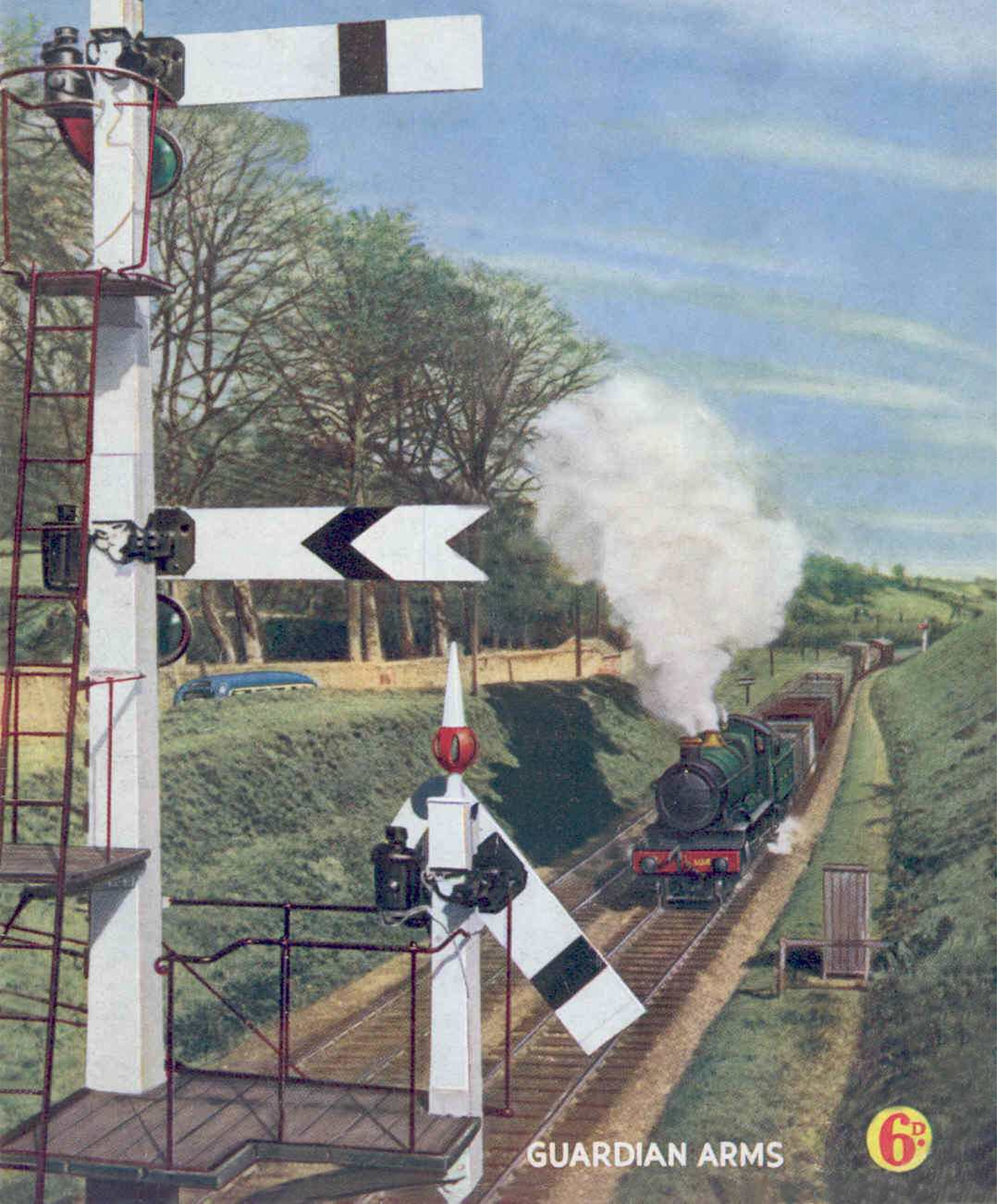


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JULY 1949

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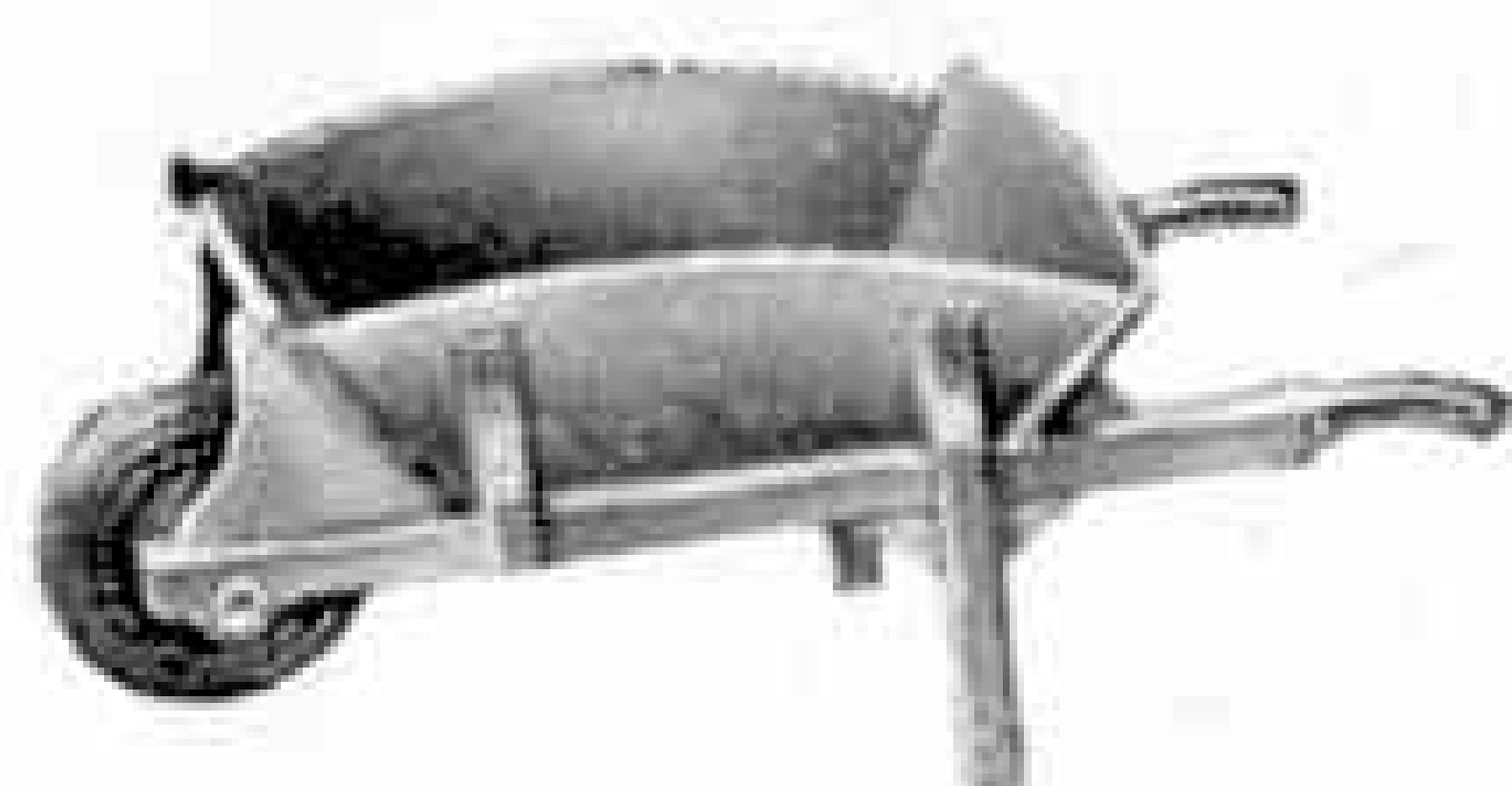
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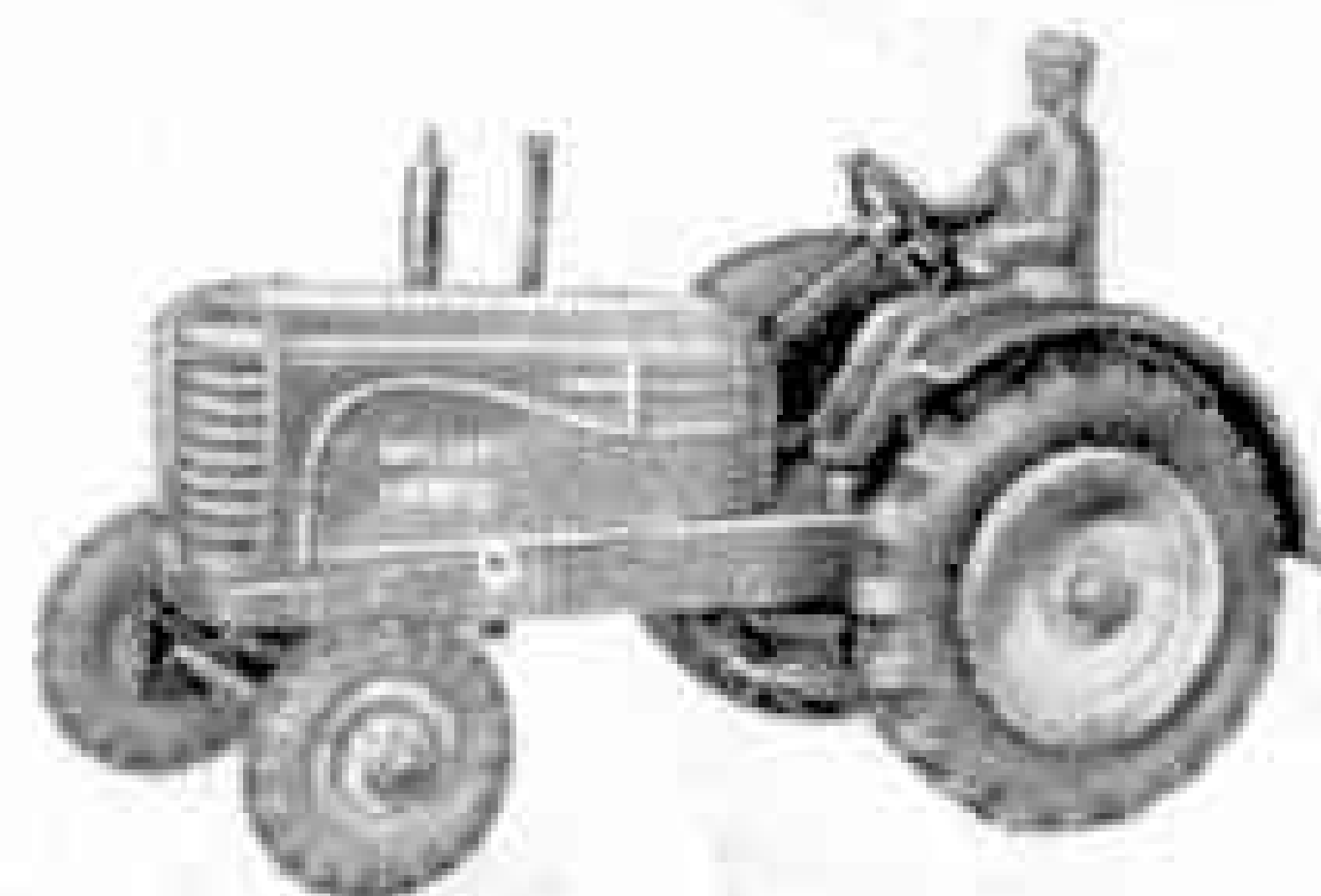
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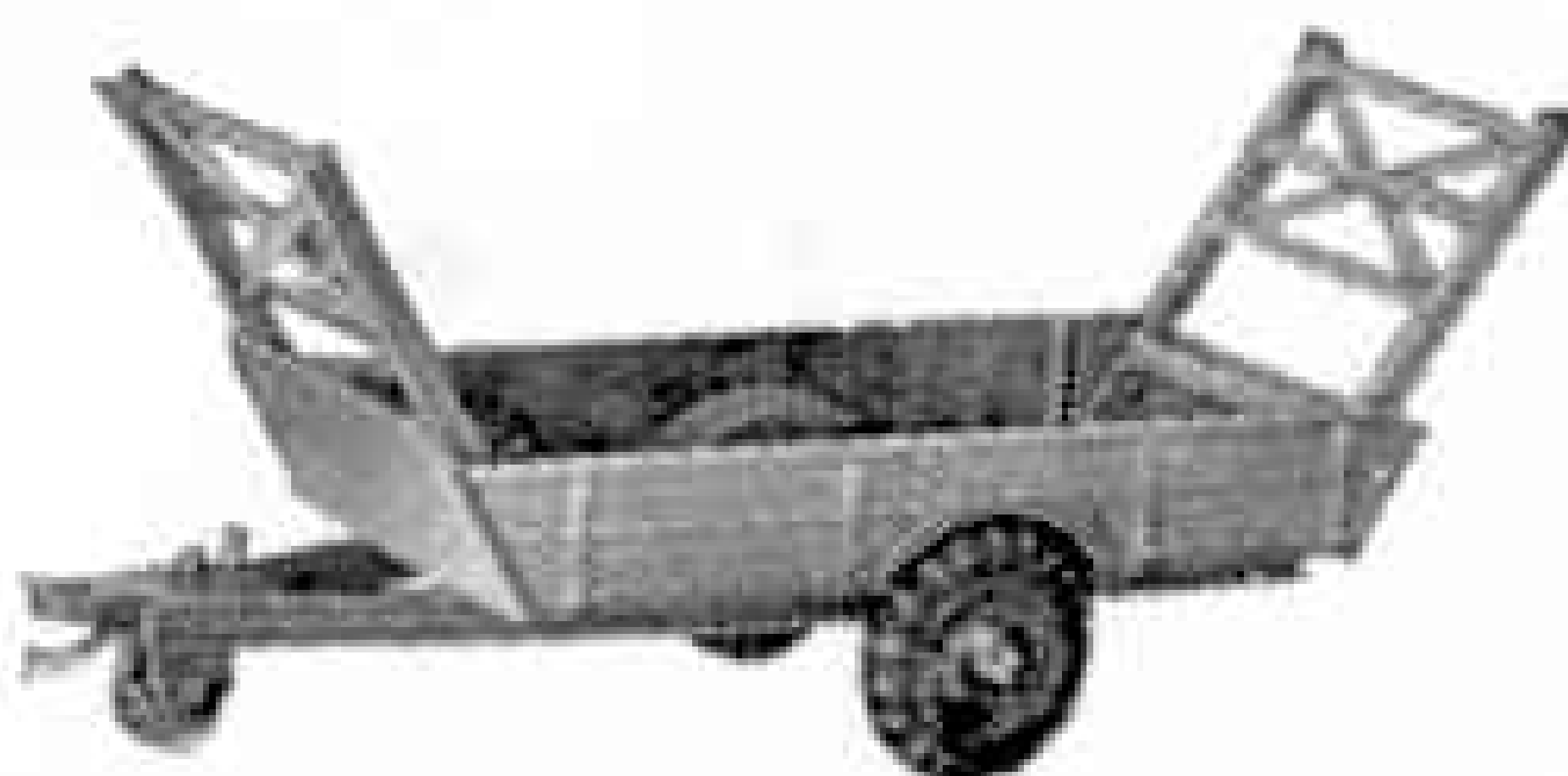
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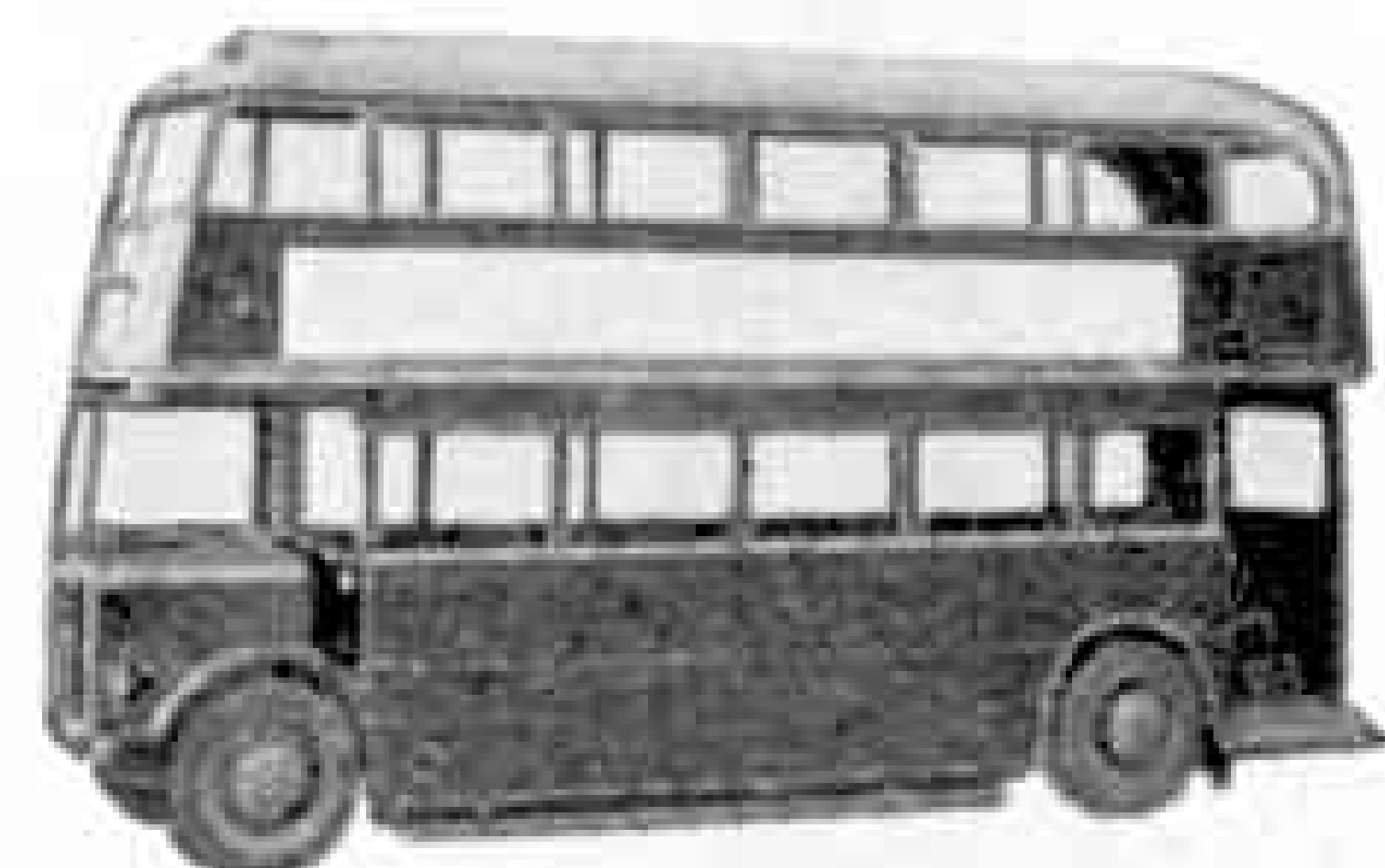
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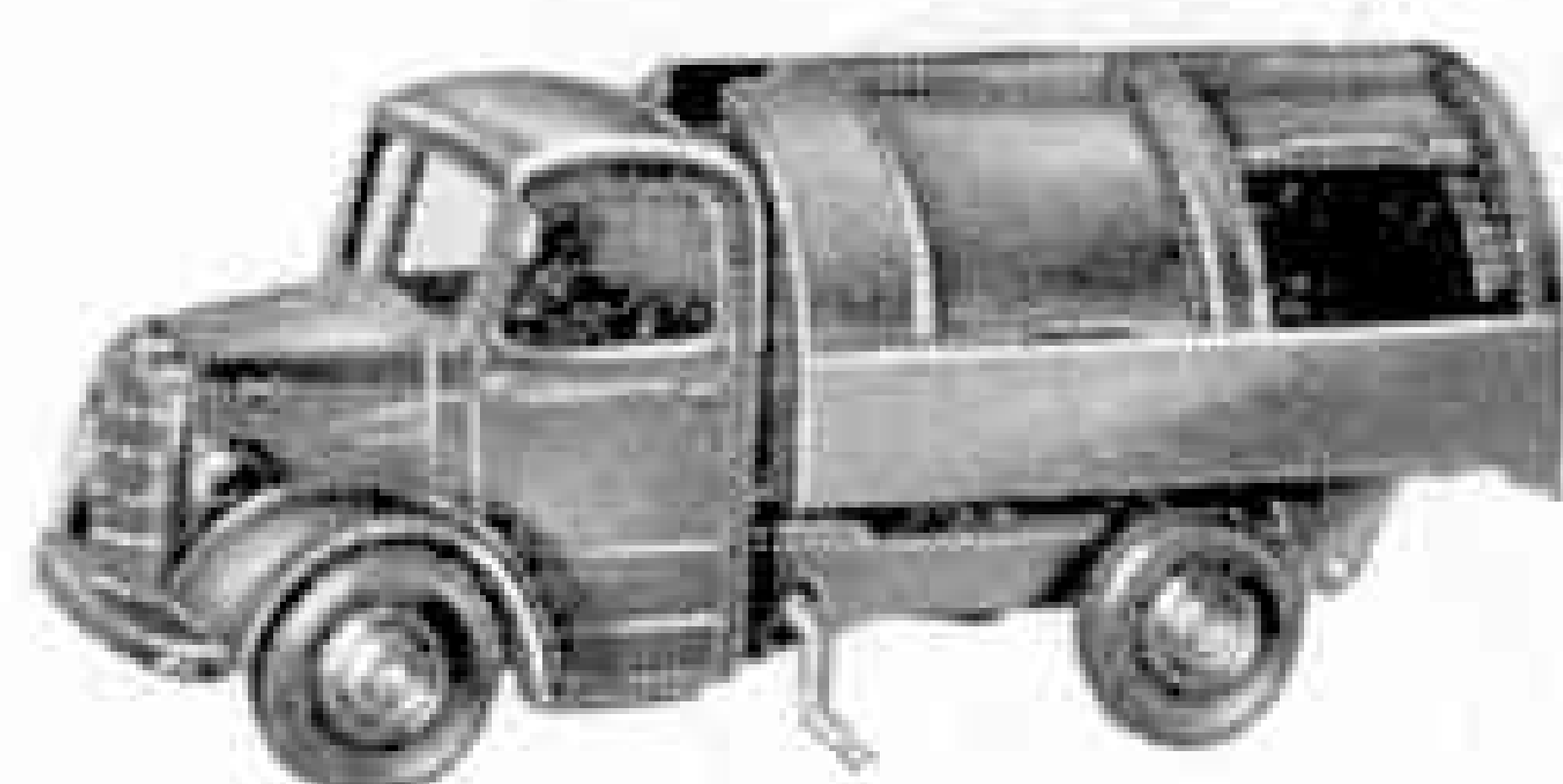
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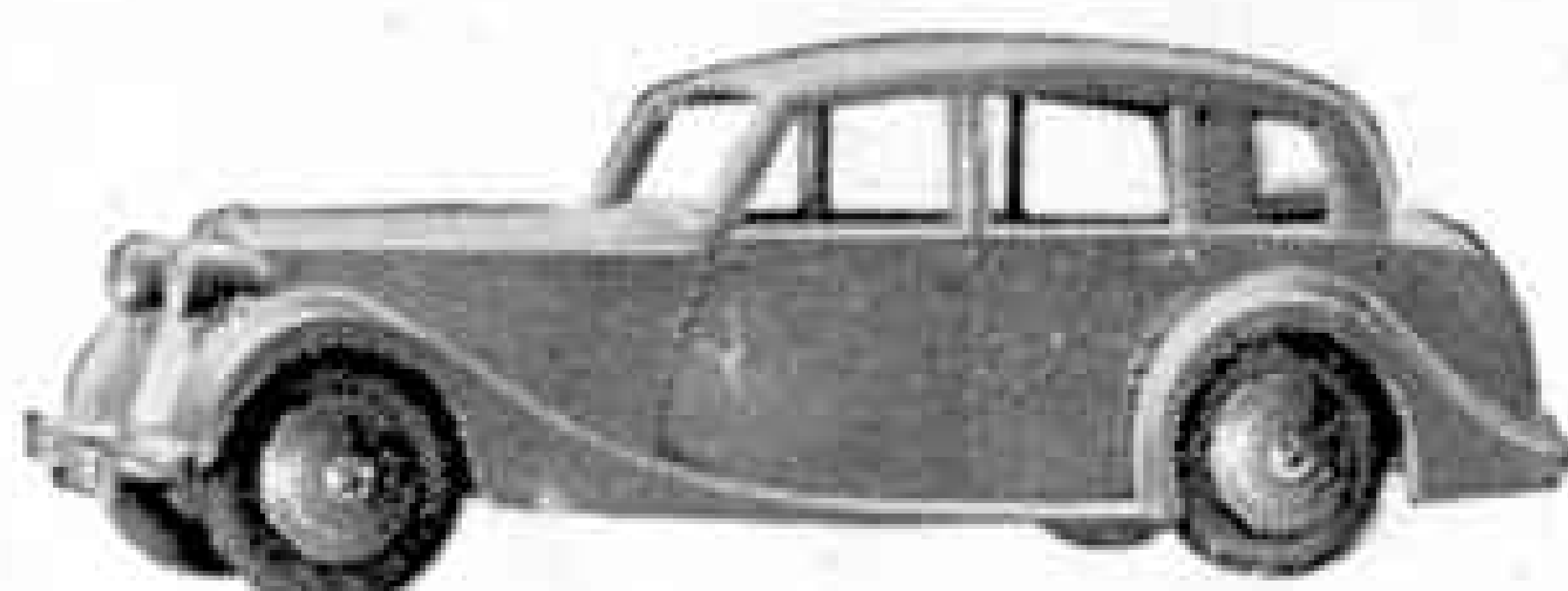
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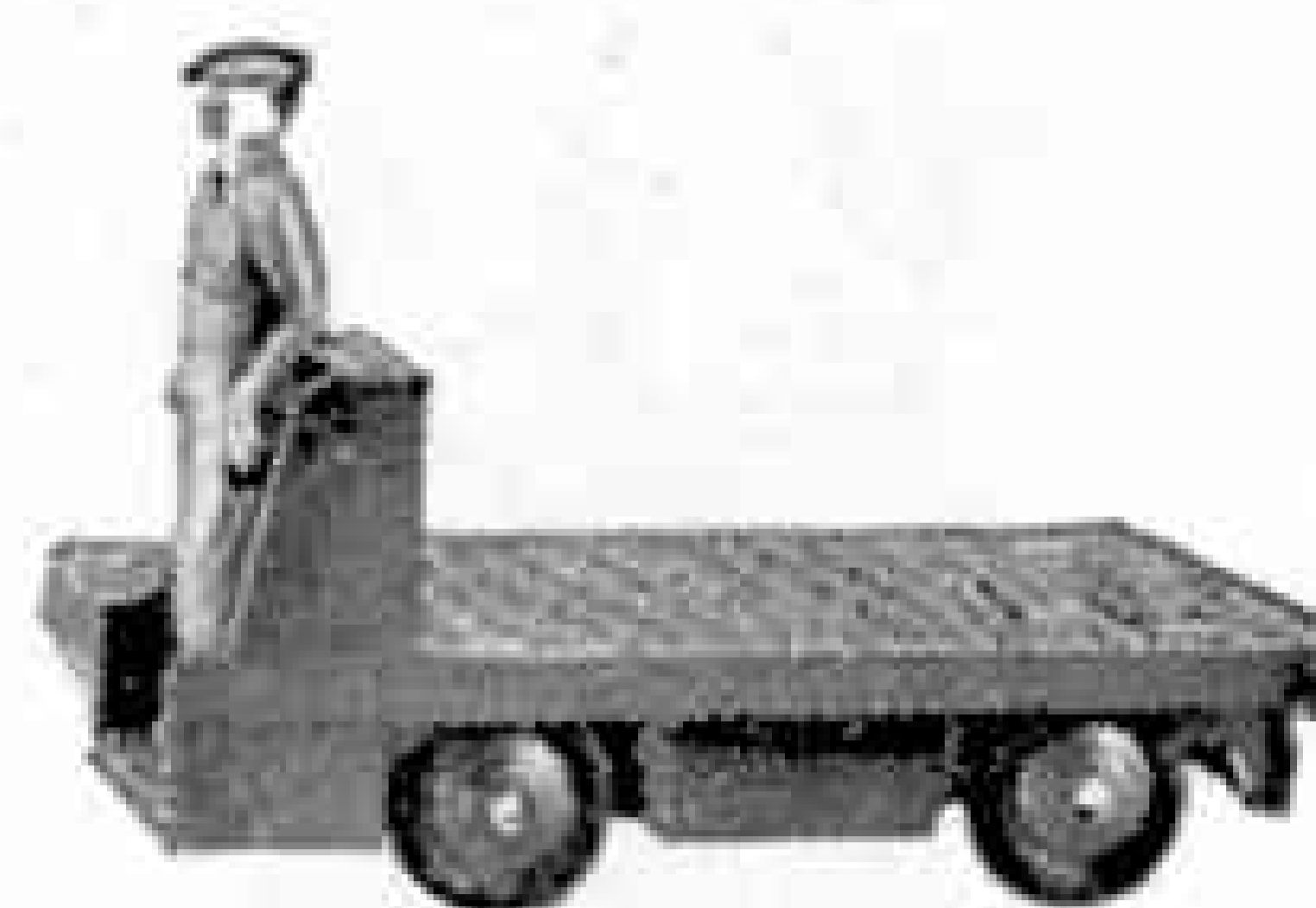
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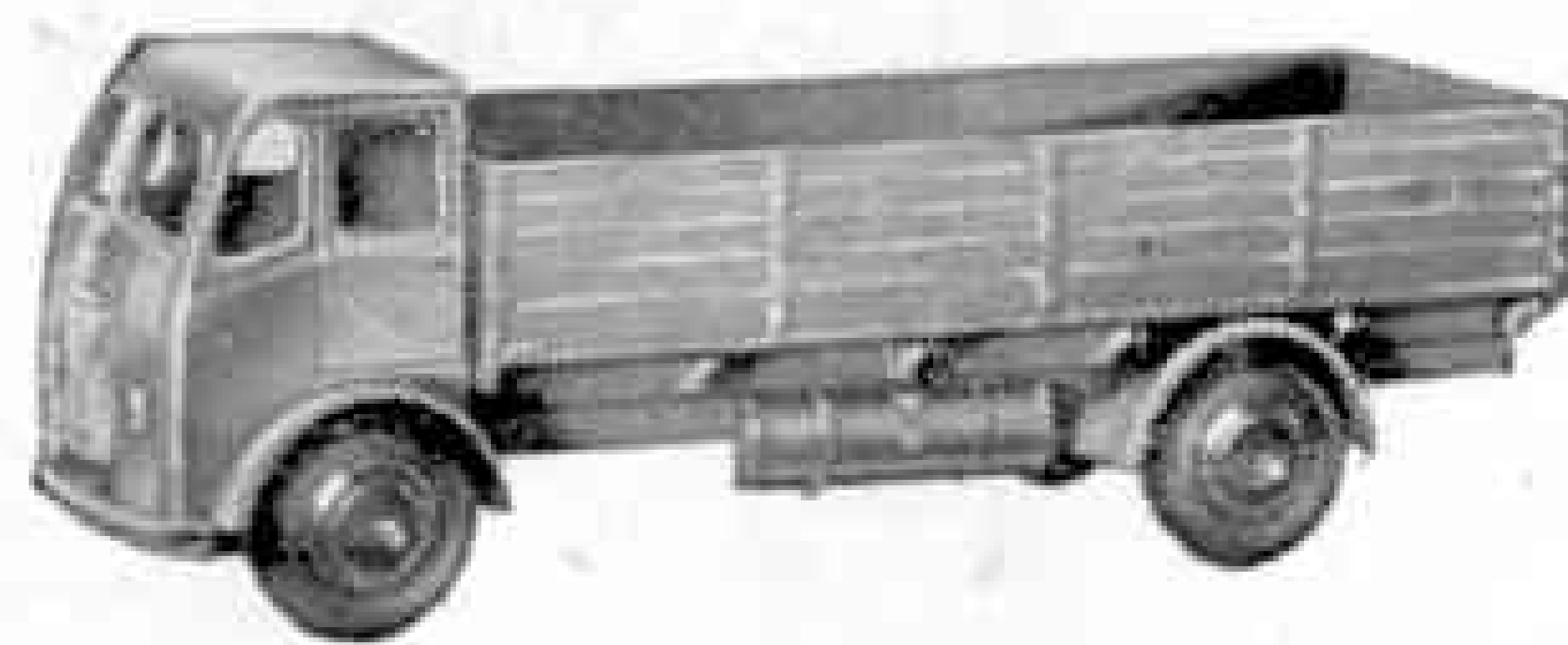
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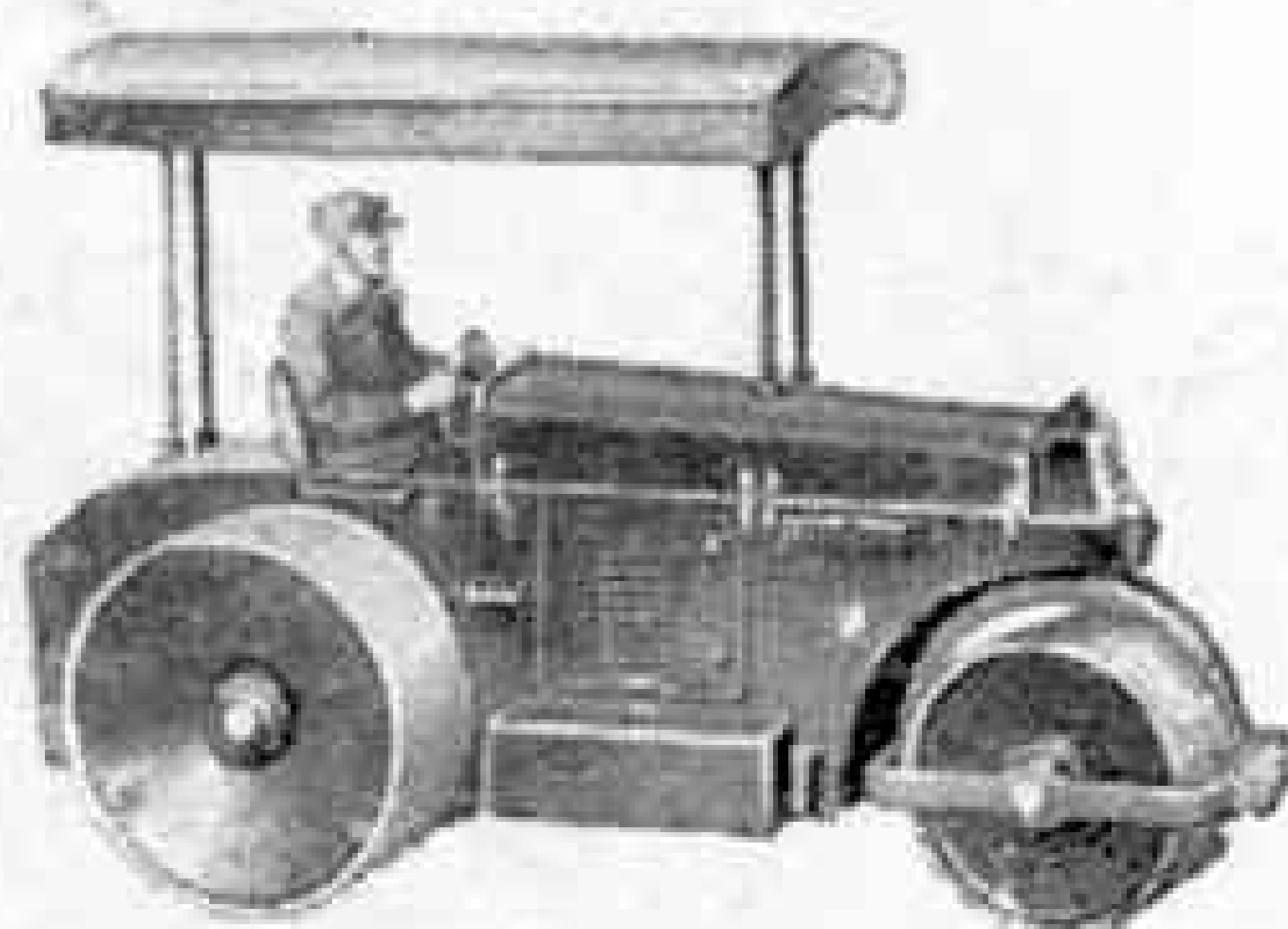
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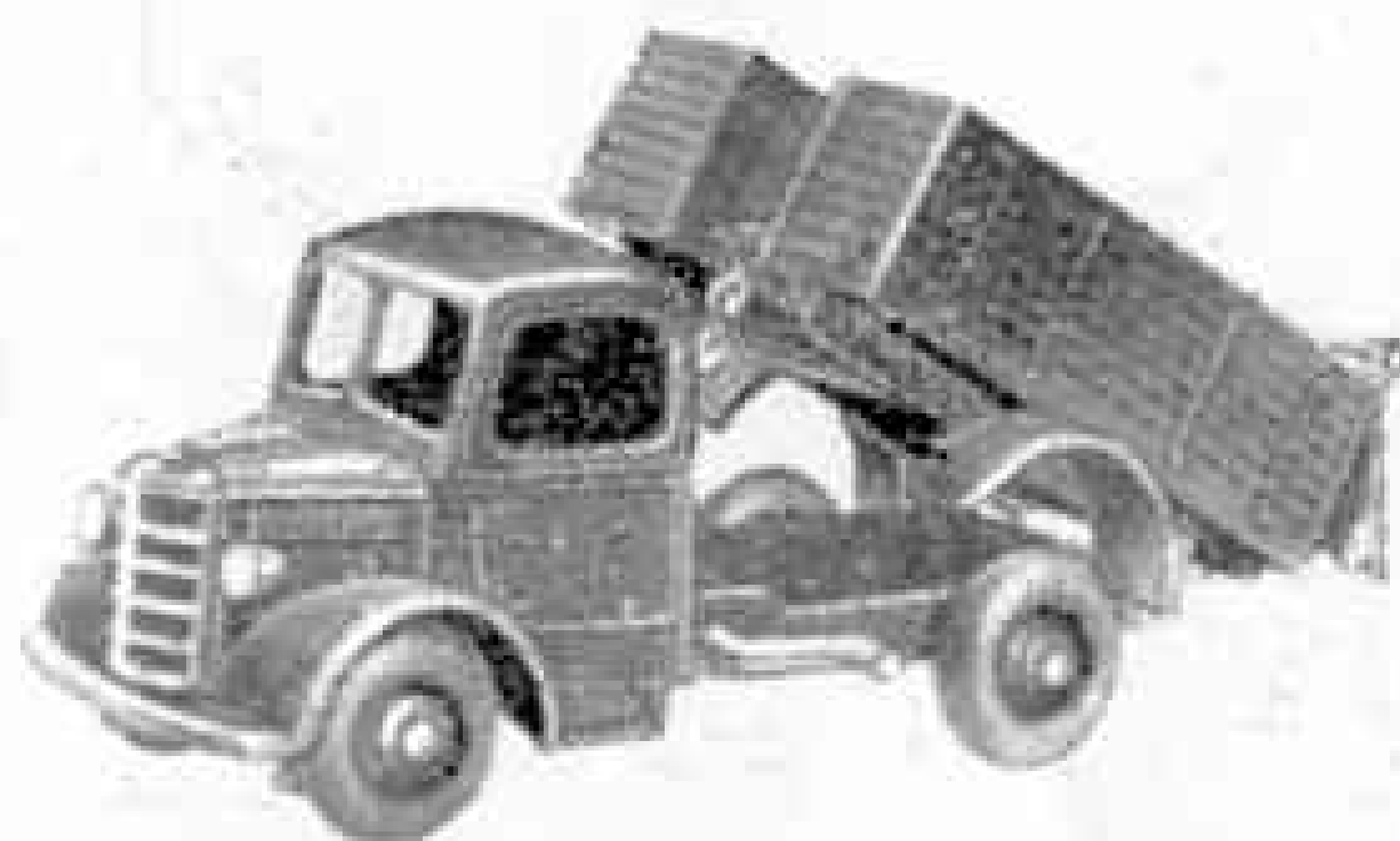
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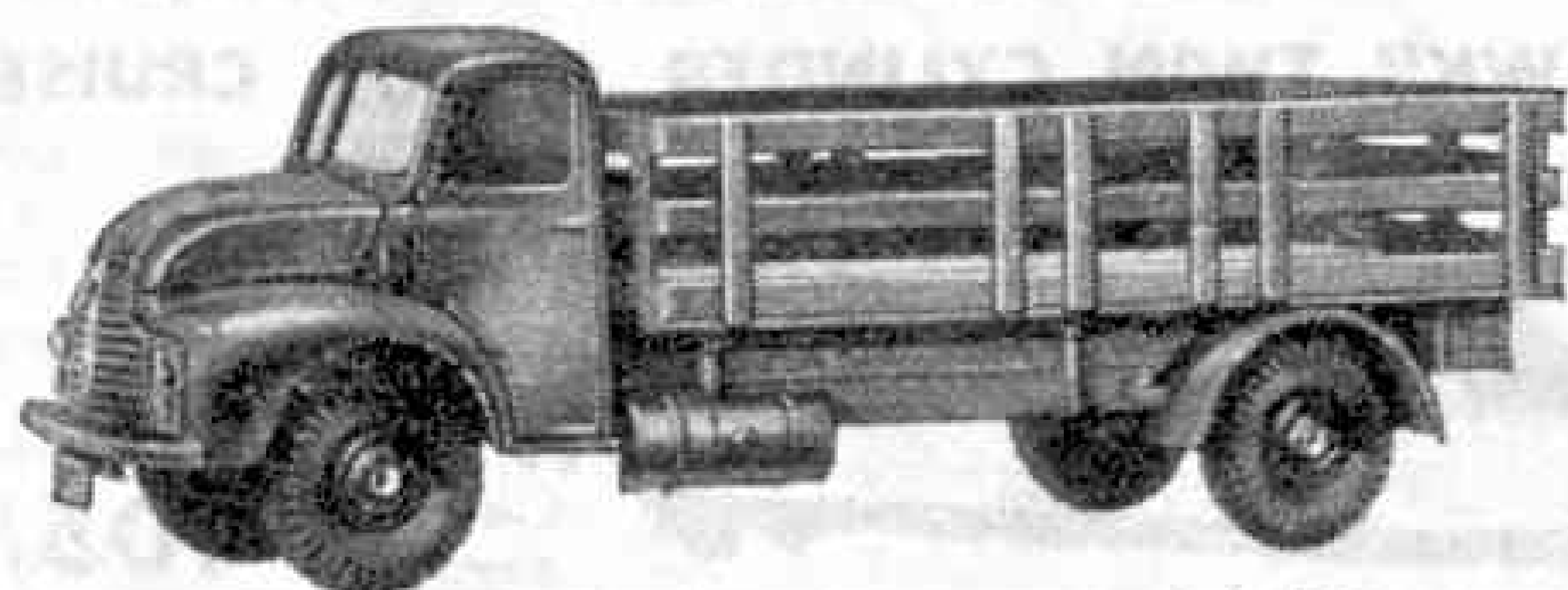
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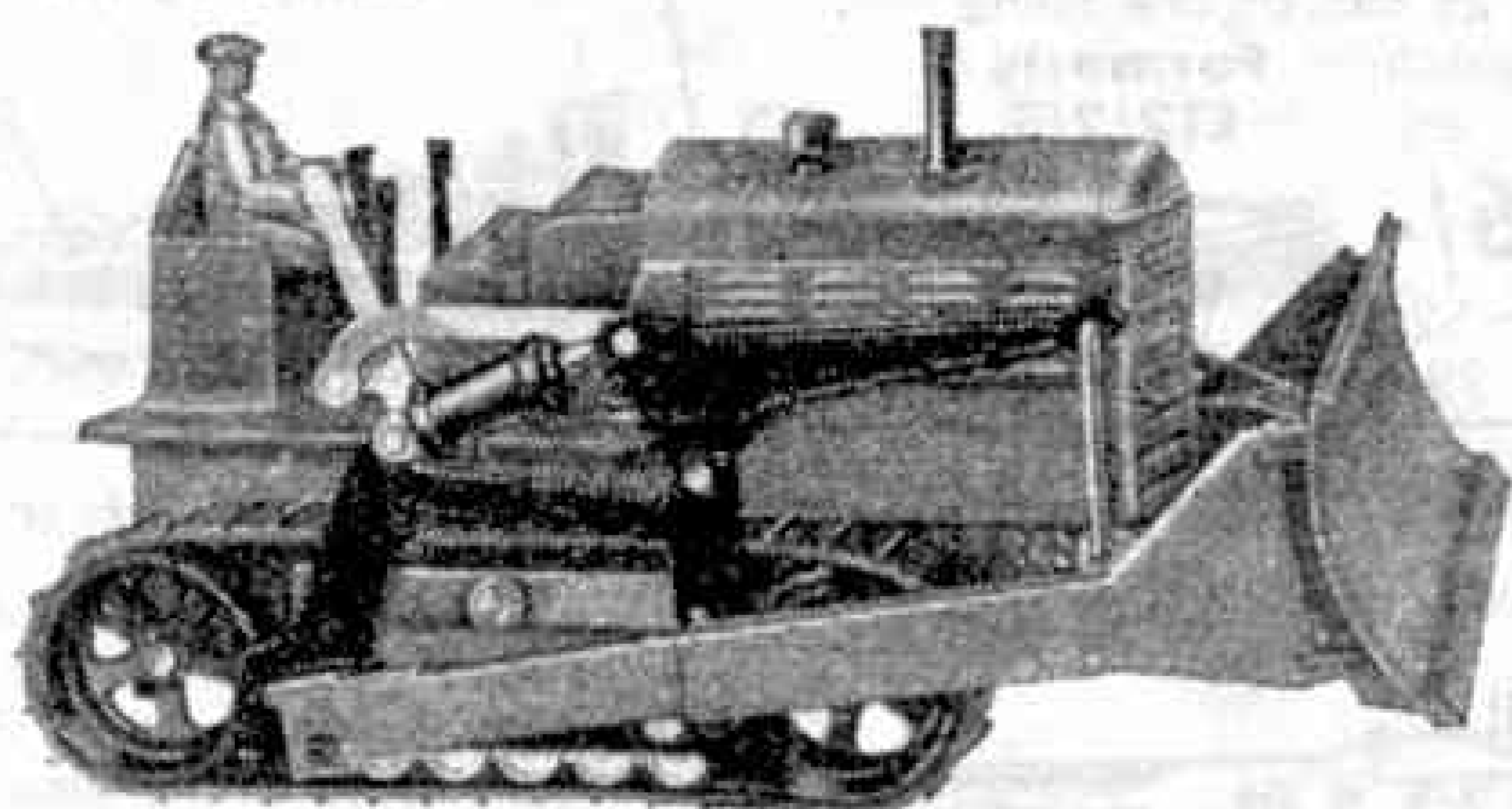
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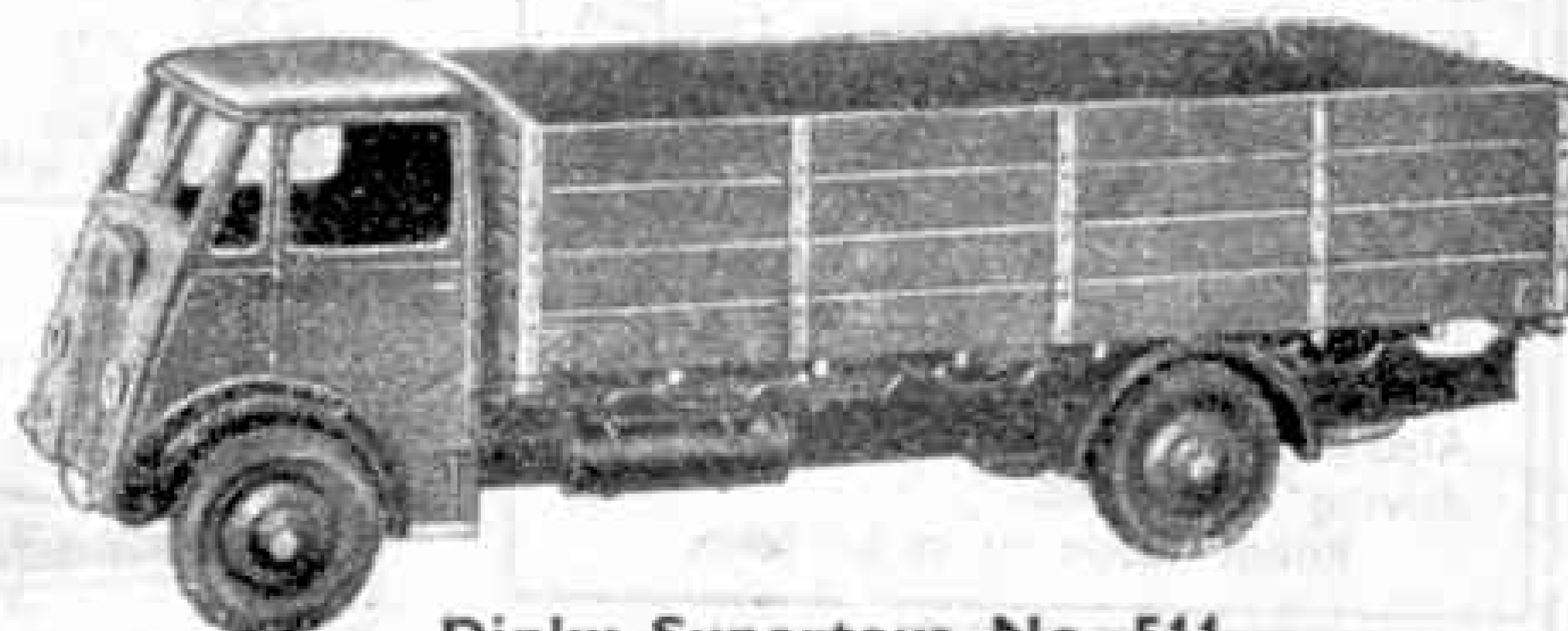
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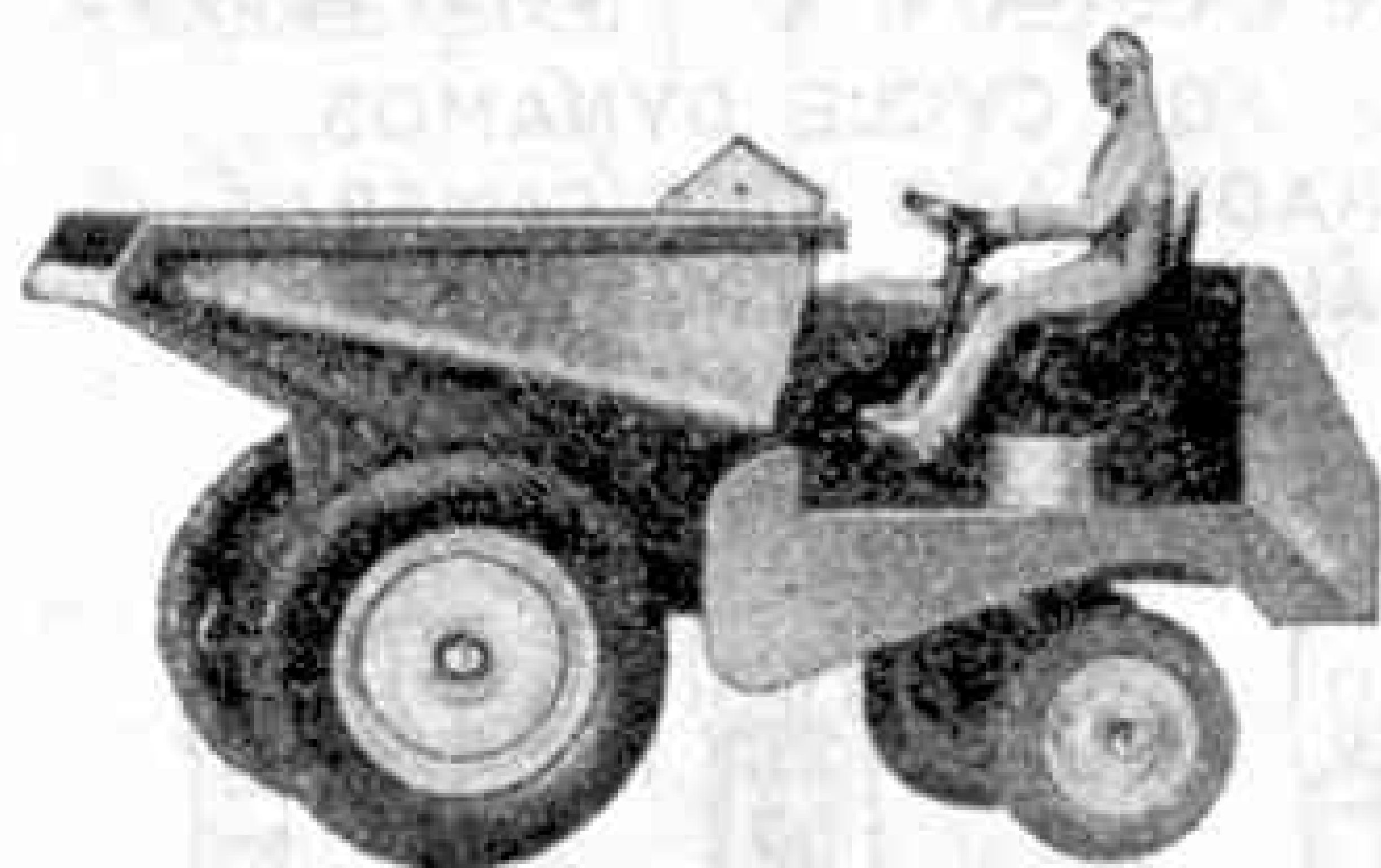
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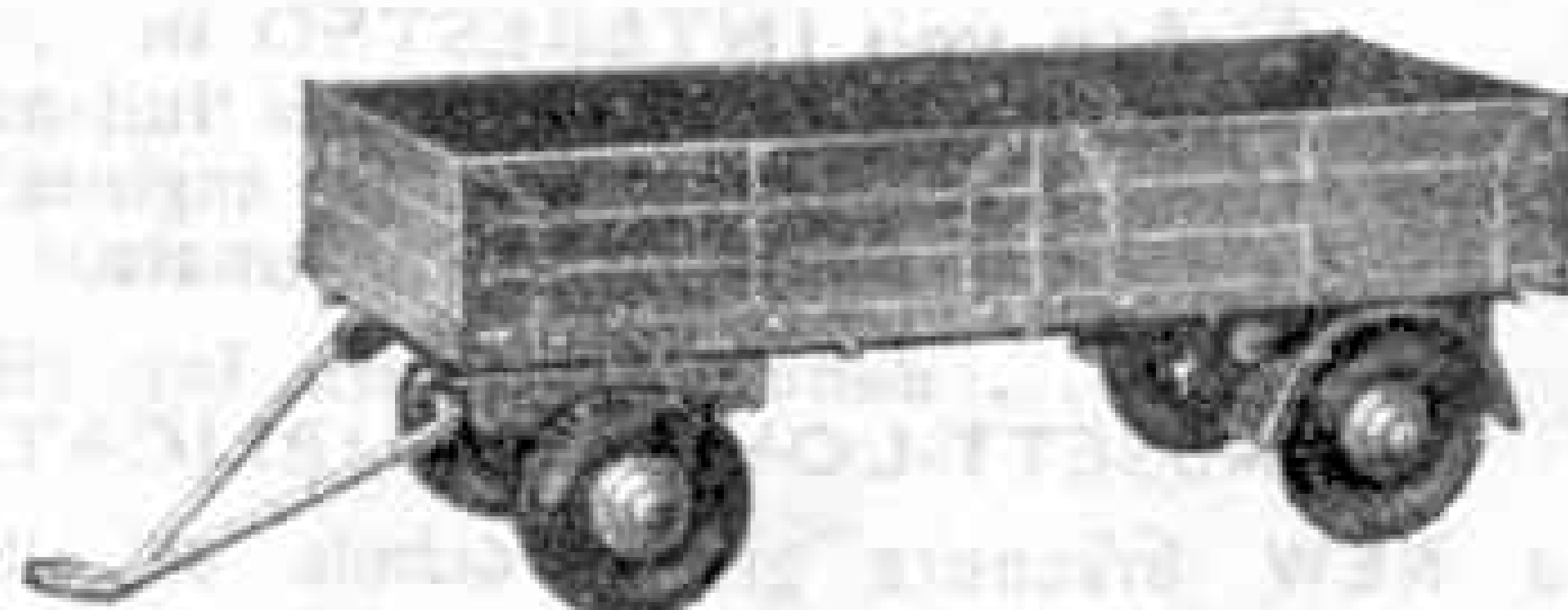
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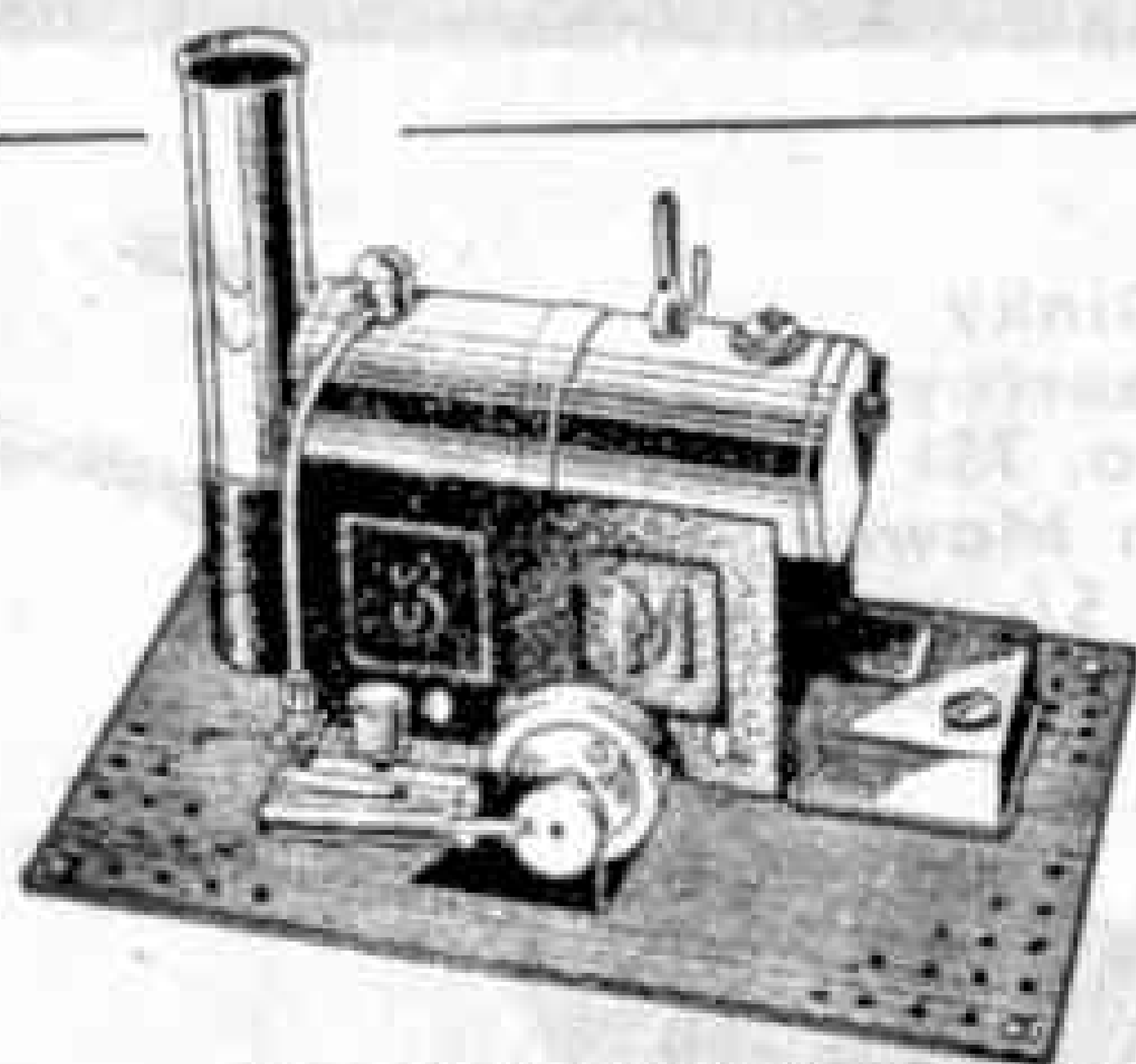


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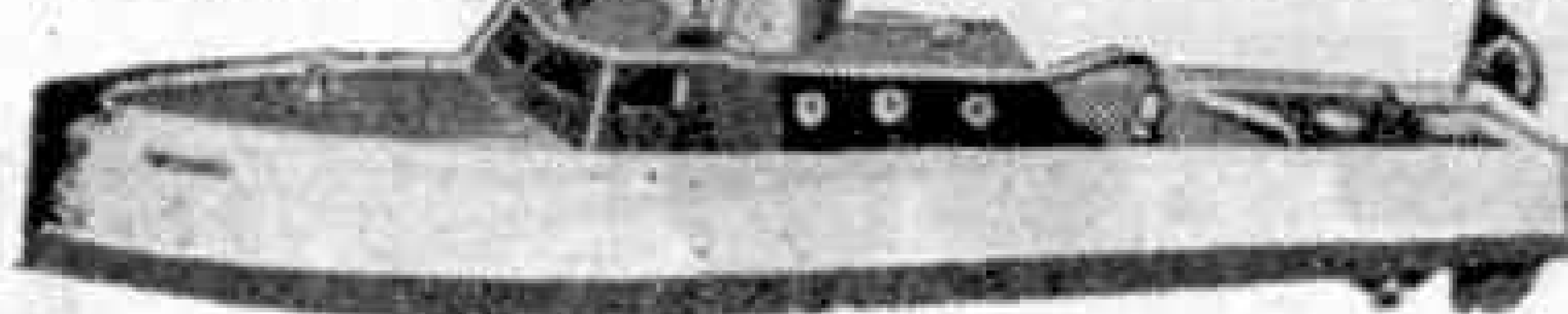
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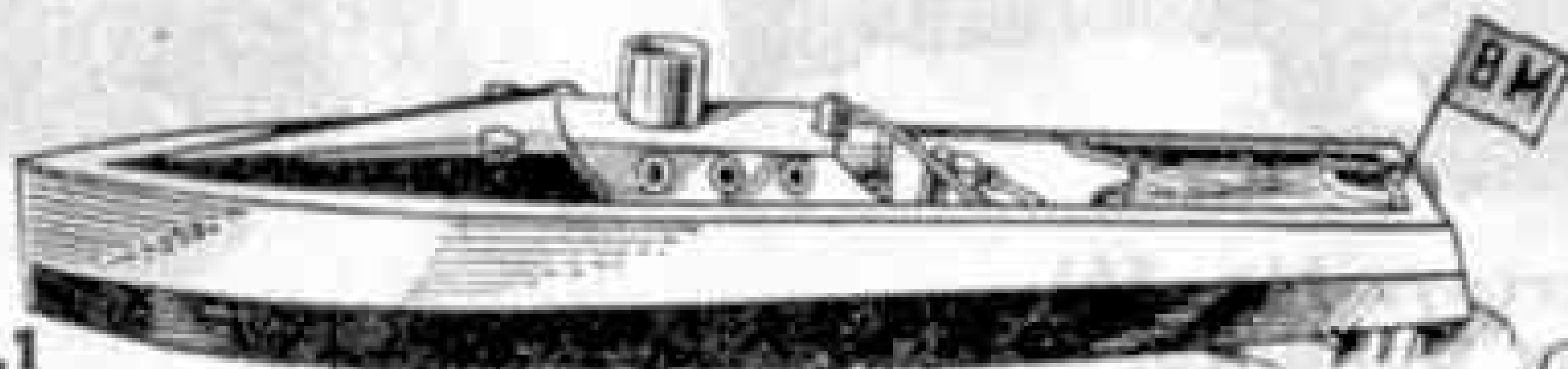


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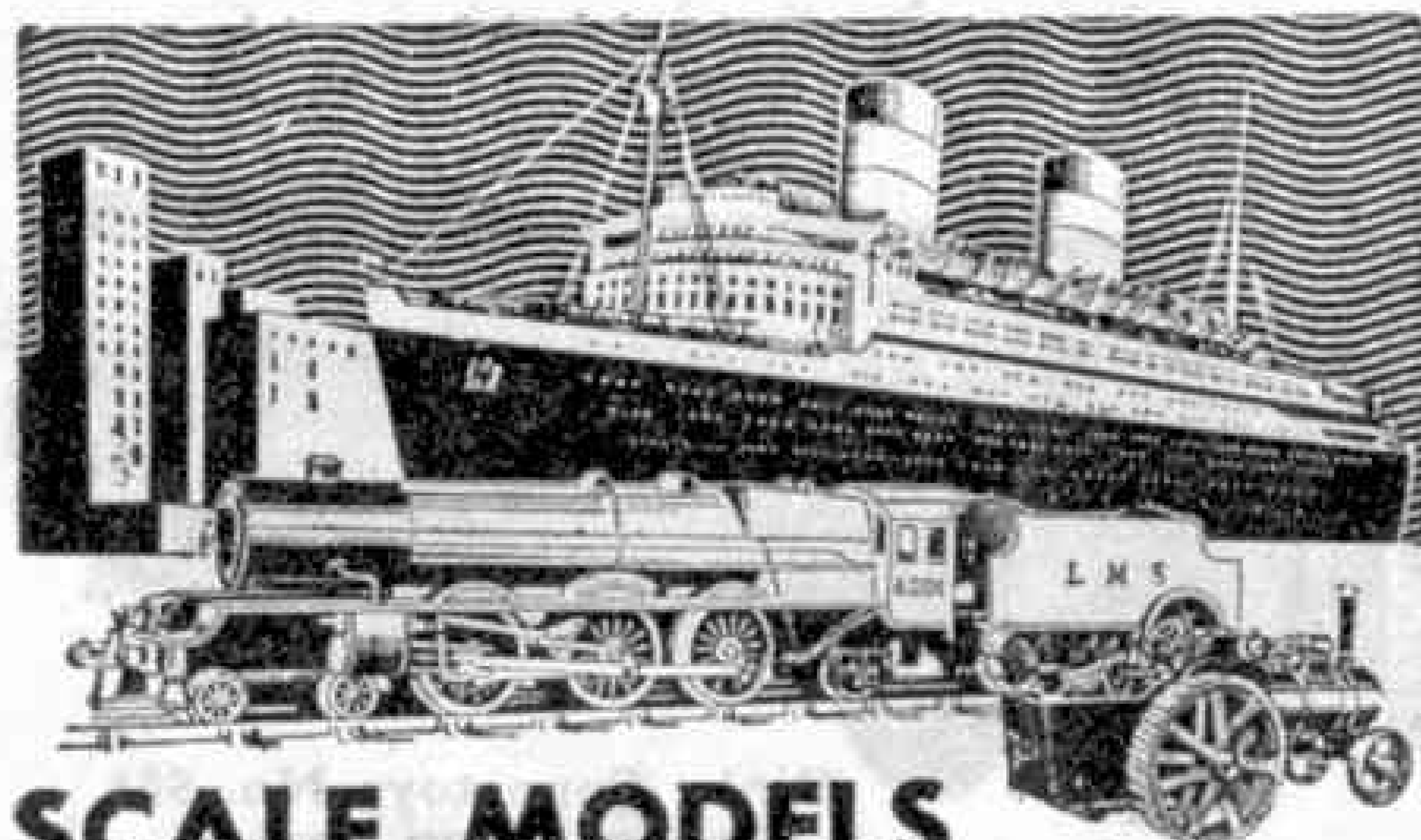
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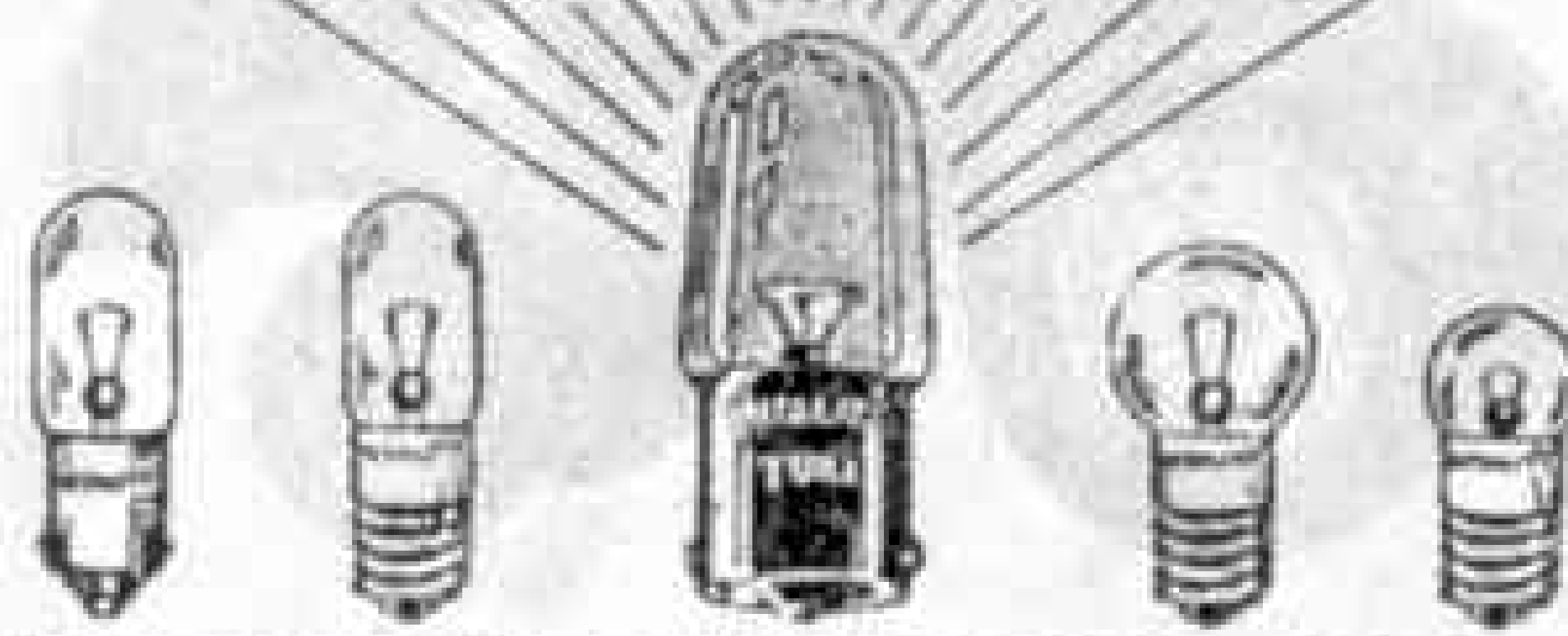
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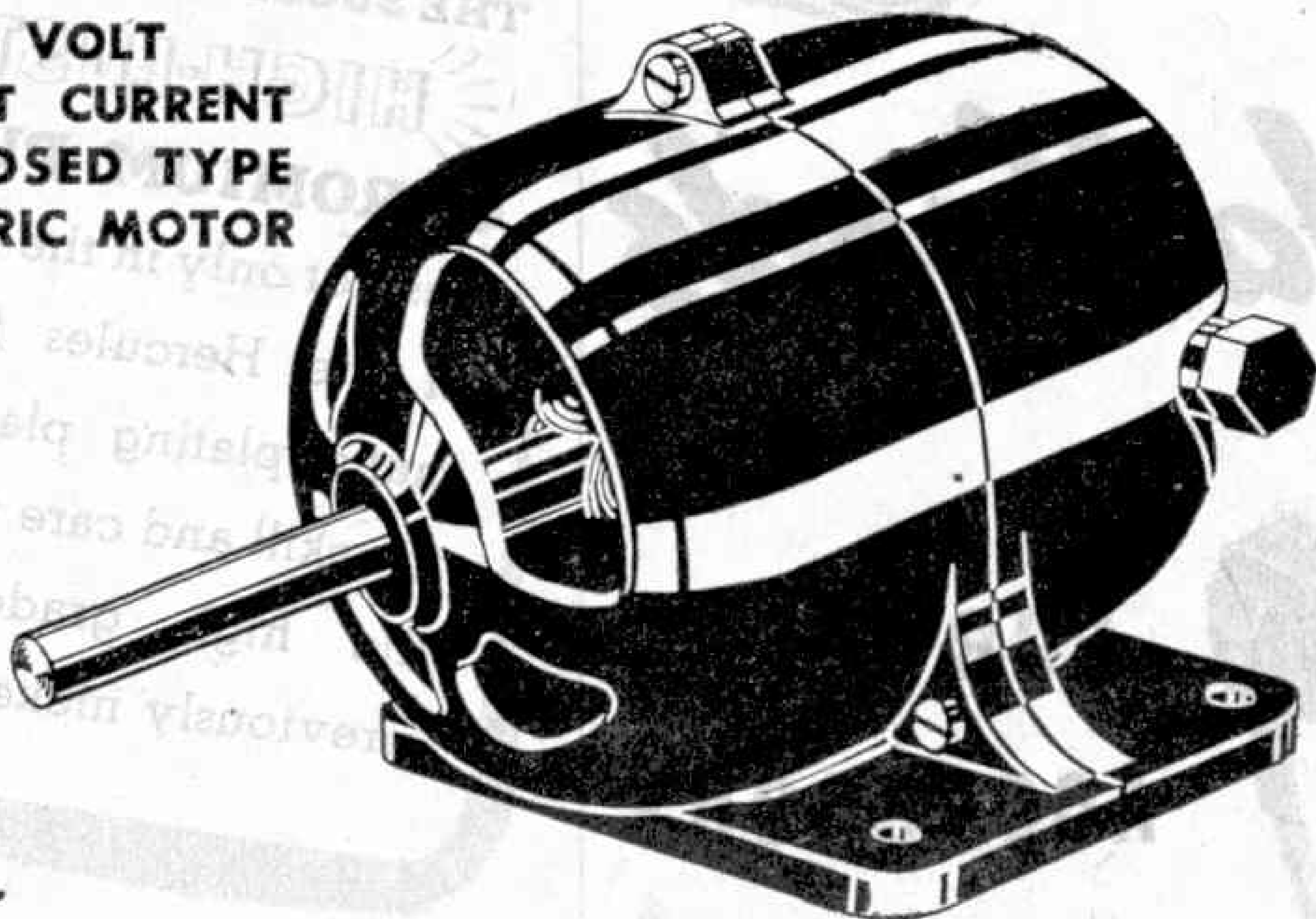
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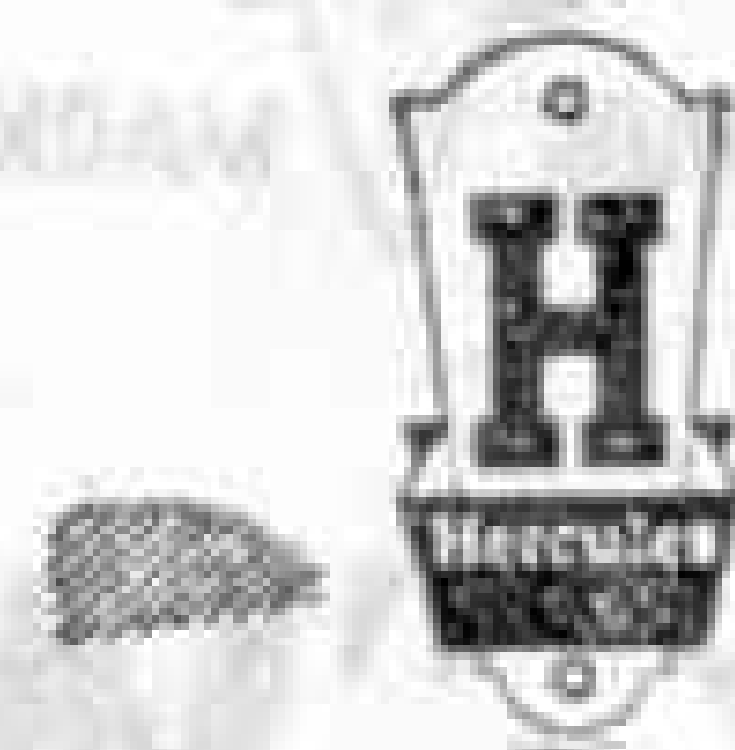
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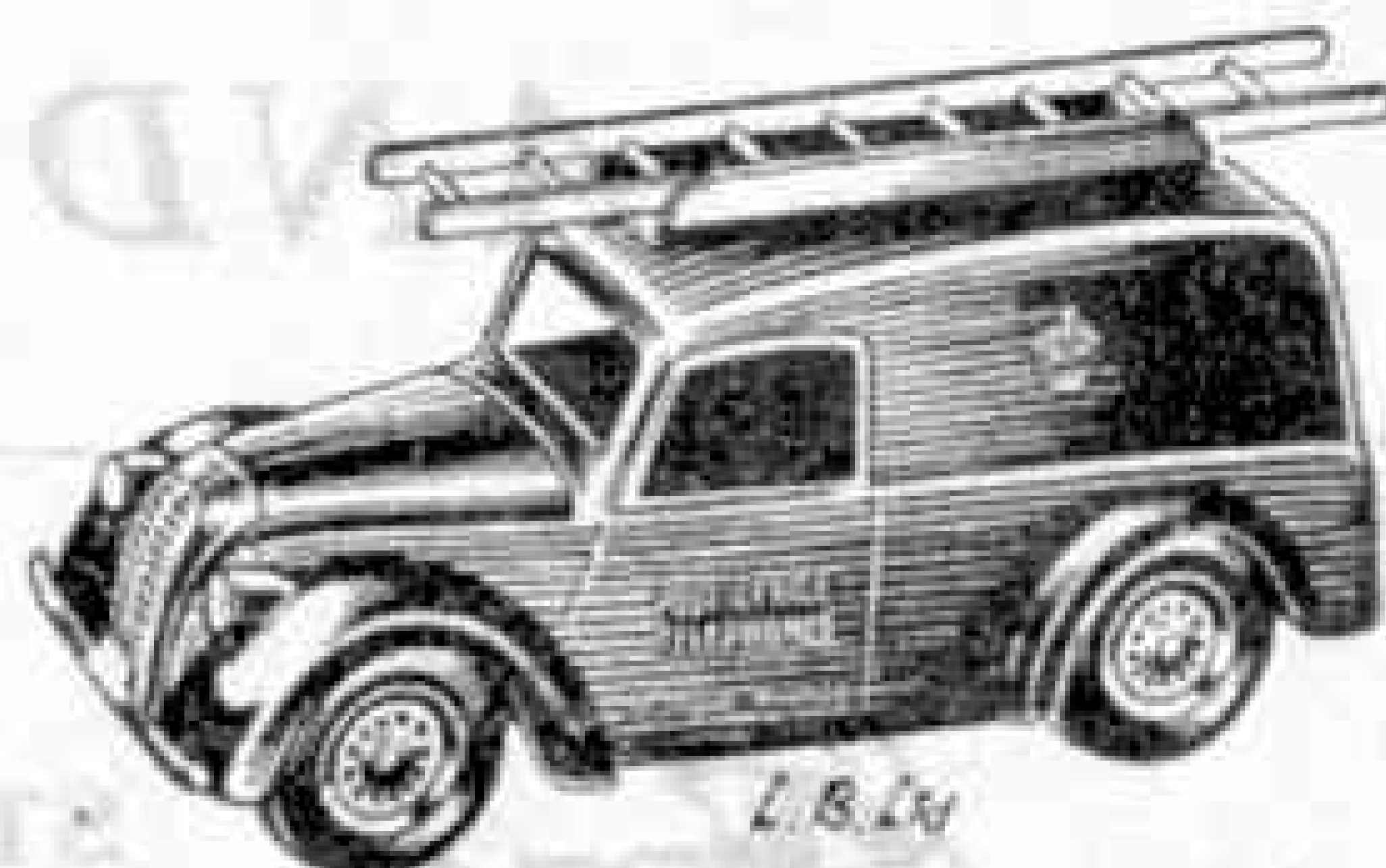
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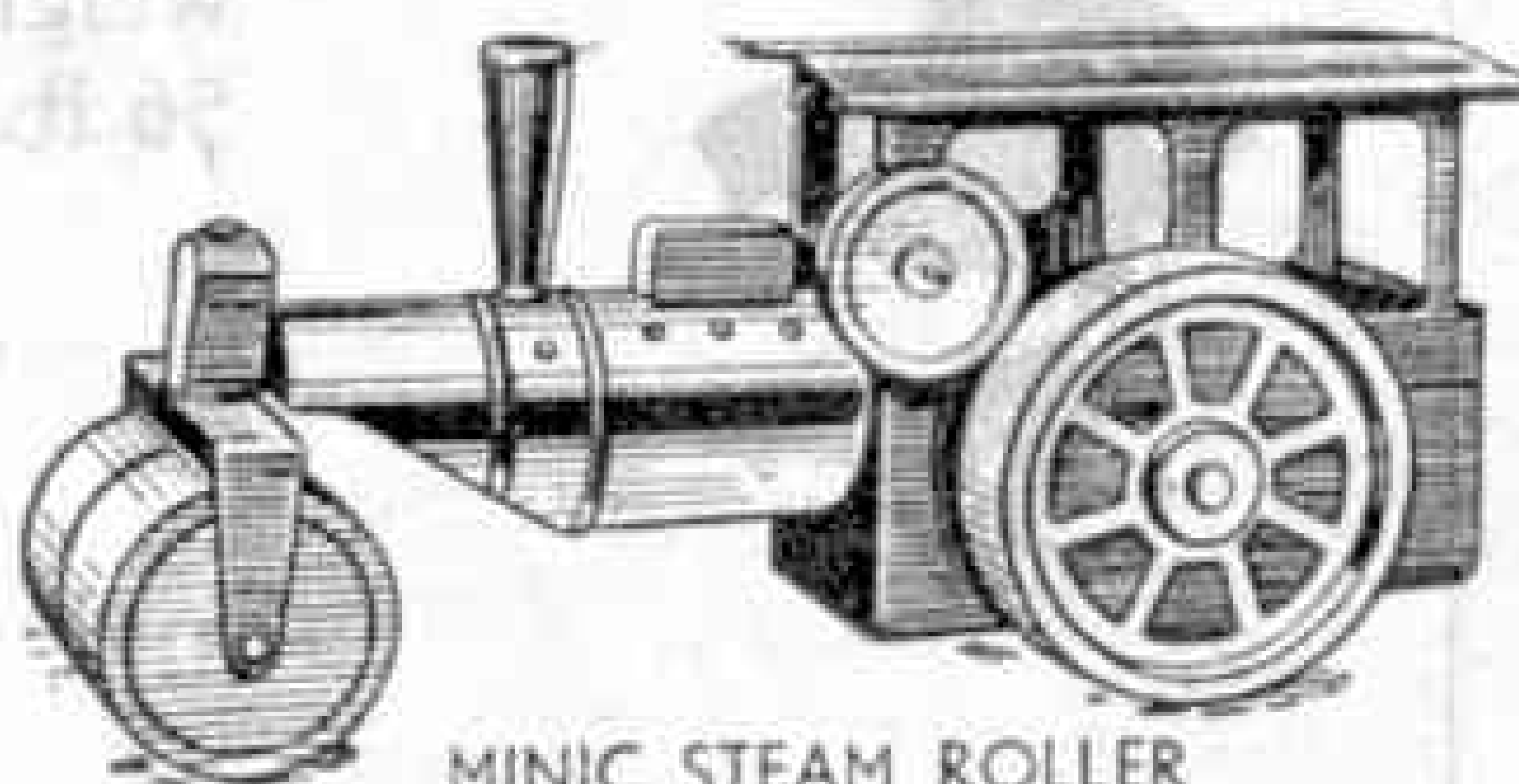
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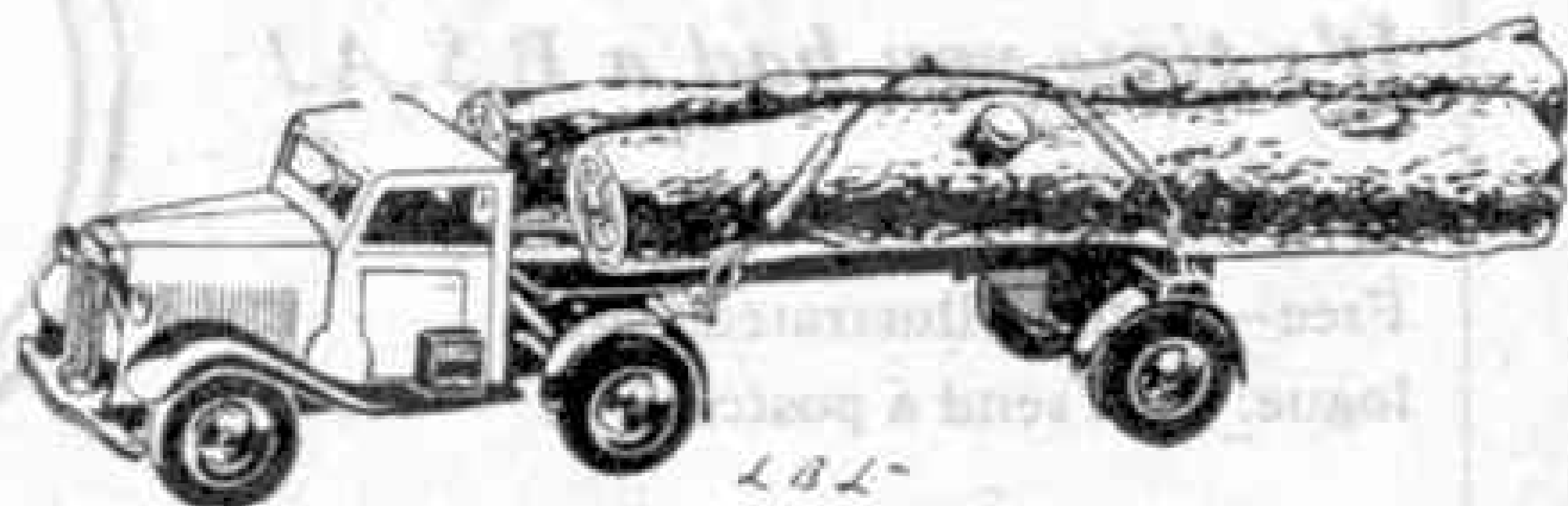
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MAGAZINE

Editorial Office:
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Vol. XXXIV
No. 7
July 1949

With the Editor

By Diesel to Glasgow

A notable British Railways event last month was the through running for the first time of a diesel-hauled train between Euston and Glasgow. Motive power was provided by the black and silver London Midland diesel-electric units, Nos. 10000 and 10001, coupled to operate as a single 3,200 h.p. locomotive.

The journey was undertaken to prove the capacity of the units for sustained running, and in the course of the trip the train had to be hauled over Shap 916 ft. above sea level, and Beattock Summit, where the altitude is 1,014 ft. There were 16 temporary speed restrictions in force due to relaying operations, colliery subsidences and so on, in addition to the normal restrictions at various curves and junctions. Even so, the sixteen-coach "Royal Scot" train, resplendent in the new standard crimson lake and cream livery, ran in two minutes early after its 401½ mile journey. Enginemen were changed on the run, this being possible by means of the gangway connections between the locomotive units and the train.

More Record British Flights

A few weeks ago a Hawker "Fury" fighter piloted by Neville Duke flew 908 miles from London to Rome in 2 hr. 32 min., some 19 min. faster than the previous record *set up by a jet aircraft*. Less than 13 hours later Duke landed the "Fury" at Karachi, where it was delivered to the Royal Pakistan Air Force, having also beaten the old 3,938-mile London-Karachi record by 3 hr. 50 min.

Next day Hawker's chief test pilot, Trevor Wade, flew the new sweptwing P 1052 jet fighter from London to Paris in 21½ min., at an average speed of 618

m.p.h., to set up yet another city-to-city record. Commenting on this flight afterwards, Mr. T. O. M. Sopwith, Chairman of the Hawker-Siddeley Group, said that had conditions been better the P 1052 would have averaged over 700 m.p.h., which means that it is almost certainly the fastest jet fighter in the world.

Of course, speed is only one of the characteristics of a good fighter, but the fact that the "Fury" flew nearly 4,000 miles in 15 hr. 24 min., and that the P 1052 was used to set up a speed record so early in its development prove that both aircraft are also thoroughly reliable. The "Fury's" record is a reminder that we should be unwise to discard all our "old-fashioned" piston-engined fighters too hastily, for in range and fire-power they are still more than a match for jets.

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The Development of the Destroyer

By Frank C. Bowen

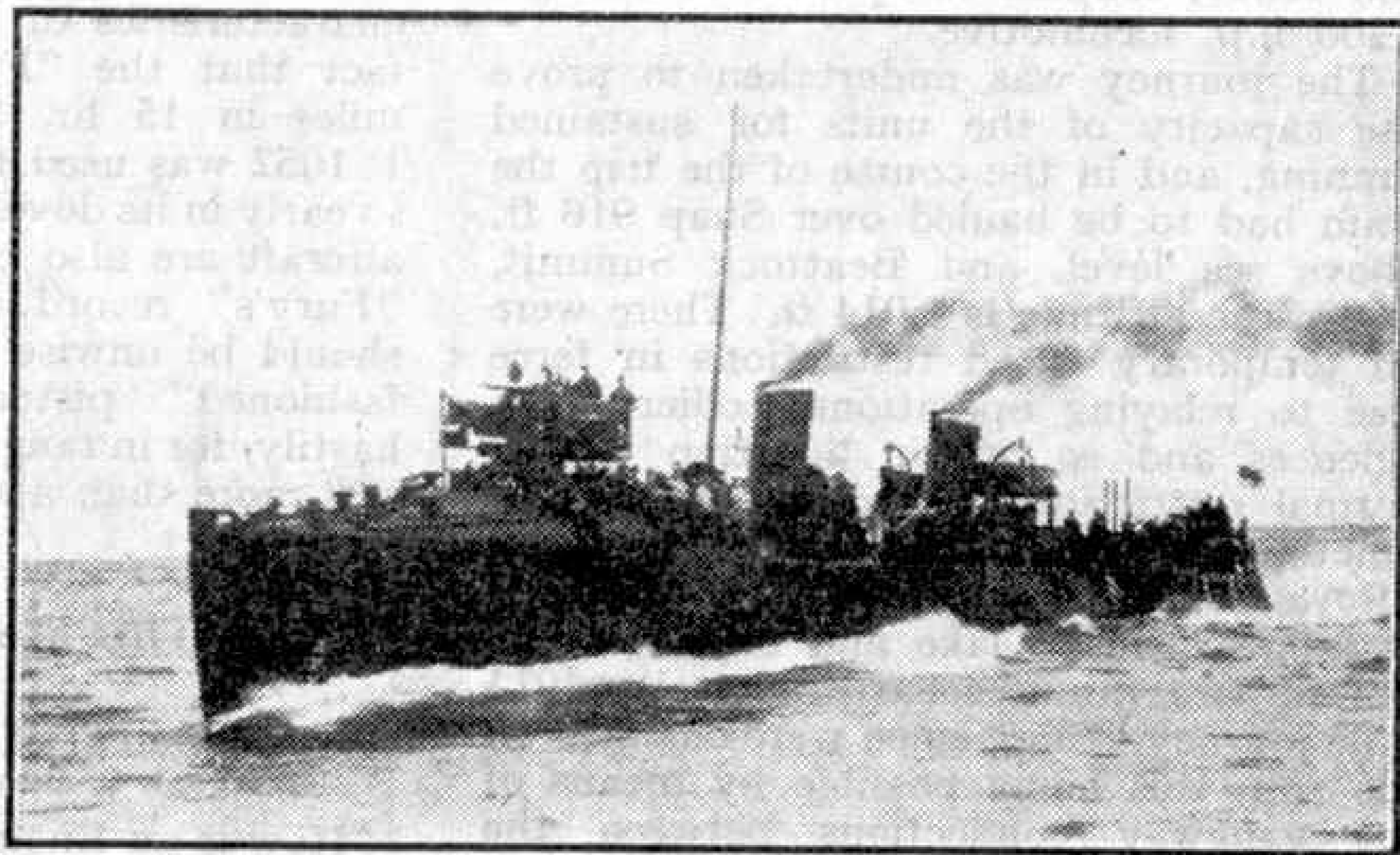
THE destroyer, or the torpedo boat destroyer to give her the full name which is now seldom used, is one of the most interesting naval types and it is quite appropriate that the names of the sloops, brigs and cutters which did such dashing work in Nelson's day should be chosen for modern destroyers. They are often called the Navy's maids-of-all-work and they live up to it.

The torpedo boat was introduced in the seventies, at first no more than a launch; but by the mid-eighties she had grown into a very efficient little ship and Continental navies had built up such large fleets that measures had to be taken against them. There were plenty of pessimists who considered that the British battle fleet was doomed. A hybrid type was evolved called the "torpedo catcher," but she was not successful because she could not be built fast enough on the lines of a small cruiser. In the early nineties, after a great deal of money had been wasted on the catchers which could not catch, the Admiralty were persuaded that the only solution was an enlarged torpedo boat, fast enough to run down a torpedo boat in all weathers, carrying guns that could destroy her with ease, and torpedo tubes to let her act the part of torpedo boat herself in weather too bad for the smaller craft.

When the decision was taken in 1893 the finest torpedo boats afloat were about 120 to 130 tons with a speed of 25 knots in a few exceptional cases, although the majority were considerably smaller and slower. The Admiralty asked the builders who could tackle such a job to provide their own designs for this super torpedo boat within a rather loose specification. The speed was the main thing; if they were fitted with locomotive boilers they had to contrive 26 knots on trial, but if they had the new fashioned watertubes 27 knots was the minimum. They all

looked like enlarged torpedo boats, the great majority designed to present as small a target as possible to the enemy's defensive fire, although one or two builders gave higher freeboard to make them more seaworthy. The first armament laid down by the Admiralty was one 12-pounder gun mounted in the "bandstand" which did duty as a bridge, three 6-pounders on deck, with two torpedo tubes on revolving mountings on deck and a third fixed in the bow under the curved turtle-back deck. The last-named was very soon abandoned on account of the danger of the destroyer ramming the tail of its own torpedo, and two more 6-pounder guns were substituted.

The first destroyer was H.M.S. "*Havock*," 220 tons displacement on dimensions



The first destroyers were built on the lines of contemporary torpedo boats, somewhat enlarged.

180 ft. by 18 ft. 6 in., with twin screws driven by engines of 3,500 horse power for a speed of 26 knots. Into the small hull, mostly machinery, a crew of 43 were packed. They were bound to be very uncomfortable and fully earned the "hard lying money" intended to compensate them, but the service was tremendously popular from the very first with all ranks.

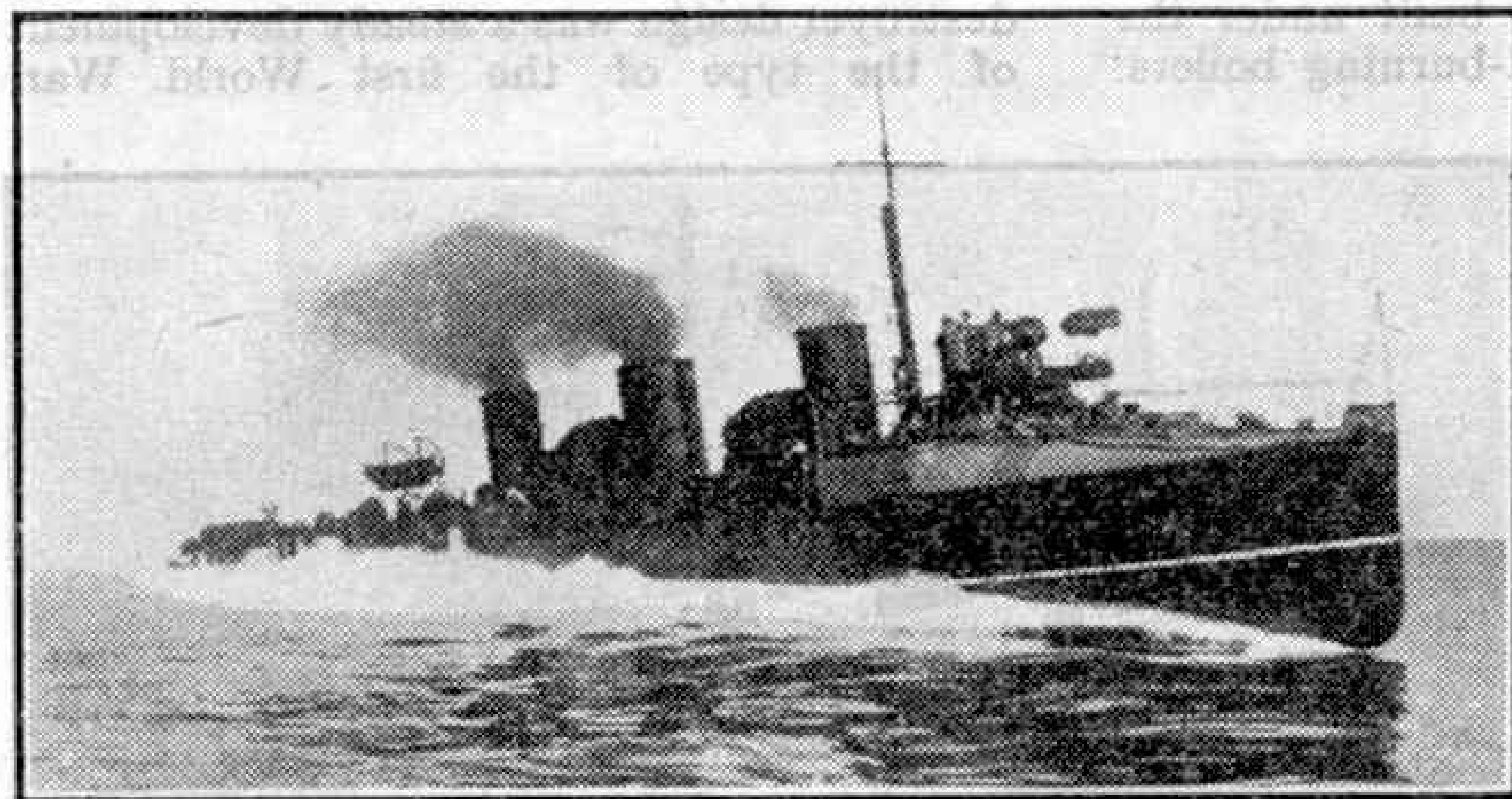
With watertube boilers the 27-knot destroyers contrived trial speeds up to nearly 30 knots, although the conditions were much easier than they later became. Some of them had two funnels, some of them three and some four. They were all

driven by triple expansion engines, which were sadly liable to break down with the hard work which the boats had to tackle. That was largely due to the very limited size, which also caused their speed to

Navy to buy them. The first out was the "*Viper*," with the ordinary hull of a 30-knotter. Parsons was considered rash to guarantee a speed of 31 knots, but she averaged 34.67 in bad weather and covered the measured mile at over 37. She was wrecked in a fog, and the second ship, the "*Cobra*," proved to be too lightly built for her tremendous power and broke in two in the North Sea.

While experiments with turbine engines were proceeding slowly the Admiralty took a step which seemed to be retrograde. They reduced the contract speed to 25½ knots, but at the same time insisted on the hull

being bigger and much more strongly built, and replaced the turtle-back deck forward by a high forecastle. The result was that in bad weather the 25½-knot "*River*" class could maintain 24 knots while the 30-knot boats dropped down to 22 or 23. After the lessons of the Russo-Japanese War had been digested the turbine was firmly established, and the 6-pounder gun was abandoned as being too light to be useful. Turbines and oil-fired boilers gave the first "*Tribal*" class, from 865 to over 1,000 tons, a speed of 33 knots. The first were armed with five 12-pounder guns and the later ones with two 4-inch, in addition to two torpedo tubes. The 2,170-ton "*Swift*,"

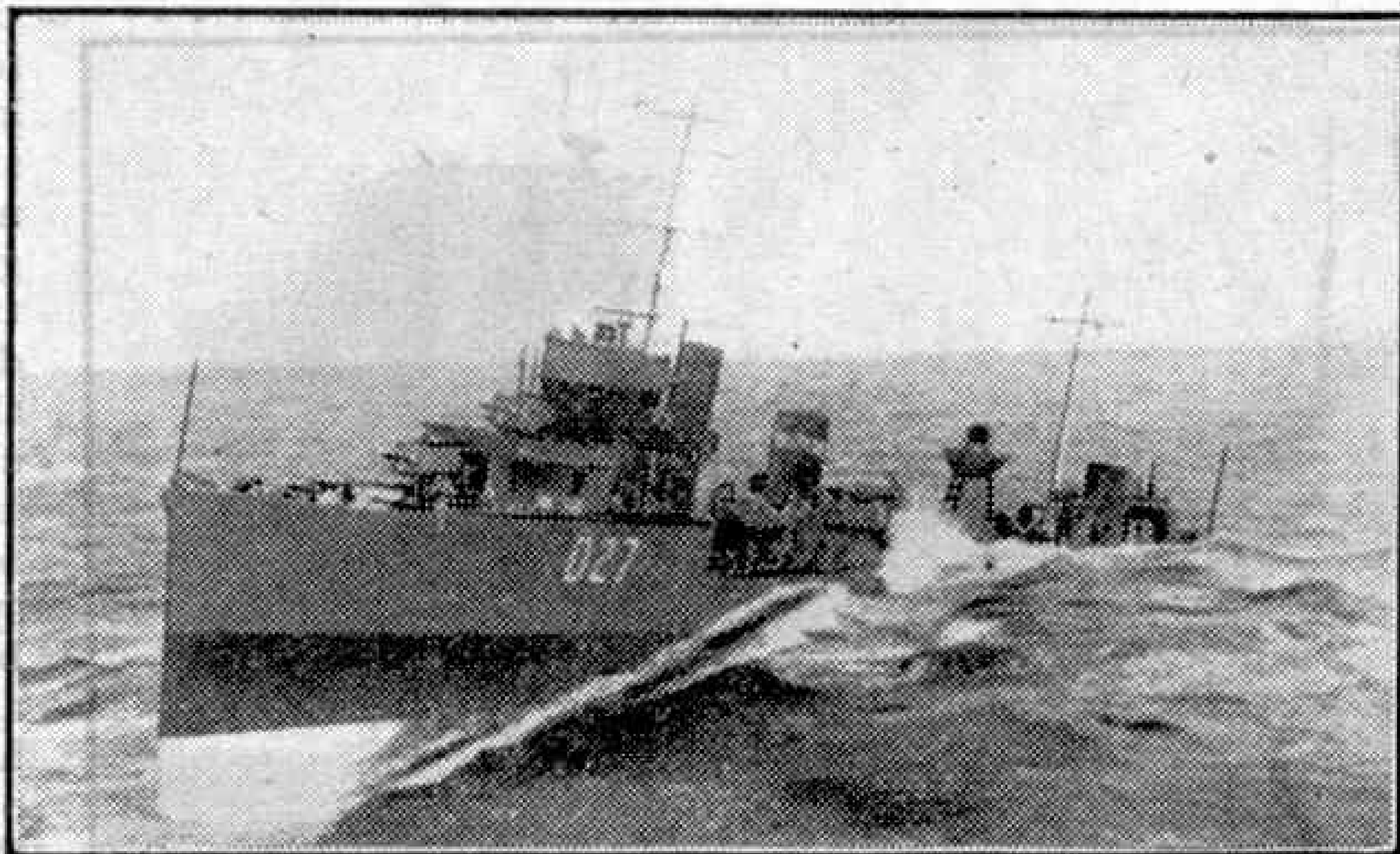


The "*Viper*," with which Parsons reached a speed of over 37 knots.

fall off rapidly in any sort of a sea. When the weather was anything like heavy their speed would drop down to about 20 knots and they would smother themselves with spray, but the torpedo boats, being smaller still, could still be caught without difficulty.

The remarkable things which the happy-go-lucky crews of the 27-knotters did with their little ships made the Admiralty realize that they could do much more if they were given better material. So the 30-knot type was introduced, ships which were not only faster but bigger, more comfortable, and better seaboats with higher freeboard and able to carry more coal. In their general principles they were precisely the same as their predecessors, with the same armament.

At the Diamond Jubilee Naval Review in 1897 Charles Parsons had created an immense sensation by dashing through the lines in the little experimental yacht "*Turbinia*" fitted with the turbine engine which he had patented and was trying to get adopted. It was just the thing for a destroyer, but as the Admiralty would not listen he had two boats built on speculation. Public opinion forced the



A destroyer of the first World War, with stem designed for ramming submarines.

with a designed speed of 36 knots, was regarded as being too expensive and the design was not repeated.

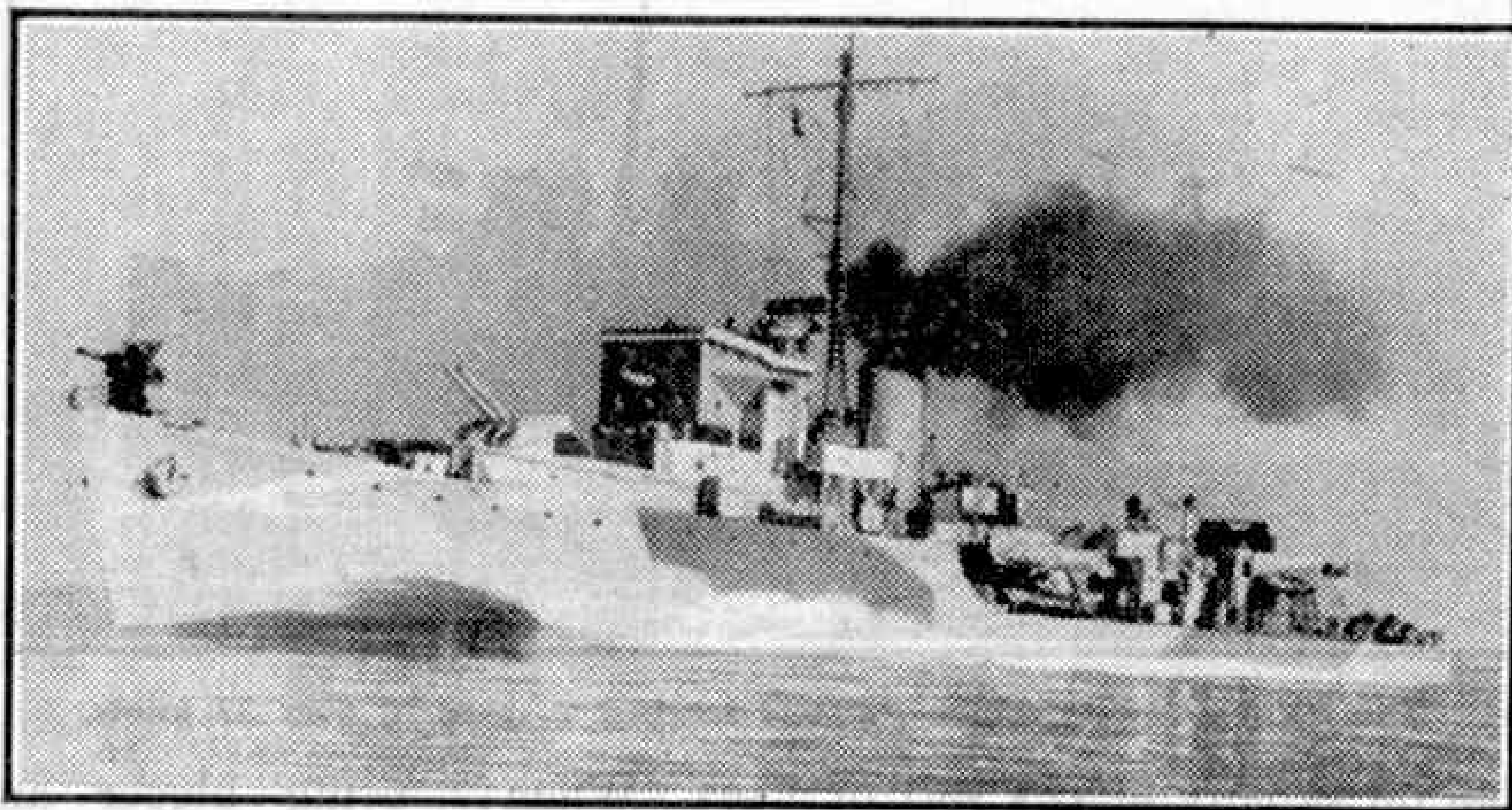
The cost of the 33-knot "Tribal" class and fears for the supply of imported oil fuel, caused the Admiralty to drop back to 27 knots in the ships built under the 1908 estimates, with coal-burning boilers.

The next classes returned to oil fuel, the saving in weight permitting the displacement to be reduced; but by the time the first World War broke out in 1914 the latest ships had a displacement of nearly 1,000, a speed of 29 knots, and an armament of three 4 in. guns with four 21 in. torpedo tubes. At that time the Admiralty were supplying the designs instead of accepting the ideas of each individual builder.

During the first World War the destroyer was used for every imaginable duty. The activities of the German submarine fleet did immense damage, and the destroyer was found to be the best antidote. Additional duties demanded higher speed, a bigger armament and numerous features which, in their turn, demanded more displacement. So, by the end of the war, destroyers had a displacement of 1,500 tons with all their load on board, were armed with four 4.7 guns and two 2-pounder pom-poms against aircraft, with six 21 in. torpedo

tubes, and could steam at 34 or 35 knots. They had comfortable quarters for officers and men and, although their motion was lively, they could keep the sea and carry on with their duties in any weather.

Between the two wars the flotilla destroyer design was a steady development of the type of the first World War,

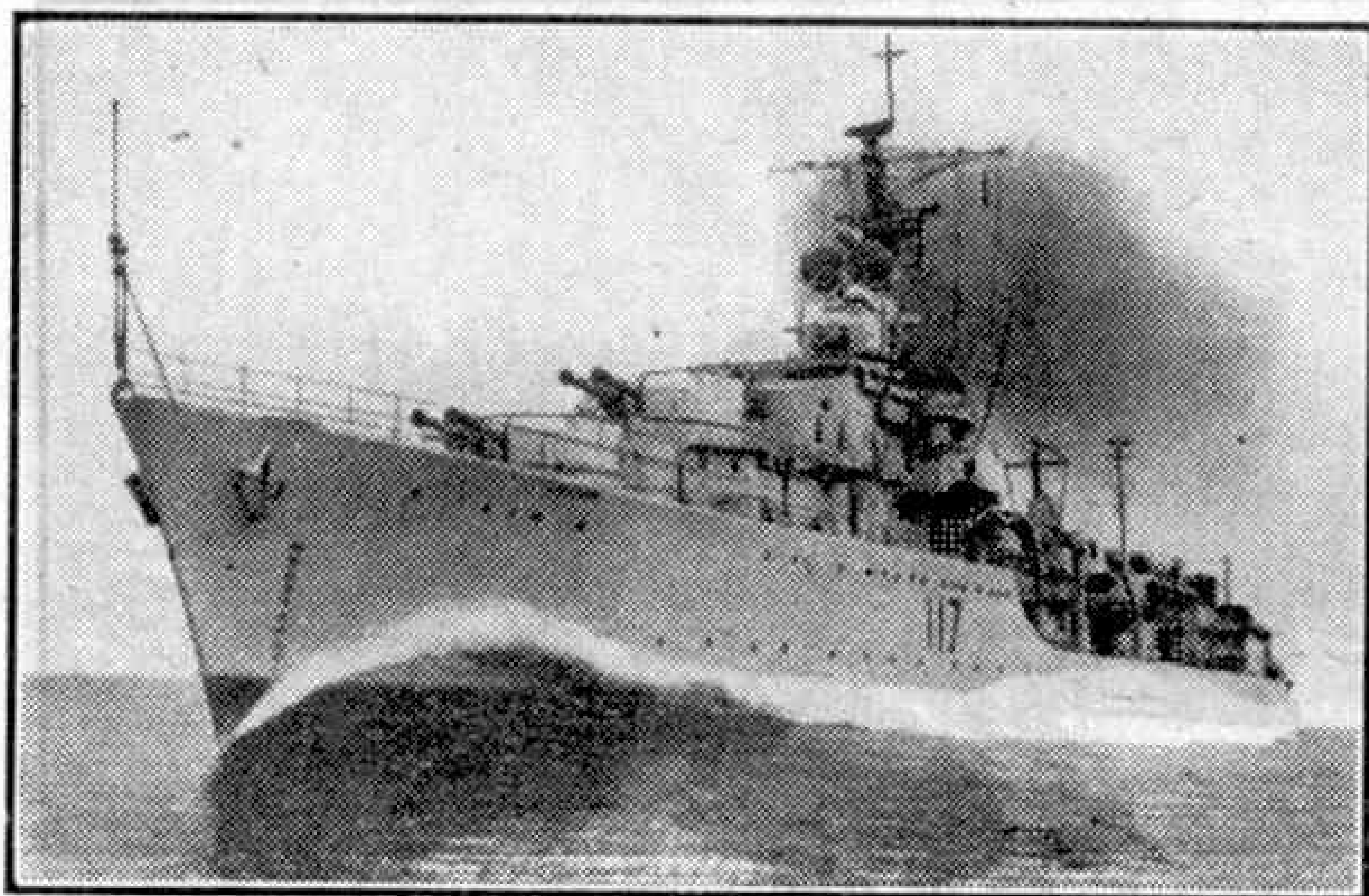


A destroyer of the "Hunt" class.

successive classes being given names beginning with the initials "A" to "I." Technical improvements permitted the displacement to be reduced. They were all 2-funnelled ships, the "I" having a tonnage of 1,370, a speed of 36 knots and four 4.7 in. guns in addition to a number of small anti-aircraft pieces and 10 torpedo tubes which were reduced to five when new fittings such as radar added to the topweight during the war. They cost £320,000 each, and it was then decided that the duties of the destroyer had become so numerous that subdivision was necessary. So the second "Tribal"

class was built primarily for gunfire—1,870 tons, 36½ knots with an armament of six 4.7, two 4 in. and numerous small anti-aircraft guns, but only four torpedo tubes. To carry out the duties which were within their power the very much cheaper "Hunt" class was built, beginning with 1,000 tons displacement, 27½ knots speed and four 4 in. guns backed by small anti-aircraft pieces. The first type had no torpedo tubes but two or three were mounted in the later ones.

The flotilla destroyers of
(Continued on page 282)



H.M.S. "Alamein," designed to operate against the Japanese.

Have You Ever Thought About This?

How is an Engine Lubricated?

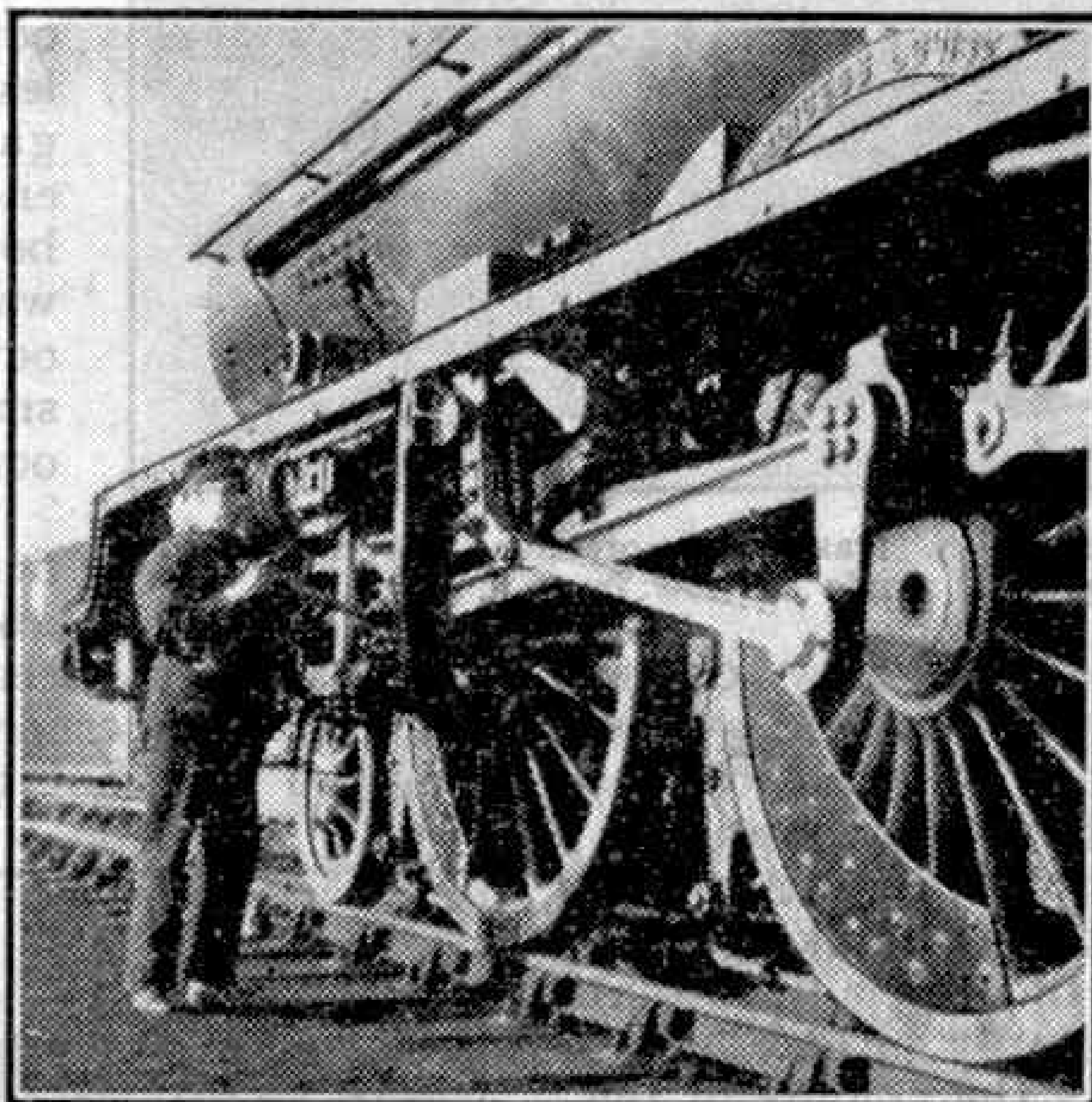
By "Shed Superintendent"

WHEN a driver prepares a locomotive for service, he is responsible for attending to the lubricators. For a modern four-cylinder engine he is supplied with about 10 pints of oil for every 100 miles the engine is to run. Four pints of this will be for lubricating the internal parts such as valves and pistons, and as these parts are exposed to high-temperature steam the oil is of heat-resisting quality. The other six pints of engine oil are for lubricating the external parts including the axle boxes, coupling and connecting rods, valve gear parts, etc., and as each bearing is fitted with an oil box, there may be 80 or 90 of these to fill with his oil can.

A few of the Southern Region engines have the valve motion and inside big-ends enclosed in an oil bath holding 35 gallons of oil; but the majority of engines in this country have independent oil boxes on each part. Each oil box contains a piece of worsted wound on a twisted wire, known as "trimming"; the worsted passes a small supply of oil, by capillary action, from the oil box to the bearing, enough to maintain a film on the working parts.

In theory, a film of oil of microscopic thickness is sufficient to keep bearing surfaces from metallic contact; and provided the bearing is in good condition, very little oil is used in practice. Grease lubrication is used extensively in hot countries for external parts, as it does not run out of the bearings and pick up grit, like oil does. Grease-packed roller bearings are occasionally seen in Britain: the return crank bearing visible in the photograph is an example.

The coupled-wheel axleboxes, being heavily stressed and subjected to horizontal thrusts as well as vertical loading, are fitted with worsted pads, to wipe the journal with oil from underneath, in addition to a supply of oil to the "crown" or top of the bearing. Axlebox supply pipes are either fed from large oil boxes on the footplate or from a mechanical lubricator.



The driver of a London Midland 4-6-2 busy with his long oil feeder before a run. Photograph by courtesy of Churchill Machine Tool Co. Ltd., Manchester.

To force oil into the internal parts, against steam pressure, either a mechanical or hydrostatic lubricator is necessary. A mechanical lubricator consists of a box containing plunger pumps, submerged in oil and operated by a camshaft. The camshaft is driven by ratchet and pawl mechanism, the pawl or pawls deriving their movement by a rod connected to any convenient part of the motion. These pumps are capable of forcing oil into

the valve chests and cylinders against steam pressure, but because single drops of oil are of little use to lubricate the large surfaces of the cylinder barrels the oil drops are atomised by steam jets before entry.

An alternative lubricator for valves and pistons is the hydrostatic type, consisting of a container from which oil is displaced by condensed steam. A sight-feed glass is provided for each valve and cylinder, through which drops of oil pass at the rate of two or three a minute. The oil drops are then mixed with steam to atomise them and to force the mixture into the main steam pipes. Hydrostatic lubricators are always fitted on the footplate, so that the enginemen can watch the sight-feeds.

Fuelling the World's Airlines

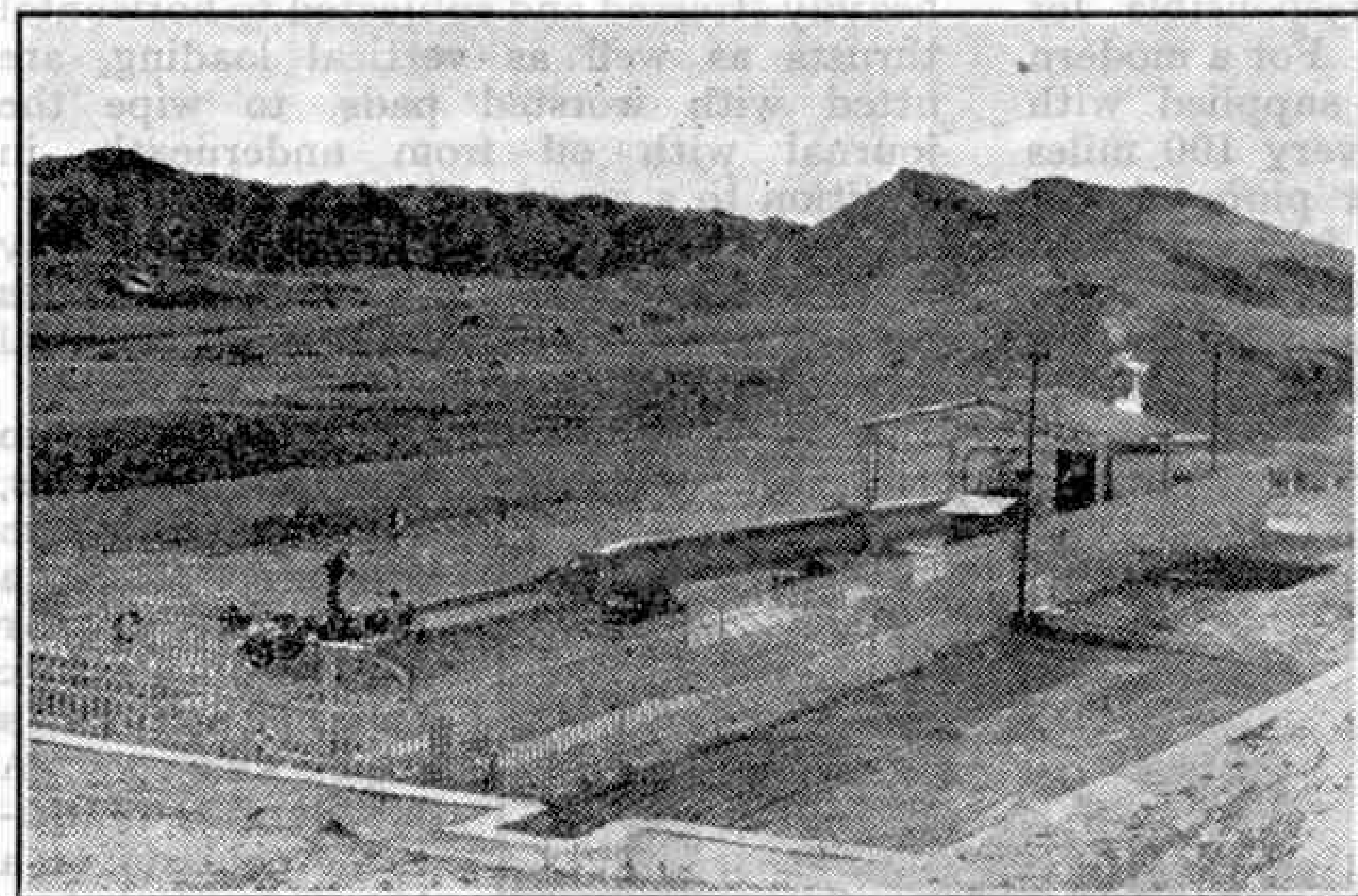
THERE is a story of two men making their first air journey. Their 'plane touched down in Paris and a smart green and yellow fueller truck sped out to fill

distribution, supplying not only aviation spirit but also kerosene fuel for jet engines.

During the war the Anglo-Iranian Oil Co. developed plant at the Abadan refinery, largest in the world, to process crude oil from the nearby oil-fields of Southern Iran and convert it into aviation spirit for the British and U.S. air forces in the Mediterranean and Far East. Yet at the start the total world output of 100-octane aviation spirit was less than half-a-million gallons a day—not enough for a single major bombing raid; Abadan was producing no 100-octane spirit and only small quantities of lower-octane aviation spirit.

Then came the R.A.F.'s decision to standardize on 100-octane spirit.

Anglo-Iranian already knew that spirit from Iranian crude oil could be further "cut up" so that the better parts would

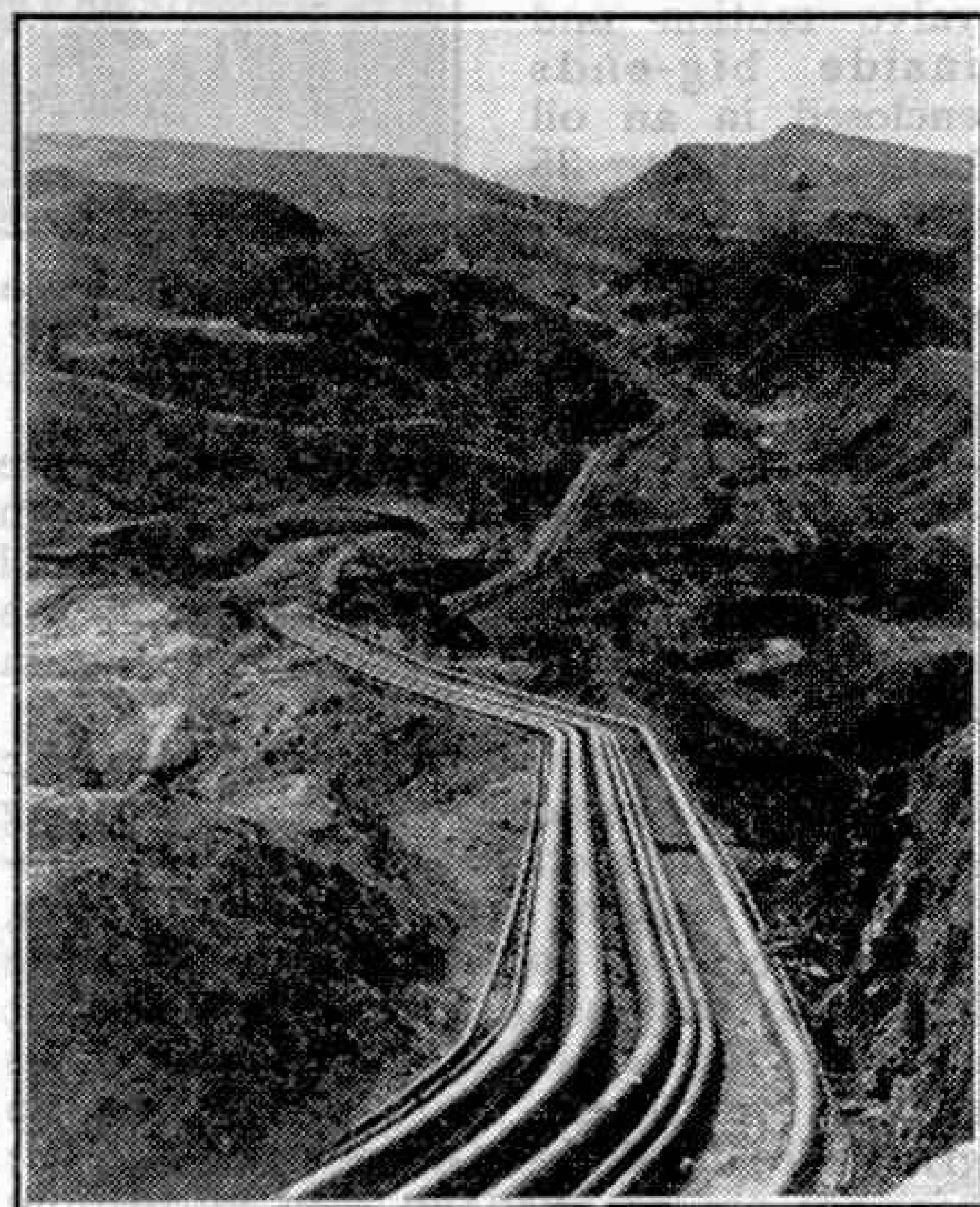


A typical oil-producing well in S. Iran. Unimpressive, but millions of gallons a year of crude oil flow from it.

up the tanks. The 'plane flew on to Marseilles and again a green and yellow truck dashed out to it. The next stop was Rome, and again the same thing happened. The first passenger looked at his watch and remarked, "This 'plane is making good time." "Yes," replied the other, "but that truck isn't doing too badly either."

Green and yellow are the colours of the B.P. aviation service. Airfields from Iceland to Australia are equipped with these smart fuelling tankers, many of them Leyland Hippo six-wheelers, manned by trained crews in green uniforms, ready to fuel an aircraft as soon as it touches down. When the war ended, the Anglo-Iranian Oil Co. realized that the impetus it would give to air travel, in the form of increased speed, safety and comfort, would have to be matched by increased efficiency in ground servicing, including fuelling. They set out to re-build and expand the B.P. aviation service to cover the eastern hemisphere, until to-day B.P. spirit can be obtained at airports throughout the principal countries of Europe, in the Middle East and Australasia—and this is only the beginning of their expansion.

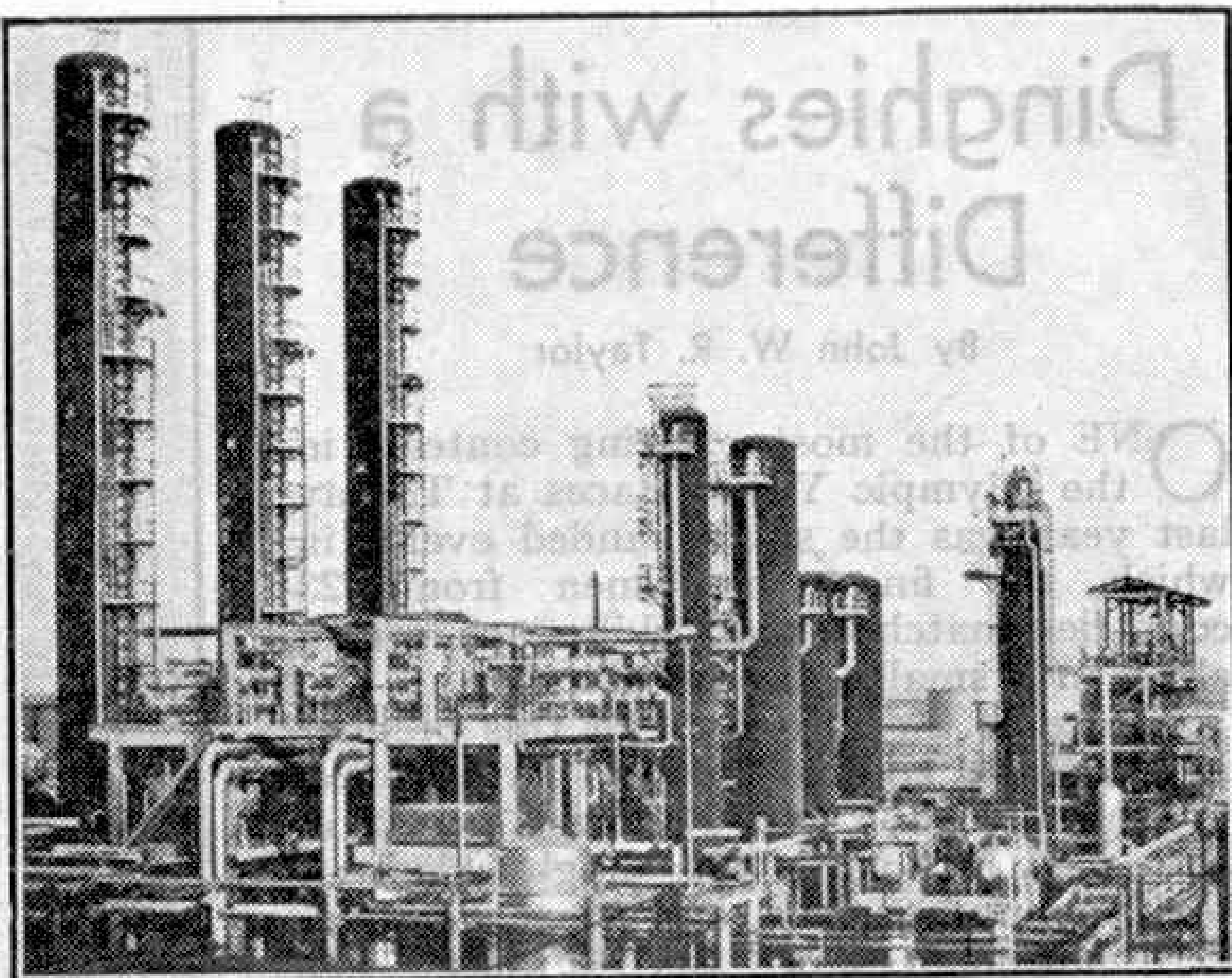
Abadan, at the head of the Persian gulf, is the main link in this chain of world-wide



Snake-like oil pipe lines carry crude oil from the Iranian oil fields through the barren hills to Abadan.

yield an aviation spirit of an improved octane value, and back-room boys at their Sunbury-on-Thames research station discovered a method, known as the alkylation process, of obtaining much larger quantities of equally good spirit from the same amount of crude oil. Almost simultaneously, two other companies working on the problem discovered the alkylation process too. Further work at Sunbury made it clear that refining plant already installed at Abadan could be used to extract from motor spirit certain aromatic hydro-carbon compounds of great value in aviation spirit.

These discoveries led to a vast increase in the production of aviation spirit at Abadan, and by V.E. day the refinery was turning out one million gallons a day. To-day that output is diverted largely to civilian use, and spirits of even higher quality are being produced. Greater production, both of aviation spirit and of other petroleum products, is expected



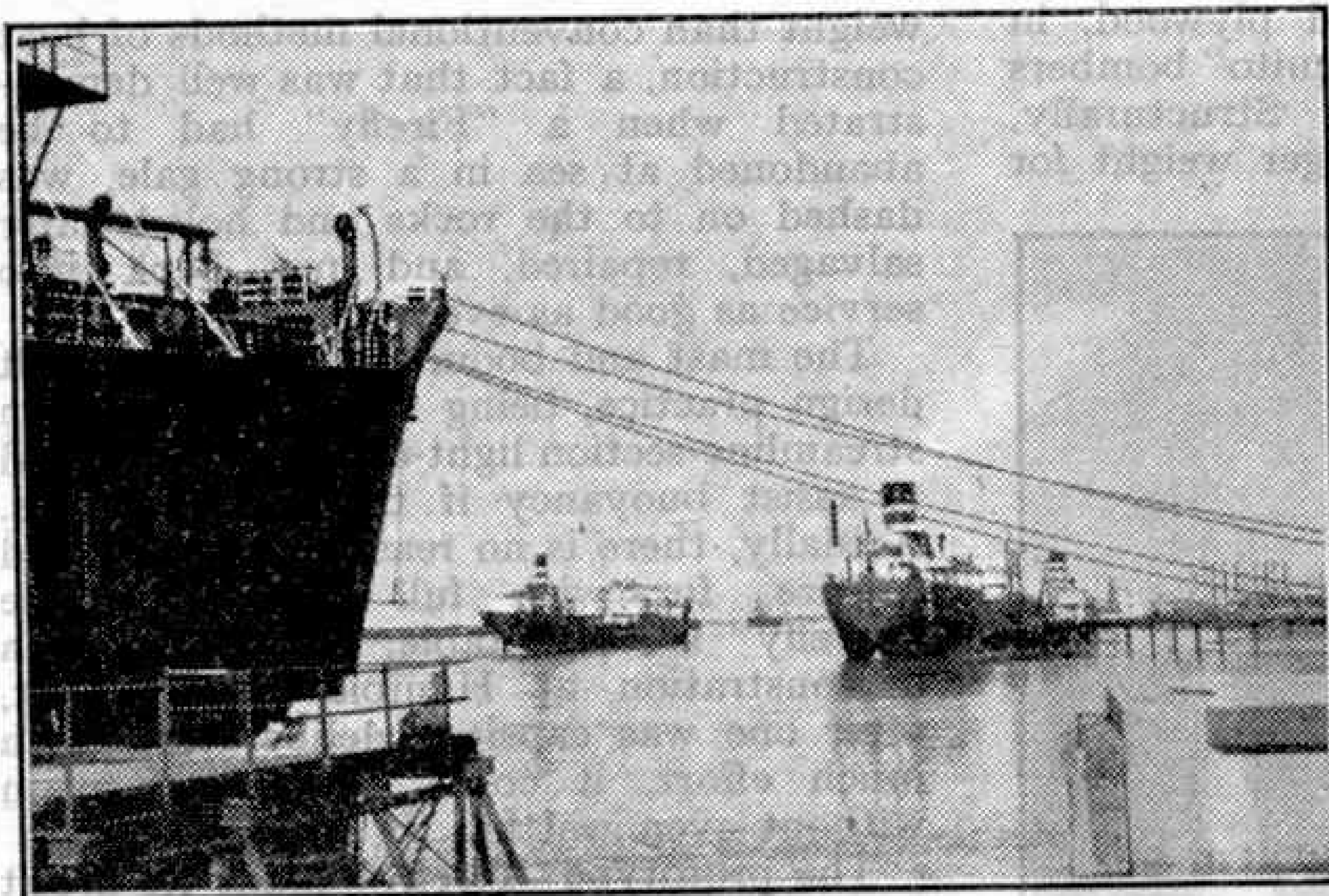
An alkylation unit at Abadan. This new process made possible bulk production of high-octane spirit and helped the R.A.F. to establish air superiority over the Luftwaffe during the war.

activities is held in London. To London the company's customers, the airlines of the world, send their estimated demands for aviation spirit, and on the collation of these estimates the movement of the sea tankers from Abadan depends. The tankers feed the main installations of each country on its sea-board, and thence the spirit flows to local depots, sometimes by road, sometimes by rail and sometimes by water, according to the transport facilities and geography of each territory. In Switzerland the main installations are fed by barge up the Rhine from the great North Sea ports, and Italy utilizes railcar tankers for onward distribution. At each airfield are bulk tanks for storage of the spirit. At regular intervals throughout the long journey from the refinery the spirit is filtered and tested,

to reduce the possibility of deterioration or contamination; rigid rules for control ensure that the high quality of the fuel is maintained. Every unit of transport that handles the spirit is provided with a built-in system of filtration.

The last line in the distribution chain is forged when an

(Continued on page 282)



Anglo-Iranian Oil Co. tankers at Abadan, first link in the world-wide distribution chain of B.P. aviation spirit.

from Iranian oil in the near future. This output is a substantial dollar earner, since some is sold directly for payment in dollars, and some in markets which would otherwise have to be supplied from dollar sources.

Although Abadan is the main centre of aviation spirit production, the key to its

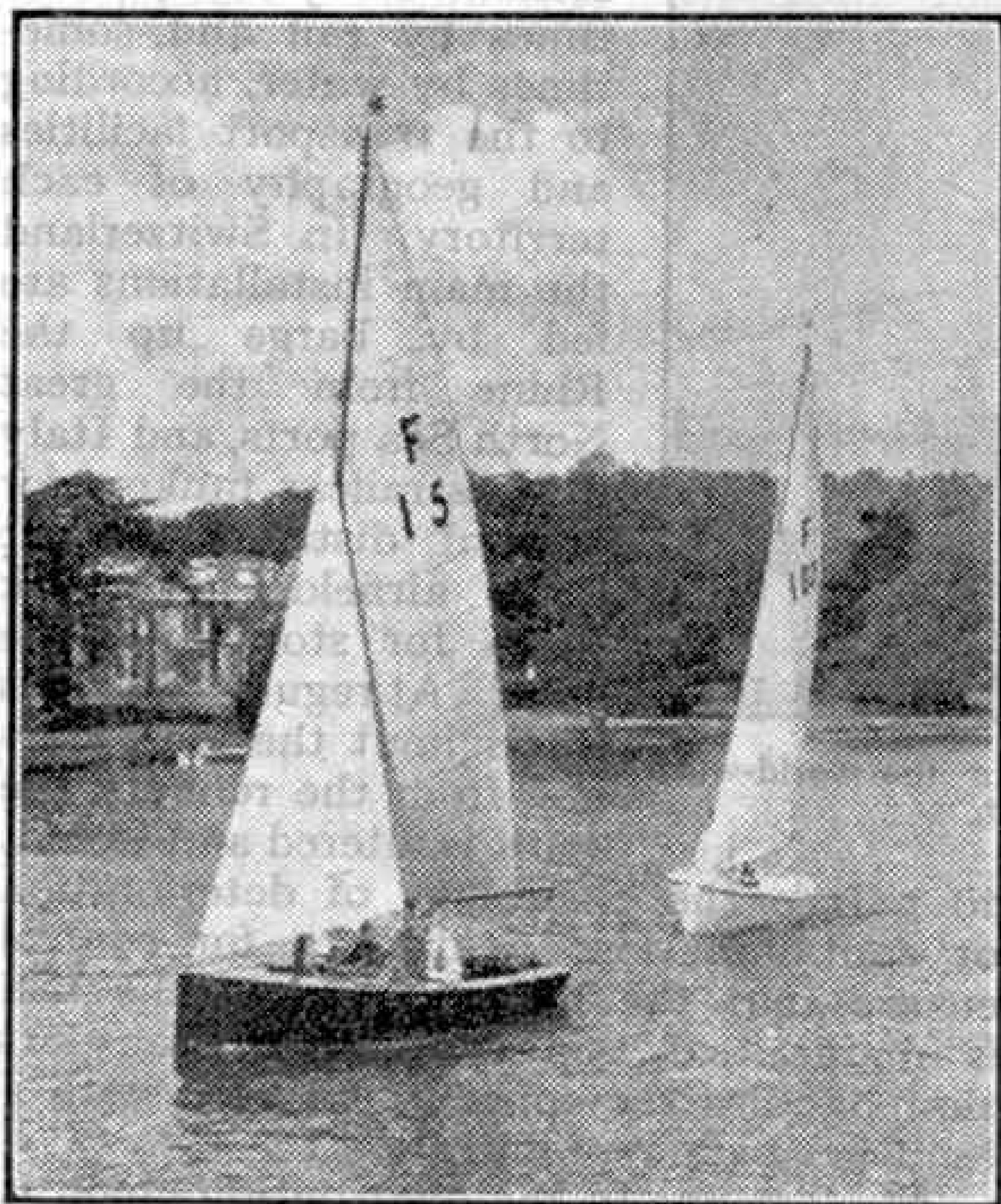
Dinghies with a Difference

By John W. R. Taylor

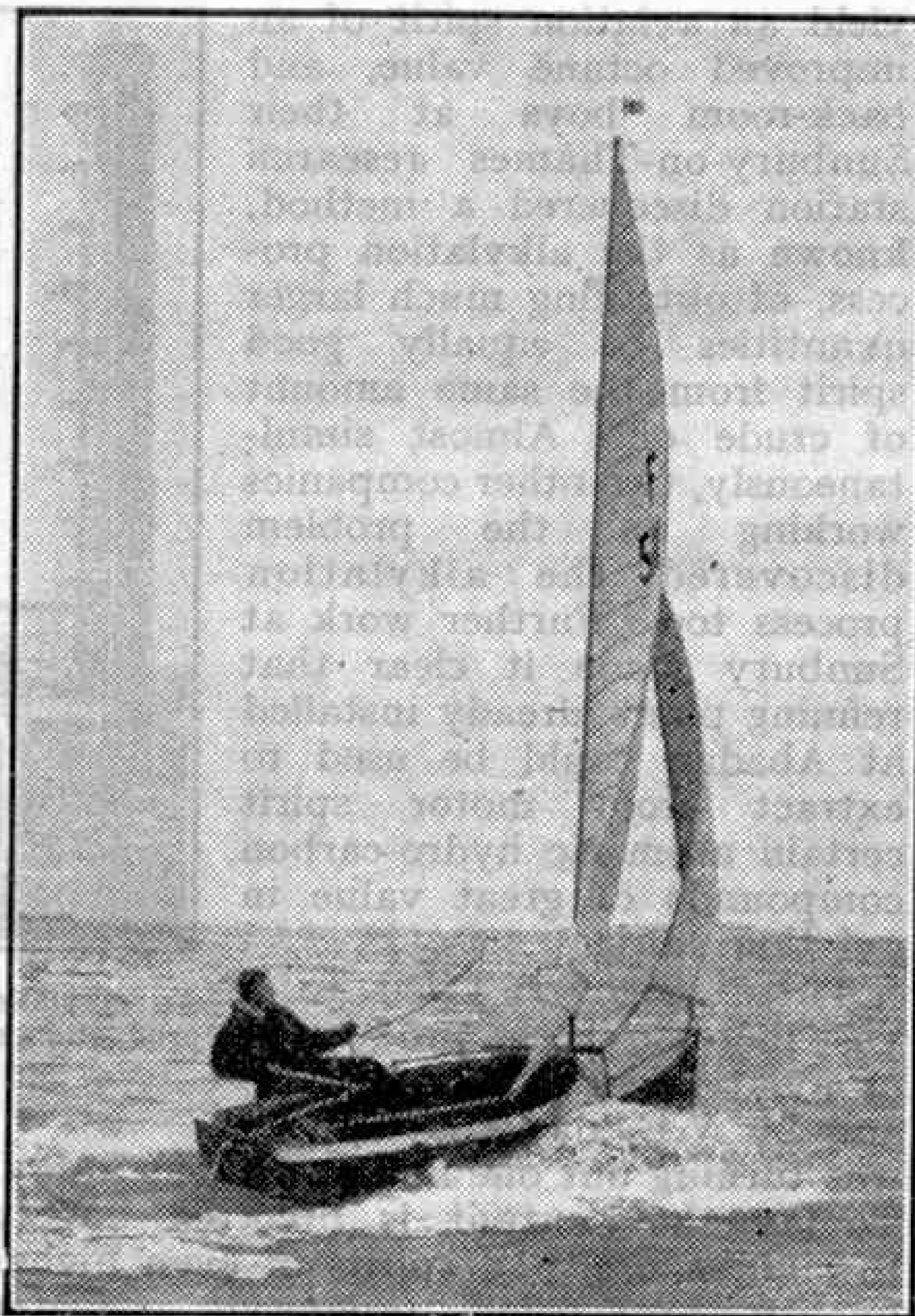
ONE of the most exciting contests in the Olympic Yacht Races at Torbay last year was the single-handed event, in which the finest helmsmen from 23 countries matched their skill, each racing alone in a small "Firefly" dinghy.

Choice of the "Firefly" for this premier international contest followed its adoption by the British Yacht Racing Association as a new National 12-ft. dinghy class—a high honour for such a revolutionary design. But, although new, the "Firefly" has behind it the combined experience and resources of its internationally-famous designer, Uffa Fox, and the Fairey Aviation Company, whose subsidiary Fairey Marine Ltd. build the boats at Hamble, in Hampshire.

As might be expected from such a parentage, the "Firefly" has several distinctly aeronautical features, which helps to explain its spritely performance. For example, its hull is made from $\frac{1}{4}$ in. thick resin-bonded moulded plywood, in much the same way as "Mosquito" bombers were made during the war. Structurally, moulded ply is much stronger weight for



"Firefly" Dinghies on the Thames.



In the hands of an expert the "Firefly" will skim along like a speedboat, at 10 knots in a fresh breeze.

weight than conventional methods of boat construction, a fact that was well demonstrated when a "Firefly" had to be abandoned at sea in a strong gale, was dashed on to the rocks and holed, later salvaged, repaired, and put back into service as good as ever.

The mast and boom also reflect aircraft design practice, being manufactured from streamline-section light-alloy tubing, sealed to assist buoyancy if the boat capsizes. Actually, there is no reason why it should capsize, for with full racing rig the "Firefly" is very stable; what is more, a demonstration at Hamble proved that, after one was capsized deliberately, with much effort, it could be righted again without even wetting its crew!

The prototype "Firefly" made its debut in the race for the Henley-on-Thames Challenge Trophy in May 1946, finishing first in its heat the first time it sailed in a race. In the final, against opposition from expert crews in familiar boats, it finished a good second. Fairey Marine no longer had any doubts of the quality of their new dinghy, but restrictions on raw materials and labour shortages generally prevented quantity production that year. So the first batch (Continued on page 282)

BOOKS TO READ

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

"SELECTED FOR ENGLAND"

By R. J. CANNON
(Ian Allan Ltd. 2/-)

Ian Allan Ltd. have broken new ground with this excellent little book on England's Test Match cricketers, in which every boy will revel. After a foreword by Alec Bedser, it gives in compact form details of the careers of the greatest of English test cricketers of recent times, with notes on their records and accomplishments not only in Test cricket, but also in county matches. These interesting accounts are supplemented by figures of batting or bowling averages, in certain instances both, throughout their careers, in county matches and in Tests against Australia, South Africa, West Indies and New Zealand.

For each of the great cricketers concerned there is a good photograph, many of the illustrations being action shots. "M.M." readers interested in the great national game will thoroughly enjoy every line of the booklet, and the wealth of information on cricket records given in it no doubt will be put to good use in settling arguments on cricket facts.

Copies may be obtained from leading booksellers or direct from Ian Allan Ltd., 33, Knollys Road, Streatham, London S.W.16., price 2/2½ post free.

"LOCOMOTIVES WORTH MODELLING"

By F. C. HAMBLETON
(Percival Marshall & Co. Ltd. 10/6)

Frequently when delving into locomotive history we are seized by the idea of modelling a particular engine. We may not have seen the original. Perhaps it was broken up long ago, and even if it still exists it may be difficult to obtain sufficient details. With the present book in hand we should find no such difficulty in modelling any of the engines shown therein. The drawings are excellent and numerous supplementary views and sections give exact proportions of chimneys, whistles, lubricators and so on, with their elusive curves.

The book also is good as a contribution to locomotive history for those not likely to model any of the engines shown, as in it there is a wealth of information on famous engine classes and their designers that helps to build up the "atmosphere" so necessary for their proper appreciation. The author tells his story attractively, bringing to life each engine in turn from the great railway days of the past.

"PRACTICAL HINTS TO SCOUTERS"

By LEONARD G. ATTRILL
(Brown, Son and Ferguson. 2/6)

Many problems beset the path of the Scoutmaster, and all who have taken up the post will welcome this new edition of the book written by the late Rev. R. P. E. Cheesman, brought up to date by Mr. Attrill, for the wisdom and knowledge that these officials of the Scout Movement have gained from experience will help them to avoid blunders into which they may fall. It will do more than this, however, for it will also provide them with a method that will ensure the development of the right atmosphere in their Troops.

The book covers the entire subject, from the enrolment of recruits and the working out of a programme of Troop work to the co-operation between the various divisions that mark the Scout Movement. It is very practical in character, covering actual details of programmes for Wolf Cubs, Scouts, Senior Scouts, Sea and Air Scouts and Rovers, and the ideals and principles of the movement are kept well in the forefront all the way through. A useful feature is a good index.

"THE A.B.C. OF PHOTOGRAPHY"

By F. and M. PARTINGTON
(Fountain Press. 3/6)

This latest addition to the wealth of literature now available on the photographic hobby is intended for the beginner, and is on similar lines to the well-known "Photofacts" series of pocket handbooks from the same publishers. It is written in a frank and friendly style that will appeal to the newcomer to this fascinating hobby. After explaining the "how and why" of box and roll-film cameras, the authors deal with lenses and shutters, films and filters, loading and unloading a camera, and, of course, the very important matter of exposure. The amateur enthusiast who likes doing everything for himself will find practical chapters on developing, printing, enlarging, mounting and spotting, and there is also a short chapter on indoor photography. Neat diagrams and several full-page half-tone photographs add to the value and interest of this excellent handbook.

"WATCH ESCAPEMENTS"

By Dr. J. C. PELLATON
(N.A.G. Press. 10/6)

This account of a subject of the greatest interest to all watchmakers is a translation by S. Paris of part of a course in watchmaking in use in the Swiss horological schools. It is intended to play a part in the revival of watchmaking in England, and is precise and methodical, with most drawings 20 times the actual size of the parts illustrated, and others on an even larger scale. Only in the last few years has it been realized that the modern mass production of watches in Switzerland owes its success to exact knowledge of the geometry of the escapement, and this account of the subject should prove of the greatest value.

"MODEL GLOW PLUG ENGINES"

By Lt. Col. C. E. BOWDEN, A.I.Mech.E.
(Percival Marshall. 3/6 net)

"Glow plug ignition," states the author, "is a new adaptation of one of the earliest forms of ignition for internal combustion engines." The model glow plug engine has been an immense success in the United States. Lt. Col. Bowden believes that it will also enjoy great popularity over here when its advantages and disadvantages are fully understood, and his handbook is an endeavour to promote this understanding by giving a complete explanation of its working, with useful operational hints.

Explanatory diagrams, sectional drawings and many half-tone illustrations add to the interest and value of the book.

"BASIC TECHNICAL ELECTRICITY"

By H. COTTON, M.B.E., D.Sc., M.I.E.E.
(Cleaver-Hume Press Ltd. 8/6 net)

Nowadays we all need to know something of electricity for use in our daily work or in our hobbies and pastimes. The Cleaver-Hume Electrical Series, of which this book is the first, is intended to supply this need in a thoroughly modern and scientific manner.

From a discussion of the nature of electricity we pass to accounts of sources of current, the electric circuit, the chemical effects of electricity, and accumulators. Then follow sections on the heating effect of electricity, magnetism and electro-magnetism, electrical measurements and static electricity. The book is simply written and excellently illustrated and it gives the essential knowledge on which later books in the series will be based.

Railway Notes

By R. A. H. Weight

National News

Standard types of signs or notices to be used at British stations will be rendered in Gill Sans type on a background of the Regional colour. Signs will consist of enamelled metal plates designed to give clear indications. Large signs bearing the station name in 12 in. letters are to be fixed at the incoming ends of platforms at all stations on main trunk routes, also at principal stations on subsidiary lines. Smaller name signs will continue to be displayed at intervals along platforms; these will usually be 3 ft. long, having letters 3 in. high.

British Railways 1949 locomotive building programme provides for 465 new engines, 156 of which are to be constructed by contractors, the remainder in various railway works. Some are already in hand, while others will be put on order as materials become available later. There are to be 32 L.M.R. mixed traffic 4-6-0s, 10 each W.R. "Castles" and "Halls," 28 L.N.E.R. type "B1" 4-6-0s and 28 "A1" 4-6-2s, with two "Merchant Navy" and 15 "Battle of Britain" 4-6-2s for the S.R. For the latter region are also

The orders for 27,225 freight train vehicles of all kinds include 10,215 mineral wagons being constructed by contractors, and 400 fish vans for the East Coast route.

Various interesting examples of inter-working using lines or rolling stock of the former L.M.S. or L.N.E.R. have lately been reported from Scotland. The Glasgow-Oban (L.M.S.) and Glasgow-Fort William-Mallaig (L.N.E.R.) routes are both famous for scenery. Some of the grandest of both may be enjoyed while travelling by the 9.31 a.m. from Glasgow, Queen Street, to Oban, which goes over the former L.N.E.R. route past Helensburgh, Loch Long, Loch Lomond, to Crianlarich, thence by way of Loch Awe and Connel Ferry (formerly L.M.S.) to Oban, returning similarly in the evening.

Several interchanges of locomotives are taking place on other Scottish lines. Though a good many green ex-L.N.E.R. engines are still about, lined black is more in evidence as the finish for mixed traffic or older passenger locomotives.

There is a Tavern on the Train

Eight novel and splendidly appointed "Tavern Cars" are being built at Eastleigh Works for selected express services on the Eastern and Southern Regions; some are already running. They are designed to run attached to a restaurant of the latest type, and contain kitchen and pantry, with attendants' compartment; bar and snack counter with stainless steel

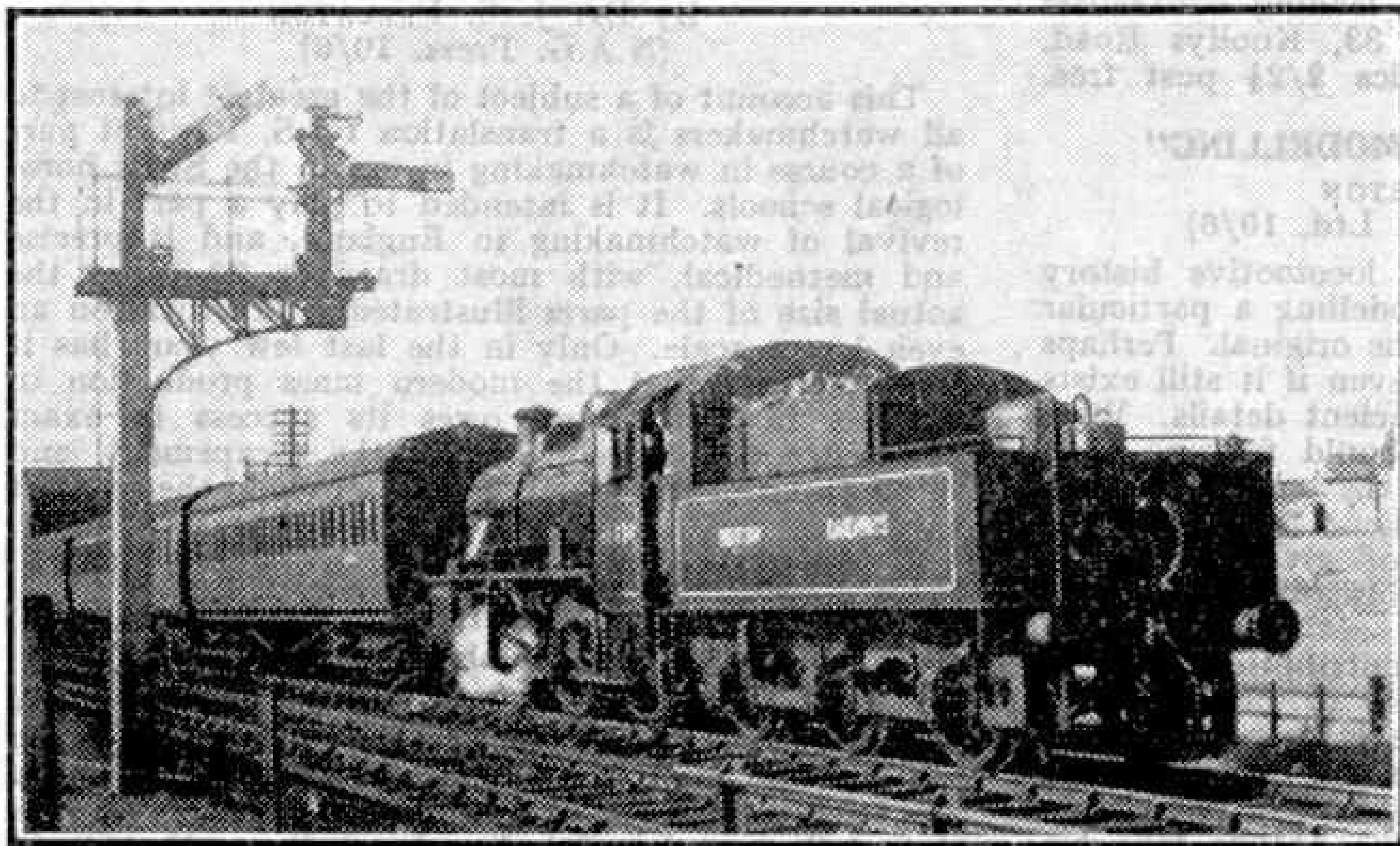
and plastic fittings; refrigerator and ice-cream conservator. The internal decoration resembles that of an old-world inn, with white-washed walls, oak beams, wooden settles and tables, small-paned high windows, hanging old type metal lanterns, and a floor covering imitating the black and red tiling of the country inn. Externally the lower half of the cars, painted in the new crimson lake livery, is lined out to represent brickwork. The cream upper section is broken by vertical black panels giving the impression of an old half-timbered house.

Each of the new cars will carry painted "Inn" signs externally and internally, the names chosen being: "White Horse," "Jolly Tar," "Dolphin," "Three Plovers," "The Bull," "The Salutation," "The Green Man," "The Crown."

The ordinary dining car has redesigned seating accommodation of extremely comfortable type. These new sets will operate in the S.R. "Atlantic Coast Express," the "Master Cutler" and "South Yorkshireman" expresses to and from Marylebone, the "White Rose" between King's Cross and Leeds; the "Norfolkman" between Liverpool Street and Cromer, via Norwich, and also in the cross-country boat trains running between Liverpool, Manchester, Ipswich and Harwich.

The First Penny Timetable

Just 100 years ago, Andrew Reid published at Newcastle-on-Tyne the first penny railway timetable ever printed. To celebrate its centenary of production, "Reid's Railway Guide" lately reproduced a facsimile of the original cover, with specimen pages from an early issue. Reid followed up his pioneer timetable with a series of "Reid's Railway Rides," illustrated with engravings, describing journeys from London to Glasgow, Edinburgh and Dublin, in the form of long folding maps. His descendants produced the first pictorial railway posters in colour.

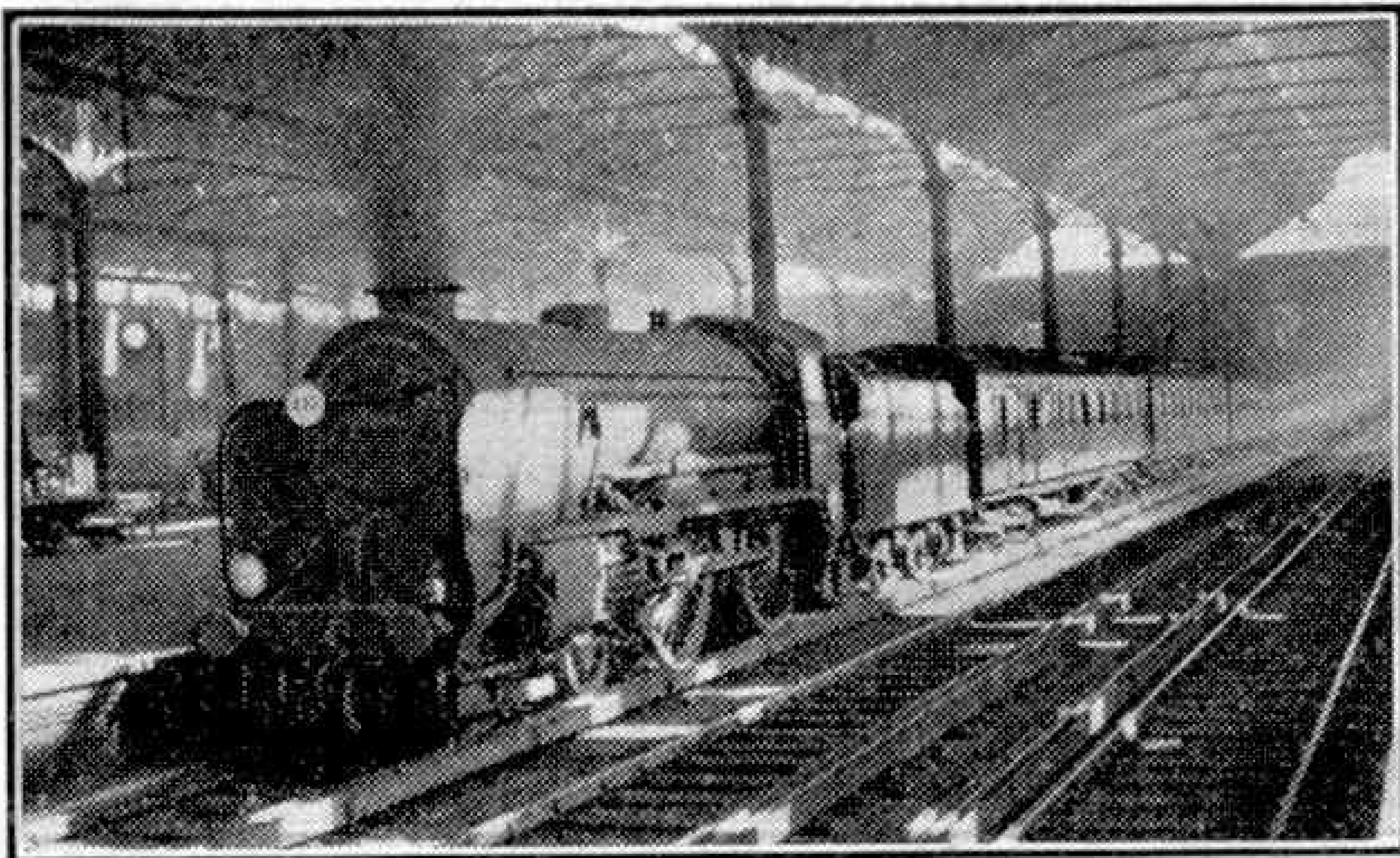


A London Midland light 2-6-0 No. 46434 at work on the Wigan branch of the former L.N.E.R., now under London Midland control. Photograph by W. S. Garth.

ordered the five "Leader" special type mixed traffic tanks, one diesel-mechanical shunter, 15 diesel-electric shunters of 350 h.p., and two main line diesel-electric locomotives.

New 2-6-0 mixed traffic engines include 27 L.M.R. class "4," and 70 L.N.E.R. type "K1," the latter being the two-cylinder higher-pressure version of the smaller Gresley 2-6-0, originally built with three cylinders for West Highland service. There will be 54 L.M.R. type 2-6-4Ts to come, and 30 of their 2-6-2Ts, as well as 10 more 2-6-2Ts for the W.R., which is also to have 95 additional 0-6-0Ts including a new outside-cylinder class. Fifteen 0-6-0Ts are to be built by the E. and N.E. Regions. There may be, in time, some further interchanges of engines between Regions, and those now about to be constructed may not all work on their native metals.

Current plans include the provision of 1,685 steam train passenger carriages, 839 to be corridor coaches for main line service including some restaurant and sleeping cars. Vans or miscellaneous vehicles built for passenger train service will number 287, in addition to 500 electric train coaches.



Southern No. 30929 "Malvern" at Victoria on the Newhaven Boat Express during the last week of steam operation. Photographs on this page are by W. Philip Conolly.

It is interesting to recall in this connection that for many years prior to the 1914-18 war the largest English railway companies published bulky general timetables, with maps and much other information, at the modest selling price of one penny. They are of great interest to study nowadays. The G.N.R. summer timetable for 1914 is on the writer's desk at the moment; it contains some 230 pages, each 1 ft. deep.

Southern Tidings

Speedy replenishment of carriage water tanks is much facilitated at Victoria Station, London, S.R. by a new battery-driven mobile pump, with storage capacity for 275 gallons of water.

A notable development in May was the regular haulage of the London-Newhaven boat expresses by new main line electric locomotive No. 20003, which is painted green. The ordinary coaches of the train appeared for the first time on 15th May in new crimson lake and cream livery, though the Pullman refreshment car, of course, retains its normal colours. It is intended to continue the use of one of the three electric engines, at any rate on the day boat trains, the engine being utilized also for goods work during much of the remainder of each 24 hours. The haulage of a through W.R. train each way between Eastbourne and Brighton is fitted in as well on summer Saturdays.

Although "Schools" 4-4-0s had been the usual motive power during the last nine months, an "Atlantic" was seen in full cry with 380 tons on the London-bound boat train only a few days before the change-over was rostered. These famous L.B.S.C. 4-4-2s had been a mainstay of the service for many years. Various types of express, mixed traffic and tank engines share the haulage of the through steam trains between the Midlands and Brighton—Eastbourne—Hastings.

On the Reading-Redhill line 4-4-0s from each of the separate pre-grouping companies may be seen, including S.E.C.R. "B1s," L.B.S.C. "B4s," and L.S.W.R. "L11s" or "T9s." Some "Paddlebox" 4-6-0s are in service again, together with other engines of different classes ex store. Most of the shunting in the

Eastleigh neighbourhood is performed by "E4" radial tanks on account of considerable "G6" withdrawals. Some "M7" 0-4-4Ts fitted for motor train working are running from Horsham shed, while 67-year-old "D1" Stroudley 0-4-2T No. 2253 was still working merrily from Tunbridge Wells at the time of writing.

"Battle of Britain" No. 34059 "Sir Archibald Sinclair" was making trial runs in May last with special or ordinary trains from Liverpool Street to Norwich, Parkeston Quay (Harwich) and elsewhere on the Eastern Region. These lines have seen little of "Pacific" operation hitherto, as the Gresley or other Doncaster types are too big.

New Western Region Locomotives

Latest modified "Halls" are No. 7903, "Foremarke Hall," No. 7904, "Fountains Hall" and No. 7905 "Fowey Hall"; 0-6-0Ts Nos. 9678-80 also have been completed.

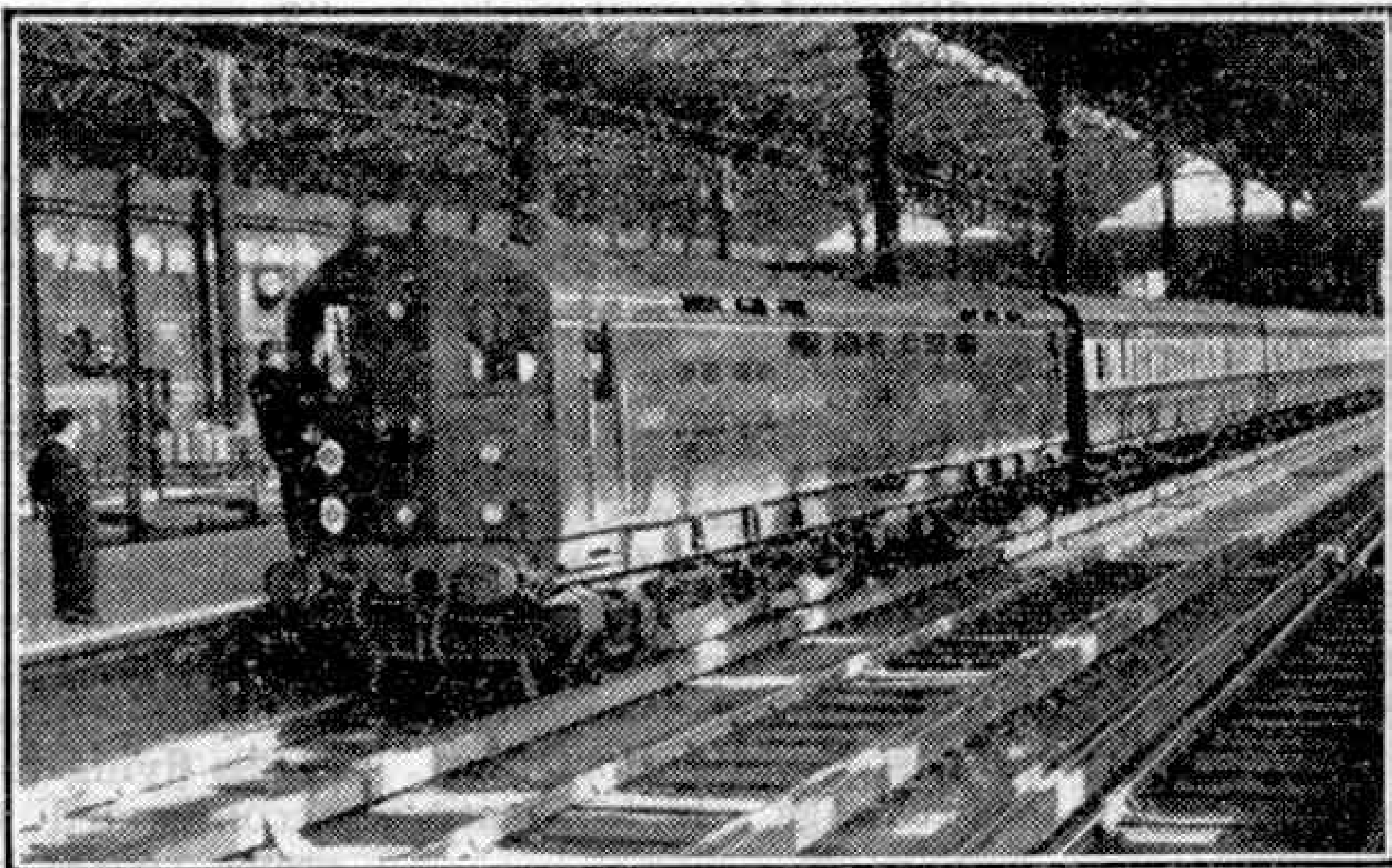
London Midland Regional News

As on other Regions, numbers of plain tenders are noted on repainted engines, as the British Railways crest is not yet much in use. The new carriage colours, however, are beginning to appear.

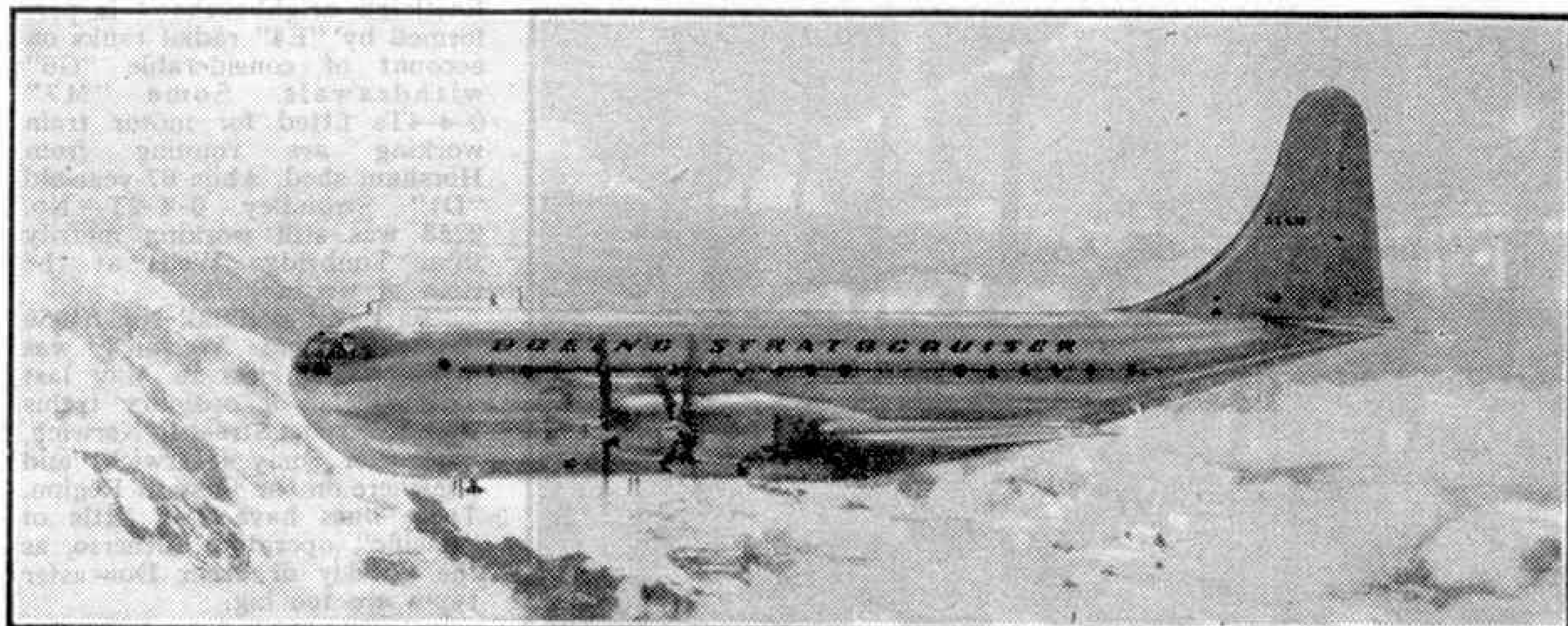
The diesel-electric express locomotive No. 10001 lately achieved a long continuous spell on round-trip Manchester—St. Pancras working; little had been seen of 10000, but the two together ran from Euston to Glasgow non-stop on 1st June with "The Royal Scot." This trip was the longest non-stop run yet made in Great Britain with diesel traction and it saw the first appearance of the diesel units on British Railways in Scotland.

This Month's Cover

Railway enthusiasts will be specially interested in this month's cover. This shows a Western Region goods train being directed into a relief or loop line ahead by the small "doll" of a characteristic Great Western bracket signal. The original photograph by J. G. Hubback appeared as a half-tone reproduction in "Studies in Steam No. 2." By courtesy of the publishers, Ian Allan Ltd., this striking scene is now used as an "M.M." cover.



Southern electric No. 20003 on the Newhaven Boat Express. The coaches are finished in British Railways crimson lake and cream.



Double-Decker of the Air

The Boeing "Stratocruiser"

By John W. R. Taylor

"MUST the brief glory of the sailing Clippers end this great nation's role upon the seven seas? Or may we draw from this rich heritage the inspiration for new ventures, with Yankee Clippers sailing forth again?"

When those words were written many years ago, their American author little realized that one day a young man named Juan Trippe would take up his challenge and send forth new fleets of Clippers, not upon the seven seas but through the skies above them. For when Trippe laid the foundations of his great Pan American Airways network in 1927, he decided to give each of his air liners a "Clipper" name.

Pan American has grown from small beginnings in a tradition of free enterprise, using always the finest aircraft available. And when "*Clipper Flying Cloud*"—first of P.A.A.'s new fleet of giant Boeing "Stratocruisers"—touched down at London Airport on 4th April last it was obvious that the tradition is being maintained. The "Stratocruiser" is undoubtedly the finest air liner in regular service anywhere to-day, superseding the "Constellation" as flagship of the world's airlines. As a luxury liner it is the first aircraft able to fly direct from New York to London, carrying 61 passengers at speeds up to 340 m.p.h.; as a 100-passenger "skycoach" it can bring new speed, comfort and economy to short-range high-density services.

Pan American is the only airline operating "Stratocruisers" at present, but

soon it will be joined by four others, including our own British Overseas Airways Corporation which has six on order from Boeings and recently bought four more from the Scandinavian Airlines System. So we shall be seeing a lot of these 71-ton, double-decker aircraft in the next few years.

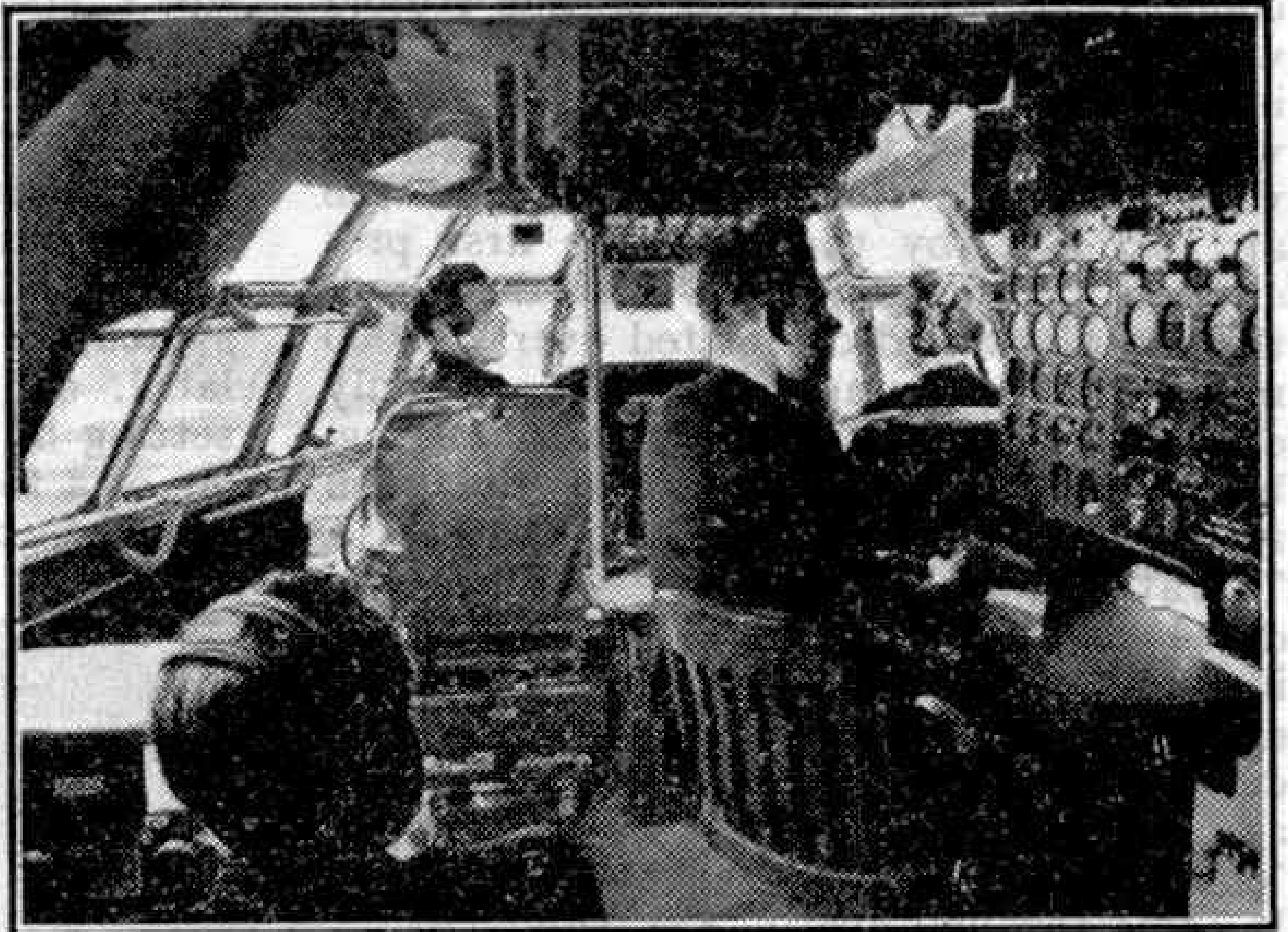
The success of the "Stratocruiser" is no mere coincidence, for its development began indirectly no less than 13 years ago when Boeings started work on a bomber to supersede the B-17 "Flying Fortress," which had just gone into production. The new bomber was destined to achieve fame during the second World War as the B-29 "Superfortress," and the "Stratocruiser" was conceived in 1944 as the C-97, its military troop and cargo-carrying team-mate.

The idea was to build the two aircraft in parallel, using B-29 wings, undercarriage, engines and tail unit on the C-97, but with a fuselage of greatly increased capacity, created in effect by building two B-29 fuselages on top of each other. This gave the U.S.A.A.F. a unique bomber-transport team which at the same time simplified production, squadron maintenance and spares problems and meant that, as the two aircraft possessed virtually the same range, speed and flying characteristics, B-29s flying to an advanced base could be accompanied by C-97s carrying ground crews, spares, fuel, bombs and equipment. In this way, the squadron could go into action almost immediately on arrival.

The sudden collapse of Japan prevented operational use of the bomber-transport team idea, but improved versions of both aircraft are still in production at Boeing's Seattle factory, in the shape of the B-50A "Superfortress" and C-97A "Stratofreighter." The "Stratocruiser" is the civil passenger version of the C-97A. Although externally similar to the old B-29 and C-97 the B-50, C-97A and "Stratocruiser" are in fact 75 per cent. new, with more powerful Pratt and Whitney "Wasp Major" engines, each developing 3,500 h.p., higher performance and payload.

The creation of the "Stratocruiser" by taking a "Superfortress" and putting another fuselage on top of the existing one sounds very nice and simple. Actually it was far from easy, as no airline navigator wants a couple of machine-guns poking him in the ribs all day, and passengers usually object to riding hooked inside a bomb-bay. So it is hardly surprising that the story of the four and three quarter million hours of design, development and testing that went into the "Stratocruiser" makes fascinating reading.

Every component went through a rigorous test programme to ensure that it would stand up to years of hard work



In the roomy control cabin on the upper deck of the Boeing "Stratocruiser" air liner. The illustrations to this article are by courtesy of the Boeing Airplane Company, U.S.A.

on the airlines. In some cases they were fastened to complex instruments of torture that stretched, compressed, shook, banged or rubbed them, imposing years of normal wear and tear in a few hours. For example, a complete undercarriage unit was mounted on one machine and thumped into the ground 41,500 times to prove that it would not fracture under continued heavy landings.

Other parts were installed on B-29s for test under flying conditions. In this way the ailerons were flown 2,840 miles and the elevators 7,171 miles before the "Stratocruiser" itself left the ground.

Further airflow tests were made with models of the "Stratocruiser" and "Stratofreighter," which spent 720 hrs. in wind tunnels, during which tests were conducted at speeds as high as four-fifths the speed of sound. One 10½ ft. span model, complete even to movable control surfaces, extendable wing flaps and powered propellers, helped Boeing engineers to predict accurately the aircraft's performance and handling characteristics long before the prototype flew.

When it did take off for the first time on 8th July 1947 it was very different from the aircraft now in service with P.A.A. Instead of



Part of the main passenger cabin of a "Stratocruiser" built for Pan American World Airways. Half-way along on the right a spiral staircase leads to the lounge on the lower deck, and at the far end of the cabin is a large galley.

comfortable seats, its interior was stuffed with three tons of special precision test instruments able to record every minute vibration, stress, temperature and pressure variation while the machine was in the air. In fact, by the time the first production "Stratocruiser" was delivered, the prototype had completed over 250,000 miles of test flying, including not only every conceivable type of airline flying, but also stalling, diving and flying in icing conditions. In one test a "Stratocruiser" was dived at 498 m.p.h.; in another, one of its engines was purposely cut on take-off, just as the fully-loaded plane became airborne. It came through every phase of the programme with flying colours.

Extensive tests of this nature cost a lot of money, and inevitably put up the initial cost of production aircraft, but they contribute immeasurably to safety, for, as a large notice in the Boeing factory claims: "It's what you don't see that counts." Passengers in a "Stratocruiser" can be certain that all the complex mechanical and structural devices outside the four walls of their cabins are as good as skilled engineers and long years of experience can make them.

On the other hand, an aircraft manufacturer who failed to realize that what you *do* see counts too would sell very few aeroplanes, and the "Stratocruiser's" passenger accommodation is as luxurious as its structure is sound. To test the comfort of the sleeping bunks, Boeing's Vice-President in charge of engineering and sales, Wellwood E. Beall, and other prominent executives took off their jackets and went to sleep in them. But even Boeing cannot afford to pay its executives to sit down in the passenger seats, stand up, sit down again, and so on for hours on end, to see how the materials will stand up to wear and tear. So they devised a machine to subject the chair fabric to scuff tests and so reproduce the effect of a passenger sitting down in one of the chairs time after time.

As a matter of fact, the company set

up a special section of its Engineering Division to do nothing but design the aircraft's reclining seats, spending more than 100,000 man-hours and £125,000 on the job. In its finished form each seat has a miniature control panel on the armrest, which includes a call-bell, reading light switch, an "occupied" placard, seat number label, ash tray, lever for adjusting the setting of the back, and a socket for the leg of a food tray; one version can also be quickly converted into a comfortable



A Boeing "Stratocruiser" flying over Puget Sound, near Seattle, where these giant air liners are built.

sleeping berth, 6 ft. 4 in. long and 3 ft. 6 in. wide.

Foam rubber padding ensures comfort and helps to keep down the weight of a pair of seats to 75 lb. The results, according to Boeing, are that "whether you're a petite blonde of 100 lb. or a buxom bread-and-butter and egg man of 300 lb., you'll be equally comfortable. The same seat which comfortably supports the 100 lb. blonde without springing her up into the luggage rack is equally pleasing to the 300-pounder without sinking him to the floor."

An outstanding feature of the "Stratocruiser," however, is that passengers are not compelled to spend hour after hour of flight rooted to their seats. In fact, there is a small cocktail lounge on the lower deck, reached by means of a spiral staircase from the main cabin, for the benefit of passengers who want to stretch their legs or have a quiet drink with some friends.

The overall impression throughout the "Stratocruiser" is one of spaciousness, from the flight deck (Continued on page 282)

Engineering Notes

Moving a 350-ton Press

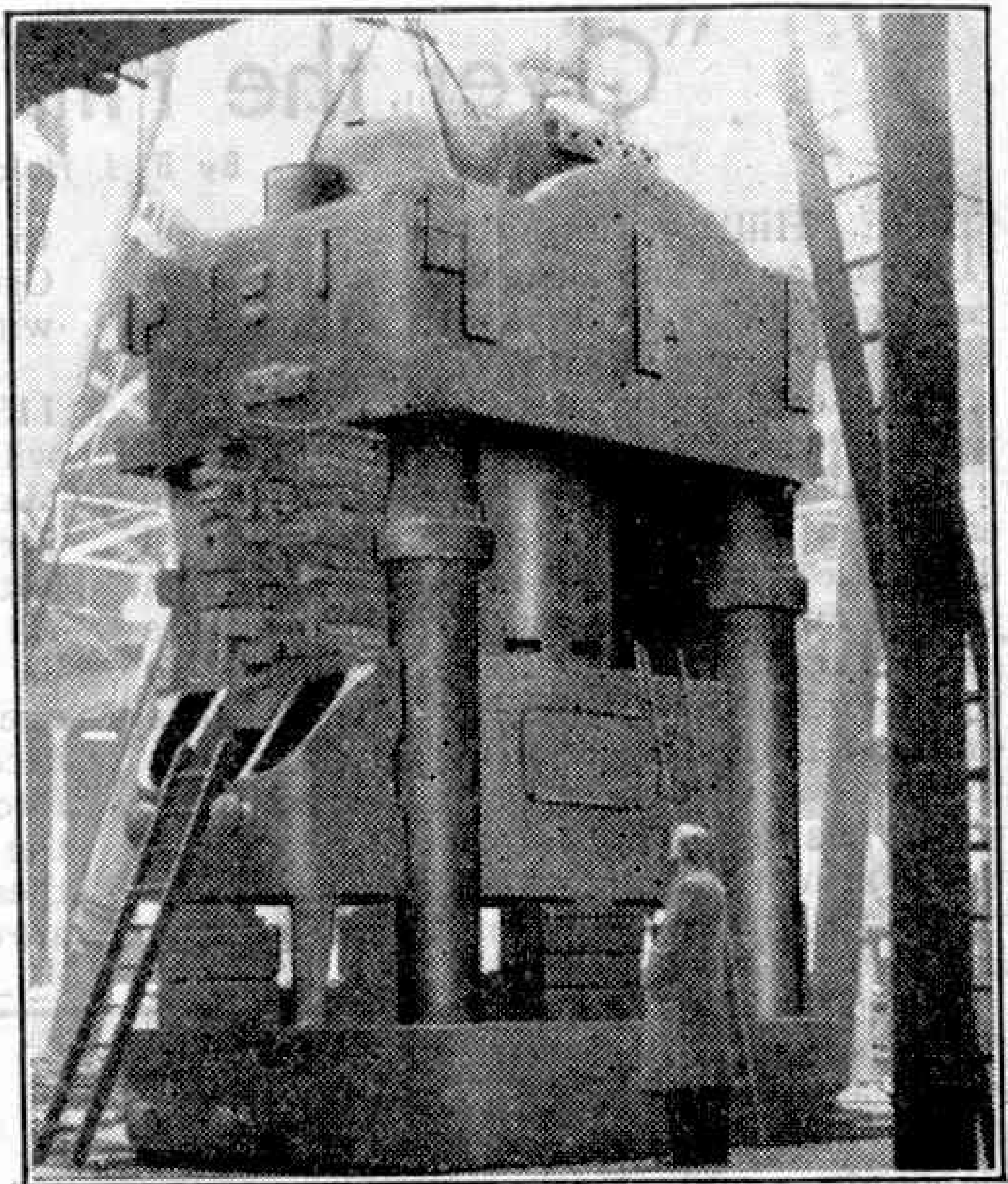
Handling heavy machinery is always a difficult task, particularly when it has to be dismantled in the factory where it is at work and moved to another position without interfering too much with operations in progress. How this was accomplished with a 5,000 ton rubber die press, weighing 350 tons, makes an interesting story.

The press is shown in the upper illustration on this page. It has three main sections, a head piece weighing 75 tons, a platen of 65 tons and a base of 85 tons. For lifting these it was decided to use the oldest method in the world, employing two very heavy ship's derricks, 60 ft. long, which were erected through an opening made in the roof of the factory directly above the press. When the derricks were rigged the head piece was lifted 7 ft. to 8 ft. above the top of the columns of the press, and then lowered 20 ft. to the ground. Two 10-ton winches supplied the lifting power, and two 6-ton winches the luffing power for the derricks. All of them were hand operated, and with them 12 men lowered the headpiece to the ground in 3½ hours.

There were no trolleys big enough to carry the three heavy pieces of the press. Old main line metals therefore were laid on their sides, and steel balls were inserted on them, with heavy plates laid on top to give a roller base action. With this arrangement the sections were moved 400 ft., including two turns at right angles, in about half a day, without interfering with production or with machinery in the immediate vicinity.

A Roadless Track Development

The lower illustration on this page shows an interesting development of the D.G. Half Track introduced by Roadless Traction Ltd., Hounslow, the

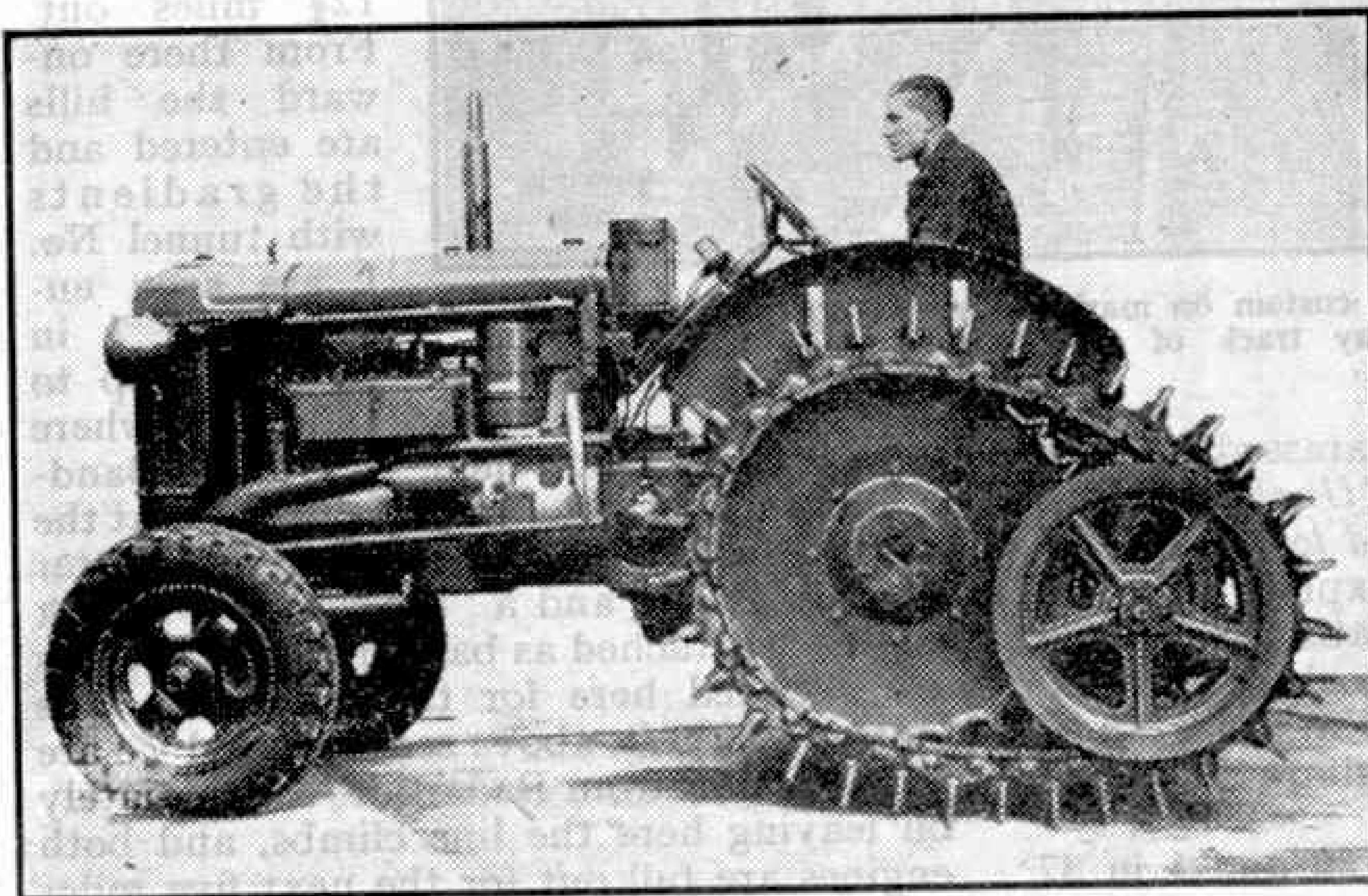


Dismantling a heavy press for removal to a new position. The three main sections were lifted by ship's derricks and hand winches. Photograph by courtesy of Machinery Installations Ltd., Acton.

original form of which was illustrated and described in the "M.M." for October 1946. In operation the track is in effect the rigid rim of an immense wheel. When assembled it is equivalent to a wheel of 15 ft. diameter, and after a period it settles down to a curve that is the same as that of a wheel of 20 ft. The effective diameter and efficiency then slowly increase with wear, for a period that as yet is not known.

The new Skeleton type D.G. track, as it is called, retains all the advantages of the big wheel, but instead of ground plates it has spud plates fitted on each link. These support the tractor on their lower edges, as can be seen in our illustration. They are ½ in. thick. Half of them are 12 in. wide and the other half 6 in., so that the area of support is considerable. As a result a tractor equipped with them does not sink deeply into the soil, and in soft ground the load is taken at a point 2 in. to 3 in. below ground level. After it has passed over a loose, fine seed bed in dry conditions the impressions made by the spud plates tend to fill up and their track can scarcely be seen.

The new track is much lighter than the standard one already in use, and gives excellent results on a greasy surface. It is not intended to replace standard track, but in difficult conditions it has many advantages.



The Roadless Fordson Major fitted with the new skeleton type D.G. Half Track described on this page. Photograph by courtesy of Roadless Traction Ltd., Hounslow.

"Over the Hill" in Assam

By B. J. Holden

THE "Hill" section of the metre gauge portion of the Bengal Assam Railway connects Badarpur in south Assam with Lumding in the Assam Valley and passes through country covered with dense jungle intersected by mountain torrents and rivers. The section is packed with interest to engineers and railwaymen. The natural difficulties encountered in the construction of this railway were considerable, and the local Naga tribes had to be reconciled to this encroachment of their territory. The drainage and engineering maintenance has to be of a very high order. A constant watch has to be kept for earth slips during the monsoon season, which is an anxious time for traffic and engineering departments alike.

There are further natural obstacles in the form of wild elephants and tigers. Before the introduction of the heavy "Garratt" engines, the former were known to pit their strength against trains and cause derailments; but the "Garratts" hold their own against these animals, and in September 1944 an elephant was killed near Hatikhali. Tigers cause trouble in various ways. On

one occasion a wire from a harassed Station-master read as follows:—"Unable to cross trains owing to staff confined to quarters for fear of tigers." I should explain that the points, as at a crossing station, are hand worked and have to be locked and unlocked by hand keys, similar to the arrangements for working intermediate sidings in this country.

Grades and tunnels abound and 1 in 37 is the steepest grade. The presence of 37 tunnels amid the worst malarial district of Assam alone presents a problem of its own

to the railway and medical authorities. Great strides have been made by treatment with mepracrine.

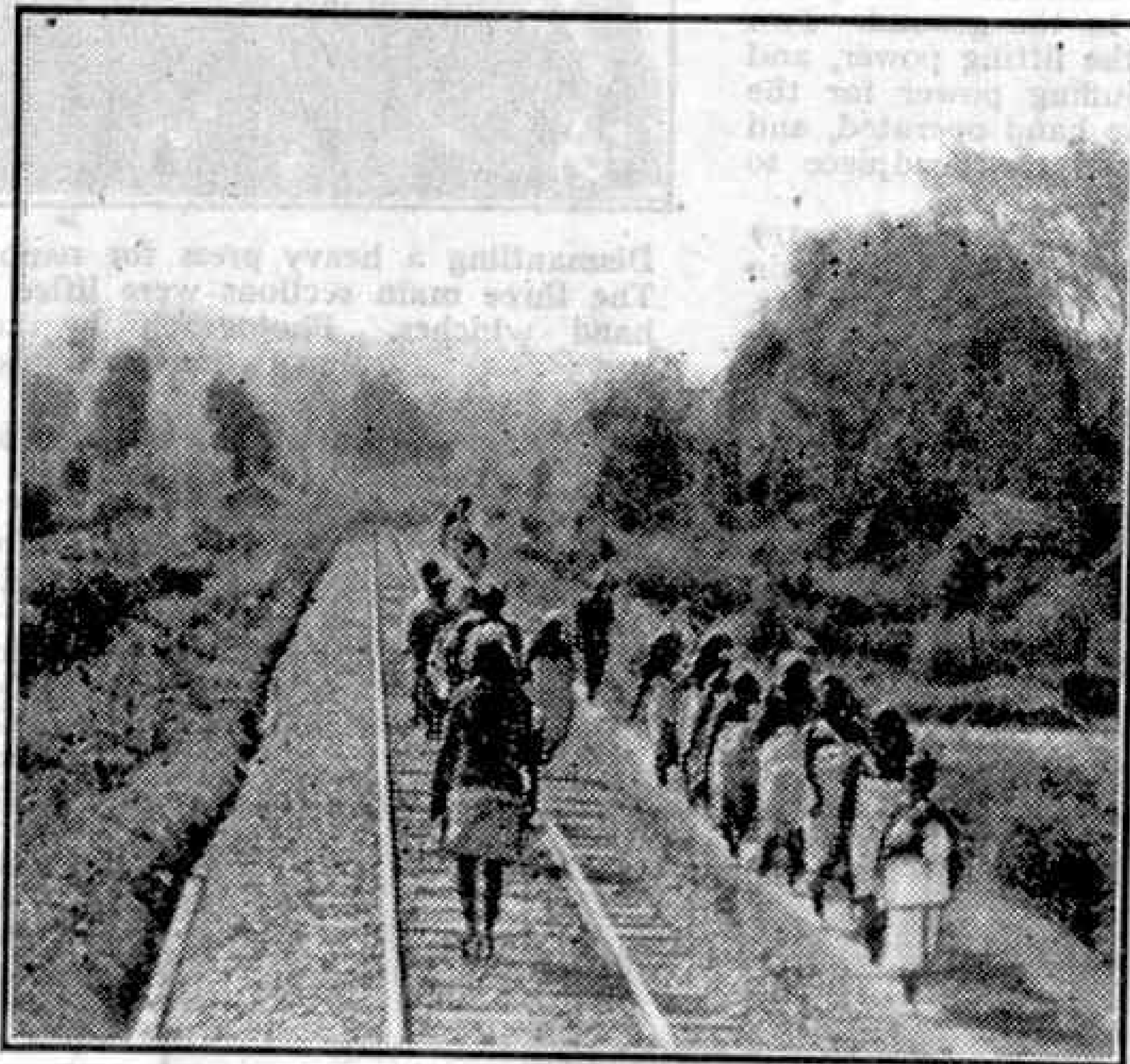
To describe, briefly, the line over the 115½ miles from Badarpur to Lumding we will start at the former station, where the Mail train connection from Calcutta via Seraganj arrives in the morning, having left that city at 10.0 a.m. the previous day. All trains going "over the Hill" have to be vacuum braked and brakes must be effective on 75 per cent. of the whole train, according to the special instructions in force over this section. All staff working on the section must pass an examination in these rules and regulations. Before trains are despatched from Badarpur and Lumding

trains are examined on pit lines at those stations and the brakes are specially tested by vacuum testing plant.

On leaving Badarpur the line swings northward across the River Barak by a box girder bridge and is generally level to Chandranathpur, 12½ miles out. From there onward the hills are entered and the gradients with tunnel No. 1 are soon encountered, 1 in 65 ruling up to Damchara where

water is taken; then on past Bandarkhal and Ditokcherra to Harangajao at the foot of the 11-mile climb of 1 in 37. Water is again taken, and a "C" class 2-6-2 tank engine is attached as banker; these engines are shedded here for this purpose. This station is 489 ft. above sea level and we are now 30 miles from Badarpur. Immediately on leaving here the line climbs, and both engines are full out for the next five miles to Mailongdisa where the banker takes water, now at 1,060 ft.

On resuming, we climb past Khanladisa



A regular custom on market day; hillmen and their wives use the railway track of the Bengal Assam Railway to reach Maibong village.



A petrol train at Ditokcherra headed by a heavy "Beyer-Garratt" locomotive. In accordance with the regulations, special protection vehicles are marshalled next to the engine to keep the petrol tanks away from the front end.

to Jatinga, the summit of this 1 in 37 grade. Here the banker comes off, having reached 1,855 ft. From this point the line falls through Haflong Hill and Robi to Lower Haflong where the only refreshment room on the section is situated. This station is the principal one intermediately and is almost half-way, at an altitude of 1,505 ft. Shortly after leaving here the track descends through a tunnel and emerges on to the high Dyang Viaduct which spans a deep jungle gorge, a fine engineering feat. From this point the grade is up again to Mahur at 1 in 65, a picturesque station with Naga tribespeople selling their fruit and wares on the platform. For the next 15 miles it is almost continuously downhill at 1 in 60 through Phaiding, Dhautaja and Wading to Maibong. At one point it is possible to look down and see the line at a lower level as it circles round and down from the hills. At Maibong there is a native bazaar, and a medical post. Hill people on bazaar days walk the track into this village.

The line has fallen 920 ft. from Mahur in 15 miles and is now only 899 ft. above sea level. From Maibong the grades are more undulating onward to Lumding, but the jungle encroaches very close to the railway and it is in this part of the line that the elephants give trouble, especially near Hatikhali. There are several stations in this region, including Lumding, a junction 465 ft. above the sea, which joins up the Pandu-Tinsukia line over which flowed very considerable traffic in the War years 1942-45 to feed the railheads at Manipur Road and Lido for the Burma campaign.

The working of traffic over the Hill section depends on how quickly trains can be moved up and down the 1 in 37 grade. The headway between these points therefore governs the headway of despatch from

Badarpur and Lumding, providing of course trains can be examined and passed fit within that time. To save unnecessary running over that section, bank engines returning from Jatinga to Harangajao are coupled to down trains; in fact, it is a Hill section rule that down passenger trains must have the returning bank engine attached "inside" the train engine to assist in braking down this steep grade.

The speed of down trains must be continually checked, and at four places there are runaway "catch sidings." These are cut away into the hillside, and the entrance points are manned and set for the "straight" only when up trains approach, and when down trains are actually brought to a stand at a "stop" post by the points. This ensures that down trains descending the grade are under control.

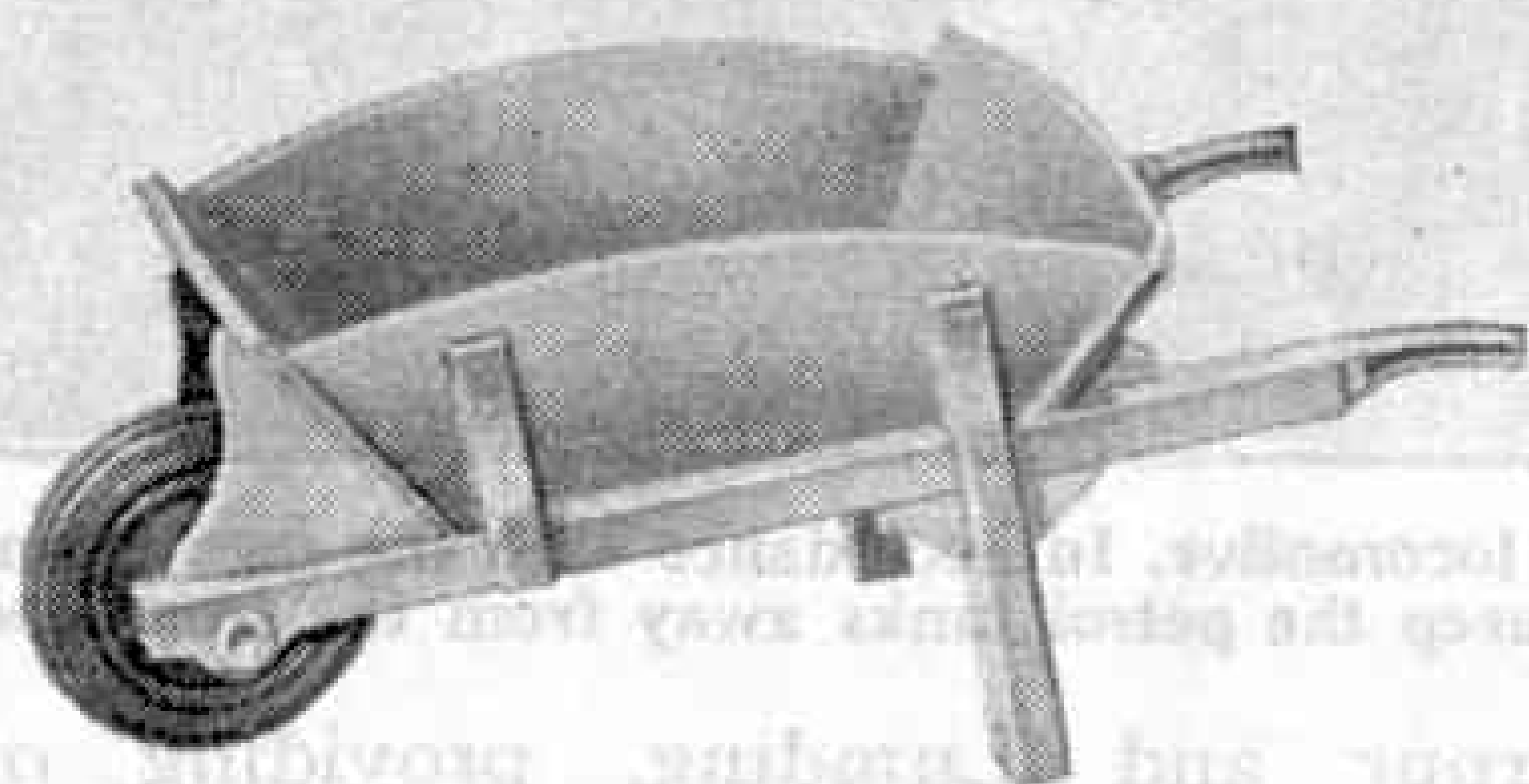
In July 1944 a down special goods train got out of control between Mailongdisa and Harangajao; luckily the engine kept the rails, but the centre 12 wagons swung off the track and were hurled down the hillside. Eight were recovered, but the other four remain there to this day. As a result of this accident the line was blocked for 24 hours.

On another occasion a down train was waiting in the loop at Mailongdisa to cross an up train which was a long time in section. The up train eventually arrived, but the down train was set in motion due to brakes leaking off and the vibration of the up train running on the main line. The driver of the down train engine was not aware he was moving until he crashed into the up train, striking it in the centre so that the train crew were uninjured, the heavy front end of the "Garratt" protecting the enginemen of the down train. The loop here has no trap points.

Dinky Toys and Supertoys

Garden Implements and a New Style Lorry

THIS month we have a fine array of additions to the range of Dinky Toys and Supertoys. The new models, six in number, are illustrated on these pages, and a glance at the pictures will show



Wheelbarrow, Dinky Toys No. 105b.

how varied in type and interest these are.

Four of the new products are Dinky Toys, designed for gardening or farming operations. The first, Dinky Toys No. 105b, is a neat reproduction of the homely but indispensable wooden garden wheelbarrow, with ample capacity in the barrow itself, sturdy handles and legs, and a wheel of the rubber-tyred type now popular. Next comes the Sack Truck, Dinky Toys No. 107a. This delightfully simple model also is very strongly constructed. It is provided with a good back, or "foot iron," that can readily be pushed underneath a miniature sack to enable it to be lifted on to the truck.

Dinky Toys owners will soon find many uses for these models, and their inclusion in Dinky Toys layouts of various types will add a neat touch of realism. This applies also to the

4-wheel Hand Truck, Dinky Toys No. 105c, which is shown at the foot of this page. This is a really delightful product, fine in appearance and with plenty of movement to increase its interest. The front wheels are mounted on a swivelling bogie, so that the truck can be turned in a small space and can readily be manoeuvred into awkward places. The handle also is hinged, and when not in use can be turned upright, leaning against the front of the truck, out of the way. In the garden the prototype of this model is employed for moving boxes and pots carrying seedlings and plants, and anything else the gardeners require in their work.

The last of our Dinky Toys this month is the Harvest Trailer, Dinky Toys No. 27b, the novelty of which gives it a very strong appeal. Its original is designed for carrying hay, straw or sheaves of corn, and to enable this to be done with ease and safety it is provided with end racks that are detachable, so that they can be removed when corn in sacks and other loads that are not so bulky are being carried. This feature



Sack Truck,
Dinky Toys
No. 107a.



Harvest Trailer,
Dinky Toys No. 27b.

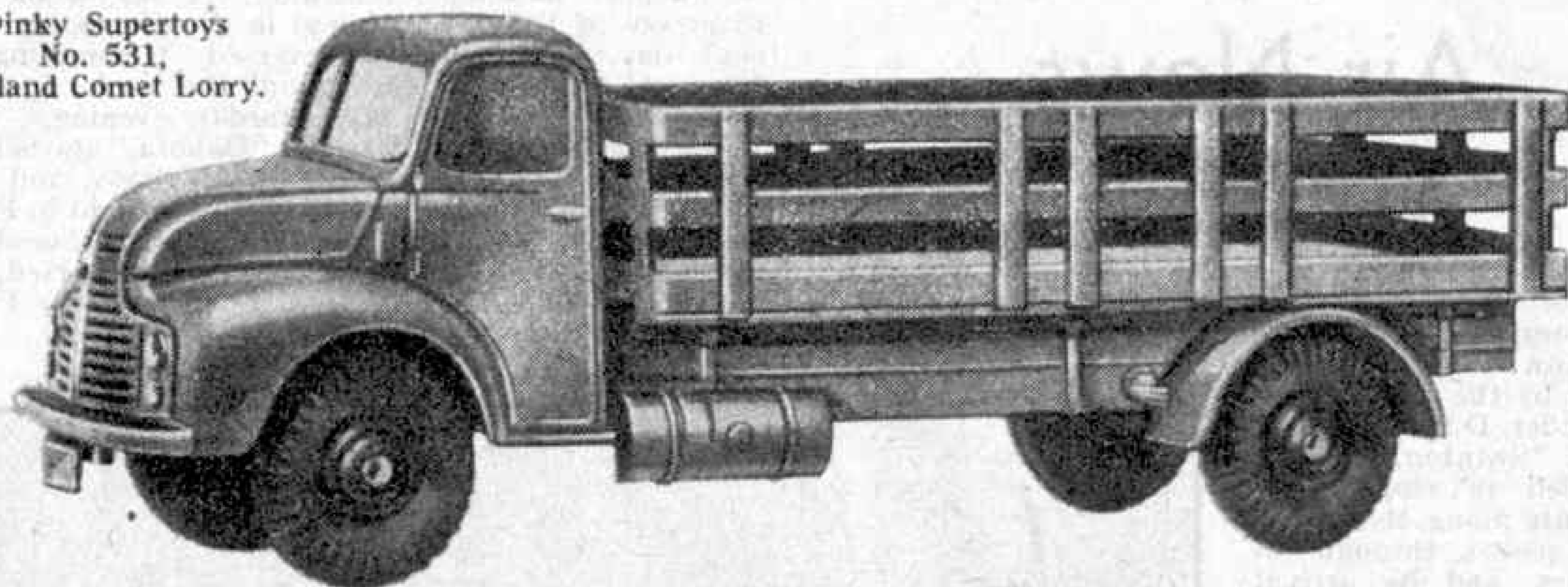


4-wheel Hand Truck, Dinky Toys No. 105c.

is reproduced in the model, the end racks of which are easily removed and yet are solidly in position when inserted in their guides. The Harvest Trailer can readily be hitched on to a Dinky Toys tractor or lorry, and it has a small wheel on which its front rests when it is not connected to its towing vehicle.

The remaining new products are both Dinky Supertoys. One is the magnificent

Dinky Supertoys
No. 531,
Leyland Comet Lorry.



miniature Leyland "Comet" Lorry, No. 531, seen at the head of this page. It is a representative of an entirely new range of medium weight diesel-engined export models, to be made available in limited numbers at home, that has been introduced by Leyland Motors Ltd. In these an entirely new appearance has



Dinky Supertoys
No. 751,
Lawn Mower.

been given to Leyland products. The familiar radiator has been dispensed with. Instead there is a concealed stack, and a bonnet and front end that are decidedly modern in style are incorporated. Access to the engine is given by raising the "crocodile jaw" bonnet, and behind this is a pressed steel cab of modern styling, the smoothly flowing lines of which blend into the new front end.

The Dinky Supertoys miniature of this new Leyland reproduces these features in splendid style, and the effect of the design, with its semi-forward cab, is to give a vehicle that is well balanced and striking in appearance. This is a model that will make a splendid show on the

roads of the layouts that many enthusiasts have constructed for displaying their miniatures in action.

The inspiration for the second of this month's Dinky Supertoys, No. 751, comes from the garden. It is a very handsome miniature Lawn Mower, with roller drive. The roller is correctly split to allow the Lawn Mower to be turned in a little space without damage to the Dinky Toys layout lawns on which it will be used, and it drives the cutting cylinder through gearing. The cylinder has seven blades, and in correct position underneath is a miniature sole plate. In front there is a representation of the small roller that in practice is used for varying the height of the cutter, while a detachable grass box also is fitted.

How realistic this excellent model is can be seen from the two pictures on this page showing it from different angles. The upper one shows the cutting cylinder well and also illustrates the sturdy framework, which is correctly braced. In the lower one the grass box is seen in position. It is removed for emptying the grass by just raising it in its slots, and it can be put back again as readily as that of a real lawn mower.



Another view of the
Dinky Supertoys Lawn
Mower, with the grass
box in position.

Air News

By John W. R. Taylor

Sponson Developments

By the time you read this the little Percival "Proctor" light 'plane illustrated on this page should have completed a special flight of 13,500 miles from Croydon to Australia, piloted by the Hon. Simon Warrender, D.S.C., and Mr. C. N. Swinton. It is scheduled to stop at 42 keypoints along the route, which passes through 16 countries, and on arrival will be delivered to an Australian Aero Club.

The main purpose of the flight is to investigate the possibilities of overseas markets for the "Tribian" amphibian, the prototype of which is now being built by Sponson Developments Ltd., a new British Company of which Mr. Warrender is Sales Director. The flight will also give further proof of the sturdiness and reliability of the "Proctor," and its "Gipsy Queen" engine, in particular and British light 'planes as a whole.

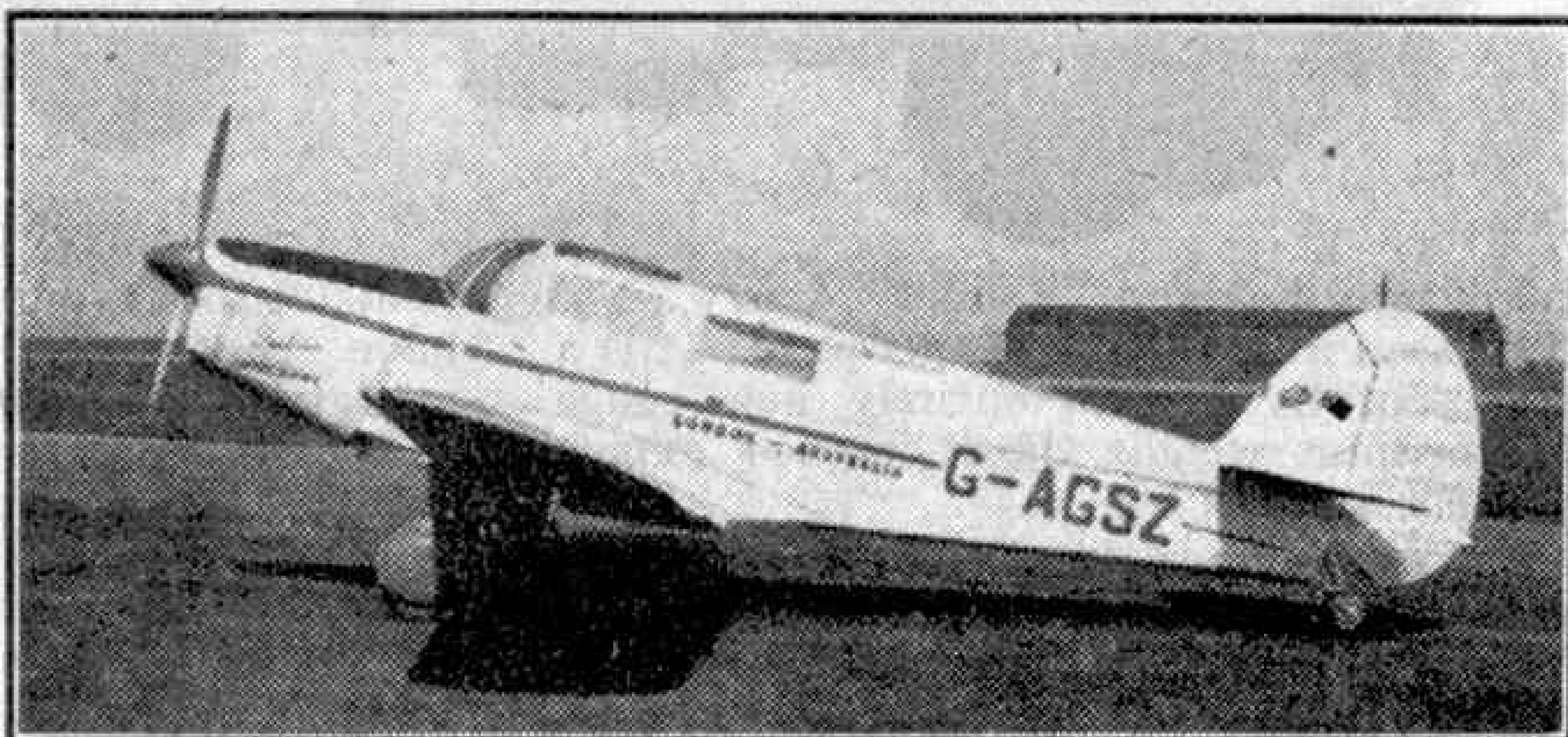
The Sponson "Tribian" is a promising little 3-4 seat all-metal amphibian, powered by either two 145 h.p. "Gipsy" Majors or two 155 h.p. "Cirrus" Majors. With a range of 800 miles at 140 m.p.h. it will offer new standards of usefulness to the private owner and for such jobs as mosquito control or air taxi work.

New B.E.A. Services

The first post-war scheduled air services from Birmingham and between North and South Wales are now being operated by British European Airways. The latter service, flown by D. H. "Rapide," starts from Liverpool and flies to Cardiff via Hawarden

on Monday mornings, returning via Hawarden and Liverpool to Valley (Anglesey) in the afternoon. The next day the service is reversed, terminating at Liverpool, and so on throughout the week, finishing at the Liverpool base on Saturday evening.

The other service, operated by "Dakota," starts from Manchester, and on Mondays, Wednesdays, and Fridays calls at Birmingham on the outward flight to Paris, returning non-stop to Manchester. But on Tuesdays, Thursdays and Saturdays the process is reversed, and the aircraft flies non-stop from Manchester to Paris, calling at Birmingham on the return flight.



The Percival "Proctor" V used for the 13,500-mile flight to Australia referred to on this page. Photograph by courtesy of Sponson Developments Ltd.

"Able Mabel"

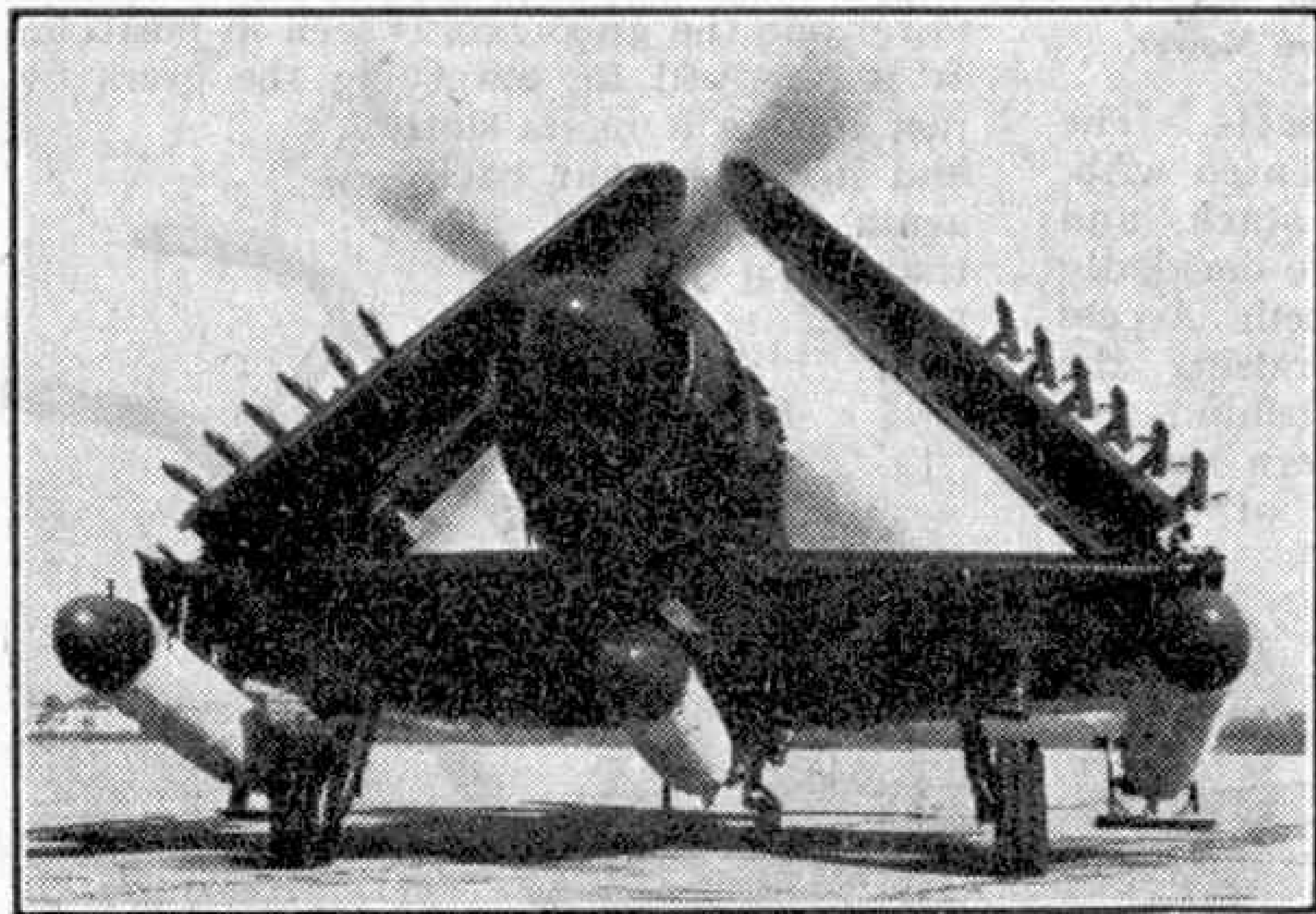
The Martin AM-1 "Mauler," illustrated below, is one of the most formidable single-engined "strike" aircraft in the world. Because of its ability to operate from carrier decks with a payload of more than 9,000 lb., pilots of the U.S. Navy, with which more than 100 "Maulers" are already in service, have dubbed it "Able Mabel."

With its normal warload of 12 five-inch rockets, three 2,200 lb. torpedoes and four 20 mm. cannon, the "Mauler" weighs over 25,000 lb., and is thus the heaviest single-engined aircraft ever flown. Even this figure can be exceeded by 4,000 lb. under overload conditions, giving the aircraft a six-ton payload over a considerable range. At either weight the "Mauler" takes off at a bigger weight and carries a greater payload than the average 21-passenger, twin engined air liner, and in spite of this pilots report good controllability even at low speeds.

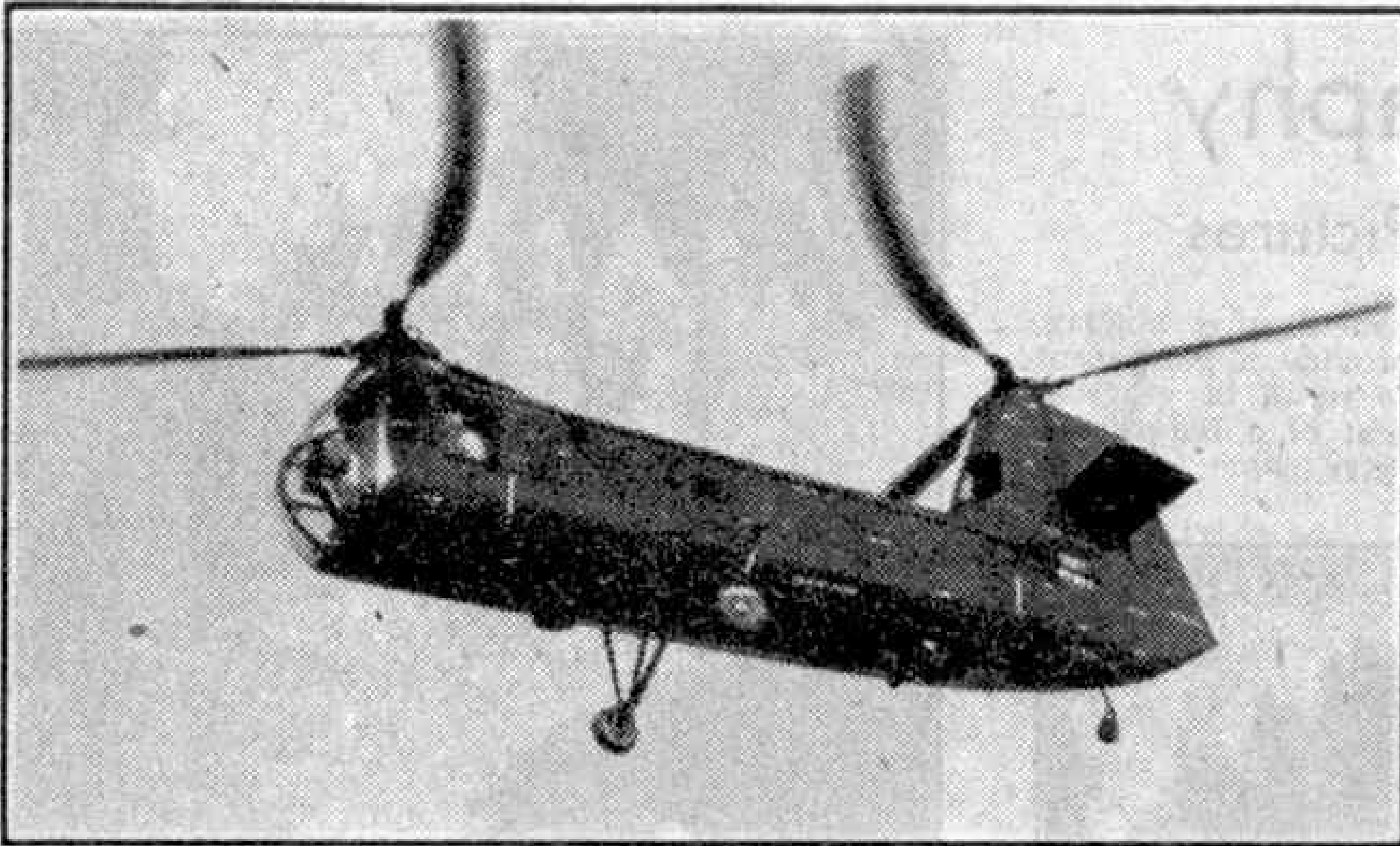
The "Mauler" is powered by a 3,000 h.p. Pratt and Whitney "Wasp Major" engine, has a top speed of 350 m.p.h., and a maximum range of over 2,000 miles with external fuel tanks.

Supply-Dropping in Malaya

Since the beginning of this year Royal Air Force "Dakotas" have dropped some 50,000 lb. of supplies each month to troops and police operating against bandits in Malaya. The amount may be insignificant compared with the vast effort of the Berlin Air Lift, but if it were not for these "Daks," whose aircrews can accurately place supplies of rations, ammunition and equipment on tiny dropping zones often surrounded by jungle, the range of action of the troops would have been severely restricted.



The formidable armament of the Martin AM-1 "Mauler," which is here seen with wings folded. Photograph by courtesy of the Glenn L. Martin Company, U.S.A.



A new picture of the Piasecki XHJP-1 twin-rotor helicopter. Photograph by courtesy of the Piasecki Helicopter Corporation, U.S.A.

Latest Piasecki Helicopter

The new Piasecki XHJP-1 helicopter, illustrated above, is designed for operational duty with the U.S. Navy, and combines the tandem rotor layout of the well known Piasecki "Rescuer" with sleek all-metal construction and special new features to improve efficiency on rescue missions. The XHJP-1 won a Navy design competition in 1946, for a compact, high-performance helicopter specifically designed to operate from aircraft carriers, battleships and cruisers under rigorous sea-going conditions. The finished aircraft exceeds the original requirements, having a top speed of over 130 m.p.h. and being compact enough to go down the smallest carrier's lift without folding its rotor blades, although the blades do fold to facilitate stowage below deck.

Because of its spacious cabin the XHJP-1 can carry with ease three stretcher patients as well as pilot and co-pilot. A rescue hatch near the pilot's seat is big enough to permit passage of a loaded stretcher, which can be lifted straight up into the cabin by means of a hydraulically-operated hoist mounted above the hatch. Alternatively five passengers can be carried instead of three stretchers, the tandem rotor arrangement permitting them to move about in flight without adverse effect on control.

The XHJP-1 is powered by a 525 h.p. Continental engine, and has a maximum payload of over a ton. It will replace catapult aircraft, and even destroyers, for many naval duties.

Round the World Air Service

For the first time in aviation history anybody can now fly round the world by any one of a thousand alternative air routes, at a fixed cost. The fare of £421/17/- via the North and mid-Pacific routes, or £491/15/- via Australia covers all the expenses of the journey, provided the traveller does not stay longer than 48 hrs. at any hotel en route and does not retrace his footsteps. No extra fare has to be paid if he wishes to stay longer than two days at any point of his route, although, naturally, he has to pay the additional hotel expenses; and he must complete the journey within a year.

The scheme is operated by 17 of the world's leading airlines, including all

three British Corporations, and reaches more than 165 cities in 40 different countries in all five continents. It should be of inestimable value to business men seeking new markets overseas, as well as to people who just want to see the world in comfort. Passengers can change their itineraries *en route* just as they please, and can take 40 kg. of free luggage, compared with 30 kg. on normal airline routes.

The Shape of Wings to Come

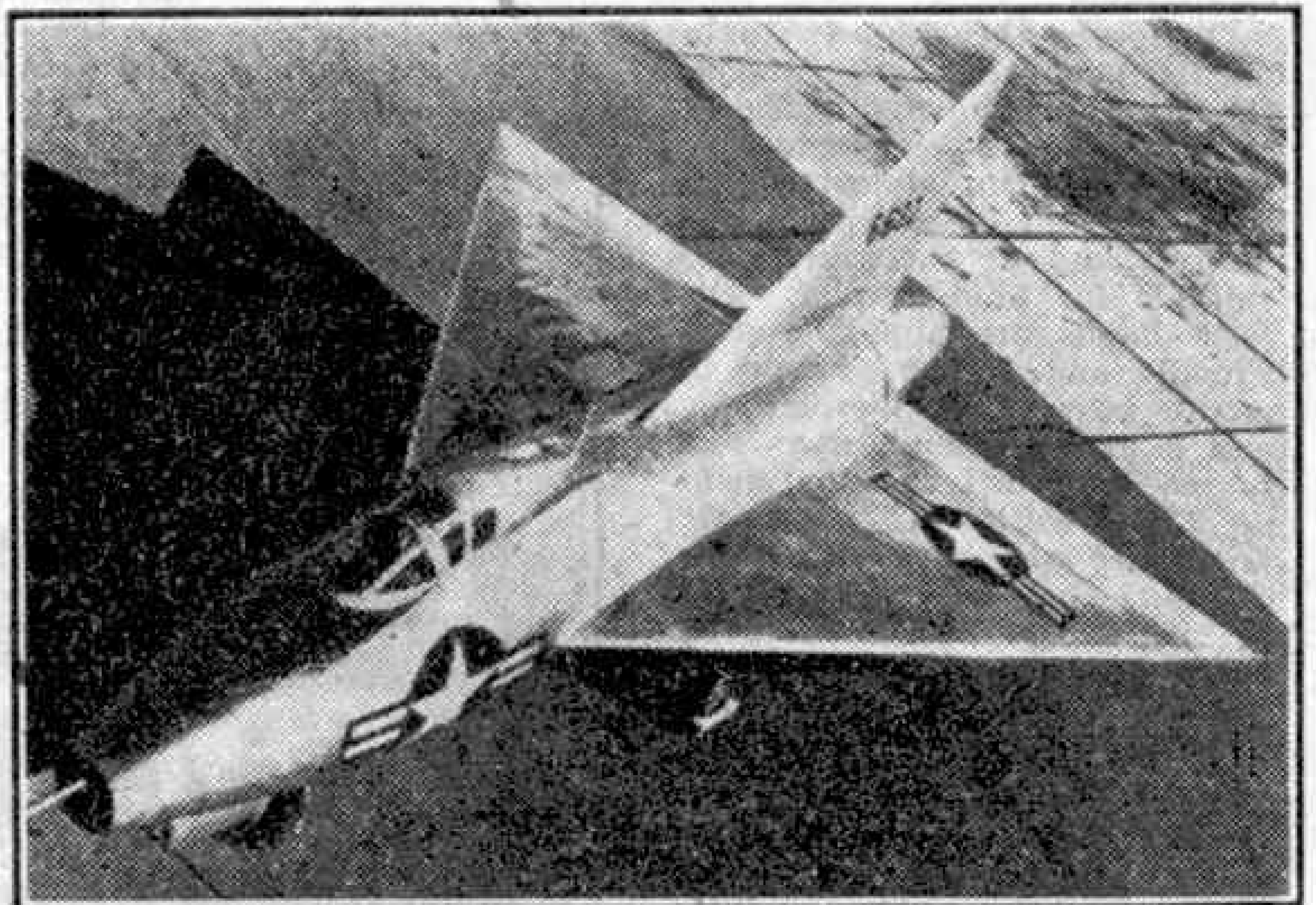
The Convair Model 7002, shown in the lower photograph on this page, is probably the most advanced aircraft ever built. Designed purely for research, it is being used to explore the stability and control characteristics of the Delta Wing—so called through its resemblance to the triangular Greek letter Delta.

Delta-wing models have been under test in wind tunnels for several years, particularly in Germany, where Alexander Lippisch designed several revolutionary jet fighters basically similar in layout to the new Convair. These tunnel tests indicated that the wing offered both low drag and better control at transonic and supersonic speeds, but the theories were never put to practical test in flight until the Model 7002 flew for the first time early this year.

The machine is powered by a 5,200 lb. thrust Allison J-33 turbo-jet, and has 60 deg. of sweep-back on its wings, which have combined full-length ailerons and elevators along their trailing-edges. These eliminate need for a tail unit, but a fin and rudder are fitted to improve directional control and stability. No performance details have been released.

U.S. Fighters Named

World speed record holder, the North American F-86 sweptwing jet fighter, has been named "Sabre." Another of the U.S.A.F.'s latest aircraft, the Northrop F-89 all-weather jet fighter, is to go into service as the "Scorpion," a most appropriate name in view of its slim upswept tail.

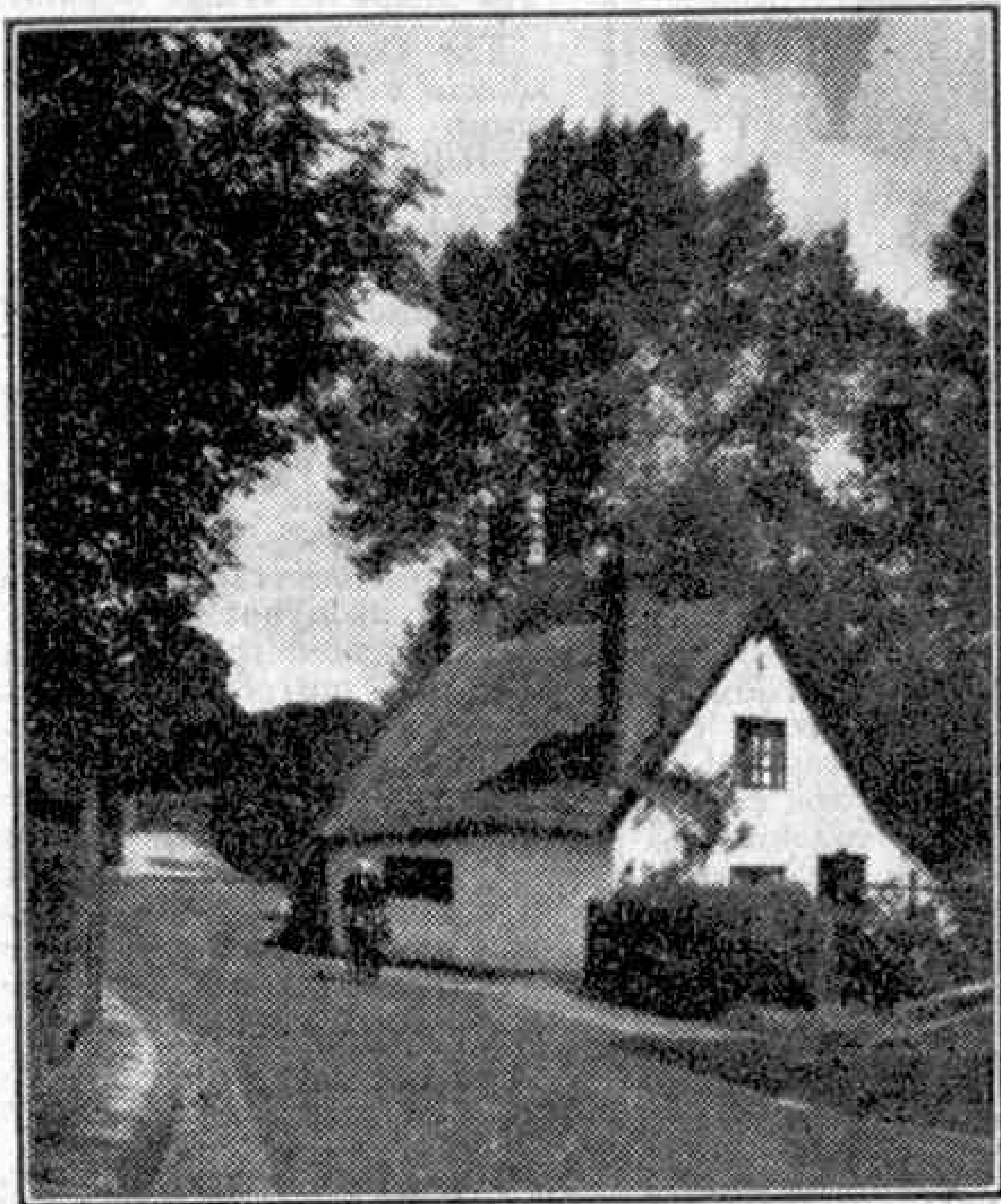


This view of the Convair Model 7002, newest research aircraft of the U.S. Air Force, shows the unusual wing design. Photograph by courtesy of U.S. Air Force, Wash., D.C.

Photography

Countryside Pictures

A CAMERA doubles the enjoyment of a holiday, as the snapshots obtained provide a permanent record that enables its owner to recall in years to come the pleasures and excitement of a happy and carefree time. This month we give some hints for

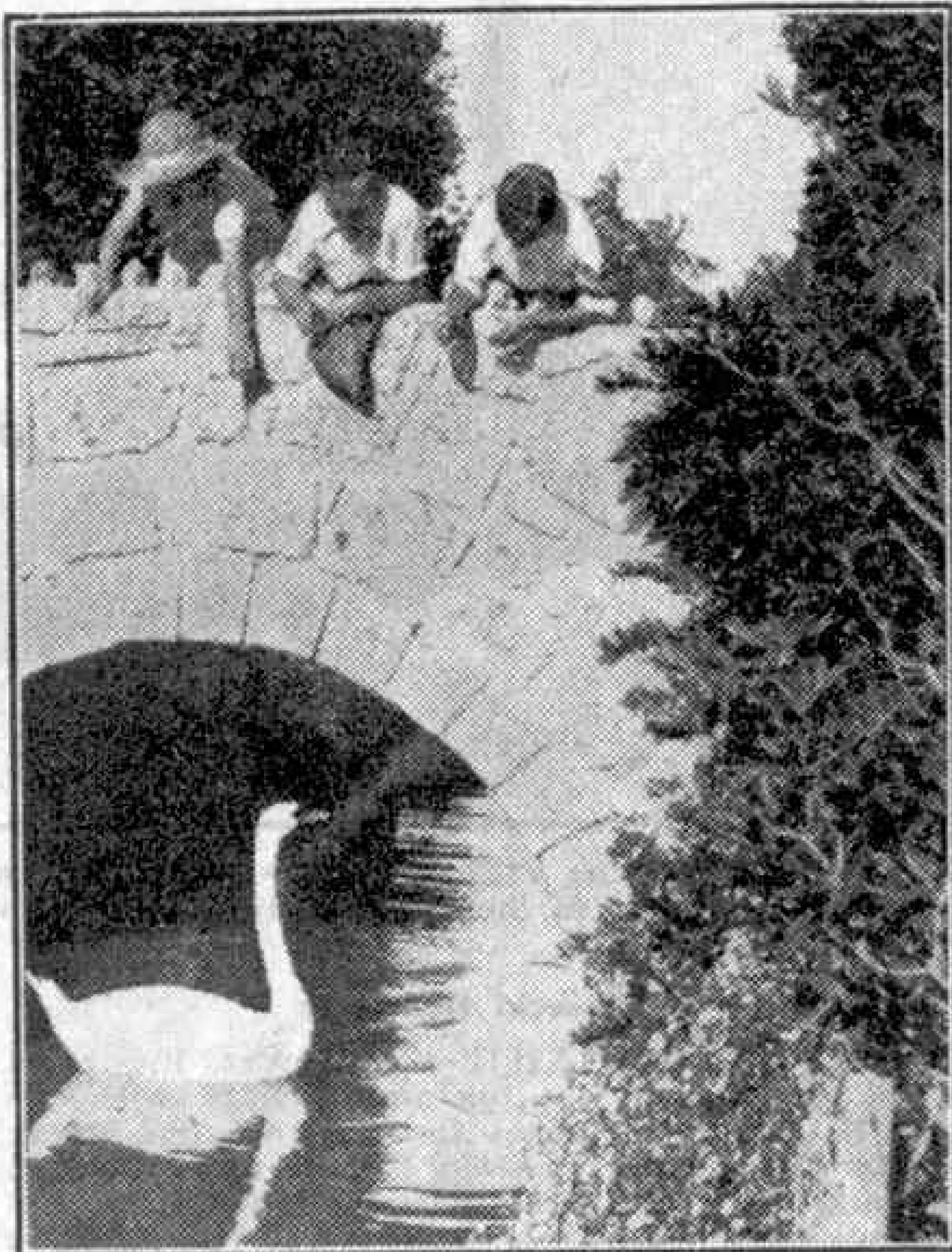


A 450-year old cottage at Mobberley, Cheshire. Photograph by McKenzie Cullen, Wythenshawe, nr. Manchester.

readers who are spending their holiday in the countryside.

Obviously the subjects to be photographed there must depend very largely upon where one stays, and the nature of the neighbourhood. If you have the good fortune to stay at a farm, almost everything around you will be of interest and at the same time suitable for photography. The farm hands are almost always friendly and willing to help to secure interesting photographs, and of course they always like to receive prints showing them at their work. If by some mischance your photographs are a failure, just send the persons to whom prints have been promised a few lines explaining what has happened.

Old-fashioned cottages in picturesque settings make attractive subjects for the camera, as one of our illustrations shows. Old country churches are another popular subject. In photographing them, or indeed any tall structure, remember to keep your camera level. If you cannot include

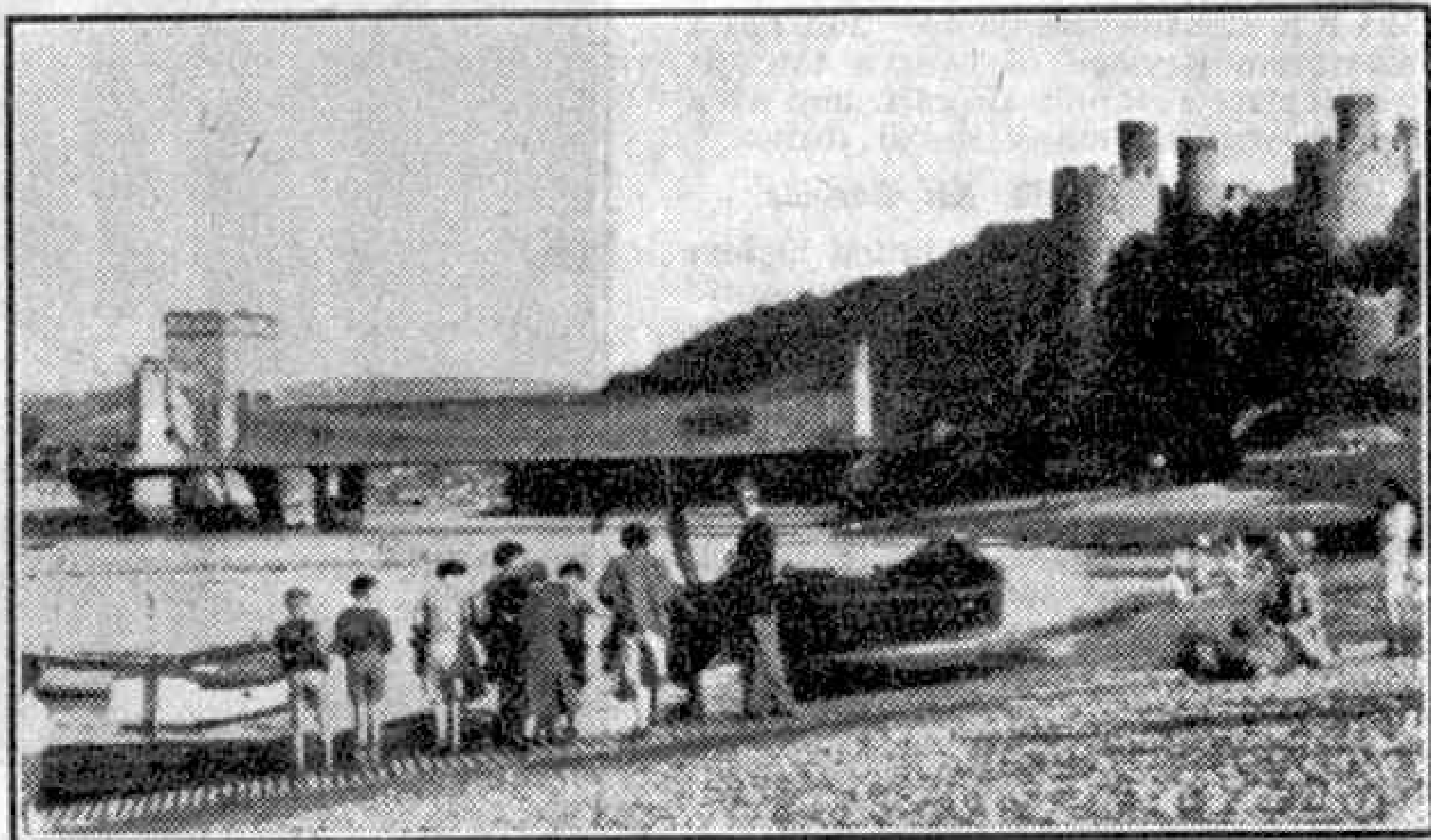


Feeding the swan. Photograph by Miss N. P. Milne, Hawkes Bay, New Zealand.

all the building by so doing you should try a fresh viewpoint. Do not tilt the camera upward, as this will result in a photograph showing the building apparently leaning backward.

Many delightful scenes are to be found in woods, but the light under the trees is greatly reduced. Shafts of sunlight here and there, breaking through the high foliage, may give an effect of plenty of light, but this is deceptive, and it is very desirable to use an exposure calculator to give you the correct exposure.

Waterfalls in a woodland setting also are very attractive, but they are not easy to photograph satisfactorily as an exposure long enough for the surrounding rocks and trees is generally too long to give the effect of moving water. Even a moderately good photograph of such a scene is worth having.



Conway Castle and Suspension Bridge, North Wales. Photograph by Delia O. Woodford, Petworth.



Club and Branch News



WITH THE SECRETARY

A LIBRARY WITHOUT A LIBRARIAN

When looking over the 1948 report of the Maylands M.C., the well-known Australian organization, I was delighted to read in it the words "We have dispensed with a librarian, and strangely enough our list of missing books has been considerably reduced as a result."

At first glance this may seem a minor detail in the story of the club, and in itself it is perhaps of little importance. Yet it seems to me to show that the members of the Maylands M.C. have the true Guild and club spirit. They certainly need no check on their dealings with the volumes in the library, and I am sure that they show the same trustworthiness and sense of responsibility in other branches of club activity.

The system used is simple. Each member has a card on which he enters the numbers of the books he borrows. Once a month volunteers run through the stocks and make up a list of books not recorded, and when this is seen by members the missing books almost invariably turn up at once.

A PARENTS' ASSOCIATION

The report in which this interesting note is to be found is a very long one, and deals fully with many important points in the organization and conduct of a successful club. The most striking feature, described by Mr. V. Malmgreen, Leader, as possibly the most important development in the history of the Club, is the account of the formation of a Parents' and Friends' Association. The immediate purpose of this is to help to raise funds for providing better accommodation, but it is quite clear that the members are determined to give the Club support in every way possible, and to encourage its officials to extend the good work they are doing.

The formation of such an Association may not be possible in all Meccano Clubs, but the lesson of Maylands is one that can be applied in various ways. Parents and friends of members can be interested in the actual work of a Club by putting on good shows at Exhibitions and Open Nights, and if at all possible they should be invited to attend ordinary meetings of the Club whenever they wish, if only to prove that members do not make great efforts only on special occasions.

Officials of Branches of the Hornby Railway Company also should keep this in mind. There must be few parents of either Meccano or Hornby Train enthusiasts who would not be delighted to see something of the good work that members of Clubs and Branches are doing, and who would not be ready to give support in some way to the activities of these organizations. Opening the Club or Branch room to them is one of the best ways of ensuring this.

CLUB NOTES

HORNSEA M.C.—A wide variety of hobbies is pursued in addition to steady Meccano model-building. Recent events have included Talks on the telephone, electricity and other scientific subjects, while Gardening also is receiving attention. A Demonstration of soldering methods by Mr. R. W. Shooter, Leader, was another interesting event. Games played are Cricket and Bowls. Club roll: 26. *Secretary:* R. E. Lancaster, Carlton House, Carlton Avenue, Hornsea.

NORBURY M.C.—Meccano Nights, Competitions, Discussions and Talks continue to be the central features of the programme. Visits are many and



Members of the Waterloo and Cowplain (Portsmouth) M.C., with a Meccano-graph and other models built by them. Mr. A. T. Nicholson, President, is on the right, and Mr. A. A. Foster, Leader, on the left. This Club was affiliated two years ago this month, and its members have distinguished themselves by steady progress in model-building, which has now reached a high standard. An Electrical Section has now been formed, and its members have established telephone communication between the two huts in which the Club meets.

attractive, recent ones including Rambles to various districts for observation of buses, trolley buses and trams. Club roll: 29. *Secretary:* J. W. Taylor, 186, Mersham Road, Thornton Heath, Surrey.

CAER URFA (SOUTH SHIELDS) M.C.—Steady progress is being made with model-building and other regular pursuits of members. Model boat building is now being encouraged. In an interesting contest entrants were required to arrange scenic details on the Club's model railway. Stamp topics have been introduced. Club roll: 25. *Secretary:* G. Burrows, 113, Quarry Lane, Cleadon, South Shields.

BRANCH NEWS

HASLEMERE AND GODALMING—An outstanding event has been the Annual Exhibition. This was open for two days, and in addition to a Hornby Train Layout it included a Display of Meccano and other models, with Dinky Toys. *Secretary:* T. Ash, Lower Birtley Farm, Witley, Surrey.

STROUD—Two separate Hornby Train Layouts have been designed and operated with success. It is hoped that a Visit to a coal mine will be arranged. A new Branch room is now in use, and Hornby Train enthusiasts in the neighbourhood are invited to join. *Secretary:* D. Hargest, 6, Folly Lane, Stroud.

Among the Model-Builders

By "Spanner"

HOW TO USE MECCANO PARTS

Crankshaft (Part No. 134)

The Meccano crankshaft is particularly suitable for use in simple model engines. Its purpose is to convert rotary motion to reciprocating motion or vice-versa. It gives a stroke of 1 inch, and an ordinary Meccano Strip is intended to be used as the connecting rod. The Strip is slipped into place in the centre of the crank portion and held in position by Spring Clips.

A more elaborate connecting rod can be built up as shown in Fig. 1. This consists of a Rod 2, carrying a Coupling 1. Two $1\frac{1}{2}$ " Strips are attached to the Coupling and are held in place by a $\frac{1}{4}$ " Bolt 3, passed completely through the end transverse hole of the Coupling, and by a pair of Set Screws 4, which grip the connecting rod in the Coupling. The position of the connecting rod in the centre of the crank is maintained by a Spring Clip 5 placed between two Washers.

CRANE WINDING GEAR

Fig. 2 shows a type of winding gear specially suitable for use in Meccano cranes and similar models. The shaft of the winding handle 1, carrying a $\frac{1}{4}$ " Pinion 2, is engaged at one end by a $3\frac{1}{4}$ " Strip 4. The latter is bolted to the framework at 5 and is bent to allow a Collar and Washer to be placed on the winding shaft between it and the gear-box frame. The Strip 4 thus serves as a spring which tends to retain the operating shaft in such a position that the Pinion 2 is out of engagement with the Gear Wheel 3 on the winding drum shaft.

Consequently in order to rotate the drum the wheel 1 must be pressed inward while it is rotated; immediately it is released the Strip 4 returns it to its former position, throwing the Pinion 2 out of gear with the Gear Wheel 3.

On the other end of the drum 6 is a Flanged Wheel 7 and Bush Wheel 8. These form a small drum around which the brake band 9 is wound. One end of the latter is tied to a Fishplate mounted on a Rod 10,

whilst the other is given a few turns round the Rod, and secured to a bolt inserted in a Collar. On operation of a crank 11, the Rod 10 winds up the Cord 9, so exerting a braking effect on the winding drum.

A Ratchet Wheel 12 is secured to the shaft of the latter and is engaged by a Pawl 13. The necessary pressure is imparted to the Pawl by a

piece of Spring Cord 14. The Cord 15 tied to the Pawl is connected to a weighted lever 16, and is guided over a 1" loose Pulley 17 that revolves independently on the Rod 10. Normally the weighted lever 16 rests against a stop 19 and allows the Pawl to engage the Ratchet Wheel 12. If the arm 16 is thrown over, however, its weight raises the Pawl clear of the teeth of the Ratchet and so leaves the winding drum free to revolve. A piece of Cord 18 anchors the weighted lever to the frame of the gear box.

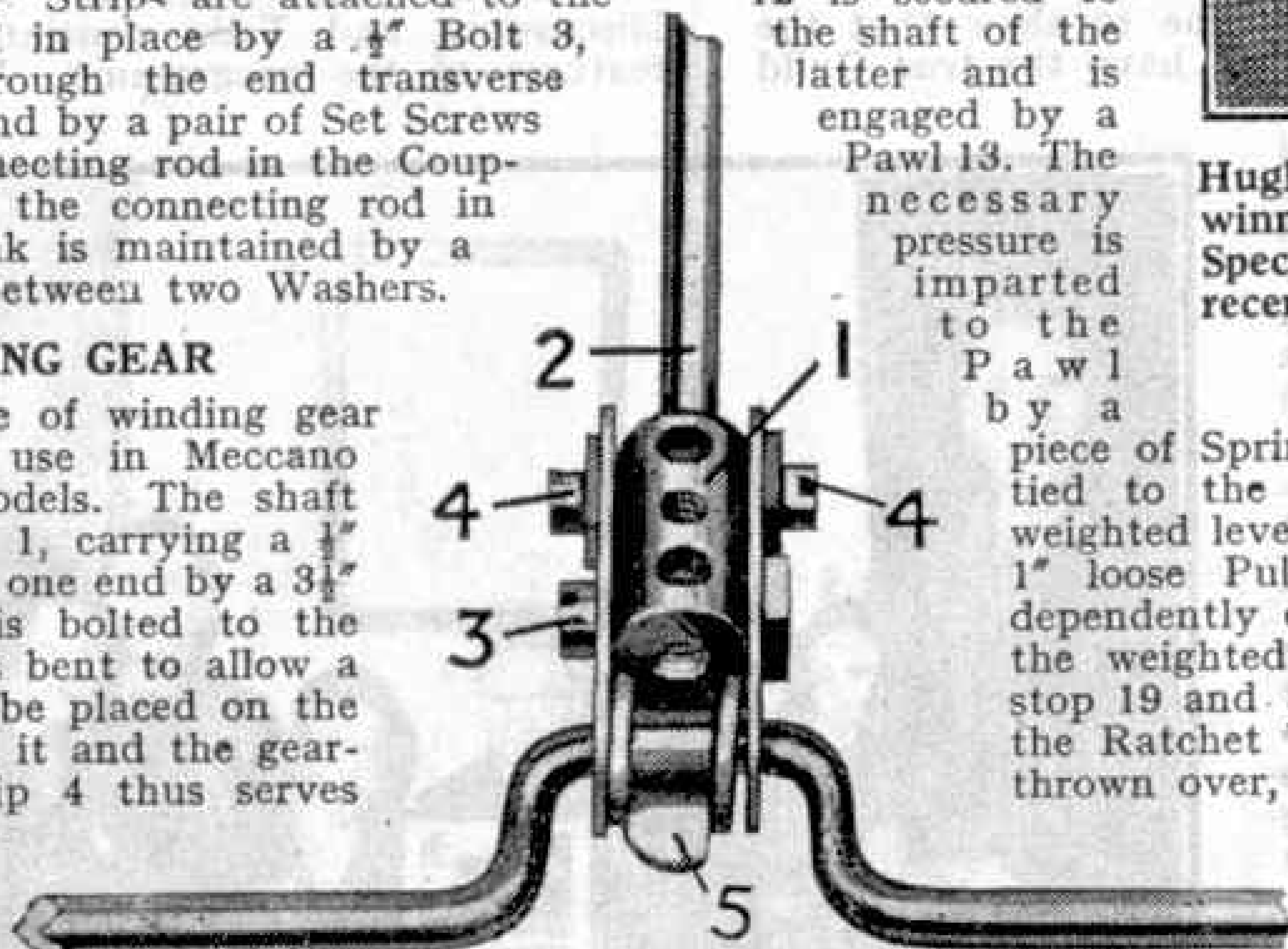


Fig. 1. A simple method of building a connecting rod "big-end" for use with the Meccano Crankshaft.

A FINE CRANE BUILT IN TANGANYIKA

Cranes have always been one of the most popular subjects for Meccano models and many very fine examples have been illustrated in the "M.M." Recently another fine crane model came to my notice and I am illustrating it in Fig. 3. This model represents an overhead gantry crane and was built by Mr. C. J. Aberdeen, Tanga, Tanganyika, who has been a Meccano enthusiast since childhood. It is a large model, measuring 5 ft. long, 2 ft. wide and 2 ft. 6 in. high, and it contains about 2,500 nuts and bolts. It is complete with all the movements found in a real crane of this kind, and the only non-

Meccano parts used in its construction are a few strips of wood, which are used for the flooring of the gangway of the gantry.

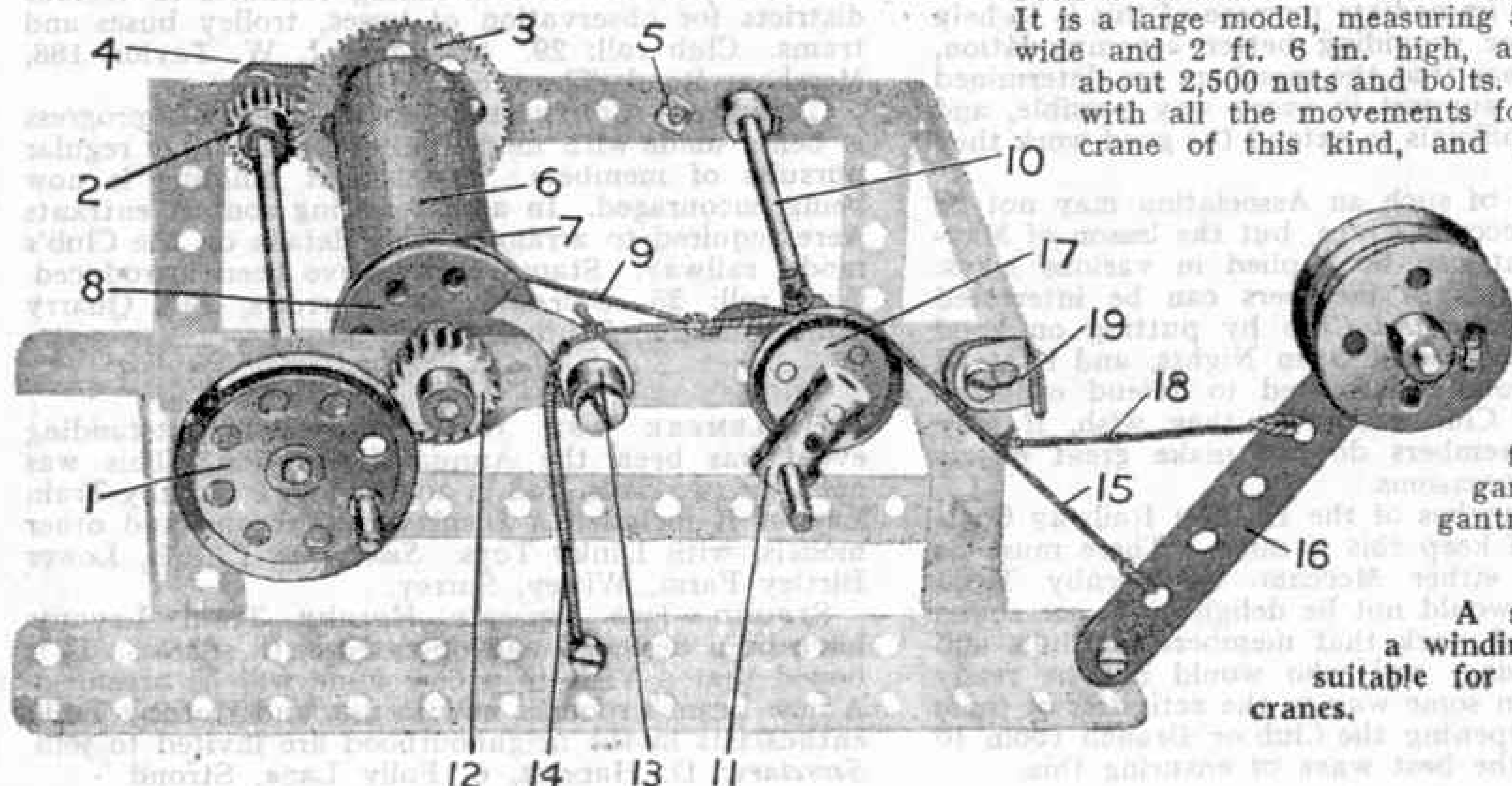
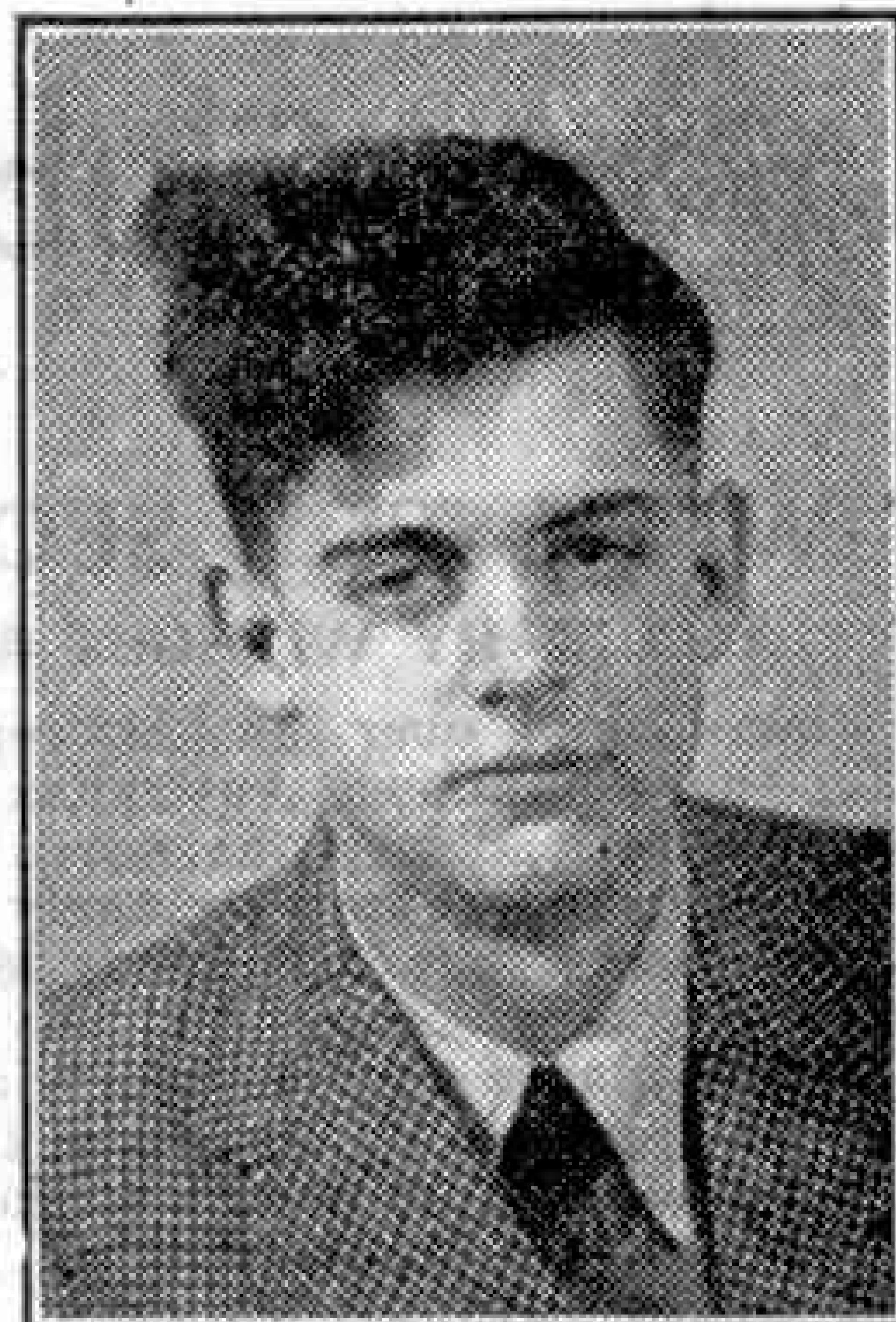


Fig. 2.

A suggestion for a winding mechanism suitable for use in model cranes.



Hugh Makins, Bruton, Somerset, winner of Second Prize and a Special Editor's Prize in the recent "Collis Truck" Model-Building Competition.

A HIGH-SPEED WINDER FOR RUBBER POWERED AEROPLANES

I am sure that aircraft enthusiasts will be interested in the neat high-speed winder illustrated in Fig. 4, details of which were sent to me by Mr. B. T. Gillyatt, Chesterfield. The device reduces the time required to wind rubber motors to a few seconds.

The step-up gearing is housed between two end plates, each consisting of two Semi-Circular Plates connected by $1\frac{1}{2}$ " Strips. A $2\frac{1}{4}$ " Strip 1 is bolted between the Semi-Circular Plates, and the end plates are joined by two $1\frac{1}{2}$ " x $\frac{1}{2}$ " Double Angle Strips. A winding handle formed by two Cranks bolted together is fixed on a $1\frac{1}{2}$ " Rod mounted in a Double Bent Strip 2 and in the rear of the housing as shown. The $1\frac{1}{2}$ " Rod is fitted at its inner end with a 57-teeth Gear 3 meshed with a $\frac{1}{2}$ " Pinion on a 2" Rod 4. Rod 4 carries also a 57-teeth Gear 5 meshing with a $\frac{1}{2}$ " Pinion 6 on a $1\frac{1}{2}$ " Rod mounted in a Double Bent Strip 7 and in the front of the housing. The Couplings 8 engage the propeller of the aircraft.

A ratchet device prevents the motor from unwinding if the handle is released accidentally. A Pawl without boss 9 is held by a $\frac{1}{2}$ " Bolt, and engages the teeth of Pinion 6. A Driving Band holds the Pawl against the teeth.

If required the mechanism can be completely enclosed by two $5\frac{1}{2}$ " x $1\frac{1}{2}$ " Flexible Plates. These should be bolted to one of the $1\frac{1}{2}$ " x $\frac{1}{2}$ " Double Angle Strips, and curved around the Semi-Circular Plates. The opposite ends of the Plates are held by a bolt screwed into a Threaded Coupling 10.

The winder unit can be bolted to one end of a framework suitably shaped to hold the model aircraft so that its propeller engages the Couplings 8 on the high-speed shaft. The framework should be built up from Strips and Angle Girders, and fitted with adjustable clamps to hold the aircraft in position.

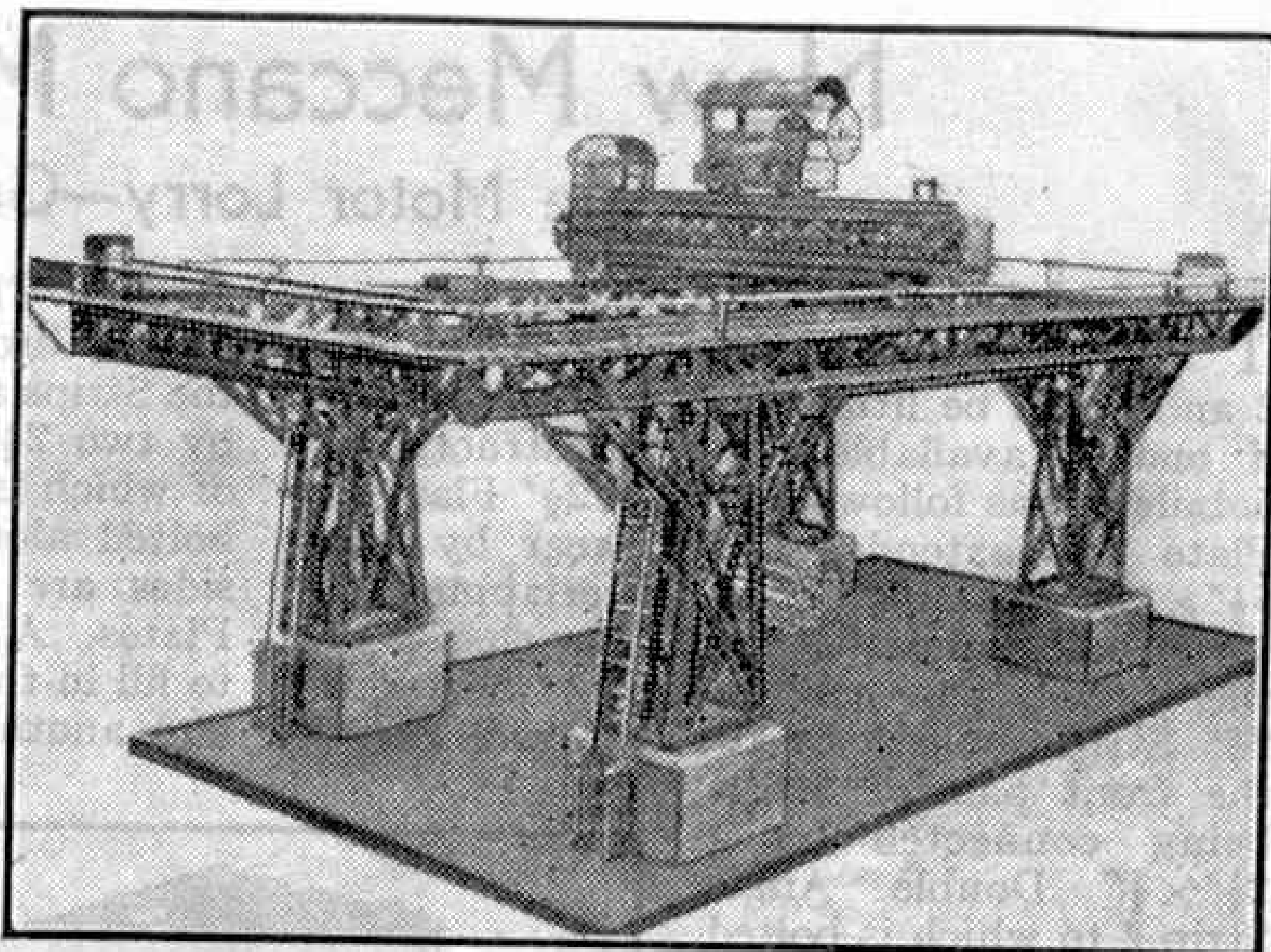


Fig. 3. This imposing gantry crane is the work of Mr. C. J. Aberdeen, Tanga, Tanganyika. It represents an actual crane having a lifting capacity of 450 tons.

building Contest announced in last month's issue of the "M.M." is still open, and intending competitors should send in their entries as soon as possible. The contest is open for models of any size and subject, and readers of all ages may compete. The actual model should not be sent; a photograph or a good sketch is all that is necessary.

Entries will be divided into two Sections. A, for competitors living in the British Isles, and B, for readers living Overseas. The closing dates are: Section A, 30th July; Section B, 30th November.

The following prizes will be awarded in each Section: First, Cheque for £3/3/-; Second, Cheque for £2/2/-; Third, Cheque for £1/1/-. There will be also five prizes each of 10/6, and five prizes each of 5/-.

ADVANCED MODEL-BUILDERS COMPETITION

The first Advanced Model-builders Competition was announced in the June issue of the "M.M." In this contest competitors are invited to design a machine capable of filling small round boxes, each with

10 pills, and placing a lid on each box. The competition is intended specially for older and experienced model-builders. It is not likely that beginners will have the necessary knowledge and skill to compete successfully, but there is nothing to prevent them from submitting entries if they wish to do so.

Only the essential parts of the mechanism need be built, but there must be sufficient to show how the various operations are carried out.

The competition is open to readers in any part of the world, and the closing date is 30th November. Photographs or good sketches of models, together with a description of the essential mechanism, are all that is required.

The prizes to be awarded are as follows: First, Cheque for £3/3/-; Second, Cheque for £2/2/-; Third, Cheque for £1/1/-. Five prizes each consisting of 10/6.

Entries should be addressed: "Advanced Model-Builders Competition No. 1, Meccano Ltd., Binns Road, Liverpool 13."

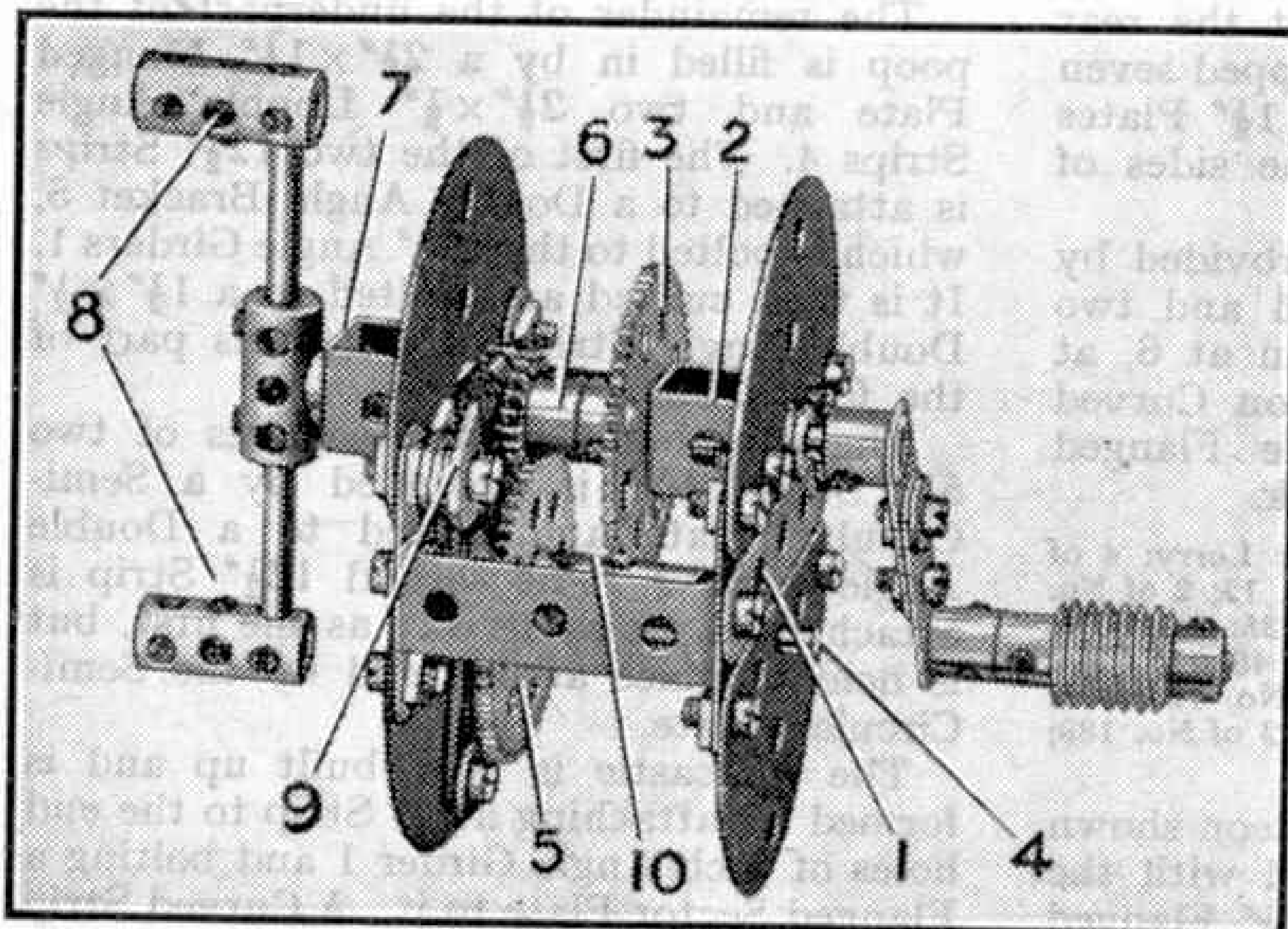


Fig. 4. A compact high-speed winder for winding the rubber motors of model aeroplanes. It is designed by B. T. Gillyatt, Chesterfield.

MECCANO COMPETITIONS

JUNE GENERAL MODEL-BUILDING CONTEST

We wish to remind readers that the General Model-

New Meccano Models

Simple Motor Lorry—Galleon

THE simple motor lorry shown in Fig. 1 is built from the contents of Outfit No. 2 and could be fitted with a *Magic Motor* if one is available. The constructional details are as follows. A $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate 1 is extended at the rear by two $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates overlapping it seven holes, and this forms the chassis of the lorry. The cab is built from four $2\frac{1}{2}"$ Strips bolted to the Flanged Plate, the front pair of Strips being connected by a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 2 to which is bolted a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate that forms the roof. A $2\frac{1}{2}" \times 2\frac{1}{2}"$ Plate 3 attached to the roof and to the $2\frac{1}{2}"$ Strips by Angle Brackets closes in the back of the cab. The front of the vehicle is a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate bolted to the $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate also and to a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 4 that connects the $2\frac{1}{2}"$ Strips. A Flat Trunnion is fixed to the $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate to represent the radiator. A Bush Wheel held on a $\frac{3}{8}"$ Bolt 5 forms the driving wheel.

Two $5\frac{1}{2}"$ Strips bolted at the sides to the $2\frac{1}{2}"$ Strips and extended at the rear by two further $5\frac{1}{2}"$ Strips overlapped seven holes, are attached to the $5\frac{1}{2}" \times 1\frac{1}{2}"$ Plates by Angle Brackets to form the sides of the lorry.

Bearings for the wheels are provided by two Trunnions at the rear end and two Fishplates, one of which is seen at 6, at the front. A $2\frac{1}{2}" \times 2\frac{1}{2}"$ U-Section Curved Plate 7 bolted underneath the Flanged Plate represents the petrol tank.

Parts required to build model Motor Lorry: 4 of No. 2; 6 of No. 5; 3 of No. 10; 8 of No. 12; 2 of No. 16; 4 of No. 22; 1 of No. 24; 4 of No. 35; 41 of No. 37a; 38 of No. 37b; 4 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 3 of No. 111c; 2 of No. 126; 1 of No. 126a; 4 of No. 155; 2 of No. 188; 2 of No. 189; 1 of No. 190; 1 of No. 199.

Construction of the model galleon shown in Figs. 2 and 3 is commenced with the building of the poop. A $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate is extended down at one end by two $3\frac{1}{2}"$ Strips, and at the other by two $5\frac{1}{2}"$

Strips. These are bolted to two $12\frac{1}{2}"$ Angle Girders 1, and the spaces between the Strips and the Angle Girders are braced by two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips, one of which is seen at 2. Two $5\frac{1}{2}"$ Strips are bolted along the Flanged Plate, and the sides are filled in by $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates. A $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate is used to fill in the fore and aft walls of the poop, and another similar part forms the floor.

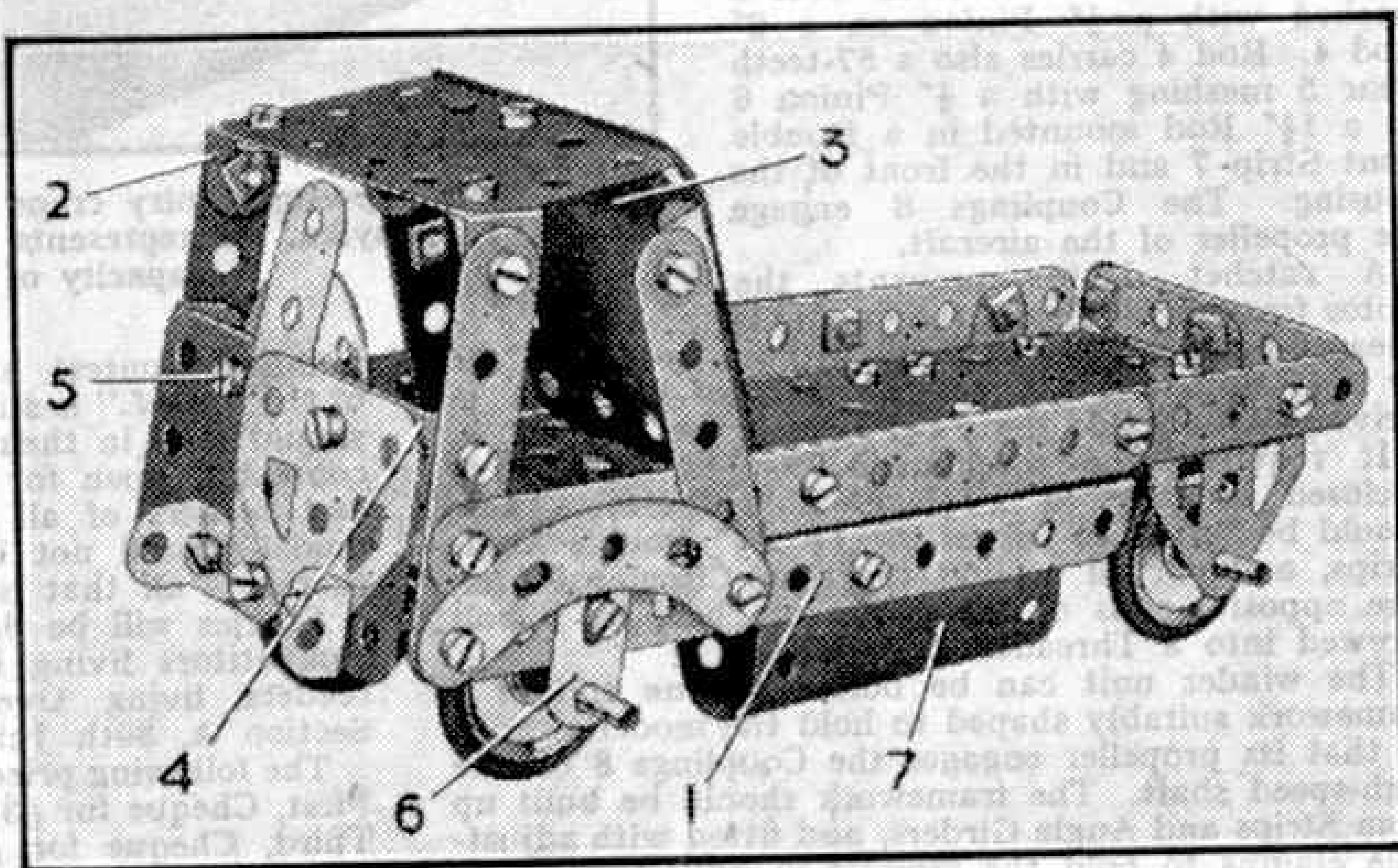


Fig. 1. A simple model motor lorry that can be built from Outfit No. 2.

A $1\frac{1}{2}"$ Strip bolted to the Angle Girder 1 on each side has two $12\frac{1}{2}"$ Strips and one $10\frac{1}{2}"$ compound strip 8 bolted to them.

The remainder of the underpart of the poop is filled in by a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flanged Plate and two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips 4. The first of the two $12\frac{1}{2}"$ Strips is attached to a Double Angle Bracket 5, which is bolted to the $12\frac{1}{2}"$ Angle Girders 1. It is then curved and bolted to a $1\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 6 that forms part of the forecastle.

The compound strip 8 consists of two $5\frac{1}{2}"$ Strips and is extended by a Semi-Circular Plate and bolted to a Double Angle Strip 7. The second $12\frac{1}{2}"$ Strip is attached in the same way as the first, but is held in place at one end by the Semi-Circular Plate.

The forecastle is next built up and is formed by attaching a $2\frac{1}{2}"$ Strip to the end holes of each Angle Girder 1 and bolting a Flanged Sector Plate to it. A Curved Strip is bolted to the $1\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 6 and is attached to the Flanged

Sector Plate. A $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate fills each side of the forecastle, and another similar Plate bolted to the $1\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 6 and Flanged Sector Plate, is bent to repeat the curve of the Curved Strip. A Trunnion is bolted to the end of the Flanged Sector Plate.

The hull is built up on a framework of Strips, and is ribbed by Formed Slotted Strips. The $2\frac{1}{2}"$ Strip shown at 9 is extended downward by a Formed Slotted Strip, which overlaps another one by two holes, and is joined to a similar $2\frac{1}{2}"$ Strip on the other side of the model. Two $5\frac{1}{2}"$ Strips, one of which is seen at 10, are bolted along the bottom and two Formed Slotted Strips are attached to them. Two compound plates made by overlapping a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate and a $1\frac{1}{8}"$ radius Curved Plate are bolted to the $12\frac{1}{2}"$ Strips, and bent round to produce the curve of the hull. The remainder is filled by two U-Section Curved Plates slightly flattened.

A Wheel Disc and a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate 11 fill the back and are held by a $1" \times 1"$ Angle Bracket. The rudder, which is represented by a Flat Trunnion, is attached by an Angle Bracket to the Wheel Disc.

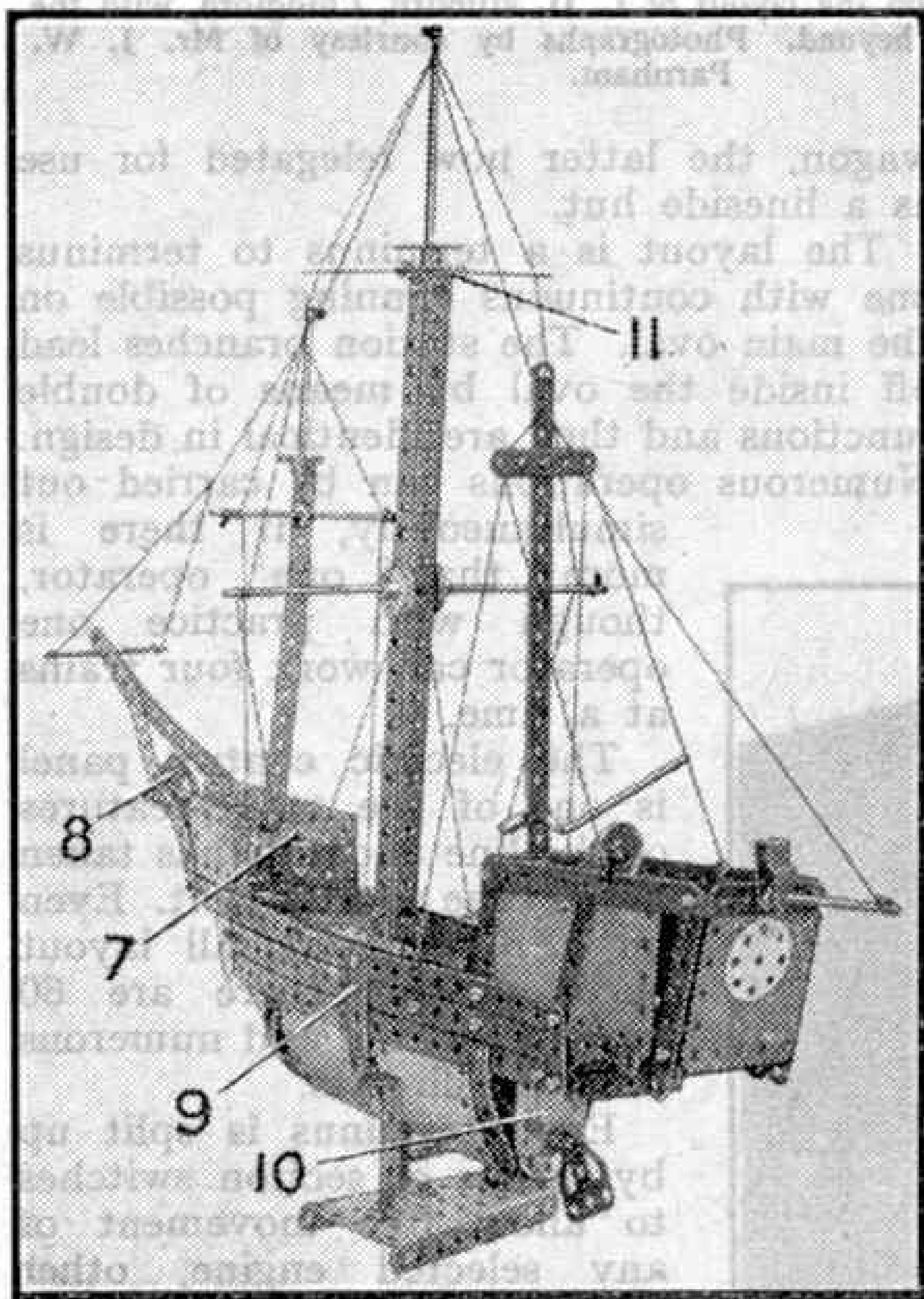


Fig. 3. Another view of the sailing ship showing details of the stern.

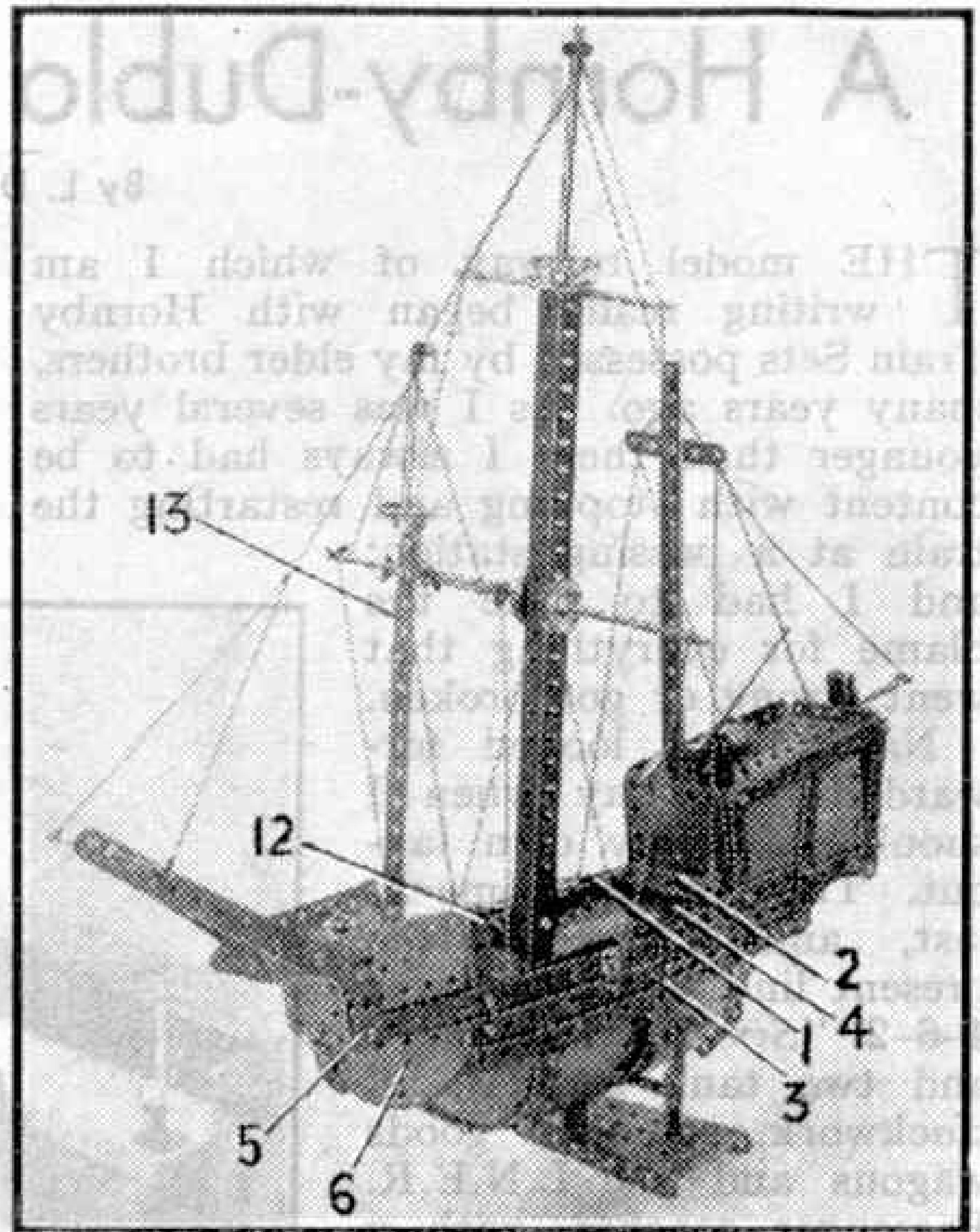


Fig. 2. A realistic old time sailing ship. It is designed for Outfit No. 5.

The ship's wheel is made by locking a $1"$ Pulley on a Threaded Pin passed through a Trunnion bolted to the Flanged Plate. A $\frac{1}{2}"$ Pulley and four Washers form a capstan.

The main mast is built by joining two $12\frac{1}{2}"$ Angle Girders, and for this a Double Bracket and a Double Bent Strip 12 are used. The Double Bent Strip 12 is bolted to the mast, and a $5\frac{1}{2}"$ Strip and a Bush Wheel are attached to it. The mast is extended upward by a $5"$ Rod locked in the Bush Wheel. The lower cross-spar is a compound rod made with a $5"$ and a $3\frac{1}{2}"$ Rod connected with a Rod Connector 13, and is locked to the mast by two $1"$ Pulleys. The mast is connected to the deck by a Reversed Angle Bracket bolted to the Angle Girder 1, and spaced from the mast by four Washers. Two $12\frac{1}{2}"$ Strips form the aft mast and two $5\frac{1}{2}"$ Strips the fore mast, which is extended by a $4\frac{1}{2}"$ Rod in a $1"$ Pulley connected to the mast by an Angle Bracket 14, bolted to its boss.

Parts required to build the model Galleon: 6 of No. 1; 14 of No. 2; 2 of No. 3; 12 of No. 5; 2 of No. 6a; 4 of No. 8; 1 of No. 10; 4 of No. 11; 5 of No. 12; 2 of No. 12a; 2 of No. 15; 1 of No. 15a; 1 of No. 16; 1 of No. 19g; 3 of No. 22; 1 of No. 23; 1 of No. 24; 3 of No. 24a; 12 of No. 35; 90 of No. 37; 8 of No. 37a; 12 of No. 38; 1 of No. 40; 1 of No. 44; 1 of No. 45; 1 of No. 48; 8 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 2 of No. 80c; 4 of No. 90a; 1 of No. 111a; 4 of No. 111c; 1 of No. 115; 2 of No. 125; 2 of No. 126; 1 of No. 126a; 1 of No. 147b; 4 of No. 188; 4 of No. 190; 2 of No. 191; 3 of No. 192; 2 of No. 199; 2 of No. 200; 1 of No. 212; 2 of No. 214; 4 of No. 215.

A Hornby-Dublo Layout Develops

By L. D. Milburn

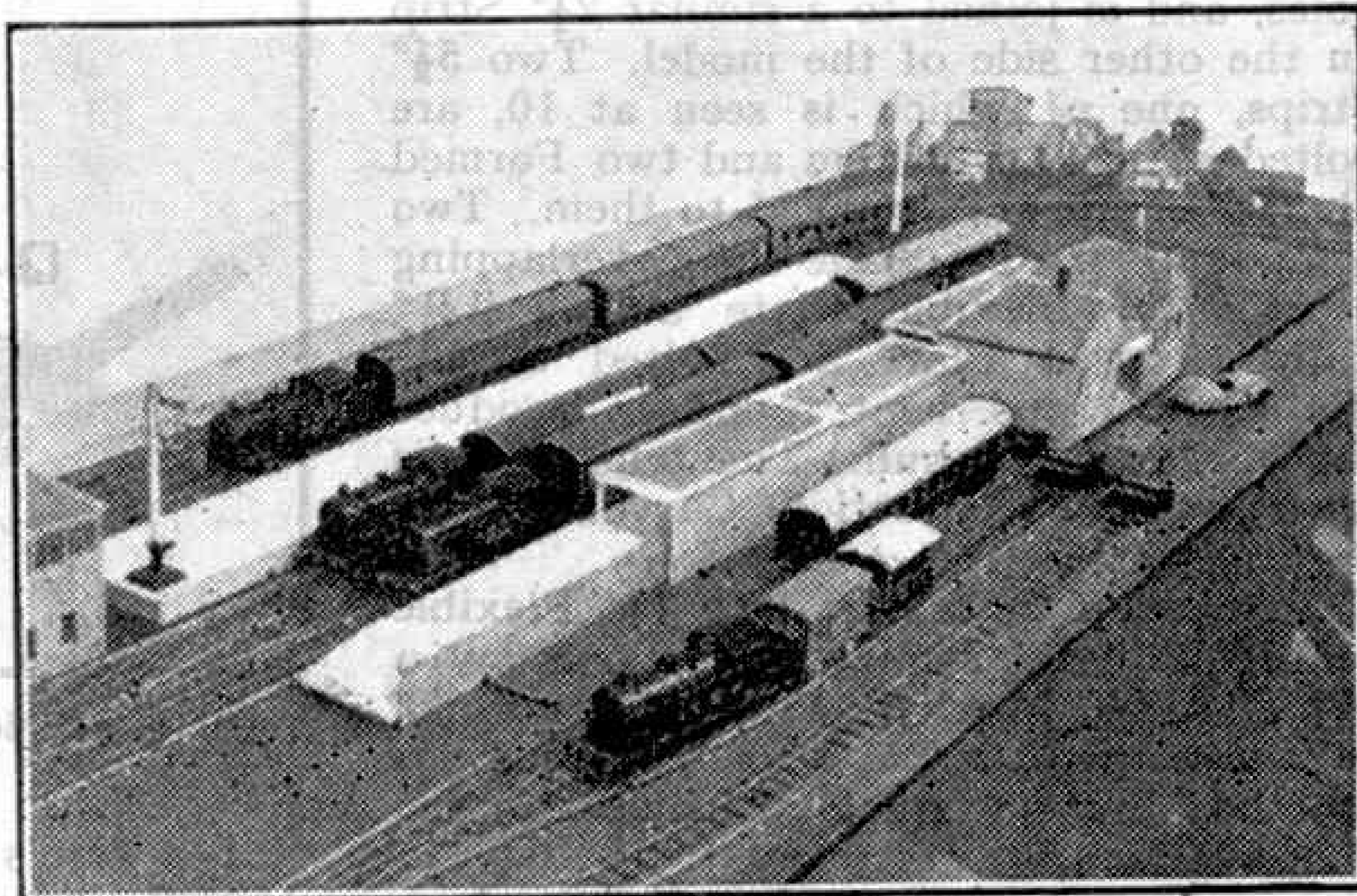
THE model railway of which I am writing really began with Hornby Train Sets possessed by my elder brothers, many years ago. As I was several years younger than them I always had to be content with stopping and restarting the train at a passing station; and I had to take the blame for everything that went wrong or got broken.

Naturally I looked forward to the day when I should have my own layout. The day did come at last, and I began the present line with a pre-war 4-6-2 "Sir Nigel Gresley" and two tank engines, all clockwork, some 14 goods wagons and six L.N.E.R. Passenger coaches, with a fair amount of track and points.

Later I decided to have a permanent electric system. The outer line of a double track oval was got running, and the inner line followed, with one Hornby electric tank engine as well as the clockwork stock. The layout was modified several times but, although the line was never really "complete" until last April, it was in the main operative in its present form.

The clockwork engines and stock were used for a time with the electric stock, which was added to by degrees. There

were then six L.N.E.R. engines, two of them 4-6-2s and four tank engines. The present stock consists of six Hornby-Dublo tank engines and one old Continental engine used for "push and pull" work. There are nine coaches and one goods



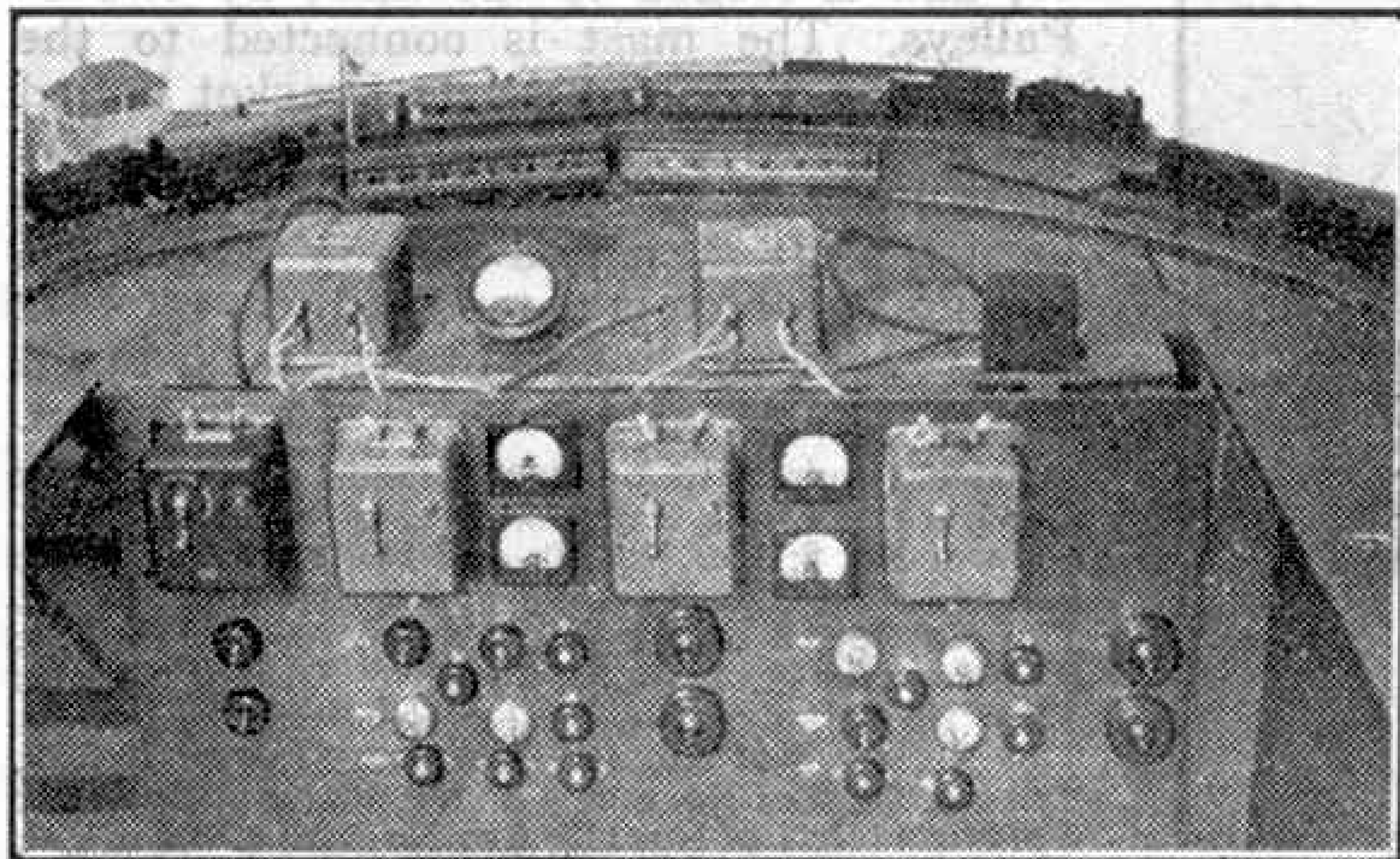
One of the stations on the layout of L. D. Milburn, Chingford, with the through main line beyond. Photographs by courtesy of Mr. J. W. Parnham.

wagon, the latter now relegated for use as a lineside hut.

The layout is a terminus to terminus one with continuous running possible on the main oval. The station branches lead off inside the oval by means of double junctions and they are identical in design. Numerous operations can be carried out simultaneously, if there is more than one operator, though with practice one operator can work four trains at a time.

The electric control panel is one of the main features of the line and this has taken much time and thought. Even on a relatively small layout such as this there are 60 yards of wiring and numerous different circuits.

Each terminus is split up by means of section switches to allow free movement of any selected engine, other engines in the terminal section being switched out until required.



The control panel situated at one end of the layout, with everything convenient to the operator's hand.

Hornby Railways Out of Doors

AT this time of the year a subject that frequently crops up in the correspondence dealt with at H.R.C. Headquarters is the use of Hornby layouts in the garden. Therefore the following notes may be of interest to any readers who are thinking of laying down their railways out of doors.

It must be stated straight away that Hornby railway components are designed essentially for indoor use. They are not suitable for permanent use outside. There is, however, no reason why a Hornby layout should not be operated in the open air on a fine dry day. In this way it is possible to enjoy the warmth and sunshine while carrying out a programme of train operations. There are various precautions to be observed, but as long as due care is taken, outdoor railway working could be a regular feature during the summer months.

Outdoor railwaying has various advantages over indoor working. The amount of space available for a layout is more generous than is usually possible inside the house. Another point is that natural scenic effects are provided in a ready-made form by the garden itself. Before starting to lay down the track, it is wise to get permission to do so from the garden authority!

It is tempting to lay down the rails on the lawn, if there is one, but it is very necessary to make sure that this is dry and that the grass is short enough to permit the trains to run successfully. Another point is that a level site is desirable or there may be trouble with derailments. Any serious ups and downs here and there are likely to upset the train running arrangements.

If the rails can be laid on a concrete

pathway or tiled walk the levels are almost certain to be satisfactory. It is a good plan, before putting down the track on such surfaces, to sweep up the area that is to be covered in order to get rid of any loose dust. This will help to prevent grit being picked up by the more or less oily mechanisms and bearings of the engine and rolling stock.

Although the engine and stock have probably been lubricated and cleaned up before use, it is always well to examine them thoroughly after a spell of outdoor running, and to remove any traces of dust and so on that may have been picked up in the course of the day. This looking-

over also applies to rails and any accessories that may have been in contact with the ground and so may have become slightly damp during the time they have been laid down. A careful wipe over each item with a slightly oily rag will avoid any trouble through possible rusting.

If the model railwayman is unfortunate enough to be caught out with his trains in a sudden shower, he should take particular care that the equipment is well dried before the final oily wipe. A little shaking will help to get rid of any loose drops of water, and the drying-off should be done with a piece of material that soaks up rather than spreads the remaining moisture. A little of this sort of thing goes a long way; so watch the weather!

A scheme that saves a lot of trouble in assembling and in the subsequent taking-up of the system is to screw down the rails on a suitable baseboard more or less permanently. This idea is useful indoors, but it is even more so when the line is to be moved outside frequently and then brought in again after use.



Alan Macintyre of Alloway, Ayr, with his Hornby Train layout in the garden. Alan is an enthusiastic M1 train owner.

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For other Stamp Advertisements see also pages 280 and xi.

Stamp Collecting

United States Commemoratives

By F. Riley, B.Sc.

IN recent years a flood of new designs commemorating a wide range of events of all kinds has appeared in the United States and has aroused considerable comment. Criticism is perhaps inevitable when some 29 new commemorative stamps are issued in a single year in one country alone, as happened in the States in 1948, but it must be remembered that there the population exceeds 130,000,000, so that an enormous number of stamps are required. Those who object to commemoratives of any kind are really the only ones who can feel particularly aggrieved. The rest of us can welcome these issues generally, although we hope that future years will not be so prolific as 1948. After all, stamps honouring the poultry industry and certain others of last year seem out of place alongside commemoratives of outstanding events in U.S. history.

A collection of all United States stamps would be a really bulky affair, for the Gibbons catalogue numbers reach well over 1,100. It is comparatively simple to classify the stamps in groups, however, and enthusiasts can set about forming collections of one or more of these groups that interest them. All of us of course will pass over the very earliest of United States stamps, particularly those issued by postmasters of certain cities and towns before 1847, for these are scarce and highly valued. Some of the general issues that followed from 1847 also

are costly, but the time soon came when stamps appeared that in used condition at least are within the pockets of ordinary collectors, apart of course



from stamps that for special reasons have acquired high values.

The earliest stamps bore portraits of Franklin, Washington and other pioneers of American Independence who later became Presidents, and here is the hint for the first group of those already suggested. Presidential portraits of various kinds continued to appear, and in 1938 the issue began of a special Presidential series, all of similar design. With the exception of Herbert C. Hoover and Franklin D. Roosevelt, every President of the United States up to that time was included in this issue, along with Franklin and Martha Washington. Both exceptions were living in 1938, but President

Roosevelt died in 1945, and his portrait graced the four stamps of a special issue of 1945-46.

The United States authorities have not been slow to recognize other great Americans, and a few less well known, and the Presidential series can easily be extended with good results into a portrait gallery that includes many famous figures.

A well arranged collection with good notes would be really interesting. Its subjects would range from Christopher Columbus, the discoverer of America, to Will Rogers, the famous humorist who said "I never met a man I didn't like," words reproduced on the Rogers portrait stamp issued in November of last year.

Historical events of great importance in the story of the United States provide another interesting section of the commemorative stamps of the country. Most of these are straightforward commemorations. An outstanding example was the issue of three stamps in 1920 to celebrate the 300th anniversary of the landing of the Pilgrim Fathers. The 150th anniversaries of various battles of the War of Independence provided other stamps from 1925 to 1933, when there was a special issue, with a design showing Washington's Headquarters during the War, celebrating the proclamation of peace at the end of the great struggle.

In 1944 a stamp illustrating the 75th anniversary of the completion of the first railway across the North American Continent appeared. The discovery of

gold in California in 1848 was celebrated last year by the appearance of a special stamp, which shows Sutters Mill, Coloma, where the famous discovery was made that started the great gold rush to the Far West.

Another good example of a commemorative of this kind is the stamp marking the 200th anniversary of the founding of what is now Washington and Lee University, in Virginia, as it bears the portraits of the two great Virginians after whom the University is named. Yet another celebrates the 50th anniversary

of the formation of the celebrated Rough Riders, raised by Theodore Roosevelt for service in the Spanish-American war. The design of this stamp shows a statue of Capt. "Bucky" O'Neill, a Rough Rider who was killed while leading his men in battle in Cuba.

An interesting series of U.S. commemorative stamps celebrates anniversaries of the formation of the States of the Union. There are nearly 50 States, and (Cont. on page 282)



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Stamp Gossip and Notes on New Issues

By F. E. Metcalfe

JUST now a number of collectors will not be so active as far as their hobby is concerned, for after all there is a lot to do outside in July. Yet if you collect modern colonial stamps, and many do, don't overlook those new varieties which are popping in and out all the time. They will cost a lot more when winter comes, and after all, winter is never very far behind as far as Great Britain is concerned.

The writer of these notes recently made a trip to Turkey, and he was able to buy in the post office, which makes a set so much more interesting, a set of the new air stamps, issued a short time ago. There are six stamps in the set, and they were printed in photogravure by the Swiss firm of Courvoisier.



There are various designs and the one illustrated is exceedingly interesting, for it shows the old Turkey as well as the new, which

typifies this country in its present state of development. The buildings show the citadel, which is the old part of Ankara, the capital, and the very modern looking bridge is to be found in the public park, in the new part of the city. As everybody knows, Ataturk decided to leave Istanbul, the old capital, and form a new one on the Anatolian plateau. He selected Ankara, which was little more than a ramshackle village, and mapped out a fine city. Ankara is, in parts, a fine city to-day, after only 20 years, which isn't long for creating a city.

We are illustrating another stamp of Turkey, which shows a statue of Ataturk. This statue is in one of the new streets, named by our British Tommies Big Horse Tail Street—they couldn't master the Turkish name. They get the name from the fine bronze horse on which Ataturk is astride. Altogether Turkey is an interesting country to collect. Used stamps are fairly easily come by, and many are quite attractive.

A collector sent in a stamp from Iraq, with an overprint which had had an addition horizontally, and wanted to know what it was all about. Well, as there are many copies of this stamp, and no doubt other readers are wondering about the same thing, we may as well illustrate it and explain that actually three stamps have been treated similarly by the Iraqi Post Office. The values concerned are the 2f, 3f and 5f, and the addition to the overprint has to do with the tax which is being imposed to help Arab troops against Jewish forces. The stamps are still being used apparently, though there can be little need for them now.

Collectors have been intrigued by the stamps which are appearing for the various Malayan States. Eleven



sets to five dollars are scheduled to come out, and already several have actually appeared. It is the perforation which has caused the surprise, and this is so fine— $17\frac{1}{2} \times 18$ —that the usual perforation gauges cannot measure it. Now collectors are wondering if there will be a change in subsequent prints. It is best to buy your sets now to make sure, for if there is a change these present printings will turn out scarce indeed.



Another country which is generally in the philatelic news is Switzerland, and the ultra-modern stamp recently issued that is here illustrated will interest many "M.M." readers. A glider is depicted on this dark purple and yellow stamp, and an attempt has been made in the design to symbolize aerodynamic buoyancy. The stamp was only on sale for a few days

in April, and it was for use for special flights in Switzerland.

There is no doubt about it that Switzerland is making a good thing out of postage stamps, not only by issuing them, but also by printing them for other countries, such as India, Turkey, etc. Technically, these Swiss printed stamps are first class, but one soon gets tired of photogravure productions for some reason or other. There is nothing to touch line engraved stamps really, and our own printers cannot be beaten in this class of work.

Probably the most popular group of stamps in the world are those of our own Commonwealth of the present reign, and lots of attempts have been made to calculate how many collectors there are of these stamps in the world. The latest statement of Gibbons, the great stamp firm which a few months ago published for the first time a K G VI catalogue, is that they have sold 90,000



copies in a few months. There are of course many collectors who either use other catalogues or none at all, so the number of collectors of the stamps in question must be very large indeed. Incidentally Gibbons state that the next edition of their catalogue will be published in the autumn, and a number of changes are predicted. Lots of collectors will be tip-toe from now on.

Collectors are getting very restive over the forthcoming U.P.U. stamps, and dealers say that they are booking many orders, but there is no need for panic, for dealers can be depended upon to get supplies, even from countries which are outside the sterling area.

Things are warming up now for the great international exhibition which is to be held in London next year. Australia and New Zealand also announce exhibitions for 1950, so the pot hunters look to be in for a great time.

And now for a tip. Try to complete your sets of modern South African stamps, either in mint or used pairs. Very soon the whole current set will be replaced by new ones.

The Development of the Destroyer—*(Continued from page 252)*

the "J" class had only two boilers exhausting into a single funnel; their displacement was 1,540 tons, their speed 36 knots, their armament four 4.7, several small anti-aircraft guns and four torpedo tubes. During the war that design was developed down to the "Z" class of 1,710 tons with four of the new 4.5 in. guns, a bigger high-angle battery and eight tubes.

Towards the end of the war it was once again necessary to build specialized types. For Arctic service in connection with the Atlantic and Russian convoys the "Weapon" class was of 1,980 tons, steamed 34 knots and mounted four 4 in. and numerous anti-aircraft guns, with 10 torpedo tubes. Against the Japanese in the Pacific the "Battle" class had a displacement of 2,325 tons, a speed of 36 knots, and an armament of five 4.5 in., 14 anti-aircraft guns and 10 torpedo tubes. The "D" class were an enlarged edition of the "Battle" class, 2,610 tons normal displacement but no less than 3,500 with all their weights on board, 36 knots speed, and the earlier ships' armament increased by an extra 4.5 and two more anti-aircraft guns.

The contracts for many ships of these three types were cancelled immediately after VJ-Day; many of them were towed straight round from the builder's yards to the scrappers; but doubts are now being entertained as to the wisdom of that move.

Fuelling the World's Airlines—*(Continued from page 255)*

aircraft lands and the B.P. fueller moves off to meet it. The tanks are never found to be empty, since a generous safety margin is carried, so that usually one road tanker is enough to meet its demands. Nevertheless a minimum of two fuellers is kept at each airport, and often several others. A "Dakota" carries 3,000 gallons, including storage, and the latest type of four-engined craft accommodates 6,500 gallons; the giant "Brabazon" holds no less than 9,000 gallons. To cater for these demands, 2,400-gallon four-compartment tanks are provided on the fleet of 19H1 Hippos that is now being built up. Two pumping units deliver fuel to the aircraft by boom gear at a rate of 60 gallons per minute each. The vehicles are finished in the green and yellow of the B.P. aviation service and carry its distinctive winged emblem.

This article is reproduced from "The Leyland Journal" by courtesy of the Editor.

Dinghies with a difference—*(Continued from page 256)*

of "Fireflies" was used for demonstration and rigorous all-weather tests, during which one boat was filled with stones and left awash by the tides in Hamble River, in and out for nearly two years including the savage winter of 1946, without marked deterioration.

As raw materials became available and clubs began to realize that the "Firefly" offered a chance to resume pre-war activities at comparatively low cost, the demand for these dinghies became very great. As a result more than 500 were built at Hamble in 18 months, a record output of one type by one boat builder in so short a time, only made possible by the simple moulded construction, which also ensures that all "Fireflies" are identical in hull form. Total production is now well over 600, and boats have been delivered to clubs as far apart as Argentine and Iraq, Sweden and Singapore.

Although the "Firefly's" high performance makes it a favourite for racing, that is by no means the limit of its usefulness. It is in fact a delightful little dinghy for less hectic sailing on the Broads, rivers, reservoirs or the open sea. Roomy, and docile enough to be handled by children, for whom the makers supply a special reduced rig, it represents a pioneer effort to bring the open-air thrills of real sailing within reach of everyone's pocket.

Double-Decker of the Air—(Cont. from page 262)

in the nose to the galley in the tail.

The bad old days when aircrews worked in a cramped cell surrounded by a jungle of instruments, levers and gadgets, have gone. P.A.A. pilots had a hand in designing the flight deck, which is the most spacious ever built into a commercial landplane. Normal provision is made for a crew of five consisting of pilot, co-pilot, flight engineer, radio operator, and navigator, but for short-range "skycoach" services a crew of three would be adequate. Crew members can walk around during flight, converse easily because of the low noise level, and have their own toilet facilities.

Immediately behind the flight deck in the P.A.A. version is a luxurious stateroom for eight people, ideally suited for a large family or group of business men who want a certain degree of privacy. On either side of the aisle leading back from here to the main cabin are beautifully-fitted out dressing rooms for men and women, each able to accommodate six people at a time.

The main cabin has double rows of seats on each side of a centre aisle, with the circular staircase to the lower deck midway along its length. Like the other passenger compartments, it is fully air-conditioned, and pressurized to enable the aircraft to operate with complete passenger comfort at heights up to 25,000 ft., well above most bumpy weather or storms. Finally we come to the galley, which is as big as the average household kitchenette and can serve all the passengers and the crew with three complete meals during a 12 hr. flight. The equipment includes two ovens and four refrigerators.

On the lower deck are a forward cargo compartment with a capacity of 520 cu. ft. and a rear luggage compartment of 325 cu. ft. Both are pressurized, and together they accommodate up to five tons of freight. Passengers can even take their pets with them if they wish, as the rear compartment can be warmed or cooled as required.

Stamp Collecting—(Continued from page 279)

these commemoratives alone will provide quite a nice little collection that should be very attractive if well done. The Minnesota stamp on page 279 is an interesting example. The procedure was to organize an area or district as a territory first, and when this territory was well-established, with responsible government, it became eligible for admission as a State. Minnesota became a territory in 1849, and so enters the list of commemoratives this year. The design of the stamp features the Red River ox cart, which was the chief mode of transport in the territory 100 years ago and received its name from one of its principal rivers, which flows north into Canada. Minnesota became a State in 1858, and presumably we can expect another stamp to celebrate that event in nine years time.

The natural features of the United States provide a real wealth of material for the designer of pictorial stamps. The outstanding stamps of this kind are those of the National Parks issue of 1934, which illustrate such well-known places as the Grand Canyon, the Yosemite Valley and Yellowstone Park. With these as a centre a very fine collection can be made of stamps showing scenic wonders in the States, including some picturing great works such as Boulder Dam. The air stamps of the United States form another excellent series. It is interesting to find that one of these stamps, which appeared in 1923, shows a de Havilland biplane.

In this article I can only touch on a few of the various schemes that may suggest themselves to those looking for special corners of the stamp world in the issues of the United States. Such collections can be extended by taking into account the stamps of the Philippines and other associated countries. For instance, stamps are being issued this year in the Panama Canal Zone that will add to the story of the California gold rush illustrated by the 1948 commemorative already referred to. Many of the "Forty-niners" reached the diggings by way of Panama, and their passage is illustrated and commemorated by this issue.

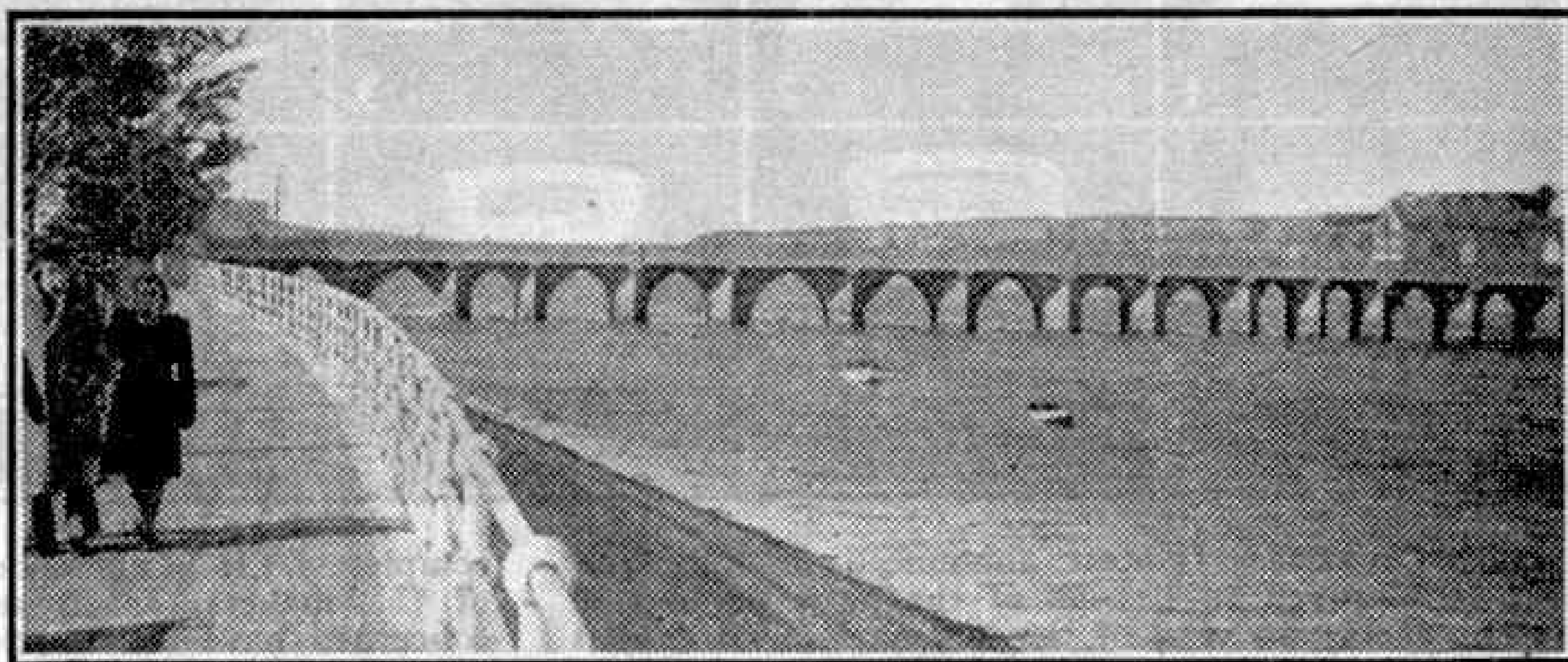
From Our Readers

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.

BIDEFORD'S ANCIENT BRIDGE

During a recent holiday I had the luck to visit Devon and in particular, the town of Bideford, the ancient borough so well known to all readers of Charles Kingsley's "Westward Ho." Part of this story of Elizabethan times was written at Bideford, which was the birth-place of Sir Richard Grenville, who in his "Revenge" fought a famous battle against an overwhelming Spanish fleet at Flores, in the Azores.

While at Bideford I was particularly interested in the old bridge that spans the estuary of the Torridge, the river on which the town stands. "Everyone who knows Bideford cannot but know Bideford Bridge," wrote Kingsley, and it is certainly worthy of the attention of every visitor.



The famous bridge at Bideford, in North Devon, now an ancient monument. No two arches of this structure are of the same span. Photograph by A. Gulati, London S.W.11.

The early history of the bridge is not very clear, but legend ascribes its beginning to a dream of the parish priest, in which he saw a suitable site for the foundations of the bridge in the tide-swept sand and mud of the Torridge. The queer variation in size of the 24 arches—no two are the same width—has been accounted for by the quaint suggestion that

the poor built the narrow ones and the rich the wide ones, but it is more likely that the foundations of the piers were set where the presence of rock made it possible.

The first structure was of wood and was erected about 1280. This was replaced by a stone bridge about 200 years later. Since then the structure has been widened and altered, but the original form has always been retained. The present width and graceful parapet were engineered in 1925 and its approaches also were improved. The bridge has now been made an ancient monument.

A. GULATI (London S.W.11).

SNAKE CHARMING IN INDIA

Snake charmers are familiar figures in Southern India. They are mainly occupied in providing entertainment but they have more useful work at times. Some 20,000 Indians die every year from snake bites and snake charmers are often employed to rid dwellings of these deadly reptiles.

The accompanying photograph, taken by my friend John Scrivener while he was in India, shows a snake charmer at work. The musical instrument used is generally 15 in. long, with a hollow bulb carved out of the stem. Most snake charmers appear to resist the effects of a snake bite; in some cases this is believed to be possible because they have been bitten so often that they have become immune to the poison. Others, who do not wish to run any danger, extract the snake's teeth, through which the poison is injected, while quite a few continue to carry pamboo-kaloo, or snake-stone, which apparently heals a cobra's bite when it is placed on the wound for a short time.

The belief that snakes can hypnotize people and animals is a fallacy. It seems to be due to the absence of movable eyelids, which give snakes a stony stare that is apparent even when asleep.

Although the cobra continues to cause havoc among human beings in India, it is still worshipped by many Hindus, particularly in Southern India.

S. A. BENNETT (Birmingham 23).

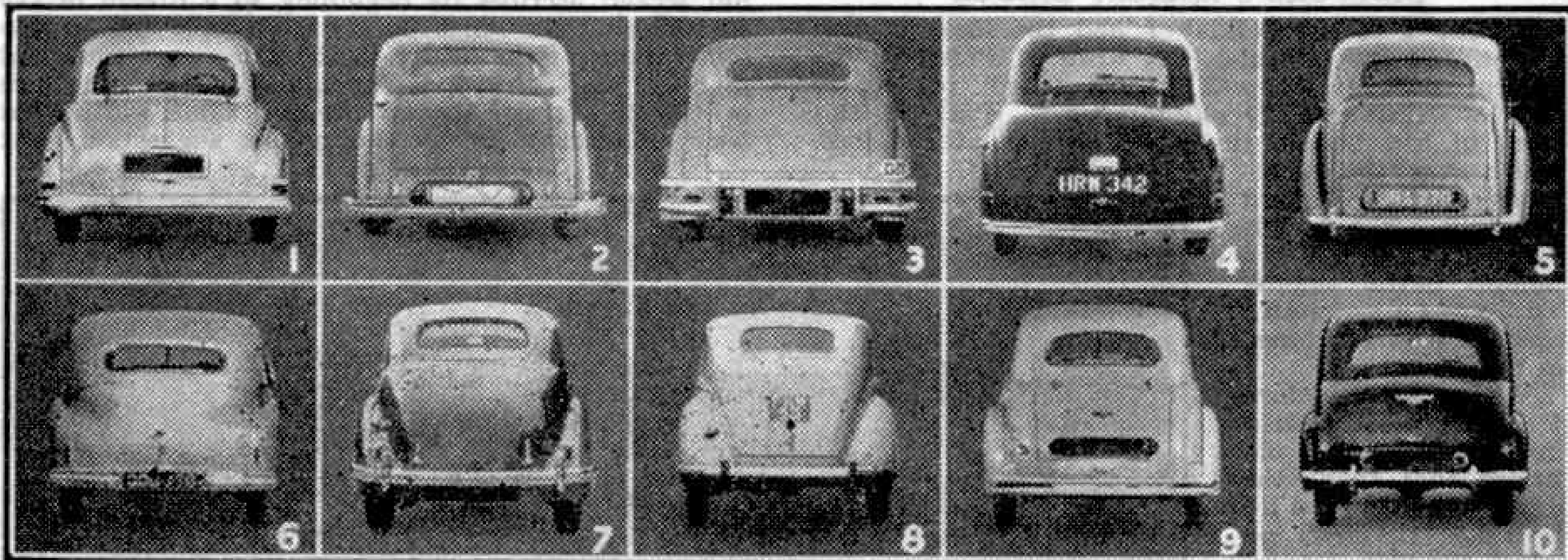


Indian snake charmers giving a performance with their cobras. Photograph by J. Scrivener.

Competitions! Open To All Readers

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

Seen from Behind



The Car Faces Contest announced in the April "M.M." proved to be one of the most popular of recent years. In view of the intense interest that it aroused we are following it up with a similar competition that we are sure readers will welcome, even if some of them find it a little more difficult. In this contest we are giving entrants 10 pictures showing direct rear views of modern British cars and we ask them to say which cars are represented.

The pictures are numbered 1 to 10, and in their entries readers must state for each number the name of the car that the corresponding picture represents. As in the previous contest, sufficient information must be given to identify the model

completely. It is not enough just to give the names of the makers, as in several instances the firms concerned have other models in production.

There will be two sections in the contest, for Home and Overseas readers respectively, and in each of these prizes of 21/-, 15/- and 10/6 will be awarded to the competitors who send in the best entries in order of merit. If there is a tie for any prize the final award will be based on the neatness and novelty of the entry.

Entries must be addressed "Car Rear View Contest, Meccano Magazine, Binns Road, Liverpool 13." The closing dates are 31st August in the Home Section, and 30th November in the Overseas Section.

A Locomotive Square

For our second competition this month we have a novel word square competition, devised by our reader C. G. Groom, Pinnock, in which the names of well-known locomotives of British Railways are involved. The square involved is shown below. It has 64 spaces, like a chess or draught board, and the horizontal lines are to be filled with the names of the locomotives indicated by the following clues:

| | | | | | | | |
|---|--|--|--|--|--|--|--|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |

1. Peeress now nationalized.
2. Church dignitary, Scottish in origin.
3. Famous battle.
4. Famous battleship.
5. Should it wear a halo?
6. Recently won promotion in League.
7. West Country town.
8. Its deflector plates must really be wings, it seems.

When the correct names are inserted in the rows of the square the name of yet another locomotive will be spelled out by the letters in the diagonal beginning at the top left-hand corner.

For their entries in this contest competitors are asked to send in the complete square. They must not cut out the square printed on this page, but instead must draw a copy on a sheet of paper or card.

The competition is divided into the usual two sections, for Home and Overseas readers respectively, and in each of these prizes of 21/-, 15/- and 10/6

will be awarded for the three best entries in order of merit. If necessary the judges will take the neatness or novelty of the entry itself into consideration.

Entries should be addressed "July Locomotive Square, Meccano Magazine, Binns Road, Liverpool 13." The closing dates are 31st August in the Home Section, and 30th November in the Overseas Section.

July Photographic Contest

In this month's Photographic Contest, the 7th of our 1949 series, readers are asked to submit general summer outdoor photographs. These may include not only lake, woodland and mountain scenes, but also pictures taken in towns or villages in which the summer aspect is clear. It is left to entrants themselves to decide whether to include figures or not.

There are only two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of each print must be stated exactly what the photograph represents. A fancy title may be added if desired.

The competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate sections for overseas readers. In each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed "July Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13." Closing dates: Home Section, 30th July; Overseas Section 31st October.

Competition Results and Solutions

HOME

FEBRUARY 1949 ENGINEERING CHOICE CONTEST

1st Prize: D. Houlker, Accrington. 2nd Prize: J. Bradbury, Taunton. 3rd Prize: A. R. Young, Bournemouth. Consolation Prize: P. G. Taylor, Leicester.

FEBRUARY 1949 STATIONS CONTEST

1st Prize: W. Hinam, Sheffield 8. 2nd Prize: C. E. Wrayford, Bovey Tracey. 3rd Prize: C. J. Burnley, Chester. Consolation Prizes: B. L. W. Polley, London S.E.24; A. Conway, Loughborough.

MARCH 1949 DOUBLET'S COMPETITION

1st Prize: J. G. Hayman-Joyce, Abingdon. 2nd Prize: R. A. Hands, Nottingham. 3rd Prize: G. Cope, Upminster. Consolation Prizes: R. G. W. Napier, Edinburgh 9; P. D. Cottrell, Isleworth; J. H. Brodie, Glasgow, N.W.

MARCH 1949 RAILWAY QUIZ

1st Prize: C. E. Wrayford, Bovey Tracey. 2nd Prize: A. J. Wood, Birmingham 32. 3rd Prize: F. Mills, Kearsley. Consolation Prizes: B. J. Holden, Burgess Hill; B. E. Timmins, Birmingham 24.

MARCH 1949 PHOTOGRAPHIC CONTEST

1st Prize, Section A: P. W. Lang, Sevenoaks; Section B: R. Whitehead, Ulverston. 2nd Prize, Section A: J. S. Stone, Barton-on-Sea; Section B: R. J. Welch, London S.E.21. 3rd Prize, Section A: W. Forsch, Stoke-on-Trent; Section B: B. B. Foskett, London S.W.15. Consolation Prizes: H. J. Edwards, Tunbridge Wells; C. H. Thomas, Aldershot; J. P. Nicholson, Lincoln; D. C. Thorby, Spalding; C. F. Stott, Brentwood; S. L. Connors, New Malden; D. E. Dore, Greenford; R. A. Surch, Birmingham 22c; P. Anthony, Worcester; D. R. Davies, Harrow; B. Gett, Glossop; K. Rapley, Ilford.

OVERSEAS

SEPTEMBER 1948 ERRORS CONTEST

1st Prize: L. G. Poole, Melbourne, Australia. 2nd Prize: A. R. Tinckam, Sydney, Australia. 3rd Prize: J. A. Gomes, Bombay, India. Consolation Prizes: H. Harder, London, Canada; G. M. Reoch, Gadzema, S. Rhodesia.

OCTOBER 1948 CROSSWORD PUZZLE

1st Prize: W. W. Jenson, Wellington, N.Z. 2nd Prize: A. C. Hughes, Johannesburg, S. Africa. 3rd Prize: J. T. Pope, Lower Mitcham, S. Australia. Consolation Prizes: G. P. Fennell, Dublin, Eire; T. Searson, Salisbury, S. Rhodesia.

OCTOBER 1948 RAILWAY TERMS CONTEST

1st Prize: S. H. Walsh, Auckland, N.Z. 2nd Prize: B. Simmons, Colombo, Ceylon. 3rd Prize: K. Knowles, Durban, S. Africa. Consolation Prizes: L. G. Poole, Melbourne, Australia; J. A. Gomes, Bombay, India.

OCTOBER 1948 PHOTOGRAPHIC CONTEST

1st Prize, Section A: A. R. Tinckam, Sydney, Australia; Section B: J. Nordwald, Pietermaritzburg, S. Africa. 2nd Prize, Section A: E. de Sincay, Lausanne, Switzerland; Section B: W. Clare, Bray, Eire. 3rd Prize, Section A: R. M. Cox, Tauranga, N.Z.; Section B: G. Burns, Warragul, Australia. Consolation Prize: R. D. Boyle, Hawke's Bay, N.Z.

NOVEMBER 1948 STORY CONTEST

1st Prize: C. Burman, Vicksburg, U.S.A. 2nd Prize: T. S. Leander, Valetta, Malta, G.C. 3rd Prize: M. J. Ring, Mount Eden, N.Z. Consolation Prizes: R. Saunders, Durban, S. Africa; K. Kempster, Eire.

SOLUTIONS

AUGUST 1948 OLYMPIC QUIZ

1. J. E. Lovelock, New Zealand. 2. U.S.A. 3. 10.3 secs. 4. Berlin, 1936. 5. Finland. 6. 26 miles, 385 yards. 7. K. Son, Japan. 8. R. M. N. Tisdall, 400 metres hurdles. 9. 800 metres, T. Hampson and 50,000 metres walk, H. H. Whitlock. 10. 100 metres, 400 metres, 1,500 metres, 110 metres hurdles, high jump, long jump, pole vault, discus, javelin, weight.

AUGUST 1948 NAME SQUARES CONTEST

Astra Pharos Ltd., B.S.A., I.C.S., and Hercules.

SEPTEMBER 1948 SHIPS CONTEST

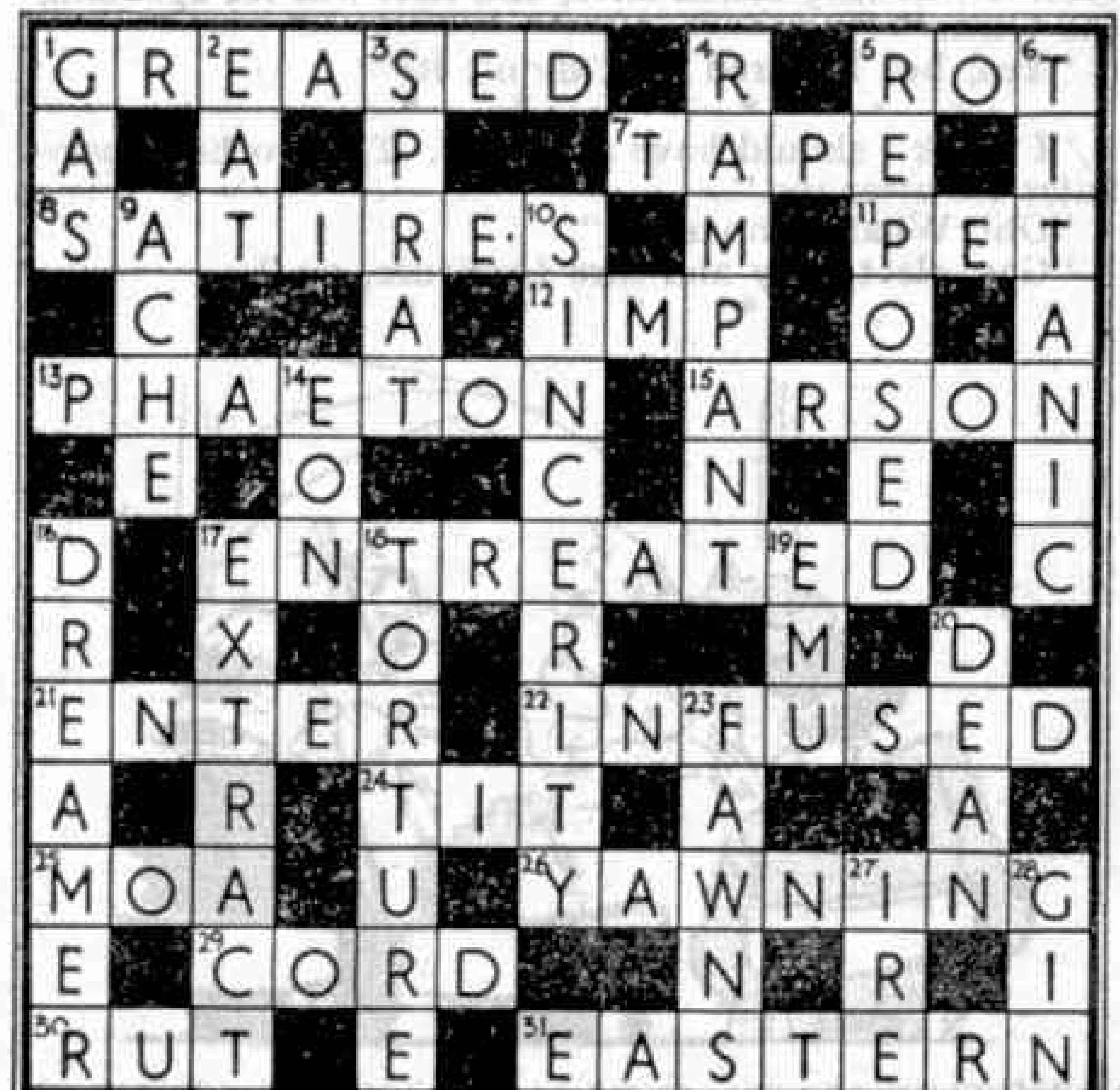
1. Queen Elizabeth. 2. Vandyke. 3. Derbyshire. 4. Nieuw Amsterdam. 5. Asturias. 6. Andes. 7. Highland Chieftain. 8. Franconia. 9. Beaverdell. 10. Rangitata. 11. Worcestershire. 12. Clan Cameron.

OCTOBER 1948 RAILWAY TERMS CONTEST

1. Signal arm. 2. Clamp and screw device for bending rails. 3. Damaged wagon. 4. Space between the tracks of a double line. 5. Ground disc signal. 6. Locomotive or vehicle off the rails. 7. Train going into a yard or sidings. 8. One or more wagons uncoupled from a train for shunting purposes. 9. Signalman. 10. Smoke deflectors; or, sometimes, back-light vane of signals. 11. To draw up the fire of a locomotive with the steam blower; whistle for signals; creating a vacuum in the brake system. 12. Permanent way. 13. Set of coaches permanently coupled together. 14. A long poker with an arrow-shaped head, used for breaking up clinker. 15. Delivery pipe of a water tank; brake or feed pipe hose connection.

NOVEMBER 1948 LOCOMOTIVE SHADOWS CONTEST

1. Southern Region "T9" 4-4-0 (Ex-L.S.W.R.). 2. Western Region "Bulldog" 4-4-0 (Ex-G.W.R.). 3. L.M. Region "5XP" 4-6-0 (Ex-L.M.S.). 4. Southern Region "King Arthur" 4-6-0 (Ex-S.R.). 5. L.M. Region "3P" 2-6-2 Tank (Ex-L.M.S.). 6. Western Region "94XX" 0-6-0 Tank (Ex-G.W.R.). 7. L.M. Region "Clan Goods" 4-6-0 (Ex-H.R.). 8. N.E. Region "C7" 4-4-2 (Ex-North Eastern Railway). 9. G.N.R. Stirling 4-2-2 8 ft. "Single."



October 1948 Crossword solution.

Fireside Fun

"Whatever made you think of working hard eight hours a day?"

"I didn't. The boss thought of it."



"Say driver, can you take a joke?"

"Sure! Where do you want to go?"

"You've finished your letter, I see. What are you looking so worried about?"

"Well, I had it on the tip of my tongue, but it's gone."

"Just think hard for a minute and it will come back."

"Not this time. I mean the 2d. stamp."

"Yes, the greens were in a terrible state, and the fifth tee was just a sloppy mess."

"You should go to a better place for lunch and, anyway, why have so many cups of tea if it wasn't fit to drink."

"Just look at that typist! Fast asleep again!" exclaimed the insurance office manager. "I'll sack her."

"No, don't do that, sir. Just put a printed notice on her, telling people they can sleep safely like this if they insure with us."

"No, corporal punishment is wrong. Look at my case. I was only caned once, and that was for speaking the truth."

"Yes, but it cured you, didn't it?"

"I think I should have a rise, sir. Three other companies are after me."

"Oh! What companies?"

"Gas, electricity and hire furniture, sir."



"Mummy can we go home when the man's sawed through that wood?"

BRAIN TEASERS

TRY THIS BY YOURSELF

The square of 25 letters shown below has a very mixed appearance. The letters have been very carefully arranged, however, so that by starting in a certain square and moving in turn to any square adjoining it, up, down or diagonally, a well-known proverb can be spelled out. What is the proverb?

| | | | | |
|---|---|---|---|---|
| Y | N | E | B | H |
| A | C | H | T | R |
| M | O | T | T | O |
| O | O | O | P | L |
| K | S | S | I | O |

S.W.C.

A WEIGHTY PROBLEM

A customer buying potatoes was surprised to find that the greengrocer had only four weights. When she mentioned this the greengrocer said that he could weigh any number of pounds of potatoes up to 40 lb. What were the four weights?

SAFETY MEASURE

A crazy genius set out to encircle the Earth at the Equator with an iron band, presumably to hold it together. When he had finished he found that the band stood up a foot above the surface. How much would he have to cut out of it to make it fit snugly? As he was a genius, although crazy, he had of course first removed all mountains!



"You ought to get heavy damages after a crash like that."

"Damages! It's repairs I want."

SOLUTIONS TO LAST MONTH'S PUZZLES

The three names disguised in our first puzzle last month were Atlee, Churchill and Truman. The code employed is the obvious one in which each letter is represented by the number showing its order in the alphabet.

The number of sweets left when Tom, Dick and Harry went to sleep was 25.

It is noise that comes and goes with a motor lorry, is always with it but is no use to it.

The figure required in our fourth puzzle is 18. When the two digits are added together and the result squared the number 81 is obtained.

THIS MONTH'S HOWLER

Crematorium is Latin for a dairy.

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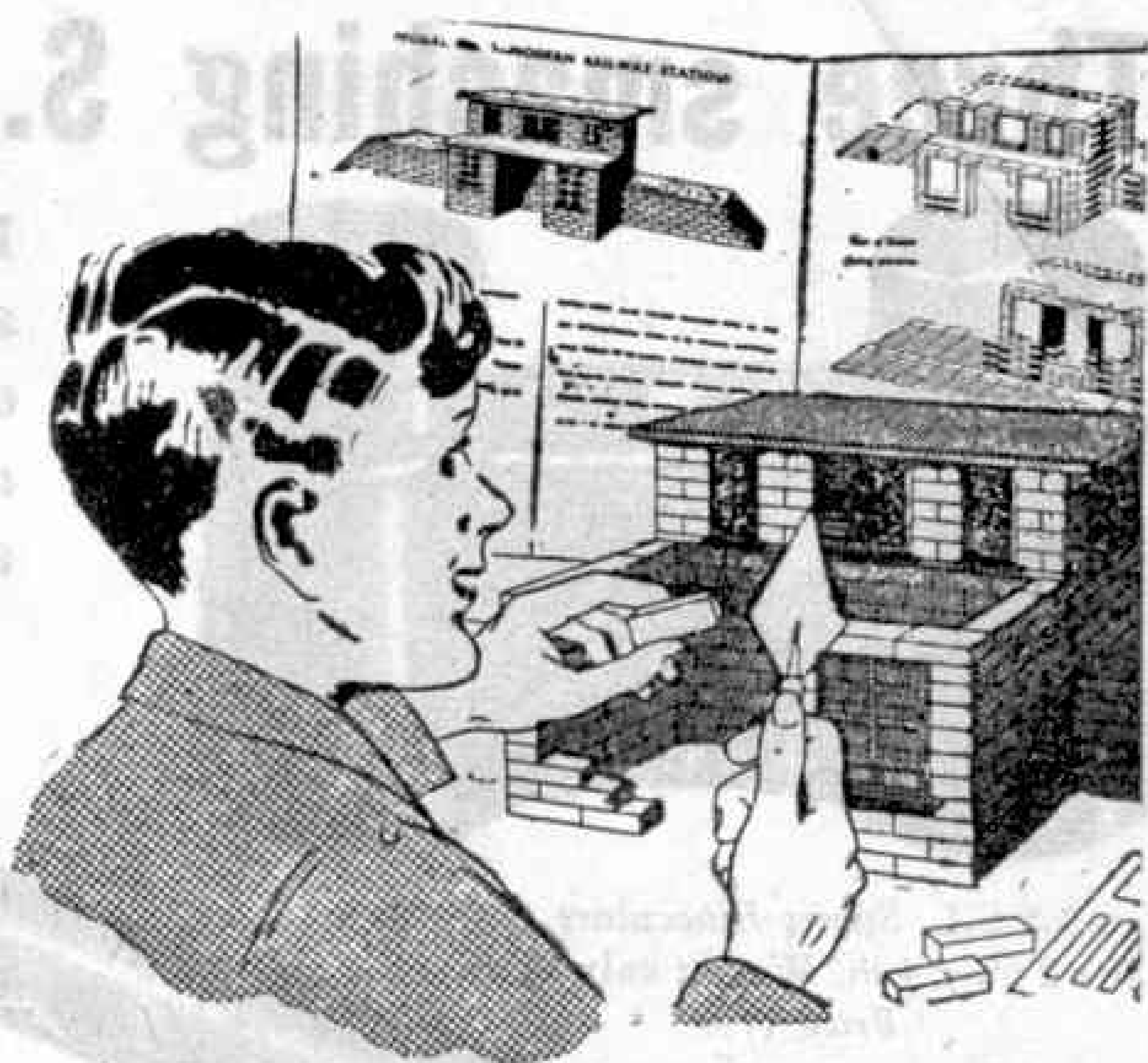
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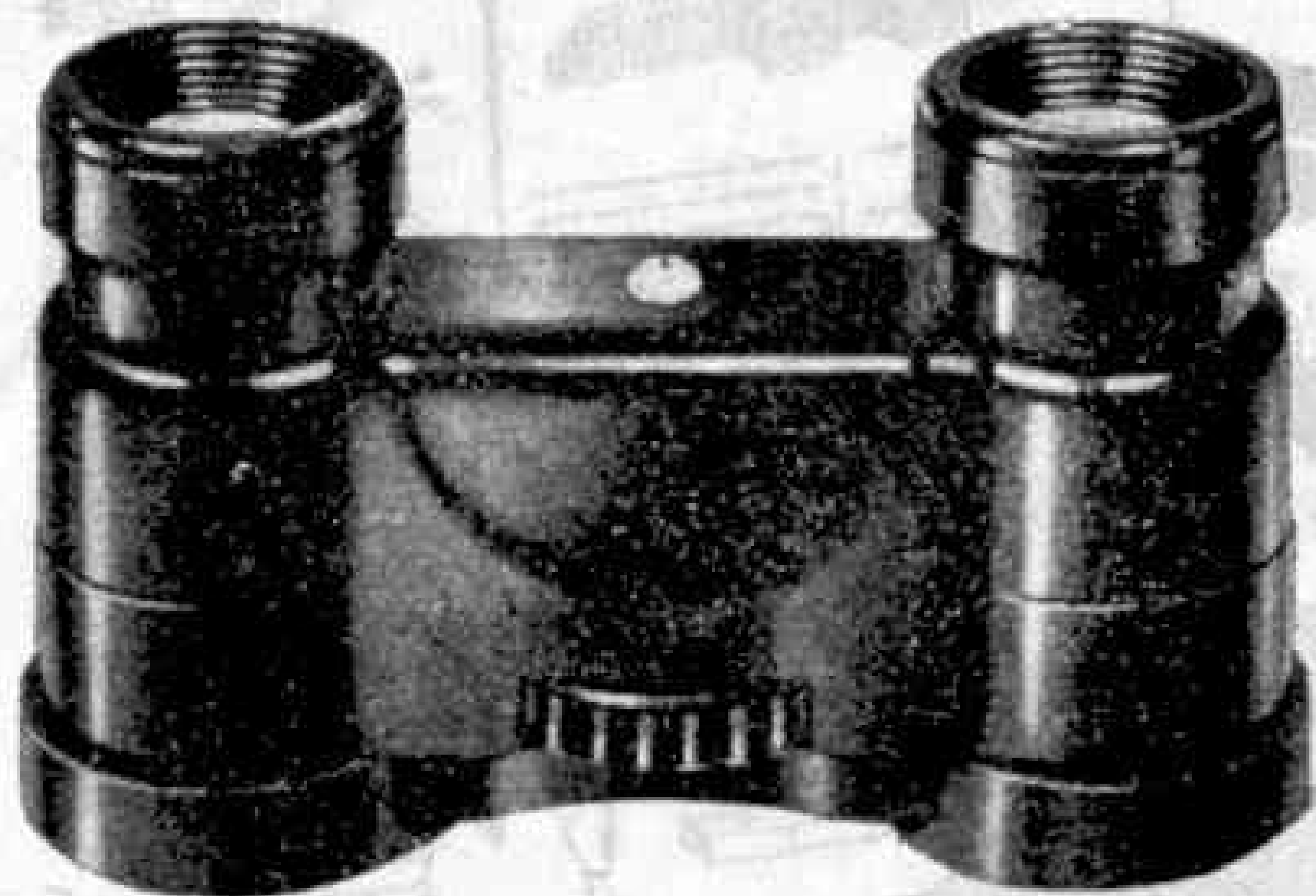
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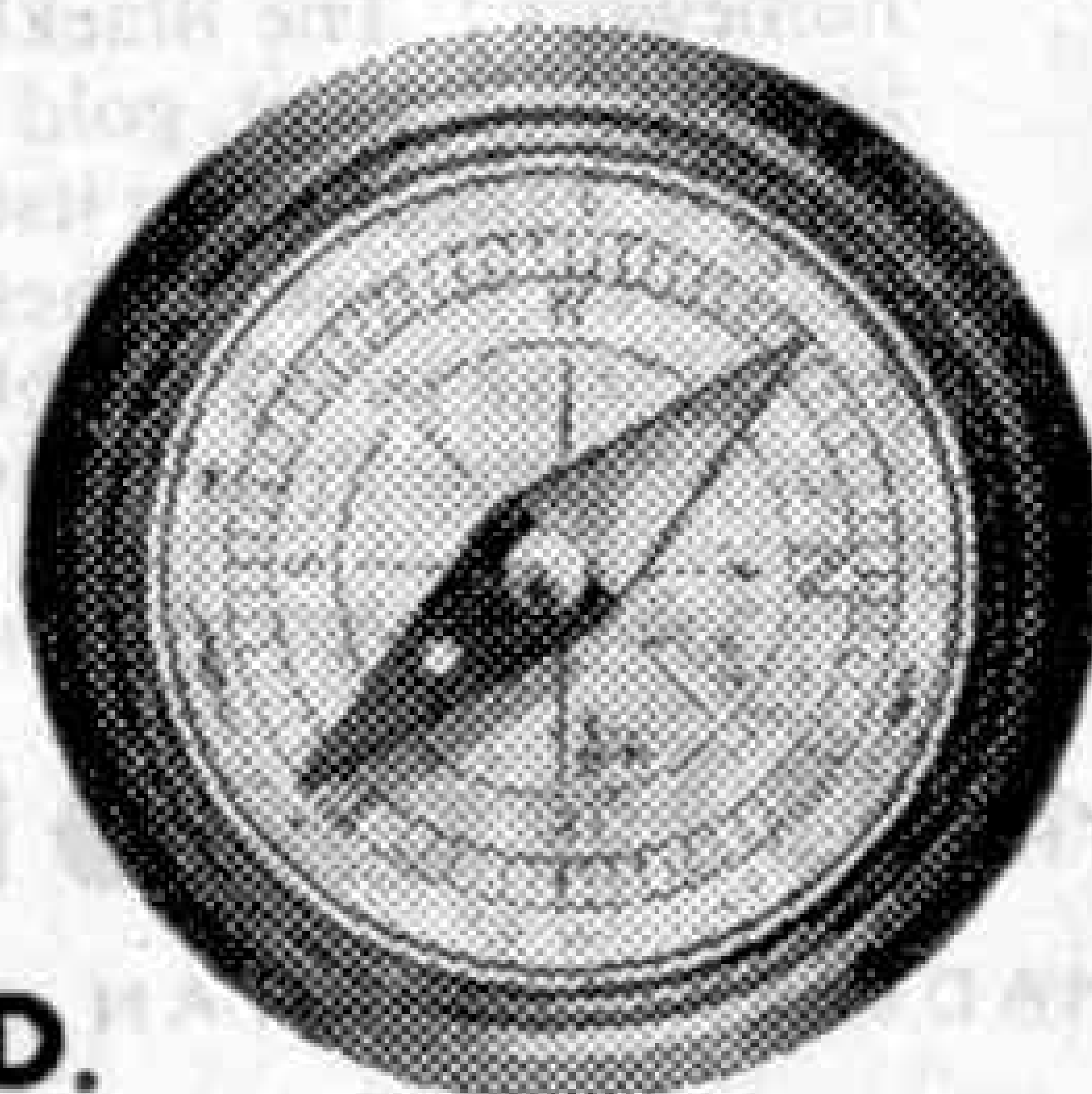
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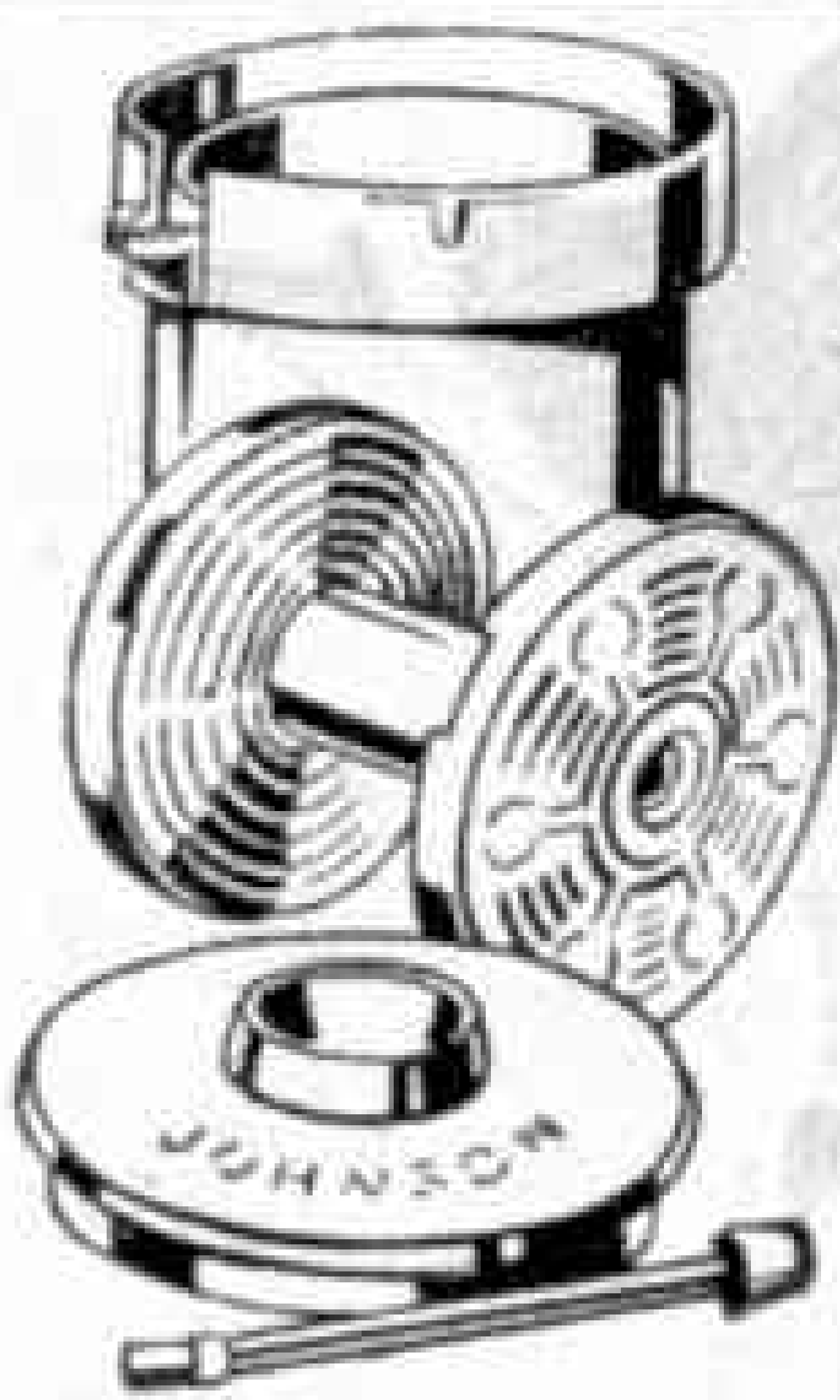
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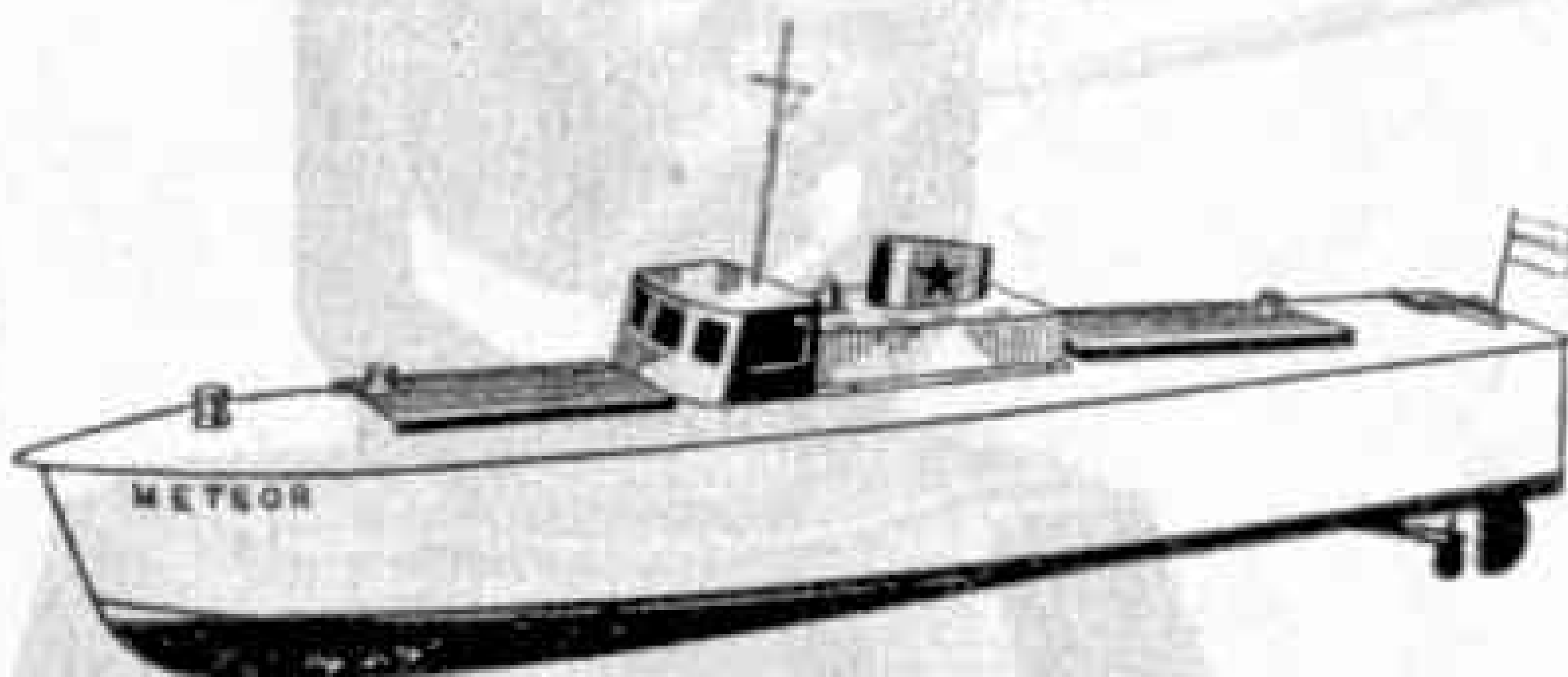


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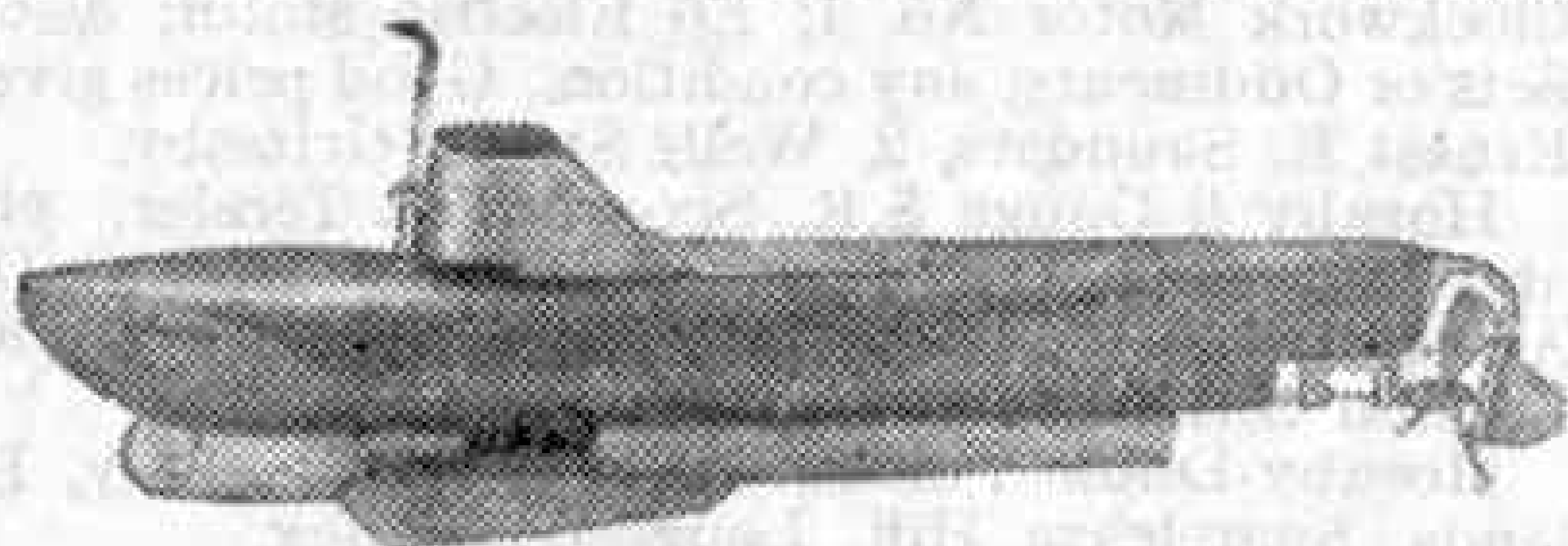
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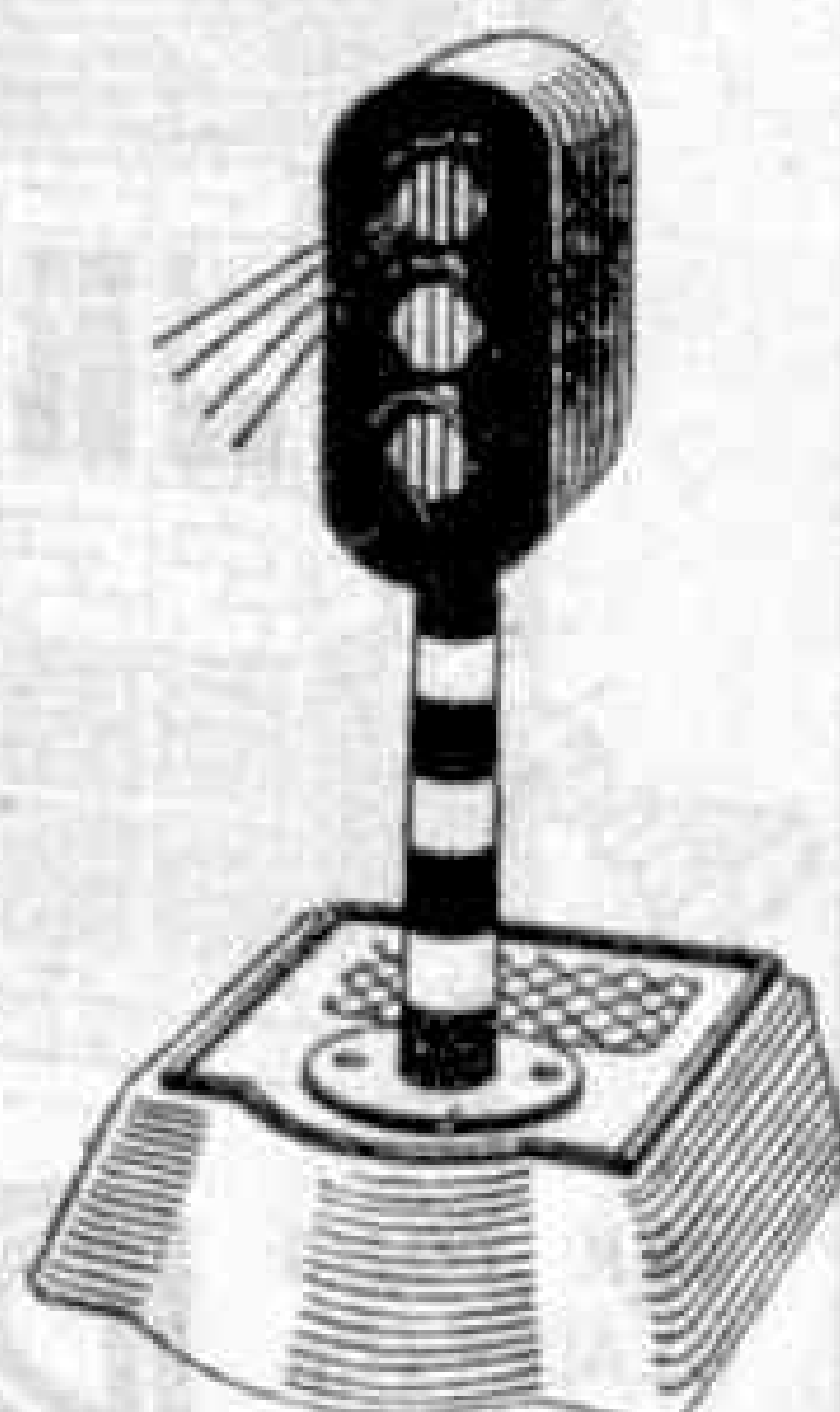
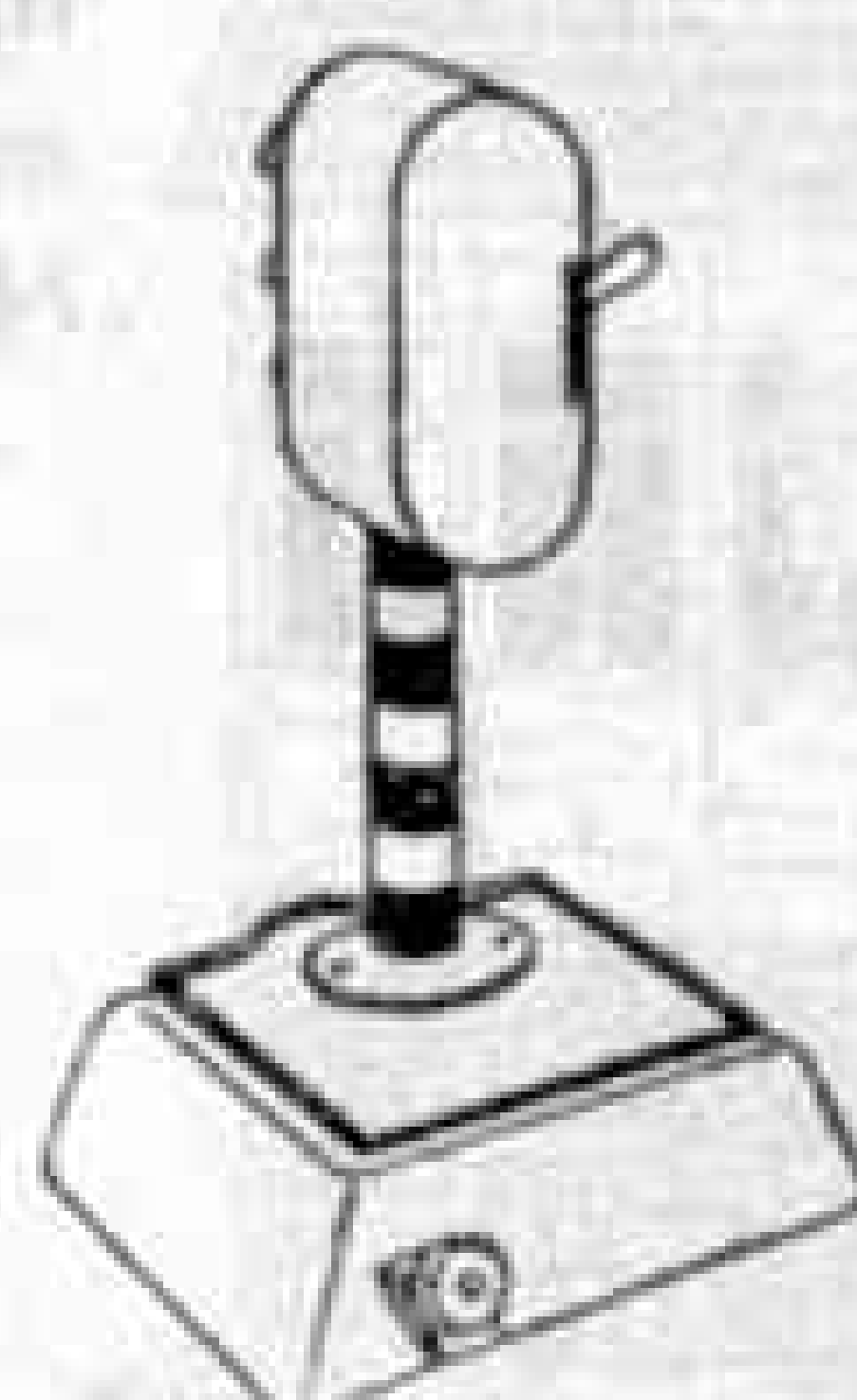
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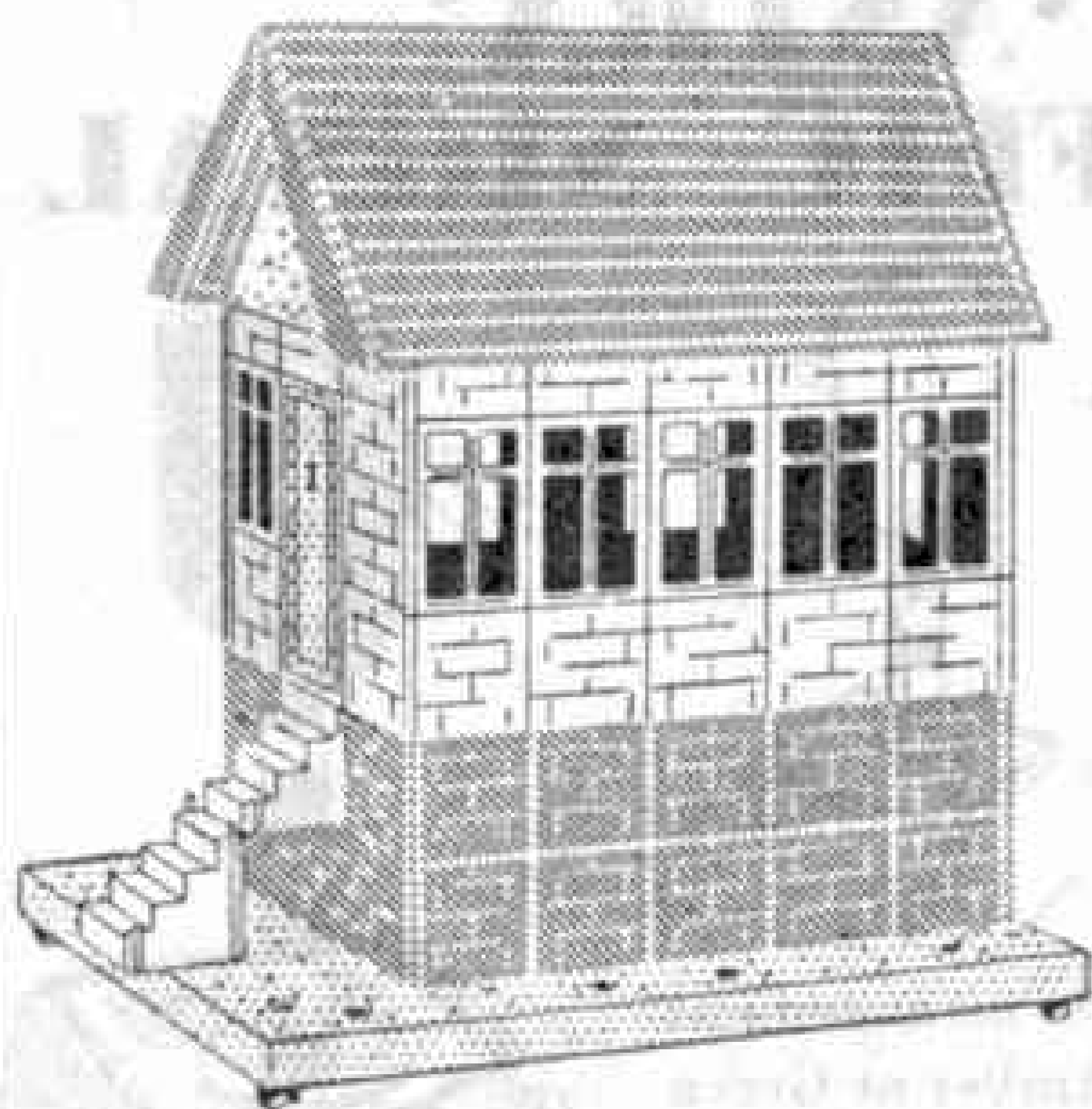
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