VOL. XLII No. 12 DECEMBER 1957

MECCANO MAGAZINE

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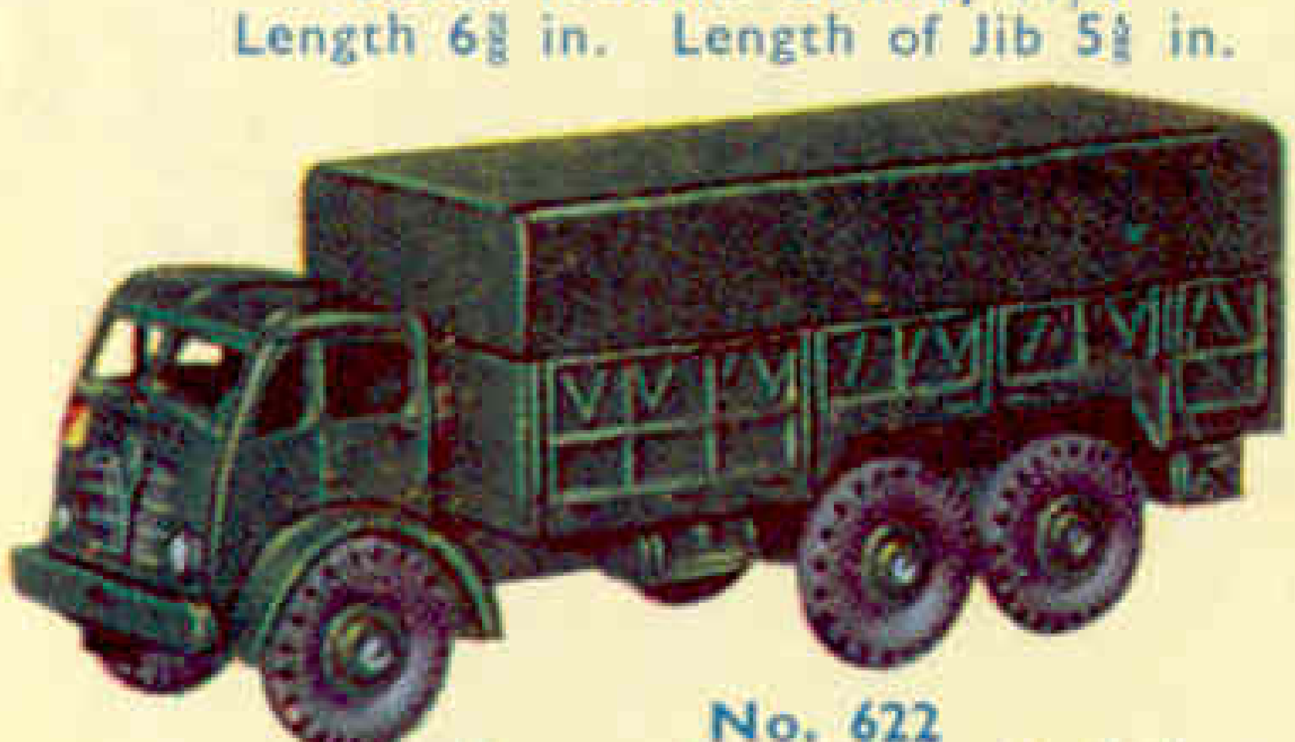

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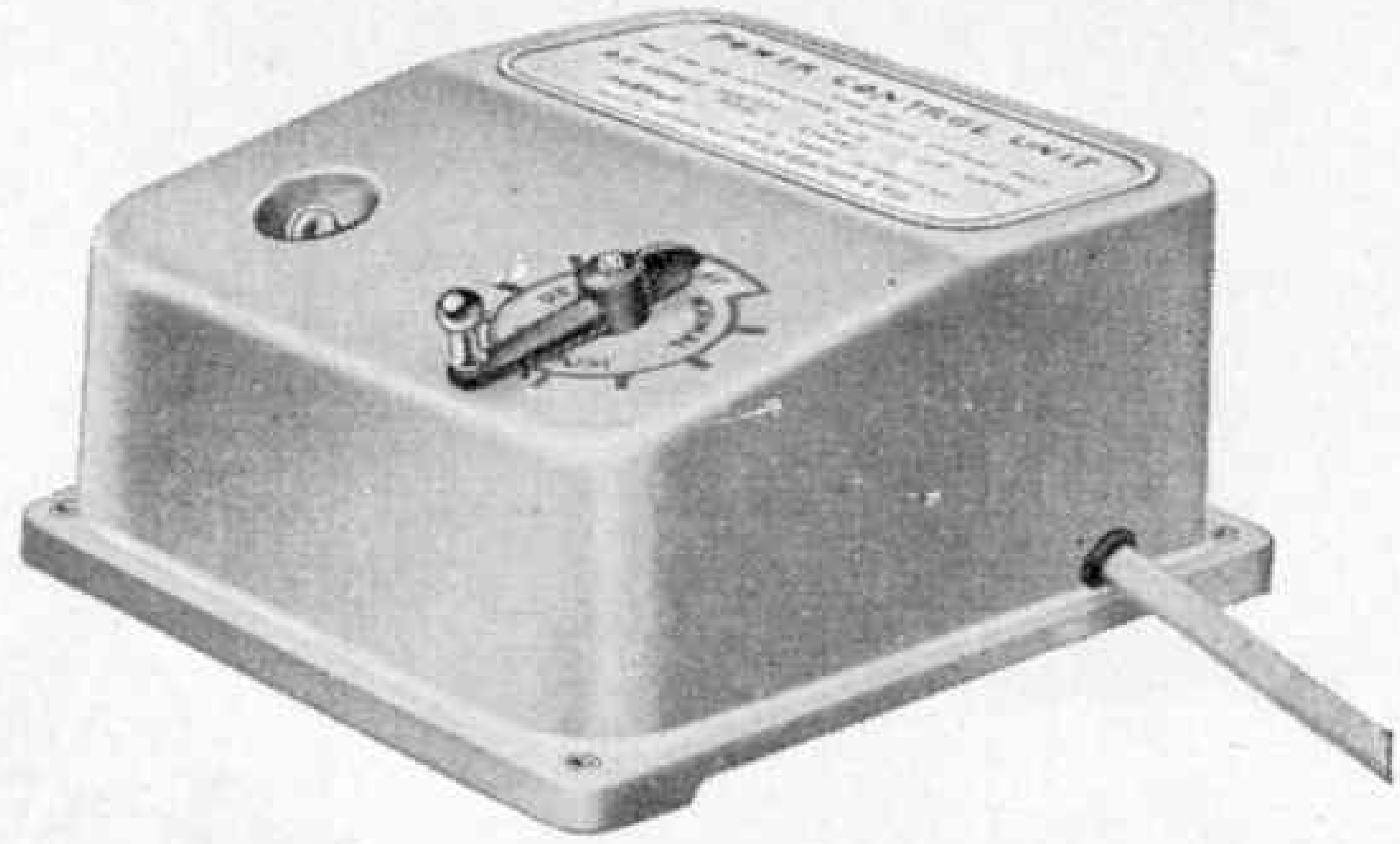

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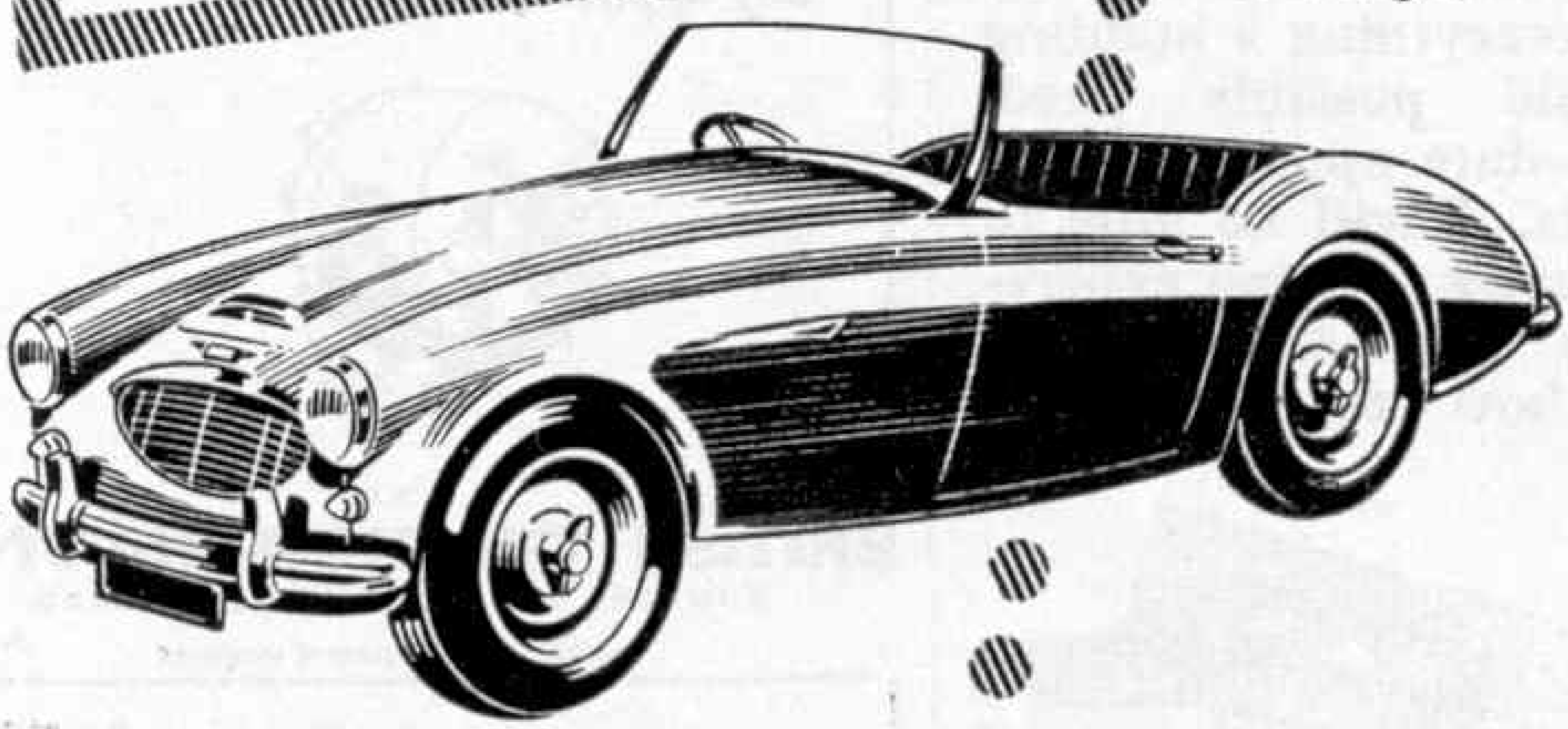

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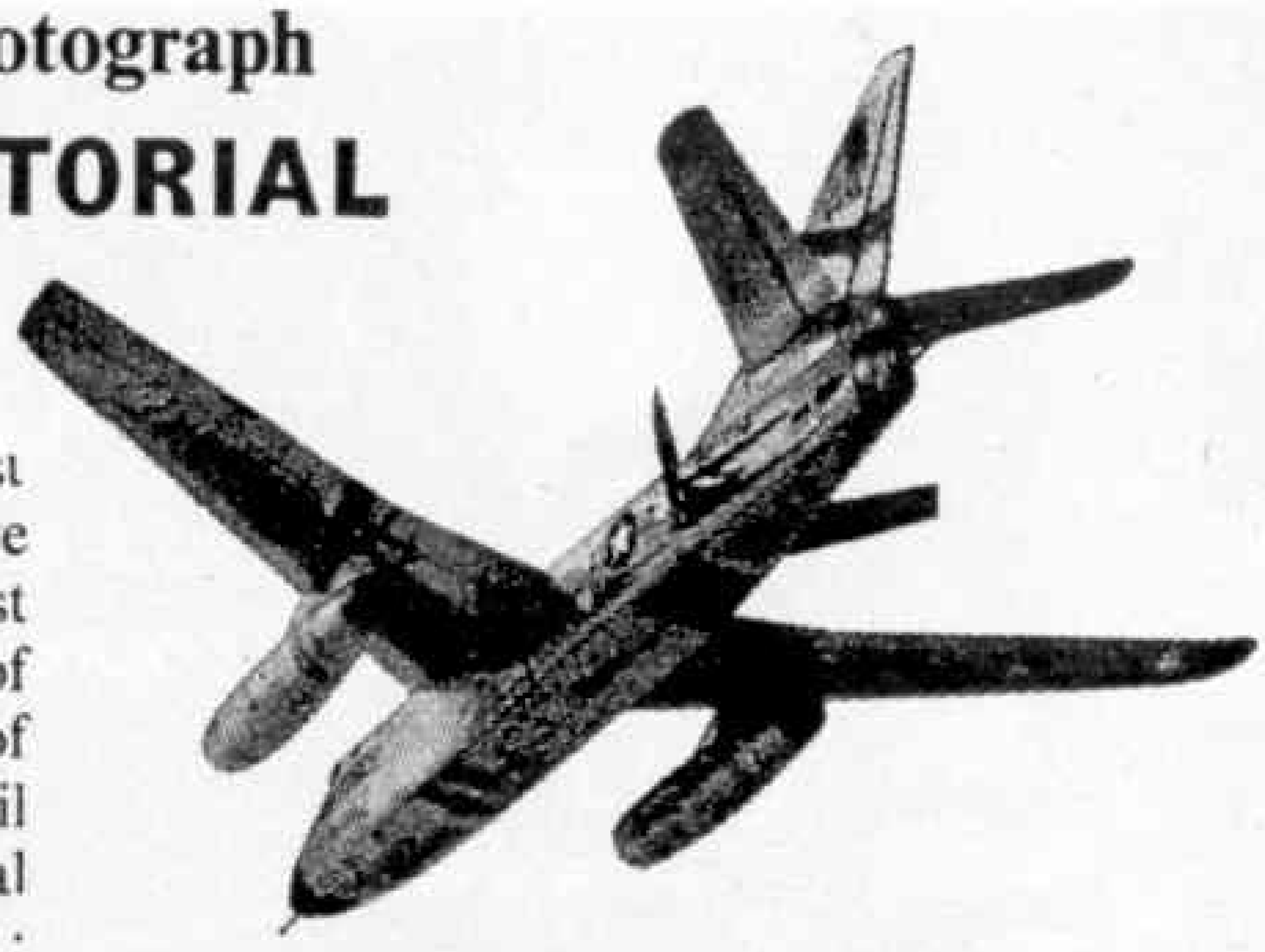

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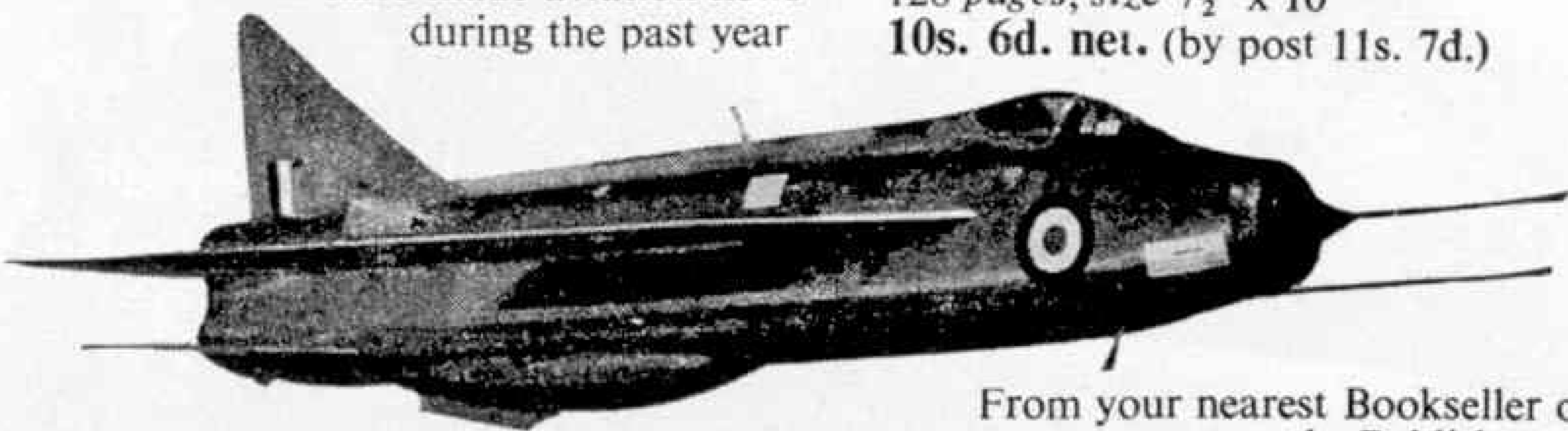

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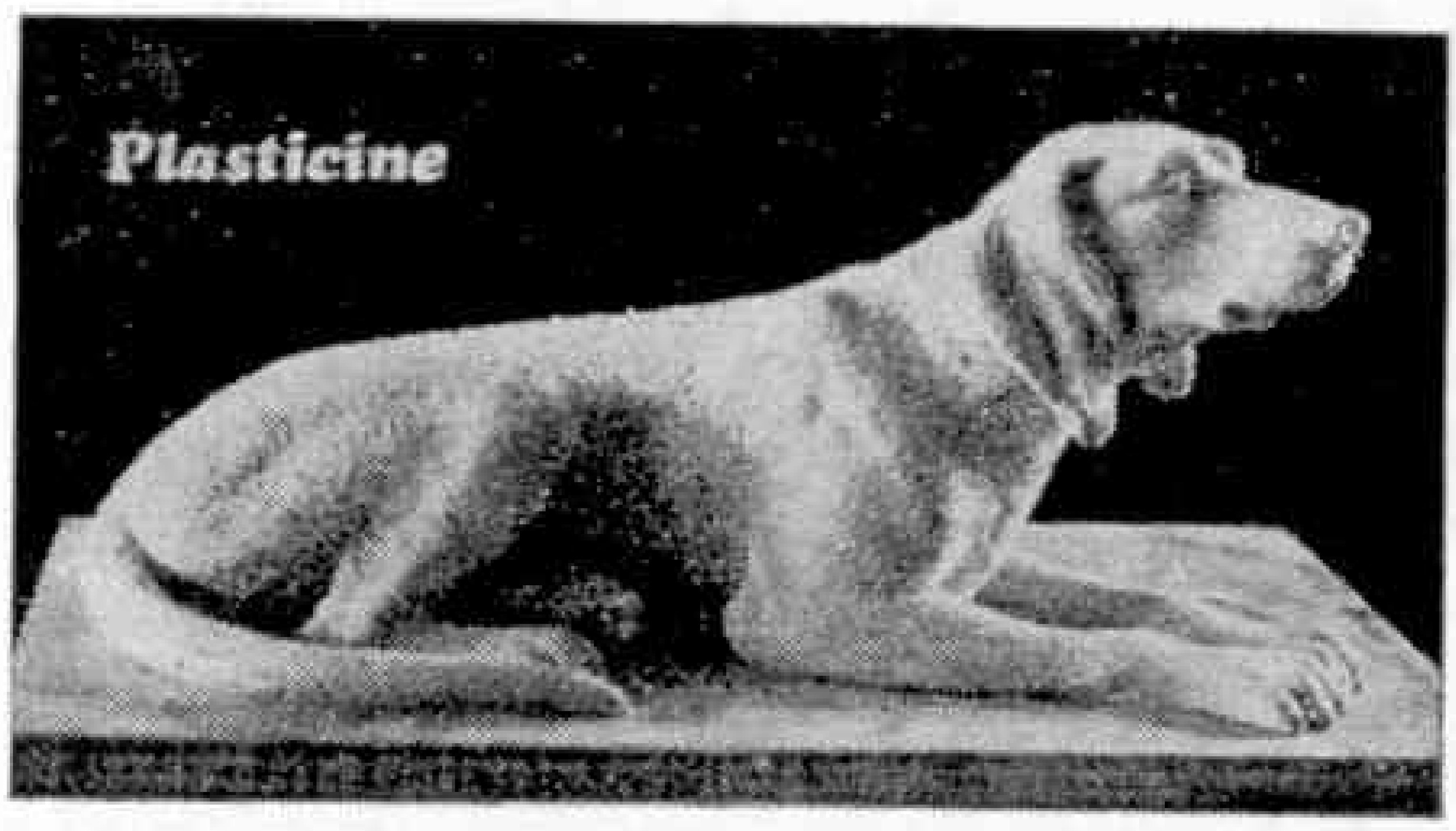

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MECCANO MAGAZINE

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EDITOR : FRANK RILEY, B.Sc.

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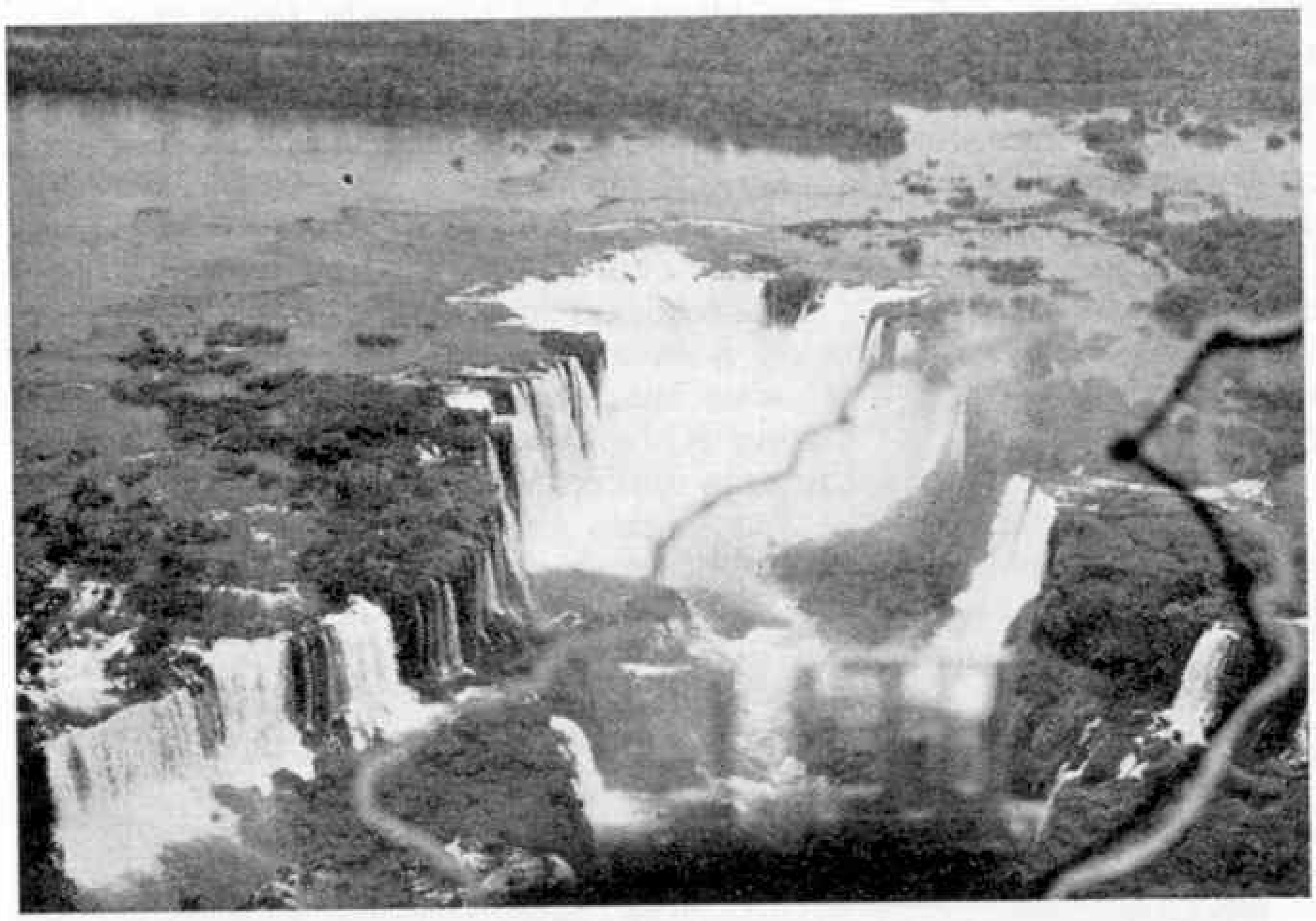
Christmas Greetings

The year 1957 must have been a very busy one at the Editorial Offices, for it seems to have brought me very quickly to the time when I have the pleasure, a very sincere one, of wishing you all a very happy time during the Christmas season. This greeting goes round the world, and will reach about a quarter of a million readers and members of their families and friends, for my correspondence shows that practically every copy has two or three readers, while many have even more.

There is scarcely a country in the free world where the Magazine does not penetrate. The picture on this page provides two interesting examples, for it illustrates a famous waterfall that is in the course of a river separating Brazil from the Argentine Republic, in both of which the *M.M.* has many readers. The reason for its appearance here is that it was taken from the *Silver Hummingbird*, the flight of which round Central and South America is described in the article that begins on page 589 of this issue.



The Iguassu Falls, in South America. The picture was taken through the transparent front of a helicopter, the "Silver Hummingbird," on which the outline of South America was drawn.

Waterfalls, and views at sea or on lakes and rivers, always make fine pictures, and there are colourful effects to be seen on canals, as our cover shows. This is based on a photograph sent in by I. Broadhead, a regular reader of the *M.M.* The chief effect here of course is due to the bright colouring of the barges. One of these is a motor boat and the other a butty, which it hauls. The name of the former is *Gardenia* and that of the latter *Meteor*. Both now belong to the British Transport Commission, following the nationalisation of the canals, and the Captain or Steerer is Joseph Beechey, one of a famous canal family mentioned in the article on page 586 of this issue. Joe indeed comes from a long line of canal boat people.

The Editor

The planet Venus, once thought to have been the Star of Bethlehem, appears crescent-shaped when seen through a telescope. Photograph by A. P. Moore, F.R.A.S.

The Star of Bethlehem

By Arthur Nettleton

THE star in the East, which guided the Wise Men to the cradle of Christ at Bethlehem, still presents an enigma to the world of science. Centuries of debate and investigation have failed to identify this heavenly body with certainty, though present-day astronomers do not deny that such a phenomenon is feasible.

Was it a comet, a wandering star, or a new star in the course of creation? Each of these possibilities has been carefully examined without a definite answer being found. Another idea is that, by some amazing coincidence in the sky, certain planets were in conjunction when viewed from the Earth, thus appearing as a new star of intense brilliance.

The one undeniable fact is that the Star of Bethlehem was a heavenly light of exceptional brightness. The Wise Men of the East regarded it as a celestial sign, and it preceded them as they made their way to the manger at Bethlehem.

This was not the only star connected with strange and momentous happenings, although it was the most important example in human history. A number of other major events down the centuries have been accompanied by phenomenal stars. For instance, the Norman invasion of England in 1066 was marked by the spectacle of a great ball of fire in the heavens. This is not only recorded in documents of that time, but it is also depicted in the famous Bayeux tapestry. Even in this 20th century it has sometimes been noted that signs in the sky have coincided with historic occurrences. An unusually bright star appeared in 1910 when King Edward VII lay dying.

Yet the Star of Bethlehem stands in a class entirely apart. Whereas the other phenomena have been satisfactorily explained, no universally acceptable explanation of the Nativity Star seems possible.

One of the earliest lines of enquiry into its identity envisaged it as perhaps a comet. The one known as Halley's Comet has been widely favoured by astronomers in this connection. This heavenly body was first observed by Edmund Halley, then Astronomer Royal, in 1682. He discovered it while making astronomical observations at Greenwich Observatory, London, and he was able to calculate that it would reappear every 75 years or so.

His forecast proved correct, the comet being seen again in 1759, 1835 and 1910. It was the "sign" that became visible during King Edward VII's last illness, and there is no reason to doubt that it will be seen again early in 1986.

Halley and other astronomers have traced this comet backward through

Bethlehem today, successor to the little place where Christ was born, and where the Wise Men were led by the Star of Bethlehem. Photograph, Jordon Tourist Department.

history, too, and have linked it with other important events. It may be taken as practically certain that the star shown in the Bayeux tapestry is Halley's Comet. Yet it could scarcely have been the heavenly light that has become known as the Star of Bethlehem. Despite the efforts of astronomers in the past to identify them as one and the same, we now know from the records that on its return about the beginning of the Christian era, Halley's Comet did not show up until at least four years after Christ's birth. Further, the path of that comet is well-known, and at no time could it have led the Wise Men to Bethlehem. It would have followed them, not preceded them on their journey from the East.

The theory that the Nativity Star was a conjunction of three or four planets has also been carefully considered. Such coincidences do occur, though they are rare. About once every 800 years the planets Mars, Jupiter and Saturn come so near together that they appear as one when observed from the Earth.

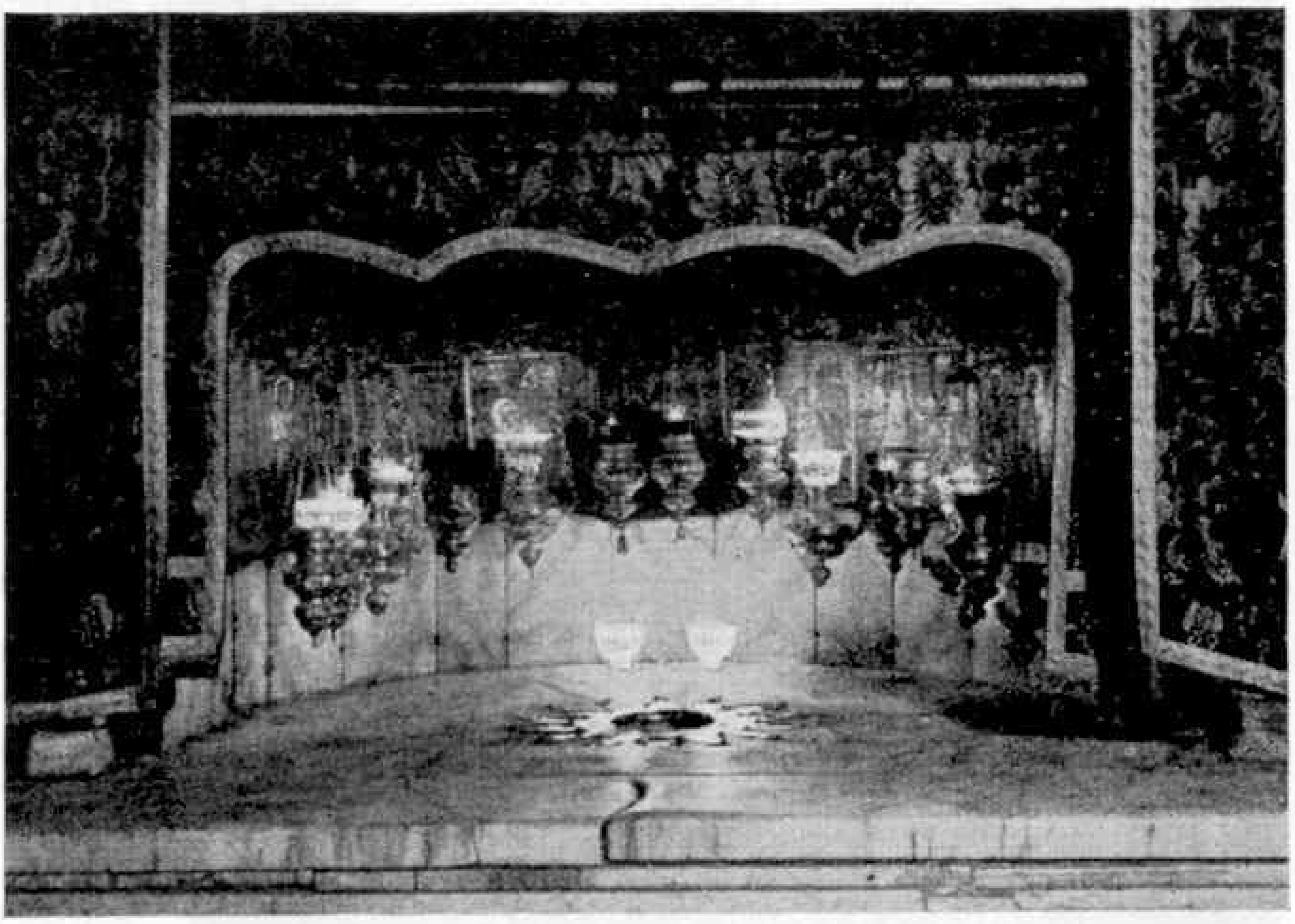
As long ago as the 17th century the idea that such a conjunction might account for the Star of Bethlehem was widely supported. Johann Kepler, the German-born astronomer, worked out that a conjunction of the three planets just mentioned occurred in the year 7 B.C.

Could this have been the Star that heralded the birth of Christ? The theory stood up well for many years, its supporters pointing out that the exact year of the Nativity was uncertain, and that it did not necessarily correspond with the year we now call A.D.1.

But Kepler's identification of the Star of Bethlehem was upset in 1826 when another German astronomer, using better instruments and making more accurate calculations, revealed that the three planets were not in absolute conjunction at any time near the date of Christ's birth. Never within a period of many years round that date were they so near together, as seen from the Earth, that they would look like just one star.

There is the further possibility, which has been put forward in the past, that the Star may have been a single planet that came exceptionally close to the Earth, so that it looked bright enough to be an omen for the Wise Men.

Planets do approach so near to the Earth that they appear unusually brilliant. In 1716, for instance, Venus, the Evening Star, was so close that it could be seen from London in broad daylight, and a similar rare proximity of this or another planet may have caused the Wise Men to regard it as a portent. But we have no evidence that Venus or any other planet was very near the Earth 1,957 years ago.



The birthplace of Christ at Bethlehem. In the floor of a niche, a silver Star of Bethlehem is fixed below an altar. Photograph, Jordon Tourist Department.

One piece of information that astronomers would welcome in their attempts to identify the Star of Bethlehem is its colour. On that point there is a complete absence of knowledge. Stars and planets differ considerably in colour, and from the differences it is possible to learn a good deal. Knowledge of the colour of the Nativity Star would indeed either lend weight to one or other of the theories or would help to disprove them.

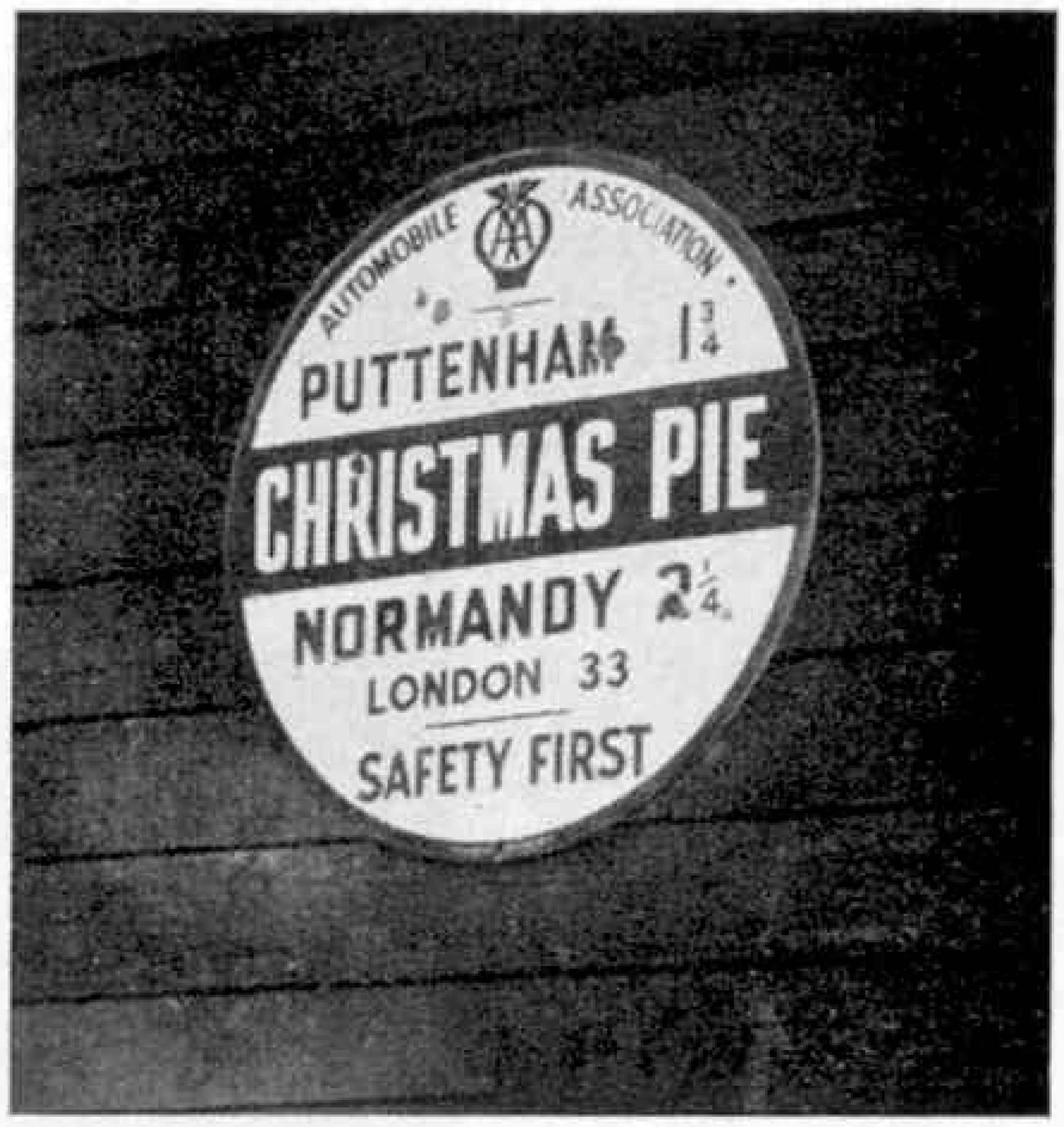
Was it a nova—a newly-created star that suddenly made itself known? Such newborn stars, created by the clashing of two dead suns, may be bright enough to attract the layman's attention, but astronomers point

(Continued on page 634)

Seasonable Signs

Place Names with a Christmas Flavour

By
Geraldine Mellor



DOES the name Christmas Pie make your mouth water? It certainly conjures up a most pleasing picture, doesn't it? And a village of this name actually exists near Guildford, Surrey, and though it is only small and quite uninteresting, many intriguing legends are associated with its delicious name.

Christmas Pie is situated between Wanborough and Normandy, and comprises only a few dwellings, a telephone kiosk and a barn. The first legend about it tells us that at Christmastime many years ago, a certain farmer's wife in the village found herself so poor that she could not afford anything for the Yuletide pie except roots from the garden, so she filled it with these. Imagine her surprise and joy when on opening the pie on Christmas Day she found it to be overflowing with rabbit, pork, sage and onions! From that time the village was christened after Christ's birthday.

A second explanation is that a baker named Christmas, a proper name not uncommon in Surrey, resided in the house know known as *Christmas Pie Cottage*. In the garden there stood at one time a huge stone basin, shaped like a pie and about five feet in diameter, in which Mr. Christmas is said to have baked his pies.

A third tradition concerning the singular title of this tiny village asserts that a farmer called Christmas owned some woodlands on this spot. As "pye" is a south-country word for copse or wood, what was more natural when a name was required for the little community which grew up later than that choice should be for a combination of the landowner's name and the kind of land which he owned?

We expect it to be cold at Christmas, and in the north of my own county of Hertfordshire, at the very eastern end of the lovely Chiltern Hills, there stands a tiny hamlet named Cold Christmas. It is exceedingly cold and bleak here in December, and that, perhaps, is how the name originated.

If you would like to take a look at Cold Christmas sometime you must take the A10 road north from the town of Ware for about a mile and a half to a public house, the *Sow and Pig*, where at the cross-roads a lane to the right bears a direction post with the name *Cold Christmas*. The small community may be found a mile along this lane.

There is another Christmas in the Chilterns, for between Henley and Oxford is Christmas Common, consisting of a few cottages grouped round a charming common. Nearby are the picturesque villages of Hambleton, Turville and Fingest.

Bristol, believe it or not, has a Christmas district! I found this out recently when I visited that interesting west country city and suddenly discovered that I was in the middle of a thoroughfare called Christmas Street. This is a most fascinating old-world street along which only one modern vehicle can pass at a time, for it is still the same width as were all this town's streets over four hundred years back. It was good to observe that several of the gabled timber houses with overhanging storeys, which date from the Middle Ages, are still there, as well as a handsome Early English stone archway standing in the centre of them.

This arch is the only relic left of St. Bartholomew's Hospital, founded before 1260, later the Grammar School (1532-1637) and Queen Elizabeth's Hospital (1767-1847), and at one time it led into the hospital.

Round the corner of Christmas Street I found *Christmas Steps*. Both these festively-named places are situated right in the centre of Bristol, in an ancient part where no modern "improvements" have crept in. Early in the history of Bristol, a yearly custom was observed at Christmas when all poor persons in the town would assemble on the steps to receive food and money from a charitable guild. Since that time the steps

have always been called by their festive title.

At the top of the steps is the Chapel of the Three Kings of Cologne, the only one called by this title in England, and attached to the wall of this chapel is a seventeenth-century tablet telling us that *This streete was steppered down and finished September 1669*, the work of Jonathan Blackwell, Sheriff.

I must include two London names with a Yuletide flavour.

The first of these is that of Pudding Lane, near the Monument, which is in Fish Street. This strangely called thoroughfare received its name from the fact that in days of long ago it was famous for the making of particularly delicious and well-spiced puddings, especially at Christmastime. The second is Holly Lane, in the Hampstead district of London, where at one time holly trees grew profusely.

People and Craft of the Narrow Canals

By C. P. and C. R. Weaver

THERE seems little doubt that the canal boats introduced in the days of Brindley, the pioneer of British waterways, were of the simplest construction with little or no decoration, being bow-hauled by men who worked on the "day system." Their direct descendants can be seen to-day on the Birmingham Canal.

As the waterways spread further afield and journeys became longer, the necessity arose for living accommodation aboard and so came the family boats. These boats, between 69 and 72 ft. long with a beam of 6 ft. 10 in. to 7 ft. 2 in., were made expressly to fit the narrow locks and so conserve water. They had rounded bilges, as this form of hull took less energy to propel, but when manual haulage gave way to horses the added power available and the need for more cargo space brought the square bilge into being.

Evolution from that day has given us successively the gay decorations of castles and roses, and brass work, mechanical propulsion to oust the horse, steel to replace wood, and now since nationalisation a standardised colour scheme of blue and yellow. Still, whatever the official attitude, the painted boats will be a permanent reminder of those happier days when man had time to live, and moreover, time to embellish his work with beauty.

British Waterways' choice of blue and yellow has led to much controversy, but it is only fair to say that the two main carrying fleets, those of Fellows Morton and Clayton and The Grand Union Canal Carrying Co., which were merged on nationalisation, did not operate such beautifully painted craft as those of Samuel Barlow Co. Ltd. and The Mersey Weaver Carrying Co. There has only been a change of house colour—the cabin interiors and many items of running equipment are still painted in traditional pattern.

Early records have little to offer in the way of information on the subject of boat decoration. Many theories have been put forward, but we think the decorations may well have been developed by the boat people themselves. After all, they lived in close contact with every item portrayed—

The "Ovaltine Boats," run by Mr. Stokes and family, Hawkesbury Junction, Oxford Canal. The butty, on the right, has a fine ropework Swan's neck. The illustrations to this article are from photographs by the authors.

flowers, the castellated towers of stately homes, bridges, water, etc. Telford himself used the turret to decorate some of his aqueducts and Rennie made full use of all architectural embellishments.

How the highly coloured diamonds and circles came to be used is also a matter of some conjecture, but it could be that these figures, made up from basic geometric shapes, were easily drawn with simple instruments and then coloured with readily obtained paints.

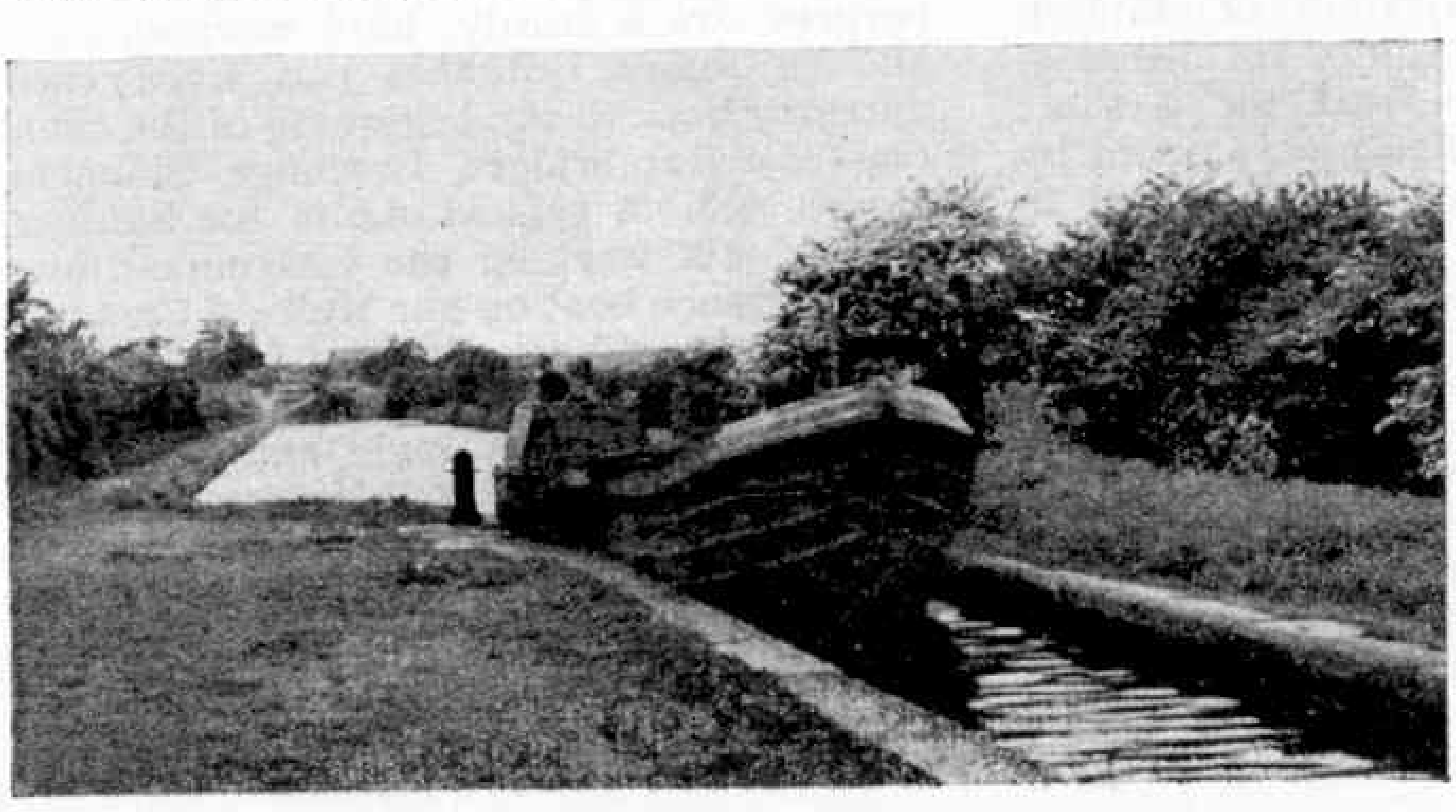
No hard and fast design exists for building the traditional narrow boat, at least not for the wooden variety. These were, and still are to a very limited extent, fashioned and constructed by a departing race of craftsmen using basic woodworking tools, such as the adze, saw, shell auger, etc. Every part of the boat has been developed to fulfil a precise function. The foremost tent-like structure, or cratch, supports the side cloths and sheets besides acting as a cover for spare ropes and fenders, though a temporary erection, or deckboard, is used sometimes. The telescopic towing mast in its large square case and the stands not only divide up the hold, but also serve to support the gang planks. These planks when in position form a cat-walk along which one reaches the fore-end.

The rudder, or "elum" in canal language, is hung at the rear on two forged iron hooks, its large size being necessary to maintain adequate control. The tiller, gracefully curved and tapered, is painted in bright colours. It is quickly detachable in order to prevent damage when working through locks, and can be reversed in its socket to lift it out of the way for ease of access to the cabin. From the top of the rudder post or "Ram's head" to the rear of the rudder blade stretches a "Swan's neck," a beautifully woven piece of rope work, gleaming white with pipe clay. Flowing over the "Swan's neck" we may find a white Mare's tail; both these forms of decoration are becoming extremely rare. No one quite knows how the latter custom came into being, but it is generally accepted that the tail was kept when a favourite horse died and was then attached to the rudder, which after all would be as good a place as any; some boat people however consider this decoration an ill omen and will not fit it. Decoration is completed by small rope fenders and strips of whitened canvas (tingles) tacked along each side of the blade, and of course the many coloured geometric designs.

Mr. and Mrs. Hambridge, who with their family work three narrow boats—two motors and a butty. The Hambridges come from a long line of canal folk and are among the most skilled of the boat people.

In the cabin we see human ingenuity stretched to the limit. No space or corner is wasted, for this is the boatman's home, of which he is justly proud. In it, maybe, he was born, has lived and will die, as perhaps have several generations before him. The bed and table fold away into side compartments, the table being a cupboard door, with a drawer cunningly placed beneath it to catch any crumbs. Drawers under side benches, a stove, a coal store—everything is there and yet nothing gets in the way, every inch being utilised to the full.

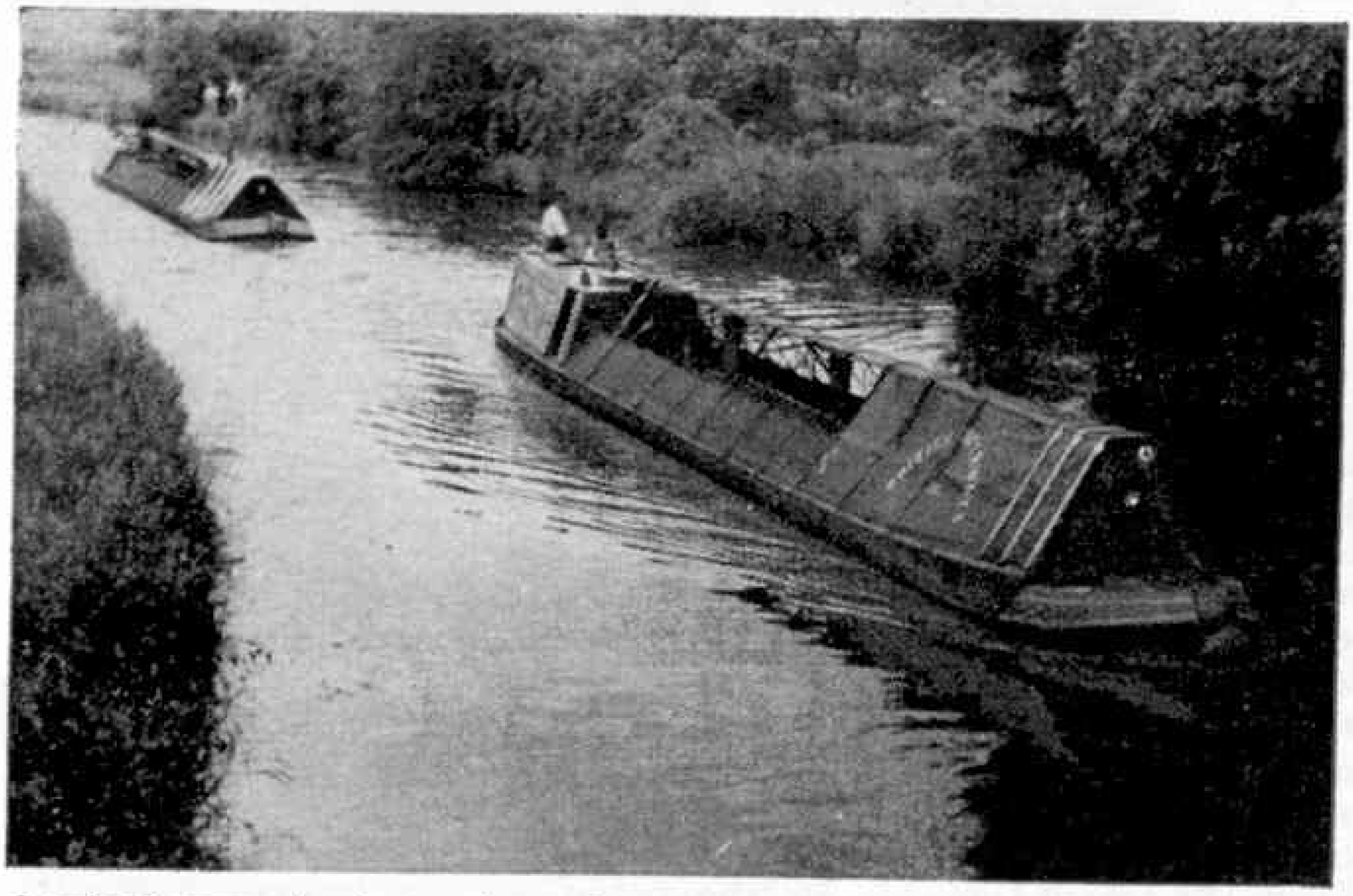
Even in modern boats there are the open work plates, gleaming horse brasses and crimped paper curtains complete with coloured paper bows. The cabin indeed is a veritable show piece and



This picture of a narrow boat entering a lock, at Minworth, on the Birmingham and Fazeley Canal, is an example showing close fitting to conserve water.

in the majority of cases is spotlessly clean.

So far our description has mainly concerned the "butty," a descendant of the very earliest horse drawn boats. The narrow motor-boat as we see it to-day, allowing for detail changes in design and materials, has altered little over the past fifty years. It was originally evolved from the horse-drawn type of boat, the stern end being altered to accommodate an engine room forward of the main cabin and a counter added to house the propeller and rudder, mounting a gracefully curved and decorated tiller or "Ram's head."



A pair of narrow boats carrying coal on the Oxford Canal near Rugby. Both boats have side cloths and cratch erected.

A narrow coaming running along the outside of the cabin from counter to back-end permits easy access to the engine room, but seriously limits interior width. For this reason the generally accepted living quarters are in the wider and more spacious butty, any overflow of children being relegated to the motor for sleeping. Steam propulsion was used for a short period, but this was quickly superseded by the internal combustion engine owing to the more compact installation and simplicity of control.

The arrangements evolved for towing are very interesting and show ingenious development. There is a fore-end stud to which the tow line or "snubber" is attached, more especially in the case of the modern towed "butty." In the days of horse towage the "tackle" or harness was fitted with brightly coloured rollers to prevent chafing. The length of the snubber can be as much as 70 ft. when towing in long pounds, or it can be as short as 10 ft., according to circumstances. For towing when empty, two crossed short straps are used, thus bringing the butty under more positive control by the motor and all but making the second steerer superfluous.

"Breasting up," or running side by side, is often resorted to when travelling through flights of wide locks, saving time and making full use of limited man power, a pair of boats often being worked by a crew of two. An interesting development concerning the towing of the butty is the use of running blocks placed on the top of the stands. A long cotton line passes through these blocks to a detachable stud situated on the roof within reach of the steerer, who can allow the line to slip when getting under way and so eliminate snatch.

Boat building grew up around the main canal centres. Although the boats conform to a general layout, every builder has his own particular curves and details. Thus it is easy to pick out a "Shroppie" or Shropshire Union fly boat from a "Riccy" (Rickmansworth) one, or a Braunston boat built by Barlow's from a Banbury one built by Tooley. So also is the decoration distinctive, and we have the brilliant reds of a Tooley, the greens of a Braunston, and so on.

The boat people, who must *not* be called bargees, are a sturdy, hard working race, and in many instances can trace their ancestry back to the beginning of the canal era—the Hambridges, Beecheys, Skinners, Hones, etc. A typical one is Joe Skinner, who is still working the last mule-drawn long distance boat on our Midland Canals—mules replaced horses in later days. He is a No. 1 or "owner worker" in his own right, and with *Dolly* the mule and his butty *The Friendship* is a well-known figure up and down the Oxford Canal. When he goes another chapter of canal history and an age of proud independence will pass into oblivion. We are happy to say he is still hale and hearty.

(*Continued on page 634*)

Curiosity easily satisfied! The controls of the Bell 47J helicopter "Silver Hummingbird" are readily visible through the transparent nose. Illustrations reproduced by courtesy of the Bell Aircraft Corporation, U.S.A.

The Flight of the "Silver Hummingbird"

By John W. R. Taylor

TO young aircraft spotters in Venezuela, the Bell Model 47J helicopter registered YV-E-APO is no more exciting than any of the other 13 helicopters operated by Aerotecnica S.A. But that is because they do not know the story behind the painting of a tiny bird that it carries on each of its cabin doors; because this is *El Picaflor de Plata*—the *Silver Hummingbird*—which once made the most gruelling, dramatic demonstration flight ever undertaken by a helicopter.

When it first came off the assembly line in 1956 it bore the U.S. registration N2464B and was the second of the redesigned "J" version of the famous Bell Model 47 helicopter.

The original Model 47, ten years earlier, had only two seats in a car-type cabin and was powered by a 175 h.p. Franklin engine; but in the process of building more than 1,700 civil and military Model 47's, for an endless variety of jobs, Bell had improved the design steadily to obtain higher performance, better reliability and more comfort—and the result was the 47J.

Even from the outside, it looked different from the earlier versions, with a more streamlined cabin and a smooth oval-section tail-boom instead of the usual open girder-structure. Inside, there were still greater changes, with comfortable seats for four persons and a new Franklin engine giving up to 240 h.p. for take-off. No small helicopter had ever before been able to carry a payload of over half a ton at a cruising speed of 95–100 m.p.h., and Bell wanted to prove that it was also versatile, sturdy and dependable. That is how they came to plan the flight of the *Silver Hummingbird*.

South America is one of the biggest markets for American aircraft, and Bell reckoned that if a 47J could be sent off on a 17,000-mile tour of 15 Latin American countries, carrying in its own cabin all the spare parts and servicing equipment needed to keep it flying throughout the flight, it could hardly fail to create interest in the right places. They did not realise just how much publicity the *Silver Hummingbird* would get or that its pilot, Joe Mashman, would earn a gold medal for "exceptional courage and valour" before he returned to Fort Worth, Texas, home of the Bell Helicopter Corporation.

Mashman must have wondered what lay in store when he set out on the long tour with service engineer Joe Beebe. His helicopter was perfectly standard, with smartly-furnished cabin, an electric hoist, stretcher kit, tools and the personal luggage of its crew. There was a long-range fuel kit, consisting of a 50 gallon drum that could be rigged up in the cabin to extend the *Hummingbird's* range to 600 miles without refuelling, and all the spares that were considered necessary—a set of spark plugs, fan belt and distributor points.

Shortly after this last transmission, the *Hummingbird* made history by becoming the first helicopter to cross the Andes from Chile to Argentina, by way of the famous Cristo Pass. For a time, it seemed as if this part of the tour would not go according to plan. Day after day, for nearly a week, the two airmen said goodbye to people at their hotel, only to return later in the day. Twice they got into the air, but were driven back by bad weather that the "met" men had not expected. Fortunately, it was a case of third time lucky, although Mashman made the flight alone, at a height of 17,000 ft. through bumpy air, so that he could carry in the cabin some bulky equipment that was wanted in the Argentine. Beebe followed by airliner.

This was not the only occasion when the weather proved troublesome. Often the helicopter was forced to fly 20 miles out to sea to avoid strong head winds over the coast, or skim along the top of the jungle to stay under the overcast, or career along past ragged mountain peaks in a 60 m.p.h. tail-wind, while its crew searched for landmarks through odd holes in the clouds.

One advantage was that, being in a helicopter, Mashman and Beebe were able sometimes to pick out a likely-looking mountain poking through a layer of cloud, land, stretch their legs and dump their empty tomato juice cans, the sight of which will certainly puzzle any future climber who claws his way to the top the hard way.

One of the two Bell Model H-13J helicopters bought by the U.S. Air Force for use by President Eisenhower. It is similar to "Silver Hummingbird."

All this may sound a lot of fun; but it was also hard work. A total of 250 flying hours were logged during the 83-day tour, and the helicopter was airborne on at least 72 of those days. Its electric hoist was demonstrated 400 times, lifting a total of 72,000 lb. without incident. This included delivering and retrieving men from the decks of moving naval vessels.

Only 40 hours of maintenance were needed throughout the 17,000-mile tour and these involved only routine daily inspections before flight. Nor did the engine miss a beat, although it had to operate on everything from 60 octane Mexican motor petrol to 100 octane aviation fuel, when the correct 80/87 octane supplies were not available. One cache at which it refuelled had been left by the five U.S. missionaries who were murdered earlier in the year by Ecuadorian head-hunters.

Only when Mashman received an emergency call for help was it decided to fit the spare plugs and fan belt as a precautionary measure, because the flight ahead promised to be a particularly hazardous one.

A young girl named Luisa Bravo, daughter of a well-known Peruvian journalist, was the sole survivor of a motor accident that had killed her two companions and left her with a broken spine in the copper mining town of La Oroya, one of the highest places in the world, 12,400 feet above sea level.

Despite the dangers of having to fly at up to 17,500 feet in turbulent air, Mashman went to La Oroya, picked up the girl and landed her in the grounds of a Lima hospital, in front of 8,000 cheering Peruvians.

It was for that rescue that Joe Mashman received his gold medal from the city of Lima in August of this year. By then, the *Silver Hummingbird* was hard at work carrying men, equipment and supplies to offshore oil drilling platforms in Lake Maracaibo. She now has a pontoon undercarriage for landing on the water, and some of the fuselage skin panels have been removed to save weight and enable more payload to be carried.

One of the places where the "Silver Hummingbird" was demonstrated during the South American tour was El Teniente, a Chilean copper mining town 9,000 ft. high in the Andes.

The adventures of the two Joes started even before they were clear of Texas. Eager to clear Customs and get south of the border as quickly as possible, they began sorting out their passports and documents while still in the air. To their horror, the all-important papers were suddenly sucked out of an open window. Quick as a flash, Joe Mashman whipped over the controls and began circling until he spotted the papers fluttering to the ground. Then he landed and, luckily, found them all together.

This was just as well, because the whole tour was planned to such a tight schedule that hardly a moment could be lost anywhere. Nevertheless, when the President of Mexico asked to see the *Silver Hummingbird* Mashman could hardly refuse to stay in that country an extra half-day to oblige.

Told to report to a football field near the presidential palace, he landed there at 8 a.m. Half an hour later the Mexican secret service showed up and surrounded the field at 100-ft. intervals. At 9 a.m. armed guards arrived. Shortly afterwards, Mashman saw a large car drive up on the other side of the field. A window was lowered, a face appeared in the opening and looked out for a minute, then the window was raised and the car drove off. At 10 a.m., Mashman asked when the President might be expected to come to see the helicopter, and was told that he already had—from his car!

Fortunately, it was not always like that. The *Hummingbird* was soon back on schedule and the Presidents of Panama, Guatemala, Ecuador and Paraguay all took a ride in it. President Rojas Pinilla of Colombia went one better, by flying it himself; while President Alfredo Stroessner of Paraguay told Mashman that his 12-year old son had completed more than 15 hours of solo flying on a Bell 47G belonging to the Paraguayan Air Force.

After the tour "Silver Hummingbird" was switched to commercial helicopter service. In this picture a 750 lb. oil drill bit is being loaded aboard at Lake Maracaibo.

Not all the passengers were potential customers because, in demonstrating its versatility, the *Hummingbird* flew into some out-of-the-way places and usually ended up by giving somebody a ride. In return, the locals went out of their way to help, and the efforts of amateur radio operators were particularly appreciated, because they enabled Mashman and Beebe to keep in regular touch with their families.

While the families collected in the home of an amateur operator who works for Bell, the two Joes sent messages from radio transmitters belonging to such varied enthusiasts as the head of the U.S. Air Mission in Guatemala, the chief pilot of a local airline in Lima, and a young American priest, Father "Gus," who rode a motor-scooter 25 miles from San Jose Mission to Santiago in Chile to arrange a broadcast.

The up Bristolian in charge of No. 7034 Ince Castle passing Tilehurst, where it was captured by the camera of M. W. Earley, Reading.

Railway Notes

By R. A. H. Weight

Aboard the "Pembroke Coast Express"

One of the illustrations in the July 1957 *Railway Notes* depicted the *Pembroke Coast Express* arriving at Newport (Mon.). This is frequently a notable moment, as the *P.C.E.* is decidedly the fastest train on the London to South Wales service, being normally booked to cover the 133½ miles from Paddington to Newport in 131 min., starting at 10.55 a.m.

When I was recently privileged to be a recording passenger, No. 5016 *Montgomery Castle* had one more than the 8-coach load rostered for this fast timing, or about 335 tons gross including a large passenger complement. The performance was masterly throughout. Speed went above the 70 m.p.h. mark soon after Southall and remained so on the level past Slough, Maidenhead and Reading, until brakes went on for a track-repair slowing. The lost time was soon amply recovered. Drizzle gave way to fine conditions and 68-66 m.p.h. was maintained up faintly rising grades beyond Didcot amid Wiltshire downlands.

After a slight check at Highworth Junction we rolled gently through that impressive railway centre and junction, Swindon, 77¼ miles in 74 min. Among dozens of locomotives in various states of "dress or undress" outside the famous Works I noticed 4-6-0s *Sir Felix Pole, Gladiator* and *Walton Hall*, in spotless new green livery.

About 5½ miles further on, at Wootton Bassett, we left the original Bristol, via Bath, route and were soon running at over 70 again, dropping only to 60 at the top of a long 1 in 300 rise. So we passed mile post 100 at Badminton, Glos., in 96 min. as booked. On descents past various junctions on the north-eastern outskirts of Bristol speed rose to 80 m.p.h., and as we hurtled down into the "big hole," as railwaymen term Britain's longest tunnel, that under the Severn, we had covered 118 miles in no more than 111¼ min., thus appearing to have plenty of time.

The 4⅓-mile tunnel was traversed in 4 min. 5 sec. with a maximum of over 70 near the half-way lowest level and the engine was pulling out of its depths beautifully when signals were against at the worst possible place for a stop! A spirited restart was made up a 1 in 90 bank. Then within 7 miles, 68 m.p.h. was attained on level track, so getting us into Newport only a matter of seconds behind time. Notwithstanding formidable delays we had averaged more than a mile-a-minute all the way!

In just over 2½ hr. from London we were at Cardiff. After an extensive exchange of passengers, we now set off again on the quickest steam timing thence to Swansea, past great industries and ports, open country and scenic heights, uphill and down. With several minutes in hand we curved round and descended past Landore, where *Montgomery Castle* and her able driver, D. Rees, and Fireman B. Joyce are stationed, to stop in Swansea, High Street, at 2.38 p.m.

Part of the train goes to Carmarthen, Whitland, Tenby and Pembroke Dock, serving delightful villages and small coastal resorts in West Wales. It returns similarly in the afternoon, joining on to the restaurant car portion at Swansea for a fast run up, calling at the same principal stations, being due Paddington at 7.45. On account of terminal or junction layouts at Swansea and Carmarthen stations, there is reversal at each with a fresh engine. In both cases, however, there are direct lines enabling a through run to be made when necessary without calling at the passenger platforms.

Locomotive News and Doings

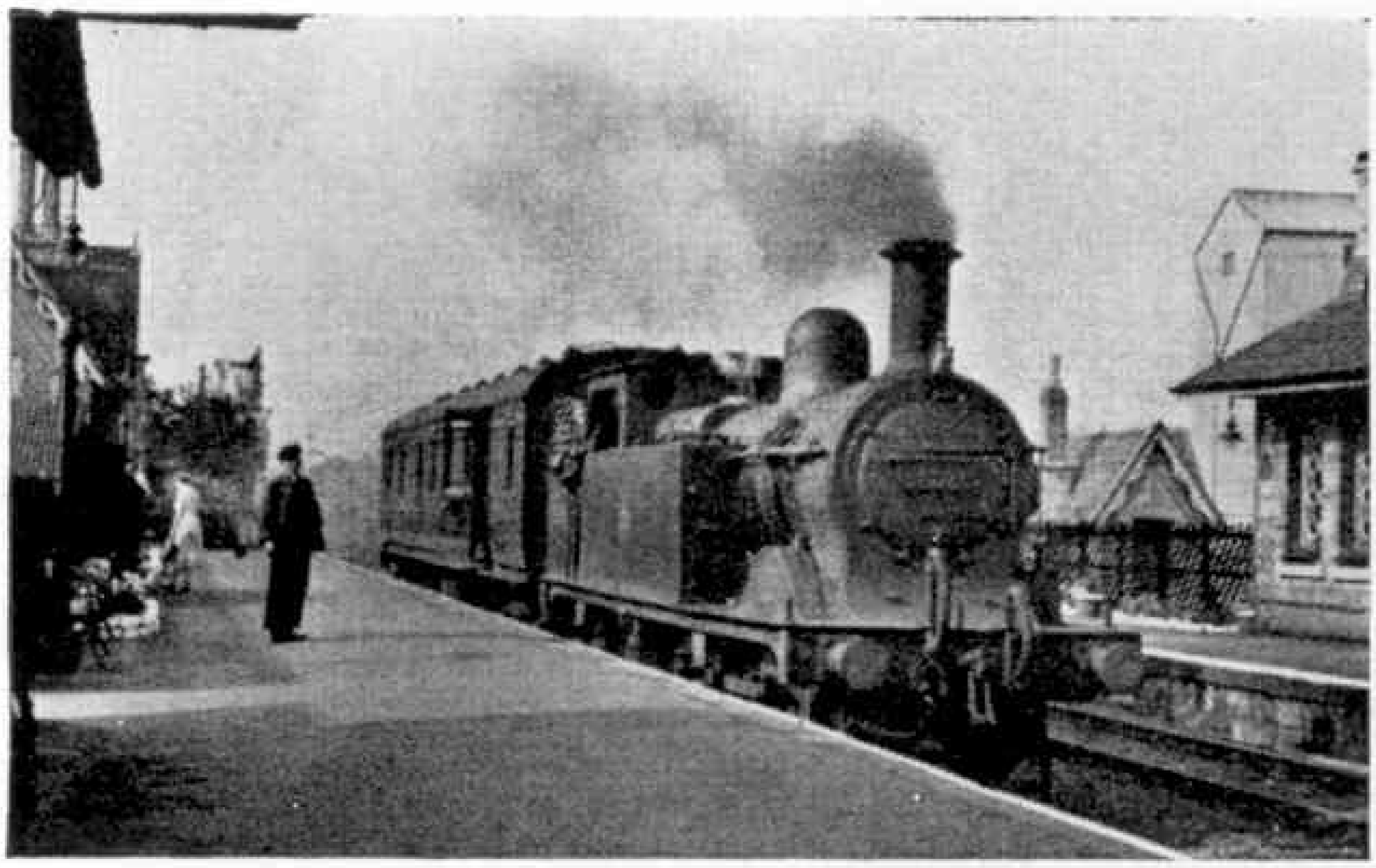
New locomotives have been placed in service and alocated as follows. Class 9 2-10-0 Nos. 92146-8, 92178, 35A, Peterborough. Class 4 2-6-0 Nos. 76096-7, 67A, Corkerhill, Glasgow, and 76112, 68B, Dumfries. Diesel-electric six-wheeled 350 h.p. shunting type Nos. D3379-80, 55D, Royston, Yorks.; D3381, 55E, Normanton; D3382-5, 66B, Motherwell; and D3439-40, 34A, King's Cross. Four-wheeled 200 h.p. design Nos. 11226, 73C, Hither Green, and 11227-9, 72D, Plymouth. Diesel-hydraulic Nos. 11713-4, 62B, Dundee, Tay Bridge.

When 2-10-0s numbered 92173-7 are built, it is intended to fit them experimentally with Berkley Mechanical Stokers.

There has been considerable reallocation of Pacific engines working on and from the Eastern Region, with more stationed at King's Cross in classes A1-3-4 and none on the Great Central section. The majority at Grantham and Doncaster sheds are of A3 type. There are fewer at Leeds (Copley Hill), whence four A3s have moved to Heaton and Gateshead, N.E.R. main line depots.

The greatly improved express services between King's Cross, the North Eastern area and Scotland described in October incorporate an unprecedented number of through locomotive workings between London and Newcastle, also of non-stop runs by night and day over the 232 and 268 miles respectively between Darlington, Newcastle and King's Cross each way. More "V2" 2-6-2s are stationed at Leicester, Central, and haul principal trains on the Marylebone-Sheffield service.

The Devons Road Motive Power depot, Bow, London E, at one time housing large numbers of former North London Railway, later L.M.S. steam tank engines, is being altered and re-equipped as a



The type of railway scene that is fast disappearing. An ex Midland 0-4-4T No. 58085 with a one-coach branch line train at Southwell. Photograph by T. G. Hepburn, Nottingham.

pioneer diesel locomotive shed that may well serve as a pattern for future similar development. Modern workshops and stores, oil tanks and battery-charging equipment are being provided. Ultimately 25 mixed traffic diesel-electric locomotives will be stationed there, principally for operating cross-London freight trains, serving the docks and connecting with various main line yards and stations. Some of the D8000 class are already in service there, with 8 of smaller shunting types.

The very powerful *Deltic* diesel-electric locomotive has lately been running between Liverpool and London on express passenger as well as fast night freight trains. Several compound 4-4-0s were observed in September on passenger trains to and from Blackpool and Southport, and also on Skipton-Colne-Liverpool (Exchange) trains, by Mr. D. S. M. Barrie and myself. While close to the Preston-Ormskirk-Liverpool, L.M.R. Central Division, through route, I saw 4-6-2 No. 72004 *Clan Macdonald*, which had worked through from Glasgow, and also standard class 4 4-6-0s each way on semi-fast trains, and an ex-L.Y.R. 0-6-0, among other types. Mr. Barrie noticed an unusual short-distance boat train hauled by a "Black 5" 4-6-0 running tender first! The journey from Fleetwood to Blackpool North with 8 corridor coaches was in connection with a vessel from the Isle of Man.

Western Region "Radio Train"

Unique in its way is a new W.R. 7-coach cafeteria car set formed of centre corridor stock with tables, in which B.B.C. programmes can be received and relaid throughout the train. Recordings, announcements and speech may also be broadcast within it, providing possibilities of considerable variety. The train will be available for party excursions by prior arrangement.

Public address equipment is fitted in the principal long distance British Pullman car expresses, and in certain observation cars.

Southern Tidings

Now that the running of the recently instituted diesel-electric trains on the London-Hastings direct route has settled down, timekeeping is usually good and there is often a margin, although the schedules in most cases are a good deal faster than hitherto. Their rapid acceleration sometimes means signal delays along the densely occupied inner and outer London suburban tracks because, for example, of a stopping electric train closely ahead.

Some of the speeds I have recorded on steeply uphill sections have been 10 m.p.h. or more faster than many of the best achieved by Schools class engines on principal trains with fairly heavy loads. For their size, of course, as steam locomotives those monarchs of the 4-4-0 world were regarded as among the most efficient, but two supercharged 500 h.p. diesel engines in each 6-coach set actuating powerful electric motors can exert strikingly greater power, particularly when starting or climbing.

Two more rebuilt light Pacifics are Nos. 34003 *Plymouth* and 34027 *Taw Valley*. Both of them after running-in were working London-Kent coast fast trains in October. No. 34005 *Barnstaple*, illustrated in the October issue and the first to be modified, took up boat express duties between Victoria and Dover or Folkestone during August last.

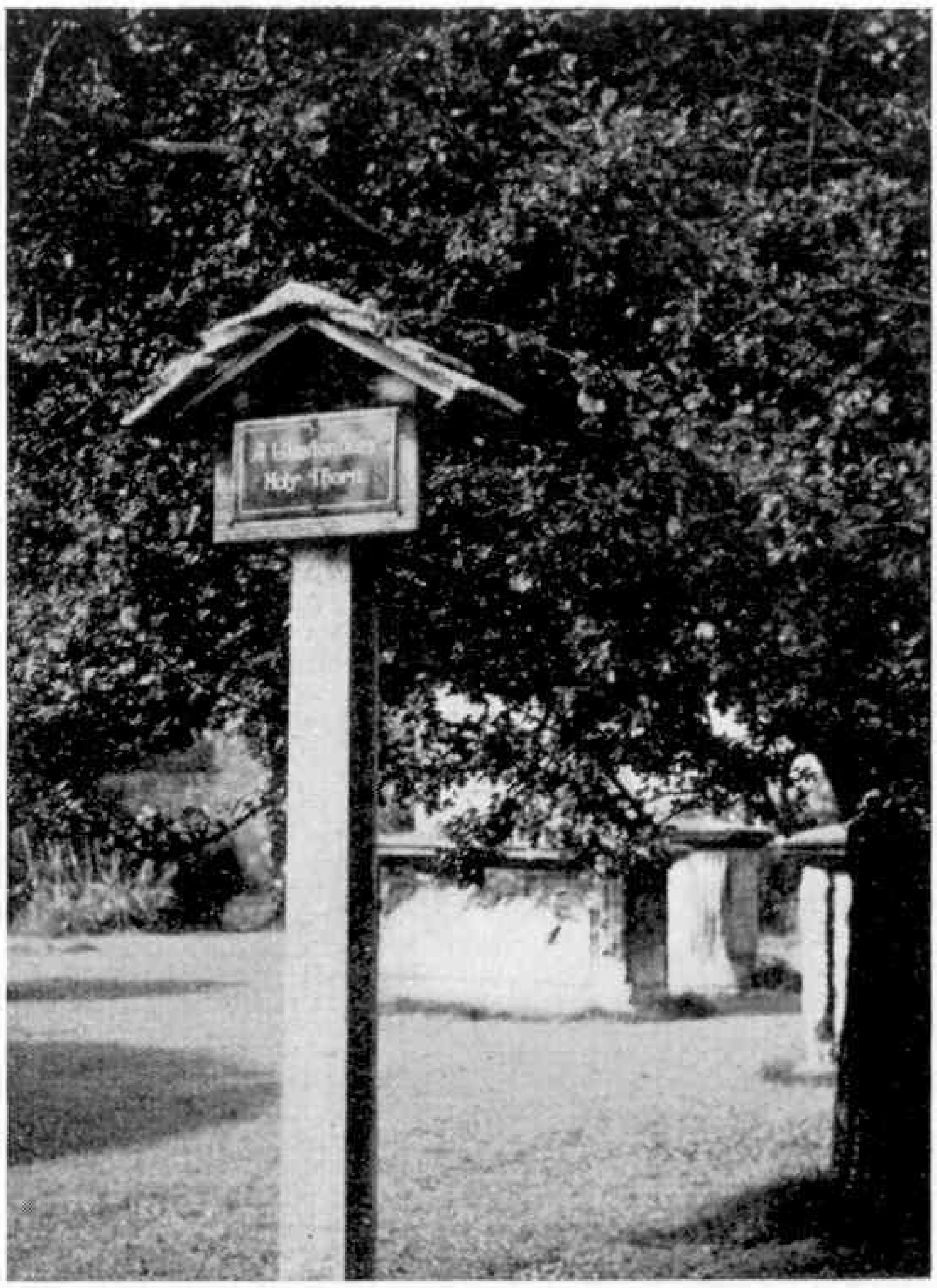
Class 4 2-6-4Ts of former L.M.S., and B.R. standard types take a considerable share in the working of the regular interval and extra business services over the Oxted routes to and from London, Tunbridge Wells, Brighton, Eastbourne. The B.R. 80000 class is also used between Tunbridge Wells, Tonbridge and Redhill.

* * * *

During the past summer diesel railcar sets coupled together and detached temporarily from their usual runs were employed to a considerable extent to form special excursion trains, both advertised and chartered by parties. In some instances quite long runs were involved to coastal or other resorts.

The railroads of the U.S.A. spend more than a billion dollars a year in improvements in equipment, plant and services. Last year they carried 430 million passengers more than 28 billion miles.

B.R. standard 2-6-4 Tank No. 80019 approaches Oxted with a train from Tunbridge Wells to Victoria. Photograph by S. Creer.



The Mysterious Holy Thorn

By

Leslie E. Wells

IN the grounds of Glastonbury Abbey, Somerset, stands one of the world's strangest trees—the Holy Thorn, which is found nowhere else in England. It blossoms every Christmastide. This always arouses immense interest, attracting crowds on Christmas Day to witness this wonder of nature.

Glastonbury is an ancient Somerset borough that is associated with the legends of King Arthur. It is popularly believed to be Avalon, the mystical city to which Joseph of Arimathæa brought the Holy Grail and where he built a marble church. Joseph is also supposed to have brought the famous Glastonbury thorn, seen in the illustrations on these pages, which blossoms in midwinter, and here is the story of this famous tree and its successors.

Every Christmas the altar vases of Glastonbury's parish church are massed with blossoms from this thorn of eastern Mediterranean origin; there is a pious belief that it was from a similar tree that Our Lord's persecutors plaited the Crown of Thorns. A charming custom is that of sending a sprig of the thorn at Christmas to the reigning monarch. This began in the time of Charles I, and the gift of blossoms is now sent each year to the Queen.

The original Holy Thorn is believed to have been brought to Britain by Joseph of Arimathæa on Christmas Day, A.D.63, when he landed on the Isle of Avalon. Centuries ago the district of Glastonbury was under water and the range of hills formed an island. A direct sea route existed from the Isle of Avalon to the Bristol Channel.

We are told that after the Crucifixion, Joseph set sail from Palestine with eleven companions. Before leaving he cut a stout stick from a thorn tree.

After a tiring journey his boat nosed its way into the inland waterways of Avalon. On dry land once more, Joseph found his staff extremely comforting. He thrust it into the ground, and spoke words to the effect that he and his followers were "all weary." Today that hill in Glastonbury where Joseph is reputed to have landed is still called Wearyall Hill.

The story goes on to tell how Joseph then left his staff stuck in the ground. There it took root, and became the Holy Thorn of Glastonbury, which miraculously *Blossoms at Christmas, mindful of Our Lord.*

For centuries the Thorn, a stout plant with a double trunk, flourished on Wearyall Hill. One of the trunks—said to have been as large around as a man's body, was hewn down by a sixteenth-century Puritan, who got what he richly deserved when a flying chip blinded him in one eye. The fallen tree kept on blossoming for thirty years. The other trunk was felled by a Roundhead, though the stump remained visible till the eighteenth century.

Plants grown directly from seeds of the Holy Thorn lose their parent's Christmas-blossoming characteristic. So scions of the parent-tree are grafted to a number of common thorns throughout the neighbourhood to preserve the yearly Yuletide miracle. This had been done by the time the original Thorn was cut down, so the continuity of the miraculously timed blossoming was maintained.

In Glastonbury itself, apart from the chief thorn in the Abbey grounds, a younger tree stands in a corner of the grounds, and a third has recently been planted on Wearyall Hill, where the original tree grew.

The local council frequently receive requests from overseas for cuttings. The most famous of these overseas thorns is that at St. Alban's Cathedral in Washington. Indeed, in November 1951, when the Queen, then Princess Elizabeth, and the Duke of Edinburgh visited the American capital, St. Alban's bush lived up to the tradition that the Holy Thorn flowers for royalty as well as Christmas, and put out four blossoms.

It appears the first reference to the Glastonbury Holy Thorn is in a thirteenth-century supplement to William of Malmesbury's twelfth-century history of Glastonbury Abbey. From then on we can discover several references to the phenomenon of its Christmastide flowering. For example, in 1535, Thomas Cromwell, chief minister to Henry VIII, was sent "two flowers wrapped in black sarsnet, that in Christmas mass, even at the very hour when Christ was born, will spring and burgeon and bare blossoms." And there is a seventeenth-century poem by Charles Smedley in which the fair Cordelia

> Blooms in the winter of her days
> Like Glastonbury Thorn.

Is the story of St. Joseph of Arimathæa true? Recent excavations in the Abbey grounds have revealed pottery of the first and second centuries A.D., suggesting settlements here during the time of St. Joseph. It is certain that there would have been someone on Wearyall Hill to greet him and his followers because there were early lake villages and a Roman settlement at the bottom of Wearyall Hill. One thing seems certain and that is the Holy Thorn of Glastonbury will continue to blossom at Christmastime to the delight and attraction of people the world over.

"AIRCRAFT ANNUAL"
Edited by John W. R. Taylor

"SHIPS ANNUAL"
Edited by Craig J. M. Carter
(Ian Allan, 10/6 each)

This latest *Aircraft Annual* is well up to standard. The subjects range from aerial fire watching over the thickly-timbered Gila National Park in south-western New Mexico to gliding in Great Britain. There are articles on how designs for new aircraft are "tried out" by means of model aircraft in test tanks; the development of guided missiles; herding cattle on a vast Texas range by means of a helicopter; and the systems of squadron markings used by Bomber Command, R.A.F. Sandwiched between these and other topical articles are excellent pictorial sections.

This second edition of *Ships Annual* contains a wealth of interesting information. The Editor reviews world merchant shipping events and developments during the past twelve months, and other contributors deal with such subjects as cargo liner types; early Scandinavian motor vessels; the Black Sea tramp; pleasure steamers past and present; and the gas turbine in marine propulsion. Like Ian Allan's other Annuals, this one is lavishly illustrated, both in line and half-tone.

Air News

By John W. R. Taylor

Viscount Production Records

Since the beginning of this year, Vickers have been turning out Viscount turboprop airliners at the rate of 10 a month—one every three days. The new 800 and 810 series aircraft are built in the main works at Weybridge, while the smaller 700 series aircraft are produced at Hurn, near Bournemouth.

Up to the beginning of October last, orders for the Viscount totalled 374, of which 235 had been delivered. The orders had come from 46 different operators in 31 countries, and were worth £143½ million. An important point is that delivery time has been reduced to 12 months for standard aircraft, by setting up no fewer than six separate assembly lines with a combined length of over a mile.

One of the latest international Viscount operators is Icelandair, whose two series 759 aircraft are used on services between Reykjavik and the British Isles. The first of them, TF-ISN *Gullfaxi*, is shown at the end of its delivery flight to Reykjavik in the illustration on this page.

Icelandair Viscount "Gullfaxi" arriving at Reykjavik Airport for the first time, on 2nd May, 1957.

Hustler Indeed

When General Power, Chief of the U.S.A.F.'s Strategic Air Command, went for a flight recently in the Convair B-58 Hustler four-jet delta-wing bomber, it is reported to have reached a speed of 1,380 m.p.h. at a height of 50,000 ft. and to have cruised at supersonic speeds for over half an hour.

Originally, only 30 Hustlers were ordered; but a large new production contract was placed in September last.

Lightplane Flies Tasman Sea

The first crossing of the Tasman Sea by a lightplane for 23 years was made on 6th August last by Mr. Miles King, governing director of Rex Aviation Pty. Ltd., who flew a twin-engined five-seat Cessna Model 310 from New Plymouth, New Zealand, to Sydney, Australia, by way of Norfolk Island. Time taken for the 1,779-mile flight over one of the world's stormiest air routes was just under 11 hours.

Last time a lightplane flew between New Zealand and Australia was in 1934, when Mr. Francis Chichester made the crossing in a Gipsy Moth seaplane. His crossing took four months, because of a long delay for repairs at Norfolk Island.

The Cessna was shipped from the United States to New Zealand and flown over the Tasman for delivery to Utah Australia Ltd., a company of construction engineers. Two of a later model—the 310B—have been ordered by Australia's Commonwealth and Scientific Industrial Research Organisation for use in "rain making" operations.

Gnat Trainers for R.A.F.

Folland's enterprise in developing the little Gnat interceptor as a private venture at last seems to be reaping a well-earned reward, because the Ministry of Supply has given the company a contract for a batch of two-seat Gnats for the Royal Air Force. They will be used to give pilots instruction in flying at transonic speeds.

Previously a total of 57 single-seat Gnats had been ordered, of which six were for the Ministry of Supply and the rest for the Indian and Finnish air forces. In addition, the fighter version will be built under licence by Hindustan Aircraft in India and Valmet Oy in Finland.

Me 109 Still Being Built

Few people seem to realise that the Messerschmitt Me 109, the *Luftwaffe's* standard single-seat fighter in the Battle of Britain, is still in production in Spain, or that it now has a Merlin engine, as did its old enemies the Hurricane and Spitfire.

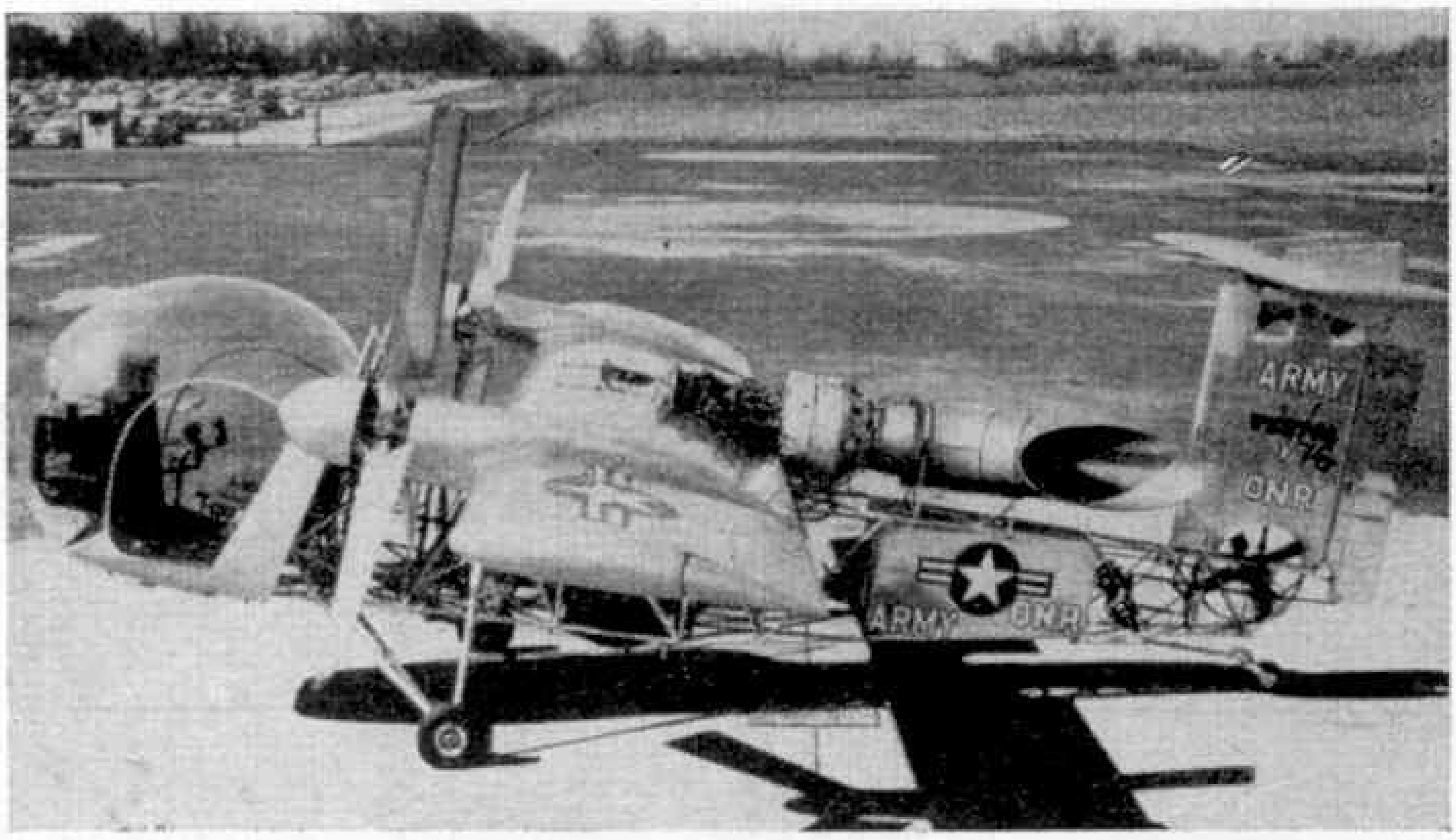
The Spanish Air Force began re-equipping with Me 109's no less than 20 years ago and had bought 95 of various marks from Germany when supplies were cut off during the war. The Hispano company then started to build the fighter under licence at Seville, after re-designing it to take a 1,300 h.p. Hispano engine; and about 225 were produced before the decision was taken to switch to a new version with a 1,400 h.p. Rolls-Royce Merlin 500.

The current production version is the HA-1112M-1-L, which is armed with two wing-mounted 20 mm. cannon and eight 22 lb. Oerlikon ground-attack rockets on underwing racks. Used mainly as an operational trainer, it has a top speed of 414 m.p.h. and a range of 405 miles at 376 m.p.h.

Beavers Move Home

The Colorado Game and Fish Commission are helping to prevent overcrowding in beaver settlements by flying the animals in pairs from densely populated areas to places where there is more room. They are put into boxes and dropped by parachute at their new homes from light aircraft. Spring-loaded doors on the boxes open as soon as the beavers have landed. They are by no means the first living creatures to be dropped to new homes, because the U.S. Fish and Wildlife Service regularly restocks lakes by "sowing" tiny fish from lightplanes which skim over the water.

This unusual looking aircraft is the American-built Vertol 76 tilt-wing model described on this page.



Tilt-Wing Prototype

The first of the two remarkable tilt-wing aircraft that are under development in America, the Vertol 76, has been completed and is undergoing its initial ground testing.

As can be seen from the illustrations on this page, it has the simplest possible airframe, with a tubular steel fuselage and a cabin from an existing helicopter, because its sole purpose is to prove the practicability of the tilt-wing idea, for the U.S. Office of Naval Research and U.S. Army.

The Vertol 76 is powered by a single Lycoming T53 turboprop, which drives two combined rotor-airscrews mounted on the wing leading-edges. For take-off, the wing is tilted vertically, so that the airscrews act as helicopter rotors and enable the aircraft to lift itself vertically into the air. At a safe height, the wing is gradually tilted towards a normal horizontal position. As this happens, the airscrews begin to give forward thrust as well as lift and the aircraft starts to move forward. Eventually, it builds up sufficient speed for the wings to provide all the lift needed to keep it airborne and it then cruises in exactly the same way as a conventional fixed-wing aircraft, with the wings in a normal horizontal position. Small vertical and horizontal tail rotors, enclosed in rings and known as ducted fans, provide directional control and stability during vertical take-off and landing and while the wing is being tilted.

Big advantage of a tilt-wing aeroplane is that it will take off and land vertically and hover like a helicopter, but has a much higher speed, because its rotor-airscrews are used only to provide thrust in cruising flight. It is fairly complicated mechanically; but airlines like B.E.A. regard it as a competitor for helicopters on inter-city air-bus services.

Comets Cross the Atlantic

Five Comet jet transports crossed the Atlantic from east to west in a single week in September of this year. Three were Comet 2's of R.A.F. Transport Command, of which two flew non-stop from Aldergrove, N. Ireland, to Gander, Newfoundland, in under 5¼ hours, before carrying on to Pinecastle in Florida, where R.A.F. Vulcan and Valiant bombers were to take part in the annual U.S.A.F. bombing competition. The third, carrying the Chief of the Air Staff, Air Chief Marshal Sir Dermot Boyle, flew from London Airport to Goose Bay and Ottawa, via Keflavik in Iceland.

On the following day, the two Comet 1A aircraft belonging to the R.C.A.F. returned to Ottawa after modification by de Havilland at Hatfield, via the Azores and Chatham, New Brunswick.

There are now 14 Comets in service, including 10 R.A.F. Comet 2's, which fly about 100,000 miles a week and have carried Her Majesty the Queen, Prince Philip and members of the Government on several occasions, and two civil Comet 2E's with which B.O.A.C. are building up jet experience on experimental and freight services. Deliveries of 19 Comet 4's to B.O.A.C. and six Comet 4B's to B.E.A. will begin in 1958-59.

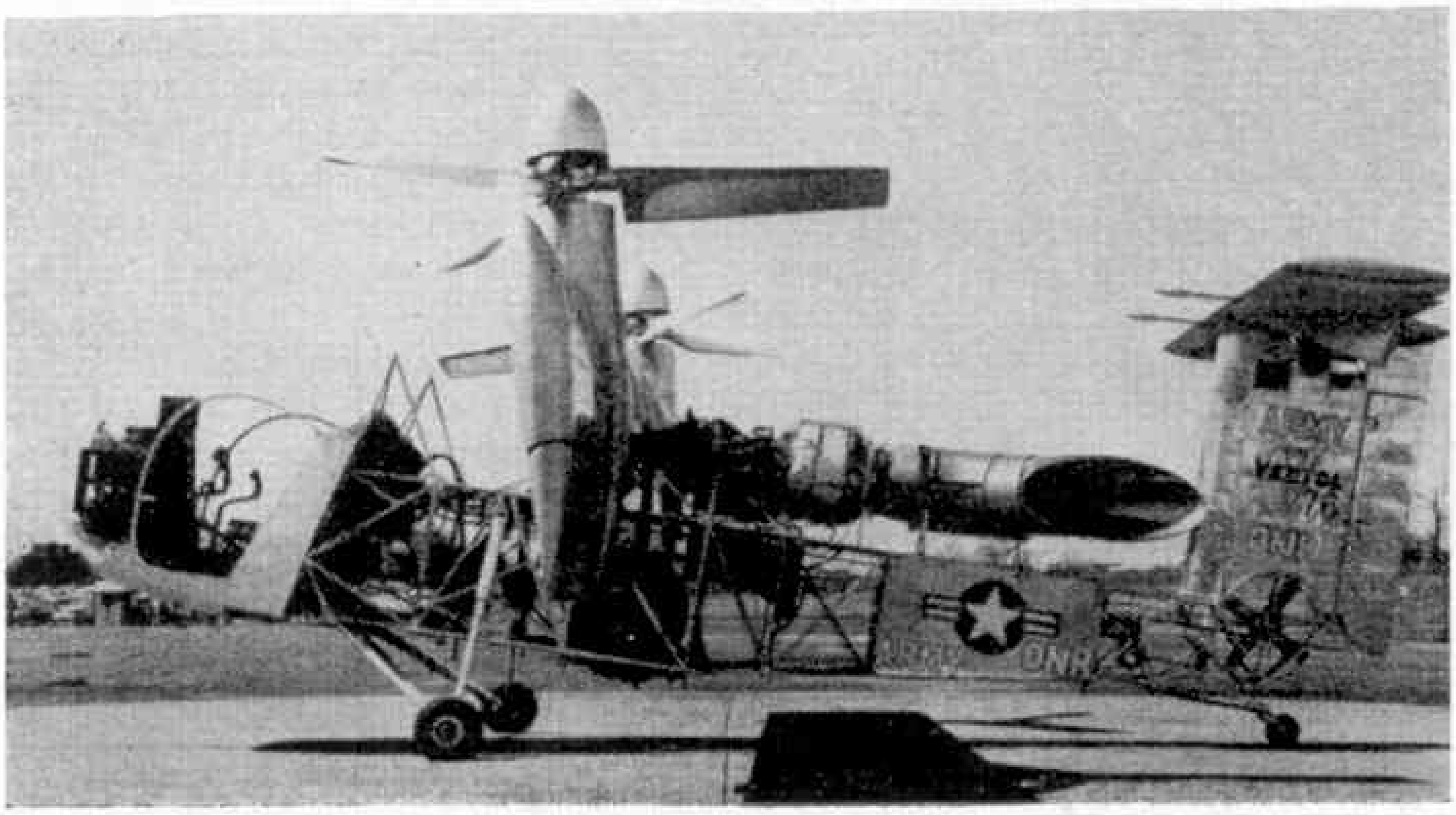
Russian Jet Record

News that the world's 1,000 km. (621 mile) closed circuit speed record, held since 1955 by a Saab J29 jet fighter, has been beaten by a Tupolev Tu-104A twin-jet *airliner* gives yet more proof of the superb quality of modern Russian aircraft. According to Moscow Radio, the Tu-104A carried a ten-ton payload on the flight, which took 61 min. 48 sec., at an average speed of 604 m.p.h. This exceeded the old record by almost 45 m.p.h., and the jet-liner is said to have reached several times a speed of 639.9 m.p.h.

Earlier, a Tu-104 had lifted a 20-ton payload to 38,713 ft. and had covered 1,200 miles at 565 m.p.h. with a two-ton load.

* * *

American companies have built more than a million aircraft piston-engines in the past 50 years.



In this picture the Vertol 76 is shown with wing tilted up for take-off.

Working Below Water

Wonders of the Cox Underwater Gun

By Kenneth Rudge

THE job in the Royal Navy about which probably least is known by the public, and which consequently has acquired a great deal of romantic appeal, is that of the diver. The idea of roaming the bed of the ocean in a world so utterly different from the everyday surroundings above gives the diver's job a certain magic that none other holds.

The main point to remember about diving is that it is not an end in itself. A man who knew everything about the technique of diving and the use of the diving suit would be of practically no use to the Navy unless he had another skill too, such as shipwright, rigger, engineer or blacksmith. Diving is simply a means of getting to a place of work.

Among the jobs that Naval divers might expect to do in the ordinary way are searching for lost anchors, recovering practice torpedoes, cleaning foul moorings and inspection and maintenance of ships' bottoms. Jobs like the raising of sunken vessels are much less frequent, and such sensational tasks as the recovery of gold or other valuable cargo from sunken craft almost always fall to divers employed by civilian contractors.

The picture at the head of the page shows a diver working in water with an oxy-hydrogen cutter. Photograph by courtesy of Siebe, Gorman and Co. Ltd.

Before a diver goes below the surface every care is taken to ensure his safety, and the correct wearing and maintenance of his dress and equipment are most important. Beneath his suit the diver wears plenty of thick, warm woollen clothing. Water can make a man very cold indeed when he is immersed in it for a long time. Usually a red woollen cap is worn to keep the head warm.

The standard diving dress is made of sheet rubber between two layers of twill, with a thick rubber outer collar that makes a watertight joint with the metal breastplate or corselet. The cuffs are of rubber, and with the aid of rubber rings make a watertight joint at the wrist.

Normally a diver prefers to work without gloves, since the sense of touch is so important to him, for visibility is usually poor or he may not be able to see anything at all. In very cold waters, however, he may be forced to wear leather or rubber gloves.

The copper and brass corselet fits over the shoulders of the diver, and it is to this that the helmet is fitted. The helmet is of tinned copper, and screws on to the corselet. It has windows at the front and sides. Occasionally a helmet has a window over the front glass to give an upward view. The helmet has an inlet valve, through which air enters from the air pipe, and an outlet valve, which releases the foul air into the water. This is on the back of the helmet so that bubbles do not obstruct the diver's view. There is also a connection for the telephone cable to the attendant boat above.

On his feet the diver wears leather boots with wooden soles, to which are riveted lead soles, each boot weighing about 18 pounds. Brass toecaps are sometimes fitted. On top of everything else go the lead weights, of 40 lb. each, on front and back.

One piece of equipment on the belt of every diver is a knife. This is not provided for fighting off attack by a shark or octopus, as so many stories might lead one to believe, but to enable him to cut himself free if he becomes entangled in some way when below the surface.

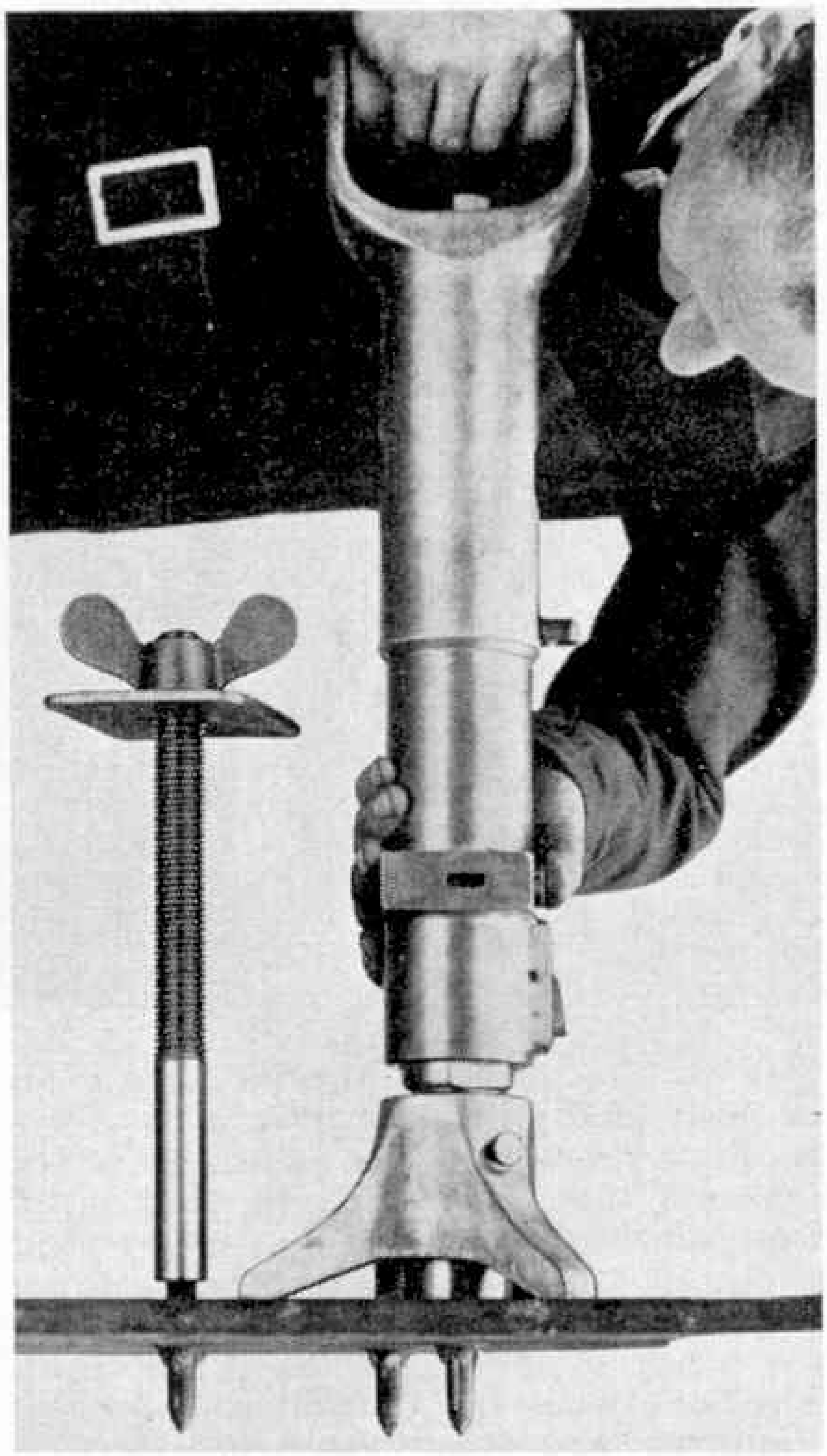
It is sometimes asked why a diver needs so many heavy weights about him, when it would appear that even the copper helmet and corselet would be enough to take him to the bottom. It must be remembered that in order to counteract the pressure of the water upon the diver at depth, air has to be pumped into his suit at high pressure. The deeper he goes the more air must be forced into his suit. As a result of this the diver's dress becomes very buoyant and that is why the weights are needed.

In order to descend a diver merely grasps the shot rope—a weighted hemp line—and slides down it to the bottom, taking care not to go too quickly. Too much speed would cause him to reach deep water before the pumps above had forced sufficient air into his suit, and he would receive a severe squeeze.

A common fallacy is that a diver is hauled up by his attendants when he wants to come to the surface. This is only done in an emergency, however, since the diver has only to close his outlet valve in order to go up. At once the air pressure in his suit rises, and the increased buoyancy carries him upwards.

Although telephonic communication is largely used nowadays, every diver must be fully conversant with the code of signals used between himself and his attendant, using his breast rope or air pipe. The attendant in the boat above has a highly responsible job. He needs to give his undivided attention at all times to the progress of the diver below, and without a good man above him, the diver might be in considerable danger.

In years gone by a diver had at his command only manual tools for carrying out work below water. These were often effective in cutting or drilling timber, but they were of little use in dealing with metal.



Using the Cox Gun to fire steel bolts through steel plate. Photograph by courtesy of the Temple Cox Development Company Ltd.

Nowadays, however, metal cutting is done by means of oxy-hydrogen or oxy-electric appliances. Metal joints can be made with oxy-arc welders, and holes can be punched, or bolts driven into metal, with a Cox Gun.

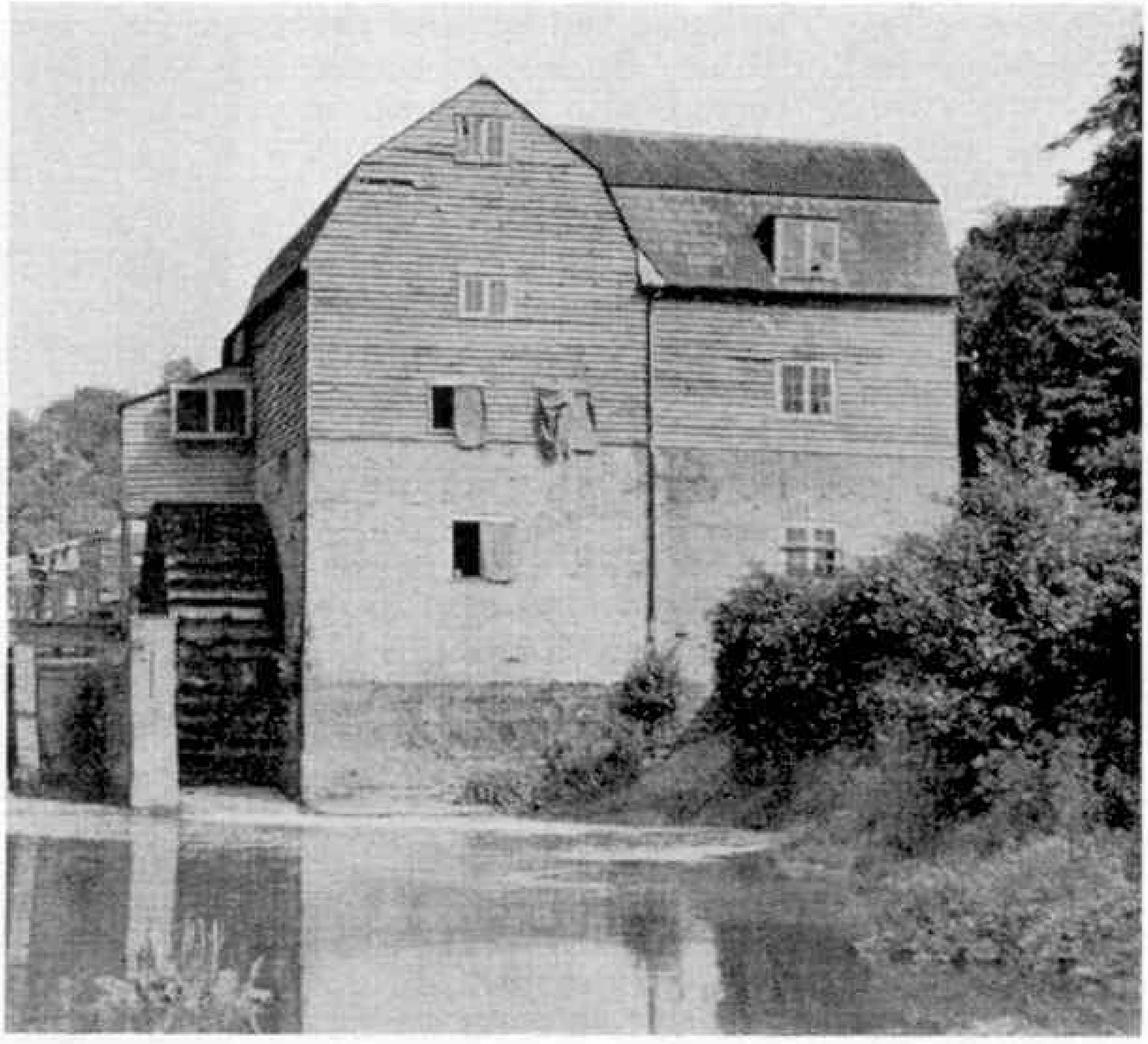
The latter is an amazing tool, almost worthy of a science-fiction story. The gun, weighing 36 lb., fires steel bolts of $\frac{5}{8}$ inch diameter and $4\frac{1}{2}$ inches long into steel plates of up to 1 inch thick, without recoil, flash or report!

A unique use for this versatile tool is found when air has to be pumped into an enclosed space below water, to help with lifting operations. Into the ship's plating is fired a hollow bolt with a solid nose. With a special screwdriver passed through the bolt the diver can unscrew the head, which falls inside the plating. An adaptor can then be screwed on to the threaded end of the bolt on the diver's side, and air pumped into the interior.

Mills of Time

By

Arthur Gaunt, F.R.G.S.



The watermill seen in the picture at the head of the page is Castle Mill, near Dorking, on the River Mole. It is one of the finest within easy reach of London.

SO far the passing centuries have dealt fairly kindly with our watermills. They are more robust and less vulnerable to the elements than our windmills, and many have survived to attract tourists by their appearance as well as by their long history.

Yet today there is growing concern for the future of these picturesque souvenirs. The Society for the Protection of Ancient Buildings, and other bodies interested in safeguarding our scenic and historic legacy, are urging that at least a proportion of our watermills be kept for posterity instead of being allowed to fall into disuse and decay.

There is something particularly appealing in the rustic scene of an old millstream turning a giant wheel to operate groaning machinery in an adjoining millhouse. Historically, too, our watermills have rather more to recommend them than our windmills, for our forefathers discovered the value of waterpower long before they learned how to harness the wind.

The hundreds of mills listed in the Domesday Book are known to have been watermills. No existing English watermill is as old as that, but a considerable number occupy sites that have had a water-driven mill for centuries. Just below the bridge at Killinghall, near Harrogate, is a Nidd-side mill with a story going back to the beginning of the 13th century, and the present building dates from about 1500. It was originally a corn mill. More recently it has been a saw-mill, and since 1738 it has been owned by the same family. With its weir, it makes a pretty picture from the bridge.

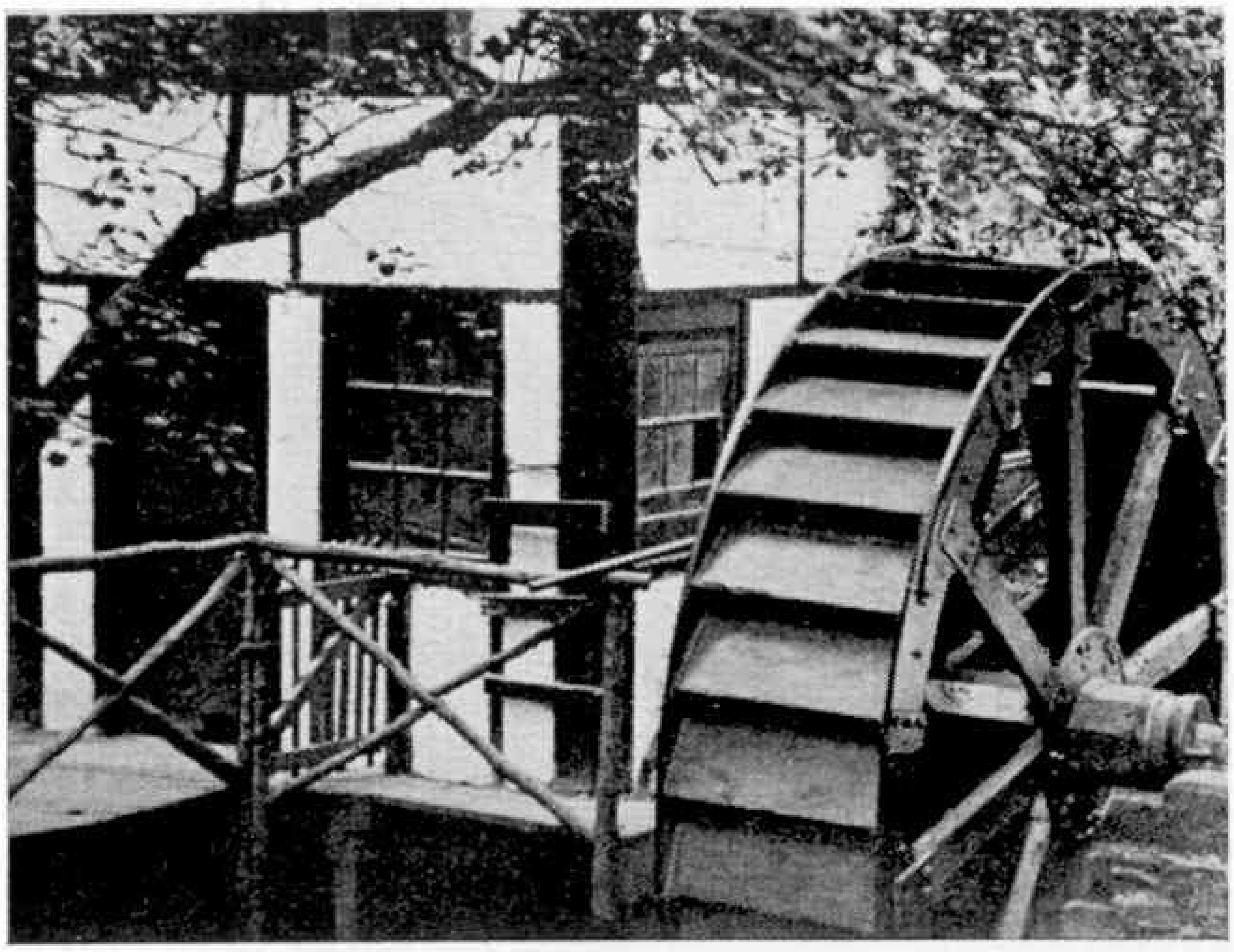
You will find a good many watermills still at work here and there by slow-running rivers, but the number is declining rapidly. Corn grinding and wood cutting are not the only jobs they do today. Some are malt mills, others cut cattle cake, a further group turn out agricultural tools, and some mix fertilisers.

There is a watermill at a banknote making works at Laverstoke, Hampshire. This business was established by a Huguenot 200 years ago and his descendants still run it. Throughout these years the specially made paper, with its secret watermarking process, has been manufactured with power supplied by the River Test.

In bygone times most of our watermills were owned by monastic authorities, manor lords, and others of high rank, and one of the most attractive monastic mills is the Abbey Mill at Tewkesbury. It is on a site mentioned in early Norman records, and it was grinding corn until about 30 years ago.

A number of charming watermills are within easy reach of London, and some are in regular use today. One of the finest is

Here is an Isle of Man example of a little watermill that has a large wheel.



Castle Mill, beside the little River Mole, just outside Dorking, Surrey. Although within a few hundred yards of the busy Dorking-Leatherhead main road, it is in a sylvan setting, and the mill itself is a weatherboarded building with a large outside waterwheel.

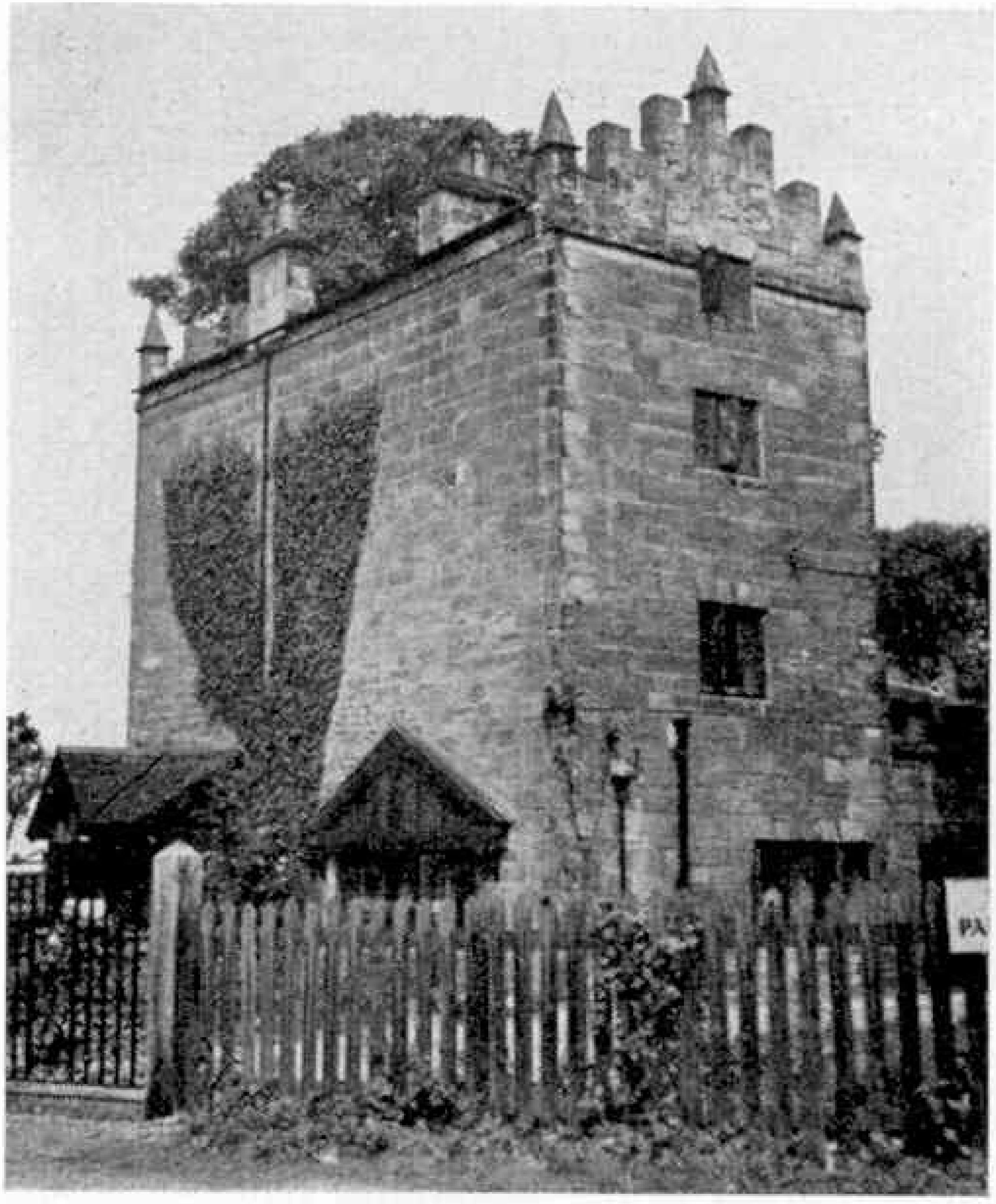
Mapledurham Mill, in the Thames Valley, near Reading, is another with a history covering several hundred years, while an exceptionally large example is on the River Wey at Pyrford, Surrey. Like Castle Mill, Dorking, it owes much of its attraction to its weatherboarded construction. Still another watermill in this style is Houghton Mill, Huntingdonshire. Although it is now used as a hostel, outwardly it is still a water-driven mill, and it stands in a beautiful setting beside the Ouse.

In the Middle Ages, when royal charters were given for building and running watermills, nobody but the owner of such a grant was allowed to harness the rivers and streams. So everybody who grew corn had to take it to the official mill to be ground, and in some instances ovens were built into the millhouse, so that the bread could be baked there too!

Some of our watermills have an added appeal by reason of their associations. The Abbey Mill, Tewkesbury, already mentioned, is the one described in *John Halifax, Gentleman*, as the home of Abel Fletcher, where the young hero of the story worked. Guy's Cliff Mill, Warwick, is named after Guy of Warwick, the Crusader who became a hermit and lived in a cave nearby.

An engaging addition to the list is King's Mill, beside the Trent near Castle Donington. The nearby house has long been known as the Priest House, and it has the appearance of a fortified home. Yet there is no evidence of a church or chantry chapel here, and not much is known about the early story of the mill, though there is a document relating

This Nottinghamshire watermill is a very fine example. It is the Lowdham Mill, one of two still turned by the Dover Beck. Four others once turned by the same stream are now decaying.



The Priest House, King's Mill, near Castle Donington, a Trent Valley watermill.

to a watermill in 1551 at this spot. Another document shows that in 1794 the present mill was used in paper making.

The need to safeguard our watermills from decay is now urgent, for they are falling into disuse at an alarming rate. One cause is the bringing of electric power into the countryside, a development that is leading to the disuse of water power.

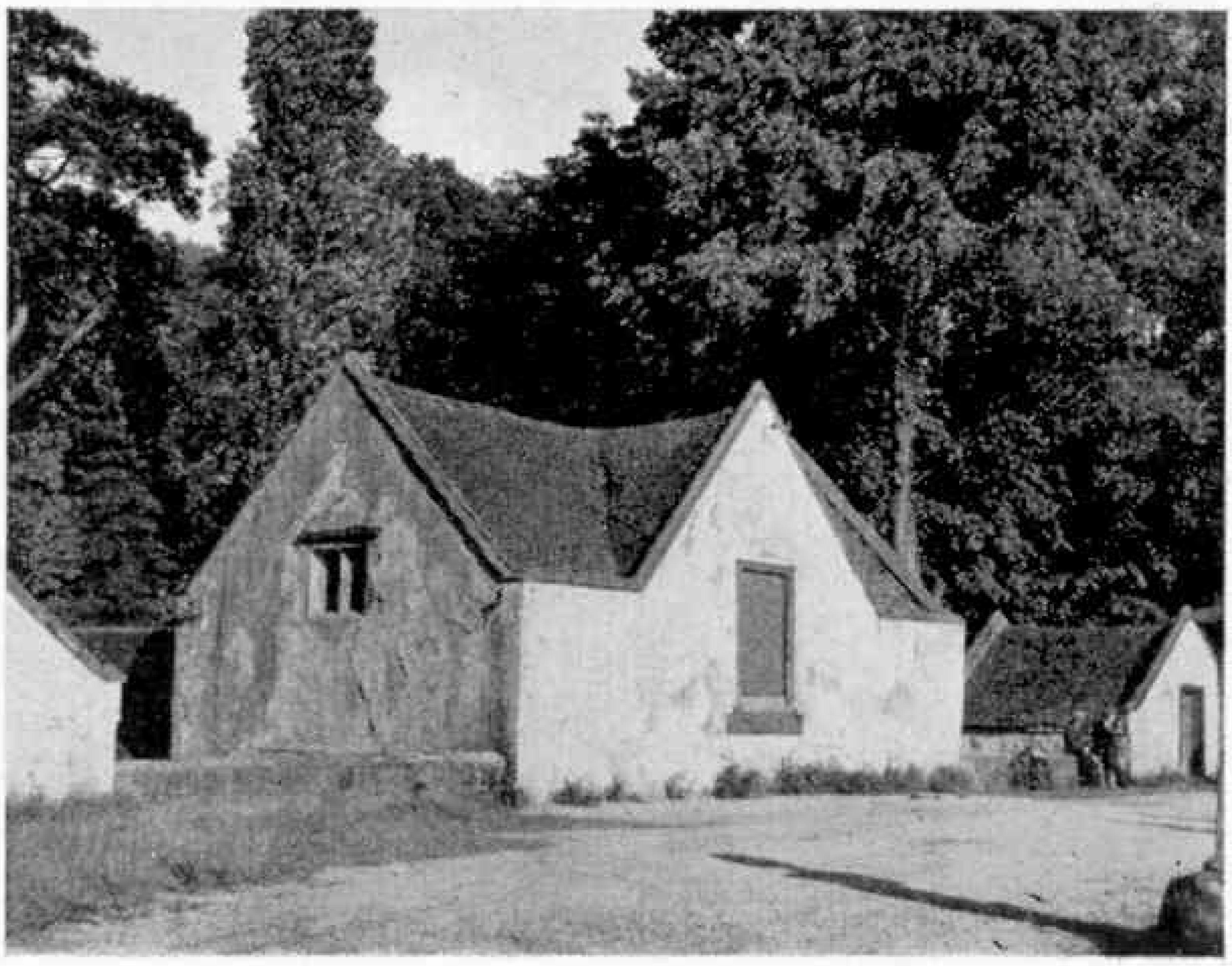
The watermill is also dependent partly on the weather, not of course as greatly as the windmill, for water can be stored and the wind cannot. Yet a few weeks of drought may lower the level of the mill pond and put the wheel out of action, or reduce its speed.

The extent of the threat to our water-driven mills is shown along a short stretch of the Dover Beck, in Nottinghamshire. Where six watermills worked only a few years ago, only two are now running. Lowdham Mill has been well maintained, and Hoveringham Mill still turns, but the others are in various stages of decay.

Among the organisations now actively preserving watermills, or agitating to that end, is the National Trust. A few mills are actually Trust property—such as Houghton Mill, Bourne Mill (a striking 16th century one near Colchester, built from the ruins of an abbey), and Burnham Overy Mill, between Hunstanton and Wells.

Shalford Mill, near Guildford, came to the National Trust in a curious way. Built in the 18th century, and presenting a picturesque appearance, it was falling to ruin 25 years ago. Then anonymous gifts of money were delivered to the Trust, marked merely "Ferguson's Gang," with a request that these be used to repair and endow Shalford Mill. This was done in 1932, and today that Surrey watermill is safeguarded as a national heirloom.

Comparatively few of our threatened watermills can be taken over in that way, of course, but the Society for the Protection of Ancient Buildings has a section for stimulating interest in them, providing technical advice about their upkeep, and giving encouragement and financial help wherever possible. It would, indeed, be a grievous loss if the English watermill vanished. Interest in saving as many as possible has arisen only just in time.



A Leicestershire watermill near Melbourne Hall that is in working order. After turning the wheel the water is led to the gardens nearby.

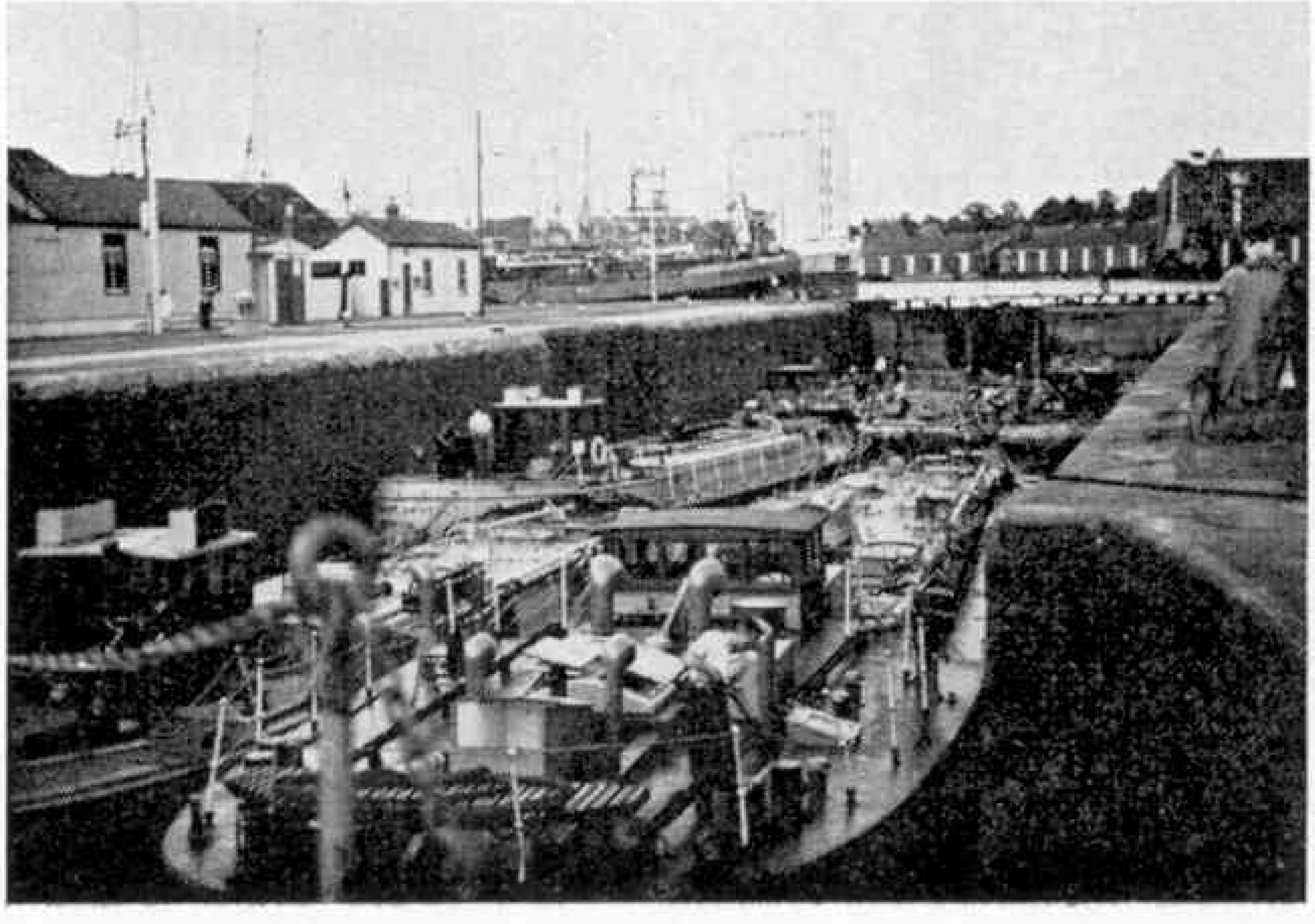
MECCANO MAGAZINE

Junior Section

IN a way this is a canal boat issue, with its colourful cover scene and the stories of canal boats and the people who run them on page 586. The two pictures on this page emphasise this. The upper one, contributed by C. P. and C. R. Weaver, shows a boatman's wife steering a butty, which is a barge not provided with motive power, on the Grand Union Canal. Today practically all of these are hauled by motor barges instead of the traditional horses.

The lower picture on this page shows a scene at Sharpness Docks, on the Severn. It was sent in by Miss G. M. Paul, Exmouth, who points out that traffic in and out of this busy port is dependent on the state of the tide, ships entering or leaving the Docks through a short lock. The six motor barges seen in the lock were laden with petroleum and were waiting for the water to rise to the correct level when the photograph was taken, while beyond, inside the dock, was an outward bound tanker making ready to enter the lock. The lock gates are operated and controlled by up-to-date mechanism.

Merchandise reaches the Docks from all over England, carried there in barges through the great network of canals still in operation, and tankers and other larger ships from overseas reach the port by way of the lower channels of the Severn.



Easy Model-Building

Spanner's Special Section for Juniors

Derrick Crane and Searchlight Models

THIS month I have prepared details of two more attractive models designed specially for young Meccano enthusiasts. One is a simple but realistic working model of a Derrick Crane. This uses only a few parts in its construction, but through careful design a remarkably realistic effect has been obtained, and by turning the Crank Handle it is possible to use the Derrick Crane to raise light loads. It provides yet another example of the wide range of attractive models that come within the scope of even the smallest Meccano Outfit, for all the parts used in the construction of the Derrick Crane are contained in Outfit No. 00.

The Derrick Crane is shown in Fig. 1, and you should begin by making the base, which consists of two 2½" Strips bolted together at one end and connected at the other end by two Fishplates. The Fishplates must be bolted together, and the same bolt is used to fix in place two Trunnions. Use the Trunnions to support a Crank Handle, and fix two 1" Pulleys on the Crank Handle to hold it in place.

The next step is to fix an Angle Bracket 1 tightly to one of the 2½" Strips of the base. Pass a bolt 2 through a 5½" Strip 3, and screw a nut on it. Now pass the bolt 2 through a 5½" Strip 4 and the Angle Bracket 1, and screw a second nut on the bolt. Tighten the two nuts together to fix the Strip 4 tightly to the Angle Bracket. Fasten a ⅜" Bolt 5 in Strip 3 by two nuts, and fix a similar Bolt 6 in Strip 4.

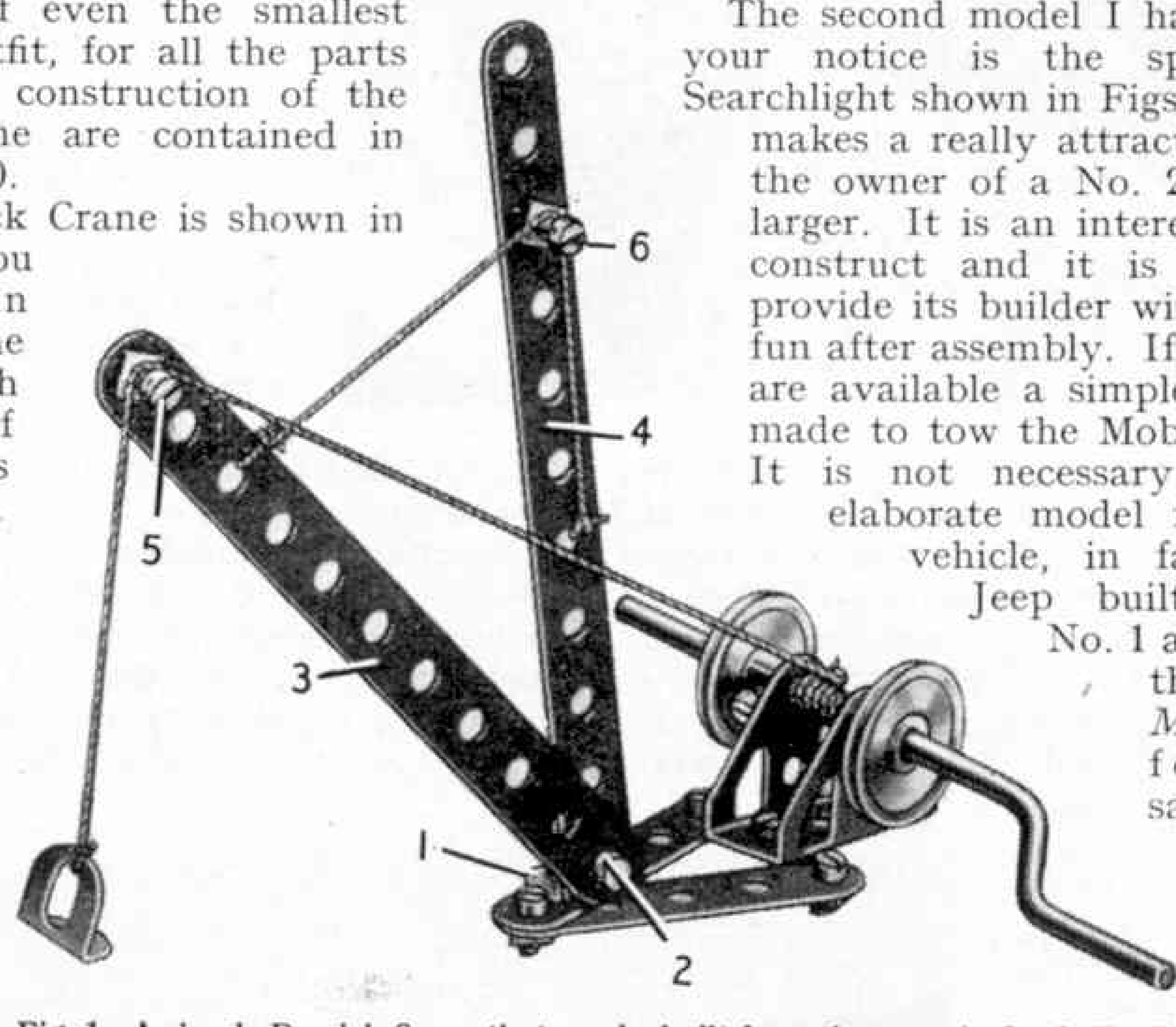


Fig. 1. A simple Derrick Crane that can be built from the parts in Outfit No. 00.

Tie one end of a piece of cord to the Strip 4, pass the cord over the Bolt 6 and fasten the other end to the Strip 3. Fasten another length of cord to the Crank Handle, pass it over the Bolt 5 and tie an Angle Bracket to the free end of the cord. The Angle Bracket forms a hook to support the load to be raised or lowered by the Derrick Crane.

A full list of the parts used in the construction of the Derrick Crane is given at the end of this article.

The second model I have to bring to your notice is the splendid Mobile Searchlight shown in Figs. 2 and 3. This makes a really attractive subject for the owner of a No. 2 Outfit or one larger. It is an interesting model to construct and it is one that will provide its builder with a lot of real fun after assembly. If sufficient parts are available a simple truck can be made to tow the Mobile Searchlight. It is not necessary to build an elaborate model for the towing vehicle, in fact the model Jeep built with Outfit No. 1 and described in the March 1956 *M.M.* will be found quite satisfactory.

The truck supporting the searchlight should be built first. Strengthen a 2½"×2½" Flexible Plate along three sides with 2½" Strips, and along the fourth side with a 2½" Stepped Curved Strip, and bolt two Trunnions 1 to the Plate. Fix a 2½" Strip 2 to each Trunnion, using the bolts to attach a Fishplate on each side. The 1" Pulleys forming the wheels are fixed on a 3½" Rod mounted in the Fishplates.

A 2½"×½" Double Angle Strip 3 should be attached to the rear edge of the Flexible Plate, using two Angle Brackets and a ½" Reversed Angle Bracket for the purpose. The bolt securing the Reversed Angle

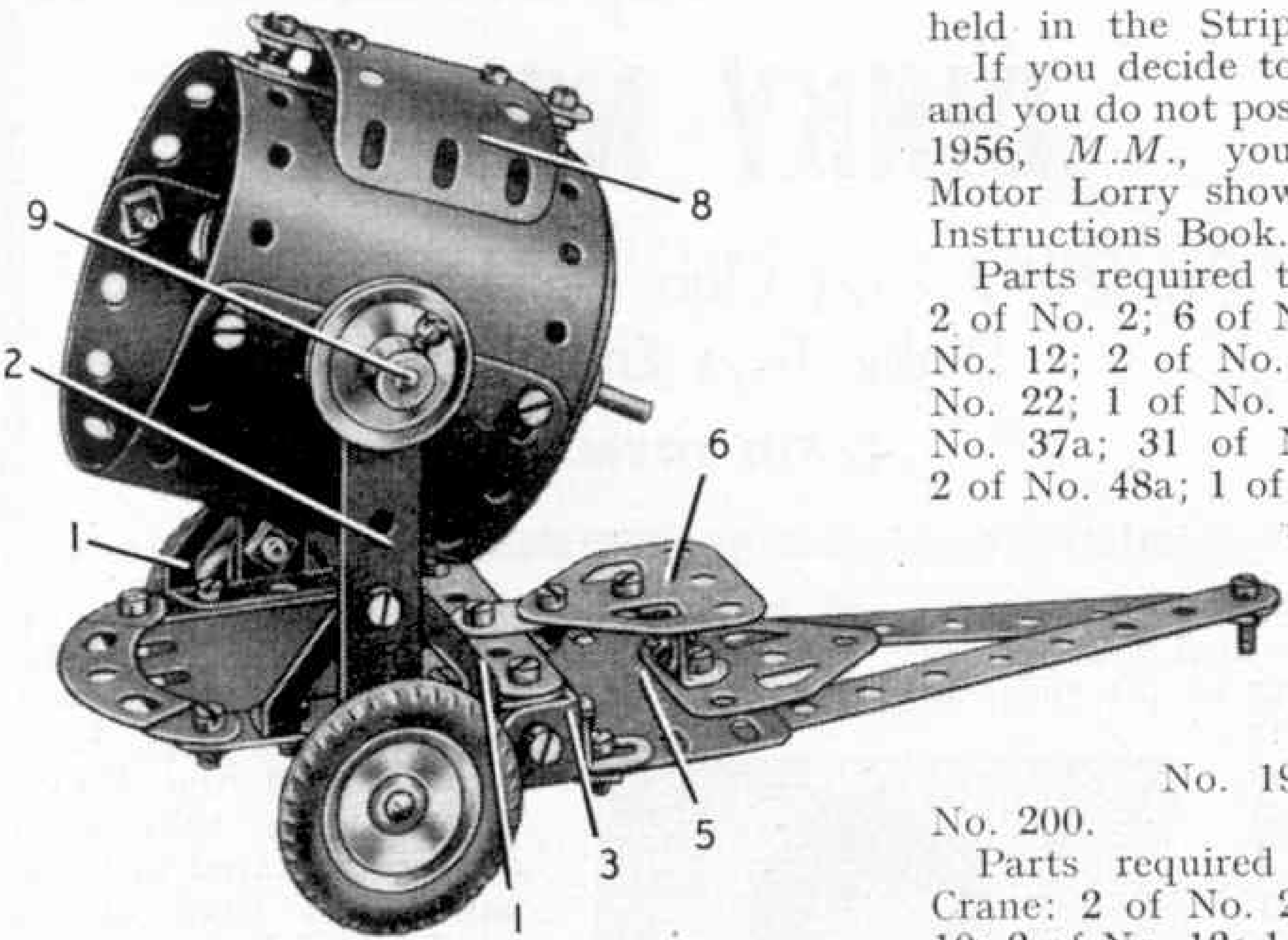


Fig. 2. This Mobile Searchlight is a fine model to build and play with. All the parts needed for its construction are contained in Outfit No. 2.

Bracket to the Plate is used also to fix in place a Fishplate 4. A $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate 5 is bolted to the lower lug of the Reversed Angle Bracket and to two Angle Brackets fastened to Double Angle Strip 3. Two $5\frac{1}{2}''$ Strips forming a towbar are held by the same bolts that fix the Plate 5 to the Angle Brackets. The rear ends of the $5\frac{1}{2}''$ Strips are connected by a $\frac{3}{8}''$ Bolt. A Flat Trunnion is fixed to the Plate 5, the bolt holding also an Angle Bracket. Another Angle Bracket is fastened to this and supports a Flat Trunnion 6, which is bolted to the Fishplate 4.

To make the searchlight you must curve a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate into a semi-circle, and bolt it to the ends of two $1\frac{11}{16}''$ radius Curved Plates fastened together. The Bolts used to connect the Curved Plates are $\frac{3}{8}''$ long, and each of them is held in the Plates by two nuts. A $2\frac{1}{2}''$ Strip 7 is held against the heads of the Bolts by nuts, and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate 8 is bolted to Strip 7 as shown.

To complete the searchlight, a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip must be bolted across one end of the cylinder formed by the Flexible and Curved Plates. A 2" Rod fitted with a Cord Anchoring Spring is passed through the centre hole of the Double Angle Strip, and a Road Wheel is held on the Rod by a Bush Wheel. The searchlight pivots on a $3\frac{1}{2}''$ Rod 9 held in the Strips 2 by 1" Pulleys.

If you decide to build a towing vehicle and you do not possess a copy of the March 1956, *M.M.*, you could use the small Motor Lorry shown in the No. 2 Outfit Instructions Book.

Parts required to build the Searchlight: 2 of No. 2; 6 of No. 5; 3 of No. 10; 6 of No. 12; 2 of No. 16; 1 of No. 17; 4 of No. 22; 1 of No. 24; 2 of No. 35; 38 of No. 37a; 31 of No. 37b; 1 of No. 38; 2 of No. 48a; 1 of No. 90a; 3 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 2 of No. 142c; 1 of No. 176; 1 of No. 187; 2 of No. 188; 1 of No. 190; 1 of No. 191; 2 of No. 200.

Parts required to build the Derrick Crane: 2 of No. 2; 2 of No. 5; 2 of No. 10; 2 of No. 12; 1 of No. 19s; 2 of No. 22; 10 of No. 37a; 6 of No. 37b; 2 of No. 111c; 2 of No. 126.

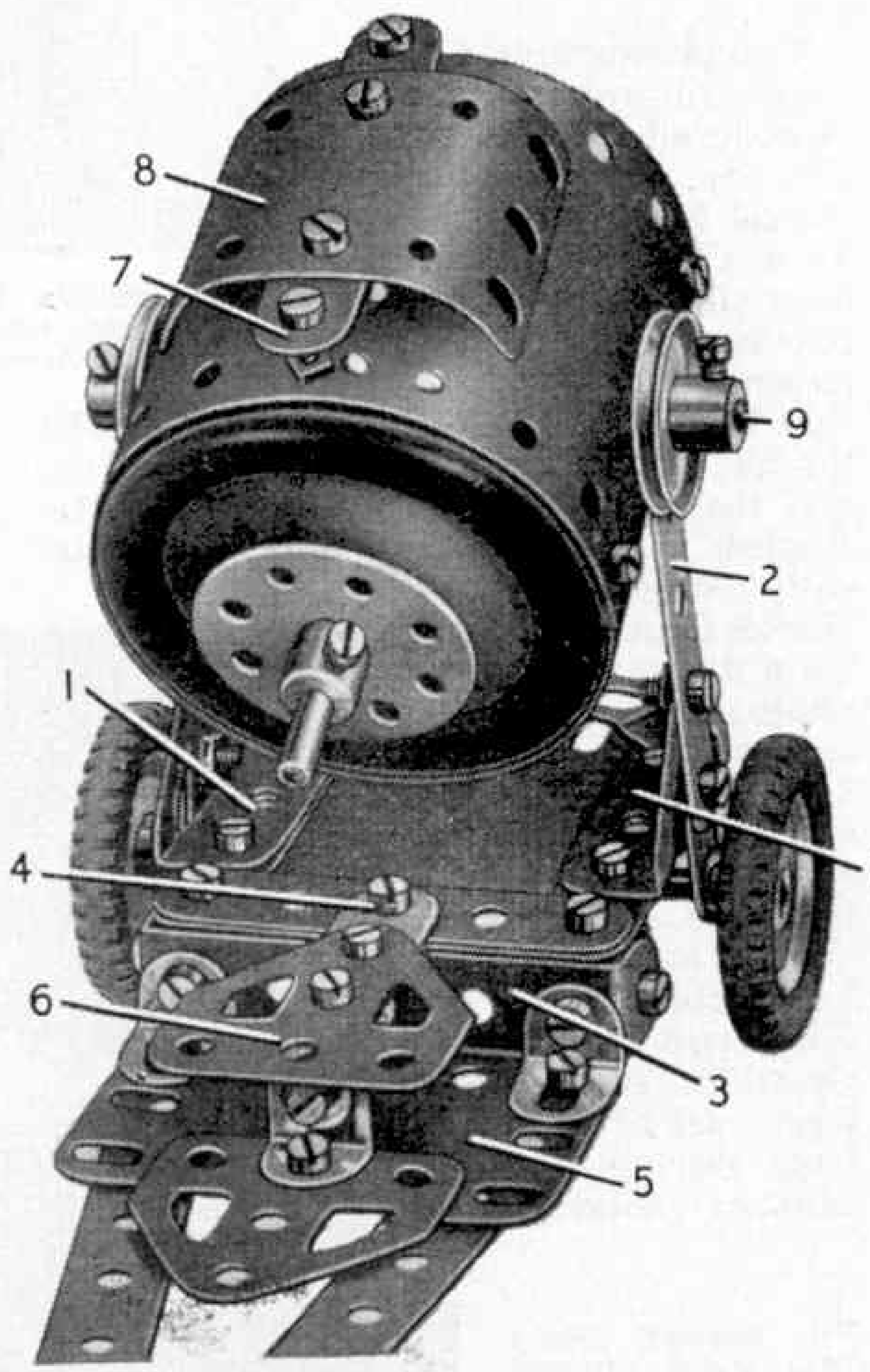


Fig. 3. A close-up of the Searchlight from the rear, showing details of the wheeled base.

DINKY NEWS

For Dinky Toys Club Members and All Dinky Toys Enthusiasts

By **THE TOYMAN**

ONE of my most pleasant tasks these days is reading the mail that arrives in ever increasing volume at my office in Binns Road. These letters are sent by Dinky Toys Club members living in all parts of the world, and I am always particularly pleased when I find that a correspondent has included a photograph of himself, or his layout, with his letter.

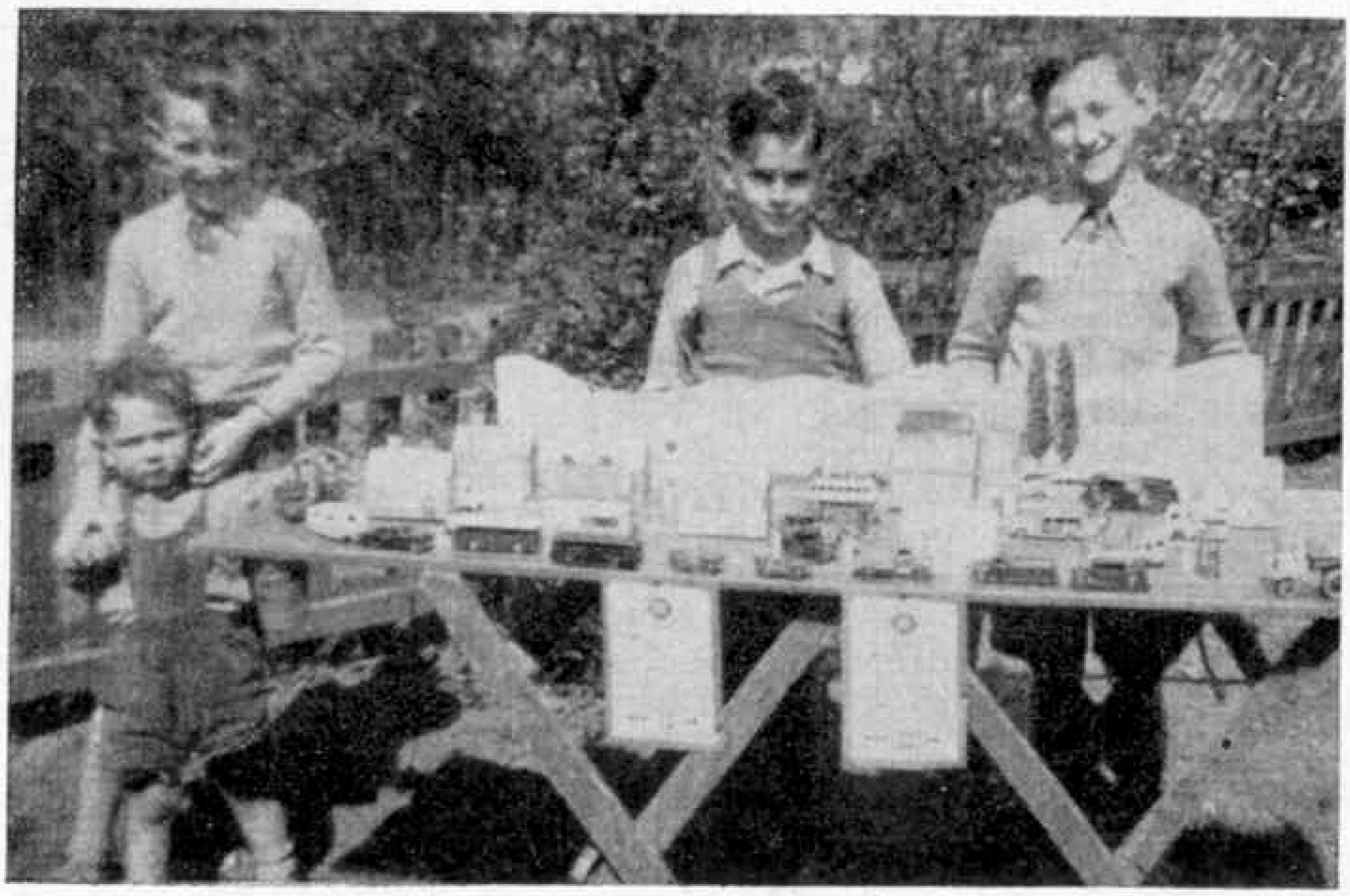
Marcel Miranda is a keen Dinky Toys collector who lives in Rosario, Argentina.

Two photographs I have received recently are reproduced on this page. The one at the top shows Marcel Miranda, a Dinky Toys Club member who lives at Rosario, in the Province of Santa Fe, Argentina. Marcel tells me that he has started to build a large layout for his Dinky Toys and Hornby railway, and that he is basing his plan on a little English village. The layout is only in its early stage, but Marcel is going to send me a photograph of the completed scheme and if it is suitable I shall reproduce it in a future *M.M.*

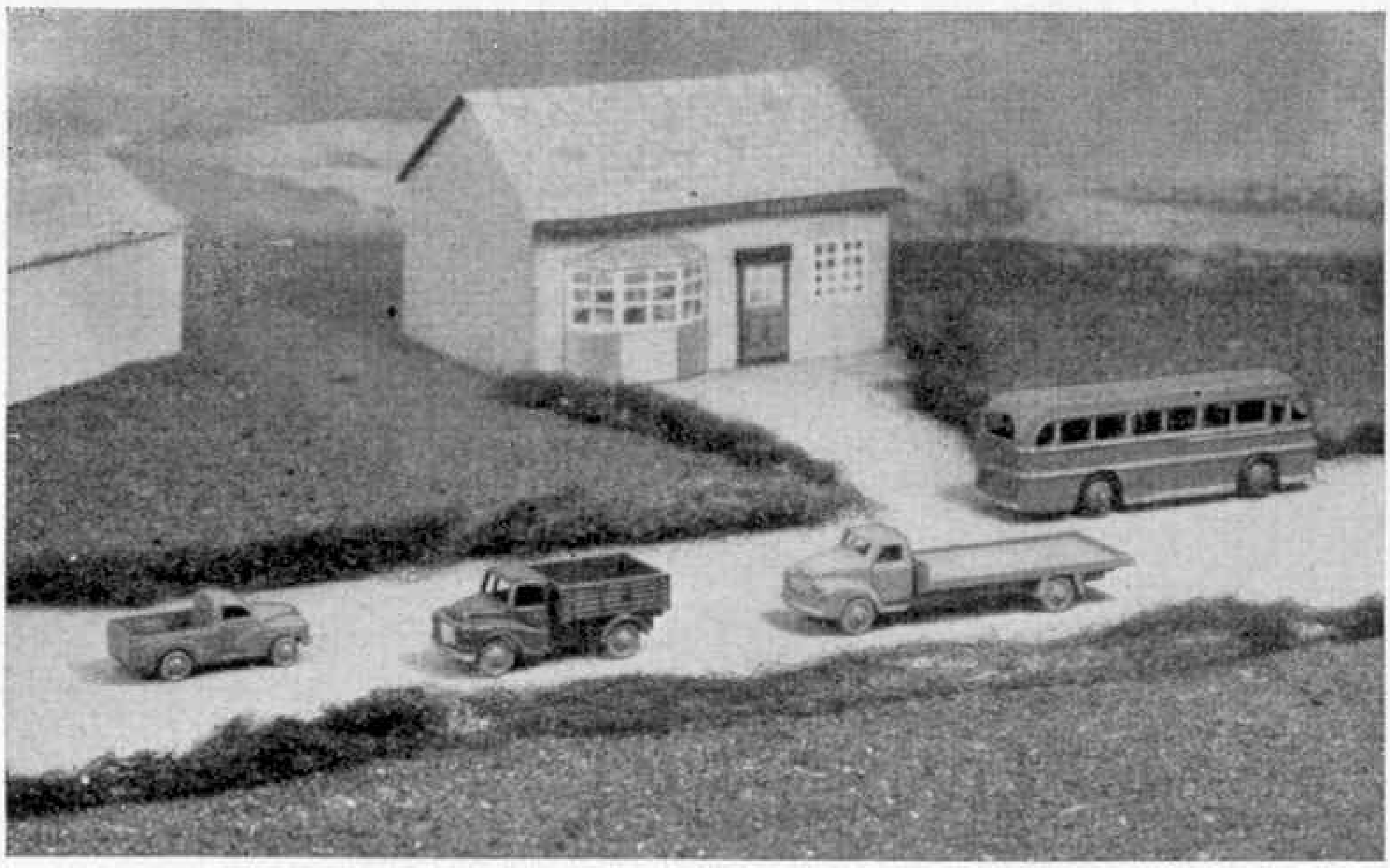
Peter and David Leatherbarrow of Aughton Park, Ormskirk, spent a large part of their time during the summer holidays in making various layouts for their Dinky Toys. They are shown with one of the layouts and two of their friends in the lower picture on this page. They have studied the Dinky Toys layouts that have already appeared in these pages, and have gained much useful knowledge from them. Now they hope that in turn other readers will find something of interest in their layout.

And now for some news about the latest additions to the Dinky Toys series. A glance at the pictures on the next page will show that I have three new models to bring to your notice this month, and the country scene illustrates their most important feature. This is that they are made to a smaller scale than the present range of lorries, trucks, etc.

The new series is listed under the title



The splendid Dinky Toys layout designed and built by Peter and David Leatherbarrow, Aughton Park.



This simple country scene features the models in the new Dublo Dinky Toys series.

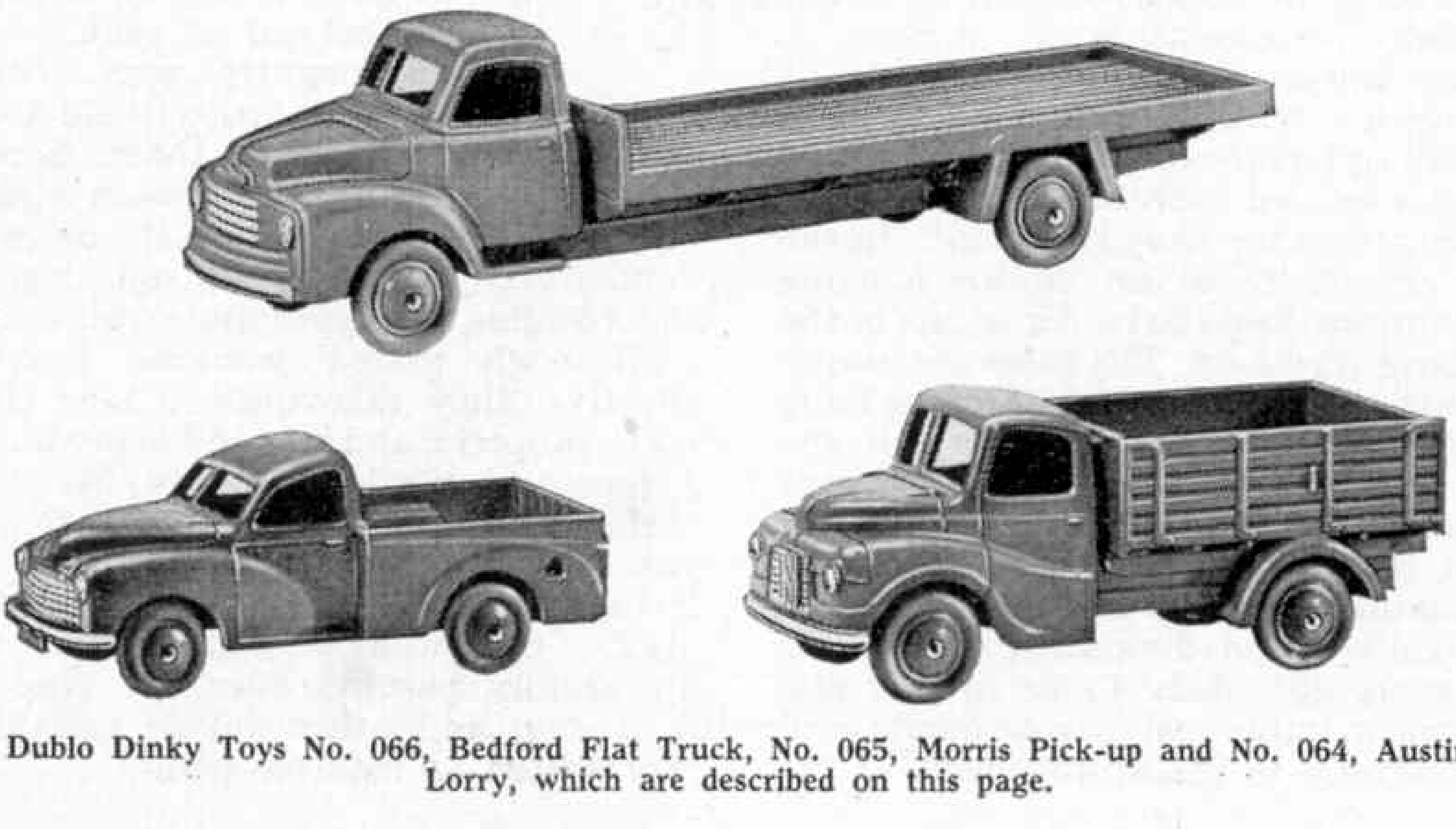
Dublo Dinky Toys, and the three models now available are No. 064, Austin Lorry, No. 065, Morris Pick-up and No. 066, Bedford Flat Truck. As the name Dublo Dinky Toys implies, the scale is that of Gauge 00 model railways, so they are just the thing for combined road and rail layouts. The models are made with the typical attention to detail and the excellence of finish that are the characteristics of all Dinky Toys. A novel feature common to the three is the new style wheels with which they are fitted. These are moulded from grey plastic, forming combined wheels and tyres that look attractive and are strong and durable.

No. 064, Austin Lorry, is a typical example of the type of sturdy, short wheelbase lorry used for general haulage work of many kinds. The model has a body with fairly high sides and tailboard, so that it can be used for carrying a good load of loose material as well as for crates, sacks and other packages. It is enamelled in green with the radiator and bumper finished in aluminium.

The Morris Pick-up, No. 065 is a model of one of the versatile light vehicles used by many firms to deliver goods locally, or to carry tools and light equipment. Our model is attractively finished in red.

No. 066, Bedford Flat Truck, has a flat body that can easily be loaded with heavy articles by using a crane or a hoist, or the truck can be run alongside a special loading platform. It is enamelled in grey.

As you can see from my pictures, and from the illustrations in colour on the back



Dublo Dinky Toys No. 066, Bedford Flat Truck, No. 065, Morris Pick-up and No. 064, Austin Lorry, which are described on this page.

cover of this issue, the three models will make attractive additions to any collection of Dinky Toys.

Now I would like to draw your attention to the simple but effective fire station shown in my last picture. The provision of a fire service for a Dinky Toys community makes a striking addition to a layout, and is well worth the small amount of work involved in preparing the scene. Actual fires cannot be contemplated in a miniature town! But there is plenty of scope for make believe, and for exercises to keep the firemen up to the mark in efficiency.

My picture shows a small fire station designed to accommodate two Fire Engines. There is a garage with two doors, so that either Fire Engine, or both, can leave quickly in an emergency, with a building to represent the offices and quarters for the firemen, and a special tower for exercises and for drying the hoses after they have been used. In the picture several hoses are shown hanging from the tower, and the ladder of one of the Fire Engines is raised. The hoses are simply represented by lengths of white string hung over Meccano Rods passed through the tower. A fence round the station yard completes an effective scene.

Have you a fire station for your layout? The arrangement of the attractive scene above is described on this page.

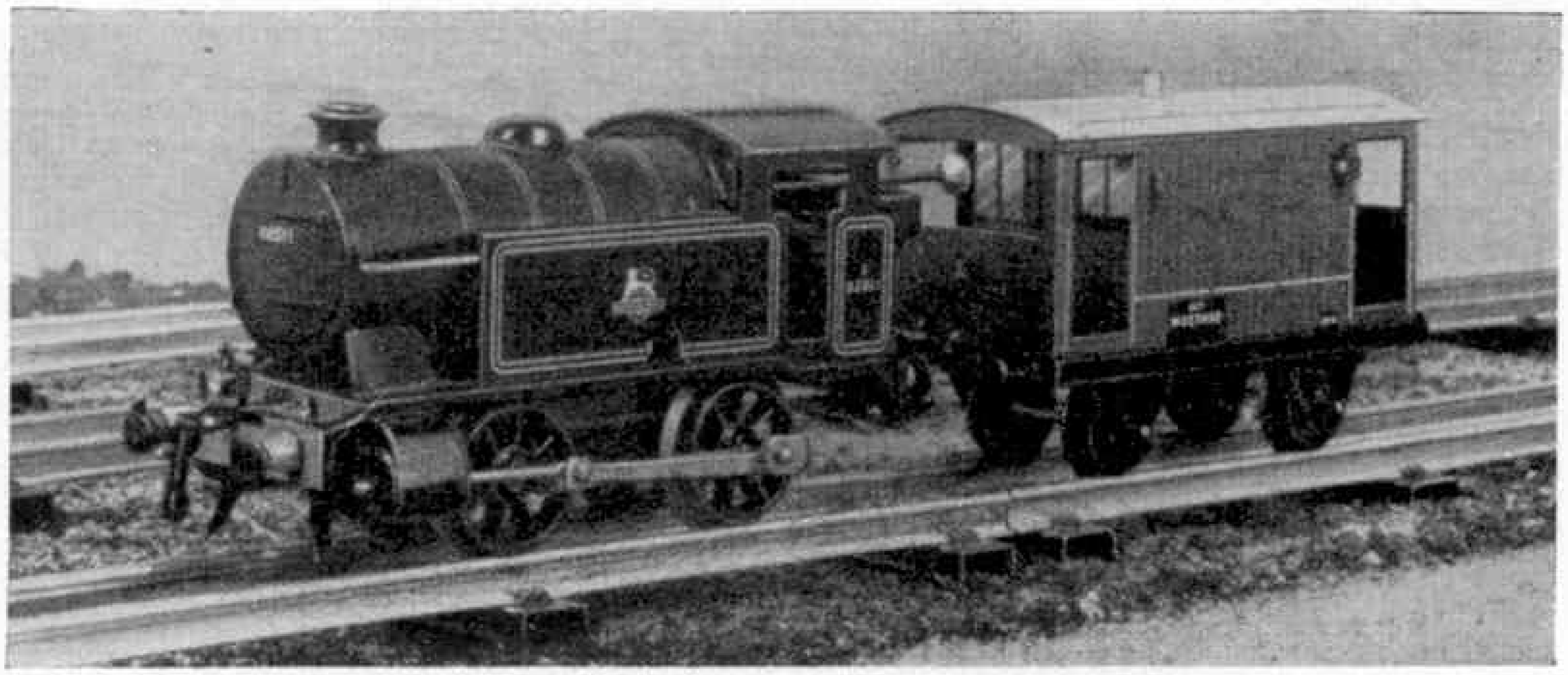
Many readers have asked for details of the miniature buildings used in my scenes. Detailed instructions for making a particular building are not likely to be of any real value, since individual requirements will vary according to the arrangement of the layout and the space available, but a few notes on the construction of buildings generally may be helpful.

I find the most satisfactory material to use is cardboard, as it is easily worked and can be painted with ordinary water colours. The first step is to decide on the general design of the building required, then mark it out in pencil on a sheet of cardboard. Draw any doors and windows at the same time, and cut them out carefully if you intend to have real glazed windows and opening doors. Pieces of celluloid can be used to glaze the windows.

The sides and ends of the building can be marked on separate sheets of cardboard, but take care to allow a strip of about ½" at the end of each side and along the upper edge, so that you can bend the strips round and glue the ends and the roof to them. Score the cardboard with a knife or scissors before you bend it. When the glue is set you can add details such as chimneys, and then paint the building in appropriate colours.

Although glazed windows look very effective, they take quite a long time to make properly, and in many of my buildings I represent windows simply by painting them on the cardboard. I use a light blue paint with streaks of darker blue across it to give the effect of reflections in the glass. The window frames and sashes are simply painted over the blue when it is dry, and other details can also be represented in suitable paint.

Hornby No. 40 Tank Locomotive begins its duties by taking a Goods Brake Van down the line to collect Wagons.



"Tommy Dodd" writes about

Running a Hornby Engine

AFTER the talks regarding Hornby rolling stock that have occupied us during the past few months, I think that we might now have a chat about Hornby engines. After all, the engines are the most spectacular features of any railway. This is especially so on a beginner's line, where there is perhaps only one engine to start with. Many railways of this kind will come to life towards the end of this month, when new Hornby engine drivers will be "learning the road" and trying out the capabilities of their new locomotives.

In the first place it is important always to do what the instructions packed with your engine or Train Set tell you. These have been carefully prepared to help you and they should *not* simply be put aside in the unpacking process and disregarded. It is easy enough to say this, I know, but a few moments spent in reading the instructions before you begin to get things on the move will be well spent. Quite a few of the difficulties about which Hornby Train owners write to me from time to time could be avoided if only the instructions were studied before getting to work.

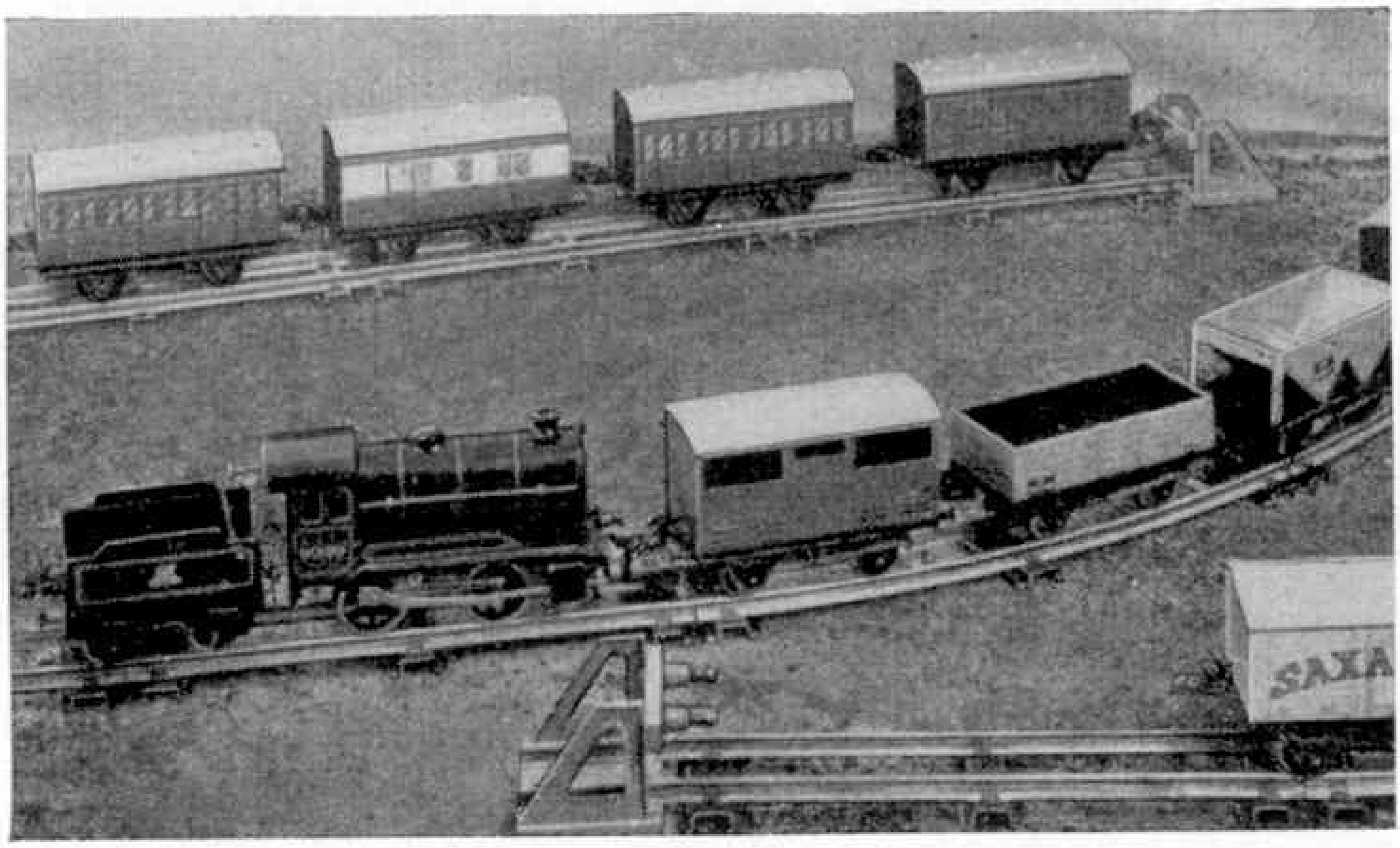
Winding up is sometimes a trial for the younger engineman, but as a rule, especially at Christmas time when so many miniature railways begin, there are plenty of older people about who will carry out this essential operation. Whoever does the winding should make sure that the key is properly placed on the winding shaft and pressed fully home. The winding itself should be a smooth steady operation, with the engine brake applied. It is a good plan to count the number of turns of the key required, or half turns if more convenient, to wind up the spring fully. This should be done *once only*, and giving the engine two or three half turns less than this as a matter of habit will go far toward avoiding any possible damage to the spring.

Oiling of course is necessary before the engine runs, in fact before it is wound up, but oiling is a thing that is liable either to be neglected or overdone. The Hornby engineman should aim at the happy medium, a light film of oil being maintained in the axle bearings and on the gears. *Don't* on any account let oil get on to the wheel treads. This will make the track oily; slipping and loss of power will result. If you do find the wheels or track getting oily, wipe them clean straight away with a good dry rag.

If the engine you have is one with a reversing mechanism—all Hornby Locomotives have this except the No. 20—make sure that you know which is the forward position and which is the reverse. The instruction leaflet tells you particularly about this, and you will soon learn.

The No. 30 Locomotive and the No. 40 Tank can be reversed only by working the lever or rod in the cab. The Nos. 50 and 51 engines can be reversed in this way too, but they have the additional feature of reversing mechanism that can be worked from the track by means of the BBR Rail.

I find that there is a certain amount of confusion regarding the use of this rail,



A mixed goods train being hauled by a No. 50 Locomotive, running tender first.

although here again the instruction leaflet contains the appropriate information. The trigger attached to the reversing gear that engages the trip piece on the BBR on either of these engines is on the *right hand side,* looking forward. To reverse the Locomotive from the track therefore the trip of the BBR Rail should be set accordingly.

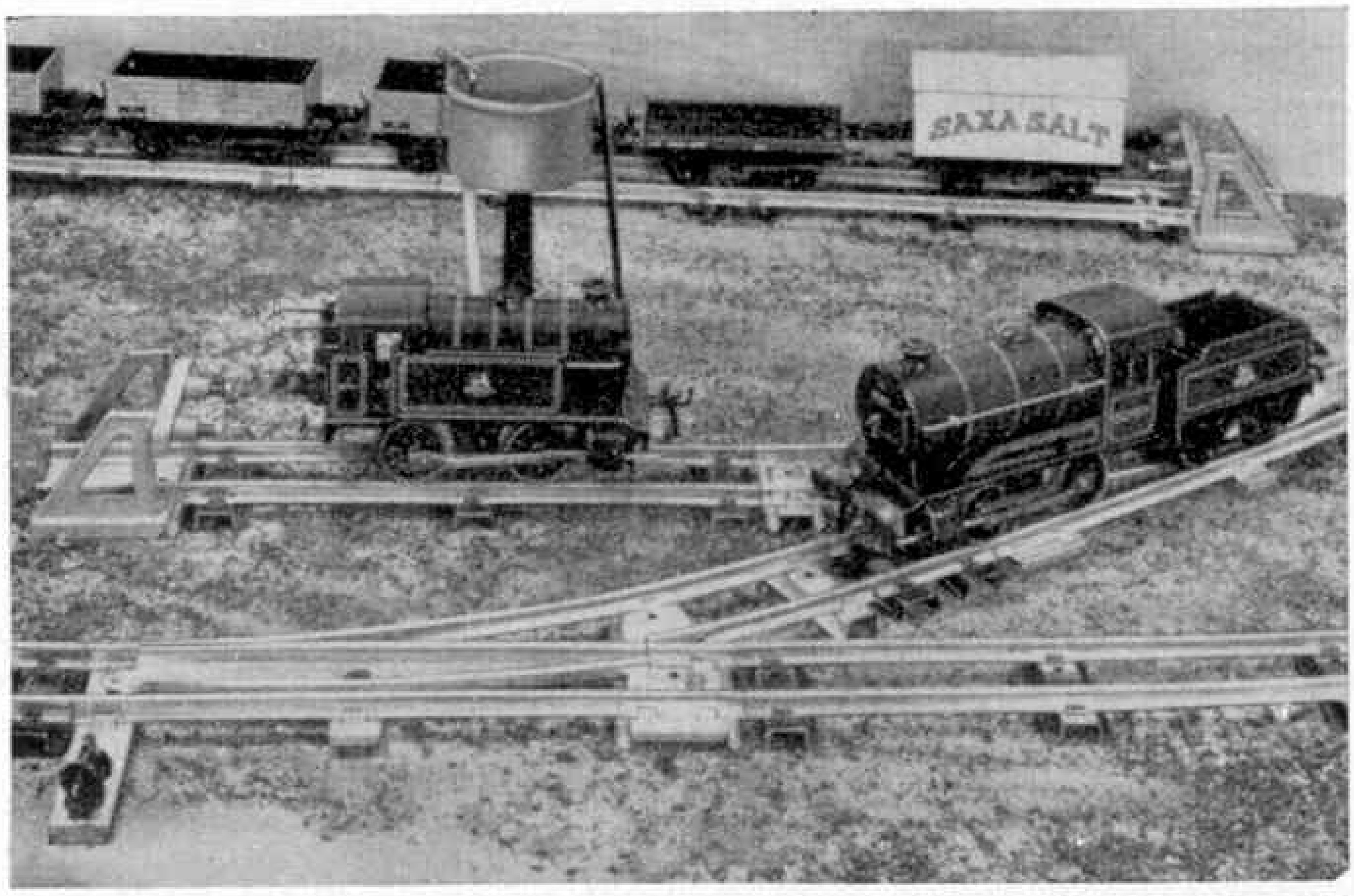
The central position of this trip is the "neutral" one when running a No. 50 or a No. 51 Locomotive, so that the trip must be set to one side or the other according to the way round that the engine is facing. *DO NOT* attempt to reverse the engine when it is moving fast. Immediately the rail trip has engaged the trigger below the Locomotive, and the engine begins to move in the new direction the operator must quickly move the rail trip to the central or neutral position. Otherwise in moving back over the trip the engine will again be reversed, and this process can continue several times, the engine moving forward and backward alternately.

It is a great temptation, especially for very junior enginemen, to push the engine along the track. This should never be done when the spring is unwound as it is liable to cause damage.

It must be remembered that a new engine of any kind never shows its best paces at first. This is because the working parts have not become what is known as "run-in." As this running-in process goes on, with care and attention to lubrication, the behaviour of your engine will improve. Smoother running, and an improvement in the distance covered or the load hauled on one winding, can then be expected. So if your new engine seems to be a little stiff at first, give it time to develop its proper speed and power, and do not forget to oil it, but don't repeat the dose too often.

Once you have been through the earlier stages of engine running you can work out the duties for which the locomotive is to be used. On a small railway this is a simple matter, as the same engine

(Continued on page 634)



A simple installation for locomotive purposes on a Hornby layout. The No. 40 Tank is "taking water," while the other engine is waiting for the Points to be set for the main line in the foreground.

The Argentine national monument at Rosario. Photograph by M. Miranda, Rosario.

Of General Interest

A National Monument

The monument seen in the illustration above is at Rosario, in the Argentine Republic, and is almost 300 ft. high. In its interior there are two lifts by means of which visitors can reach the top of the monument, from which they can see the whole of the city of Rosario. There is also a great hall in which is a flame that burns constantly in memory of Argentine's Unknown Soldier. Another noteworthy feature is a gallery where the national flags of all the nations of the American Continent are displayed.

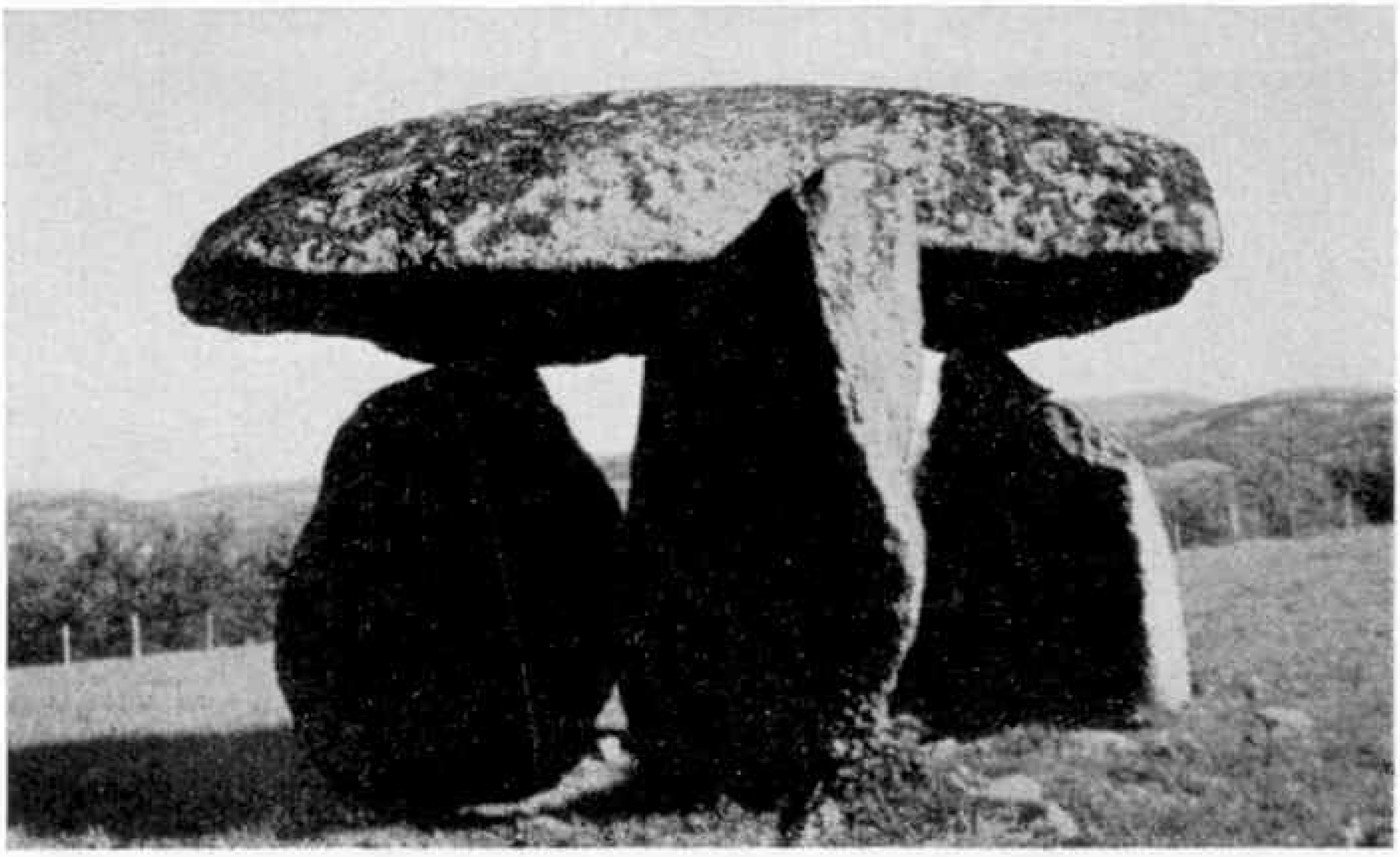
The monument has been constructed in beautiful garden surroundings on the bank of the Parana River. It was inaugurated by the President of the Argentine Republic in June of this year.

A Prehistoric Structure

From this up-to-date monument I turn to a very old one with the strange name of Spinsters' Rock. It is at Drewsteignton, and is the sole example of an erect cromlech in Devon. It now belongs to the National Trust.

The stones were erected very early, probably before 1,000 B.C., and it is said that a group of stone circles and avenues once centred on it. The upper slab is 15 ft. long, 10 ft. wide and 2 ft. thick, and weighs some 16 tons.

The curious name given to the cromlech is derived from a legend that three energetic spinsters built it one morning before breakfast as a pastime! It fell down in 1862. One account says that a crane from Devonport dockyard was used for its re-erection, and rcds or pins were inserted as a safeguard against further calamity.



The Drewsteignton cromlech, Devon. Photograph by C. E. Wrayford, Bovey Tracey.

Gardens in a City

By the Editor

TWO pages of pictures of beautiful gardens seem to me to be exactly right in a Christmas issue. They are reminders of the beauties of our gardens of the summer of 1957—and gardens were beautiful although the season was first terribly dry and then terribly wet—and help us to look forward to even better gardens in the summer of 1958, which we hope will give us a much better holiday season than the present year has done.

It was a picture in the October *M.M.* of the garden at the Gospel Oak station of the London Midland Region that started this. But before we go any further let me just tell you what it is all about. Every year London Transport organises a Station Garden Contest, in five sections, the Metropolitan North, the Metropolitan South, the Northern Line, the District and Piccadilly and the Central Line. In each, prizes are awarded for the best gardens cultivated by the staffs of the stations concerned, and there is a Silver Challenge Trophy for the best of all London Transport Railway Station gardens.

The Challenge Trophy was won this year by the garden seen in the first of our illustrations, which is at East Acton, on the Central Line. The foreman, Patrick O'Brien, who is seen in the garden, has worked on it for five years. It is alongside the exit from the westbound platform, and was merely a tip for coal and ashes until the gardening enthusiasts among the staff started work on it. Looking at the wealth of bloom in the flower beds, and at the lawn, rockery walls and stepped paths of this garden, is something that appeals not only to those who made it—and to the judges—but also to passengers using the station, who are as enthusiastic as the station staff themselves.

Station foreman Patrick O'Brien in the station garden at East Acton. This was judged best of all on the London Transport railway system.

Golders Green station garden was awarded first prize on the Northern Line.

First prize in the Metropolitan (South) section went to Hammersmith.

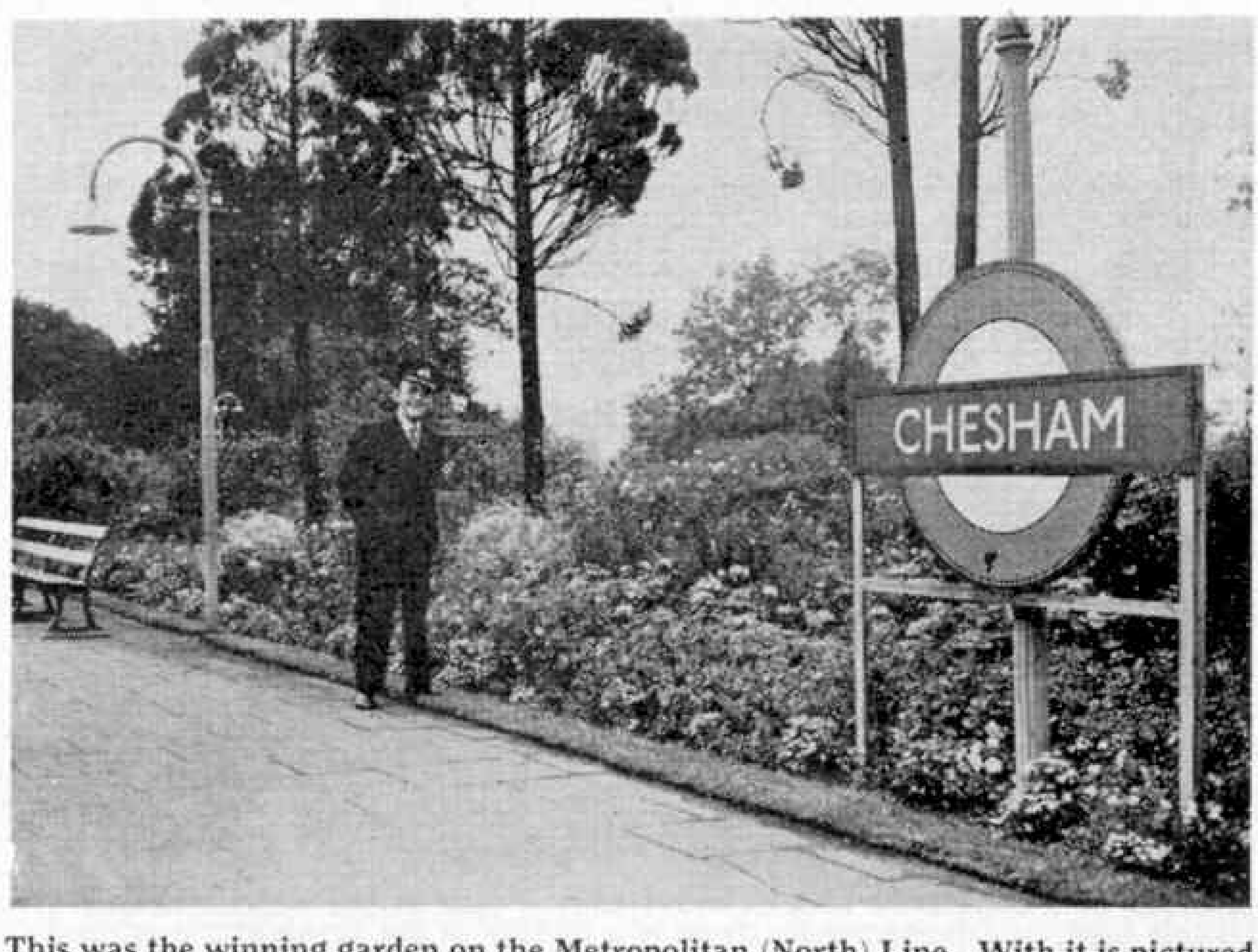
was Herbert Hudson, the stationmaster.

I am sorry that I have no room for a picture of the fifth first prize winning garden, that at Arnos Grove, on the District and Piccadilly Line. The trackside display there of signalman Ernest Lethbridge, which was judged best of all in 1956, was again outstanding. It included a trim stretch of lawn, behind which was a flower bed 120 ft. long, and it was highly commended by the judges as a close runner up to the winning garden at East Acton.

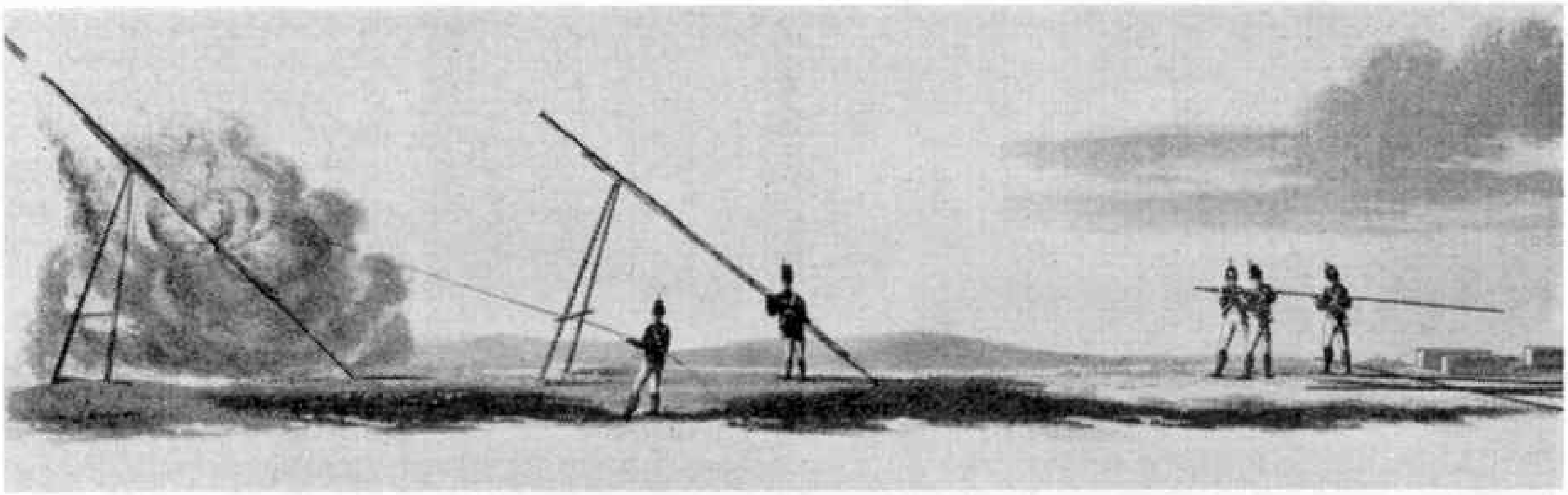
Many readers of the *M.M.* travel about within the area covered by London Transport, and I hope that these pictures will encourage them to keep a sharp lookout for developments during 1958. All Regions of British Railways run annual Station Garden Competitions, for which there are always remarkable entries, so here is something on which readers in other parts of Great Britain too can keep an eye. And in the meantime the pictures that appear now will help to keep bright the memories of many fine summers in the past—and encourage us all to hope for many more in the future!

It is really astonishing to contemplate, not only the garden at East Acton, but also those of other prize-winners. The winning gardens at Golders Green, Hammersmith and Chesham look like exhibits at a flower show, as did many others taking part in the competition, and the judges must have found it very difficult to sort out the entries.

Watchman P. J. Morgan at Golders Green won the Northern Line title for the second year in succession with a splendid display of flowering plants, most of which were raised from seed by himself, as indeed did the creators of practically all the gardens entered. The picture of the Hammersmith prize-winning garden suggests that the site is by no means ideal for efforts of this kind, and our wonder at the success of Motorman A. C. Taylor, seen in the picture, is increased when we learn that his plants grow in about 9 inches of soil, so that his garden could almost be described as a greatly extended windowbox. The unusual centrepiece is worthy of note, and helps to compensate for the lack of natural features that the site presents. The creator of the delightful garden that greets all those who use Chesham station in their travels to and from London



This was the winning garden on the Metropolitan (North) Line. With it is pictured Herbert Hudson, stationmaster at Chesham, who tended it himself.



Rockets are not New!

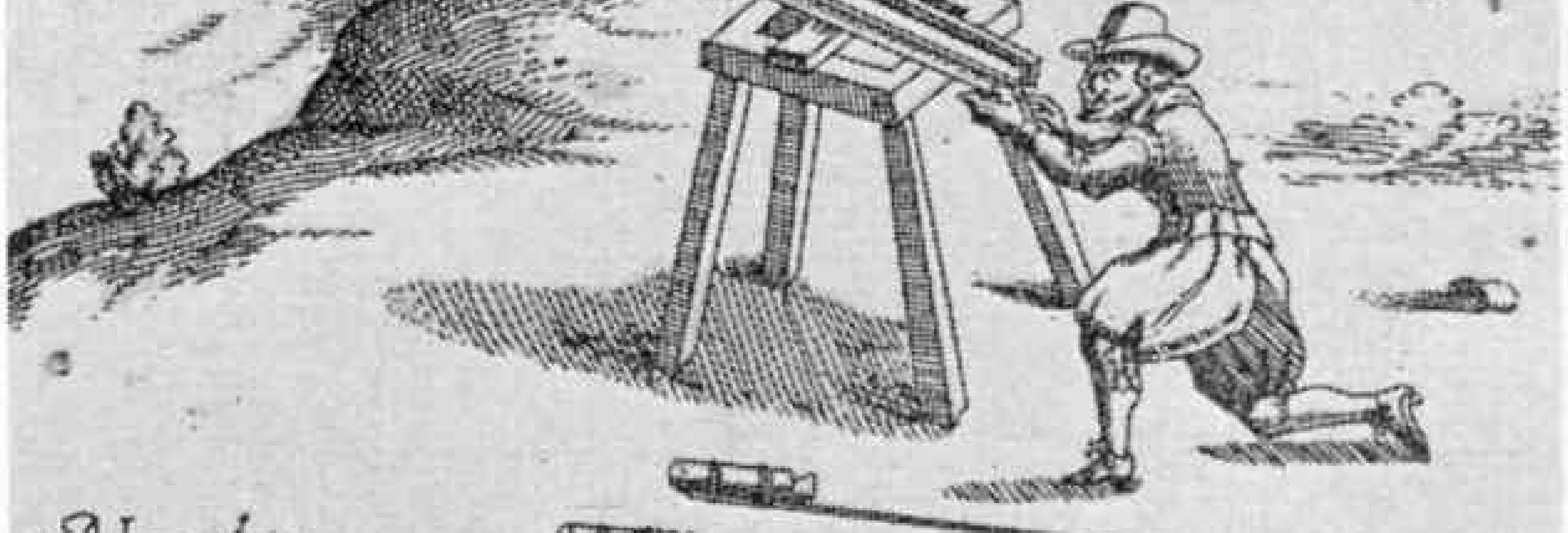
By Vernon Berry

A FEW years ago the "man in the street" regarded interplanetary travel as something fit only for science fiction and comic strips, or as the baby of a few cranky scientists who intend to escape to the Moon, or live in a man-made satellite, after their H-bombs had made the Earth uninhabitable.

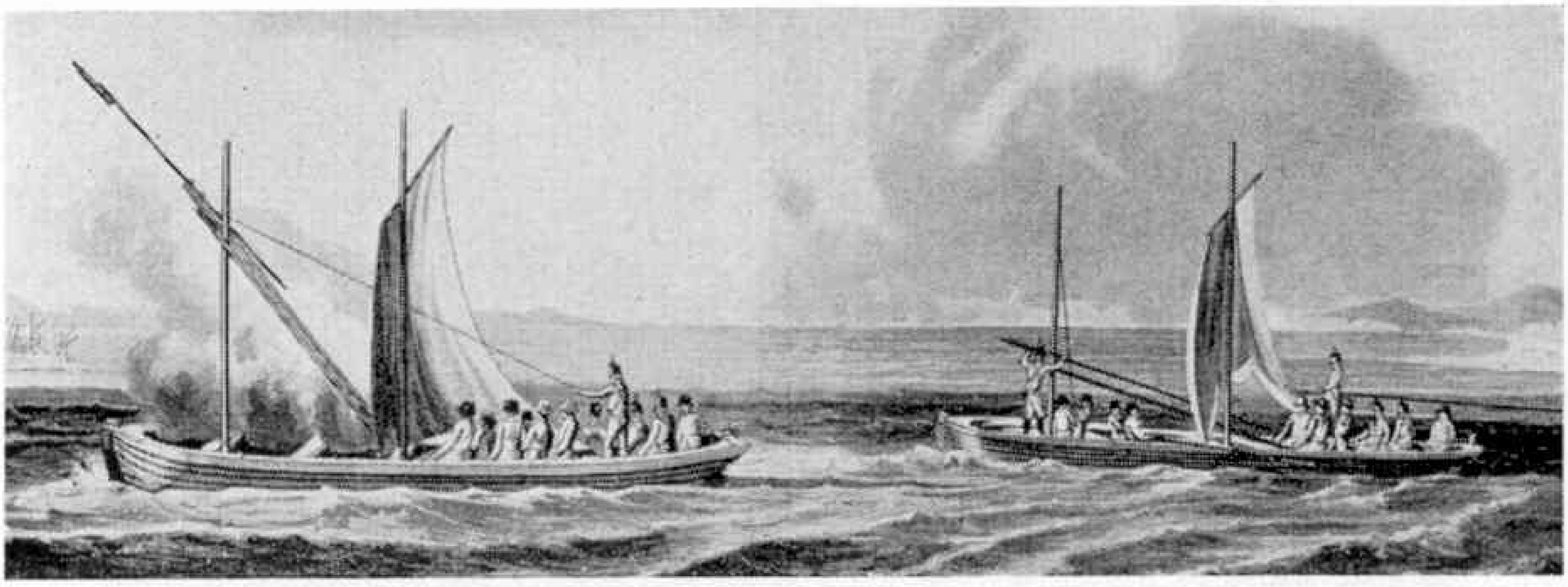
For some time we have had almost weekly press reports of exploratory rockets reaching the borders of space, and of guided missiles travelling thousands of miles before plunging into the sea. And now we have had the launch of an artificial satellite in Russia, with others to follow there and in the U.S.A. So the same man almost takes it for granted that space travel is just around the corner. He knows the difference between a jet engine, a turbo-prop engine and a rocket motor, and rightly looks upon them as wonders of our modern age. But does he realise the antiquity of the rocket?

Our "man in the street" would probably be amazed, and even sceptical, if told that rockets were used as weapons of war more than seven centuries ago, or that the first attempt to build a jet-propelled aircraft was probably that of the Chinese mandarin Wan-Hu, about 1500 A.D. The mandarin had already made several successful ascents in a Sedan-chair attached to man-lifting kites and, greatly daring, he made one of the earliest attempts at free flight. His "Flying Machine" consisted of two man-lifting kites rigidly attached to each side of his Sedan chair. A long spar was strapped across the back of the chair and 47 rockets were fitted to the spar. One windy morning the machine was pointed into the wind, the mandarin entered his chair, and at his command 47 coolies held torches to the 47 rockets. That is said to have been the last ever seen of the mandarin Wan-Hu and his 47 coolies!

Primitive as this early attempt at flight may seem, it is worth noting that both the man-lifting kites and the dry-fuel rockets used by the venturesome mandarin had reached a stage of



Warfare with Congreve's rockets about 1813 is seen in the upper illustration on this page, and immediately above is a picture of the firing of the earliest rocket known to have been used in European warfare. Illustrations, Picture Post Library.



Congreve's rockets could also be fired from small boats.

development that was not to be surpassed until the beginning of the last century.

The first known use of rockets and bombs in warfare occurred in China in 1232 A.D., when Ogdai, the son of Ghengis Khan and the conqueror of North China, besieged the ancient city of Kaifeng, in the rich province of Honan. The defenders, the treacherous Chin, or Golden Tartars, used two "Secret Weapons" with telling effect. These were the explosive bomb, and the incendiary arrow, which flew by itself.

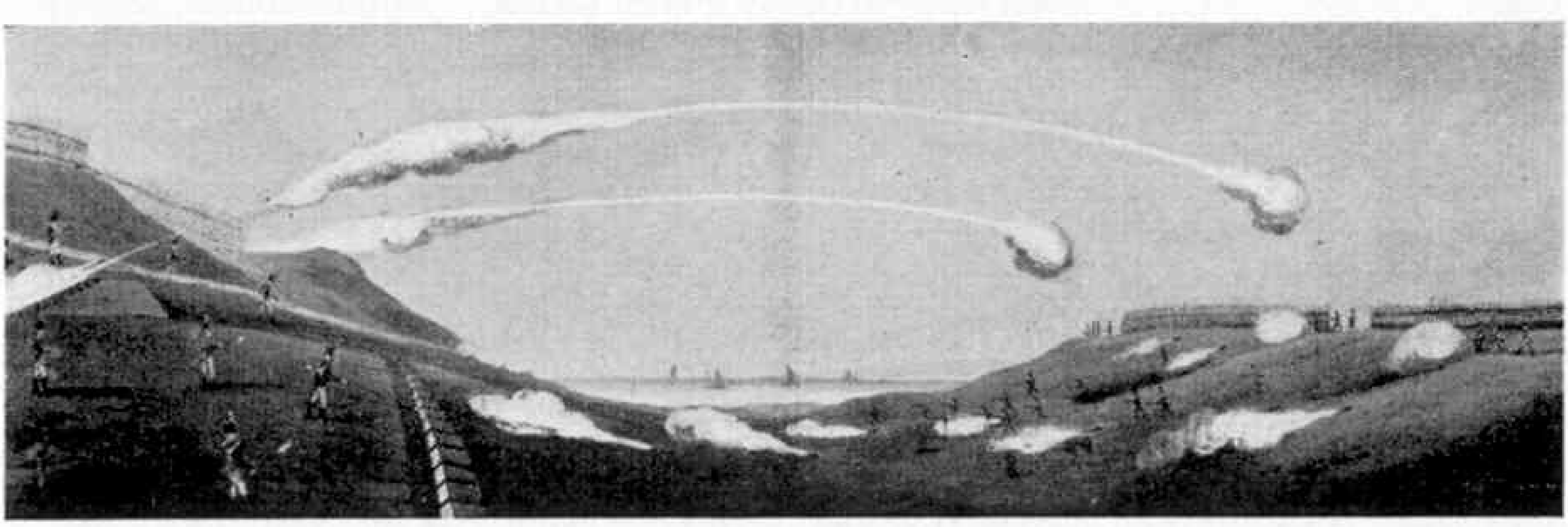
A few years later Marcus Graecus wrote his famous book *Liber Ignium*, in which was described for the first time the manufacture of various combustible materials, including gunpowder and rocket powder. Copies of this book came into the hands of Roger Bacon in England and Albertus Magnus in Germany, both of whom have been credited with the invention of gunpowder in their own countries. During the same century two Arabs, Ibn Albaithan in 1240 and Hassan Abrammah in 1280, wrote books giving recipes for the manufacture of gunpowder and rocket powder. The manufacture of gunpowder and the use of rockets was therefore fairly well known throughout the civilised world from England to China in the 13th Century.

It is generally considered that gunpowder was developed by the Chinese, or their Tartar conquerors, from the famous "Greek Fire" used by the Byzantine Greeks. "Greek Fire," used for flaming arrows and incendiary pots, is reported to have consisted of a mixture of sulphur, charcoal, turpentine, pitch, and either petroleum or naptha. The Greeks later added common salt to give it a yellow flame, falsely imagining that this made the fire hotter.

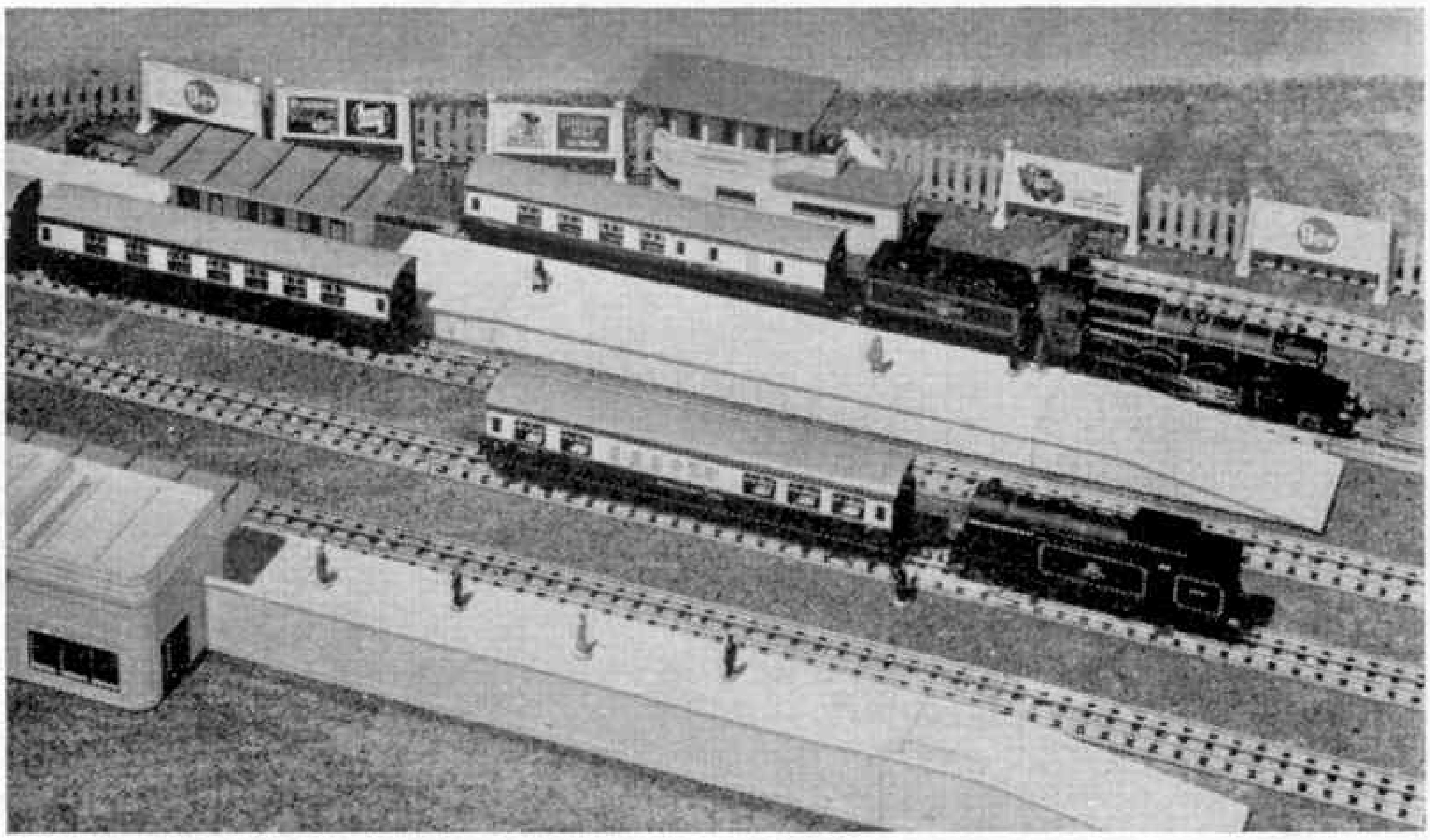
A popular story is that in making Greek Fire the Tartars unwittingly added saltpetre, which they found in Northern China, in place of common salt, thus producing an explosive mixture. It must have been a great surprise to the first archer to use the new mixture to have his "flaming arrow" shoot off into the sky under its own power without waiting to be shot by the bow.

The rocket continued to be used as an Eastern weapon of war until early in the 19th Century, when it began to prove ineffective against the increasing accuracy

(Continued on page 634)



Another picture of rocket warfare, showing Congreve rockets in use by the British Army.



HORNBY RAILWAY COMPANY

New Coaches, and Cars

By the Secretary

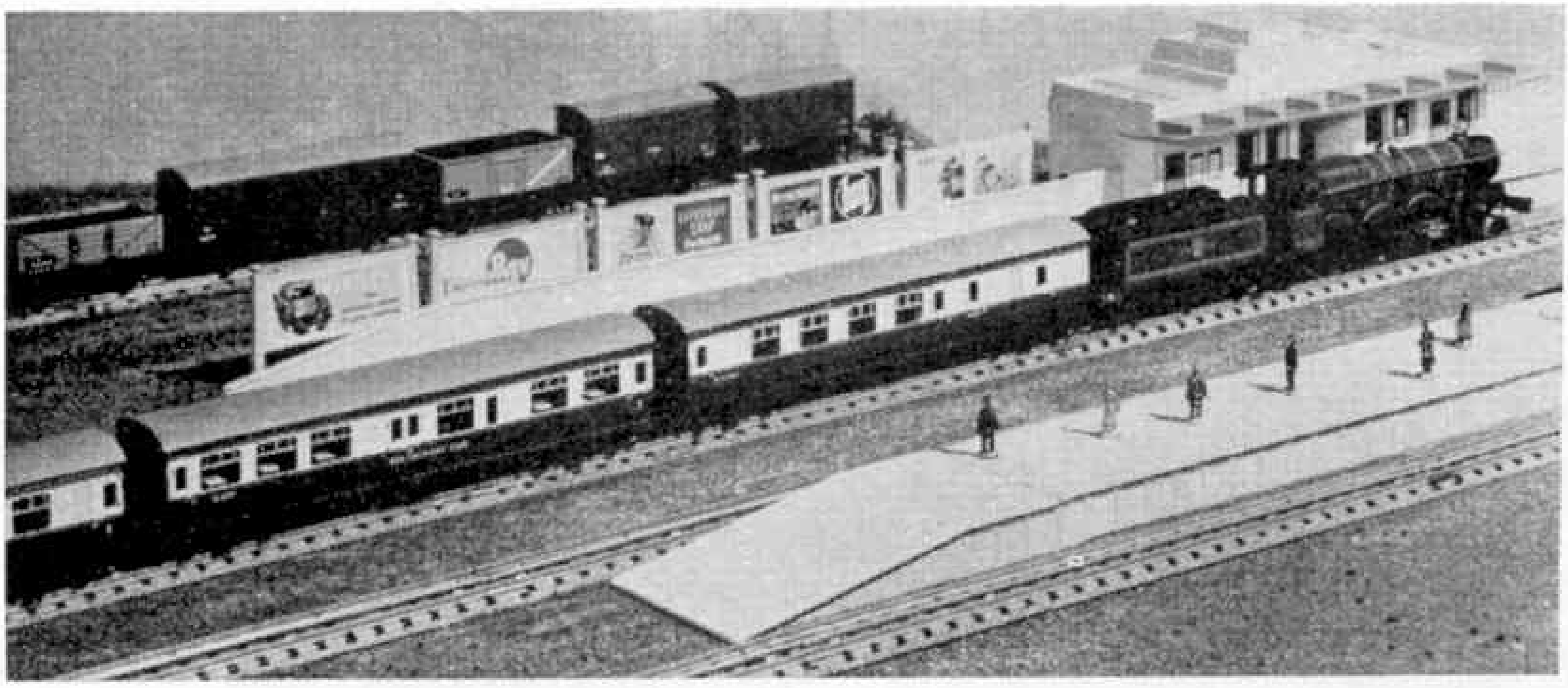
IN our talk last month on the splendid new Hornby-Dublo *Bristolian* Train Set, most of the things I told you concerned the *Bristol Castle* Locomotive and Tender. I had space for only a few words on the D21 Corridor Coaches, finished in brown and cream livery, that are also included. The finish of these closely resembles that of the former G.W.R., which is again seen on the rolling stock of the principal named expresses of the Western Region. So now I am turning to these fine Coaches, and to that other new Hornby-Dublo item, the D20 Composite Restaurant Car.

You may have seen the Coaches already, and if so you must have admired them for their clean looking colour scheme of "Western" brown and cream. As I told you last month, they are available in two types, one a 1st/2nd and the other a Brake/2nd. The sight of them immediately suggests railway scenes at Paddington and many other points in the Western Region where train observers follow up their hobby, and I have endeavoured to reproduce one or two such scenes in the pictures on this and the next page. You will find indeed that the Coaches provide the means of assembling trains that look like real "Western" expresses, especially if you use with them the Hornby-Dublo D20 Composite Restaurant Car in Western Region colours.

The 0-6-2T makes ready to pick up the Restaurant Car to attach it to the train halted at the main platform. "Bristol Castle" has already drawn off the leading coach and is waiting with it on the bay line.

Coming now to this latter, this is of the type with a central kitchen section, and seating accommodation at the ends for first class and second class passengers respectively. This kind of restaurant car has been chosen because of its compact design. Where expresses are restricted in length, which is often the case on miniature railways, the new Car has the advantage that it provides restaurant and kitchen facilities without occupying too much space and making trains excessively long.

The new Restaurant Car is based on a W.R. design, and is of course in W.R. livery to match the D21 Corridor stock just referred to. You would probably notice that in suggesting its use on Western expresses I was careful to add the words "in Western Region colours." The reason is that it can be had *also* in B.R. red and cream, for use along with Corridor Coaches in standard B.R. colours. So every Hornby-Dublo owner can now run a Restaurant Car correctly on his layout.



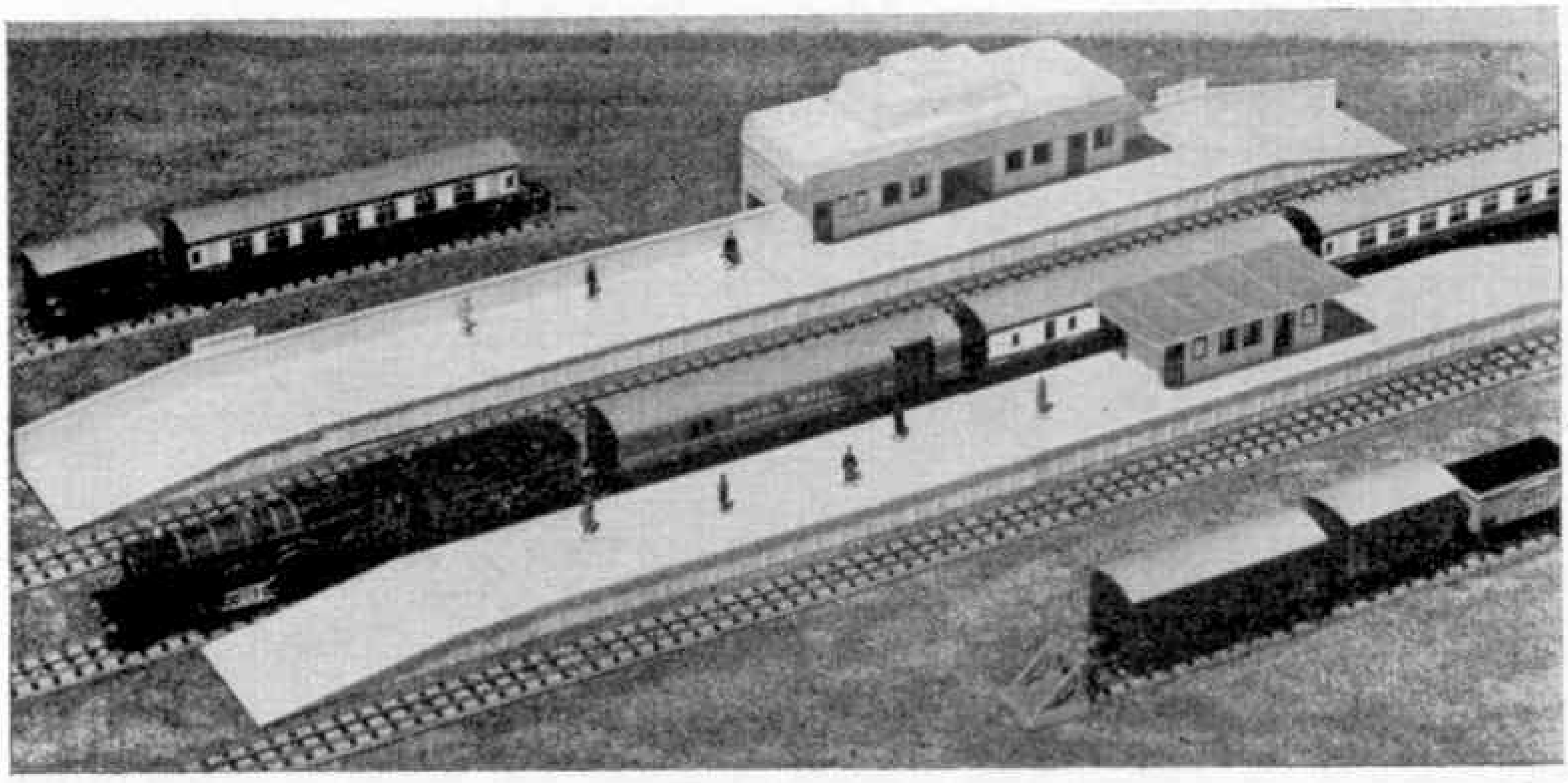
A Restaurant Car express headed by "Bristol Castle" spins through the Station. Details of the Car are clearly shown.

The D20 Restaurant Car follows standard Hornby-Dublo practice in the bodywork and underframe, but has a striking new feature—its wheels are now moulded in black in one piece with their axles, so that they are exceedingly smooth and quiet in running. The two sides of the Car differ slightly, just as do those of the real cars of this type, because there is necessarily a corridor or passageway past the kitchen, and the door and window layouts about this part of the sides are different from one another.

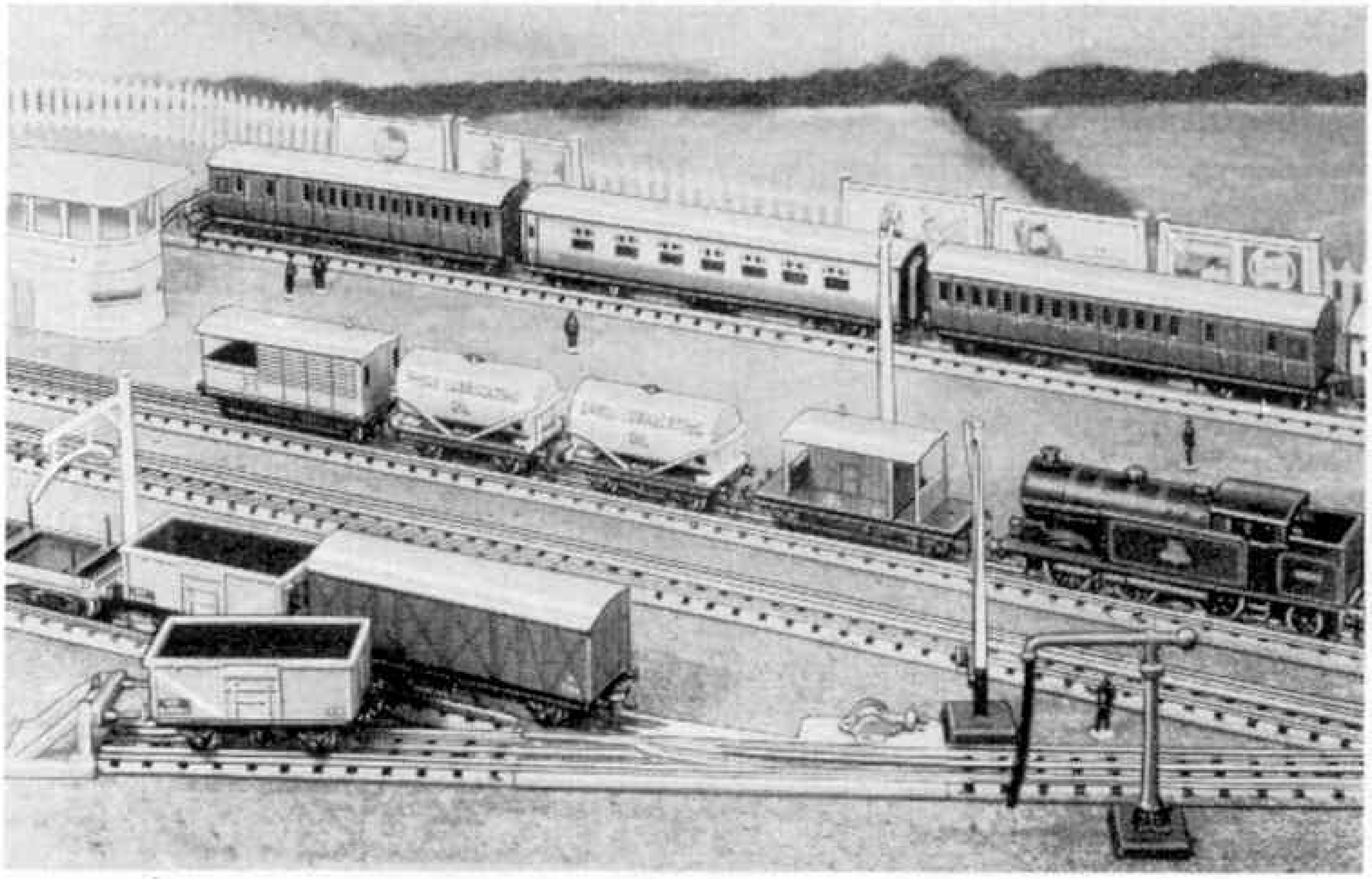
Apart from the disposition of the windows and doors and the obvious purpose of the Car, which is proclaimed on its sides in the wording *Restaurant Car*, a novelty of note mentioned last month is the fact that the interior of the car is fitted up to represent the two saloons for first class and second class passengers respectively, with tables and seats on either side, and the central kitchen and side corridor.

The Restaurant Car is not included in a Train Set, but the addition of the one in W.R. livery to the stock of the newly introduced *Bristolian* EDP20 Train Set adds considerably to the effectiveness of the train as a whole. The complete "rake" or assembly makes a really good show behind the tender of *Bristol Castle*. Similarly the B.R. red and cream Restaurant Car would be a welcome and distinctive addition to any Hornby-Dublo express made up of the components of any of the Train Sets including *Duchess of Montrose* or *Silver King*.

Now another pleasant surprise for you—the Dublo Dinky Toys announced by my friend *The Toyman* and fully described and illustrated on pages 606–608 of this issue. These three little motor vehicles have been introduced specially for 00 gauge layout purposes and are just the thing for use round and about the stations, yards and level crossings. You will see them used in such situations in these pages in due course. We must have a "road motor" talk as soon as I can arrange this.



"Bristol Castle" on a Hornby-Dublo express, with the T.P.O. Mail Van next to the tender.



A short train of tank wagons passes along the main line in charge of the Hornby-Dublo EDL17 Tank locomotive.

Hornby-Dublo Tanks

How to Keep Busy on Your Layouts

IT is probably correct to say that the Tank Locomotives are the busiest engines on any Hornby-Dublo layout. Indeed, there are some railways on which only tank engines are used, those that are in their simple early stages being excellent examples. Such railways are supplied by Hornby-Dublo Train Sets, either passenger or goods, that include one or other of the tank engines of the range and they make a splendid beginning.

As such railways develop, so invariably does the variety of rolling stock, and here the tank engine owner is fortunate because such an engine can deal with a very wide variety of traffic. Probably most Hornby-Dublo layouts have at least one EDL17 Tank Locomotive on the strength. This is the popular 0–6–2T, one of which appears in the picture above. It is equally at home on a local passenger or goods train and it is of course invaluable for shunting duties. On some layouts it is the custom to have one of these engines constantly on duty at the main station. There it can deal with yard shunting and it is at hand also to carry out any attaching or detaching movements that may be necessary when any long-distance train calls.

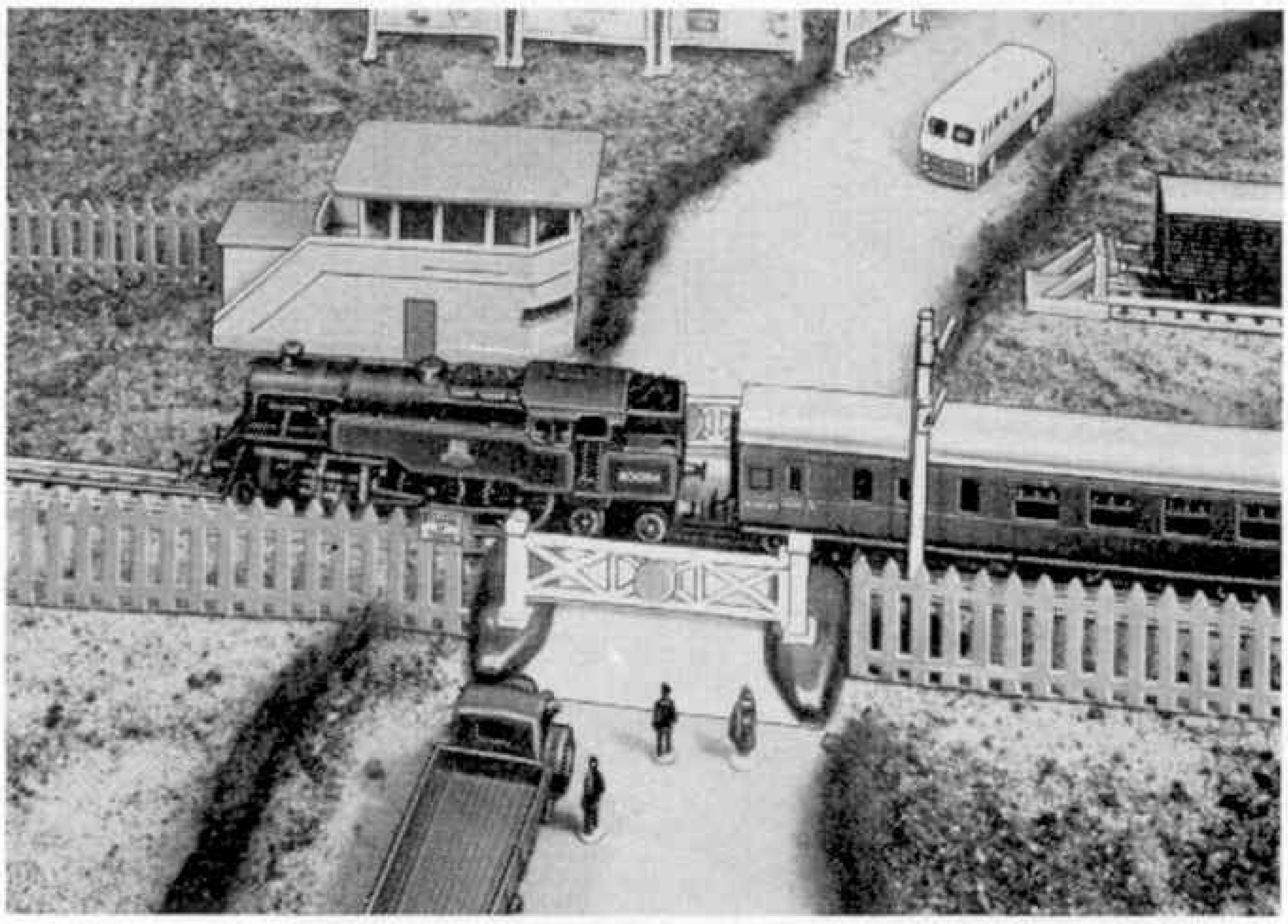
Operations of this kind are slick and enjoyable only when the layout is planned in advance with an eye on them. This means that Points, Signals, Uncoupling Rails and Isolating sections should be well placed. A few experiments may be necessary before the final arrangement can be determined, but this adds to the fun, and is of practical value to the Hornby-Dublo owner.

By the way, in carrying out station and yard operations move the control handle gently. Attention given to this point results in much more satisfactory running than if shunting movements are carried out roughly, and at too high a speed.

There is no need to confine the 0–6–2 Tank to the neighbourhood of the goods yard and station. It is a type of engine that can travel farther afield and there are many Dublo layouts on which such engines are kept hard at work on an intensive local passenger train service. For such trains the D14 Suburban Coaches are invariably used, but now and again Corridor stock may make its appearance, particularly on the longer-distance or what we may term "outer-suburban" services.

Tank engines have the advantage that they do not need to be turned at the end of the journey when they arrive at a terminal point. You will know which way round the engines on your favourite local service usually face, and can follow the same practice. But if you have one of the

The Hornby-Dublo EDL18 2-6-4T takes a train of D22 Corridor Coaches over the Level Crossing.



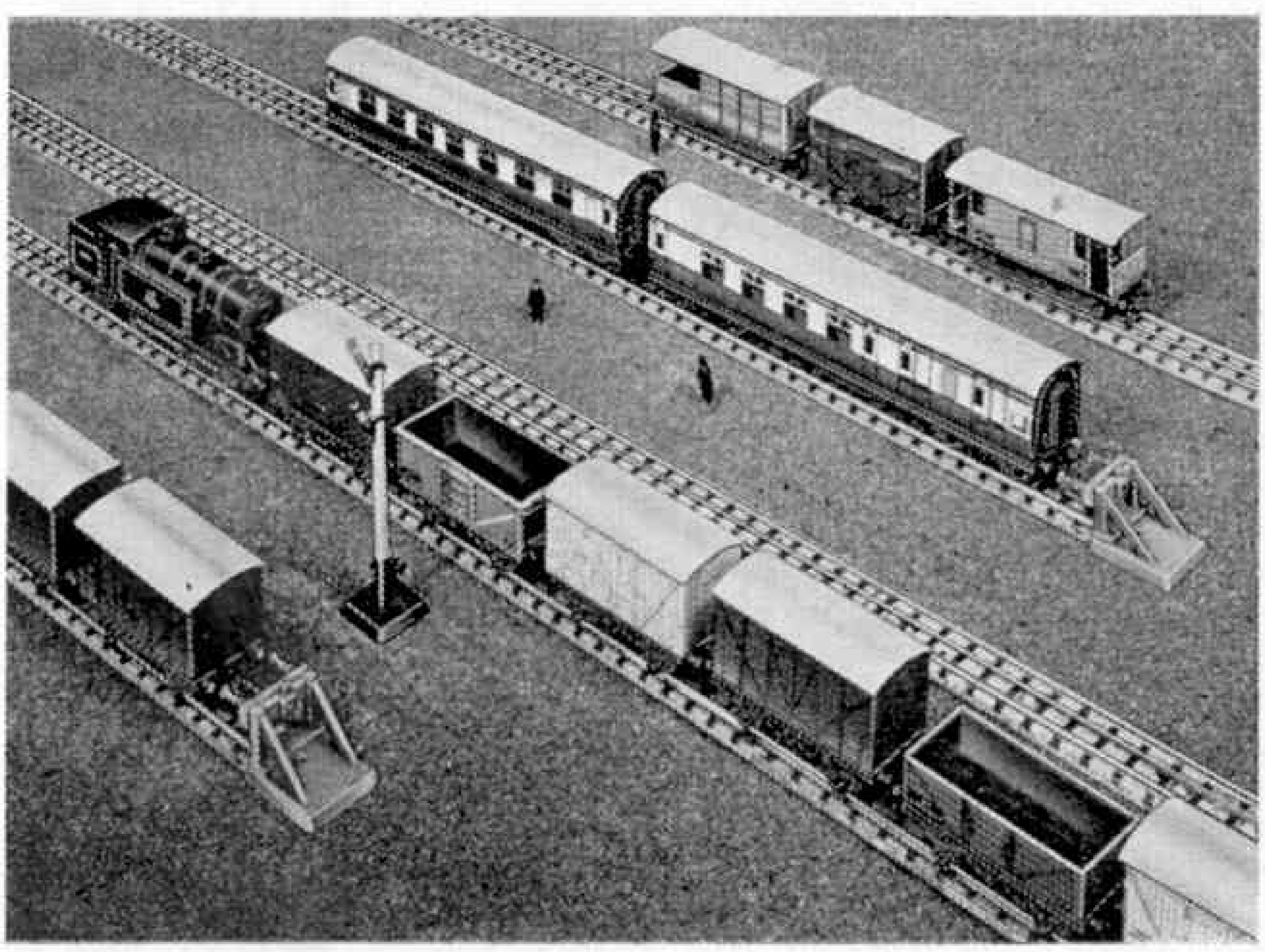
splendid Hornby-Dublo Turntables there is no reason at all why you should not turn your Tank engine round on it. This is usually done with the bigger tanks in actual practice, when these are likely to travel a fair distance, and the scheme certainly can be applied with the sturdy EDL18 2-6-4T of the Hornby-Dublo system. This is a genuine mixed traffic type, which can be used on shunting duties occasionally if required, but it will be more at home on main or branch line running.

In addition to heavier suburban work the 2-6-4 is a splendid engine for the longer distance or "residential" services, in which heavy and sometimes fast trains have to be dealt with. These are the sort of jobs that may require the engines to be turned at the end of the run, but this is a point on which the Hornby-Dublo owner can please himself. Some of the longer distance trains of this kind may include corridor stock, and a complete train arranged on these lines looks quite imposing.

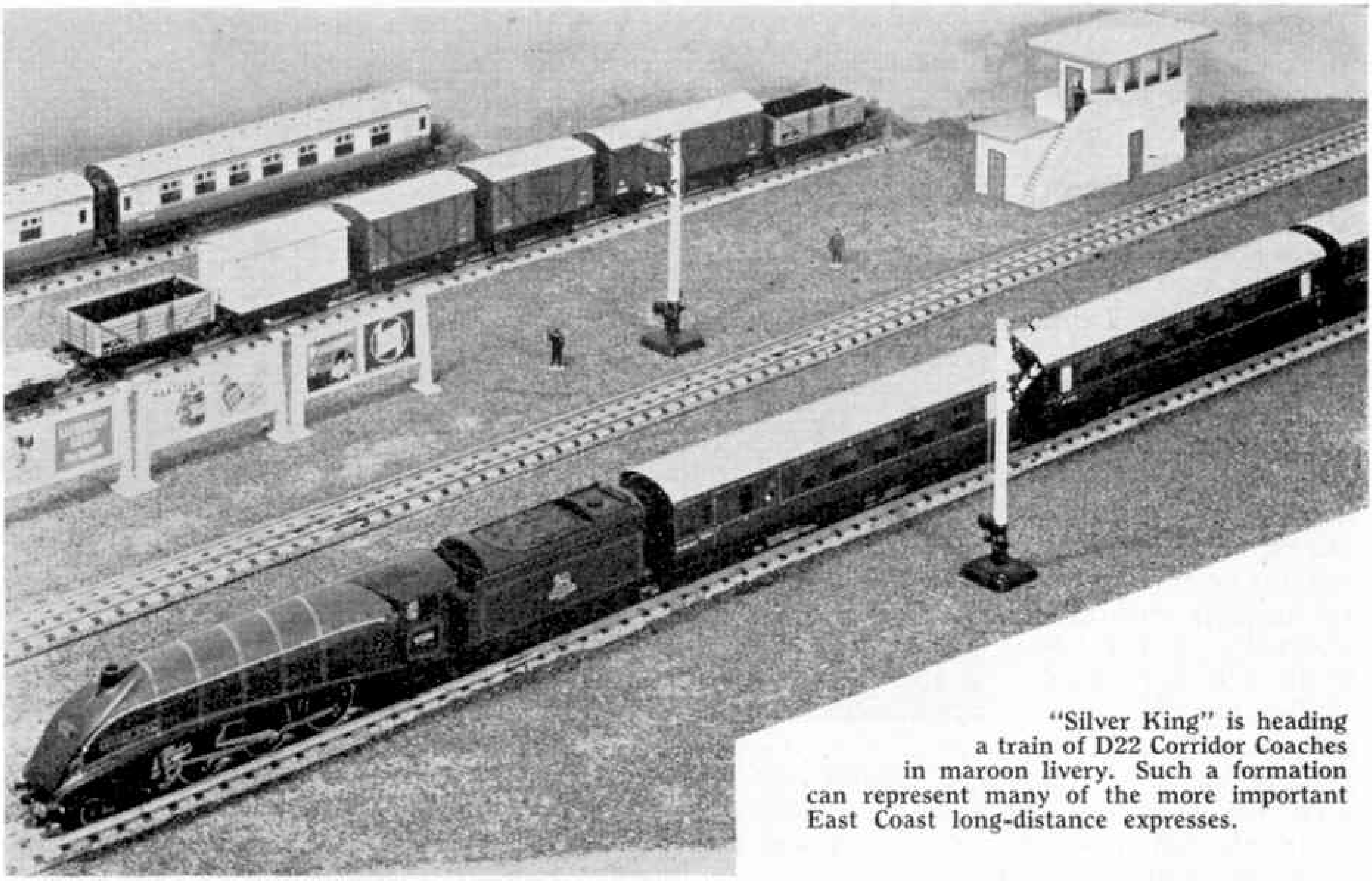
Another activity in which the 2-6-4T can lend a hand is in the working, over part of their journey, of one or two Coaches that form part of a main line express. These may be operated over a branch line if the system includes one. Alternatively on a simpler layout the "through portion" may have to make several circuits of the main track before it is combined with the Pacific-hauled main train to complete the journey. Some interesting schemes of this kind can be worked out and variations in the method of working for the up and down journeys can be introduced.

For this type of running it will be necessary to use corridor stock and you will see an example of this in the illustration on this page of a 2-6-4T making its way along a single line branch with a through portion consisting of D22 Corridor Coaches. These are the standard vehicles in B.R. maroon livery.

Sometimes a train of this kind may include ordinary compartment stock as well for local passengers. This will add to the interest of working.



A mixed train of the kind familiar in actual practice, is on its way in charge of a Hornby-Dublo 0-6-2T.



"Silver King" is heading a train of D22 Corridor Coaches in maroon livery. Such a formation can represent many of the more important East Coast long-distance expresses.

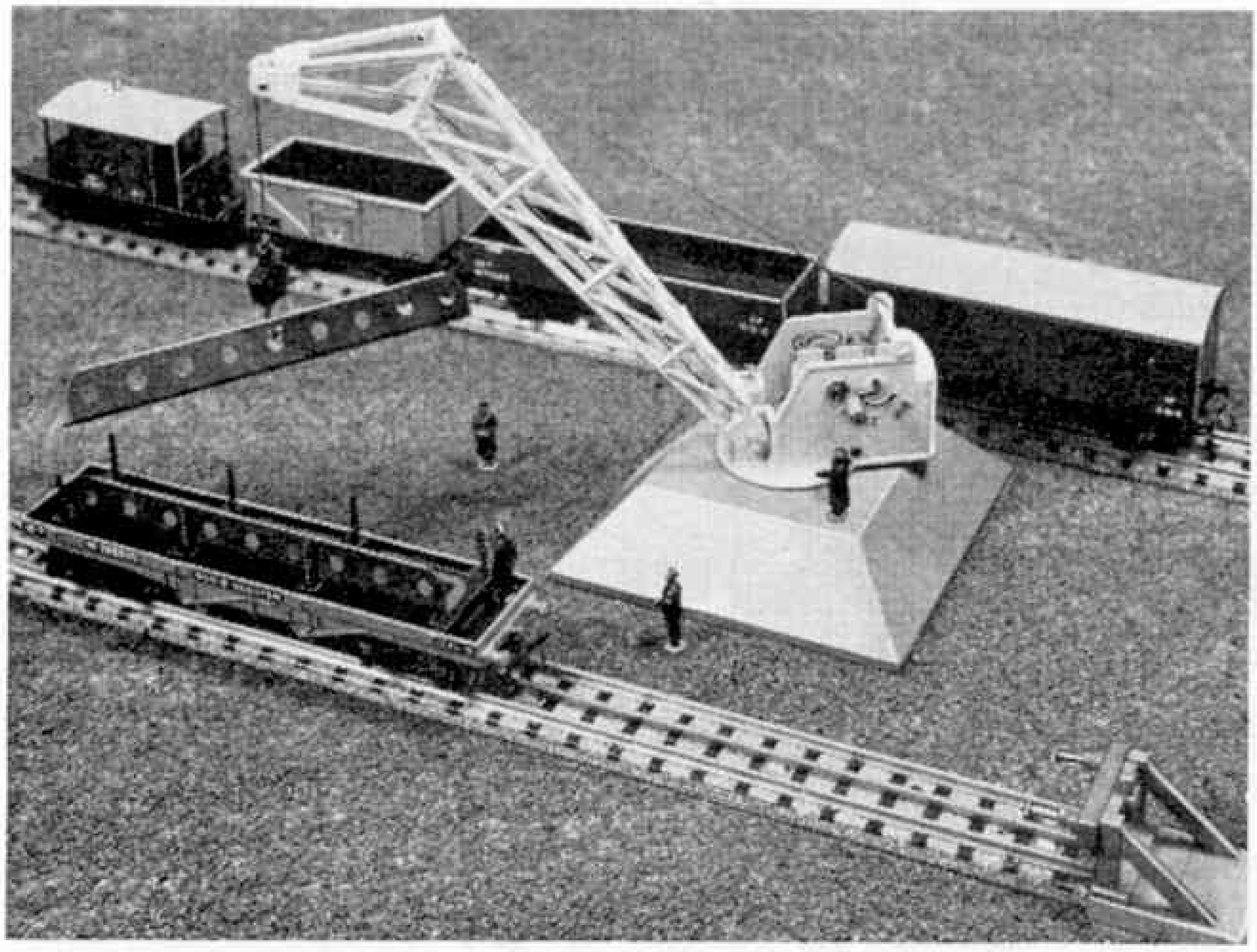
More Passenger and Goods Notes

THE pictures on this and the next page suggest a chat to follow up, in a sense, subjects that have been dealt with recently in these pages in connection with Hornby-Dublo railways and their running. You will recall that in the *M.M.* last August we referred to the appearance of the D22 B.R. Corridor Coaches and, as a result, the arrival in the Hornby-Dublo System of Train Set EDP22 bearing the name *Royal Scot*.

Quite apart from the running of the train in this Set there are plenty of uses for the D22 Coaches. They are finished in B.R. maroon livery that is now becoming standard, with certain exceptions that have already been mentioned in these pages, so that they can be used to represent many of the long-distance expresses of today. Although most of us, especially beginners, tend to regulate our train make-up by what we have in our first Train Set, all kinds of variations are possible to meet particular requirements. As the illustration above shows, we can run a train of D22 stock behind a *Silver King* Locomotive, if we want to, and the distinguished appearance of a train made up in this way is apparent. The enthusiast therefore can reproduce the working of many of the longer-distance East Coast expresses that operate over the Eastern, North Eastern and Scottish Region tracks in turn.

If you do not happen to have D22 maroon stock on your railway, then you can quite reasonably use the red and cream D12 vehicles provided in the *Silver King* Train Set. You can even use the two types together if you wish, because such combinations are not unknown in actual practice at the present time. Probably many Hornby-Dublo owners who run such trains will wish to include the attractive new Composite Restaurant Car. This will give an air of distinction to any train, whether the other Coaches are similarly finished or not.

The notes given last month on loads for Hornby-Dublo Wagons dealt more particularly with Wagons of the open type, and the Well Wagon. This month we illustrate a loading scene showing Meccano 4½ in. Angle Girders being loaded on to the useful Hornby-Dublo Bogie Bolster Wagon. This is a splendid Wagon for long loads of this kind, whether girders, timber or miniature tree trunks. You will notice that the lifting is being carried out by the



A heavy lift in the Hornby-Dublo goods yard. The Crane is of course the well known Dinky Toy No. 973, which makes a good heavy-duty appliance for Hornby-Dublo layouts.

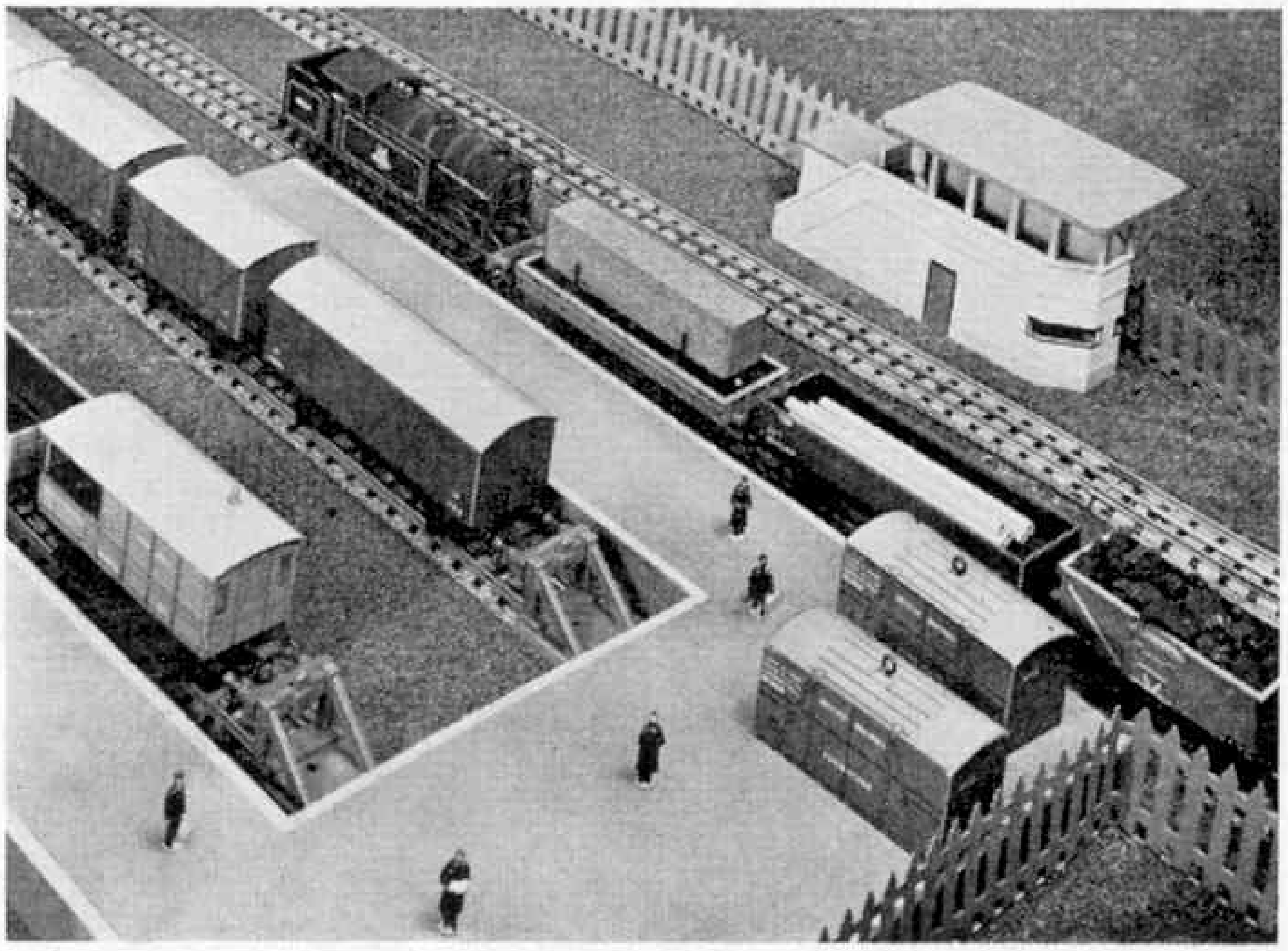
Goods Yard Crane, familiar to most of you as Dinky Toys No. 973. Although this is really intended for use with Hornby Gauge 0 railways, it makes a fine big Crane for heavy lifts in Hornby-Dublo and after all real cranes do vary considerably in size.

Many Hornby-Dublo owners use this Crane on their layouts and its operation in an efficient manner is a really satisfying business. The combination of movements possible in rotating the crane itself, in raising or lowering the jib, and in hoisting the load makes for good operation and of course this means good fun.

You can see further loads in the lower picture on this page. The train alongside the loading "bank" has, next to the engine, a Double Bolster Wagon on which there is a hefty sawn timber. Balsa wood is good for this sort of thing as it is light. Next we have the Tube Wagon, another long wheelbase vehicle, with its load of "tubes." Actually these are drinking straws cut to length. These are easily obtainable, and you will probably find some of them about the house when you want them.

The nice healthy-looking coal in the Mineral Wagon really is coal, broken small and washed. It is then mounted on a card insert fitting in the Mineral Wagon in such a way that only a single layer of the load is necessary. You need an adhesive to stick the coal in place, and Seccotine or something similar will do the job splendidly.

No doubt the Hornby-Dublo Containers waiting on the goods bank will remind you of the new Dublo Dinky Toys motor vehicles, because one of these is specially intended for Container traffic. Full details regarding the three vehicles so far available are given by *The Toyman* elsewhere in this issue.



There is plenty of traffic at this goods depot on a Hornby-Dublo railway. Two of the standard Furniture Containers are standing on the "bank."

Among the Model-Builders

By "Spanner"

Compact Gear Reduction

The compact gear-box shown in Fig. 1 will be found useful in many models in which a large reduction ratio is required. A ratio of 243 : 1 is provided between the driving shaft 1 and the driven shaft 2.

The Rod 1 carries a fixed ½" Pinion 3 that engages a 57-tooth Gear loose on the Rod 2. The Gear is provided with two Bolts, the shanks of which extend on either side of a ⅜" Bolt 4. This Bolt is inserted in the boss of a ½" Pinion, but a nut prevents it from gripping the Rod. In this way, Gear and Pinion rotate freely on the Rod as one unit. The Pinion engages a second 57-tooth Gear coupled in a similar way to another ½" Pinion. The final Gear 5 is fixed on Rod 2 and the drive can be taken from either end of the Rod. Similarly the Rod 1 can be driven from whichever end is more convenient in the model.

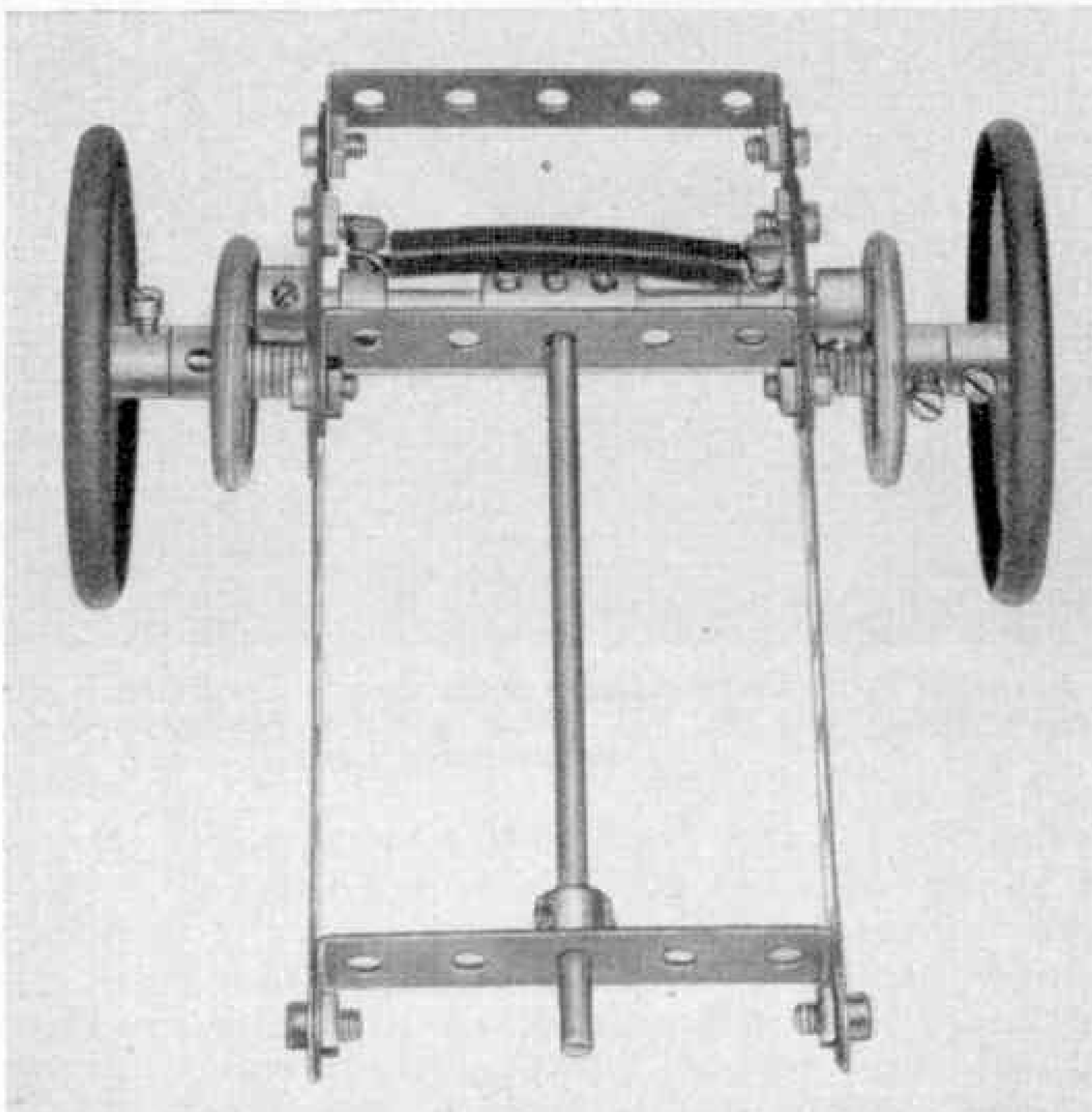


Fig. 2. A Drift, Part No. 36c, is used as the operating member of this brake mechanism, details of which were sent in by T. Pickard, Bishop's Castle.

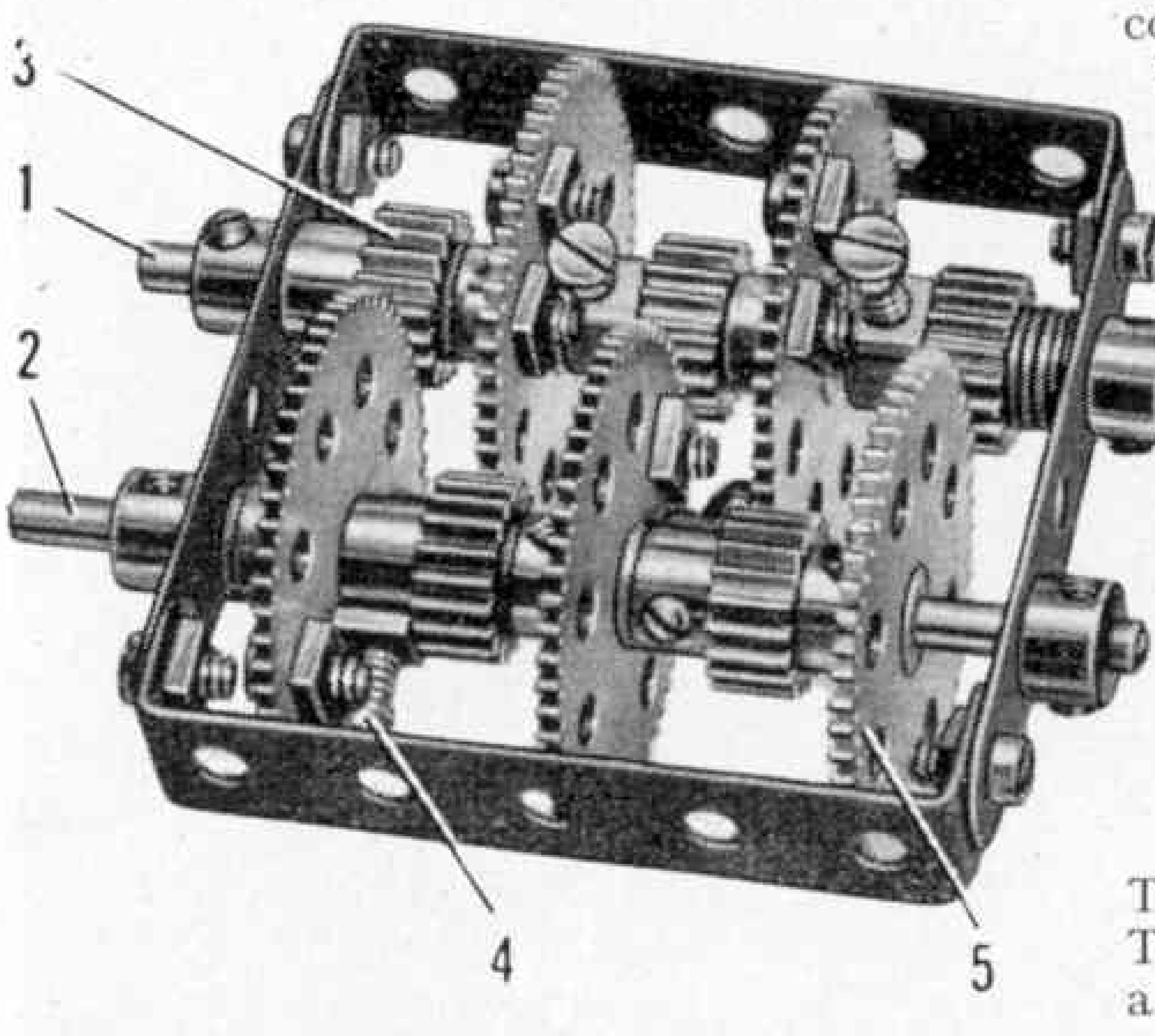
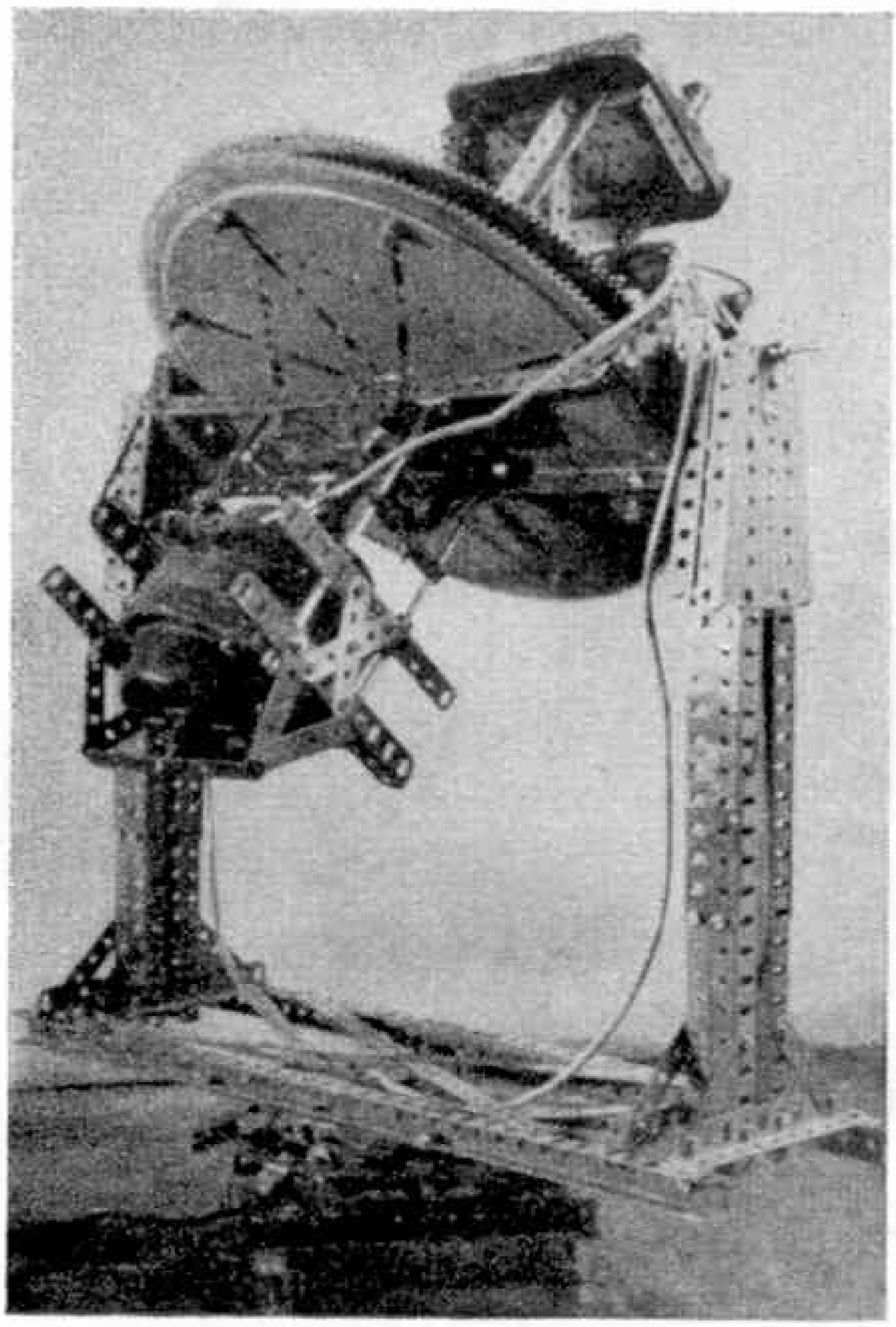


Fig. 1. This compact gear arrangement provides a reduction ratio of 243 : 1 between the input and the output shafts of the mechanism.

A Novel Brake Mechanism

The adaptability of Meccano constructional parts is well known and has been illustrated many times in the mechanisms and models featured in the *M.M.* Most model-builders are on the look-out for new or unusual applications for Meccano parts, but the adaptability of some of the tools used in the assembly of Meccano models is sometimes overlooked. The normal uses of these tools are so obvious that there is a tendency to regard them as being of little value as constructional parts. This is not the case, as you will see from the ingenious rear wheel braking system for a model vehicle shown in Fig. 2. This arrangement, which was designed by T. Pickard, Bishop's Castle, makes use of a Drift, Part No. 36c, as the operating member of the mechanism.

The design of the mechanism can be altered to suit the general layout of the



The demonstration gyroscope built by Mr. M. A. Viglioglia, Buenos Aires. Brief details of the instrument are given on this page.

vehicle to which it is fitted, but in the example shown in Fig. 2 the rear axle is mounted in Flat Trunnions bolted to the chassis of the model. The axle carries two 1" Pulleys with Rubber Rings, spaced from the Flat Trunnions by Washers. The brake shoes are Collars on two $1\frac{1}{2}''$ Rods, each of which is passed through the chassis side member into the long bore of a Coupling. A Drift is mounted in Double Angle Strips bolted between the chassis side members, with its pointed end inserted in the centre cross bore of the Coupling. The brake return spring is a Tension Spring attached to bolts screwed into Collars on the $1\frac{1}{2}''$ Rods.

The Drift should be connected to a suitable brake pedal or lever. When the Drift is moved towards the rear of the model, it is pushed further into the hole in the Coupling, and in doing so it forces the $1\frac{1}{2}''$ Rods outward and presses the Collars against the Rubber Rings on the 1" Pulleys. The Tension Spring releases the brake when the Drift is withdrawn from the Coupling.

A Meccano Gyroscope

Mr. M. A. Viglioglia is a very keen Meccano enthusiast living in Buenos Aires, and some time ago he sent me details of a gyroscope he made for experimental purposes. The framework and the heavy flywheel of the gyroscope are made with Meccano parts, and the design is such that the axis of the flywheel can be pointed in any direction. The flywheel consists of two Roller Races from the pre-war Geared Roller Bearing unit, with Strips bolted to them to increase the weight of the flywheel.

The gyroscope is operated by a fractional h.p. electric motor that drives the flywheel directly at 1,600 r.p.m. Careful attention to the balance of the model ensures that there is little or no vibration, and Mr. Viglioglia tells me that he has found the gyroscope extremely useful for demonstration purposes.

A Simple Automatic Reversing Mechanism

The simple crank-operated automatic reversing mechanism illustrated in Fig. 3 was designed by J. R. Brooks, Clacton, Essex.

The operating crank of the mechanism is a Bush Wheel fixed on the input shaft. A Strip lock-nutted to the Bush Wheel is lock-nutted also to a Crank on a Rod that carries a 57-tooth Gear. The Gear engages a $\frac{1}{2}''$ Pinion on the output shaft. As the Bush Wheel rotates the connecting Strip imparts an oscillating movement to the Crank. This is stepped-up by the gearing, and the output drive is reversed automatically.

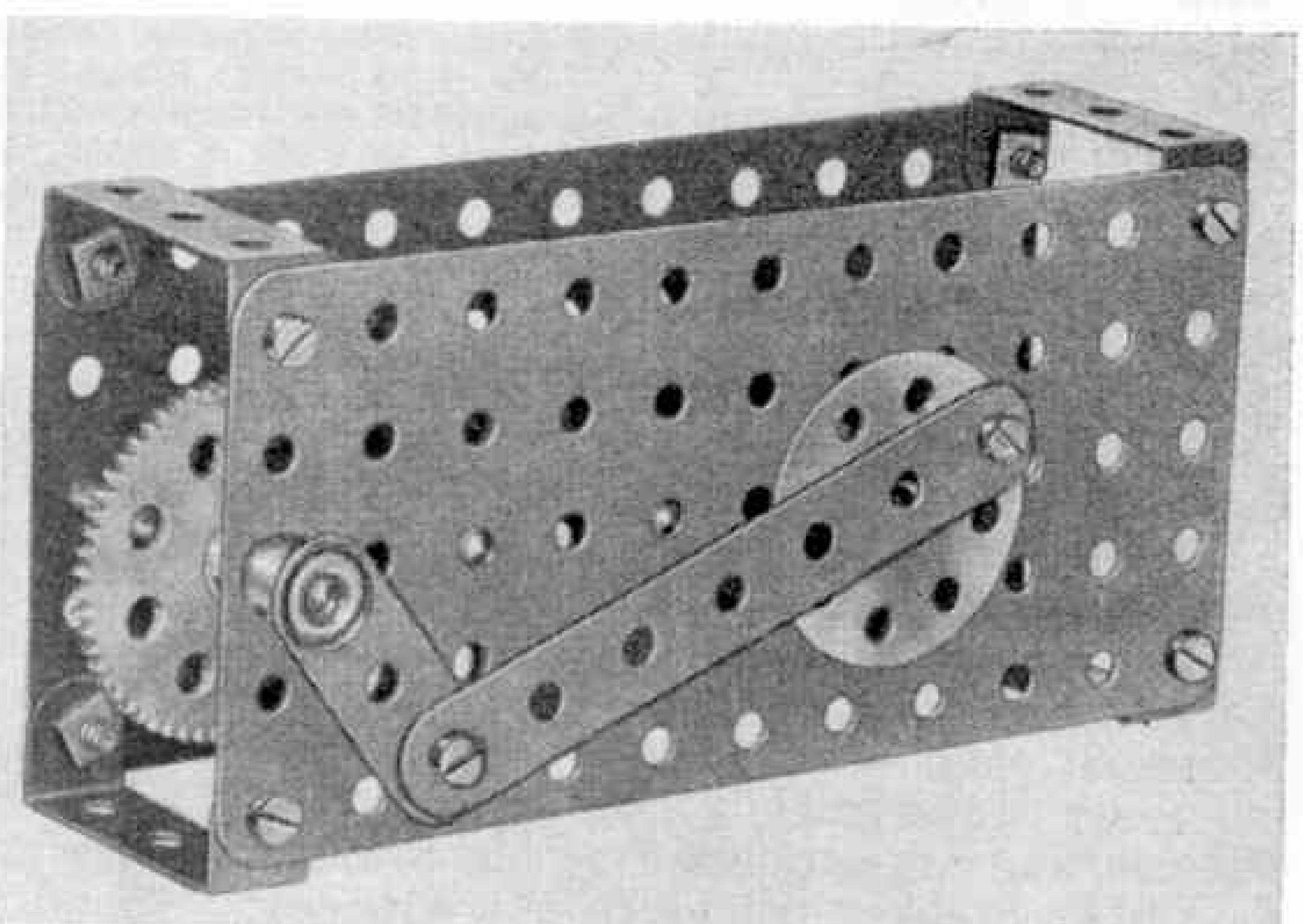
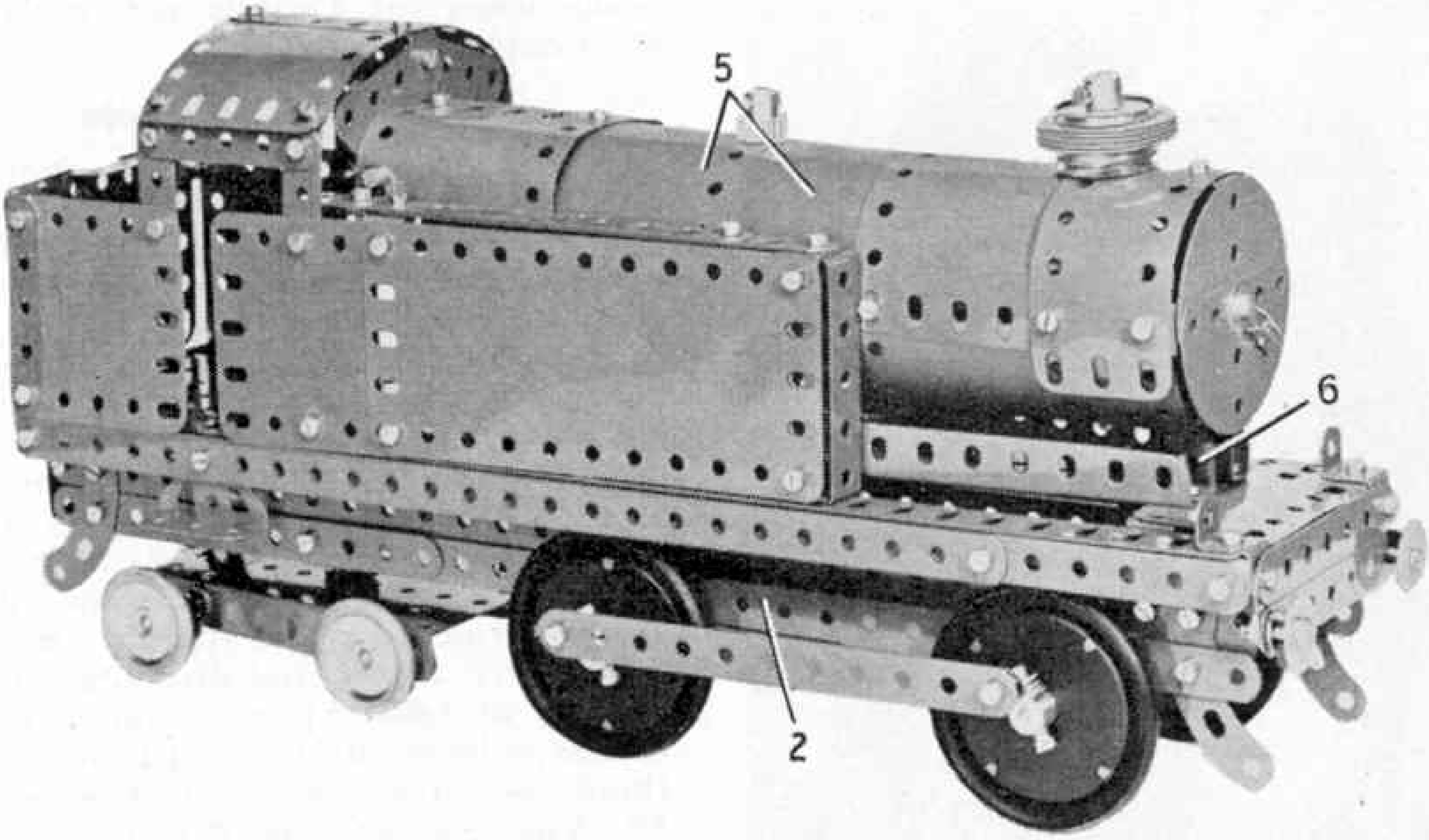


Fig. 3. A simple but effective automatic reversing mechanism operated by a crank movement. The arrangement is based on an idea submitted by J. R. Brooks, Clacton.



Tank Locomotive

A Grand Model for Outfit No. 5

THIS realistic model 0–4–4 Tank Locomotive has many attractive features, including working coupling rods. The model is designed for construction with parts in a No. 5 Outfit.

The main frame of the Locomotive is made by bolting two $12\frac{1}{2}''$ Angle Girders to the side flanges of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, overlapping the parts six holes. A $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 1 is bolted in the third holes from the front ends of the Girders. A made-up strip, formed by two $12\frac{1}{2}''$ Strips overlapped 20 holes, is attached to each $12\frac{1}{2}''$ Angle Girder by two Fishplates. Another made-up strip 2 on each side is supported by $2\frac{1}{2}''$ Stepped Curved Strips as shown in Fig. 1.

Fig. 1. The attractive model 0-4-4 Tank Locomotive shown above is designed for construction with the parts included in a No. 5 Outfit. Working coupling rods are one of its many interesting features.

Strip 2 consists of a $12\frac{1}{2}''$ and a $5\frac{1}{2}''$ Strip overlapped six holes. A $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 3 is bolted between the strips 2. To complete the main frame two $12\frac{1}{2}''$ Strips on each side are connected to the front end of the Angle Girder by an Angle Bracket and are supported at the rear by a Double Bracket bolted to the Flanged Plate.

The water tank on each side consists of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ and a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate bolted together. These Plates are supported by a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip at the front and by an Angle Bracket at the rear. The Double Angle Strip is bolted by its lower lug to the Angle Girder, and another Double Angle Strip is held by the same bolt. The upper lug of the second Double Angle Strip supports a strip 4, made from two $5\frac{1}{2}''$ Strips overlapped 9 holes. Strip 4 is connected to the side of the water tank by an Angle Bracket.

Each side of the coal bunker is a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate fixed to a Fishplate bolted to the Double Bracket at the rear of the frame. The rear edge of the Flexible Plate is strengthened by a $2\frac{1}{2}''$ Strip. The back of the coal bunker is made by fixing a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate, extended at each side by a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate, to the rear end of the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate. The sides and the back of the coal bunker are connected by $1'' \times 1''$ Angle Brackets.

The smoke-box is formed by two $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates rolled into a circle and bolted round a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. The front section of the boiler consists of two curved $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates attached to the smoke-box, and these are extended

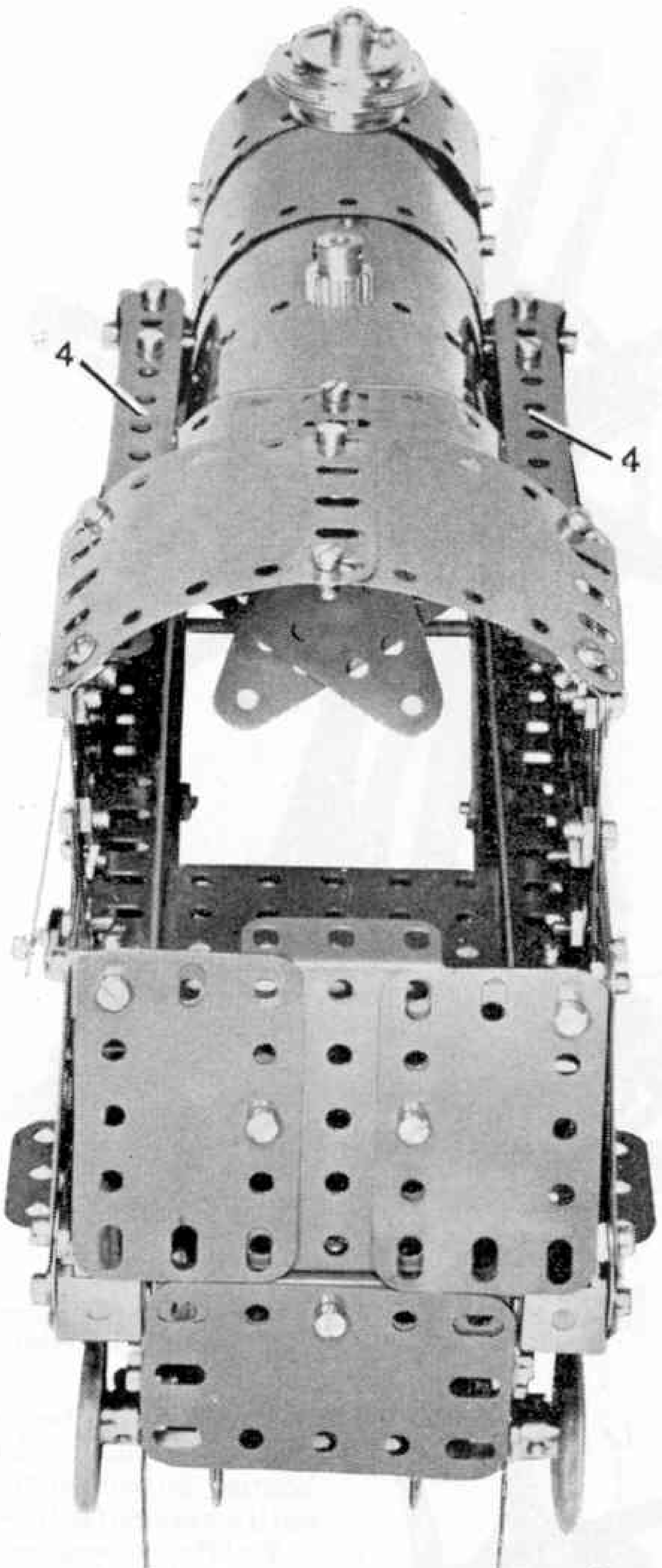


Fig. 2. Looking down on the model to see the details of the cab and boiler plating.

towards the rear by two curved $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates 5. To make the chimney a 1″ Pulley, four Wheel Discs and two 1″ loose Pulleys are placed on a 2″ Rod, which is passed through the Flexible Plates and is held in place by a Bush Wheel. The dome is a $\frac{1}{2}''$ Pinion fixed on a Threaded Pin. The front of the smoke-box is made from two Semi-Circular Plates.

At the front the smoke-box is supported by a Double Bent Strip 6, the bolts being used also to fix in place a Flanged Sector Plate and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate. Two $\frac{1}{2}''$ Reversed Angle Brackets are bolted to the front ends of the $12\frac{1}{2}''$ Angle Girders, and two $3\frac{1}{2}''$ Strips connected by Fishplates are attached to the Reversed Angle Brackets. The buffers are $\frac{3}{4}''$ Washers spaced from the lower $3\frac{1}{2}''$ Strip by Spring Clips and Washers on a $\frac{3}{8}''$ Bolt and a Pivot Bolt. The rear end of the boiler is bolted to two opened-out U-section Curved Plates, which are attached to Angle Brackets bolted to the strips 4.

The cab roof consists of two $1\frac{11}{16}''$ radius Curved Plates supported by Obtuse Angle Brackets, which are bolted to $2\frac{1}{2}''$ Strips on each side as shown. Two $2\frac{1}{2}'' \times 2''$ Triangular Flexible Plates are bolted to a Double Bracket, fixed centrally to the front edge of the roof.

The front pair of driving wheels is fixed on a 4″ Rod mounted in Flat Trunnions, and the rear pair is arranged on a 4″ Rod supported in $1\frac{1}{2}''$ Strips. A $5\frac{1}{2}''$ Strip 7 on each side is slipped over the Rods before the Road Wheels are fixed in place. An Angle Bracket is attached to the boss of each Road Wheel by placing thıee Washers on a bolt, inserting the bolt through the slotted hole of the Angle Bracket and then screwing it tightly into a threaded hole in the boss. The Angle Brackets on each side are (Continued on page 634)

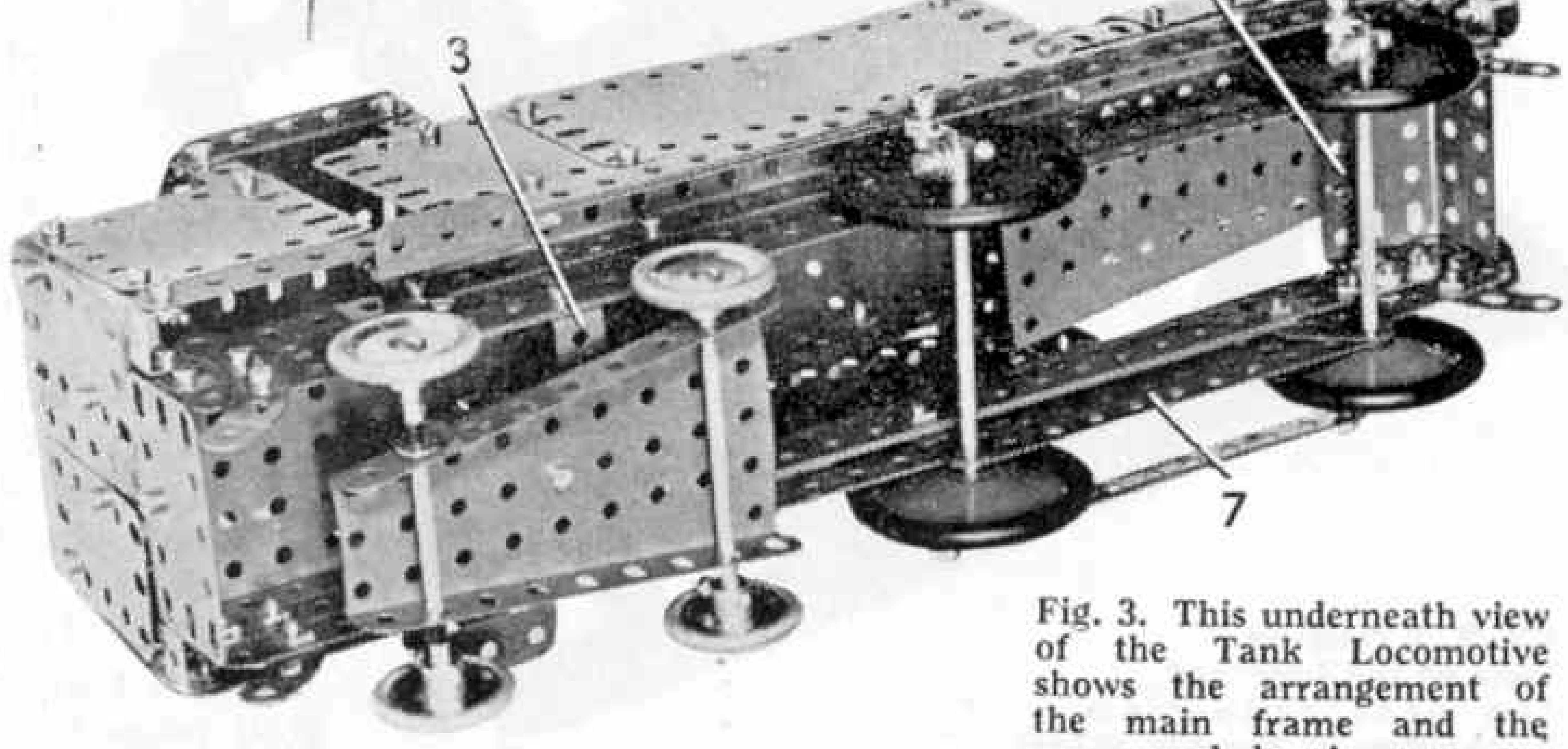


Fig. 3. This underneath view of the Tank Locomotive shows the arrangement of the main frame and the axle bearings.

MODEL OF THE MONTH

ROTATING BIG WHEEL

AMUSEMENT machine makers and fairground owners are constantly seeking new and more exciting rides for the thrill-seeking public, and with this end in mind a Big Wheel of a novel kind has been assembled in Battersea Pleasure Park. Our model this month is based on this machine.

The general design of the actual Wheel follows conventional practice, but instead of being fixed to the ground the supporting columns are attached to the rotating member of a large diameter roller bearing unit. In the real machine two electric motors are used, one to turn the Wheel on its axis and the other connected to bogie units in the roller bearing to rotate the entire superstructure.

For the convenience of model-builders who have only one Electric Motor, our model uses a single E020(S) Electric Motor that provides power for both the drives. The drive to the roller bearing is transmitted by a lever-controlled friction clutch, which enables this drive to be engaged or disconnected as desired. The drive to the Wheel itself is transmitted by a vertical Rod passed through the centre of

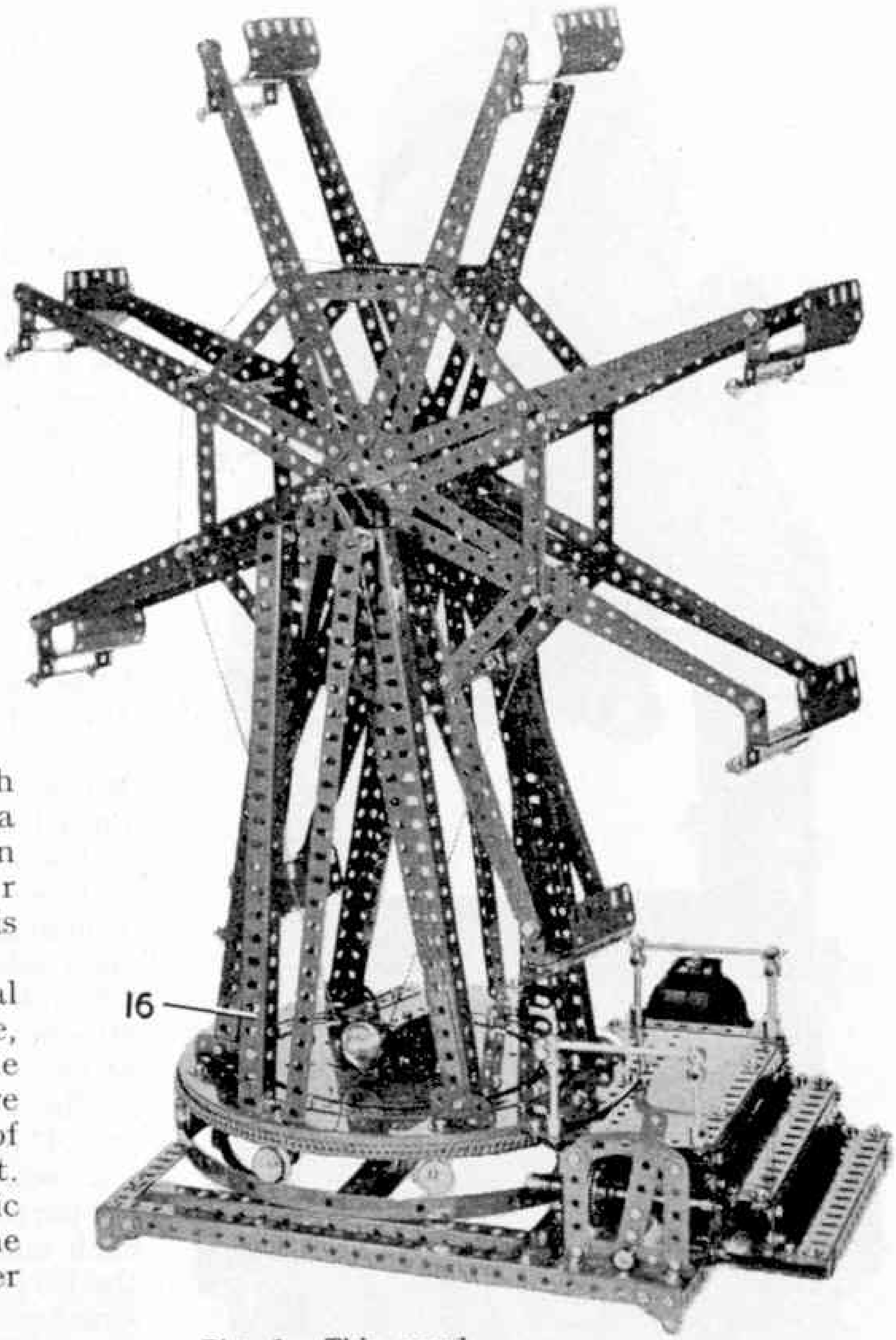


Fig. 1. This novel type of Big Wheel makes a splendid subject for the Model of the Month.

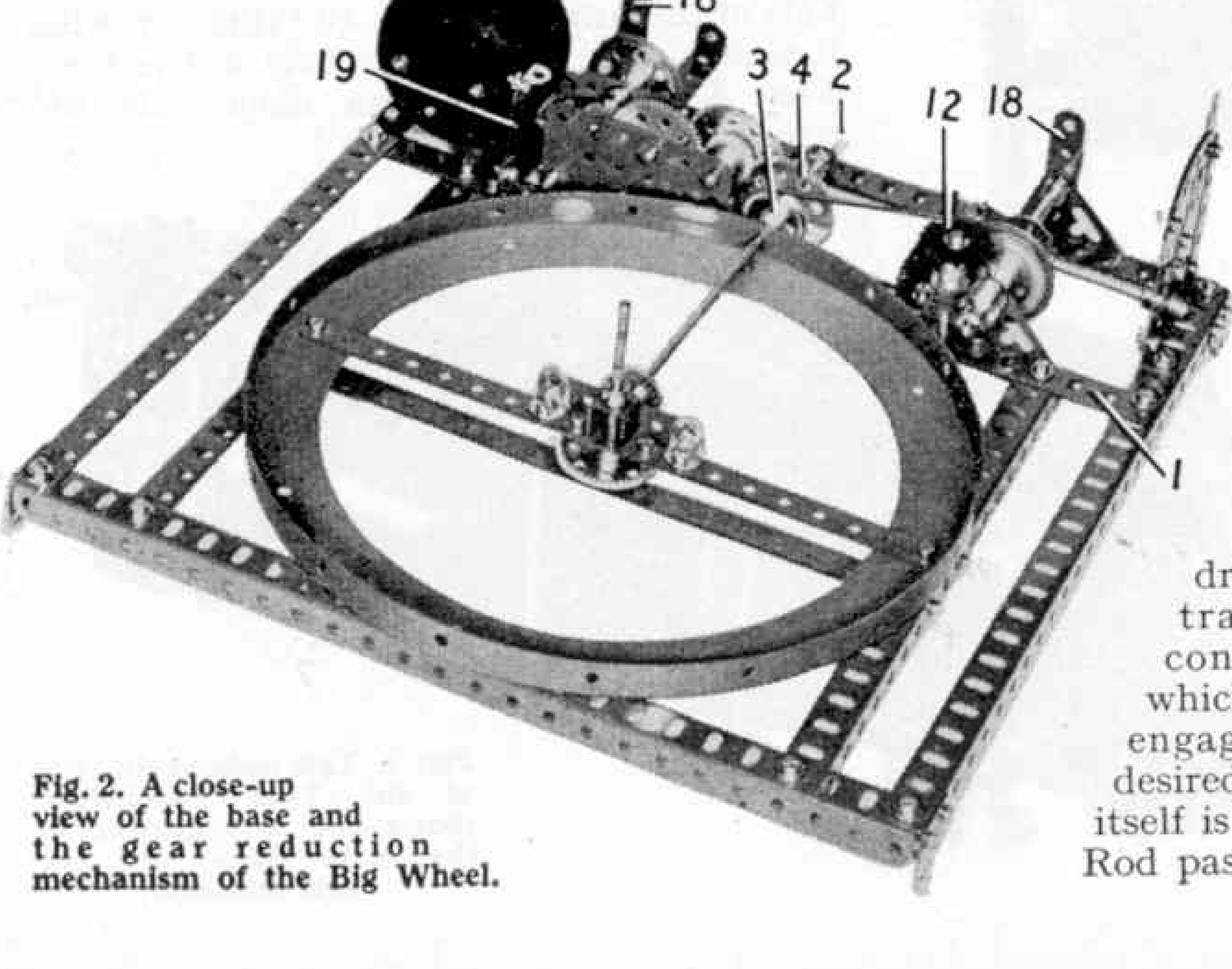


Fig. 2. A close-up view of the base and the gear reduction mechanism of the Big Wheel.

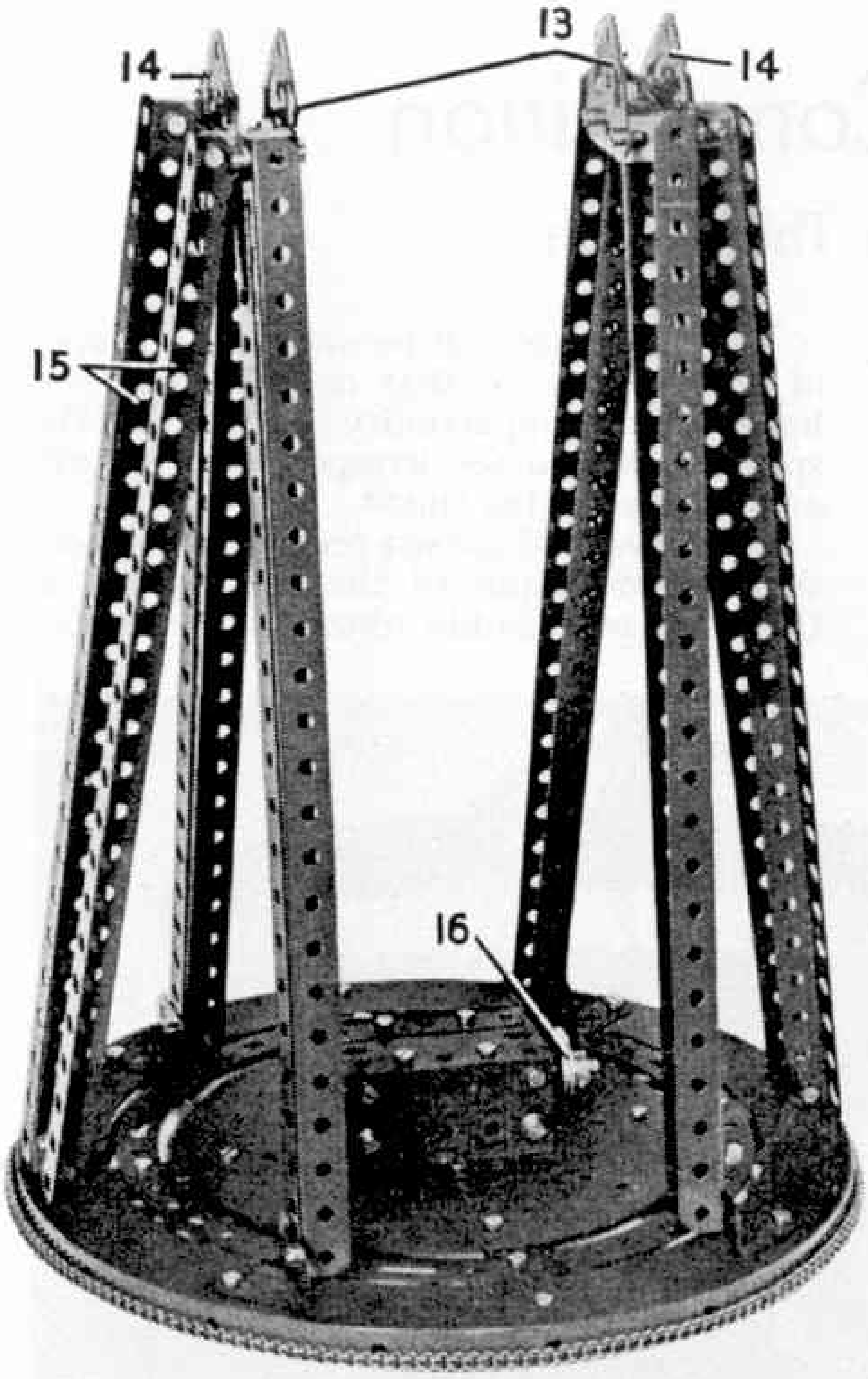


Fig. 3. The supporting columns and the upper member of the roller bearing.

the roller bearing unit. This Rod is geared to a horizontal Rod, and a Pulley on the latter is connected by a Cord belt to the Wheel. The Cord is passed round Bolts fitted to the spokes of the Wheel, to give the same effect as a large diameter pulley.

The triangular arrangement of the supporting columns for the Wheel is noteworthy. It provides a sturdy structure, but the weight is carried directly over the rollers of the bearing, so that the centre section of the bearing does not actually support the superstructure and is required only to locate the bearing member on its axis.

Readers wishing to build the Big Wheel should write to the Editor for full constructional details and a list of the parts required, enclosing a 2d. stamp for postage. Overseas readers in Canada, Australia, New Zealand, South Africa, Ceylon, Italy, Rhodesia and the United States of America can obtain copies of the *current* Model of the Month instructions by writing to the main Meccano agents in those countries, enclosing suitable stamps for postage. We advise model-builders to send for the instructions right away. The main Meccano model-building season is now well under way, and there is sure to be a big demand for details of this attractive model, construction of which will provide pleasant occupation for a winter evening.

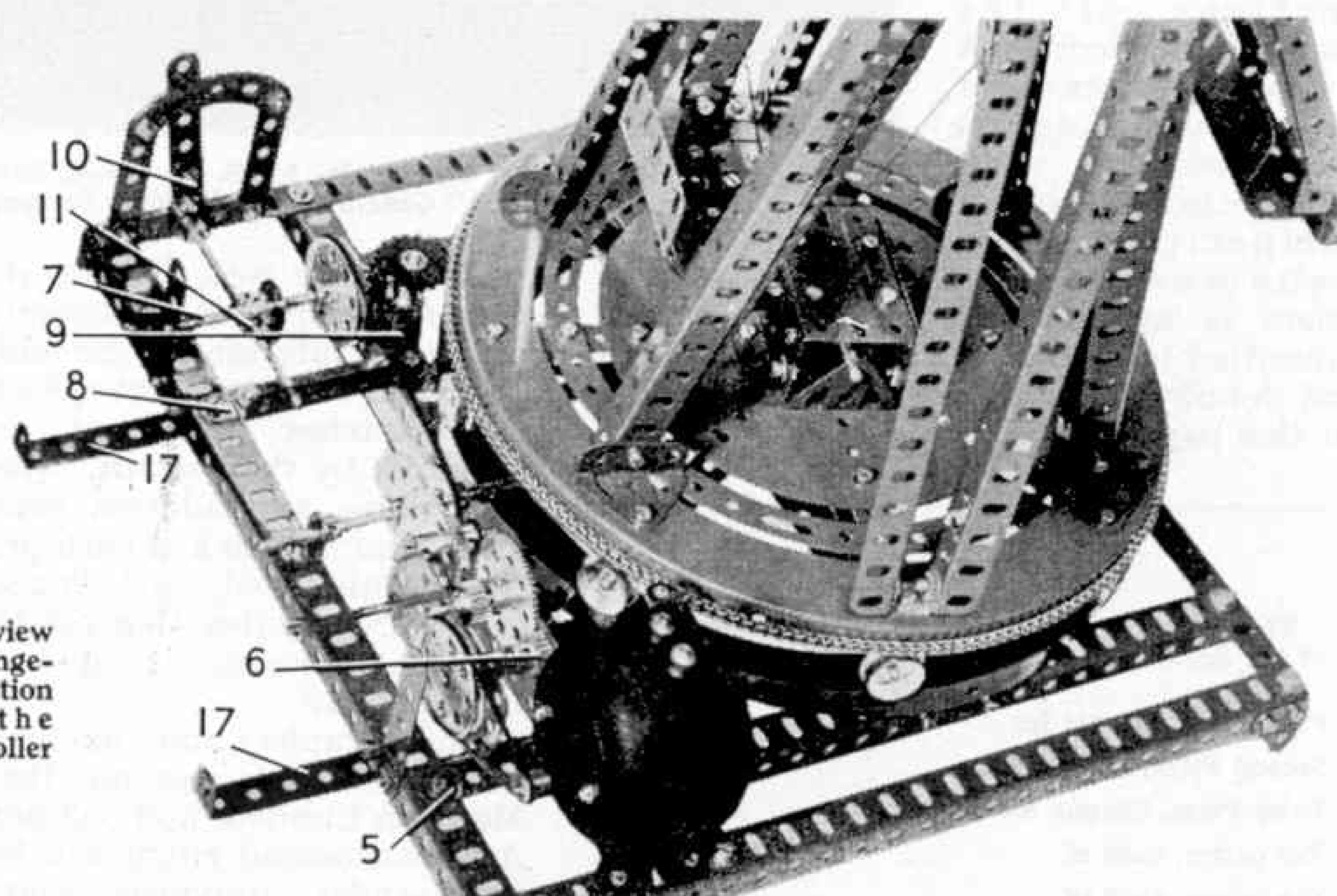


Fig. 4. This view shows the arrangement of the friction clutch and the drive to the roller bearing.

Meccano Competition

Closing Date This Month

THIS is the last opportunity we have to remind intending competitors to send in their entries to the current General Model-Building Contest, which was first announced in the September *M.M.* The competition closes for entries on 31st December, so there is still time to build a model, prepare details of it and send them along.

The competition is for models of any kind and size. There are no restrictions on the subjects that can be modelled, or on the sizes of the Outfits or the number of parts used in their construction. The only rules are that the models must be the unaided work of competitors and that entries must be posted to reach us not later than the end of this month.

There are two Sections of the competition, Section A is for competitors under twelve years of age on 31st December next, and Section B is for competitors aged twelve or over on that date. A fine range of prizes is available for the best entries submitted in each of the Sections A and B, and details of these are given in the panel on this page.

This fine model Roundabout won a prize for B. W. Rowe, Newton Abbot, in a previous "M.M." General Model-Building 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: 31st December, 1957.

Full allowance will be made for the ages of competitors, so that each entrant will have an equal opportunity to win one of the splendid cash prizes, irrespective of his age and the size of his Outfit.

Entries should consist preferably of good, sharp photographs of the models, but if these are not readily obtainable, sketches will do quite well, if they show the main features clearly. Notes covering any points of special interest can be added if desired. It should be noted that the photographs or the sketches need not necessarily be prepared by the entrant. The competitor's age, name and address must be written clearly on the back of each print or piece of paper submitted, and entries should be sent to September General Model-Building Contest, Meccano Limited, Binns Road, Liverpool 13.

Photographs and sketches of prize-winning models become the property of Meccano Limited, and will not be returned. An unsuccessful entry will be returned to the sender provided that a suitable stamped addressed envelope is sent with the entry for that purpose.

Club and Branch News

WITH THE SECRETARY

THE CHRISTMAS PARTY

Very soon my office will begin to take on its annual festive air as it becomes adorned with Christmas greeting cards from Clubs and Branches in the Home country and abroad. Nothing could emphasise more clearly the universal fellowship engendered by these twin organisations than this delightful and colourful display, and the arrival of these expressions of goodwill from so many world-wide sources is a heart-warming experience.

For my part, I gladly avail myself of the opportunity that this page of the *M.M.* provides to wish a Merry Christmas to every member of the Guild and H.R.C. and of all Clubs and Branches. In this country most Clubs and Branches celebrate the festive season by a Christmas party at which fun and games combine with lots of good things to eat to make it a grand occasion.

If no such event has yet been planned it is not too late to do something about it now. And don't forget that if parents and friends of members are invited the general pleasure and happiness will be increased, with great benefit to Club and Branch affairs generally!

CLUB NOTES

Hornsea M.C.—In the voting upon winter activities Meccano model-building gained first place, with games and film shows second and third respectively. *Leader:* Mr. R. W. Shooter, 84 Cliff Road, Hornsea, E. Yorks.

Newtown School (Waterford) M.C.—The Club room has been repainted. During a recent visit to the Waterford C.I.E. terminus members were able to inspect one of the Company's diesel electric grade A locomotives. The goods yard also was visited, where members were able to look over some of the heavy haulage steam locomotives. *Secretary:* J. Gillespie, Newton School, Waterford, Eire.

NEW ZEALAND

Christchurch M.C.—Model-building has continued, and several meetings have been devoted to demonstrating home built models. These have covered a wide range of subjects, from a lighthouse to a motor chassis, and from cranes to drilling machines. The Club gave a display of their models at the Shirley Parish Doll Show. A visit to a carpet making factory was most interesting. *Secretary:* R. Boundy, 25 McBratney's Road, Sallington, Christchurch, New Zealand.

BRANCH NEWS

Potters Bar—A girder bridge in Meccano and a tunnel have been added to the Branch layout. A Branch Magazine has been started. *Secretary:* R. Woods, 120 The Walk, Potters Bar, Middlesex.

Hale End (London)—More members have been enrolled and there is much enthusiasm. A new layout is being constructed on the Branch's portable baseboard, and work done up to the time of writing this report includes building up the landscape and adding a cutting and a tunnel. Some members are lending their own Hornby-Dublo equipment to supplement that owned by the Branch. *Secretary:* A. L. Coe, 463 Hale End Road, Highams Park, London E.4.

Mile End (Portsmouth)—In addition to their extensive Hornby-Dublo layout the Branch now have a Hornby Clockwork one. In order to accumulate funds for the purchase of additional rolling stock a series of monthly Open Nights is being held, when visitors can see the Branch layouts in operation. The next will be held on 4th December, and there will be another on New Year's Day, 1st January, next. *Secretary:* A. Firman, 171 Fratton Road, Portsmouth.

Kidderminster—The Third Annual Display was a great success. The Hornby-Dublo layout extended the full length of the room, and track operations were carried out continuously. There were also excellent displays of working Meccano models and steam engines. Photographs of trains, aircraft, and motor buses, decorated the walls, and the whole set-up was bright and attractive. The exhibition realised £6 11s. 6d. Outings to places of railway interest add variety to the programme. *Secretary:* A. J. Potter, 35 Woodfield Crescent, Kidderminster.

Mr. A. J. Nicholson, Chairman, on the left, operating the Hornby-Dublo layout of the Mile End (Portsmouth) Branch, which is also a Meccano Club, watched intently by officials and members responsible for Branch layouts and their equipment. On the extreme right is A. Firman, Branch Secretary. Illustration by courtesy of "Evening News and Southern Daily Mail", Portsmouth.

For other stamp Advertisements see also pages 632 and xxvi

Stamp Collectors' Corner

By F. E. Metcalfe

CHRISTMAS AND CHARITY STAMPS

Although the step had been rumoured for some time, it nevertheless came as quite a shock when the Australian Post Office announced that it would issue two Christmas stamps, 3½d. and 4d. in value, in November. It was certainly a departure for a country in the British Commonwealth to make such an issue, but it was not the first time by any means that one of our sister nations had issued a charity set, as most stamp collectors already know.

New Zealand was an early example, for as long ago as 1929 this Dominion released in December a 1d. stamp, with a 1d. premium for an Anti-Tuberculosis fund. The design depicted a nurse. In the following October the same design was used for a stamp of the same face value, the only difference being that instead of the inscription below the portrait reading *Help stamp out Tuberculosis*, there was the new one *Help promote Health*.

I am afraid that from the point of view of big sales, these issues were not a success. Today both stamps are quite scarce, particularly the second, and cost somewhere about 10/- and 15/- a copy respectively. Just one point here. If you should decide to buy a copy of both or either, take care to get really nice ones, for there are a lot of poor copies about.

Then in October 1931 the New Zealand Post Office brought out the first Health stamp issue, known to collectors as the Laughing Boy issue, and each year since 1931 a new Health set has appeared. Such has been the gradual increase in sales, that now they total several millions per issue.

There have been all kinds of designs. For the first few years after the appearance of the "Laughing Boy" pair, only a single stamp was issued at a time. Those from 1932 to 1934 are scarce, and in consequence rather expensive to buy. That for 1932 depicting Hygeia, the Goddess of Health, is the best. The design for 1935 was quite a novelty. Described as the Key to Health, it shows a plump youngster framed by a key-hole. Another point about these early issues, after the first, is that they were recess printed.

Apart from the annual Health issue, in 1936 a special charity issue of two stamps was released, both showing a New Zealand soldier at Anzac Cove. By then these charity stamps were becoming more popular, and this release sold very well. Even today a pair can be bought for round about a shilling. Incidentally, the background is supposed to feature Anzac Cove, but I read recently that the scene was actually a bit of New Zealand itself. But who cares? The stamps are popular and the object behind the issue was a worthy one.

One Health set followed another, year after year. The 1939 stamps were surcharged with a new value. The same design—children playing with a ball—was used in the following year, but the colours were changed and there was no surcharge. The 1945 issue showed the Peter Pan statue in Kensington Gardens.

In 1949 came the first "Health" stamps printed by the photogravure process. There is a very interesting variety on the 2d. stamp of that year. A nurse and child are depicted, and above the nurse's head is the value 1d. Under the d of this there is normally a dot, but on one stamp this dot may be missing. If you find such a copy, as well you may, you have a stamp worth about thirty shillings.

The Queen and Prince Charles appear on the 1950 set, and the Royal children in that of the following year. Naturally these sets are very popular, but I think that perhaps the most sought after set is that of 1953, one design of which shows girl guides and the other boy scouts. The borders of these stamps have dots and dashes that spell out letters in Morse.

Fiji also tried the charity stamp idea, but I am very sorry to say that it did not go well. It needs time of course for such things to catch on, and I hope Fiji will try again, for the object of the issue was a worthy one—the relief of Fiji soldiers of the last World War who had contracted tuberculosis.

Countries outside the Commonwealth have issued scores of charity and Christmas stamps. Austria, Belgium and other states have produced some very attractively designed stamps. And of course there are many Christmas and charity seals. We even issue some of these ourselves. They are not postage stamps, and we should of course take care that any we buy are for a worthy cause.

And just to finish up, I'll refer to a real postage stamp that looks like a seal and indeed has deceived many regarding its status in consequence. This is the Cuban stamp illustrated on this page. *Navidad* is Spanish for Christmas. But Spanish or English, there is good old Santa Claus all right, and on a genuine Christmas postage stamp.

A FEW OF THE

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For other stamp Advertisements see also pages 630 and xxvi

Stamp Gossip

WILD LIFE

I don't think any stamps in the world have such interesting designs as those issued for the various French Colonies, that is from the point of view of thematic collectors. One collector greatly interested in animal stamps recently showed me his collection. Quite a percentage of the copies were from these territories, but none showed wild life more in the raw than the one illustrated here. That hippo, and the crocodile, look really fearsome.

For those who want to form an animal collection, I suggest that they go in for birds as well—they are my favourites—for together a really worth while collection can be formed. It need not be expensive either, for governments nowadays are producing plenty of stamps with animal and bird designs, and many cost very little.

IT'S A SMALL WORLD

We all remark glibly that our world has become a small one. Yet even so I question if we really realize how small, if indivisible, it is. I had evidence the other day of how we have grown to be part of one another. Those of us who can remember how things were before the advent of aeroplanes used to look upon South American countries, at least the small ones, as almost belonging to another world. As far as their day to day lives were concerned, they did. But now this is all changed, and even far away Colombia showed how mixed up its destinies are with ours when it issued some time back stamps to let the world see that it was helping in the fight against communism in Korea. These remain of topical interest, although they appeared some time ago.

Indivisible world? It could be if we would let it.

POSTMARKS

There seems to be a growing interest in postmarks, and our own Post Office is giving publicity, with postmarks if not with stamps, to various events calling for their assistance in that respect. But I am afraid that our postmarks are rather uninspired as compared with those of foreign post offices. One of these, from Denmark, is being illustrated. I am afraid that my knowledge of Danish is meagre, but I am sure that the Danes would sit up and take notice when they received letters with this cancellation.

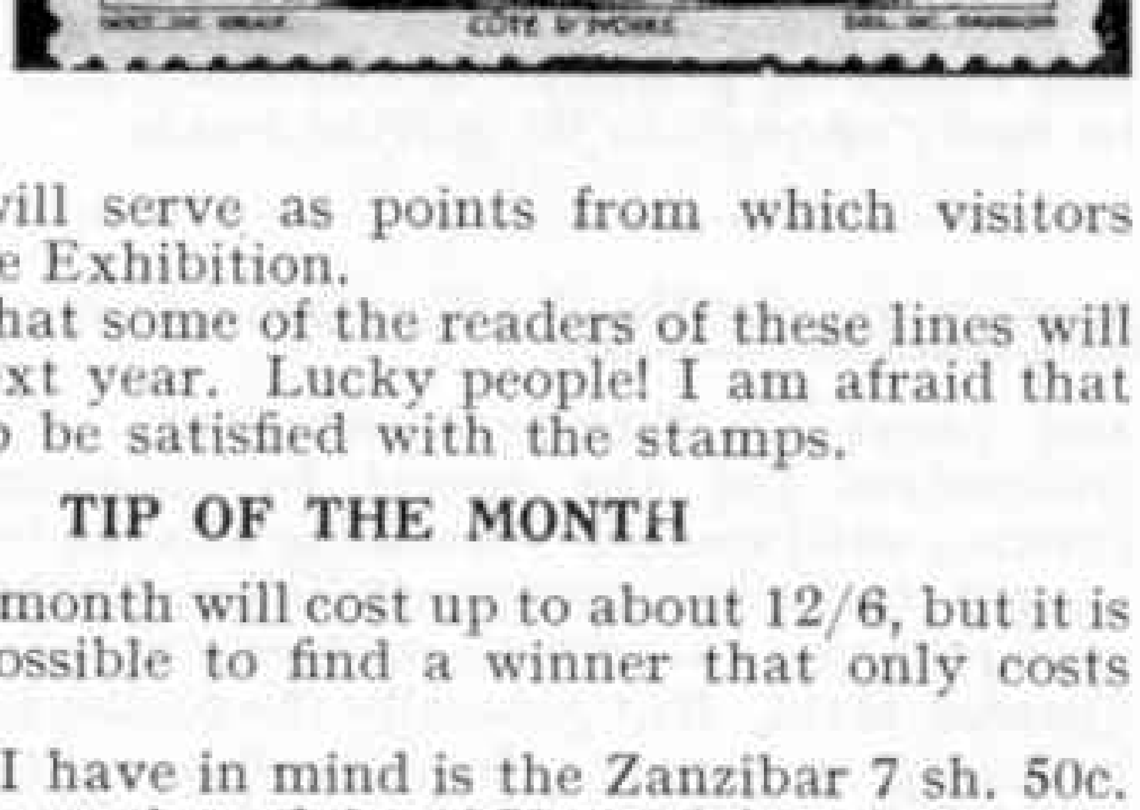
I think it is quite a good idea to collect these postmarks, particularly the foreign ones. Nicely mounted, with an English translation written underneath each, they would make up an inexpensive collection of interest to yourself and to all your friends, even if they don't collect stamps. Incidentally, Switzerland releases beauties from time to time.

ATOMIUM

Phew, what is happening to our world? When we erected those funny looking objects at the London Festival, we thought they were the last word, as they probably were. But just take a look at the Belgian stamp illustrated here. It was issued as advance publicity for the Exhibition to be held in Brussels next April.

And all those balls, what do you think they represent? Each of those spheres will be 60 ft. in diameter, and they will be connected by tubes ten feet in diameter. The whole structure will actually be 120 yards high, so it will be visible from a long way off, and not just from the Exhibition grounds in which it will be erected.

The public will be able to visit the spheres by escalators. The lower spheres will house displays showing the peaceful uses to which atomic energy can be harnessed, and the upper ones will serve as points from which visitors can survey the Exhibition.



I suppose that some of the readers of these lines will see all this next year. Lucky people! I am afraid that I will have to be satisfied with the stamps.

TIP OF THE MONTH

My tip this month will cost up to about 12/6, but it is not always possible to find a winner that only costs coppers.

The stamp I have in mind is the Zanzibar 7 sh. 50c. (used) which was issued in 1952, and has just been replaced by another stamp in the new set. There are quite a lot of used Zanzibar stamps about, which means that there are plenty to make up into sets, with the exception of this value, which has been very rarely used. I think a copy could be obtained for 12/6 now, but its value should increase quite a lot as time goes on. So if you are interested act now.

The Star of Bethlehem—*(Continued from page 583)*

out that the light from even the nearest takes hundreds of years to reach us. It is therefore difficult to believe that the Star of Bethlehem comes into this category. To do so would mean that a Star created centuries before it became visible from the Earth was the harbinger of the Nativity, and this idea is directly contrary to all testimony about the phenomenon. All accounts show that the Star of Bethlehem was something that appeared for only a brief time, too. But it is unlikely that it could have been an unidentified comet, since with few exceptions comets follow orbits that involve their reappearance. Yet it might of course have been a comet that was one of the exceptions and became lost to us.

The more this Christmas mystery is investigated, the harder it seems to solve. Historians and geographers, as well as astronomers, have applied their knowledge to it. For instance, historians have pointed out that comets were long regarded as omens of evil, and that if the Star were such a celestial body it is hard to understand why it was welcomed by the Wise Men.

Geographers have helped astronomers' investigations by determining as far as possible the route from the East to Bethlehem 2,000 years ago. At that distant period the journey would probably follow a somewhat different route than might be expected today, and information about the old trails has helped to show whether certain planets and stars could in fact have served as a guide to the Manger.

All in all, however, the most that can be said with certainty about the Star of Bethlehem is that it was no imaginary or allegorical phenomenon. Even 2,000 years ago the science of astronomy existed, mariners having some knowledge of it, and the celestial light marking the first Christmas must have been exceptional to be regarded as a harbinger of glad tidings.

Whether we look upon it as a miracle or a heavenly marvel capable of scientific explanation, it remains a wonder still.

People and Craft of the Narrow Canals—
(Continued from page 588)

Talking of *The Friendship*, what magic there is in the names of boats and what scenes the memory conjures up when we see *Sunny Valley, Forget-me-Not, Clygate, Aster* and other beautiful names!

Much has been written about the education of the canal boat children. They are the product of a folk who are skilled in their own job, and you should see some 10-year-olds handling a pair of boats! Illiterate some of them may be by "modern" standards, yet they have an outlook and psychology that would give a lead to many people "off the land." We are proud of our association with them.

In closing, a word of warning please. If you should perchance be on a lock side when some boats are locking through, do *not* stand and stare into the cabin. It is the boatman's home. He is justly proud of it, and values its privacy. Get to know him and you may be lucky enough to be invited inside.

Rockets are not New!—*(Continued from page 615)*

and range of European weapons. The Europeans themselves put the rocket to occasional use. The Italians used rockets with some success in their private wars of the 14th Century, and British pirates occasionally used rockets to set fire to the ports they besieged on the Spanish Main. But generally the rocket found little use in European warfare, because of the erratic flight and unpredictable range of the crude rockets used. They could only be used against a large target, such as a besieged city.

Meanwhile, in India, war rockets had developed to a stage where they could be used against troops and small targets, such as individual buildings. The Indian rocket of the 18th Century was contained in an iron tube and guided by a long bamboo pole. These rockets were fitted with explosive, fragmentation and incendiary shells in their heads. They were probably used for the last time at the battle of Seringapatam, Mysore, in 1799, when Prince Tipu Sahib used more than five thousand rocket throwers in his fight against the British. Regiments of rocket throwers were at this time an integral part of many of the Indian Armies.

The effectiveness of the Indian rocket revived interest in Great Britain and Colonel (later Sir) William Congreve developed a rocket with a range of three thousand yards and weighing up to forty pounds. Two hundred of Congreve's rockets were first used against the French at Boulogne on the evening of 8th October, 1806, setting fire to part of the town. Spurred on by their success, the British Navy used over forty thousand rockets in the Battle of Copenhagen. But so many of the rockets hit British ships, or even returned to their senders, that the Navy was reluctant to put them to further use.

Congreve continued to develop his rocket, however. He fitted shells to increase their military usefulness and in 1812 the British Rocket Brigade was formed and saw action against Napoleon's Army. The British also used rockets against the Americans at the Battle of Bladensburg in 1814. But with the rapid improvements in artillery during the 19th Century the rocket lost favour as a military weapon and was almost forgotten for a century. Then the modern rocket appeared, during World War II, in the form of the famous Bazooka, followed by a large variety of naval and aircraft rockets, and finally by the German V-1's and V-2's. Congreve's rocket was not completely forgotten, however, since it continues to be used to this day as the well-known life-saving rocket to be found in Coast Guard Stations all over the world.

Running a Hornby Engine—*(Continued from page 610)*

probably will be used for passenger or goods traffic. It will therefore have to divide its time between the two kinds of services, and this will lend variety to the working that will be found quite enjoyable.

As the layout develops, perhaps another engine will become available and then the duties of the two can be made to fit in with one another in a realistic manner. They can take turns at working passenger and goods trains perhaps, or it may be that you will prefer to keep each one to its own particular kind of duty.

Look at the pictures on pages 609-610. I hope they will help to give you one or two ideas. In the first one the No. 40 Tank begins its day by taking a Goods Brake Van along the line to pick up some wagons. In the second, the No. 50 Locomotive is hard at work and then, finally, we see engines "at home". The tender engine is in fact "ready for off" again and is only waiting for the Points to change.

Meccano Tank Locomotive—*(Continued from page 625)*

connected by a 5½" Strip, pivoted on ⅜" Bolts fixed in the Angle Brackets by two nuts each.

The bogie is a Flanged Sector Plate and its wheels are 1" Pulleys with Rubber Rings fixed on 3½" Rods. A ½" Reversed Angle Bracket is bolted tightly to the Flanged Sector Plate and is lock-nutted to the centre of Double Angle Strip 3.

Parts required to build the Tank Locomotive: 10 of No. 1; 10 of No. 2; 2 of No. 3; 8 of No. 5; 2 of No. 6a; 2 of No. 8; 8 of No. 10; 3 of No. 11; 12 of No. 12; 2 of No. 12a; 4 of No. 12c; 2 of No. 15b; 2 of No. 16; 1 of No. 17; 5 of No. 22; 2 of No. 22a; 1 of No. 24; 2 of No. 24a; 2 of No. 24c; 1 of No. 26; 4 of No. 35; 118 of No. 37a; 110 of No. 37b; 16 of No. 38; 2 of No. 38d; 1 of No. 45; 8 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 4 of No. 90a; 2 of No. 111a; 6 of No. 111c; 1 of No. 115; 3 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 147b; 4 of No. 155; 4 of No. 187; 4 of No. 188; 2 of No. 189; 4 of No. 190; 2 of No. 191; 4 of No. 192; 2 of No. 199; 2 of No. 200; 1 of No. 212; 2 of No. 214; 2 of No. 222.

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.

"Highests"

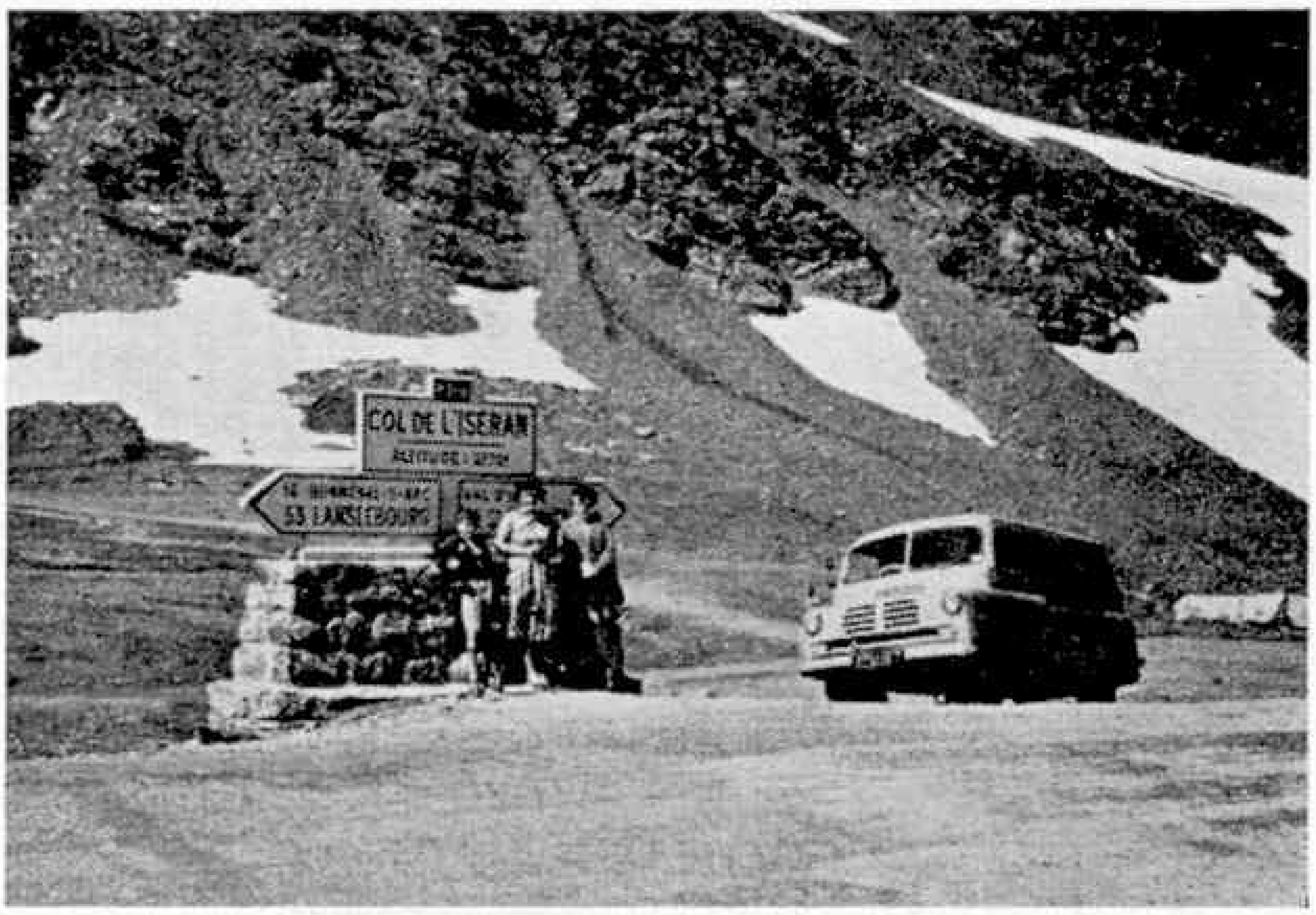
In Geneva, on a recent Swiss tour, I saw a fountain that claims to be the highest in the world. It certainly beats that at Chatsworth, since its height is 300 ft.

On the same trip, I saw also the highest cable railway in the world, up to the top of the Aiguille du Midi (12,600 ft.) from which we had a close-up view of Mont Blanc (15,780 ft.) the highest mountain in Europe.

Then we drove along the road across the top of the Barrage de Tignes, the dam with the highest wall in Europe, 590 ft. in height, including foundations.

Finally we went over the Col de l'Iseran, at a height of 9,088 ft., the highest road in Europe.

N. A. Jones (Great Baddow).



At the summit of the Col de l'Iseran. Photograph by N. A. Jones, Great Baddow.

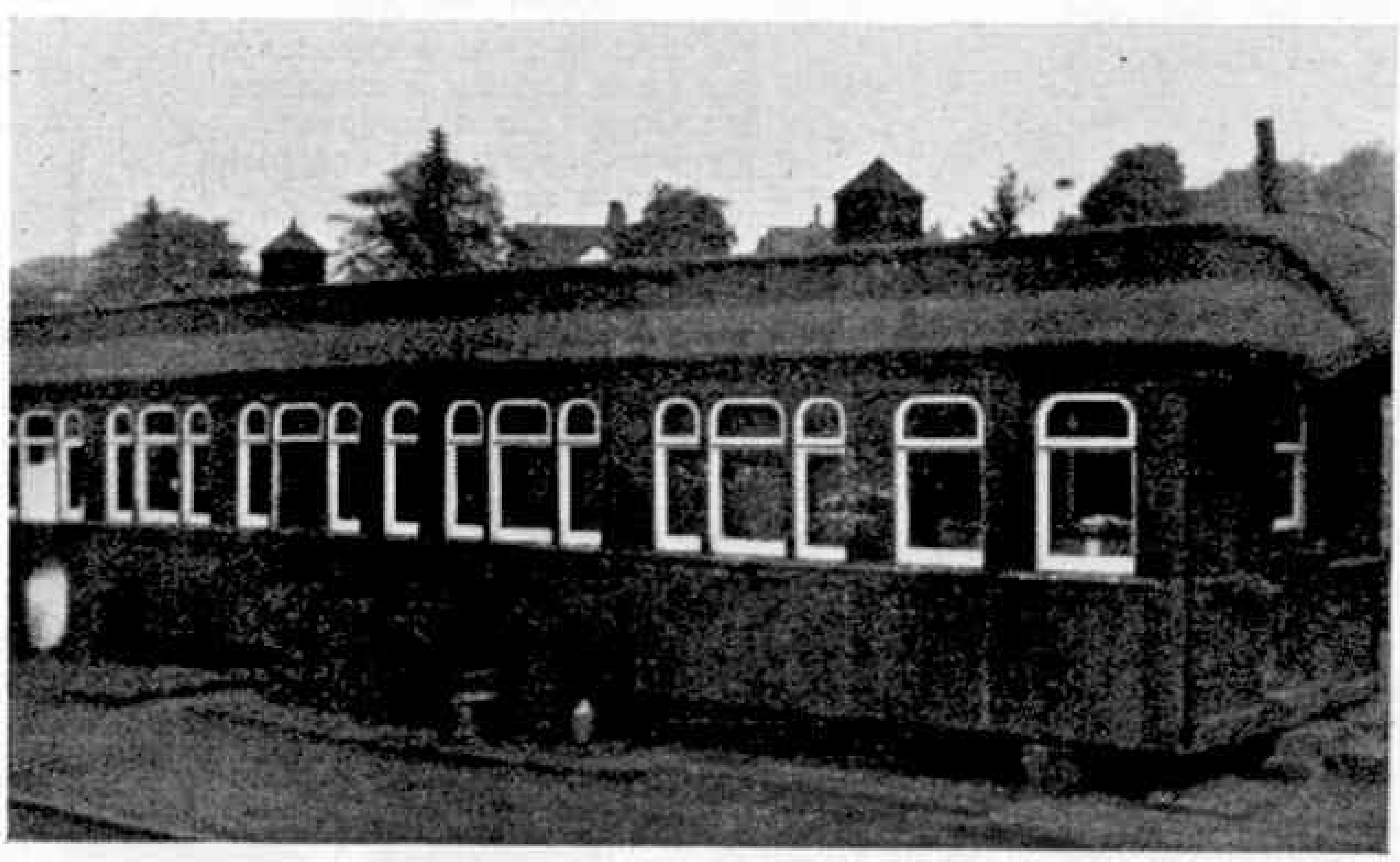
A Midland Railway Relic

An interesting reminder of the days of elegant railway travel is seen in the accompanying picture. It is an original Pullman Car of the old Midland Railway, built in 1874 by the Pullman Car Company of America. It was shipped here to this country in parts and assembled at Derby.

The car was luxuriously appointed, with lovely furnishings and fancy window lights. It ran on the Midland and about 40 years ago it was sent to Cheadle Heath station, near Stockport, to be used as a mess hut.

It is interesting to hear one of the old timers speak of the difficulty in unloading the car on its arrival there. It is used now as a foreman's office and workmen's hut, being divided into two sections.

It is in excellent condition, although when it was intended to move it recently, it was found that it had settled in the centre. P. B. Carrier (Cheadle Heath).

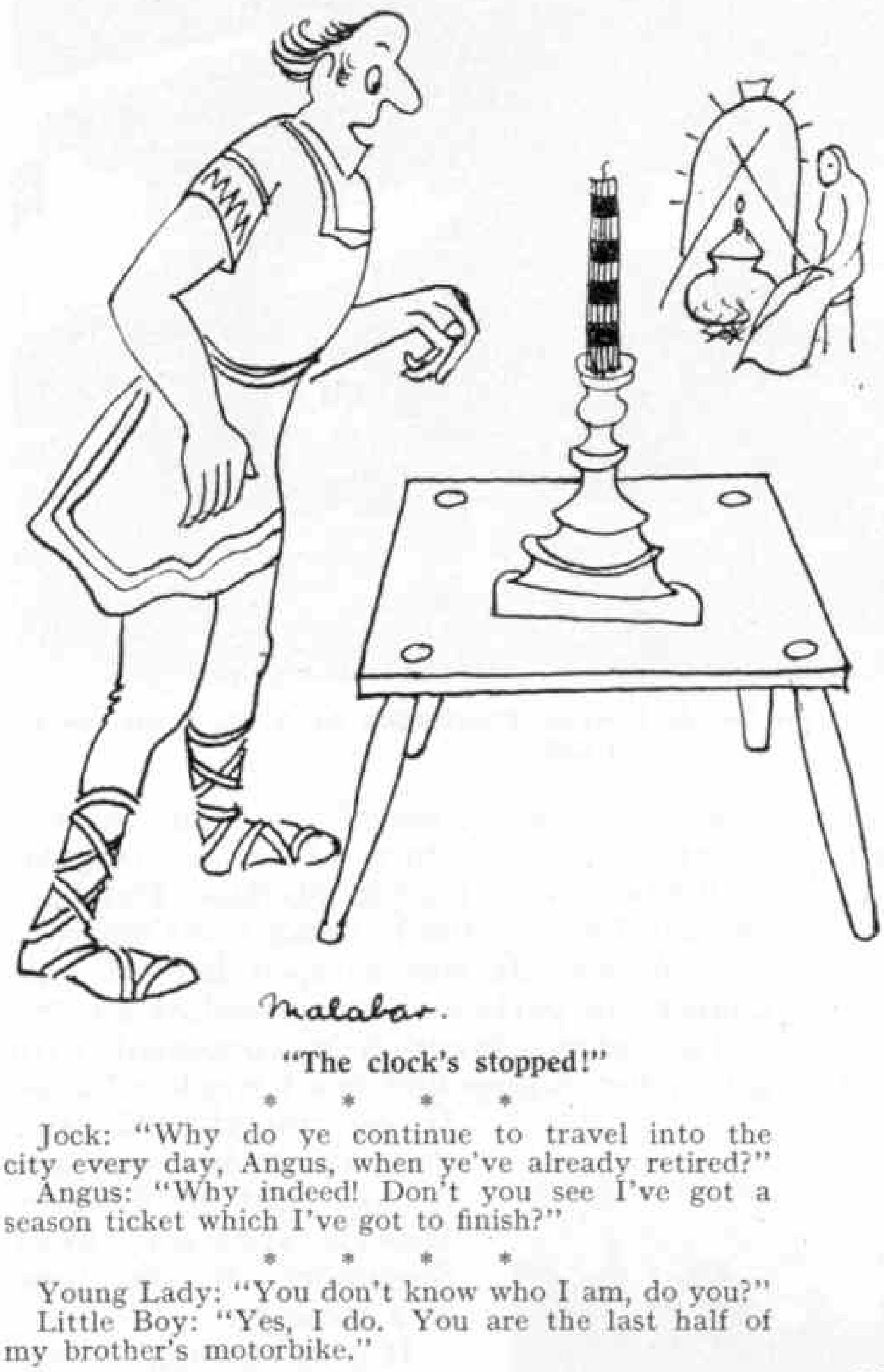


A Pullman Car built in 1874 for the former Midland Railway. Photograph by P. B. Carrier, Cheadle Hulme.

Fireside Fun

Teacher: "Can anyone tell me what a man of mettle is?"
Tommy: "A man with copper hair, steel eyes, a bronze complexion, iron jaws and a brass neck."

* * * *



"The clock's stopped!"

* * * *

Jock: "Why do ye continue to travel into the city every day, Angus, when ye've already retired?"
Angus: "Why indeed! Don't you see I've got a season ticket which I've got to finish?"

* * * *

Young Lady: "You don't know who I am, do you?"
Little Boy: "Yes, I do. You are the last half of my brother's motorbike."

* * * *

Mean motorist: "I want a glass of water in the radiator, a teacup of oil for the crankcase, and a pint of petrol. I think that's all."
Attendant: "Then you wouldn't want me to cough into your tyres?"

* * * *

"What do you do when you pull away from the kerb, madam?" asked the driving instructor of his new pupil.
"Well," she answered unhesitatingly, "I usually scrape the mudguard of the car in front."

* * * *

"Yes, ma'am," said the sailor, relating his experience to an old lady. "I was torpedoed in the Atlantic and lived for a week on a tin of sardines."
"Dear me," said the old lady, sympathetically, "how did you keep from falling off?"

Small boy: "It's raining, daddy."
Father (reading newspaper): "Oh, let it rain."
Small boy: "I was going to, daddy."

* * * *

For the umpteenth time the prisoner stood before the judge.
"I thought I told you the last time you were here that I never wanted to see you again?" the judge declared sharply.
"You sure did Judge," said the man, "and I wish you'd tell these policemen that. They wouldn't believe me."

* * * *

Hostess: "Our dog is just like one of the family."
Bored visitor: "Which one?"

* * * *

New Lodger: "But you told me in your letter that there was a beautiful view for miles."
Landlady: "Well, so there is. Just put your head out of the window and look up!"

* * * *

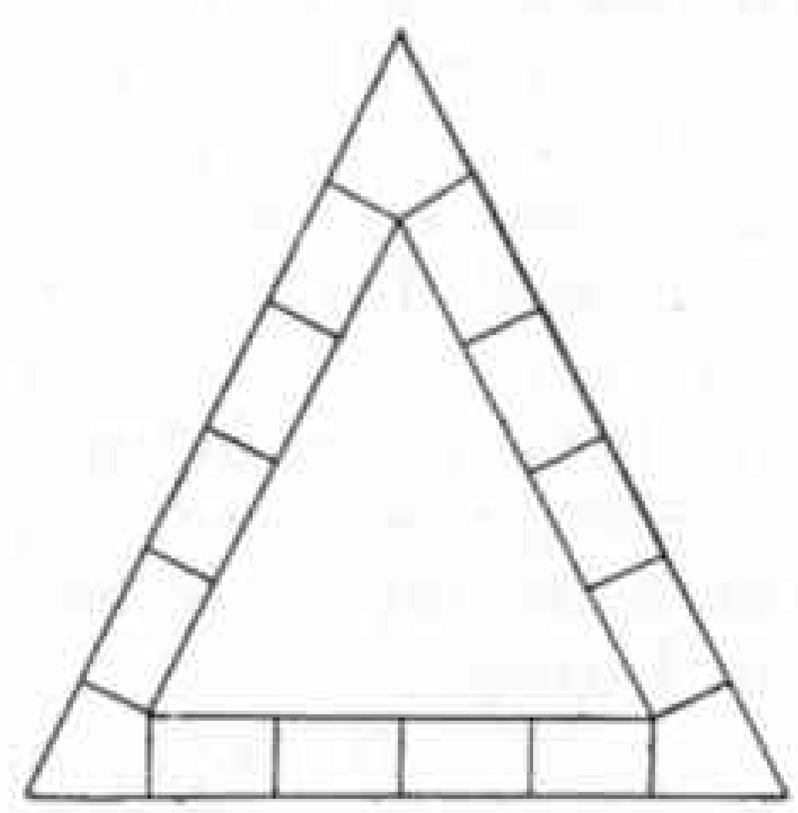
Science Master: "Now boys, you will notice that this machine is turned by a crank."
And he wondered why they all laughed.

* * * *

BRAIN TEASERS FOR THE CHRISTMAS PARTY

A TRIANGLE OF NUMBERS

The triangle shown below contains fifteen compartments. What different numbers must be placed in each compartment so that the total of all the numbers on each side of the triangle is 84?



ALL "SMITHS"

1. The scene of a famous siege.
2. A London one.
3. Could be an author or a worker in precious metal.
4. You'll find this one in a poem.
5. Not so valuable as No. 3 but very useful.
6. This one keeps us safe.

* * * *

WHAT AM I?

My first denotes a company.
My second shuns a company.
My third calls a company.
My whole amuses a company.
What am I?

* * * *

ANSWERS TO LAST MONTH'S PUZZLES

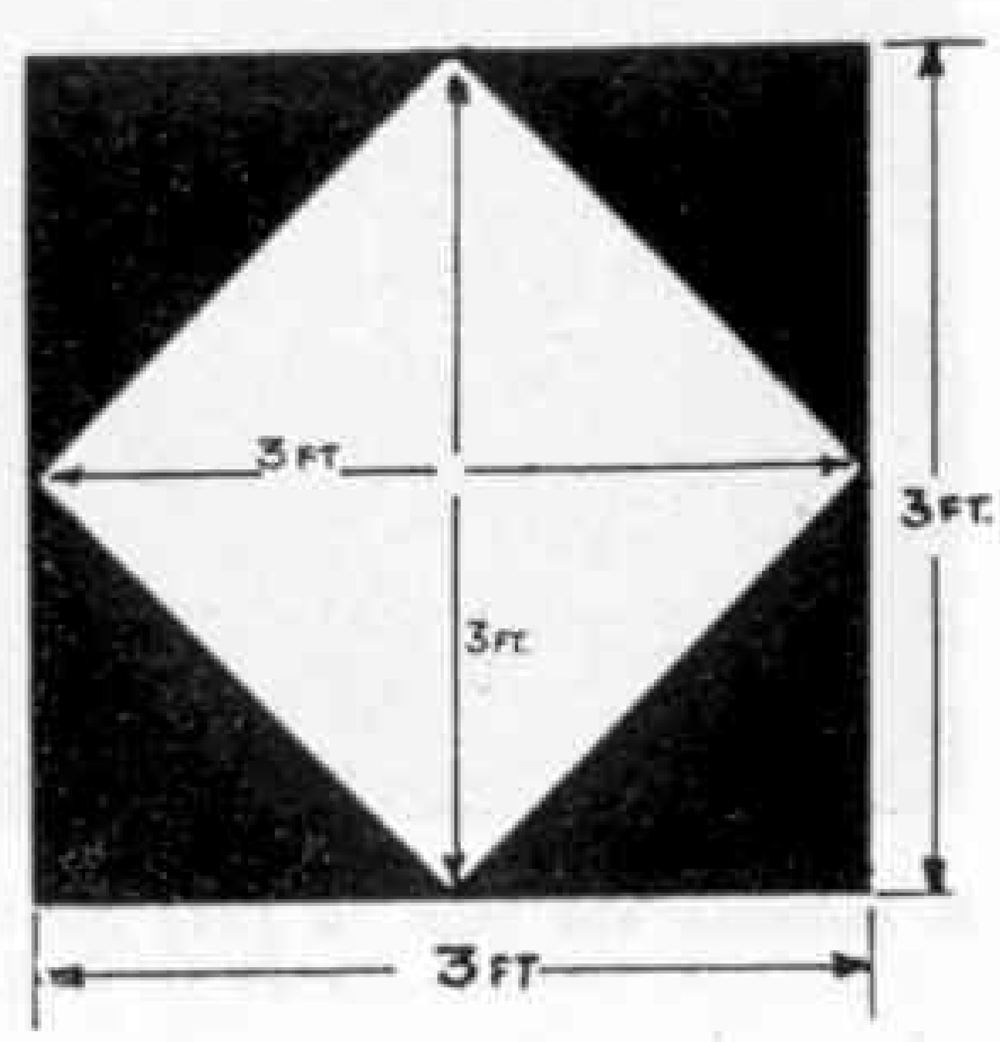
The Eggs Puzzle

There were 301 eggs in the store.

* * *

The Magic Window

The sketch herewith shows how the window was blocked off so as to leave a square window 3 ft. high and 3 ft. wide.



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Vol. XLII
Jan.—Dec., 1957


It's more fun to
PLAY SAFE!
DON'T LET ACCIDENTS KEEP YOU OUT OF THE GAME
Going skating? Don't fall in! Make sure the ice is not too thin
DANGER
At winter sports you must be bold But wrap up warm or you'll catch cold
It's fun to have a snowball fight But don't use stones— it isn't right!
—AND HERE'S ANOTHER GOOD TIP! Remind Mother that chewing delicious Wrigley's Spearmint Chewing Gum is naturally good for your teeth and won't fill you up between meals. Ask her to buy you some today.
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SPEARMINT
CHEWING GUM

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GUARDS VAN	**FRUIT VAN**	**HIGH OPEN**
PETROL TANK	**MEAT VAN**	**ALL-STEEL**

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(*see also pages 630 and 632*)

READERS' SALES AND WANTS

SALES

"M.M.s" 1953-1955, excellent condition. Also January-June 1956, February and July 1951, May 1950. Highest offers—Michael Hogg, 21 Petrie Crescent, Elgin, Moray, Scotland.

Bayko Building Set 4—many Accessories, £3/10/-, o.n.o., good condition. Gibbons "Simplified Stamp Catalogue," 1953, 7/6.—Drake, 35 Tweedy Road, Bromley, Kent.

"M.M.s" January 1950-April 1956 (ten missing). Good condition. Offers?—McMellin, 103 Mount Road, Sunderland.

Stamp Album containing 900 Stamps. Any offers? 0 Gauge Accessories. S.A.E. for particulars.—Thackray, Millfield Lane, Easingwold, Yorkshire.

Bassett-Lowke Track, approx. 100 ft., two Parallel, two Left-hand Points, one Double Junction, £12 or nearest offer.—J. Parkins, The Barn, Snails Lane, Rockford, Ringwood, Hants.

"M.M.s" 1944-52; Buses Illustrated, 1-10; Railway Photographs, etc., Cheap. S.A.E.—Curtis, 54 Manor Drive, London N.20.

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"M.M.s" January 1944-January 1952, complete, 30/- o.n.o. Post free.—Marwood, Union, Birmingham 15.

"M.M.s" December 1948-October 1956. "Eagles" Vol. 1, No. 1-Vol. 6, No. 40. Offers?—P. Bowler, 5 Claremont Road, West Kirby, Cheshire.

"M.M.s" February 1950 to January 1957, 32/6. Also "B.O.P.s" January 1951 to September 1955, seven missing, 25/-. Good condition.—G. Fay, 1 Glenbank, Waterloo, Liverpool 22.

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WANTS

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Collector requires Obsolete Dinky Toys Army Vehicles (all types). State price and condition.—Twelves, 27 Chadvil Road, Cheadle, Cheshire.

Obsolete Dinky Toys, all types, state type, price, condition.—Morrice, 115 Urquhart Road, Aberdeen.

Dinky Tramcars and Motor Buses. Details and prices to—T. M. Deasy, 15 Perran Road, Tulse Hill, London S.W.2.

Obsolete Dinky Trams, Aeroplanes, Military Vehicles. Details to—Moisson, 43 Ryfold Road, Wimbledon Park, London.

Urgently required, obsolete Dinky Toy Chrysler Airflow, price, etc.—Skelding, 64 Fortis Green, East Finchley, London N.2.

Clockwork Gauge 0 4-4-2 Loco "Nord" Tender Wagon-Lits Coaches.—W. Howard, 23 Jesmond Dene Road, Newcastle-on-Tyne 2.

0 Gauge Hornby Loco. 4-6-2 L.M.S. *Princess Elizabeth*—Kennedy, 31 Wimblehurst Road, Horsham, Sussex.

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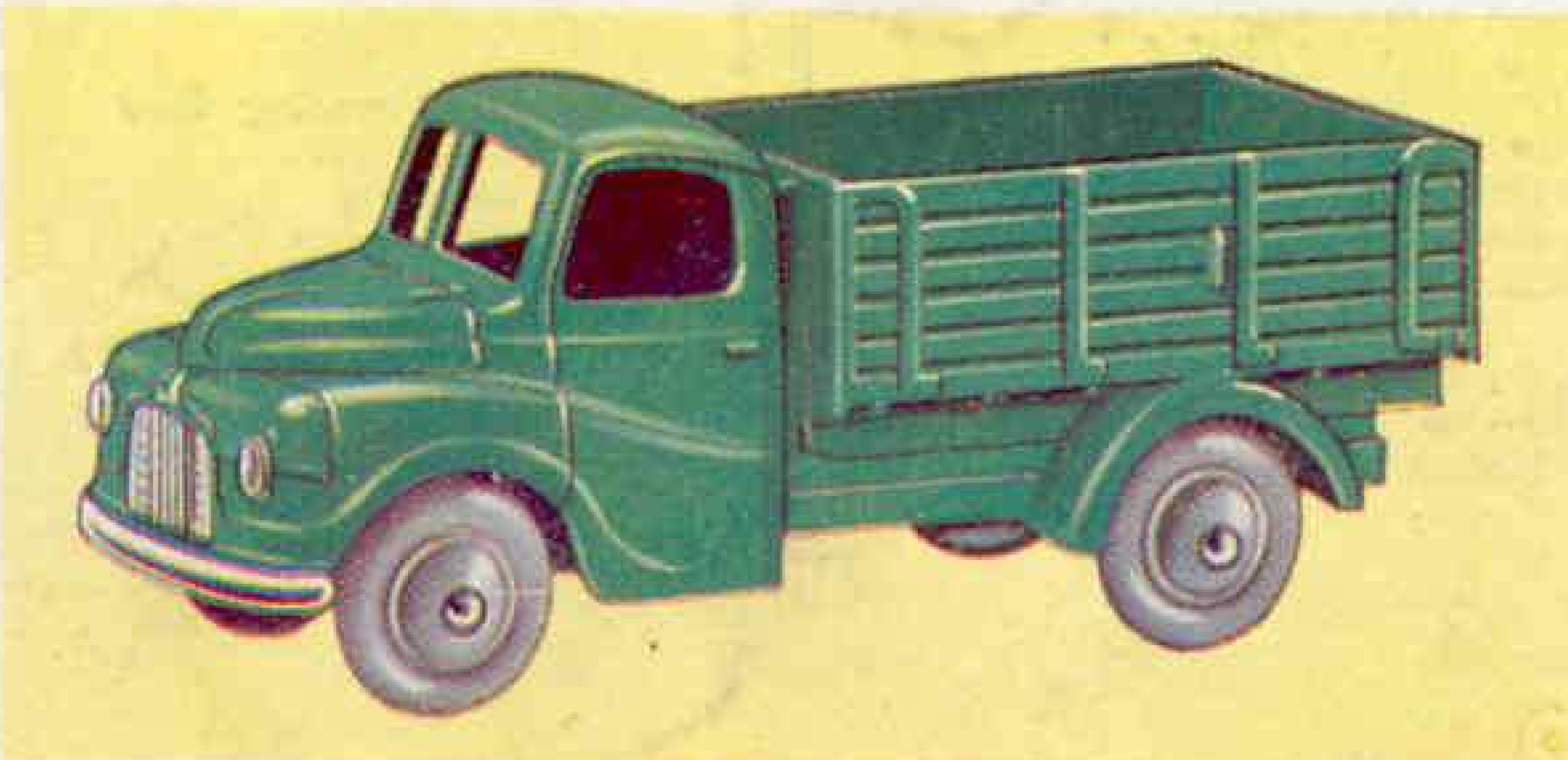

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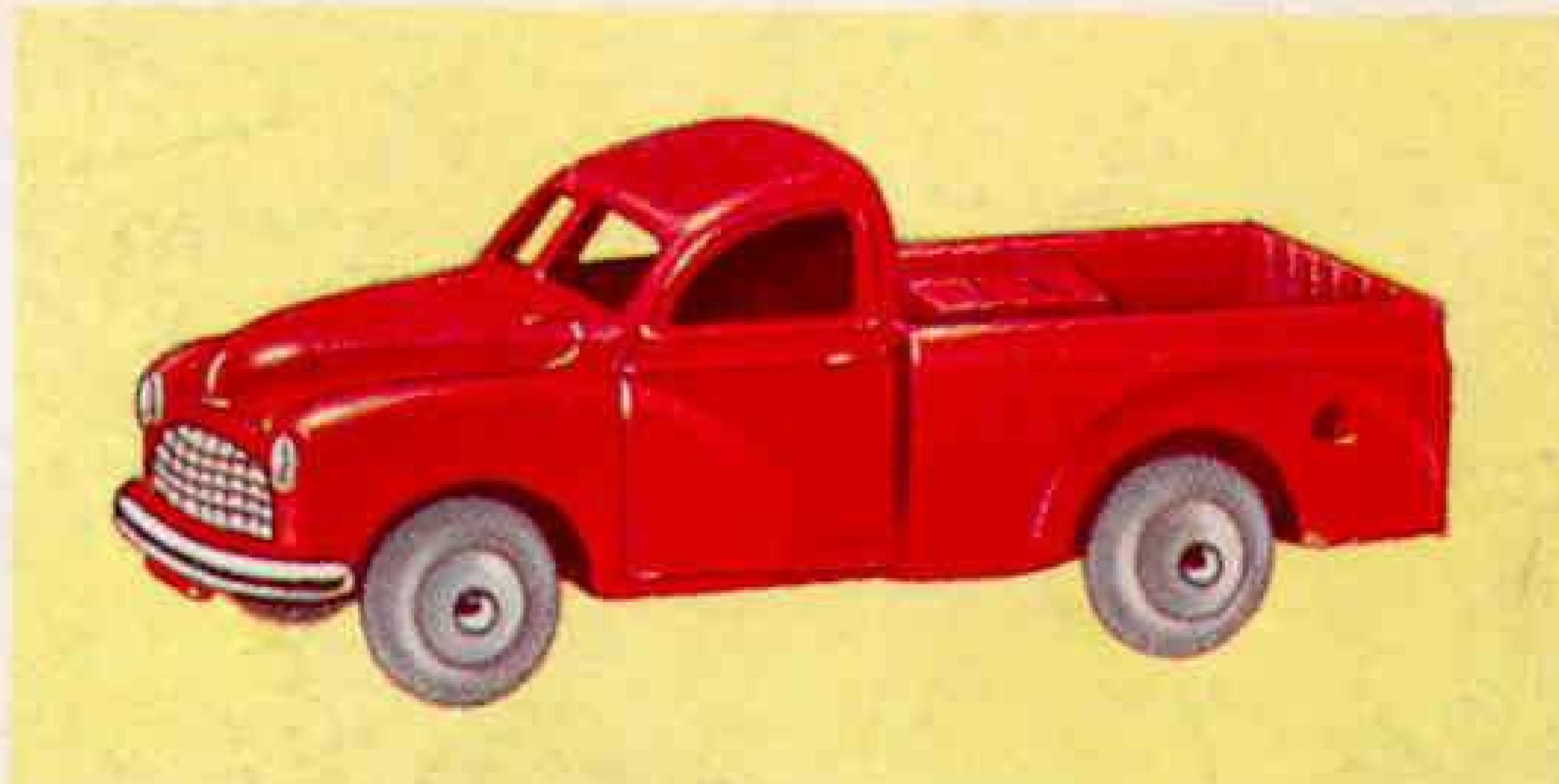

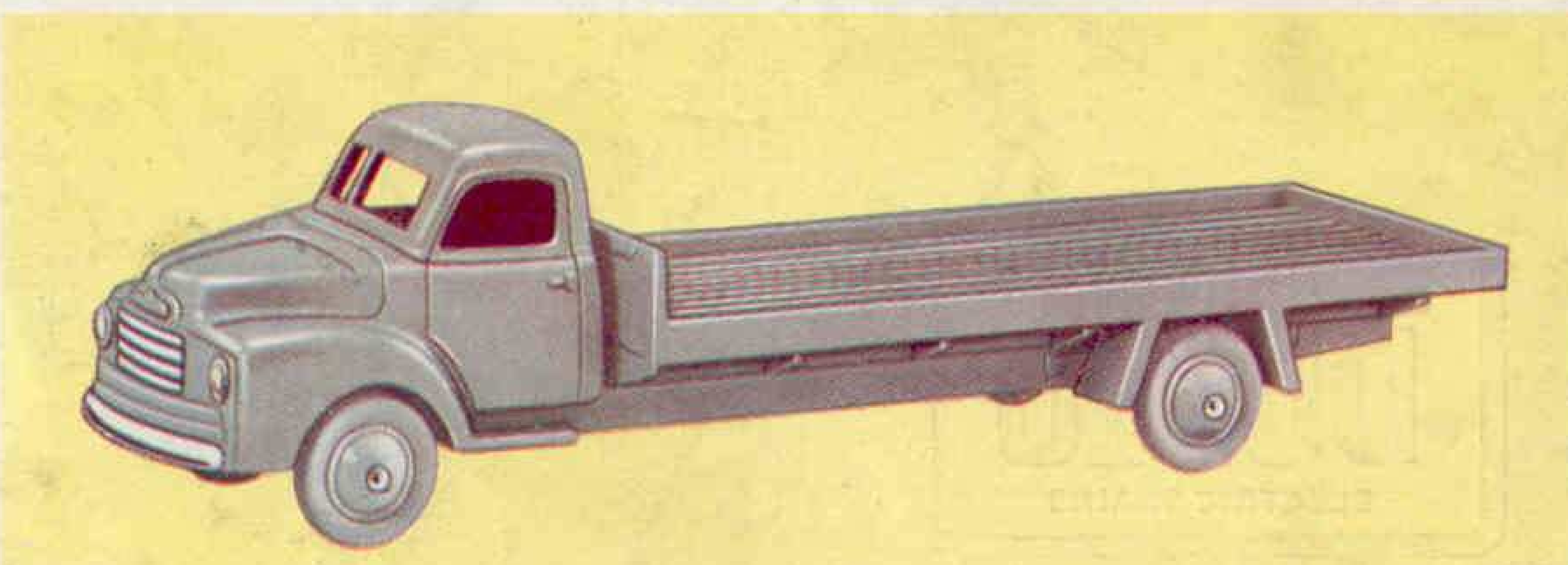

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MODEL OF THE MONTH

BIG WHEEL

Illustrated in the December 1957 issue of the Meccano Magazine

Details of the Base

The base structure is made by bolting together four $12\frac{1}{2}$" Angle Girders to form a square, with 1" Corner Brackets attached to the corners to raise the structure slightly. A $12\frac{1}{2}$" Angle Girder 1 is bolted across the square and two $9\frac{1}{2}$" Angle Girders are arranged between the Girder 1 and one side of the base. A $9\frac{7}{8}$" diameter Flanged Ring is bolted to the Girders as shown, and a $9\frac{1}{2}$" Strip with a Double Bent Strip attached centrally to it is fixed across the Flanged Ring. Another $9\frac{1}{2}$" Strip is bolted to $1\frac{1}{2}$" Angle Girders fixed to the $9\frac{1}{2}$" Angle Girders.

A 3" Rod mounted in the $9\frac{1}{2}$" Strips and the Double Bent Strip carries a $1\frac{1}{2}$" Contrate and is held in place by a Collar. The Contrate is spaced from the upper $9\frac{1}{2}$" Strip by four Washers, and engages a $\frac{3}{4}$" Pinion on an 8" Rod 2. This Rod is mounted in the Flanged Ring, in an Angle Bracket bolted to the base, and in a $2\frac{1}{2}$" Strip attached to the upper $9\frac{1}{2}$" Strip by Angle Brackets. The Rod carries a 1" Pulley 3 and a 57-tooth Gear 4.

Arrangement of the Roller Bearing

The hub of the bearing "spider" is a Face Plate, and to this eight $3\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips are bolted radially. Each Double Angle Strip supports a $4\frac{1}{2}$" Rod in its lugs, and each Rod carries a Collar and a $\frac{3}{4}$" Flanged Wheel with its boss spaced from the Double Angle Strip by four Washers. The boss of the Face Plate is free to turn on the centre 3" Rod, and the Flanged Wheels must rest freely on the upper edge of the Flanged Ring.

The Driving Mechanism

An E020(S) Electric Motor is bolted to one of the base Girders and to a $3\frac{1}{2}$" Strip 5. The Motor pulley is connected by a Driving Band to a $1\frac{1}{2}$" Pulley on a $1\frac{1}{2}$" Rod, which carries a $\frac{1}{2}$" Pinion 6 and is mounted in two 3" x $1\frac{1}{2}$" Flat Plates. These Plates are held by nuts on two $3\frac{1}{2}$" Screwed Rods, which are fixed by further nuts in the Girder 1 and one of the outer Girders of the base.

Pinion 6 drives a 57-tooth Gear on a $1\frac{1}{2}$" Rod also mounted in the Flat Plates, and a $\frac{1}{2}$" Pinion on the same Rod engages another 57-tooth Gear on a further $1\frac{1}{2}$" Rod. A $\frac{3}{4}$" Pinion on the latter Rod is arranged to mesh with the Gear 4.

Pulley 3 is connected by a Driving Band to a $1\frac{1}{2}$" Pulley loosely mounted on a 4" Rod 7 supported in $1\frac{1}{2}$" Corner Brackets. The Rod carries a Worm Gear, a 1" Pulley with Rubber Ring and a Collar fixed in position, and a Compression Spring and a $\frac{3}{4}$" Washer. The Compression Spring is placed next to the boss of the $1\frac{1}{2}$" Pulley and the $\frac{3}{4}$" Washer is arranged next to the Compression Spring.

A 4" Rod is mounted in a $2\frac{1}{2}$" Angle Girder bolted to the frame and in a $2\frac{1}{2}$" Angle Girder supported by a $3\frac{1}{2}$" Strip 8. One of the bolts fixing Strip 8 in place secures also a $1\frac{1}{2}$" Strip and a Double Bent Strip 9, and the other bolt carries two Washers to space the Strip from the frame

Two $2\frac{1}{2}$" Strips bolted to the 2" Angle Girder support two $2\frac{1}{2}$" Stepped Curved Strips that form a quadrant for a lever 10. This lever is a 3" Strip bolted to a Crank fixed on the 4" Rod. A Coupling 11 on the same Rod is fitted with two bolts that bear against the $\frac{3}{4}$" Washer on Rod 7. By moving the lever the loose $1\frac{1}{2}$" Pulley is pressed against the Rubber Ring on the fixed 1" Pulley, to complete a friction drive to the Rod 7. The Worm on Rod 7 meshes with a $\frac{1}{2}$" Pinion on a 2" Rod mounted in the $1\frac{1}{2}$" Strip and the Double Bent Strip 9. The 2" Rod carries a 1" Sprocket 12.

Assembly of the Supporting Columns

Two $9\frac{1}{2}$" Strips are bolted across a $9\frac{7}{8}$" diameter Flanged Ring and a $7\frac{1}{2}$" Circular Strip and a 6" Circular Plate are bolted to the Strips. Four Trunnions are fixed to the Flanged Ring, and each is used to support the lower ends of two $12\frac{1}{2}$" Angle Girders. The two Girders are joined by a Fishplate at their upper ends, and the pairs of Girders on each side are connected by a Flat Trunnion 13. Another Flat Trunnion 14 is attached to Double Brackets bolted to the Girders.

Two $12\frac{1}{2}$" Angle Girders 15 on each side are fixed to a Double Bracket bolted to the Flanged Ring, and are attached to Angle Brackets at their upper ends.

The Flanged Ring is placed on the central 3" Rod of the base, so that the Ring rests on the Flanged Wheels of the bearing. A $\frac{3}{4}$" Pinion is fixed on the Rod to hold the Flanged Ring in place. The $\frac{3}{4}$" Pinion engages a $\frac{3}{4}$" Contrate on a $3\frac{1}{2}$" Rod fitted with a 1" Pulley 16. The $3\frac{1}{2}$" Rod is mounted in Trunnions bolted to the 6" Circular Plate. A cover over the gearing is provided by a $2\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plate, two $2\frac{1}{2}$" Flat Girders and four $2\frac{1}{2}$" Angle Girders arranged as shown in the pictures. A length of Sprocket Chain pressed tightly round the upper Flanged Ring engages the teeth of the Sprocket 12.

Construction of the Wheel

Each side of the wheel is made by bolting sixteen $9\frac{1}{2}$" Strips to a Face Plate as shown, joining the outer ends of the Strips in pairs to form eight spokes. The spokes are connected by a ring of eight $3\frac{1}{2}$" Strips, and the two completed sides are joined by eight $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips Each carriage consists of a U-section Curved Plate opened out slightly and fitted with a $2\frac{1}{2}$" x 1" Double Angle Strip and two $\frac{1}{2}$" Reversed Angle Brackets. The Reversed Angle Brackets support a $2\frac{1}{2}$" Strip and the lugs of the Double Angle Strips are lock-nutted to the ends of the spokes of the wheel. A $\frac{1}{2}$" Bolt is attached to each spoke by two nuts, and a length of Cord is passed round these Bolts and round the 1" Pulley 16.

The wheel is mounted on a $6\frac{1}{2}$" Rod held by Collars in the Flat Trunnions 13 and 14.

The Steps and Loading Platform

The steps are formed by $7\frac{1}{2}$" Angle Girders and $7\frac{1}{2}$" Flat Girders bolted together, and they are attached to two $2\frac{1}{2}$" x $\frac{1}{2}$" Double Angle Strips 17 and two $2\frac{1}{2}$" Strips 18. The platform consists of two $5\frac{1}{2}$" x $2\frac{1}{2}$" Flexible Plates and two $2\frac{1}{2}$" x $1\frac{1}{2}$" Triangular Flexible Plates bolted together and attached to the upper step and to two $3\frac{1}{2}$" Strips fixed to the step. The inner edge of the platform is formed by two 4" Stepped Curved Strips attached to the Plates by three Fishplates. The handrails are made from Rods supported in Rod Sockets and Handrail Couplings. The platform is bolted to an Angle Bracket fixed to a 2" Strip 19, which is connected to the base by another Angle Bracket.

PARTS REQUIRED

36 of No. 1A	3 of No. 22	1 of No. 96
4 " " 3	3 " " 25	2 " " 103F
1 " " 4	3 " " 26	3 " " 103K
13 " " 5	3 " " 27a	3 " " 109
1 " " 6	1 " " 28	8 " " 111A
1 " " 6A	1 " " 29	18 " " 111C
17 " " 8	1 " " 32	1 " " 120B
2 " " 8A	294 " " 37A	16 " " 125
5 " " 8B	228 " " 37B	6 " " 126
6 " " 9D	64 " " 38	4 " " 126A
2 " " 9F	2 " " 38D	2 " " 133
7 " " 10	1 " " 40	4 " " 133A
6 " " 11	2 " " 45	4 " " 136A
9 " " 12	8 " " 46	1 " " 145
1 " " 13A	10 " " 48A	1 " " 146
1 " " 14	8 " " 48B	1 " " 155
8 " " 15A	21 " " 59	2 " " 167B
2 " " 15B	1 " " 62	4 " " 179
3 " " 16	1 " " 63	1 " " 186
1 " " 16B	2 " " 73	1 " " 186A
1 " " 17	2 " " 80A	1 " " 188
7 " " 18A	2 " " 89B	2 " " 192
8 " " 20B	2 " " 90A	8 " " 199
2 " " 21	1 " " 94	2 " " 221
		1 E020(S) Electric Motor.