VOL. XLIII. No. 1

JANUARY 1958

MECCANO MAGAZINE

STATUE OF LIBERTY

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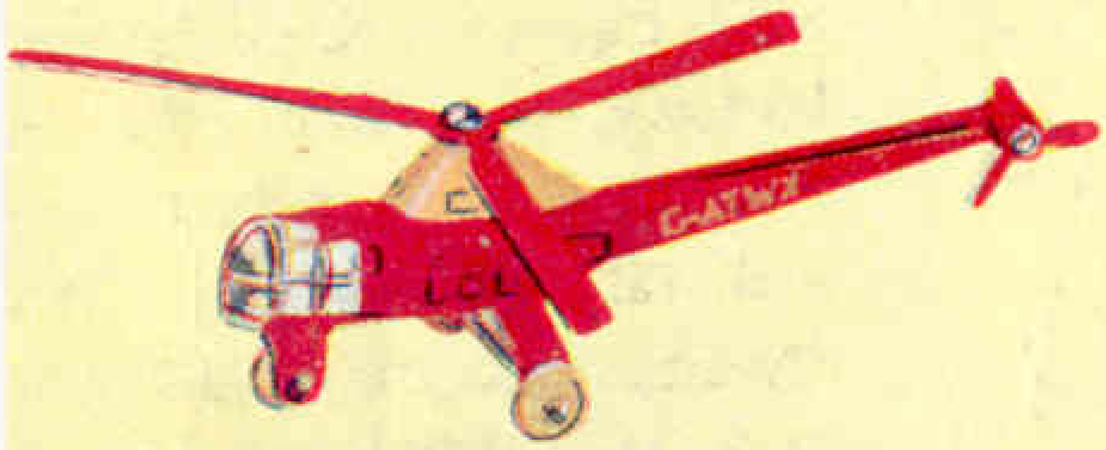

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Jaguar Type D Racing Car
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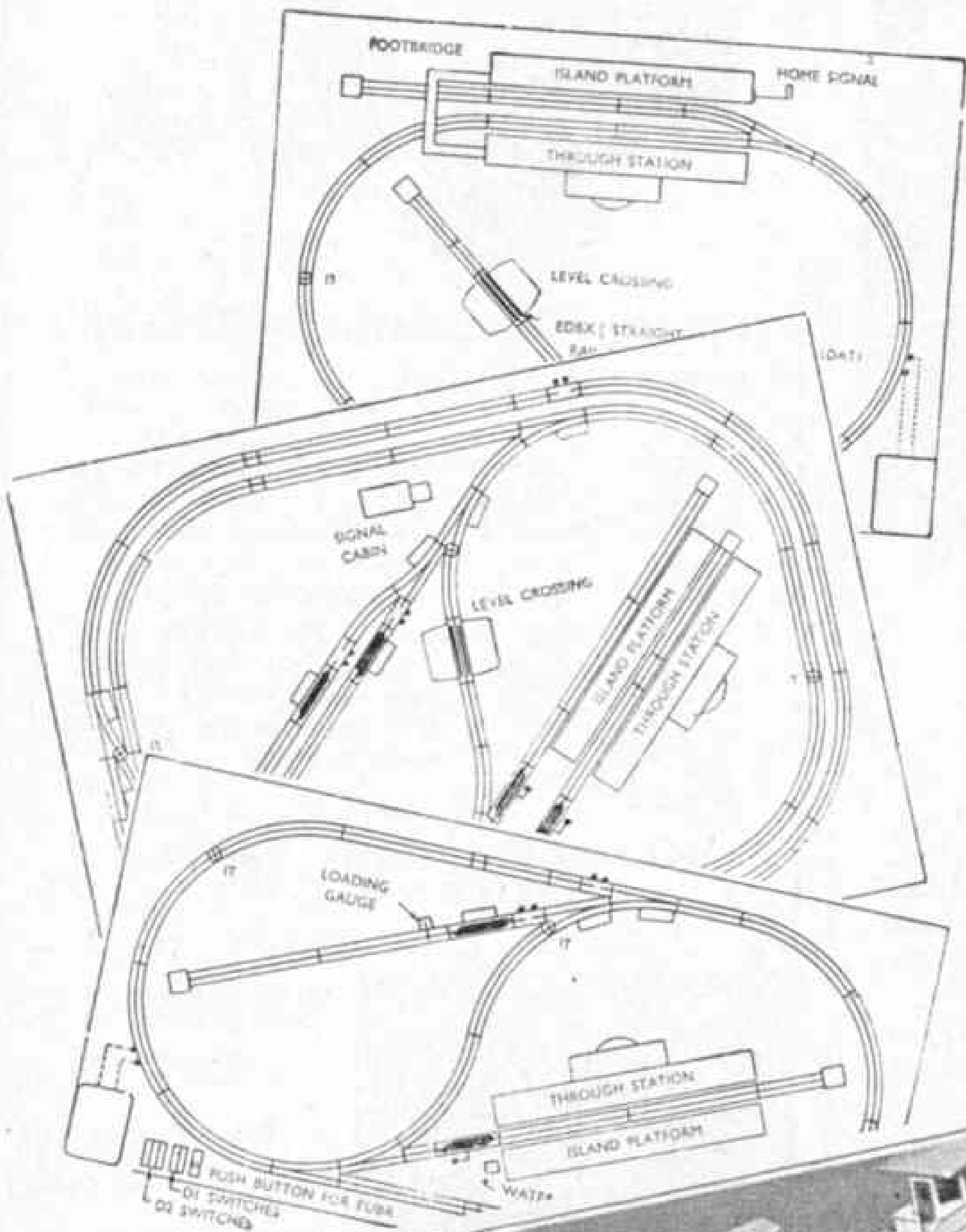

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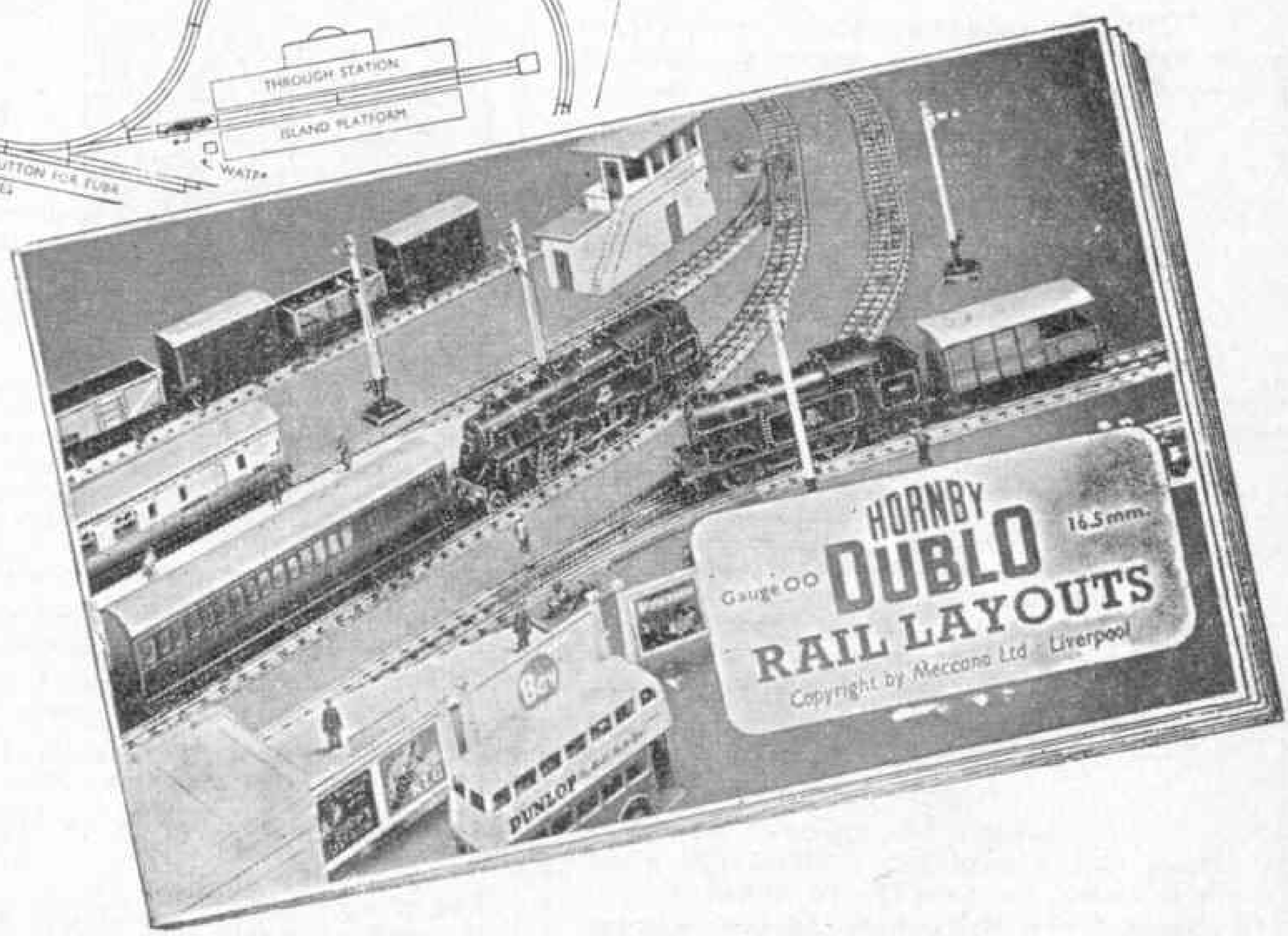

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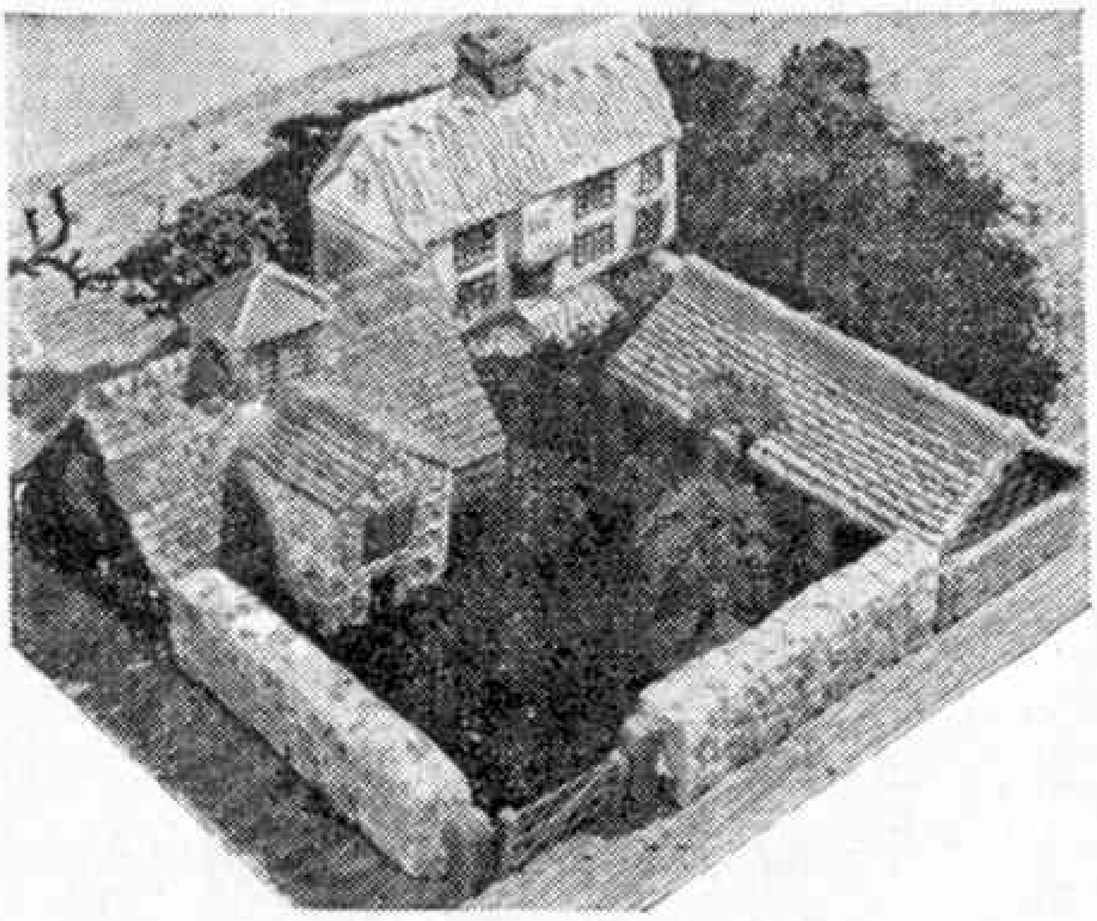

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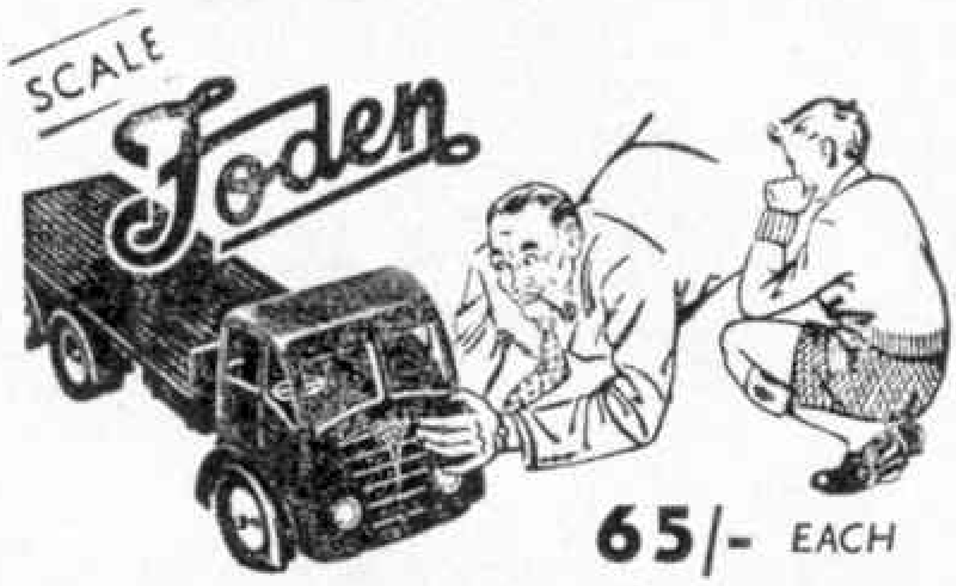

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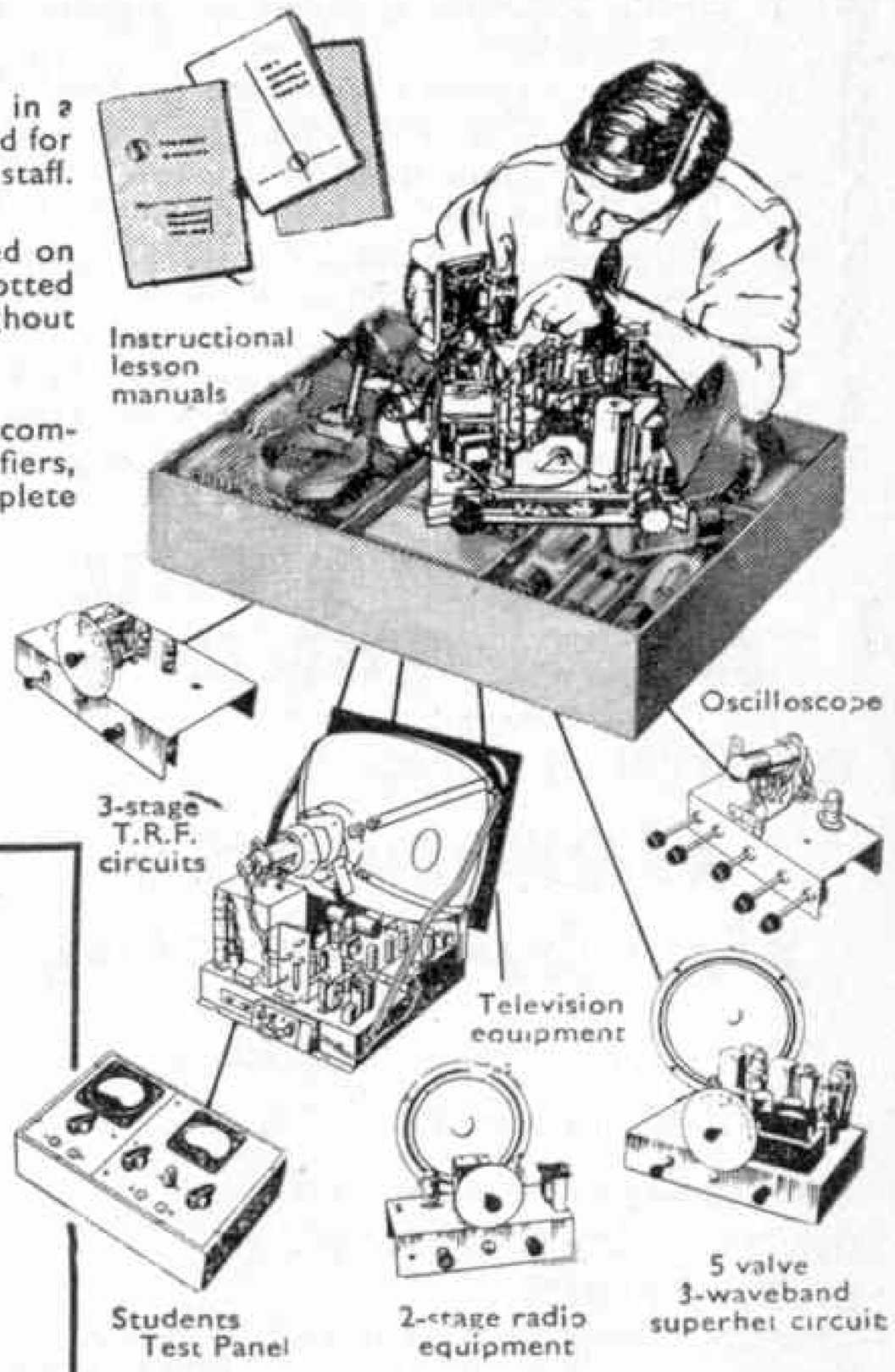

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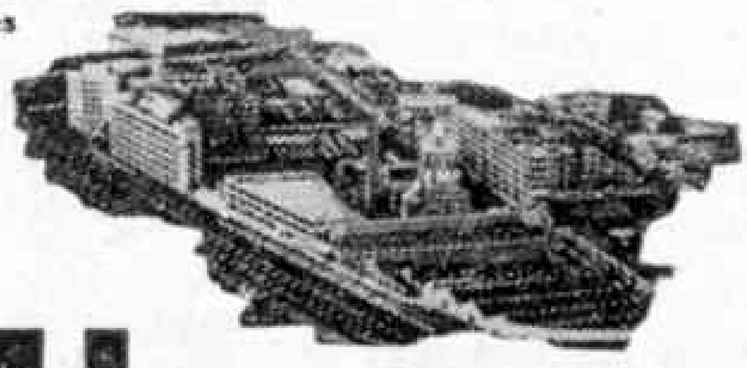

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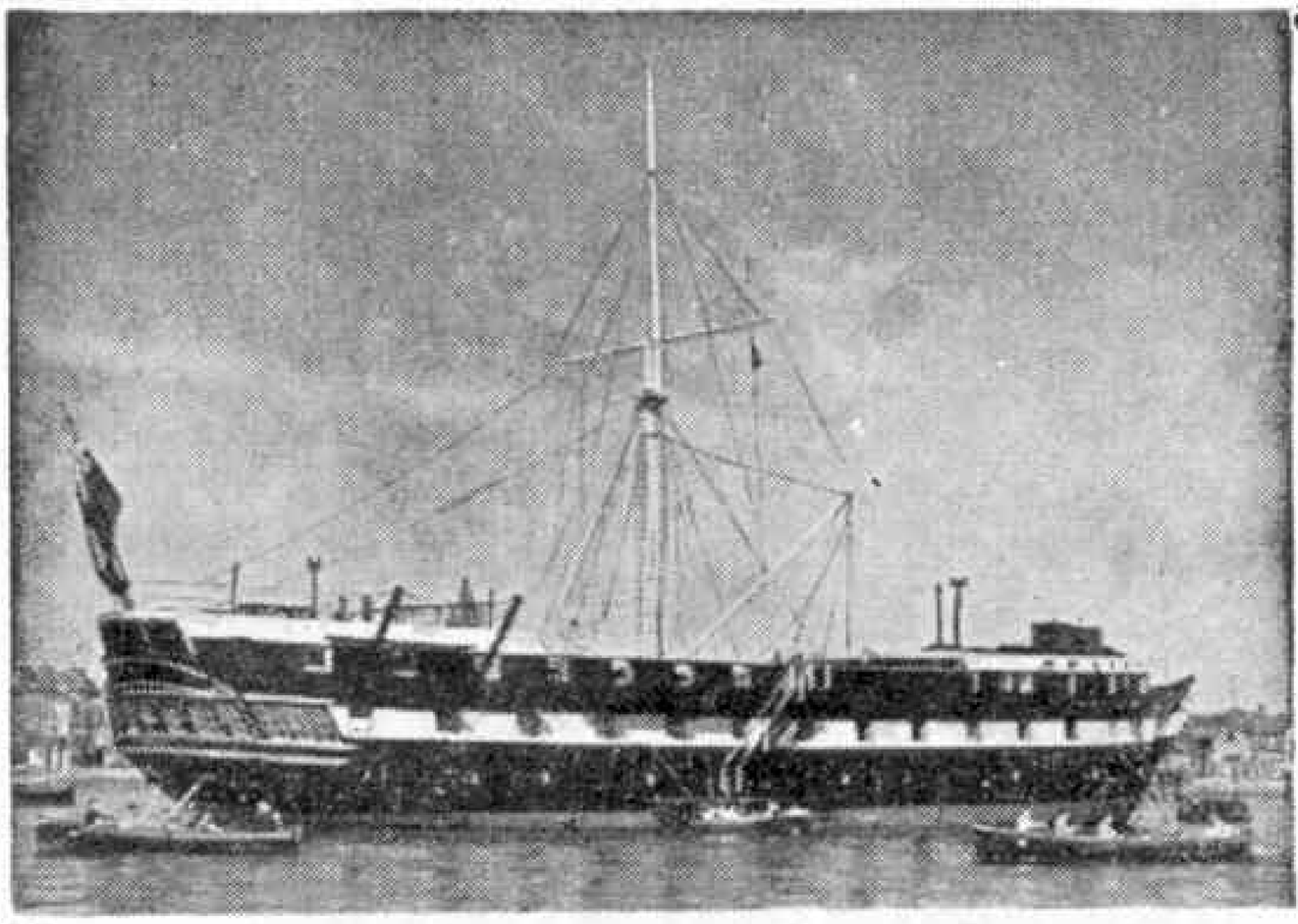

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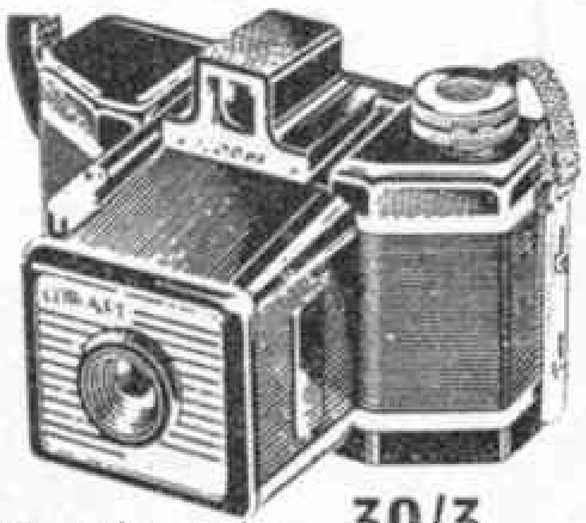

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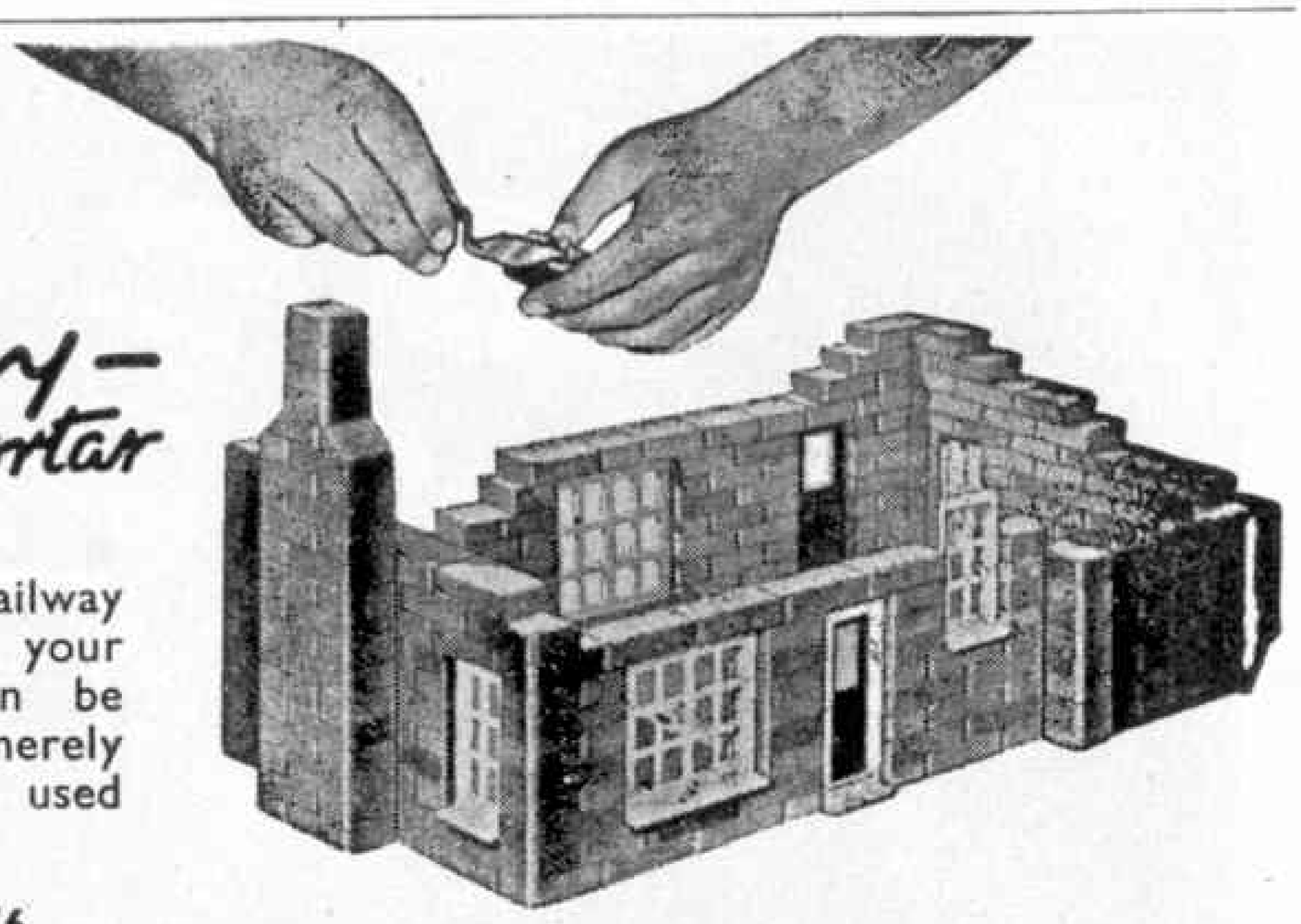

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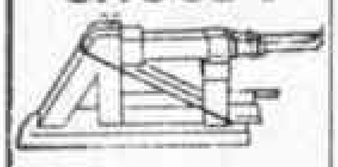

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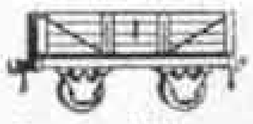

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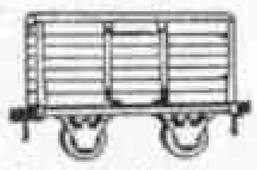

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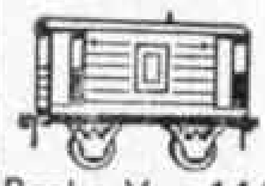

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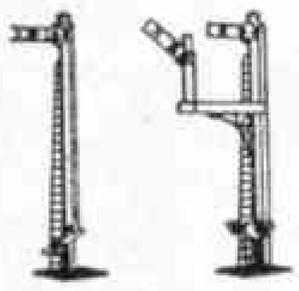

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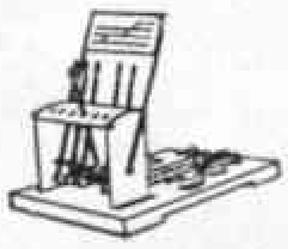

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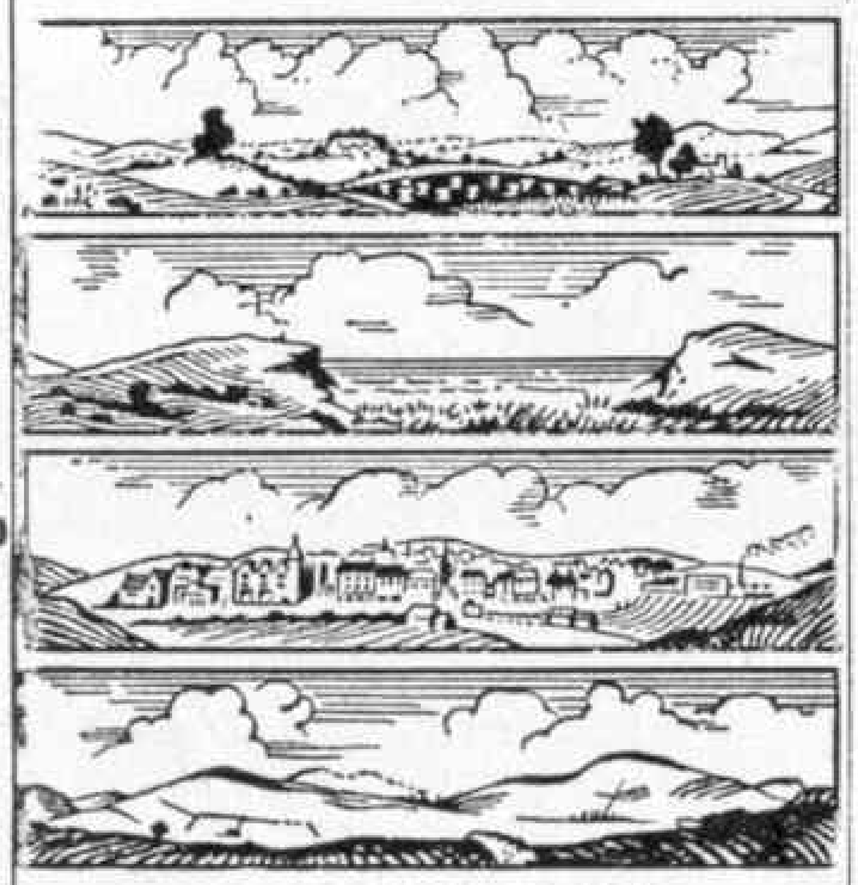

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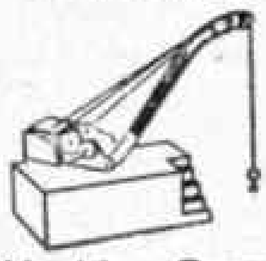

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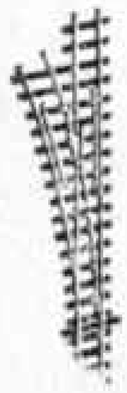

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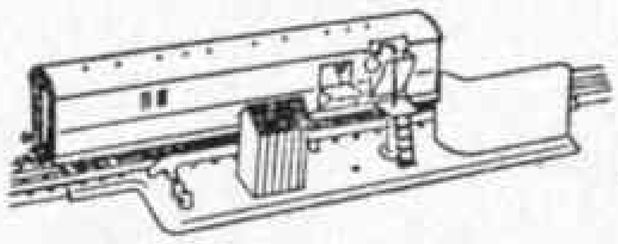

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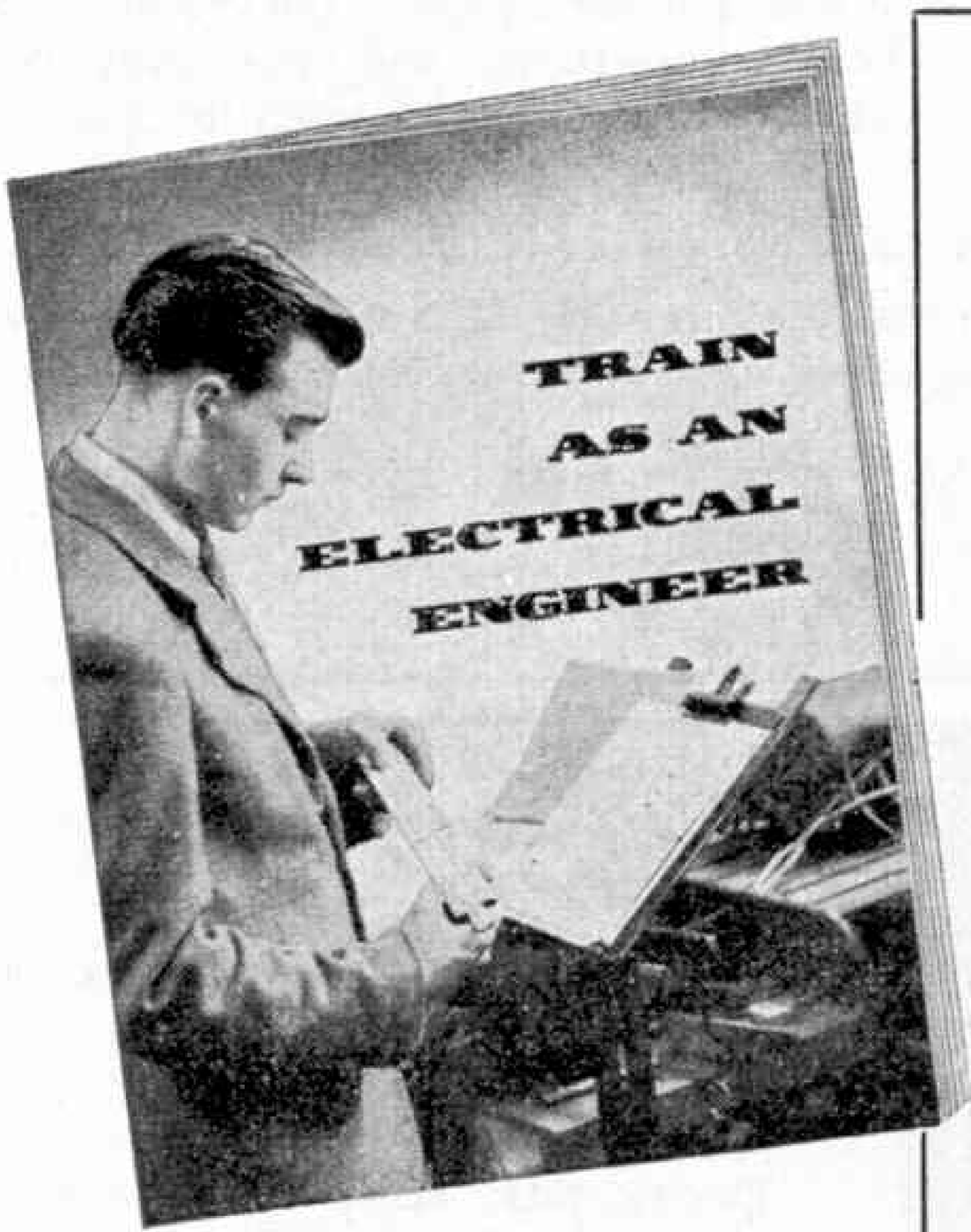

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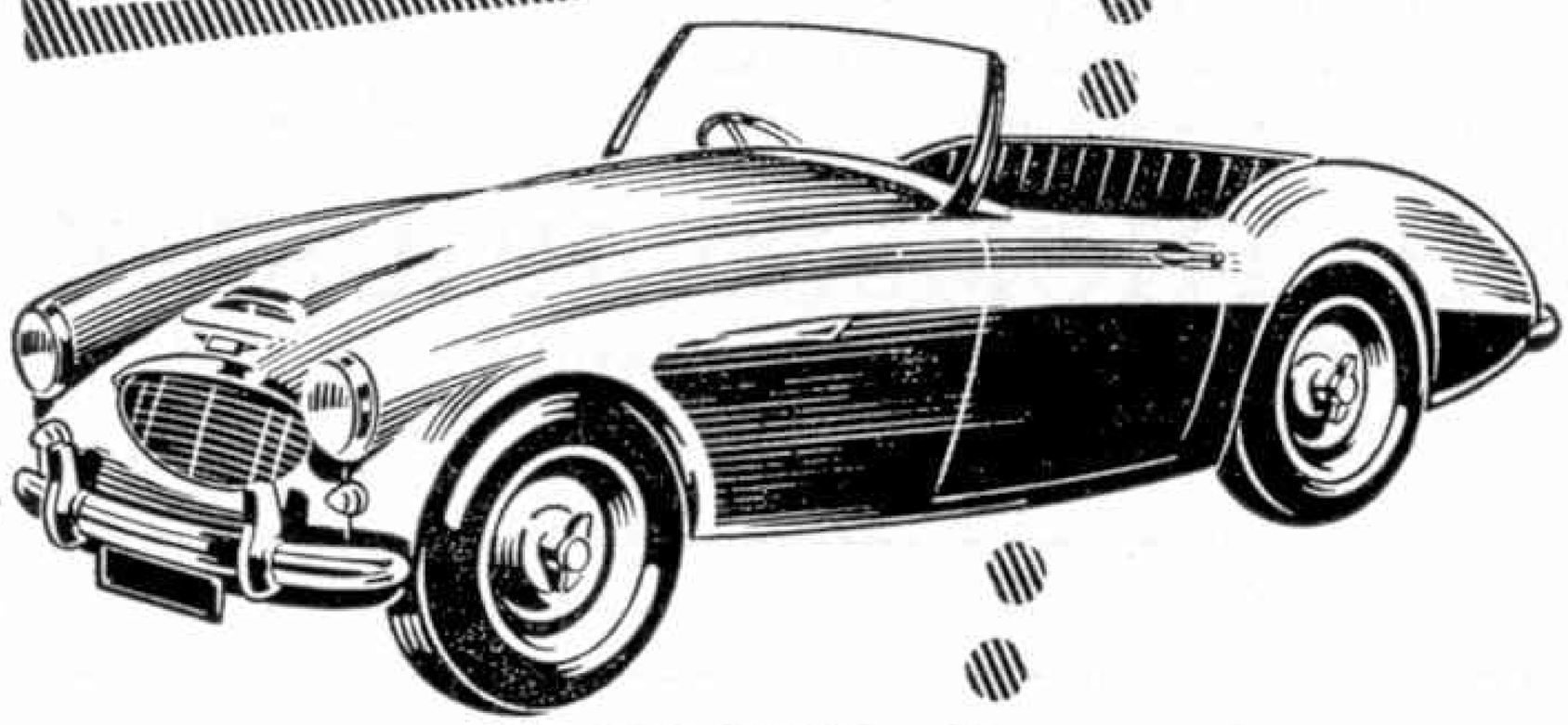

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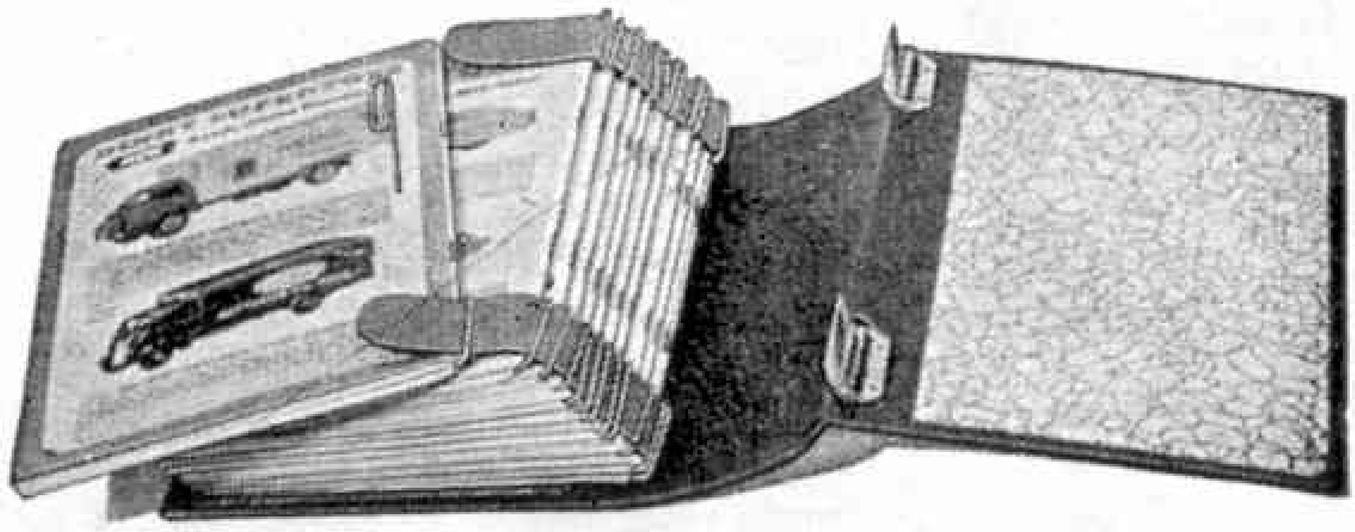

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No. 5a " " 5 " " 6 ..	**18/–**
No. 6a " " 6 " " 7 ..	**1/17/6**
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MECCANO MAGAZINE

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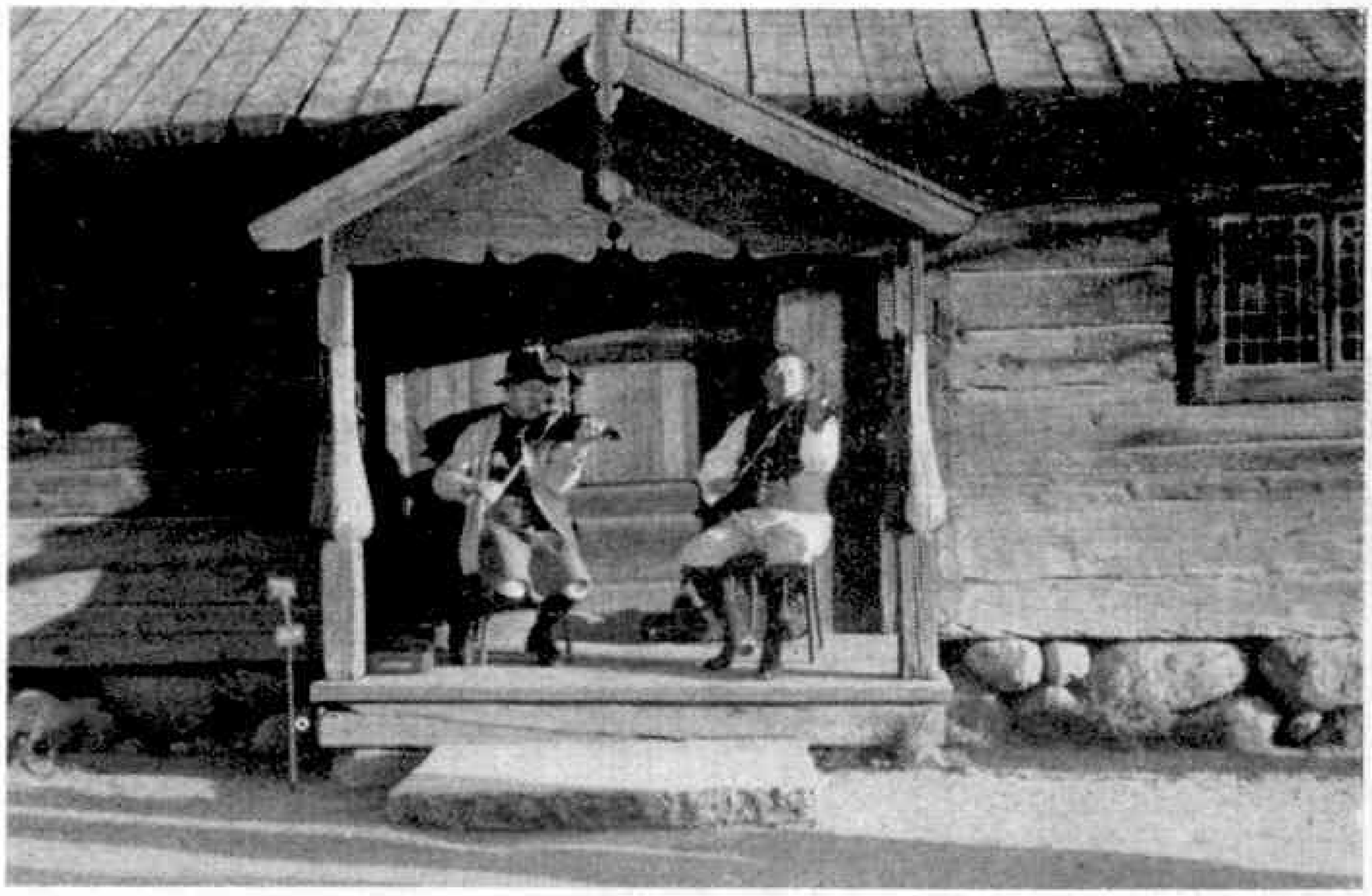
Aiming High!

Is there any new way of wishing people a Happy New Year? This is very unlikely, but on the other hand, does it matter how we wish them a Happy New Year, so long as we do it sincerely? So, I send to every reader of the Magazine my very heartiest good wishes for 1958. I hope that for everyone of you it may be a period of sound prosperity and progress, and that when in December next you look back upon the events of the year you will have a feeling of satisfaction with what you have accomplished.

Whether you will be able to do this or not depends entirely upon yourselves. I want to do so as far as the Magazine is concerned, and to find next December that during 1958 the *M.M.* has made great strides, that it has gained more readers, and that more of those who take it regularly have written to tell me that it is of increasing interest and value to them.

Now let us look into this issue. Apart from this page, it begins with the Statue of Liberty, in New York Harbour, a picture of which you will have seen on the cover as soon as the issue reached you. For the rest, there is a variety of general articles, which among other things deal with tunnelling, flying through the air and penetrating into space.

Before the aeroplane was invented we used the word "world-wide" when we wanted to describe something that affected us all. Now that we can climb many thousands of feet into the sky, and are diligently searching for ways and means of travelling at least as far as the Moon, we shall soon want a new adjective, world-deep perhaps or solar system-wide, for events of the kind dealt with on page 8 of this issue. If this new feature appeals to you, let me know, so that I can decide whether to include it as a regular feature. In this Geophysical Year, and afterwards, there will certainly be many exciting efforts of this kind to record.



Fiddlers in costume provide an interesting picture in one of Sweden's open-air museums, that at Skansen, Stockholm, which is described in the article beginning on page 22.

The Editor

Statue of Liberty

By the Editor

OUR cover this month shows the Statue of Liberty, in New York Harbour. This is perhaps the best known statue in existence. For more than 70 years it has been a symbol of hope for millions who have entered the United States as immigrants in search of a new life of peace and freedom.

The idea behind the creation of this magnificent work represents far more than that, however. It was originally named *Liberty Enlightening the World*, so on its pedestal on Bedloes Island the Statue appears to be not only a message of hope to all entering the United States, but an example to the whole world, bidding us value liberty, and do all that we can to ensure freedom everywhere.

The uplifted torch not only lightens the way of those arriving in the New World, but also that of all who leave it, wherever they may be bound. And in the picture of the Statue at the head of the page there is evidence of the ceaseless passage across the seas between the two worlds in the appearance of the *Queen Mary*, one of the two giant Cunarders that with the *United States* and other liners and cargo vessels maintain continuous communication between all the countries of the free world.

A statue to command New York Harbour must be enormous, and this can truly be said of the Statue of Liberty, for it carries its torch to a height of 305 ft. above the sea. Most of us know something of its story. It was the work of Frederick Auguste Bartholdi, a famous French sculptor, and was accepted by the people of the United States as a symbol of friendship when it was formally dedicated by Grover Cleveland, then President of the United States, on 28th October, 1886.

In the torch a powerful electric light is kept on from dusk to dawn. A glance at the cover, or at the picture on this page, will show just where the "flame" of the torch appears, but some of you may not realise that this, the highest point of the Statue, is just above a gallery to which visitors can climb and from which they have a marvellous view of the Hudson River front of New York and of great stretches of land and sea.

If you have never actually seen the Statue, you can get some idea of its dominance by remembering that if you could place it in Parliament Square it would rival the clock tower of the Houses of Parliament in height.

Some Odd Railway Souvenirs

By

Arthur Gaunt

A bust of George Stephenson over a railway coat-of-arms. It can be seen at the entrance to Boston Park, Rotherham.

TO the model railway enthusiast, as well as to the student of railroad history, souvenirs of railway developments down the years are always of interest. Some mementoes of this kind, however, are easily overlooked, for they are in unexpected places.

Hidden away in a now disused burial ground of Cheapside, Bradford, for instance, stands a memorial column connected with the early days of the Midland Railway. It was erected nearly 100 years ago as a mark of respect to Edward Charlton, locomotive manager at what is now Forster Square Station, Bradford, and was paid for by workmen whom he supervised.

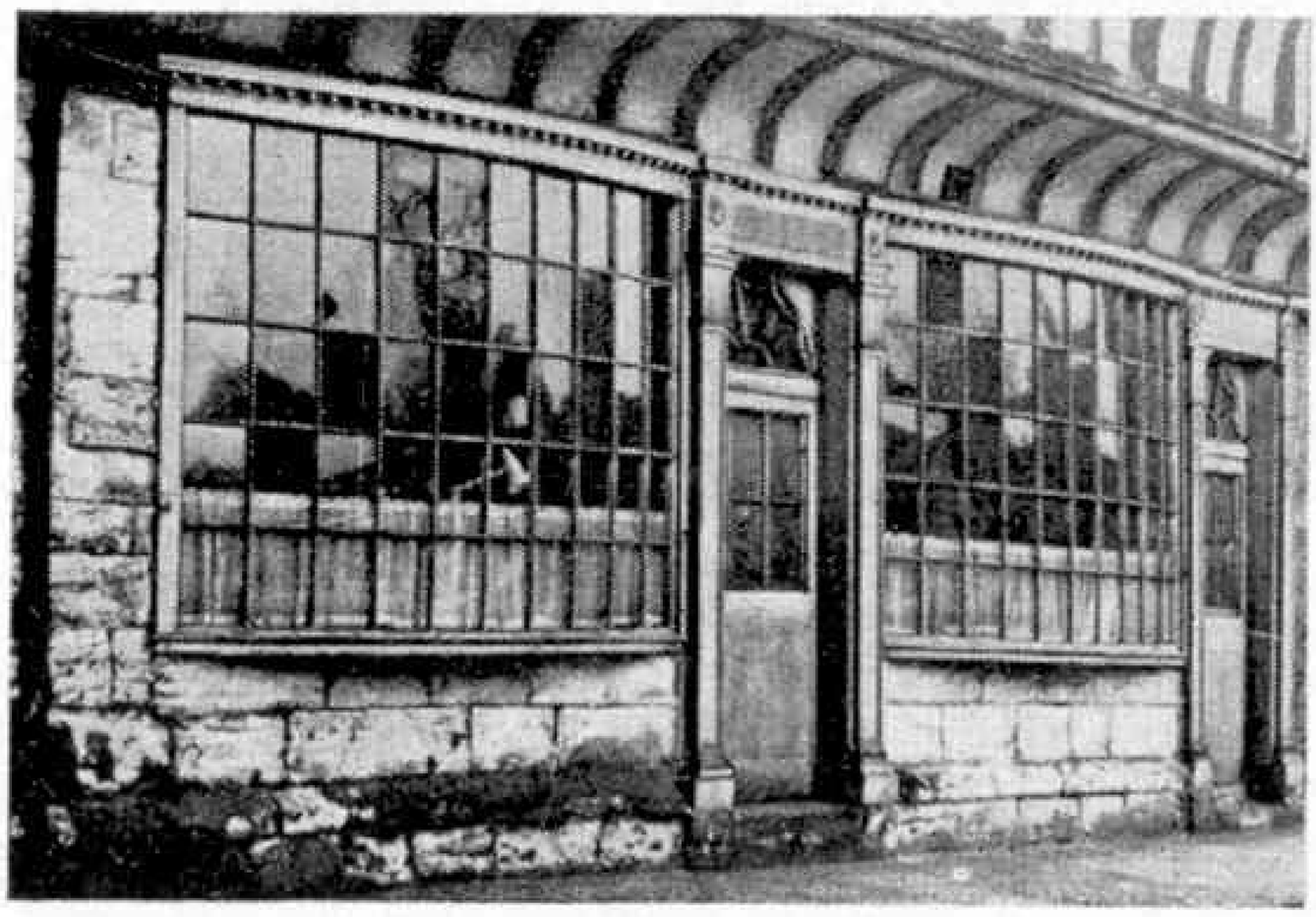
The most interesting feature of the monument is a representation of a locomotive carved on it. This shows the type of locomotive in general use a century ago, with large driving wheels, a tall chimney and little protection for the driver.

It was a Bradford-born man, too, who gave Berry Brow Station, on the Huddersfield - Penistone line, several entertaining sculptures, including two miniature trains carved in solid rock. These carvings overlook the station platform, and though they have weathered somewhat since they were executed 70 years ago, they still reveal the sculptor's skill.

In point of fact, their creator was only 18 years old when he carved them. They were the work of John Charles Stocks, a Yorkshire youth who went to India to restore some of the buildings there. But ill health forced him to return, and he became a woolsorter at Bradford, exercising his skill at stone carving chiefly as a hobby.

In addition to the miniature trains, Stocks also carved at Berry Brow lifelike busts of Queen Victoria, Milton, and Shakespeare. A fourth head in this illustrious company represents a permanent way inspector of 1886!

Otley, the Wharfedale market town, has a souvenir of the building of Bramhope Tunnel, on the Leeds-Thirsk line, in 1845–1849. The job was a difficult engineering feat, requiring hundreds of navvies, and several were killed in mishaps before the tunnel was



The shop in College Street, York, where George Hudson, the "Railway King," is believed to have been a draper's apprentice.

This monument at Otley is in memory of navvies killed during the construction of Bramhope Tunnel, on the Leeds and Harrogate line. It is a model of one of the tunnel entrances.

completed. A monument to them stands in Otley parish churchyard, erected by the contractors, and it is a reminder that our extensive railway system was not built without considerable loss of life.

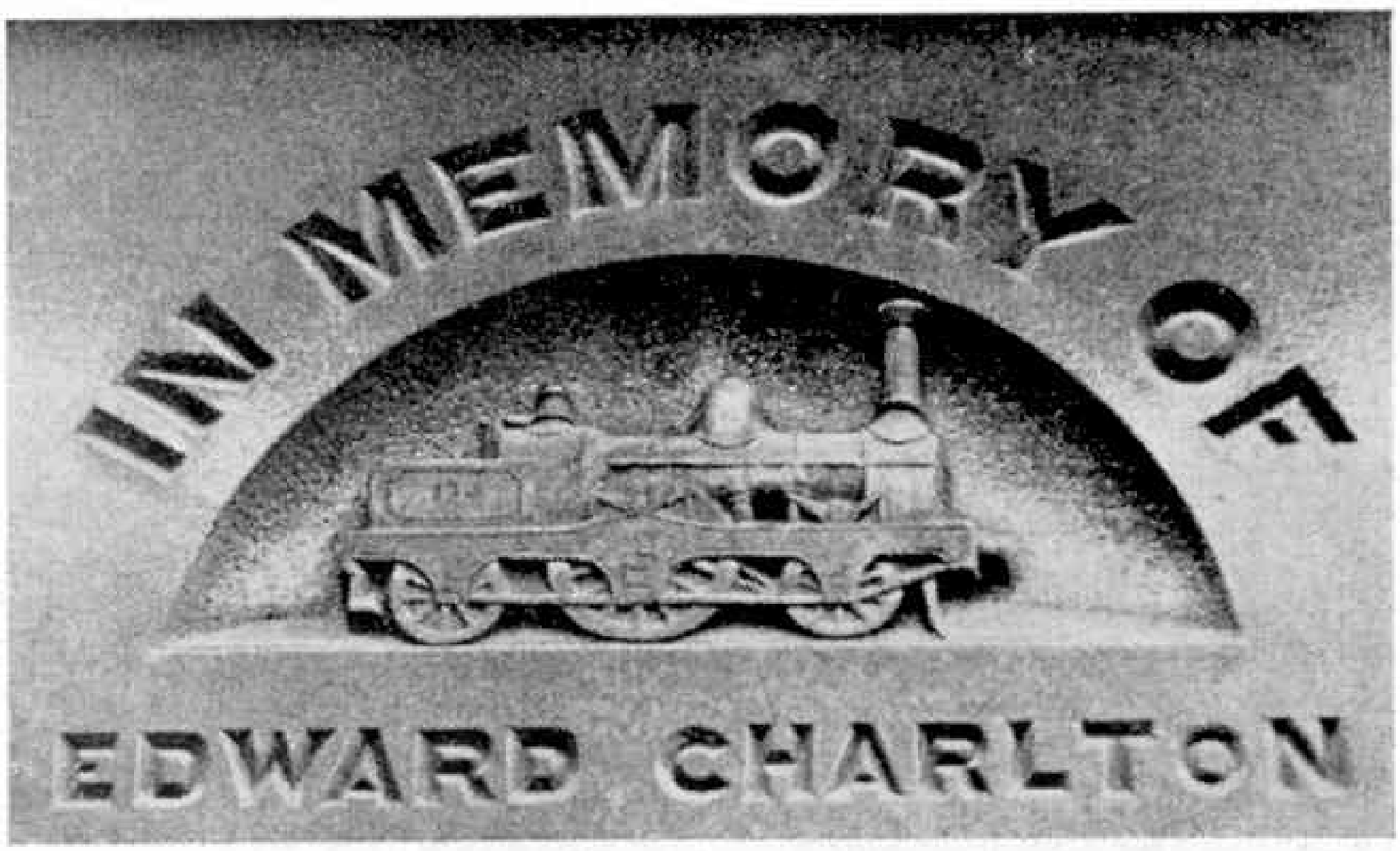
The memorial is actually a small-scale replica of the ornate entrance at the Arthington end of Bramhope Tunnel. Passengers on the diesel-electric train service now operating between Harrogate and Leeds get a fine view of the turreted entrance from the forward-facing seats.

The Railway Museum at York is one of the most popular attractions there, but a little-known railway souvenir is to be found in College Street, behind the Minster. Here is a shop with two bow windows, the premises being built into St. William's College. The railway interest of this shop is that it is believed to be the one where George Hudson, the "Railway King," served his apprenticeship as a draper's assistant.

Hudson's employers were so pleased with him that when one of them retired he was made a partner in the firm. This promotion enabled him to save a considerable amount of money, and when a substantial legacy also came his way he invested his fortune in railway shares. Abandoning drapery for railroad promotion, he was largely responsible for the construction of the East Coast Route to Edinburgh. His railway interests extended to the Midlands and to the Eastern Counties as well as the North East, and in some of his projects he co-operated with George Stephenson.

When Hudson successfully contested the Sunderland division and was elected M.P., in 1845, he chartered a special train to carry the news of his victory to London newspapers. The shop in College Street, York, is not only an attractive architectural souvenir, but also a memento of a figure famous in railway history.

Visitors to Boston Park, Rotherham, may see a coat-of-arms surmounting a wall near the entrance. Over this crest is a weatherworn bust believed to represent George Stephenson, for such busts were sometimes displayed on railway stations, and the coat-of-arms is the badge of the old Sheffield and Rotherham Railway.



A Bradford carving illustrates the type of locomotive in use 100 years ago.

The piece of sculpture is thought to have come from the original Westgate Station at Rotherham, when the building was taken over by the Post Office 80 years ago. The crossed arrows are from the Sheffield coat-of-arms, and the guns from the Rotherham corporate seal.

New York's Triple Tunnel

Improving an Underwater Highway

By the Editor

THE position of New York is one of the most remarkable in the world. The great city started with a settlement on what is now known as Manhattan Island. This is a stretch of land, about 13 miles long and 2 miles across, that separates the Hudson River from another waterway now known as the East River, the former on its western side and the latter on its eastern side, as its name suggests. On the north side Manhattan Island is cut off from the mainland by the Harlem River, while to the south is the great stretch of New York Harbour, leading to the Atlantic Ocean.

On the left are the New Jersey portals of the original twin tubes of the Lincoln Tunnel, connecting New York with Jersey City under the Hudson River, and on the right is the portal of the recently completed third tube.

Today New York has spread across the waterways surrounding Manhattan Island, where it began, and this has meant providing ways and means of travelling to and from the Island. For a long time ferries provided the only means of doing this, but long ago they became quite unable to cope with the ever-increasing demand, which has become almost overwhelming in this motor age, and other ways had to be found.

So today New York is a city of bridges and tunnels. Some of the world's most famous bridges have been constructed across the waterways surrounding the Island of Manhattan. Among these is the great George Washington Bridge across the Hudson River, with a span of 3,500 ft. that made it the largest suspension bridge in the world at the time of its construction. Other great structures, crossing the East River, are the Brooklyn, Manhattan and Williamsburg Bridges, near the southern end of Manhattan, and the Queensborough and Triborough Bridges farther north.

The tunnels that burrow under the waterways around the city are no less remarkable than the bridges that span them. Some of them give railway access to the centre of New York, but others are road tunnels, built to cope with the ever-increasing motor traffic of the area. There are two under the Hudson River, known as the Lincoln and Holland Tunnels respectively, and one under the East River, with yet another that runs from the tip of Manhattan across New York Harbour to Brooklyn, on Long Island, another borough of New York City.

Every year the demand for more facilities for this cross river traffic increases, and to help to meet it a new bore has been added to the two existing tubes of the Lincoln Tunnel. This system now consists therefore of three double track road tubes. Of these one is devoted to eastbound and another to westbound traffic, while the third can be used for traffic in either direction, the choice depending on the direction of the greatest intensity of traffic.

The traffic capacity of the three routes, tunnels, bridge and ferries, across the Hudson River is stupendous. The Lincoln Tunnel was completed in 1940 and it was

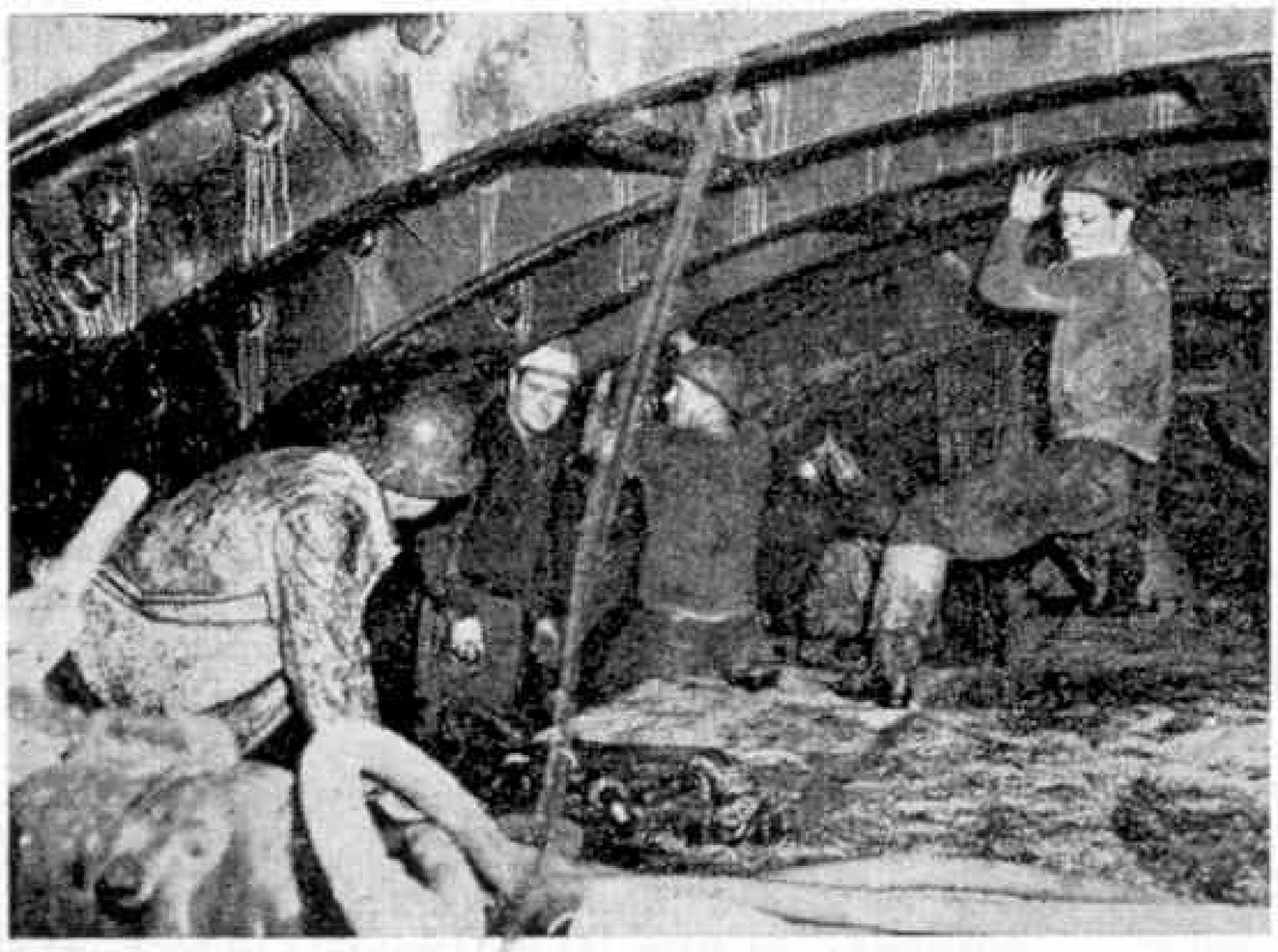
then thought that by 1948 as many as 75,000,000 vehicles would be crossing the river every year. Of these the George Washington Bridge was expected to take 26,000,000, and the Holland and Lincoln tunnels 18,000,000 each, leaving the remaining 13,000,000 for the ferries. Traffic today is considerably more dense.

An aerial view of the approaches and connections to the Lincoln Tunnel on the New Jersey side.

The third tube of the Lincoln Tunnel has been bored under the Hudson River a short distance to the south of the twin tubes already in existence. It is this one that is used only for eastbound traffic from New Jersey, on the western shore of the Hudson River, to Manhattan, while the most northerly tunnel of the three is used only for traffic in the opposite direction. What is now the central tube is operated either way, according to traffic requirements.

The third tube was driven beneath the Hudson River by the shield method, which was also used in the Holland Tunnel and in the existing tubes of the Lincoln Tunnel. In its original form this shield was invented more than 120 years ago by Sir Marc Brunel, who used it for driving the tunnel beneath the River Thames between Rotherhithe and Wapping. With many improvements it has come generally into use for tunnelling purposes, and is indeed one of the tools of the tunnel engineer, his other principal tool being compressed air.

The shield used in driving the third tube of the Lincoln Tunnel was a horizontal cylinder over 18 ft. long and more than 31 ft. in diameter. In a way it resembled a glass tumbler laid on its side. It was built of steel plate, with horizontal and vertical steel members to strengthen it, and attached to the front face of the framework were a series of steel plate bulkheads, with trapdoors that could be opened to admit rock and earth into the tunnel.



A daily force of 200 men, usually referred to as "sand hogs," worked in compressed air when driving the third tube of the Lincoln Tunnel under the Hudson River.

On the forward edge of the circumference of the shield were cast steel cutting edges. Behind the shield itself were 28 giant hydraulic jacks, each of which could exert a thrust of 200 tons. It was these gigantic jacks that drove the huge steel shield forward under the river on its trip of more than a mile from the bottom of an 85 ft. vertical shaft in rock at the New Jersey end, where it was erected, to a shaft on the Manhattan shore.

To begin with the shield travelled through rock, which had to be blasted, the debris being pulled into the tunnel for removal through the shaft. After each push forward cast iron ring sections were erected behind it in order to form the lining of the

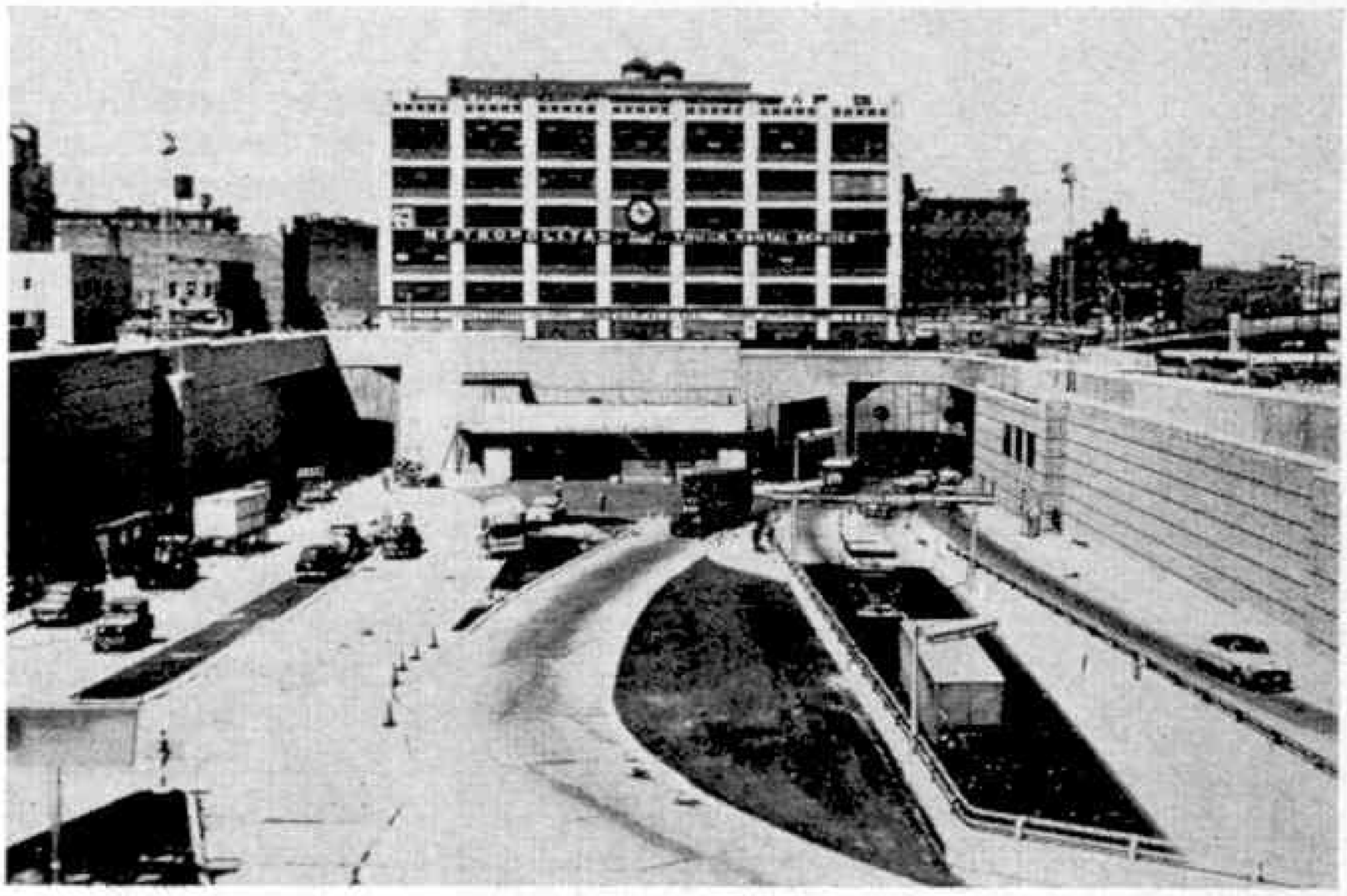
tunnel. Each ring was 2 ft. 8 in. wide, and consisted of fourteen segments and a small key or locking centre. High tensile steel bolts held the successive rings together.

In preparation for what was to come when the shield travelled into the mud and silt at the bottom of the river, a concrete bulkhead 10 ft. thick was erected behind the shield after it had travelled about 60 ft. forward. The idea was to fill the space between this bulkhead and the travelling shield with compressed air, the purpose of which was to keep out the soft mud that otherwise would have rushed into it. The material underlying the Hudson River is in fact semi-fluid and could only be kept from penetrating into the boring by this use of compressed air.

In these circumstances only "sand hogs" can work. These are men specially trained for duties in compressed air, and special precautions have to be taken to prevent their being attacked by a dread disease, known to the men as bends, that is due to the solution in the blood under high pressure of nitrogen from the air. The oxygen of the air too is dissolved, but is quickly used up, just as it is in ordinary breathing. In order to prevent attacks of the bends, which may be very painful and perhaps even fatal, men passing outward from a high pressure space must pass through a special lock in which the pressure can be reduced very slowly, so that the dissolved nitrogen is released gradually. This of course is exactly the same method that is used in bringing up deep sea divers from great depths.

As the shield moved forward towards the river it left rock and entered the soft silt material under the river. Progress had been limited to one or two rings a day when tunnelling in rock, but here movement through the river silt reached as high as thirteen rings, or 35 ft. daily. Tunnelling went on day and night, a steady stream of men and materials being locked into or out of the working chamber, where the high air pressure was maintained.

When pushing the shield forward under the river as much as four fifths of the silt displaced by the tube was simply pushed aside. The remaining fifth was taken in as ballast by opening trapdoors in the front of the shield, its weight counteracting the buoyancy of the uncompleted tunnel. At the centre of the river the top of the tube is about 25 ft. below the bed, which means that it is 75 ft. below the water surface at high tide.



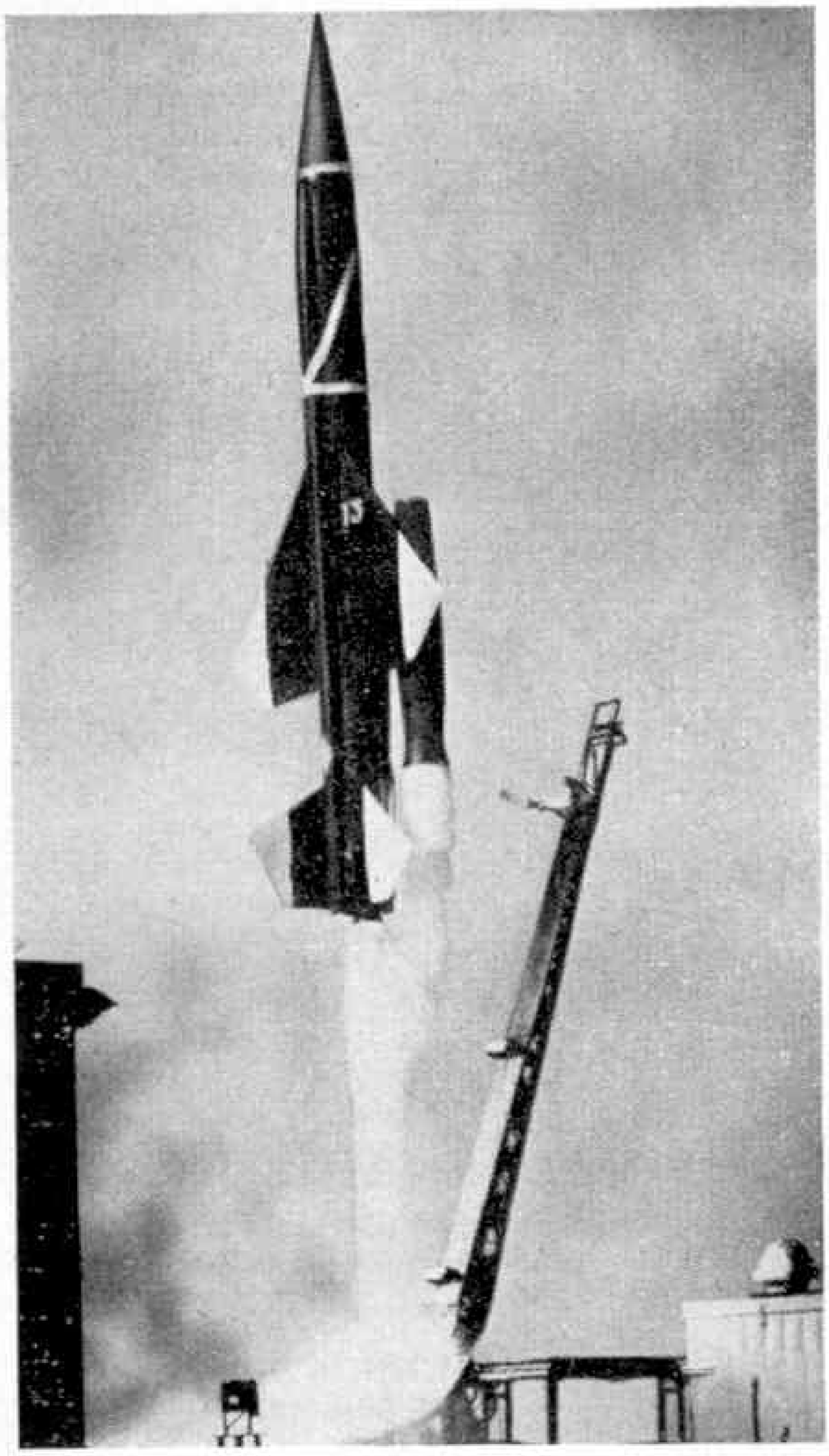
The New York exit portal of the recently completed third tube of the Lincoln Tunnel is seen on the left in this picture. The portal of what is now the central tube of the three is on the right.

The distance across the river to be completed by the shield was rather more than a mile and soon after reaching the New York shore line rock again was encountered. Boring continued to the foot of a vertical shaft that had been sunk in New York, and this completed the tunnelling itself. Afterwards the compressed air pressure was shut off, and the silt and mud that had accumulated in the bottom of the tube were removed. The interior was then concreted. The lining is 14 in. thick, while the roadway slab and the roadway ceiling are each 5 in. thick.

The roadway ceiling is the bottom of a duct that is used to suck exhaust gases out of the tunnel, and below the roadway is another duct through which fresh air is pumped in. Finally the walls and ceiling of the tunnel were lined with tiles and a 4 in. asphalt pavement was laid, making the roadway 18 in. in thickness.

Besides the underwater tunnel, extensions had to be bored to the neighbourhood of the existing portals of

(Continued on page 14)



The United States Air Force Bomarc interceptor missile. It is the experience gained in the development of such missiles that has led to such projects as Farside and Vanguard. Photo. U.S. Information Service.

Space Notes

by

J. Humphries, B.Sc.(Eng.), A.M.I.Mech.E., A.F.R.Ae.S.

ALTHOUGH quite a large number of people believed in the possibility of space flight, it is doubtful if the majority of the population really thought that it would ever happen. This was changed overnight in October last when the Russians launched Sputnik I. Those "in the know" had been expecting a Russian satellite to be launched, but were rather surprised by its size—about eight times as heavy as the American Vanguard. And even rocket and space-flight experts were stupified by the announcement that Sputnik II, launched on 3rd November, had a weight of more than half a ton.

The Russian "Sputniks"

Although the Sputniks have received tremendous publicity very little technical information has been released on them or their launching rockets. Of Sputnik I we know that it is a sphere 23 in. in diameter, weighing 184 lb., and has radio transmitters operating on 20 and 40 megacycles. Initially the satellite was circling the Earth in 96.2 mins., and speeding up by 1.5 sec. a day, at a maximum height of 630 miles and a minimum of 120. After a month the period of revolution had decreased to 94.7 mins. and was diminishing by nearly 3 secs. a day, while the maximum height had been reduced to 500 miles, with a much smaller decrease in the minimum height.

Sputnik II was placed in rather a higher orbit, with 1,025 miles as the maximum height, but again with only about 120 miles minimum height. This satellite weighed over half a ton and besides carrying a large load of scientific instruments also had a dog aboard. Information was transmitted for seven days only and although Russian official sources say that this was as planned, this seems very dubious. Either the transmitting equipment had gone wrong or a fresh set of batteries was due to be switched in at a later date—perhaps on receipt of a signal from a ground station.

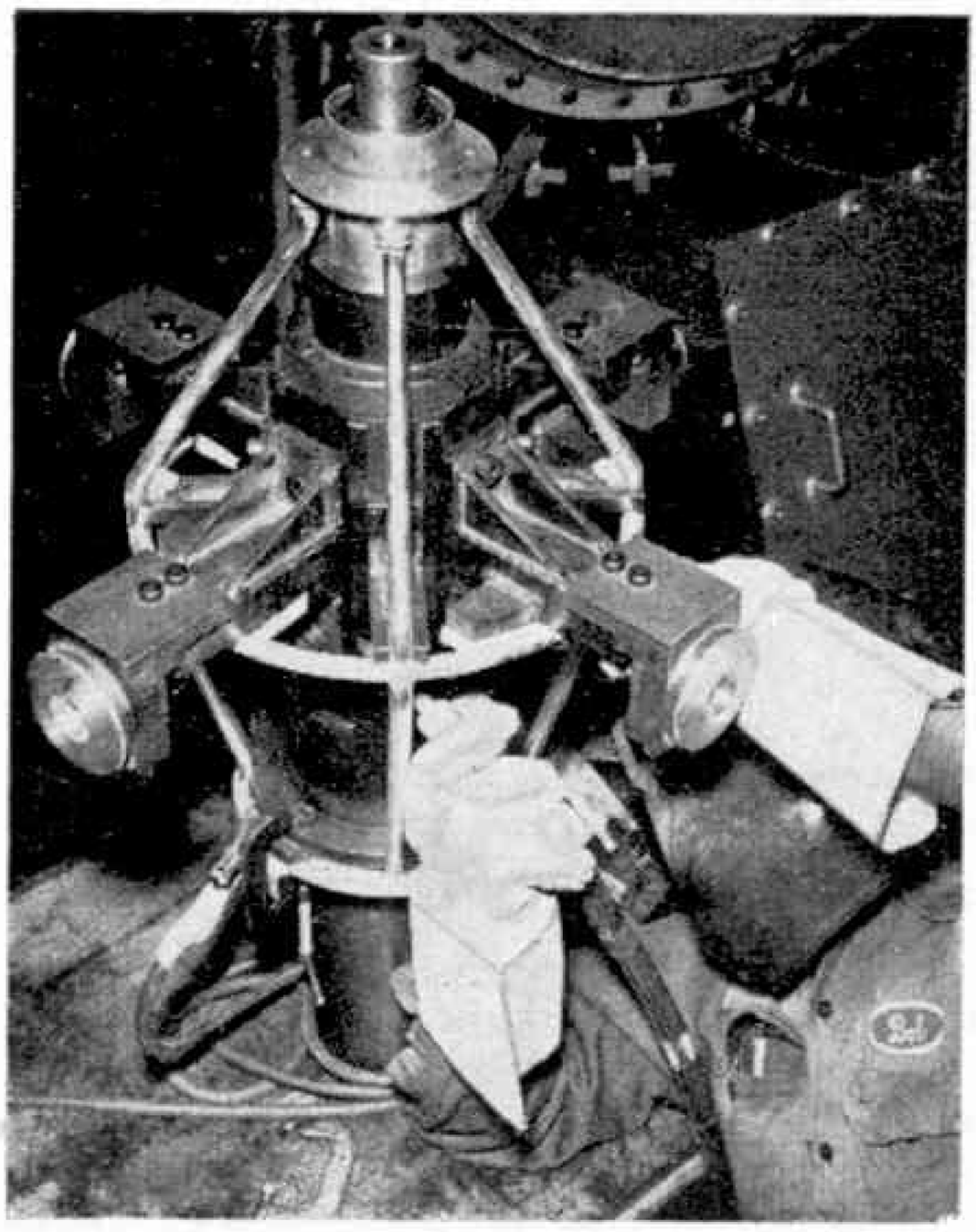
Some estimates can be made of the sizes of the launching vehicles by assuming that conventional propellants—perhaps liquid oxygen and paraffin—and modern methods of missile construction have been used. In both instances the vehicle is likely to have had three stages and if one assumes a conical construction, tapering almost to a point at the top of the last stage, then the Sputnik I vehicle might be about 12 ft. in diameter at the base and 80 ft. tall, and that of Sputnik II 25 ft. in diameter and 120 ft. tall. The all-up weight of the former would be about 80 tons and the initial thrust 100 tons. The latter would weigh about 500 tons initially and have a thrust of 600 tons, perhaps made up by using six 100-ton thrust rocket motors.

The Vanguard

The American Vanguard satellite was to

have been ready for launching in the autumn of 1957. Trouble with the rocket motors for the first two stages has held up the programme, and the date of firing the first full-scale 21½ lb. satellite has now been put back to about March or April 1958. These motors tended to burn out during running and some time was spent in redesigning them before they were satisfactory. Two test firings of Viking high altitude rockets were made during the development work, one of them carrying the Vanguard third stage in order to test the method for spinning it and separating it from the second stage. The other Viking carried Vanguard guidance and a special transmitter known as Minitrack, and these worked satisfactorily.

Although the Sputniks have beaten the Vanguard in the race into space the Americans have shown a much better spirit of international co-operation in the course of their project than have the Russians. Fairly detailed information has been released on all phases of the development and even amateur astronomers have been recruited to help in the "Moonwatch," which is a programme in which teams of amateurs equipped with quite simple telescopes will plot the course of the satellite as it circles the Earth after being launched into space.



The internal frame structure of the Vanguard satellite is chiefly of aluminium tubing.

The U.S. Vanguard satellite partly assembled. The pictures on this page are from Brook and Perkins Inc. photographs.

Project Farside

Many scientific measurements of the upper atmosphere and in space can be carried out with quite small instruments. But the air drag near to the ground, up to say 100,000 ft., is so high that quite a heavy multi-stage rocket is needed for even a small load. By substituting a balloon for the first stage the total weight can be reduced very considerably and in fact this technique has been used on a number of occasions in the past.

Project Farside, designed to reach a height of 4,000 miles (equal to the Earth's radius) and to travel half-way round the world is the most advanced balloon-carried rocket to be made to date. Six firings have been made, but only the last of these was a success. The instrument payload was 3½ lb., and was designed to withstand the tremendous acceleration of 200 g. to which it was subjected while the rocket motors were firing. The rocket was about 30 ft. long, varying from 8 ft. in diameter at the base to 4 in. at the top step, and the balloon was 200 ft. in diameter. The rocket was launched at a height of 100,000 ft., where it was above 90 per cent. of the Earth's atmosphere, and information was transmitted back to base with a specially designed transmitter.

Four rocket stages were used and all

(Continued on page 54)

Road and Track

By Peter Lewis

Jack Brabham

I am not surprised that Aston-Martin, who are making a strong challenge for sports car championship honours this year, have signed up 31-year-old Jack Brabham. There is no doubt that the Australian's style during the 1957 season—most of the time as a "works" driver for Cooper cars—has progressively improved. He is a much steadier and more tactically minded driver than when he first came to this country in 1955.

Brabham arrived from Australia with an imposing list of successes, the reward for a forceful approach to motor racing. It was he who built the first rear-engined Cooper F.1. car, with a Bristol power unit, and raced it during his first season in this country, not with a great deal of success but nevertheless with a great deal of enthusiasm.

Now that Jack Brabham—who incidentally is a highly skilled development engineer as well as a driver—will race as a member of Reg Parnell's Feltham team, I feel sure that we shall see a further improvement in style with no lessening of determination, which may well lead to offers from Formula 1 *equipes*.

Jack Brabham, the Australian driver who has done very well in various kinds of motor races in recent years.

A New Sports Car

The entries for Le Mans next June will, I hope, include a new British Gran Turismo car—the 2-litre Peerless. Last month I was privileged to drive the prototype, with designer Bernie Rodger by my side, and after an exhilarating trial run, I returned to Peerless Motors, full of praise for this rapid, stable sports car, which offers high performance with race-bred handling and is expected to sell for £1,500, including purchase tax.

The engine is the well-tried 4-cylinder 1991 c.c., twin carburetter Triumph T.R.3 power unit, which develops 100 b.h.p. at 5,000 r.p.m. The four speed gear-box, which has Laycock de-Normanville over-drive on 2nd, 3rd, and top, and thus has seven forward gears, is also used on the T.R.3.

The excellent Girling disc brakes on the front wheels and drum brakes on the rear are also from the T.R.3., and one of the many attractions of the Peerless is that the vast service and repair organisation of the Standard Motor Company, which is giving maximum co-operation, will be at the disposal of owners, both at home and abroad.

The Peerless is unique in that it is the only British Gran Turismo car with a combination of a space frame (rectangular section steel tubes) and De Dion rear suspension, a form of suspension used on many modern Grand Prix cars.

With so much to offer, it does not surprise me that John Gordon, of Peerless Motors, Slough, plans to start production in April/May at the rate of twenty a week and to build a thousand in the first year.

On the road I found the acceleration of the Peerless astonishing for a 2-litre car. From 0–50 takes under 7 seconds and from 0–80 takes less than 17, and both times are quicker than for the standard Triumph T.R.3. in spite of the fact that the Peerless is a full four-seater. It is a car that inspires complete confidence in the driver, cornering as though on

The Peerless car described on these pages, with Bernie Rodger, its designer, on the right behind it.

rails, and with that delightful reserve of power that makes overtaking on our inadequate roads an easy and safe task.

Petrol consumption, I am told, is in the region of 30 m.p.g. when the Peerless is handled gently, but when one can purchase a thoroughbred at such a reasonable price who is going to worry about petrol? In America, from where enquiries are being received at the rate of three or four a day, the very creditable performance of the Peerless will, I have no doubt, be used to the full and the car may well become one of our most sought-after exports.

Two-Pedal Control

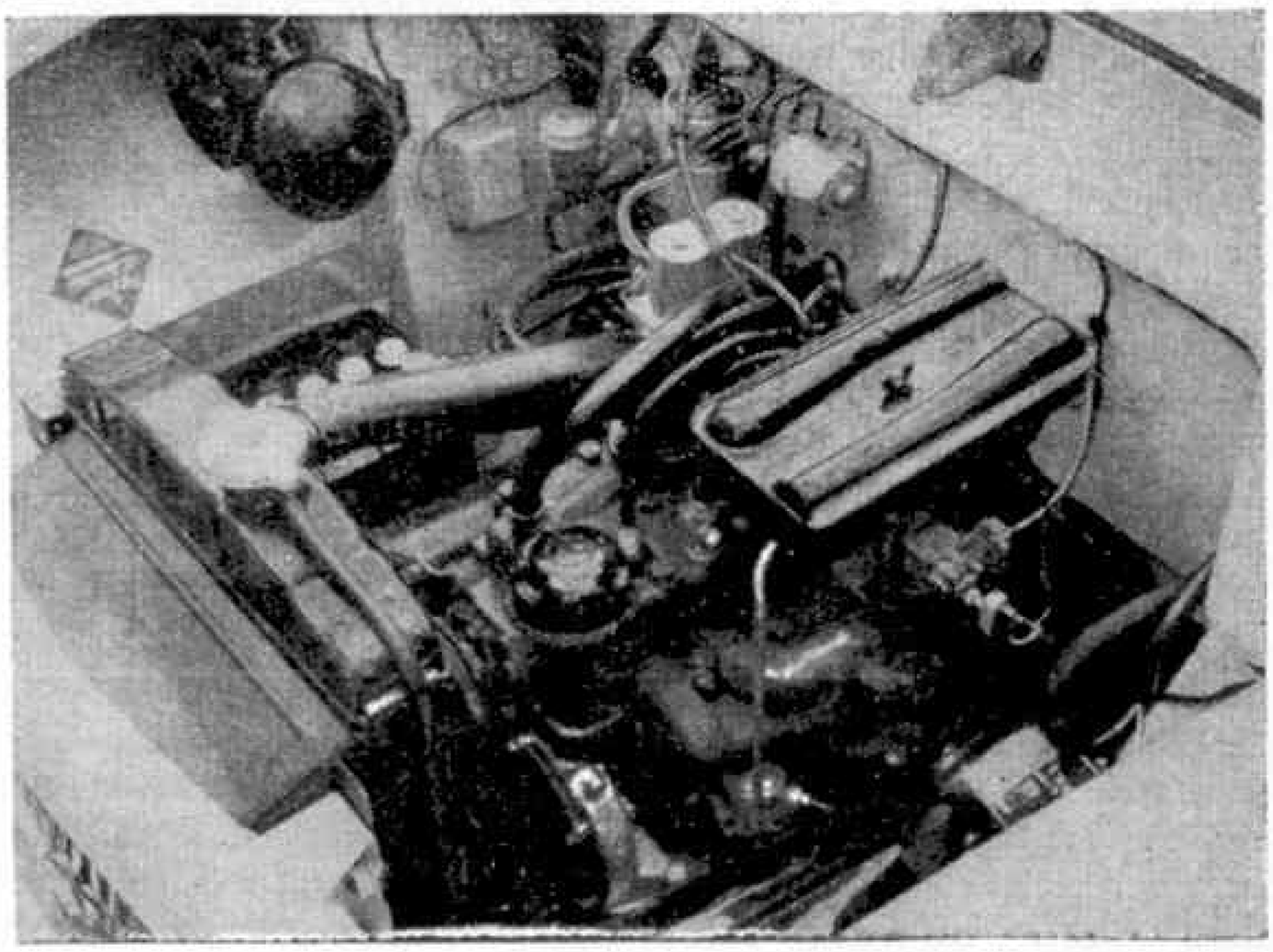
At Goodwood, on Motor Show Test Day, I drove a dozen or so cars, ranging from the 3-cylinder Berkeley to the Rolls-Royce Silver Cloud, and one of the most interesting was a Ford Anglia with the two pedal control that will become available this month on Prefects and Anglias. Although I am one of the old die-hards who like a clutch to press and a proper gear lever to either push or pull, I must admit that I found two pedal control fascinating.

For the driver who is not interested in what goes on under the bonnet it is sufficient for him to know that there is no clutch pedal to press with his left foot, and that this particular component is actuated merely by light hand pressure on the gear lever.

To change gear the driver only has to release the accelerator pedal and move the gear lever to the next higher gear position. The clutch will disengage when the knob at the end of the gear lever is held and will not re-engage until the knob is released, by which time the gear is "home."

Two pedal control, which costs £24 7s. 6d. including purchase tax above the basic price of the car, comprises three main units; the normal type of centrifugally-operated single dry plate clutch; a solenoid-operated vacuum control unit: and finally a vacuum servo cylinder.

When the driver presses the knob of the gear lever in order to move it, the contacts of a switch in the actual knob are closed, the solenoid is energised, and the vacuum control valve is opened. A vacuum is thus created in the servo cylinder and the clutch released. When pressure on the knob is released the vacuum valve is closed and air is admitted to the servo cylinder. This destroys the vacuum and the clutch can then re-engage.



Under the bonnet of the two-pedal Ford Anglia.

London's New Air Terminal

By John W. R. Taylor

BECAUSE they are a coach-ride away from the nearest aeroplanes, air terminals lack much of the excitement and interest of airports. But they are very important places, not just for the job they do in starting passengers on their journeys to far-away destinations, but because visitors from overseas gain their first real impressions of a city at its air terminal. If this is dirty and crowded, its staff discourteous or inefficient, they will expect the worst in the city itself—often with good reason!

So, when B.E.A.'s London terminal was moved from Waterloo to West Kensington in October last, I decided to go along to see how it will cater for the needs and comfort of the millions of air travellers who will pass through it in the next few years, and to tell you what it is like.

To start with, it is important to remember that this new West London Air Terminal is not a permanent structure. B.E.A. expect to use it for only 7–10 years, by which time they will have built a much larger terminal, possibly on a site next door to the present one. If, as is expected, four times as many people travel by air in 1965 as in 1956, when the world total was over 80 million, it will probably *need* to be bigger; but there should be no overcrowding at the present terminal in the meantime, because it is spacious and has been planned to check passengers' tickets and get them on their way in the shortest possible time.

One big advantage is that it is only 40 minutes away from London Airport by coach, compared with 65 minutes for the old Waterloo Terminal. It will be quicker still when the Cromwell Road extension has been completed to speed up road traffic through Chiswick and Hammersmith. So that is one point in its favour right away.

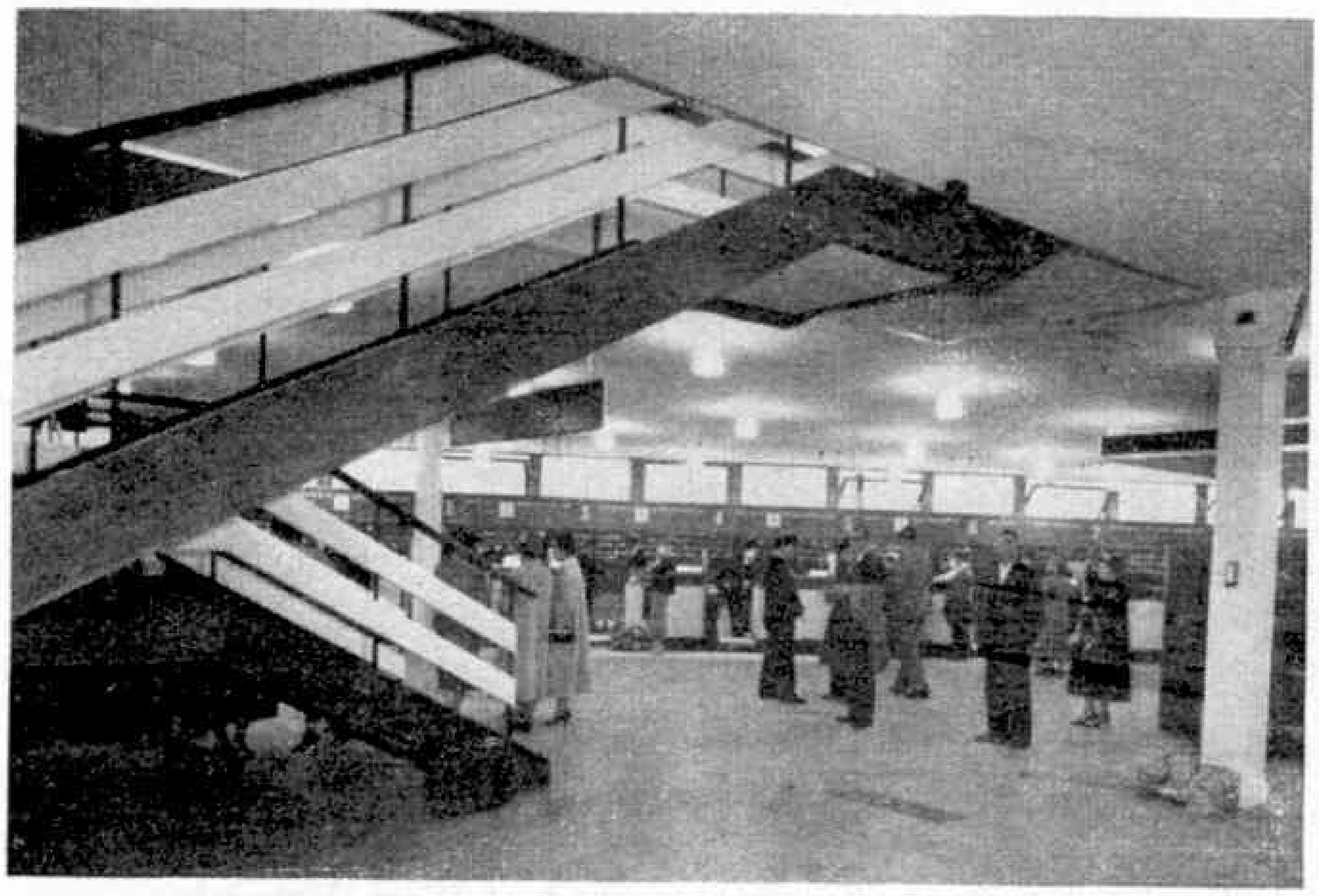
B.E.A. had their eyes on the site some time before they needed to move from the old Festival of Britain restaurant building at Waterloo, which had served them well since May 1953. But by the time their plans had been approved, only 4½ months remained in which to put up the terminal, because they were told they must leave Waterloo by early October 1957 to make way for a great new building programme.

Nor was it a straightforward job, for space is so limited in London that the only solution was to stand the terminal on a two-acre concrete and steel platform built over the network of railway lines between Earls Court, Gloucester Road and South Kensington stations.

A B.E.A. coach leaving the West London Air Terminal for London Airport.

This platform was constructed by the London Transport Executive, who employed William Old Ltd. as the main contractors. The terminal building was then erected by Richard Costain Ltd., who had 141 days in which to do their part of the job. By careful planning and choice of building materials they did it in 108 days—an achievement which seems remarkable when one visits the place.

It is, perhaps, a little less "arty-crafty" and elaborate in appearance than its predecessor at Waterloo; but, both inside and out, it gives the impression of workmanlike beauty and efficiency. I was lucky enough to be shown around by Mr. Arthur, one of the five duty officers who take it in turns to supervise the smooth operation of the terminal. He was obviously proud of the progress that has been made towards speeding the handling of passengers and I soon discovered why.



The ground floor reception area in the new Air Terminal. The illustrations to this article are by courtesy of British European Airways.

Inside the "Departures" entrance is an enquiry desk; but few travellers need to ask their way, because there are plenty of clear directional signs to guide them to wherever they want to go. To the right of the enquiry desk are counters at which tickets can be bought for almost anywhere in the world; but I assumed I already had a ticket and followed Mr. Arthur to see how I should be "processed" if I were a passenger arriving the scheduled 15 minutes before the airport coach was due to leave.

One big improvement became apparent right away. Instead of having to hunt out the ticket desk for their particular flight and then, perhaps, queue up behind half-a-dozen other passengers who will travel on the same aeroplane, travellers can now go to any one of the check-in desks which form a continuous counter 50 ft. long down one side of the departure hall.

This saves a lot of time and some passengers wonder, in consequence, why they have to report 15 minutes before leaving for the airport. The answer is that the latest B.E.A. Viscount 800 air liners carry up to 57 passengers at a time. If all these people arrived at once only two or three minutes before the coach was due to leave, even that long line of check-in-desks, manned by efficient, grey-uniformed girls, could not cope in time.

Naturally, a few unfortunate or inconsiderate people do arrive at the last moment, and are then told that if they report to one of another row of desks on the far side of the hall, it might be possible to get them on the coach. It usually is; but that's no reason for not sticking to the rules, without which everyone would get in a hopeless muddle.

Having checked in and seen his baggage labelled and put on a moving conveyor belt, en route to the airport coach, the average traveller will still have probably ten minutes or so in hand. But there is plenty to do in that time if he does not want simply to sit and wait.

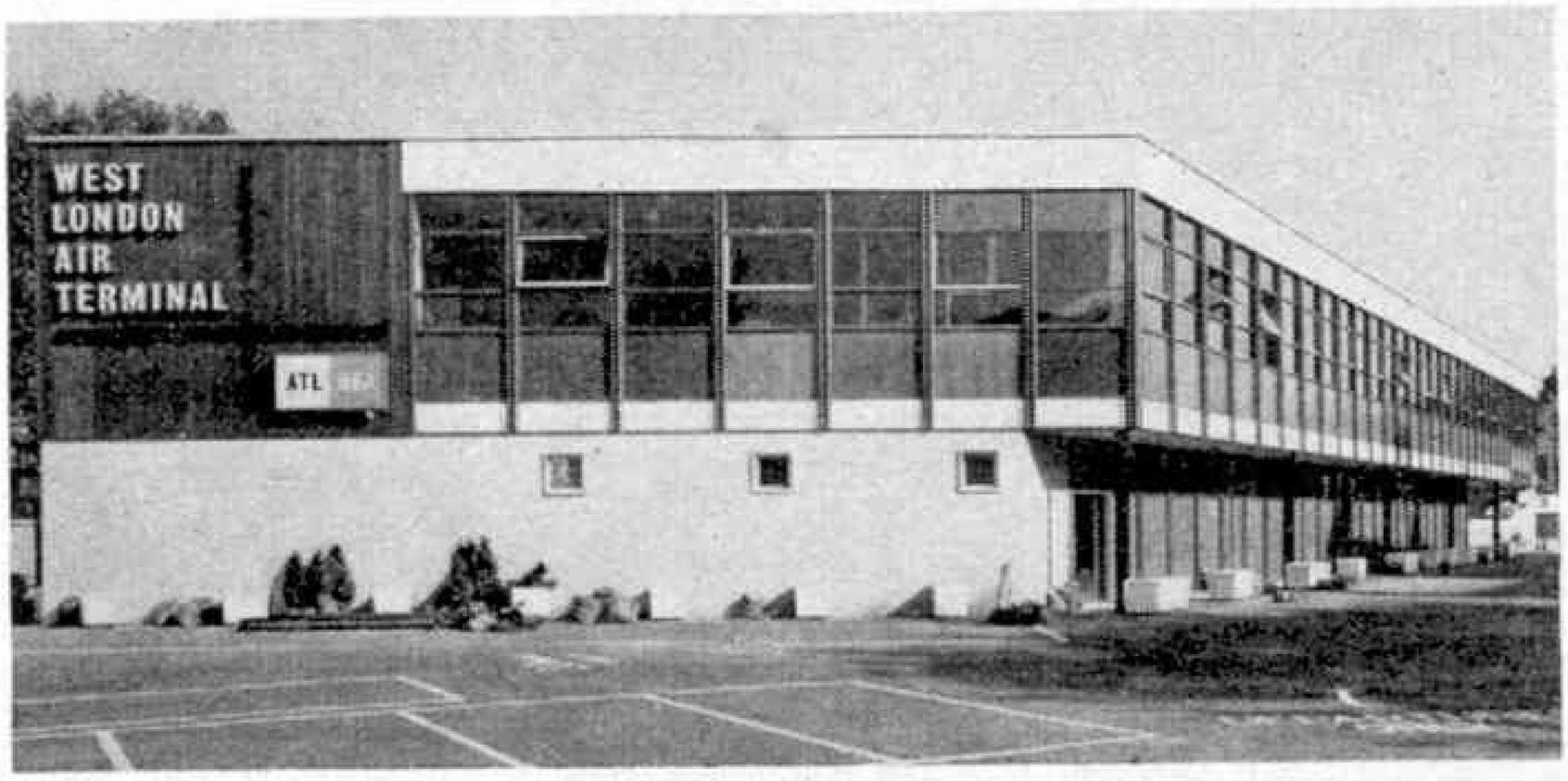
One thing he must do is pay five shillings "airport service" tax to the Government, without which he would not be allowed to leave the country, plus another five shillings coach fare. There is a cashier's desk near the check-in counter to take care of this, and a Bank to help with any other financial problems.

Not needing to worry about such items, being a mere visitor, I went with Mr. Arthur up the broad staircase that stands in the centre of the hall but which is so designed that it seems to take up no space at all. At the top, we were in a large, colourful, brightly-lit lounge filled with comfortable armchairs. To our right was a smartly-decked bookstall dealing in everything from paper-cover Penguins to large reference books, sweets, souvenirs and even a toy Viscount that would gladden the heart of any boy traveller.

To each side of the bookstall are tobacconist and chemist shops; and there

are the usual post-boxes, together with a parcels office to handle any small and urgent air parcels that people care to take along.

However, knowing that food interests most young *M.M.* readers more than cigars, post offices or machines from which life insurance can be bought, I went with Mr. Arthur to the attractive restaurant that fills almost half of the first floor passenger accommodation. Here, for the traveller with only a few minutes to wait, were long, gaily-coloured counters displaying the kind of creamy chocolate cakes that small boys dream of, as one item on a long menu that caters for all tastes at prices that should satisfy anyone.



General view of the exterior of the new West London Air Terminal.

For those with more time, the chef will prepare anything from a Welsh rarebit to a steak on the latest types of grill; and there is a bar where grown-ups can have a drink with their friends until called to their coach by the announcer.

In addition to these passenger facilities, the West London Air Terminal contains offices, rest rooms and an excellent canteen for the staff, of whom about 60 at a time are on duty in three shifts, 24 hours a day. There is a private telephone exchange, with an internal and external network of lines and in direct communication with the airport and airline offices in London, and a teleprinter system. Eventually, a closed-circuit television system will also be installed to supplement the normal public address system that keeps passengers and visitors informed of coach departures and arrivals.

Only real drawback is that there is not much room at present for cars on the site; but most people will probably travel by train—Gloucester Road underground station is only 400 yards away—or by taxi or bus. There are plans for constructing a large park for passengers' cars on the land alongside, on which the permanent successor of the terminal may one day be built.

Meanwhile, West London Air Terminal will gradually get into its stride. At the time of my visit, it was handling some 800 passengers a day; and although the opening of Gatwick Airport for Channel Islands traffic will divert many passengers to Victoria instead of West Kensington after April of this year, it may not be long before it has reached the peak of 16,000 passengers a day recorded at the Waterloo terminal. Indeed, with even-cheaper "thrift" class fares on the way, the eventual total is frighteningly unpredictable. All that B.E.A. are willing to forecast is that 1½ million passengers will pass through the terminal in its first year.

That's a lot of people, to whom must be added the friends who come to greet them or see them off. It is good to know that their first and last impressions of London will be gained in such a fine terminal, with the care, courtesy and efficiency of Mr. Arthur and his colleagues to speed them on their way.

New York's Triple Tunnel—

(*Continued from page 7*)

the Lincoln Tunnel. One of these, on the New York side, was constructed by the open-cut method. In this a great trench is dug, the tunnel structure is installed, and earth is then returned to fill up to the original street level.

Ample street connections too were provided. On the New Jersey side five lanes were added to the plaza in front of the portals of the tubes, and the approaches, including the elevated loop structure seen in the upper picture on page 6, also were widened and extended. Improvements on the New York side included new approaches and an expressway.

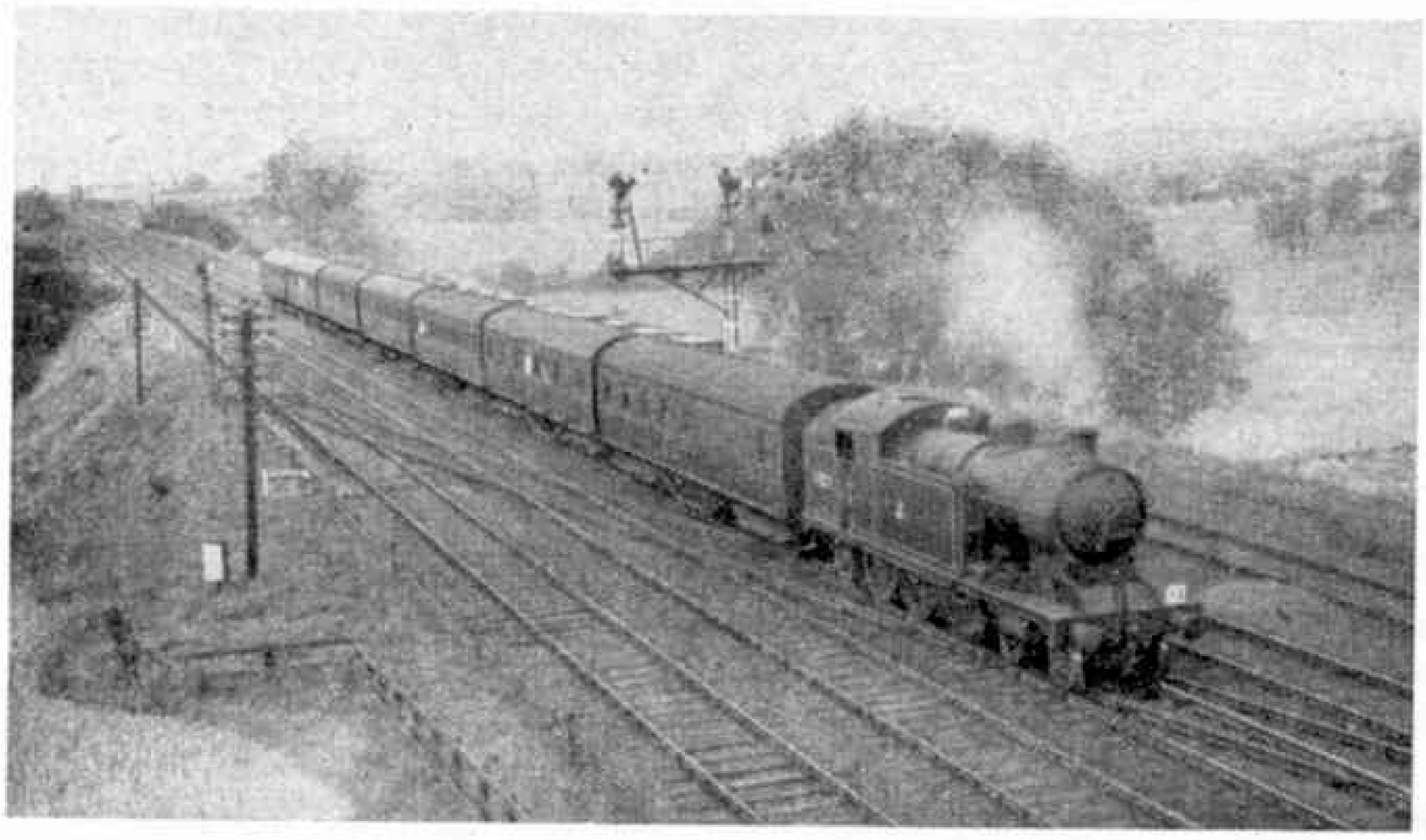
In a tunnel of this kind ventilation is of the greatest importance. To provide for it two ventilation buildings were provided, one above each of the shafts at the end of the underwater bore. In these buildings there are 24 fans, which provide for a change of air in the third tube every one and a half minutes.

The third tunnel was opened on 25th May of last year. In 1956 over 21,600,000 vehicles used the Lincoln Tunnel, and the third tube will increase its annual capacity by 50 per cent. Its cost was more than £35 million.

More Adventures with a Camera

By H. Gordon Tidey

WHEN my annual railway photography trip looms ahead I realise the increasing importance of devoting my energies to obtaining shots of engines that —alas—are fast disappearing. As I had been informed that the former North Eastern area had been somewhat neglected recently I decided to visit that district. After some consideration it appeared that the neighbourhood of Stockton-on-Tees gave promise rather than the main line between York and Newcastle, which is now almost monopolised by engines of Doncaster origin. When deciding this I had in view the tremendous iron ore traffic near West Hartlepool.



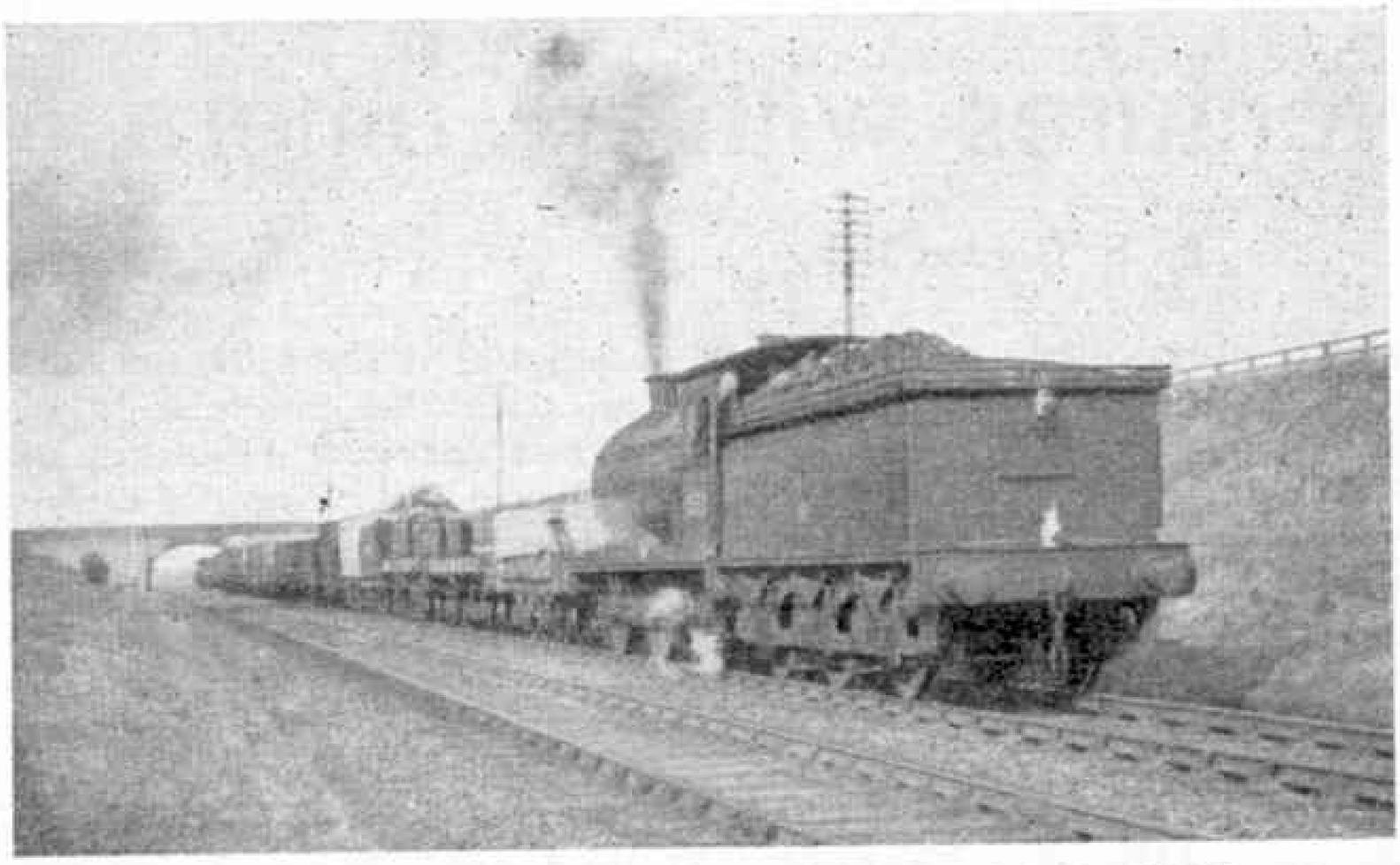
N.E. type 4-6-2T No. 69873 approaching Billingham-on-Tees with a down semi-fast train. The illustrations to this article are from photographs by the author.

Running out my trusty little A30 and loading up, I said goodbye to Potters Bar on a glorious sunny morning, intending to take it easy with stops on the way and stay in Newark the first night. When I reached the town I had the afternoon to spare, so I visited the E.R. Station and there got one or two shots, including the up *Flying Scotsman*. As buses are becoming increasingly popular with collectors, photographing them now forms part of my activities. So I made my way to the bus terminus, and managed to obtain a dozen exposures before the light became too dull. That is one of the advantages of early July —one can work until quite late in the evening.

It is a sad thought that the railways now have to contend with the competition of these extensive bus services, resulting in the complete abolition and closing of many branch lines and even the dismantling of stations. For this reason some of the branch lines and stations are becoming increasingly interesting—they may not even be in existence when one is next in the neighbourhood! A typical example is the L.M.S. main line between Crewe and Stafford. Many times have I visited Whitmore (for the troughs), travelling by train from Crewe. The station is now non-existent, together with several others on this stretch.

On the following day I went on to Stockton. This town boasts the widest High Street in the Kingdom, and my hotel faced the widest part. It was market day, and things were in something of a turmoil, so I found my own way to my room, which I had previously booked, wondering if it were suitable for changing plates. I need not have worried, because it proved to be on the top floor at rear of premises, so there were no outside street lights to bother me. And there was no fanlight in the door and the curtain on the window was thick enough to exclude any stray light.

Next morning, after exploring the district towards West Hartlepool without success in finding suitable spots for photography, I made my way to Billingham-on-Tees, which is a fairly busy station on the line between Stockton and Sunderland and Newcastle. A large amount of the traffic is freight, consisting mostly of iron ore trains, but there were also a good number of slow and semi-fast trains to Middlesbrough, West Hartlepool and Sunderland. In addition there were several King's Cross-Newcastle trains that



Up goods approaching Greatham, headed by 0-6-0 No. 65820.

take this route, hauled mostly by Green Arrow V2s, but occasionally by A3s, and the new diesel electric service to Newcastle.

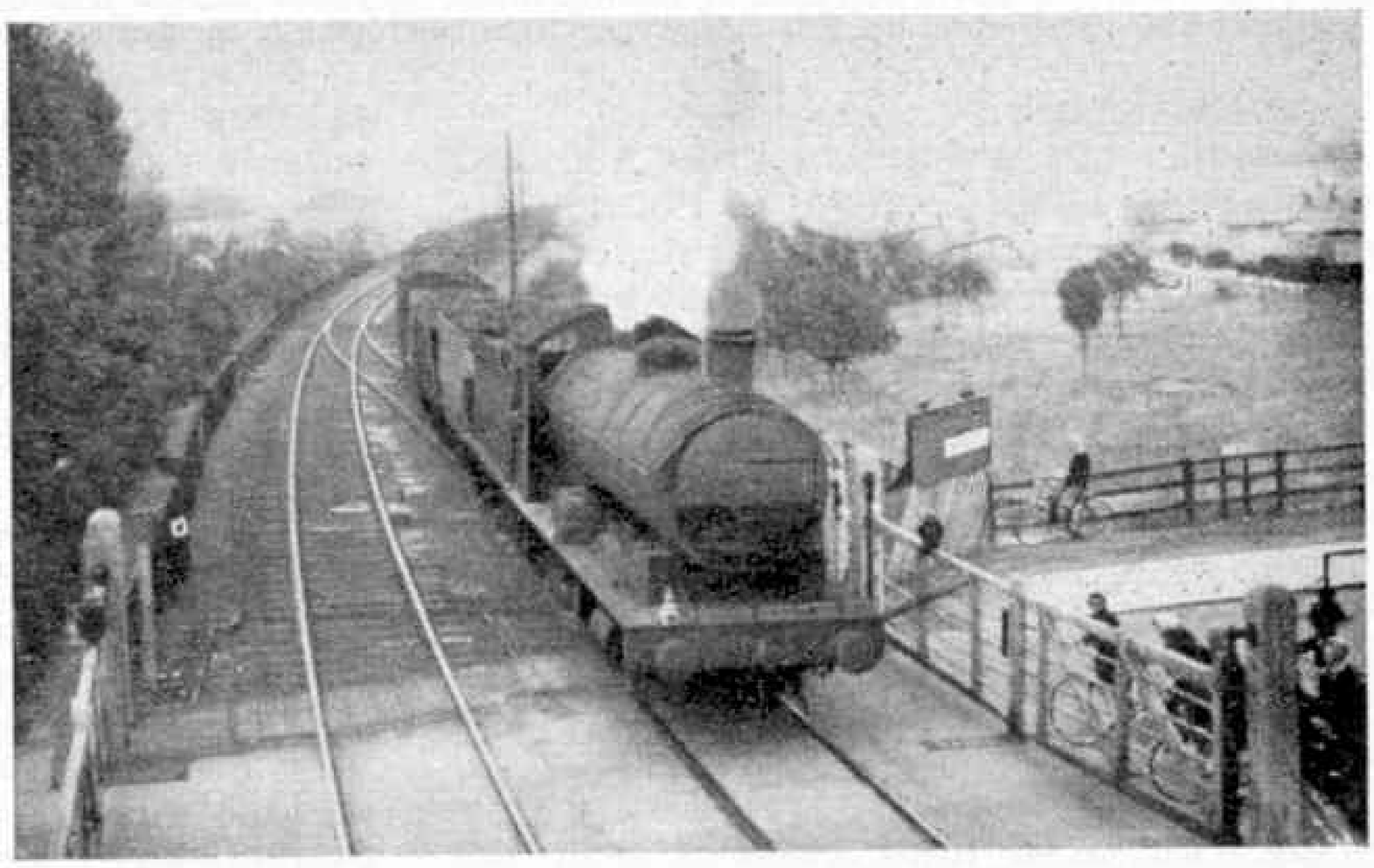
I spent the whole day there and obtained a variety of results, including pictures of the late N.E. 4–6–2 tanks, a number of late N.E. 0–6–0s and 0–8–0s on goods, an Ivatt class 4 4–6–0, and several of the G.C. pattern 4–6–2T that were built for this region after the grouping. Returning to Stockton in the late afternoon, I added to my collection of bus photographs and after dinner took a stroll down to the station.

Next morning gave promise of a fine sunny day. I passed through Billingham, taking the new arterial road, which crosses the railway by a bridge about half a mile south of the station and gives excellent opportunities for shots in both directions. I spent an hour here and obtained several shots of goods and slow and fast passenger trains, after which I proceeded to Greatham, where I spent the rest of the day.

At Greatham there was almost a procession of mineral trains in both directions, mainly hauled by 0–8–0s of N.E. origin, but also by 0–6–0s. The Stationmaster bemoaned the fact that the powers that be have imposed a service of fast diesels on a line already much congested. I saw, and photographed, expresses from King's Cross to Newcastle and vice versa, as well as several semi fast and stopping trains, the former hauled by V2s and the latter by B1s, and several classes of tanks, but by far the greater part of the traffic was mineral, and I was surprised to find that a large proportion of these are worked by engines running tender first. How the crews get on in wet weather is a matter of conjecture, because when travelling this way at any speed there is no protection whatever for them.

I recalled visiting this neighbourhood between the two World Wars, and sadly compared the conditions that prevailed then, when almost all the engines were of N.E. type, with those of today. It becomes increasingly difficult to find variety in locomotives wherever one goes, and anyone living in the London area need proceed no further than King's Cross, Euston or St. Pancras to observe precisely the same classes as are now in evidence at say York, Carlisle or, in fact, any of the large centres.

One sometimes sees curious happenings at wayside stations and at the termini of branch lines. I have in mind an occasion when I saw an 0–6–0 goods utilising the jet designed for damping the coal on the tender for the purpose of washing off an obsolete bill from a board laid on the platform.



A coal train entering Billingham. The locomotive is N.E. T2 0-8-0 No. 6392.

British Railways have not quite succeeded yet in abolishing all records of private ownership and at Greatham I found a board at the goods yard headed "North Eastern Railway." This reminded me of another near Bruton on the old Somerset and Dorset still headed with original name. I have records of each of these and determine to add to them as occasion arises.

The actual village of Greatham does not appear to be much changed since I perforce made a considerable sojourn there during the first World War, when I was stationed in the district, as although there has been a good deal of new building, it is mostly on the outskirts and does not detract from the old-world appearance of the main streets of the village. The station is situated a considerable distance from the actual village, so after obtaining a number of shots, including several diesels in both directions, I returned to the village for a snack at one of the "locals."

There I met some villagers who gave me a number of useful tips as to the growing of vegetables and on returning to the station I added a few more shots to my bag. Finally I made my way back, with a further pause at the overbridge near Billingham, and on reaching Stockton betimes I added yet more to my bus collection. When darkness came I changed plates without trouble.

On leaving Stockton, I took my time with the intention of reaching Retford the same evening. I passed through Thirsk, York and Selby, and then found a promising overbridge from which I added to my extensive Eastern and North Eastern Region shots, although the weather was dull and threatening. I eventually arrived at Retford in late afternoon, where I stayed and gathered in bus pictures. Next day was a rainy one, but as I had a few plates left I decided to visit Castlethorpe Troughs on the L.M.R. and therefore found my way across country to Stony Stratford, from whence these troughs are easily reached by car.

After dinner I ran out to Castlethorpe to explore, as it was my intention to find my way to a bridge at the south end of the troughs that I had previously reached only by an interminable walk along the track. This I found I could do by going down a private farm road, the farmer kindly allowing me to do this. I therefore spent the next morning at this spot and obtained some quite presentable shots, but in a rather poor light.

An L.M. Region scene. The down Mid-day Scot approaching Castlethorpe hauled by No. 46200 "The Princess Royal."

About midday down came the rain, so I made tracks and after a drive through continuous rain, typical of a present day English summer, I arrived safely home in the early evening. During the eight days I had covered some 680 miles, and exposed many dozen plates, and had added some 50 odd to my collection of bus pictures.

"TRAINS ANNUAL"

"LOCOSPOTTERS' ANNUAL"

Trains Annual 1958 makes its usual welcome appearance, with well varied and illustrated contents. Locomotive subjects receive plenty of attention, including developments in Swindon practice since the war and E.R. experiences with the B.R. "Britannias," and there are also reviews of one of the steam lines through the Pennines, modern marshalling methods and Automatic Train Control, all subjects in which the railway enthusiast will find much to interest him. Price 10/6.

Locomotive "spotters," and many who are not, will find plenty to interest them in the second volume, the price of which is 6/6. Diesel developments, fireless locomotives and Gresley Pacifics each have chapters to themselves, and of special interest to *M.M.* readers at the moment is an account of the W.R. *Bristolian* and the locomotive work required to keep time on its tight schedule. There are other attractions in plenty, with a goodly number of illustrations.

Both books are published by Ian Allan.

The House-Sparrow

By R. H. Ferry

GARDENERS all over the country set out tin-foil bird scares to frighten away the house-sparrows. While one can sympathise with the gardeners it is well to take a wide view of the situation. Black fly, green fly and many other garden pests are eaten by house-sparrows, birds that are not often given credit as insect eaters, and often are condemned quite erroneously as all-out destroyers of vegetable, fruit and grain crops.

In true fact, house-sparrows eat many insects that other birds will not touch, the pestilent bitter tasting cabbage white butterfly being one of these. It is interesting to note that in Persia sparrows were once trained especially for this purpose, that is for hunting harmful butterflies. The sharp-eyed house-sparrow, always with an eye to the main chance, makes quick work too of destructive scale insects that other birds, even wrens and tree-creepers, do not seem able to find. The saw-fly that does such damage to our valuable oak trees is also taken readily by sparrows.

A naturalist statistician once worked out that 3,400 sparrows, feeding their broods at the rate of 2 caterpillars every 10 min. during 6 out of 24 hours, would kill almost 25,000 caterpillars a day, so that in three months about 23 million larvæ would be prevented from destroying valuable products of the land.

But even with these figures one cannot make a saint of a sparrow, for the bird is primarily a seed eater. Yet, as in the case of the rook, it should be remembered that much of the grain picked up by sparrows and found in their crops would have been wasted in any case.

Though sparrows nest almost all the year round and every building is a potential home site for them, they are by no means as common a species as generally thought. There are approximately 5 million house-sparrows in Great Britain, but there are far more finches, blackbirds and robins.

I quote from E. M. Nicholson's noteworthy book *Birds and Men* (Collins)—"Of Britain's 56 million acres only some 3 million are built up or used for gardens, allotments and similar purposes. The whole area inhabited by house-sparrows is unlikely to exceed 5 million acres, leaving 90 per cent. of the land area entirely sparrowless." On moors and commons therefore it is quite possible to travel all day without setting eyes on these birds, which swarm in every city park and every street gutter.

The sparrow is a friendly bird, the only one that has elected to live in close association with human beings.

A lone sparrow is a thing that one hardly ever sees, whether in town or country. If a sparrow happens to get lost it is as distressful as a single starling on a TV aerial. David saw one and in the Bible made special report of it—"I watched and am become like a sparrow that is alone upon a housetop."

Every sparrow is an interesting individualist, but sociability is a necessity and at the same time the strong point in the survival of the sparrow race. It is

A visit to a bird table.

the only bird that has elected quite voluntarily to live in close association with man, and by using its sharp wits to full advantage it has managed to keep a full crop ever since.

How sparrows first came to be *house*-sparrows is an interesting story. Long ago in the Middle East sparrows discovered the safest places in which to make their nests were under the eaves of temples, and the lesson once learned was quickly adopted by the whole species.

The great naturalist, W. H. Hudson, stated that far more had been written about sparrows than any other birds, but it is rather strange that we have only just started to look really seriously into the sparrow's domestic life. Some unexpected or unsuspected facts have fairly recently come to light. A point that farmers may find difficult to believe is that sparrows rarely range further than half a mile from their home site. They are not in fact great explorers, and even though not actually nesting most sparrows visit the old nesting site once a day.

One does not see sparrows flying very high, or with the aerial grace of tits or finches. The elevation of a roof gutter is quite high enough for a sparrow to see "what's cooking" in the next field, garden or allotment, and if there is "anything doing" the sparrow starts to chirp, letting every feathered neighbour near at hand know about it.

House-sparrows have been described as noisy birds. The twittering that comes from thousands of gossiping throats in the evening, however, when the traffic has slackened down, is pleasant music to the ear of a bird lover. Like chaffinches, sparrows become very talkative before rain—they are reliable bird weather forecasters. There is an old rural saying that "when sparrows ceaseless chirp at dawn of day, wet weather is surely on the way." The habit that sparrows have of dust-bathing in carefully prepared seed beds is not popular with gardeners, but it is a consolation to know in times of drought that sparrow dust bathing is a sign of coming rain. The sagacious sparrow knows that it will be some time before it gets the luxury of another dust bath, so it makes the most of it.

Though the house-sparrow may appear to live a carefree life in our midst, it has a whole host of enemies. In fact it is the universal provider on the menu of most predatory birds and animals. As much at home on the ground as on the roof, it is easy meat, of course, for prowling cats. In the day-time black-headed gulls swoop down and take their toll of sparrow flocks, and at night the little and tawny owls attack them, flying silently over sparrow

(*Continued on page 54*)

Here is another example of the sparrow's friendliness.

Air News

By
John W. R. Taylor

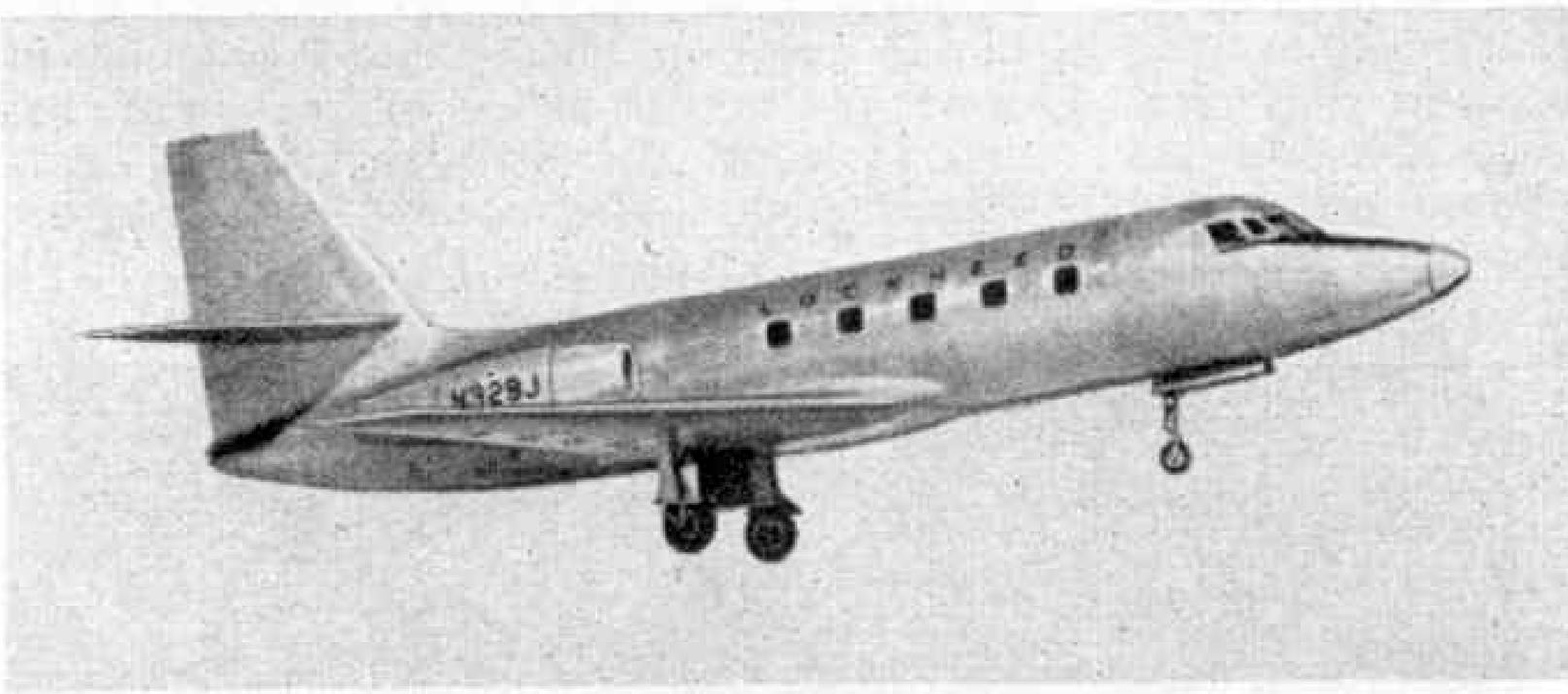
The rear loading door of the Edgar Percival EP.9 can be left off to facilitate the dropping of freight from the cabin during flight.

British Engines Best

Another success for British engines in America has been reported by the Lockheed company, who fitted two Bristol Orpheus turbojets on the prototype of their new JetStar executive transport because the U.S. engines for which it was designed were not ready in time. The Orpheus engines have proved outstandingly successful in the JetStar's flight trials and are now offered as an alternative to four of the smaller Fairchild J83 or General Electric J85 turbojets for production machines. As in the French Caravelle, the engines are mounted in pods on the side of the rear fuselage.

Intended to carry a crew of two and ten passengers in airline-style comfort over ranges of up to 2,000 miles at 500-550 m.p.h., the JetStar will go into production only if the U.S. Services place a sufficiently large order to subsidise the civilian version. There is a good chance that this will happen, because the U.S.A.F. is interested in the possibility of such an aircraft to keep its older pilots trained in jet flying as well as for transport duties.

Incidentally, the JetStar was flown only 241 days after its basic design was finalised. Lockheed had such faith in their employees that they predicted in March of last year that the prototype would fly at ten o'clock on the morning of 4th September, 1957. At that precise moment, it had actually been in the air for two minutes! They also said that the first of their big Electra turboprop airliners would fly on 31st January, 1958, and it will be interesting to see if they meet this target too.



The Lockheed JetStar prototype in the air. The two turbojets are mounted in pods on the side of the rear fuselage.

EP.9 Exports

Britain's newest aircraft company, Edgar Percival Aircraft Ltd., of Stapleford Aerodrome, Essex, has landed contracts worth over £100,000 for nine more of its sturdy EP.9 general-purpose monoplanes. Three of them have gone to Tripoli, where Bahamas Helicopters are operating a miniature airline on behalf of an oil company which has drilling parties working in the heart of the desert. These parties can only be transported regularly and supplied by air, and the EP.9's are flying in technical equipment, food, clothing and household supplies, which can be loaded quickly and easily through large freight doors at the rear and side of their roomy fuselage.

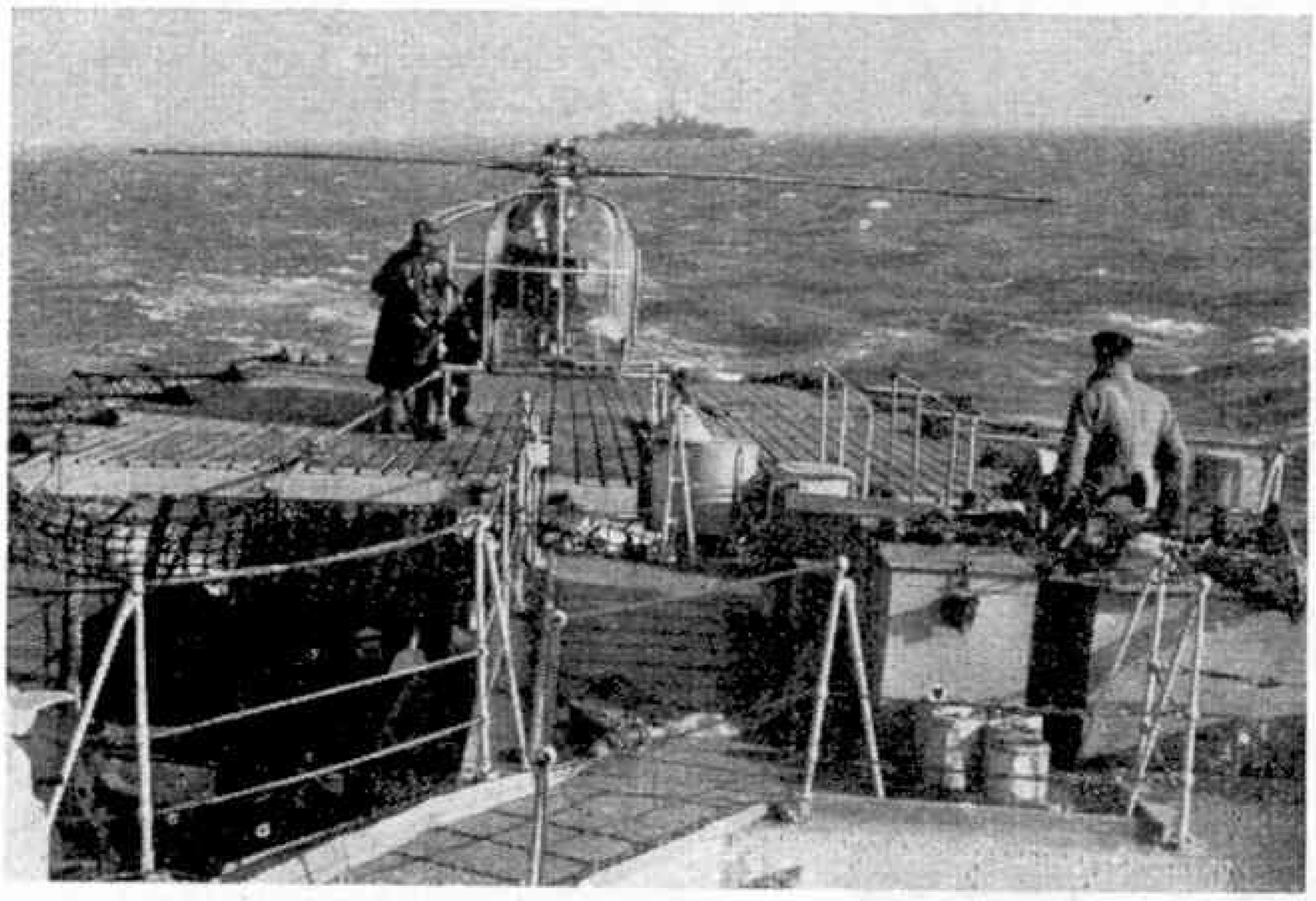
Other EP.9's have been sold to a French company for passenger and cargo flying in North Africa; to E. Ludt, A.G. of Germany for aerial spraying of orchards and crops; to a Swedish company for spreading fertiliser and to Canada for carrying passengers and freight in the "bush" country.

One of the two latest EP.9's exported to Australia for fertilising operations has gone to a firm in Albury, New South Wales, which was the birthplace of Edgar Percival, founder of the company that makes the EP.9 and one of our most famous designer-pilots since the 1930's, when his Mew Gulls dominated British air racing.

Designed, built and flown in only 20 months and put into production in record time, the EP.9 is powered by a 270 h.p. Lycoming engine and can carry six persons, over half a ton of freight, or nearly a ton of insecticide, spraying equipment and fuel when used as an agricultural aircraft. As can be seen in the top illustration on this page, the EP.9's rear-loading door can be left off to enable freight to be dropped from the cabin in flight.

French Helicopters Visit U.S.A.

As part of the sales programme for their new jet helicopters, the French Sud-Aviation company sent two SE-3130 Alouette II five-seaters to the United States for demonstration flights last autumn. When one of the aircraft flew over New York Harbour it was photographed while passing the Statue of Liberty, and our cover this month reproduces the scene.



The Fairey Ultra-Light helicopter on the small platform at the stern of the Naval frigate H.M.S. "Grenville" during recent take-off and landing trials.

Groceries By Air

During the winter months, some ranchers in Idaho, U.S.A., have their food delivered by air. A grocer from Hell's Canyon flies a weekly round delivering supplies to the homesteads, whose owners are asked only to provide a landing strip 500-600 ft. long, with an old pillowcase, pair of trousers or petticoat flying in the breeze as a windsock.

Ultra-Light Joins the Navy

A news item of unusual interest is that the Fairey Ultra-Light helicopter has completed a highly-successful series of trials from a platform built over the deck of the Naval frigate, H.M.S. *Grenville*. Operating in exceptionally rough weather in the English Channel, the little jet-driven helicopter made more than 70 landings and take-offs in winds of up to 62 knots, with the deck pitching 10-12 ft. and rolling up to 14 degrees in each direction.

The object of the trials was to find out whether helicopters could be used for reconnaissance from small ships in all weathers, and my guess is that the result will be a well-earned order for Ultra-Lights for the Royal Navy.

Missile News

Two of America's most important anti-aircraft guided weapons gave impressive demonstrations of their capabilities recently. At Eglin Field, Florida, a Super Sabre fighter fired a small five-inch target rocket and then launched one of the four Sidewinder infra-red "heat-seeking" missiles carried on racks under its wings. The Sidewinder chased after the target rocket, overtook it and blew it smartly out of the sky.

At about the same time, one of Boeing's big ramjet-powered Bomarc pilotless interceptors was launched against an unmanned B-17 Fortress target aircraft that was flying over the Atlantic more than 50 miles from the firing base. Although no warhead was fitted, the Bómarc hunted down its target, dived on it from 60,000 ft. and actually hit and destroyed it.

Indian Names for U.S. Army Aircraft

Some of America's most famous Indian tribes are back on the warpath—indirectly—because the U.S. Army has decided to give its helicopters and fixed-wing aircraft Indian names, except in the case of those like the Beaver, Otter and Bird Dog which already have well-known names.

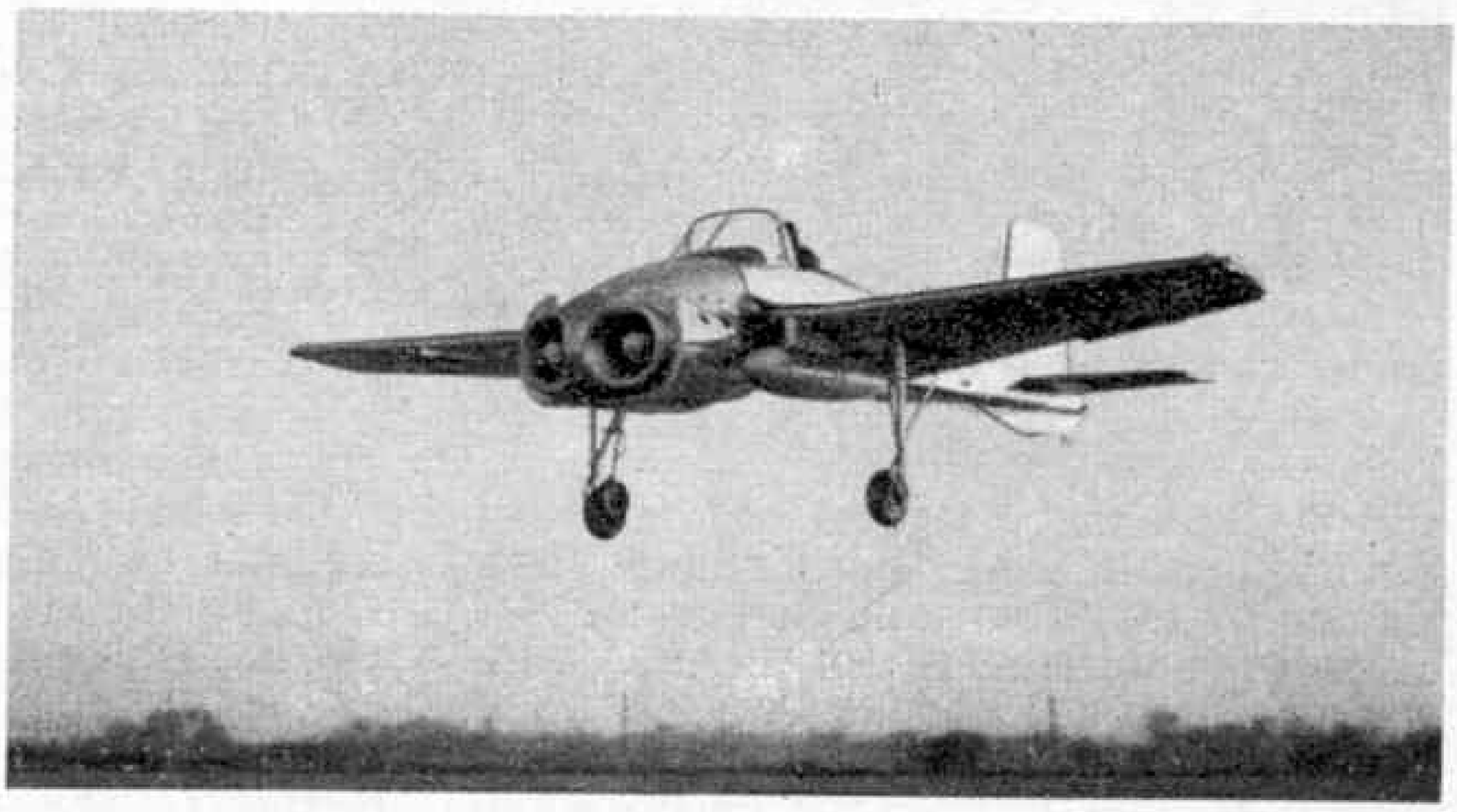
Names so far announced include the Chickasaw (Sikorsky H-19), Choctaw (Sikorsky H-34), Mojave (Sikorsky H-37), Pawnee (Hiller Flying Platform), Shawnee (Vertol H-21) and Sioux (Bell H-13).

New VTO Aircraft

With the first flight of the Fairey Rotodyne on 6th November, 1957, Britain can claim to have the world's first vertical take-off airliner. No ordinary helicopter, the turboprop Rotodyne promises to carry 48 passengers or 4½ tons of freight over ranges up to 400 miles at 185 m.p.h.

Meanwhile, another different vertical take-off technique is being tested in America by the Bell X-14 research aircraft. Thrust diverters or vanes located behind its two British-made Armstrong Siddeley Viper turbojets deflect the jet blast towards the ground and so raise the X-14 into the air by direct jet lift. For forward flight, the pilot simply diverts the jet exhaust slightly rearward, to provide forward thrust as well as lift. Then, when speed is high enough to enable the fixed wings to support the aircraft, the jet exhaust is allowed to escape rearward in the usual way, so that the X-14 flies like other jet-planes.

Because normal control surfaces have no effect during hovering and at slow forward speeds, the X-14 is equipped with compressed air nozzles at wing-tips and tail to provide directional control at that time. In cruising flight, its elevators, rudders and ailerons take over in the normal way. The X-14 has a span of 34 ft. and is 25 ft. long.



This vertical take-off aircraft is the Bell X-14, which has two Viper turbojets mounted in its nose.

A New Style in Museums

Displays Showing How Our Ancestors Lived

By F. W. Robins

MUSEUMS *can* be dull. On the other hand, they need not be, even to those not particularly interested in "old things." This has been shown in recent years by a change in the way of displaying relics of past life. Instead of putting them in glass cases, full of rows and rows of similar things, there is a growing effort to preserve and set out the evidences of our social history in their proper surroundings. This is done by tableaux, as in the Beatenberg caves in Switzerland and in the Folk Museums at Dijon, in Provence and elsewhere, or by putting them in their natural settings in open air museums, so that visitors can see them as the peoples of the past associated with them did.

Interior of a Faroe Island Cottage in the museum at Sorgenfri, Copenhagen.

At a time when increasingly urgent appeals are being made for the salving of old buildings scheduled for demolition, one's mind turns to the brilliantly successful open air museums of Scandinavia in particular. There, instead of fighting an often losing battle to preserve educational architecture, particularly secular buildings, in their original positions, they are removed bodily to concentrated gatherings of their kind. Then they are not only safe from future threats, but are in surroundings more in keeping with them than if they were left in an incongruous sea of modern council estates and shops.

The next step is to furnish the salved buildings with appropriate fittings. This presents no great difficulty. Given a home for domestic appliances, furniture, craft tools and the like, it is astonishing what can be done by acquiring things held in private collections or hoarded as family heirlooms.

In the Scandinavian countries, this sort of thing has been in vogue for some years, with the result that at Bygdoy, near Oslo, and at Skansen, on the island of Djurgärd, Stockholm, a large number of typical national houses, farms, cottages, mills and even churches, have been got together and properly furnished. There they give visitors a more or less complete picture of vanishing peasant life.

The Skansen folk park includes a Lapp encampment and an open air theatre, where folk dances are performed from time to time. To its buildings most of the peasant life exhibits from the Nordiska museum have been removed and most of the attendants are in national costume.

Skansen is national, but there are smaller regional museums elsewhere, notably at Härnösand, in the north, and at Old Upsala, two miles outside the interesting university city.

Denmark has, perhaps, gone a stage further. There comparatively small but none the less useful collections of rural life

A street in the "old town" at Aarhus, Jutland, Denmark.

are to be seen at Glud, Herning and Hjorring, in Jutland, as well as three other outstanding and extensive examples. One of these is at Aarhus, where what is known as The Old Town is a gathering of more than fifty old buildings, mostly half-timbered. These range from the Mayor's House, with its rooms illustrating different periods, and the tradesman-mayor's shop, to the wooden well head in the centre of the square. Among them are a windmill, a water mill, a distillery, an apothecary's shop, and a smithy, with a saddler's and a chandler's, a tobacco warehouse and even a confectionery shop. At the last-named, visiting groups of schoolchildren stand and stare until they realise that the sweets displayed are not edible!

The Old Town at Aarhus is essentially a collection of town houses and town crafts, mostly from various places in Jutland. One minor item that seems to carry a suggestion to us in England is the preservation of some of the trade signs. These are dying out with us even more rapidly than in Denmark, where some are still in use, and soon there may be few of ours left to collect.

In the two other leading open air museums, though they are both on the outskirts of big towns, the theme, curiously enough, is rural. One is just outside Odense, Hans Andersen's town. This has its wind and water mills, its village inn, its smithy, its almshouses, several farmhouses and—serving a useful purpose—its tea garden. There are actual animals in the farmyards and attendants in old time costume.

In the suburbs of Copenhagen, at Sorgenfri, is the third of these museums. This is the biggest collection of all. In it there are over seventy buildings, including farmhouses of varying types and districts, mills, a pottery, a seafarer's house, a primitive farmstead from Schleswig with family and animals under the same roof, and even a Faroe Island cottage, with its primitive fireplace. Interesting details are the "village moot" ring of stones and several examples of the balance lever water raiser, which has travelled across Europe from Egypt and is the predecessor of the pump. Here the open air museum is augmented by a museum of rural craft and industry just across the road.

In all these cases, the buildings are not just shells. In each of them, the machinery and implements of the farm, the domestic appliances of the farm household, including

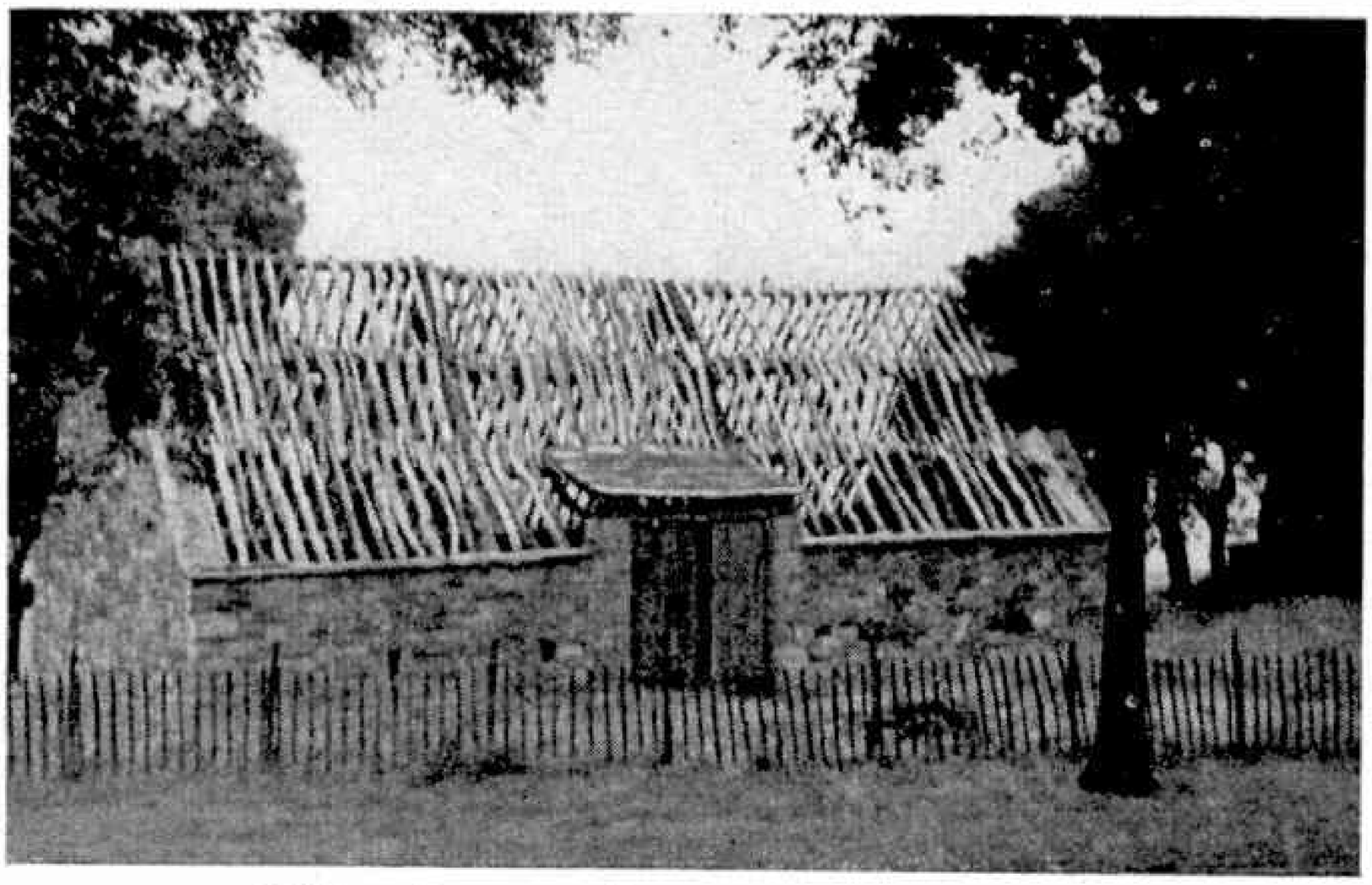
Crofter's Hut at Kingussie.

bowls and frames for dipping candles, dairy utensils, etc., are there, just as they would have been when the farms and homes were occupied.

In this country too a start has been made. Mr. Shepherd's good effort at building up a town street in an old warehouse at Hull was, unfortunately, lost in the blitz. There is, however, the old street of shops, with a tallow candle factory, in the women's court of the old prison at York, as a good example of what can be done on a small scale. This has since been echoed at Kirkstall, Leeds, where a smithy has been included. In Yorkshire, too, is the nearest approach in England to the Scandinavian examples, at Shibden Hall, Halifax. The nucleus there is a half-timbered manor house, furnished, but the yard has been equipped with a series of craft shops, including not only a typical smithy but also a nailmaker's forge. A barn has been re-erected close by, as a start to something bigger.

The most ambitious British attempt is the National Folk Museum of Wales, at St. Fagan's Castle, under the enthusiastic direction of Dr. Iorwerth Peate. Here, again, the principal part of the museum, at the moment, is an old mansion, fitted up in period and including a big Welsh kitchen with the dog wheel for turning the spit, among other things. In the grounds, which provide ample room for future acquisitions, rather more than a start has been made towards a gradual accumulation of rural and craft buildings, such as a mill, an old Welsh barn and the like. In range and widespread interest, it is still a long way from the northern open air museums, but it is progressing towards that goal. The pity of it is that the matter is getting urgent, as every year sees something or other disappear that is not merely a relic of the past but is also part of our education in the evolution and wherefore of things.

In the Isle of Man, a whole village, Craigneish, is being preserved as a living museum of Manx peasant life. A cottage I entered showed the transition, from the open loft that started the upper storey, to the upper storey itself, in the form of a bedroom under the roof, open at one end to give a view down to the living room, with its old hearth, and reached by a steep stair. This is one stage removed from a cottage in Connemara, where a loft was being fashioned for occupation by putting boards across the wall tops, reached by a ladder.



Old barn in course of re-erection at Shibden Hall.

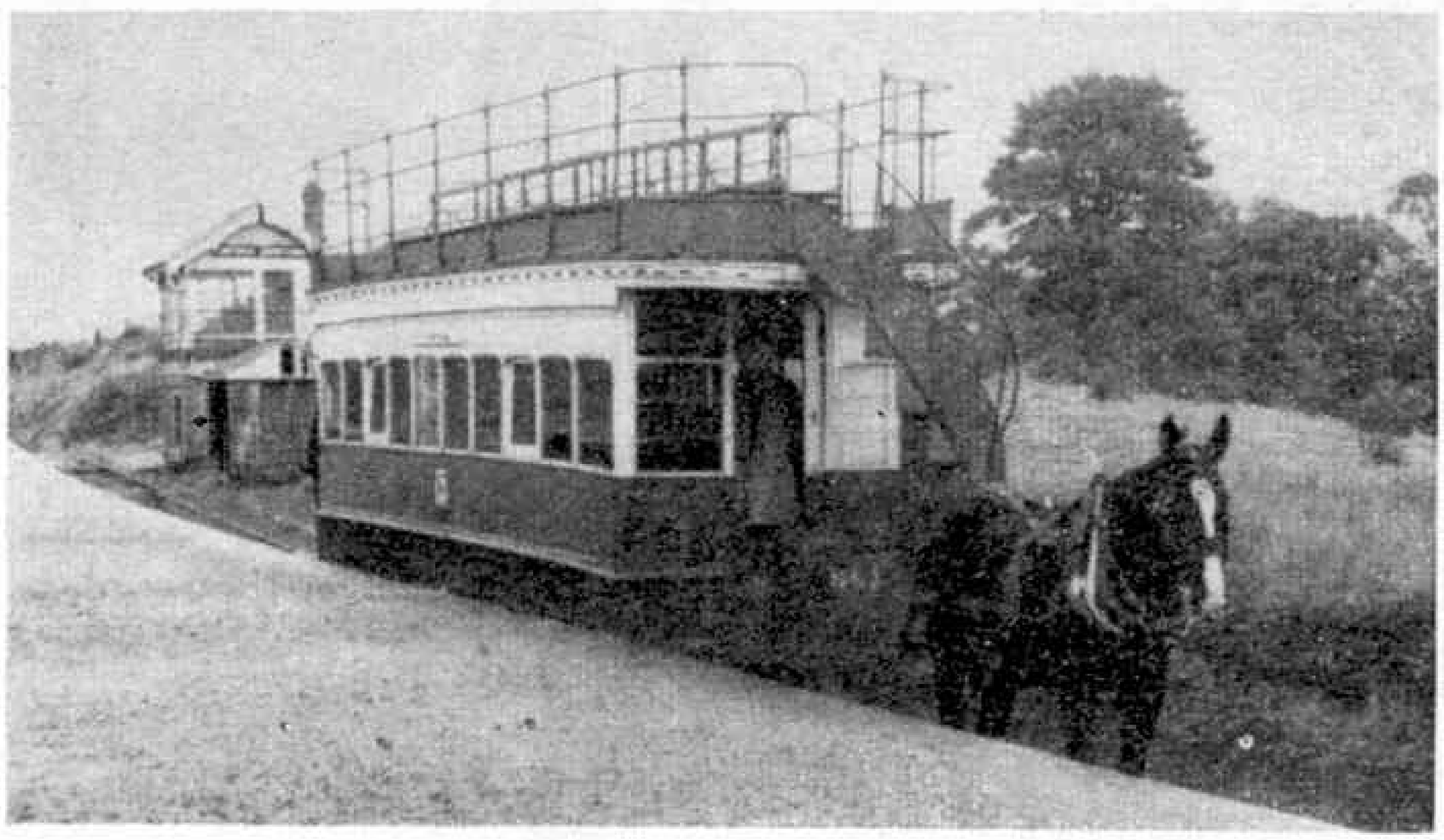
The Rural Industries Museum at Reading is not quite in the same category, having little space in which to "plant" buildings from elsewhere. It has, however, a collection of vehicles, including farm wagons, and, most usefully, a workshop for their restoration, skilfully and accurately, under the charge of an expert. After all, a carefully restored working model is much better than a decaying wreck or a picture of something which has gone.

In Scotland, the well-intentioned Highland Folk Museum at Kingussie was, unfortunately, closed and allowed to become derelict. But it has recently been re-opened under the auspices of Edinburgh University and, although it was impossible to go into the crofters' houses when I was there, they were in reasonable condition and were to be put in order so that they could be opened up again.

In Denmark, incidentally, the main open air museums are extensively subsidised by the two famous brewery concerns at Copenhagen. The smaller examples, however, such as those at Herning and Glud, are the products of individual enthusiasm.

MECCANO MAGAZINE

Junior Section



The Fintona Horse Tram

The fine picture above has reached me from Geoffrey Oates, Doncaster. Most of you will probably recognise in it the famous horse tram that ran between Fintona and Fintona Junction, on the Omagh-Enniskillen Section of the Great Northern Railway of Ireland. This service came to an end on 30th September of last year. It has been worked by a horse drawn tram since 1854. The vehicle in use at the time of closure was painted in the cream and blue livery of the G.N.R.(I) for its bus and railcars, and it also boasted the company's coat of arms on each side. Cinder was laid between the rails, for the benefit of the horse, and a small stable was provided at each end in which it could rest between journeys.

Latterly nine trips were made daily each way to connect with the trains at Fintona Junction. The time allowed for the journey was usually 15 minutes, the speed being about 3 m.p.h. The gradient was slightly in favour of the horse on the return journey from Fintona Junction, and on the visit of Mr. Oates encouraged it to canter home.

It is interesting to record that after holding sway for 103 years, this horse-drawn tram was not withdrawn in favour of a more modern method of transporting passengers to and from the Junction. It was indeed the closing of the railway serving the Junction that caused the "death" of the Fintona Horse Tram.

Felix and Mitten seem to be keen Hornby-Dublo Train fans. They certainly keep careful watch on operations carried out by Leo Wilson, Lower Hutt, Wellington, New Zealand.

Easy Model-Building

Spanner's Special Section for Juniors

Two Models for Outfits Nos. 0 and 4

THE first of two new models I am describing this month is an Office Chair, a simple little model designed for Outfit No. 0. It is shown in Fig. 1.

To make the seat of the Chair you must bolt two Flat Trunnions to a Bush Wheel 1, so that the holes at their pointed ends overlap. Now fix a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 2 to the Bush Wheel, and fasten a $2\frac{1}{2}''$ Stepped Curved Strip to each lug of the Double Angle Strip. Bolt a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip between the upper ends of the Curved Strips, and fix a $2\frac{1}{2}''$ Strip 3 to the centre of the Double Angle Strip.

For the base you should fix two Trunnions to a $2\frac{1}{2}''$ Strip 4 and bolt two Fishplates to the flange of each Trunnion as shown. Fasten a 2″ Rod in the base of the Bush Wheel 1 and slide a 1″ Pulley on the Rod. Now pass the Rod through the centre hole of the Strip 4 and place another 1″ Pulley on it. Press the two 1″ Pulleys together and fasten them on the Rod so that it is supported vertically in the Strip 4.

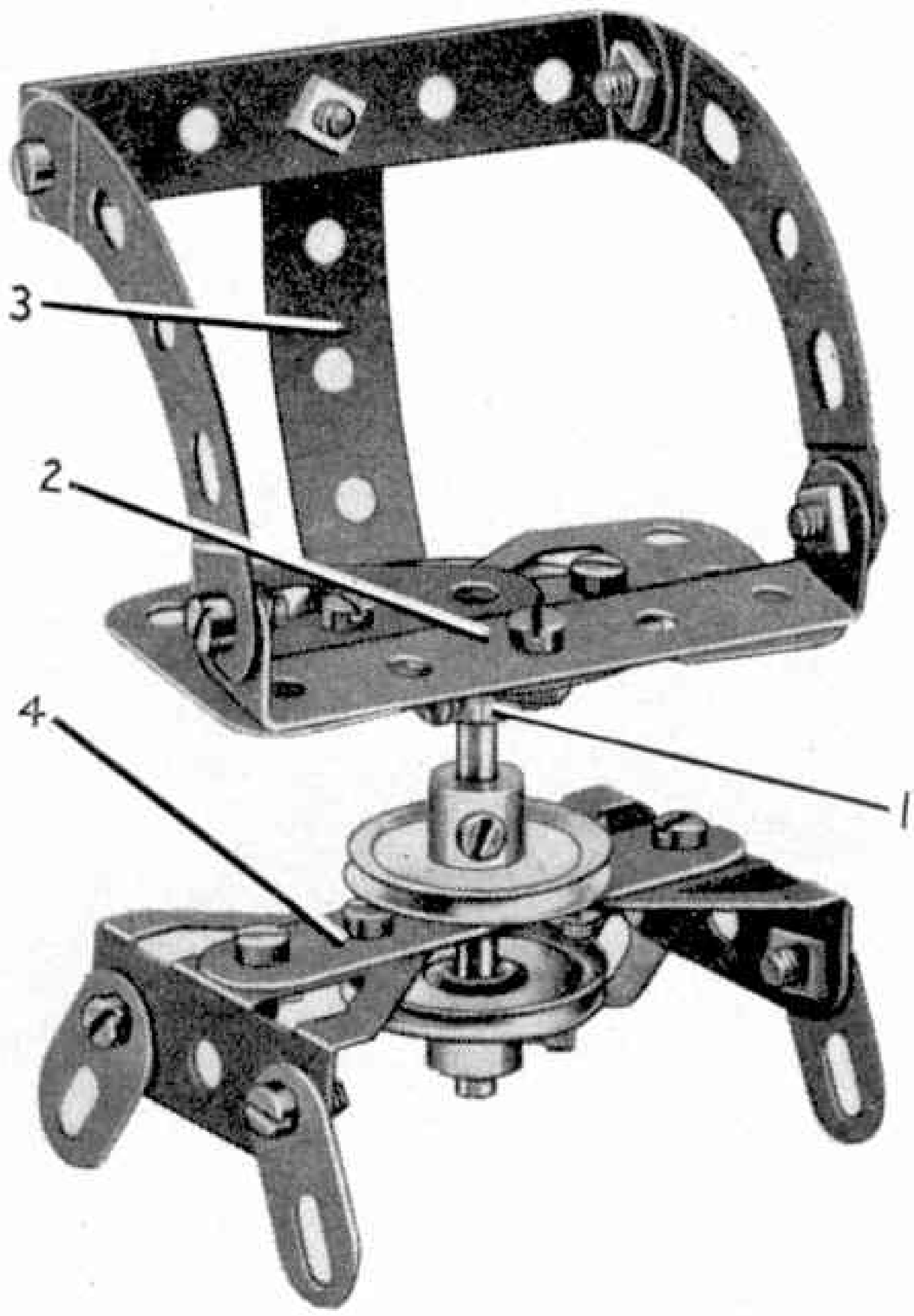


Fig. 1. This Office Chair makes a novel, easy-to-build subject for No. 0 Outfit owners.

A list of the parts required to build the Office Chair will be found at the end of this article.

The second model is the attractive Hammerhead Crane shown complete in Fig. 3. The wheeled base of the model should be built first, and you should begin this by bolting a Flanged Sector Plate to each of the shorter flanges of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate. Fix a $5\frac{1}{2}''$ Strip 1 to the lower end of each Flanged Sector Plate and attach a similar Strip to Angle Brackets bolted to its flanges. The wheels are 1″ Pulleys and you should mount these on a 1″, a 2″ and two $1\frac{1}{2}''$ Rods supported in the pairs of $5\frac{1}{2}''$ Strips.

To complete the wheeled base fix $2\frac{1}{2}''$ Stepped Curved Strips as bracing members between the Flanged Plate and the Flanged Sector Plates, and bolt a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 2 between the long flanges as shown.

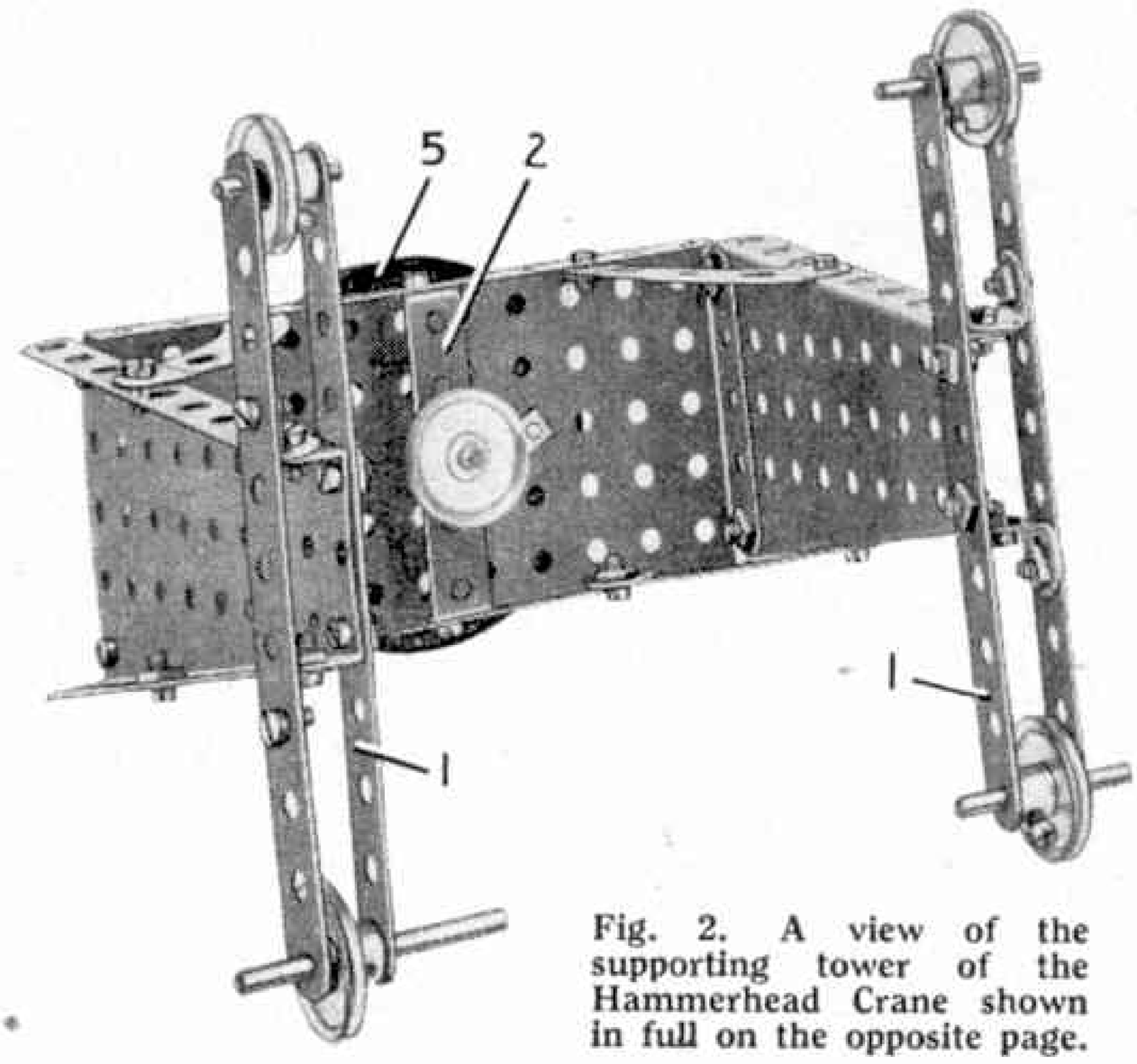


Fig. 2. A view of the supporting tower of the Hammerhead Crane shown in full on the opposite page.

You should start construction of the boom by bolting a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate 3 to a 3″ Pulley 4. Fix a 2″ Rod in Pulley 4, pass it through a similar Pulley 5, the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate and Double Angle Strip 2, and hold the Rod in place with a 1″ Pulley.

The next step is to attach a $12\frac{1}{2}''$ Strip 6, a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate and a made-up strip 7 to each flange of the Plate 3. Connect Strip 6 to a similar Strip 8 by means of a Fishplate, and bolt Strip 8 to the Flexible Plate. Fix a $3\frac{1}{2}''$ Strip 9 to the rear end of strip 7 and connect it to the Flexible Plate by a made-up strip 10. The strips 7 and 10 are each made with a $5\frac{1}{2}''$ and a $2\frac{1}{2}''$ Strip. The Strips on each side are connected across by five $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips, in the positions shown in Figs. 3 and 4.

To make the travelling carriage bolt two Double Brackets to a $2\frac{1}{2}''$ Strip and arrange them to slide freely on the Strips 8. Bolt a Stepped Bent Strip underneath the $2\frac{1}{2}''$ Strip and mount a $\frac{1}{2}''$ loose Pulley 11 on two bolts held in the sides of the Stepped Bent Strip by nuts. To operate the carriage you must turn a Crank Handle held in the strips 10 by Spring Clips. Cord tied to the $2\frac{1}{2}''$ Strip is passed over a $3\frac{1}{2}''$ Rod 12, is wound three or four times round the Crank Handle and is tied again to the $2\frac{1}{2}''$ Strip.

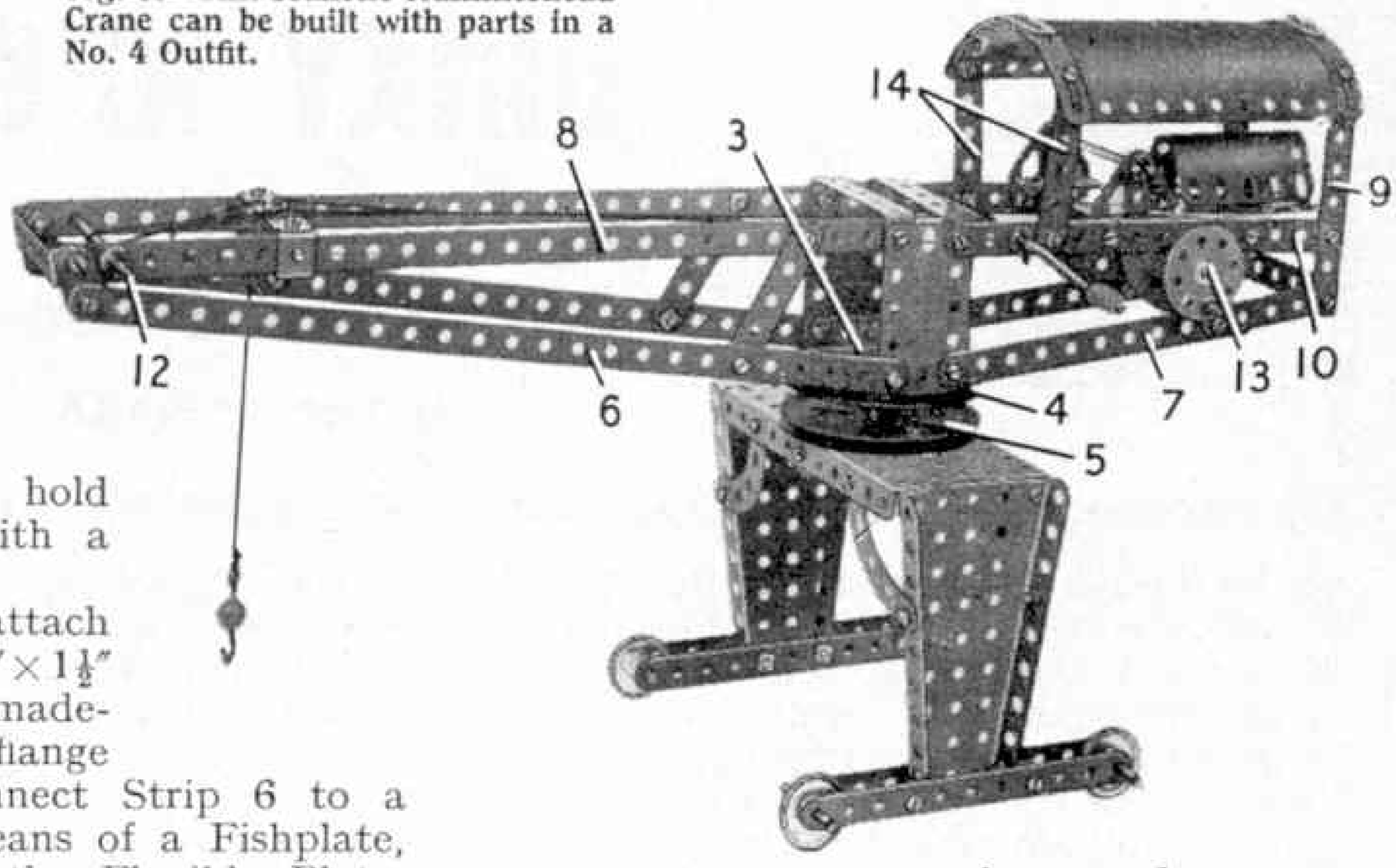


Fig. 3. This realistic Hammerhead Crane can be built with parts in a No. 4 Outfit.

Raising and lowering the load is operated by Cord tied to a $3\frac{1}{2}''$ Rod 13. The Cord is passed over Pulley 11 and is fitted with a Small Loaded Hook. Rod 13 carries a Bush Wheel fitted with a $\frac{3}{8}''$ Bolt as a handle, and it is mounted in Semi-Circular Plates bolted to the strips 10.

The floor of the control cabin is a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate. You should bolt this to one of the Double Angle Strips at the rear of the boom and support its front end with Angle Brackets. Two Trunnions bolted to the floor support a $3\frac{1}{2}''$ Rod, and a U-section Curved Plate is bolted to an Angle Bracket to represent the operating machinery. The cabin roof consists of two $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates edged by Formed Slotted Strips, and attached to Obtuse Angle Brackets bolted to Strips 9 and 14.

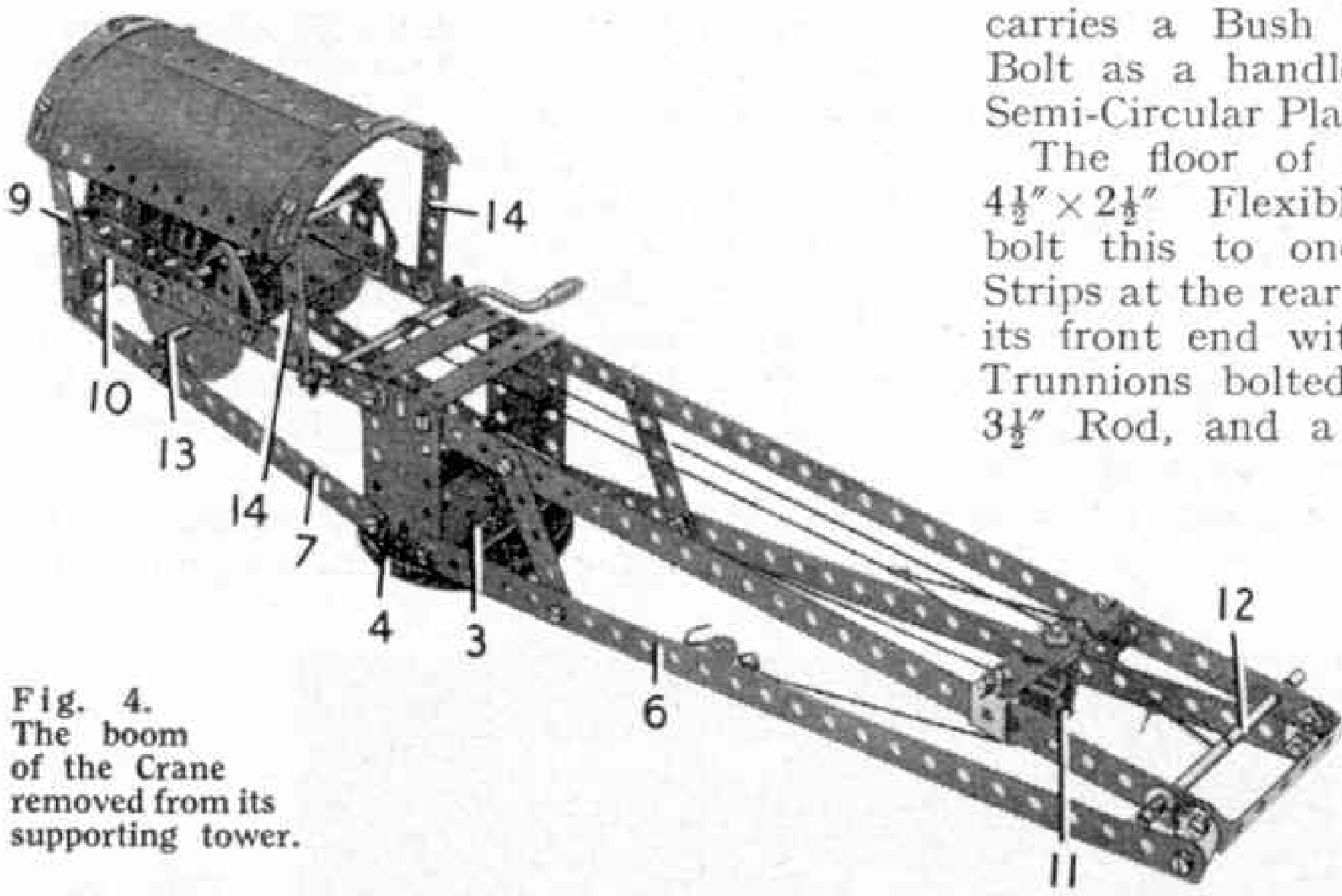


Fig. 4. The boom of the Crane removed from its supporting tower.

Parts required to build the Hammerhead Crane: 4 of No. 1; 8 of No. 2; 2 of No. 3; 9 of No. 5; 2 of No. 10; 2 of No. 11; 7 of No. 12; 4 of No. 12c; 3 of No. 16; 2 of No. 17; 2 of No. 18a; 1 of No. 18b; 2 of No. 19b; 1 of No. 19g; 5 of No. 22; 1 of No. 23; 1 of No. 24; 7 of No. 35; 80 of No. 37a; 79 of No. 37b; 8 of No. 38; 1 of No. 40; 1 of No. 44; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 1 of No. 57c; 4 of No. 90a; 1 of No. 111c; 2 of No. 126; 2 of No. 188; 1 of No. 191; 2 of No. 192; 1 of No. 199; 2 of No. 214; 4 of No 215.

Parts required to build the Office Chair: 2 of No. 5; 4 of No. 10; 1 of No. 17; 2 of No. 22; 1 of No. 24; 16 of No. 37a; 16 of No. 37b; 2 of No. 48a; 2 of No. 90a; 2 of No. 126; 2 of No. 126a;

DINKY NEWS

For Dinky Toys Club Members and All Dinky Toys Enthusiasts

By **THE TOYMAN**

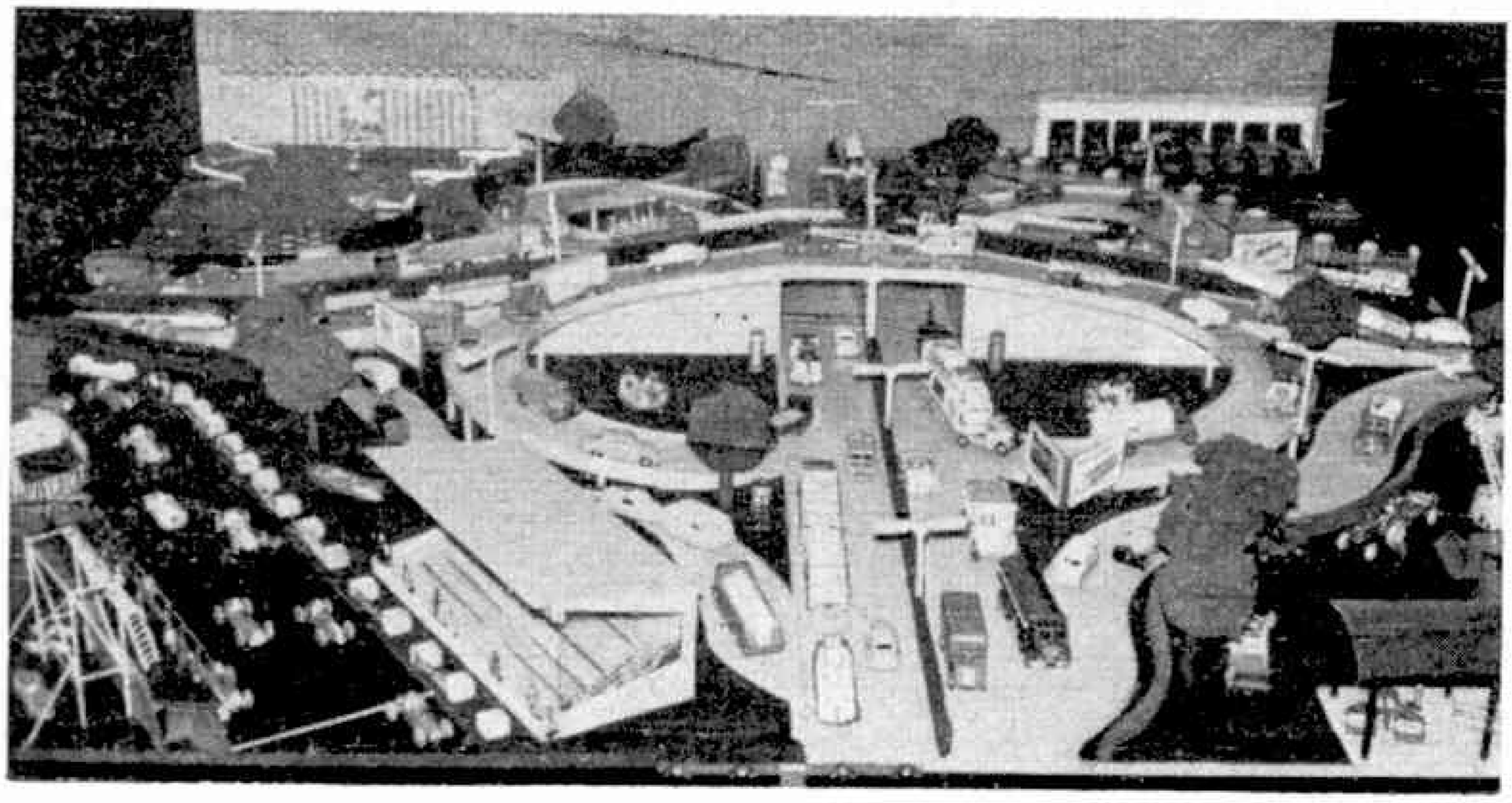
ANOTHER Christmas with all its festivities has come and gone since the last time I had a chat with you, and as usual, there are now many hundreds of boys and girls, who, as a result of Christmas presents received, have joined the ranks of Dinky Toys owners for the first time. Probably some of your friends can be numbered among these, and if so you can help them to obtain the greatest possible pleasure from the Dinky Toys collecting hobby by telling them all about the Dinky Toys Club and persuading them to become members. You will also be helping yourself and the Dinky Toys Club generally.

I expect you have already studied the accompanying pictures, but I would like to draw your special attention to the lower one on this page. This shows a very fine Dinky Toys layout that represents a clover-leaf road junction, with an airport, an army depot, a motor car race track and a machinery depot occupying the four corners respectively. It was designed and assembled by Mr. B. M. Wilson, Barking, Essex, and I think it is the best and most original built by a Club member that I have seen.

The layout is assembled on a baseboard 7 ft. square, which can be folded. The flyover, ramps, grandstand and race pits are constructed from hardboard; the trees from foam rubber and — old chair legs! A disused bath mat of the foam rubber type also provided the material for the hedges, and the fences, scoreboard and Dutch barn, which is visible in the lower right-hand corner, are made from Balsa wood. The model was built to accommodate the whole range of Dinky Toys, and there were in fact 155 Dinky Toys and Supertoys on the layout when the photograph was taken.

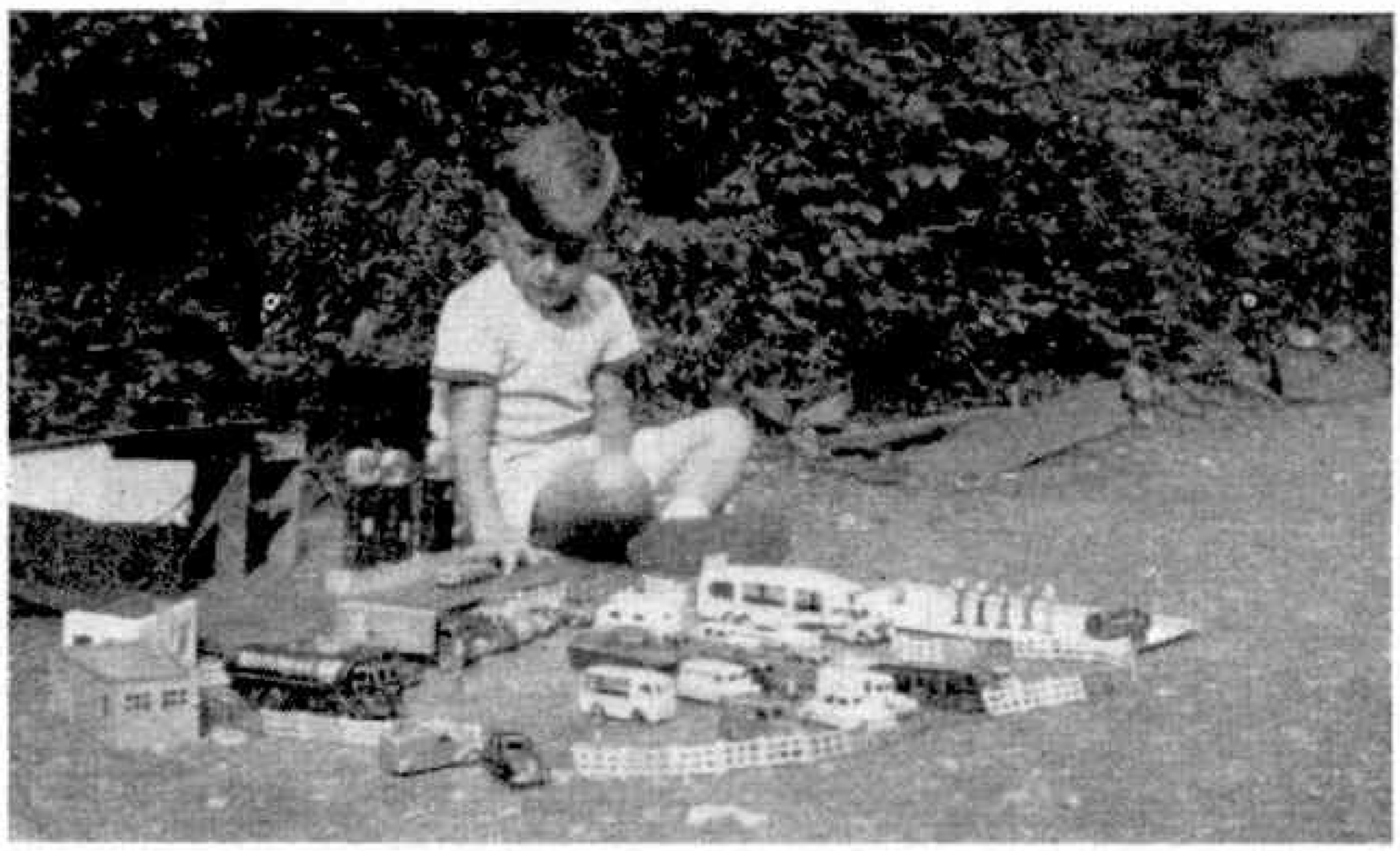
M. Firczuk, an enthusiastic Dinky Toys collector who lives in Sayreville, U.S.A.

The new model I want to bring to your notice this month is another important



This splendidly detailed Dinky Toys layout includes a miniature race track. It is owned by B. M. Wilson, Barking.

addition to the range of Dinky Toys Army vehicles. It is No. 643 Army Water Tanker, and two pictures of it appear on these pages. One of these shows the model "in action," while the other is a close-up view that reveals the accurate moulding and the splendid amount of detail included in the Water Tanker.



Raymond Henso, E. Croydon, playing with his Dinky Toys out of doors during a spell of fine weather.

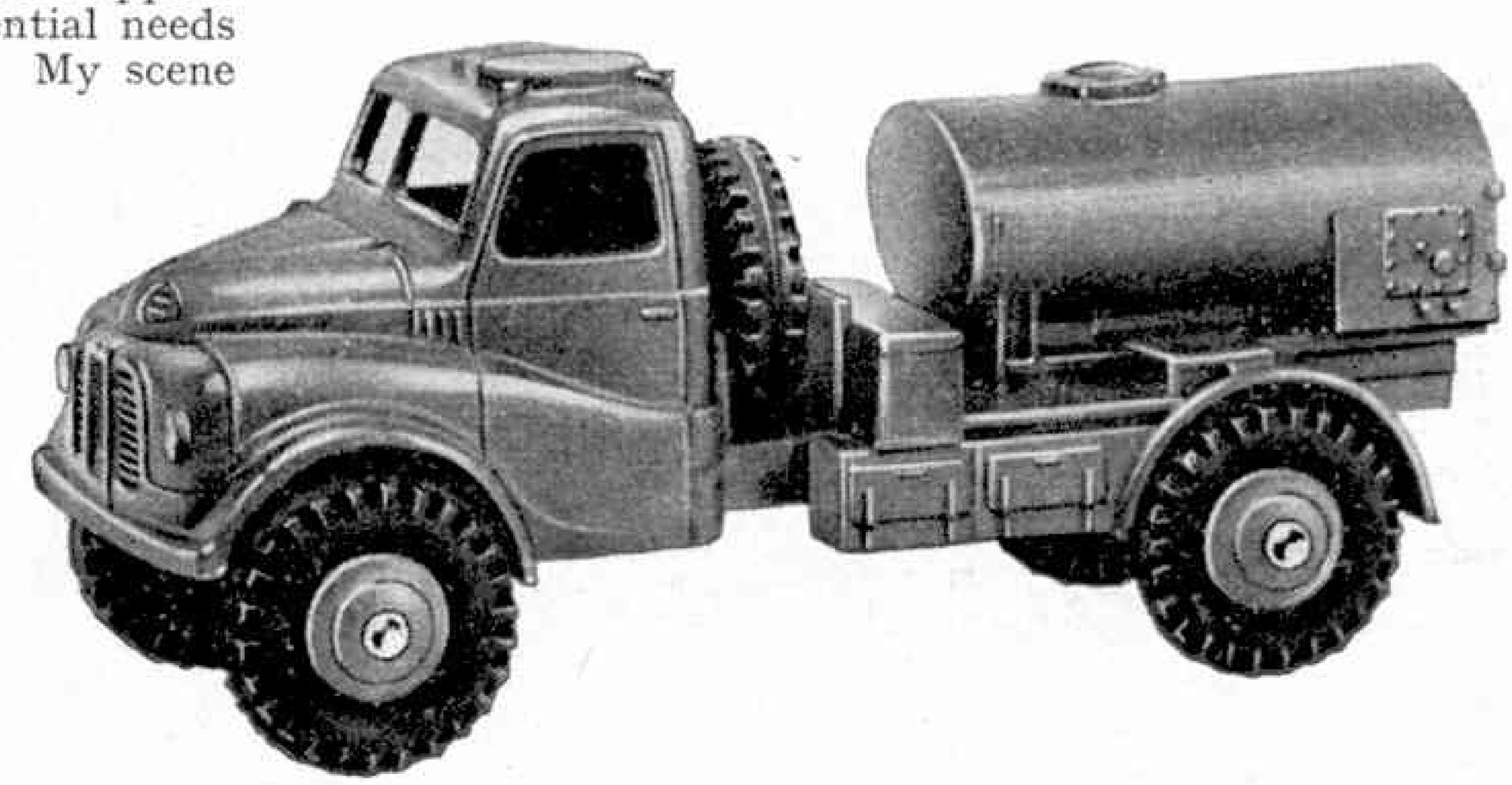
The vehicle represented by the attractive Dinky Toys miniature is an Austin commercial chassis modified to meet service requirements, with four-wheel drive. The vehicle is fitted with a 200-gallon capacity water tank, and the Dinky Toys model carries the familiar blue and yellow signs of the Royal Army Service Corps at the front and rear.

The Dinky Toys Army Water Tanker represents one of the vehicles engaged in ensuring that a mechanised unit has sufficient supplies to meet the essential needs of its personnel. My scene represents a Water Tanker and a 3-ton Army Wagon rejoining the column after they have been for fresh supplies. A group of soldiers watches the approach of the vehicles keenly. No doubt they have been looking forward eagerly to their arrival.

The new Army Water Tanker is fully up to the high standard set by the earlier models in the Army series. It is exceptionally well detailed and is finished in the correct shade of service green.

The scene with the Army vehicles shows the models operating over a desert, where water supplies are likely to be very limited. My next picture, on page 30, is in complete contrast, and much more in keeping with the time of the year so far as enthusiasts in Great Britain are concerned. It is a snow scene, and in it I have made use of two very popular Dinky Toys, the Telephone Service Van, No. 261, and the Breakdown Lorry, No. 430.

The picture shows one of the situations often encountered in bleak country after a storm and a heavy snowfall. One of the posts carrying telephone wires across a moorland road has been blown down during the storm and has fallen across the road. Travelling conditions would be difficult enough along the exposed road because of the snow, but the accident to the telephone post has blocked the road completely. To clear it as quickly as possible a local garage has provided a Breakdown Lorry to drag the post to one side, while Post Office Telephone Engineers have arrived in



This fine Army Water Tanker, Dinky Toys No. 643, is the new model for this month.

This realistic desert scene shows the new Water Tanker, No. 643, and a 3-ton Army Wagon, No. 621.

their Van to try to restore communications as soon as the road is clear. From the look of the tangled telephone wires they will have quite a difficult task, and I do not envy them, working under such icy conditions!

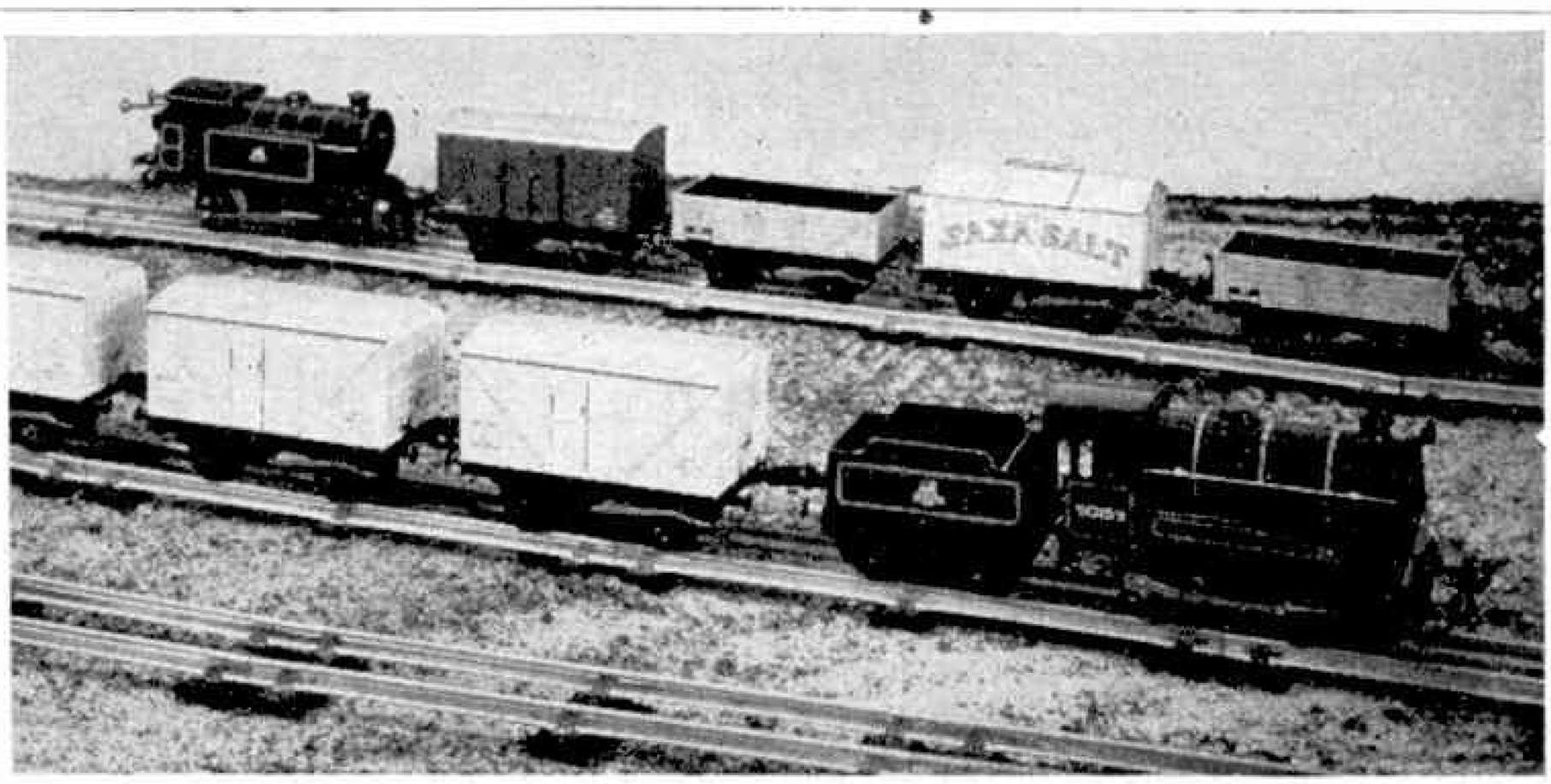
The general arrangement of the scene follows the practice I have outlined in previous articles, with a cloth or a sheet of paper spread over blocks laid on a suitable baseboard. You should arrange the blocks irregularly to give the effect of rolling, bleak hills when the cloth or paper is laid over them. Beyond that all you require are a few handfuls of salt to spread over the scene, and of course the appropriate vehicles and the telephone posts.

I have described the assembly of miniature telephone poles previously, but the following brief details of the scheme may be helpful to new readers. For the posts I use the handles from small paint brushes that have outlived their original purpose. The cross arms are matchsticks glued to the handles, or tied in place with cotton. Cotton is used to represent the telephone wires, and it should be passed through small pieces of paper glued to the cross arms.

A snow scene of the kind shown in my picture is surprisingly easy to arrange, and the result is well worth the time and the small amount of effort involved in arranging the scene. If you spread the "snow" on an existing layout, take care to keep it within the limits of the baseboard. If you decide to make a special snow scene it is a good idea to use a large tray for the base.

After the storm! Heroic work by Dinkytown repair men after a heavy snowfall.

"Tommy Dodd" writes about:



Keeping Traffic Moving

IN the earliest days of our railwaying it is not difficult to achieve the aim of all transport operators—to keep traffic moving. We have a simple oval track and a train of convenient length, and we wind the engine time after time to send it off on its journey. The train is never still for long, for after all running it is fun, and there is nowhere else for the train to go except along its continuous track.

Then we begin to see that there is more to it than this. By degrees the railway grows. We lengthen the straight run by the addition of further rails and perhaps the space we have allows us to increase the width of the railway too. That is easy enough, because in addition to the standard Straight Rails there are Half Rails and Quarter Rails, both straight and curved, to help us to stretch our layouts to fill the space available.

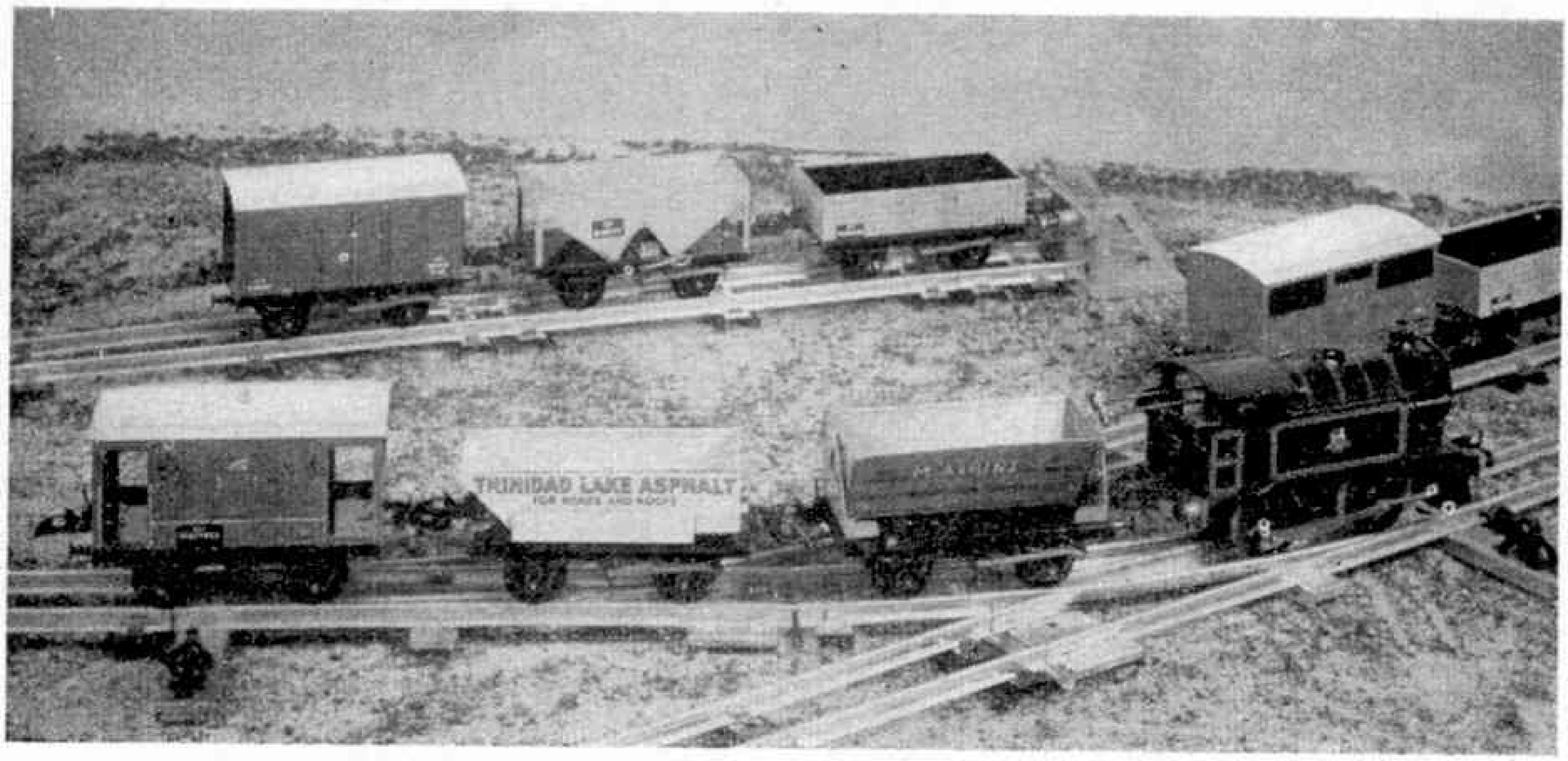
In the picture at the head of the page an express goods train of No. 50 Refrigerator Vans is seen headed by a No. 51 locomotive. A local goods train is shunting in the background.

The addition of Points makes it possible to include sidings and loop lines and it is at this stage that the younger owner sometimes make changes in his layout that hinder rather than help the running of the trains. Sidings are useful, of course, besides being railwaylike. We can always use them to hold rolling stock not in use or even to accommodate a whole train when necessary. But until the railway is developed to include running loops and alternative routes, with sidings in addition for the storage of stock, it is probably better, on a Hornby Clockwork railway, to aim at maintaining the continuous running idea in our track developments.

Here is an idea of what we should have in mind. If we have a plain siding the train entering it can run straight in if the siding is approached by facing Points, that is to say Points laid so that they offer an alternative route to the train. Once the train is in the siding it cannot resume main line running unless it is backed out again. On the other hand, if the train backs into the siding first it will have a straight run out. But whichever way we manage things a reversing movement is necessary. So on the whole, perhaps, we should aim at having loops, that is side tracks with points so arranged that trains can run straight in from the main line and can regain it later by running straight out again.

A loop helps to make a railway busier, for it can readily form a passing place in a track that is otherwise single line so that there can be more than one engine in service, and traffic can be worked correctly in each direction. One train just waits in the loop while the other makes its journey round the main track. This gives plenty of good practice in what I may call line control, that is in the correct setting of the Points according to the movements to be made and in the management of the engines and rolling stock.

This kind of experience will be useful



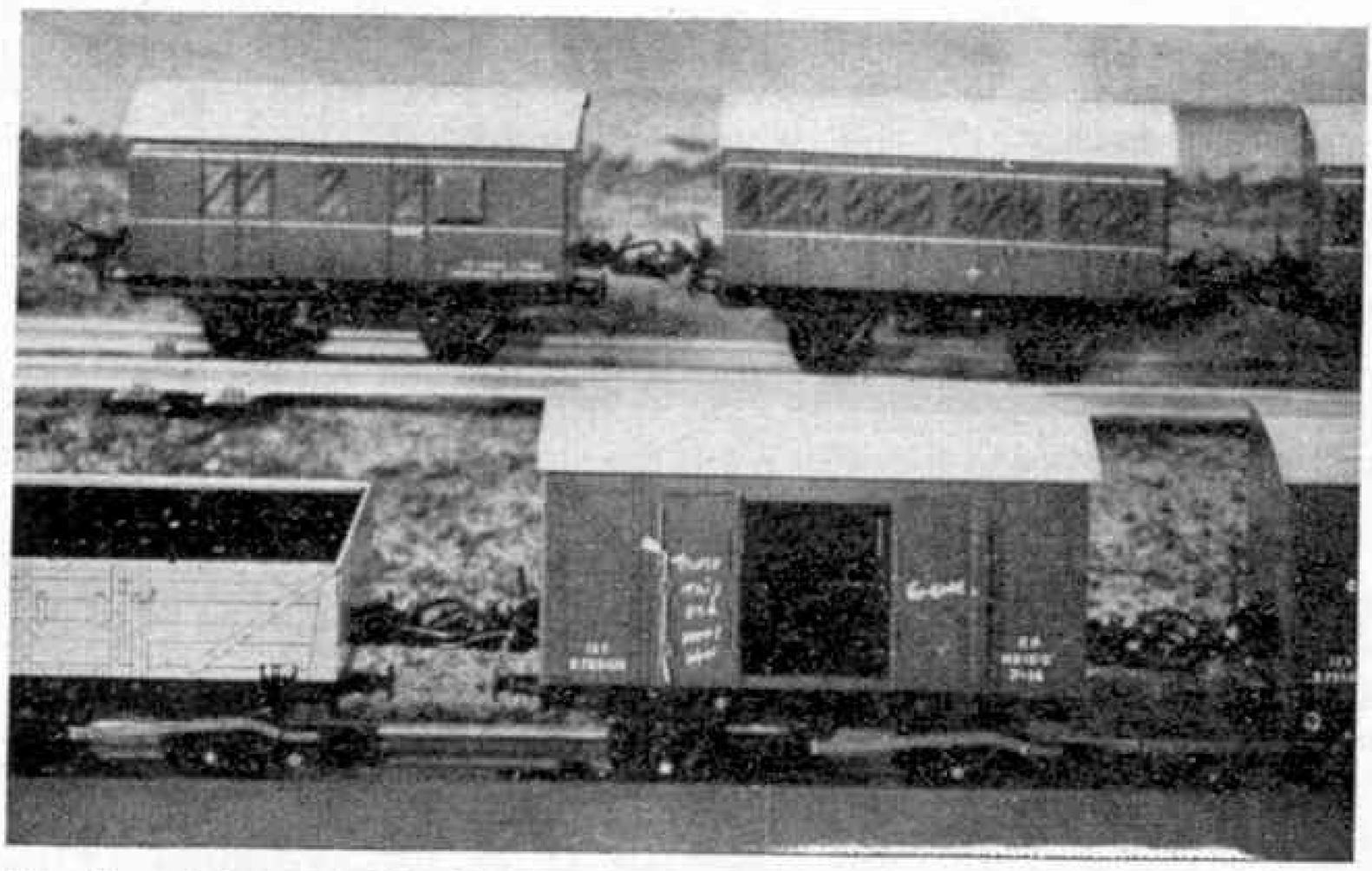
A Hornby No. 40 Tank sets off with a short train of Tipping Wagons. No doubt these are required at some engineering operations down the line.

when the layout is built up to include a system of sidings later. Such a system may well have a series of Points leading to various tracks, and operating one set of Points may call for working others as well, according to the movements to be carried out. This sort of thing is shown in a simple manner in the picture above where two Points, one Left Hand and one Right Hand, are used to provide a connection between a siding system and the main line. The moving train has already encountered left hand facing Points and the engine and the first wagon are then just passing over right hand trailing Points to gain the main line.

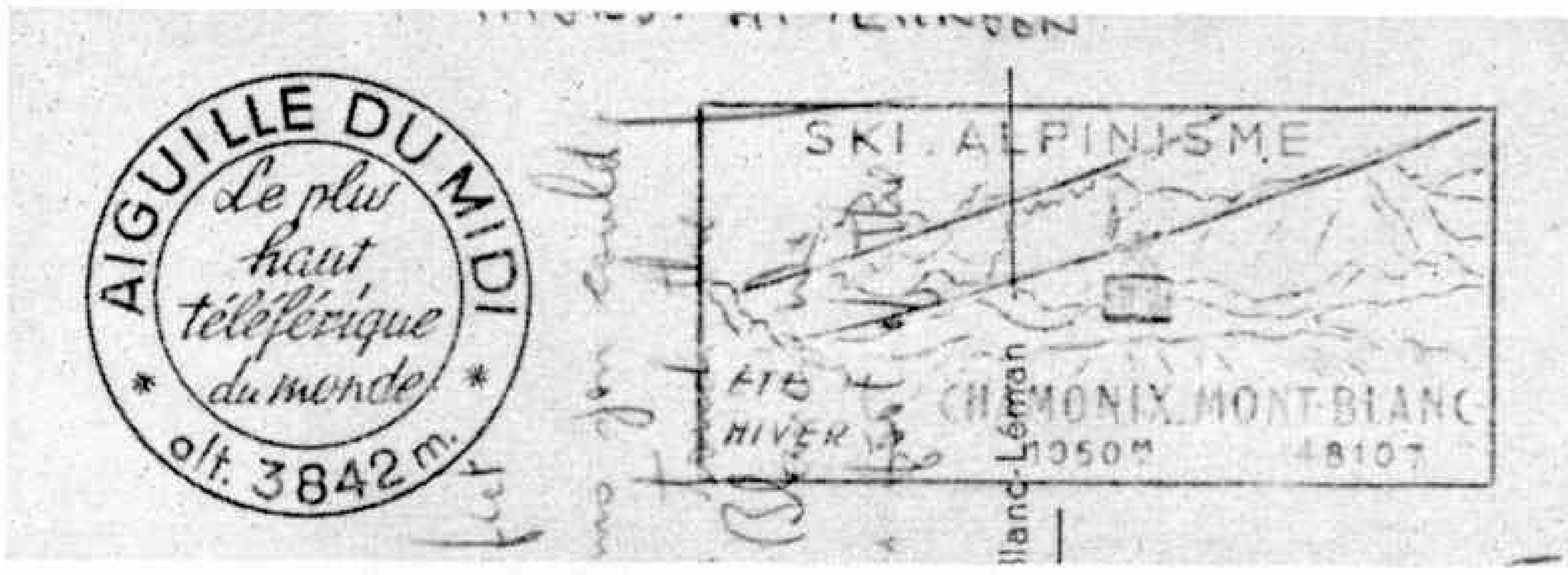
In the arrangement shown one pair of switch rails should always be set for the straight when the other is set for the curve. If this rule is followed it will make for safety in working as long as we start off correctly by working one point lever and following this by working the other.

Last month we talked about Hornby engine running and many of you have become Hornby enginemen since then. Remember that apart from the engine itself, the condition of the track and the rolling stock has a great deal to do with the performance you will get from your locomotive. With care and attention the running of new equipment will improve. Engine and stock will run more easily after use and I feel too that the track does become "ironed out," as it were, as the result of running so that it provides a smoother path for trains.

Apart from the improvement normally expected from an engine as it becomes run in, you will find that the extension of the railway to include more straight track will help matters too. This provides the opportunity of adding further vehicles to the train and then more interesting and realistic working with more varied rolling stock begins.



The hinged doors of Hornby No. 50 Vans, when open, provide the opportunity for the writing of destinations or instructions on their inner sides, to guide the goods loaders.



Of General Interest

More About Postmarks

The Highest—

The inclusion in the *M.M.* of pictures of postmarks on cards sent from high places has produced some interesting correspondence, and I am wondering if the postmark at the head of the page is the highest ever. It was sent to me by M. W. Jones, Great Baddow, who while on holiday last summer was lucky enough to take a trip on the cable railway to the top of the Aiguille du Midi, a sharp peak rising steeply from the Chamonix valley, and situated very close to Mont Blanc. There he put the card in a postbox at a height of 12,605 ft., and the postmark states that the "teleferique" is the highest in the world, giving the height in metres.

The cable railway is certainly a wonderful piece of work. On it our reader was lifted over 9,000 ft. in two stages, being suspended at one point more than 1,600 ft. above the ground, and the station at which the ascent finished is perched on top of a bare pinnacle of rock just a few feet lower than the Aiguille.

—And the Lowest

By way of contrast, I am able to show you, at the foot of the page, the postmark on a letter posted at the *lowest* Post Office in the world. This was sent to H. N. C. Shadlock, B.P.A., of Hemsworth, Pontefract, by a friend in Israel, and came from Sedom, at the south-western end of the Dead Sea. This place is 392 metres, or 1,285 feet, below sea level. The cancellation is particularly interesting because it has the date 14.2.56, which was the actual date of the opening of the post office.

Mr. Shadlock remarks that Sedom is very close to the actual site of the very ancient cities of Sodom and Gomorrah which were destroyed by "brimstone and fire." The Dead Sea is one of the most important sources of potash, bromine and other chemicals in Israel, and Sedom is the centre of that trade.

An up Manchester express on the Midland main line near Radlett. The engine is class 5 4-6-0 No. 44984. This and the upper illustration on the next page are from photographs by C. R. L. Coles.

Railway Notes

By R. A. H. Weight

Midland Express Journeys

Many of the fast timings to and from St. Pancras introduced last summer, requiring start to stop averages of about 60 m.p.h. over a rather severely graded route, have lately produced some exciting running. The 6P 3-cylinder Jubilees with a full load for the hardest schedules—nine modern corridor coaches and restaurant cars, over 300 tons in all—literally have not a second to spare sometimes if delays occur or weather and other conditions are unfavourable, though fine efforts are often forthcoming from engines and crews.

I went through to Manchester in September behind No. 45650 *Blake*, a smart Kentish Town locomotive, on the 12.25 p.m. from St. Pancras, which travels by way of Nottingham utilising one of a number of alternative routes that the former Midland Railway layout provides. The load was 310 tons, including passengers, etc. There is a lot of uphill work in the first 20 miles past Elstree and St Albans, and we had to slack at the latter city because of engineering work, being over 2 min. late when passing Luton at 74 m.p.h. Opportunity to recoup was taken swiftly, however, in more ways than one, as we accelerated rapidly down the gradual descent towards the Ouse valley, attaining 92 m.p.h. near Ampthill followed by a sustained 88, and passing Bedford station at 84 m.p.h., 49¾ miles in 50 min. from the start.

The sharp pull up to Sharnbrook summit, mile-post 59¾, reduced speed just below 50, followed by a maximum of 70 near Wellingborough, bringing us to Kettering Junction, 1¼ miles south of the station, 70¾ miles in 68¼ min., and on the right side of time. There trains destined for the Melton Mowbray route that we were to follow cross over cautiously to the slow line and travel thereon through Kettering and out into the country again until diverging at Glendon Junction.

Unfortunately, in addition to some miles of slower travel made necessary, *Blake* also had to observe a long track-repair caution in the same area, causing 3 min. loss, half of which was recovered along the ensuing 47 miles to Nottingham. This station was reached only 1½ min. late after another maximum of 83½ m.p.h. The 123½ miles from London had taken 125½ min. though scarcely more than 2 hrs. net on allowing for the delays in wet, misty weather.

Proceeding across country we arrived in the remarkable Trent station, stopping at the east side of the island platform on the up main line from Chesterfield and the north to St. Pancras! We were bound for Derby, but the network of junctions permits departure from Trent in either direction and we were soon curving round to join the track leading from the north end of the down platform, and also the Leicester-Derby direct line, which avoids Trent altogether.

More connecting spurs, avoiding lines and marshalling yards are noted around Derby station, partly rebuilt and modernised. This is a hub of the Midland Division with the important trunk-route from Bristol and Birmingham merging there. Restaurant cars were detached, and the footplate crew changed, and then we were off again with 7 coaches to tackle the long and severe climb through the Peak of Derbyshire, culminating in the grandeur of Monsal and Miller's Dales and at Peak Forest summit, well over 900 ft. above sea level amid limestone crags and moorlands. There were some steady ascents at about 40 m.p.h., and stops at Matlock and Miller's Dale, where a diesel unit was on trial before taking over the elevated Buxton branch working. Speeds up to 70 down the long and sharp descent into the Manchester outskirts followed, with more interesting railway networks and locomotive observations, and we arrived at the Central station, which rather resembles St. Pancras internally, soon after 4.30 p.m.

In the opposite direction by the 10.25 from Central, the 6 coaches were hauled to Derby by Stanier class 5 2-cylinder 4–6–0 No. 44822. Finer weather with improved visibility allowed greater appreciation of the lovely hills, dales, woods and so on. There are numerous tunnels and viaducts. With a stop at Chinley, where the scenic North Peak line towards Sheffield diverges, the 17-mile climb to Peak Forest was a tougher proposition, but time was kept until signals called a halt before Derby, speed not rising above 62 to keep the train steady on the winding descent between the Miller's Dale and Matlock stops.

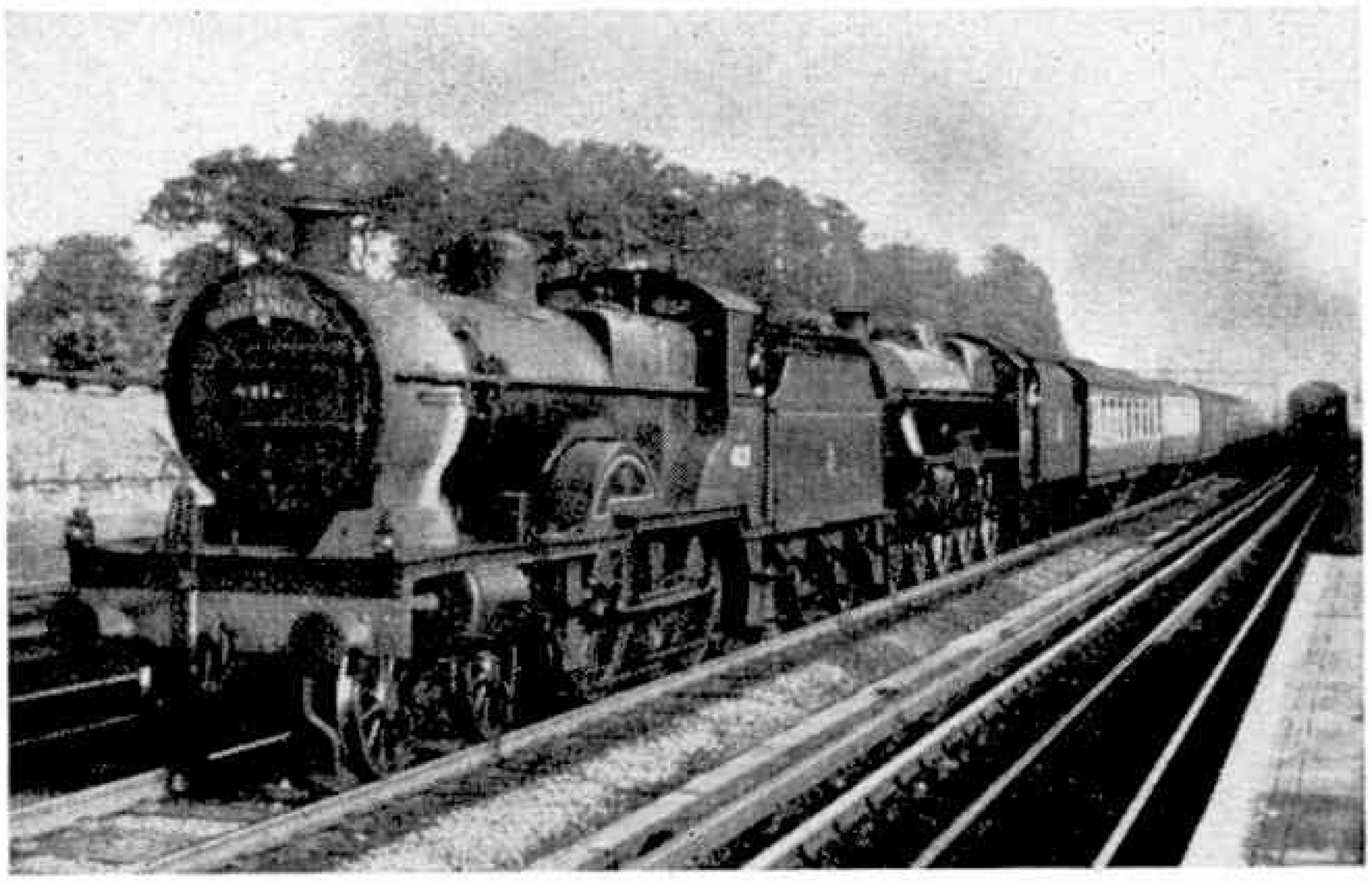
Since these runs were made an innovation has been the transfer of 6 larger 7P Royal Scot class 4–6–0s to Kentish Town depot, whence they are being employed with apparent success on the St. Pancras-Manchester expresses. This should also reduce the amount of double-heading lately necessary on busy days on trains with loads exceeding the class 5 or 6P limit.

Locomotives in the News

New locomotives have been added to stock and allocated as follows: class 9 2–10–0 Nos. 92150, 18B, Westhouses shed; No. 92149 and also Nos. 92178-9 with double chimney, 35A, Peterborough; class 4 2–6–0 No. 76113-4, 65B, St. Rollox, Glasgow. The last named were probably the last two steam locomotives

to be built at Doncaster Works, a famous plant that has produced 2,228 engines for the G.N.R. and its successors, including so many outstanding designs such as the Pacifics in classes A1-4. No. 76098 has been allocated to 67A, Corkerhill, Glasgow.

With diesel-electric propulsion, the first 1,250 horse-power main line mixed traffic type A1A-A1A No. D5500 is allocated to 30A, Stratford, from the Brush Electric Company's Works; 1,000 h.p. Bo:Bo Nos. 8005-11, 1D, Devons Road, London; standard shunting class, Nos. D3386-93, 65A, Eastfield, Glasgow; D3441-4, 34A, King's Cross; D3445-6, 35A, Peterborough. Diesel-hydraulic 225 h.p. Nos. 11715-6, 62B, Dundee, Tay Bridge.



The down "Midlander" for Birmingham and Wolverhampton is here seen passing Carpenders Park. Compound No. 41121 is piloting Jubilee 4-6-0. No. 45738 "Samson."

It is interesting to learn from the Western Region that No. 7013, *Bristol Castle* was lately transferred from Worcester to Old Oak Common shed, whence it works to various destinations including Bristol. Standard class 5 4-6-0s are stationed at King's Cross now and are seen on many different services far and wide. V2 2-6-2s shedded at Neasden or Leicester haul the principal trains on the Great Central section, operated by the E.R.

Aboard the "Midlander"

These titled trains are the only two of the 2-hr. Birmingham-London L.M.R. expresses to bear names. Their journeys start at Wolverhampton and Euston respectively, with mile-a-minute timing between Coventry and London. One leaves Birmingham at midday, and the other leaves Euston at 5.50 in the evening, Mondays-Fridays.

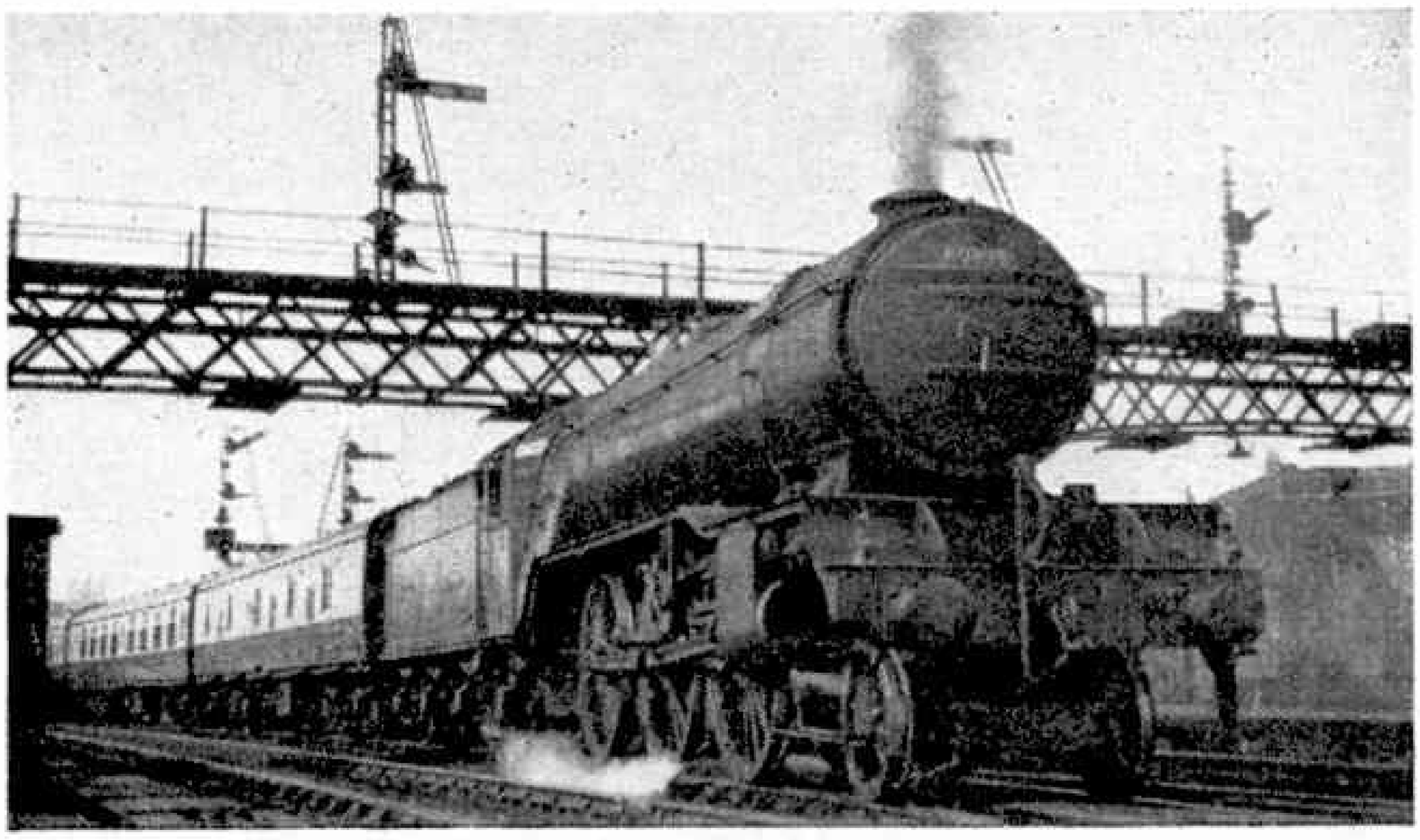
From Euston at 5.50 p.m. I rode behind Jubilee No. 45733 *Novelty*, with two coaches added to the choice maroon 9-set and nearly full, making a load of about 370 tons in all. Three more important named expresses bound further afield were to follow us at 10-minute intervals. Engines were ready for them at Camden as follows: *Mancunian*, 6.0 to Manchester, No. 45540 *Sir Robert Turnbull;* 6.10 to Liverpool, *Merseyside Express*, No. 46200 *The Princess Royal;* 6.20, *Ulster Express* to Morecambe, for Heysham, No. 46239 *City of Chester*.

There was a severe slowing for repair work before Bletchley, where speed could have been high, but all signals were clear and with the customary fast finish after leaving the main line at Rugby, No. 7 Box, we were not much behind time at Coventry. An assisting engine such as is depicted in the accompanying illustration would have been welcome on that occasion!

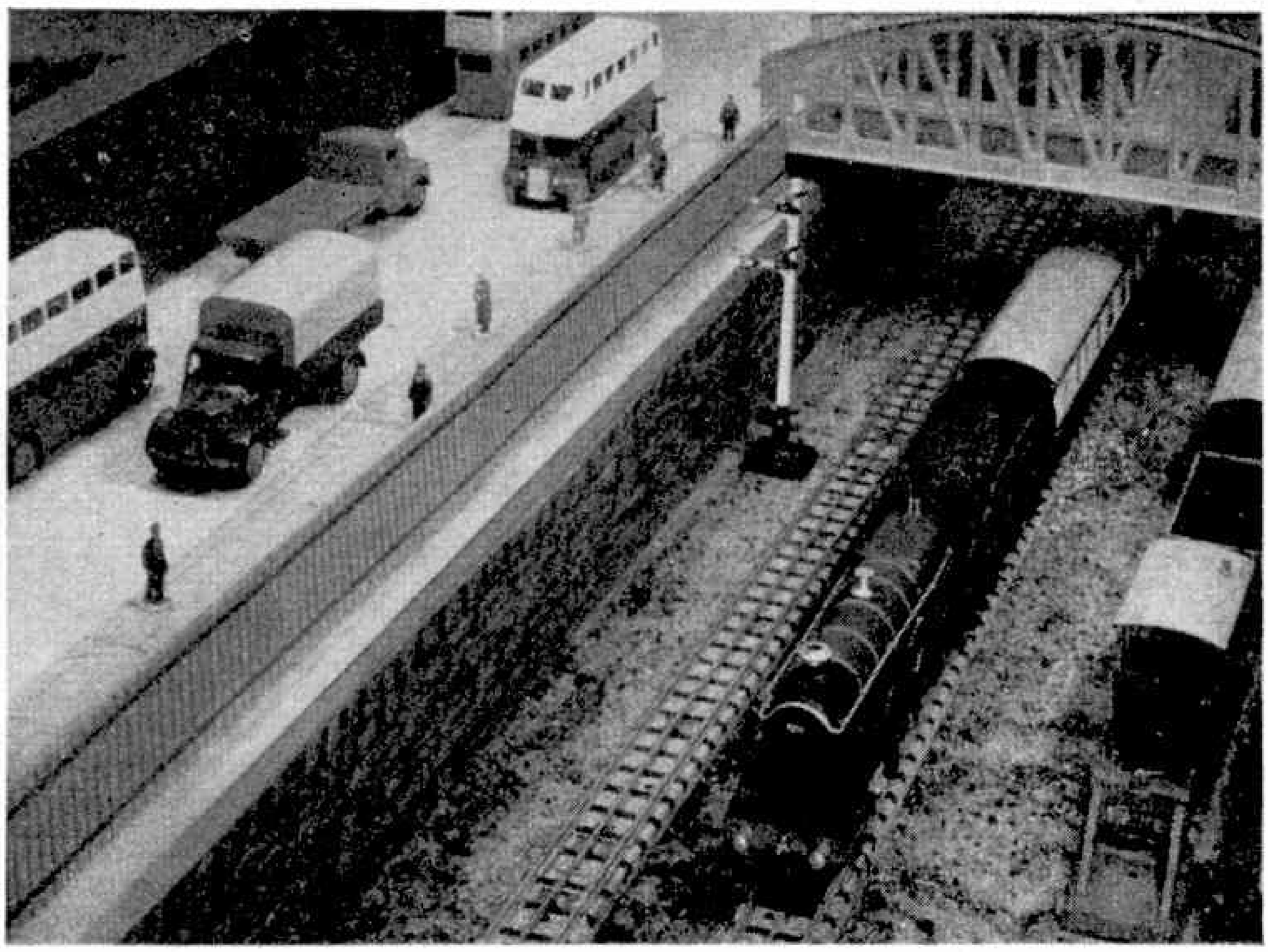
Scottish Running and Observations

On the afternoon Perth-Euston express with a heavy load, 13 plus van weighing some 455 tons, Mr. Norman Harvey logged an excellent run from Carstairs to Carlisle behind Britannia 4-6-2 No. 70054 *Dornoch Firth*. The ascent to Beattock Pass, which is not so arduous on the north as the south side, was achieved with a minimum of 48 m.p.h., followed by an average of 67 down to the Border and Gretna Junction with maxima of 76-79 m.p.h. So notwithstanding two slowings, Carlisle, 73½ miles, was reached in 73½ min., 1½ min. less than the fairly tight 75 min. allowance.

At Perth and while travelling thence via Stirling and Falkirk to Edinburgh, I noted further interesting examples of interchanged train and locomotive working between former L.M.S. and L.N.E.R. lines or services. The southbound "Postal" on the first stage of its long run to Crewe and Euston, also conveying passengers from Aberdeen to Perth, was hauled as far as the latter city by a V2; the mail vans were taken forward by B.R. class 5 4-6-0 No. 73009, and the following Glasgow and Edinburgh train in which I travelled by similar L.M.R. type No. 44925 to the busy junction of Larbert. From there the Edinburgh portion, hauled by ex-L.N.E.R. D49 3-cylinder 4-4-0 No. 62725 *Inverness-shire*, ran on to the Glasgow (Queen Street-Edinburgh (Waverley) main line, but diverged in Edinburgh to arrive at the former Caledonian Princes Street terminus.



Green Arrow 2-6-2 No. 60898 starts away from Aberdeen for Edinburgh. Photograph by M. A. Arnold.



"Bristol Castle" threads a shallow cutting below street level. This situation provides a splendid opportunity for using the Hornby-Dublo Girder Bridge.

HORNBY RAILWAY COMPANY

"Going Western"

By the Secretary

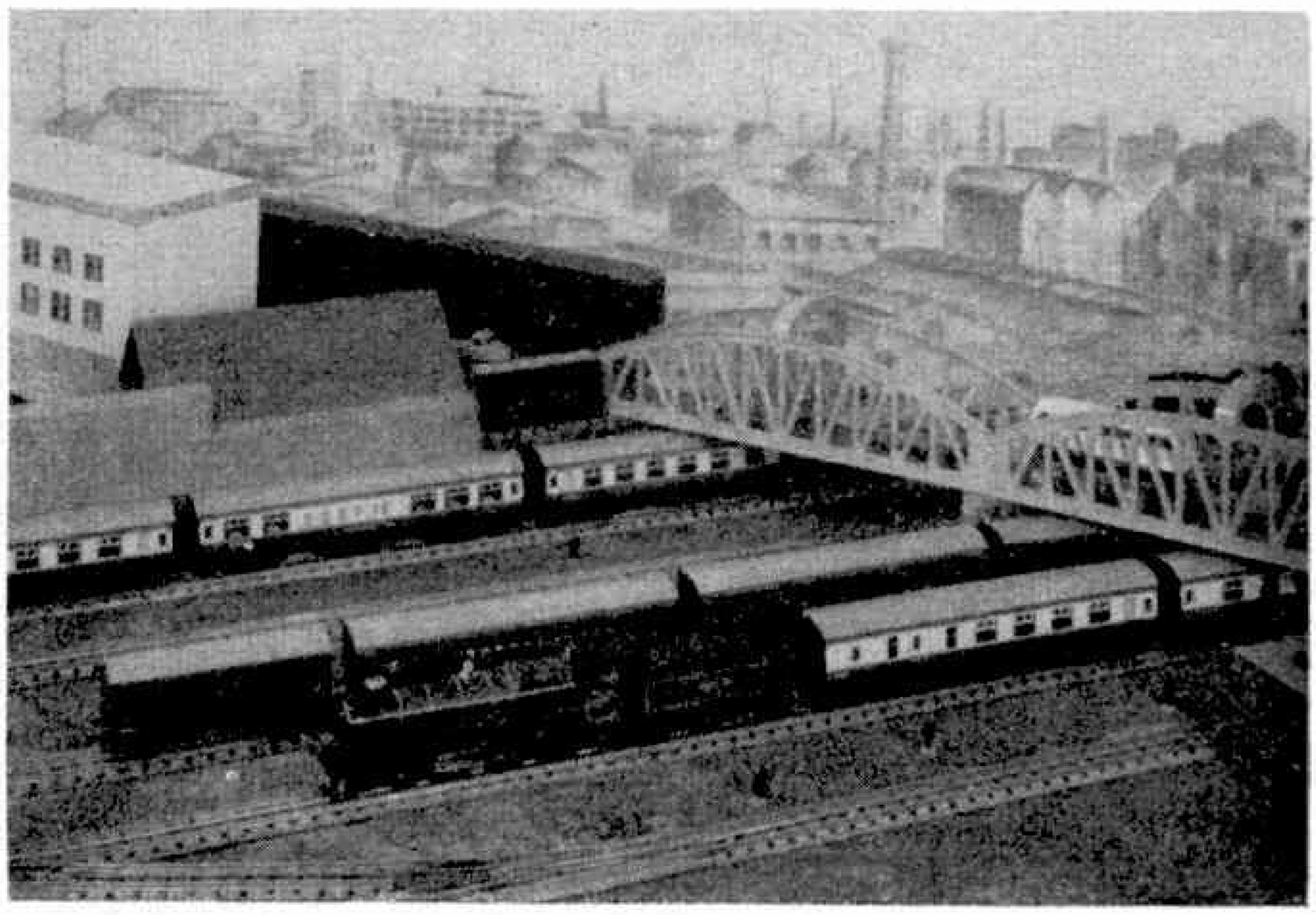
IT is quite clear from correspondence received from Hornby-Dublo owners everywhere that the Hornby-Dublo *Bristolian* Train Set and the separate W.R. introductions are providing lots of splendid running on many miniature railway systems. I know that many Hornby-Dublo railways have begun operations recently and any one starting with a *Bristolian* Train Set, or a *Bristol Castle* Locomotive and W.R. stock, is fortunate indeed.

Many *Bristol Castle* enginemen have referred with enthusiasm to what they describe as the "scale performance" of the engine, which makes it easy to handle from the control point of view. The introduction of the Castle into Hornby-Dublo may well develop a tradition of "driving" practice in miniature in keeping with the skilled handling called for in real-life train running in the Western Region.

Suppose that your *Bristol Castle* comes backing down steadily into the platform road, where its train is waiting. You ease up gently, to engage the Couplings between the tender and the first Coach—there is no need for the fireman to get down between them in Hornby-Dublo, as the Couplings do the job for him! Then when all is ready for departure you can make what I may call a "Paddington start," for the engine will move off with its train in an easy confident manner and settle down to a good spell of smooth, speedy travel.

In its purposeful acceleration *Bristol Castle* matches the feats of the real engines of the class. You will not need any extreme speed to run your miniature train to time. *Bristol Castle* is not made that way, and it will travel quite fast enough for the safe negotiation of curves and points.

Obviously the working of a miniature *Bristolian* service will be the first thought of the owner of the new Train Set or the components. This is a non-stop service between Paddington and Bristol, with a start to stop average speed of over 67 m.p.h. To maintain this the real *Bristolian* has to hold a speed of nearly 80 m.p.h. over the greater part of its run and in places can reach 90 m.p.h. or more. It is to match this performance with equivalent speeds in Hornby-Dublo that our miniature *Bristol Castle* has been designed. All who have seen



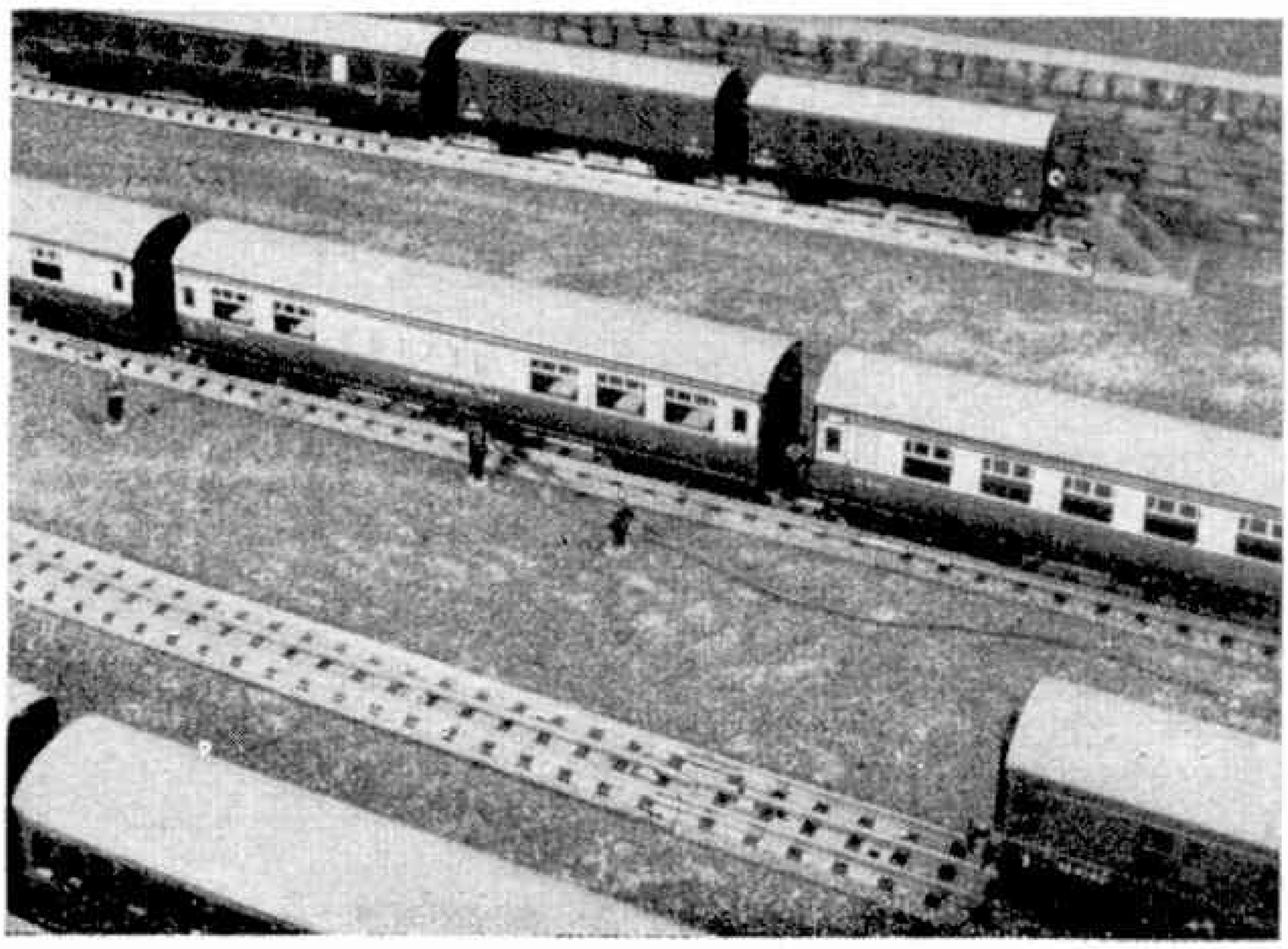
"Bristol Castle" heads out of the City with a Hornby-Dublo express. On the far track a Restaurant Car train is running in.

the engine in action, including Western Region enginemen, have been delighted with its smooth development of power, in which it is so like the real "Castles."

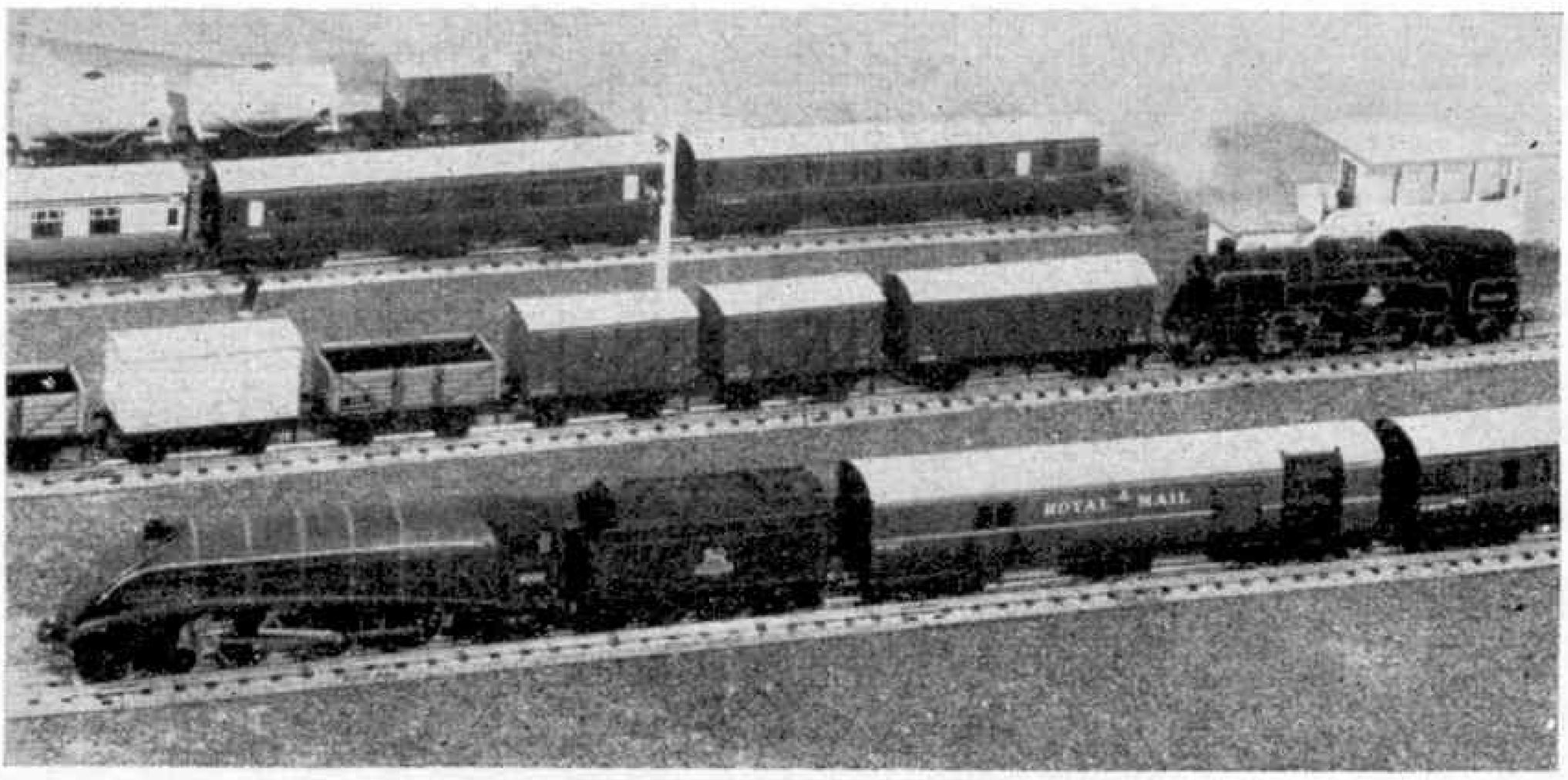
Well, after a fine smooth run your W.R. train, whether it represents the *Bristolian* or any other of the fleet of named trains made up of rolling stock in W.R. colours, runs into the arrival platform. After the usual wait the engine has to dispose of its train. During this operation it is certain to have to negotiate crossover Points with the engine pushing the empty stock. A point in design here that makes for convincing performance of this operation is that the *Bristol Castle* Locomotive and its tender are permanently coupled by a stout drawbar, as I told you in a previous talk. In addition, the fact that the body of the tender is a casting and therefore reasonably heavy, makes it possible to back a heavy train through reverse curves and Points without difficulty. A tender like this can scarcely be "pinched" off the road and derailed in passing on the push from the engine to the train. This, together with the splendid control afforded at low speeds, makes for station and yard movements that are just as convincing as the running of the engine on the main line.

The disposal of a train is in a sense part of the process of beginning things all over again in order to make the train ready for its next departure. If your train includes a Restaurant Car, and very many Hornby-Dublo expresses now boast this splendid item of equipment, then this provides the opportunity of such things as the scene shown in the lower illustration on this page.

The gas cylinders carried by many restaurant cars have to be charged from the mains in the carriage sidings. The miniature figures in the pictures are making sure that the Car carries an ample supply of "gas" for its next trip, otherwise there will be complaints from hungry passengers, not to mention the Restaurant Car staff! The "hose" they are using, a length of Connecting Wire, simply emerges from a hole in the baseboard. There could be a little manhole cover made of card, or perhaps a small metal lid of some kind would do instead.



Here Hornby-Dublo railwaymen are "gassing" the Restaurant Car. Their "hose" is a length of standard Connecting Wire.



Any Questions?

MOST H.R.C. members take advantage of the fact that they can write to Headquarters for information and advice on the running of their trains, either Hornby or Hornby-Dublo. That is one of the privileges of H.R.C. membership, and attention is drawn to it here for the benefit of newcomers, and also of *M.M.* readers generally, who are urged to tell us about the latest developments on their layouts and to ask questions regarding future extensions and additions.

Many write to me regularly, but others do not seem to get round to writing at all. This is a pity, because in a sense they are out of touch with things and may not be obtaining the best possible results from their equipment. So if you haven't already "got on the waggon," to use an Americanism, make up your mind to do so at the first opportunity.

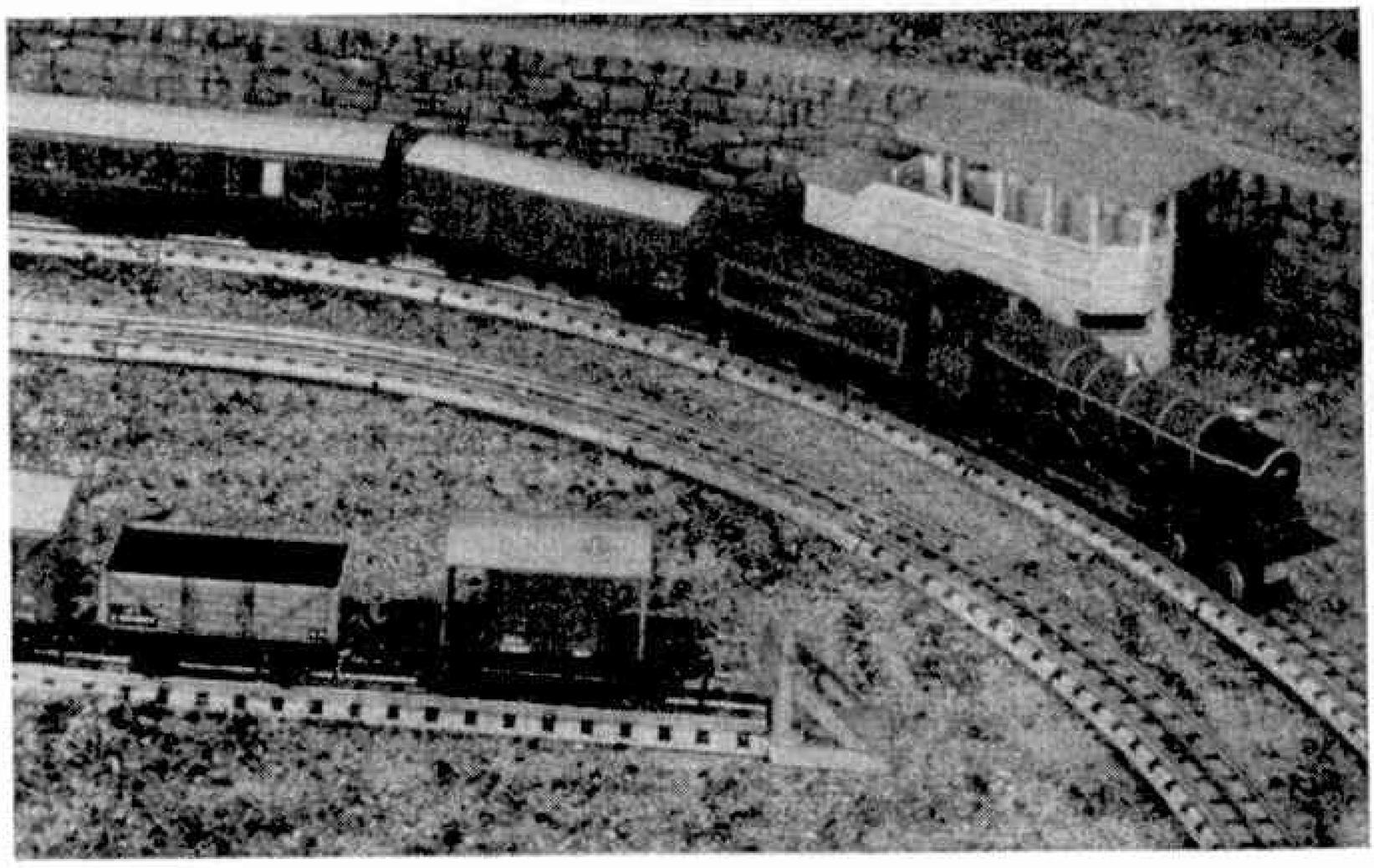
Above is "Silver King" with the T.P.O. Mail Van at the head of a Hornby-Dublo express. The 2-6-4 Tank is hauling a mixed goods in the opposite direction.

Let us have a look at some of the pieces of Hornby-Dublo rolling stock about which questions are frequently asked. One of these is the T.P.O. Mail Van. With its Lineside Apparatus it forms quite an exciting item of equipment because of its special working feature—the exchange of miniature mail bags while the train is on the run. So the T.P.O. is not just another vehicle to run in a train. It works, and works well so long as the instructions regarding it are carefully carried out.

Although the matter has been dealt with previously in the *M.M.* at some length, it is not always appreciated that the current supply to the contact rail of the Lineside Apparatus MUST be quite separate from that used for train driving. The supply required is 12 to 15 volts, either A.C. or D.C., and the method of obtaining this will depend on what electrical equipment is already in use for running the railway. If the available power circuits are taken up for train running, and for working the various Electrically Operated Accessories, then a supply for the T.P.O. alone is called for. This can be arranged by means of a suitable transformer, if you have one, an accumulator or even dry batteries. If the latter method is chosen, three Ever Ready type 126 or three Drydex type H30 4.5 volt dry bell batteries will give satisfactory results. Make sure that batteries are fresh when you buy them; dry batteries have only a limited shelf life. And by the way, do not worry about a buzzing noise you may hear when the apparatus in the Van is worked by an A.C. supply. If you use an accumulator or dry batteries you won't hear it at all.

Many questions concern layouts. The answers may be in the instructions included with track material, such as Points and Signals, or in the publication *Hornby-Dublo Rail Layouts*, details of which will be found

in the advertisement pages in this issue. But if something is not quite clear, or if you want to develop a layout for yourself and are not sure about various points, then by all means write for explanations and advice. Write indeed if your own efforts are quite successful, for between us we may hit on something even better.



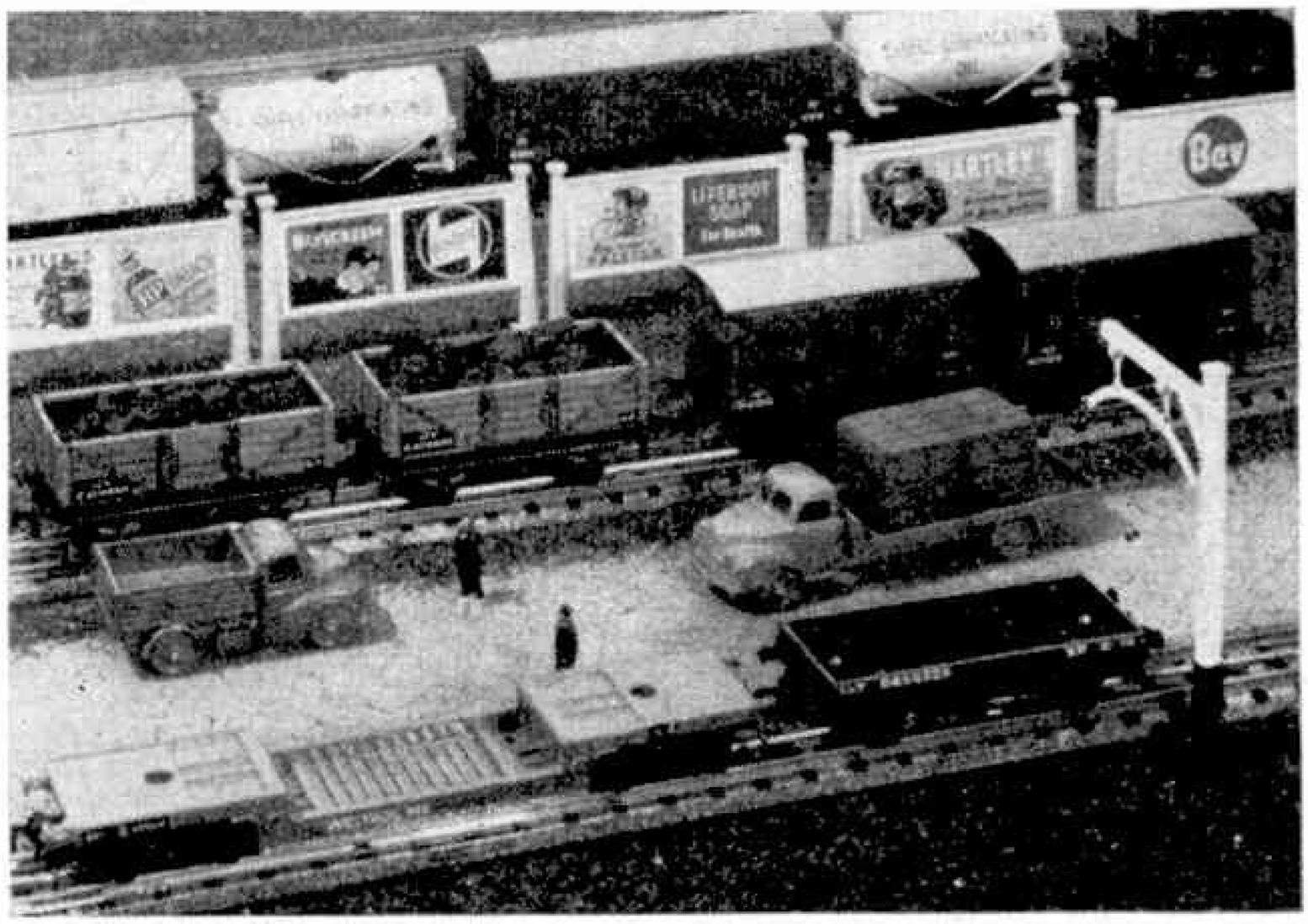
"Bristol Castle" rounds the curve with a train of D22 Coaches and a Long-Wheelbase Ventilated Van coupled behind the Tender.

Many of our younger owners apparently have the idea that a particular Locomotive should only be used with the type of stock in its original Train Set. This applies of course more particularly to passenger trains. Actually, there is practically no restriction in the manner in which the Coaches of the Hornby-Dublo system can be used together. For instance, your *Bristol Castle* Locomotive need not always be operated with D21 Coaches in W.R. brown and cream finish. Such vehicles for the most part are reserved for the named expresses of the Western Region, and you can run red and cream vehicles correctly behind *Bristol Castle*. Alternatively, the more recent D22 Corridor Coaches in maroon livery also can be used on W.R. services, or those run in connection with other Regions.

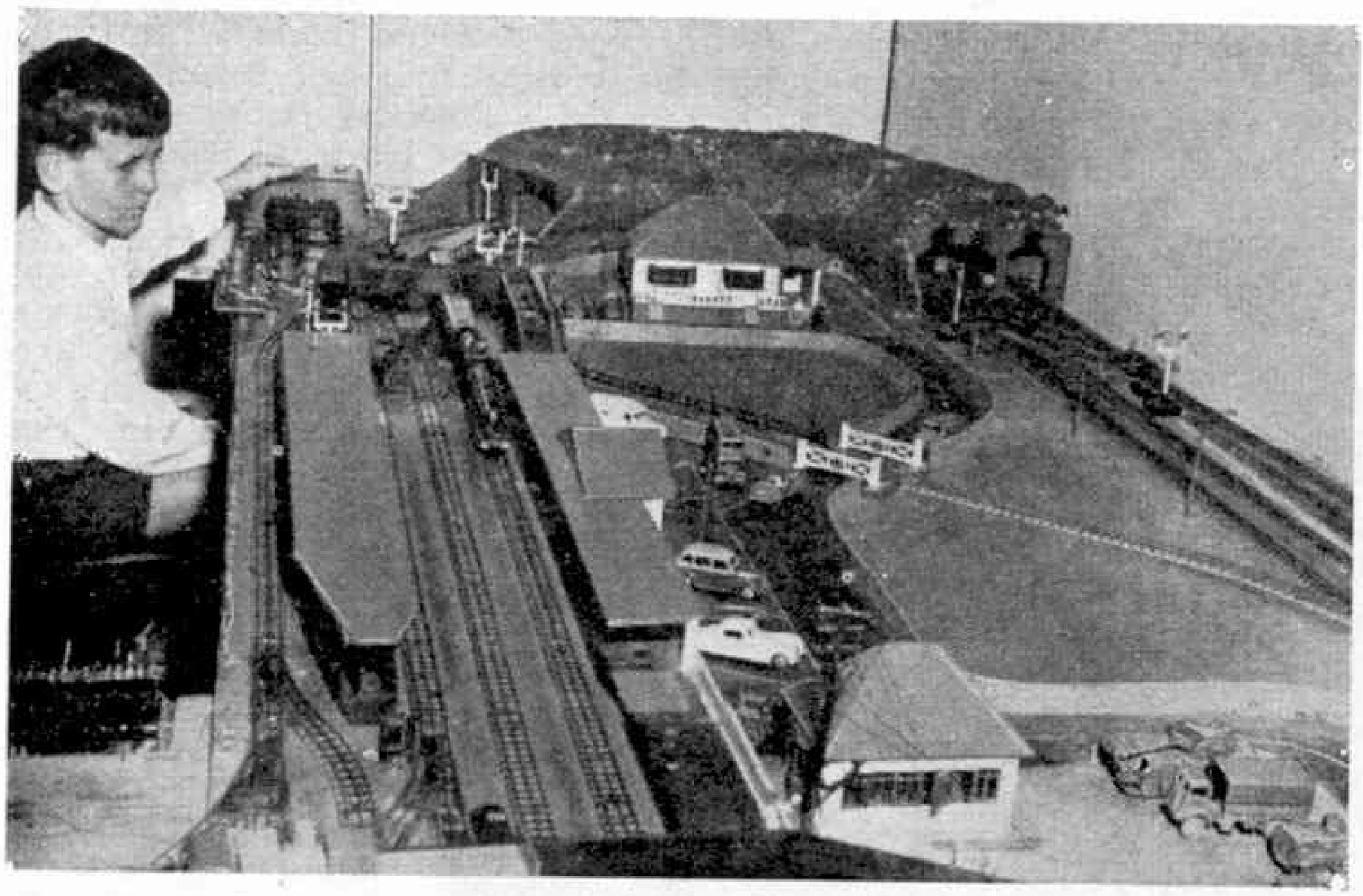
With goods services there is plenty of scope for variety in stock because most real wagons commonly work through between the various Regions. So Hornby-Dublo Wagons and Vans of various kinds can be run together, with due regard to the types of traffic for which they are intended. Goods Brake Vans are slightly more restricted in the scope of their movements.

The use of Dinky Toys with Hornby-Dublo layouts frequently leads to questions regarding the individual vehicles that are suitable. These no doubt will become fewer in number in view of the recent introduction of the series of Dublo Dinky Toys that were first announced last month. There are two of these vehicles in the picture below and you can see how well they fit in with the general scheme.

Of the older Dinky Toys the various Coaches, Nos. 281, 282, 283, also No. 290, Double Deck Bus, are suitable for 00 Gauge railways. In addition, No. 420 Leyland Forward Control Lorry, will do nicely.



Dublo Dinky Toys vehicles are prominent in this scene. The Bedford Flat Truck carries a "case" made at home from a block of wood.



"M.M." reader James Davidson, of Nkana, Northern Rhodesia, busy with his Hornby-Dublo layout. Photograph by courtesy of the Editor of the "Rhokana Review."

The "Nkana Division" in Hornby-Dublo

A Northern Rhodesian Reader's Layout

THE *Nkana Division* seems a good name to give to the Hornby-Dublo layout of which you see part in the picture above, for the owner, James Davidson, lives in Nkana, Northern Rhodesia, and this is the name given to the terminal station on his railway.

The system began one Christmas, as so many others have done, with a Hornby-Dublo Train Set. The original oval track was soon extended, and further developed to include two main running tracks, with sidings branching away from the main continuous system. Considerable further expansion then took place, and in this the owner was fortunate to have the interest and experience of his father, Mr. James Davidson, to guide him in the design and constructional work, and also in his railway operations. The railway indeed has now become a full time concern for all the Davidson family.

As a result the sidings already mentioned have been developed on a section of baseboard at right angles to the main board, and this part now forms quite an extensive railway yard including a turntable, coaling plant and oil storage tanks. The baseboard has grown even beyond this! The whole structure is now U-shaped, the latest extension parallel to the original board carrying the terminal station. This is situated at a higher level than the rest of the railway, and the working of the 1 in 40 incline that leads up to it adds to the interest of operation.

The track system is so arranged that a train starting from the terminus can join the main part of the system and make as long a journey as necessary on the continuous tracks. Then, by means of points leading to a diagonal loop across the main part of the board that you can see in the illustration, it can reverse its direction of travel, regain the incline section and so run back to the terminus.

There are Corridor Coaches as well as Suburban stock in use, and express passenger and goods trains are handled by a *Duchess of Montrose* 4–6–2 and a 2–6–4 Tank respectively. Shunting is carried out by an 0–6–2T, which normally is based at *Ndola*, the intermediate station on the continuous part of the railway.

A touch of local colour is provided by the working of a train known as the *Kaffir Mail*, to use a popular term, although the official description is "Mixed train." This consists of goods vehicles and passenger stock, the passenger coaches being at the rear end. These are thus readily detached and left while any shunting of the goods stock is carried out at an intermediate station.

Club and Branch News

WITH THE SECRETARY

AN OUTSTANDING EXHIBITION

First, I have much pleasure in wishing a happy and prosperous New Year to all members of the Guild and H.R.C., and I hope that in all Clubs and Branches 1958 will be a year of steady progress.

Looking back over Club and Branch activities during 1957, I feel that the year has been notable for the number of strikingly successful Exhibitions that have been held, and every month has brought me news of fresh successes of this kind.

A recent instance came from far-away Australia where on the 5th, 6th and 7th September last, the Maylands M.C. held their annual Exhibition in the Perth Town Hall. This flourishing Australian Club have established a local reputation for fine work, and planning and preparation for the September Exhibition began as far back as March last—as soon as the first of their 1957 Winter Sessions commenced, in fact.

Appropriately entitled *Mechanics in Miniature*, the Exhibition was opened on the first day by Mr. L. F. Kelly, Minister of Mines and Industries, and throughout was very well patronised. Many visitors came from places as far as 60 miles from Perth. A nice gesture was the ready acknowledgment by Maylands M.C. of the able assistance they received from the Fremantle M.C., who brought several models they had already shown at an Exhibition in Fremantle Town Hall. The combined display included 65 splendid models, of which 40 were electrically operated. Mr. Jack Stanbridge, a local Meccano dealer who is a good friend of the Club, had a large Hornby-Dublo mountain railway layout in operation.

The Maylands M.C. are fortunate in having an excellent Parents Committee, who financed the Exhibition and also organised a Fête and Jumble Sale which they conducted in conjunction with the Club Display. Local newspaper and radio publicity helped further to ensure that the triple event was widely known, and a profit of £200 was made—and 15 new members added to the Maylands Club roll.

CLUB NOTES

MILE END (PORTSMOUTH) M.C.—Model-building activity has centred mainly round the construction of a "Super" Submarine which it is hoped to complete in time for the Club's Meccano Exhibition next month. Non-members in Portsmouth and district who are keen model-builders are being invited to submit entries for a competition at the Exhibition, when a prize will be awarded for the best entry. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

NEW ZEALAND

CHRISTCHURCH M.C.—The Club display at the Shirley Parish Doll Show, briefly referred to last month, was very favourably commented upon by visitors. There was ample space in which to stage a good display, and a fine array of working models was arranged. This event was followed by a Club display at the Christchurch South Intermediate School, where a competition for Meccano models and model aeroplanes produced some excellent entries from pupils of the school. One of the most popular Club models on both occasions was a rail car that automatically ran forward and backward about 5 ft. in each direction, current being picked up from a centre rail. *Secretary:* R. Boundy, 25 McBratney's Road, Sallington, Christchurch, New Zealand.

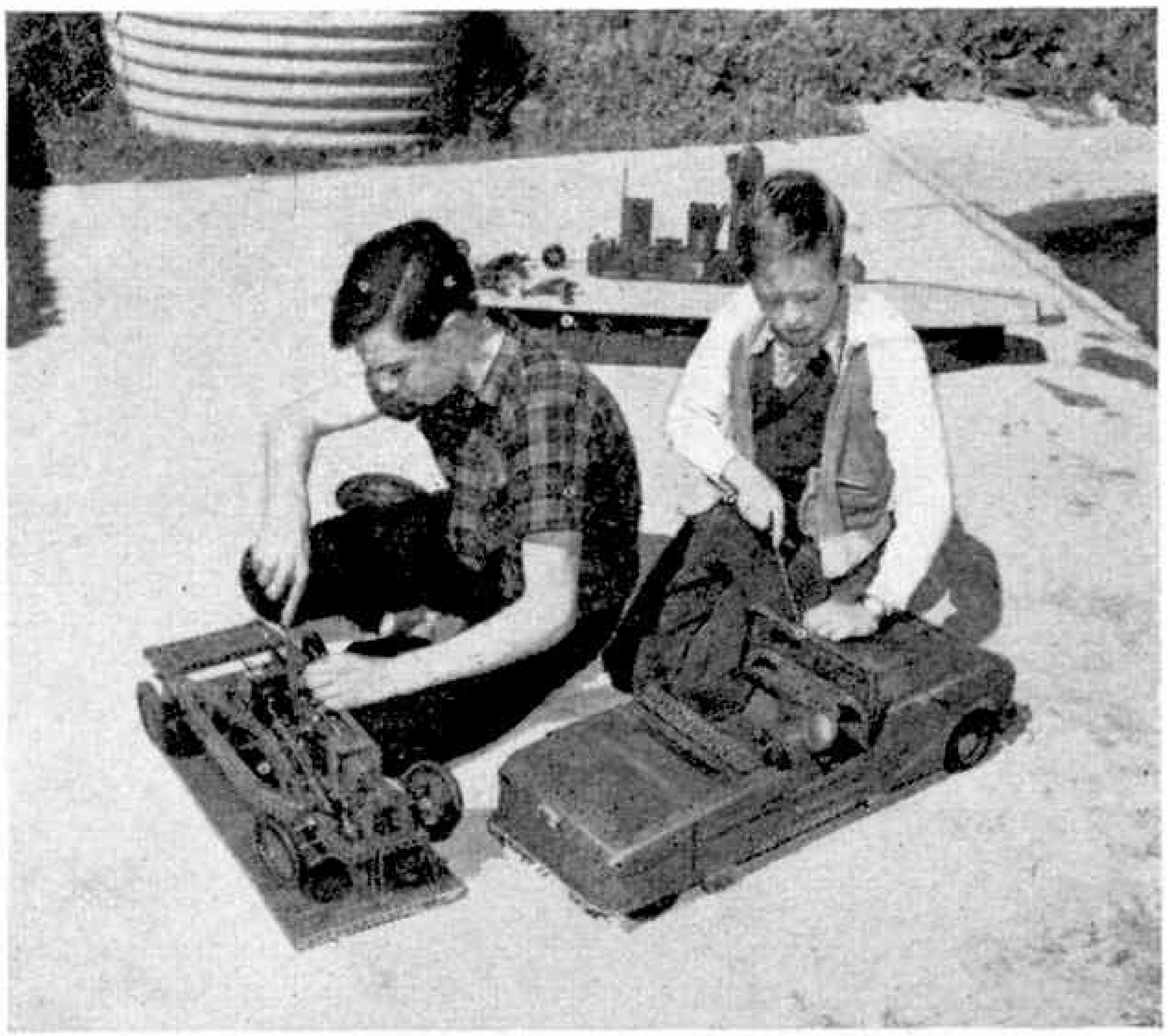
BRANCH NEWS

EDLINGTON COUNTY SECONDARY SCHOOL (DONCASTER)—The Branch is recovering from the loss of almost all its equipment during a school burglary last Spring, and thanks to a core of keen and loyal members has begun to rebuild up stocks of equipment and to carry out limited track operations. *Secretary:* Mr. K. J. Templeman, 41 Warmsworth Road, Doncaster, Yorks.

MILE END (PORTSMOUTH)—More members have been enrolled. The new electric baseboard is progressing rapidly, much good work being put in by R. Young. The series of Open Nights continues very successfully. *Secretary:* A. H. Firman, 171 Fratton Road, Portsmouth, Hants.

UNINCORPORATED BRANCH

POTTERS BAR—The Branch layout is now in full working order, and interesting train running is being carried out. The layout forms a main line with two stations and a small halt. *Secretary:* R. Woods, 120 The Walk, Potters Bar, Middlesex.



Lionel England (left) and Warren Bransby (right), two members of Maylands (Western Australia) M.C., working on two of the Meccano models for the Club Exhibition held in Perth Town Hall last September and described on this page. Photograph by courtesy of West Australian Newspapers Ltd.

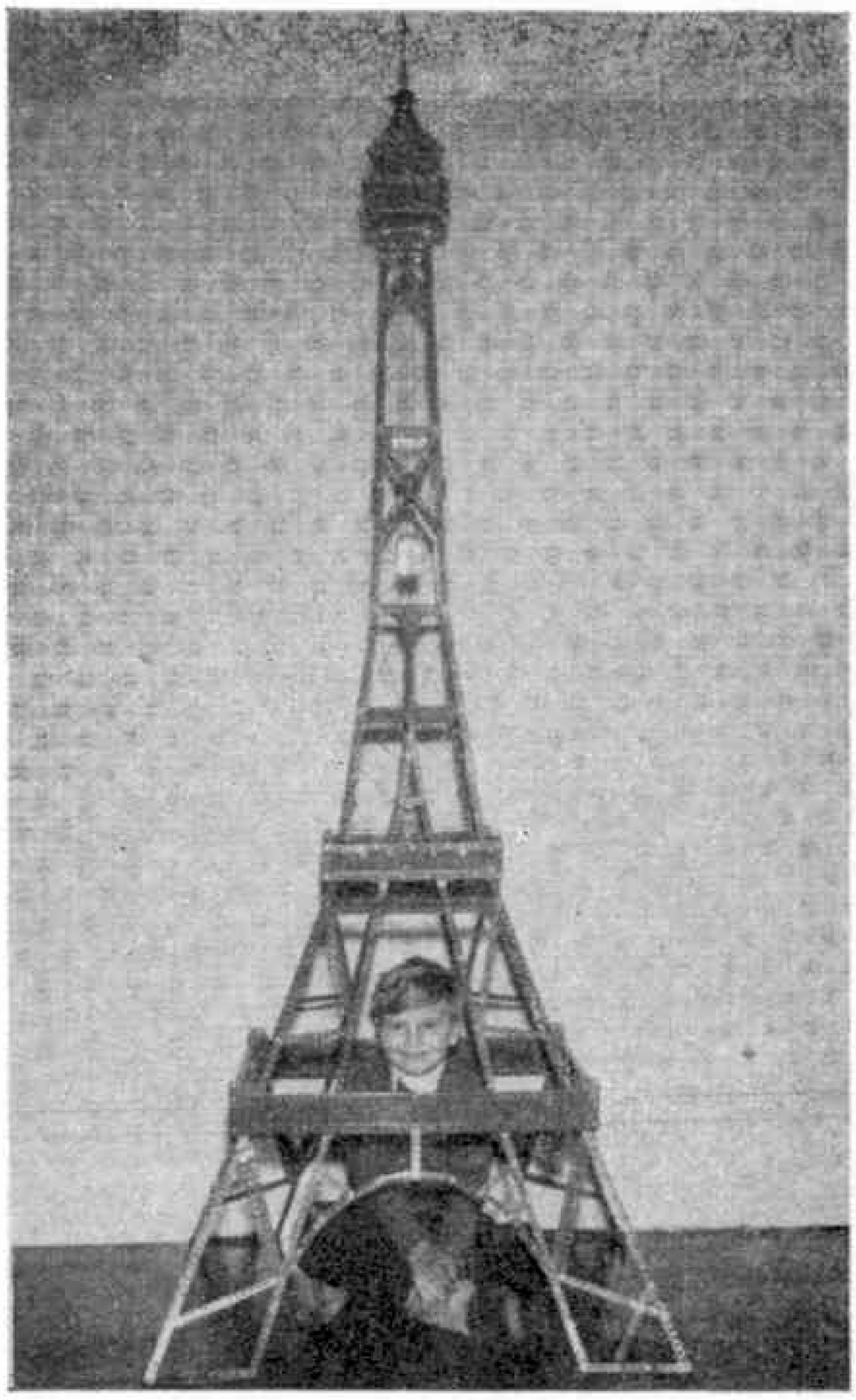
Among the Model-Builders

By "Spanner"

A Fine No. 10 Outfit Model

The elegant model Eiffel Tower shown alongside is an excellent example of the many splendid models that can be constructed from the parts in Meccano Outfit No. 10. It was built by Mr. L. W. Hallaway, Hornsey, from the illustrations and details given in Special Instructions Leaflet No. 14. This is one of the series of 20 Leaflets, each describing a No. 10 Outfit model, that are available.

Some idea of the size of the model is given by comparing it with the figure of young John Hallaway, who is seen comfortably seated in its base. Mr. Hallaway did not say how long it took him to build the Tower, but I would like to congratulate him on completing it so successfully.



The young man seated in the base of this fine model Eiffel Tower is John, son of Mr. L. W. Hallaway, Hornsey, who built the model from the details given in Special Instruction Leaflet No. 14.

A Crane Control Unit

C. Cohen, Cape Town, is a very keen model-builder and is Secretary of the progressive Cape Peninsula Meccano Club. In one of his letters recently he mentioned an attractive model of a dockside crane he has made, and he sent an excellent drawing of one of the control units fitted to the model. This unit is shown in Fig. 1, and as you can see it is extremely neat and compact. The builder was fortunate to be able to inspect cranes under construction at the docks, and he based his design on an actual control unit fitted to one of the real cranes.

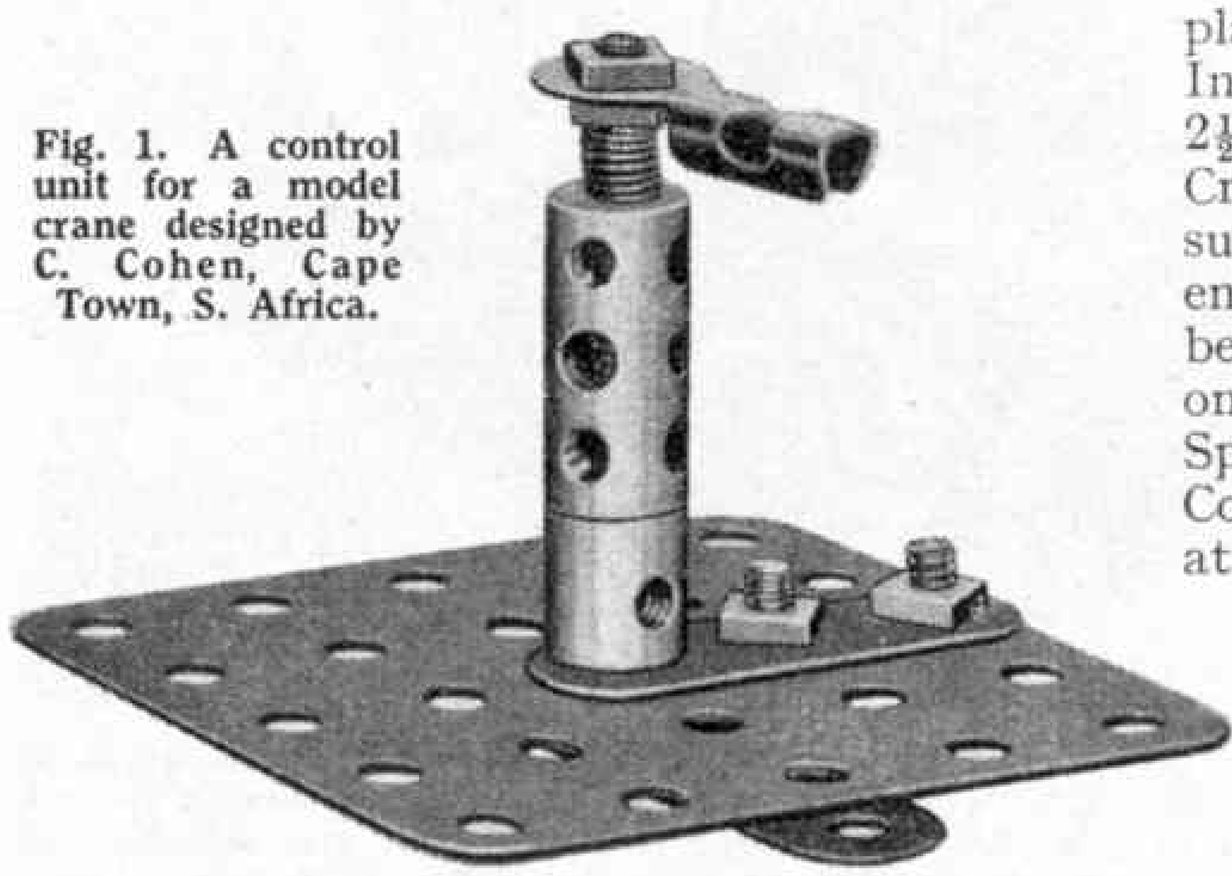


Fig. 1. A control unit for a model crane designed by C. Cohen, Cape Town, S. Africa.

To use the arrangement to the best effect the connecting rod between the control unit and its mechanism should be placed underneath the floor of the cab. In Fig. 1 the floor is represented by a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plate, and a Threaded Crank is bolted to it. The Threaded Crank supports a 2″ Screwed Rod, at the lower end of which a $1\frac{1}{2}''$ Strip is fixed tightly between two nuts. A Coupling is placed on the Screwed Rod, then a Compression Spring, and finally a Rod and Strip Connector is clamped between two nuts at the upper end of the Screwed Rod.

The Compression Spring serves to restrain the movement of the Screwed Rod so that it does not rotate too freely in the Threaded Crank. The Rod and Strip Connector forms the control lever, and the $1\frac{1}{2}''$

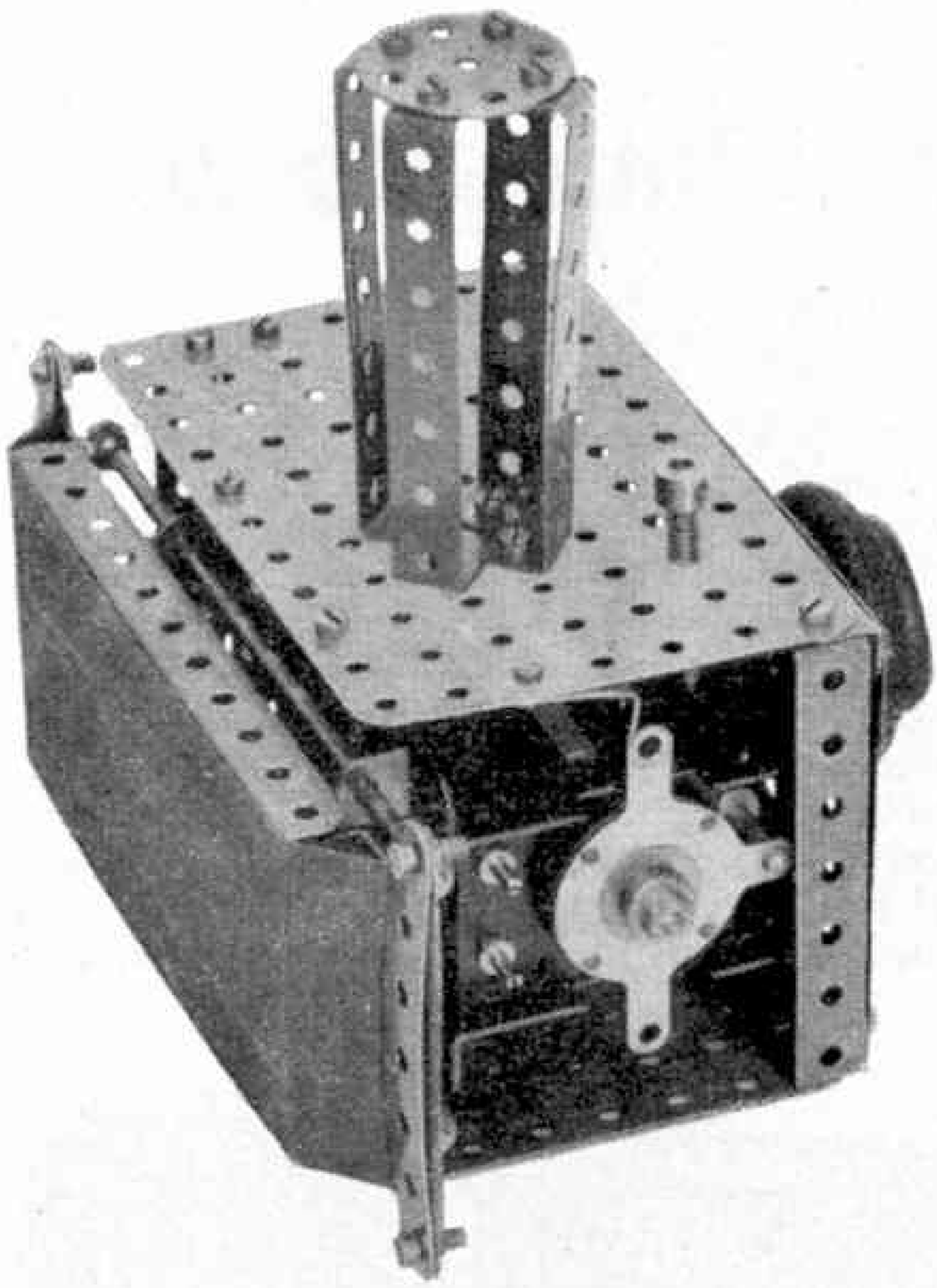


Fig. 2. A useful Sanding Machine for the home workshop. It is operated by an E20R(S) Electric Motor and was built by Mr. H. H. Taylor, Huddersfield.

Strip is connected to the crane mechanism.

Sanding Machine

The sanding machine shown in Figs. 2 and 3 was designed by Mr. H. H. Taylor, Huddersfield, and will be found a useful addition to a home workshop. Readers who wish to build it are advised to start with the operating mechanism and this is assembled on an E20R(S) Electric Motor. First of all two 1½″ Corner Brackets are fixed to each sideplate of the Motor, and these support two 1½″ × ½″ Double Angle Strips 1. It should be noted that Washers are placed between the side-plates and the Double Angle Strips. A $\frac{7}{16}$″ Pinion on the Motor shaft drives a 60-tooth Gear on a 2½″ Rod, which carries also a ½″ Pinion 2. This Pinion meshes with a 57-tooth Gear on a 2½″ Rod fitted with a Helical Gear, which drives a 1½″ Helical Gear on a 3″ Rod supported in the Double Angle Strips 1. The 3″ Rod is held in place by a Collar, and at its lower end it carries a Triple Throw Eccentric, arranged to give a ½″ stroke.

A 3½″ × ½″ Double Angle Strip 3 is bolted to each flange of the Motor, and the same bolts hold in position a 3½″ × 2½″ Flanged Plate 4. Two 6½″ Rods passed through the lugs of the Double Angle Strips are fitted at each end with Handrail Supports, which are fixed by their nuts to 2½″ Angle Girders bolted to the end flanges of a 5½″ × 2½″ Flanged Plate. A 2½″ Flat Girder at each end also is attached by the Handrail Supports. A 5½″ × ½″ Double Angle Strip 5 is arranged between the end flanges of the Flanged Plate. The strap of the Eccentric is extended two holes by a 2″ Strip, and a Threaded Pin fixed in the end hole of the Strip extends into a hole in the Double Angle Strip 5.

The housing or casing consists of three 5½″ × 3½″ Flat Plates connected by two 5½″ Angle Girders. At one end a 3½″ × 2½″ Flanged Plate and a 3½″ × ½″ Double Angle Strip are bolted between the Flat Plates, but at the other end only a Double Angle Strip is used, in order to provide access to the Motor terminals. One supporting handle consists of four 3½″ × ½″ Double Angle Strips bolted to a Wheel Disc, while the other is formed by two 1″ Pulleys and a 1½″ Pulley all fitted with Tyres and fixed on a 2″ Rod held in a Double Arm Crank bolted to the housing. The mechanism unit is fixed in the housing by bolting the sides to the flange of the Flanged Plate.

The machine is controlled by a push button formed by a Collar on a 2½″ Rod held in a Coupling 6. A 1″ Rod fixed in the Coupling engages the Motor switch. The 2½″ Rod is passed through the side of the housing and a Compression Spring is placed on it as shown. Sandpaper is fixed over the 5½″ × 2½″ Flanged Plate by clamping its ends between Strips bolted over the Flat Girders.

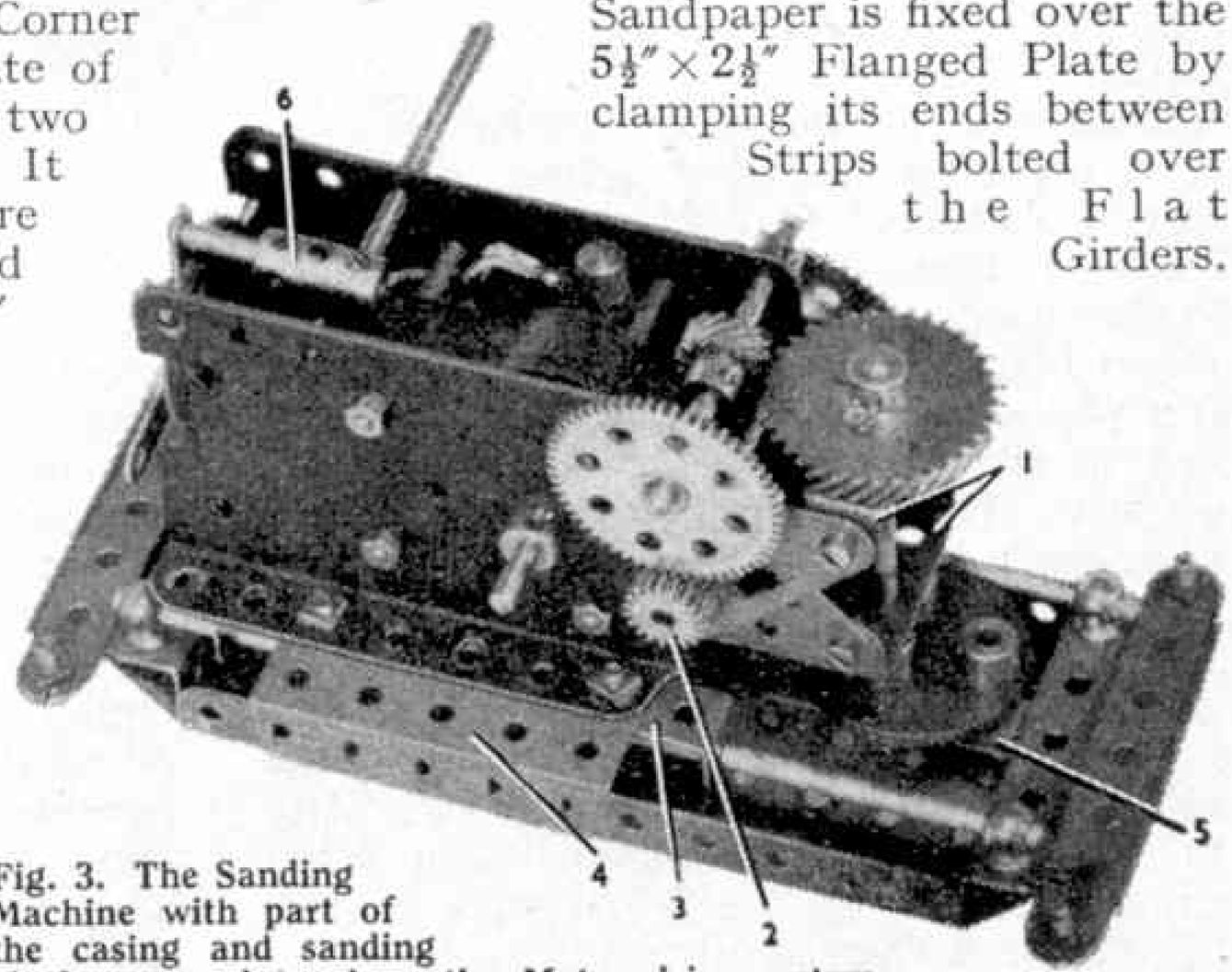


Fig. 3. The Sanding Machine with part of the casing and sanding block removed to show the Motor drive system.

A New Model for Outfit No. 6

Delivery Van

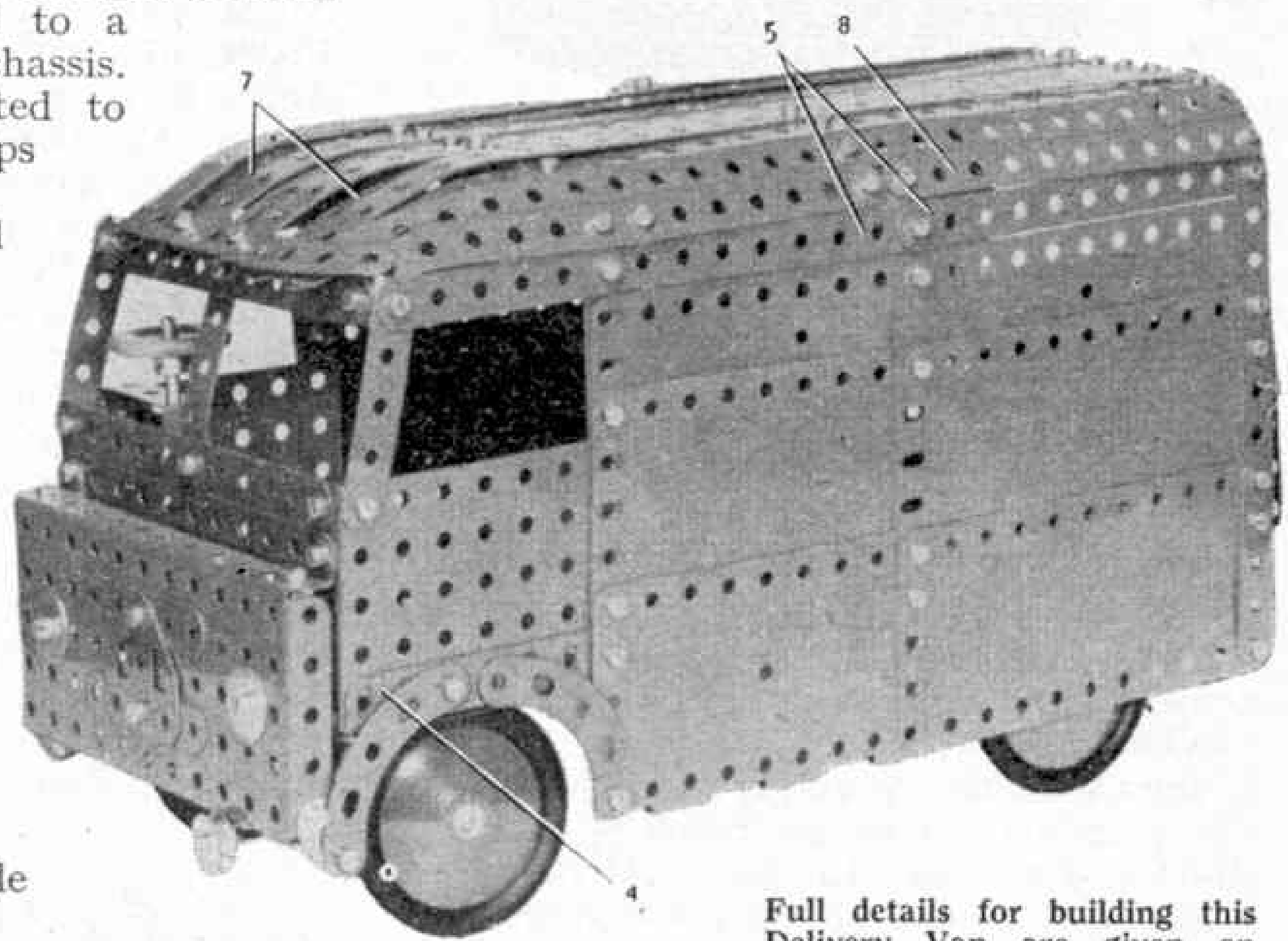
TO make the chassis two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips are bolted between the ends of two $12\frac{1}{2}''$ Angle Girders. The rear axle is a 5″ Rod held by Spring Clips in Flat Trunnions bolted to the Girders.

Each front axle is a $1\frac{1}{2}''$ Rod mounted in a Double Bracket and held in place by a Collar and a Road Wheel. A $1\frac{1}{2}''$ Strip 1 is placed between the lugs of one Double Bracket and a $2\frac{1}{2}''$ Strip 2 is passed between the lugs of the second Double Bracket. A $\frac{3}{8}''$ Bolt is passed through the Strip and the Double Bracket at each side, and is lock-nutted to a Trunnion 3 bolted to the chassis. A $3\frac{1}{2}''$ Strip is lock-nutted to the rear ends of the Strips 1 and 2.

The floor of the model is made by attaching a $12\frac{1}{2}'' \times 2\frac{1}{2}''$ Strip Plate to each of the chassis Girders. These Plates are strengthened at the front and the rear by $2\frac{1}{2}''$ Strips, and $12\frac{1}{2}''$ Angle Girders 4 are bolted along the outer edges of the Plates. The gap between the Plates is filled by a $12\frac{1}{2}''$ Strip attached to two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips.

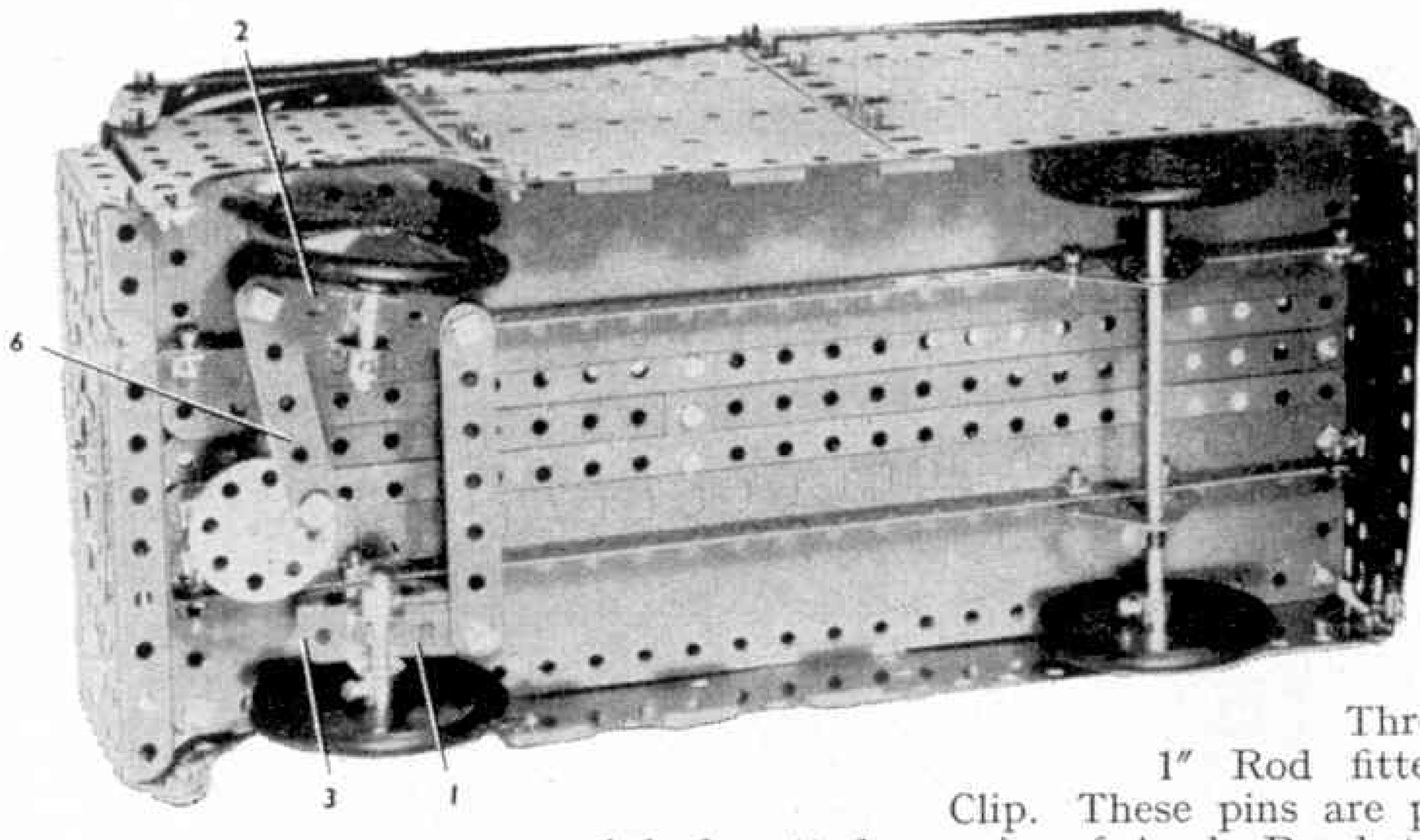
Each side of the body consists of a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, one half of a Hinged Flat Plate, two $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates, two $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates and a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate. These Plates are bolted together as shown and the side is attached to the Girders 4 and to $5\frac{1}{2}''$ Strips fixed vertically to the Girders. The rear $5\frac{1}{2}''$ Strip is extended downward by a $2\frac{1}{2}''$ Strip, and two $5\frac{1}{2}''$ Strips 5 overlapped three holes are attached to the upper ends of the vertical Strips. The Strips 5 are extended forward by a 3″ Strip, which is connected to the $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate by a $2\frac{1}{2}''$ Strip to form the side windows. The front wheel arch on each side consists of two $2\frac{1}{2}''$ Stepped Curved Strips.

The front of the cab is made by bolting two $5\frac{1}{2}''$ Strips to the flanges of the $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plates, and then fixing a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate to Angle Brackets held by the same bolts as the lower Strip. The bottom corners of the Flanged Plate are connected to the wheel arches by Fish-plates. Two $\frac{3}{4}''$ Washers bolted to the Flanged Plate represent headlamps, and two $2\frac{1}{2}''$ Strips and a Flat Trunnion form the radiator. A $\frac{1}{2}''$ Pulley attached by a $\frac{3}{8}''$ Bolt to an Angle Bracket represents a fog lamp. The upper edge of the windscreen frame is a $5\frac{1}{2}''$ Strip fixed to Angle Brackets, and the centre division is a $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip.



Full details for building this Delivery Van are given on these pages. The model is designed for construction with parts in a No. 6 Outfit.

The steering wheel is a 1″ Pulley with Rubber Ring fixed on a $3\frac{1}{2}''$ Rod. The Rod is held by a Collar in two $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips bolted to one side of the cab, and it carries at its lower end a $\frac{1}{2}''$ Pinion. The Pinion engages a 57-tooth Gear on a $1\frac{1}{2}''$ Rod, which is mounted in the cab floor and in a Double Bent Strip bolted underneath the floor. The $1\frac{1}{2}''$ Rod carries at its lower end a Bush Wheel, to which a $2\frac{1}{2}''$ Strip 6 is connected by a Pivot Bolt. The Strip 6



This picture shows the arrangement of the chassis and the steering mechanism.

is lock-nutted to the front end of the $2\frac{1}{2}''$ Strip 2—as shown above.

To make the cab roof Formed Slotted Strips are fixed to the vertical $5\frac{1}{2}''$ Strips at each side. The inner ends of the Formed Slotted Strips are connected to those of the opposite side by $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips. The centre section of the roof is filled in by five $12\frac{1}{2}''$ Strips bolted to the $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips. Further $12\frac{1}{2}''$ Strips, numbered 7, are attached to the centre holes of the Formed Slotted Strips, and made-up strips 8 on each side are attached in the free sections of the slotted holes in the Formed Slotted Strips. The strips 8 on one side consist of two $5\frac{1}{2}''$ and a $3\frac{1}{2}''$ Strip, while on the other side a $5\frac{1}{2}''$ Strip, two $3\frac{1}{2}''$ Strips and a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip are used.

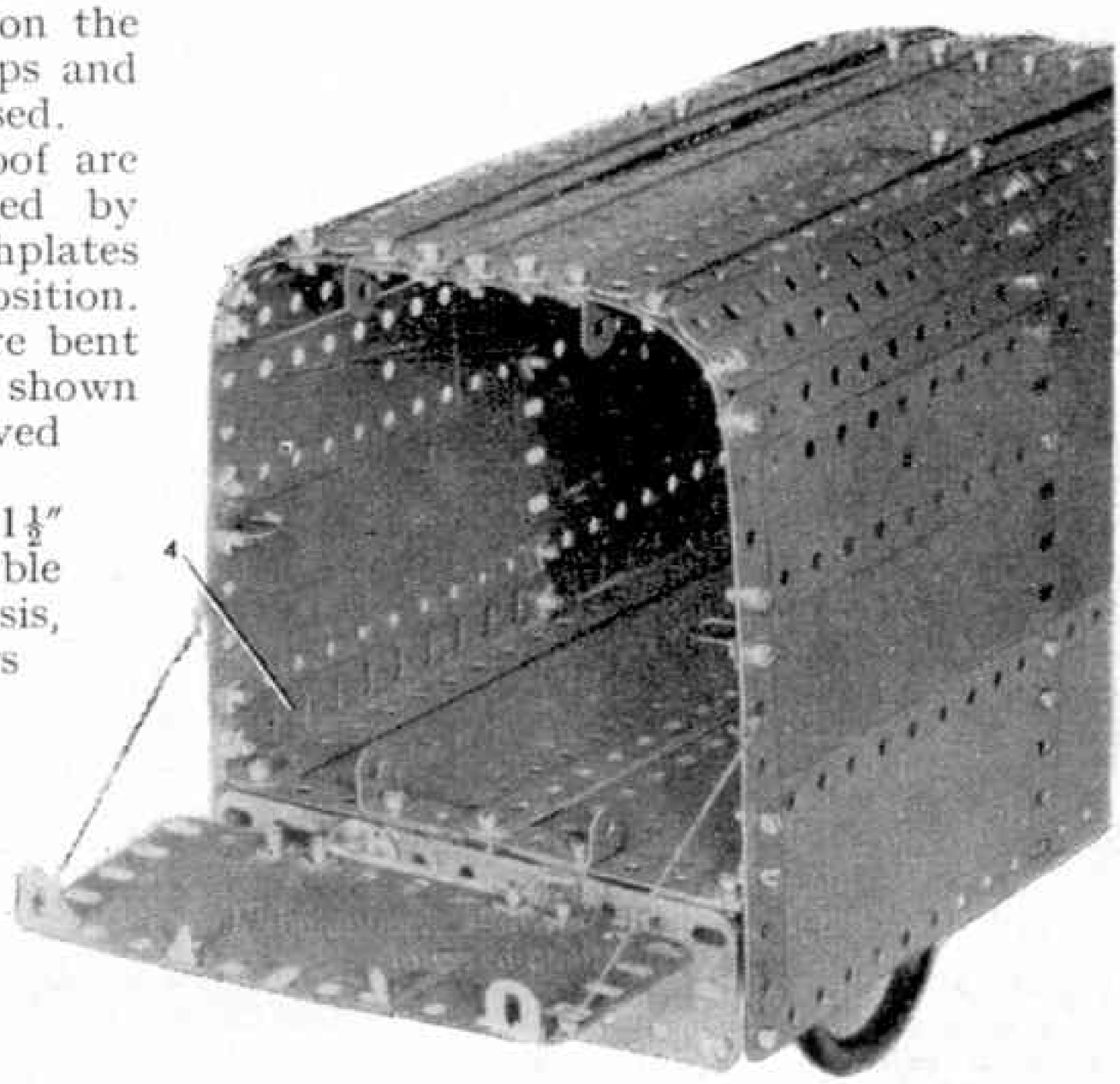
The remaining sections of the roof are filled in by $12\frac{1}{2}''$ Strips supported by Obtuse Angle Brackets and Fishplates attached to the Strips already in position. The front ends of the roof Strips are bent downward slightly and are edged as shown by a $1\frac{1}{2}''$ Strip and two $2\frac{1}{2}''$ Curved Strips.

At the rear of the body three $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates are bolted to the Double Angle Strip at the end of the chassis, and are connected to the lower corners of the sides by Angle Brackets. The tailboard consists of three $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates bolted together and fitted with two Right Angle Rod and Strip Connectors. These are mounted on a 4″ Rod supported in Angle Brackets bolted to the back of the body. Further Angle Brackets are fixed to the tailboard and the sides of the body, so that they overlap when the tailboard is raised.

Pins to secure the tailboard in the raised position are formed by a Threaded Pin and a 1″ Rod fitted with a Spring Clip. These pins are passed through the pairs of Angle Brackets.

If a Clockwork Motor is available it will be easy to modify the model to take a Motor drive.

Parts required to build the Delivery Van: 12 of No. 1; 14 of No. 2; 4 of No. 3; 2 of No. 4; 12 of No. 5; 2 of No. 6a; 4 of No. 8; 6 of No. 10; 2 of No. 11; 13 of No. 12; 2 of No. 12c; 1 of No. 15; 1 of No. 15b; 1 of No. 16; 3 of No. 18a; 1 of No. 18b; 1 of No. 22; 1 of No. 23; 1 of No. 24; 1 of No. 26; 1 of No. 27a; 3 of No. 35; 137 of No. 37a; 128 of No. 37b; 2 of No. 38; 2 of No. 38d; 1 of No. 40; 1 of No. 45; 2 of No. 48; 7 of No. 48a; 1 of No. 48b; 1 of No. 52; 2 of No. 53; 3 of No. 59; 2 of No. 90; 4 of No. 90a; 3 of No. 111c; 1 of No. 115; 2 of No. 126; 3 of No. 126a; 1 of No. 147b; 1 of No. 155; 4 of No. 187; 3 of No. 188; 4 of No. 189; 3 of No. 190; 2 of No. 191; 4 of No. 192; 2 of No. 197; 1 of No. 198; 2 of No. 212a; 4 of No. 215.



A rear view of the model, showing the hinged tailboard in its lowered position.

MODEL OF THE MONTH

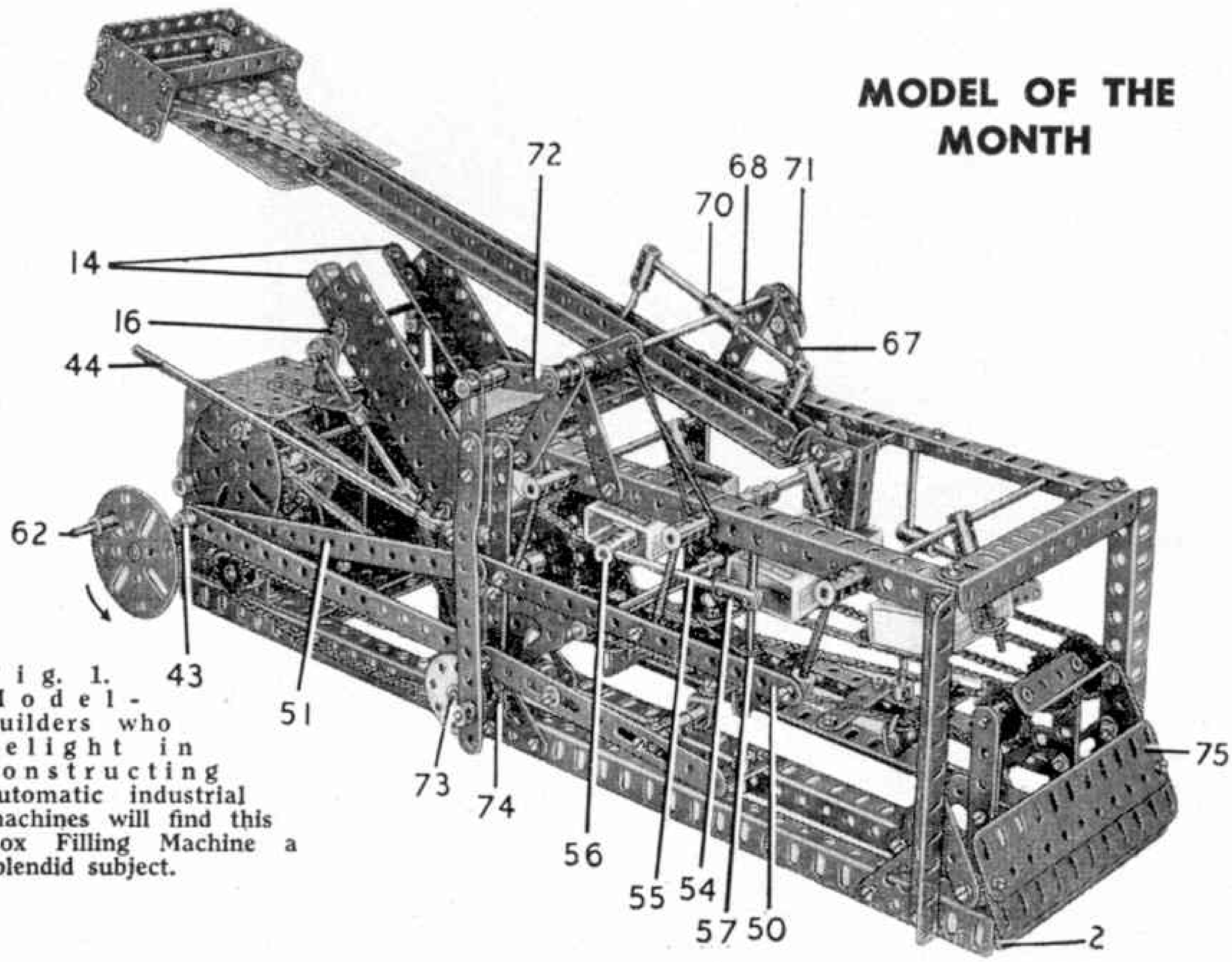


Fig. 1. Model-builders who delight in constructing automatic industrial machines will find this Box Filling Machine a splendid subject.

Automatic Box Filling Machine

WE are sure model-builders will like the ingenious new model Automatic Box Filling Machine that forms our subject this month. It is an attempt to build in Meccano a machine that will carry out a packing process of a modern industrial character and

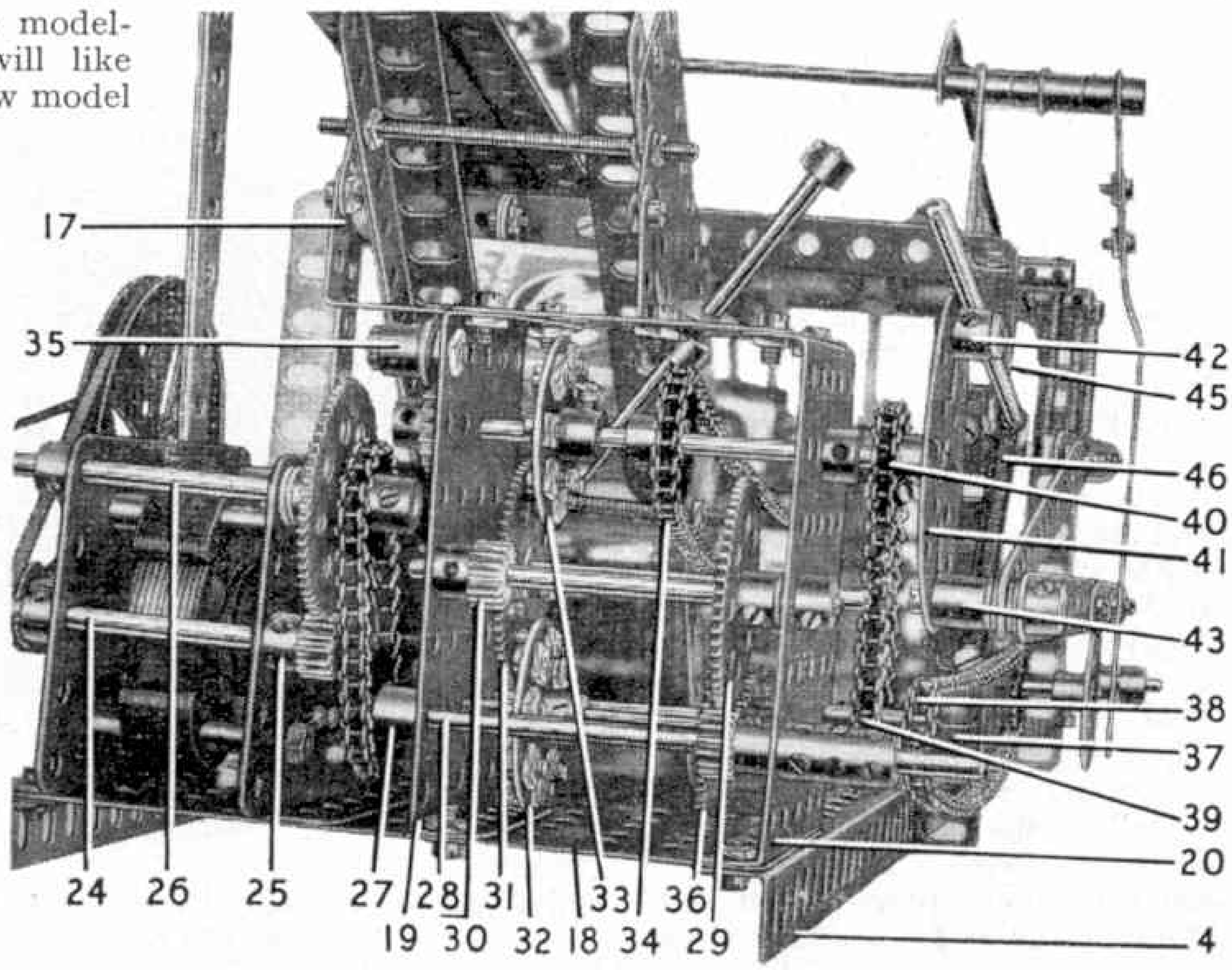


Fig. 2. A close-up view of the automatic gear-box that controls the sequence of operations.

was designed by Mr. H. Taylor, Huddersfield, a textile machinery expert, who is never more happy than when he is attempting to reproduce in Meccano complicated mechanical movements of all kinds.

With the model, steel balls placed in a hopper at one end of the machine can be loaded automatically into match boxes, 10 units being placed in each box. The empty match boxes are placed in a feed chute, from which they are caught up by a chain conveyor and carried along to the loading point. As the boxes pass along, they are automatically opened ready to receive the steel balls, ten of which fall into each box as it passes under the loading chute. The filled but still open boxes, are then carried on the conveyor to an automatically operated "finger" that closes them, so that they are ready for discharge from the belt at the other end of the machine.

All the movements of the machine are driven by an E20R(S) type Electric Motor through an ingenious automatic gear-box. This gear-box provides intermittent drives in the correct sequence to the conveyor chain, the box opening and closing fingers and the filling mechanism.

Full constructional details of the Box Filling Machine, and a list of the parts required to build it, can be obtained by Home readers by writing to the Editor, enclosing a 2d. stamp for postage. Overseas readers in Canada, Australia, New Zealand, South Africa, Ceylon, Italy, Rhodesia and the United States of America should write to the main agents in those countries for their copies of the *current* Model of the Month instructions, enclosing suitable stamps for postage.

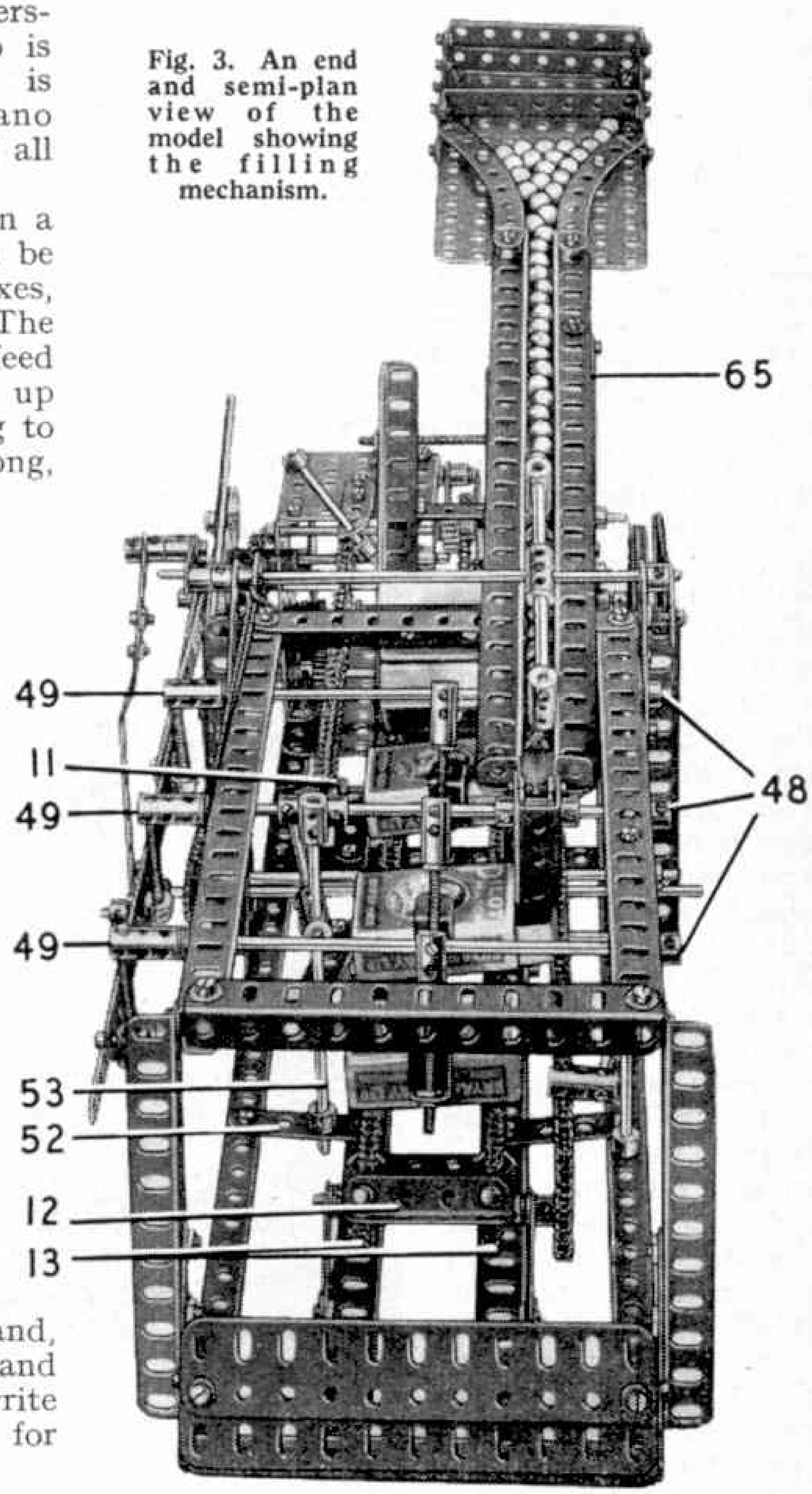


Fig. 3. An end and semi-plan view of the model showing the filling mechanism.

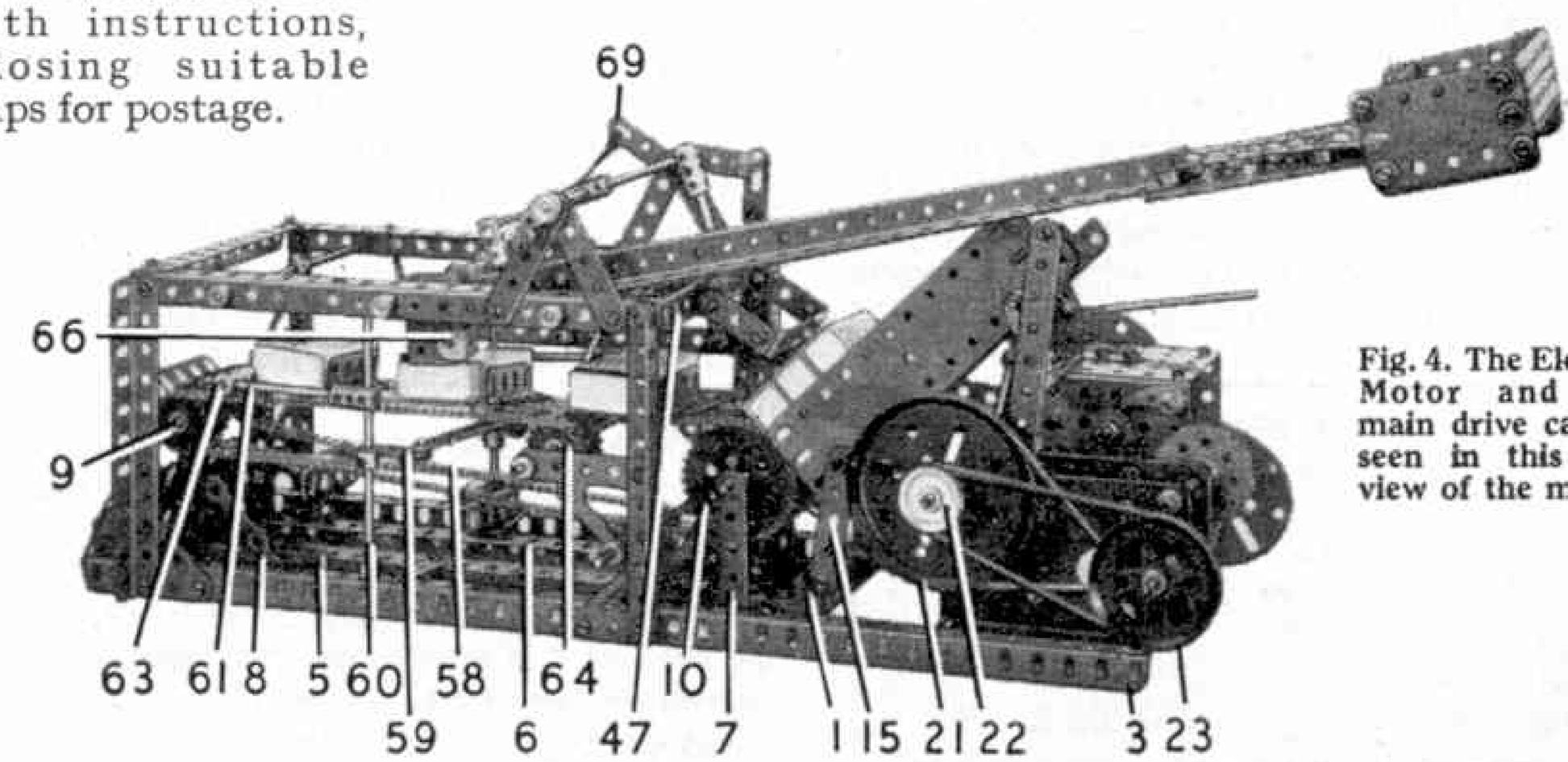


Fig. 4. The Electric Motor and the main drive can be seen in this side view of the model.

Meccano Competition

A General Model-Building Contest for the New Year

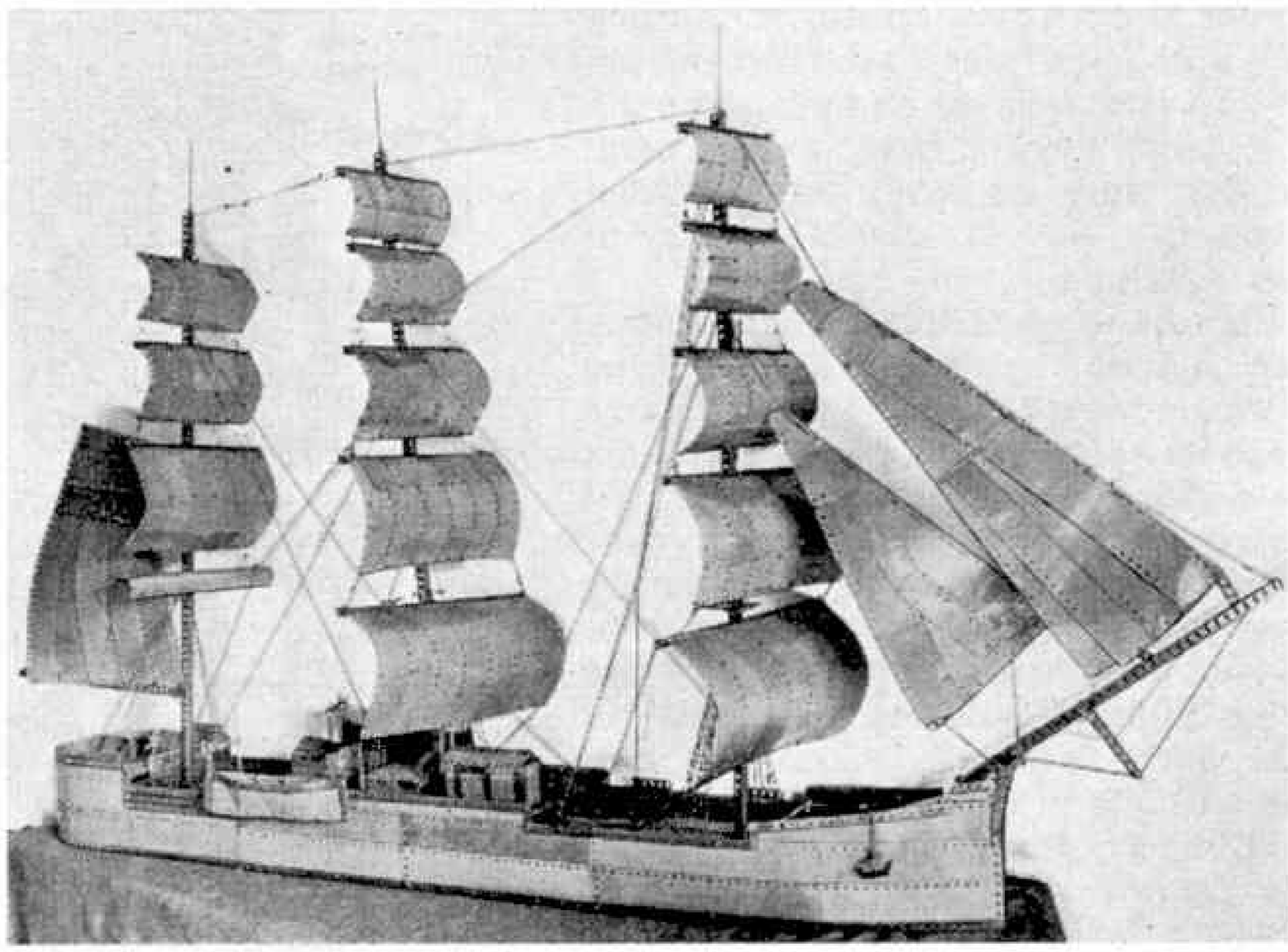
THE New Year is traditionally a time for making good resolutions, and one of the best that can be made by enthusiastic model-builders is to enter the new general model-building competition we are announcing this month. It is well worth while sending in an entry for the contest, for by doing so you have an opportunity to win one of the splendid cash prizes offered for the best models submitted.

The contest follows the usual form for this type of competition. The models entered can be of any kind and you can use just as many parts as you like to build your model. There are absolutely no restrictions on the subjects of the models or on the sizes of the Outfits used to build them. The only rules are that the actual construction of each model must be the result of a competitor's own, unaided efforts, and that entries must be posted to reach us not later than 30th April next.

At this time of the year there are many newcomers to the Meccano hobby, and we hope all of them will send in entries for the competition. Don't be put off if your model-building experience is limited or if you have only a small Outfit. The main thing is to choose a suitable subject you can make really well with the parts you have available, so that you can build an attractive, realistic and sturdy model. A small, well-designed model will have just as much chance of success as a large and complicated structure, as the judges will make allowance for the parts available to the builders when they examine the entries.

Naturally we do not expect very young model-builders to compete against older and more experienced Meccano enthusiasts, and for this reason entries will be divided into two Sections. Section A is for competitors under twelve years of age on 30th April next, while entries from competitors aged twelve or over on that date will be placed in Section B. Details of the prizes to be awarded for the best models submitted are given in the panel on the left below.

The actual models must not be sent. Entries should consist of photographs or sketches of the models, and each competitor's age, name and address must be written clearly on each print or sheet of paper submitted. Prize-winning entries are not returnable but unsuccessful entries will be returned if a suitable stamped addressed envelope is sent with the drawings or photographs.



This fine model of a grain carrying wind-jammer was built by Derek Hacking, Beighton, Sheffield, for whom it won a Prize in a previous M.M. competition.

THE PRIZES

The following prizes will be awarded in each of the Sections A and B.

	£	s.	d.
First Prize, Cheque for	4	4	0
Second Prize, Cheque for	2	2	0
Third Prize, Cheque for	1	1	0
Ten prizes, each of		10	0
Ten prizes, each of		5	0

Closing Date for Entries: 30th April, 1958.

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.

Weed cutter at work on the Trent and Mersey Canal near Rugeley, Staffs. Photograph by G. Lewis, Rugeley.

Canal Clearing

In September last I saw near Rugeley, Staffs., on the Trent and Mersey Canal, a British Waterways weed cutter at work. This was cutting off all the reeds at the sides of the canal as well as in the middle.

The cutter is propelled by two large wooden paddle wheels at the rear, which churn the water up tremendously. The cutting is done by two blades, one on each side. These can be raised or lowered, according to the depth of water, by means of a long handle. Where the reeds are thick the cutter takes several "runs" at them. It can go forward or backward, and is steered by means of a wheel on a long shaft that is connected to the paddles.

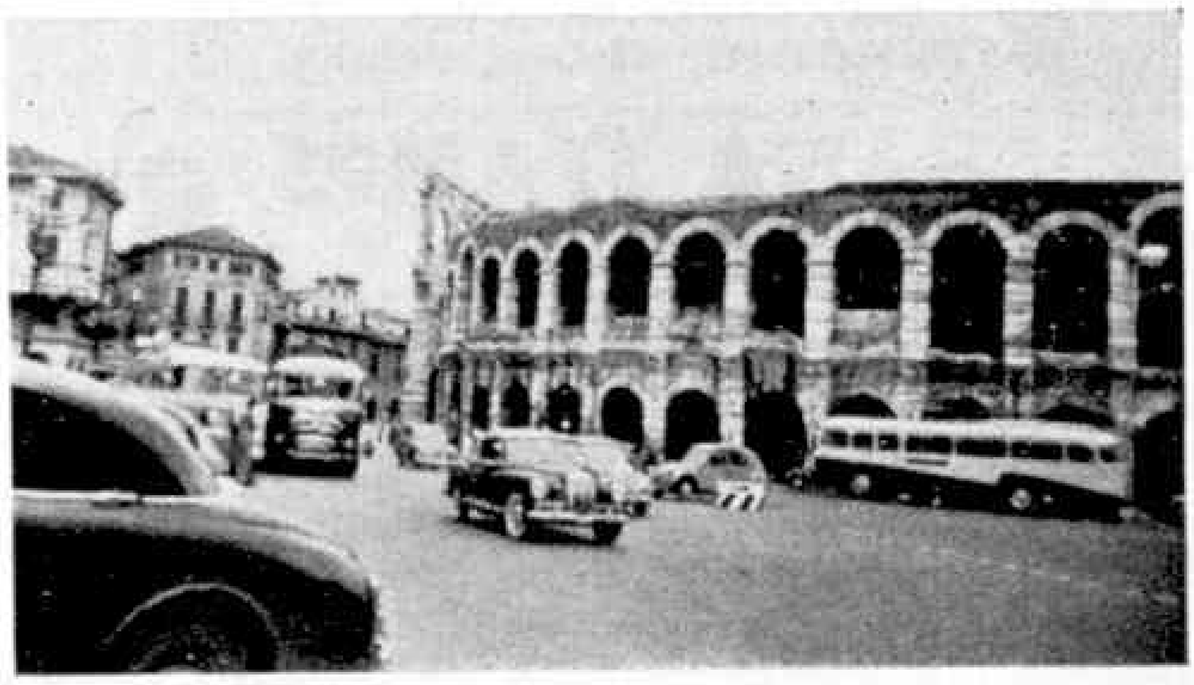
The "driver" sits on a little seat, which is something like a bosun's chair, and all the controls are within easy reach. When he has cut a large quantity of reeds he lifts his cutting blades up to the surface, and pushes the reeds in front of the cutter, collecting all erring clumps with a boat-hook. The reeds are pushed in this way to the elevator, and an old barge placed at 45° to the canal bank, blocking most of the canal, helps to direct them to the elevator itself, which is so placed that it completes the blockage. The elevator picks up the reeds, and deposits them on the bank.

This activity is necessary in order to keep canals clear for traffic.

G. Lewis (Rugeley).

Ancient and Modern

The arena at Verona in North Italy was built by the Romans of the 1st Century A.D. It was made to resemble the great Flavian amphitheatre in Rome. Most of the external arcades were destroyed in an earthquake in 1183, and subsequently the debris was used to supply building materials. Now only a bit of the arcade is left, and this can be seen in the accompanying illustration.



Modern traffic passing the remains of the ancient amphitheatre at Verona, Italy. Photograph by M. D. Oastler, Glasgow.

The arena itself is still in good condition, and is used as an open air theatre. When full its seating accommodates 25,000 spectators.

M. D. Oastler (Glasgow).

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Stamp Collectors' Corner

By F. E. Metcalfe

ROYAL VISITS

The recent tour of Canada and the U.S.A. by the Queen and the Duke of Edinburgh has aroused new interest in Royal Visit stamps. Canada has issued a very attractive stamp to mark the occasion, and I think that the inclusion in the design of the portrait of the Duke as well as that of the Queen has been particularly welcome.

The rule now seems to be that the only postal recognition given to members of the royal family, apart from Queen Elizabeth herself, when they carry out tours overseas is a special postmark. Still, we can indeed provide a nice little lot of Royal Visit stamps, which when nicely mounted and well written up both surprise and charm our non-collecting friends. And as time goes on such a collection will grow more extensive.

I must make it clear that stamps have been issued to commemorate visits of other royal personages. For instance, Australia issued a set of four stamps in 1951 to commemorate the Golden Jubilee of the Commonwealth, and the 5½d. stamp of this issue pictured the Duke of York, later King George, opening the First Federal Parliament in 1901. Perhaps that issue cannot exactly be described as one made to commemorate a royal visit, but there was no doubt about the Australian issue of 1954, when three stamps were released in honour of the visit of the Queen and her husband.

It is worth while giving details of this 1954 set of stamps. The 3½d. and 2/- values show both the Queen and the Duke, while the 7½d. depicts the Queen in her state robes. But it is the 3½d. stamp to which I would like to draw your attention. On this there has been what is known as a re-touch on the hair of the Duke. This variety is illustrated in the Commonwealth Q.E. II Catalogue and as the stamp is common enough used, there are plenty about to study, and if you find one with the re-touch and it is a nice used copy, you have found a pound note! A mint copy is worth much more.

I may explain that a re-touch arises if a plate gets damaged and the affected part has the design redrawn in, as it were.

There was a fine philatelic crop when King George VI, Queen Elizabeth and the two Princesses visited Southern Africa in 1947. First South Africa brought out three pairs of stamps—in those days its stamps were alternately printed in Afrikaans and English—and these were overprinted for South West Africa as well. The 1d. value shows the King in naval uniform, alone, the 2d. value the King and Queen, and the 3d. the two Princesses. Incidentally there is a nice variety on the latter stamp. It is known as the "blind princess," for there is a smudge across Princess Elizabeth's eyes. These stamps are not particularly scarce, so copies will be easier to find.

Besides South Africa and South West Africa, Basutoland, Bechuanaland, Southern Rhodesia and Swaziland all contributed new stamps to celebrate the big event, and there were also a number of special train postmarks, etc., used. This little lot alone can be made to fill one or two pages, which will be very attractive. Covers are quite common, and these are cheap also.

Another important Royal Visit was philatelically celebrated by Canada in 1939, when King George VI and the Queen visited that great sister nation of ours. Three stamps were issued. They are plentiful, and easy to come by, so there is no need to detail them. Nor need I say much about the next Royal Visit stamp issued by Canada in 1951, when both Princess Elizabeth, as she was then, and the Duke were featured on a 4c. stamp.

The extensive tour that the Queen and the Duke made in 1953–4 was not quite as extensive as that undertaken last year by the Duke of Edinburgh, but it did touch points as far apart as Aden, Gibraltar, Fiji, Ceylon, Malta, Kenya, Jamaica, New Zealand and Australia, and all these countries issued special stamps. With the exception of Australia and New Zealand, only singles were issued, and none is particularly scarce. The set for New Zealand consisted of two stamps, the Queen alone on the 3d. value and Her Majesty with her husband on the 4d. These stamps are particularly attractive, and a mint pair, plus a nice cover, make up a fine page.

Of course I have not finished the list yet. Newfoundland was honoured in 1939 by a visit from King George VI and Queen Elizabeth, when the royal couple visited Canada. A 5c. stamp was issued, showing portraits of both the King and the Queen. Later this stamp was surcharged twice, a rather strange thing to do. Contrary to what generally happens, the original stamp was not a particularly big seller, and as a lot of stamps were left it was decided to surcharge them for ordinary postal use.

Kenya also issued a pair of Royal Visit stamps in 1952, apart from the one already referred to on the Grand Tour. The then Princess Elizabeth was visiting the territory, and to commemorate the event the K.G. VI 10c. and 1/- stamps (Cont. on page 54)

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For other stamp Advertisements see also pages 50, xxii and xxiii

Stamp Gossip

SHADE VARIETIES

Recently I received from a collector two current Nigeria 2d. stamps, asking if I could explain the difference in colours, which as he put it, was more than a mere shade variation. I think other collectors may be similarly puzzled. This stamp has got us all a bit foxed, and I will try to explain what I know about it.

In July 1956 the colour of the stamp was changed from black and ochre to a purple slate. We were also advised that the stamps were being printed in Belgium at the Continental branch of the British firm of Waterlow and Sons, who are the present printers of Nigerian stamps. The new stamps released by the Crown Agents in London were purple slate in colour, but collectors soon noted that used copies coming from the Colony were of a bluish-slate, a colour quite lacking the purple to be found in the London release. It was one each of these two colours that my correspondent had picked up.

If that were all the matter would be simple, but it has been complicated in two ways. The first was a statement that the difference in colour was caused by the action of the climate. I think this can be dismissed as incorrect. Secondly, stamps of yet another colour have turned up from the Colony. These are a sort of grey black, and to cap it all a new printing just released by the Crown Agents is of stamps of a purple-grey black. That makes four colours, all quite different.

SOUTH WEST AFRICA

Not so long ago, I got a very interesting letter from a lady in Windhoek, plus a nice cover, with various current stamps affixed. She told me that local St. John Ambulance Brigade Cadet divisions were collecting stamps for funds, and perhaps an article on S.W.A. stamps in the *M.M.* might help to sustain enthusiasm. The trouble is that there are so many stamps issued today about which I should like to write, but I cannot cover them all in the space available.

My correspondent refers to the current set of S.W.A., and rightly says that some of them are lovely. As a matter of fact I gave the set quite a write-up when it was first placed on sale. The first four values reproduce rock paintings. The 1d. stamp depicts two bucks, and what a born artist the prehistoric man or woman who drew those must have been. Just a line or two and a smudge of paint, and the result shows two animals in a state of alertness. The 3d. value is another gem, and these, with other values showing native types and animals, make a set that all should try to obtain.

FLYING DOCTORS

I am much indebted to Mr. R. Kydd for the cover he sent with one of the new Australian 7d. stamps, which though issued as a definitive, that is a stamp for regular use, is dedicated to the Royal Flying Doctor service. This is a service of mercy that not only Australia, but the whole of the British Commonwealth can be proud of. Actually I had the privilege of meeting one of these doctors last summer, and he was all that one would hope and expect such a man to be. The stamp too is a beautiful one, worthy of the service it honours.

Incidentally, while on Australian stamps, I would like to pay a compliment to those who engrave and print the stamps of the Dominion. They often design them also, and it is those stamps that usually merit the most praise.

ARROWS TO ATOMS

As I write these lines, we are all very excited about Russia's "Red Moons" and the stamp issued by the U.S.A. to commemorate the 50th Anniversary of the Statehood of Oklahoma seems to fit in with our present mood. During the next few years we are going to be startled by one wonder after another. Whether we'll be any the happier for it is a moot point.

THE TIP OF THE MONTH

To get back to the Nigeria 2d. stamp referred to earlier, look out for a mint copy of the stamp that is of the bluish-slate shade, or colour. It can now be picked up at under 1/-. Get a mint copy, not used.

Space Notes—(*Continued from page 9*)

were powered by solid fuels. The total burning time for all four stages was only eight seconds. The first two stages fell back to Earth after burn-out; this was the primary reason for launching over water from Eniwetok Atoll, in the Pacific. The last two stages were burnt up in their high-speed fall towards the Earth. The top speed was about 17,000 m.p.h., and occurred as the last rocket motor burnt out. Information was gathered on the Earth's magnetic and gravitational fields, cosmic rays and meteors.

The successful firing was made on 22nd October, 1957, and it was reported that the top stage may have exceeded the 4,000 mile mark by a few hundred miles. The telemetering device in the nose cone of the last stage sent a signal for eight minutes after take-off. The signal then faded away, but was picked up again 75 minutes later. It is not at present planned to fire any more of these rockets.

The House-Sparrow—(*Continued from page 19*)

roosts. On one occasion I saw a moorhen, usually a vegetarian, grab a sparrow at the edge of a pool and kill it by drowning. Rats would as soon eat a sparrow as anything. The adult sparrow, as it hops about as if its legs were tied together, keeps a sharp look out and rarely gets caught, but thousands of sparrow fledglings never reach maturity.

Certainly the balance of nature is well set as far as sparrows are concerned. Though many sparrows rear three or four broods each year, their total population does not appear to fluctuate a great deal. If anything there has been a slight rise in numbers in the past half century. Perhaps this is due to the busy life that man now leads—sparrow killing clubs are extinct.

Before driving away the sparrows it is well to consider their worth, as they did in Biblical times when two sparrows were valued at one farthing. A pair of sparrows today is probably worth a great deal more than that to the gardener, agriculturist and tree planter. An old Cornishman once told me that the way to keep sparrows away from seeds was to put a seed or two under the tongue when planting them. This, of course, is just a quaint superstition. A more practical way is to see that the birds are well supplied with water—for it is thirst rather than hunger that turns house-sparrows into raiders.

Who killed Cock Robin? Certainly not the sparrow, for though as cheeky as a Cockney barrow-boy it is always a friendly little bird.

Stamp Collectors' Corner—(*Continued from page 51*)

had the legend "Royal Visit 1952" added. Alas the stamps were only on sale a few days, for the sad news about the King meant that his daughter had to return at once to England.

Malta is another Colony that has made two issues of Royal Visit stamps. I suppose that the three stamps issued in 1950, with a design including what purports to be a portrait of Princess Elizabeth, is about the poorest likeness that has appeared on any of our Commonwealth stamps. In fact I am sure that no one would know whose portrait it was supposed to be, unless they were told.

And that more or less concludes a quick run through the stamps issued in the Commonwealth to celebrate Royal Visits. None of the stamps is scarce, and a complete collection is within the scope of most pockets. As a small investment, I think one could spend more and fare worse in some other directions.

"THE AEROPLANE PICTORIAL REVIEW (No. 2)"
(Temple Press, price 10/6d.)

The success of the first *Pictorial Review*, published in 1956, ensured the issue of a successor. This second edition is on the same lines, and its close upon 300 illustrations are the best and most striking photographs reproduced in the aeronautical weekly *The Aeroplane* since the previous *Pictorial Review*.

Here are excellent pictures of the latest types of civil and military aircraft, training and Naval machines, helicopters and ground missiles. A more personal touch is given by the inclusion of many pictures of people and events which have made aviation news during the year under review. There is a descriptive caption to each illustration.

"THE AEROPLANE DIARY, 1958"
(Temple Press)

This neat pocket diary includes a special aeronautical section that contains a mass of interesting information. There are lists of the R.A.F. Commands, rates of pay of officers and other ranks, illustrations of the badges of rank, mach number chart, international civil aircraft markings, table of airline distances, technical details of current British aircraft and aircraft engines, list of the principal flying records, and so on.

The diary is available in two editions, rexine covered at 4/- and leather covered at 6/-, including Purchase Tax. Add 6d. for postage if you decide to order direct from the publishers, Temple Press Limited, Bowling Green Lane, London E.C.1.

GAMAGES BOOK OF MODEL TRAINS, BOATS, CARS, AIRCRAFT, ETC.
(Price 1/-)

As its title implies, this publication deals with miniature reproductions of various makes of many forms of transport. There are trains, including Hornby Clockwork and Hornby-Dublo of course, available in complete Sets or as individual items, boats, motor driven and otherwise, that can be had complete or in kit form, and a very wide range of model motor vehicles. The latter are in different styles and on various scales, and they range from those models without mechanisms to fascinating power-driven affairs. Both present day and vintage vehicles can be obtained in kit form.

Kits are the keynote, too, in aircraft modelling. There are planes to fly and planes merely intended as static models, with details of internal combustion engines for aircraft work and radio control apparatus; and a special section deals with the management and the finishing of the plastics commonly used in various constructional kits nowadays.

Needless to say, illustrations are plentiful and the book represents good useful value at a shilling.

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Competition! Open To All Readers

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

Which 1957 Cover Do You Like Best?

The illustration above reproduces, on a very small scale, the 12 covers of last year's issues of the *M.M.* Being in black and white, it does not give any idea of the colour and brilliance of the originals, and is intended only as a reminder of what the subjects were. We invite readers to give us their opinion of these 1957 covers.

It is only necessary for each entrant to state on a postcard: A, which of the covers he likes best; and B, in what order he thinks they will be placed by the combined votes of competitors. In each list the covers must be referred to by the names of the months when they appeared, and it is not necessary for a competitor to place his own favourite at the top of his list under the second heading.

The names, addresses and ages of entrants must be written on their postcards, which should be addressed to *1957 Cover Voting Contest, Meccano Magazine, Binns Road, Liverpool 13.* As usual there will be two sections in this competition, for Home and Overseas readers respectively, with prizes in each of 21/-, 15/- and 10/6 for the three entries judged the best, and consolation prizes for other good efforts.

Closing dates: Home Section, 28th February; Overseas Section, 31st May.

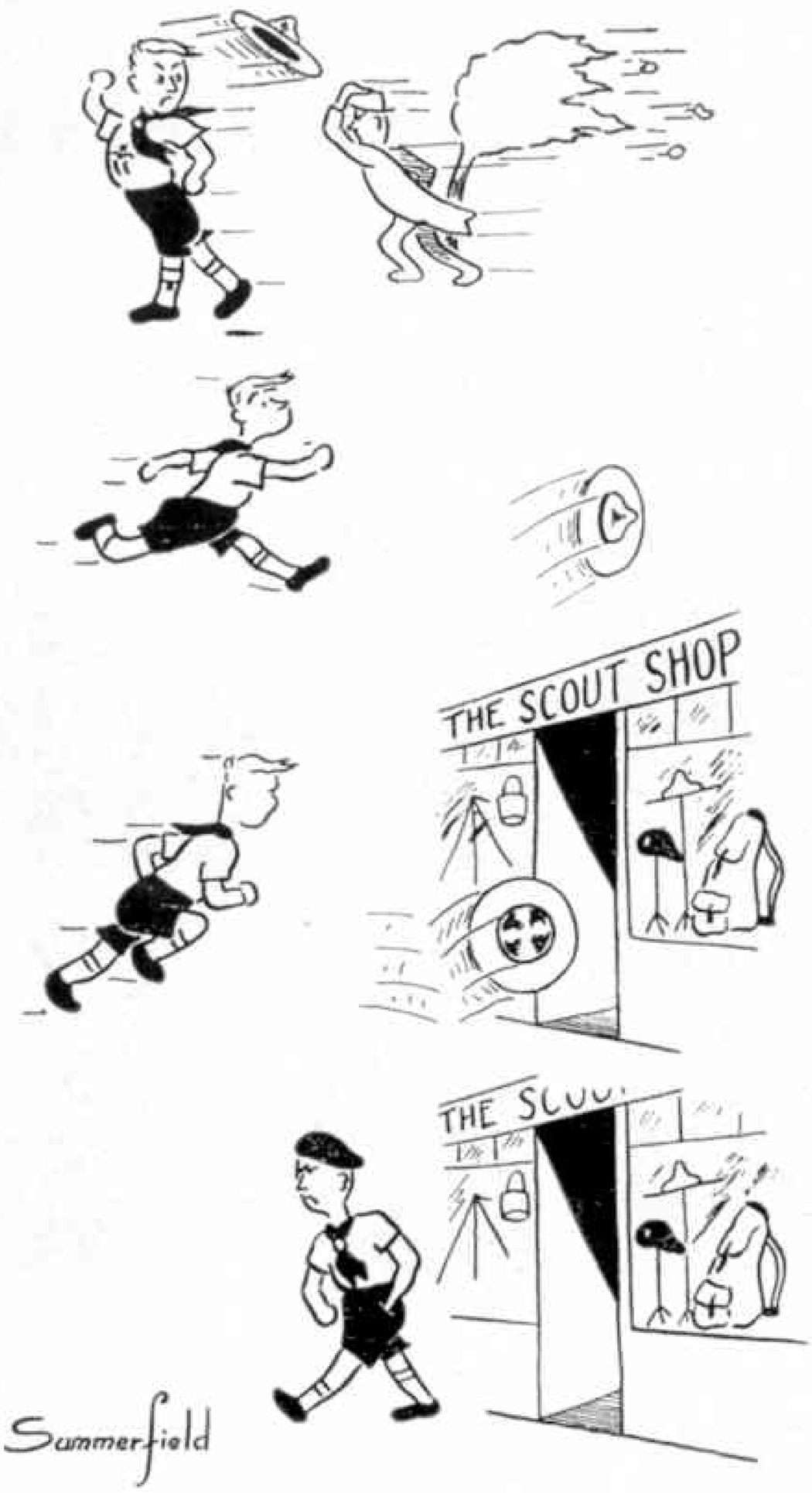
ALF FRANCIS—RACING MECHANIC

(G. E. Foulis and Co. Ltd., 25/- net)

The story of the career of Alf Francis, the now famous racing mechanic, is one that will appeal to motor racing enthusiasts of all ages. When he joined the H.W.M. team in 1948, he had had no previous experience of racing cars, and indeed had never seen a race. How he seized his opportunity, and made rapid strides in what to him was a new career is told in this book, in which the story is written up by Peter Lewis as it was told to him by Alf Francis himself.

The life of a motor racing mechanic is a crowded one, as the story shows. He must indeed have an almost unbelievable amount of enthusiasm, and it is this quality that is assigned to Alf Francis by the most famous of the racing motorists whom he has served—Stirling Moss, who contributes the foreword to this book. He and Alf Francis almost managed the almost impossible task of beating the factory teams, in spite of the immense difference in their resources, and Stirling gives a good deal of credit for the showing they put up with his private Maserati to Alf Francis and his mechanical "green fingers."

The book will provide motor racing enthusiasts with many happy hours as they browse through its pages. In them they are transported to the scenes of great events in the racing motor world since that day in 1948 already referred to, and they meet practically every great figure associated with the sport. Besides all this there is real humour and adventure, and readers will enjoy this story as much as Alf did the real events themselves.



"I do odd jobs at the hat shop in the High Street."
"I know. My daughter is wearing one!"

* * * *

Gypsy (at fair): "I can tell your fortune."
Reveller: "How much?"
Gypsy: "Ten bob!"
Reveller: "How did you guess?"

* * * *

A would-be poet sent one of his efforts to the local paper with a note: "Let me know if you can use this poem. If not, I have other irons in the fire."

He received the following reply from the Editor: "Remove the irons. Insert poem."

* * * *

A teacher took her pupils for a trip through a Museum of Natural History.

"Well, my lad," Dad asked little Peter on the latter's return, "where did you go with your teacher this afternoon?"

"Huh," replied Peter, with disdain, "she took us to a dead circus."

* * * *

Angler: "It was at least that long. I never saw such a fish in my life!"

Friend: "I believe you, old man."

* * * *

It was examination time in composition. The teacher directed the class to write a brief account of a cricket match. All the pupils wrote busily except one small boy. Just as the allotted time was about to elapse, he suddenly awoke to life and scrawled the following sentence just in time. "No game. Rain stopped play."

Fireside Fun

"Guard, why is this train not stopping at this station?"

"Our engine driver has been owing the station master ten shillings for the past fortnight!"

* * * *

Waiter: "Did you ring the bell, sir?"

Guest: "No, I was tolling it. I thought you were dead."

* * * *

BRAIN TEASERS

A WILD FLOWER HUNT

Hidden in each of the word columns below is the eight letter name of a wild flower. Each word in each column contains two consecutive letters of the name. Can you track down the names?

BLEACH	BROACH	CRICKET
TONGUE	CHECKS	BOWLED
BEACON	RODENT	BEFORE
BULLET	CLOSED	BOTTLE

* * * *

WHERE DID THEY GO?

Can you find the names of the places to which each of the children mentioned below went for their holidays?

(1) Billy went to a Cheese (Somerset).

(2) John went to Part of the Body plus a small lake (Lancs.).

(3) Ruby spent her holiday at a NUT TREE plus a LAKE (Surrey).

(4) Arthur and Elsie went to a FRESH FRUIT (Berkshire).

(5) Peter had a good time at a KIND OF GRAIN (Sussex).

(6) Dorothy visited PART OF A SHIP with her brother Tom (Yorkshire).

(7) James went to a WATER BIRD plus A BODY OF WATER (Glamorgan).

(8) George went by car to his aunt at a NUMBER OF TREES (Kent).

(9) Richard had a fine time on a DARK BODY OF WATER (Lancs.).

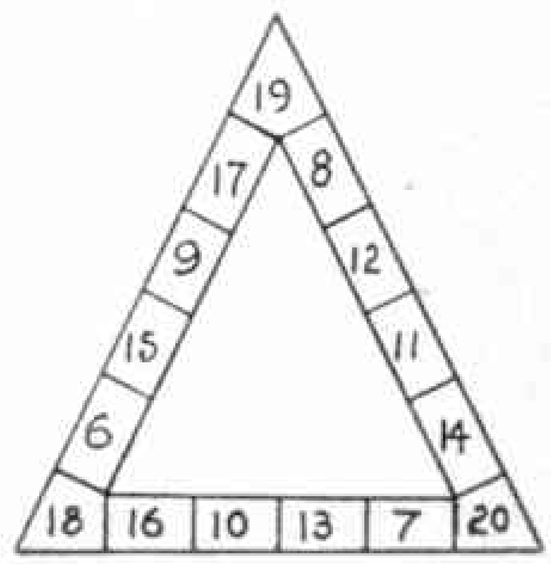
(10) FROZEN RAIN and PRETENCE provided a jolly holiday for Timothy and Lucy (Sussex).

* * * *

ANSWERS TO LAST MONTH'S PUZZLES

A Triangle of Numbers

The solution to the Triangle Puzzle is shown on the right.



* * *

All These are "Smiths"

(1) Ladysmith.
(2) Hammersmith.
(3) Goldsmith.
(4) Blacksmith.
(5) Coppersmith.
(6) Locksmith.

* * *

What am I?

The answer is a Conundrum.

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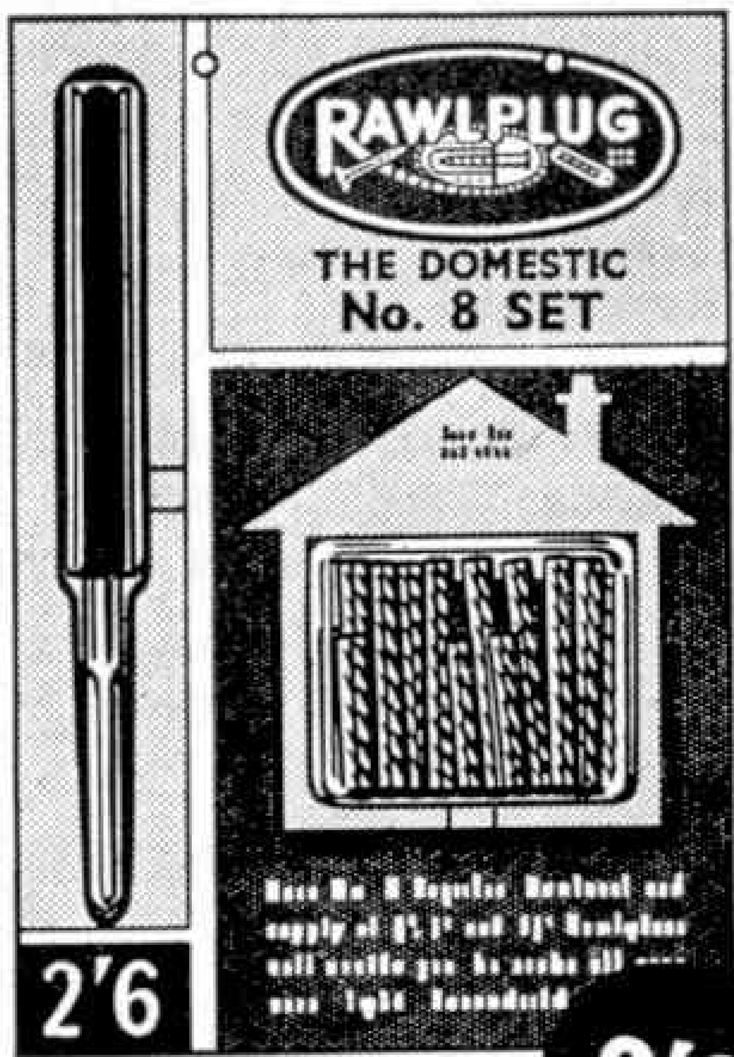

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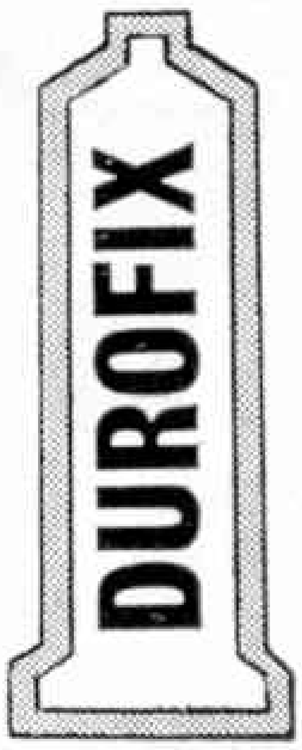

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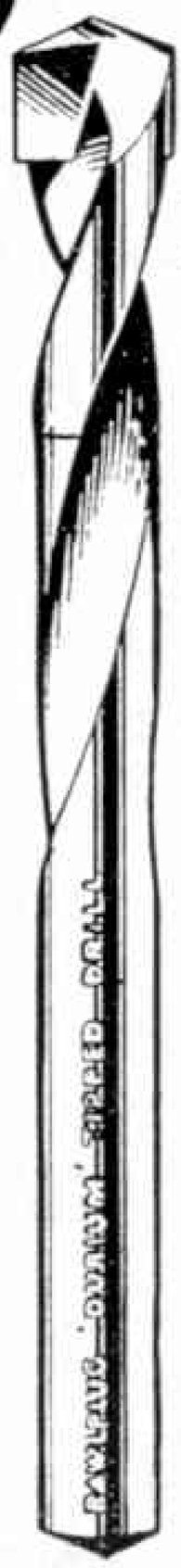

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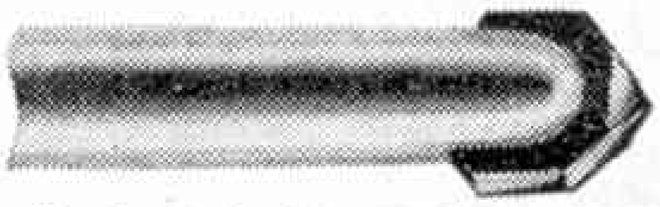

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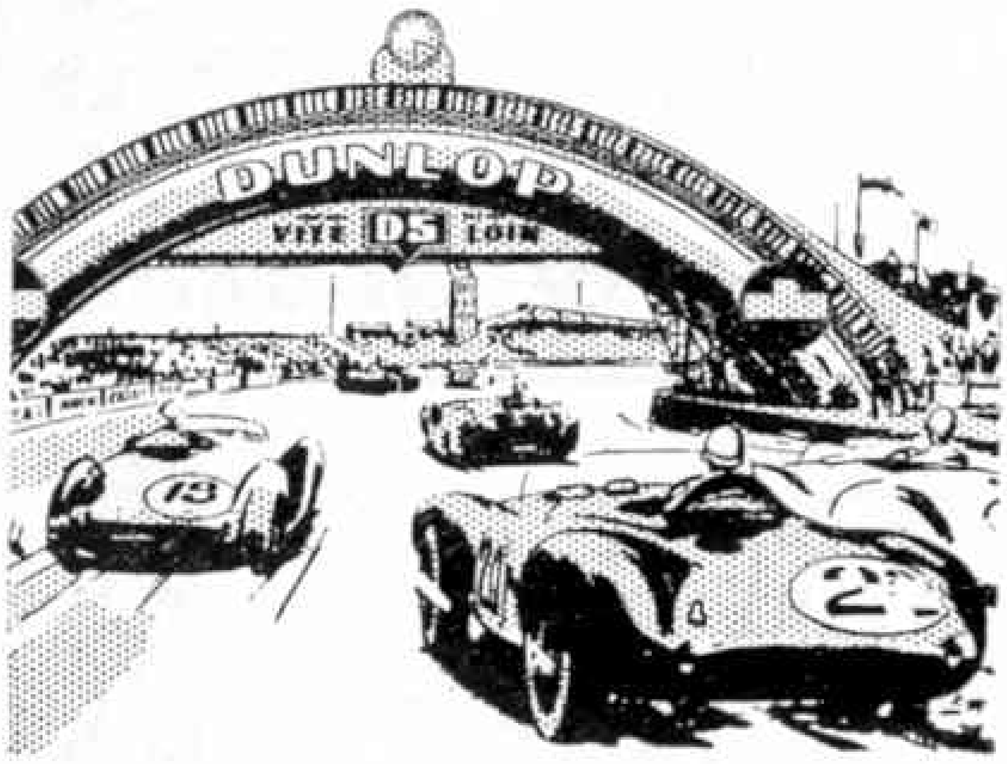

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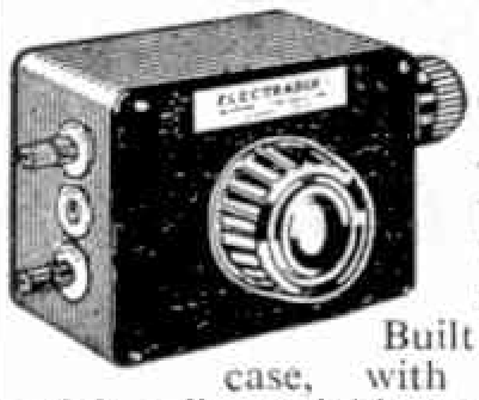

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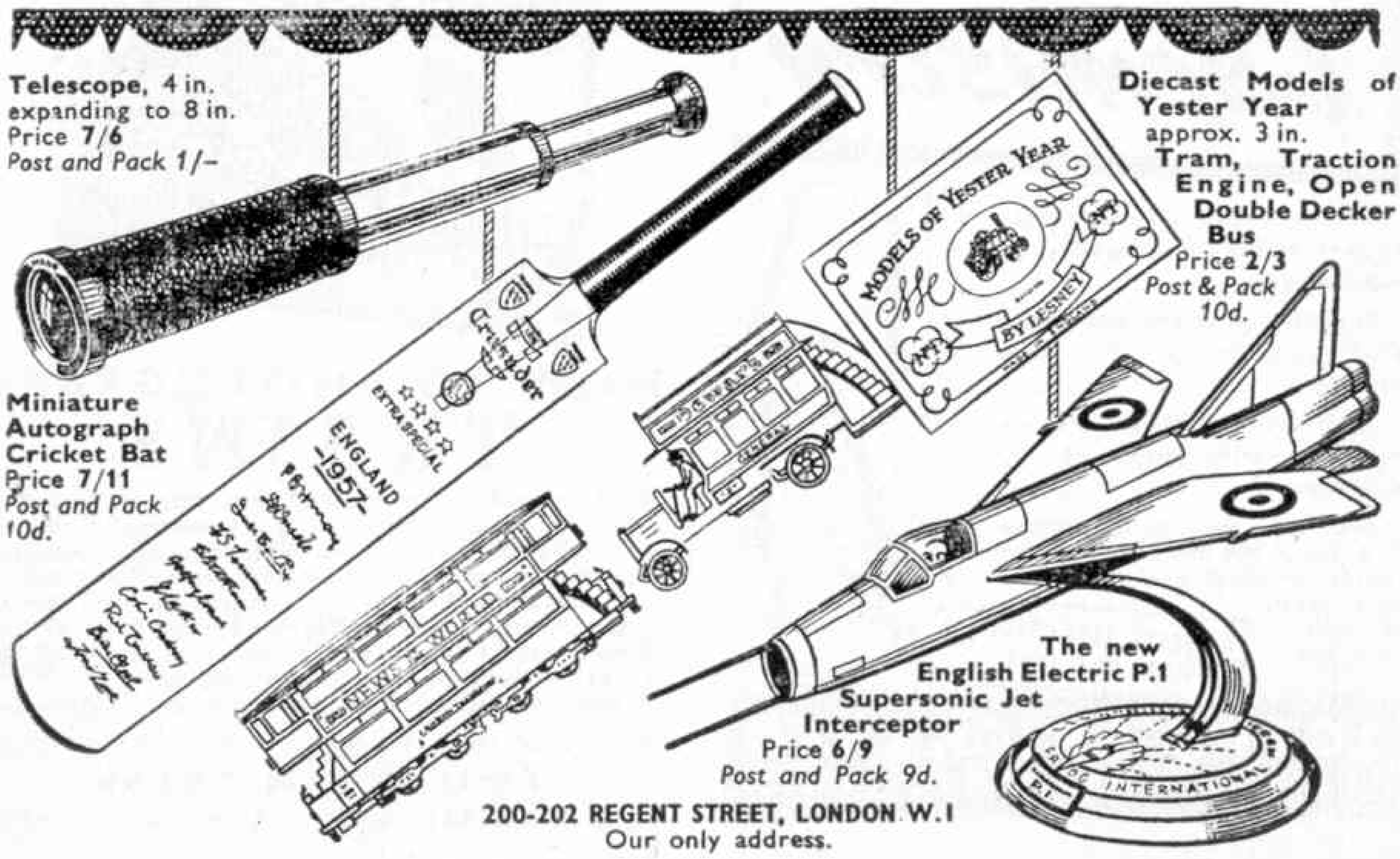

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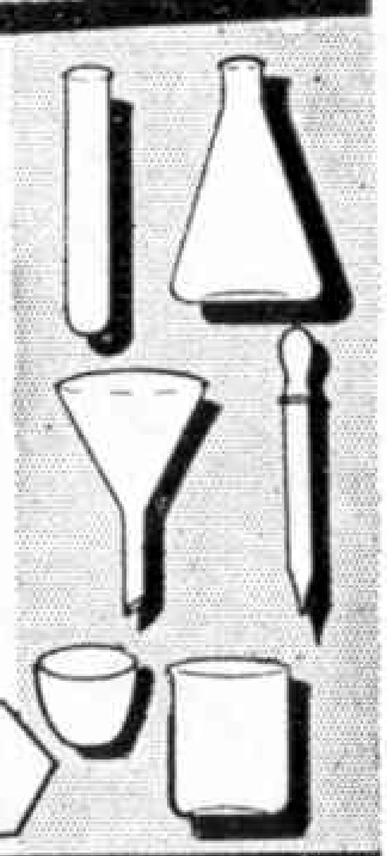

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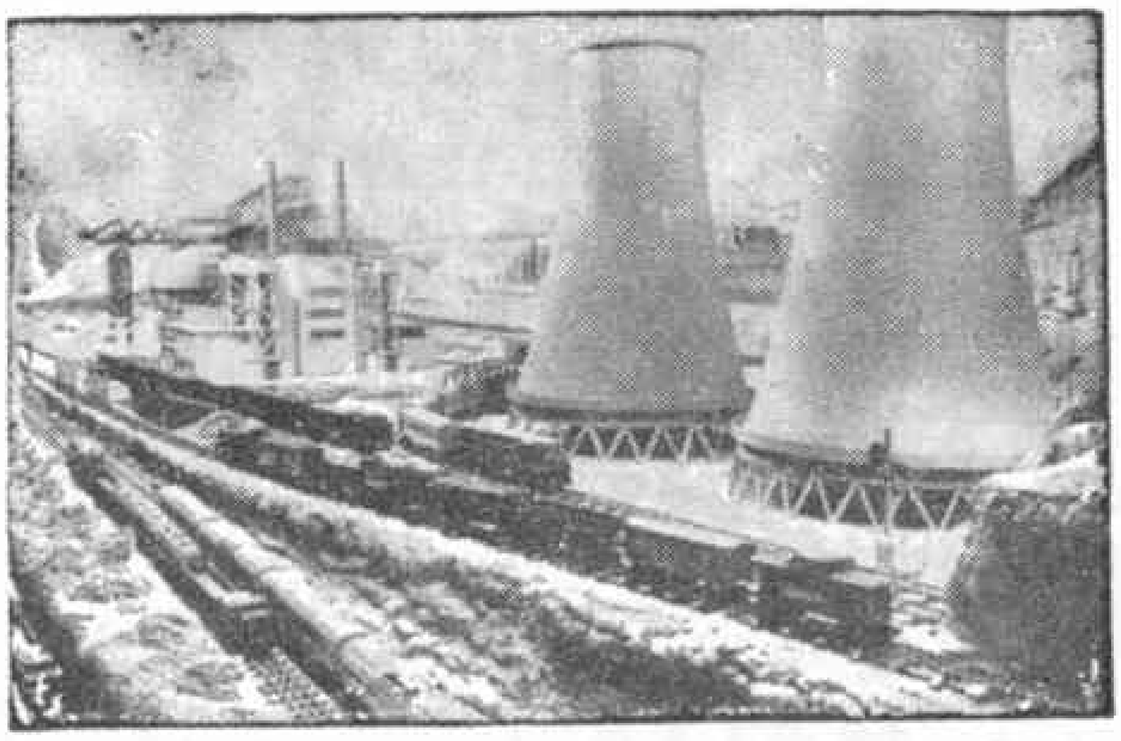

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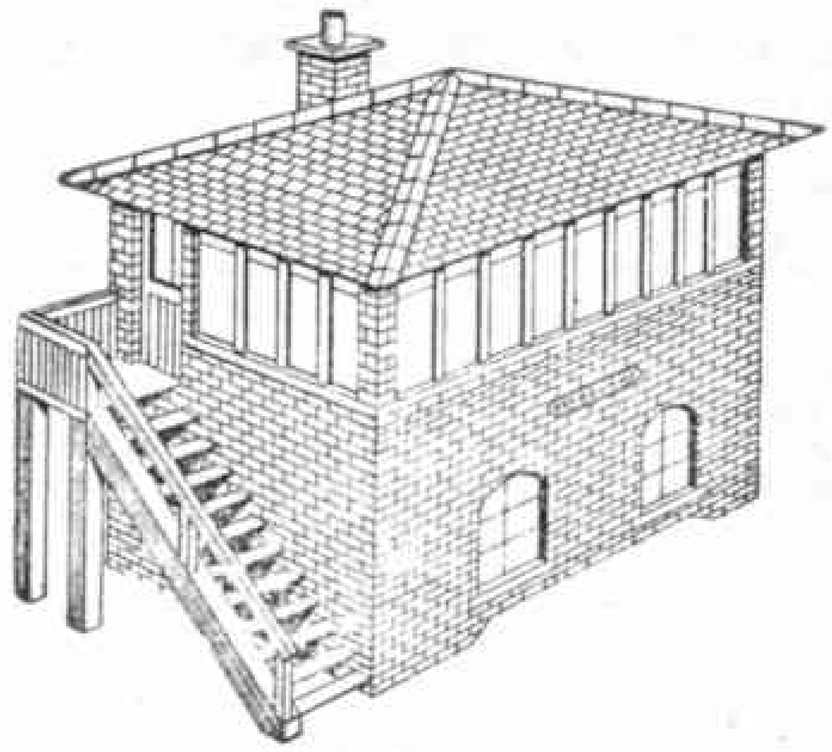

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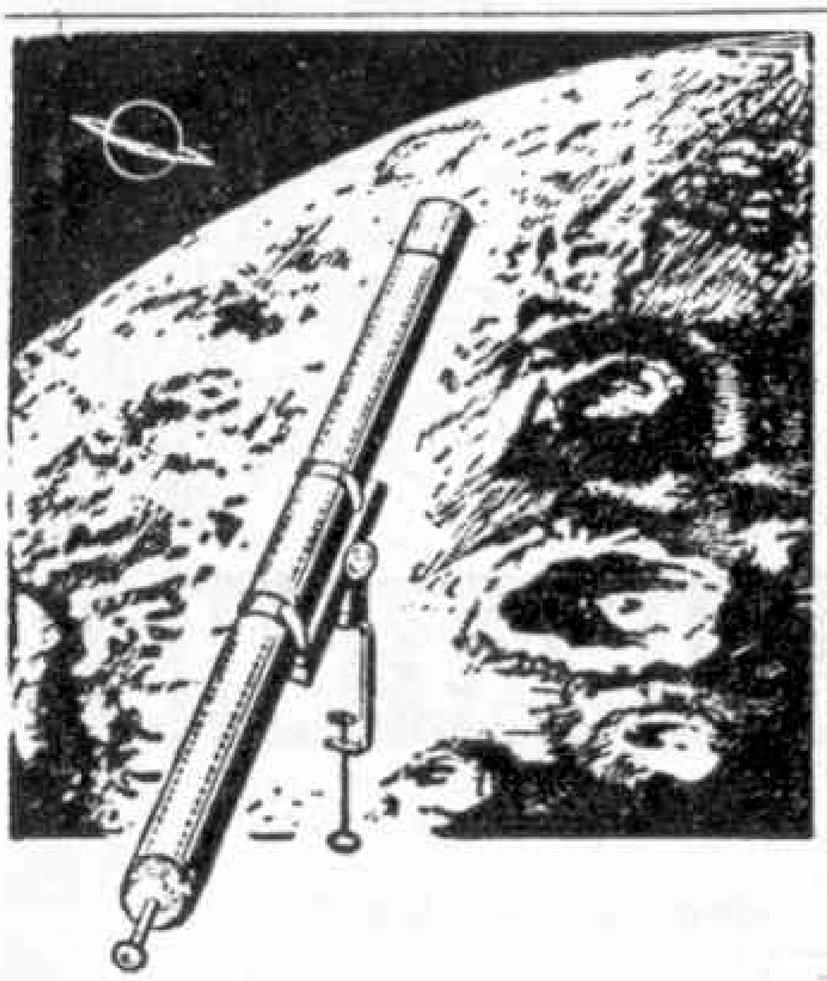

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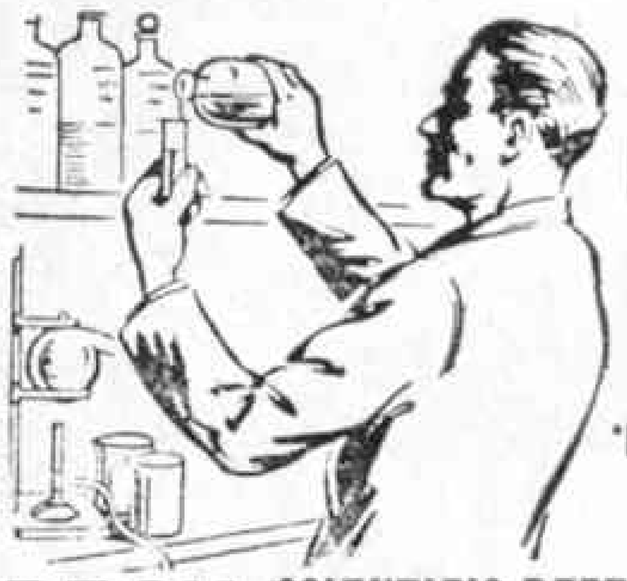

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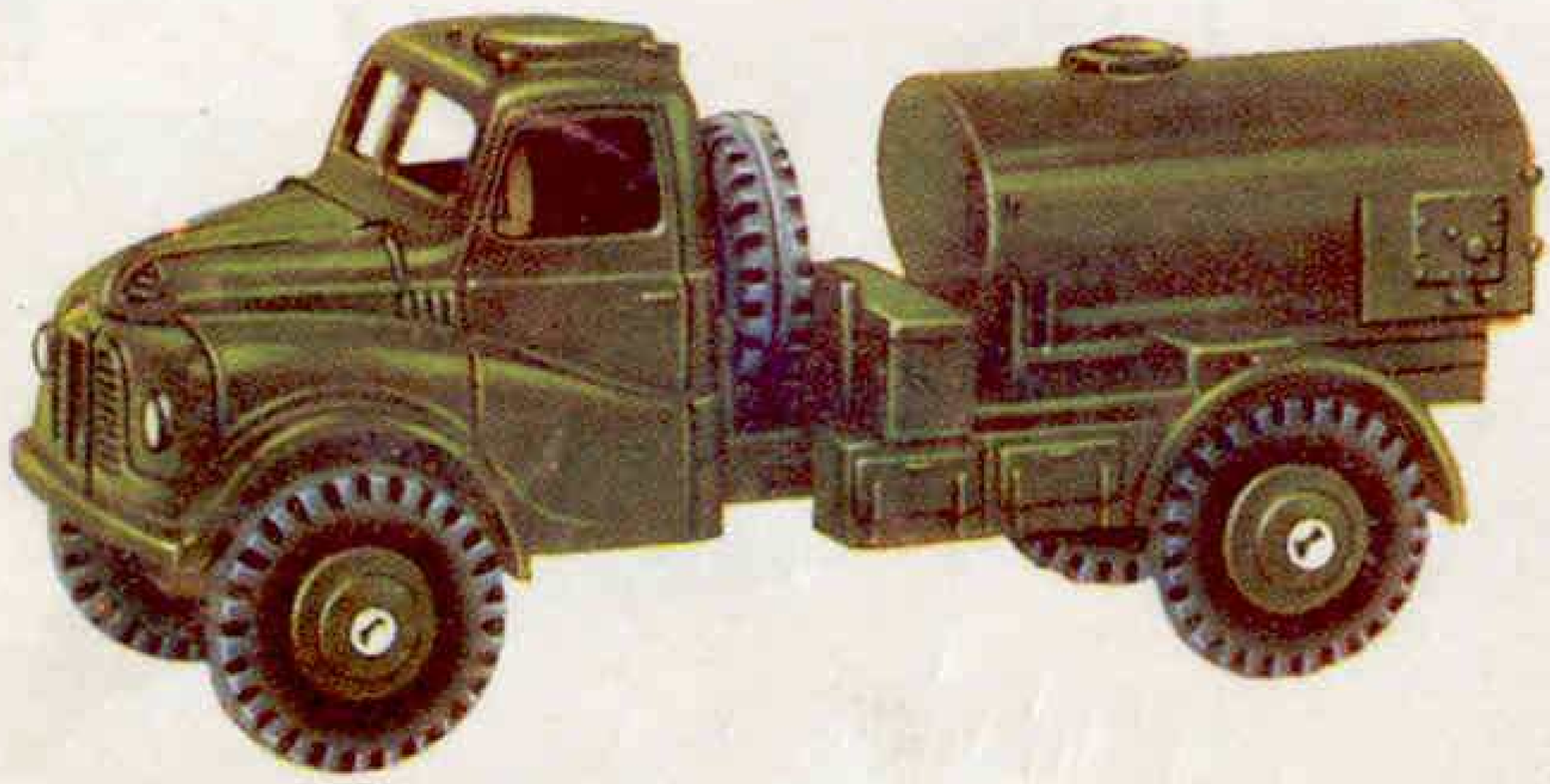

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MODEL OF THE MONTH

AUTOMATIC BOX FILLING MACHINE

Illustrated in the January 1958 issue of the Meccano Magazine

Details of the base frame and the conveyor

Construction should be begun by bolting two 5½" Angle Girders 1 and 2 between two 18½" Angle Girders 3 and 4. Four holes from each end of the Girders 1 and 2 two 12½" Angle Girders 5 and 6 are fixed, and two Corner Gussets 7 are bolted three holes from the inner ends of the Girders 5 and 6. Two Corner Gussets 8, extended upward one hole by 3" Strips, are attached to the outer ends of the Girders 5 and 6.

A 3" Rod 9 is mounted in the Strips bolted to Corner Gussets 8, and is fitted with three 1" Sprocket Wheels. Two Washers are placed between the boss of each Sprocket and the bearings for the Rod. A 3½" Rod is supported in the Corner Gussets 7 and two 2" Sprockets 10 and a 1" Sprocket 11 are fixed on the Rod. Two lengths of Chain, each consisting of 144 links, are arranged round the Sprockets 10 and the Sprockets 13 on Rod 9. The lengths of Chain are connected by eight 2" Angle Girders 12, which are attached to the Chains by roundheaded bifurcated paper clips. The clips are passed through holes in the Girders and links in the Chain, then the prongs are opened out at right angles to the Chain. There must be 17 clear links between each Angle Girder, and the lengths of Chain must be taut.

The delivery slide for the empty boxes consists of two 5½" Angle Girders 14, each fitted with a 5½" x 1½" Flexible Plate. The Girders are spaced by nuts on two 3" Screwed Rods, the lower one of which carries two 2½" Strips 15 fixed between nuts, while on the upper one two Fishplates 16 are similarly attached. The Strips 15 are connected to the Girder 1 by Corner Angle Brackets and the Fishplates 16 support a 2½" x 1" Double Angle Strip 17. The latter part is later bolted to the top of the gear-box housing.

Arrangement of the Motor and the Gear-Box

A 5½" x 3½" Flat Plate 18 is attached to the Girders 3 and 4 and an E20R(S) Electric Motor is bolted to the Plate. Two 3½" x 2½" Flanged Plates 19 and 20 are fixed in position and their upper ends are connected by a 2½" x 2½" Flat Plate.

A ½" Pulley on the Motor armature shaft is connected by a Driving Band to a 3" Pulley 21 on a 3½" Rod. A 1" Pulley 22 on the same Rod drives a 2" Pulley 23 on a Rod 24, which carries also a 7/16" Pinion 25. This engages a 60-tooth Gear on a 3" Rod 26, and a ¾" Sprocket on the same Rod is connected by Chain to a similar Sprocket 27 on a Rod 28. A 7/16" Pinion on Rod 28 drives a 60-tooth Gear 29, and a 7/16" Pinion 30 on the same Rod as Gear 29 engages a 60-tooth Gear 31, which is fitted with four Set Screws held by nuts in adjacent holes.

The Set Screws in the Gear 31 engage intermittently with further Set Screws in the holes in two Bush Wheels 32 and 33. A 1" Sprocket 34 on the same Rod as Bush Wheel 33 is connected by Chain to the Sprocket 11. A Pawl 35 on a Pivot Bolt engages a Ratchet Wheel on the same Rod as Bush Wheel 33. To adjust this part of the mechanism, turn shaft 28 until the Set Screws in Gear 31 just disengage those in the Bush Wheel 33. Now rotate the conveyor Chains until the centre of the holes in one of the Girders 12 are exactly 1½" from the Rod carrying the 2" Sprockets 10. Now fix the Sprockets on the Rod.

A 50-tooth Gear 36 on the same Rod as Bush Wheel 32 engages a $\frac{3}{4}$" Pinion on a $3\frac{1}{2}$" Rod 37. This Rod carries two $\frac{3}{4}$" Sprockets 38 and 39. Sprocket 39 is connected by Chain to a similar Sprocket 40 on a $3\frac{1}{2}$" Rod, which carries also a Face Plate 41. A Collar 42 and an Adaptor for Screwed Rods 43 are bolted to the Face Plate as shown. An 8" Rod 44 is placed in a Rod and Strip Connector lock-nutted to an Angle Bracket that is bolted to a $5\frac{1}{2}$" Angle Girder 45. A Spring 46 is used to press the Rod against the Collar and the Adaptor for Screwed Rods attached to the Face Plate. Set Rod 28 so that when the Set Screws in the Gear 31 and the Bush Wheel 32 are just disengaged, the Rod 44 is almost horizontal and bears against both the Collar and the Adaptor for Screwed Rods.

A Rod held in an End Bearing attached to the Motor switch is supported in a slightly bent $2\frac{1}{2}$" Strip bolted to the top of the gear-box.

Details of the Box Handling Mechanism

The "fingers" controlling the locking, opening and closing of the boxes are supported by a rectangular framework attached to the base. This framework consists of $5\frac{1}{2}$" and $9\frac{1}{2}$" Angle Girders, the upright Girders being braced by $1\frac{1}{2}$" Corner Brackets. A $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip is bolted to the $5\frac{1}{2}$" Angle Girder 47 and is fitted with $1\frac{1}{2}$" Strips that support another $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip. This forms a stop to prevent more than one box at a time being removed from the delivery slide.

Three $6\frac{1}{2}$" Rods 48 are mounted in the framework and each is fitted with a Coupling 49, a Collar and a Threaded Coupling. Each Threaded Coupling has a 2" Screwed Rod fixed in it by a nut, and a $\frac{1}{2}$" Reversed Angle Bracket is held at the lower end of the Screwed Rod between two nuts. The Couplings 49 are fitted with Flexible Coupling Units, each of which carries a Collar, and a $7\frac{1}{2}$" Strip 50 is mounted on bolts screwed into the Collars. A $7\frac{1}{2}$" Strip 51 is lock-nutted in the next to end hole of Strip 50 and is held by a Collar on the shank of the Screwed Rod Adaptor 43.

A Short Coupling is mounted loosely between two Collars on the centre one of the three Rods 48, and this Coupling and a 2" Strip 52 form bearings for a 5" Rod 53. This Rod carries a Coupling 54, a Crank 57 and another Crank. Coupling 54 is extended by a 3" Rod 55 that carries another Coupling 56 fitted with a 1" Rod. The latter Rod forms the finger for opening the boxes. Crank 57 has a $4\frac{1}{2}$" Strip lock-nutted to it and also to a Crank 59 fixed on a 5" Rod 60. A Coupling on Rod 60 carries a 3" Rod 61 fitted with another Coupling that serves as a finger to close the boxes after the filling operation.

The lower Crank on Rod 53 is set at right angles to the Coupling 54, pointing to the outside of the framework. A 1" x $\frac{1}{2}$" Angle Bracket is bolted to the Crank and an Adaptor for Screwed Rods is fastened on a bolt inserted in the small lug of the Angle Bracket. A Swivel Bearing is fixed on the shank of the Adaptor for Screwed Rods, and a $\frac{3}{8}$" Bolt is passed through a $5\frac{1}{2}$" Slotted Strip and is fixed in the "spider" of the Swivel Bearing. The Slotted Strip is extended by a $9\frac{1}{2}$" Strip that pivots on the Adaptor for Screwed Rod 43.

To adjust the mechanism place a box in the delivery slide and turn handle 62 anti-clockwise. The box will be carried forward by the Chain conveyor until it stops opposite the Coupling 56. The Face Plate 41 should now rotate, pressing the Reversed Angle Brackets on the 2" Screwed Rods against the sides of the boxes on the conveyor to hold them in place. The Rod 55 should now operate, so that the 1" Rod in Coupling 56 opens the box about $\frac{5}{8}$". A supporting Chain 63 for the opened boxes is passed round a 1" Sprocket on Rod 9 and round a similar Sprocket 64 on a Rod mounted in Corner Gussets. Another 1" Sprocket on the same Rod as Sprocket 64 serves to support the main conveyor Chain.

Arrangement of the Chute

Two $12\frac{1}{2}$" Angle Girders 65 and two $12\frac{1}{2}$" Flat Girders are connected

at their lower ends by a $1\frac{1}{2}$" Strip. Right and Left Hand Corner Angle Brackets are spaced from the Angle Girders by three Washers each on a $\frac{3}{8}$" Bolt, and these Corner Angle Brackets support a Channel Bearing. A Double Bracket 66 is pressed over the Channel Bearing but is not bolted in place. The Channel Bearing is located between Collars on one of the Rods 48. The upper end of the chute is supported by two $4\frac{1}{2}$" Strips bolted to the Motor side-plates and attached to the Girders 65 by Angle Brackets.

A $5\frac{1}{2}$" x $3\frac{1}{2}$" Flat Plate is bolted to the upper ends of the Girders 65 and two 4" Stepped Curved Strips are spaced from the Plate by Collars on $\frac{3}{8}$" Bolts. Two $2\frac{1}{2}$" Angle Girders attached to the Plate support $2\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plates, and these are connected as shown by $3\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips. The chute should be wide enough to allow Meccano Metal Balls to roll freely down it, and the bottom of the chute should be lined with cardboard.

The Filling Mechanism

To each side of the main frame bolt two $2\frac{1}{2}$" Strips 67 to form bearings for a Rod 68, which carries a Crank 69 and a Coupling 70. A 6" Driving Band is looped between the Crank and one of the Rods 48. The Coupling 70 carries two 2" Rods, each fitted with a Coupling in which a Centre Fork is fixed. The distance between the Centre Forks is adjusted so that they just span 10 Metal Balls. A Pawl 71 engages a $\frac{1}{2}$" Bolt and prevents the lower Centre Fork from touching the bottom of the chute. When the lower Centre Fork is fully depressed the upper one just clears the Metal Balls.

A Crank 72, with a Screwed Rod Adaptor attached to it, is fixed to Rod 68. A 2" Slotted Strip held on the Screwed Rod Adaptor by Collars is extended by a $5\frac{1}{2}$" Strip pivotally attached to a Bush Wheel on an 8" Rod 73. Rod 73 carries also a $\frac{3}{4}$" Sprocket 74 connected by Chain to the Sprocket 38.

With the Threaded Pin used to connect the $5\frac{1}{2}$" Strip to the Bush Wheel in a position approximating to 2 o-clock, the Face Plate 41 should have its Collar and Screwed Rod Adaptor in line horizontally. The Crank 72 is adjusted so that when the Threaded Pin is in its lowest position, the rear Centre Fork touches the bottom of the chute and the front Centre Fork is raised to allow the Balls to roll into a box.

Two $5\frac{1}{2}$" Flat Girders 75 are fixed to a $5\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strip bolted to 2 " Strips attached to the framework.

PARTS REQUIRED

1 of No. 1A	2 of No. 13A	114 of No. 37b	6 of No. 69A	1 of No. 147
2 " " 1B	5 " " 14	63 " " 38	1 " " 72	1 " " 147A
1 " " 2	2 " " 15	1 " " 43	2 " " 80C	1 " " 148
3 " " 2A	1 " " 15A	1 " " 46	3 " " 81	2 " " 154A
2 " " 4	9 " " 16	2 " " 48A	2 " " 89B	2 " " 154B
7 " " 5	5 " " 16B	4 " " 48B	2 " " 94	1 " " 160
5 " " 6	2 " " 17	1 " " 48D	2 " " 95	1 " " 165
3 " " 6A	2 " " 18B	2 " " 52A	7 " " 96	1 " " 166
2 " " 7A	1 " " 19b	2 " " 53	6 " " 96A	30 " " 168D
4 " " 8	1 " " 20a	1 " " 55	2 " " 103	4 " " 173A
2 " " 8A	1 " " 22	1 " " 55A	2 " " 103B	3 " " 175
10 " " 9	1 " " 23A	38 " " 59	6 " " 108	1 " " 186A
2 " " 9D	3 " " 24	5 " " 62	2 " " 109	2 " " 186C
8 " " 9E	1 " " 25	11 " " 63	3 " " 111A	2 " " 188
2 " " 10	3 " " 26D	3 " " 63C	10 " " 111C	2 " " 189
1 " " 11	1 " " 27	1 " " 63D	1 " " 115	1 " " 212
2 " " 12	3 " " 27D	2 " " 65	3 " " 125	1 E20R(S) Electric Motor
1 " " 12B	145 " " 37A	20 " " 69	4 " " 133	6 match boxes.