of 150 lb., with an extreme length of 18 ft. The complete schooner, named "*Aurora del Titicaca*," proved very successful in service.

More troublesome was an ice-breaking ferry built on the Tyne for Lake Baikal before the Trans-Siberian Railway was completed in one length of track. The lake bridged the gap between the Eastern and Western ends of this railway, with the ferry as the connecting link. After the ship had been set up in the yard, in the usual way, it was marked off and dismantled. Fifteen boilers had to be provided for the machinery, with the weight limit fixed at 20 tons. Altogether, the whole structure, which had a combined weight of 2,700 tons, was spread over 6,900 separate packages. These were sent out to Russia in a cargo ship only six months after receiving the order, and they journeyed 1,500 miles by rail to the lake, where they were transferred from the trucks into sledges. Ponies and labourers hauled the sledges to an improvised dockyard, where the ferry was put together.

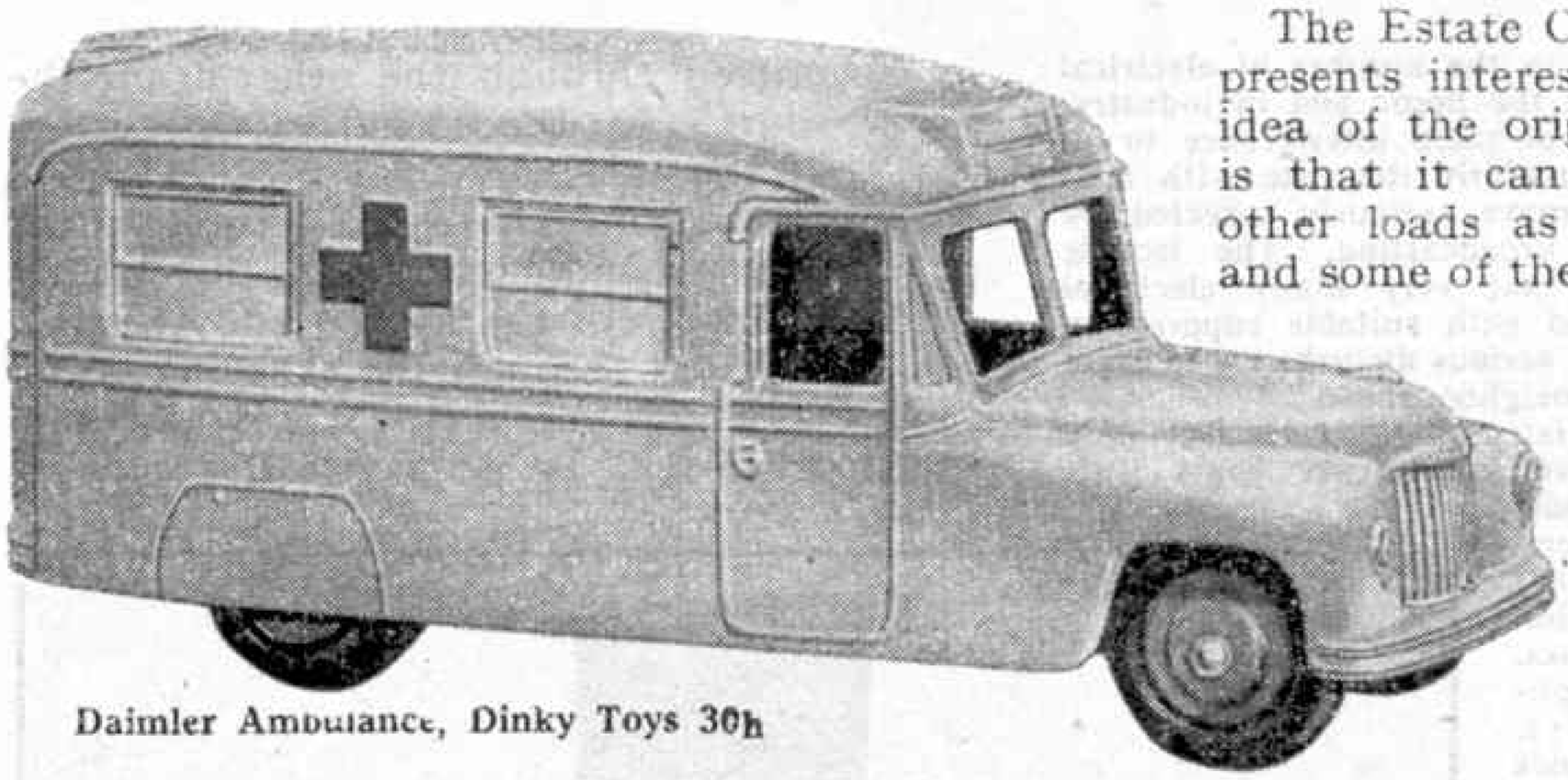
The final system of ship delivery is on the sectional plan, differing from "knock-down jobs" in that the vessel goes out in large sections, usually three, instead of small pieces. Reassembly is greatly simplified by this method, although the transport charges are generally heavier. The illustrations show a new vessel recently completed by Yarrow and Co. Ltd., Scotstoun, for work on the Niger and Benue Rivers in Africa. This is the shallow-draft motorship "*Kaedi*," built for French owners in Warri, in Southern Nigeria. She has a displacement of 188·55 tons and carries 90 tons of cargo, the overall length being 114 ft., with a breadth of 21 ft. 6 in. and a draught of 4 ft. She was built complete in the yard, and then dismantled into three sections. The mast, funnel, upperworks and other fittings were packed into cases for shipment in one consignment.



Bow view of the forward section of the "Kaedi," with the middle section alongside, on the final stage of their preparation before going overseas.

# Dinky Toys and Supertoys

## Daimler Ambulance and Estate Car



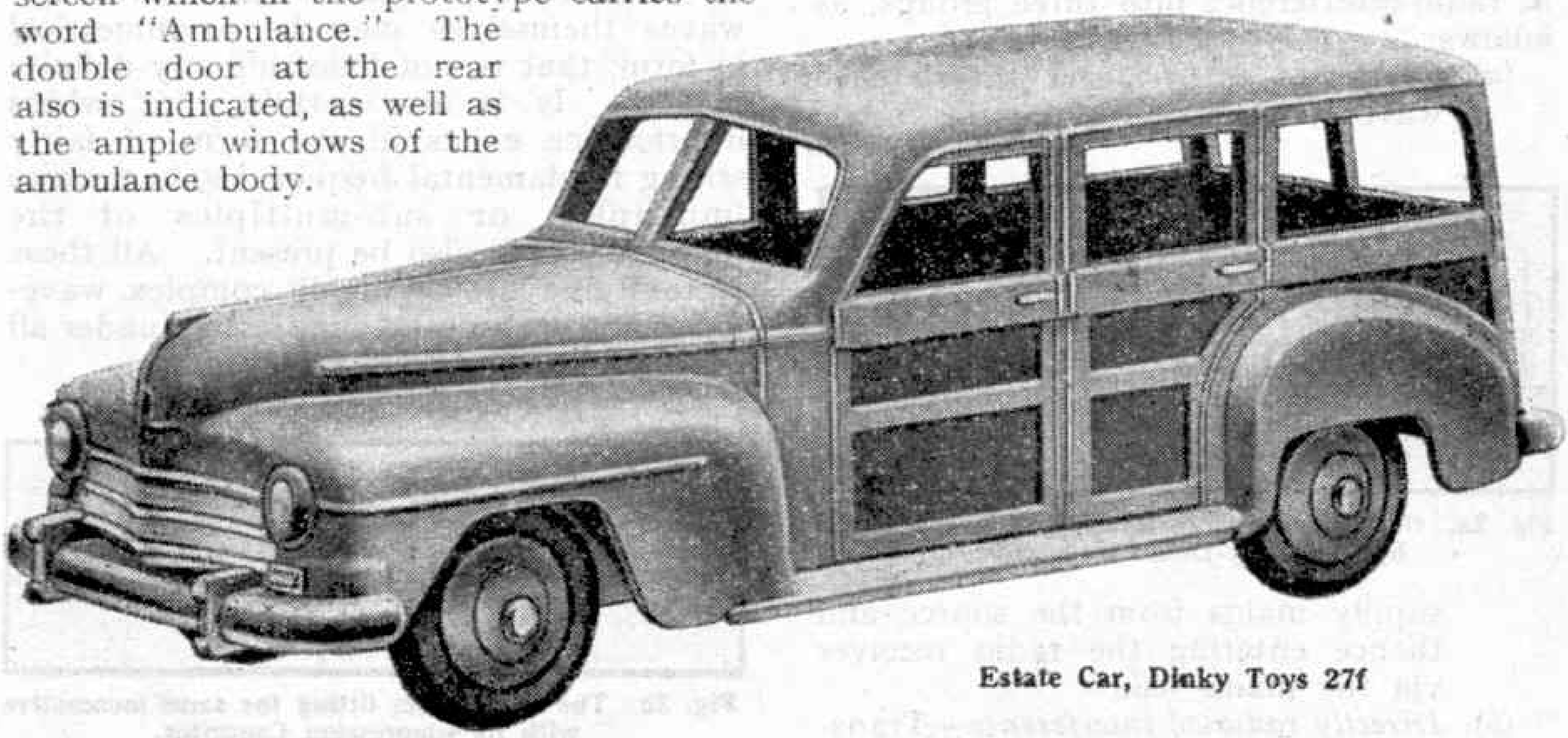
Daimler Ambulance, Dinky Toys 30h

THE new products for review this month are both Dinky Toys. One is a really handsome ambulance that will delight every Dinky Toys owner and will prove a splendid addition to the fleets of those who operate road layouts. The second is an equally life-like miniature of the type of vehicle variously known as an estate car, a shooting brake, or a station wagon.

The Daimler Ambulance, Dinky Toys 30h, is a handsome vehicle finished in cream, with the Red Cross prominently displayed on its sides. It is a miniature of the Daimler 27 Ambulance, and is distinguished by its faithful rendering of the actual form of its prototype, with the characteristic radiator and bumpers. Every main detail is reproduced, including the petrol filler cap, the covers for the rear wheels and the casing above the windscreen which in the prototype carries the word "Ambulance." The double door at the rear also is indicated, as well as the ample windows of the ambulance body.

The Estate Car, Dinky Toys 27f, presents interesting contrasts. The idea of the original of this vehicle is that it can carry luggage and other loads as well as passengers, and some of the seats are removable in order to allow for the transport of bulkier or heavier loads. The door at the back is indicated on the miniature, in addition to the four doors, two on each side, that give normal access. The Estate Car body is mounted on a splendid representation of a modern chassis of American style, with massive mudguards, an imposing horizontal front end grille and a substantial bumper.

Most Dinky Toys layouts include a countryside section, and for these the new Dinky Toys Estate Car is an ideal vehicle. It can be used also to good effect on layouts representing town scenes, as estate cars are largely employed for collecting light loads from stations, warehouses and shops and carrying them out into the countryside. The Daimler Ambulance also can be introduced into such a layout with complete realism, especially if a hospital is included among the public buildings represented. Running it at speed to the scene of a "smash" will provide a real thrill.



Estate Car, Dinky Toys 27f

# Suppression of Radio Interference in Hornby-Dublo Trains

**The continued increase in the number of electrical appliances in use, both in the home and in industry, has brought the problem of radio interference to an acute stage. This is particularly the case with television, which is much more seriously affected by interference than sound broadcasting. The trouble lies simply in the fact that very many electrical appliances, unless provided with suitable suppression devices, are liable to cause serious disturbance to users of radio apparatus in the neighbourhood.**

**It is not always appreciated that the liability of a particular source to cause interference bears little relation to its size. A model electric train running around its track may cause sufficient interference to affect reception along a whole row of houses. Some manufacturers of high-class radio receivers, recognising the consequence of severe interference, fit filtering devices to their sets. The ideal, however, is to suppress the interference at its source. Meccano Limited have taken what may be regarded as a pioneer step in the toy industry by introducing radio interference suppression devices as an integral part of the Hornby-Dublo railway system.**

**Suppression devices have already been fitted to the Hornby-Dublo Terminal Rail, the Controller, and the "Duchess of Atholl" locomotive. They will be fitted to all other Hornby-Dublo locomotives during the year.**

**The following article has been specially written by the Head of our electrical research department for the benefit of older readers who wish to have a technical account of the problems involved.**

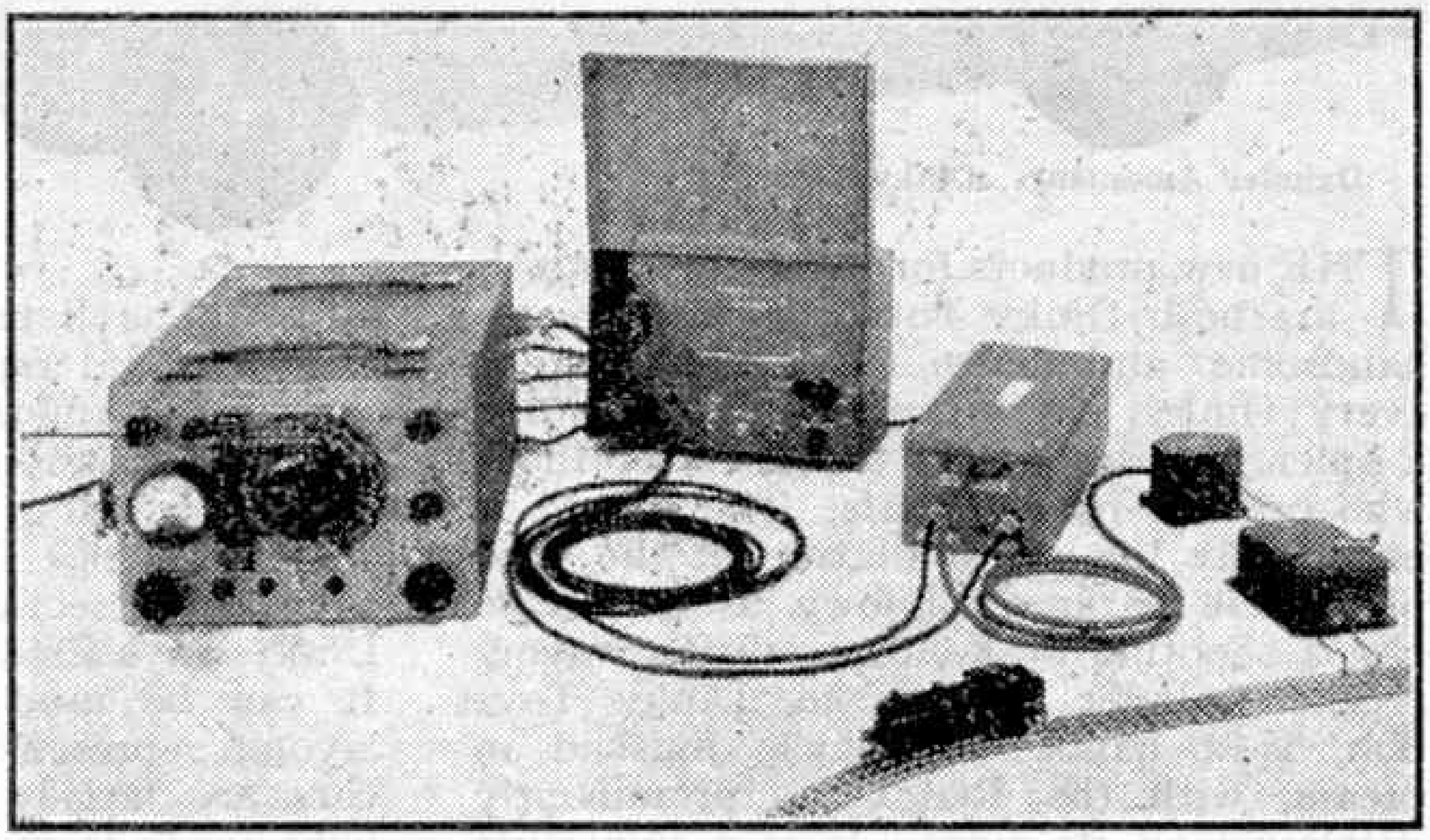


**Fig. 1. Typical arrangement for measuring interference signals from a Hornby-Dublo locomotive.**

IT is convenient to classify "man-made" radio interference into three groups, as follows:

(*a*) *Conducted interference*—Interference waves transmitted along the public supply mains from the source and thence entering the radio receiver via the mains lead.

(*b*) *Directly radiated interference*—Transmitted through the ether from the source to the aerial/earth system of the receiver.

(*c*) *Re-radiated interference*—Interference waves conducted along the supply mains from the source and then re-radiated through the ether as in (*b*).

Any one, or all, of the three types of interference may be propagated, according to the nature of the interfering source. Generally, interference waves are untuned; in other words, they are not confined to any particular frequency and therefore may affect a receiver over a wide range of wave bands. Again, the interference waves themselves may be asymmetrical in form; that is, not following any definite pattern. It is also certain that where interference exists in the form of fairly strong fundamental frequencies, harmonics (multiples, or sub-multiples of the frequency) will also be present. All these factors give rise to highly complex wave-forms and make total suppression under all conditions difficult of achievement.

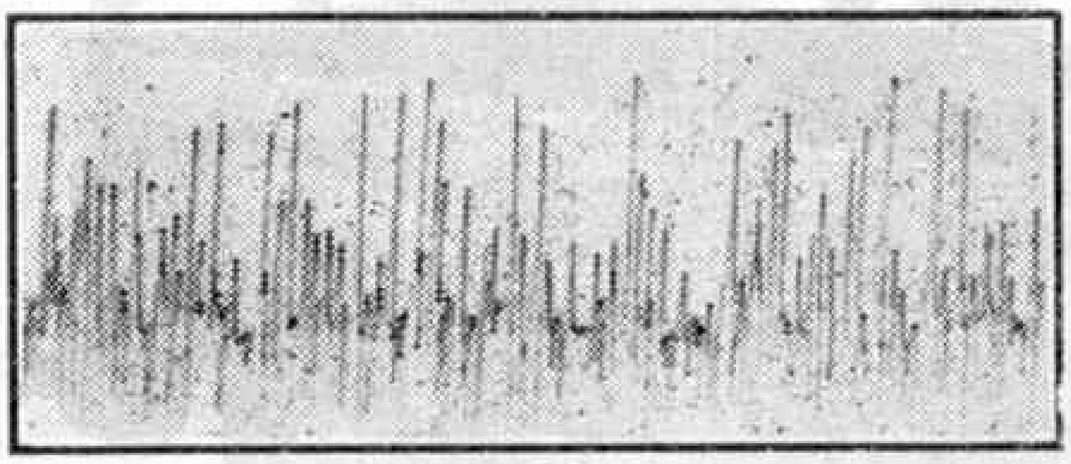


**Fig. 2a. Oscillograph of an interference wave set up by a Hornby-Dublo locomotive.**

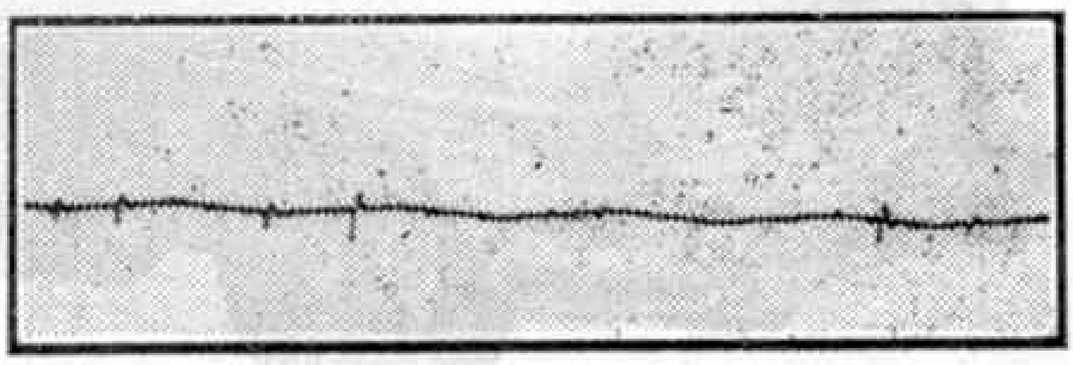


**Fig. 2b. The result after fitting the same locomotive with its suppression Capacitor.**

The *degree* of interference noticeable in a radio receiver is proportional to the ratio of interference signal strength/broadcast signal strength. This explains why, under certain circumstances, interference is discernible on a radio set tuned between stations, but disappears when the set is properly tuned in. Everything should be done, therefore, to ensure an efficient aerial and earth on a radio set, even if the latter is so close to a broadcasting station as to pick up normal signals *without* an aerial. In many cases interference noise can be lessened considerably by altering the direction in which the aerial is run relative to the assumed interference source.

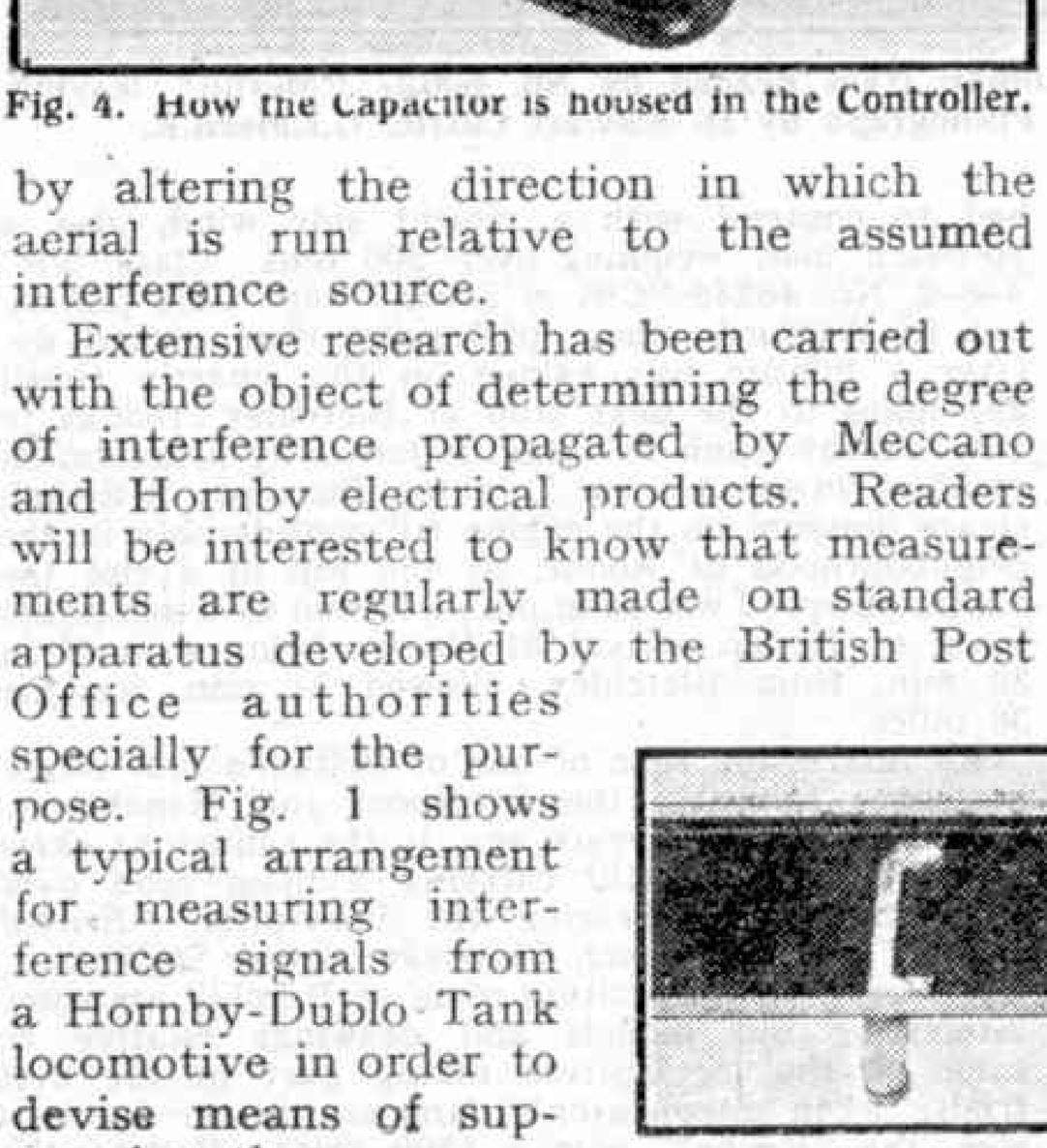


**Fig. 4. How the Capacitor is housed in the Controller.**

Extensive research has been carried out with the object of determining the degree of interference propagated by Meccano and Hornby electrical products. Readers will be interested to know that measurements are regularly made on standard apparatus developed by the British Post Office authorities specially for the purpose. Fig. 1 shows a typical arrangement for measuring interference signals from a Hornby-Dublo Tank locomotive in order to devise means of suppressing them.

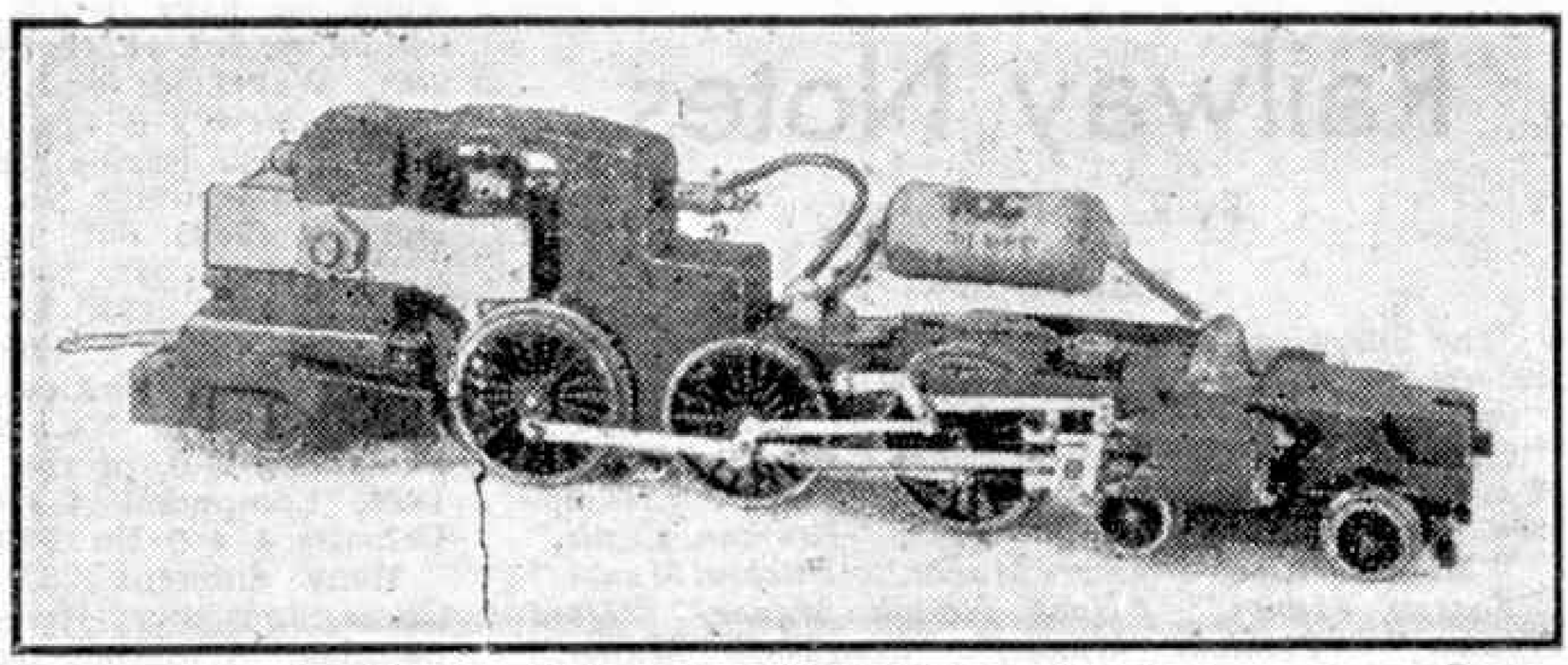


**Fig. 3. A Capacitor fitted in the locomotive.**

## Hornby-Dublo Electric Locomotives as a source of interference.

It was found at an early stage in the investigations into Hornby-Dublo locomotives as a source of interference that they gave rise mainly to interference of type (*b*), with a proportion of type (*c*). The generation of the interference waves is due to two distinct sets of conditions. They are:

(1) The action of the brushes on the commutator, where sparking at the brush tips ensues during the period of current reversal through the armature windings.

(2) Sparking between collector shoes and the track conductor rail, occurring principally at rail joints.

Condition (1) is responsible for a very complex waveform which has a superimposed audible frequency note, the pitch of which varies with the speed of the loco.

Condition (2) sets up a series of shock waves, that is, waves of very short duration but having a high initial amplitude, which result in aperiodic "plops" or "bangs" in the receiver speaker. The interference from both sources is emphasised greatly by the track, the latter acting as a strong radiator, the characteristics of which vary according to the size and layout of the system, and also to some extent to the position occupied by the locomotive at any instant relative to the point on the track where connection is made to the Controller. (*Cont. on page 142*)

**Fig. 5. A Capacitor under the Terminal Connecting Rail.**

# Railway Notes

By R. A. H. Weight

### National News

The following are the names chosen for the engines referred to by the Editor on page 97: Western Region "Castle" class; "*Cadbury Castle*," "*Clun Castle*," "*Cranbrook Castle*," "*Cromwell's Castle*," "*Denbigh Castle*," "*Hartlebury Castle*," "*Ince Castle*," "*Liddington Castle*," "*Ogmore Castle*" and "*Taunton Castle*."

"Manor" class; "*Dinmore Manor*," "*Ditcheat Manor*," "*Foxcote Manor*," "*Hook Norton Manor*," "*Iford Manor*," "*Lechlade Manor*," "*Longworth Manor*," "*Lydham Manor*," "*Odney Manor*" and "*Ramsbury Manor*."

E. and N.E. and Scottish Region "Pacifics"; "*Bois Roussel*," "*Pommern*," "*Aboyeur*," "*Scottish Union*," "*Boswell*," "*King's Courier*," "*Amadis*," "*Willbrook*," "*Flamboyant*," "*Silurian*," "*Bongrace*," "*Foxhunter*," "*Alcazar*," "*Archibald Sturrock*," "*Patrick Stirling*," "*H. A. Ivatt*," "*Edward Fletcher*," "*Wilson Worsdell*," "*Sir Vincent Raven*," "*Great Central*," "*Great Eastern*," "*North Eastern*," "*North British*," "*Bonnie Dundee*," "*Bon-Accord*," "*Auld Reekie*," "*Saint Mungo*," "*Saint Johnstoun*," "*Aberdonian*," "*Holyrood*," "*Borderer*," "*Midlothian*," "*Abbotsford*," "*Balmoral*," "*Sir Walter Scott*," "*Redgauntlet*," "*Madge Wildfire*," "*Marmion*," "*Guy Mannering*," "*Kenilworth*," "*Hal o' the Wynd*," "*Meg Merrilies*," "*Guillemot*," "*Curlew*," "*Kestrel*," "*Osprey*," "*Peregrine*" and "*Sea Eagle*."

### Western Tidings

Continuing the long series of "Hall" class large mixed traffic 4–6–0s, No. 7906 "*Fron Hall*" was lately placed in service, together with 2–6–2T No. 4179, light 0–6–0 pannier tanks Nos. 1613–9; and 94xx heavier 0–6–0T type, built by contract, Nos. 8405–7, 8454.

Withdrawn engines include No. 2667, the last of the "Aberdare" inside-cylinder 2–6–0 goods class, which had consisted of 81 engines, and 4–6–0 express engines of the "Saint" series No. 2929 "*Saint Stephen*," No. 2941 "*Easton Court*" and No. 2942 "*Fawley Court*," all familiar in the Bristol district.

Several more "Bulldog" and "Duke" 4–4–0s have been withdrawn.

No. 7026 "*Tenby Castle*" is allocated to Stafford Road, Wolverhampton. Two W.R. large 2–6–2Ts, Nos. 6129 and 6166, were lately on loan to Neasden Shed, E.R.

### London Midland Notes

One of the new light "2F" 2–6–0s, No. 46413, was recently tried on slow passenger and freight trains along the W.R. from Swindon to Bristol and then to Didcot.

Class "5" 4–6–0s have been reported on N.E.R. passenger workings between Carlisle and Newcastle. A new engine of that class at 68A shed, Carlisle, is No. 44668.

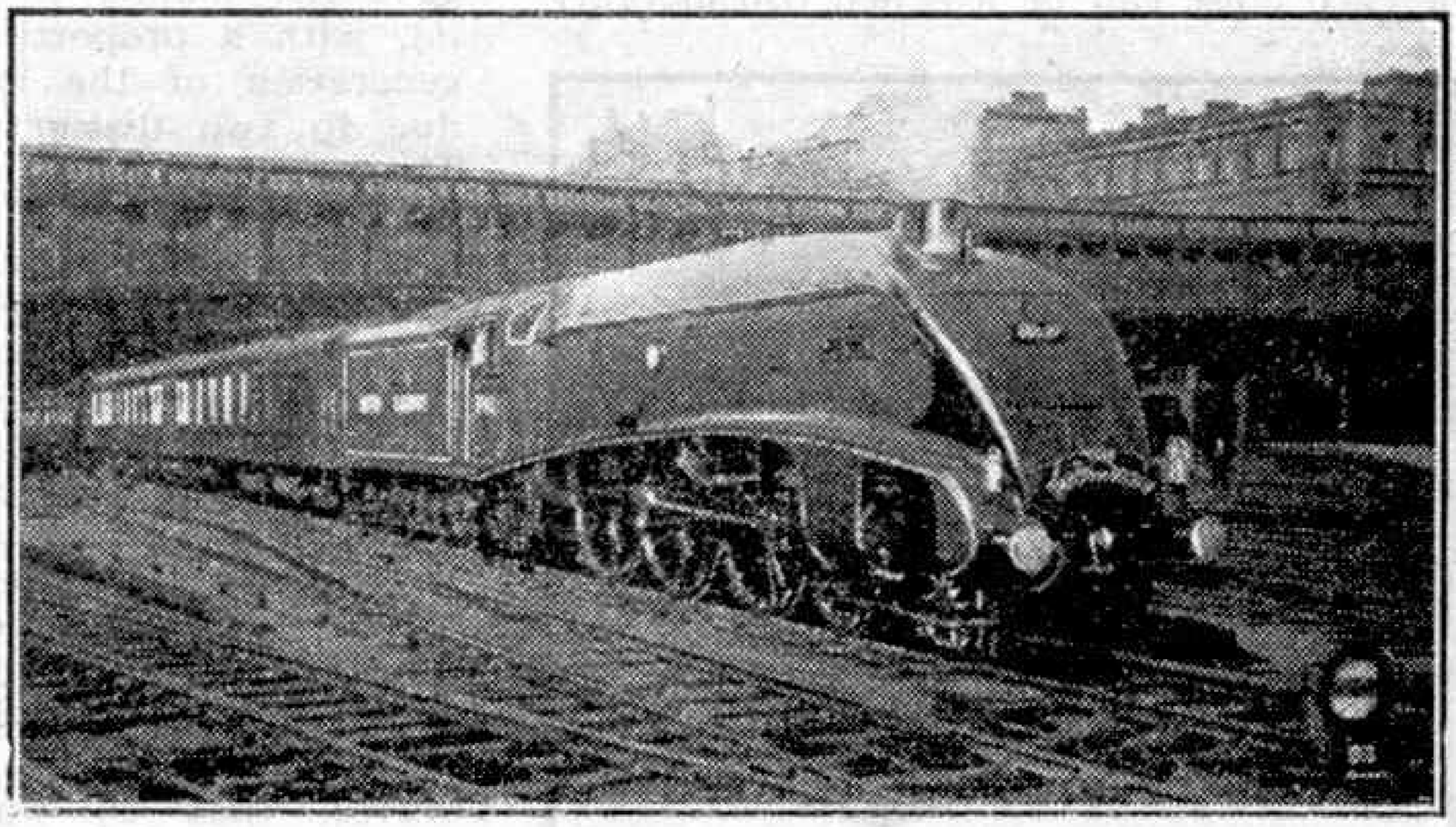
The latest class "2" 2–6–2Ts, built at Crewe, of which we have details are numbered and allocated as follows: No. 41249, 14A, Cricklewood; Nos. 41250–4, 25A, Wakefield; and Nos. 41255–9, 25G, Farnley, Leeds. New 2–6–4Ts, class "4," built at Derby for the Scottish Region, are Nos. 42126–7, stationed at 66B, Motherwell; Nos. 42128–30, 66C, Hamilton; and No. 42131, 64C, Edinburgh.

New class "4" 2–6–0 Mixed Traffic engines are Nos. 43048–9, 17A, Derby; and 0–6–0 diesel electric shunters are Nos. 12060–2, 21A, Saltley, and No. 12063, 14A, Cricklewood. Among engines lately condemned are No. 20216, the last large-wheeled Midland 2–4–0, of the express type, dating back to 1876, Compound 4–4–0 No. 1031, and class "3" Belpaire 4–4–0 No. 739.

Many different "5XP" 4–6–0s are seen on the Crewe-Shrewsbury-Hereford run in various styles of painting. A journey from Ludlow to Leeds provided runs behind the following different engines: Fowler 2–6–2T, No. 40055, as far as Shrewsbury; class "4" 2–6–0 No. 43022, on to Crewe; 4–4–0 Compound No. 1159, thence to Manchester; and "Jubilee," 5XP No. 5705, "*Seahorse*" forward through the Pennine country to Leeds.

The wisdom of providing an engine of the most powerful type in charge of a keen top-link crew was emphasised just before last Christmas when the 10.50 a.m. semi-express from Euston to Blackpool had to contend with a violent side wind, also a 16-coach load weighing over 500 tons. Class "7P" 4–6–2, No. 46248 "*City of Leeds*," kept time exactly out to Watford, where passengers were picked up. Over a minute was gained on the smartly timed 29¼ miles to the next stop at Bletchley, thanks to an excellent climb to Tring, followed by a maximum speed of 76 m.p.h. near Leighton Buzzard. Although steam pressure on the engine fell considerably in the neighbourhood of Roade, at the top of a rise the minimum speed was 55 m.p.h., followed by a maximum twice of 71, an arrival at Rugby being secured in 39 min. from Bletchley, allowed 41 min. for the 36 miles.

An interesting relic of one of Britain's first steam passenger railways, the Liverpool and Manchester, opened nearly 120 years ago, is the sandstone skew arch at Rainhill, still carrying a main road over the railway and bearing the inscription "*Erected 1829. Charles Lawrence, Chairman. George Stephenson, Engineer.*" In the waiting room at Rainhill are some interesting old models and drawings relative to some of the locomotives taking part in the first trials, when Stephenson's famous pioneer locomotive, the "Rocket" won a £500 prize. Passing the site to-day we may see "5XP" 4–6–0 engines hauling

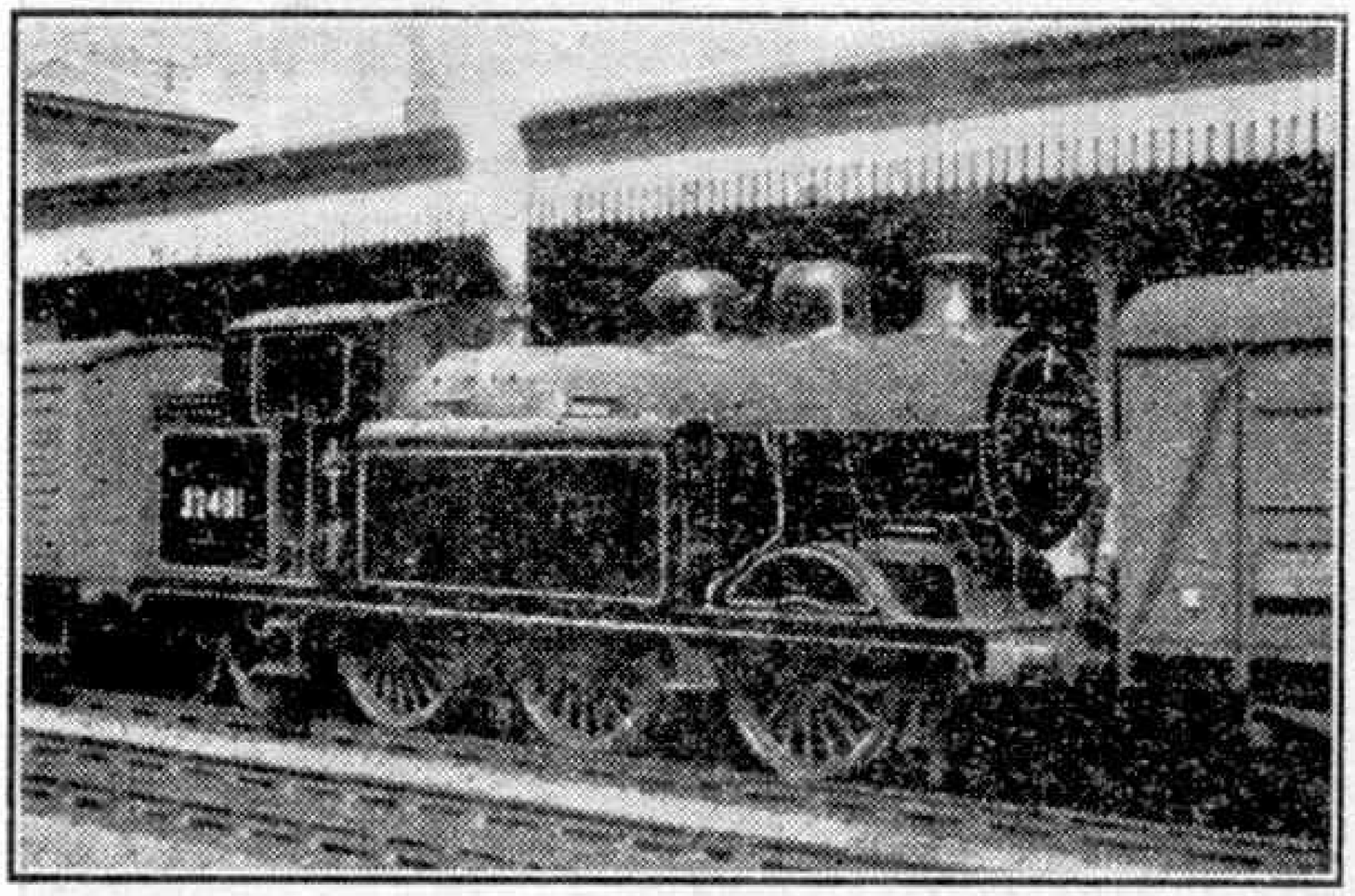


**The up "Queen of Scots" Pullman train headed by No. 60027 "Merlin" leaving Edinburgh (Waverley). Photograph by D. Stewart Currie, G.I.Mech.E.**

through buffet-car corridor trains bound from Liverpool to Hull.

### Locomotive Notes from Northern Ireland

On the G.N.R. (I.) "V" class 4-4-0 compound No. 85 recently went into Works to be fitted with a new Belpaire boiler. This engine, named "*Merlin*," will thus be similar to the others of the class. "U" class 4-4-0s, Nos. 197, 198 and 199, painted blue with black and white lining, have been named "*Lough Neagh*," "*Lough Swilly*" and "*Lough Derg*" respectively. There are thus now three batches of 4-4-0s, both simple and compound, painted blue. A reader also informs us that black livery with straw coloured lining has been adopted as standard for locomotives of the Northern Ireland, Ulster Transport Authority, formerly L.M.S. Northern Counties Committee.



Southern rebuilt 0-6-2T No. 32401 in B.R. black with lining. The extra dome is not in use. Photograph by D. L. Bradley.

### Canadian Mechanised Marshalling Yard

A large freight marshalling yard is under construction at Montreal with 40 tracks designed on the "gridiron" plan, wagons being propelled over a hump and then, for the first time in Canada, regulated in speed as they descend by electrically operated switches and retarders such as are used in this country at Whitemoor and Toton. There will be a wagon repair yard, engine shed with very large turntable, also general floodlighting as is employed in the latest yards here.

### The "Brighton Belle"

In 1908, the London, Brighton and South Coast Railway in conjunction with the Pullman Car Company introduced what was then described as the "most luxurious train in Britain" for ordinary passengers, running in an hour between London (Victoria) and Brighton. For some time it was the only daily train of its kind, formed entirely of Pullman cars and though it conveyed first class passengers only in its early years, it was very popular. The writer's first journeys by it were made about 36 years ago behind one of the first series of L.B.S.C. "Atlantic" engines; sometimes the motive power was a 4-4-0, or one of the Marsh 4-4-2 express tanks. His next run on the "*Belle*," as it was always known locally, was under Southern Railway auspices, when third class cars were also provided and the train made two trips each way daily, the engine being a "King Arthur."

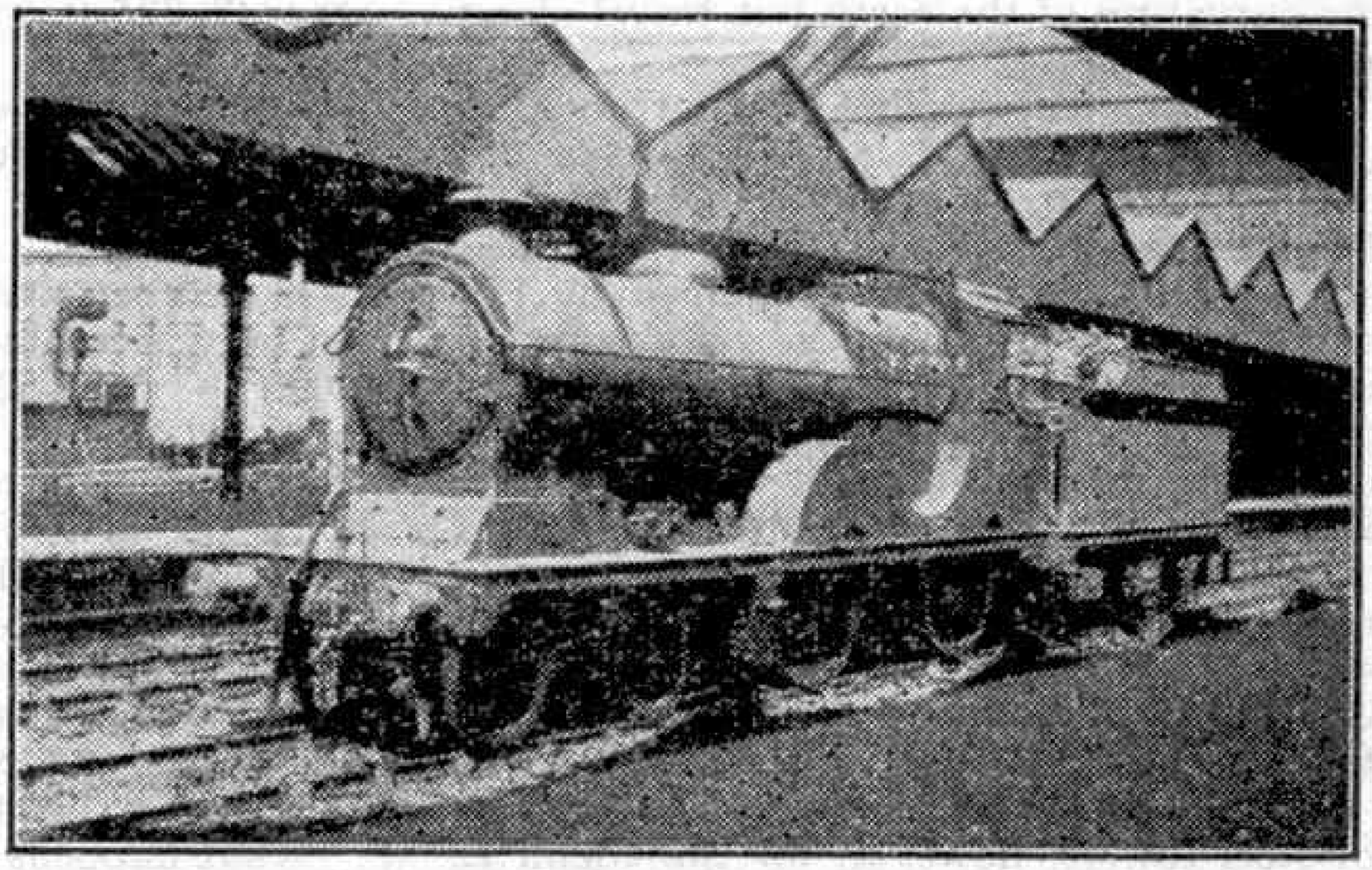
Since 1933, specially-built sets of cars fitted with electric traction motors have been operated as part of the general electric service between London and Brighton. The train is now named "*Brighton Belle*" and makes three journeys each way per day. On a run down this winter, electrically operated with 10 cars, the trip was made unchecked, apart from certain slight slowings over junctions, with the greatest of ease just within the 58 min. allowed in the working time table, though the advertised time is still one hour, a good dinner being served meanwhile. Some excellent runs were, of course, made in steam days when time had to be made up. The distance is 51 miles.

### Metre Gauge Locomotives for India

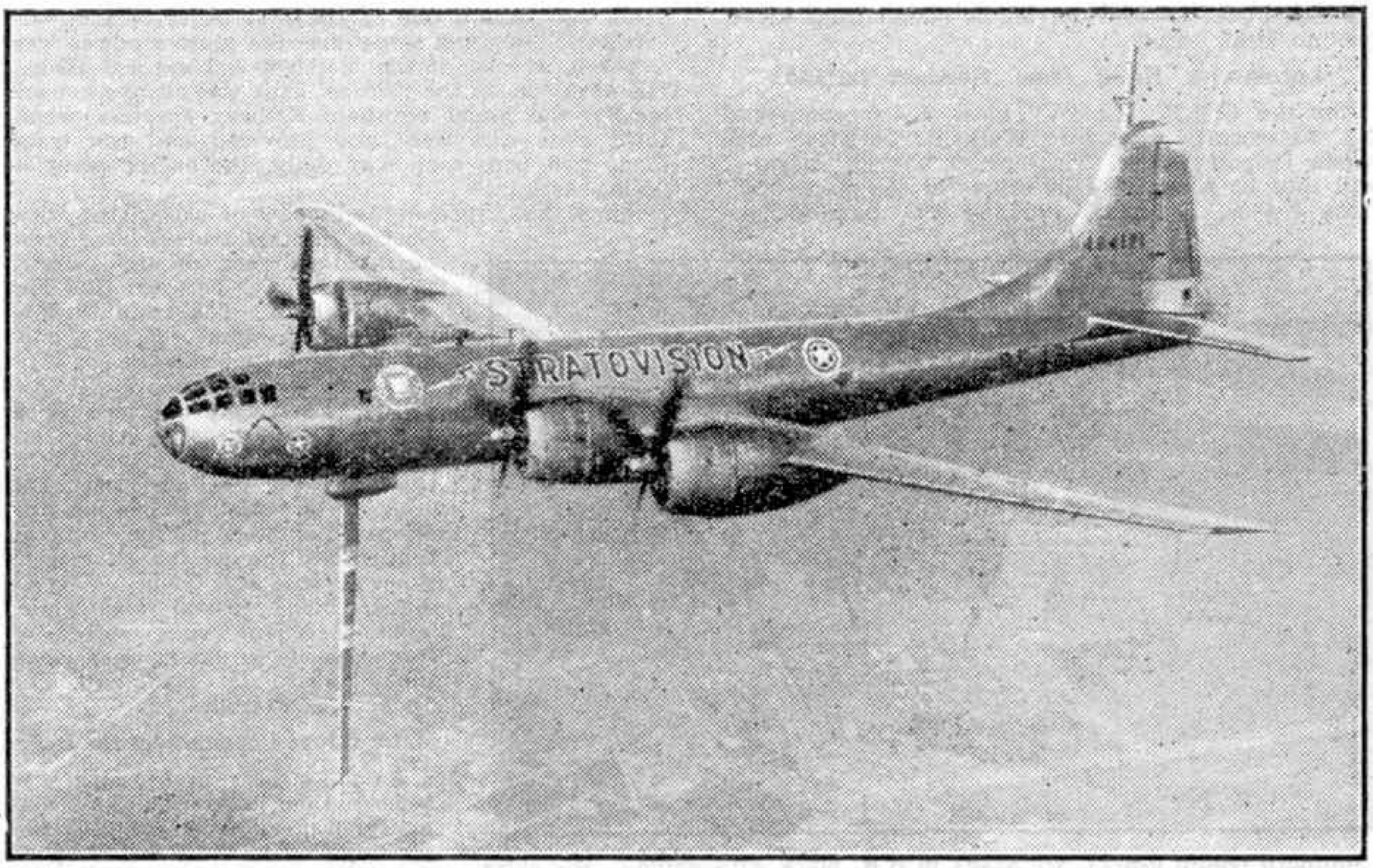
Among the interesting new construction lately in hand at manufacturers' works in England for shipment to India and designed for the metre, or narrow 3 ft. 3 in. gauge, have been ten 4-6-4 tank engines with outside cylinders, Belpaire fire-box, wide fire-grate, Walschaerts gear and electric lighting. These were completed by the Vulcan Foundry Ltd., and shipped from Liverpool. In addition four light 4-6-2 tender engines somewhat similarly equipped have been built by W. G. Bagnall Ltd., Stafford. A stipulation was that no axle weight should exceed nine tons so that the whole design had to be on the small side.

### New Rolling Stock for London Transport

For London "tube" service on the "Bakerloo" line, an experimental car has been rebuilt at the London Transport Acton Works having high incurving windows. These should enable standing passengers to see the names of stations more easily as well as providing more light when running out in the open.



A veteran Great Central 4-4-0 standing at Manchester (Central), where engines of this class have long been familiar. Photograph by B. H. Carter.




**The experimental "Stratovision" station, a modified Boeing B-29 "Superfortress." The illustrations to this article are by courtesy of The Glenn L. Martin Company, U.S.A.**

# Stratovision

By John W. R. Taylor

NATURE was bountiful to radio fans. If she had neglected two electro-chemical layers several hundred miles up, which reflect sound waves back to earth, reception would be impossible beyond line-of-sight range of a broadcasting station, because radio waves do not follow the curvature of the earth but travel along a straight line.

For some reason, she was not so kind to television viewers, for TV waves are not reflected by the atmospheric layers. To make matters worse, they are blocked out by hills, mountains and even by tall buildings. In the past, the only solution has been to build tall transmitter masts to relay the waves. The one at Sutton Coldfield, for example, is 750 ft. high, and even then its guaranteed range is only some 50 miles. Many more similar masts will be needed before television services can be extended to every part of Great Britain—a prospect that will hardly find favour with our airline pilots.

There may be no need for such a forest of steel towers, however, for the Glenn L. Martin Aircraft Company and the Westinghouse Electric Corporation of America have developed a new scheme named "Stratovision," which uses just one mast, five miles high, instead of a whole lot of 750 ft. ones.

This sounds like an awful lot of mast, but really it is not as bad as it seems, for the mast itself is only 25 ft. long. The other 26,375 ft. are provided by an aircraft flying five miles up, with the mast projecting down beneath its fuselage, as shown in the illustration on this page.

All the early trials of "Stratovision" have been made with a converted Boeing B-29 "Superfortress" bomber, which can not only accommodate easily the necessary 8,000 lb. payload of men and equipment, but can fly it around in lazy circles 26,000 ft. above the earth non-stop for hours on end. Flying the B-29 is hardly the job for a pilot who wants to see the world, for it goes nowhere in particular and is in no hurry to get there; but it may well be the means of bringing television quickly to people who otherwise would have had to wait years for it.

What happens is that as the "Superfort" flies around it picks up and re-broadcasts programmes put out by stations on the

ground. The short waves sent out from its airborne transmitting mast blanket a section of the earth's surface like a great inverted ice cream cone, covering an area 525 miles in diameter.

This means that a single aerial transmitting station would be quite sufficient to bring television to every corner of England, Ireland and Wales, and parts of Scotland.

Nor is "Stratovision" just a dream of the future. On the contrary, thousands of television set owners in the American States of Ohio, West Virginia, Western Pennsylvania, Maryland, Virginia, New York and up into Ontario, Canada, have already been able to watch a baseball game played in Boston, Massachusetts, thanks to Station W10XWB, which is the official designation of the "Superfortress" transmitter. Other demonstrations have reached up to 270 towns in 10 States, all at the same time.

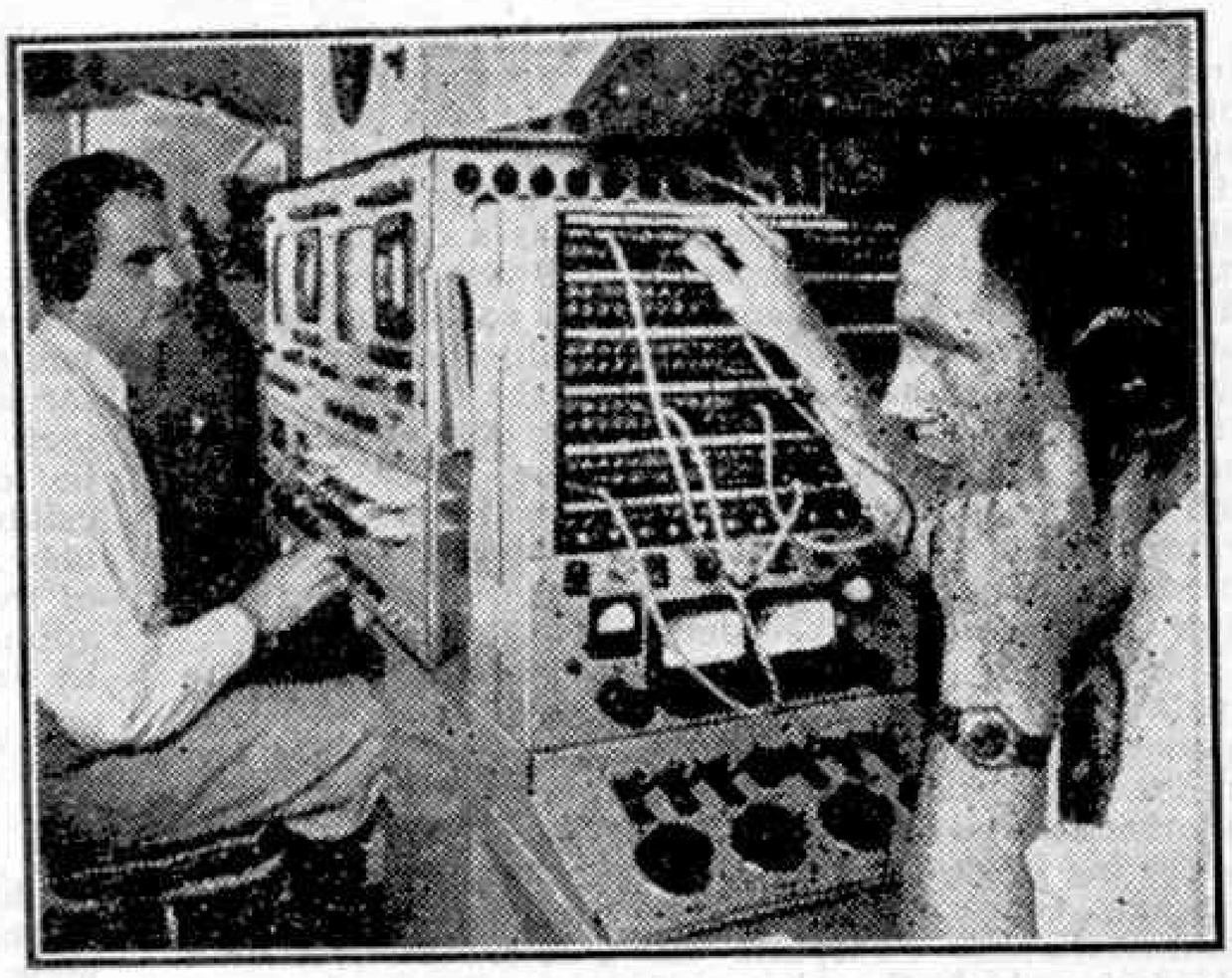
The aerial TV station does not entirely replace ground stations, although Martins have designed a mobile camera-transmitter unit, housed in a trailer, which with the B-29 could take care of the whole process from photography to final transmission to viewers.

What happens now is that programmes from ground stations are received through an eight-foot aerial mounted atop the B-29's fin. This aerial is fitted with several rings, each designed to receive a programme on a different frequency.



Cutaway view of Martin 2-0-2 air liner showing how television and broadcasting equipment would be installed for high-altitude transmitting of programmes.

The signal is carried from there to a specially-designed cabin, just aft of the bomb-bay, which houses receiving and broadcasting equipment plus the four or five-man crew required to keep the station on the air. From its control panels the signal is sent to a broadcast aerial



C. E. Nobles, on the left, originator of "Stratovision," monitors the television signal received in the B-29 and transmitted from it.

that projects downward, during flight, from the forward end of the fuselage.

Like the receiving aerial, this 25 ft. streamlined mast—retractable for landings—has a number of rings, each carrying a different programme. A single 'plane can thus serve as at least nine broadcasting stations at the same time, sending out enough different shows to please every type of audience.

If "Stratovision" goes to work on a commercial basis, a standby 'plane will be in the air constantly, to take over from the No. 1 machine in case of engine failure or other trouble.

That is the story of Martin-Westinghouse "Stratovision" to date. It may not arrive on a regular nation-wide scale this year, or even next. But it offers such immense advantages from the financial viewpoint that it is almost certain to be adopted commercially one of these days.

The pioneering B-29 may not be doing the televising then, for Martins have designed a special version of their well-known 2–0–2 air liner, which could do the job even more economically. But the B-29 made the whole thing possible.

# BOOKS TO READ

*Here we review books of interest and of use to readers of the "M.M." With certain exceptions, which will be indicated, these should be ordered through a bookseller.*

### "STEAM UP"

By ERIC TREACY (Ian Allan Ltd. 10/6)

Here is a book for enthusiasts, by an enthusiast, for the author, while not professing expert knowledge of the locomotive, is one who is under the indefinable spell of the railway, with its smells, its noises, and its atmosphere. The book has been written more as an expression of enthusiasm than as a definite treatment of this or that aspect of railway work. Thus, as the author has already made a name for himself as a photographer of railway subjects, several of whose pictures have appeared in the "*M.M.*" from time to time, many of the pages of the book are occupied by excellent reproductions. Most of these tell their own story and ably illustrate the thoughts expressed in the written sections, in which various personal experiences on the lineside, at stations, and on the footplate are detailed.

One of these sections does in fact deal with the spell of the railway, putting into words thoughts of a kind that must have occurred to many other less expressive enthusiasts in similar circumstances. In another section the author brings home the atmosphere of the big junction and also that of the country passing station, each of which has its own charm and characteristics. Footplate riding is the subject of a third, in which the observations on the engine and the enginemen at work are well set down. There is too a plea for the continuation and even the extension of locomotive naming that will probably promote many a friendly argument.

The author has had some exciting and humorous lineside adventures in covering with his camera the locomotive exchanges of 1948, and the stories of these bring an excellent and entertaining book to a fitting conclusion.

### "STAMP COLLECTING FOR BOYS AND GIRLS"

By L. M. AND M. WILLIAMS
(English Universities Press. 5/- net)

The authors of this excellent book are well-known writers on stamps, and in this "Junior Teach Yourself Book" they give good service to boys and girls who take up stamp collecting. After showing the infinite variety and attraction of stamps they explain exactly what to do to form a general collection, giving advice about albums and hints on identifying stamps as well as showing how to remove stamps from envelopes without harming them, and how to mount them.

When the collector has gone so far he or she begins to be interested in the stamps themselves, and the need for information of this kind is met by sections on printing, paper, watermarks, gum and methods of separation. Stamp designs and other interesting stamp topics complete an excellent little book.

### "SIMPLE ELECTRICAL EXPERIMENTS"

By C. E. PAGE (Percival Marshall, 3/- net)

To understand really advanced electrical work requires a knowledge of mathematics and mechanics, but simple electrical experiments will give boys a good idea of the science and are by no means difficult to carry out. In addition, experiments of this kind are fascinating, and above all they help readers to realise the great part electricity plays in modern life and to understand something of how it does this. Mr. Page has kept these thoughts in mind in planning the experiments described in his booklet. The material required for them is not very elaborate, and if the reader follows the directions carefully in making use of it he cannot fail to attain success. Actual descriptions are made clearer by the many careful drawings in the book.

### "CAMPING ADVENTURES ON CANNIBAL ISLANDS"

By EVELYN CHEESMAN (Harrap. 7/6)

Miss Cheesman is a well-known collector of birds, insects and plants who has explored New Guinea and the neighbouring islands of the Pacific in pursuit of specimens. While staying on these islands she encountered many remarkable native tribes and had countless interesting adventures, and here she tells us what she saw and heard on Maleluka, the second largest of the New Hebrides. Previous white visitors to the island had not penetrated far inland because of the fierce black-skinned bushmen there who hated white people, and indeed could be described as cannibals. The author however established herself as a friend of the dreaded tribesmen and added in a remarkable way to our knowledge of the island and its people, as well as its plants and animals. Her story is an absorbing one, illustrated by excellent drawings and two maps.

### "ENGINEERING WORKSHOP DRAWING"

By H. BINNS, A.I.Mech.E.
(English Universities Press)

This work is in two volumes, which are included in the Technical College Series of the publishers. In view of the modern emphasis on efficiency and technical skill and knowledge, the books of this series fulfil a definite need. The two volumes in it under review are up to date, thorough and systematic. Their purpose is to act as a guide to apprentices in engineering shops, who with their aid will learn to read drawings and to make simple detail drawings and sketches for themselves. Those who work carefully through the well-graded examples given by Mr. Binns will come to combine clarity with precision.

The second volume is more advanced than the first, forming a second year course, and the two together are admirable for the combination of drawing skill and understanding of the principles involved that they will foster.

The price of Vol. I is 7/6 and that of Vol. II 9/6.

### "ANIMALS OF THE FARM"

By MARGARET KENT (Harrap. 3/6 net)

Here is another delightful animal story book for our younger readers, concerned this time with creatures who live on the farm. In it we meet pigs, horses, cows, sheep, and of course a dog and a cat, as well as a nice old donkey and a goat. These are not merely described. Instead we see them in their daily lives, along with people who own them and look after them, and the young folk who are growing up to understand them.

The book is made more attractive by the splendid drawings and the coloured frontispiece contributed by E. C. Mansell.

### "DUPREE'S TENDERFOOT"

By F. HAYDN DIMMOCK (Venturebooks. 4/-)

Sgt. Dupree was hero of a former story by Mr. Dimmock of adventure in Alaska, and here the author gives us another exciting yarn of the Canadian Mounted Police. His hero is regarded as the sergeant's pet because the latter inspired him to join the Force and had been responsible for his training, but in his first patrol he shows endurance and skill that proves him to be no Tenderfoot, but a capable policeman. There is mystery as well as trailing and shooting in the story, but whatever the difficulties Blain overcomes them and brings in the villain responsible for the troubles that he is called upon to look into.

This yarn is told in Mr. Dimmock's best manner and has excitement and danger on almost every page.

### "IN THE WORKSHOP"

By "DUPLEX" (Percival Marshall. 8/6 net)

The origin of this well got up book is the series of articles appearing in "*The Model Engineer*" under the title "*In The Workshop.*" The authors of these articles have drawn on their wide practical experience in describing the hand and machine tools used in workshop practice, and in explaining their use, and here we have detailed instructions given in a form that will appeal to both the beginner and to the more advanced model engineer. In fact, any model maker who has thoroughly absorbed the information given in the book and put it to practical use with success, as he should be able to do, can be looked upon as a practical and competent worker.

As usual with Percival Marshall books there is a wealth of helpful drawings and diagrams that emphasise the practical character of this workshop guide.

### "THE RAILWAY DIGEST"

(George Lapworth & Co. Ltd. 2/6 per copy)

"*The Railway Digest*" is now published three times a year, in Spring, Summer and Winter respectively. The Spring number is expected to appear during this month.

The Winter issue of 1949-50, which is the latest available at the time of writing, preserves the high standard of interest set in previous "*Digests.*" Apart from news items and one or two anecdotes, the bulk of the material consists of extracts from technical and other publications suitably condensed. This does not mean that the different chapters are a series of scrappy notes. Typical matters dealt with are the British locomotive exchanges of 1948, Canadian mail train work, railway subjects as illustrations on postage stamps, U.S.A. dining cars and the Drumm battery trains of Eire. There is a fair number of illustrations, and this typical "*Digest*" issue has a well-arranged appearance.

Copies of the Spring issue can be ordered direct from the publishers George Lapworth and Co. Ltd., Vernon House, Sicilian Avenue, London W.C.1. The price is 2/9 including postage.

### "GUEST CASTLE"

By KATHLEEN FIDLER (Lutterworth Press. 6/-)

Miss Fidler requires no introduction to most of our younger readers who love stories, and they will thoroughly enjoy her latest book. Guest Castle is a historic Scottish building overlooking the great waters of the North Sea, which is turned by its owner into a guest house. A nicely varied collection of guests arrive, among them two families of boys and girls, together with a mysterious group of grown-up people who act very strangely. The purpose of these mysterious visitors is found to be the discovery of treasure landed near the Castle for support of a Jacobite rising. Their evil purpose is thwarted, but not until the young folk have had some narrow escapes from disaster.

The story is well told, with humorous touches as well as really desperate situations.

### "HIS MAJESTY'S PLAYERS"

By C. H. EDMONDSTON AND M. L. F. HYDE
(Harrap. 8/6 net)

It is very pleasing now and again to return to interesting times in the past and to meet many of the famous men who lived in them. This we can do in "*His Majesty's Players,*" which tells the story of two boys who fought, played and enjoyed the adventures of youth in the days of Charles I and Cromwell. They were members of a travelling company of young players who appeared before the King and Queen at Court, and in their travels they encounter many adventures that lead in the end to the arrest of one of them, his escape, and the departure of the two for the New World.

The book is authentic in its detail of the period in which the story is set. Its characters are lifelike and the action throughout is lively. There is a coloured frontispiece and six other full page illustrations.

### "TWELVE NATURE TALES"

By YVONNE POULTON (Harrap. 4/- net)

All children are interested in butterflies, bees, birds and other small creatures, and here are 12 stories about them that will please younger readers of the "*M.M.*" Each of the stories is based on an imaginary incident in the life of a particular small creature and is written in simple and attractive language. Miss Poulton indeed makes live and attractive characters of her starlings, robins, lizards and other creatures. It is quite clear that she understands them and their ways, and she has the ability to convey their characteristics to her readers.

### "GARDEN RAILWAYS"

By R. E. TUSTIN
(Percival Marshall & Co. Ltd. 10/6)

Those who are contemplating an outdoor system, laid with weather-resisting permanent way, will find this book extremely practical. Its contents are based largely on the experiences of the author himself on his Gauge 0 outdoor line, which has been in existence for more than ten years. In ten chapters the reader is taken over many points from preliminary considerations to the actual engineering work involved in the way and works. Signalling, motive power and rolling stock are dealt with, and finally notes on special features conclude a readable and adequately-illustrated book.

### "THE LOCOMOTIVES OF THE G.E.R."

(By C. Langley Aldrich. 10/6)

The fifth edition of this well-known locomotive book has become necessary because of the popularity of its predecessors. In it opportunity has been taken to incorporate certain corrections and revisions. It forms a descriptive illustrated souvenir of the locomotives of the former Great Eastern Railway from 1862 to 1922, and deals with their subsequent history under the L.N.E.R.

The book, which is fully illustrated, has been compiled with care and enthusiasm for the locomotives it deals with, and is a valuable record of the Stratford products. It is published by E. V. Aldrich, 15, Queen Street, Brightlingsea, Essex, at 11/- including postage.

### "KIDNAPPED IN THE DESERT"

By ELIZABETH ROGERS (Warne. 6/- net)

The story begins in Egypt, where the heroine is dismayed by the kidnapping of her father, a millionaire who is spirited away to a hideout in the desert. With Capt. Baker she sets off in her own plane to scour the desert in search of the missing man. Disaster overtakes them in a desert dust storm, and other dangers threaten at times to put an end to their efforts. All ordeals are safely overcome, however, and the missing man is brought back to civilisation.

There is a coloured frontispiece.

### "STRANGER AT THE INLET"

By MARTIN COLT (Museum Press. 6/- net)

A stranger in a small seaside place is always a subject of interest, and when he behaves suspiciously and it is known that smuggling is thriving in the district, it is scarcely surprising that he is suspected of being concerned with this lawless activity. That is Slim Warner's fate when he settles for a holiday in the Baxters' cottage. He is supposed to be recovering from a serious illness, but lifts heavy weights without difficulty. He also shows remarkable interest in the harbour and boats in it, and later is discovered to have a secret wireless transmitter. At length he is revealed as a government man, probing into the smuggling racket. Then he and the Baxter boys have some really stirring adventures and run real dangers before the smugglers are trapped.

The yarn is a stirring one, well illustrated by means of a coloured frontispiece and drawings, and a map in the end covers helps readers to follow the story.

# King of the River

## The Otter at Home and in Captivity

By R. H. Ferry, F.Z.S.

AS I write these notes on the fern-clad bank of a West-country stream, a pack of rough coated hounds is hard pressing an otter. A few moments ago a thin chain of silvery bubbles, known as the vent, marked the passage of a hunted beast as it made its way up stream beneath the surface of the water. Behind, line-abreast, come the hunt servants wading knee deep, and swishing their poles to prevent the otter doubling back and stealing a quick run to safety down stream.

An otter landing after a swim. The illustrations to this article are from photographs by Oliver G. Pike, F.Z.S.

But in spite of the blood-stirring notes of the Master's horn and the clamour of the excited villagers, I am not greatly perturbed on the otter's behalf. For the beast they hunt, a lone dog otter, has been pursued many times before; he knows all the cunning ways of giving the hounds the slip even when they are right on his tail. Often I have come on him on more happy occasions as he and I have been fishing the same stretch of water at the end of the day, when the bigger fish are less shy, and the hazel shadows thrown across the shallows by the setting sun afford camouflage for the stalking angler.

The otter knows every bank excavated by colonies of water voles, every hollowed tree, and the earthy caves that shelve far under the banks. He knows too the watery dykes and the thick overgrown woods that rise steeply on the slopes of the valley to either side. There is every chance that he will escape, as he has often done before. The odds, in spite of the hounds specially trained to kill him, are all happily in his favour.

Whether we like it or not, when animals are destructive or too numerous they have to be controlled by hunting or trapping. Otters are not as a rule pests, nor are they as destructive to fish life as water bailiffs and anglers would have us believe. Occasionally one hears of a pair of bold "rogue" otters systematically hunting salmon pools, but most otters like nothing better than to live peaceful and retiring lives in beautiful river haunts far removed from man and his sporting activities. As they undoubtedly eat a number of trout and game fish, it is unfortunately overlooked that they also devour scores of eels, and eels are very destructive to fish spawn of all kinds. Besides eating fish these animals play an important part in the balance of nature, hunting down river and meadow voles, young rabbits in the water meadows, and many other waterside creatures.

Otters were once classed as fish, and the monks, who were not allowed to eat meat at certain seasons, conveniently put otter on their menu. They are not truly amphibious animals, as they have to surface fairly frequently to breathe air. Otters are in fact not infrequently drowned when they have become entangled in fishing nets. Yet few animals are better suited to life in the water. The bright round eyes are so situated that they can see up and down, the head is flat, and the tail, which acts as a rudder, is long and streamlined. The webbed feet are

**The otter occasionally pauses when enjoying a meal and takes a short swim before returning to the feast, for it is always suspicious.**

attached to short, powerful and loose-jointed legs. As the otter's foot has no "heel," its spoor is easy to distinguish in riverside gravel. There is a round ball under the sole of the foot and the impression it leaves is termed the "seal." The animal has two coats. The water soaks through the outer and longer coat, and runs off the fur of the skin. Thus the otter has to shake itself like a dog to dry. Otter skins are much in demand by countrymen, for they make excellent weather-proof gloves and waistcoats.

Young otters, known as "lits," are born as a rule in the winter on a waterside platform of rushes and reeds, and here they will often sunbathe quite openly to the view of passers by. The holt or home, a complicated excavation in the river bank, has an underwater entrance and also an emergency exit that is sometimes as far distant as 25 yards. The young do not take to the water like ducks, but have to be taught to swim by their mothers.

Otters make good and useful fishing pets if caught young and trained. The best diet is fish food, together with milk and porridge gruel. At a later stage the fish can be excluded from the ration, and thereafter only given as a treat and as a reward for good behaviour. This is an important factor in the pet's whole training. There are, of course, few English rivers where one can train an otter, for fish are scarce and there are no less than two million human anglers; but a private owner of a lake or pool, one interested in natural history, is usually glad enough to give permission for the training to take place.

The procedure is not unlike teaching a puppy to retrieve. First lessons are given with a fishskin stuffed with straw, which is thrown about in a water meadow till the otter has learned to carry it back to his master's feet. The next stage is to throw a dead fish on to the surface of the water, where it will float belly up and be clearly seen. On a light cord attached to a collar the pet is encouraged to go in after the quarry, and by gently pulling on the cord the beast will soon realise that the fish must be brought back. When the otter understands this perfectly, and not before, a fish is one day weighted so that it will sink slowly, necessitating a dive to retrieve it. Finally the otter gains confidence, and will soon hunt live fish of its own accord, bringing them back to its master for the reward of a fishy tit-bit.

In this training, which may take six months, a good deal of patience is required, for otters are extremely sensitive and nervy. An impatient tap on the nose, the most tender part of the otter's anatomy, may result in putting the animal off fishing for life, or even cause its death. On the other hand an over-petted beast takes quick

(*Continued on page 142*)

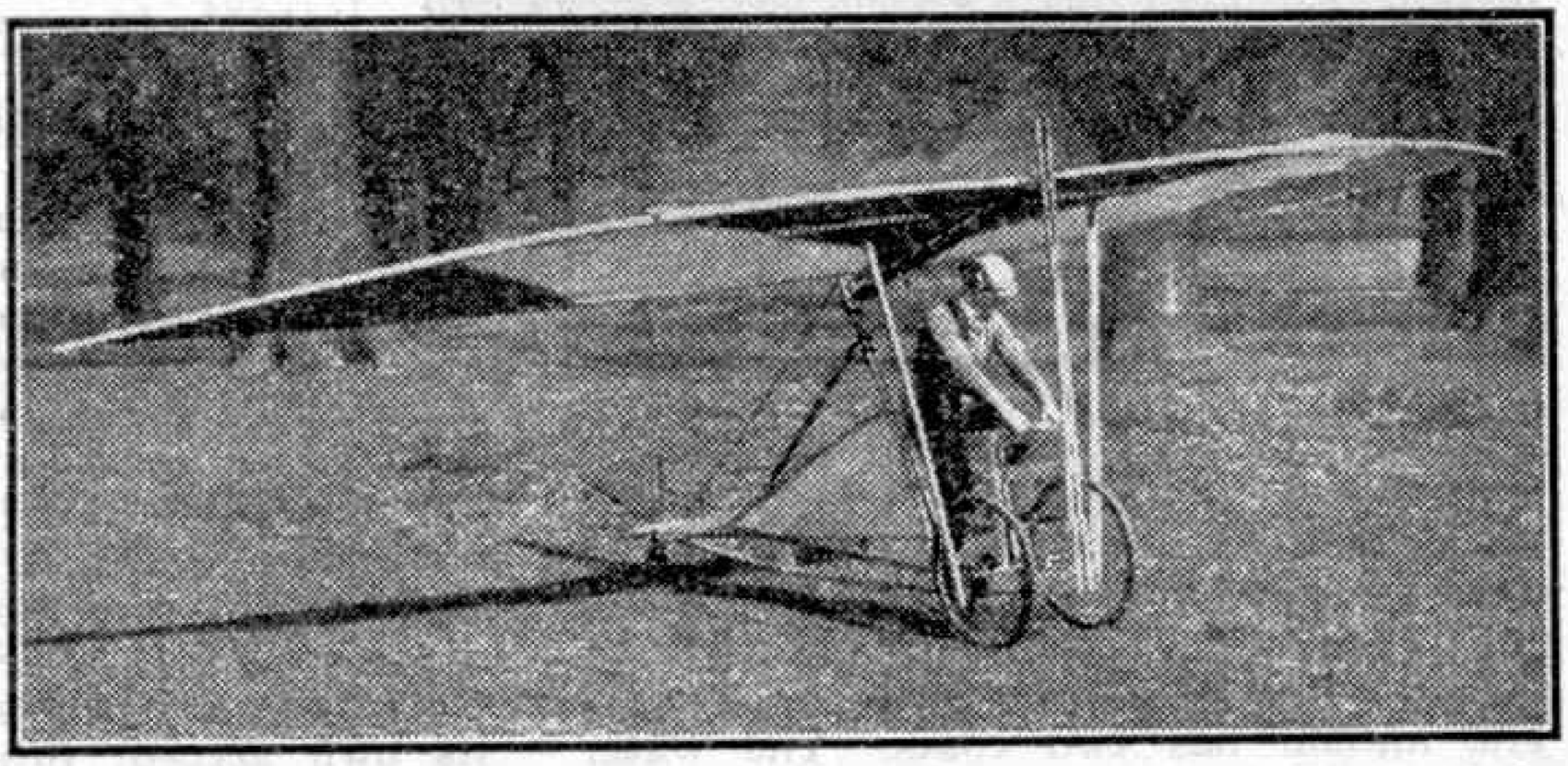
**Most baby otters are born in winter. This nest or "holt" was in the open on a marshy tract and when discovered was partly covered with snow.**

# Unorthodox Aircraft

By George V. Gould

WITH the rapid development of jet propulsion of aircraft during and since the World War it is interesting to look back at some of the less orthodox methods of propelling aeroplanes, advocated during the two or three years prior to 1939.

Although the airscrew, or propeller, has been the almost universal method of inducing flight, as far back as 1480 Leonardo da Vinci had designed a machine that could be made to fly by means of flapping wings. His machine was only on paper, however, and da Vinci is much better known for his wonderful paintings; the most famous of these being *"The Last Supper"* and the *"Mona Lisa."*



**A pedal-operated ornithopter, or flapping wing type of aeroplane. Photograph by courtesy of The Royal Aeronautical Society.**

The idea of an ornithopter, as a flapping wing type of aeroplane is called, was revived in 1937 by an inventor from Surbiton, in Surrey. This 'plane was equipped with a 10 h.p. engine, and also had a variable pitch propeller. It was claimed that it could rise vertically, and land in a small area—rather in the manner of an Autogiro.

Another machine that somewhat resembled the Autogiro was the "Vertaplane." This was an American invention, and was demonstrated at Philadelphia during 1937. It was a biplane, but varied from normal practice by having the upper of the two wings mounted on a central pivot. For normal flight, the movable wing was locked, but when taking off or coming in to land, it could be released, and, being driven by means of a separate motor, acted as a rotor, enabling the 'plane to rise or descend vertically.

Also of American origin was the "Paddle-Wheel" 'plane. A large working model of this invention was demonstrated a few years before the War. The machine had a rather deep fuselage, and in place of wings and tailplane were large and small "paddle-wheels." These tubular, finned wheels were about as wide and as long as the wings and tailplane of a normal aircraft would be. The intention was, that in flight, the revolving wings would propel the 'plane through the air rather in the way that a paddle-steamer is propelled through the water. The wings, however, had the double function of propelling and of keeping the machine aloft. It was said that by suitably adjusting the controls in flight the "Paddle Wheel" 'plane would also hover motionless in the air.

For sheer economy, the monoplane invented by Enea Bossi, a naturalised American, would certainly take a lot of beating. His device was known as the "Cycleplane," and, as the name implies, it obtained its motive power from the user's legs. Pedals were connected through chain and gearing to two propellers which attained sufficient speed to take the machine through the air. Bossi himself reached a speed of 20 m.p.h. and a height of 28 ft., when testing his "Cycleplane," and an Italian friend flew for five furlongs under his own power, on the same machine. As can be imagined, however, it required considerable strength to keep going for any length of time.

But with all these various methods of transforming power into flight, the petrol-driven internal combustion engine has remained supreme—until the coming of the jet. As for the future, we have already had rocket-driven aircraft in more or less experimental forms, and maybe one day atomic powered 'planes will make even the jets seem slow and old-fashioned.

# Photography

## Camera Work in March

By John J. Curtis, A.R.P.S.

EVERY keen amateur photographer is a nature lover and, as such, at this time of the year feels the urge to get out into the countryside to seek new inspirations from the signs of returning life in trees and hedgerows. It is therefore very natural that that bunch of Primroses growing in such a picturesque way on the bank, or that small group of Daffodils close by the waterside, should immediately bring the camera into action, and after both subjects have been viewed from all angles to get the best lighting,

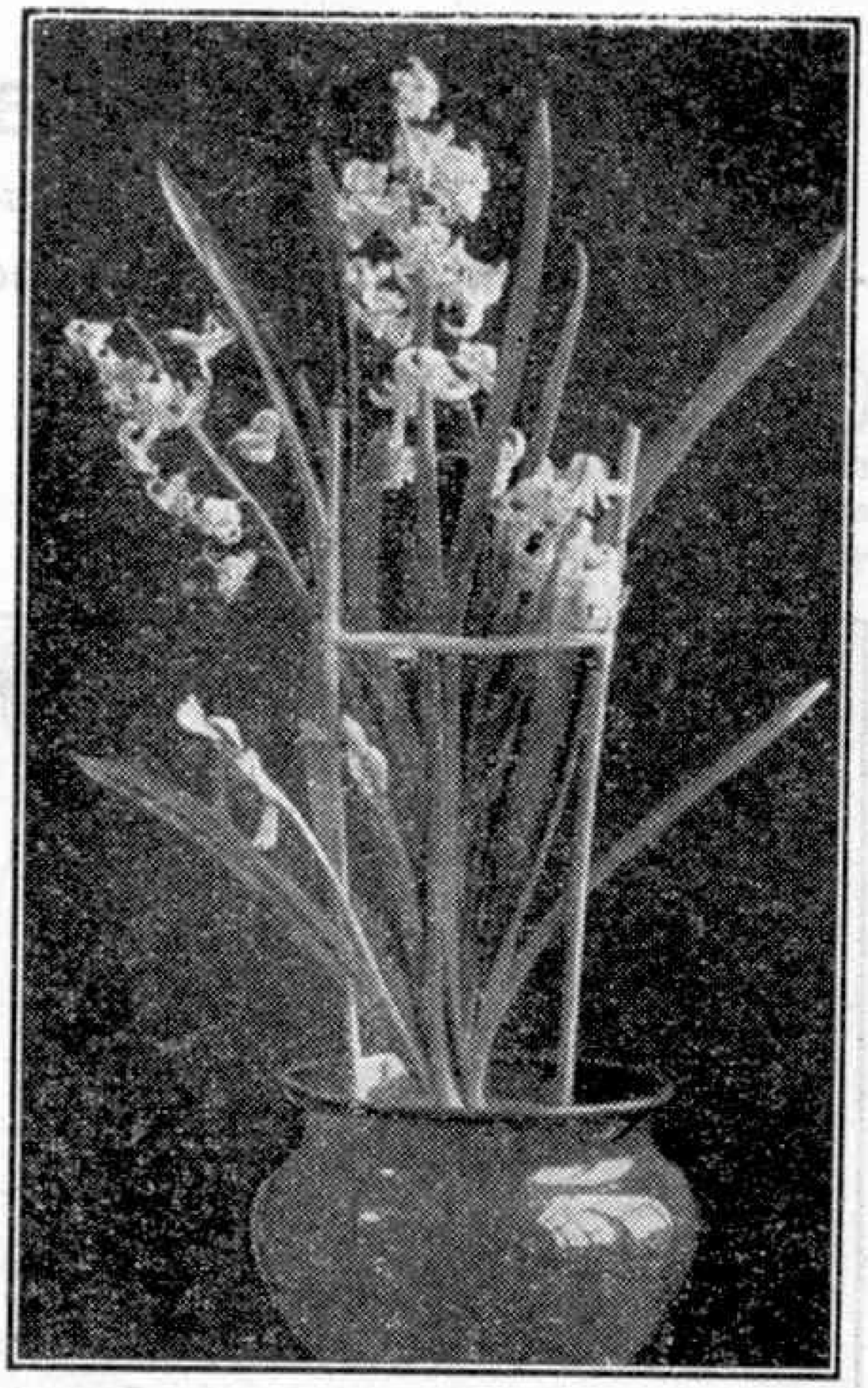
**Group of garden daffodils. Photograph by John J. Curtis.**

position and distance, a couple of exposures are made.

A short walk in the woods will possibly reveal some trees which have reached the "Sticky-bud" stage. It should be easy to find a branch somewhat isolated which would give a very artistic result if it could be shot with a cloud as a background. Possibly this would mean holding the camera under the bough and pointing to the sky, but this is not difficult as a short exposure of about 1/25th with F8 is about all that is wanted. Keeping on the lookout on the walk it might be that a wild plum, cherry or other fruit tree is noted; there are signs of the blossom coming and in two or three weeks it will be well worth while making another visit.

It must not be assumed that the only way to acquire charming results of Spring Flowers is to take them in their natural setting. Many gardeners make a special feature of them and the camera can provide some excellent records of how successful their beds of Crocuses, Narcissi, etc., have proved.

In like manner, indoor shots can be made of a few blooms artistically arranged in vases for decoration purposes; this is a subject which every photographer should study, as



**Bowl of hyacinths. Photograph by J. Allen, Eastleigh.**

there is much to be learned in composition that will prove very helpful in all other branches of pictorial photography.

A panchromatic film with a two or three times filter is an advantage for giving a truer rendering of colour gradations. The filter will necessitate increasing the exposure but, even so, 1/5th or 1/10th according to the light should be about right. Use light direct from a window, but the camera should have its back to the source of light.

**A carpet of daffodils. Photograph by John J. Curtis.**

# Using the Meccano Gears Outfit

By "Spanner"

## Dragline Excavator and Performing Musicians

OWNERS of Outfit No. 3 and a Gears Outfit A will be able to build both the interesting models shown in Figs. 1 and 3. Actually the Dragline Excavator seen in Fig. 1 can be built from Outfit No. 2 and the Gears Outfit, but the extra parts contained in Outfit No. 3 will be required to assemble the Performing Musicians, which are most amusing when set in motion by means of a *Magic* Motor.

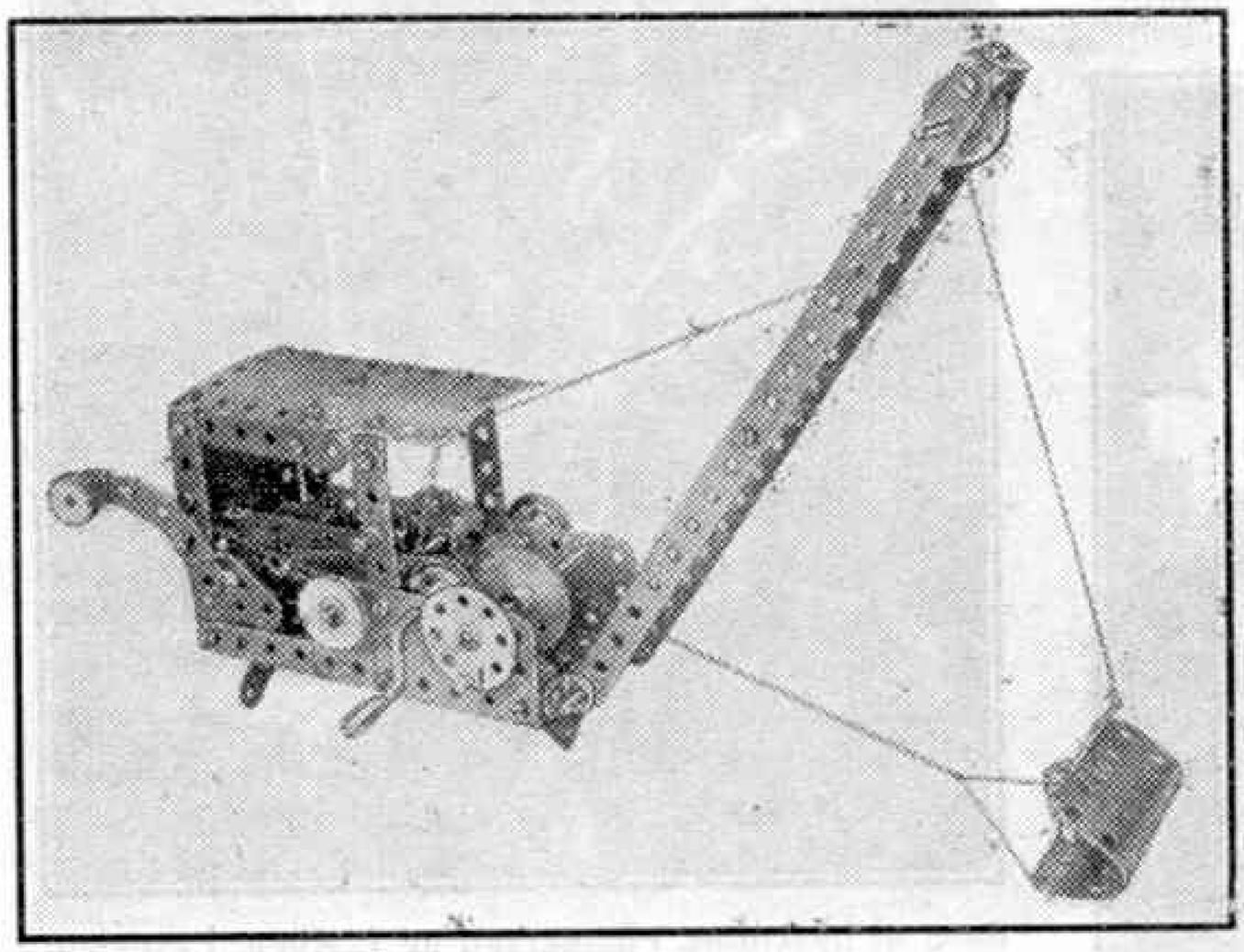


**Fig. 1. This dragline excavator uses an Outfit No. 2 and a Gears Outfit.**

### Dragline Excavator

In building the Dragline Excavator a *Magic* Motor is first bolted to a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate. A $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate is then attached to one side of the Plate, and two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates, overlapped, to the other. A Flat Trunnion is also bolted to this side, and is extended upward by a $2\frac{1}{2}''$ Strip. Three other $2\frac{1}{2}''$ Strips are bolted to the Flexible Plates as shown, and the front and rear pairs are connected at their upper ends by Double Angle Strips. The back is filled by a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate attached by Angle Brackets.

The mechanism consists of a Crank Handle that carries $\frac{1}{2}''$ and $\frac{3}{4}''$ Pinions that mesh with either 57-tooth Gear 1 or 50-tooth Gear 2.

The Cord that operates the luffing of the jib is attached by a Cord Anchoring Spring to Rod 3. A length of Cord tied to a $\frac{3}{8}''$ Bolt 5 and taken round a $1''$ Pulley on Rod 3 and attached to a $2\frac{1}{2}''$ Curved Strip, forms a strap brake that prevents the jib from over-running. Rod 4 controls the movement of the bucket, and it carries a handle assembled by fixing a $\frac{3}{8}''$ Bolt to a Bush Wheel 6.

The jib is made by bolting four $5\frac{1}{2}''$ Strips in pairs and joining them at the outer ends by two Angle Brackets. It is pivoted on a $2''$ Rod mounted in Angle Brackets 7, the Rod being kept in position by Spring Clips.

The bucket is a U-section Curved Plate with a Trunnion bolted to it, and the roof is formed from two $2\frac{1}{2}''$ Curved Plates, to which two $2\frac{1}{2}''$ Strips are attached by Angle Brackets.

Parts required to build the model Dragline Excavator: 4 of No. 2; 6 of No. 5; 8 of No. 12; 2 of No. 16; 2 of No. 17; 1 of No. 19g; 4 of No. 22; 1 of No. 24; 4 of No. 35; 40 of No. 37; 4 of No. 37a; 4 of No. 38; 1 of No. 40; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 4 of No. 111c; 1 of No. 125; 2 of No. 126;

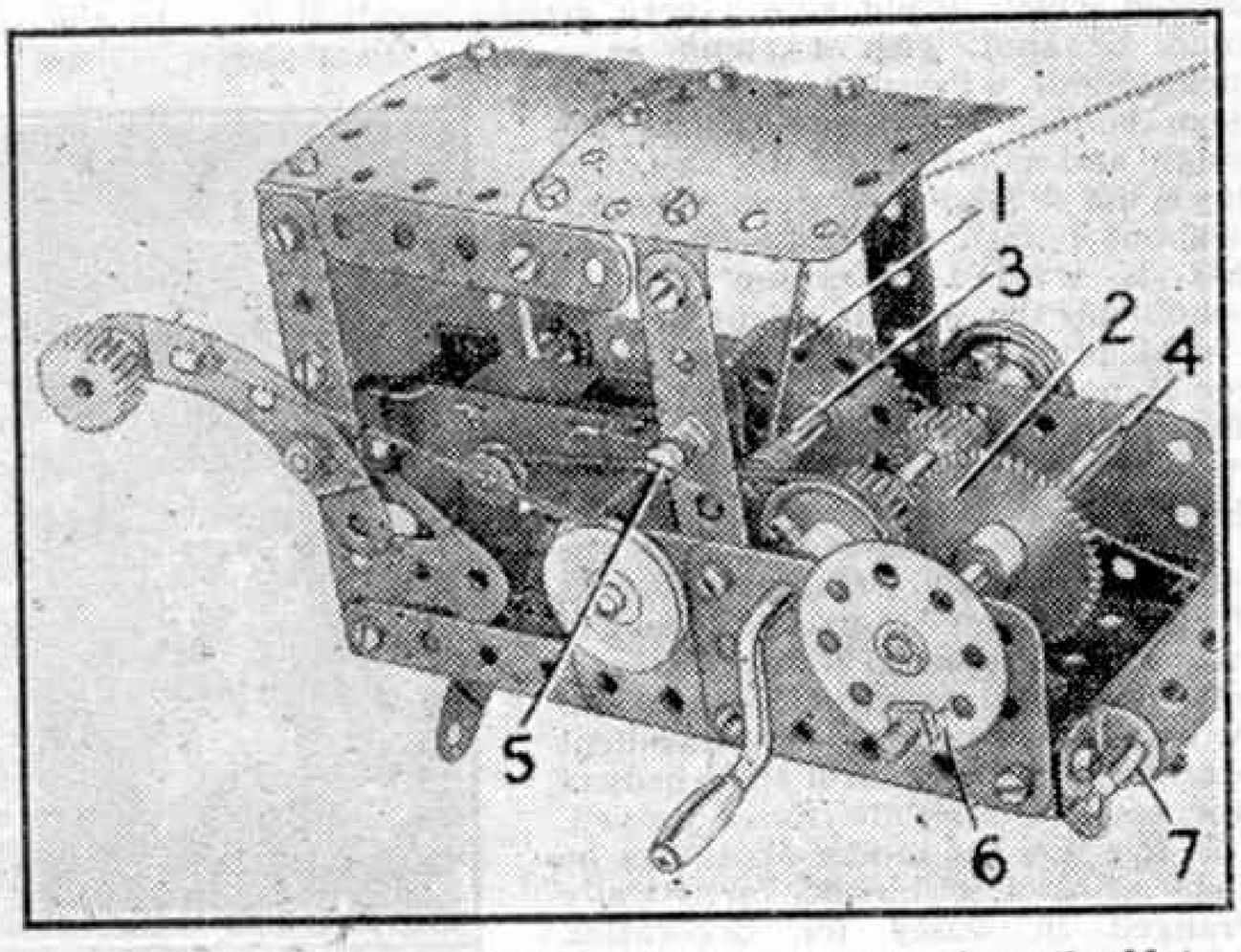



**Fig. 2. A close-up view of the excavator showing how the Motor drive is transmitted through the gearing.**

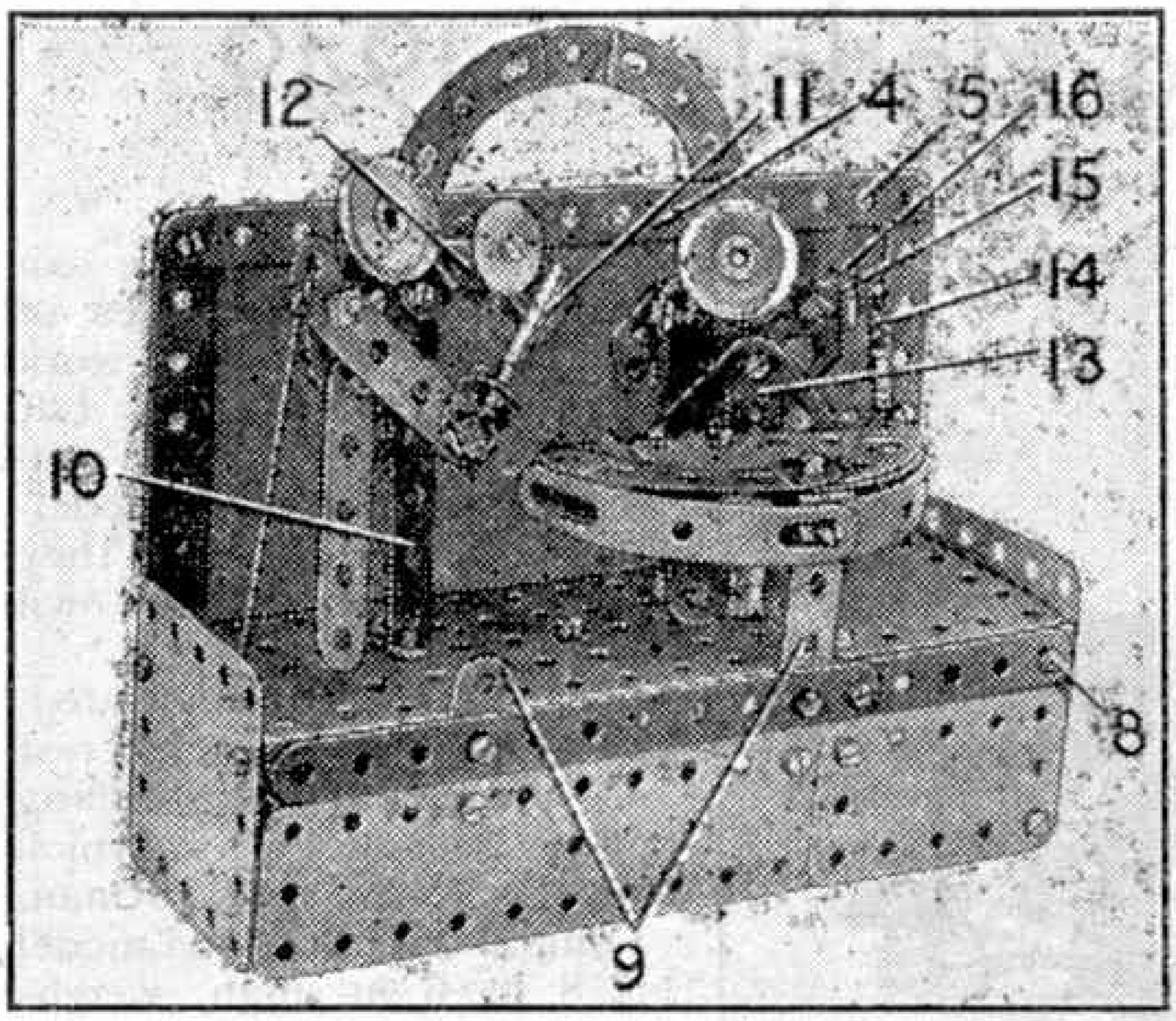



**Fig. 3. These performing musicians are amusing to watch in motion. The model is operated by a Magic Motor.**

1 of No. 126a; 1 of No. 176; 1 of No. 186a; 2 of No. 188; 1 of No. 189; 1 of No. 190; 1 of No. 199; 2 of No. 200; 1 Gears Outfit "A"; 1 *Magic* Motor.

## Performing Musicians

Assembly of the Performing Musicians model is best commenced with the screen that forms the rear of the stage. This consists of two 4½" × 2½" Flexible Plates 1, one 5½" × 2½" Plate 2 and one 2½" × 2½" Flexible Plate 3. It is strengthened by three 5½" Strips, and a further 5½" Strip 4 extended by a 2½" Strip 5 is bolted along the top. A 5½" × 2½" Flanged Plate 6 is bolted to the screen and is extended by a 2½" × 2½" Flexible Plate 7. The ends are plated by two 1 11/16" radius Curved Plates, flattened. One of these is bolted to the flange of the Flanged Plate, and the other to a 2½" × ½" Double Angle Strip, held by Bolts 8 at each side. The 5½" × 1½" and 2½" × 1½" Plates at the front are attached to the Flanged Plate by 2½" Strips 9.

The body of the violinist is formed by a Flat Trunnion to which is bolted a 2½" × ½" Double Angle Strip 10 and a 2½" Strip representing the other leg. His arm, a 2½" Strip, is pivotally attached to the Flat Trunnion, and the bow is represented by a 1½" Rod. The violin is formed by a Bent Strip 11 and a ¾" Washer, and is bolted to the Flat Trunnion by a Reversed Angle Bracket 12. The 1" Pulley forming the man's head is locked on a Fishplate bolted to the Flat Trunnion.

The body of the second figure is built by bolting a Flat Trunnion to a Trunnion 13. Two 2½" Strips are bolted to the Trunnion and curved to represent the legs. One arm is formed by attaching a Fishplate to an Angle Bracket, and is pivotally attached by its elongated hole to an Angle Bracket bolted to the Flat Trunnion. The other arm is a 1½" Rod mounted in a Rod and Strip Connector 14. The Connector is locked on a ⅜" Bolt which is then passed through the Angle Bracket 15 and the Fishplate 16 is then fixed on its shank between two nuts.

A Bush Wheel is bolted to the Trunnion 13, and a 2" Rod is locked in this and a 57-tooth Gear Wheel bolted to the Flanged Plate.

The *Magic* Motor is next bolted in place at rear of the screen, in the position shown in Fig. 4. A length of Cord takes the drive from the Motor to Rod 17, which is mounted in Strip 18 and also in a Reversed Angle Bracket bolted to the Strip. The Rod carries a ½" Pinion meshed with a 1½" Contrate Wheel on 4" Rod 19. Bearings for this Rod are made by attaching a Fishplate to a Trunnion and also by bolting a Wheel Disc by a Double Bracket to the Flanged Plate. Two 1" Pulleys on the ends of Rod 19 have Angle Brackets bolted to their bosses. A nut and a Washer are placed (*Continued on page 142*)

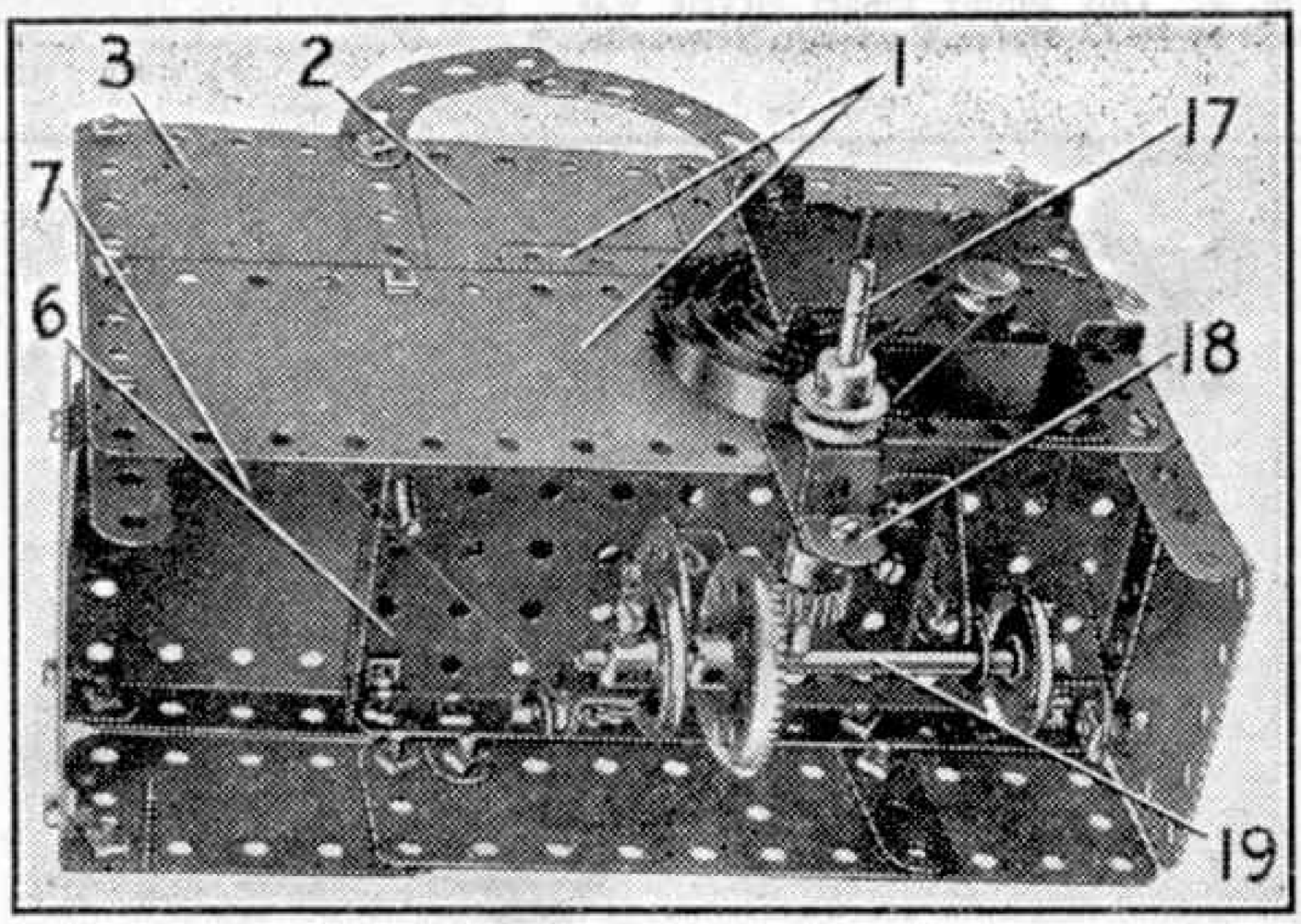



**Fig. 4. A view underneath the stage showing how the performing musicians are operated.**

# Prize-winning Models of 1949

By "Spanner"

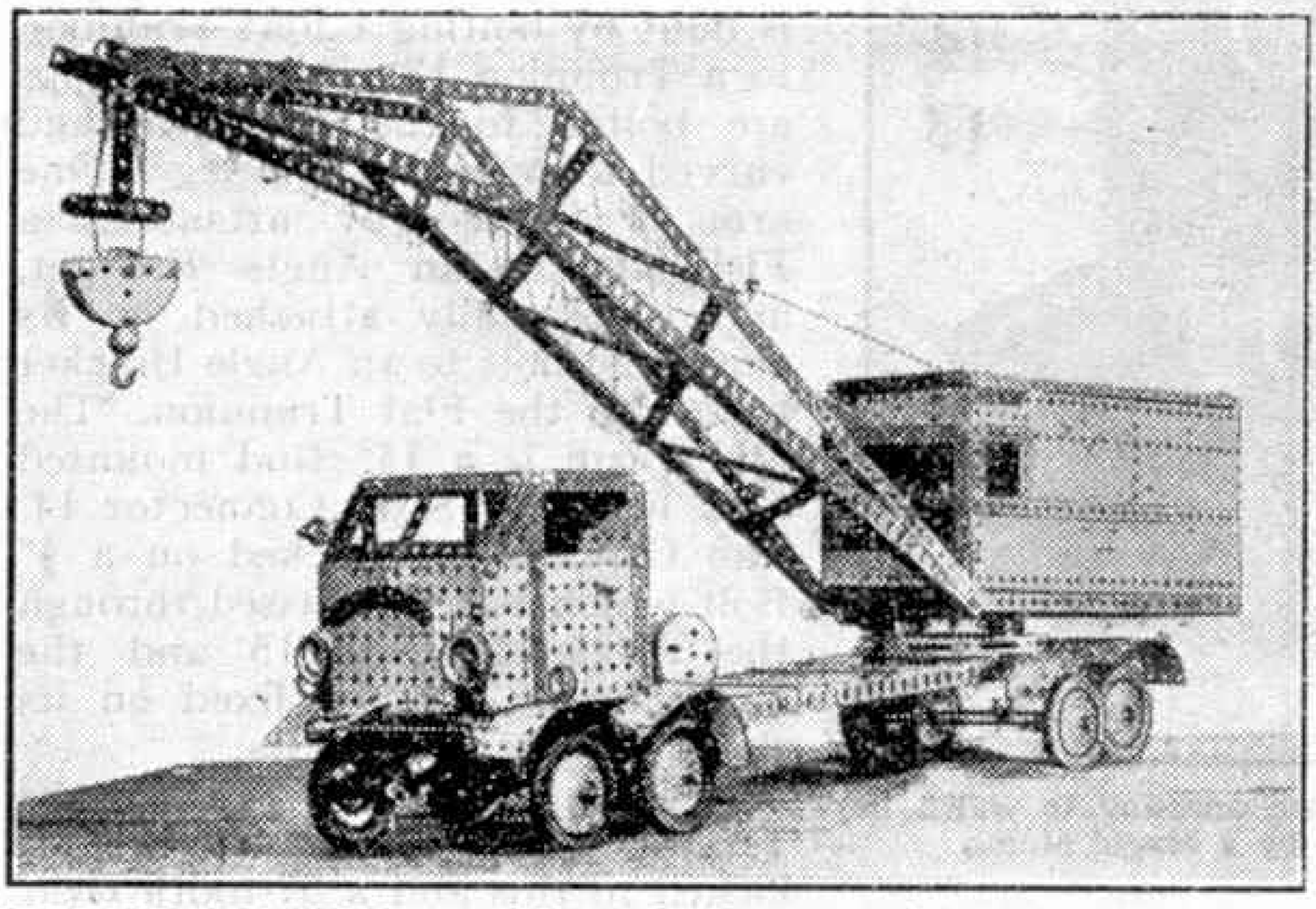


**Fig. 1. A striking lorry crane, which won a prize for Guy Hayward, Woodbridge.**

ILLUSTRATED on this and the opposite page is a selection of models that won prizes in Meccano Competitions announced in the *"M.M."* during 1949. The entries in these contests cover a very wide range of subjects. Some of them are elaborate, involving the use of a large number of parts; others are simple in construction and make use of only a few parts. The important point, however, is that all the models have unusual constructional features or qualities that attracted the attention of the competition judges. The few that I am able to illustrate can give only a rough idea of the high standard of work done by competitors, but it is hoped that they will at least provide other model-builders with ideas they can apply in their own model-building.

Among those illustrated, one of particular interest is the giant level-luffing crane seen in Fig. 5, which was built by F. Coltman, Loughborough. This model is 8 ft. 6 in. high, weighs

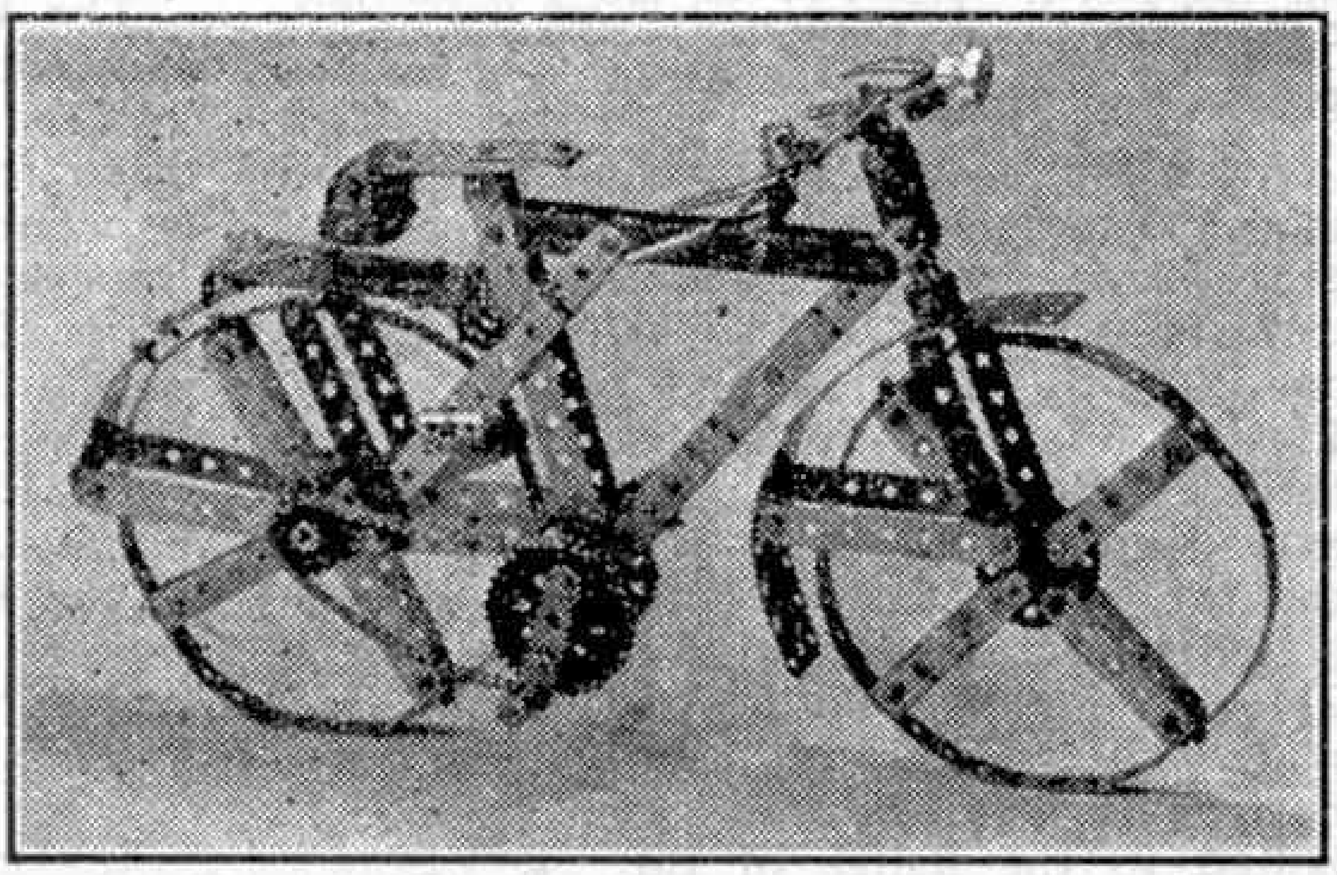
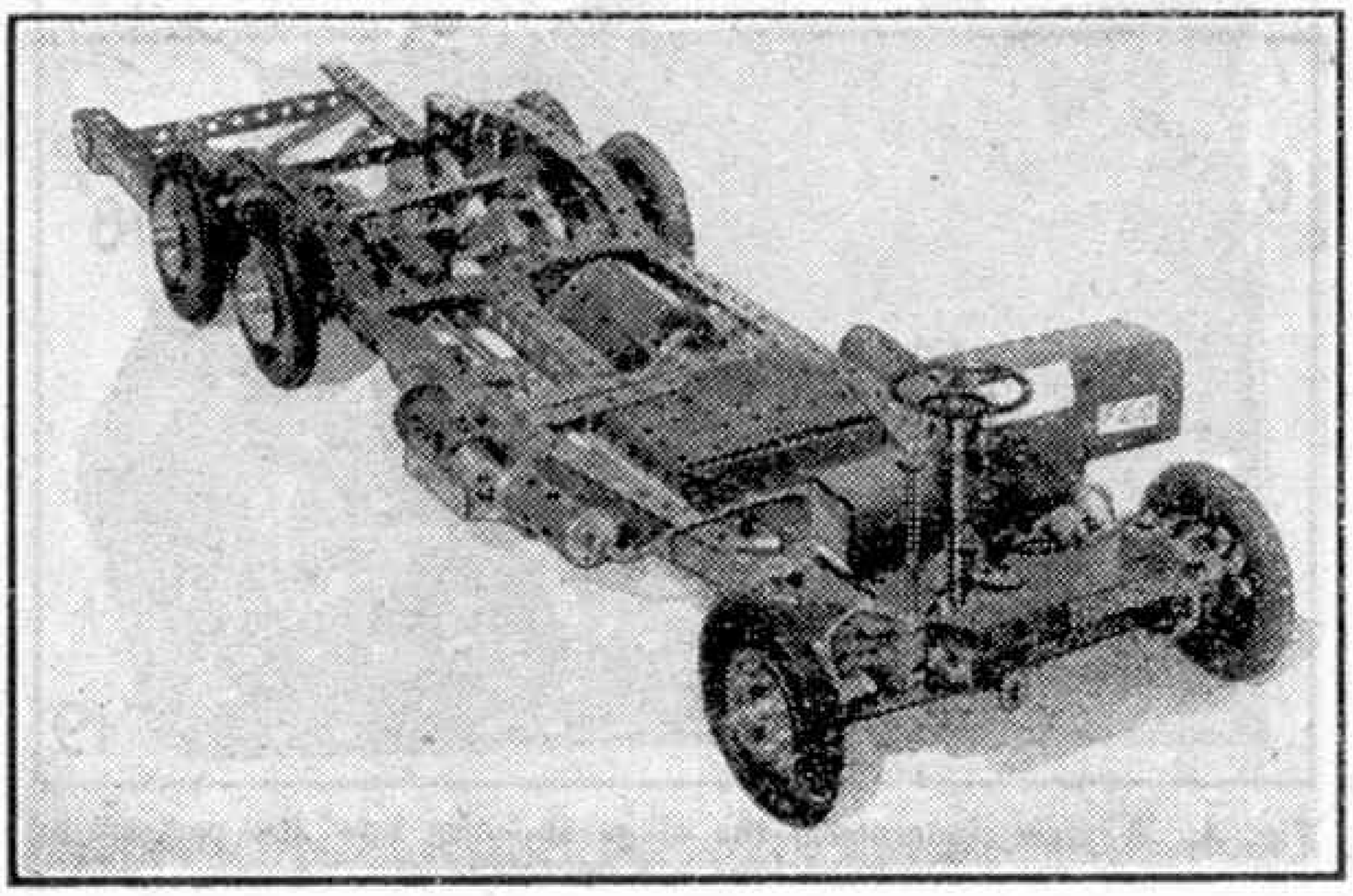


**Fig. 2. This simple model bicycle was built by M. G. Slater, Gosforth, Newcastle.**



1½ cwt., and performs all the motions of a real crane of this kind, and it demonstrates excellently the sturdy and realistic girder construction that is possible using Meccano parts. An interesting feature is that the grab can be opened or closed at any point within the height of lift. The model owed its success not so much to its size as to its sturdy construction combined with remarkable realism and good proportions.

Not all the prize models

**Fig. 3. A finely detailed trolley-bus chassis constructed by Paul K. Coetzee, Pretoria, South Africa.**

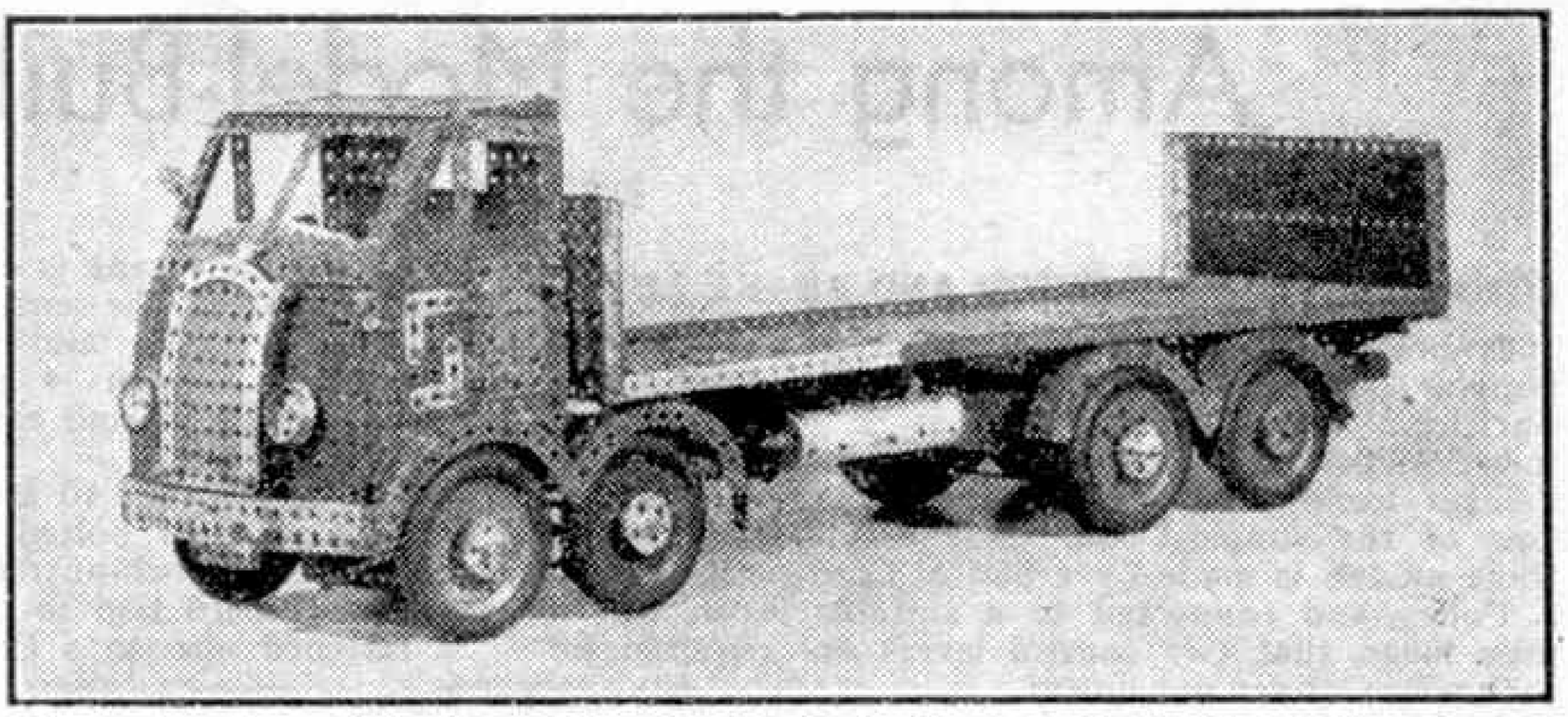
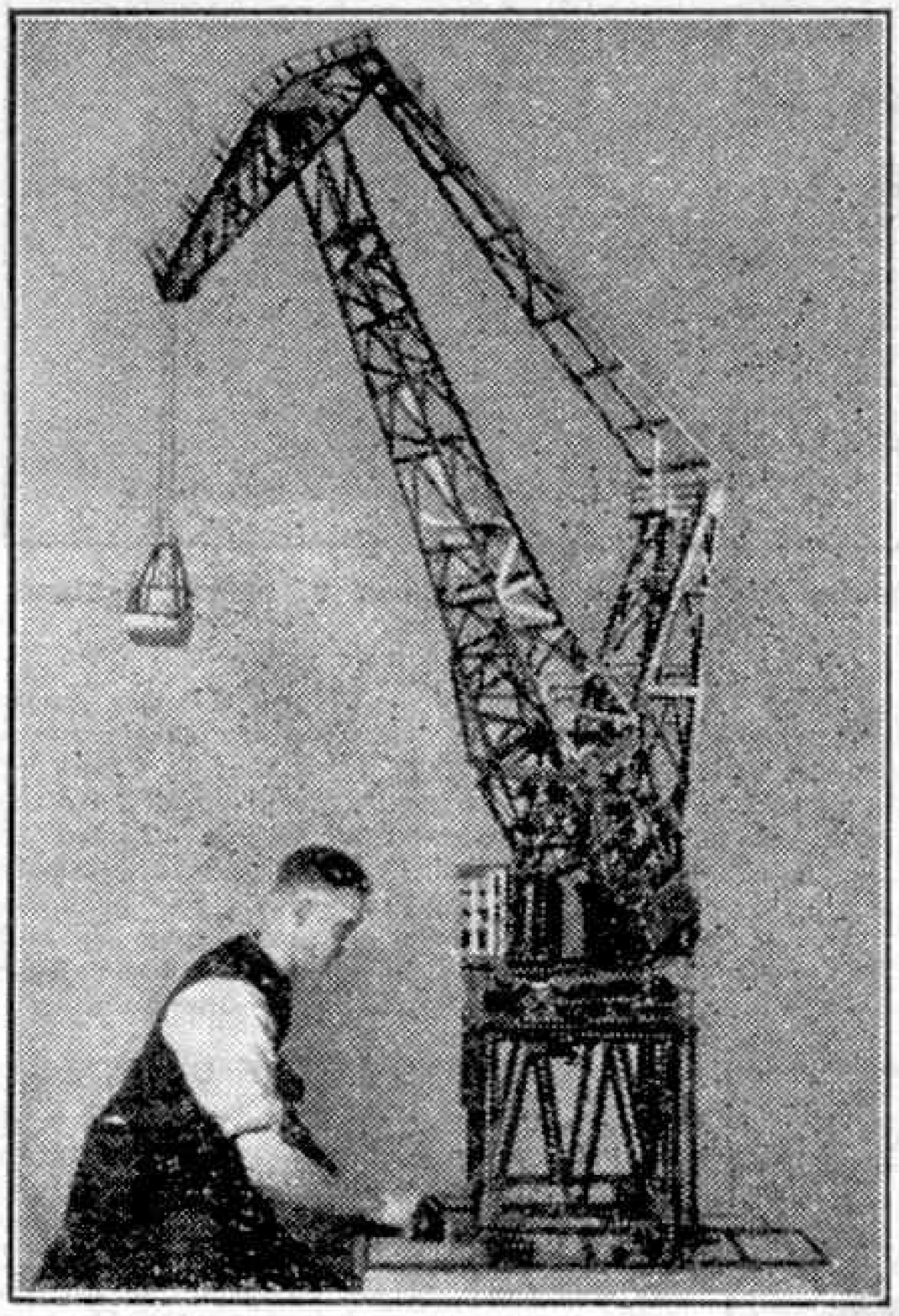


**Fig. 4. A Foden Diesel Lorry driven by a 20-volt Motor. It is the work of W. A. Picken, Gainsborough.**

were of the giant type, however. Typical of the more simple ones is the realistic bicycle shown in Fig. 2. This was built by M. G. Slater, Gosforth, Newcastle-on-Tyne. Readers will note the detail included in this model and the neat way in which the saddle-bag is constructed. Attention to detail and neatness in reproducing even small items put this model in the prize-winning class.



A more elaborate model, and one that is very realistic, is the Lorry Crane seen in Fig. 1. This is the work of Guy Hayward, Woodbridge.

An Overseas competitor Paul K. Coetzee, Pretoria, won a prize with the well detailed model of a trolley-bus chassis that is shown in Fig. 3. It would take a lot of space to mention all the points of interest in this model, but I hope readers will be able to pick out some details for themselves from the accompanying illustration.

Another outstanding road vehicle was a Foden Diesel Lorry sent by W. A. Picken, Gainsborough, and shown in Fig. 4. It is fitted with a 20-volt Motor geared down through 9:1 ratio gearing and driving through a 3-speed and reverse gear-box to the first and second differentials on their respective rear axles.

A model of very different type is that which won a prize for I. A. Heywood, Macclesfield. This is a reproduction of a "K" class destroyer and is illustrated in Fig. 6. Here again neatness and care in reproducing details brought success to the model, and I would like to mention particularly the bridge construction and the gun mountings. Among the small armament are a multiple pom-pom and a twin barrelled Lewis gun.

**Fig. 5. A giant crane and its builder, F. Coltman, Loughborough.**

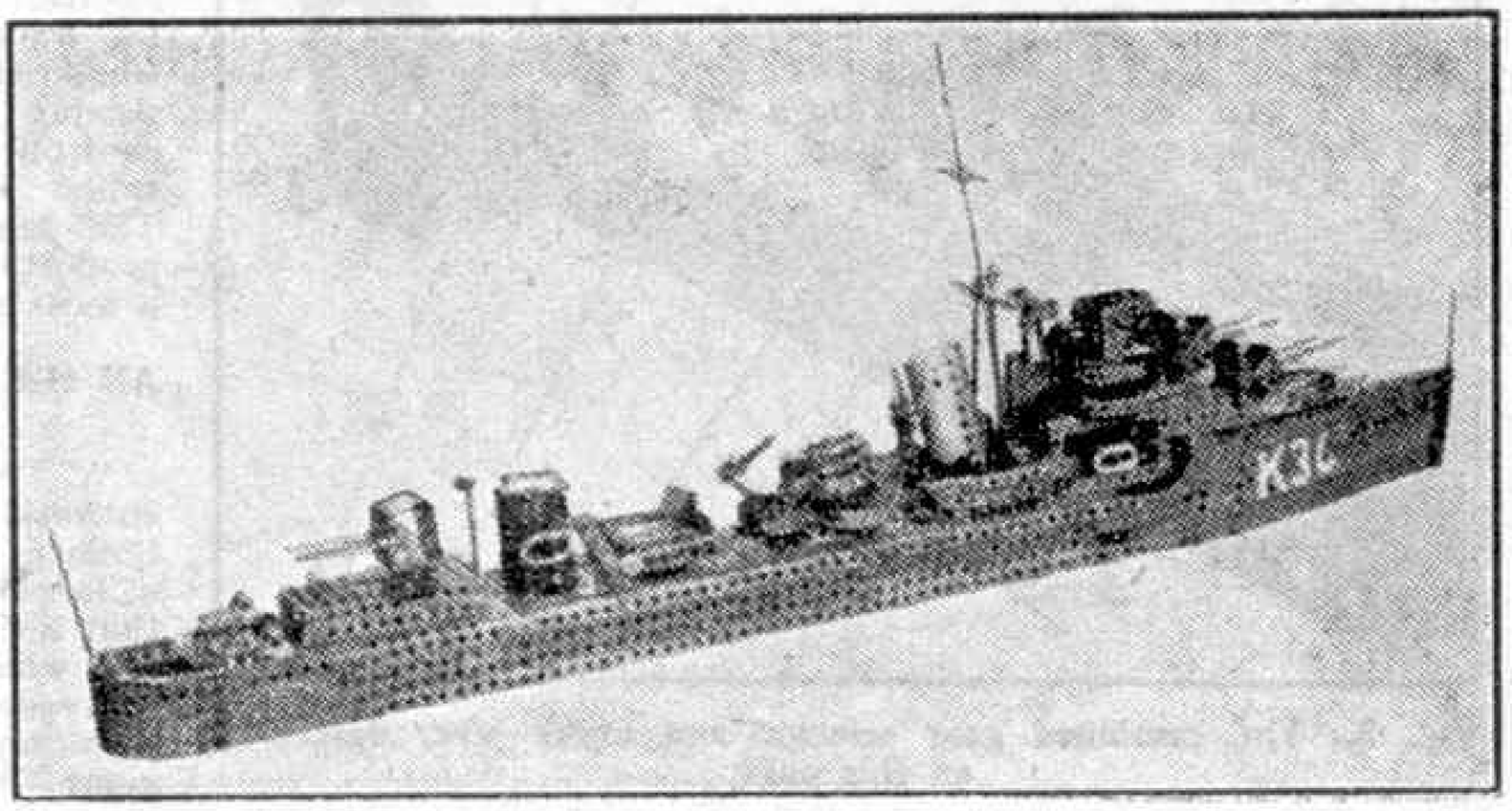


**Fig. 6. A realistic destroyer which won a prize for I. A. Heywood, Macclesfield.**

# Among the Model-Builders

By "Spanner"

### COMBINED GEAR SELECTOR AND BRAKE LEVER

Cranes and excavators of all types are always popular subjects with model-building enthusiasts, but from my correspondence it is apparent that many model-builders find difficulty in fitting a convenient form of brake to the winding drum shafts. One of the simplest and most suitable brakes for these models is made by a belt of Cord passed round a Pulley and connected to a suitable lever, but it may mean that two control levers are required for each power-driven movement, and this is inconvenient in large models where the number of movements makes control difficult. I am therefore describing this month a simple combined gear selector and brake lever that provides forward, neutral and reverse drive to the winding shaft and a positive brake in all positions of the lever. The mechanism is shown applied to one winding shaft in Fig. 2., but it can be duplicated quite easily for a number of separate movements.

A driving shaft 1 is mounted in the gear-box housing and carries at one end a ¾" Contrate 2. The Contrate engages with a ½" diam. ½" face Pinion fixed on a sliding Rod 3. This Rod is fitted also with two ½" Pinions 4 and 5 that can be moved into mesh with a 1½" Contrate. The 1½" Contrate is fixed on the winding shaft, and a drum is formed by a Bush Wheel and a 1½" Pulley 6.

A control lever 7 is pivoted on a suitable base, and passed between two 2½" small radius Curved Strips fixed to 2" Strips bolted to the base. A connecting Strip 8 is lock-nutted to the lever, and also to a Crank 9 pivoted on a Rod fixed to the gear-box housing. The Crank is extended by a 2" Strip, and a Bolt fixed in the end hole of the Strip engages between a Collar and the ½" diam. ½" face Pinion on Rod 3. Pinions 4 and 5 are positioned so that forward, neutral and reverse drives are obtained by sliding Rod 3.

The brake lever 10 is a 1" Rod held in a Rod and Strip Connector bolted firmly to a Fishplate. The Fishplate is lock-nutted to lever 7, and a short length of Cord tied to the Rod and Strip Connector is fastened also to a Crank 11. The Crank is fixed on a 2" Rod mounted in a 1½" × ½" Double Angle Strip bolted to the base, the Rod carrying also a second Crank 12. A length of Cord tied to Crank 12 is passed round Pulley 6 and is tied finally to the base. A Spring 13, fastened to Crank 12 and to the base, is used to keep the Cord taut and so apply a braking effect to the winding shaft. The brake is released by pulling lever 10 towards lever 7, and thus control of the braking and gear selector can be carried out simultaneously using only one hand.

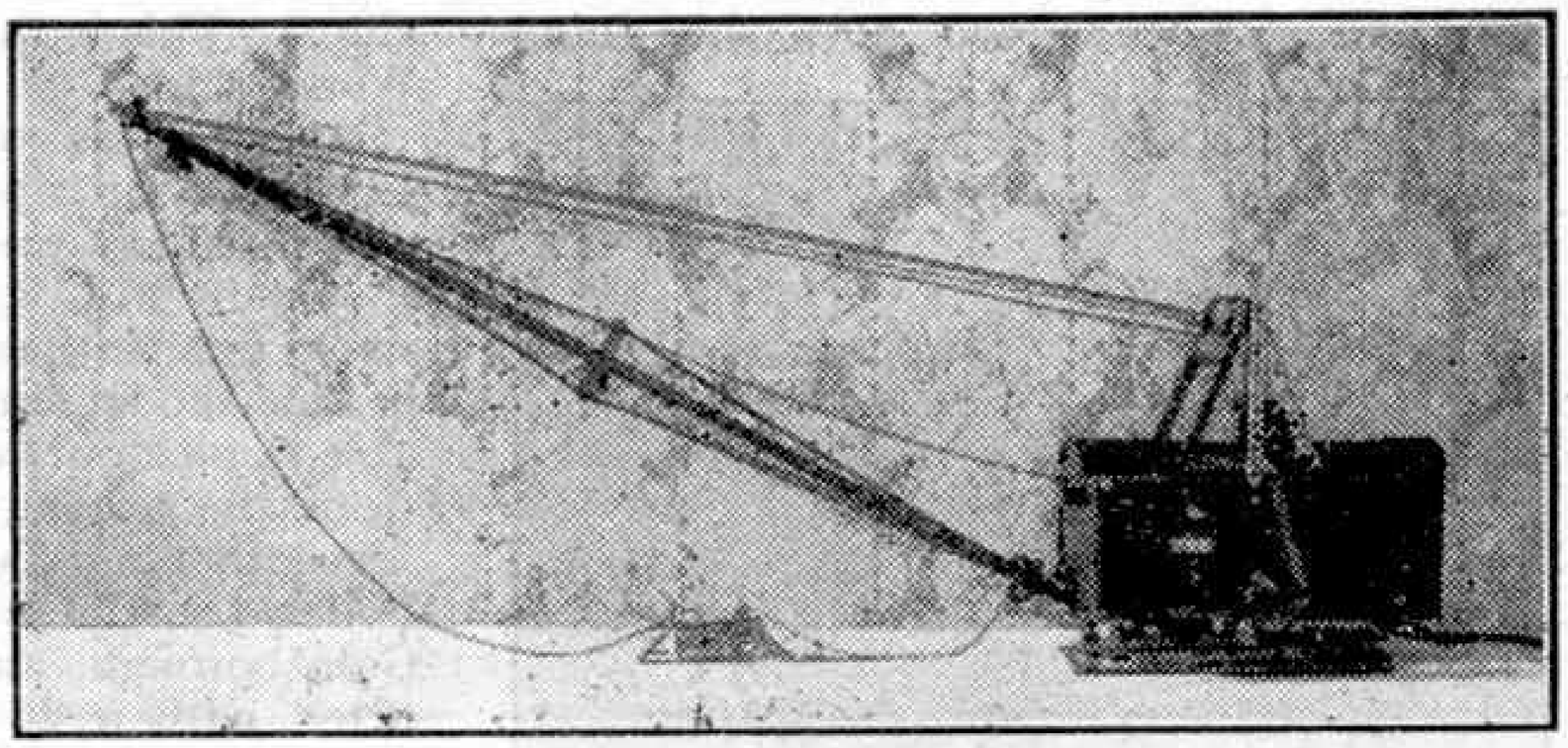


**Fig. 1. A fine model walking dragline built by William P. Fisher, Ashland, Pa., U.S.A.**

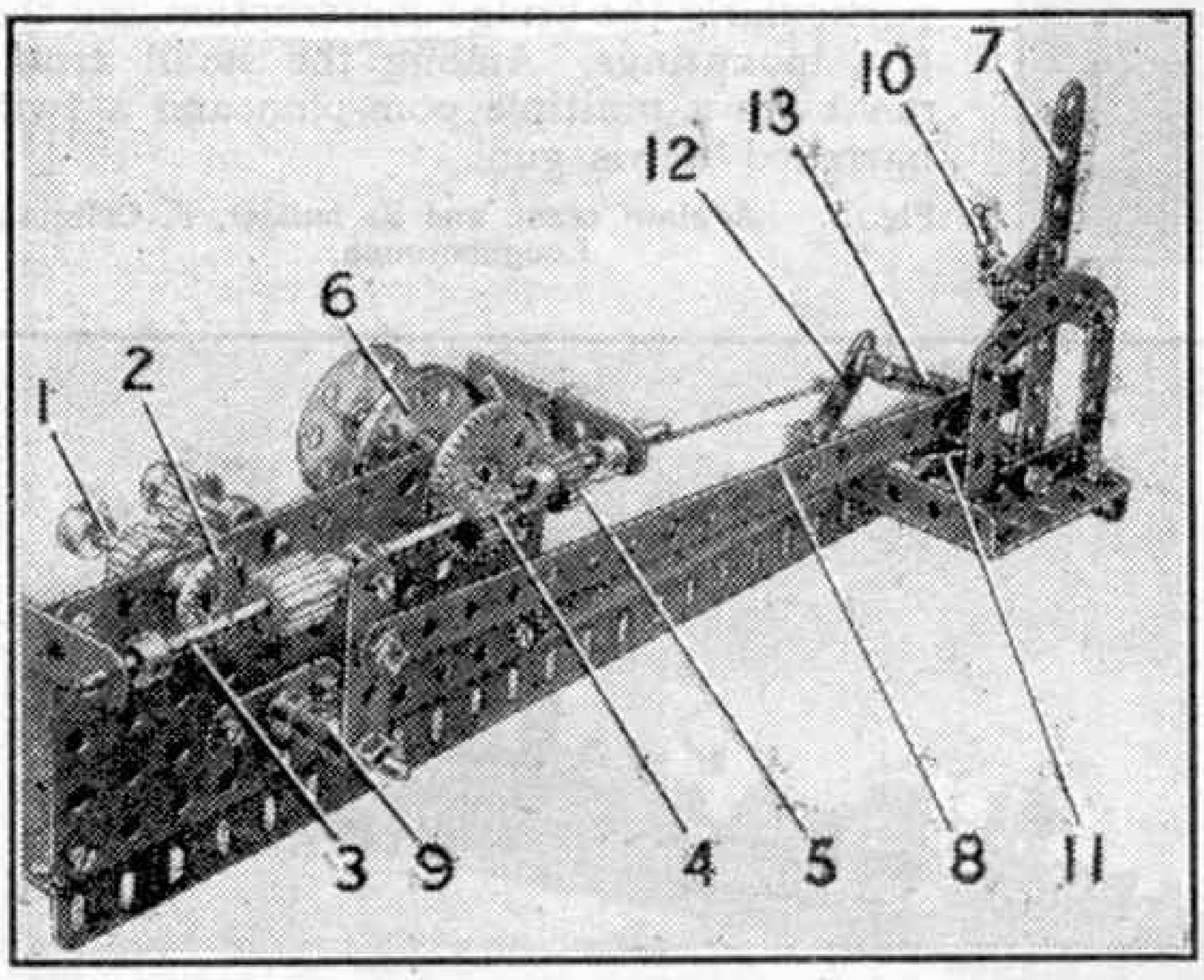



**Fig. 2. The combined gear selector and brake lever described on this page.**

### MECCANO IN THE U.S.A.

Among the prize-winners in a recent Meccano Competition was an American model-builder, William P. Fisher, Ashland, Pennsylvania, who built the very fine walking dragline shown in Fig. 1 on this page. It is based on a Marion type excavator and is operated by two electric motors, one of which drives the walking, hoist and drag movements, while the other operates the boom slewing mechanism. The mechanism is controlled from the rear of the cab, which is assembled from cardboard. The graceful tapering boom is well-proportioned and the entire model has a most realistic appearance.

### AN IDEA FOR BUILDERS OF SUPER MODELS

W. N. Cramer, a keen Meccano enthusiast living in Clinton, De Witt County, U.S.A., recently sent details of a large built-up geared roller bearing that is capable of supporting great loads and which will be of particular interest to readers able to indulge in the construction of very large models such as giant hammerhead and block-setting

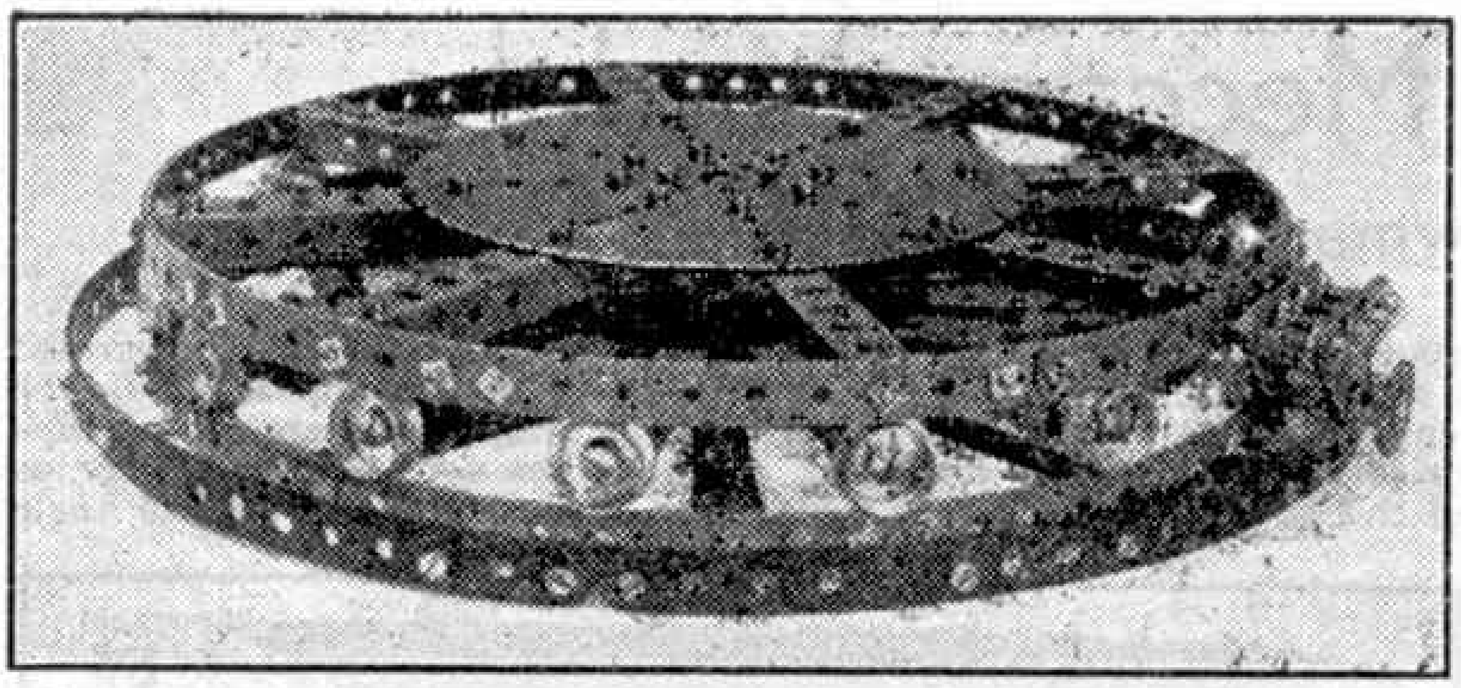


**Fig. 3. A built up geared roller bearing capable of carrying a heavy superstructure. It is designed by W. N. Cramer, Clinton, Illinois, U.S.A.**

cranes. Details of Mr. Cramer's assembly are shown in Figs. 3, 4 and 5.

The bearing is designed to carry a very heavy superstructure, and the retaining frame for the rollers has the same outside diameter as the Meccano Flanged Ring, Part No. 167b. The details of the assembly and the parts used will be clear from the illustrations, and it will be seen that the rollers run on a ring of Strips. The driving action is given by a Pinion engaging the teeth of a geared ring formed from Rack Strips, this Pinion being mounted on the same axle as a Sprocket driven from the power unit.

The Pinion and Sprocket should be located at the side of the superstructure. A Rod may be put through the centre of the assembly and rotated independently or not as desired.

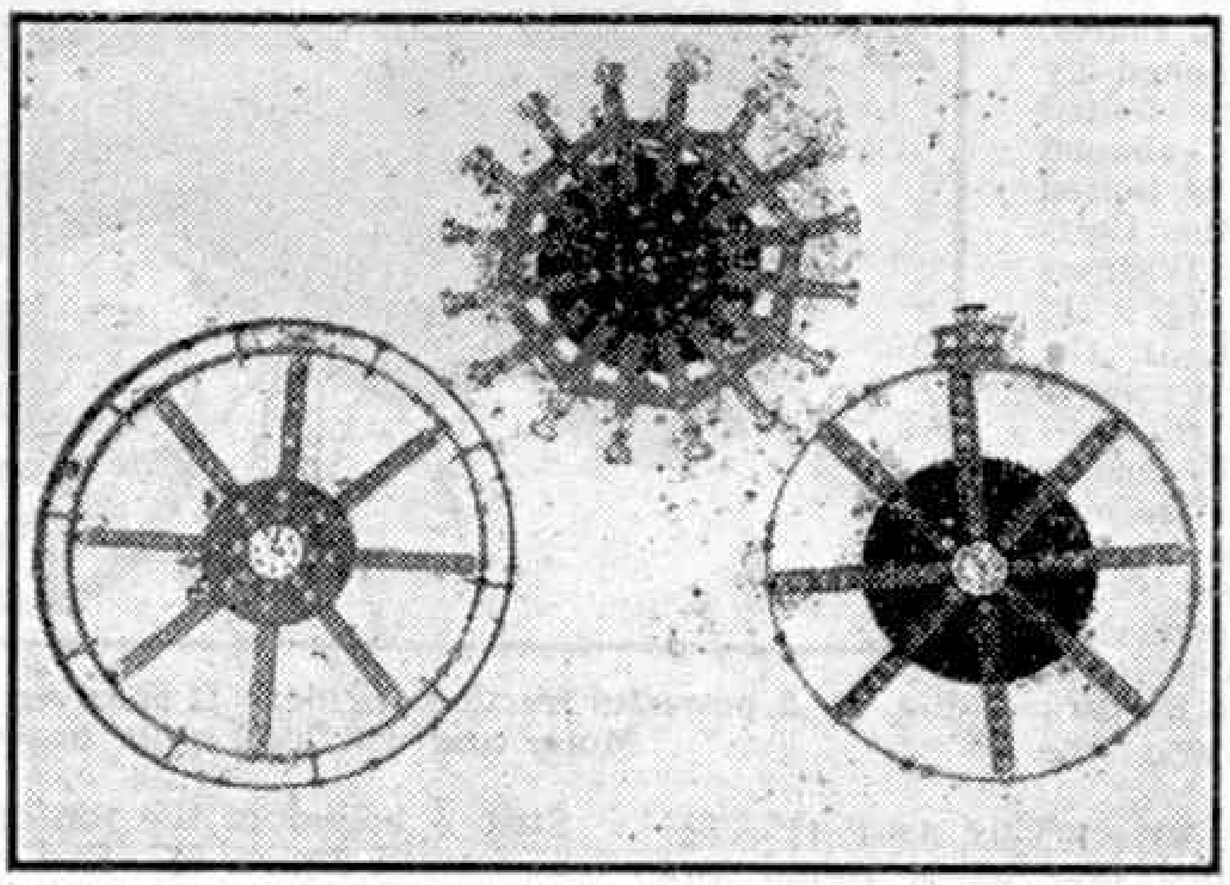


**Fig. 4. The three components that form the complete geared roller bearing.**

The bearing is a very interesting and skilful piece of work, its only fault being that Meccano parts must be bent to construct it. However, some model-builders may think this worth while in order to obtain such a serviceable structure.

A Meccano Eccentric requires ample lubrication because of its large rubbing surfaces, and this is a point that model-builders should not overlook whenever they use one of these parts in models.

## Make a Note of this Competition

### A Chance to Win a Useful Cheque

We wish to remind readers that the "Priestman Excavator" model-building Competition which was announced in the January issue of the "*M.M.*" is still open for entries. In this Contest fine Cash Prizes are offered for Meccano models of the Priestman "Wolf" Excavator, a description and illustrations of which appeared in the competition announcement. The Contest is divided into Home and Overseas Sections and is open to readers of all ages living in any part of the world. The First Prize in each Section is a Cheque for **£6/6/-** and there are also 22 other cash prizes in each Section.

The **Home** Section of this Competition closes on **29**th April next, and the Overseas Section on 31st July.

To enter the contest it is not necessary to send the actual model. A good photograph, or failing this a good sketch of the model, together with a short description of its principal features, are all that is required. The competitor's age, name and address should be written clearly on the back of each photograph submitted, and the envelope containing the entry should be addressed: "*Priestman Excavator Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13.*"

As this is one of the most interesting competitions we have organised for some time we hope that as many readers as possible will decide to send in entries.

## HOW TO USE MECCANO PARTS

### Eccentrics (*Parts Nos. 130 and 130a*)

There are two kinds of Meccano Eccentrics, part No. 130, which gives three different throws ($\frac{1}{4}$", $\frac{3}{4}$" and $\frac{1}{2}$"), and part No. 130a, which gives one throw only ($\frac{1}{4}$"). The term "throw" means the radius of eccentricity, so that the total rectilinear movements or strokes obtained for the three rows of No. 130 are $\frac{1}{2}$", $\frac{3}{4}$", and 1" respectively, while that of No. 130a is $\frac{1}{2}$". The great advantage of an Eccentric is that it provides an easy method of obtaining a reciprocating movement from a rotating shaft without breaking the line of the latter, as in the case of an ordinary crankshaft. On the other hand a disadvantage lies in the fact that, unlike a crank, it can only transform rotary movement to reciprocating, and cannot be used to produce rotary motion unless triplicated. In model-building, as in actual engineering, most frequent use for the eccentric is found in the operation of valve mechanism for reciprocating engines.

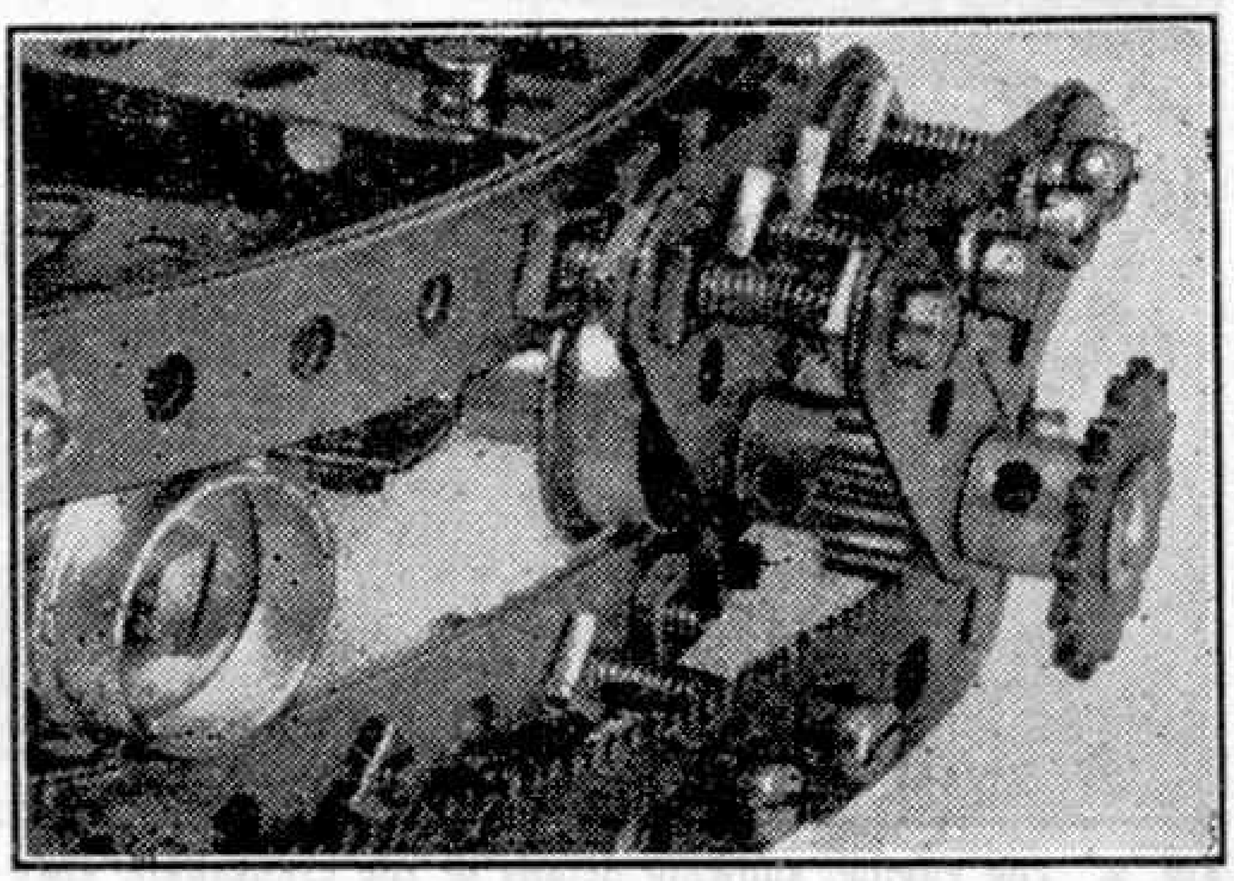


**Fig. 5. This illustration shows how the geared roller bearing is rotated through a Pinion engaging a ring of Rack Strips.**

# New Meccano Model

## Showman's Traction Engine

THE model seen in Fig. 1 represents a powerful traction engine of the kind used by travelling showmen for hauling fairground and circus equipment. Engines of this type are usually fitted with a dynamo mounted at the front of the boiler, and this supplies electricity for lighting the fairground and amusement machines, etc.

The body of the model is built from a frame of 7½" and 2½" Angle Girders 1 and 9½" and 2½" Angle Girders 2. Each side is filled in with two 9½" Strip Plates, one 5½" × 2½", one 4½" × 2½" and two 2½" × 1½" Flexible Plates.

The boiler is built by attaching four 12½" Angle Girders to a Circular Plate, and curving round the Girders four 12½" Strip Plates. The underside is strengthened by two 12½" Angle Girders bolted together to form a U-shaped girder. A Flanged Disc is bolted to the Circular Plate, the Bolts that hold it having several Washers on their shanks. A 4½" × 2½" Flexible Plate attached at the front of the Boiler forms a canopy and is edged by two Formed Slotted Strips and two 2½" Curved Strips. The boiler fittings are now bolted in position. The dynamo is represented by three Boiler Ends, and these are connected together by short Screwed Rods. The dynamo is attached by two 1" × ½" Angle Brackets to the canopy.

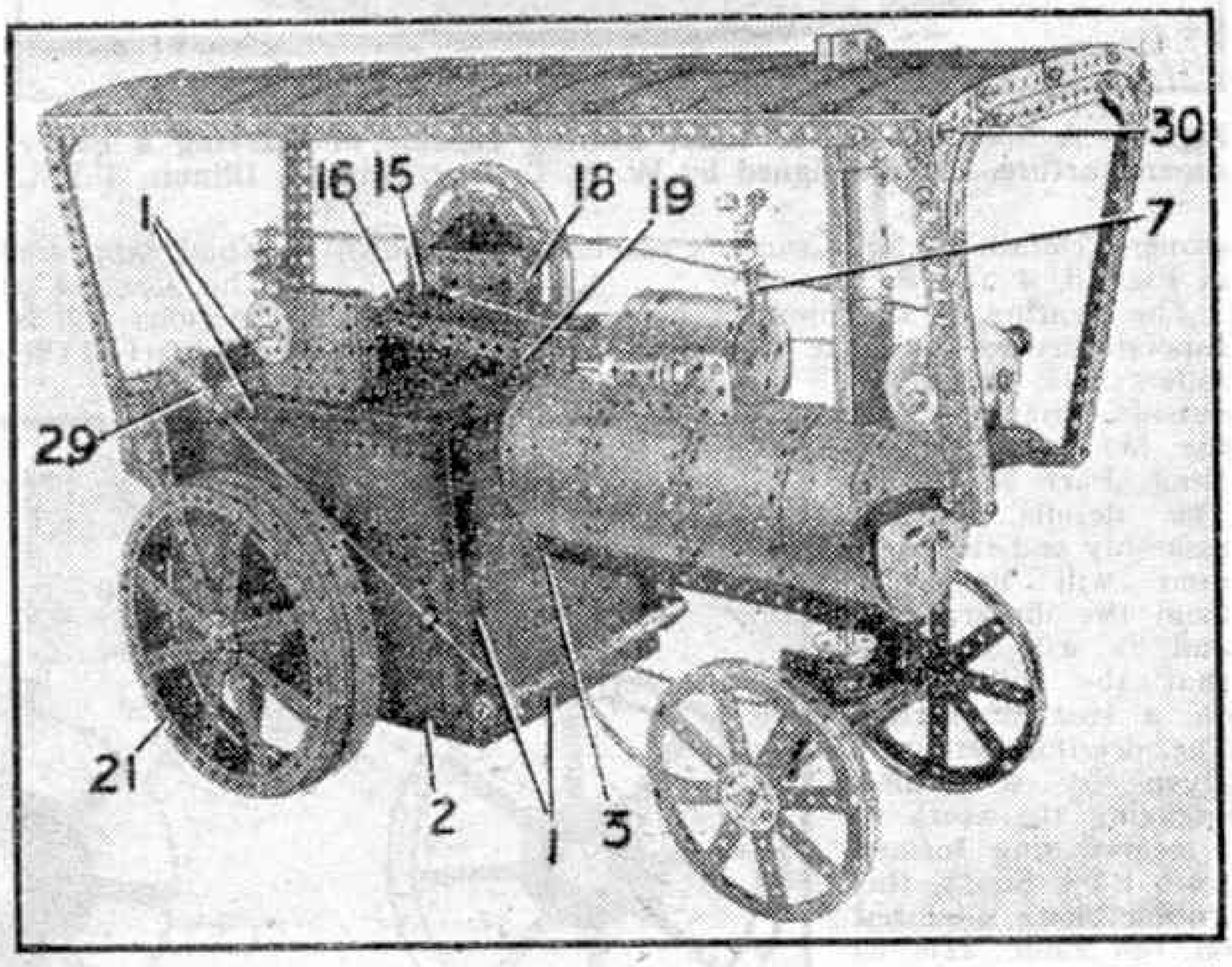



**Fig. 1. A powerful traction engine. It is driven by an E20R type Electric Motor and will haul quite heavy loads.**

The cylinder is built by curving two 4½" × 2½" Flexible Plates, overlapped four holes, round two Boiler Ends, and then attaching 3" × 1½" Flat Plates as shown. A Sleeve Piece with a ¾" Flanged Wheel at each end, represents the valve chest and is attached to the cylinder by a ½" Bolt with one or two Washers on its shank. The slide bars are formed by two 3½" Strips 4, and they are attached to the front of the cylinder by Angle Brackets. The Strips are connected at the other end to two 1½" Strips bolted at their lower ends to a 1½" × ½" Double Angle Strip 5 bolted to the top of the body. A crosshead is formed by a 1½" Rod which carries two Slide Pieces, and large and small Fork Pieces. A 3½" Rod 6 is held in the small Fork Piece and represents the piston rod. Bearings for the governor are made by bolting a 1½" Strip 7 to the Boiler End and attaching a Double Bracket to it. The governor itself is a small Fork Piece to which two Collars are attached. The boiler is attached to the body by 1" × 1" Angle Brackets, which are bolted to the ends of the 12½" Angle Girders and to compound girders at the front of the body.

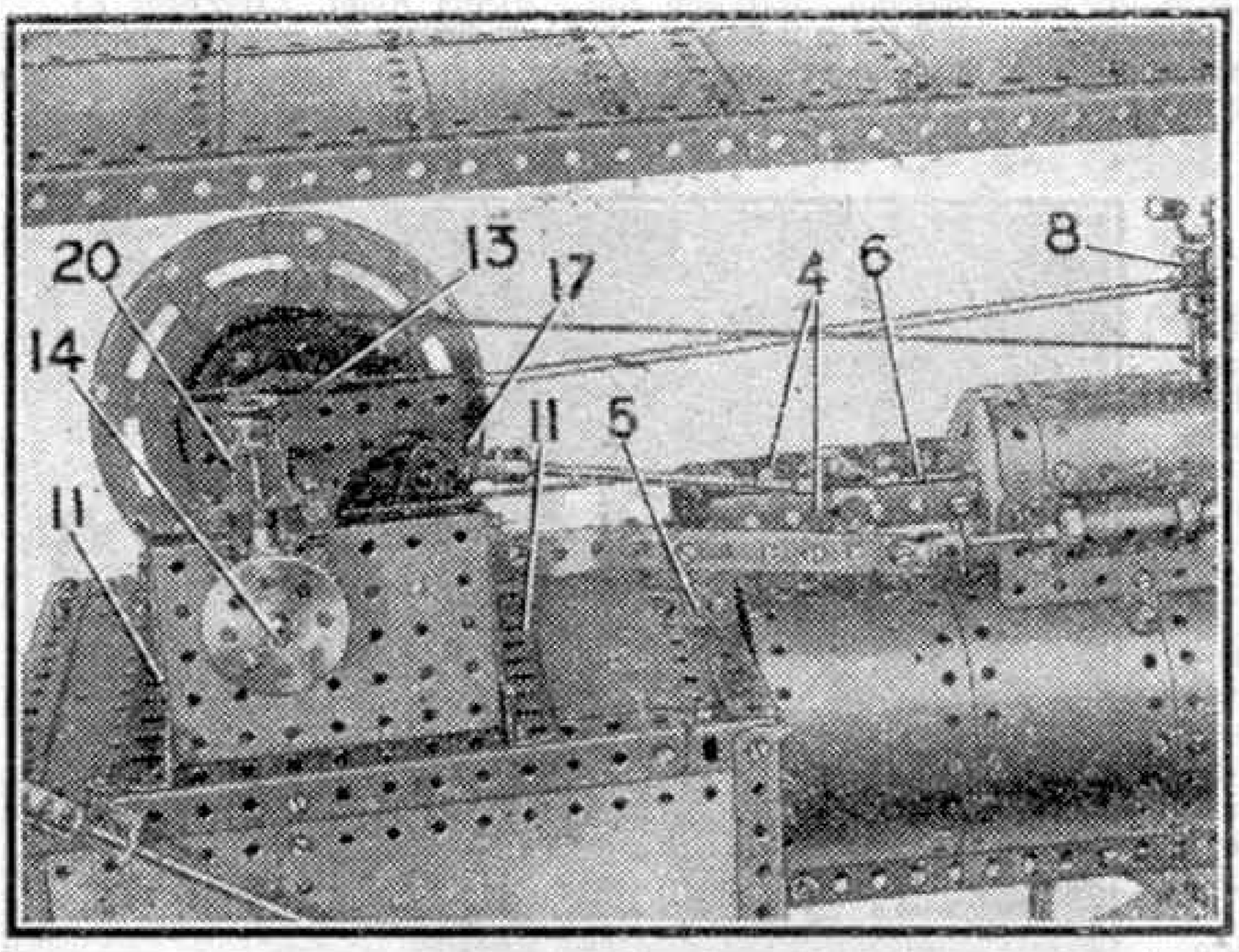



**Fig. 2. The engine, showing details of the crankshaft, slide bars, crosshead and the governor drive.**

The Motor is bolted to two 7½" Angle Girders 9, which are part of a frame built with two 9½" and two 7½" Angle Girders and two compound girders 10. The sides of the Motor are extended by 2½" × 2½" Flat Plates which form bearings for the gear rods. The Motor drives through four stages of gearing each consisting of a ½" Pinion and a 57-tooth Gear Wheel.

The Motor unit complete is fixed in the body by bolts passed through the sixth hole from the lower end of vertical girder 1, and similar girders at the rear of the body. A 1½" Bolt is fixed tightly to the centre arm of the Motor switch, and carries a Collar in which is locked a 3½" Rod that forms a control lever and allows the Motor to be stopped or reversed when the firebox front plate is in position.

Two 3½" × 2½" Flanged Plates bolted

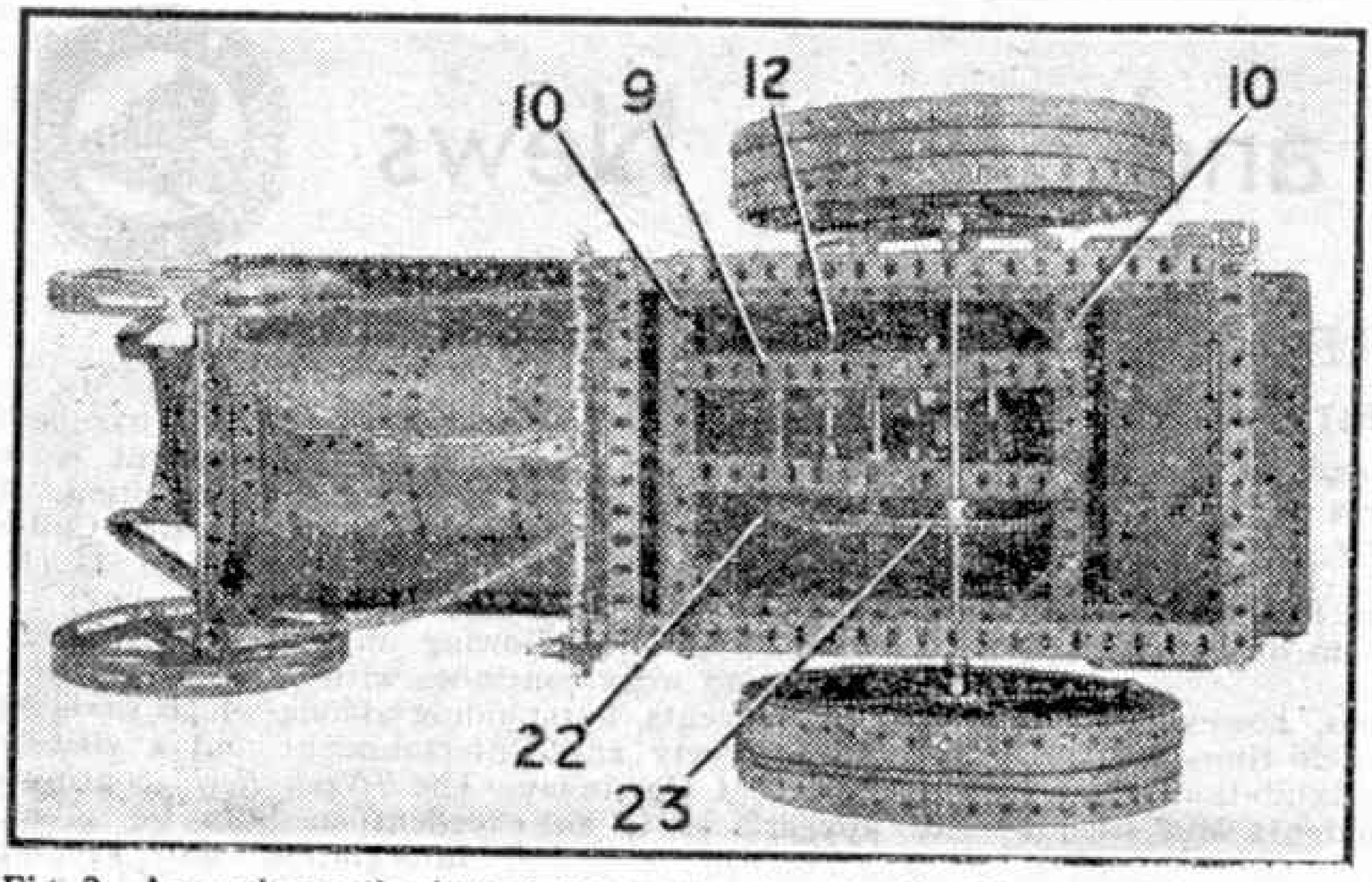



**Fig. 3. An underneath view of the tractor showing the Motor unit in position and the drive to the rear axle.**

together form each of the bearings for the crankshaft, and each set is bolted to compound girders 11. A length of Chain takes the drive from a ¾" Sprocket Wheel 12 to a 2" Sprocket 13, which is mounted on 8" Rod 14 inside one of the bearings. Each crank web is made by bolting a Crank 15 and a Double Arm Crank 16 to a Flat Trunnion. Two of these units are constructed, and are connected by a 1" Rod, on which is a Fishplate 17 bolted to an End Bearing. The connecting rod is locked in the End Bearing and also in the large Fork Piece on the crosshead. A 3½" Rod is locked in each Double Arm Crank 16, and the crankshaft so formed connected to Rod 14 by 1" Sprocket Wheels and Chain, part of which can be seen at 18.

A compound strip 19 made by bolting a 5½" and a 3" Strip together is attached to the arm of a Single Throw Eccentric. At the other end it is pivotally connected to an End Bearing in which is locked a 2" Rod.

The governor drive is taken from the crankshaft through a ½" Pulley fixed on a Rod mounted in a 1½" Angle Girder and Double Bent Strip fixed to one of the crankshaft bearings.

The flywheel is made by bolting a 4" Circular Plate and a 3" Pulley to a Hub Disc. A double length of Cord takes the drive from the 3" Pulley to a ½" Pulley on the dynamo.

The rear wheels are identical in construction, each being built by connecting two Circular Strips 21 by four 1½" Double Angle Strips and curving five 5½" × 1½" Flexible Plates round them. The spokes of the wheels are 3½" Strips. The rear axle is a compound rod made by joining an 11½" Rod and a 1½" Rod. It carries a 3" Sprocket 23 that is driven by Chain from a ¾" Sprocket 22.

The front wheel spring 24 is assembled from 5½", 4½", 3½", 2½" and 1½" Strips bolted face to face and bent as shown in Fig. 4. It is then bolted to a 2½" × 1½" Flanged Plate, the bolts by which it is secured holding also a Bush Wheel 25. This Flanged Plate is then connected to a second Flanged Plate by two 1½" Flat Girders. A 2" Rod is fixed in the Bush Wheel and Flanged Wheel 26, and passes through two 1½" Angle Girders 27 and is held in place by a Collar. The Flanged Wheel carries five Metal Balls inside its flange.

The front axle is an 8½" Rod and passes through Double Brackets 28.

The steering column is an 11½" and a 1" Rod joined by Coupling 29. It carries a Worm Gear that engages a ½" Pinion on an 8" Rod that has eight Couplings and a Collar on it. A length of Chain is passed round the Couplings several times, and each end is then connected to a Handrail Support on the front axle.

The roof is built on a frame of two 24½" Angle Girders and two compound girders 30 consisting of a 5½" and a 4½" Girder overlapped three holes.

## Meccano Competition Results

### June "General" Contest (Overseas Section)

First Prize, Cheque for £3/3/–: A. W. Dickie, St. Clair, Dunedin, New Zealand. Second Prize, Draft for £2/2/–: C. F. Th. von Ziegenweidt, Delft, Holland. Third Prize, P.O. for £1/1/–: P. K. Coetzee, Pretoria, South Africa.

Five Prizes each of 10/6: M. Lomax, Kenya, South Africa; L. Phillips, Westport, New Zealand; S. Pearce, Malta, G.C.; W. N. Cramer, Illinois, United States; W. M. Fisher, Ashland, Pennsylvania, United States.

Five Prizes each of 5/–: B. Fraser, Palmerston North, New Zealand; G. Skinner, Auckland, New Zealand; Jacoob I. Bahemia, Mauritius; R. Stewart, Timaru, New Zealand; J. Xuereb, Malta, G.C.

### Meccano Parts Voting Contest (Home Section)

First Prize, Cheque for £2/2/–: N. C. Gray, London N.7. Second Prize, Cheque for £1/1/–: T. Hellaby, London E.7. Third Prize, Postal Order for 10/6: R. Pearse, Romford.

Thirteen Prizes each of 5/–: D. Marrow, Shotton; J. F. Chipping, London E.7; M. J. James, London S.E.9; J. Greenman, Kingston; K. Oakley, Hurst Green; D. Butterworth, Leeds, 8; D. H. Tomlinson, Wells Green, Nr. Crewe; D. E. Franklin, London W.7; R. Williams, Edinburgh; P. A. Klassen, Bradford; M. G. Nutt, Cuckfield; R. Martin, Ewhurst.

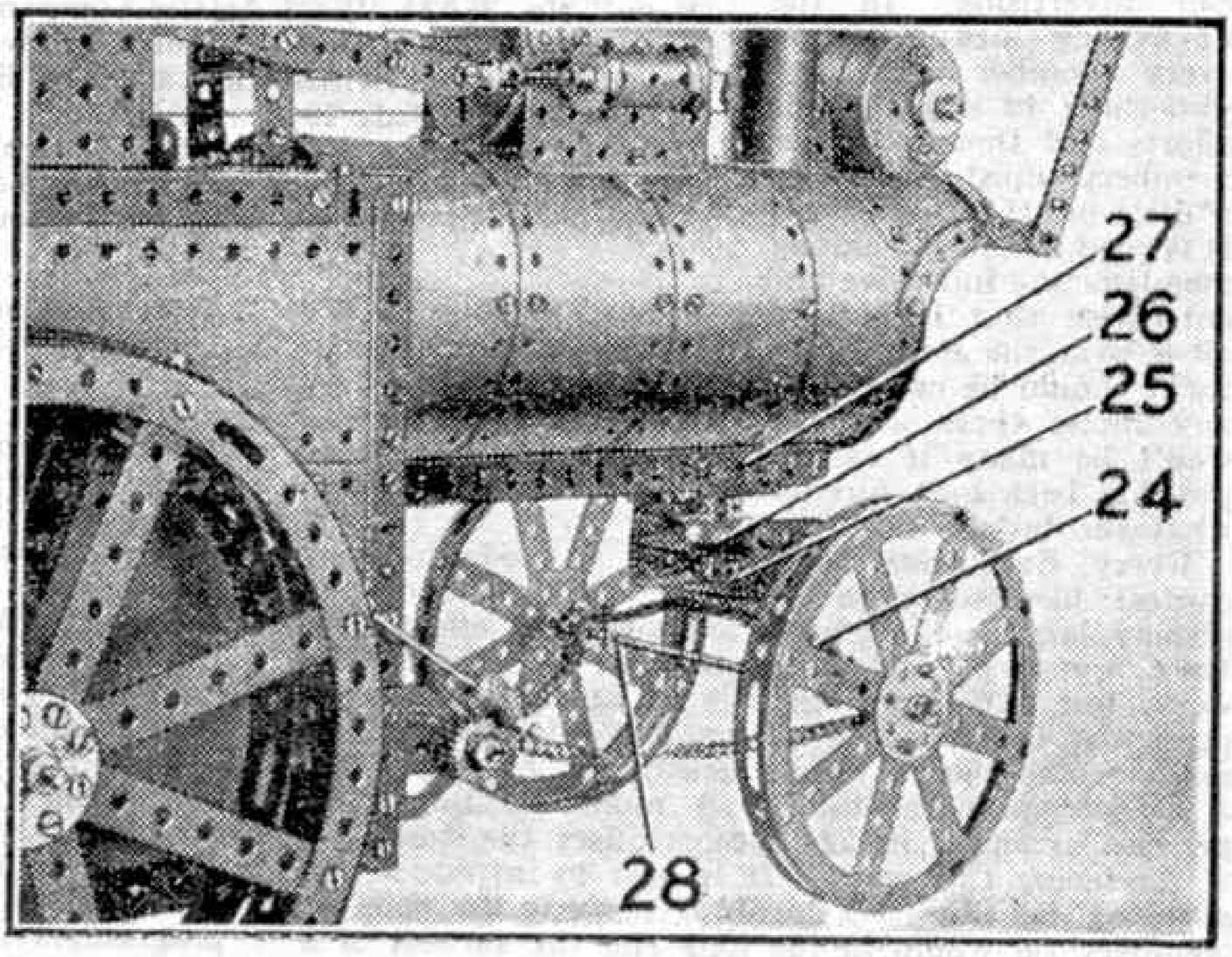



**Fig. 4. A close-up view of the front wheel mounting.**

# Club and Branch News

## WITH THE SECRETARY

### THOUGHTS ON EXHIBITIONS

We are now approaching the end of the Winter Sessions. The thoughts of members are probably on the splendid times they will enjoy in the open air during the Spring and Summer. I hope that all their ambitions in this respect will be fulfilled. although perhaps it is too much to expect an outdoor season as good as the last one.

Before the outdoor season comes, however, there is the indoor season to wind up. One time-honoured way of doing this is to arrange an Exhibition. I have always urged Leaders to show parents and friends of members what their Clubs can do by displays of this kind, and I am sure that the importance of Exhibitions at suitable times is now fully realised. The Easter holiday next month is one of these times, and an Exhibition should be arranged for then if at all possible, especially if the Christmas season was allowed to pass by without a meeting of some kind open to visitors.

Leaders should keep in mind that an Exhibition is something more than an opportunity for a display of the enterprise and cleverness of members. In addition it offers a splendid opportunity of encouraging and stimulating members themselves, and indeed this reason for arranging an Exhibition is fully as important as the need for what I may call advertising. In the necessary preparations every member will have something to do, and his efforts and those of other members must come to fruition at the right time. It is good to develop among members the initiative and enterprise that is necessary to ensure this. When all is over the Exhibition itself and the preparations for it should be carefully reviewed, in order to reveal any faults there may have been in either. There won't be many if every member is encouraged to put his best foot foremost in order to accomplish whatever task is set him.

Every Exhibition should have a model-building contest in association with it. It is splendid to display large models built by concerted effort, and these arouse general admiration for a Club and its work, but many visitors will be eager to see what particular individual members have done. For this reason there should be no lack of models that have a definite personal touch. A model-building competition arranged in age groups offers the best way of producing this result. It is best to introduce age grouping, for this gives encouragement to the younger members, on whom in the long run the success of a Club so greatly depends.

**Members of the Weymouth and District Branch, No. 503, photographed by A. J. Brown, founder and former Secretary, under the nameplate of "Merchant Navy" No. 35024 "East Asiatic Company" during a visit to the Salisbury Motive Power Depot, Southern Region, British Railways. This Branch was incorporated in July 1947. Its Leader is Mr. H. R. Roberts, Secretary, V. E. James. Members carry out regular operations on the Branch Layout, and specialise in railway visits and observations.**

## CLUB NOTES

CRYPT GRAMMAR SCHOOL (GLOUCESTER) M.C.—Model-building Competitions attracted excellent entries. A Table Tennis league tournament is in progress, in addition to a knockout competition. A start has been made with the planning of the Club's next Exhibition. Club roll: 30. *Secretary:* D. H. Gettings, 17, Riversley Road, Gloucester.

NORBURY M.C.—Following on the successful Exhibition, good work continues with epidiascope shows and other events, outstanding among which were the Christmas Party and Entertainment and a visit to the Circus at Harringay. The "*News Reel*" continues to appear. It is an excellent medium for giving information and keeping members interested in all phases of Club work. Club roll: 30. *Secretary:* J. W. Taylor, 186, Mersham Road, Thornton Heath, Surrey.

SHOREHAM-BY-SEA M.C.—Excellent meetings have been held throughout the Winter. Most of them were devoted to Model-building, but Hornby-Dublo Train operation also has been enjoyed in addition to Social and Games meetings. Terry Summers, a member of the Club, built a fine scale model of Broadcasting House, which was presented to Mr. John Snagge. Club roll: 15. *Secretary:* B. Taylor, 3, Park Avenue, Shoreham-by-Sea.

GREAVES METHODIST CHURCH (LANCASTER) M.C.—Excellent meetings are being held by this new Club. Model-building was enjoyed at some of them. At others a Film Strip kindly lent by British Railways was shown and a Brains Trust was held. A Social Meeting completed an enjoyable series. An Exhibition has now been planned. Club roll: 8. *Secretary:* T. Starr, "Derwent," Scotforth Road, Lancaster.

## BRANCH NEWS

CHINGFORD NEW ROAD—Members thoroughly enjoyed preparations for the Branch Exhibition, which kept them very busy. On the two days during which this was open 13 engines ran on the special track, with everything in perfect order. Steady progress is being made with the extension of the Branch railway. A Film Strip on railway subjects has been displayed. *Secretary:* A. Bishop, 425, Higham Hill Road, Walthamstow, London E.17.

BIRCHINGTON—A good start has been made by this new Branch, with more members coming along. It has a considerable amount of track and a good layout is being planned and constructed. A Library also has been formed and plans are being made to extend the programme by introducing Meccano Model-building. *Secretary:* B. Mandeville, Albany, Albion Road.

# Shunting on Hornby Railways

MANY Hornby train owners spend a great deal of their spare time by the side of a railway line or around some busy station. In the course of their visits they will have watched shunting being carried out, and no doubt will be keen to reproduce such fascinating operations on their own miniature systems.

Provided that reasonable care is taken, shunting can be done successfully on a suitable layout with Hornby locomotives and rolling stock. The great thing is to carry out all movements slowly, so that smooth and trouble-free working will result. Shunting in real practice is not a high-speed performance. A further important point is that the automatic couplings on all the vehicles concerned should be in good order and aligned so that they engage neatly.

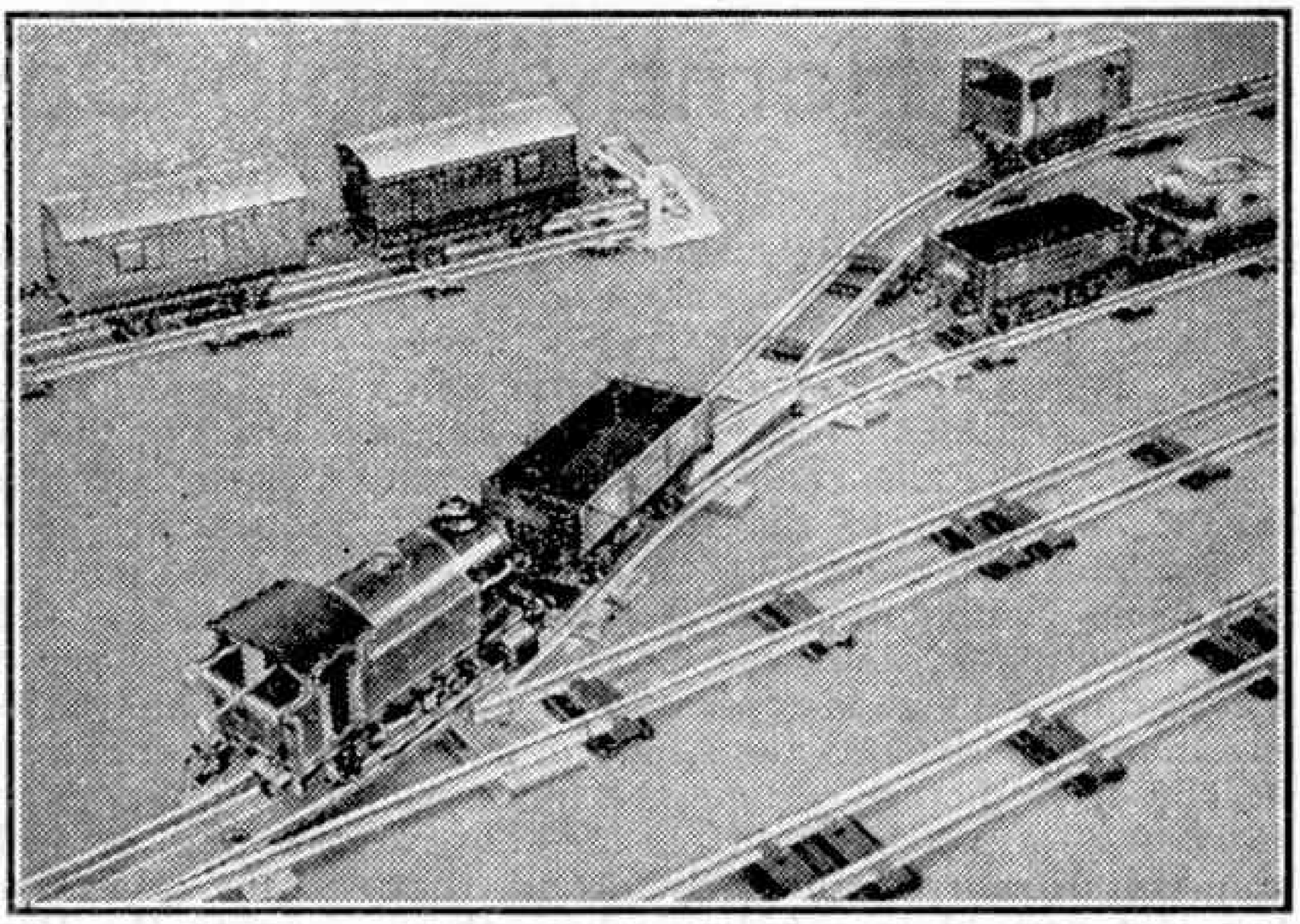
To take an actual example, we will suppose that we have an engine, such as the Hornby No. 101 Tank Locomotive, proceeding to the yard to carry out shunting operations. The yard may consist of several sidings with a few wagons and vans distributed haphazardly on the various "roads." Our task is to sort out the vans and marshal them into one train.

To begin work, we manœuvre the engine slowly into the first line of wagons, which has say two vans at the far end, and close up gently to them. We next reverse the engine and draw out of the siding until the last van has cleared the points. After setting the points, we back our vehicles into another siding, where the vans are uncoupled and left.

Uncoupling is carried out by raising the two coupling loops off the hooks. A Meccano Rod or something similar can be used with advantage to tap the loops upward. This can be done while the train is on the move, but the engine must be slowed down at the same time, and it requires a little practice to make the operation a certain one.

Next the engine and wagons draw out again, the wagons returning to their previous road. This process is carried on until we have our train of vans made up ready to be hauled away along the main line.

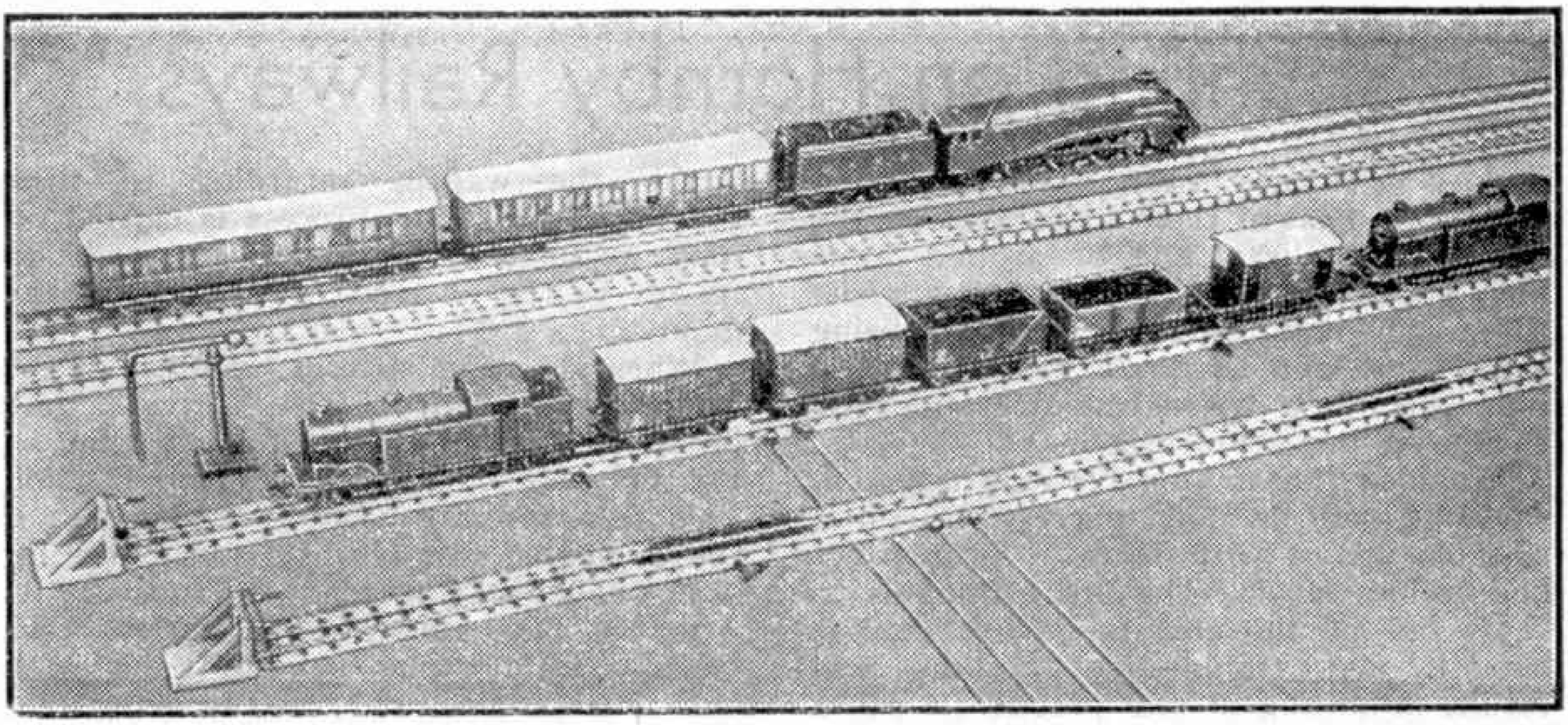
When shunting, careful handling of the engine is necessary. The "driver" may prefer to keep his hand on the engine all the time and so have it under close control. This is not really necessary, however; if the engine is wound just sufficiently for each move it will tend to run slowly. After a fair amount of practice, the Hornby train owner gets to know each individual engine and its characteristics, and will be able to carry out quite realistic operations of this kind.



**Shunting operations in progress on a Hornby layout. The Hornby No. 101 Tank shown is a handy engine for this kind of work.**

Now a word or two about the rolling stock. Make certain that the axle bearings are lubricated and that all couplings are in good condition and lightly oiled at their pivots so that they move freely. Clean wheels and rails also are very desirable, and if they are found to be dirty wipe them over with a dry cloth.

Do not attempt to shunt wagons that are loaded with heavy objects in the same train as empties, as "bunching up" is likely to occur. If loaded wagons and empty ones are intermingled, it is a good plan to deal with each wagon separately. Do not forget to obey the rule "*Shunt with Care*" when dealing with rolling stock, in order to ensure smooth working.



**The shunting engine approaches the Brake Van of the goods train. It will be seen that the train engine and the Brake Van are already uncoupled.**

# Some Hornby-Dublo Developments

IN the past few articles in these pages we have dealt with schemes involving the use of the Hornby-Dublo Uncoupling Rails and Isolating Rails. No doubt many Hornby-Dublo owners have discovered variations in the ways in which these special Rails can be applied to a layout, according to the operations that it is required to carry out.

Various combinations of Isolating Rails and Uncoupling Rails can produce some interesting results in operation. As an instance let us look at the situation shown in the first picture. Here the principal feature is a goods train, headed by a standard Hornby-Dublo 0–6–2 Tank, that has just arrived in a siding where there are two Uncoupling Rails. In the illustration, as the presence of the train prevents the details of the arrangement of the rails in the first siding being seen very clearly, the second siding in the foreground is laid out in exactly the same way. Between the first Uncoupling Rail encountered by a train and the second one, there is a Straight Half Rail and an Isolating Rail, in that order from right to left in the picture. Between the second Uncoupling Rail and the Buffer Stop is a Straight Half Rail.

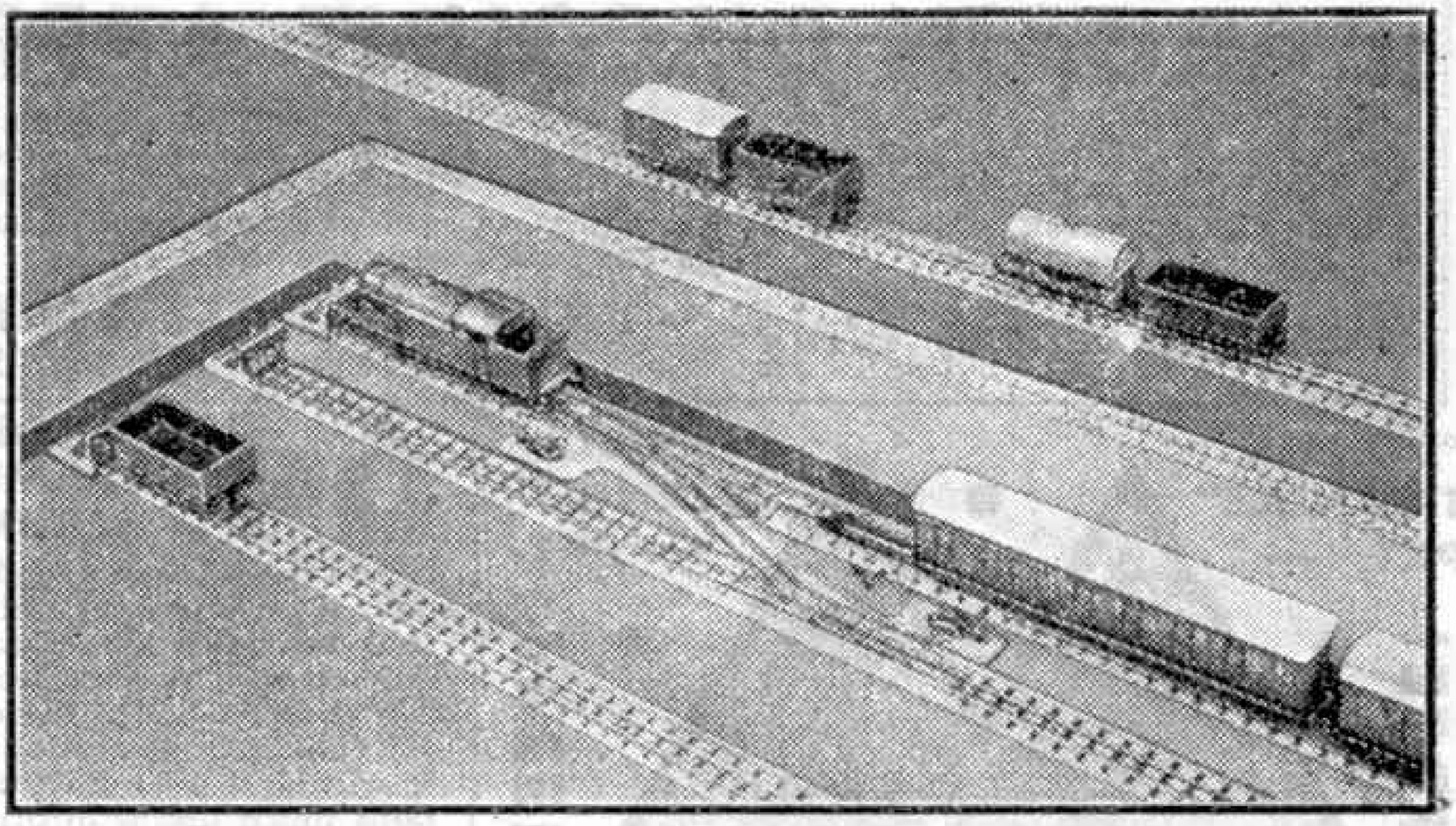
One working for which this particular arrangement can be used involves a train of four wagons and a Brake Van. This train is brought into the siding gently until the couplings between the engine and the first vehicle are just beyond the end of the ramp of the second Uncoupling Rail. Both uncoupling ramps are out of action, that is in the lowered position, while the train moves in.

The length of the train and the distance apart of the Uncoupling Rails is such that when both the ramps are raised to the operating position, the train can be backed gently until the couplings between the engine and the first vehicle, and those between the last wagon and the Brake Van, are parted. Then the train is stopped again and the section on which the engine is standing is switched out, so that the engine is isolated for the time being. This allows us to bring another engine up to the Brake Van end of the train as shown in the illustration. This second engine can be kept for shunting duties in the yard of which the siding forms a part.

The shunting engine can couple up to the Brake Van. Even if the Van is pushed up against the last wagon, the two will not recouple; their couplings are under the influence of the uncoupling ramp and are being held apart. The shunting engine takes the Brake Van away and can dispose of it in another siding, such as the one shown in the foreground of the illustration. Then it comes back to the train; but before it does so, the ramp of the first Uncoupling Rail on the siding should be put out of action. This allows the engine to couple up to the four wagons and draw them out so that they can be

distributed in other roads as required by means of Uncoupling Rails placed at strategic points.

Possibly the formation of the train is altered, and the new assembly, with the Brake Van at the rear, can be worked away by the shunting engine. Once this engine has completed its movements or is on another main section of the layout and therefore under the influence of a second Controller and Transformer, the engine that originally brought the train in can be worked away from the buffer stop section to other duties.



An example of how the Uncoupling Rail makes possible a run-round arrangement at a small terminus.

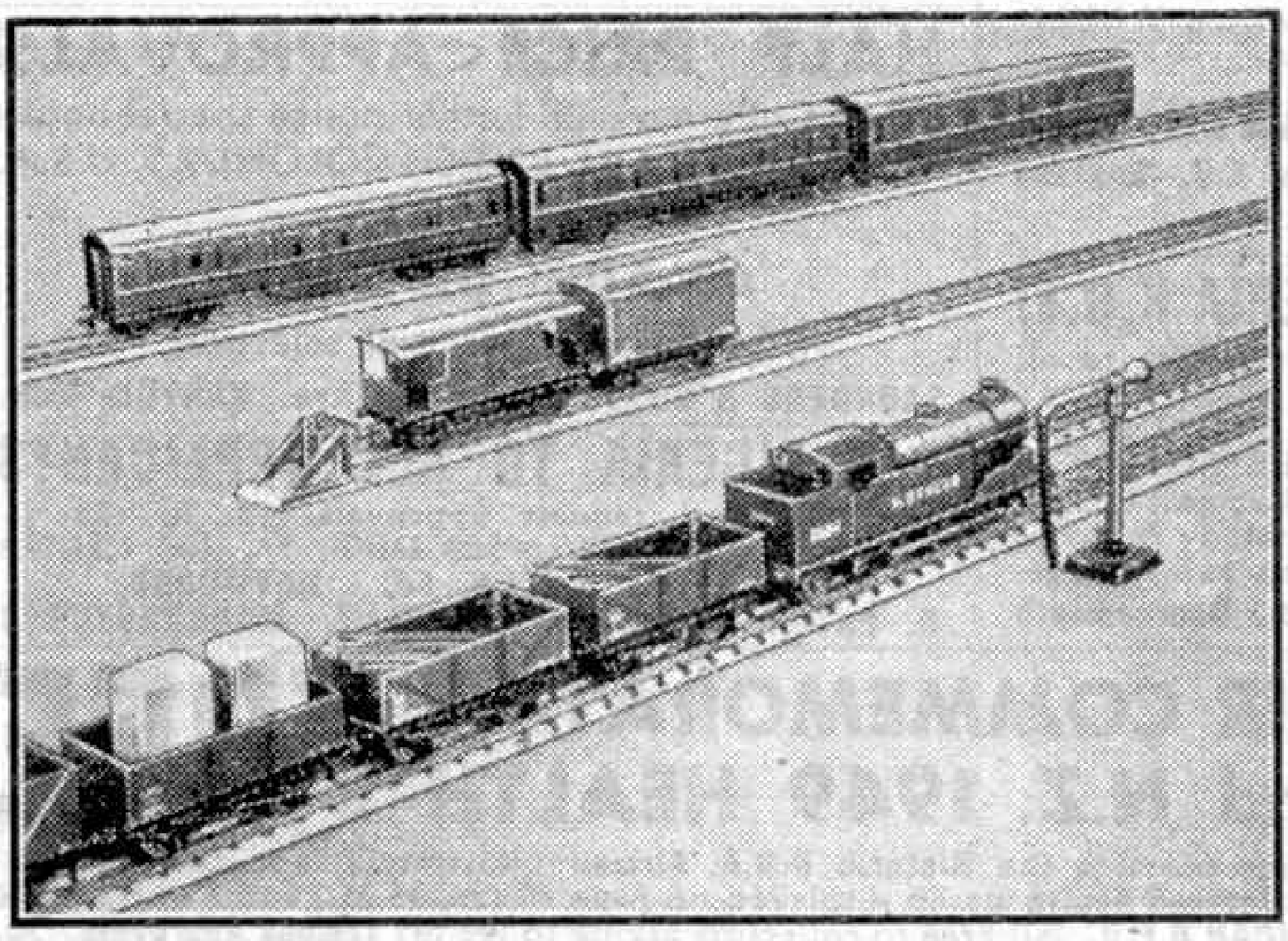
This second illustration shows a useful application of the Uncoupling Rail alone. This is situated on the platform road of a simple terminal station, where there is a loop line arranged so that an engine can run round its train on arrival. The train runs in with the uncoupling ramp out of action and is stopped so that the couplings between the engine and the first coach are just beyond the ramp. When the ramp is raised, the engine is backed up slightly. The couplings separate and the engine can then move forward clear of the Points. The Points are turned and the engine can then run round its train, if necessary, and work it away again.

This simple arrangement can be developed in conjunction with the Isolating Rail so that the arriving engine can stand in the buffer stop section after uncoupling; another engine could then come on at the other end of the train and work it out. The scheme would, in fact, be similar to that of the goods train operations described previously.

It will be noticed that in each case the amount of standing room for the engine in the two schemes dealt with is no more than a Straight Half Rail. This is just sufficient for the standard Dublo Tank. Where tender engines are involved, a standard Straight Rail is necessary.

Buffer stop sections or any sidings where engines are likely to stand for any length of time can very well be provided with one of the new Hornby-Dublo Water Cranes. One of these useful accessories is shown in the third illustration. The arm or top member of the Crane swivels on the column so that the "bag" or feed pipe can be led to an engine standing alongside.

If the Water Crane is placed between two tracks, engines standing on either track can be "watered." This new accessory is well modelled, with the usual ball-shaped counterweight to balance the arm and feed pipe. The base includes a reproduction of the water-control valve wheel mounted on a column.



The Hornby-Dublo Water Crane makes an attractive fitting in the sidings. The head of the crane can be turned to "water" engines on either side of it.

*For other Stamp Advertisements see also pages 138 and xv.*

# Stamp Collecting

## Pictorials from Sarawak

By F. Riley, B.Sc.

OVER 100 years ago Sir James Brooke went to Borneo to help the Sultan of Brunei, on the North coast of that wonderful tropical island, to deal with Sea Dayak pirates and head hunters. The struggle lasted six years, but in the end Brooke triumphed and for a reward he was given the district of Sarawak. There he and his successors held sway as Rajahs until July 1946. During this period Sarawak was enlarged by other concessions, and to-day it is almost as large as England and Wales and has a sea coast about 500 miles long. In it live more than 540,000 members of various races, including Sea and Land Dayaks, Kayans, Kenyahs, Malays and Chinese.


Until this year the stamps of Sarawak have always carried portraits of members of the Brooke Dynasty, and the centenary of the country was celebrated by a special stamp on which were portraits of Sir James Brooke, the first Rajah, and Sir Charles Brooke and Sir Charles Vyner Brooke, his successors. The centenary year was 1939, but the stamp did not make its appearance until five years later. Part of the delay was caused by the Japanese occupation, which lasted until 1945. The Government of the Rajah was then restored, but in the following year the country was ceded to Great Britain and is now a British colony.

The first Crown Colony issue in Sarawak, which appeared in 1947, consisted of 15 portrait stamps in various colours. The design was that of a pre-war issue, overprinted with a crown and the initials G.R. These served for a time, but in January of this year there came the excellent pictorial issue of which examples are illustrated on this page. In this there are 15 different designs. Most of these show members of the various native races of the country. The highest value, $5, depicts the arms of the Brooke family, while the next highest value, $2, has on it a map of Sarawak.


The lowest value of the new set, the black and green 1c., shows a remarkable butterfly, one of the most beautiful in the world, that has been named after the former ruling family and is known to entomologists as Troides Brookiana. It must present a remarkable appearance, with its colouring of black and metallic vivid green and its great size, for its wing span is 6 in. The 2c. value is a good companion, for this shows a weird animal known as the tarsier, a creature that is only about 15 in. long and has enormous brown eyes and strange long toes. It moves by jumps and is active only at night.


A large stamp that illustrates another typical living creature of Sarawak is the 10c. value, on which the scaly ant-eater is seen. This creature is covered with yellowish brown scales, but its most remarkable feature is its tail, which is as long again as its body. The scaly ant-eater can climb the smooothest tree trunk and is expert in burrowing underground, which it does to dig out the termites or ants on which it feeds.

Except the 25c. value, which shows pepper vines growing in Sarawak, the remaining values of this splendid issue are concerned with the people who live in it. For instance, the 4c. shows a girl and boy of the Kayan tribe, who live inland and are noted for wood carving and bead and metal work. The 6c. value shows a Kayan woman sewing a bead pattern on a huge palm leaf hat, and the 3c. stamp shows a Kayan tomb, which is a large wooden box set on the top of a post 15 to 20 ft high.

The sea Dayaks or Ibans, with whom the Kayans were perpetually at war before the Brookes reduced the country to order, provide the designs of the 8c. and 50c. values, while the Kenyahs and Kelabits are featured on the 12c. and $1 stamps respectively. The 12c. value shows Kenyah boys with a native canoe, the prow of which is splendidly carved to represent the head of a crocodile. The Kelabits live in the rich uplands of the interior, and are expert farmers and craftsmen. The $1 value shows one of their smithies, at which they make fine steel knives and swords, using hammers of stone lashed to wooden hafts.


The 20c. value, illustrated here, shows a rice barn. Certain tribes of the interior formally lived on wild sago, but gradually they have become rice cultivators. Unlike the Ibans, who store their rice in their main buildings, these tribes build separate granaries in order to guard against loss of food from fire, and it is one of these buildings or storehouses that is shown on the 20c. stamp.

Nowadays matches are fairly plentiful in most parts of Sarawak, but in places more primitive methods of fire making are employed, and one of these is illustrated on the 15c. value, in the design of which a native boy is seen rotating a pointed stick of hard wood in a small hole in a soft wood block in which he has placed a little dry fibre. Friction produces enough heat to make the fibre burn, but the process is a difficult one for those who are accustomed to easier ways of fire raising.

*For other Stamp Advertisements see also pages 136 and xv.*

# Stamp Gossip

## and Notes on New Issues

By F. E. Metcalfe

MANY collectors prefer to overlook the fact that money plays an important part in their hobby. They look upon their stamps as something only to provide them with recreation, and without a doubt they have the right outlook.

The foregoing remarks are prompted by four collections which the writer of these notes recently inspected. Now any one of those collections was well worth having, and each owner, without spending more than £5, had gathered not only a lot of stamps, but also a lot of fun in the process of gathering. The collections were what is known nowadays as "thematic." This is a rather horribly synthetic word, but it does have the virtue of explaining itself. Two collections were concerned with stamps showing views, another with the inevitable ships, and the fourth with monuments. In each case all information available regarding the view or whatever it was which was depicted, was neatly written under each stamp. Neat writing can be quite effective, so it is not necessary to be able to print. The result all round was well worth the trouble taken and such a collection of subjects as the first consideration is to be recommended.

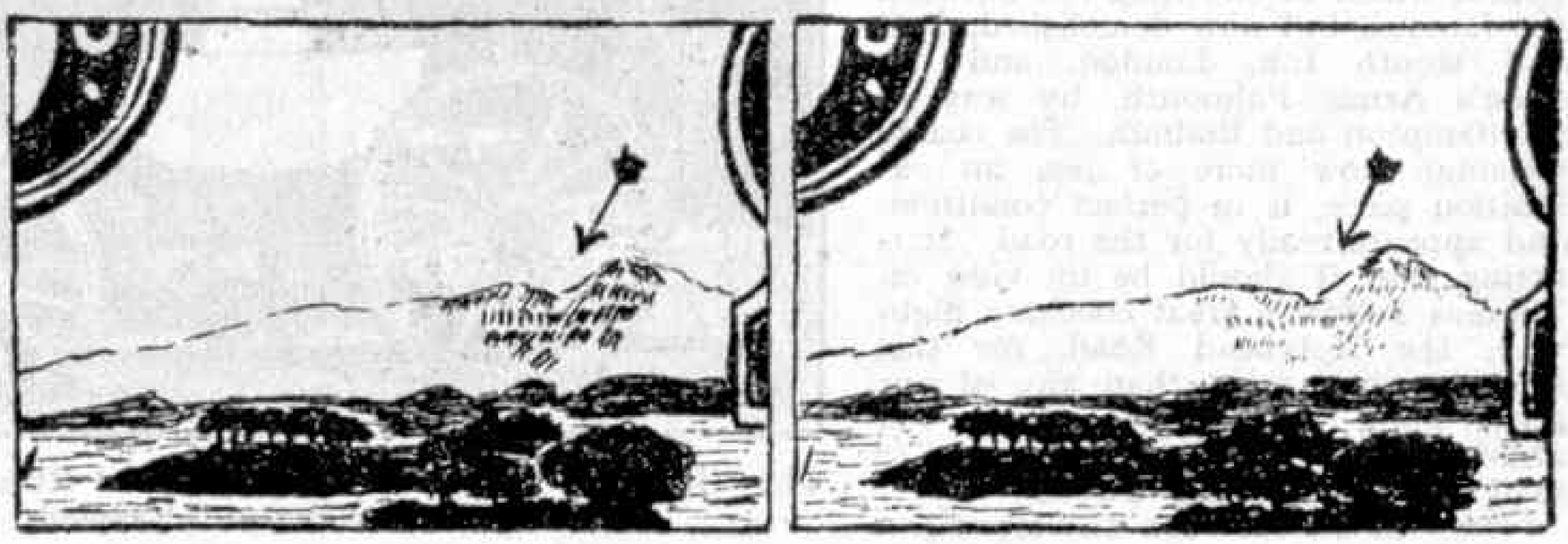

These four collectors are helping one another by "swopping" and they ignore any monetary values. All started by writing to a dealer, enclosing a few shillings with a request for as many of the particular stamps which interested them as the cash would buy. Since then odd purchases and exchanges have been all that was necessary. One of the collectors actually has over 600 stamps in his collection, and the lot has not cost more than £4 in actual cash. The themes of all these collections were not very original and any collector could easily think up something for himself. Maps make a good show. The editor of a well-known stamp magazine collects postmarks only, and these must have something to do with silver. From his writings about his collection he is apparently having a whale of a time.

Collectors of the U.P.U. sets are now busy mounting their sets, and with time to study them are taking notice of what they have gathered. Several stamp papers are talking about the best design, and while there will be no unanimity, stamps with a simple motif such as the one issued by Australia seem to earn the most votes. A beautiful stamp on these lines was issued by the Portuguese colony of Angola, and this stamp has actually been voted as the winner by one magazine, but our own Australian will take a lot of beating.


Australia has been much in the stamp news lately. Its latest addition is a lordly £2 value, which it must be admitted is quite a handsome affair. Such a high value was badly needed, for with air mail postal rates still so high packets are frequently sent which call for postage of well over £10. In fact, one was seen recently with stamps totalling £32, so the new high value cannot be said to be a production for sale to collectors only. These long-suffering people no doubt will buy many of them, but if a used copy will do, and a collector has a little patience he should be able to buy one for a few shillings. But do see that it is a nicely cancelled copy. This will make the search a little more difficult, for these air-mail cancellations are devastating efforts as a rule, and nowadays a heavy cancellation greatly devalues a stamp. For instance, in Australia our own British £1 stamps are being offered as low as 2/- each with airmail cancellations, whereas a stamp with a neat circular postmark would readily bring two or three times that sum.

It has always been claimed that stamp collecting was an easy way of acquiring a knowledge of geography, but that subject is not the only one which our hobby helps along. What about politics? For instance, last year British stamps were overprinted "B.M.A. Somalia" for use in the territory which previously belonged to Italy. Suddenly the authorities advised that stamps were now available overprinted "B.A. Somalia," which of course meant that our military administration had given way to one of a civilian character. That is a spot of political knowledge that stamp collectors gathered by the way through their hobby.


One collector has asked what is a retouch. This is a question which has cropped up before, and now is a good time to answer it, because one of the nicest retouches we have ever come across appeared a few months ago on the 10c. stamp of Kenya when it changed colour from brown and orange to black and green. A retouch is where the design of a stamp is renewed at the part which has become worn or damaged. The accompanying sketches show clearly what we mean. Looking at the top of the mountain of the right-hand one you will see how it appears normally. In the one on the left the stamp has been retouched and the top of the mountain is more prominent through the work which has been done on the plate. The sketches are slightly exaggerated to stress the point more clearly.

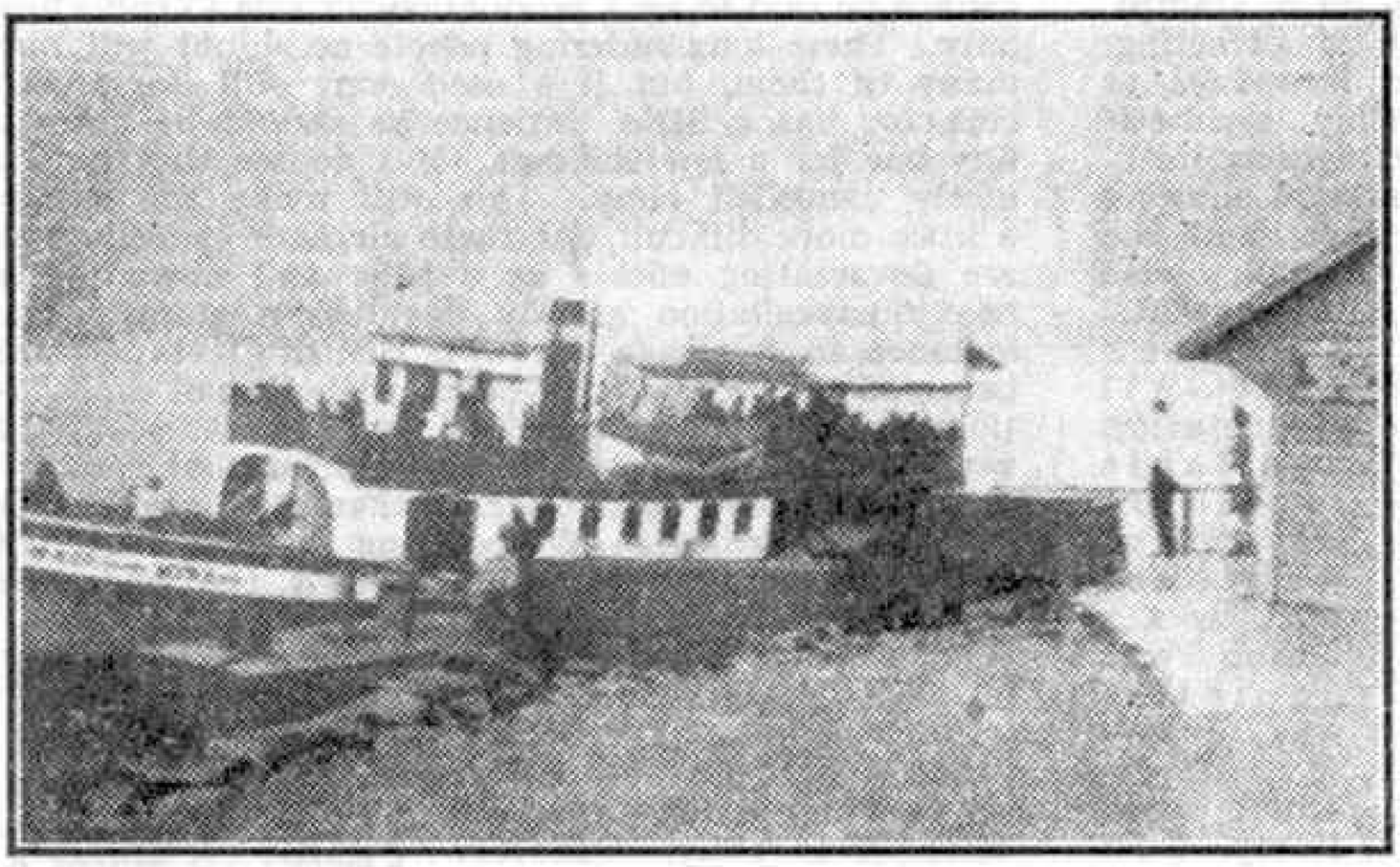


# From Our Readers

*This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.*

## THE "MAID OF THE MIST"

Niagara Falls and the surrounding district have many attractions for the visitor. One of these is a trip in the "*Maid of the Mist*," a small vessel that actually sails near the foot of the Falls themselves. The upper illustration on this page shows the vessel



**The "Maid of the Mist" on the Niagara River. Photograph by David Parrott, Monticello, Ontario, Canada.**

on the United States side of the river. The Falls themselves are to the left.

A lift takes passengers down to the place where the vessel is boarded. As it nears the Falls it is surrounded by mist, and indeed often is lost to sight; and because of this passengers have to wear raincoats, which are supplied to them on the vessel itself. The trip undoubtedly is one of the most exciting experiences that Niagara has to offer, for it gives fine views from the river of Niagara's famous bridges as well as a close approach to the Falls themselves.

DAVID PARROTT (Monticello, Ont.)

## THE LONDON-FALMOUTH STAGE COACH

When passing Tyn-y-coed, near Bettws-y-Coed, I noticed a stage-coach drawn up at the side of the main Holyhead Road. Upon inspection it turned out to be the "Roebuck" Coach, which at one time ran between the famous, but now demolished, Bull and Mouth Inn, London, and the King's Arms, Falmouth, by way of Okehampton and Bodmin. The coach, although now more or less an exhibition piece, is in perfect condition, and appears ready for the road. It is fitting that it should be on view on Thomas Telford's great coaching highway, the Holyhead Road, for this famous route, more than any of our great main roads, still retains the atmosphere of the old-time days of mail and stage coach travel.

C. R. ROWSON (Liverpool).

## ANTS

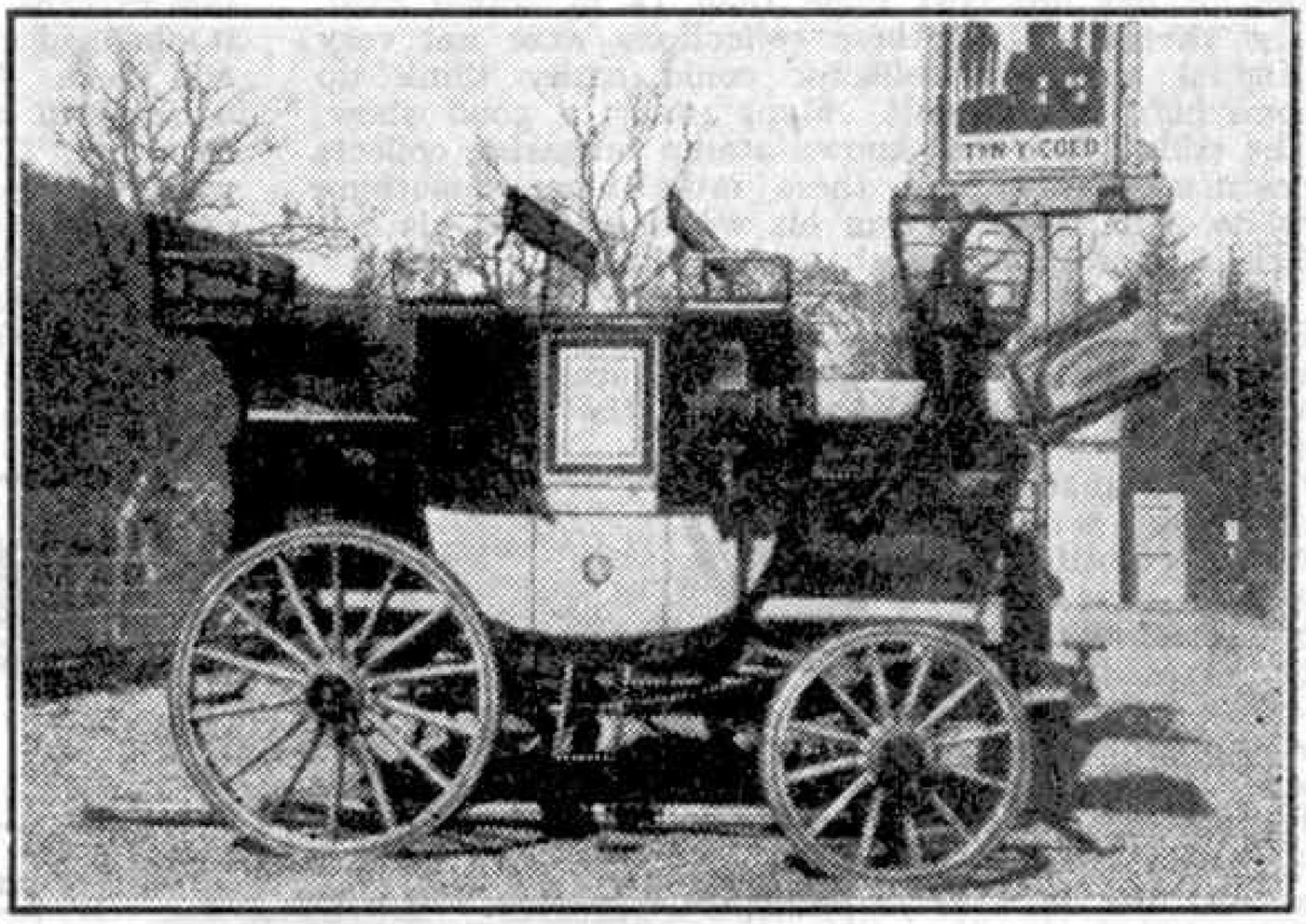
Almost all the different types of ants can be found in Africa. The small common type are to be found in most kitchens in South Africa in search of any sweet food left lying about. To prevent the ants devouring sugar, cake, sweets, biscuits, etc., these are placed in an ant cupboard, which is similar to a large meat safe, but each of the legs of the cupboard is placed in a small tin of paraffin.

Further north white ants are found in large quantities; they specialise in eating wood.

All houses in Northern and Southern Rhodesia have concrete floors to stop the unwelcome attention by ants to household furniture, wooden floors and food. Occasionally a track of ants will suddenly appear overnight issuing from a flaw or small crack in the concrete, and will be traced to a bag of sweets left on the table by some forgetful person.

Unfortunately ants don't confine their attention to wood and sweet foods. In the foundations of all houses in Central African territories ants would gradually eat away the inside of the walls if nothing were done to stop them. To counteract this a strip of lead or other metal is placed in all the walls at skirting board height, protruding about half an inch. In some houses a strip of cement about 12 in. deep is placed at floor level. This also stops ants, but not as effectively as a thin strip of metal does. This prevents the ants from doing serious harm. In its absence they would eat away the inside of the walls in the course of 25 to 30 years and would make the building unsafe.

P. J. HIRST (Lusaka).

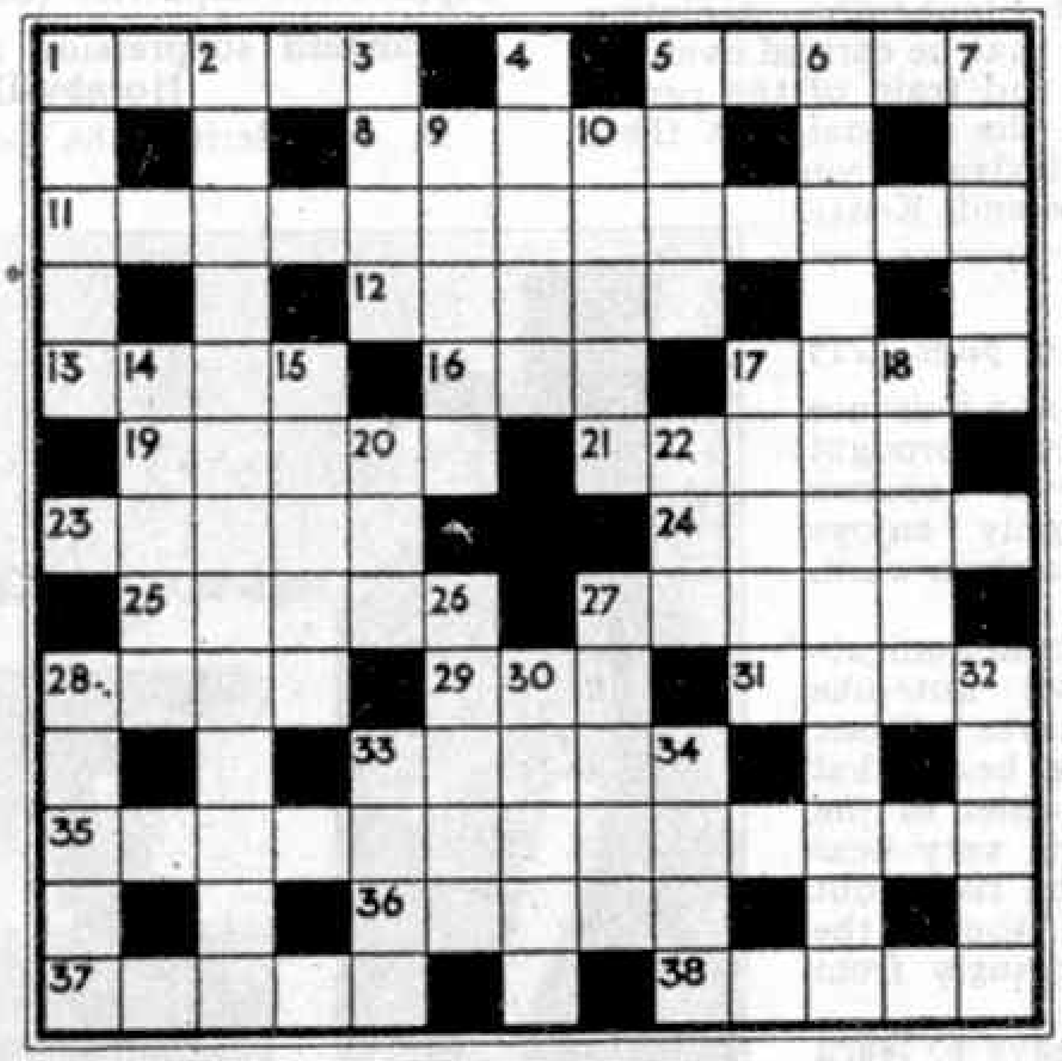



**The "Roebuck" Coach on the Holyhead Road. Photograph by C. R. Rowson, Liverpool.**

# Competitions! Open To All Readers

*Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.*

## March Crossword Puzzle



**CLUES ACROSS**

1. Enchantress
5. Made with Meccano
8. Rouse
11. Disables
12. Pebble
13. Puts on
16. Terminate
17. Vehicle
19. Official
21. Checks
23. Perfume
24. Select Body
25. Strayed
27. Brainless
28. Faithful
29. Sprinted
31. Measure
33. Counterfeit
35. Mathematical term
36. Fools
37. Drink
38. North African town

**CLUES DOWN**

1. Threw
2. Built anew
3. Sleeps
4. Meat
5. Measure
6. Resolution
7. Vigorous
9. Liquid
10. Sorts
14. Exterior
15. Portion
17. Hold up
18. Flower
20. Before
22. Number
26. Falls
27. Fireplace
28. Stain
30. Got up
32. Boy's name
33. Brawl
34. Compass point

This month we give readers one of our crossword puzzles, which we know from experience are always heartily welcome. It has been contributed by reader Ian Lambert and follows the usual lines of *"M.M."* crosswords, that is it is quite straightforward, containing no alternatives. Every word in it is to be found in Chambers or any other standard dictionary, while each clue means exactly what it says.

There are the usual two sections for Home and Overseas readers respectively, and in each of these prizes of 21/–, 15/– and 10/6 will be awarded for the best entries in order of merit. If necessary the judges will take the neatness and originality of entries into account. Solutions should be addressed *"March Crossword Puzzle, Meccano Magazine, Binns Road, Liverpool 13."* Do not cut out the diagram. Make a copy for the actual entry.

The closing dates are 29th April in the Home Section and 31st July in the Overseas Section.

## Try This One!

Doublets are always interesting. It is good fun to start with one word and to change it letter by letter until eventually another word that has some connection with it is obtained. For instance, cat becomes dog in the following chain: CAT–COT–DOT–DOG, the connection here of course being that both cat and dog are animals. For our second competition this month we have a collection of six doublets, and readers are asked to change from one word of each pair to the other in as few steps as possible. The doublets are as shown below:

| | | | |
|---|---|---|---|
| Enjoy a | TREAT | of | CREAM. |
| Put | PEER | on | ROAD |
| | READ | a | BOOK. |
| Build | MODEL | of | PARTS. |
| Out | WEEDS; | in | PLANTS. |
| | FIND | the | LADY. |

Prizes of 21/–, 15/– and 10/6 will be awarded to the competitors who complete these changes in the smallest number of steps, and of course every word in each change must be a recognised English word, to be found in any standard dictionary. In the event of a tie preference will be given to the entry having the neatest or most novel arrangement.

There will be two sections in this competition, for Home and Overseas readers respectively. Entries should be addressed *"March Doublets Contest, Meccano Magazine, Binns Road, Liverpool 13."* The closing dates are 29th April in the Home Section and 31st July in the Overseas Section.

## March Photographic Contest

The third of our 1950 series of photographic contests is a general one, in which we invite readers to send in prints of any subject. There are only two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of each print must be stated exactly what the photograph represents.

The competition will be in two sections, A for readers aged 16 and over, and B, for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections.

In each section prizes of 21/–, 15/– and 10/6 will be awarded. Entries should be addressed: *"March Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13."* Closing dates: Home Section, 31st March; Overseas Section, 30th June.

### GEORGE STEPHENSON AND THE SCOUTS

The naming of a Scout Patrol at Meopham, Kent, after the railway pioneer George Stephenson, had an interesting sequel recently. Mr. George M. Stephenson, great, great grandson of the famous engineer, presented an autographed engraving of his ancestor to Senior Patrol Leader Byford for the Patrol.

As the illustration shows, the engraving is a reproduction of the original "Chat Moss" portrait that was commissioned by Robert Stephenson, depicting his father standing by the line that he carried over the obstinate morass. An engine and train of the period appear in the background on the original, but these cannot be discerned in the illustration on this page. H. C. KING (Gravesend, Kent).

**Mr. George Stephenson, great, great grandson of the railway pioneer George Stephenson, presenting an autographed engraving of his ancestor to Senior Patrol Leader J. Byford, for the Stephenson Patrol, 24th Gravesend (Meopham) Scouts.**

**King of the River—**

(*Continued from page 121*)

advantage, and becomes as great a nuisance as a spoilt puppy. Unlike foxes brought up in captivity, an otter never becomes treacherous, and it thoroughly enjoys domestication, provided it has a clean warm bed of straw on which to lie.

In the wild state otters communicate with each other with a soft flute-like whistle, usually repeated three times. The note is as elusive as the beast that utters it. Sometimes in the quiet of the evening it seems to come from very near at hand round the bend of the river, but as one hastens toward the sound the next whistle heard comes seemingly from many meadows away.

There are many things we have to learn about these fascinating riverside animals, and no one is sure just how the otter whistles, as it is almost impossible for the beast to purse its lips to make such a sound. Some water bailiffs still hold to the old belief that the otter whistles through its nose.

**Using the Meccano Gears Outfit—**

(*Continued from page 125*)

on the bolts that hold the Angle Brackets before they are bolted into the bosses of the Pulleys. This allows the Angle Brackets to be bolted on tightly.

The cords that produce the playing movements are attached to $\frac{3}{8}$" Bolts on the Angle Brackets by small loops made in the ends of the Cord. Washers prevent them from slipping off the bolts. Experiment is necessary to find the correct length of Cord. The Cord that operates the pianist is tied to another small piece of Cord that connects Fishplate 16 and a similar part on the player's other arm.

Parts required to build Performing Musicians: 4 of No. 2; 8 of No. 5; 5 of No. 10; 2 of No. 11; 8 of No. 12; 1 of No. 15b; 1 of No. 16; 1 of No. 17; 1 of No. 18a; 4 of No. 22; 1 of No. 23a; 1 of No. 24; 1 of No. 24a; 3 of No. 35; 50 of No. 37; 6 of No. 37a; 6 of No. 38; 1 of No. 38b; 1 of No. 40; 1 of No. 44; 2 of No. 48a; 1 of No. 52; 4 of No. 90a; 6 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 188; 1 of No. 189; 2 of No. 190; 2 of No. 191; 1 of No. 192; 2 of No. 200; 1 of No. 212; 2 of No. 214; 2 of No. 215; 1 Gears Outfit "A"; 1 *Magic* Motor.

### BACK NUMBERS OF THE "M.M."

A few copies of the following issues are available, price 8d. each, including postage, etc.—October 1943; December 1945; January 1946; January, August, September and November 1947; November 1949. The January 1950 issue also is available, price 11d.

Readers wishing to obtain copies of these issues should write immediately to the Editor, "*Meccano Magazine*," Binns Road, Liverpool 13, enclosing a Postal Order in payment for the Magazines required.

**Suppression of Radio Interference—**

(*Continued from page 113*)

It will be apparent from the foregoing remarks that an unsuppressed model railway layout can be the means of causing considerable interference over a wide range of wavelengths. Fig. 2a (page 112) shows an oscillograph of an interference wave set up by a Hornby-Dublo Tank locomotive. Fig. 2b shows the result after fitting the same locomotive with its suppression capacitor (condenser).

**Standard suppression arrangement fitted to the Hornby-Dublo system.**

In considering the practical application of suppressors to Hornby-Dublo it was decided, for various technical reasons, to employ capacitors throughout the system, as a means of by-passing the interference energy. It was realised that, in order to achieve any success in this direction, initial suppression would have to be provided as close as possible to the interference source, which entailed having a capacitor of suitable value actually in the locomotive, as shown in Fig. 3 (page 113).

Although most of the energy which otherwise would be radiated is by this means absorbed, under certain circumstances, particularly on the higher broadcast and television frequencies, some interference might still be discernible on highly sensitive receivers, due mainly to the track and connecting leads acting as radiators of energy on these frequencies, and their harmonics. This is effectively dealt with by including further capacitors in the Controller (see Fig. 4) and under the Terminal Connecting Rail (see Fig. 5).

It might be imagined that in order to deal effectively with unwanted energy radiations it is only necessary to employ a capacitor of sufficient size, in fact the bigger the better. This is quite a mistake. The value of the capacitors, and their disposition in the circuit, are factors of vital importance. It is possible actually to *amplify* the interference signal by the use of a capacitor of incorrect value. An example of the importance of placing the suppressing medium in the right place in the circuit is provided by the fact that should the capacitor located under the Terminal Rail be removed and reconnected thereto with a few inches of wire, its effectiveness as a suppressor on certain frequencies would be entirely lost.

# Fireside Fun

"Manners, boy! Why don't you use the tongs for the sugar?"
"It's the tea that's hot, uncle, not the sugar."

* * * *

"You're working too hard, boy. What you need is a rest!"

* * * *

"Yes sir, that's a nice little air gun. I'll get you some slugs to go with it."
"You needn't bother. I have plenty in my garden. Just give me a box of those little pellets."

* * * *

"You see that man. He's never done a day's work for years."
"Strange. He looks prosperous. How does he live?"
"He's always on the night shift at his works."

* * * *

"I've been travelling in cars all my life, and never had a puncture yet."
"You've been fortunate. How do you explain it?"
"They were tram cars."

* * * *

"I'll read you my last poem."
"Thank goodness."

* * * *

"Have you any brandy in the car, sir?"
"Och awa! Clap one of his wafers on his forehead."

* * * *

### CAN BE READ EASILY

Readers like code puzzles and here is one that should interest them. What is meant by the following?

SDRAWKCABYLISAESDAERENILSIHT

### BRAIN TEASERS

### LOOK FOR THE TREASURE

From the letter square shown here subtract a fish, a bird, an insect and an animal. Something worth while is then left. What is it?

| | | | | |
|---|---|---|---|---|
| A | C | T | T | N |
| T | O | M | L | A |
| R | N | S | A | E |
| A | B | O | S | U |
| N | I | R | E | R |

K.J.B.

* * * *

### NOT A LEAP YEAR

The number of days in the year is made up by multiplying three consecutive numbers by themselves and adding the results together. What are the numbers?

If you have found these three numbers try then to find two consecutive numbers that give the number of days in the year when treated in the same way.

S.W.C.

* * * *

### NAME THESE TOWNS

The names of cities and towns often suggest strange ideas. Here is a puzzle in which this process is reversed, that is the ideas are given and the names of the towns suggested, all British, are wanted.

These are the ideas: 1, Water of unusual appearance. 2, Its people sound like sailors. 3, Noah's must have been an old one. 4, Can be used for making bread, but bread made from it is not eaten in Great Britain. 5, A hard place? 6, What can it be under? 7, Part of an oil lamp. 8, Animals.

B.I.N.

* * * *

"Hi! Aren't there any blinkin gates where you come from?"

* * * *

### SOLUTIONS TO LAST MONTH'S PUZZLES

Our first puzzle last month was a catch. The wire will cut through the block of ice, but the ice will freeze up again behind it, so that the block will not be cut in two at all by this method.

1st February will next be on Saturday in 1958. The second Tuesday in February 1960 will be the 9th.

The "x" experts who tried our third puzzle were liable to find that the father was 22½ years old on his birthday. If they noted that the conversation took place *before* the birthday, his age next birthday would work out at 27 and that of his son at 9. If the date of their next birthday is 29th February, however, a date that will not appear in the calendar again until 1952, the father will then be 36 years old and his son 12.

The words to be discovered in our fourth puzzle were CHURCH, LEGIBLE, EDIFIED, MAGMA, STYLIST, INGOING, ESTATES and IONISATION.

# STAMP ADVERTISEMENTS

(See also pages 136 and 138)

# MECCANO MAGAZINE

*Registered at the G.P.O., London, for transmission by Canadian Magazine Post.*

**EDITORIAL AND ADVERTISING OFFICES:**
LIVERPOOL 13, ENGLAND.
Telegrams: "Meccano, Liverpool."

**Readers' Sales and Wants.** Private advertisements (i.e., not trade) are charged 1d. per word, minimum 1/-. Cash with order. Readers' advertisements are published as soon as possible; inclusion in the first issue after receiving them cannot be guaranteed.


## READERS' SALES AND WANTS

### SALES

"M.M.s" from January 1942; perfect condition. What offers?—D. Tomes, 18, Leicester Road, Shepshed, Leicestershire.

"M.M.s" 1934-1938 inclusive; excellent condition; suitable binding; also odd numbers both pre- and post-war.—Spring, 36, "Linden Court," Anerley Park, London S.E.20.

"M.M.s" January 1939 to July 1947 inclusive (May '39, January '40, January '41, May and December '42 missing). Any reasonable offer for lot (only) secures. Good condition throughout. Box No. M.M.63.

"M.M.s" from 1930 to 1941 and 1947 to 1948. What offers?—Box No. M.M.64.

"M.M.s" and Railway Books for sale; S.A.E. for lists. Also Philips Philidyne Dynamo Lighting Set, 30/-, in perfect condition.—Clarke, 119, Thornely Crescent, Thurnscoe, Rotherham.

110 American and Indian Stamps; all different. Offers over 16/-. Apply to—C. J. Angel, Newtown, Prospect, Kilcock, Co. Kildare, Eire.

"M.M.s", March 1943-December 1949 inclusive; majority excellent condition. Offers, year or lot only.—D. Sloan, Ailsa View, Girvan Mains, Girvan, Ayrshire.

Two Hornby-Dublo Transformers; reasonable price.—Marshall, The Old Rectory, Lea, Gainsborough.

Trix Train; Tank Loco.; Transformer; Controller; Electric Point and Signal; Two Bogie Coaches; Six Goods Trucks; 60 ft. of Track. Also 28 Dinky Toys. Complete with Accessories, £10.—Moore, 20, New End Square, London N.W.3.

Copies of "M.M.s" January 1943 to December 1948 complete; good condition (two slightly torn); 37/6 post free.—K. Beck, 8, Lower Ellacombe Church Road, Torquay.

"M.M.s" February 1939-July 1943; August-December 1936; March-October 1937. Offers?—Payne, 61, Horringer Road, Bury St. Edmunds, Suffolk.

### WANTS

Hornby-Dublo Electric Tank Locomotive; Corridor Coaches (L.N.E.R.); all types of Freight Rolling Stock; City Station with Arched roof; Goods Depot; Engine Shed; Signal Cabin; Buffer Stops; Home and Distant Single Arm Signals and Junction Home Signal (Hand Operated); Electric Straight Rails, Half Straights, Half Curves and Points (Hand Operated). Must be in good condition. Give details and state price.—I. Merry, 36, Archer Road, Redditch, Worcestershire.

Good condition: Used Meccano Parts and Sets. Special Model Leaflets. Particulars and prices to—Ramon Littee, 248 E 77th Street, New York City, N.Y., U.S.A.

Electric 00 Gauge Layout or Set and Accessories. Also 0 Locomotives and Rolling Stock.—Gogerty, 38, Poulter Road, Aintree, Liverpool.

Six Trix Trucks in good condition; will exchange for Hornby-Dublo Accessories, namely Three Goods Vans, One Cattle Truck and Two Open Goods Wagons (old type couplings).—Middleton, 43, Broad Street, Peterhead.

# DINKY BUILDER

## The Building Toy for Younger Folks

Simplicity is the keynote of this fascinating building system. With Dinky Builder hinged plates and rods, the youngest children can build all kinds of models with the greatest ease—Furniture, Buildings, Windmills, Wheel Toys and scores of others.

The parts are beautifully enamelled in blue and yellow. They can be used over and over again. Nuts and bolts are not used in this system.

| | Price, incl. Tax |
|---|---|
| No. 1 Dinky Builder Outfit .. | 12/ |
| No. 2 Dinky Builder Outfit .. | 23/- |

A No. 1 Outfit can be converted into a No. 2 Outfit by the addition of a No. 1A Accessory Outfit .. .. Price 12/- (incl. Tax).

**MADE IN ENGLAND BY MECCANO LTD.**


# MECCANO GEARS OUTFIT "A"

This Gears Outfit "A" has been specially designed for owners of the smaller standard Meccano Outfits, which do not include gears.

Used in conjunction with any Outfit from No. 2 to No. 6, it will enable you to drive your models through gears just as real engineers do, instead of having to be content with pulleys and belts. You will find it quite simple to fit into your Meccano models various mechanisms of the type that are described and illustrated in the Book of Instructions.

PRICE 10/6 INC. TAX

**MADE IN ENGLAND BY MECCANO LTD.**

PUBLISHED BY MECCANO LTD., BINNS ROAD, LIVERPOOL 13, ENGLAND
*Printed by John Waddington Ltd., Leeds and London.*