VOL. XLII No. 7 JULY 1957

MECCANO MAGAZINE

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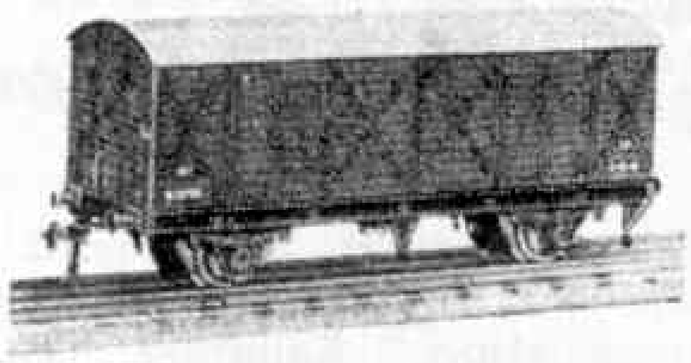

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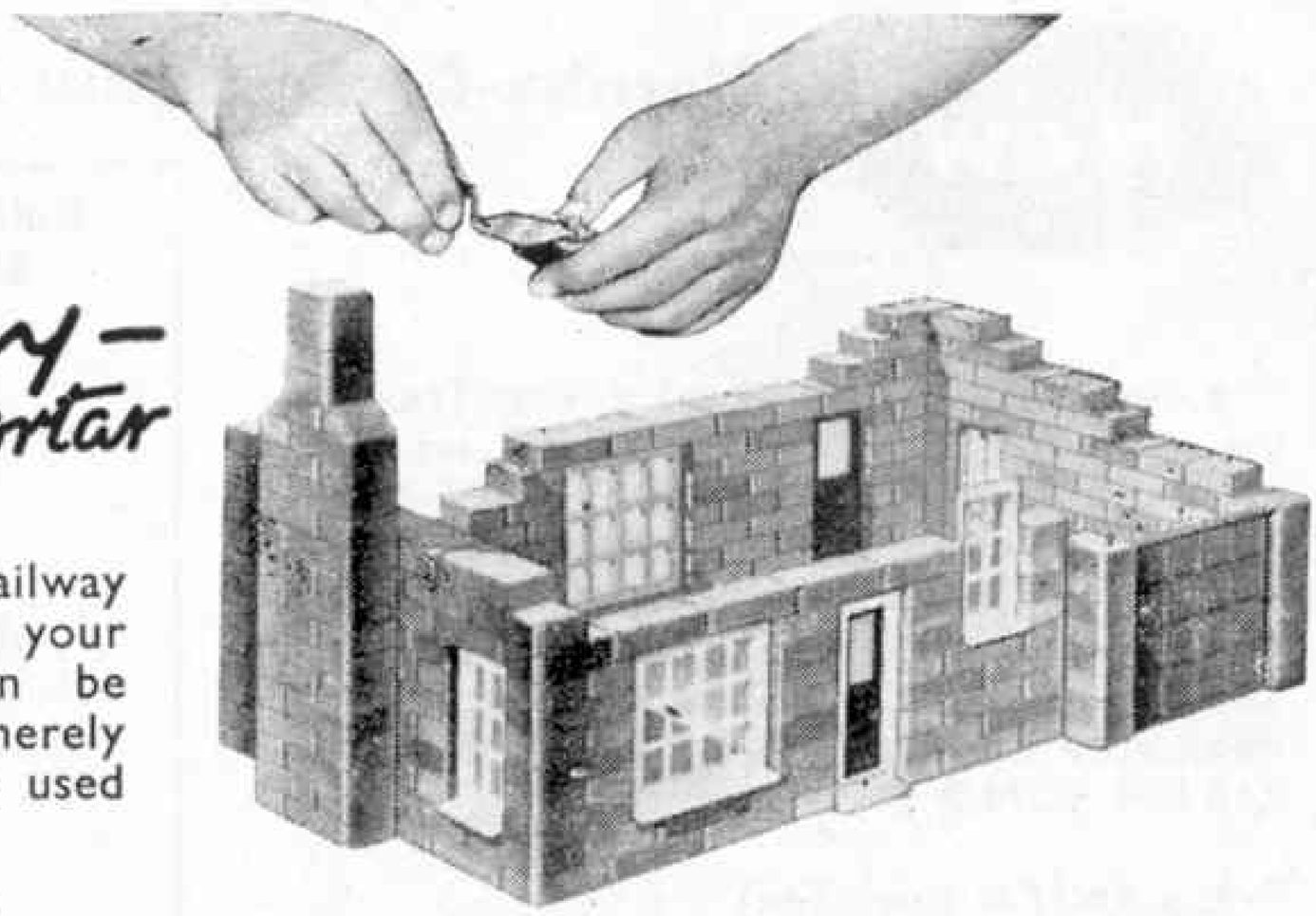

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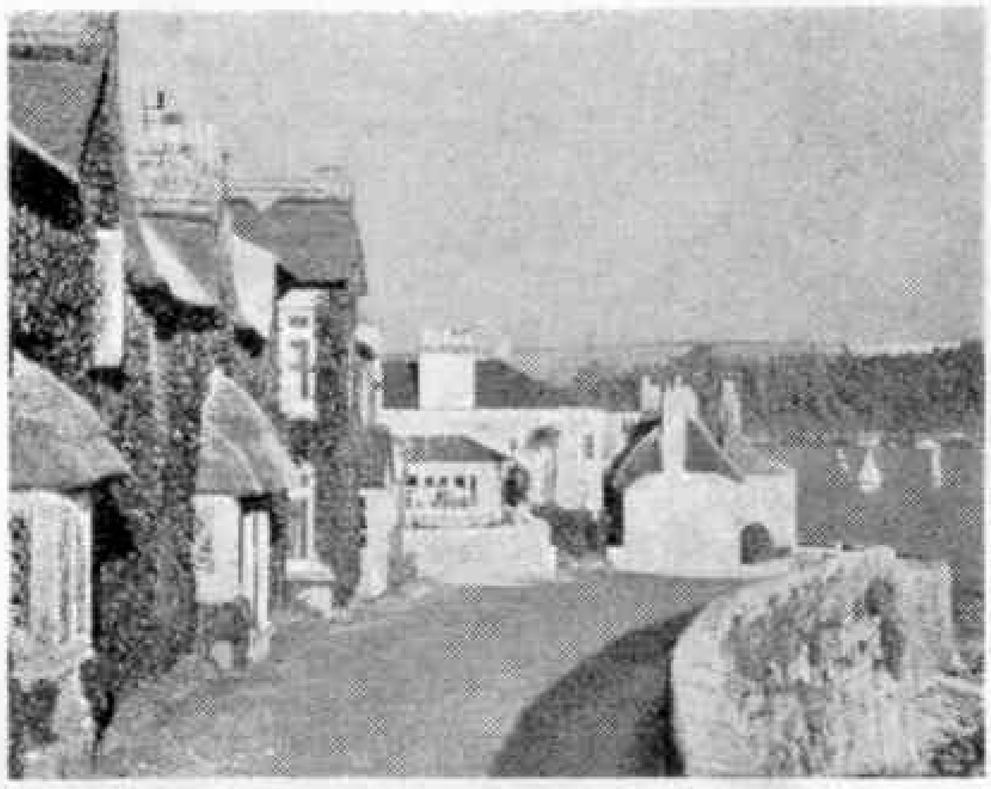

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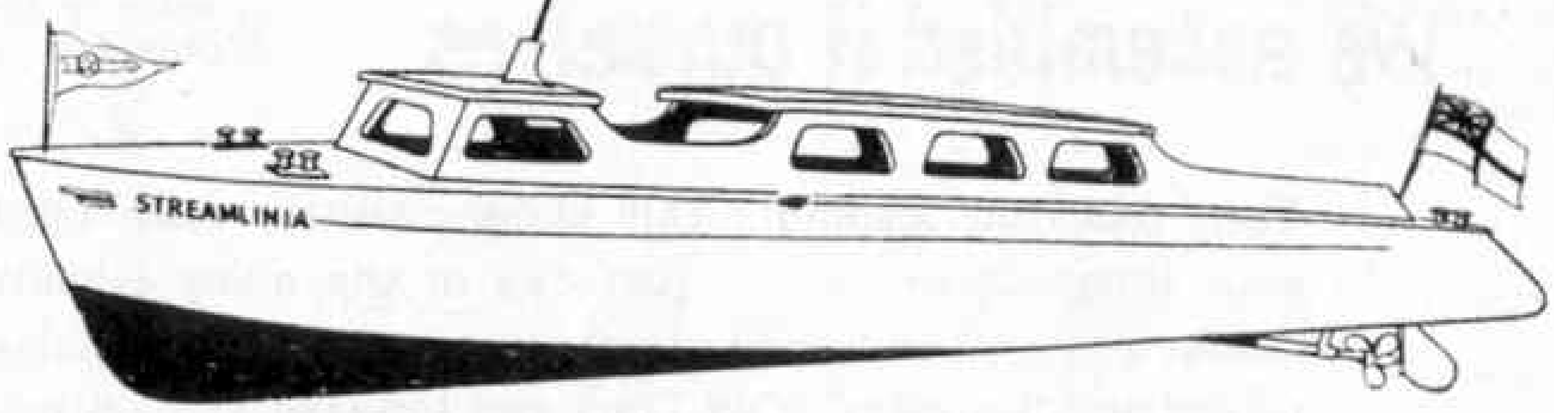

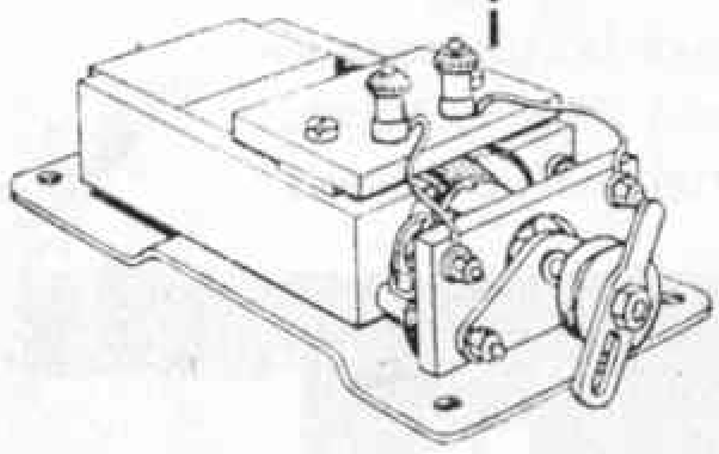

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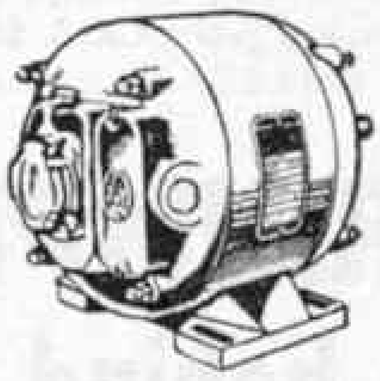

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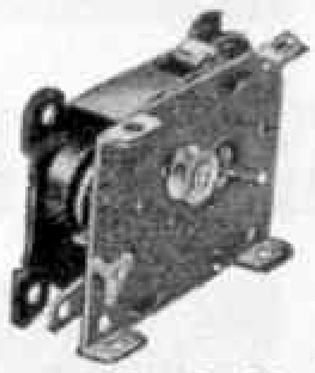

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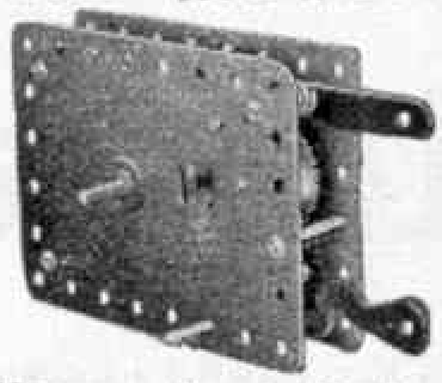

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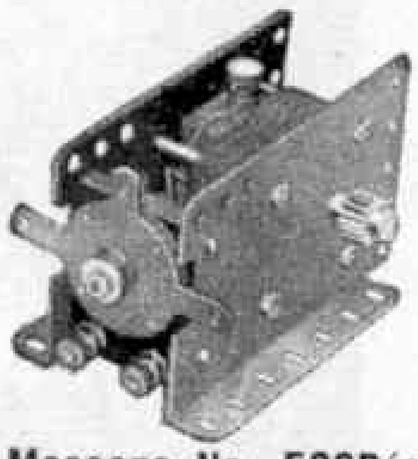

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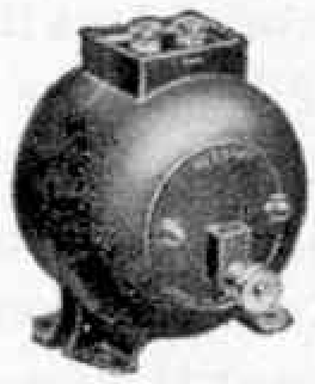

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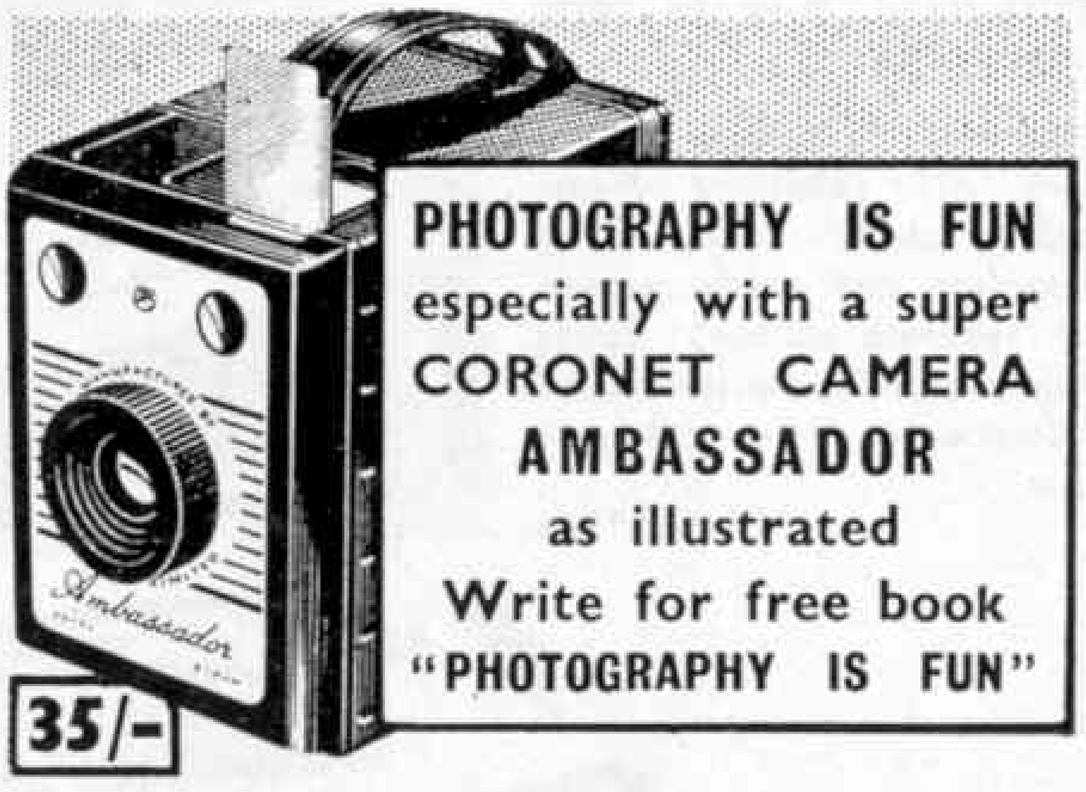

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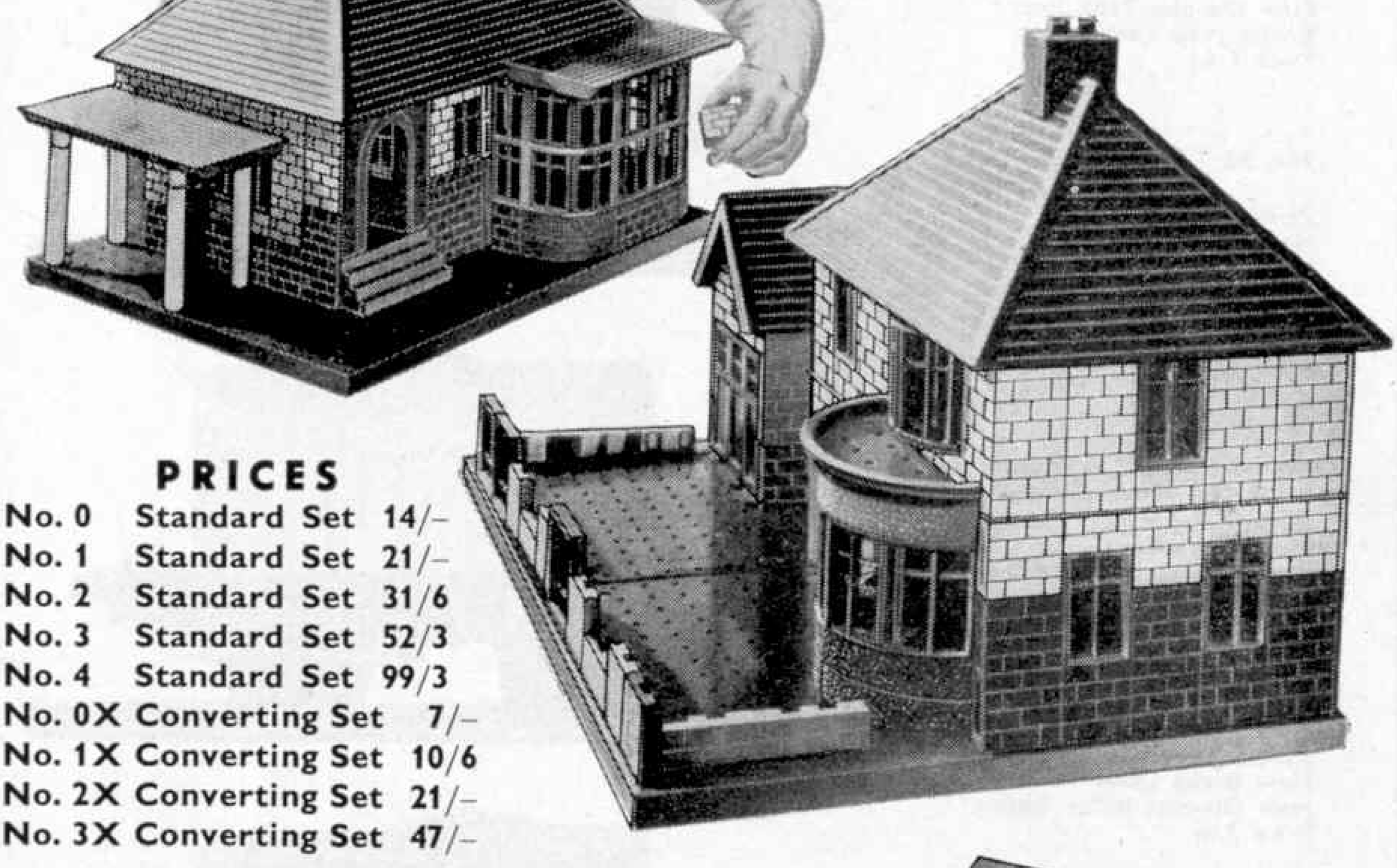

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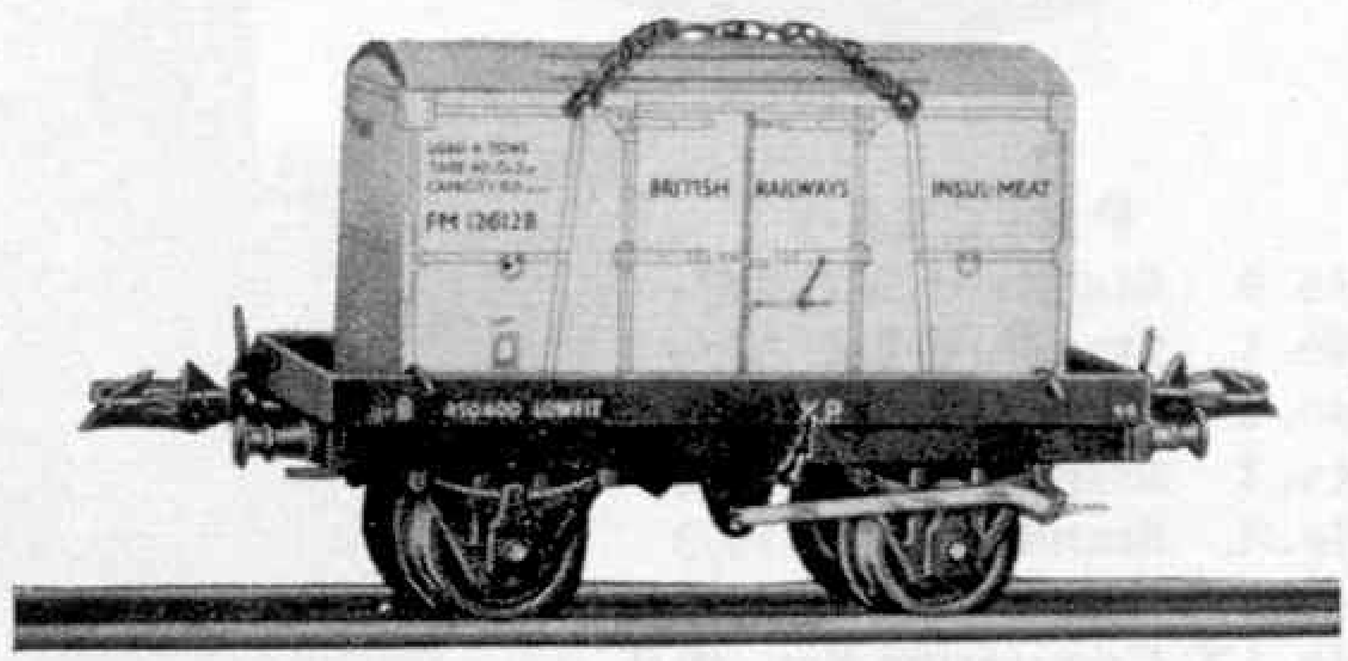

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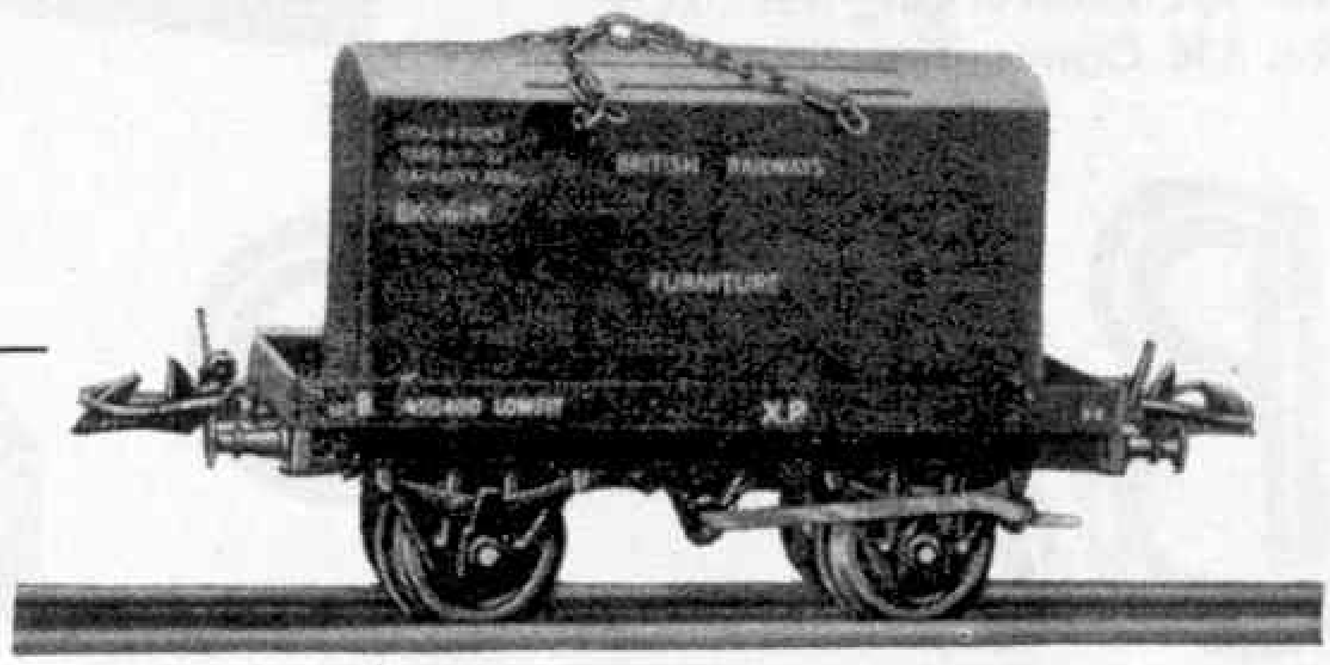

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Editorial Office:
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EDITOR : FRANK RILEY, B.Sc.

Vol. XLII
No. 7
July 1957

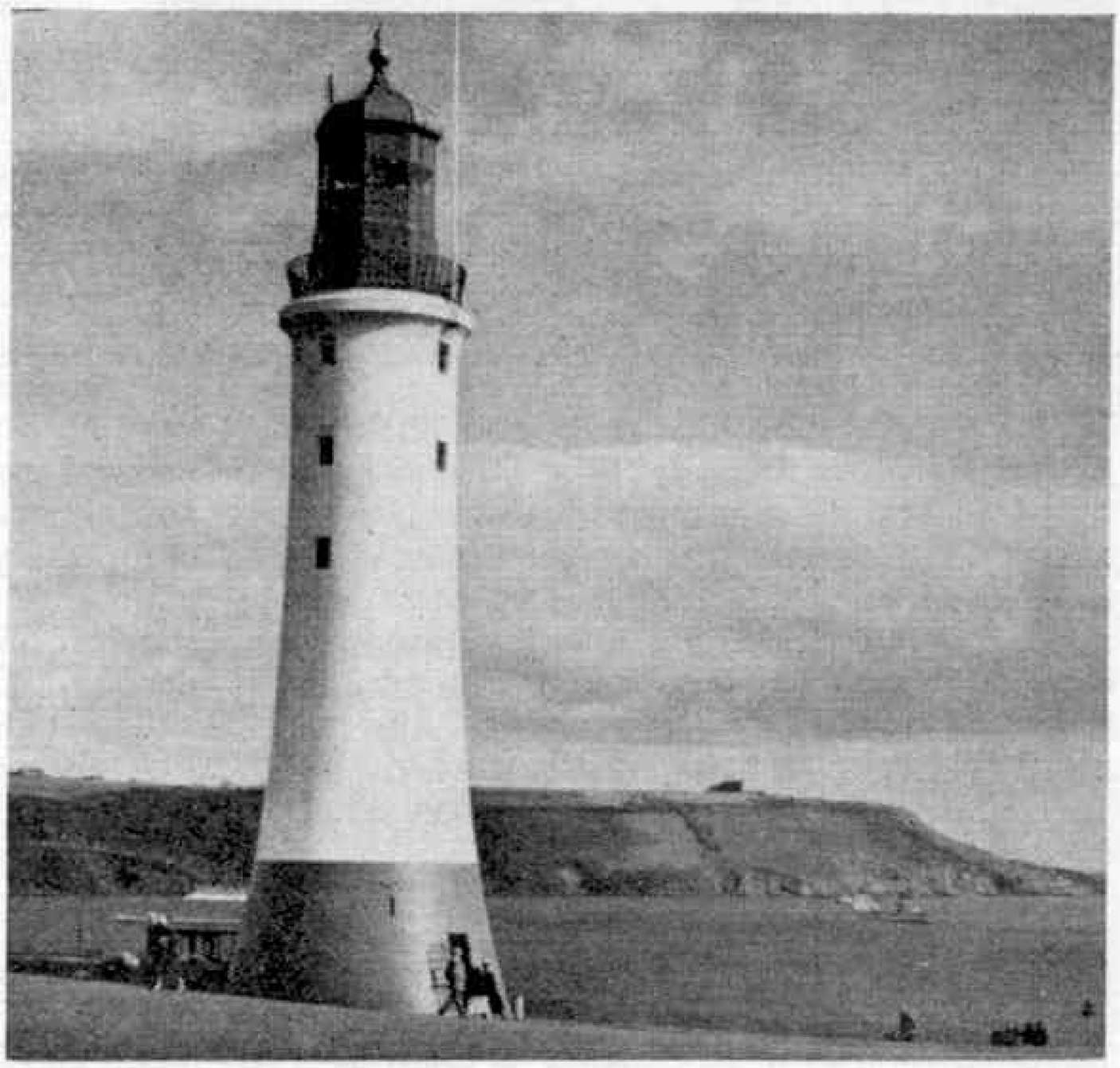
A Retired Lighthouse

A lighthouse is a wonderful seaside holiday attraction. Seeing its light at night is always exciting, and it is even more thrilling to climb the spiral stairway to the lantern itself.

I could fill pages with a list of the lighthouses round the shores of the British Isles today, but none of these would surpass in interest the one shown in my picture, although this has one strange distinction—it is a retired lighthouse! It is the historic structure John Smeaton built on Eddystone Rock, off Plymouth, and it is a wonderful tribute to the skill and courage of this pioneer that when his lighthouse became unsafe—there was nothing wrong with it as a structure; it was the rock on which it was built that was giving way—all but its stump was carefully dismantled and re-erected on Plymouth Hoe, as a memorial.

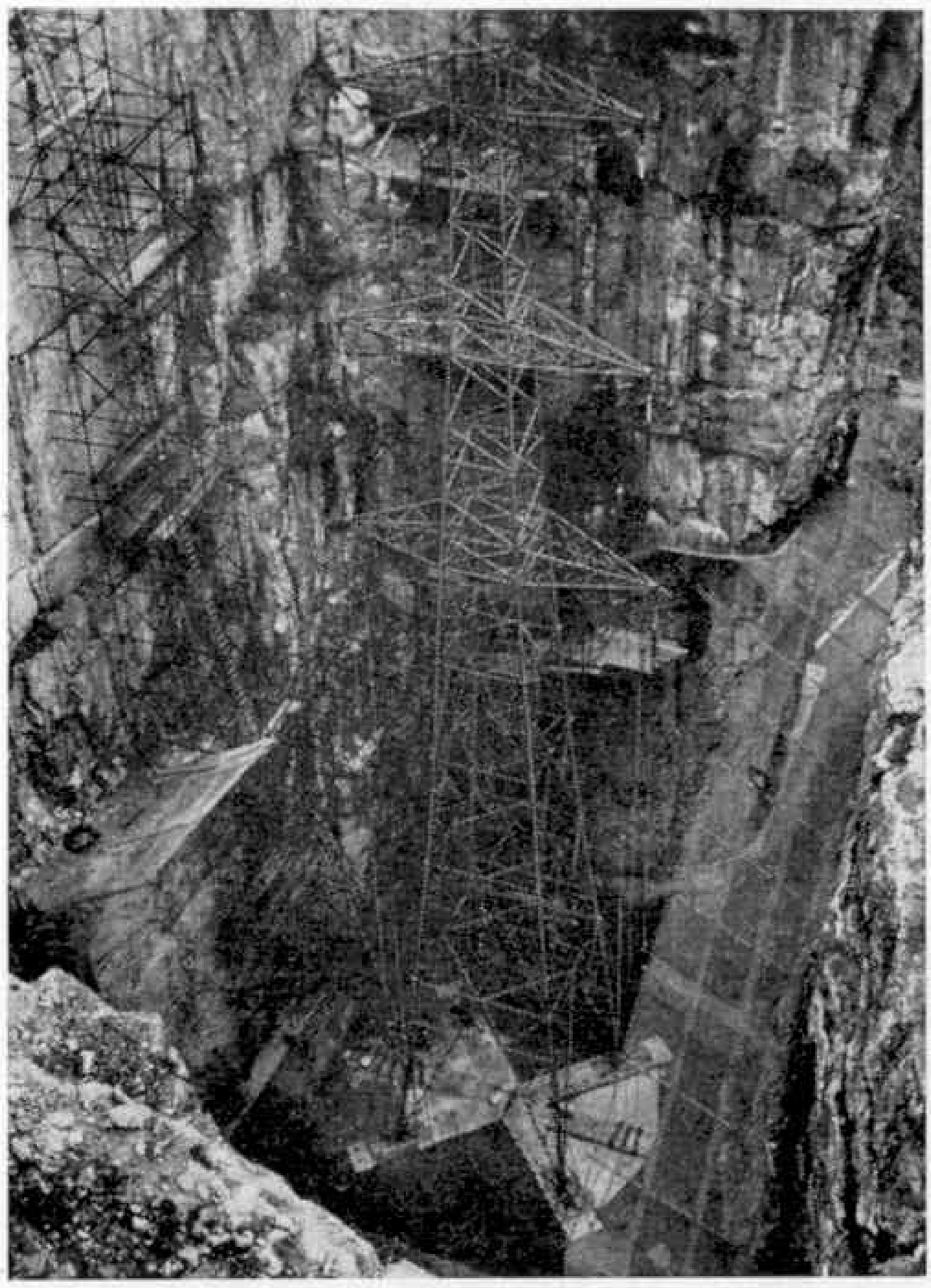
Construction of the lighthouse began 200 years ago, but was not completed until 1759. Work of this kind is not so easy as putting up a building ashore, where it is not threatened by raging seas. And 200 years ago the tackle available was very primitive in comparison of that in use today, while experience of lighthouse building on isolated rocks was lacking. One of the two lighthouses built on Eddystone Rock before Smeaton's was washed away in a storm, and the other, not much more substantial, was burned out. Both were of wood.

Those of you who visit lighthouses during your summer holidays by the seaside will rightly admire the wonderful towers and the highly efficient mechanism that sends the rays of the lamp across the seas. But if you have the opportunity to visit Smeaton's lighthouse, you will be doubly fortunate, for there you will see a notable example of the work of our British pioneer engineers.



The upper part of Smeaton's Eddystone Rock lighthouse now stands on Plymouth Hoe, and is seen in this picture. The stump is still to be seen on the rock, a monument to the great engineer who built this famous lighthouse. Photograph by F. Bunce.

The Editor



Inside the Monkey Hole

By
The Editor

THE Monkey Hole is deep and dark. It got its name from a story of days gone by of an Italian organ grinder who used to entertain men working in the quarry, for that is what the Monkey Hole once was. From its top the organ grinder dangled a rope on which his monkey would perform tricks. One day the rope broke and the monkey was killed. This ended the performances, but the name has stuck ever since.

This remarkable quarry is in the limestone district near Wirksworth in Derbyshire, and it is as remarkable for its shape as for its name. From the pictures on these pages you can see that its sides are almost vertical, and that it can only be entered through a narrow cleft in the rocks. On entering it through the cleft it is found to have a floor about 100 ft. long and 50 ft. wide, and its sides tower up to a height of about 150 ft. The floor is now clear and level, but many thousand tons of debris have been removed from it, and it is actually 10 ft. lower than when the quarrymen abandoned it.

Inside the Monkey Hole, a disused quarry at Wirksworth, Derbyshire, seen in the picture at the head of the page, there is now a station at which towers, masts and other tall structures can be tested, as explained in this article. Photographs by courtesy of Stewarts and Lloyds Ltd.

The Monkey Hole was cleared in this way because an entirely new use has been found for it—the testing of tall structures such as masts and towers. These must be able to resist the pressure of the wind, which of course can vary from a gentle zephyr to a howling gale, and engineers building structures of this kind must have some system of testing the calculations they make when designing them. The only way to make such tests is to attach ropes horizontally to the structures at various heights, and to apply forces through the ropes to represent wind pressures. It is not easy to do this in the open, because there natural wind pressures and other factors complicate matters. The ideal is to find a completely protected place, where the engineers carrying out the tests have to reckon only with the forces they apply through their ropes.

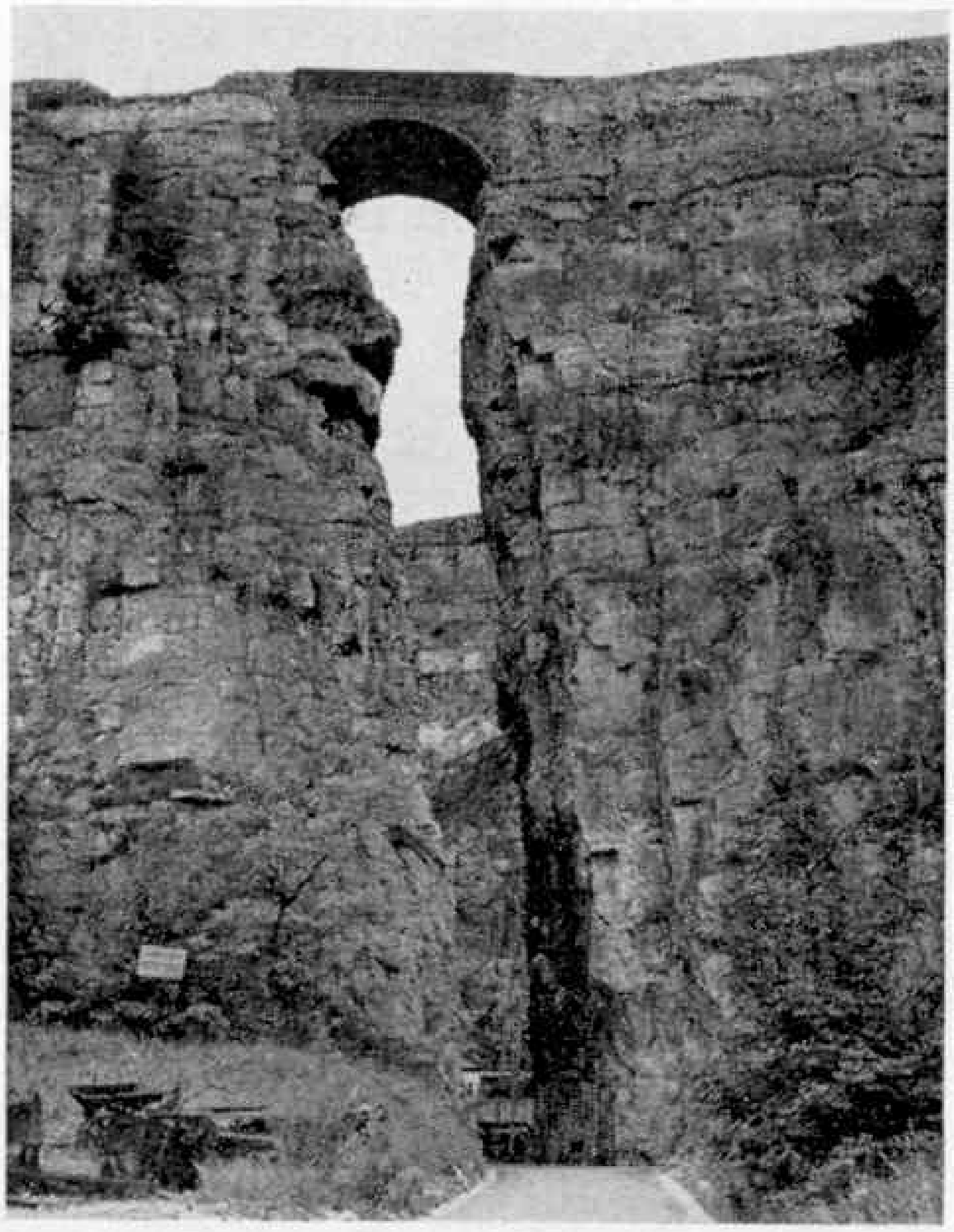
The need for a testing station for these tall structures was realised by Stewarts and Lloyds Ltd., the well-known makers of steel tubes and other products, and their first efforts were devoted to finding a suitable site within easy reach. Members of the staff who were familiar with the limestone quarries worked by the company at Wirksworth soon recalled the one known as the Monkey Hole, and as soon as it was examined it was seen that it was ideal, for except to a limited extent through the narrow entrance, the wind cannot blow upon the structures to be tested.

There is another reason why such a protected site was suitable for testing tall structures. This is that there is no difficulty in finding points for anchoring pulleys in

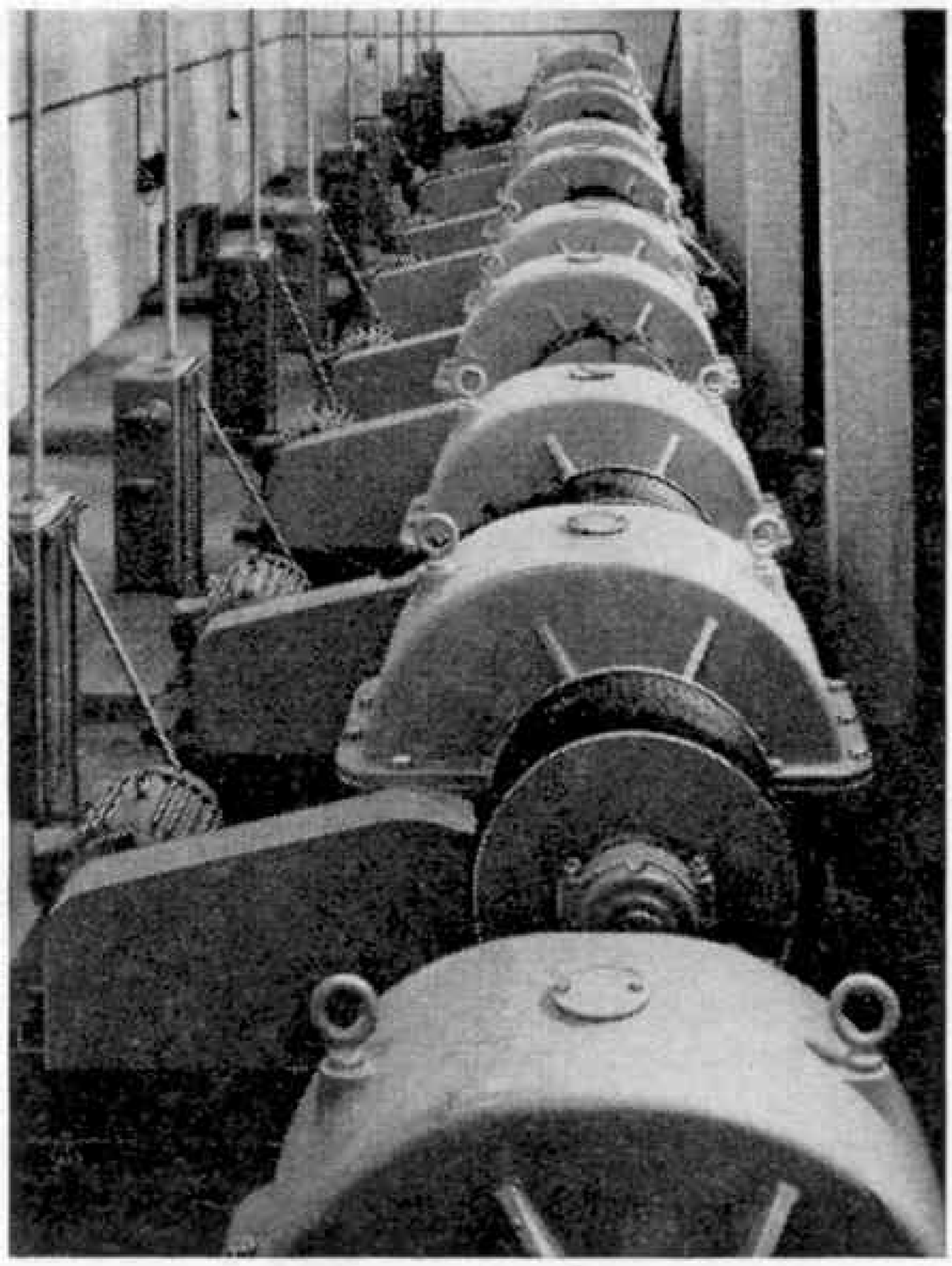
the rock face of the quarry so that ropes from the test points on the tower itself could be led horizontally to them. Tests could be carried out on open ground only if two other towers of similar height were erected to provide the loading points.

After clearing the site the first thing to be done was to lay down a universal type of concrete base to which towers of different varieties could be fixed. Loads up to 30 tons will be required for some tests, so the anchorage points at different levels had to be made very secure. In a test in which an increasing force was applied to the type of anchor selected, the eye of the anchor broke when a direct pull of 94 tons was exerted on it, but the anchor itself gave no sign of having been disturbed in its rock setting. This clearly left a good margin of safety.

The loading at each point was obtained by a pull of 5 tons, which was multiplied by the usual arrangements of multi-sheave blocks, as required, up to the maximum 30 tons. Special winches had to be designed to apply the loads. These are equipped with gears designed to keep the speed of movement of the rope very low, the rate being about 1 ft. 3 in. a minute, so that the loads are applied slowly in the tests. There are 12 winches, one for each of the ropes to the test tower passing over pulleys to the loading points, which number 12. Each has a 2 h.p. motor, running at 960 r.p.m., but the main drum makes only half a revolution a minute because of the special gearing.



The way into the Monkey Hole, the rock walls of which are about 150 ft. high.



Winches that pull on the ropes that apply forces to towers under test.

The building in which the winches are installed is opposite the entrance to the quarry, and a general view of them is given in the lower illustration on this page. There are dials to indicate the loads applied at each of the 12 selected points. Others show how much the structure under test has moved at various points. This deflection measurement is carried out on wires attached to the structure that pass over pulleys and down into tubes standing on the quarry floor. Weights in the tubes keep the wires taut and a slot in the tube allows a rough indication of the movement to be measured against a scale at the side. The deflection is measured more accurately by electrical means, which are so sensitive that movement of a twentieth of an inch is detected.

The main operator has a microphone through which he can give directions and an emergency "Stop Everything" button, which cuts off power to the winches. Two other operators control the winches by means of buttons, which must be held down all the time the winch is operating.

Assault on the Far South

The Antarctic in the International Geophysical Year

By Frank Illingworth

THERE will be more explorers and scientists in the Far South these next months than at any time in the history of Antarctic exploration. Eleven countries have sent expeditions. The "White wilderness" will be dotted with 46 "bases," three of them at the Pole; while "base camp types" pore over microscopes and peer through telescopes, two small, tough parties of Britons and New Zealanders will be making a dramatic 2,000 mile dash across the Antarctic Continent via the South Pole, and literally thousands of Americans will be swarming over the everlasting ice by air and in weird-looking tracked vehicles.

The John Biscoe II, the second of her name, in pack ice in the Antarctic. She has been employed in supplying British International Geophysical Year bases. Polar Photos.

The reason for this "massive assault" on Antarctica is the International Geophysical Year, referred to in short as I.G.Y. Forty nations will take part in this "simultaneous, planned, co-ordinated operation" under the direction of Vice-Admiral Sir Archibald Day, R.N., whose co-ordinating offices are in Brussels.

I.G.Y. research centres will be established in the polar regions, the temperate zones and tropics, in jungles, deserts, prairies and swamplands, and on islands and mountains as well as on the ice-caps of the Arctic and the Antarctic.

The main research centres on the ice-caps of the Antarctic are already established, and even now icebreakers flying the flags of Britain, Australia, New Zealand, South Africa, the U.S.A., the U.S.S.R., Norway, France, Japan, Argentina and Chile are heading through grinding pack ice towards the frozen cliffs of Antarctica with men and supplies.

The "Year" opens this month, and will last until May or so of next year. Before it closes many dramatic tales will have emerged from the Far South. Perhaps our men will emulate Admiral Richard Byrd, who came upon a bare hut dating back 40 years and yet still intact, its nails bearing no trace of rust, its food supplies frozen, and a husky standing stiffly at the door looking as alert as it did four decades ago.

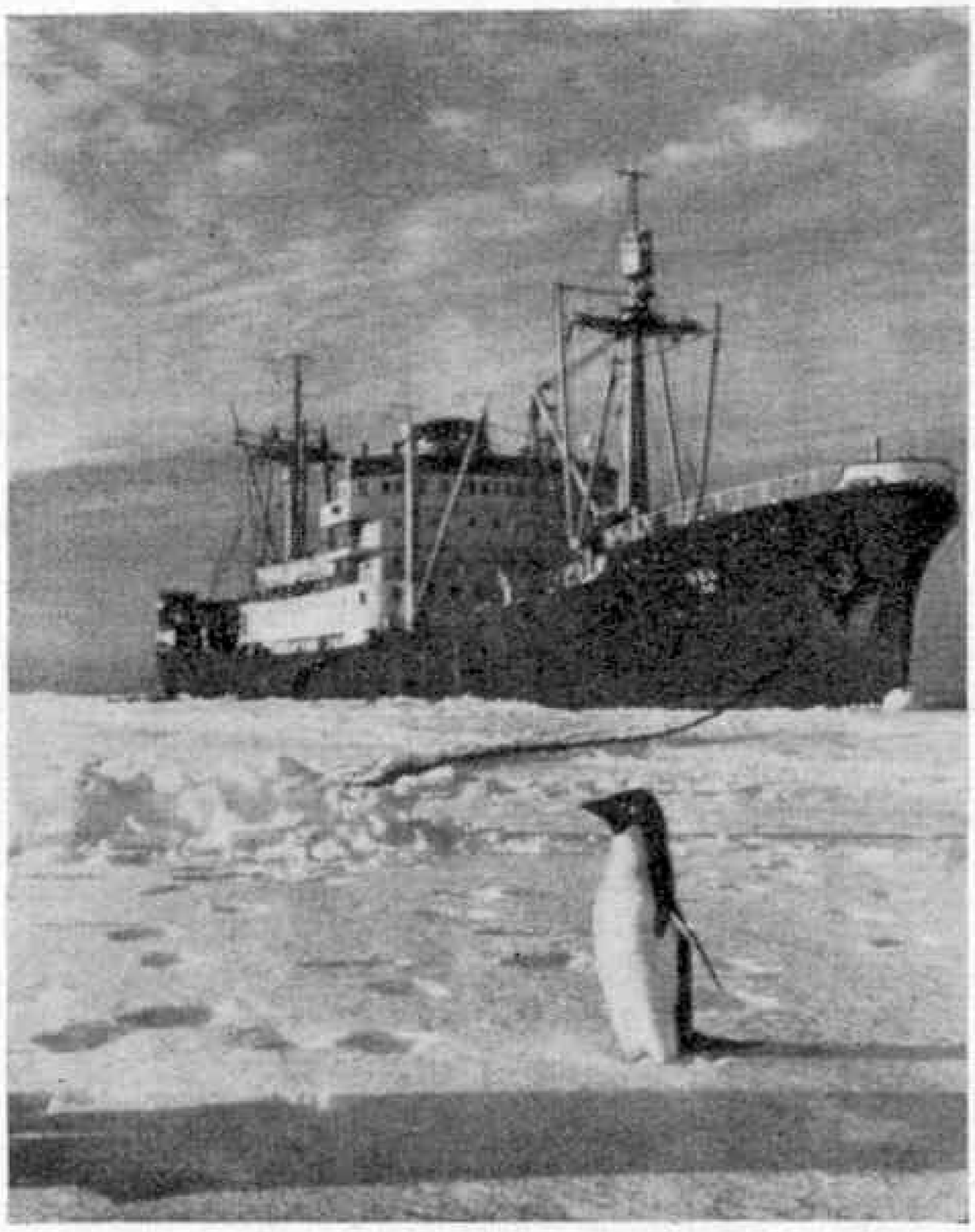
Perhaps great mineral deposits will be found, dramatic scientific discoveries made, intriguing geological questions answered. For certain our men will experience winds that can flatten buildings, the dangers of ice-cap travel and fearful cold—110 degrees and more of frost! They will also lay the foundations of new civil trans-polar air routes, and perhaps too of vast in-the-ice-cap natural refrigerators for storing world food supplies against lean years.

The new civil air routes will be the first practical results of the International Geophysical Year. Just as the shortest routes between Europe and Australasia are via the Far North, so the shortest routes between, for example, Australia and South America lie over the South Polar

Continent. Canadian Pacific Airlines recently extended their services to Buenos Aires "with a view to new Australia–South America services via the Far South"; and the French are building two major airstrips in the Kerguelen Islands, in the Antarctic, for new Africa–South America services via the "bottom of the world."

Ships, aircraft and men combine in the assault on the Antarctic. An Australian Beaver, fitted with skis, prepares to makes its first flight in polar regions. De Havilland photograph.

The Soviet Union's I.G.Y. base in the Australian sector of the Antarctic handles 4-engined aircraft, for aerial mapping, with the range to reach Australia and return to the Antarctic—or fly on towards North America. The United States *Operation Deepfreeze* includes 48 Globemasters, Skymasters and Dakotas, a major airbase on the Ross Sea south of New Zealand and another at the South Pole itself. In fact *Operation Deepfreeze* will be the biggest single undertaking in the International Geophysical Year. It comprises twelve ships including four 8,000-ton naval icebreakers and four thousand men, 366 of them scientists.



The U.S.S.R. is taking part in the present activities in the Antarctic, and here is an icebreaker from that country. Polar Photos.

The Commonwealth's contribution to the I.G.Y. is even more spectacular than that of the United States, for it includes the Commonwealth Trans-Antarctic Expedition, which will cross the Antarctic Continent via the South Pole on the longest, toughest polar journey ever undertaken.

Led by Dr. Vivian Fuchs from the new base on the Weddell Sea, and by Sir Edmund Hillary from the New Zealand base on the Ross Sea, on the far side of Antarctica, the expedition's members will follow a scientific schedule while they struggle across 2,300 miles of ice, untrodden, unmapped, unseen, subject to as intense cold as can be experienced outside a scientific laboratory, testing the thickness of the ice cap every 20 miles by exploding charges and measuring the time it takes the echo to bound back from "bed rock", and carrying out a meticulous scientific programme.

The British effort will also include the maintenance of twelve exploration and scientific bases, two of them flanked by 600 miles of grinding pack ice, the same "pack" in which the British expedition ship *Theron* was trapped last year.

British scientists at these far away outposts of the International Geophysical Year are probing such phenomena as magnetism, the Aurora—the "light" that flashes and weaves across polar skies in sheets of colour—the ionosphere, cosmic rays, airglow, gravity, seismology. In fact, while the trans-Antarctic parties are

making the first map of the surface of the Antarctic Continent beneath its 10,000-ft. thick crust of ice, "base-men" will be trying to discover, for example, if ozone, a kind of oxygen, affects the weather. If they prove that the blanket of ozone in the upper atmosphere DOES affect the weather, it may be possible to forecast accurately with the aid of ozone measurements.

Meteorology is one of the subjects for study during the International Geophysical Year. A member of the staff of the British base at Marguerite Bay, Graham Land, is seen here taking readings of temperature, wind direction, etc. Polar Photos.

The Aurora too will be closely studied. It is thought that these polar lights affect radio reception, and at the time of writing it is reported that they are to be photographed every minute throughout a 12-month period, using a cine-camera looking vertically into the centre of a convex spherical mirror, an arrangement that gives an almost complete picture of the whole sky.

By going to the polar regions it will be possible to make a continuous and detailed study of the Aurora. In January 1957 a large radar aerial made at Jodrell Bank research station in Manchester was landed at the British base in Vahsel Bay, on the Weddell Sea. This will make it possible to track the electric current known to accompany the polar lights and thought to affect radio reception.

Also to be undertaken is the study of light refraction. There's an Alice in Wonderland touch about the weird things that happen to one amid the white snows at the bottom of the world, as the members of Commonwealth Expedition under Sir Edmund Hillary and Dr. Vivian Fuchs will already have discovered.

None is so weird as the "white darkness" of an Antarctic summer's day. White darkness occurs when the sky is overcast. The clouds, scientists say, cause an "accumulation of imprisoned light between earth and sky like the accumulation of heat in a greenhouse" which causes visions to be drowned in light and results in "absolute whiteness, to which the human eye is little better adjusted than to darkness."

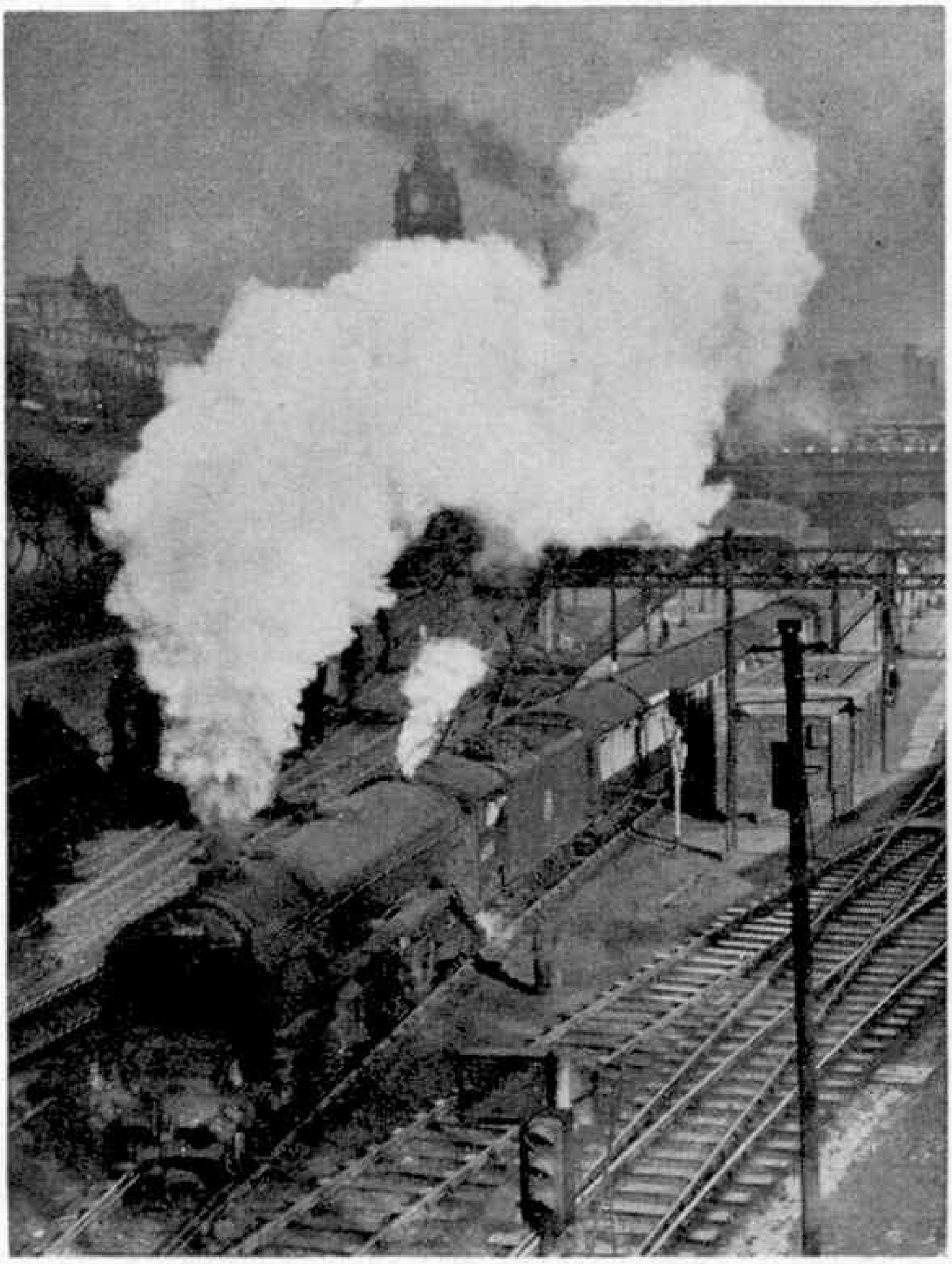
In the Far South refracted light plays ducks and drakes even with the penguins —witness the story told by Swedish explorer Bertil Ekstrom. One day he was looking absentmindedly at a penguin when the bird suddenly grew to the size of a man and stood looking at him like some grotesque shirt-fronted waiter. That knocked the smile off the Swede's ever-smiling face! He could have been excused from wondering for a moment if a prehistoric penguin had come to life, for explorers had recently found the skeleton of a 6-foot penguin. But before he could rub his eyes the bird was back to its right proportions!

Something similar happened to Paul Siple, chief scientist of an American expedition. When surveying an ice shelf two miles from his tent-camp he noticed something unusual—most unusual; the tents resembled conical skyscrapers! A small cloud drifted across the sun and in a twinkling the tents disappeared.

Dr. Siple had an idea. He dropped to one knee and immediately, from this new angle of sight, the tents sprang back into view like huge pyramids. When he rose they vanished again. And when he turned back to his surveying his tripod had disappeared! Refracted light will fling a range of mountains across the glaring white of the Antarctic's 10,000-foot-high ice cap—mountains that are not there—as was proved to a party of British explorers in the Antarctic a few months ago.

Also to be studied is the question: "Can we hope to broach the mineral wealth of this vast, frozen continent?" The answer will probably be, "Not for a long time—perhaps decades." But undoubtedly

(Continued on page 366)



The 2.15 afternoon express for Aberdeen leaves Waverley behind No. 60510 "Robert the Bruce." This illustration and those on the opposite page are from British Railways (Scottish Region) Official Photographs.

Waverley Station Scenes

and a run on the First Inter-City Diesel

By The Editor

I HAVE known Waverley Station in Edinburgh for quite a long time and the fine cover of this issue, which was prepared with the help of British Railways (Scottish Region), provides me with an opportunity of talking about this great station, the largest in Scotland, set in the heart of the Scottish Capital. It also allows me to say something about the new Inter-city diesel trains, for one of these is seen on the cover.

Although Waverley is a terminating point for trains from here, there and almost everywhere, it is not a dead-end station. Rather can it be considered as two terminals back to back, with outer through lines served by two very long platforms, or as an enormous island, with bays let in at either end. Although extensive, it is laid out almost in straight lines east and west, so you soon learn to find your way about it.

There are various ways into this temple of trains—I can think of at least six—and you can see plenty before you enter, from outside and from above, as it is crossed by several bridges. This latter feature is unusual at a big station, but arises here from the situation of Waverley, which is literally in a ravine dividing the old town of Edinburgh from the new one. I will say more about this later.

Waverley is not a palace of cold concrete. Stone, mature and dignified, is the material that you will find there, and inside the main booking hall you are not allowed to forget that this was the Headquarters of the former North British Railway, for the coat of arms of that company is worked out in colour in each of the four corners of the mosaic-like floor. This has been well worn by the feet of many thousands of travellers since the station was built about 60 years ago, but is plain to see.

Trains with famous names use Waverley, among them the old-established *Flying Scotsman*, the *Queen of Scots*, and the more recently named *Heart of Midlothian*, the *Elizabethan* and the *Talisman* services. A good way to start observations is to see the up *Flying Scotsman* leave for London at 10 a.m.

When I first knew Waverley it was an open station, and there was usually a small crowd of enthusiasts to see the train depart, in those days behind one of the North Eastern Atlantic engines that to

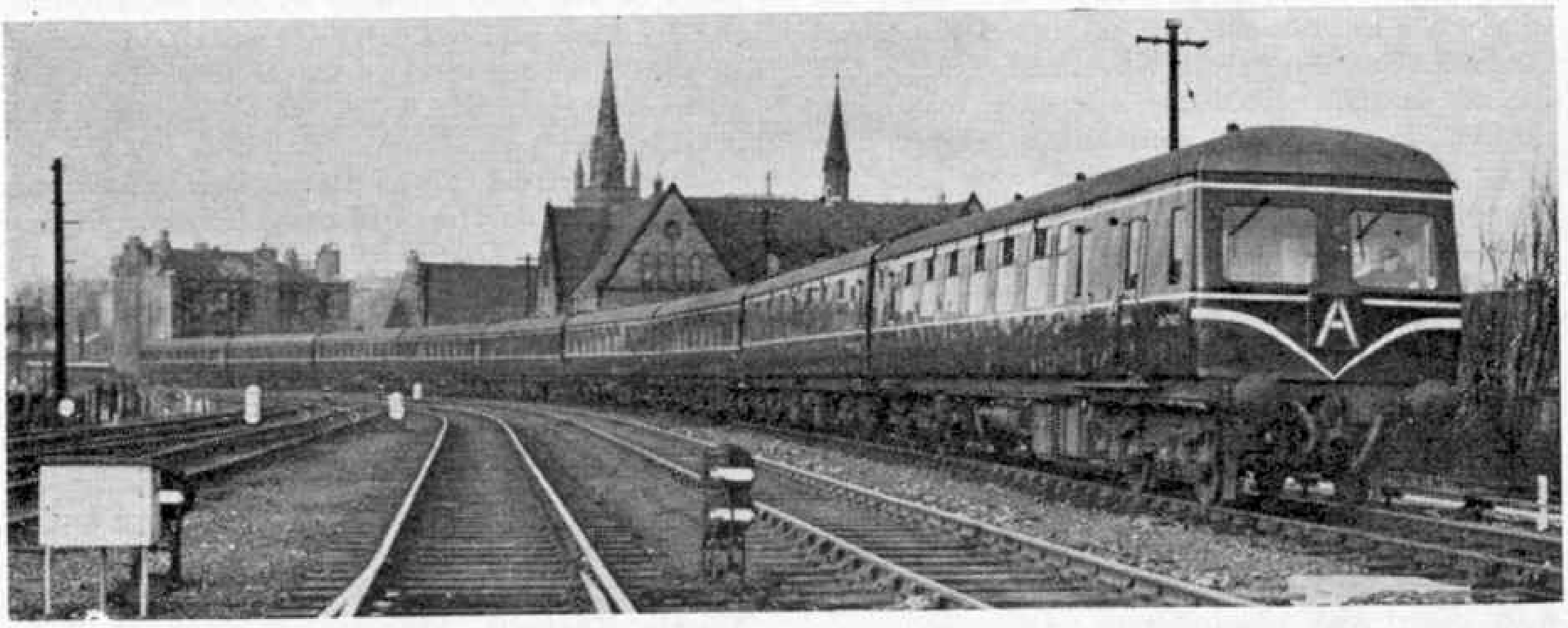
me then seemed the last word in power and beauty. Nowadays one has to have a platform ticket in order to get along and see the engine, and on a recent occasion, before the start of the summer services, I found No. 60124 *Kenilworth*, a Peppercorn A1 Pacific waiting to take the train away. It had 13 vehicles behind the tender, some of them in maroon livery and with the latest B.R. emblem. The whole train looked extremely smart and the engine impressive, although somehow lacking what I may call the Gresley touch familiar in the earlier Pacifics.

The *Scotsman* left from the eastern end of one of the through platforms, No. 1. Their length is such that two complete trains can be accommodated, one behind the other. Almost as soon as the *Scotsman* had gone, one of the bays at the eastern end saw the departure of the 10.5 a.m., now named *The Waverley*, for St. Pancras via the Waverley route to Carlisle, and soon after another London train, this time for King's Cross, also left.

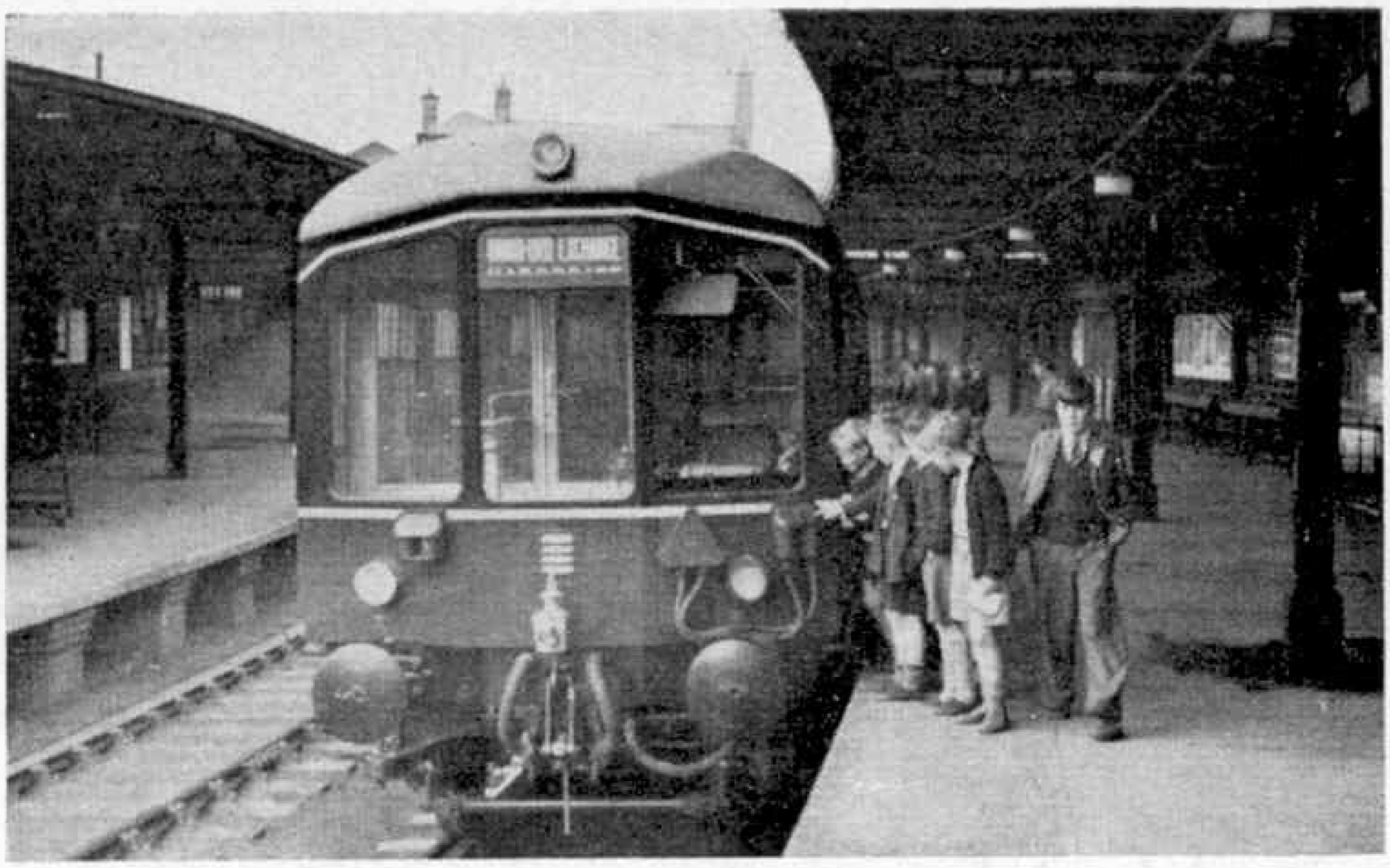
Like most big stations, Waverley handles a considerable traffic in parcels, and so on bay platform lines and other tracks there is frequently a fine collection of miscellaneous bogie and other vans to appeal to the rolling stock enthusiast. One that I hardly expected to see was a steel-built box-car-like S.N.C.F. van, lettered *On loan to Southern Region* that stood in one of the Eastern bays on one of my previous visits. It was certainly a long way from its temporary owner's tracks and further still from those of its parent French system.

The "Heart of Midlothian" leaves Waverley for the South in charge of the impressive A1 Pacific No. 60160, "Auld Reekie," an appropriate revival of the title of an N.B. Atlantic.

It would not do to leave the inside of Waverley without seeing the southbound *Queen of Scots*, the familiar Pullman service leaving Edinburgh at 12 noon. So I saw it run in from Glasgow, headed by A4 class No. 60012 *Commonwealth of Australia*. This engine came off and very soon another Gresley, but non-streamlined, No. 60100 *Spearmint*, took over the seven-car train, made up of the three first-class cars *Sheila*, *Nilar* and *Phyllis* in the



An Inter-city diesel car train of the type used between Edinburgh (Waverley) and Glasgow (Queen Street).



The boy who knows all about it, and some of his friends, subject this lightweight diesel car to close examination at Keighley. Photograph by W. Hubert Foster.

centre, with a second and a brake second at each end of the group. Like the proud Pullmans, the engine too was smart and clean and started away for the south in an appropriately quiet and dignified manner.

I think one sees more clean engines than otherwise round about Waverley and certainly none are more spick and span than the North British 0-6-0T station pilots. At the time of my most recent visit the star turn of the group was undoubtedly No. 68481, resplendent in newly applied B.R. lined black livery, and with the additional distinction of carrying an oval "target" or board in front of the chimney bearing the words *No. 1 Station Pilot*. One thing about the working of these engines is the apparently tight timing of some of the shunting moves that they have to make. But they are handled as well as they are cleaned.

I have already noted that there is plenty to be seen in the station from above. This is particularly true of the west end. A favourite spot there is the top of what are known as the Mound Tunnels. The Mound is crowned by the Scottish National Galleries and the Royal Scottish Academy. Public walks cross it to connect the two sides of Princes Street gardens, through which the railway runs outward past the historic Castle toward the Haymarket Station, and they pass close to the eastern end of the tunnels and give exactly the viewpoint that you have on the cover of this issue. In the background is the North Bridge, spanning the gap between the old town and the new; in the middle distance is Waverley Bridge, from which you can reach the station; and in front and below are the tracks, fanning out and interconnecting as they approach the station.

To the diverse sounds of Waverley and the varied steam languages of engines from Cowlairs, from Doncaster, and nowadays even from Derby and Crewe, has been added the *Halloo* of the hunting horn that is the call of the six coach diesel car trains introduced early this year to provide the Inter-city service between Edinburgh, Waverley, and Glasgow, Queen Street.

Once I had seen these sleek bright corridor trains, and had heard their call, I *had* to ride in one, so I went to Glasgow and back by this new means of transport. I found the experience full of interest. At each end of the train are two power cars with underfloor engines, the exhausts from these being carried up through piping and silencers standing vertically between the power vehicles. Each end vehicle includes a full width driving cab at the outer end, but there is a small driving "box" rather than compartment at the inner end of each twin power-car unit. The intermediate vehicles are respectively a first class side corridor coach, more or less of standard B.R. type finished to match the rest of the train, and the Buffet Car.

The finish outside is a pleasing shade of green, while white metal fittings and modern plastic surfaces are the rule inside. The general standard of comfort is high, seat backs and head rests seem just the right height, and window curtains add to the attractiveness of the interior.

Travel is smooth, I found, but there is

(Continued on page 366)

An English Electric P.1B fighter of the type which will go into service with the Royal Air Force.

Air News

by

John W. R. Taylor

Last and Fastest

News that the English Electric P.1 will be the R.A.F.'s last piloted interceptor came as a shock to most people, because it was believed that there would be at least one more aircraft of this type after the P.1, probably with mixed jet and rocket power. Now, it will be superseded in time by ground-to-air guided missiles, the first of which are already in production.

The P.1 itself will probably not be in service for two more years, as it is a very advanced aircraft and will need considerable development. To speed this, a pre-production batch of 20 has been ordered, in addition to two prototypes of the original Sapphire-powered P.1A and three prototypes of the production-type P.1B with Avon engines.

First of the P.1B's to fly, on 4th April this year, was XA847, illustrated above. Its fuselage is almost entirely different from that of the P.1A, with a central "bullet" inside the circular nose air intake, to create a shock-wave over the intake which will slow down the air entering the engines at very high speeds. The cockpit hood, which has given trouble on the P.1A by lifting off, has also been redesigned and there is a long fairing joining it to the base of the fin. In addition, we can expect the P.1B to have a kinked leading edge of the kind now being flight tested on the original prototype P.1A and which improves control at lower speeds by increasing the leading-edge camber at the tips.

Air Marshal Sir Thomas Pike, A.O.C.-in-C. of Fighter Command, has said that the P.1 has flown faster than 1,000 m.p.h. and will be capable eventually of 1,500 m.p.h. In this respect, it is interesting to see that the second prototype P.1A now has a large "blister" under its rear fuselage which may be intended to house a rocket motor or extra fuel.

Missile News

English Electric seems to be specialising in anti-aircraft defence because, in addition to the P.1, they are building one of the ground-to-air anti-aircraft missiles that will supplement R.A.F. Fighter Command in the next few years.

Named Thunderbird, this missile is a large rocket which is launched from a ramp with the help of four externally-mounted booster rockets. When their fuel is exhausted, the boosters fall away and the missile continues to the target under its own power, which can consist of either solid-fuel or liquid-propellant rocket motors. It is guided electronically from the ground and is fitted with a proximity fuse.

A second supersonic ground-to-air missile in production is the Bloodhound, which is powered by Bristol ramjet engines and has a guidance system designed by the Ferranti company. Like the English Electric missile, it has been preceded by the firing of many hundreds of test rockets and has achieved considerable success when fired against pilotless target aircraft.

Finally, there is news of the air-to-air missile that will arm the P.1 and Gloster Javelin in due course. Built by de Havilland Propellers Ltd., it is known as Firestreak and has an infra-red nose which "homes" on to the heat from the engine exhaust of its target.

Flying Customs Men

As a result of the fine work done by three D.H. Canada Beaver crop-spraying aircraft bought in 1953, the government of Pakistan has ordered two more, of which one will be equipped with amphibious floats for operation over the soggy marshland and small lakes where rice grows.

Pakistan is also using two Beaver amphibians for Customs patrol duties in the western part of the country and along the Arabian Sea coast. Their job is to cruise along for up to five hours at a stretch, over rich farmland, rugged mountain ranges, marshes and dense jungles, keeping an eye on all ground activities and maintaining radio contact with coastal and river patrol boats and a network of land-based stations. Finland, Yugoslavia, the United States and Canada use Beavers for similar work.

Russia's Civil Air Routes

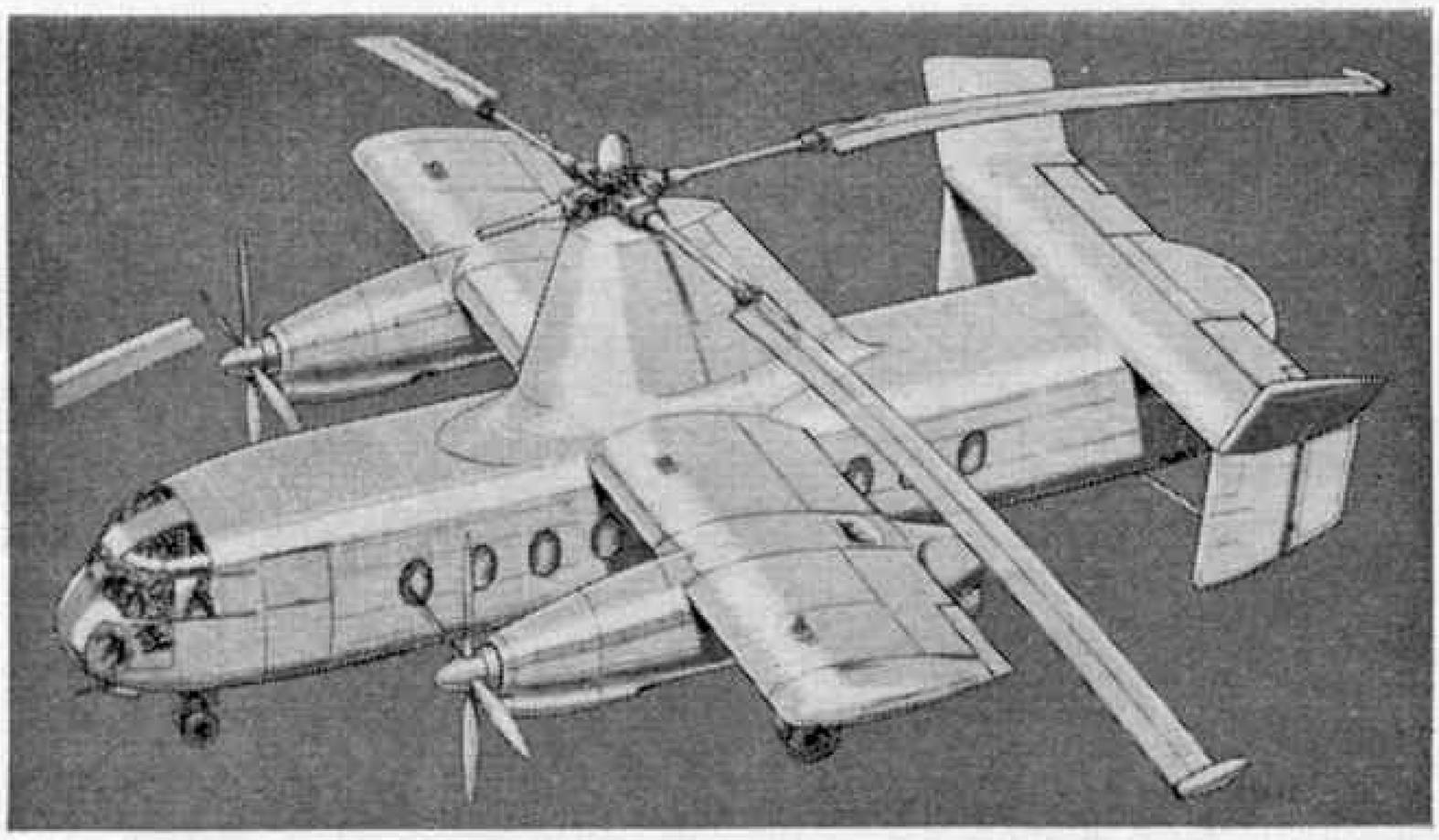
Aeroflot, Russia's national airline, has opened what should prove to be one of the most attractive air services between Western Europe and Eastern Asia by extending its Moscow-Peking service to Tokyo. By linking up with the regular Paris-Moscow services, passengers can fly almost all the way to Japan aboard 500 m.p.h. Tupolev Tu104 twin-jet air liners, which are already flying on the Prague-Moscow sector of the route and on to Peking, India, Burma and Indonesia. Aeroflot even hope eventually to operate a non-stop Peking-New York service.

Record Heavy Drop

By dropping from the air by parachute a load of 29,000 lb. (13 tons), a Blackburn Beverley has regained the record for the heaviest single item ever air-dropped, although it was in fact only 60 per cent. of the aircraft's

total payload. The drop was made at a speed of 150 m.p.h. at a height of 1,500 ft., and the load took 35 sec. to reach the ground.

No mere stunt, the drop was part of a parachute research programme aimed at developing methods of delivering heavy equipment to troops in inaccessible areas. The load, which consisted of steel plates and ballast, descended under eight G.Q. parachutes, each with a diameter of 66 ft. and containing nearly 1,000 yds. of nylon.



Drawing of the Fairey Rotodyne helicopter, the prototype of which is now being assembled for flight testing at White Waltham aerodrome.

Quieter Helicopters

At White Waltham aerodrome recently, I was able to see and hear for myself the tremendous progress that Fairey's are making in silencing the tip-mounted, pressure-jet engines of their big Rotodyne helicopter, the prototype of which is almost complete.

Dozens of differently-shaped silencers have been tested on a big rotor spinning tower at the aerodrome, and some have reduced the noise level from 105 decibels to 95 decibels at a distance of 200 ft. from the rotor. This may not sound a lot, but it represents a reduction in noise of not 10 per cent., but 90 per cent. There would be no point in reducing it any further, because the noise made by the big 90 ft. rotor itself as it turns is equivalent to 95 decibels. Even more remarkable, the silencing is achieved at a cost of only 5 per cent. of the engine's thrust.

In everyday terms, a loud motor horn at 20 ft. has a noise level of 110 decibels and a tube train 90 decibels. The Rotodyne will, in fact, be considerably quieter than a conventional piston-engined helicopter within a few seconds of take-off.

"Voice" Aircraft in Malaya

One of the most unusual air force units in the world is the Voice Flight of No. 267 Squadron of the Royal Air Force, stationed at Kuala Lumpur in Malaya. During the twelve months ending 31st March this year, its three Dakotas *Faith*, *Hope* and *Charity* and two Austers *Mee* and *Mo* flew a total of over 2,400 hrs., of which 824 hrs. were spent broadcasting messages to the terrorists hidden in the dense jungles.

Nearly every day and often at night, in all weathers, the aircraft flew at heights of between 1,200 and 2,500 ft., broadcasting "come out and surrender" messages over powerful amplifiers, with the aid of specially-recorded tapes in a number of Chinese and Indian dialects as well as the Malayan language. The surrender of many hardened terrorists is attributed to these psychological warfare operations.

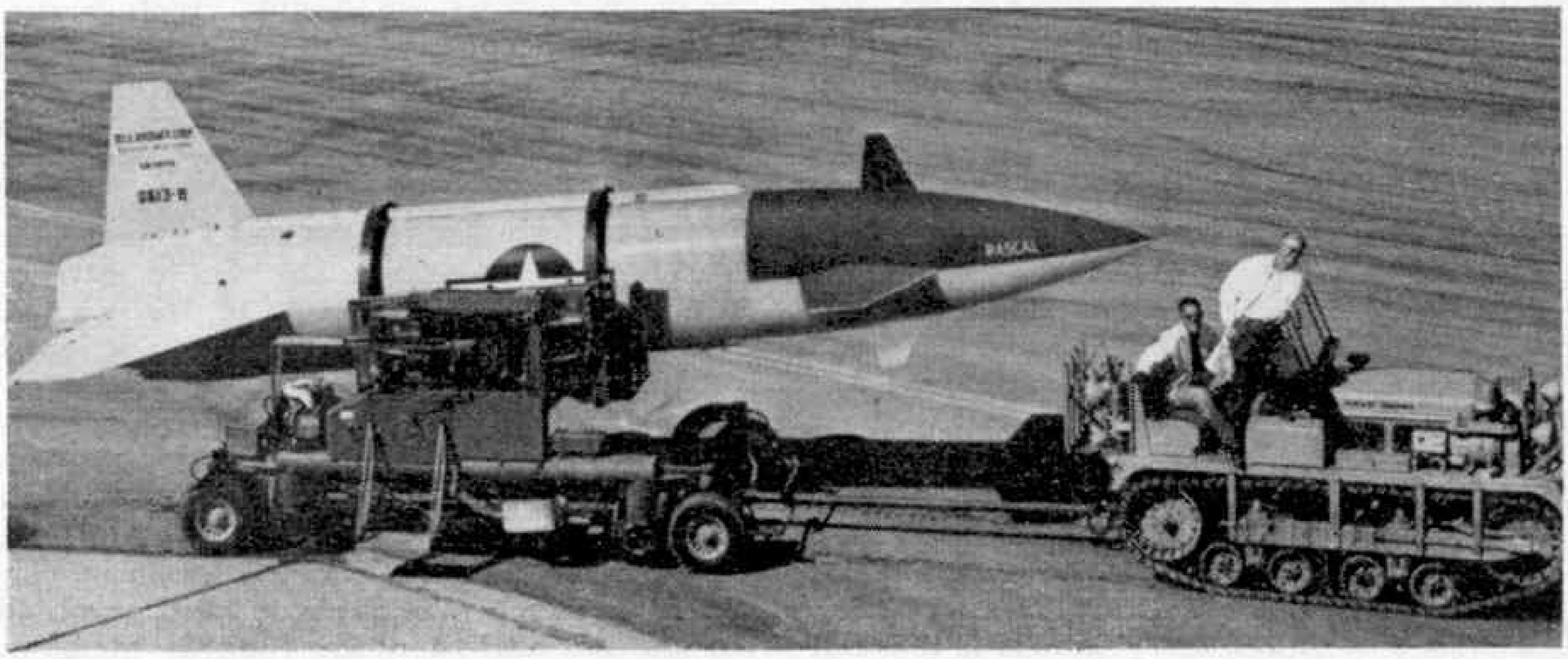
Powered Bomb

The Bell GAM-63 Rascal, illustrated below, is the weapon for which U.S.A.F. bomber crews have been waiting for a very long time. It is basically a bomb; but unlike the usual kind it will find its own way to the target if released 100 miles away, so that the bomber does not have to approach too close to a heavily-defended target area.

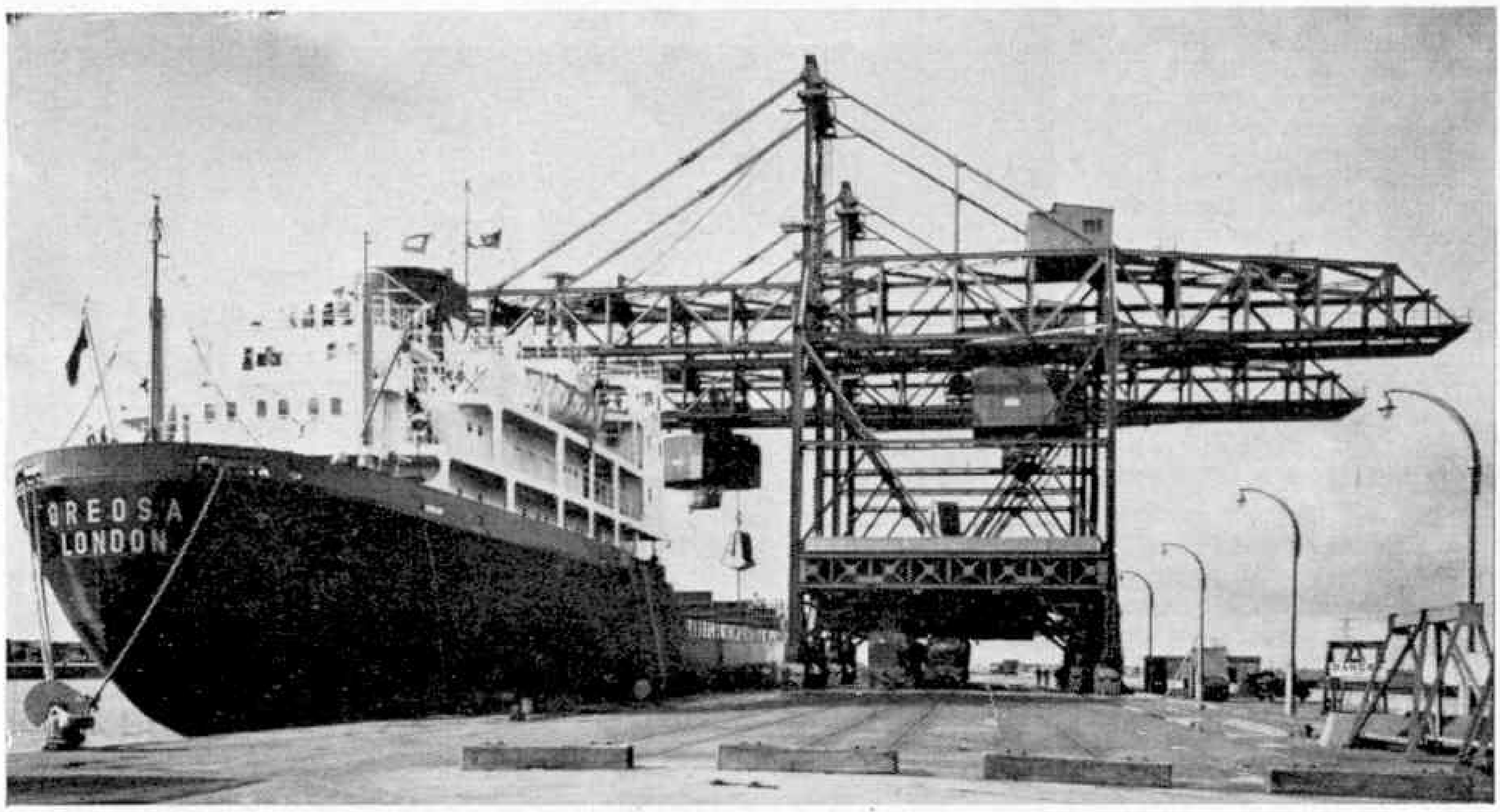
Photographs released so far have shown the Rascal being carried by a B-47 Stratojet, on which it is mounted externally on a rack on the starboard side of the fuselage, under the wing. Dropped like any other bomb, it is powered by a liquid-propellant rocket-motor which gives it a range of 100 miles at about 1,000 m.p.h. at a height of 100,000 ft., where it is out-of-range of defending fighters and missiles. It can carry either a high explosive or nuclear warhead and is about 27 ft. long.

* * * *

B.O.A.C. have ordered, from Vickers, 35 VC10 jet-liners for delivery in 1963. Each will have four Rolls-Royce Conway turbojets and will be employed on the Corporation's African, Far East and Australian services.



A Bell Rascal powered bomb is here shown secured to a ground-handling trolley for transport across the airfield.



Unloading Iron Ore

Travelling Transporters in Birkenhead Dock

THE giant machines in the picture at the head of the page are travelling transporters unloading iron ore from the *Oreosa* in Bidston Dock, Birkenhead, for dispatch by rail to the steelworks of John Summers and Sons Ltd., Shotton. They lift the ore directly out of the holds of ships carrying it with grabs capable of holding 12½ tons, one of which can be seen just above the *Oreosa*, suspended from the machinery carrier. This in turn is carried by a trolley running on rails on the platform of the transporter. When full the grabs are raised and moved inward to deposit their loads in hoppers on the transporters, below which are the tracks on which stand railway wagons ready to receive the ore from them and carry it to Shotton. The transporters were made by Clyde Crane and Booth Ltd.

There are now three of these transporters at Bidston Dock. Two of them have been in operation for some time, and the third was completed at the beginning of this year. The transporters are very large indeed, as can be realised from comparison of them with the *Oreosa*. Their total length is 226 ft., and the highest point of each is almost 134 ft. above the rails on which they move along the quay. The grab has a spread when open of 19 ft. It can clutch 90 cubic feet of ore every time it is lowered into the hold of an ore carrier, and its range of lift, from 38 ft. below quay level to 47 ft. above it, is 85 ft.

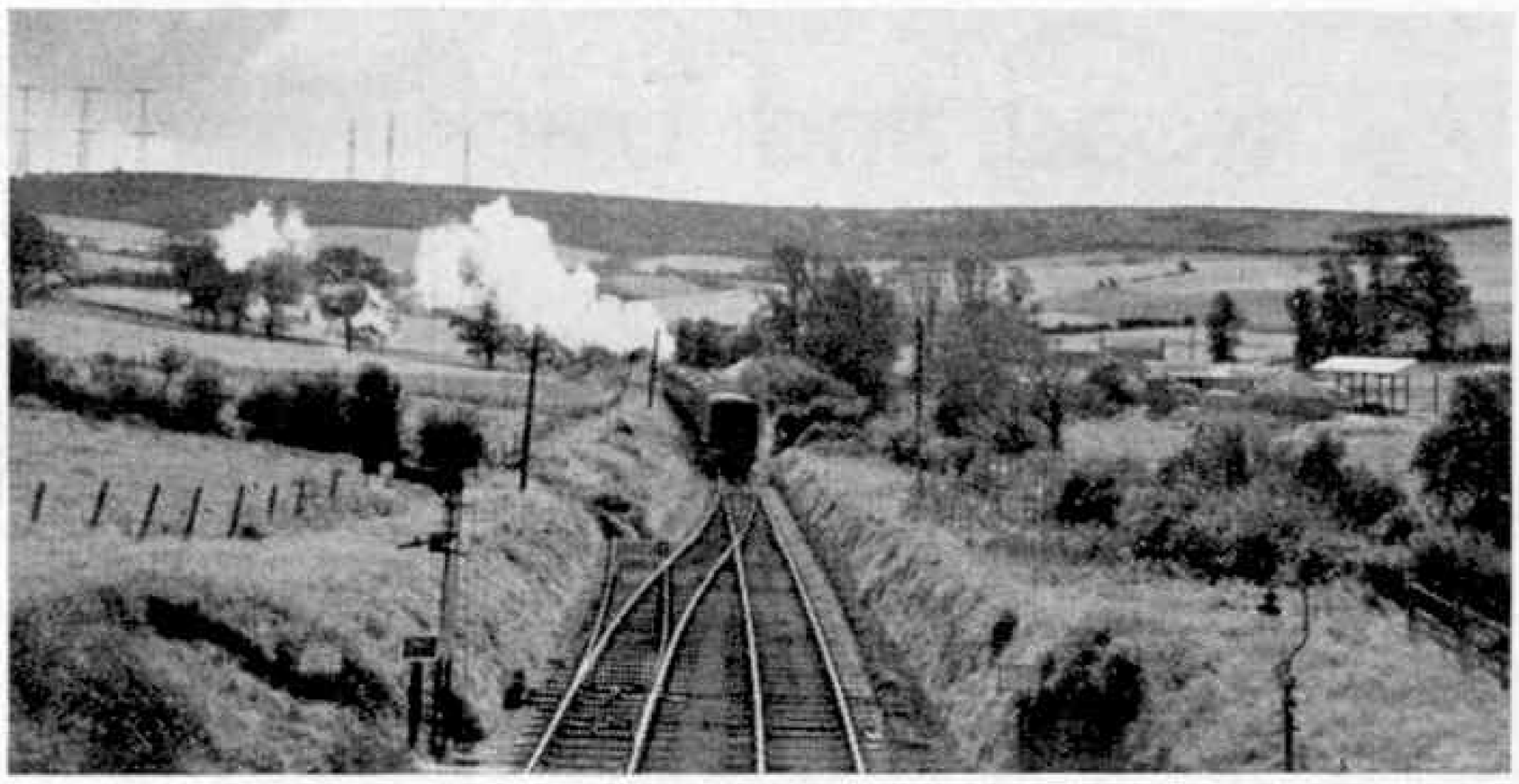
Before the transporters were erected the quay had to be strengthened to make sure that it could carry their great weight—each transporter weighs 600 tons, and eventually there may be four of them—with that of the ore trains as these are made up. Large numbers of additional piles were driven to act as supports, and in particular two continuous runs of sheet piling were placed under the positions to be occupied by the rear transporter rails.

The transporters are moved along the quay as required on double track bogies, one at each corner. Each bogie has eight wheels, the inner four of which are driven.

In our picture of the transporters these are shown in working positions, with the boom, the part that projects over the vessel being unloaded, in line. When they are not in operation the boom can be raised on hinges, well out of the way of shipping being berthed in the dock ready for unloading. To effect this there is a boom hoist winch in the house seen above the main steelwork of the transporter, and this is capable of raising the boom in six minutes. It is sometimes necessary to raise the boom while the transporter is in use, but only when in moving it from one hold to another and there are funnels, masts or other obstructions in the way.

Island Joys

by
Roland Fry



The railway runs mostly through lovely scenery, a tiny intimate railway.

ISLANDS fascinate the young in heart—of all ages. Perhaps they revive memories of pirates, smugglers and buried treasure or perhaps, in these modern days, their charm lies in their being self-contained. They do offer pleasant isolation, a touch of the exclusive, and give just so much to explore and to think about—and no more.

An island is not just a piece carved out of a larger chunk of country; it is something in its own right, something to be explored right up to its edges, without artificial boundaries, and recognising as its limits only the sea. The sea may be a stormy one, chafing angrily under slate-grey skies, or it may be a friendly sea of clear green water flecked with foam, inviting the bather—like the Solent separating that gem of an island, the Isle of Wight, from the mainland.

Among its attractions this island offers beautiful scenery, a rather quaint and appealing little railway, and sturdy but delicately beautiful yachts that fight and dance over the surging waves.

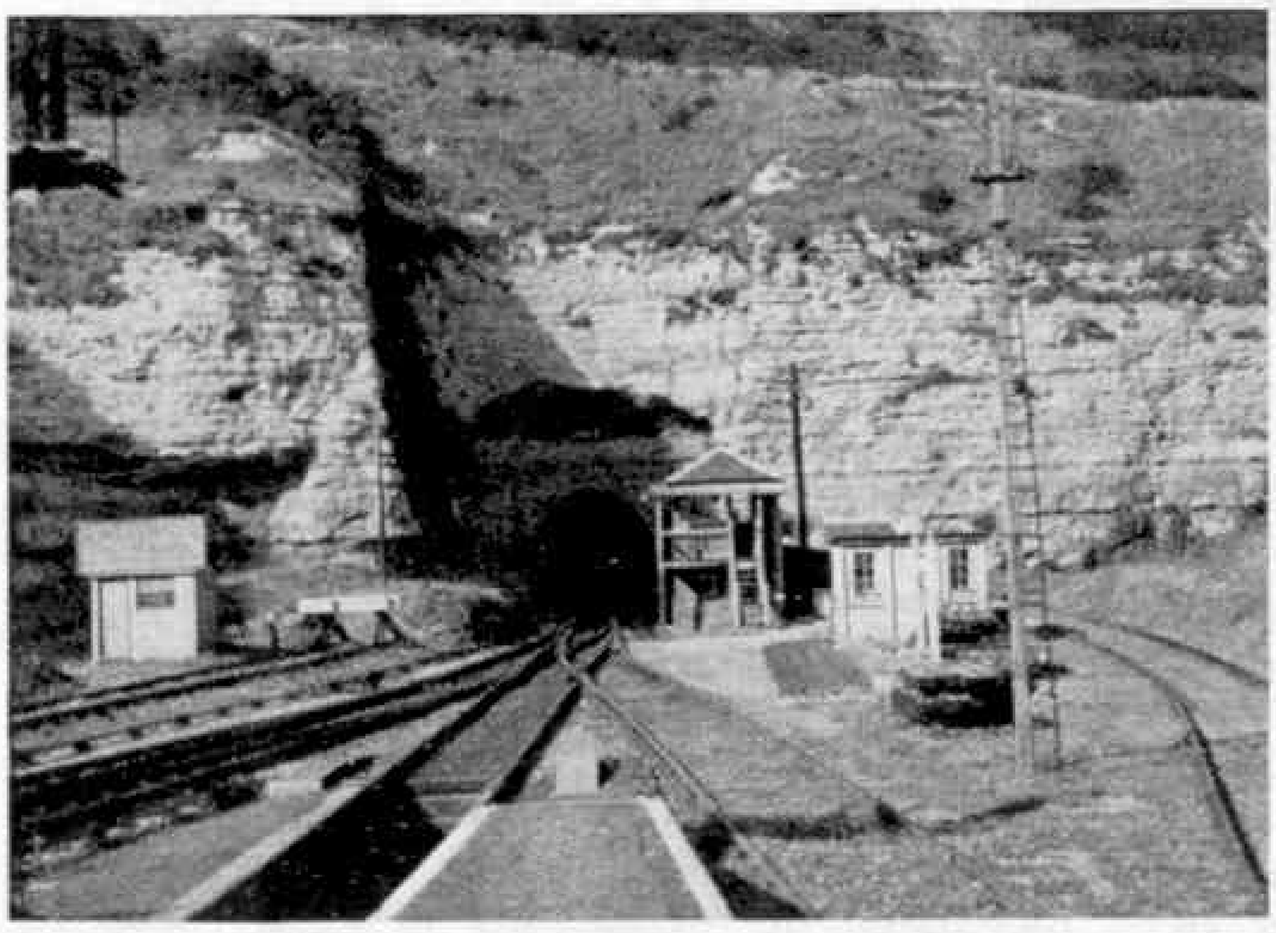
Gently rounded hills dotted with woods and covered with fields look like a giant patchwork quilt thrown over the scene and the folds are shot with flat masses of grey, green or blue as the sea spills through round the headlands.

The railway runs from Ryde to Cowes and Ventnor through lovely scenery—a tiny, intimate railway; the little 0-4-4 tanks chug up the steep gradients and then, with something like abandon, rush down the other side. Drivers, guards and porters in some mysterious way succeed in doing their work with a generous touch of holiday spirit and everyone seems to be enjoying a picnic.

The line to Cowes runs along the Medina estuary, with lovely views of land and water, and at Cowes scores of yachts spread their sails in the sunshine and brave the storms.

The line to Ventnor plunges into a tunnel soon after it leaves Wroxall, and one reaches Ventnor in a breathless rush and looks round at what seems to be a miniature Andean mountain station, where a board near a bare precipitous hillside proudly announces the height above sea-level. Equally thrilling is it to leave the train at Wroxall and walk over wild and windswept St. Boniface Down, and then drop almost helicopterlike some hundreds of feet to the garden plots of Ventnor.

There seem to be no fountains on the island into which travellers throw coins to ensure their return; the travellers just return anyway, for the second and further times with a kind of proprietary interest.

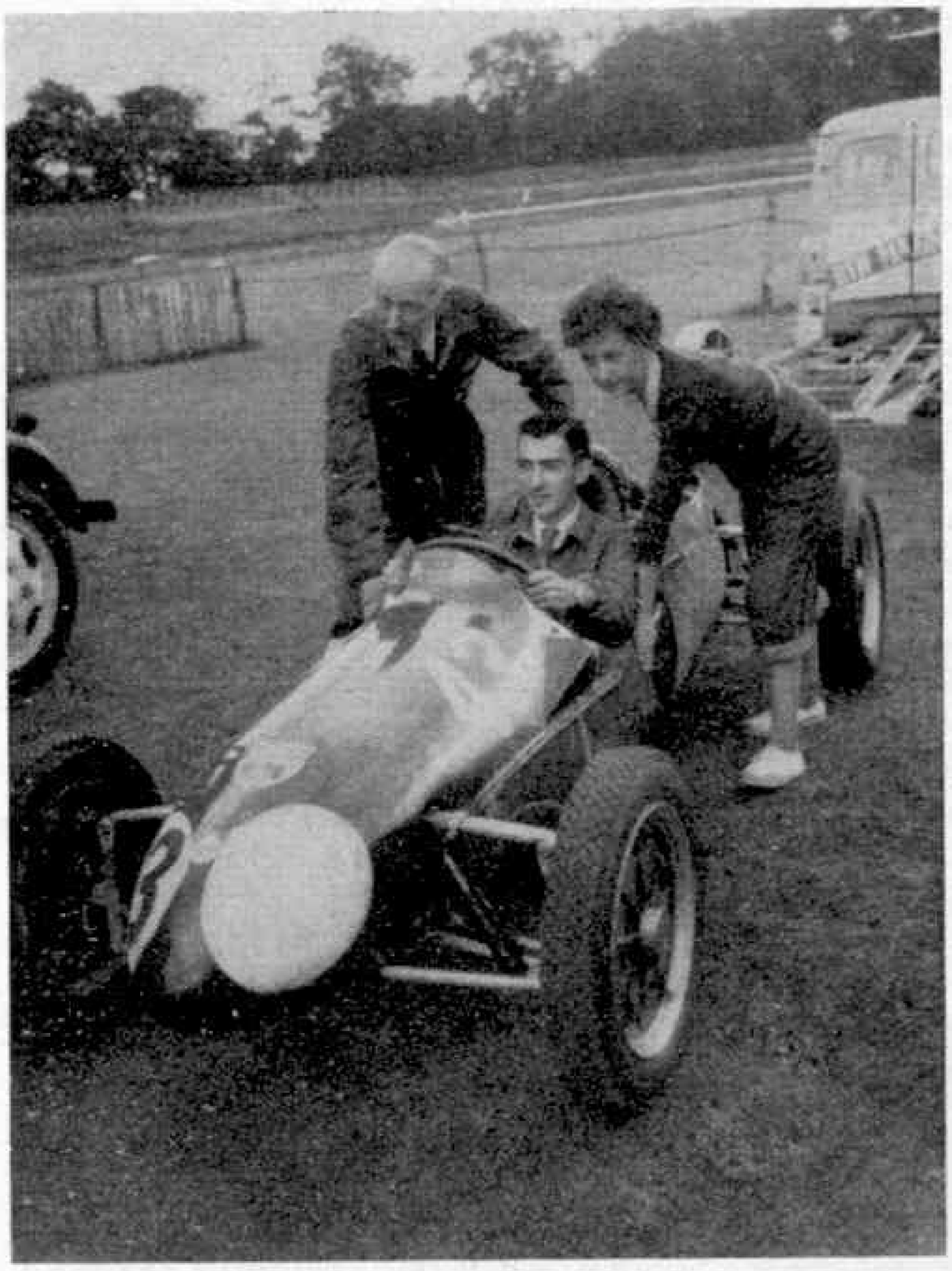


From Ventnor the line plunges into a tunnel.

Road and Track

By Peter Lewis

SIX months of planning and organisation is behind the R.A.C. 10th British Grand Prix, which takes place at Aintree on the 20th of this month. The British Automobile Racing Club, delegated by the R.A.C. with authority to organise the race this year, was faced with a formidable task, for the British classic of 1957 is also the European Grand Prix, a major world championship event which is decided on a British circuit only once in seven years.



S. Lewis-Evans, the young British G.P. driver, began his career in 500 c.c. events. Here his Cooper is seen being pushed on to the Crystal Palace track for practice before an International meeting there in 1954.

A European G.P. has only once before been held in England and that was at Silverstone in 1950, when the Alfa-Romeos of Farina, Fagioli and Parnell were first second and third.

More than £7,000 is to be awarded in prize money, including 2,500 guineas to the winner, which makes this joint effort by the R.A.C., the B.A.R.C. and the Aintree Automobile Racing Club the most valuable single race ever run in this country.

We can expect an electrifying second lap, for there is a special prize of 200 guineas for the first driver to record an average lap speed of 90 miles an hour, only .30 m.p.h. faster than the circuit record of 89.70 m.p.h. held by Stirling Moss with a Mercedes-Benz.

A race of this calibre is of course a tremendous responsibility for the organisers, particularly John Morgan, the secretary of B.A.R.C., a club with a membership that now exceeds 11,000, and his chief of staff, Geoffrey Sykes. No fewer than 80 officials, most of them B.A.R.C. members working on a voluntary basis, will be required at the northern circuit on Thursday and Friday, before the race, when the practice sessions are in full swing. This figure is increased to 150 on race day and includes Stewards, Judges, Observers, Scrutineers, Time-Keepers, Medical Officers and Marshals. When members of Mrs. Topham's permanent circuit organisation are included, it is no exaggeration to say that while the race is in progress three hundred officials will be on duty inside the circuit gates.

Aintree comes to life almost a week before the race, when some of the continental *equipes* arrive with their large racing transporters and are accommodated in garages within easy reach of the circuit. Most of the drivers arrive in Liverpool on Wednesday evening, so that they are ready for the first practice session on Thursday morning.

Mrs. Topham, who is herself a motor-racing enthusiast and was at the B.A.R.C. meeting at Goodwood on Easter Monday, has made no alterations to the circuit, so there should be no great increase on the

In the centre of this group are David Murray, the founder of the Ecurie Ecosse, and "Wilkie" Wilkinson, who looks after the team's Jaguars. Illustration by courtesy of "Motor Racing."

race winning average of 86.47 m.p.h. in the 1955 British Grand Prix. On the other hand, the tremendous current rivalry between the top-flight British drivers promises to make this one of the most exciting British classics ever run, with the possibility of a record crowd exceeding 120,000.

Stuart Lewis-Evans

After the Monaco Grand Prix I talked to 27-year old Stuart Lewis-Evans, a Grand Prix driver who had never driven a Grand Prix car until the 14th October 1956 meeting at Brands Hatch. Since then he has driven for Connaughts at Goodwood, where he won the Glover Trophy, at Naples and Monaco, a heavy programme for a driver whose previous experience was limited almost entirely to 500 c.c. racing cars.

Like Collins and Moss, but unlike Hawthorn and Brooks, he started motor-racing in this class, and his first race was at Brands Hatch in 1950, when he came home seventh in a Mark IV Cooper-Norton. Lewis - Evans is quick to emphasise that 500 c.c. racing is one of the finest, if not the finest, way of learning about the sport. "If you have the urge to go that much faster a 500 will teach you a lot about braking and drifting," he explains, "and you learn your lessons much more quickly and thoroughly than through the medium of a production sports car such as a Triumph or M.G."

The young G.P. driver is one of the very few professional racing drivers in this country. Although his father, who still races successfully, and is known affectionately around the circuits as "Pop" Lewis-Evans, owns a garage, Stuart is not connected with it, and in fact has had no other business activities than motor-racing for the last three years. Following the withdrawal of Connaught, Ferrari have signed him up for the remainder of 1957.

He lives at Bexleyheath, Kent, and is married with two children, a son of three and a daughter of eight months. Like most racing drivers he has very little time for other pursuits or hobbies, but is at present busy on a Hornby-Dublo layout. "The youngster is my excuse for building it," he told me, "but as a matter of fact I get a lot of fun and relaxation out of it myself."

Ecurie Ecosse

In a season when British Grand Prix and sports cars may finish higher in the honours list than ever before, I shall be surprised if the blue Jaguars of David

(Continued on page 366)

Flockhart and Sanderson, the drivers of the victorious Ecurie Ecosse D-type Jaguar in the 1956 Le Mans sports car 24-hour race, with Mr. Murray. Esso photograph.

Thunderbirds

By John W. R. Taylor

The Thunderbirds badge.

FOR several minutes the packed crowds at America's National Air Show had watched spellbound while four brightly-painted Super Sabre fighters were put through a succession of loops, rolls and other aerobatics in tight diamond formation, wingtips overlapping, with a bare 5 ft. gap between them, at speeds ranging from 150 to 750 m.p.h. But the climax was yet to come.

Passing low over the airfield, the fighters shot up into a vertical climb and, switching on their reheat with an ear-shattering roar, did a "bomb-burst" breakaway to the four points of the compass. Trailing white smoke as they rolled over to complete their individual rocket loops, they dived almost at the speed of sound from opposite corners of the airfield and crossed head-on only a few feet apart, right in front of the spectators.

No act in the world demands greater split-second precision and skill from those who perform it, or provides a more spine-tingling thrill for those who watch.

But these aerobatic displays by the Thunderbirds, officially the U.S.A.F.'s 3,600th Air Demonstration Team, are no mere stunts by reckless do-or-die airmen. Every basic manœuvre they perform is taught to young air force pilots when they learn to fly. Their closely-knit diamond formation is simply an adaptation of the four-plane formation used in combat, which ensures the most concentrated fire-power and best protection for a small fighter group.

The object in forming the team back in May 1953 was to show the public something of the speed and manœuvrability of modern jet fighters, and to demonstrate the close co-ordination and precision that are essential if the best is to be got out of good aircraft in action. The more precisely a pilot can fly, the more effective his aircraft will be; and the precision demonstrated by the Thunderbirds is one way in which the U.S.A.F. shows the world that it is a highly-trained and efficient fighting service.

F-84F Thunderstreak formerly used by the Thunderbirds, the official U.S. Air Force precision flying team.

So far, the display has been given to well over eleven million people in the United States, Puerto Rico and twelve countries in Central and South America.

In accomplishing more than 275 demonstrations and travelling over half a million miles, the aircraft have been kept in such perfect condition by the mechanics who form part of the team that no show has ever been cancelled because of unserviceability.

The aircraft themselves are perfectly standard and differ from those in everyday squadron service only by the addition of smoke-trail equipment and a special colour scheme. This consists of red, white and blue stripes around the nose and on the wingtips; red leading-edges on all three tail surfaces, which are painted white and scattered with blue stars; and the Thunderbird badge under the windscreen on each side of the

Some of the members of the Thunderbirds team. From left to right they are: Capt. Johnson, solo; Capt. Brenner, right wing; Major Robinson, leader; Capt. Bartley, left wing, and 1st Lt. Pogue, "slot" man.

fuselage. These markings, based on America's national flag, add colour and interest without being flashy, and are comparable with normal squadron markings, which help to give both pilots and ground crews a pride in their units.

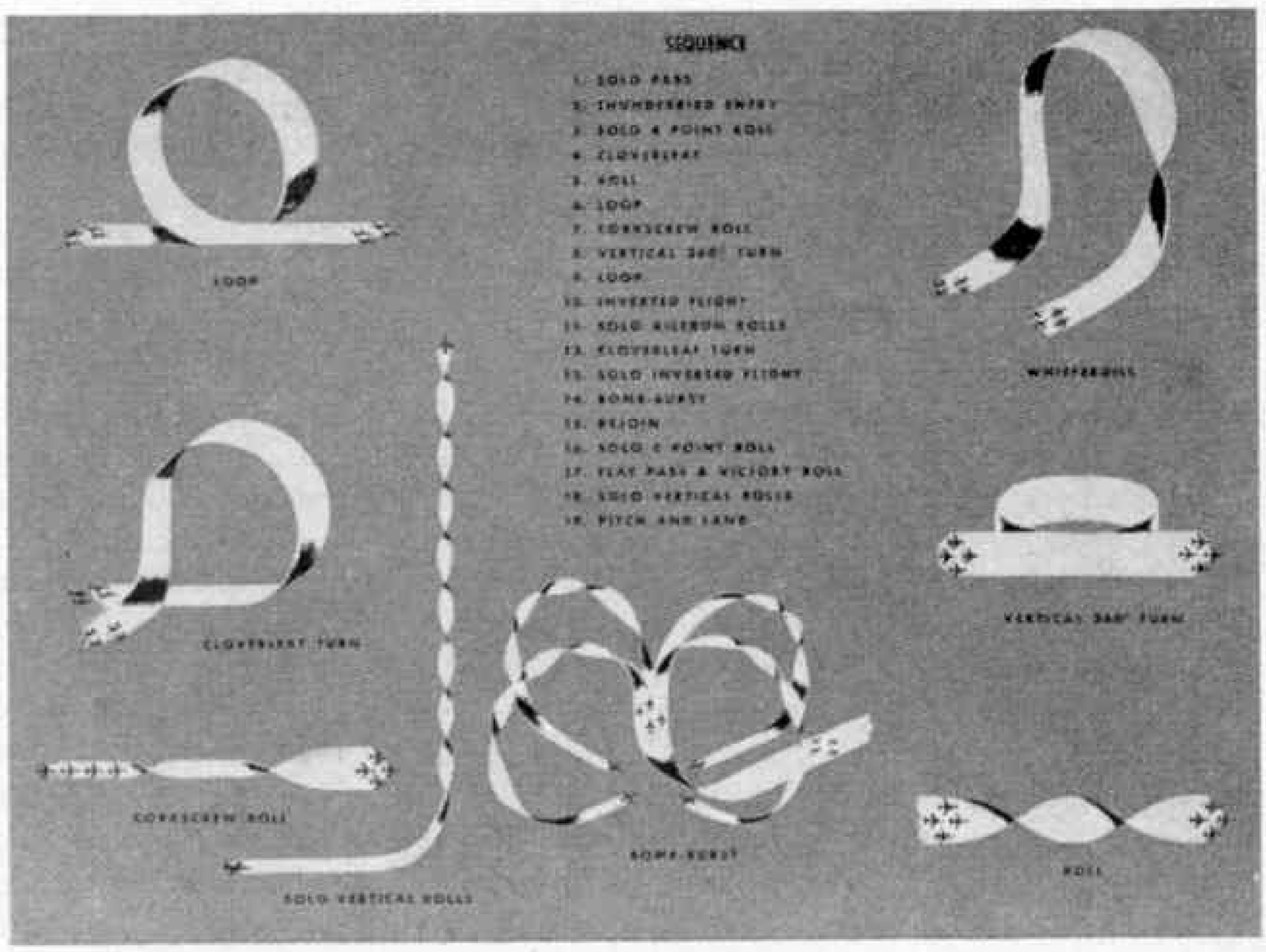
The badge is of particular interest as it shows a blue bird, with red eye and beak, bearing a white star on a red background, with silhouettes of the four aircraft in their diamond formation on the star. As might be expected, the bird is drawn in "Red Indian" fashion, as the Thunderbirds are named after some of the most famous gods in American Indian folklore, which were known to the Algonquins, Sioux, Cheyenne, Comanche, Kiowa, Arapaho, Winnebago and other tribes.

Indian legends say that thunder and lightning were caused by these enormous birds. The thunder resulted from the flapping of their wings, and lightning from the opening and closing of the birds' eyes. Thunderstorms were said to result from battles between the Thunderbirds and other less pleasant monsters, for they were good spirits who spent their time battling evil.

So powerful was the Thunderbird in the minds of the Indians that it ranked with such great gods as the Night Spirit, Earthmaker, Disease Giver, the Sun, Moon, Northwind, Morning Star, Water Spirit and the Chief of Eagles. Various tribes had different ideas on what it looked like; but most of the illustrations that survive—usually crude burned outlines on leather or buckskin—show it as a huge eagle or hawk. By a strange coincidence, it was generally painted in red, white and blue, in connection with rainbows.

Almost all the powers imaginable were credited to the Thunderbird, especially the ability to grant success in war and long honourable life. And it was so revered by the Winnebagos that powerful warriors of this tribe claimed to be reincarnated Thunderbirds. Often, they shaved their heads to resemble the "bald" effect of the American eagle, which was thought to be similar in appearance to the gods.

What sort of men are the twentieth century American warriors whose mounts carry the Thunderbird insignia on their fuselages? If you asked them, they would describe themselves as quite ordinary



These are some of the aerobatics performed by the Thunderbirds in their North American F-100C Super Sabres.

fighter pilots, adding that any competent jet pilot could master their routine with practice. But, of course, they are not novices, and the team that thrilled the crowds at last year's National Air Day had flown between them more than 13,000 hrs. and 600 combat missions, for which all had been highly decorated.

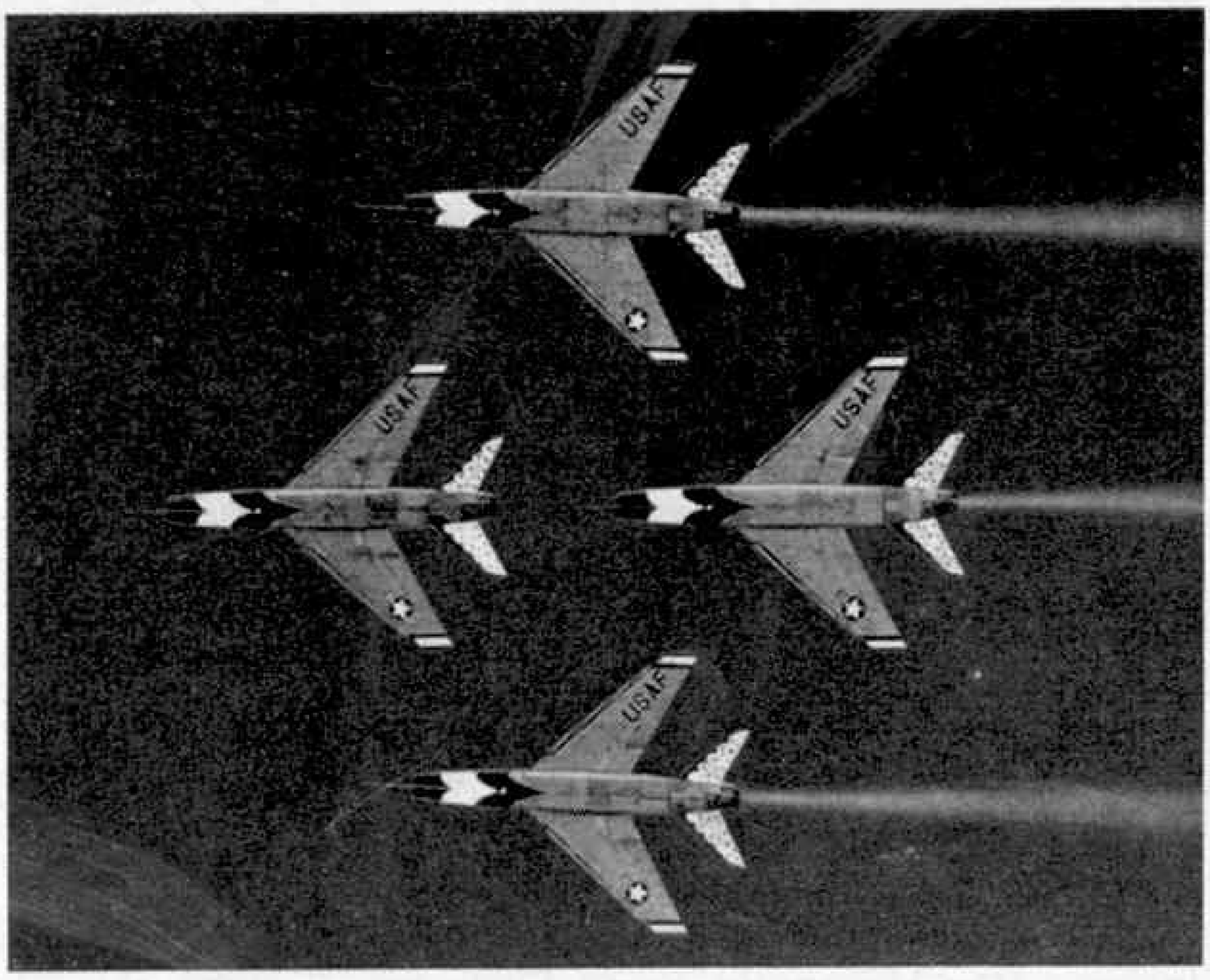
There are seven officers in the team, made up of the leader, two wing men, a "slot" man who has the difficult job of flying in the leader's slipstream, one reserve pilot, who is also engineering officer, a narrator who broadcasts a description of the display to the crowd, and a solo pilot who performs individual aerobatics simultaneously with the team show. Usually, the members are changed after one or two years and there have been so far a total of 18 different pilots.

In the original team, twin brothers—Captains Bill and Buck Pattillo—flew in the wing positions, and it was said that their ability to think alike helped when the aircraft made their head-on "bomb-burst" cross-over at the end of the show. But there are no relatives in this year's team, which consists of Major Jack Robinson, leader; Capts. John Bartley and Doug Brenner, wing men; Lt. Bill Pogue, slot man; Capt. Sam Johnson, solo; and Capt. Bob McIntosh, engineering officer. Of these six, only Bartley and Pogue were in last year's team, as solo and slot man respectively. Their ages range from 26 to 35.

How long does it take to train as a Thunderbird? Well, the team formed in May 1953 gave its first show in the following month and a total of 73 displays within 90 days of its formation. When Jack Broughton became the second team leader on 1st October, 1954, he flew with the other pilots for the first time on the 10th of the month and led his first air show on the 16th.

The aircraft have changed too in four years, because the first team flew Republic F-84G Thunderjets, with a top speed of 605 m.p.h. When they switched to F-84F Thunderstreaks in April 1955 a lot of eyebrows were raised, because aerobatics are more difficult in sweptwing aircraft and the idea of a 650 m.p.h. "bomb-burst" was a little frightening, except to the pilots. Presumably, the eyebrows went up even higher in June 1956, when the T'streaks were swopped for North American F-100C Super Sabres, for these powerful fighter-bombers have a top speed of over 800 m.p.h. and are hefty aircraft to fling around, weighing about 13 tons in fighting trim.

In addition to the five Super Sabres used in the display, the team travels with a sixth, reserve F-100C, a T-33A two-seat Shooting Star jet-trainer which is flown by the narrator and used to carry guests and photographers, and a twin-engined C-119G Packet transport which carries the all-important mechanics, spares and equipment to keep the team flying. There are 32 ground crewmen altogether, all volunteers, and they often work 36 hrs. without a break before a show to make sure that nothing will go wrong mechanically.



Here the Thunderbirds are seen flying in close diamond formation during the manœuvre in which they execute a perfect 360 deg. turn.

Nor is there any time for anything to go wrong in the air. On one occasion a new pilot who had to fly in the right wing position after only three days of practice dived in the wrong direction during the "bomb-burst" and came out on the wrong side of the runway half a second behind schedule. At the speed he was flying half a second is equivalent to an error of 600 ft., and when four aircraft do a cross-over at that sort of speed, sometimes only three feet above the ground, even split-seconds matter.

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.

Recessed Bridges

Have you noticed that many of our old stone bridges have recesses in the walls on both sides, into which persons who are crossing may retire to avoid injury from passing vehicles. There is one at Clun, in Shropshire, of which it is said that "those who pass over Clun Bridge come back sharper than they went." This means, not that they will come back more quickly, but that they will have their wits sharpened from being on the alert to escape injury from passing traffic.

Clun Bridge, Shropshire, which has deep recesses in its walls. Photograph by A. Phillip, Hassocks.

Another beautiful recessed bridge is at Stopham, in Sussex, over the river Arun. There traffic lights have been installed, because it is so narrow that two vehicles cannot pass on it. This is the oldest stone bridge in Sussex, dating from the 14th century.

A. PHILLIP (Hassocks, Sussex).

A Famous Fountain

The fountain seen in the accompanying picture is claimed to be the highest in the world. It is in the grounds of Chatsworth House, Derbyshire. When full pressure is used the water attains a height of 250 ft., and if the sun happens to be shining, a lovely display of all the colours of the rainbow can be seen through the spray.

The Emperor Fountain, as it is called, originated in a visit of the sixth Duke of Devonshire in 1826 to the Czar of Russia. In the gardens of the Imperial Palace he was shown a fountain said to throw the highest jet in the world, and the Duke determined that Chatsworth should have one that could throw a jet higher still.

K. BIRKETT (Cheadle Hulme).

The Emperor Fountain, at Chatsworth. Photograph by K. Birkett, Cheadle Hulme.

Driver Hoole in the cab of No. 60149 "Amadis" before the "Yorkshire Pullman" run described below. Mr. R. A. H. Weight, wearing a hat, is standing alongside. Photograph by W. J. Reynolds.

Railway Notes

By R. A. H. Weight

Aboard the "Yorkshire Pullman"

This long-standing and popular train is the heaviest of the three expresses running to and from King's Cross, composed entirely of Pullman cars. It provides a fast morning service, with all seats reservable, from Harrogate, Bradford, Leeds, Wakefield, Hull, Goole, Doncaster, returning similarly in the evening.

In spring sunshine, after the taking of photographs around the engine and greeting those friends who were to occupy the footplate or had come to see me off, I occupied my reserved armchair in car *Adrian* as the whistles blew a few seconds before 5.30 p.m. and we were off in an 11-car train weighing about 460 tons all found. It was not one of the A4 streamlined Pacifics that so often do well on this King's Cross turn—I had rather hoped for *Sir Nigel Gresley*—but one of the five more modern A1 type now shedded there.

Amadis may not be the steadiest of runners, but she was extremely powerful uphill and gave a grand run with plenty of time in hand. To Doncaster Mr. A. F. Pegler, a keen member of the Eastern Region Board, and Inspector Goodhand travelled in the cab. We were soon ahead of time. Although signal and engineering slowings at Hitchin and Sandy prevented customary sustained high speed along that stretch, a maximum of 85 m p.h. was reached, we were through Peterborough, 76½ miles, in 75½ min. and passed Stoke summit, 100 miles from King's Cross, in 100¾ min. at 57–58 m.p.h. Severe signal slacks befell after Grantham, then gently over Muskham Viaduct, under heavy repair, north of Newark with 77 m.p.h. speeds on each side. There were two uphill minima not below the mile-a-minute rate, and a final similar burst of fast running outside Doncaster, where we were at rest in the platform about 5 min. early, at 8.13½, although stopped momentarily at approach colour light signals.

There is an allowance to cover extra delays, but we had considerably improved on schedule as the net time unchecked would have been little over 2½ hrs. or about 151 min. for 156 miles, equalling a 62 m.p.h. average. Four cars were detached to be taken on to Hull, I think, by a B1. The total passenger capacity of the train is about 300. We had over 250 on board that evening. Sometimes all seats are booked.

The Conductor in charge of the train, in which comfort, service and meals were all that could be desired, told me of his 35 years' experience mainly on that route, and of his 3 million miles travel. A staff of 30 is allocated to the train, of whom 24 are usually on duty at a time — chefs, stewards and assistants, etc. Meanwhile the exceedingly able Driver Hoole and Fireman Ehn, with reduced load, were speeding us along the steeper gradients of the West Riding to Wakefield, and over the industrial heights of Ardsley, then as darkness fell the *Yorkshire Pullman* threaded its way across the network of tracks to run into Leeds Central, 4 min. before time.

An N1 ex-G.N.R. 0-6-2T, No. 69443, took the two Bradford cars which would form part of a non-stop short train to that city, and Hunt 4-4-0 No. 62736 *The Bramham Moor* then backed down to take charge of the main Harrogate 5-car portion to complete the northbound run, in both cases over more steep hills. Another enjoyable trip!

Not long previously, the same London driver and fireman on the Leeds (Copley Hill) A1 No. 60133 *Pommern*, with the reduced winter Saturday load of 9 Pullmans, about 380 tons, were also at Doncaster well before time on the northbound *Yorkshire Pullman*, six extra slowings notwithstanding. Similarly, on a very dark evening in bad weather, delays were recovered and another fine performance achieved by A4 No. 60014 *Silver Link* with Driver Hailstone, since retired, taking the full 11-car load. The recorders on these last two runs were Messrs. N. Harvey and L. Burley.

Castles, Far and Wide

Like the historic edifices after which many of them are named, the famous W.R. Castle class 4-cylinder 4-6-0s are scattered over a wide area. They are seen from London to Cornwall, at Fishguard in the furthest part of Wales, throughout a large part of the West Midlands, and at Basingstoke and Salisbury, or sometimes even farther afield in Hampshire, on S.R. metals. Their allocation is spread over 17 Motive Power Depots, as follows: Old Oak Common (London), Reading, Oxford, Swindon, Bristol, Worcester, Gloucester, Cardiff, Landore (Swansea), Carmarthen, Exeter, Newton Abbot, Laira (Plymouth), Penzance, Stafford Road (Wolverhampton), Shrewsbury and Chester.

The first Castles were introduced in 1923 as an improvement on the Star class, which had proved remarkably efficient. With scarcely any change in their most successful design, construction of more examples continued at intervals for no less than 27 years, since batches were built up to 1950. Including some rebuilt from Star class, there are at the time of writing 167 on British Railways lists numbered 4000, 4037, 4073–99, 5000–99, 7000–37. Recently some modifications have been introduced, such as increased superheat and certain improvements in

front-end equipment, further to increase their steaming capacity and power.

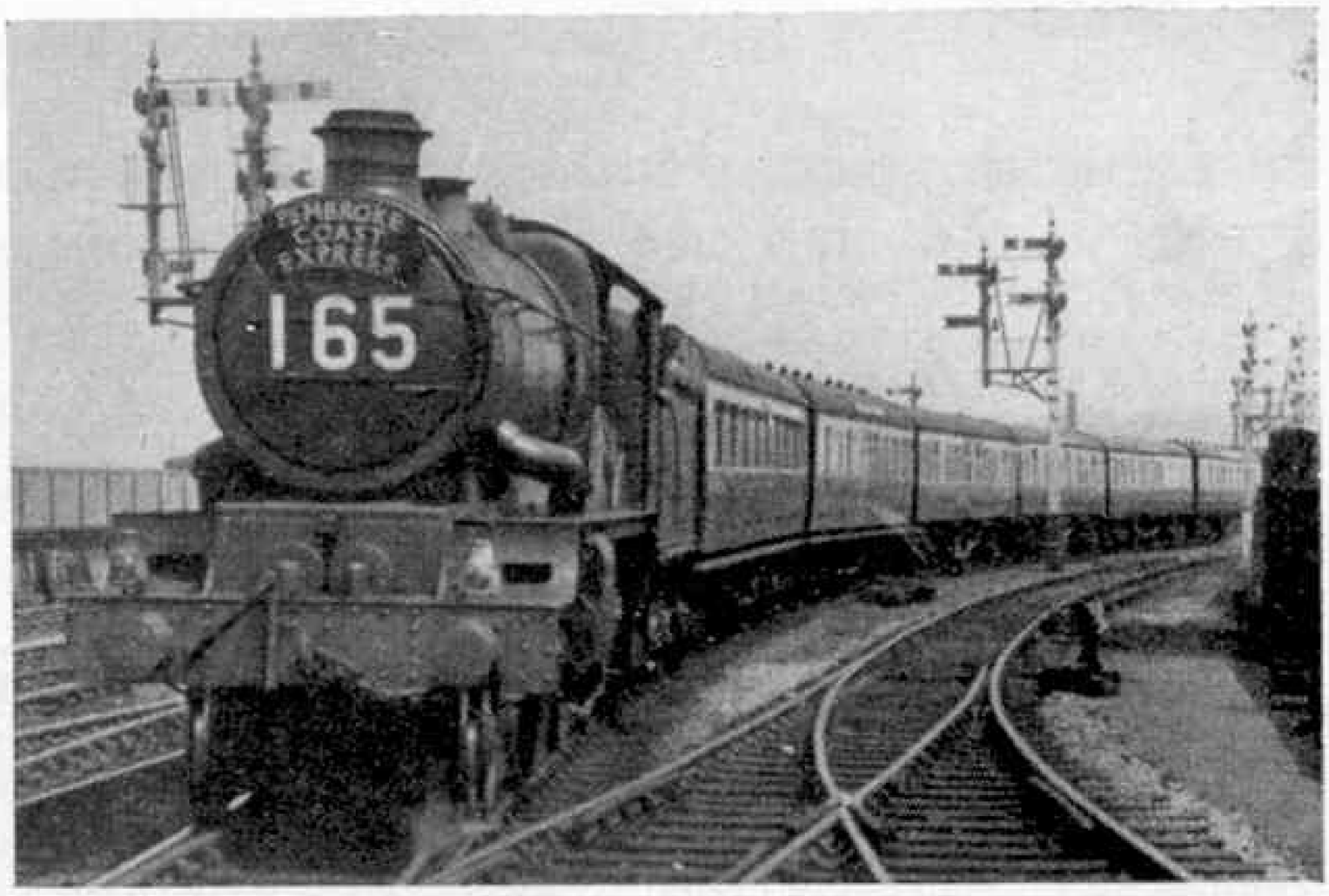
They continue to perform well on some of the fastest expresses such as the *Bristolian*, the 1.15 p.m. Paddington-Bath, the *Pembroke Coast* and others, as well as taking charge of important long distance trains, with many general service duties, over all kinds of route in England and Wales. On some of these they have been reliably familiar for more than 30 years.

Summer Train Service Developments

This year's time tables in full operation for the holiday season include a number of faster runs on the Waterloo-Southampton-Bournemouth route and a greatly improved and accelerated express service to and from St. Pancras-Leicester-Derby, Manchester, Nottingham, Sheffield, etc. There are also entirely new high speed Anglo-Scottish trains named the *Morning Talisman* affording arrivals at King's Cross and Edinburgh (Waverley) early in the afternoon, as does the *Caledonian* from Glasgow (Central) to Euston. The latter also provides a later (mile-a-minute) service than hitherto available in the opposite direction starting from Euston at 4.15. The southbound *Midday Scot* now provides an afternoon departure and quicker schedule from Glasgow and Carlisle. Fast diesel trains calling only at principal stations, and provided with buffet cars, have been introduced on the W.R. Birmingham-Gloucester-South Wales route. Many additional diesel services of more local type continue to appear around Hull, Manchester, Birmingham, Newcastle-Carlisle, and in Lincolnshire and East Anglia, for example.

An international novelty is the inclusion of a through sleeping car between London and Brussels in the *Night Ferry* service, conveyed by the same train and ship to and from Dover as the Paris sleeping cars. The popular car-sleeper night trains conveying cars in covered vans as well as passengers in sleeping cars or ordinary accommodation, enabling holidays in distant areas to start sooner, have been increased in number on certain dates. Runs include Marylebone to Glasgow and Perth and King's Cross to Perth, as well as long cross-country runs for the benefit of travellers to and from the Continent. There are many week-end expresses again during the peak season to and from London, principal centres and holiday resorts, and the usual galaxy of important named trains and others, running in some cases from Monday to Friday only.

Fast and luxurious *Trans-Europe-Express* trains, mainly diesel sets with refreshment cars with 1st class seating, all bookable in advance, are a feature of the new time tables in Western Europe connecting important cities of France, Holland, Belgium, Germany, Switzerland, states the European Railways Information Bureau (C.I.C.E.).



No. 7021 "Haverfordwest Castle" enters Newport (High Street) with the down "Pembroke Coast Express." Photograph by P. J. Sharpe.

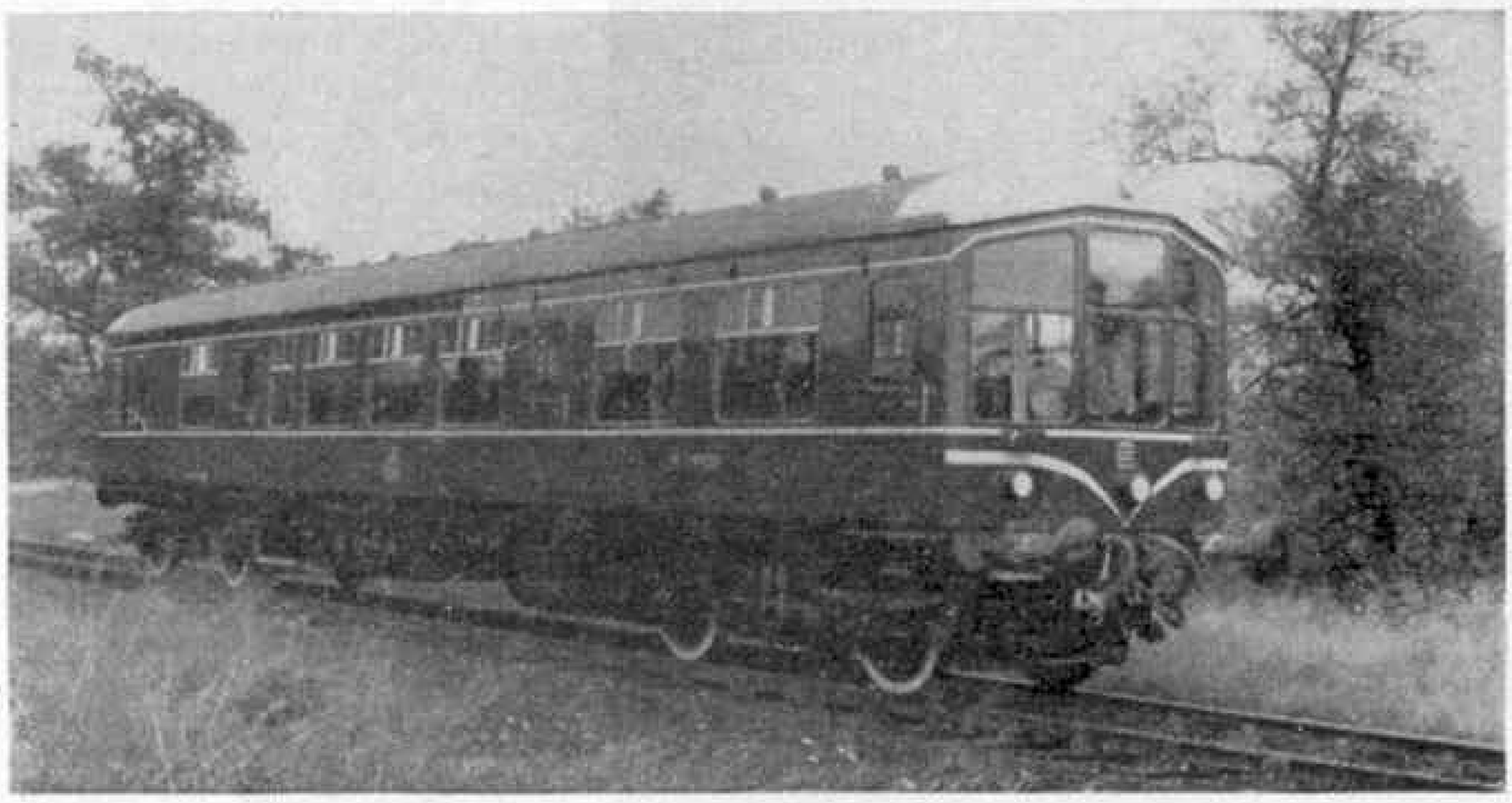
Locomotive Stock Changes

New engines for announcement here this month include class 9 2-10-0s allocated as follows: Nos. 92127, 15A, Wellingborough; No. 92128, 18A, Toton; Nos. 92129-30, 21A, Saltley, and Caprotti class 5 4-6-0s numbered 73149-52 to 65B, St. Rollox, Glasgow. In addition there are Class 4 4-6-0s Nos. 75058-9, 15C, Leicester; class 4 2-6-0s No. 76084, 24D, Lower Darwen; and No. 76085, 15C, Leicester. More diesel-electric six-wheeled standard shunting engines in Scotland are Nos. 13337-41, allocated to 62A, Thornton; and Nos. 13342-6, 62C, Dunfermline.

On the Western Region, 2-6-0s previously numbered 9300 and 9302 have been altered to 7322 and 7324, respectively. All sorts of tender and tank locomotives, including some of B.R. standard types, thereon have been painted green.

Glastonbury Abbey has been withdrawn. No. 4056 *Princess Margaret* is the sole remaining 4-cylinder 4-6-0 of the early Churchward Star class on the active list.

Three ex-Taff Vale 0-6-2Ts, Nos. 305, 385 and 397, have been condemned.



A single-unit diesel railcar of the type designed by British Railways for branch line services. British Railways official photograph.

HAVE YOU JOINED YET?

THE DINKY TOYS CLUB

Founder and President : ROLAND G. HORNBY

SINCE the Dinky Toys Club was formed in January this year applications for membership have flowed into Headquarters, and among them have been many from enthusiasts living overseas. Some of their letters have made me rather envious, for they have come from countries where a warm climate is enjoyed practically all the year round, so that Dinky Toys enthusiasts have more opportunities for playing out of doors.

Two of the fortunate collectors who are able to take advantage of this in their games are Martin Rawson, age three, who lives in Gibraltar, and Hugh Cameron, Johannesburg, South Africa, whose pictures appear on this page. Both boys are really keen collectors and have a good number of Dinky Toys.

Martin Rawson, Gibraltar, is only three years old, but he is a keen Club member and has a fine collection of Dinky Toys.

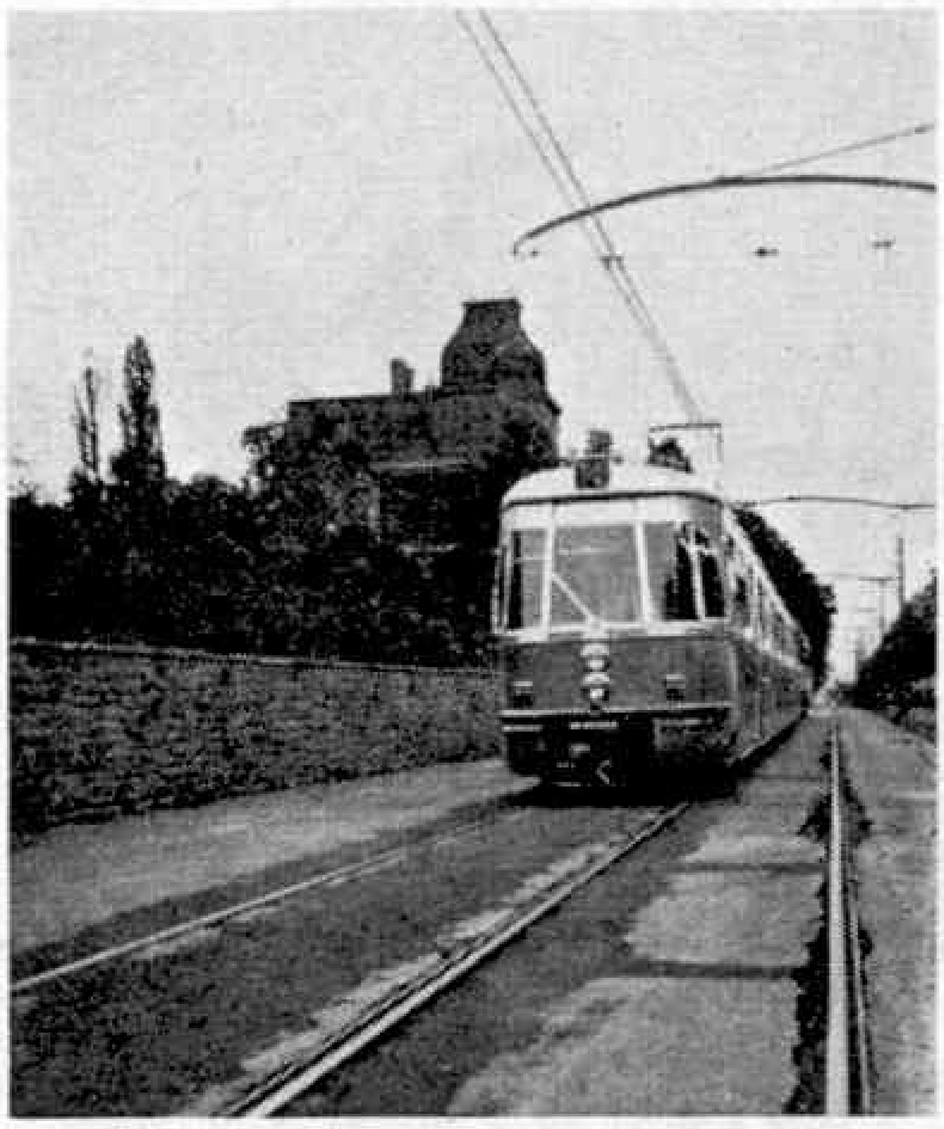
You will see that Hugh Cameron has set up his Dinky Toys in the garden, and indeed it is there that he makes most use of them. Although the climate of the British Isles cannot be guaranteed always to be fine and warm, there are usually many fine days in the summer when a good outdoor scene can be made up in the garden. Owners in these Isles should keep this in mind.

Suitable outdoor scenes can easily be devised. For instance a miniature race track can be arranged on a level piece of ground, and a hill climb route for sports cars can be set up in a corner. If the ground is reasonably firm, no more than a general levelling up should be necessary.

If you are not already a member, why not follow the lead of the many thousands of enthusiasts who have joined the Club already, and send in your application? Just write to the Secretary, Dinky Toys Club, Binns Road, Liverpool 13, enclosing P.O. for 1/- for your Badge and Certificate.

Hugh Cameron, Johannesburg, takes advantage of South Africa's sunny climate to play with his Dinky Toys in the garden.

MECCANO MAGAZINE



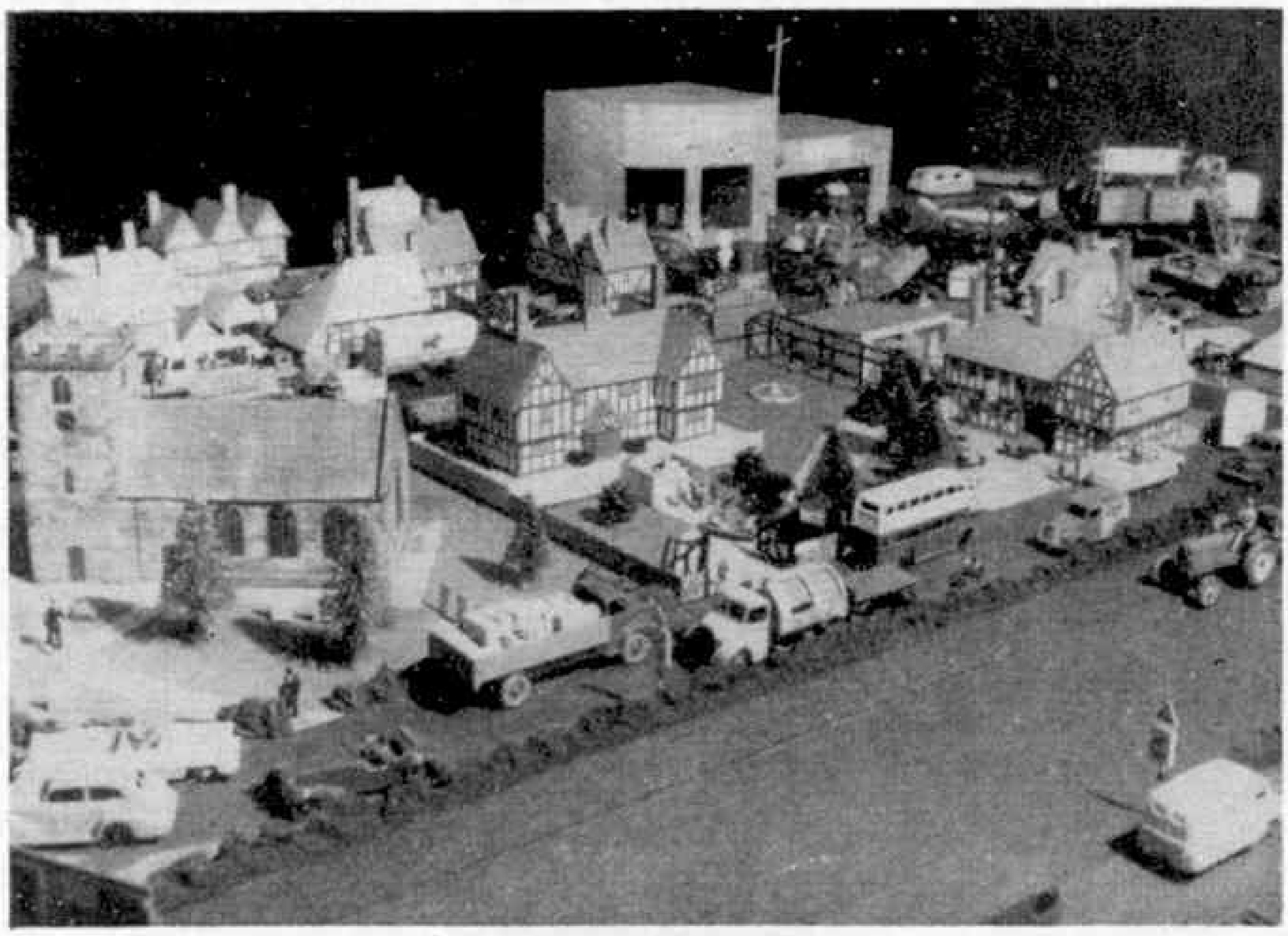
A modern streamlined tram running between Bonn and Königswinter, in Germany. Photograph by J. A. T. Watson, Sudbury.

Junior Section

TRAMCARS! Can they still be of any use, and are we making a mistake in replacing them by buses? In many places they have been greatly improved and do good work. Look at the picture above, for instance. The reader who sent it to me wrote in his letter "*When I tell people that they still use trams in Germany, they laugh and say that they must be terribly out of date.*" He thinks they are quite wrong, and his photograph gives him support, for it shows a modern express type of tramcar, streamlined, comfortable and speedy, running on separate tracks. And such tramcars are to be seen in other countries too.

The most direct route from the centre of Liverpool to Binns Road is still operated by tramcar. Sometimes I have told prospective visitors that the easiest way to reach our Works is by a No. 6a or No. 40 tramcar. After the first shock of astonishment, they almost invariably seem pleased at the prospect of a ride in a tramcar, and they certainly enjoy the trip, for it is made in one of the most modern constructed for the now disappearing Liverpool tramcar system, known to the tramwaymen as "Baby Grands."

A tramcar nowadays is a novelty to most of us! I even take rides on this route myself at times, just for the pleasure of living for a few minutes in the past, but in a month or two these tramcars, Liverpool's last, will give way to buses.



A. B. Cooper, of March, Cambridgeshire, has built this splendid layout for his Dinky Toys. It gives him opportunities for making good use of a wide range of his stock of Dinky Toys.

Easy Model-Building

By "Spanner"

Mechanical Hammer—Novel Fork Lift Truck

THIS month I have for you a simple model of an old type mechanical hammer used for forging metals, and a more elaborate example of a modern Fork Lift Truck.

The Mechanical Hammer is shown in Fig. 1 and can be built from parts in Outfit No. 00. To make the base of the model bolt two Trunnions 1 and two 2½″ Strips 2 to a 5½″ × 2½″ Flanged Plate. Strengthen the Strips 2 by bolting Fishplates 3 between them and the Flanged Plate, and place a Crank Handle as shown in the Strips 2, and fix on it a 1″ Pulley 3. Remove the set screw from the Pulley and replace it by a ⅜″ Bolt 4.

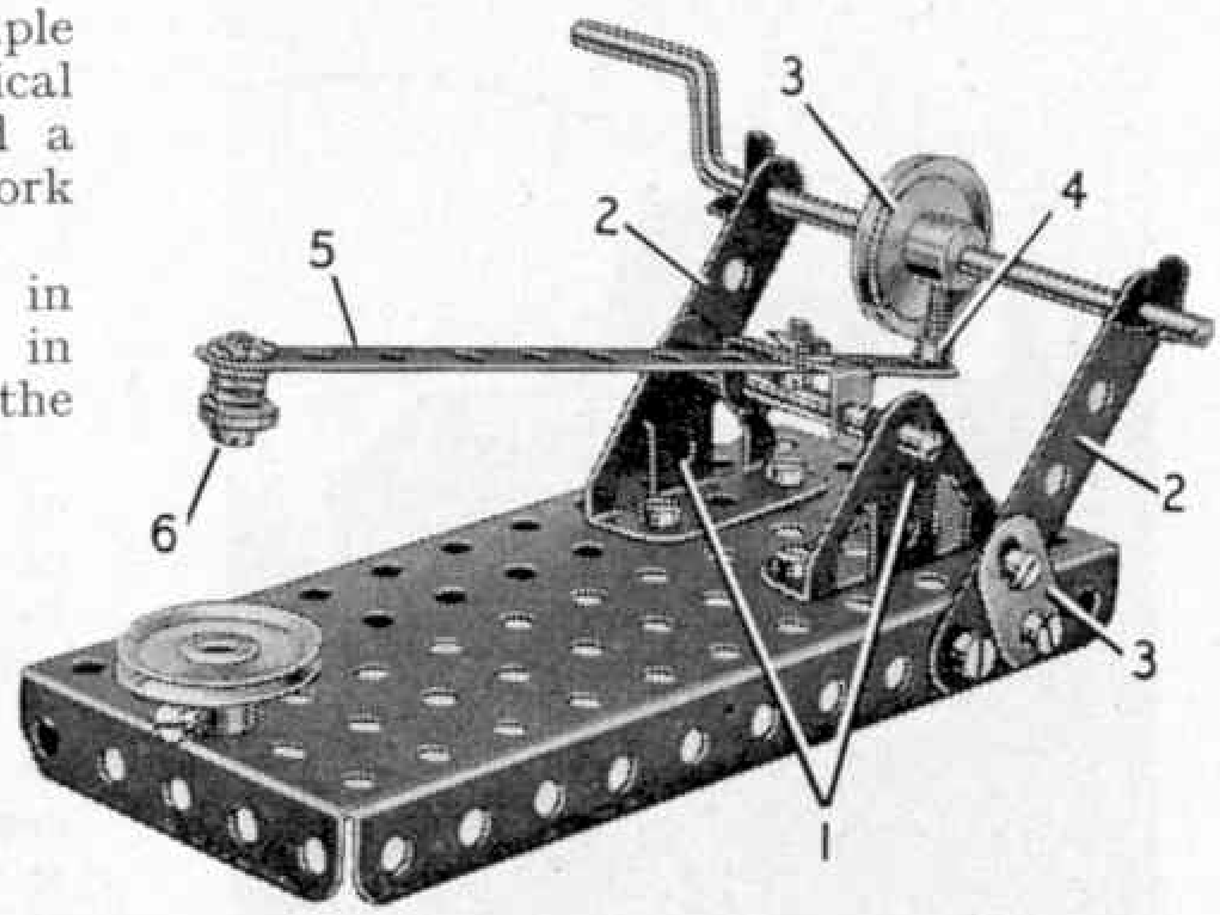


Fig. 1. This easy-to-build Mechanical Hammer makes a good subject for a No. 00 Outfit model.

The hammer arm 5 is a 5½″ Strip. Pass a bolt through the third hole from one end, and use the bolt to fix in place two Angle Brackets. Now push a 2″ Rod through the Trunnions 1 and the Angle Brackets and hold it in place with Spring Clips, so that the Strip 5 pivots freely on the Rod.

The hammer head 6 is a ⅜″ Bolt, which carries two Washers and three nuts. The anvil below it is a 1″ Pulley fixed by its set screw on a bolt passed through the Flanged Plate. The Strip 5 must be arranged so that when the Crank Handle is turned the Bolt 4 strikes against the rear end of the Strip and forces it downward, so that the hammer head is raised. As the Bolt moves clear of the Strip the hammer falls and strikes the anvil.

A list of the parts required to build the Mechanical Hammer is given at the end of this article.

The model Fork Lift Truck is of a type in which the lifting forks are at the side of the vehicle instead of the front. It can be built from parts in Outfit No. 4.

Construction should be begun by bolting two 12½″ Strips 1 to a 2½″ × ½″ Double Angle Strip attached to a 5½″ × 2½″ Flanged Plate 2. The rear ends of the Strips are connected by a further 2½″ × 1½″ Double Angle Strip, and this supports

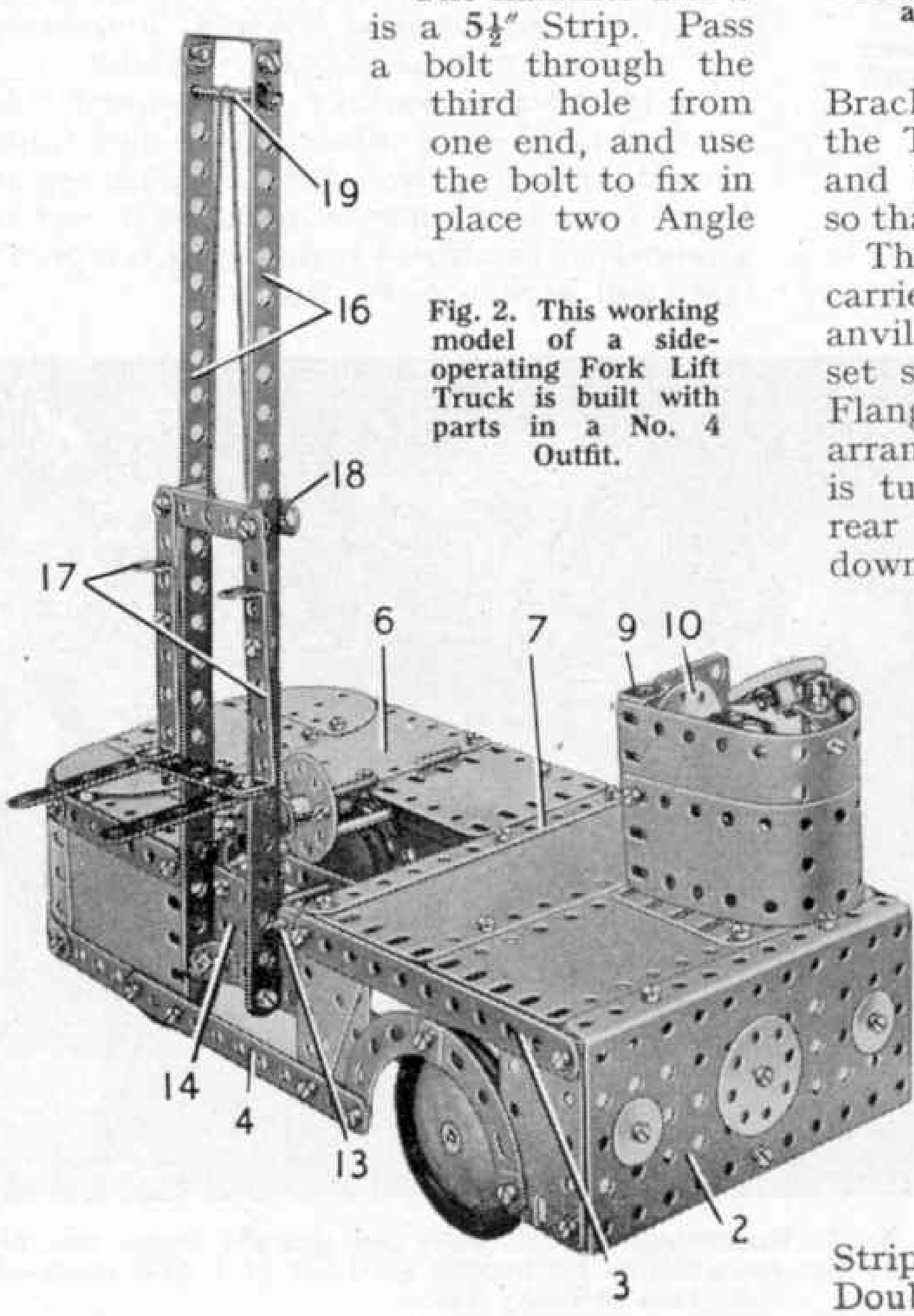


Fig. 2. This working model of a side-operating Fork Lift Truck is built with parts in a No. 4 Outfit.

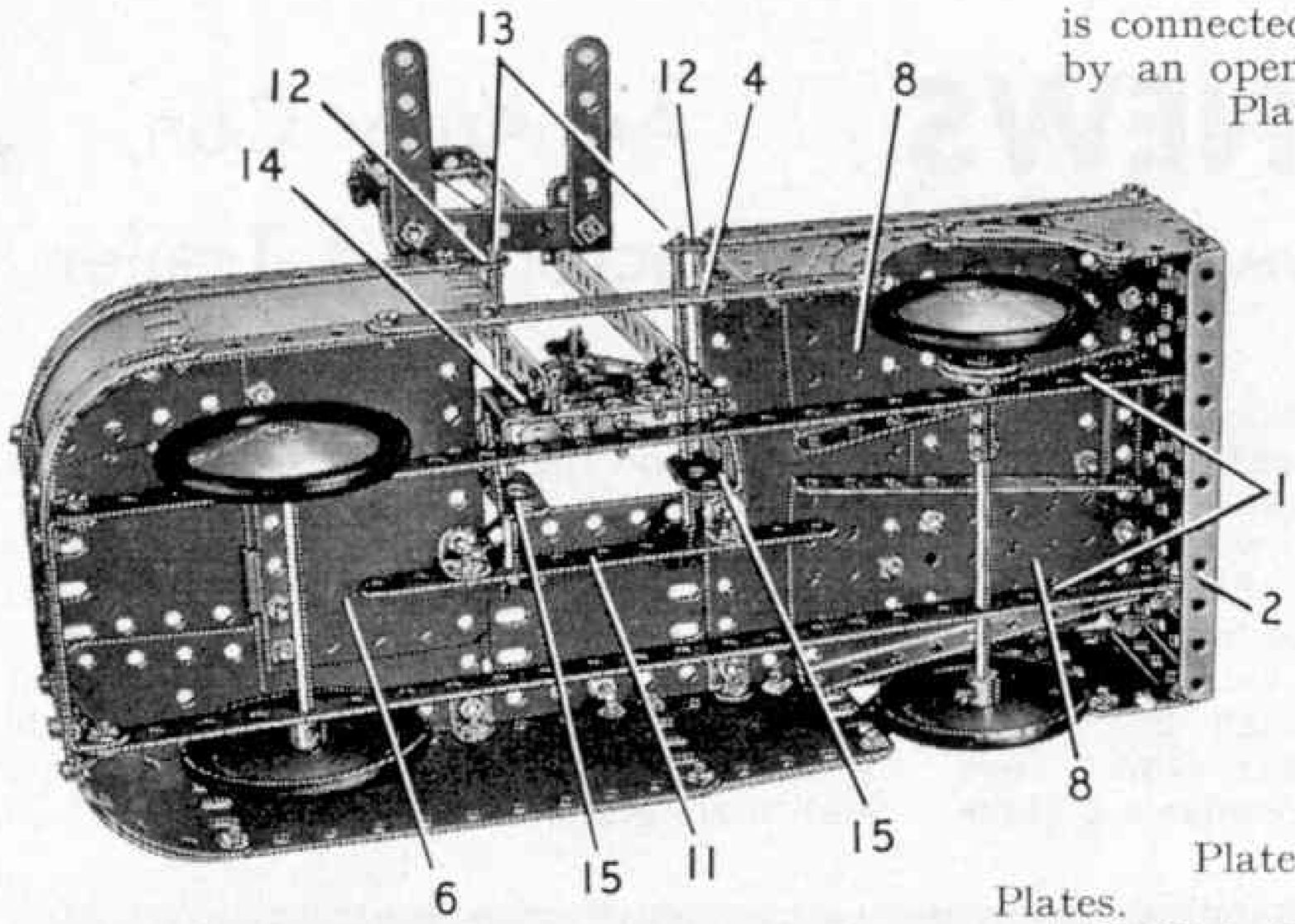


Fig. 3. The Fork Lift Truck seen from below.

two straightened $1\frac{11}{16}''$ radius Curved Plates overlapped three holes.

The side seen in Fig. 2 is made by bolting a $5\frac{1}{2}''$ Strip 3 and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate to the Flanged Plate 2, and by fixing an opened out U-section Curved Plate, extended by a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate, to the rear end of the body. The Curved Plate is edged by two Formed Slotted Strips, and the $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate is strengthened by two $3\frac{1}{2}''$ Strips. The lower $3\frac{1}{2}''$ Strip is extended by a $5\frac{1}{2}''$ Strip 4, and two $2\frac{1}{2}''$ Stepped Curved Strips forming the front wheel arch are bolted between Strip 4 and the $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate. Two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Triangular Flexible Plates are fixed between the Strips 3 and 4.

The side seen in Fig. 4 consists of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$, a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate arranged as shown, with $2\frac{1}{2}''$ Stepped Curved Strips forming the wheel arch. The upper edges of the Plates are strengthened by a strip 5, made from a $2\frac{1}{2}''$ and two $5\frac{1}{2}''$ Strips, and the lower edge of the side is completed by bolting in place a $5\frac{1}{2}''$ and a $2\frac{1}{2}''$ Strip. The side is connected to the back of the body by an opened out U-section Curved Plate and two Formed Slotted Strips.

The pin is removed from a Hinged Flat Plate and the halves are bolted together overlapped lengthways by seven holes. A plate 6 is thus formed. It is attached to the sides of the body by Angle Brackets. The space between this plate and the back of the body is filled in by a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate and two Semi-Circular Plates.

A $5\frac{1}{2}''$ Strip 7 is fixed to Angle Brackets bolted to the sides of the body, and these Angle Brackets support also a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate. Two Flanged Sector Plates 8 are bolted between the Flexible Plate and the Flanged Plate 2, and a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ and a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate are attached to the Flanged Sector Plates. The front wheels are fixed on an axle made from a $3\frac{1}{2}''$ and a $1\frac{1}{2}''$ Rod joined by a Rod Connector, and the rear axle is a $3\frac{1}{2}''$ Rod.

The driver's cab consists of two $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates bolted together lengthways and curved as shown. The Plates are fixed to $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 9 attached by their lugs to the top of the body. The steering wheel is fixed on a $\frac{3}{8}''$ Bolt passed through an Obtuse Angle Bracket that is bolted to another Obtuse Angle Bracket fixed to the front of the cab. The back of the cab is formed by two $2\frac{1}{2}'' \times 1\frac{1}{2}''$

(Cont. on page 366)

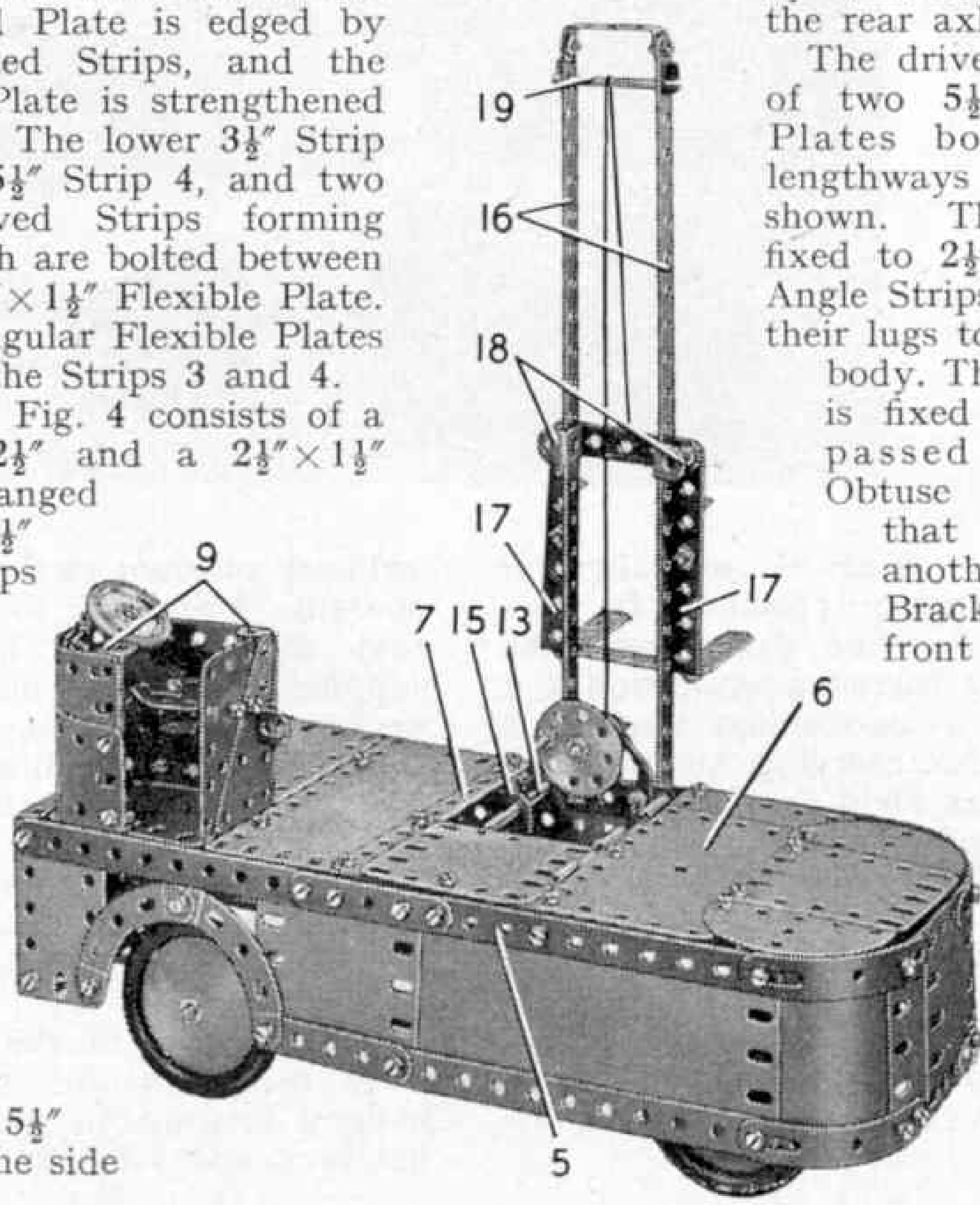


Fig. 4. This view of the Fork Lift Truck shows the arrangement of the guides for the lifting forks.

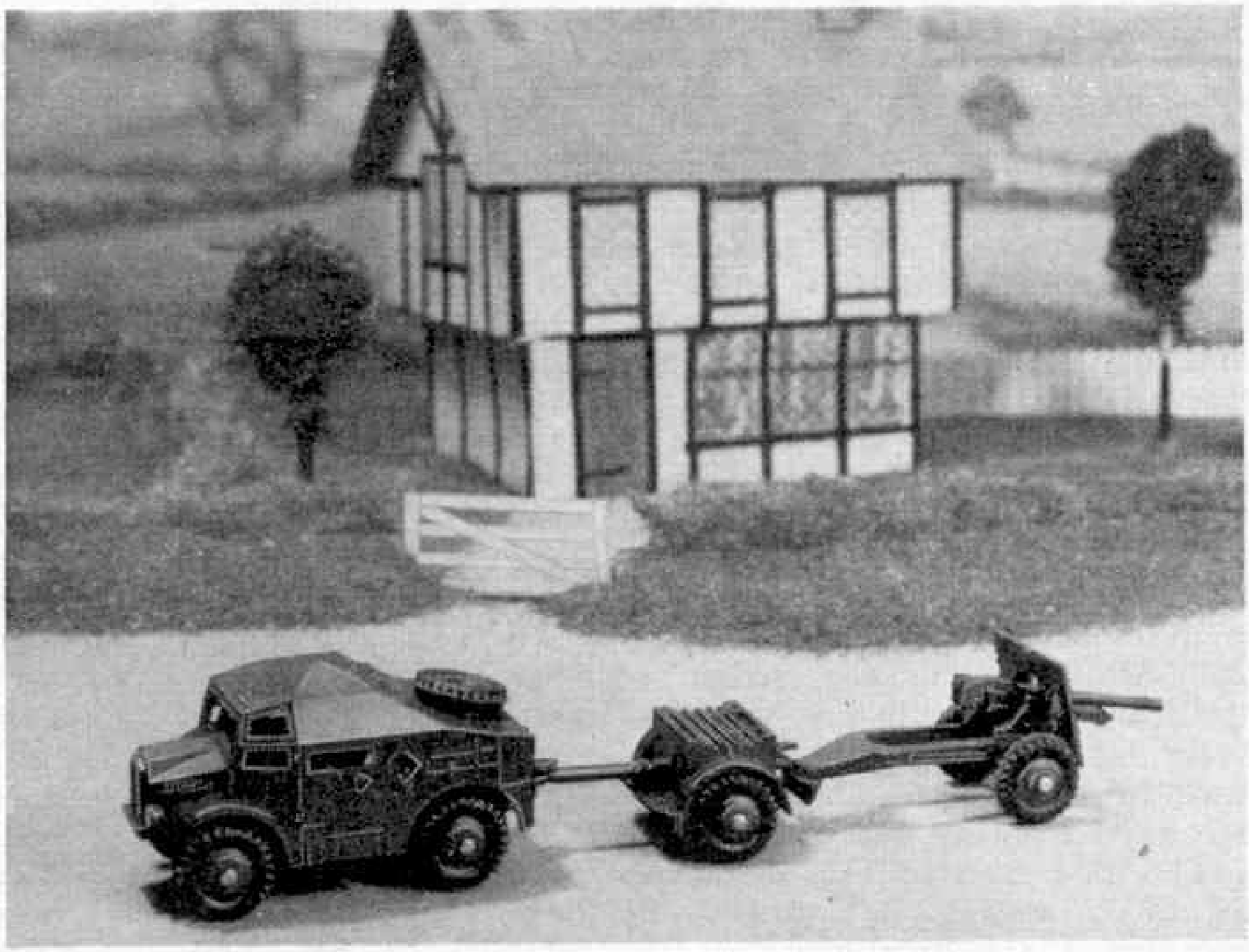
DINKY NEWS

By **THE TOYMAN**

An Army Gun, Tractor and Trailer

THIS month I have some really exciting news for Dinky Toys enthusiasts—the appearance of a new Army model that will receive an especially warm welcome from enthusiasts. This is the 25-Pounder Field Gun Set, shown in the picture on this page and in colour on the back cover.

As you can see, although the Set is available as a complete unit, Dinky Toys No. 697, actually it comprises three separate items. These are a Field Artillery Tractor, No. 688, a Trailer, No. 687, and a 25-Pounder Field Gun, No. 686. The three items are designed to form together a really splendid Set that will provide fascinating scope for use in Dinky Toys Army play schemes.



The latest addition to the Dinky Toys Army series is this splendid 25-Pounder Field Gun Set, Dinky Toys No. 697.

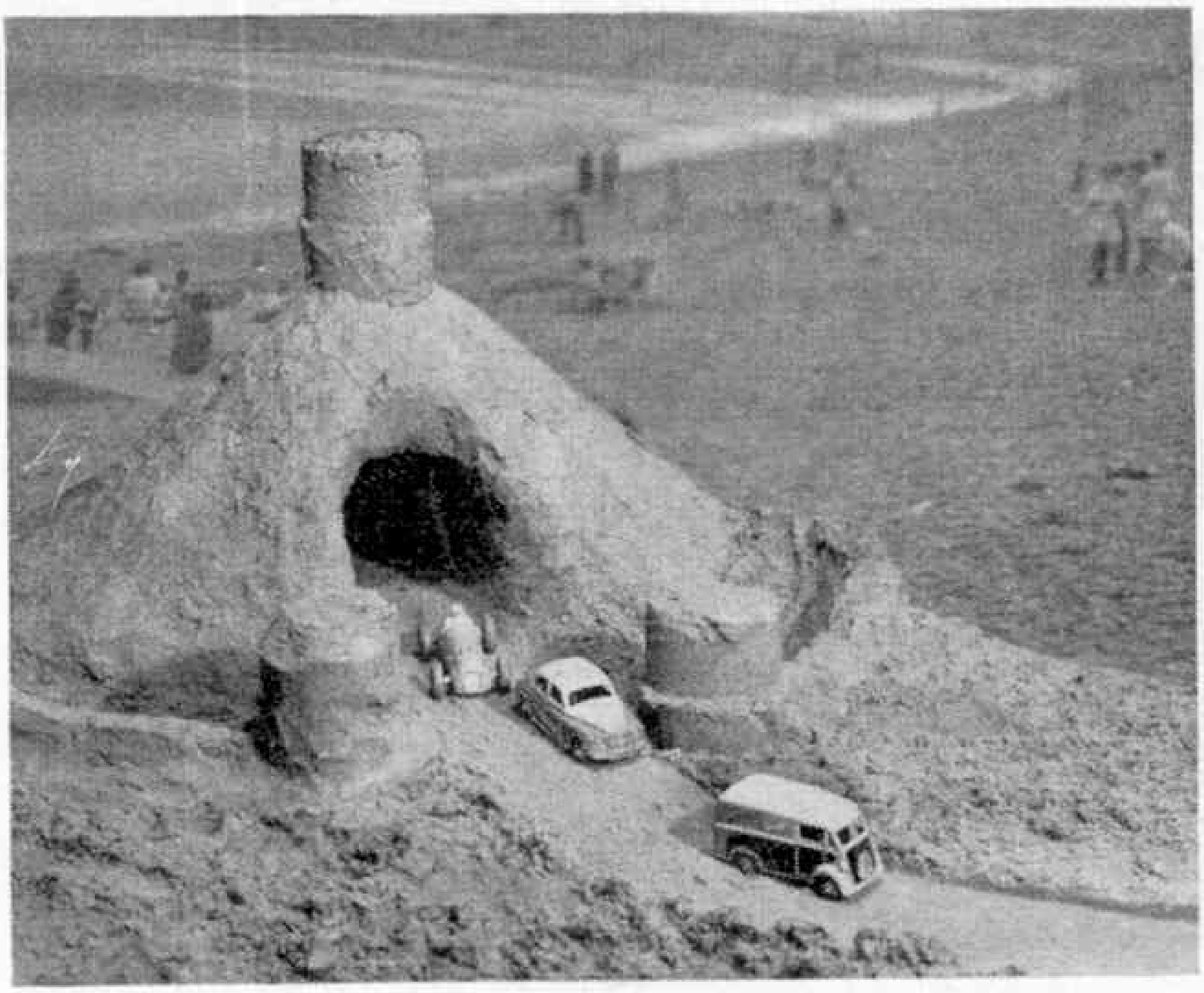
The Tractor is based on a powerful vehicle designed specially for artillery towing purposes. It has accommodation for the driver and the gun crew, and it carries ammunition and equipment such as camouflage nets. The Trailer is used for carrying ammunition.

The 25-Pounder Field Gun is one of the most versatile and effective weapons used by the British Army. Its main role is to provide support for infantry, and an outstanding example of its use in this way was in the tremendous artillery barrage before the Battle of El Alamein, during the 1939-1945 war. The 25-Pounder can be used also as an anti-tank weapon, firing armour-piercing shells.

The Dinky Toys models are fully detailed, and the barrel of the 25-Pounder Field Gun can be raised and depressed. The Tractor is fitted with a miniature driver inside the cab, and it carries Royal Artillery transfers.

Many enthusiasts have suggested that the sports cars in the range should be made available without competition numbers and with miniature drivers "dressed" in ordinary outdoor clothes instead of racing overalls. I am glad to be able to tell you that this idea has been adopted, and supplies of the two models shown in the accompanying pictures are already available. The modified sports cars are No. 104, Aston Martin DB3S (touring finish), and No. 101, Sunbeam Alpine Sports (touring finish). Similar modifications will be made to other sports cars in the range, so look out for further announcements.

At this time of the year most Dinky Toys collectors are on holiday or are looking forward to going away for their holidays, and I expect many of them will



Holiday fun! A simple scene using Dinky Toys on the seashore.

be visiting the seaside. It is a good plan to take a few of your Dinky Toys with you on holiday, for in this country at least, the weather is apt to be rather uncertain, and Dinky Toys will enable you to pass the time enjoyably if you are forced to stay indoors for a while.

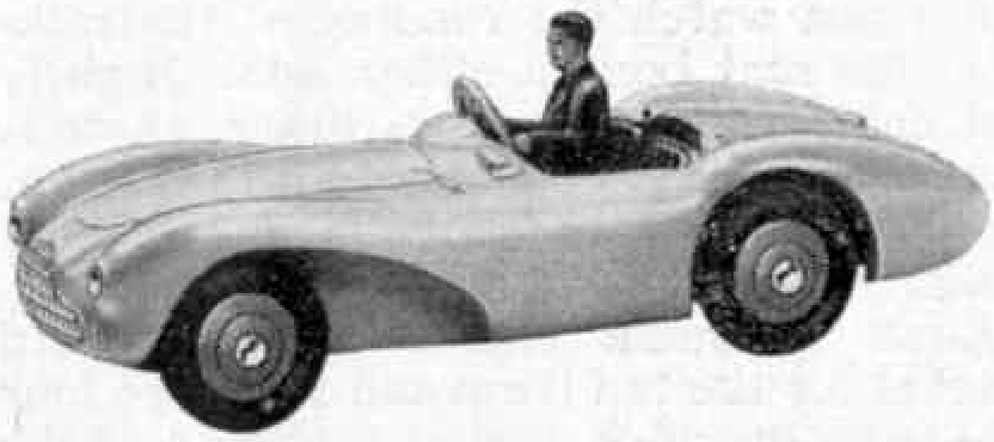
Dinky Toys are by no means only an indoor hobby, however, and you can make really good use of them if your holiday takes you to the seashore. As a matter of fact, playing on the shore with Dinky Toys is a really exciting pastime, and it is possible to make splendid temporary layouts and scenes very easily. Roads can be arranged simply by smoothing down the surface of the sand with a piece of cardboard, and miniature buildings of many kinds, including the familiar sand castle, can be shaped quite easily.

To give you some idea of the possibilities of using Dinky Toys in this way, this month I am including a special picture showing some of the models in a typical scene on the sands. The picture shows the models passing through a large tunnel passing under a sand castle. The scene illustrated is very simple, and it can be elaborated in many ways, depending on the time you have available and your skill in shaping objects with sand.

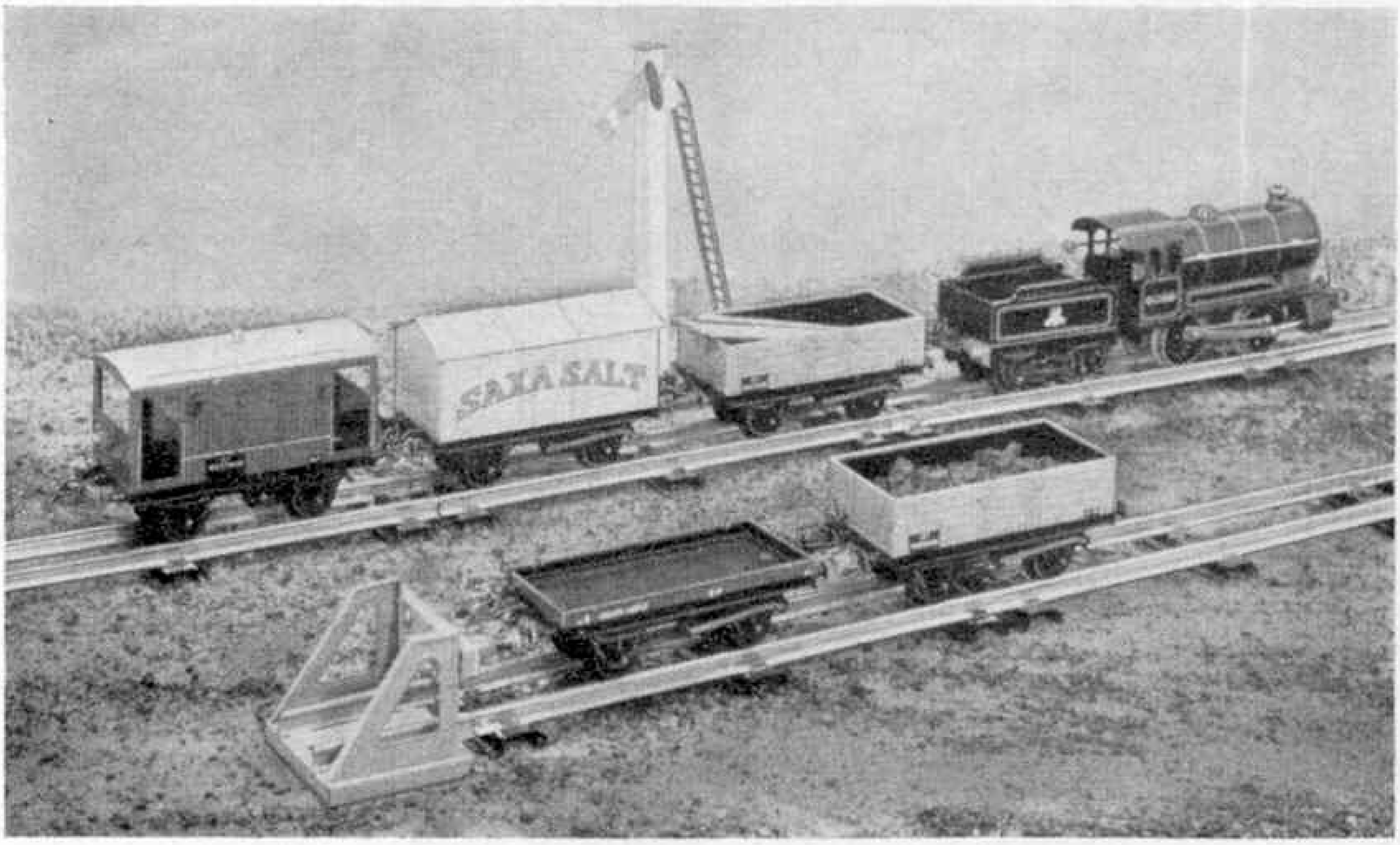
A point worth mentioning is that you can use suitable Dinky Toys during the actual construction of the scene. This is really good fun if two collectors combine their activities, for one of them can carry out the actual construction while the other concentrates on bringing along supplies of materials. The Dumper Truck and some of the large lorries can be used to carry loads of sand of the right quality to the builder, as well as twigs, shells and other materials used for decorative purposes.

If you visit the seaside for your holiday this year I suggest you try this. I am sure you will find it an absorbing and exciting pastime. By the way, make sure you start construction well above high water level, otherwise you may find your layout engulfed by disastrous floods before it is completed! Another point worth mentioning is that before packing up at the end of the day take care to brush off any loose sand, and make sure too that the models are perfectly dry.

I shall be glad to hear from any readers who are fortunate enough to be able to enjoy seashore fun with their Dinkys in this way. Send me a "snap" if you can get one. If it is suitable I may be able to use it in the *M.M.*



Dinky Toys No. 104, Aston Martin DB3S (touring finish) and No. 101, Sunbeam Alpine Sports (touring finish).



"Tommy Dodd" writes about:

Goods Brakes and Cranes

LAST month we had a talk about some of the new No. 50 Wagons and I promised further news of other similar additions to the range. To carry on the story we will move to the tail end of our train, as one of our pictures here shows the No. 50 Goods Brake Van.

This may seem a rather back-to-front way of carrying on, but the No. 50 Goods Brake is already available and perhaps some of you, like myself, have a special liking for goods brake vans, so you will want to hear something about it.

The Goods Brake Van mentioned in this article appears above with other Hornby No. 50 goods rolling stock, making up an effective railway picture.

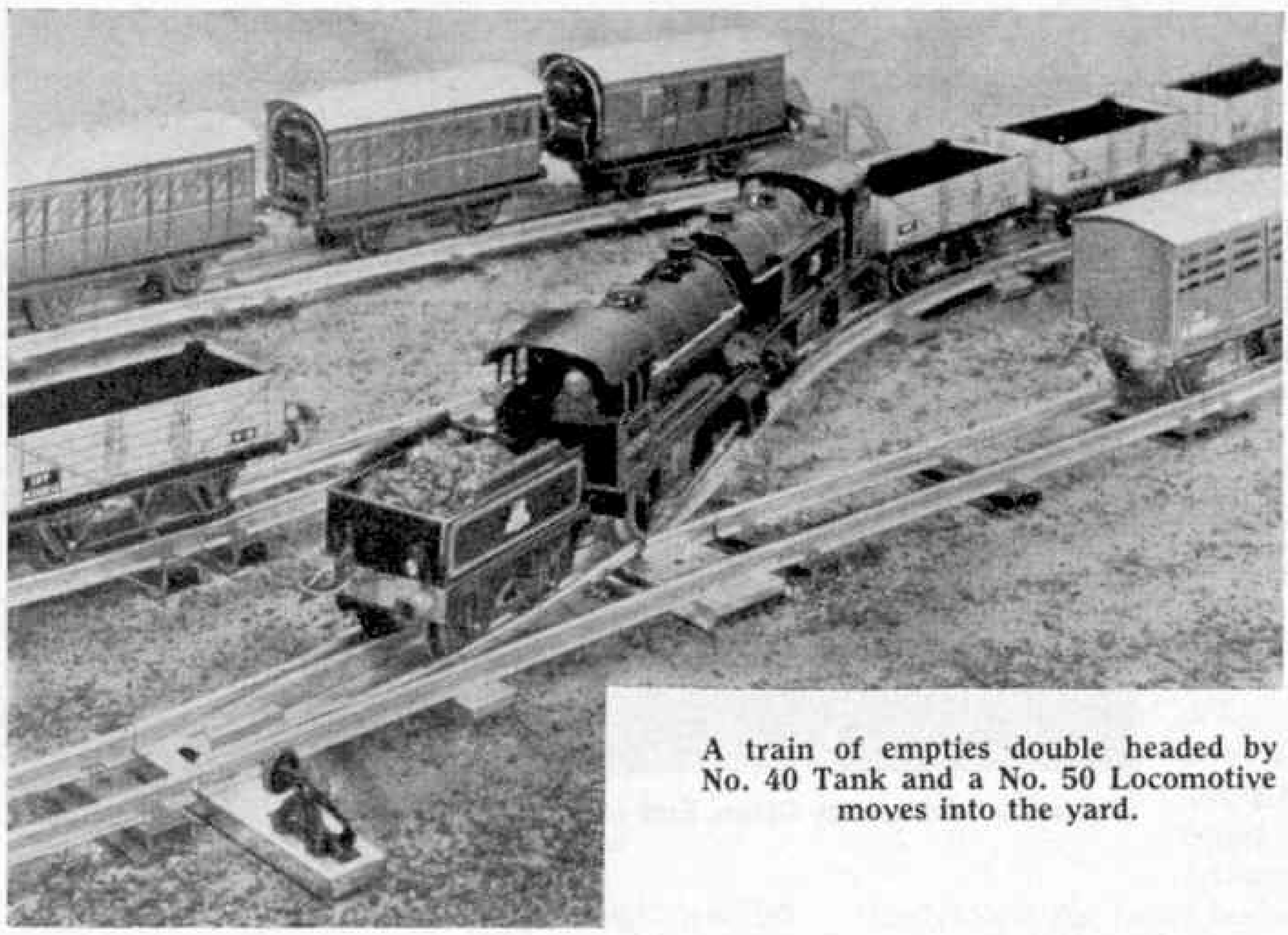
Even in these days of standardisation there is still plenty of variety in goods brakes, as the sidings in any big yard will soon show. Vans from here, there and everywhere, some marked with the names of the places to which they belong, or even their specified workings—not always followed by the way—add to the interest of railway observation.

In settling a design for a Hornby Goods Brake Van that would suit the new type of underframe common to all the No. 50 stock, it was decided to adopt the popular type of van that has a sort of verandah at each end. This has the advantage that it "looks right" in whatever direction it may be running. In accordance with modern practice, there are no side doors to the verandahs, so the miniature guard or brakesman can board his vehicle readily.

Now this No. 50 Goods Brake Van is a splendid example of the detail that can be provided by the use of tinprint. Its sides and the verandah ends are shown correctly boarded, and the bulkheads forming the ends of the centre part of the Van are printed to represent the central door and glazed windows. The sides include representations of the "duckets" or projecting look-outs, with their narrow observation windows, through which the guard can watch the running of the train from the seat box on either side. Rightly and necessarily on a goods brake, there is generous provision of hand railing, represented here in white in the printed design.

Each verandah end includes a lamp bracket for the tail lamp and there are four side lamp brackets, two at each end of the body sides. So you can have some good fun when playing the part of goods guard by

ringing the changes as necessary on the positions of the side and tail lamp that form part of the standard equipment of the Van. And there is the usual chimney on the roof, suggesting the coal stove in the Van with its cheery fire.



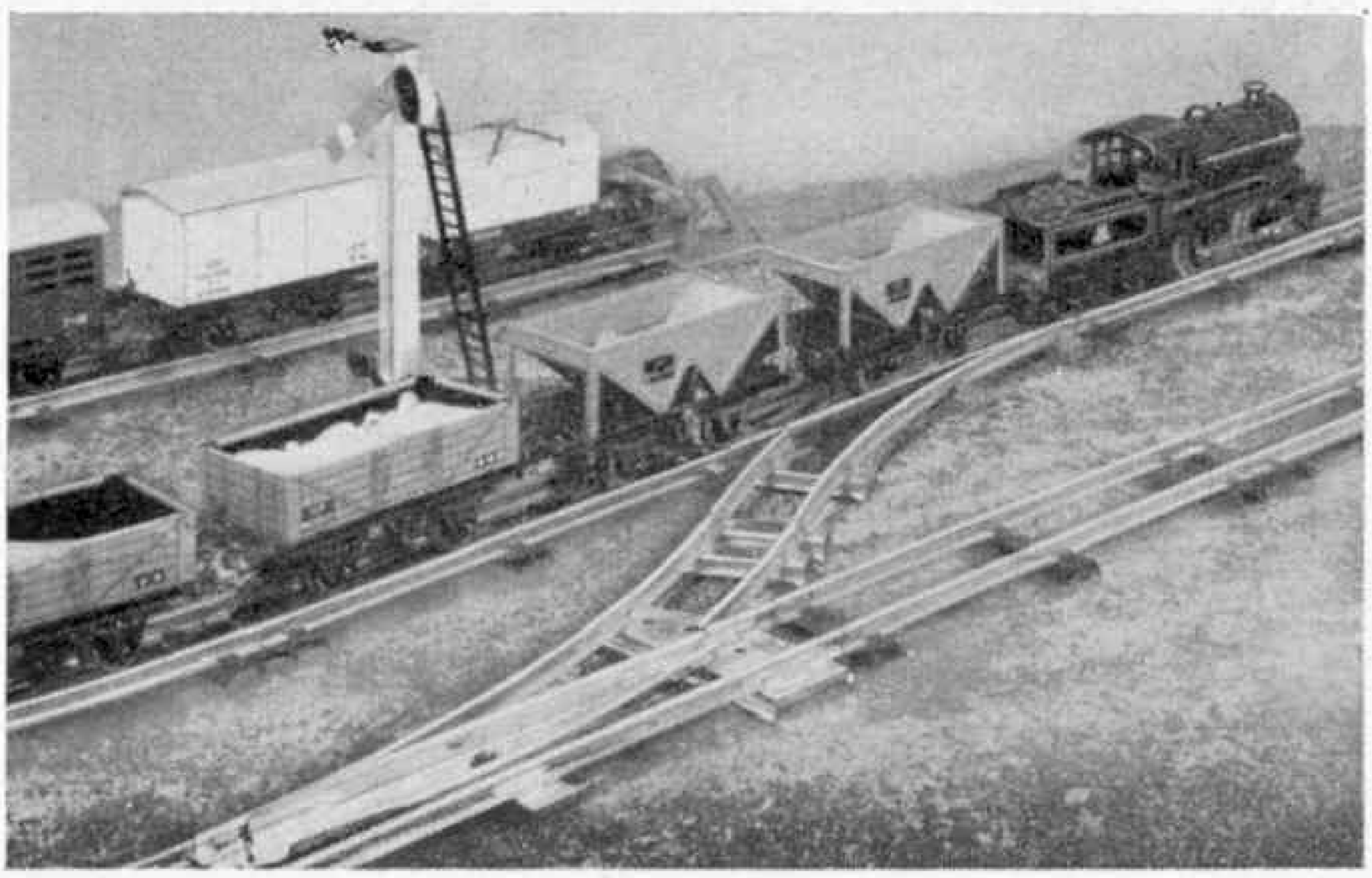
A train of empties double headed by No. 40 Tank and a No. 50 Locomotive moves into the yard.

Although the No. 50 Goods Brake Van has the same base as the Wagons we have already spoken about, it does not include the dummy brake levers, in spite of its name. You may wonder why this is. The explanation is quite simple. Real goods brake vans have their brakes applied by a hand wheel, or by turning a handle on a column on the deck of the vehicle, not by the side lever that is usual on ordinary wagons.

Now I come to the Hornby Crane Truck. This is one of the vehicles in the range that retains the familiar sprayed finish, although altered in design to bring it into the revised range as the No. 50 Crane Truck. It has the re-designed base that I mentioned last month, incorporating die-cast buffer beams and buffers, and of course it has the dummy brake levers just like the other Wagons. The crane jib and operating section remains as before.

A Crane Truck is a very useful vehicle to have about on the railway. It is scarcely equipped for breakdown work on a large scale, but it represents the lighter type of crane, sometimes still hand-operated, that is used on railways in connection with construction work and so on. I expect that some of you stage operations of this kind now and again.

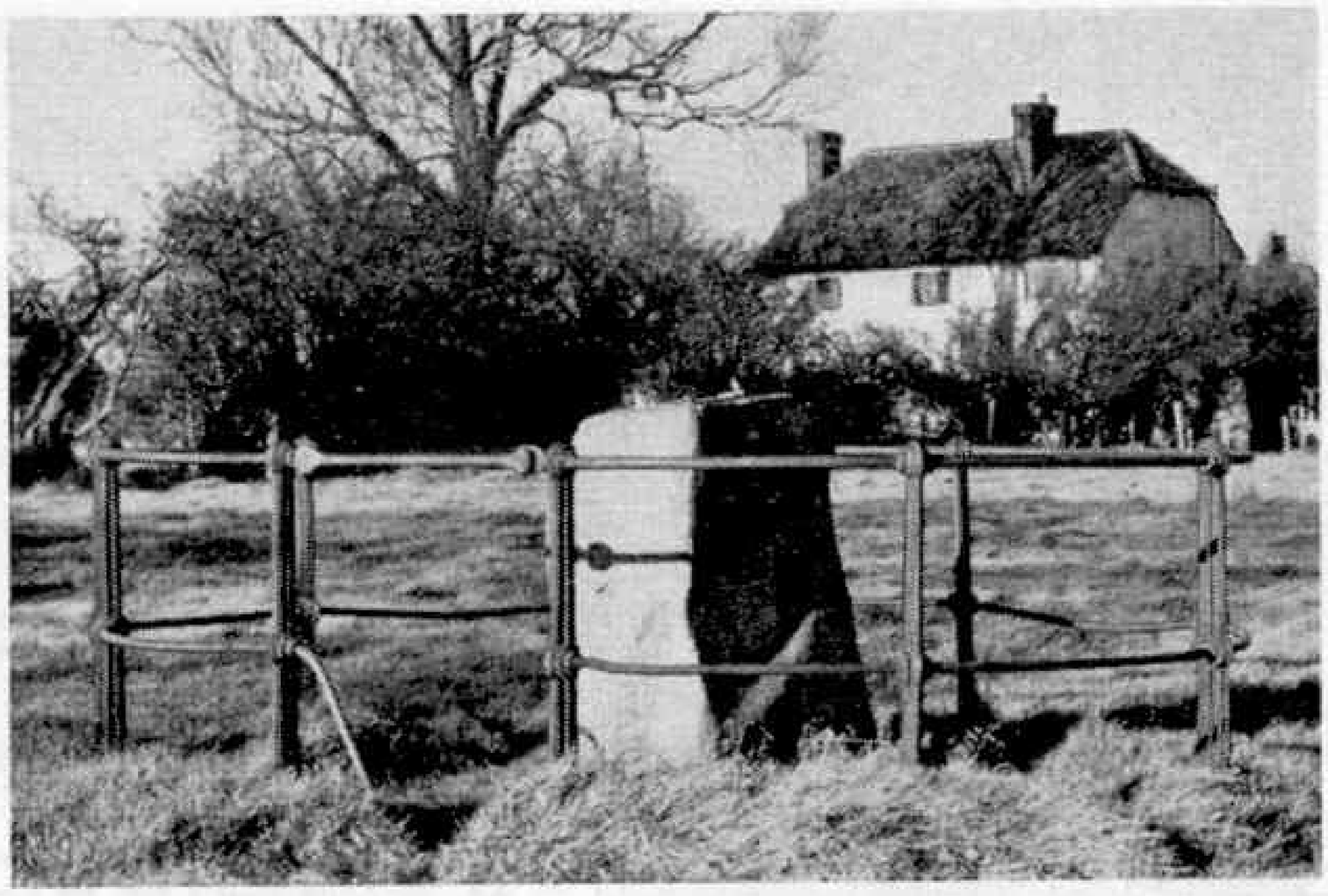
A lot of Hornby railwaymen write to me about the workings that they carry out on their own railways. A subject that crops up frequently is double-heading, or the running of two engines coupled on the same train, so I am including a picture of a No. 40 Tank and No. 50 Locomotive coupled "face to face" at the head of an empty wagon train. By the way, don't forget that the No. 40 Tank and No. 50 Locomotive coupled together will not pass the BBR Brake Rail, because of different braking arrangements.



Hopper Wagons and mixed freight, behind a No. 50 Locomotive.

Of General Interest

I WONDER how many of you can say who made the first flight in Great Britain and where it ended? The first ascent into the air was made in a balloon as long ago as September 1784 by an Italian named Vincent Lunardi. He took off from the Artillery Ground in London, and landed in an open field in the little Hertfordshire village of Standon Green End after travelling, before the wind, of course, for about 2¼ hours. To commemorate this event the stone seen in the upper illustration on this page was erected at the point where the journey ended, and an inscribed plaque on it tells the story of a "Wondrous Enterprise successfully achieved by the Powers of Chemistry and the Fortitude of Man."



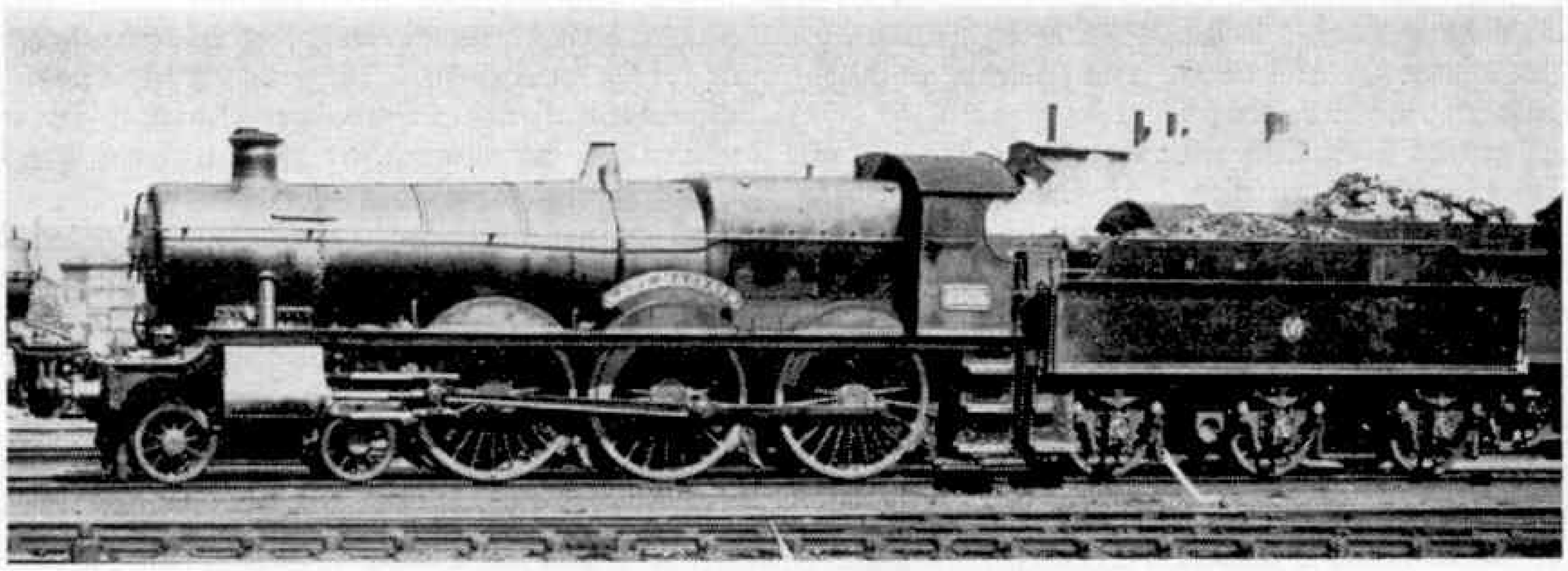
The stone at Standon Green End that commemorates the first balloon flight in Britain.

This picture and brief story of the first ascent in Britain came from W. F. Bunce, London W.2, who adds that it is odd to note that the words on the plaque were not inscribed until almost a century after the event. But that was almost 20 years before the first aeroplane flight was made, and a balloon flight was still a wonder.

Now I turn to an ascent of a different kind, with a photograph sent by Bobby Jones, a reader of the Magazine who stayed in Davos, Switzerland, for a time in order to cure the asthma from which he suffered. The picture shows a cable car on an aerial railway swinging up from Davos to a station about 900 ft. higher. The cars are painted a very bright red, with a silvery roof. The cableway is chiefly used by those who go to Davos to enjoy winter sports.

Switzerland is famous for aerial railways of this kind, some of which have enormous spans between the pylons from which the cables are suspended.

A Swiss cableway. Photograph by Bobby Jones, London W.11.



Locomotive Misnomers

By R. S. McNaught

A "WEST COUNTRY" Pacific of the Southern Region was running recently with the name *Dartmoor*, but only for a short time. It returned to the works and re-appeared with quite a different title. We shall never know whose feelings had been hurt, but the incident, which may well prove to be the last of its kind now that few new locomotives of the steam type will be built, drew my attention to the many cases there have been of "misnomers," or mis-applied names, in the past.

Strangely enough, those who are responsible for selecting the names of new ships, whether windjammers, steamers, motorships, or even perky little tugs and coasters, rarely if ever fall into the difficulties and traps that have always beset the choosers of engine names. I have made a close study of both the marine and the railway side of the fascinating subject of nomenclature, and the contrast is extraordinary.

No. 2908 of the former G.W.R. was named "Lady Macbeth." The "Lady" was classed officially as a Saint. Photograph by J. P. Wilson.

As is well known, some of the chief railway companies before the 1923 amalgamation into four "groups" managed quite well with engines that carried numbers only. One recalls the Great Northern, with three named engines *Henry Oakley*, *Great Northern* and *Sir Frederick Banbury* out of its total of 1,359, and the North Eastern, whose stock of over 2,000 included the unique "single-wheeler" tank engine *Aerolite*. In the L.M.S. group we had the Midland, with only two named engines back in history, and the Lancashire and Yorkshire, which except in earlier times was completely against the practice.

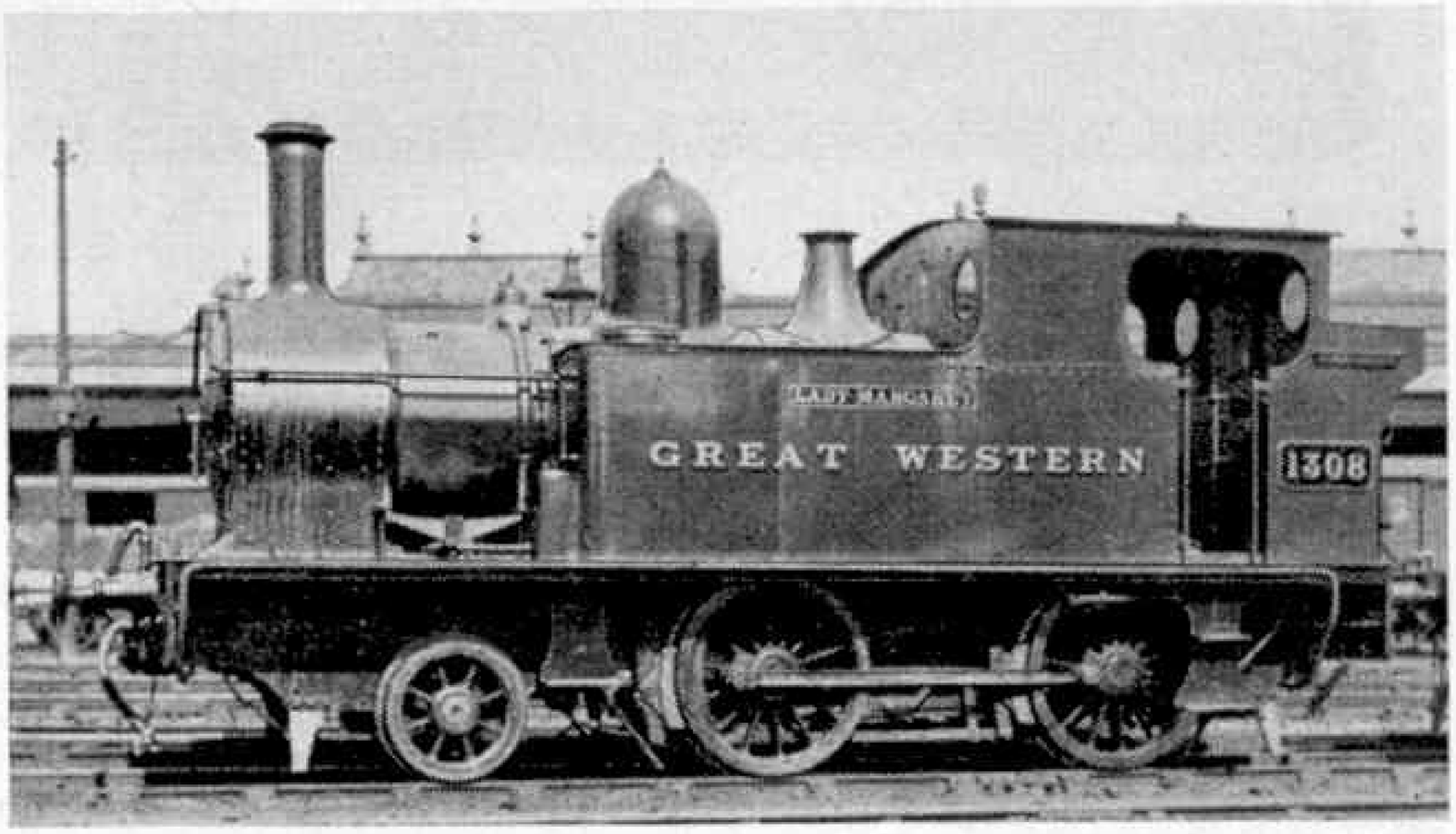
Down south, the L.S.W.R., largest constituent of the Southern, had not named a locomotive since the early 1870's, and the South Eastern and Chatham had abandoned the practice as a youthful folly of its own forebears. These celebrated old companies were in a position to make the time-honoured claim that fixing nameplates to a motive power unit never earned a penny in revenue, and some of the frequent chopping and changing they saw on other lines must in itself have been an expensive business.

The Great Western was always a strong believer in naming its engines; indeed, there was a period when they all (including the humble 0–6–0 goods designs) had a title but no number. And to make it easier for guards and others who presumably had to register a note as to the engine's identity on their reports and forms, the names chosen included *Acheron*, *Bulkeley*, *Eupatoria* and *Phlegethon*.

There was also an 8 ft. "Single" which had its name mis-spelt "*Estaffete*" instead of "*Estafette*" and this mistake was never corrected, while one unfortunate engine was called, simply and starkly, *Slaughter*, after the name of the firm who built it. This seemed to be going a bit too far and the name was removed on the orders of a Director who happened to meet the engine. It became known on its section of line as

Old Slaughter, which wasn't much improvement, although the name it had acquired was *Avonside*.

At times Swindon was apt to be too terse in its choice of names, but the authorities in due course amended over-brief engine titles. For instance, No. 100, the pioneer large-wheeled 4–6–0, was named *Dean* after the retiring Locomotive Superintendent, although its design was largely Churchward's. This later was changed to *William Dean*. Much the same thing happened years later when the titles *Brunel* and *Gooch*, which had graced a couple of a small and very select batch of 4–4–0 express engines, were used again for new 4-cylinder Castles, but this time the names of these immortal engineers were set out in full, a much more dignified and pleasing arrangement. The "Castles," it might be mentioned at this point, as a class have been singularly unlucky in the way their names have been shuffled about for various reasons.

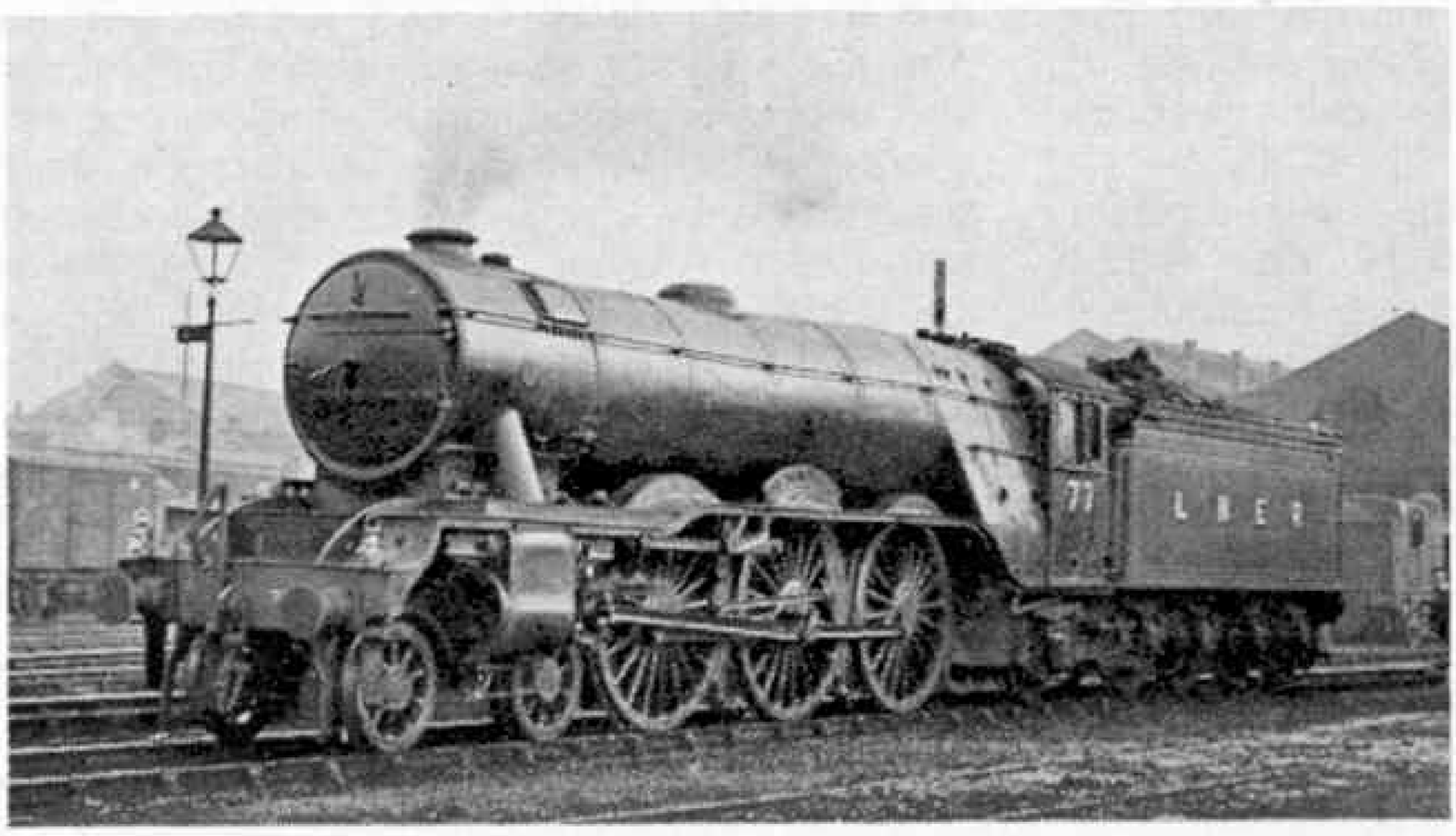


A "Lady" who was not a Saint! The 2-4-0T "Lady Margaret," once a Liskeard and Looe Railway engine, retained her name when acquired by the G.W.R. Photograph by H. C. Casserley.

Other G.W.R. nameplates which had a much shorter career than was intended were those worn in honour of Great Western towns such as *Shrewsbury* and *Falmouth*. Perhaps because a greater proportion of the dear old lady type of passenger entrusted themselves to the safe keeping of this company, it was said that the gleaming brass names on the 4–4–0s were mistaken at times for destination boards, and Aunt Amelia's confidence that she was going to Reading when she read that name on the engine was apt to be shaken when she found herself in the carriage sheds!

Perhaps the classic Great Western misnomer was *County of Cheshire* applied to a Churchward 4–4–0 early in this century, but duly amended to the correct form *County of Chester* later on. The astonishing thing was that precisely the same sequence of events took place years later with a Hawksworth 4–6–0 County. In neither instance were the discarded nameplates made available to collectors of such things!

Older readers will recall, probably with the utmost affection, the Great Western Ladies, now defunct, which included *Lady Macbeth*. This sinister character was ultimately classified officially as a Saint, as were all the original 2-cylinder 4–6–0s except one. And although the company was such a stickler for standardisation it managed to acquire a later Lady that was not one of its Ladies. I refer to the little 2–4–0 tank *Lady Margaret*, which came from the Liskeard and Looe Railway and was



The Gresley Pacific "The White Knight" was painted lined green in its L.N.E.R. days. Photograph by H. C. Casserley.

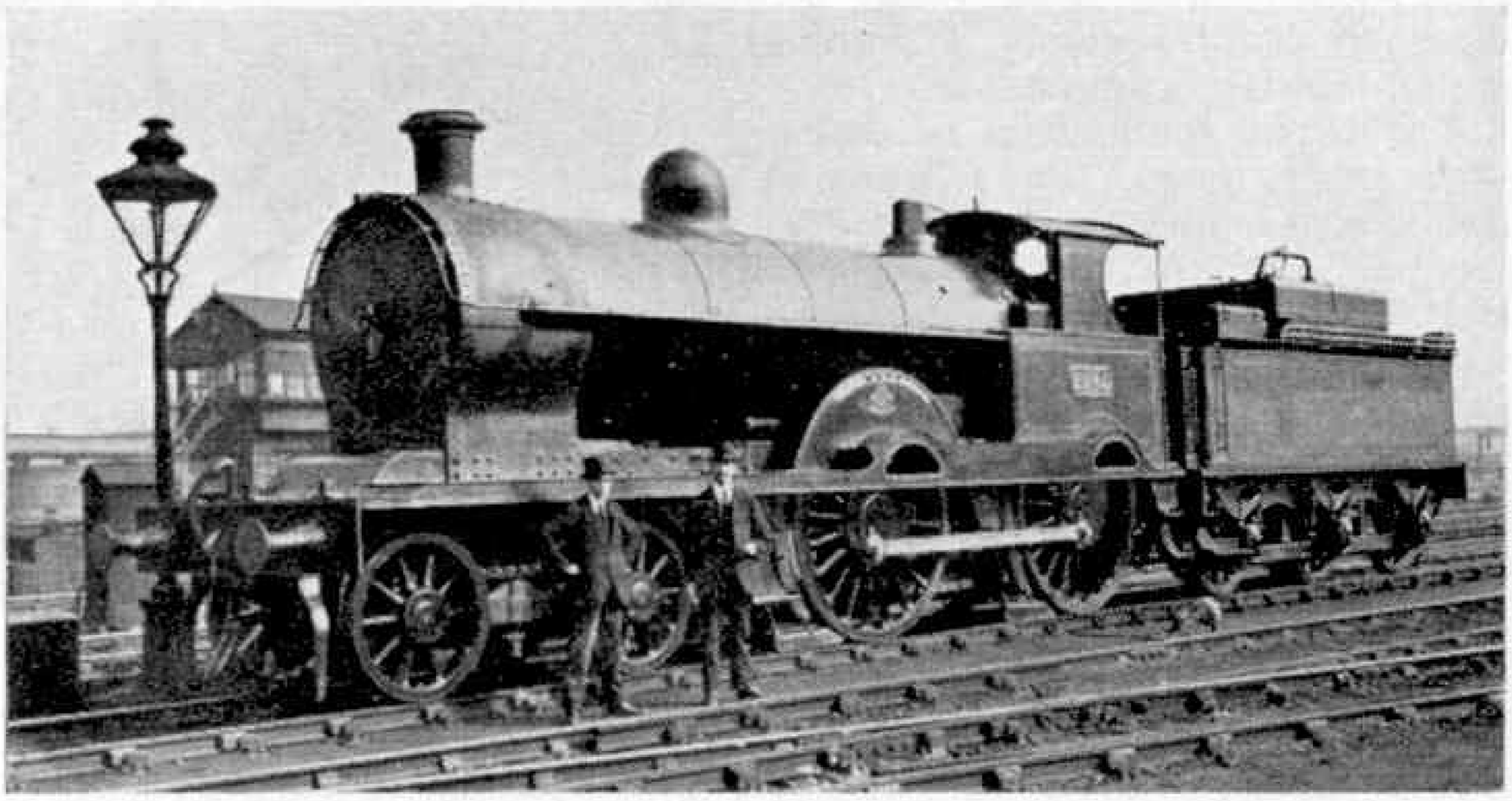
allowed to keep its dainty original nameplates.

Less criticism could be levelled against the L.N.W.R. Its vast and catholic range of engine names was popularly supposed to be kept in a certain "lucky bag" in the secret recesses of Crewe Works, alongside another bag containing numbers. As a locomotive was nearing completion some high priest would make simultaneous dips, rather on the lines of a Football Association Cup Draw.

On the whole the bag system was literally lucky and it was rare to encounter an L.N.W.R. engine badly named. Perhaps *Serpent*, *Harpy* and *Vulture*, and even *Python*, did not make for affection, and the standard brass nameplates had ample space to have obviated such disconcerting brevities as *Cook*, *Watt* or *Murdock*. Also, it seemed unfortunate to preserve such names as *Problem* and *Experiment* when neither of the later engines so named were in any way problematic or experimental. But "All or Nothing" could well have been the motto of the old "Premier Line" and while *Black Prince* in beautifully-lined shiny black still strikes me as being the most appropriately named engine of all I ever saw, the depths were surely reached early in the 1914-19 War when poor *Dachshund* ran about the land with red lines cancelling the nameplates and the word *Bulldog* inscribed above.

The great designer William Stroudley when in charge of the locomotive stock of the London, Brighton and South Coast Railway was so partial to giving his engines place-names that I have seen him referred to as Mr. Baedeker Stroudley. No remote hamlet in Sussex or Surrey seemed too small or insignificant to lend its name to a Brighton engine, and appropriately named units were kept working, so far as possible, in their correct neighbourhood. Out of 342 engines thus named by Stroudley, there were often enough twenty pairs of different types whose names varied only by one or two letters, and it could have been possible in consequence to see together three called respectively *Hatcham*, *Patcham* and *Mitcham*. Pairs that could have caused confusion, if not mere amusement, were *Boxhill* and *Bexhill*, *Twineham* and *Wineham*, and *Uckfield* and *Cuckfield*, if they had been encountered together, as was quite possible, though hardly likely except perhaps at the Works.

Stroudley's successor, R. J. Billinton, continued the same naming policy, adding 224 to those already extant, and in more modern times it has been thought provoking to see a King Arthur named *The Red Knight*, but running about in decorous lined green, followed in wartime by black livery.



The brief title "Watt" distinguished this L.N.W.R. 4-4-0 No. 2585. Photograph by H. Gordon Tidey.

Strangely enough, applying engine names on a large scale was only a comparatively modern feature with those constituents of the L.N.E.R. that went in for it at all. Their tally of unsuitable titles is naturally much smaller than in the case of the other three groups, but passing reference should be made to a few.

Although among the more capable 4-4-0s ever used, the two North British Scott class named respectively *Jingling Geordie* and *Wandering Willie* were not calculated to inspire confidence in non-railwayists seeing one of them at the head of their trains. But N.B. names were on the whole among the very best, and it is good to see many of them perpetuated on modern Eastern and North Eastern Region Pacifics.

To leave the subject on a cheerful note, it is amusing to learn that the second Gresley 2-6-2 No. 61701, which was not officially named, is known to railwaymen far and wide as "Bantam Hen"—her named partner being *Bantam Cock*, now withdrawn.

Among the Model-Builders

By "Spanner"

Disc Brake

The neat brake mechanism shown in Fig. 1 was designed by R. M. Minshull, Macclesfield, who used it in a detailed Meccano motor chassis he entered for a model-building competition.

The brake mechanism is attached to a back plate formed by a Bush Wheel 1. Two Cranks, numbered 2 and 3 in Fig. 1, are bolted to the Bush Wheel, and a 1⅛″ Bolt is fixed in the boss of Crank 2 but passes freely through the boss of the Crank 3. A Collar 4, fitted with a bolt, is fixed at the outer end of the 1⅛″ Bolt. A grub screw is screwed partly into the boss of the Crank 3, and a Collar 5 is screwed on to the projecting head of the grub screw and is tightened so that it is in line with the boss.

The brake disc is a 60-tooth Gear, and in the example shown it is free to turn on a Rod held in the boss of the Bush Wheel 1. This arrangement is suitable for a front wheel brake, but if required the Gear can be fixed on a Rod mounted freely in the Bush Wheel. The Gear is located between the boss of Crank 3 and the Collar 4, so that its teeth just clear the 1⅛″ Bolt.

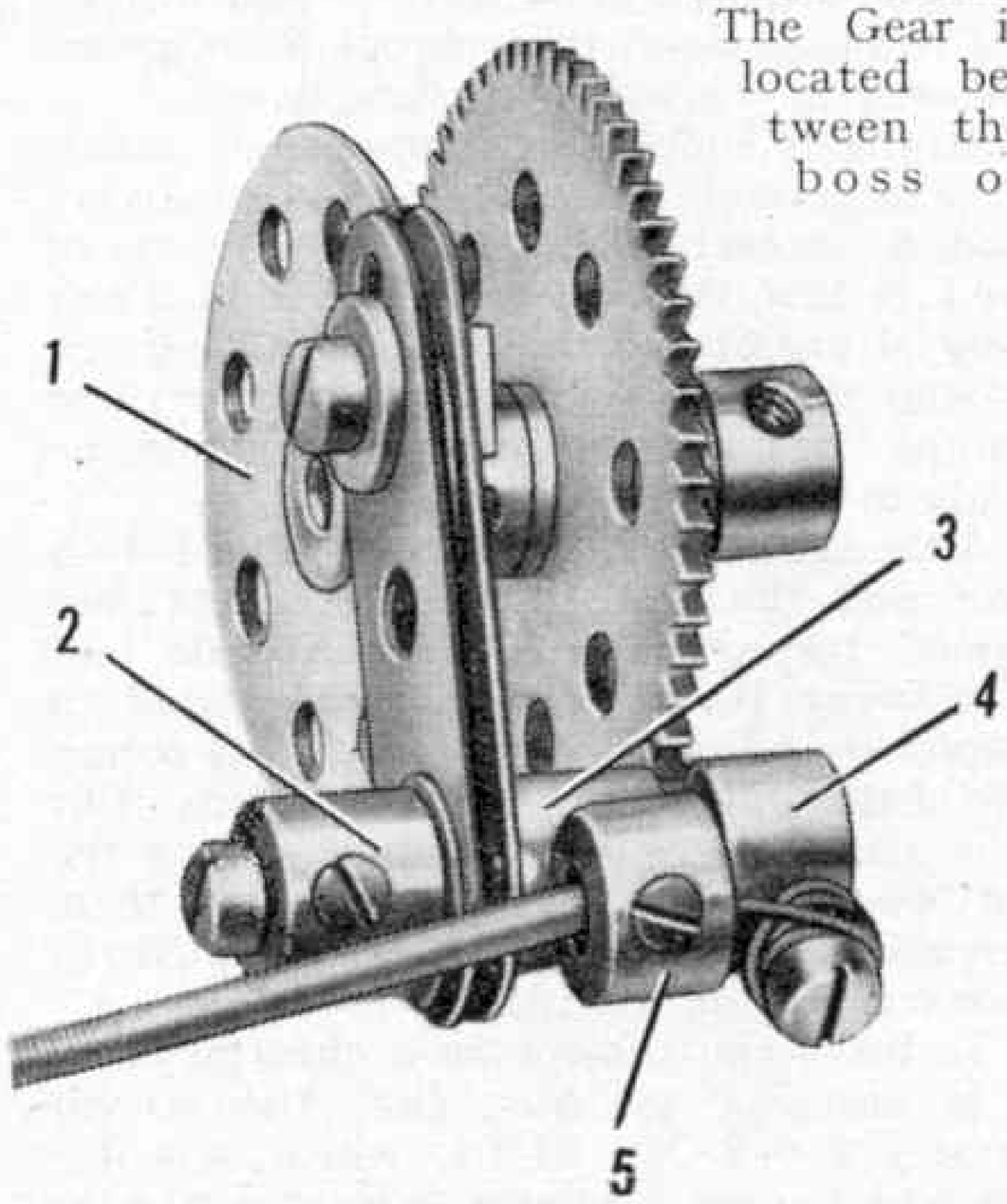


Fig. 1. A powerful disc-type brake for a model vehicle. It was designed by R. M. Minshull, Macclesfield.

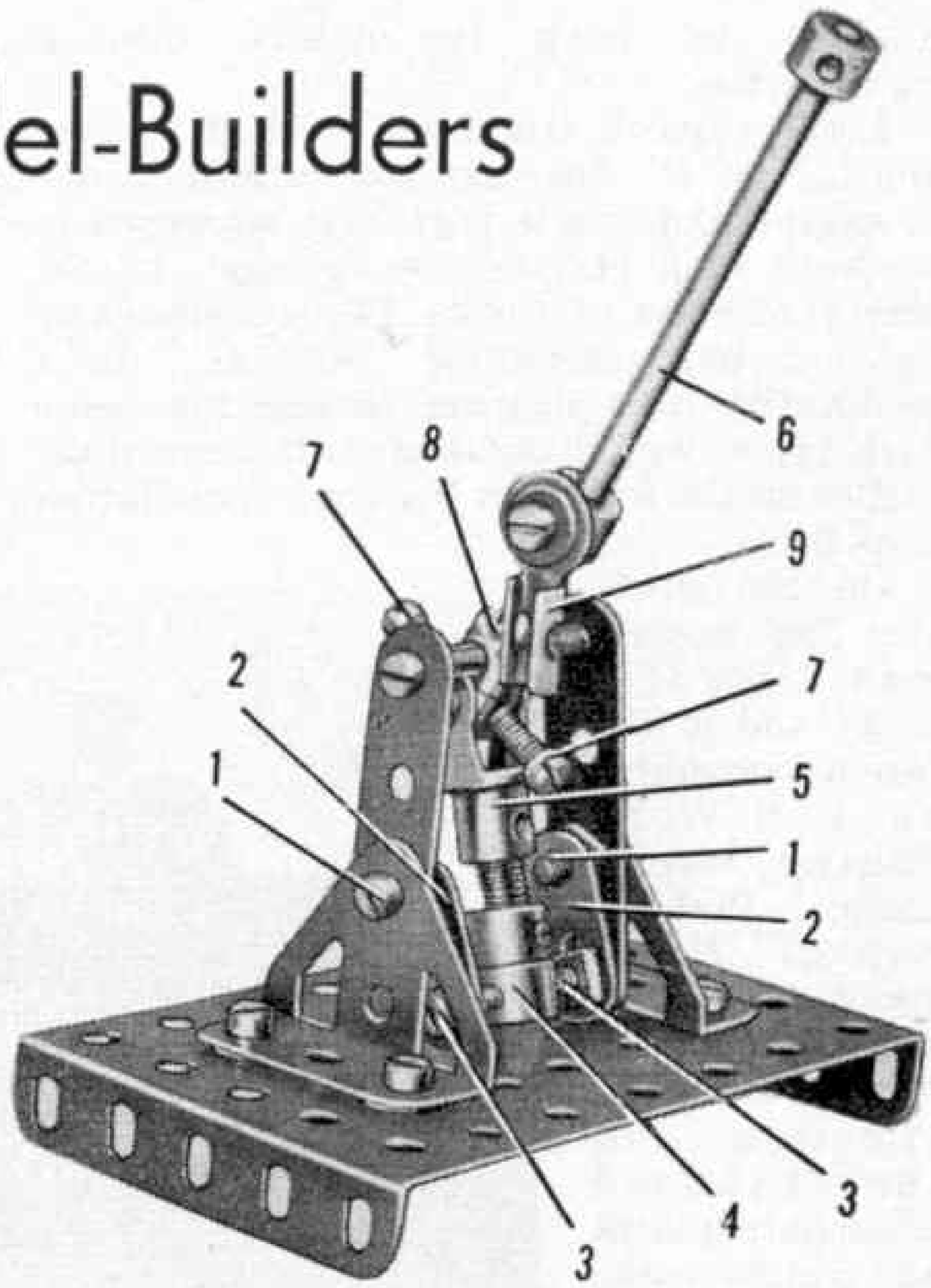


Fig. 2. This useful locking device for levers operates on the same principle as the familiar tumbler switches used for electric lights.

The brake cable is a length of wire passed through Spring Cord. The end of the Spring Cord is fixed in the Collar 5, and the wire is fastened to the bolt in the Collar 4.

A Locking Device for Levers

Fig. 2 shows a neat and effective locking arrangement to prevent a lever from moving after it has been set. It is the work of a New Zealand model-builder, Mr. G. J. Binnie, of Waihi.

The supports for the lever are 2″ Strips attached to the Trunnions by ⅜″ Bolts 1. The Trunnions are spaced from the base plate of the mechanism by a Washer on each of the bolts used to hold them in place. Two Fishplates 2 are pivoted on the Bolts 1, and ⅜″ Bolts 3 are fixed in the Fishplates by nuts. The Bolts 3 are screwed into a Collar 4 and fix in it a 1″ Rod.

A Collar and a Compression Spring are placed on the 1″ Rod, which is inserted in the boss of a Swivel Bearing 5. The lever 6 is held in the "spider" of the Swivel Bearing by two ⅜″ Bolts 7, which

Part of an attractive display of models built by B. W. Rowe to be seen in Newton Abbot station this summer.

serve also to limit the movement of the lever. A Collar 8 is fixed on the lever, and ½″ Bolts passed through the 2″ Strips and screwed into the Collar pivot the lever on its supports. A Rod and Strip Connector 9, mounted on a bolt screwed into a Collar, can be used to connect the lever to the mechanism it controls.

Four Movement Gear-Box

Mr. F. Richardson, Surbiton, Surrey, sent me some time ago details of the exceptionally compact four movement gear-box seen in Fig. 3. It was designed for use in model cranes. The gear-box housing is formed by two 2½″ × 1½″ Flanged Plates connected at each end by two 1½″ Strips. Further 1½″ Strips are bolted over the slotted holes in the flanges of the Plates, to provide bearings for two Rods 1 and 2. Each of these Rods carries two Worm Gears marked 3 and 4, and a 1″ Gear 5. Rod 1 is the input shaft.

Rod 6 is one of the four output shafts, and it carries a ½″ Pinion and a Collar. By sliding the shaft the Pinion can be meshed with one of the Worm Gears on Rod 1 or with the corresponding Worm Gear on Rod 2. Neutral is obtained when the Pinion is between the Worm Gears.

"M.M" Display at Newton Abbot

Railway officials and railway enthusiasts of all ages are showing keen interest in a small exhibition alongside Messrs. Wymans bookstall at Newton Abbot railway station, Devon. Its chief feature is the splendid Meccano model of the famous Great Western Railway locomotive *City of Truro* built by Mr. Brian W. Rowe, the manager of the bookstall, which is seen in the picture at the head of the page. The display includes many other fine models built by Mr. Rowe, and the original colour drawings of a number of attractive *M.M.* covers.

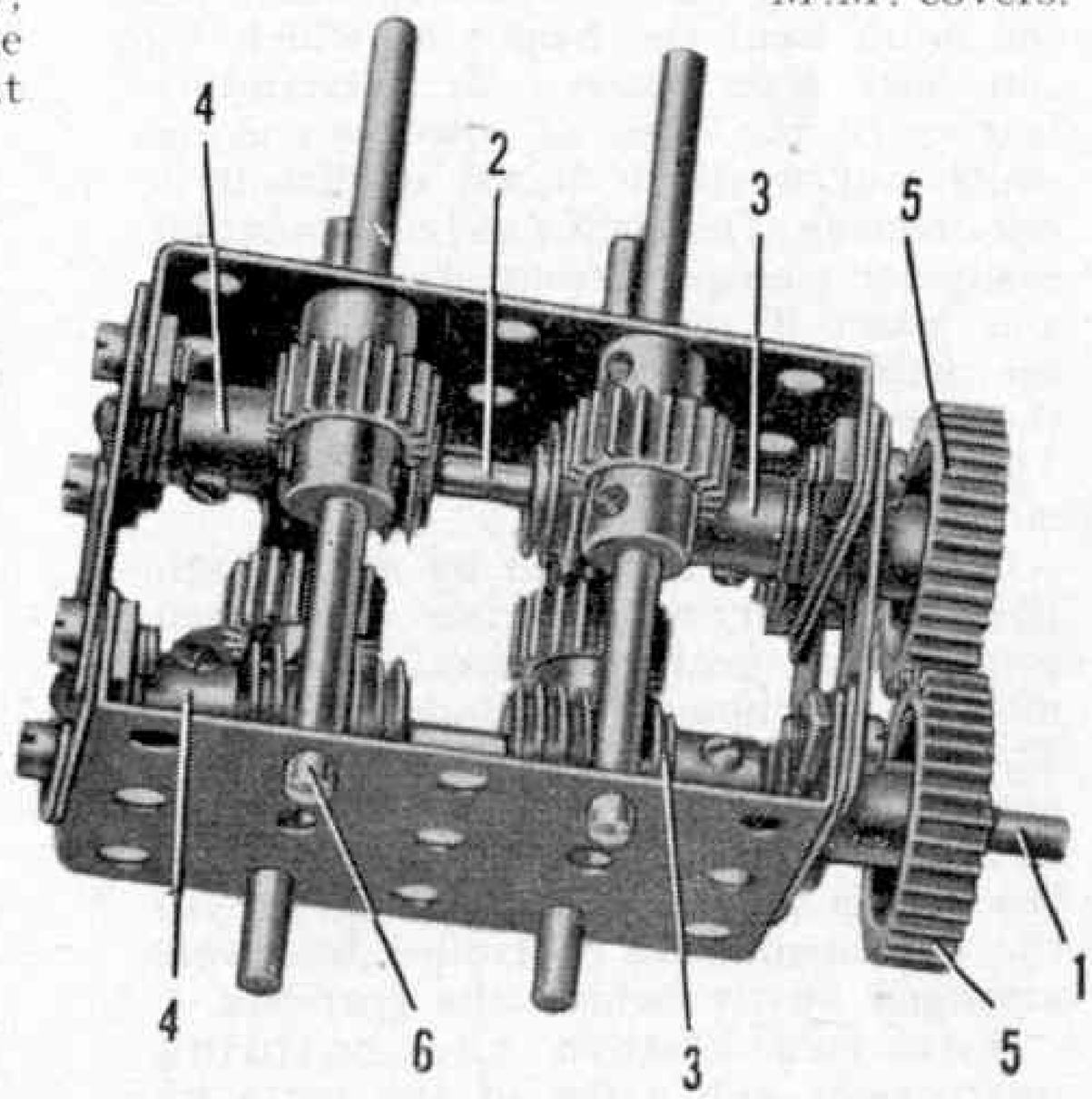


Fig. 3. A compact four movement gear-box suitable for use in a model crane. A modified form of this gear-box is used in the "Model of the Month" Tower Crane featured in this issue.

MODEL OF THE MONTH

Tower Crane

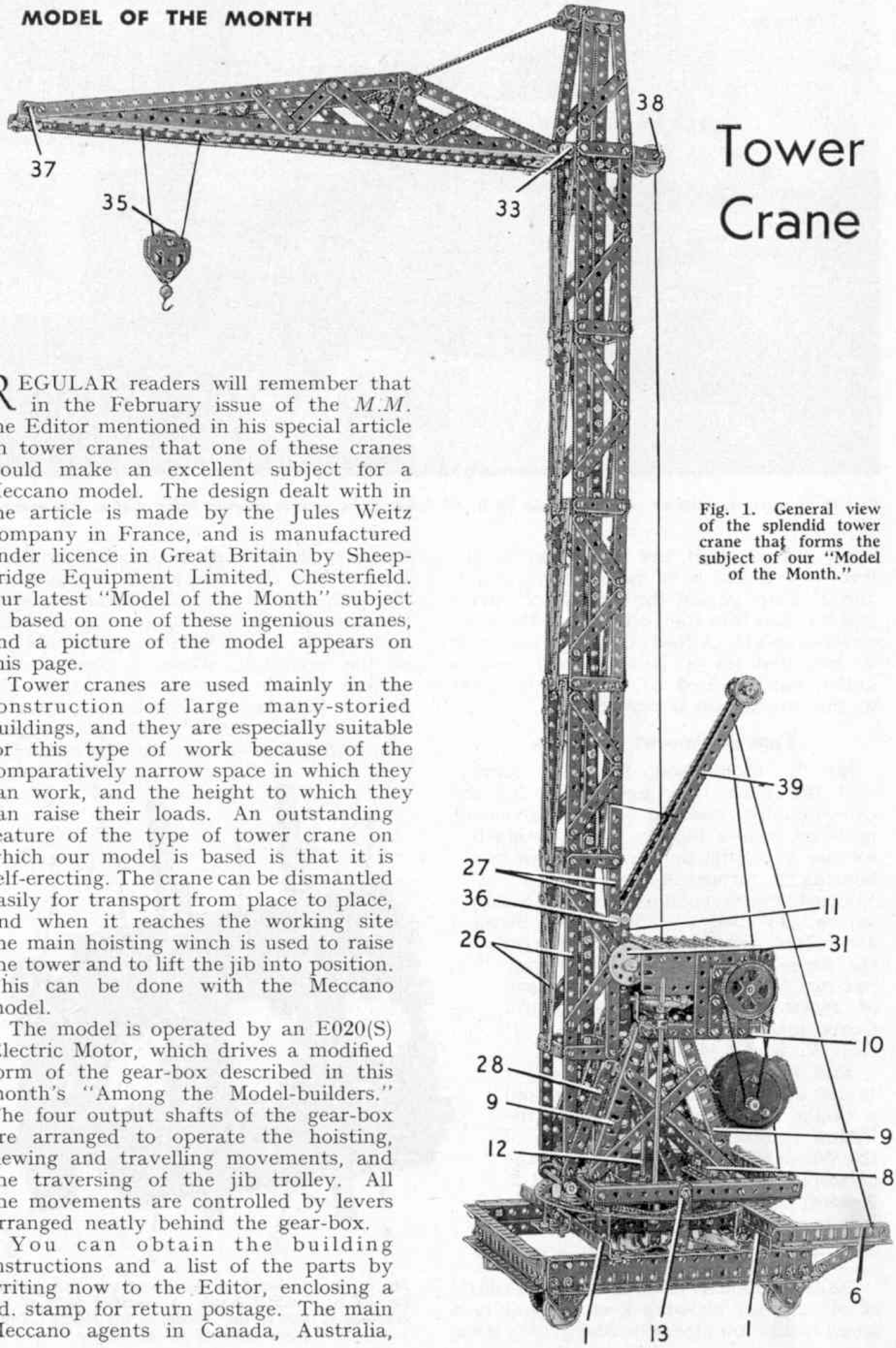


Fig. 1. General view of the splendid tower crane that forms the subject of our "Model of the Month."

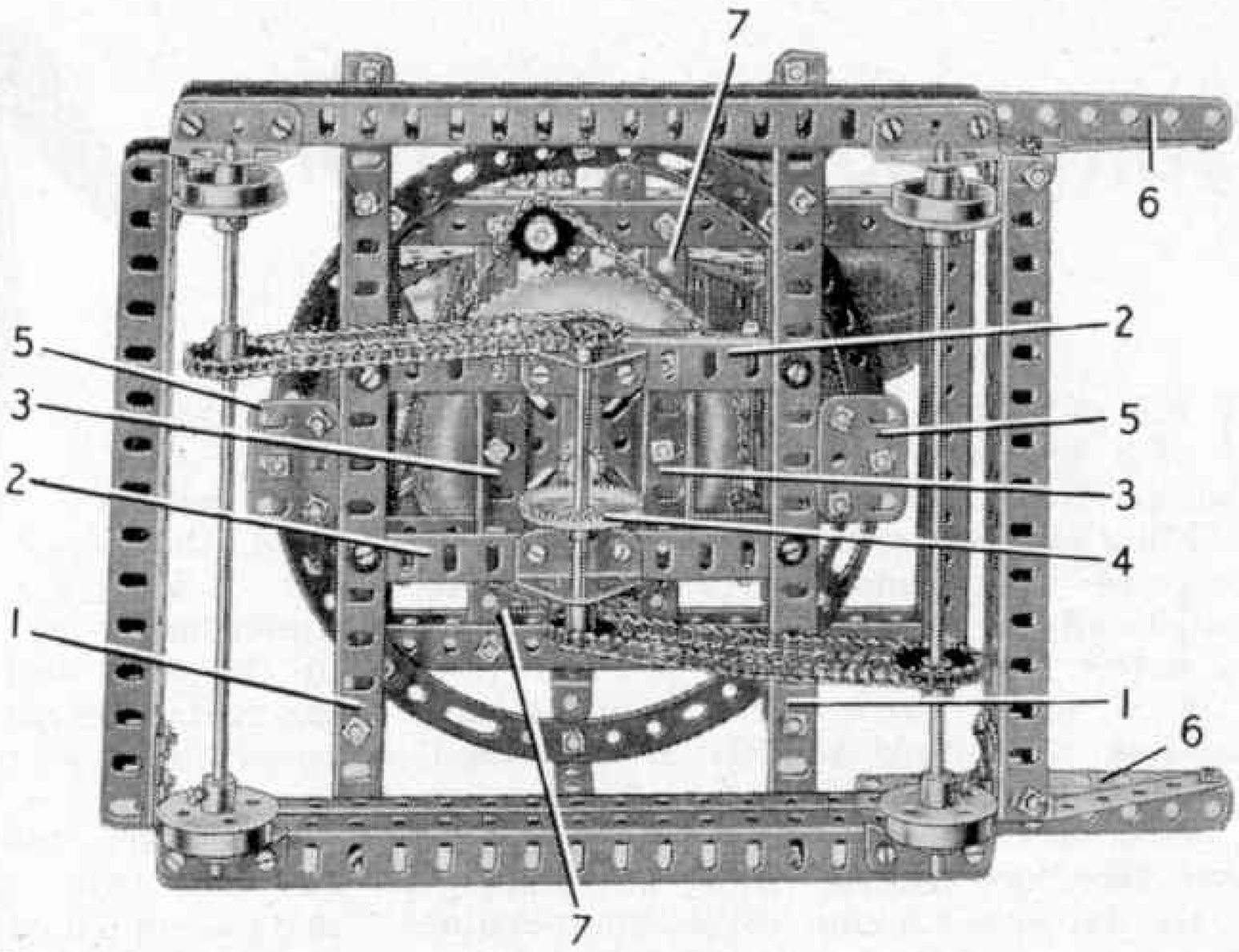
REGULAR readers will remember that in the February issue of the *M.M.* the Editor mentioned in his special article on tower cranes that one of these cranes would make an excellent subject for a Meccano model. The design dealt with in the article is made by the Jules Weitz Company in France, and is manufactured under licence in Great Britain by Sheepbridge Equipment Limited, Chesterfield. Our latest "Model of the Month" subject is based on one of these ingenious cranes, and a picture of the model appears on this page.

Tower cranes are used mainly in the construction of large many-storied buildings, and they are especially suitable for this type of work because of the comparatively narrow space in which they can work, and the height to which they can raise their loads. An outstanding feature of the type of tower crane on which our model is based is that it is self-erecting. The crane can be dismantled easily for transport from place to place, and when it reaches the working site the main hoisting winch is used to raise the tower and to lift the jib into position. This can be done with the Meccano model.

The model is operated by an E020(S) Electric Motor, which drives a modified form of the gear-box described in this month's "Among the Model-builders." The four output shafts of the gear-box are arranged to operate the hoisting, slewing and travelling movements, and the traversing of the jib trolley. All the movements are controlled by levers arranged neatly behind the gear-box.

You can obtain the building instructions and a list of the parts by writing now to the Editor, enclosing a 2d. stamp for return postage. The main Meccano agents in Canada, Australia,

Fig. 2. This picture, showing the inside of the crane base, reveals clearly the arrangement of the drive to the travelling wheels.



New Zealand, South Africa, Ceylon, Italy and the U.S. of America are provided with copies of the current "Model of the Month" Instructions, and readers in those countries can obtain copies by writing to the appropriate agent, enclosing suitable stamps for postage.

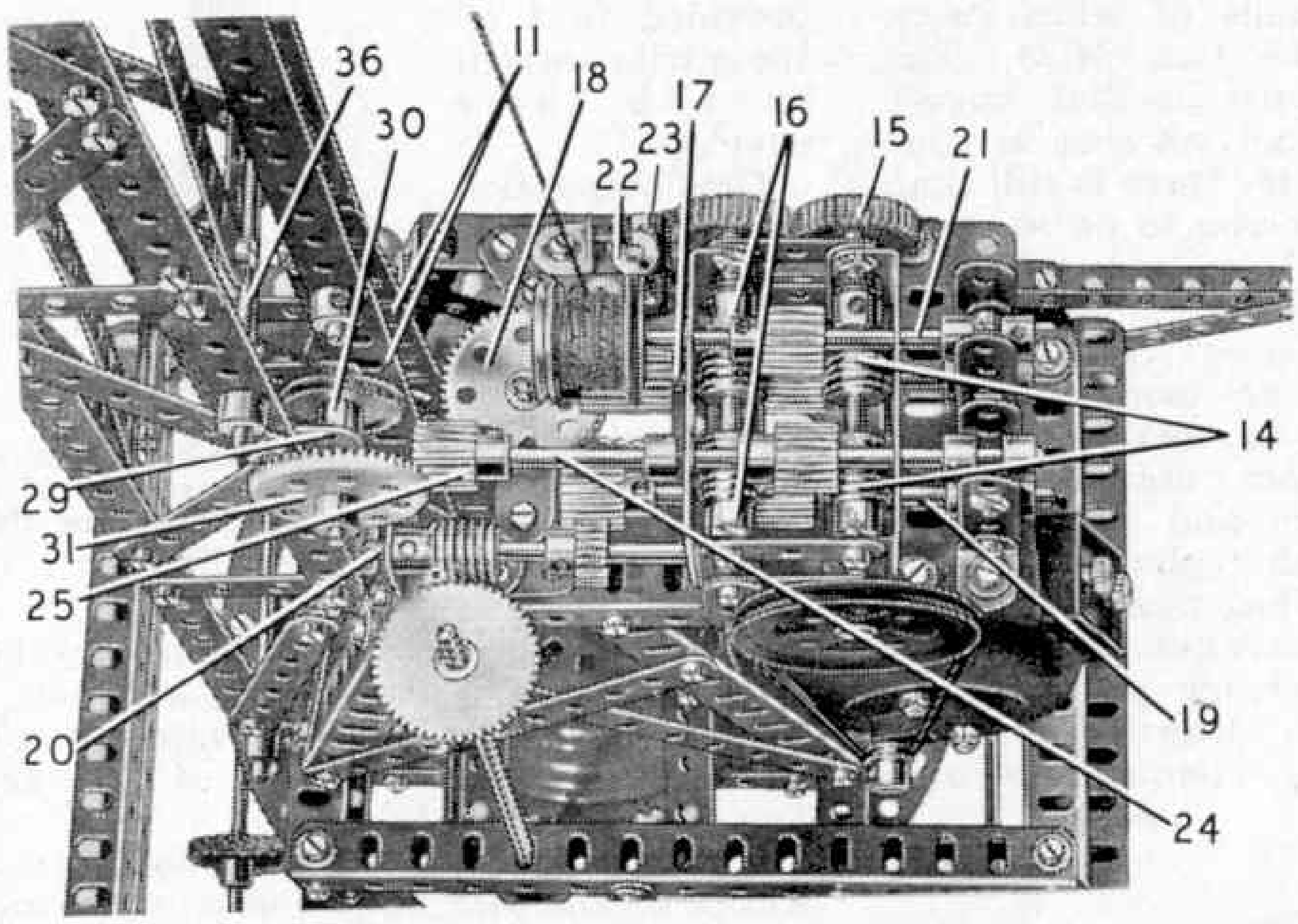


Fig. 3. A close-up view of the compact four-movement gear-box, which is used to control the crane.

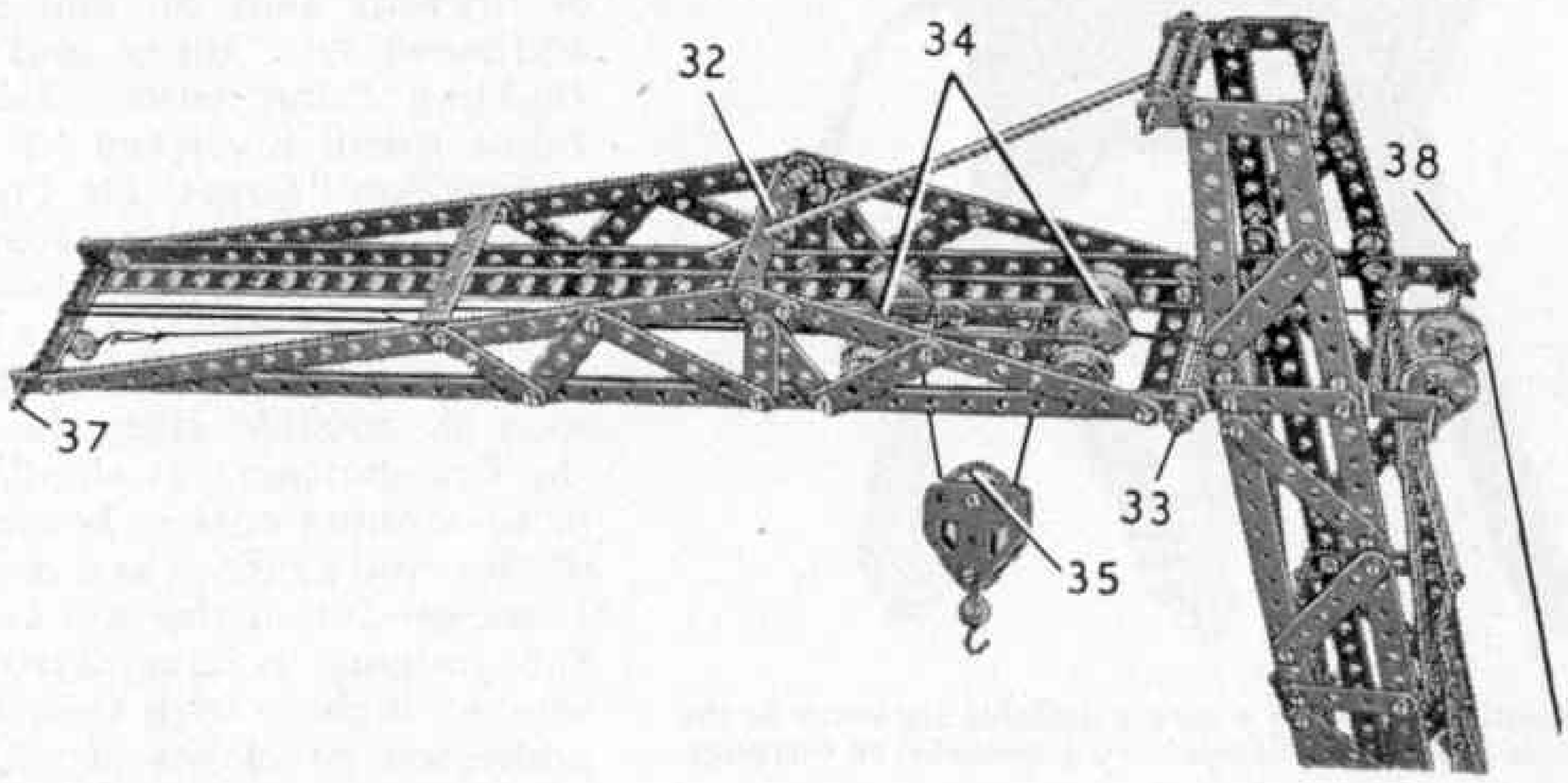


Fig. 4. This view shows the upper end of the tower, with the jib in position. The arrangement of the trolley can be seen clearly.

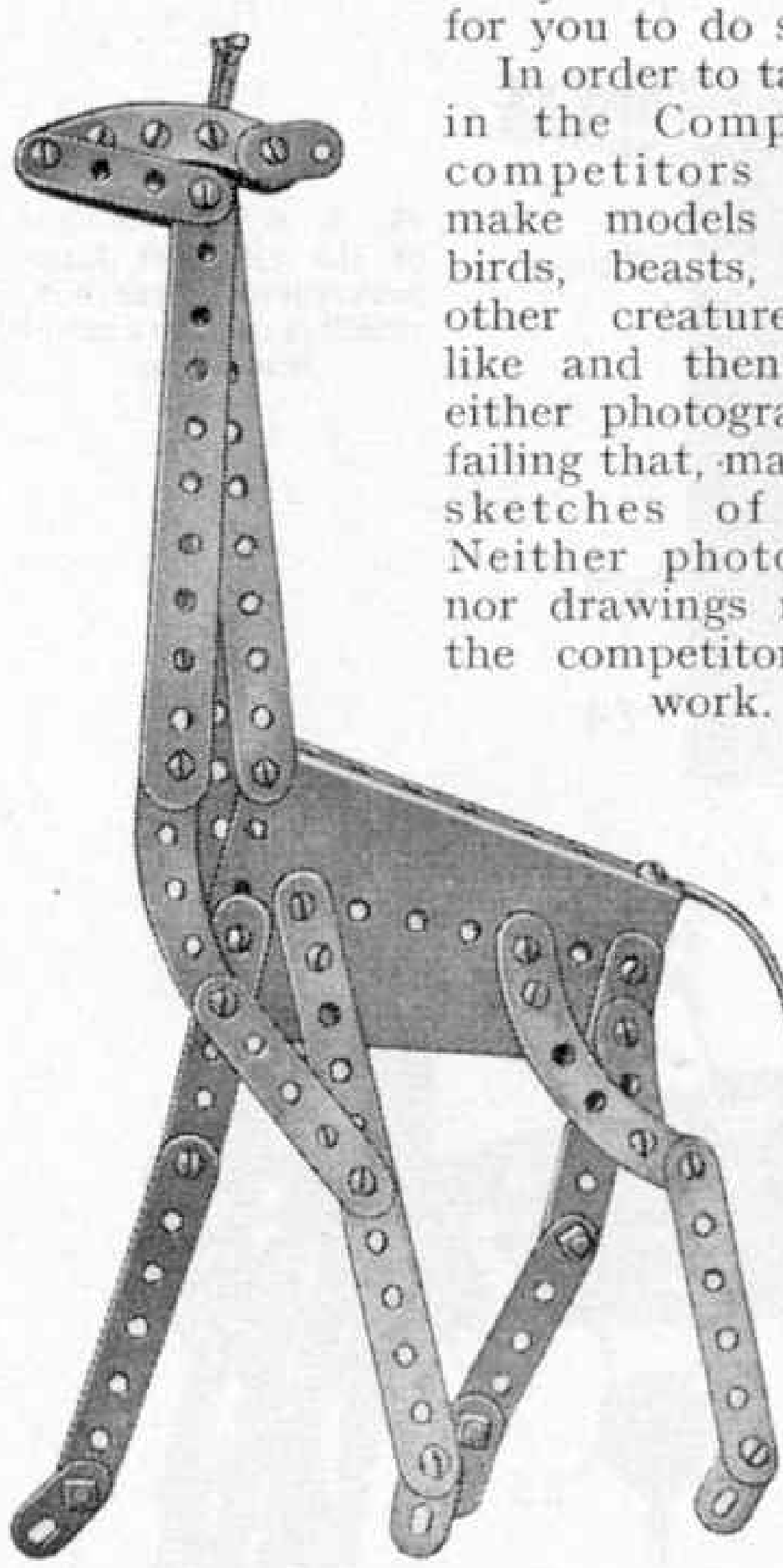
Summer Competition

Birds and Beasts

THE pictures on this page show models of a kind that make a very refreshing change from the usual run of model-building and they are only two of the wide range of "Birds and Beasts" that can be realistically, and very easily, represented by a few Meccano parts.

It is really great fun designing and building up simple models of this kind, and just the right pastime to while away a few hours indoors in wet weather. We have therefore chosen "Birds and Beasts" as the subjects for our novel Summertime Competition, full details of which were first announced in the June *M.M.* The Contest closes for entries on 31st August next, so if you have not yet sent in your entry there is still time for you to do so.

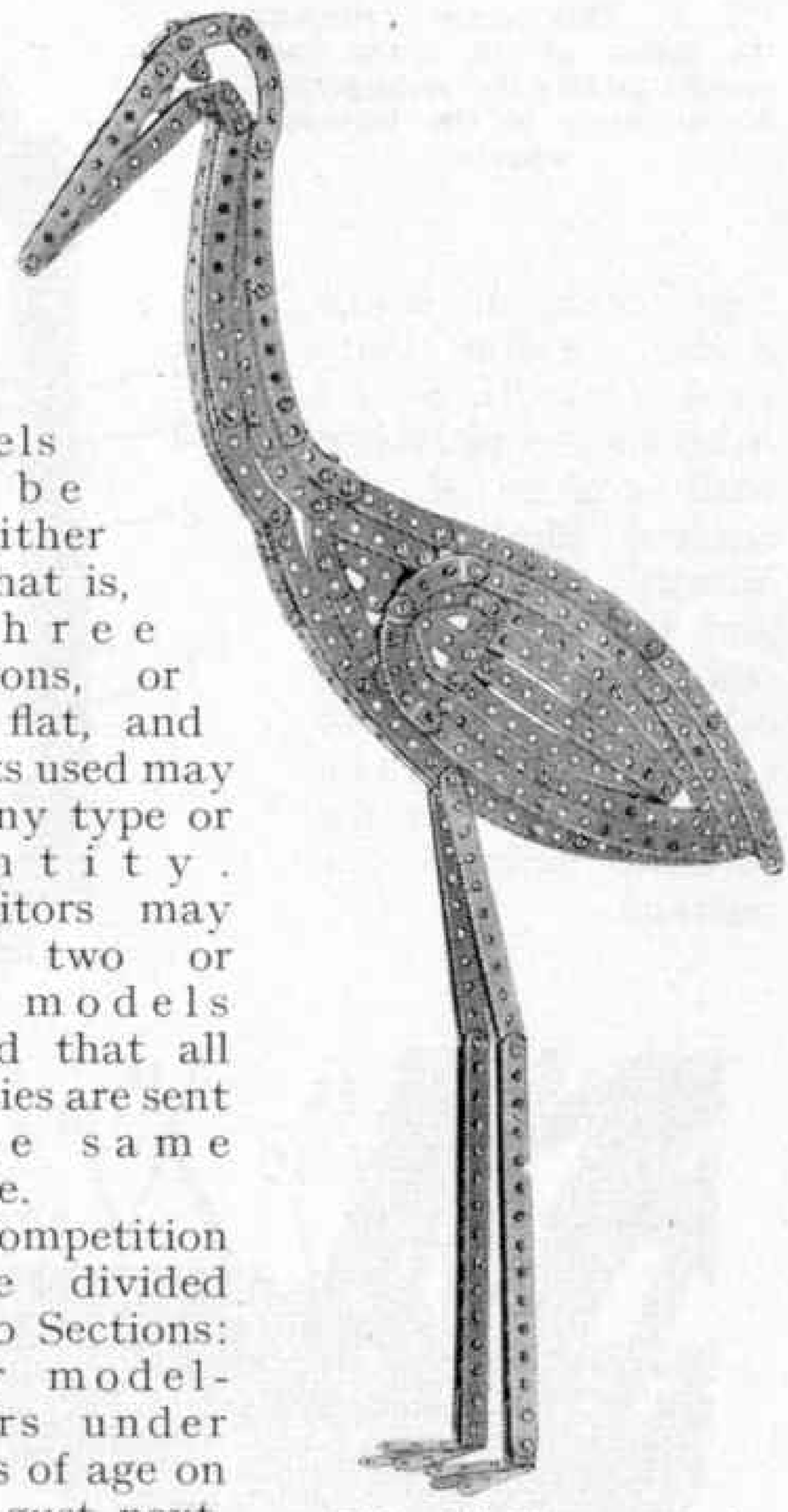
In order to take part in the Competition competitors should make models of any birds, beasts, fish or other creatures they like and then obtain either photographs, or failing that, make good sketches of them. Neither photographs nor drawings need be the competitor's own work.



An outline model of a giraffe suitable for entry in the "Birds and Beasts" Competition announced on this page.

Models may be built either solid, that is, in three dimensions, or in the flat, and the parts used may be of any type or quantity. Competitors may submit two or more models provided that all the entries are sent in the same envelope.

The Competition will be divided into two Sections: A, for model-builders under 12 years of age on 31st August next, and B, for those who will be 12 or over on that date.



This life-like stork is another example of a suitable entry for this Competition.

The following set of prizes will be awarded in each Section. First, Cheque for £4/4/–; Second, Cheque for £2/2/–; Third, Cheque for £1/1/–. Ten Prizes, each of 10/– and Ten Prizes each of 5/–.

Each competitor must write his age (as it will be on the 31st August next) name and full address on the back of each photograph or drawing sent in, and entries must be addressed to "Birds and Beasts Model-Building Competition, Meccano Limited, Binns Road, Liverpool 13."

Now don't forget! The Competition closes for entries on 31st August so you should set to work as soon as possible on building your model and preparing your entry.

Prize-winners will be notified by post as soon as possible after the closing date of the Competition. It should be noted that prize-winning entries become the property of Meccano Limited and are not returnable. Unsuccessful entries will be returned when the judging is completed, provided the senders include with their entries stamped addressed envelopes of suitable size.

Club and Branch News

WITH THE SECRETARY

NEWS FROM AFAR

Some months ago I mentioned here two thriving Meccano Clubs in India. Since then I have been delighted to receive news of a very successful Meccano Club that has been established in the Government College at Keffi, in a very remote part of Northern Rhodesia, under the leadership of Mr. N. R. Shave, one of the Masters.

Mr. Shave tells me that an excellent standard of Meccano model-building has been attained already, and that the students use Meccano for part of their Science course—in this school boys are prepared for their School Certificate. The photograph below shows the Club members with some of their first models, and since it was taken the Club has staged an Exhibition for the benefit of visitors to the School Prize Distribution.

PROPOSED MECCANO CLUB

MADRAS (INDIA)—*Secretary:* Mr. A. P. Vasudevan, 1 Burkitt Road, Thyagaraya Nagar, Madras 17, India.

CLUB NOTES

CONSETT AND DISTRICT Y.M.C.A. M.C.—The Meccano blocksetting crane and the model threshing machine have been completed. The Club will shortly move into new quarters, for which an entirely new gauge 0 layout—with an end-to-end run of 30 ft.—is being planned. The layout will represent an industrial area, and will incorporate the existing model colliery, a model coal carbonisation plant, steelworks, and a dockside. Club roll: 21. *Secretary:* T. H. Porter, 38 Backstone Road, Bridgehill, Consett, Co. Durham.

ST. THOMAS AND DISTRICT (EXETER) M.C.—More members have been enrolled, and attendances are well maintained. Good progress is being made at Model-building meetings. Club roll: 20. *Secretary:* E. Milton, 17 Beaufort Road, St. Thomas, Exeter.

MILE END (PORTSMOUTH) M.C.—A recent Open Night, prior to a three-day Exhibition, was very successful, and brought excellent offers of gifts and services for the display. New members were enrolled during the Exhibition. A Dinky Toys Club is to be formed, and hand-painted showcards announcing this were displayed at the Exhibition. A forthcoming Mock Trial was also advertised. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

BRANCH NEWS

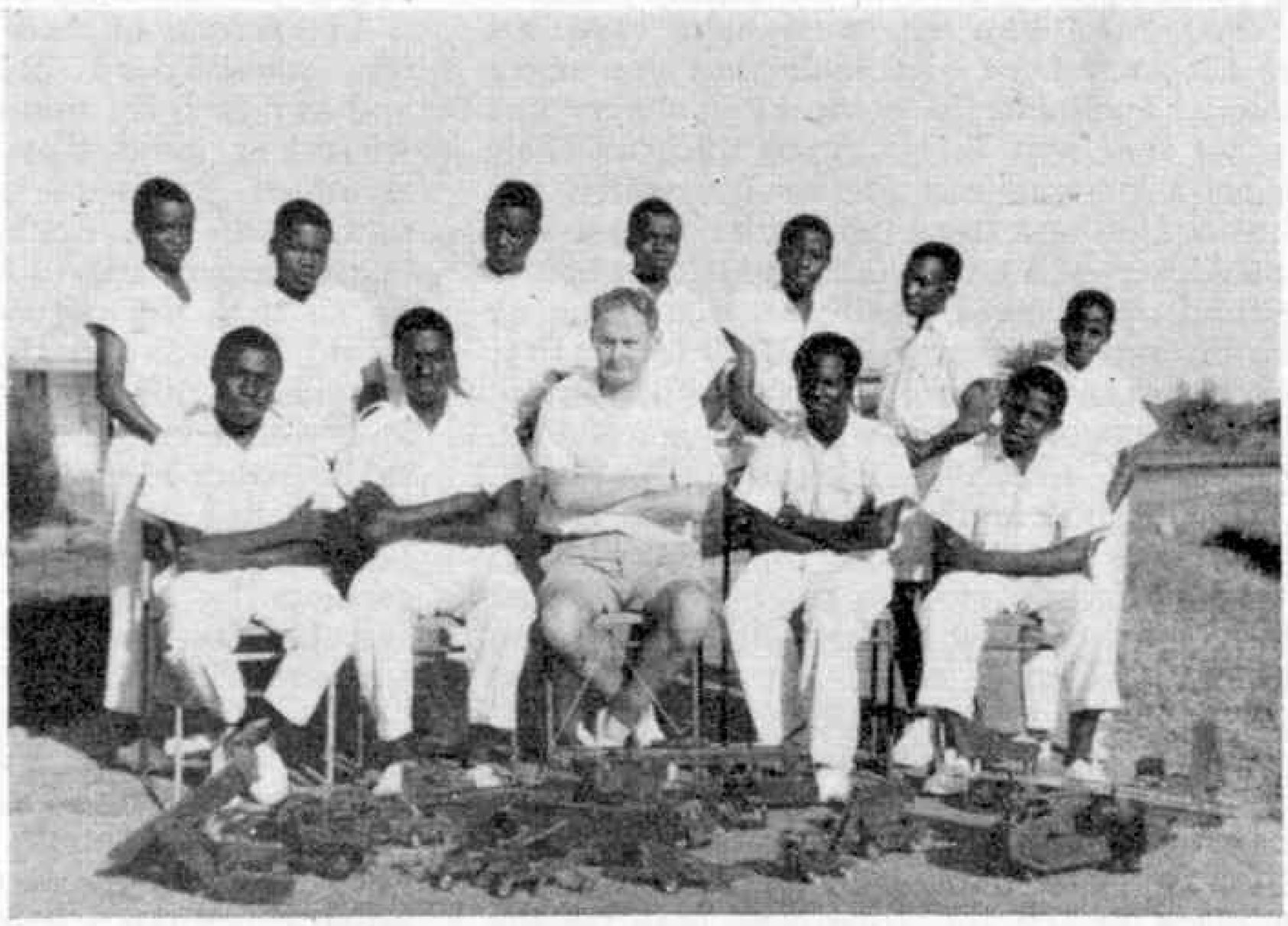
STOURPORT-ON-SEVERN—Good progress has been made in constructing a permanent layout. The baseboard has been painted, its surface coated with sawdust and the latter then painted green. Everything is now ready for laying the new track. *Secretary:* R. F. Drew, 87 Brindley Street, Stourport-on-Severn.

MILE END (PORTSMOUTH)—The Exhibition held in conjunction with the associated M.C. was a great success. Work has begun on completely reorganising the Branch layout. A large sheet of beaver board is being purchased, and this will be set up on 6 in. wooden blocks to provide a basis for a two-level layout. An interesting talk was given by Mr. P. Leggatt on his visit to Jersey. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

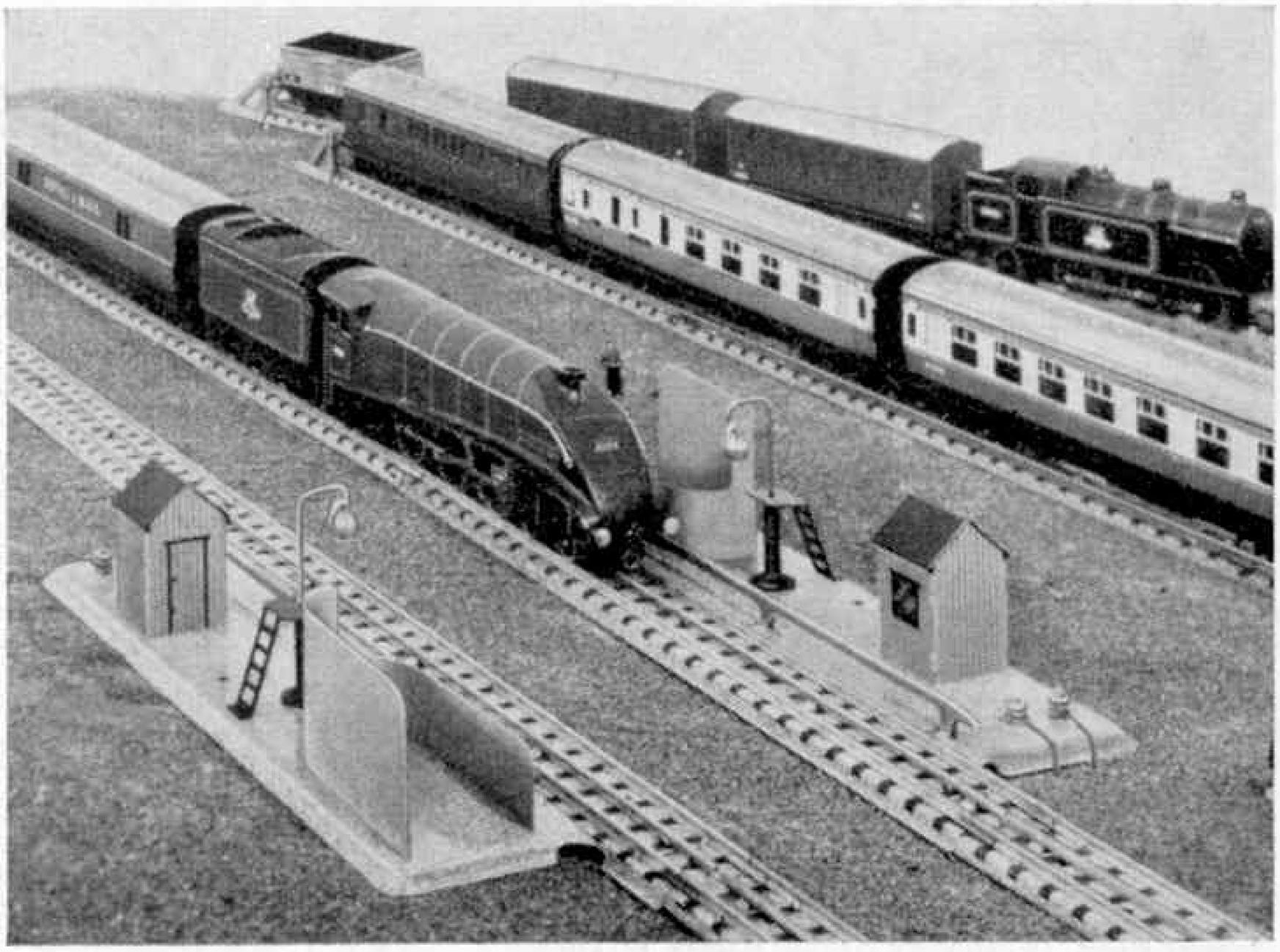
NEWPORT C. OF E. JUNIOR BOYS' SCHOOL (I.o.W.)—Train running is carried out to a timetable, and includes passenger trains, coal, timber and other freight traffic, and construction trains run in connection with layout extensions in progress. A Branch magazine has been started. *Secretary:* P. Keeley, Newport C. of E. Junior Boys' School, West Street, Newport, Isle of Wight.

AUSTRALIA

ST. KEVIN'S COLLEGE (EAST MALVERN)—At one meeting the Chairman gave a talk on New South Wales and Queensland State Railways, and on another occasion a member gave a report on "*Puffing Billy's*" 56th birthday celebration, which he and two other members attended. The Branch exhibited a layout at this event. The Chairman has also given an interesting talk on railway coach building, during which he used a model of an L.M.S. corridor composite coach to illustrate his description. *Secretary:* Mr. M. A. Saunders, 6 Ash Grove, East Malvern S.E.5, Victoria, Australia.



Officials and members of the Meccano Club recently formed at the Government College, Keffi (via Gudi) Benue Province, Nigeria. The Leader, Mr. N. R. Shave, is seated in the centre of the front row and immediately on his left is Marcus, the Secretary. In the foreground is a fine array of some of the Club's first Meccano models.



The up and the down track on this Hornby-Dublo layout each includes a T.P.O. lineside apparatus. Both standards have a Mail Bag hanging ready to be picked up by the respective mail trains.

HORNBY RAILWAY COMPANY

More Mail Matters

By the Secretary

A GOOD many of the letters you have written me about the Hornby-Dublo T.P.O. Mail Van Set must have travelled in the very type of vehicle that you write about! Incidentally, some of you may not know that real T.P.O. Vans have on their sides a posting slot for letters, which fall into a kind of letter cage inside. So you can actually post a letter on the platform before a mail train leaves, or while it is standing at an intermediate stop. But *don't* forget that such letters require an extra ½d. stamp. Letters posted in this way receive a T.P.O. postmark, which is interesting in itself.

If you look at the Hornby-Dublo T.P.O. Mail Van you will see a representation of this letter box slot on its near side, just below the Royal monogram. But I am sure that almost all of you have noticed this pleasing little detail.

Lineside signs to remind the train crew of the approach of T.P.O. apparatus have been mentioned in my correspondence. There are two different types. One provides a mark to tell the apparatus man on the T.P.O. where to put out his net in order to pick up mail from the lineside standard. The other warns the footplate men to keep their heads inside their cab until the apparatus has been passed.

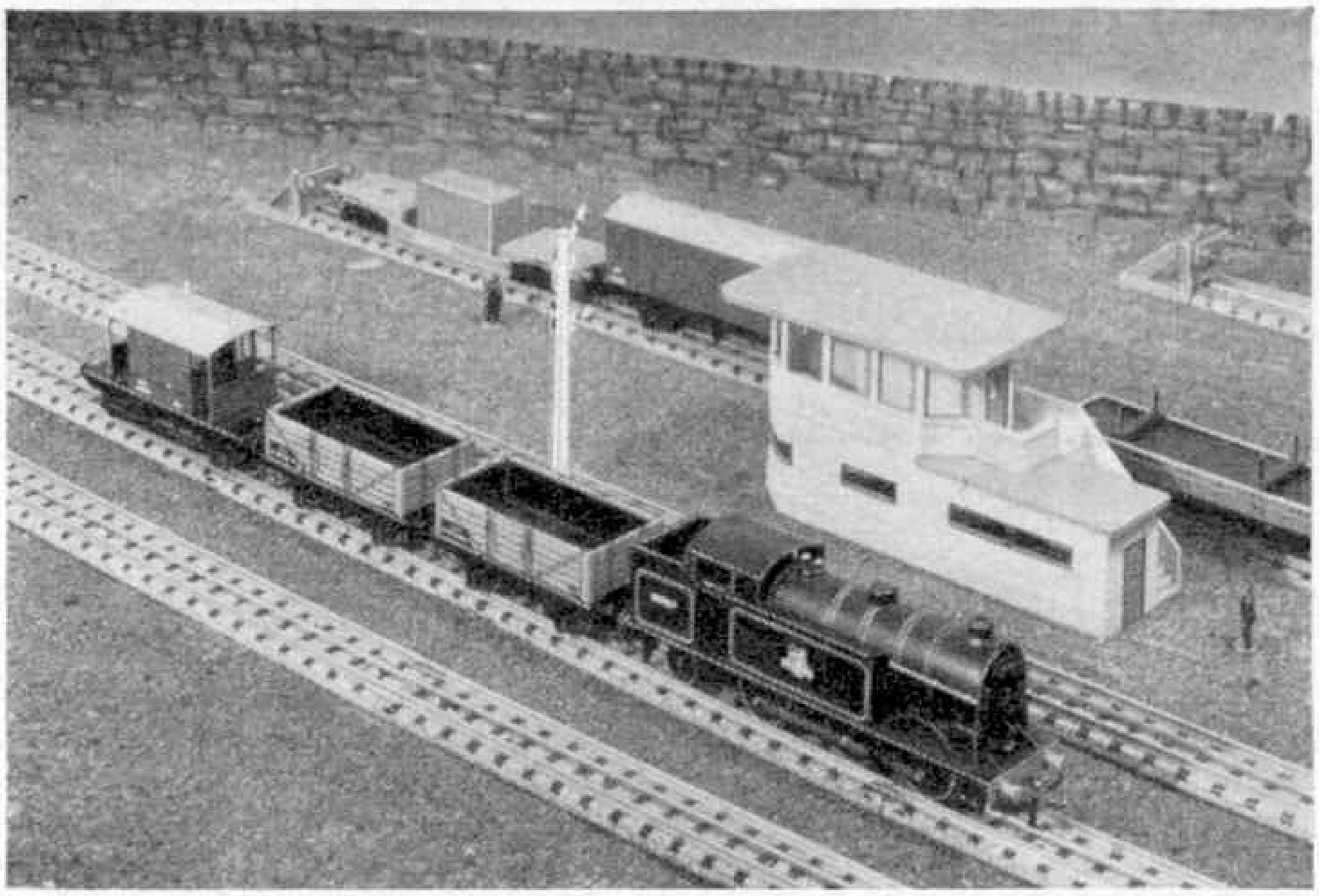
The second of these signs takes the form of a "chess-board" boldly coloured in black and yellow 9 in. squares, and to show you what this looks like in miniature I have arranged the scene shown in the lower picture on the opposite page. The real boards are usually 3 ft. square and are set up so that the top edge is 6 ft. from rail level. If made strictly to scale in 00 Gauge a board of this kind would be rather small and would not show up well; so I have taken some liberties with the dimensions.

It is not difficult to make up a simple board by drawing out the design on white card, or by painting up a board made of suitable thin wood. If you make the whole surface yellow first, the black squares can be added fairly easily with Indian Ink and a pen. This is a lot easier than trying to paint a number of small squares.

The board should really be placed a greater distance away from lineside apparatus than I have been able to show in the illustration, so remember this when fixing up such boards on your own layout. To look well it should be at least

a rail length in front of the apparatus.

"How are the boards seen at night time?" you may say, *"when most of the T.P.O.s run?"* Well, the answer is that they are spot-lighted when the apparatus is to be used.



The engine and stock of the recently-introduced EDG16 Train Set make their way along the main line on this layout. This is a useful train with which the development of the system can be started.

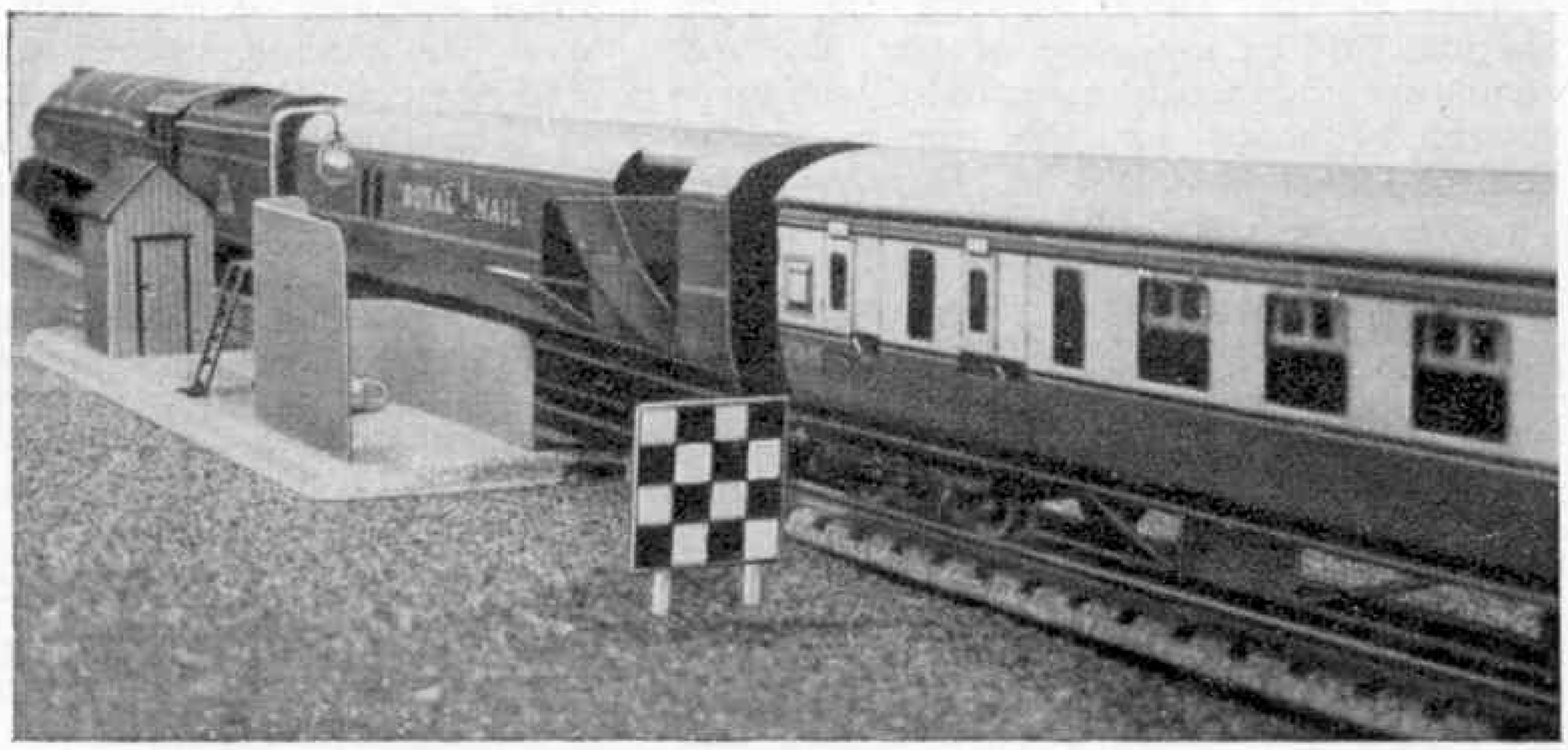
As the net of the Hornby-Dublo T.P.O. operates just as the vehicle approaches the apparatus, there is not really much point in providing a sign of the type used in full size practice for the information of the T.P.O. apparatus man. In any case he has his own method of fixing his location. A signal box perhaps, the change in sound when passing under a bridge, gives him the clue, and then after a well-counted number of rail joints beyond he swings out the off-going pouches and down goes the net!

The "apparatus man" in Hornby-Dublo is spared this trouble. He just presses the Switch button firmly down when the train approaches the apparatus, and the T.P.O. does the rest.

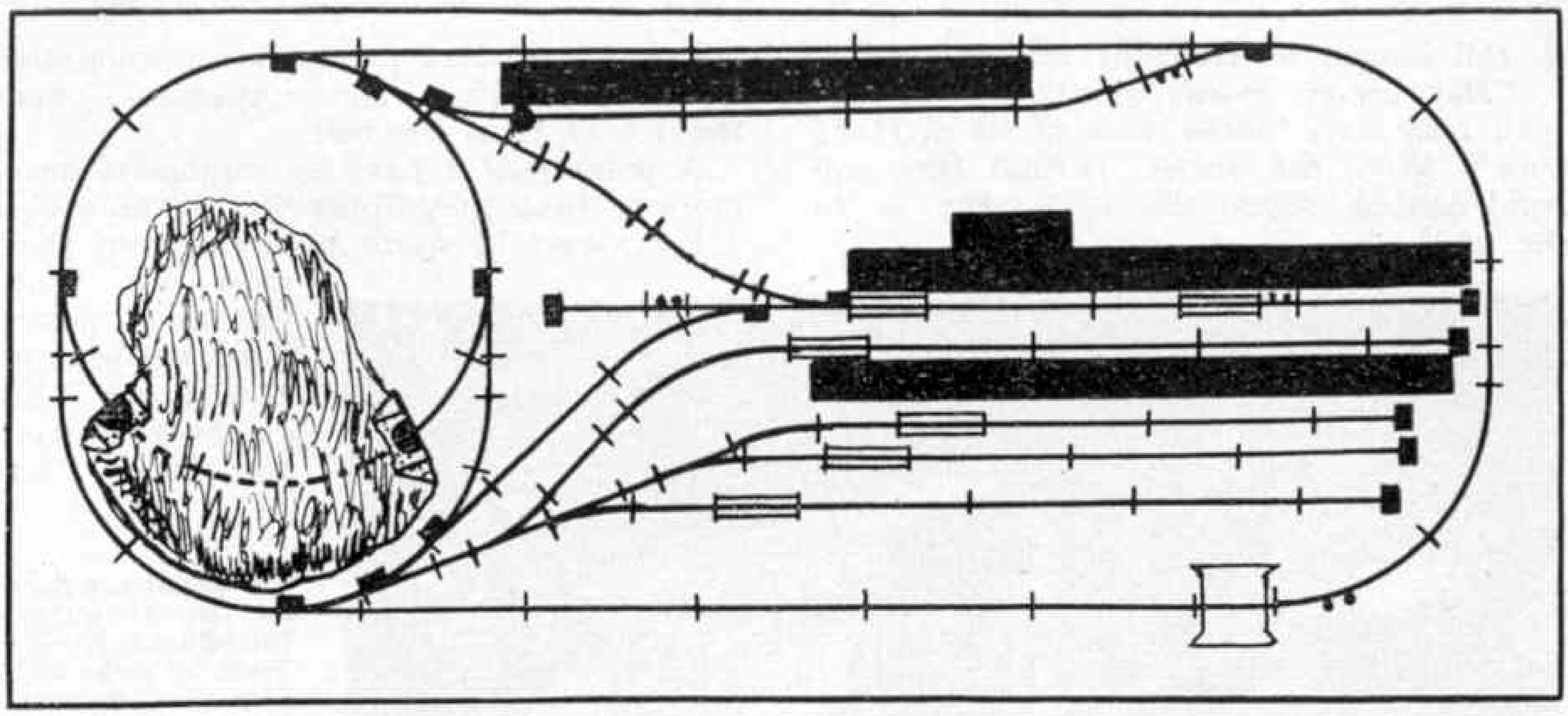
A point that I have to emphasize once more is that the supply for working the T.P.O. *must* be quite separate from that used for train driving purposes. This means *any* train on the railway, not merely the mail train in which the T.P.O. is included. I mention this because some of you appear to have been a little confused on this point.

There is no reason at all why you should not have more than one set of lineside apparatus on the one railway and I have already given you some details regarding such installations. The picture that heads the opposite page shows the up and down main line on a layout, each equipped with T.P.O. apparatus.

Now, just to end with this month, I am able to show you above how attractive the components of the simple EDG16 Goods Train Set look when they are in use—an engine, two open wagons and a Brake Van.



The Mail Bag despatched from the train has just landed, and the net is ready for that to be picked up. The chess-board warning notice as described in this article is prominent by the lineside.



A "Terminal and Through" Layout

THE layout above was developed for the use of a Hornby-Dublo enthusiast by a Meccano dealer, H. G. Cramer Ltd., of Watford, who supplied the original diagram from which the illustration has been prepared. It is felt that it will appeal to readers who are looking for a novel system providing great variety in running and railwaylike handling of traffic. It has its limitations, of course, as all layouts have, but within the space required, 9 ft. × 4 ft., it includes many features that make it particularly attractive.

The main line is a continuous single track, but the loop line that is formed at the passing station allows up and down traffic to be worked, one train waiting in the crossing loop while the other train passes through on the main line.

For convenience in operating, all the Points except those serving the main station sidings and one of the platform roads are electrically operated. This gives plenty of scope for the remote control that appeals so much to Hornby-Dublo owners. The Uncoupling Rails are of the hand-operated type, but it would be of considerable advantage to use electrically-operated ones instead, at any rate for the three shown between the station platforms.

Inside the main oval is a terminal station. The tracks leading to the upper or main platform road form a triangular layout in conjunction with a section of one of the continuous loops at the left hand end of the layout, as you see it on this page. This makes it possible for a train leaving either of the platforms, after making whatever main line journey is laid down for it in the working arrangements, to return to the station and come to rest alongside the main platform.

Next to the Uncoupling Rail at the right hand of the platform road is an Isolating Rail, followed by a short length of track forming what we have sometimes called a Buffer Stop section. This arrangement allows the train to arrive, the engine to be uncoupled and moved clear of the train to stand in the Buffer Stop section, which is then switched out.

An 0–6–2 Tank comes from the short spur, which also forms a separate isolating section beyond the Left Hand Points at the platform end, where there is just room for it. This engine can work the train away or, if it is required for a further main line run, it can draw the train out over the curved branch of these Points and then on to the main line. The train is then pushed back alongside the other platform, where the Uncoupling Rail at the end of this platform permits the engine to be released from the train and return to its spur. Then the engine that has arrived previously can be turned round the triangle, or backed out of the Station round the left hand end of the main line and so reach the Coaches waiting for it.

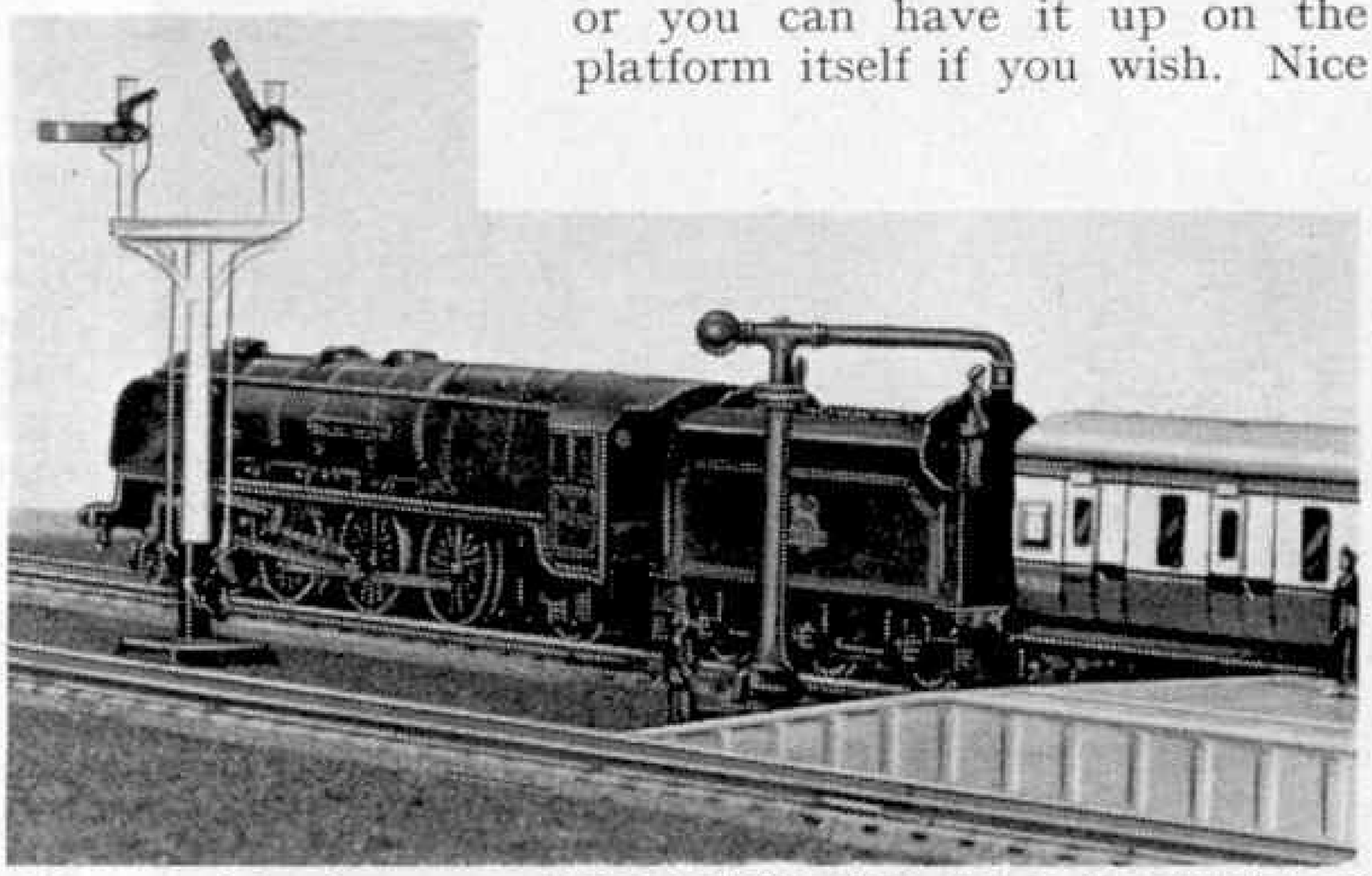
Rails required: 12 EDA1, 1 EDAT1, 6 EDA1½, 27 EDB1, 9 EDB1½, 1 EDBX½, 8 EDB1¼, 3 EDBS, 3 IBR¼, 6 UBR, 4 EODPR, 7 EODPL, 2 ISPR, 1 ISPL, 1 Insulating Tab, 11 Switches D1, 3 Switches D2, 6 Buffer Stops.

Using the Water Crane

REAL steam locomotives drink a lot of water. Hornby-Dublo locomotives don't need any, but we should have some way of representing the filling of their water tanks. So in Hornby-Dublo we have the Water Crane, an attractive and useful little item. It can be placed in all sorts of different positions on the layout, but a favourite place for it is alongside any track that can be regarded as an engine siding. Better still, where the Turntable is in use and there are several off-going tracks from it, these could have Water Cranes alongside so that engines can draw their supplies easily, whichever road they happen to be standing on.

In use the Hornby-Dublo Water Crane is extremely realistic because its upper arm is movable, just like that of a real one. So it can be turned to bring the delivery pipe to the tender or tank of the engine to be "watered." This allows the owner to follow in imagination the routine of the enginemen whose job it is to "stick the bag in the tank," as they would say. The "bag" means the leather delivery pipe of the real water crane or column. To do this in Hornby-Dublo really means cutting the full-length pipe provided, so that when the Crane arm is swung round the mouth of the pipe is just above the tank or tender filler.

The Water Crane can stand at the platform end beyond the sloping ramp, as you see it in the picture below, or you can have it up on the platform itself if you wish. Nice judgment is required of the "driver" in bringing the train to a stand so that the engine is in the correct position for "filling up."



"How much longer are you going to be?" might well be the question of the station official on the right as the enginemen look after the filling of the tender tank of their "Duchess of Montrose."

All this is make-believe, of course, but then there is plenty of that in miniature railwaying. That indeed is one of the things that make us enjoy it so much.

Many other lineside features are connected with water supplies in real practice. Those most easily reproduced in miniature by the enthusiast himself include storage tanks, pump houses and so on. This is where the structural modeller, with his wood or card buildings, has a chance to provide something really effective. Keep an eye on real structures for details.

An out-of-course stop for water by "The Royal Scot," caught by the camera of W. S. Garth. The engine is a "Duchess" 4-6-2.

An interesting corner on the Hornby-Dublo layout of Peter and Christopher Watson. The goods yard and engine shed are prominent.

"All Change"

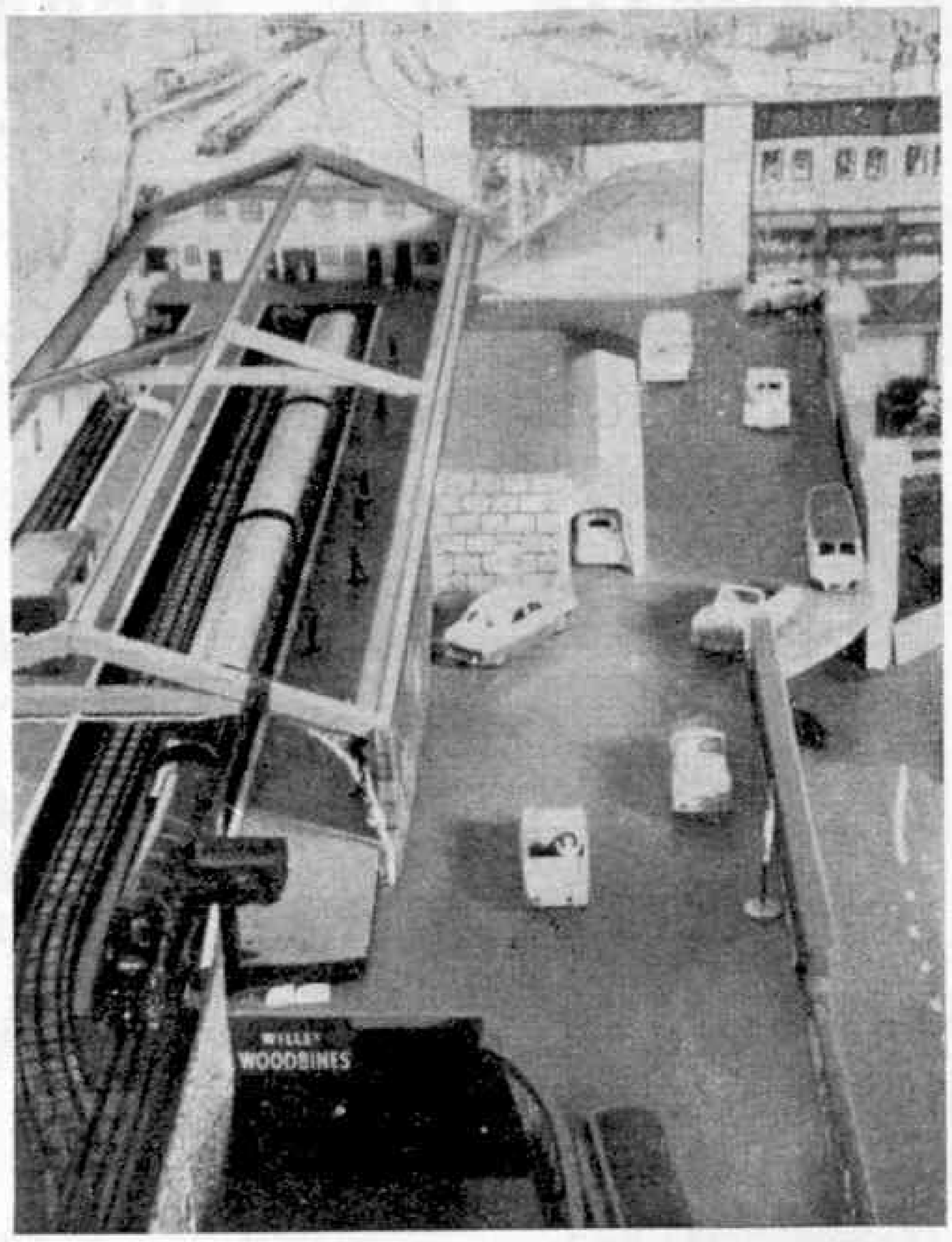
THE familiar railway phrase at the head of this page is not used here as an injunction, but rather to indicate that most miniature layouts do undergo changes in the course of their career. This is understandable, because conditions or the ideas of enthusiasts can alter, and the development of a system is governed by such things. Most of the layouts described in the *M.M.* are known to have changed, almost as soon as their descriptions have appeared in these pages, some as the result of ordinary extension, others by having changes more or less thrust upon them.

An example of the latter is the layout operated by Peter and Christopher Watson, well supported by the interest and encouragement of their father, Major F. E. Watson, R.E. This was described and pictured in the *M.M.* in October, 1955. Since then a change of residence has had to be made, the whole thing being uprooted so that the parts of the system could be transported to their new home. This part of the move of course was regarded by the boys as much more important than the mere shifting of the household effects.

Then came the first shock to the miniature railway engineers. The baseboard of the original railway fitted the new room all right, so well in fact that the owners themselves couldn't get in! Things had to change with a vengeance. A new baseboard, following the walls of the room, had to be made with an operating space in the centre. This was a wise decision. Baseboards developed for one site are rarely of much use for another without a lot of alteration, and it is really easier to build afresh. Those interested in baseboard details will probably like to know that in making the new one, well braced 2 in. square timbers were placed at frequent intervals, supporting 6 in. matchboard battens spaced 5 in. gaps apart. Then softboard was screwed to these battens, the resulting structure being approximately 3 ft. wide.

Before any track laying, etc., was attempted the whole structure was painted, a good idea that avoids the scrappy appearance that can result if the job is done at a later stage. The layout includes a double track main line. There is in addition a high level section, which ends in a terminal station known as *Ashbourne East*. Access to this is provided by means of a gradually rising approach at 1 in 45, which does not occasion any difficulty with normal loads.

The main passing station is known as *Ashbourne Central* and by this is situated the control board from which movements on the layout are supervised. This station has one island and one ordinary platform, it being possible to loop trains round the outside of the island platform in one direction only. The loop really forms an



A view of the high level terminal station and road approach. Good use is made of Dinky Toys on this layout.

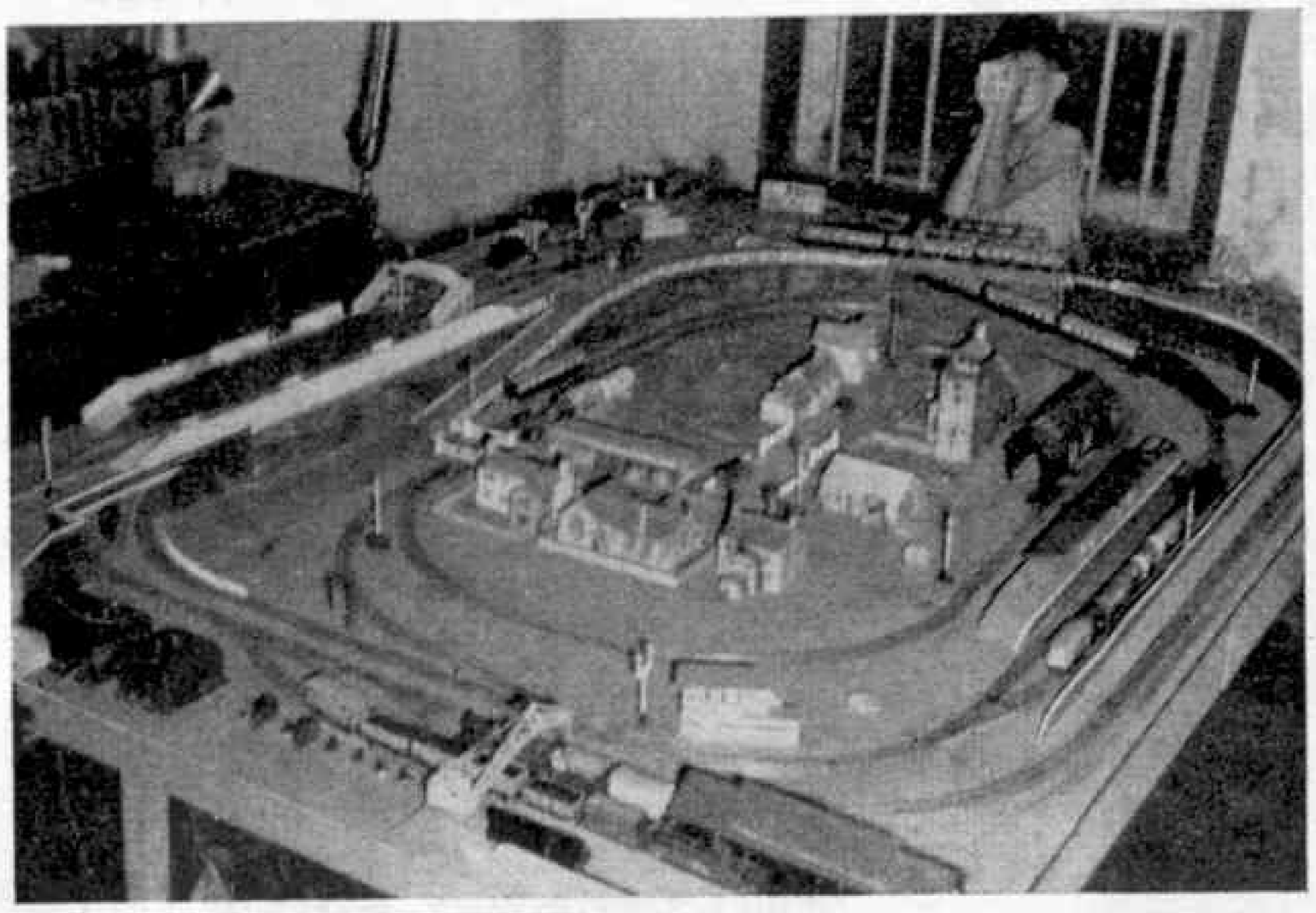
extension of a track that leaves the inner main line, crosses the outer one by means of a Diamond Crossing and plunges into a tunnel under "high ground." It emerges, after changing direction, to join the outer main track just by a level crossing. Immediately after this the island platform loop is thrown off.

At the opposite end of the system is the locomotive shed, and the goods and carriage sidings that you can see in the illustration on the opposite page. The upper picture on this page shows the high level *Ashbourne East*, which, incidentally, is to be rebuilt shortly—more change already!

As on the original system, special attention has been given to lineside effects, with convincing results. There is a well-developed road system for the many Dinky Toys vehicles possessed by the owners of the line. Some of the miniature pavements, by the way, have been cut from odd pieces of lino—no doubt left over after the house removal—and painted and marked out to represent flagstones. Improvements have been made in the lineside buildings, so that the upheaval has been beneficial in this respect, and indeed in others.

The picture below shows another layout that has undergone some changes since the earlier reference to it in the *M.M.* This is the railway worked in Colombo, Ceylon, by our friends, Allan, John, Peter and George. It was referred to previously in the *M.M.* in March of last year, and since that time has been improved to give a continuous circuit for long-distance trains and an inner circuit incorporating an "S" shaped reversing loop. In addition, another track is taken off from the main line and then passes up to the high level section, on which a terminus with sidings and ample facilities for train working are provided. The main line at normal level tunnels under this.

An interesting feature is that the high-level section is also connected with the normal level by road. So the upper section is not left "in the air" so to speak, but is made to fit into the general scheme in a realistic manner.



The present layout of four enthusiasts in Colombo. The layout now includes a raised section, which adds to the interest of working.

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Stamp Collectors' Corner

By F. E. Metcalfe

ANY OLD STAMPS?

IT is only natural that there should be forgeries and fakes of items so valuable as some postage stamps. Philatelists are not easily deceived by them, but even the most expert can be taken in occasionally. For instance, the expert committee of the British Philatelic Association recently asked that they should be allowed to re-examine a number of stamps to which they had previously granted certificates of authenticity, which was another way of saying that they now thought that they had erred.

It was the same society that not very long ago bought up the stock of facsimiles, to gives these productions an euphemistic designation, that were the clever work of one Sperati, who died about two months ago. Items similar to these had been the bane of collectors for years, and without any doubt many of these Sperati "works of art" repose in the collections of quite knowledgeable philatelists who have not the slightest idea that their treasures are not genuine.

It should be remarked in passing that the Sperati purchase made some trouble for the society that effected it. Some of the trade members thought that such things should be left severely alone, thinking that the publicity that would result from such a purchase would only frighten off collectors.

No doubt the best thing would have been for the society to have opened a subscription list, and if the sum necessary to buy the facsimiles could have been obtained in this way, to have burned the lot. As it was, what was believed to be Sperati's entire stock was bought, collections were made up, and after each item had been marked false, they were sold to members of certain societies and to the societies themselves, for reference purposes.

Sperati is only one of many who have worked on postage stamps, and there are many kinds of fakes, some of which are more dangerous than out and out forgeries. For instance, it may be that a rare stamp has been printed on the same paper, and with the same perforation, as a common one. What the faker does then is to get a copy of the common stamp, fade out the design, which can easily be done, and make a printing of the rare stamp on the scrap of blank paper, which is then of the right kind. Sperati was very skilful at this kind of work.

It must not be thought either that only the older stamps have been tampered with, though of course these have naturally been the principal targets of the fakers and forgers. Modern stamps too have suffered. Consider, for example, the Grenada 10/- of the KG VI period. This exists in a number of different perforations, one of which is rare. Stamps with this particular perforation 12 are worth around £20, whilst some of the stamps of same design and colour can be bought at not much above face value.

What the fakers do is to get hold of a copy of the latter, cut off the perforations as closely as possible, and just add the new ones. Stamps treated in this way are a trifle smaller than normal, and that is how they can be detected. But quite often people with £20 to spend on a stamp are a bit casual as to how they spend them and—well, not all the Grenada 10/- Perf 12 stamps reposing in collections are what they are supposed to be.

Shade variations in stamps are very popular, and are quite easy to fake. I remember some time ago that in one of the stamp papers there was news of a very good new shade of the Grenada 3d. KG VI stamp then current. Later copies were being offered at several shillings each. A collector who had bought one sent it for me to see. The frame was of a quite bright green, instead of the usual olive-green, the gum was perfect, and in every way the stamp appeared to be right, with no sign of any tampering.

Actually it was too good to be true. I wrote to a friend and got him to send me a copy. On comparing the two, I noted that there was an outstanding difference in colour, and that more or less confirmed my suspicions. A chemist got to work and was able to tell me that the stamps were faked, and how this had been done.

A more serious fake of the same character had to do with the Nyasaland £1 KG VI stamp. The first printings of the KG VI £1 values of Bermuda and Leeward Islands were on a bright, almost crimson, paper, but later printings were on a much duller paper. When the Nyasaland £1 came out it was on the dull red paper, and as far as is known there was never more than one printing. But one fine day a collector showed me a copy of this latter stamp on bright crimson paper.

I was suspicious from the start, though I was told later that this stamp had been given a B.P.A. certificate of authenticity, which did not convince me in the least, and in the Commonwealth Catalogue I stated more or less that I was suspicious. Now it has been found that these bright crimson stamps are fakes.

It was in view of all this that shades are listed in the Commonwealth Catalogue only if the printing to which they belong is known, and it can be checked that the stamps of that particular printing are of the same shade. This is an effective bar to shade fakers.

There is a lot more I would have liked to have written on the subject, but my space is about all taken up. Perhaps I will return to it some other day, but I must mention the greatest forgery of all, which is known as the "Stock Exchange Forgery."

In 1870 telegrams were the only means of getting news out quickly, and they were largely used for Stock Exchange purposes. Once the stamps on the forms had been cancelled, little notice was taken of them. Years afterwards, in 1898, a dealer remarked that there was something wrong about the stamps, and in 1912 another dealer spotted the forgeries. The whole affair then came out. What had happened was that some of the forms that should have been destroyed were taken out and doctored. Nothing could be done to catch the forgers at that late date, but it is thought that someone got away with anything up to £25,000 or £30,000.

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For other Stamp Advertisements see also pages 362 and xviii

Stamp Gossip

INDIA

OUR kind friend Mr. E. R. Kooka, of Bombay, has kindly sent a set of the new stamps of India, issued to be in line with the new currency, to which I referred last month. There are eleven values, and they run from one naya paise to seventy five. All are of the same design, showing a relief map of India, and five of the values have been overprinted in three different ways, for use of the International Forces stationed at Gambodia, Laos and Viet Nam. There are also a few values for official use.

That is the bare bones of the story. But a lot can be said about this new issue. First of all the stamps were designed and printed in India. From artistic and technical standpoints, they are first rate. India is to be congratulated on her new stamps.

GEORGE CROSS ON STAMPS

Perhaps one of the most interesting sets that any of the countries in the Commonwealth is likely to issue for a long time is the George Cross set of Malta, released on 15th April to commemorate the 15th anniversary of this award to that tough little island in the Mediterranean. The set of three stamps, values 1½d., 3d. and 1/–, was only on sale for a week. But plenty were bought, as all concerned knew that the issue would have a short life, and I expect that many readers will already have a set.

The stamps were printed by the photogravure process by the British firm of Harrison and Sons, who do wonderful work in this respect. Yet I must say that I much prefer line-engraved stamps, and I do hope that our Colonies will stick to the latter process of printing for their postage stamps. They may cost a bit more, and take longer to produce, but they are then well worth the difference.

This does not mean that the Malta set will not give satisfaction. It will. The Silver Cross printed on each value is a novelty, but it doesn't quite come off and I have heard more than one collector say that the stamps would have been nice enough without it.

OLD IRELAND

It is interesting to note that Gibbons are following the lead of the Commonwealth Catalogue, and the next edition of their Part One will include all Irish stamps, including those issued after our neighbour left the Commonwealth. Why they ever took any other course always surprised me, for to split the stamps up so that they were in two different catalogues made it very awkward for collectors.

STAMP BOOKLETS

More notice is being taken of booklets sold at post offices since one or two with imperf. panes have been discovered. It is understandable that quite a lot of stamp enthusiasts are now collecting booklets. American and Canadian collectors have always been keen on them, and my own postbag reflects the growing interest in them.

One letter raised a rather interesting point. On the back cover of all British Post Office booklets, at the bottom right hand corner, will be found the date and year of issue. As is known by most collectors, our 2d. stamps came out in a lighter shade of brown, for this is the value used for receipts, and it was found that signatures did not show up well on the darker colour. My correspondent bought two 5/– booklets, both with the date January 1957, and found the 2d. pane in one was of the light shade, and the other of the dark brown. He wanted to know if he had dropped on something scarce.

The answer is no, for while there are apparently not as many booklets with the light brown 2d. panes as dark, there are still quite a few, and dealers are asking about an extra 1/– for them. Still, collectors like these things, though I don't think much notice is being taken of the dates on the booklets.

SHADES

Most collectors of colonial stamps are very interested in shade varieties. One collector showed me recently a copy of the Nigeria 2d. that differed completely from the one he had in his collection. He was indeed quite excited, so wide was the difference in colour. Previously I had taken the matter up with the Crown Agents, who seemed to know very little about it, and there must be many collectors similarly fogged, so I'll explain what I know.

Last year it was announced that Nigeria 2d. stamps were changing colour, and the process of printing was changing also. It later transpired that these stamps were being printed in Belgium, by a British firm that had a branch there. The stamps duly appeared in July of last year, and proved to be of a purple-slate, although it had been announced that the colour would be grey-blue. Recently letters have been arriving from Nigeria with 2d. stamps that are dull slate in colour, and it was one of these that had so intrigued my friend. Evidently there have been two printings, and that explains the two colours.

THE MONTH'S TIP

The eleven Malayan States have separate sets of stamps, up to $5. There have been numerous printings, with some really outstanding shade varieties, and these have made the group of stamps very popular.

Now these sets are being replaced, so quite a lot of stamps will become obsolete. In consequence there is no time to be lost in filling up the blanks. As these sets are accepted as QEII issues, they will become more valuable as time goes on. That is almost certain, so get cracking, summer or no summer. Next winter will be too late.

Assault on the Far South—(*Continued from page 322*)

International Geophysical Year endeavours in the Far South will produce valuable facts about the reaction of metals, machinery and instruments to extreme cold. The result? Well, in use by the British in the Antarctic now is an "automatic meteorological mechanism that, dropped from a plane, rises on six legs like an insect, opens itself, records meteorological data, transcribes it into International Morse Code, and transmits it by radio at 17 words a minute."

No doubt with this 200-lb. Grasshopper, as it is called, in mind one authority has said, "Given automation, atomic energy and cold-proof machinery developed from experience gained in the Antarctic in the International Geophysical Year, uninhabited mining towns might one day be built at key points in the Far South."

It should also be noted that the Antarctic has increasing strategical values. For one thing, the closing of the Suez Canal and the Panama Canal would see the Cape Horn route between the Atlantic and Pacific come to the fore. This route could be controlled from the Antarctic.

So what with new civil airlines *across* and airfields *in* the Antarctic, the Far South's strategical value, and the need to continue research there, it seems certain that the end of the International Geophysical Year will see more, not fewer explorers and scientists in the frozen wastes of the Sixth Continent; in fact the I.G.Y. will usher in a new era in polar history.

Waverley Station Scenes—(*Continued from page 325*)

at times almost the same sort of snatch as the train accelerates that one experiences in a bus. In the power cars the throbbing of the engines below is of course readily detected, but it is not really disturbing, having just about the same effect that one senses on board ship. Still, I am sure that there is a future for these diesel car trains. As I write I have just received news of the use, for the first time, of one of the Inter-city diesels for an excursion between Glasgow and North Berwick, via Waverley.

These Inter-city diesel services are really a logical development of the local services provided first in the West Riding of Yorkshire and then elsewhere by lightweight twin-unit diesel car trains. It is interesting to note the small variations between the different types, but this no doubt is of benefit to those spotters who include diesel trains in their number-taking activities. Further down the scale, a similar but single-unit type of diesel car was introduced just over 12 months ago by B.R. on the run between Buckingham and Banbury, and a picture of this type of vehicle appears on page 337 of this issue.

Road and Track—(*Continued from page 331*)

Murray's Ecurie Ecosse are not well represented in the record book. It was in December 1951 that David Murray founded this Scottish team for Scottish drivers, with a garage and workshops in Merchiston Mews, Edinburgh, and engaged "Wilkie" Wilkinson to look after the XK120's.

The founder and team manager of Ecurie Ecosse is not only one of the most enthusiastic competitors in the sport of motor-racing, and one of the best liked, but a man with considerable racing experience himself. He drove a 1½ litre Maserati after the second World War, and did not give up active participation in the sport until a spectacular crash at the tortuous Nurburgring in 1952—after the formation of Ecurie Ecosse—resulted in a promise to Mrs. David Murray that he would not race again.

Since that first season of the blue Jaguars with the familiar white chevrons painted across their noses, the Scottish team has steadily gained strength and it was a great satisfaction to 46-year old David Murray when the Flockhart/Sanderson D-type won the 1956 Le Mans 24 hour race.

It was typical of David Murray that, with the green works Jaguars out of the running in 1957, he should purchase three of the 1956 works team cars with the object of participating in the World Sports Car Championship events and showing the flag for Jaguar in 1957.

Easy Model-Building—(*Continued from page 341*)

Triangular Flexible Plates connected by a Wheel Disc 10, and it is attached to a ½" Reversed Angle Bracket bolted to the side. The seat is a Flat Trunnion supported by a Stepped Bent Strip bolted to the back of the cab.

A 5½" Strip 11 is fixed to Angle Brackets bolted to the top of the body, and two Fishplates 12 are fixed to one side. The Strips and the Fishplates support two 4" Rods 13, which are held in place by Spring Clips. A 2½" × 1½" Flanged Plate 14 has two Trunnions 15 bolted to it, and the assembly is free to slide on the Rods 13.

Two 12½" Strips 16 are connected to the Flanged Plate 14 by Angle Brackets, and a 1½" × ½" Double Angle Strip is bolted between the upper ends of the Strips. The lifting platform is formed by two 2½" × ½" Double Angle Strips 17 extended by 2½" Strips and connected by further 2½" Strips. Two Double Brackets 18 are free to slide over the Strips 16. The hoisting Cord is tied to a 1½" Rod mounted in a Flat Trunnion and a ½" Reversed Angle Bracket bolted to the Flanged Plate 14. The Cord is passed over a 2" Rod 19 and is tied to the lifting platform.

Parts required to build the Side-Operating Fork Lift Truck: 4 of No. 1; 8 of No. 2; 2 of No. 3; 8 of No. 5; 4 of No. 10; 2 of No. 11; 8 of No. 12; 2 of No. 12c; 2 of No. 15b; 2 of No. 16; 1 of No. 17; 2 of No. 18a; 2 of No. 22; 1 of No. 24; 2 of No. 24a; 7 of No 35; 86 of No. 37a; 81 of No. 37b; 3 of No. 38; 2 of No. 38d; 1 of No. 40; 1 of No. 44; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 4 of No. 90a; 6 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 155; 4 of No. 187; 2 of No. 188; 2 of No. 189; 4 of No. 190; 2 of No. 191; 2 of No. 192; 1 of No. 198; 2 of No. 199; 2 of No. 200; 1 of No. 213; 2 of No. 214; 4 of No. 215; 4 of No. 221.

Parts required to build the Mechanical Hammer: 1 of No. 2; 2 of No. 5; 2 of No. 10; 2 of No. 12; 1 of No. 17; 1 of No. 19s; 2 of No. 22; 4 of No. 35; 14 of No. 37a; 12 of No. 37b; 2 of No. 38; 1 of No. 52; 2 of No. 111c; 2 of No. 126.

RAILWAY CORRESPONDENCE AND TRAVEL SOCIETY

We have been asked to announce that the Honorary Publications Officer of this Society is now Mr. T. J. Edgington, 57 Heathfield Road, Kings Heath, Birmingham 14. All requests for publications of the Society, and all enquiries in connection with them, should therefore now be sent to him.

THIS MONTH'S CONTENTS

Page
Inside the Monkey Hole 318
by the Editor
Assault on the Far South 320
by Frank Illingworth
Waverley Station Scenes 323
by the Editor
Unloading Iron Ore 328
Island Joys 329
by Roland Fry
Thunderbirds 332
by John W. R. Taylor
Locomotive Misnomers 347
by R. S. McNaught

Air News, 326. Club and Branch News, 355. Fireside Fun, 367. From Our Readers, 335. Hornby Railway Company pages, 356–61. Junior Section pages, 339–346. Meccano Competition, 354, Among the Model-Builders, 350, Model of the Month, 352. Railway Notes, 336. Road and Track, 330. Stamp Collecting pages, 363, 365.

"No Sir! That's the smoke-box. The smoking compartments are further back!"

Fireside Fun

Two men, noted for being a little on the simple side, were putting up a picture in their room. Suddenly one noticed that his friend was throwing the nails away by the dozen.

"What's wrong with the nails?" he asked.

"The heads are on the wrong end so they are no use," was the reply.

"Don't be silly," said the other. "They're for the other side of the room!"

* * * *

Mother (proudly watching her two-year old): "He's been walking like that for almost a year."

Visitor: "Amazing! Can't you make him sit down?"

* * * *

Teacher: "Now, children, a man dies and leaves £10,000, one-tenth goes to his wife, one-twelfth to an uncle and the rest to be divided between six distant relatives. What does each get?"

Johnny: "A lawyer."

* * * *

Jack: "Uncle, that shilling you gave me slipped through a hole in my pocket."

Uncle: "Well, never mind. Here's another one."

Jack: "Don't you think half-a-crown would be safer, Uncle?"

* * * *

Little Bobby had forgotten a schoolmate's birthday and sat down to write a note of apology.

"I have no excuse for forgetting," he wrote, "and it would serve me right if you forgot my birthday next Wednesday."

* * * *

Explorer: "Once I was so hungry I had to eat my parrot."

Jones: "What did it taste like?"

Explorer: "Oh, like chicken, wild duck, partridge—that parrot could imitate anything!"

* * * *

Village Bully: "If it wasn't Sunday, I'd stuff your collar down your throat."

Wee Willie: "If it wasn't Sunday, I wouldn't be wearing a collar."

* * * *

Officer taking rifle inspection: "Take this man's name, Sergeant! His rifle is filthy."

Sergeant: "Where would you be if a 'plane dropped a hydrogen bomb now on this camp? And you with a dirty rifle."

BRAIN TEASER

FIVE MINUTE CROSSWORD

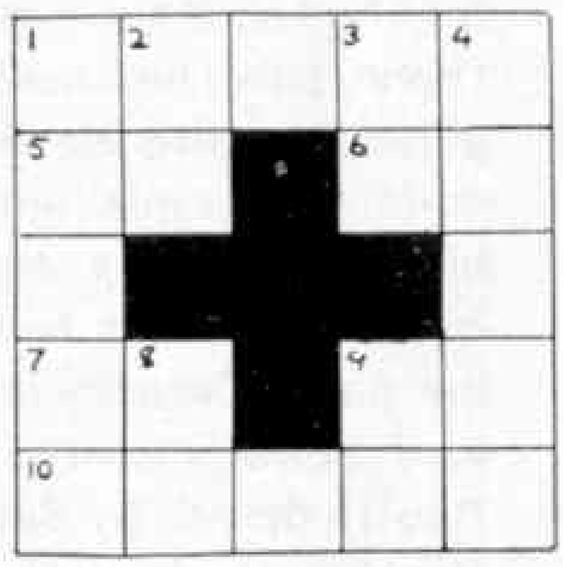
Clues

Down

1. Sources of supply: 2. It's masculine in French; 3. A professional title; 4. A joint; 8. A famous race; 9. A geographic location.

Across

1. Could be a slip; 5. Pronoun; 6. Sporting title in brief; 7. They do a lot of this in the army; 9. John's answer in a well-known ballad; 10. Scatter.



* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

Heads and Tails

To re-arrange the coins place a finger on each of the second and fourth coins of the bottom row (heads) and with one movement draw them from the bottom row and move round to a position immediately above the second and fourth coins in the top row (tails). Then without stopping but by firm pressure, push the second and fourth columns down to allow the two heads to take up their position in the top row. The effect of this is to push the second and fourth coins in each row into the row below.

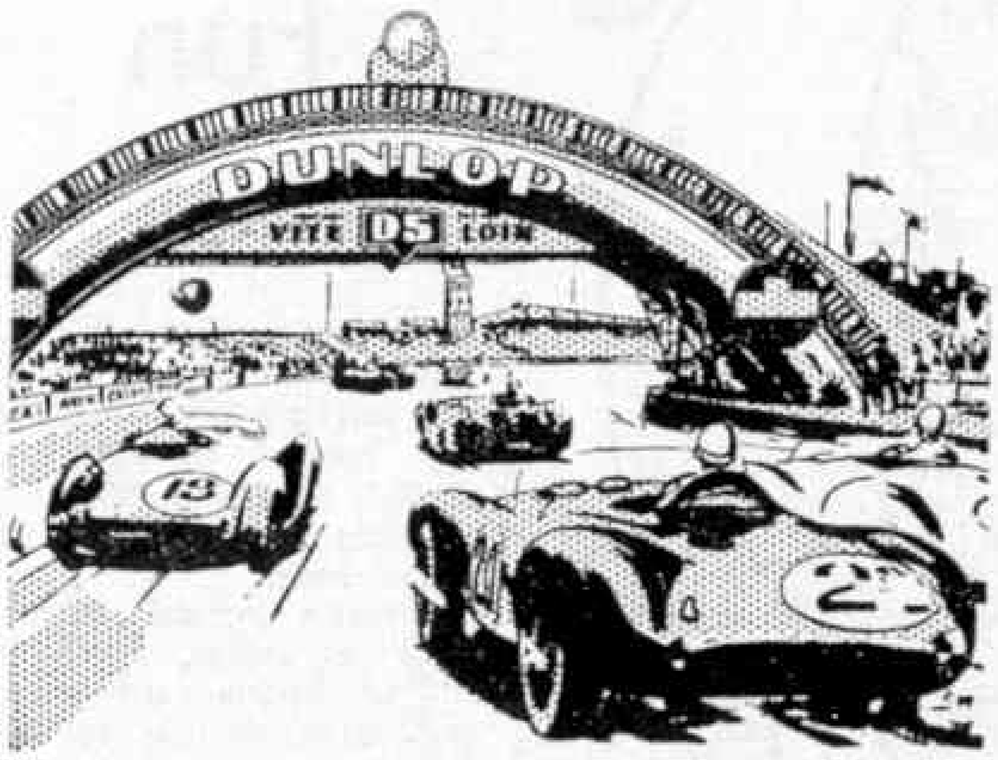
* * * *

What Name?

The name is MEXICO. On removing ME and CO—eleven (XI) remains.

HIGHLIGHTS OF LE MANS

N°1



Six against Caracciola!

1930 was an exciting year at Le Mans. In 1928 and 1929 this famous 24 hour race had been won by the famous Bentleys. Could they, everyone asked, bring it off for the third successive year? The major threat was the amazing Caracciola in his gigantic white Mercedes. Right from the start Caracciola led, closely pursued by his six Bentley opponents. Once Tim Birkin's Bentley took the lead — but not for long. Caracciola soon took over the lead again closely followed by another Bently driven by Sammy Davis. First one Bentley, then another drove the Mercedes relentlessly on until finally at 2.30. on the Sunday morning, after almost 10 hours of continuous driving the great Mercedes broke down under the strain, and Caracciola retired from the race. So it was that the Bentleys brought off their third successive win.

DUNLOP

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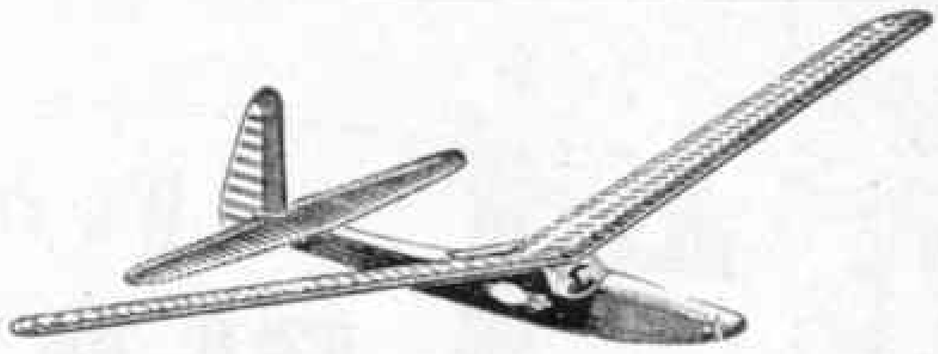

Skysail—36 in. wing span glider for tow launching **6/6**

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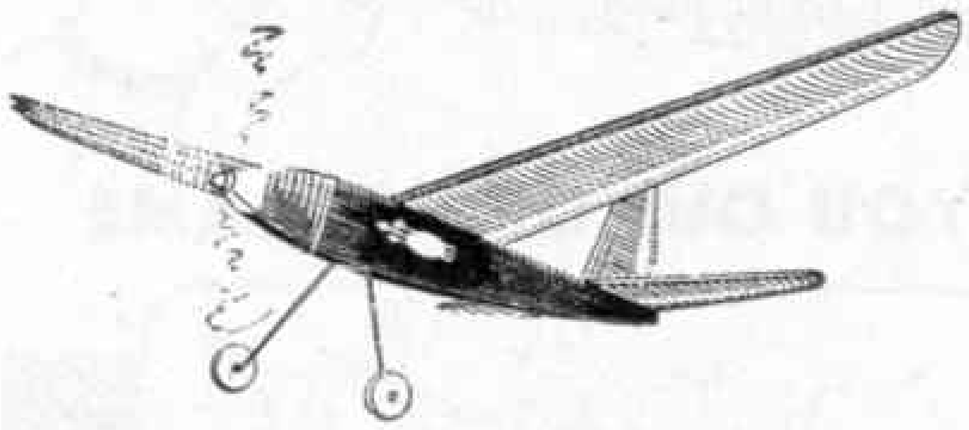
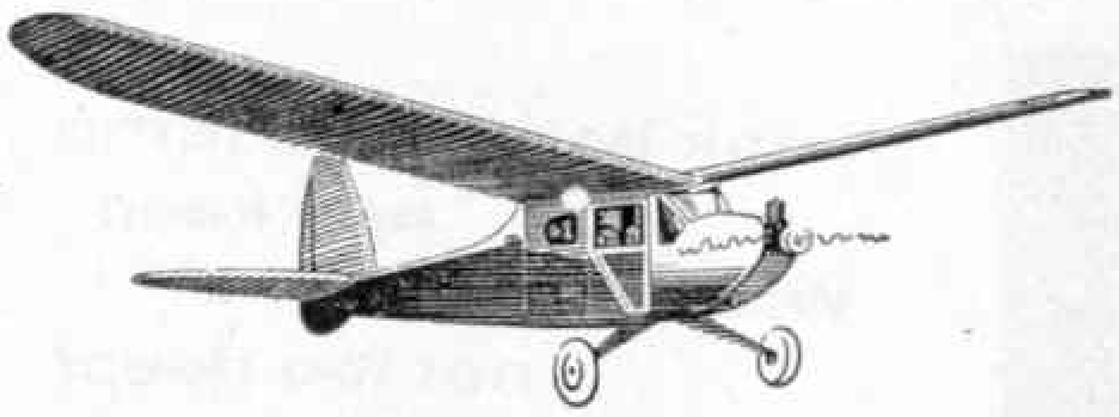


Ascender—30 in. wing span, rubber duration model, many new features **10/11**



Champion—36 in. wing span, free flight power model for ·5, ·75, ·8 and 1 c.c. motors **18/6**

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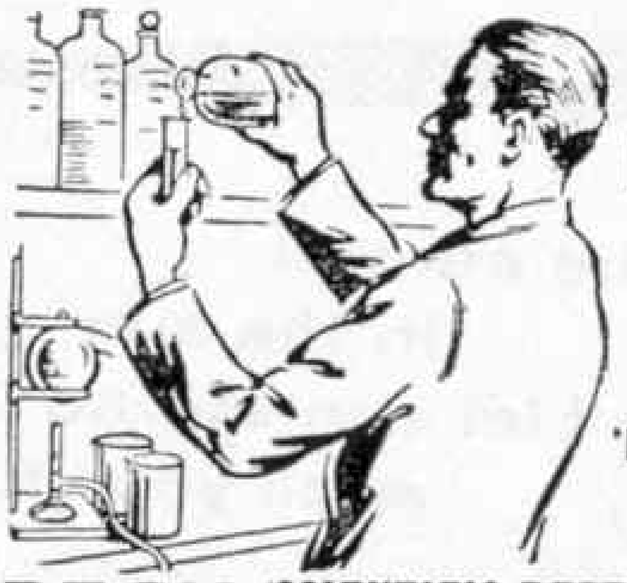

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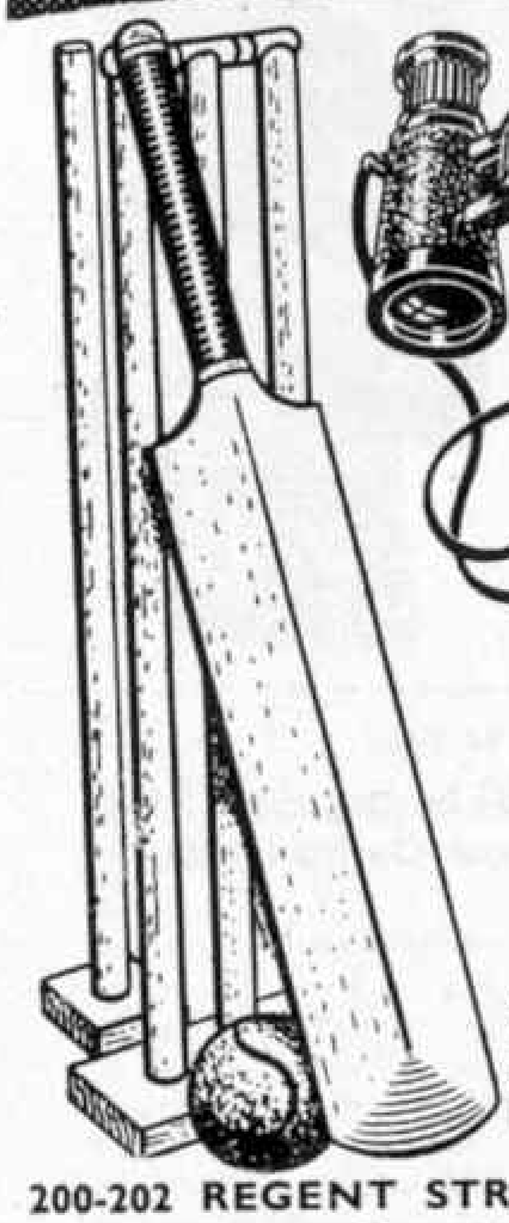

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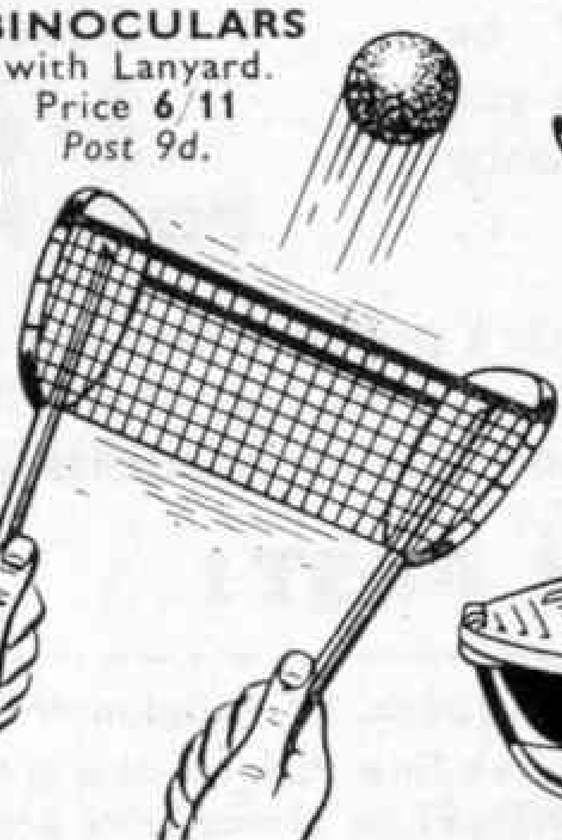

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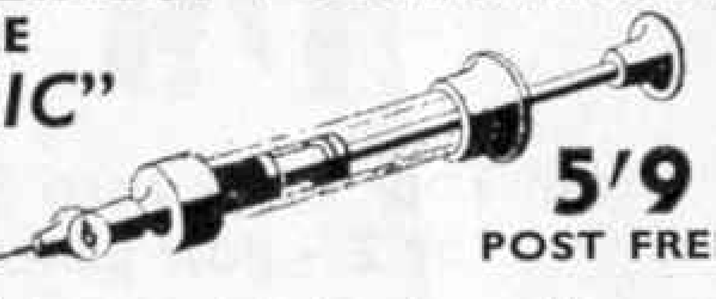

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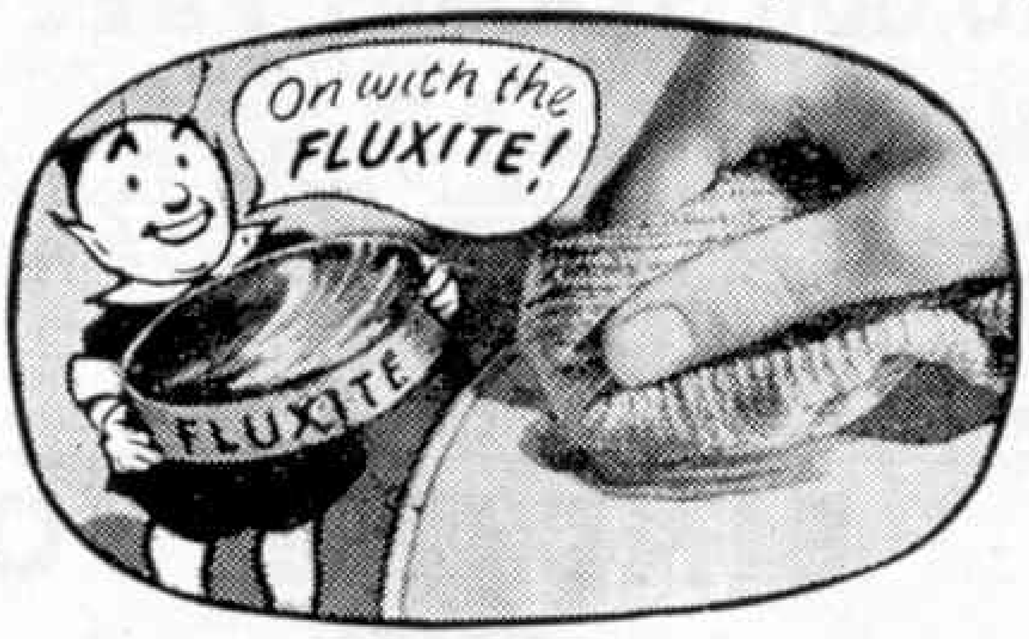

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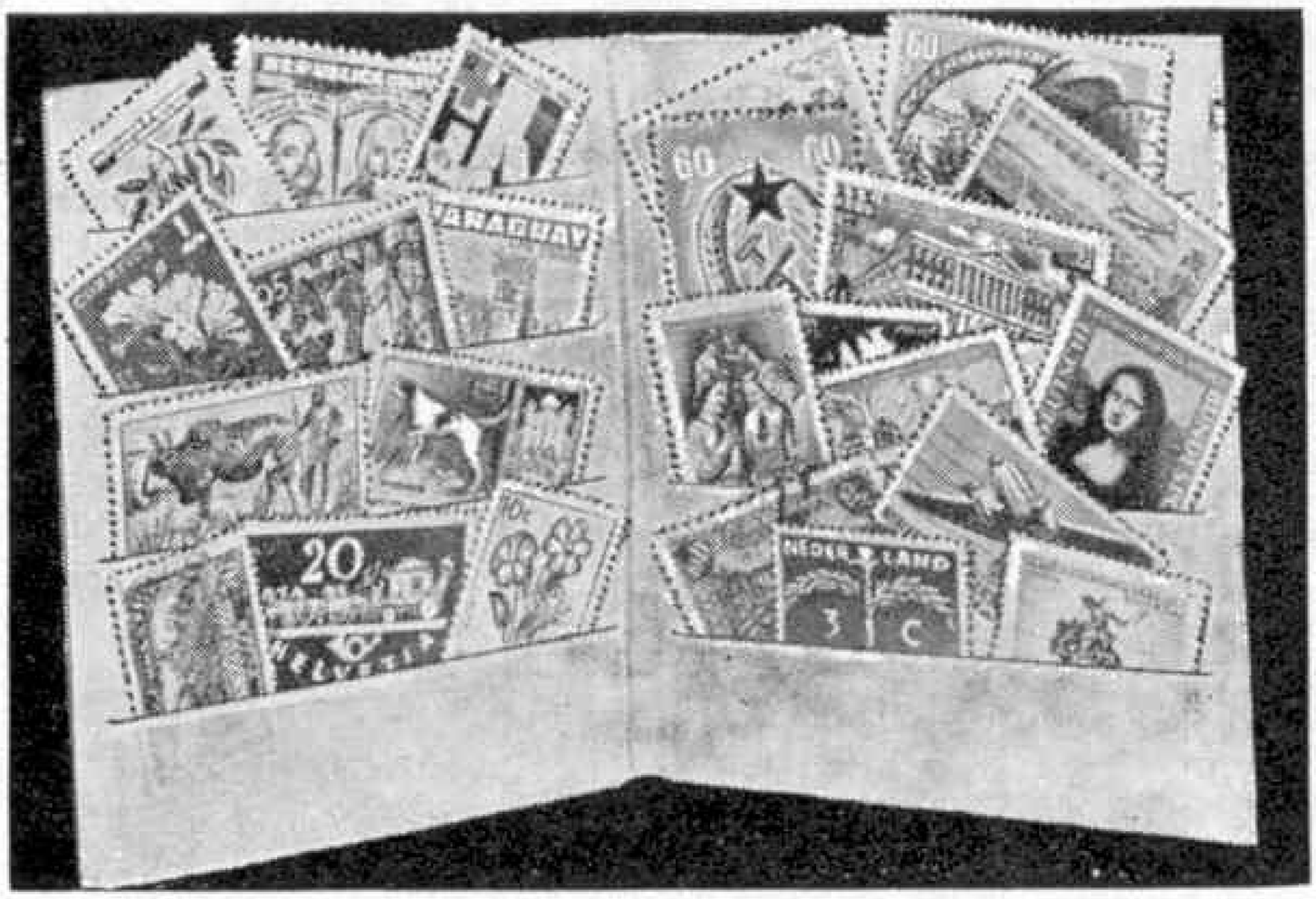

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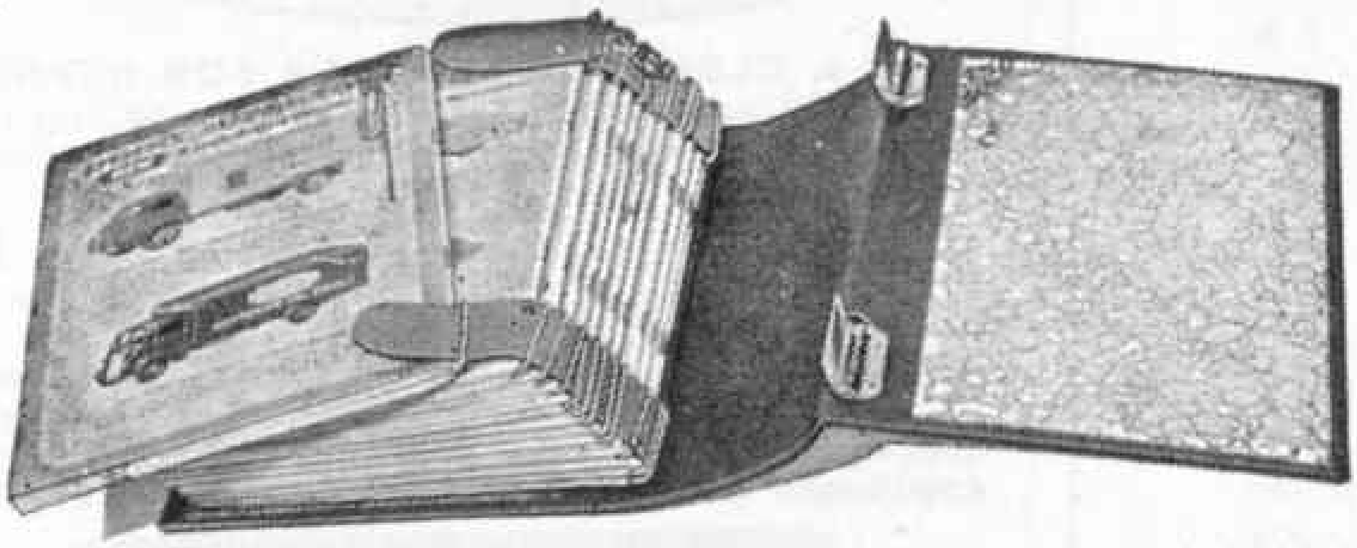

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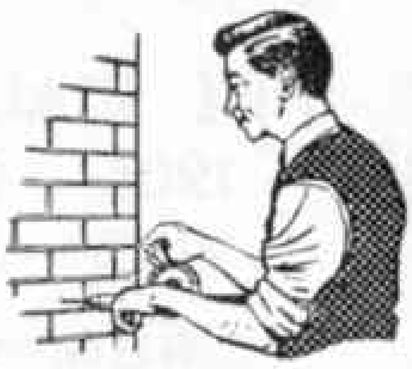

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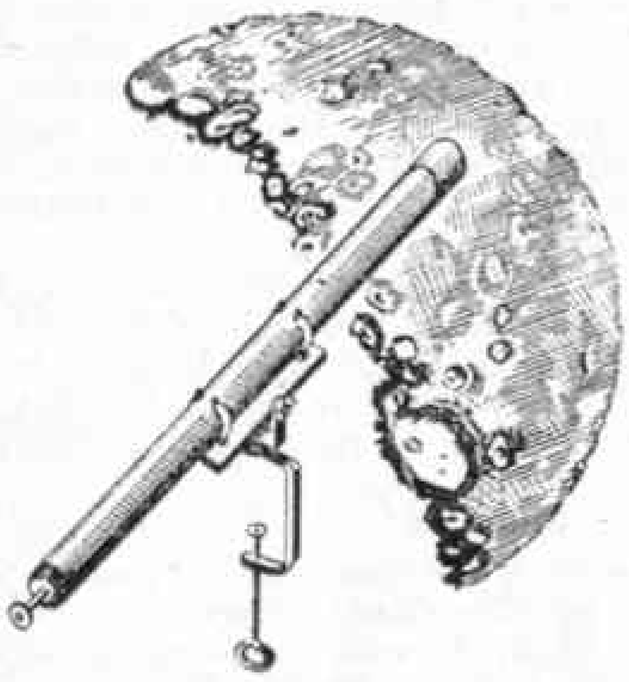

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MODEL OF THE MONTH

TOWER CRANE

Illustrated in the July 1957 issue of the Meccano Magazine

Construction of the Wheeled Base

The main frame of the base consists of four channel girders, two of which are formed by 9½" Angle Girders and 9½" Flat Girders and the other two by 7½" Angle Girders and 7½" Flat Girders. The channel girders are connected by two 1" x 1" Angle Brackets at each corner to form a rectangular base structure, and two 9½" Angle Girders 1 are bolted across the structure, with the joins braced by 1" Corner Brackets.

Two channel girders 2, each made from two 5½" Angle Girders, are fixed between the Girders 1 and these support two 2½" Angle Girders 3. The 1⅛" Flanged Wheels of the base are fixed on 8" Rods mounted in Trunnions as shown, and each Rod carries a 1" Sprocket. The Sprockets are connected by lengths of Chain to ¾" Sprockets on a 3½" Rod carrying a 1½" Contrate 4. The 3½" Rod is supported in Trunnions bolted to the girders 2.

A 1½" Angle Girder is bolted to each of the Girders 1 and supports a 1½" Flat Girder 5. Two 1⅛" Bolts are fixed by nuts in a 7½" Circular Strip, and the Bolts are fixed by further nuts in the Flat Girders 5. The Circular Strip is connected to the 9½" channel girders and to the Girders 1 by four 1" Reversed Angle Brackets.

The base is extended at one end by two 4½" Angle Girders 6, which are braced by 3" Strips connected to the main frame by Angle Brackets.

Details of the Crane Superstructure

The base of the superstructure consists of four channel girders, two of which are 7½" Angle Girders bolted together while the other two are made from 5½" Angle Girders. The channel girders are connected at their ends to make a rectangular structure, and two 5½" Angle Girders 7 are bolted across it. A third 5½" Angle Girder 8 is bolted to Angle Brackets fixed to the 7½" channel girders.

Two 5½" Angle Girders 9 on each side are connected at their upper ends by a 4½" Angle Girder 10. The Girders 9 at the front are connected to the base frame by Angle Brackets, and those at the rear are attached to Fishplates bolted to the Girder 8. The structure is braced by 5½" Strips at the front and the sides.

Two 9½" Angle Girders 11 are bolted together at their upper ends, and they are fixed to the leading one of the Girders 7 so that one clear hole remains between them. Each of the Girders 11 is braced by a 5½" Strip connected to the rear one of the Girders 7 by an Angle Bracket.

A Flanged Disc from a Ball Thrust Race is bolted to the Girders 7, and a Toothed Disc is fixed to the Girders 2 and 3. The sections of the Ball Thrust Race are then assembled, with a 4½" Rod 12 passed through the centre. A Collar is used to hold the components together, and a ½" Pinion on the Rod is arranged to engage the Contrate 4.

Four 1" x ½" Angle Brackets, one of which is seen at 13, are bolted to the base of the superstructure, so that their lugs engage the lower face of the Circular Strip. These Angle Brackets serve to steady the superstructure and relieve the Rod 12 of stresses when the crane is working.

Arrangement of the Drive and the Gear-Box

Two $3\frac{1}{2}$" Strips are bolted across the rear pair of the Girders 9 and an E020(S) Electric Motor is fixed to them. The gear-box housing consists of two $2\frac{1}{2}$" x $1\frac{1}{2}$" Flanged Plates connected at each end by two $1\frac{1}{2}$" Strips, with further $1\frac{1}{2}$" Strips covering the slotted holes in the flanges of the Plates. One end of the gear-box is supported by two $1\frac{1}{2}$" Strips bolted to one of the Girders 10, and the other end is supported by two 1" x 1" Angle Brackets attached to the second one of the Girders 10 and to two $3\frac{1}{2}$" Strips bolted between the Girders.

The Motor pulley is connected by a Driving Band to a 2" Pulley on a $3\frac{1}{2}$" Rod, which carries also two Worm Gears 14 and a 1" Gear 15. The Rod is mounted in the centre holes in the flanges of one of the Flanged Plates, and Gear 15 drives another 1" Gear on a 3" Rod mounted similarly in the second Flanged Plate. The 3" Rod carries two Worm Gears 16. The drive to each of the output shafts is engaged by sliding the shaft so that a $\frac{1}{2}$" diameter, $\frac{1}{2}$" face Pinion on it engages one of the Worm Gears. When the Pinion engages one of the Worms 14 forward drive is obtained, and by moving the Pinion into mesh with one of the Worms 16 the direction of the drive is reversed. A neutral position is provided when the Pinion is located centrally between the Worms 14 and 16.

The sliding movement of each of the gear-box output shafts is controlled by a lever formed by a $2\frac{1}{2}$" Strip. A bolt fixed in the Strip by a nut has its head located between two Collars on the corresponding output shaft. The two inner levers are lock-nutted to the lugs of a Double Bracket bolted to a $3\frac{1}{2}$" Flat Girder fixed to the Girders 10, and each outer lever is lock-nutted to an Angle Bracket attached to the Flat Girder. The lock-nutting must be carried out tightly, to prevent the levers from moving too easily. It should be noted that the standard Grub Screws of the Pinions and the Collars used in the gear-box should be replaced by 7/64" Grub Screws.

The drive to the travelling movement is taken from the output shaft 17, which is a 4" Rod that carries a $\frac{1}{2}$" diameter, $\frac{3}{4}$" face Pinion. The Pinion engages a $1\frac{1}{2}$" Contrate 18 on a vertical 4" Rod mounted in a $2\frac{1}{2}$" Strip attached to 1" Triangular Plates bolted to the Girders 10. The vertical Rod is connected to the upper end of Rod 12 by a Coupling.

The drive to the slewing motion is taken from 4" Rod 19, which carries a $\frac{1}{2}$" diameter, $\frac{1}{2}$" face Pinion that meshes with a $\frac{1}{2}$" Pinion on a 3" Rod 20. Rod 20 is supported in the gear-box frame and in a 1" x 1" Angle Bracket bolted to one of the Girders 10. A Worm Gear on Rod 20 drives a 50-tooth Gear on a vertical 8" Rod fitted at its lower end with a $\frac{3}{4}$" Sprocket. The 8" Rod is mounted in one of the channel girders of the superstructure and in a 1" Triangular Plate attached to one of the Girders 10 by two Angle Brackets. The $\frac{3}{4}$" Sprocket is connected by Chain to the Toothed Disc of the Ball Thrust Race, and Collars are used to hold the 8" Rod in position.

The winding drum is formed by two 1" Pulleys on a 4" Rod 21. A $2\frac{1}{2}$" Driving Band is placed round one of the Pulleys, and a Collar 22 presses against the Driving Band to form a brake when the Rod 21 is in its neutral position. Collar 22 is fixed on a 2" Rod held in a Coupling 23, which pivots on a $1\frac{1}{8}$" Bolt supported in Angle Brackets bolted to one of the Girders 10, and held in one of the Angle Brackets by a nut. A Driving Band is passed round Coupling 23 and is stretched slightly and is attached to the superstructure. The Driving Band forces the Collar 22 against the Driving Band round the 1" Pulley, but movement of Rod 21 in either direction slides the Pulley clear of the Collar and releases the brake.

Traversing the trolley along the jib is operated by a 5" Rod 24, fitted with a $\frac{1}{2}$" diameter, $\frac{1}{2}$" face Pinion 25.

A cover over the gear-box is provided by two $3\frac{1}{2}$" Angle Girders connected by six $3\frac{1}{2}$" Strips, with two $1\frac{1}{2}$" Strips arranged to leave a gap for the hoisting Cord. One side of the cover is a $3\frac{1}{2}$" x $2\frac{1}{2}$" Flexible

Plate edged by two vertical 3" Strips, and the other side consists of two 3" Strips and a $2\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plate. The lower ends of the 3" Strips are bolted to the Girders 10.

Construction of the Tower

The lower section of the tower consists of two $12\frac{1}{2}$" Strips 26 and two $7\frac{1}{2}$" Strips 27, connected by 2" Strips and $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips. A made-up strip 28, formed by a $4\frac{1}{2}$" Strip and a 2" Slotted Strip, is fixed in position. The tower is extended upward by two further sections, each of which is formed by four $12\frac{1}{2}$" Strips connected by 2" Strips and $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips. At the top, four $4\frac{1}{2}$" Strips are bolted in place and their upper ends are connected by $1\frac{1}{2}$" Strips and $1\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips. The sides of the tower are braced by 3" Strips as shown, and the front and the back are braced by made-up strips bolted to the Double Angle Strips. Each of the made-up strips consists of a $5\frac{1}{2}$" and a $2\frac{1}{2}$" Strip overlapped three holes.

The tower pivots on a $3\frac{1}{2}$" Rod held by Collars in a $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip bolted to the front of the superstructure. In its vertical position, the tower is fixed by bolts passed through the strips 28 into Angle Brackets bolted to the front pair of Girders 9.

A Channel Bearing 29 is bolted to one of the Strips 27 of the tower, and a $1\frac{1}{2}$" Rod is mounted in the Channel Bearing. The Rod carries a 1" Pulley 30, and a $1\frac{1}{2}$" Contrate 31 that meshes with the Pinion 25 when the tower is fixed in its vertical position.

Details of the Jib and its Trolley

The lower members of the jib are two $18\frac{1}{2}$" Angle Girders connected at their ends by $2\frac{1}{2}$" Strips. A $12\frac{1}{2}$" Strip and a $5\frac{1}{2}$" Strip are bolted to each Girder, and are connected by a 1" Triangular Plate. The bolt joining the Triangular Plate to the $12\frac{1}{2}$" Strip is lock-nutted, and supports also a $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip 32. Bracing Strips are added as shown in Fig. 4.

The jib pivots on a $3\frac{1}{2}$" Rod 33 held by Collars in a $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip bolted to the tower. In its working position, the jib is supported horizontally by an 8" Rod fixed in a Coupling, which is carried by two 1" Rods mounted in the lugs of a $1\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip bolted to the top of the tower. The 8" Rod is passed through Double Angle Strip 32 and is then fitted with a Collar.

The trolley consists of two $3\frac{1}{2}$" Strips connected by two Double Brackets. The wheels are $\frac{3}{4}$" Flanged Wheels on 2" Rods, each of which carries also a 1" loose Pulley 34.

The pulley block is formed by two Flat Trunnions connected by nuts on $\frac{1}{2}$" Bolts. A 1" loose Pulley 35 is mounted on one of the Bolts, and the other supports a small Loaded Hook.

Arrangement of the Cords

A length of Cord is tied to the inner end of the trolley, is taken over Rod 33 and is passed down inside the tower. The Cord passes under a $3\frac{1}{2}$" Rod 36, is wrapped twice round Pulley 30, then is passed under Rod 36 again and is led up the tower. The Cord is taken over Rod 33, round a $3\frac{1}{2}$" Rod 37 at the end of the jib, then is tied to a Driving Band looped round the leading axle of the trolley. The Driving Band is stretched slightly to tension the Cord.

The hoisting Cord is tied to its drum, is passed through the gear-box

cover and over a 1" loose Pulley on a 3½" Rod 38, mounted in a 2½" x 1" Double Angle Strip bolted to the tower. The Cord is passed over one of the Pulleys 34, round Pulley 35 and over the second one of the Pulleys 34, then is looped over a small Loaded Hook bolted to the outer end of the jib.

Erecting the Crane

In its dismantled position, the bolts fixing the tower to the Girders 9 are removed, and the tower and the jib are arranged almost horizontally along the ground. The 8" Rod slides through the Double Angle Strip 32 to allow the jib to pivot on its supporting Rod. To erect the crane, the erection mast 39 is first placed in position, as shown in Fig. 1. The mast consists of two 9½" Strips connected by a Single Bent Strip, and it pivots on a 1½" Rod held by Collars in the Girders 11. Two 1" loose Pulleys are held by Collars on a 1½" Rod passed through the top of the mast. Cord is passed through the mast and is fastened at each end to the Girders 6.

When the crane is dismantled the hoisting Cord is removed from its Pulleys and is fully wound on the drum. With the erection mast in place, the drum is allowed to unwind and the Cord is passed round the Pulleys of the mast and those on the Rod 38. Finally one end of the Cord is secured to the tower. By winding in the Cord, the tower is gradually pulled into its working position, and at the same time the jib resumes its normal angle. The tower is then bolted in place and the hoisting Cord can be rearranged to operate the pulley block in the normal way. When the crane is working, the erection mast is tied to the tower in a vertical position.

PARTS REQUIRED FOR TOWER CRANE

No. of Part	Qty.	No. of Part	Qty.	No. of Part	Qty.
1	12	16B	2	63	3
1A	2	17	1	77	5
2	28	18A	5	94	40"
2A	4	20	4	96	2
3	14	20B	4	96A	3
4	27	20A	1	102	1
5	30	22	3	103A	2
6	18	22A	7	103D	1
6A	14	26	2	103H	2
7A	2	26A	6	103K	2
8A	8	26B	1	111A	2
8B	8	27	1	111C	6
9	14	28	3	111D	3
9A	4	31	2	124	6
9B	2	32	5	126	6
9D	2	35	5	126A	2
9F	2	37A	420	133A	4
10	3	37B	408	145	1
11	3	38	76	160	1
12	14	40	1	168	1
12A	11	46	1		
12B	4	48	3	186	2
13A	5	48A	15	186B	1
15	1	51	2	188	1
15B	3	55A	2	190A	1
16	7	57C	2	1 E020(S) Electric Motor.	
16A	1	59	24		