VOL. XXVI. No 5 MAY 1941

MECCANO MAGAZINE

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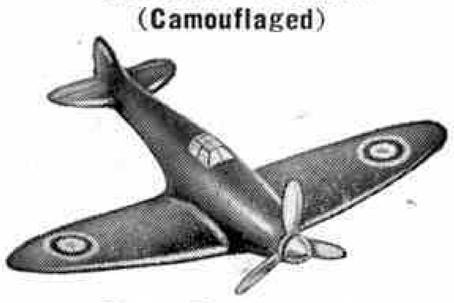
VICKERS SUPERMARINE "SPITFIRE" FIGHTER (Camouflaged)

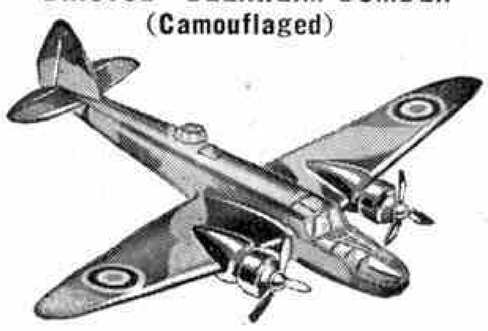


Dinky Toys No. 62e
Scale model of the Vickers-Supermarine "Spitfire," one of the fastest fighter aircraft used by the Royal Air Force.

No. 62e Camouflaged
List Price **8d.** Price with Tax **10d.**

No. 62a Aluminium Finish
List Price **8d.** Price with Tax **10d.**

"BRISTOL" BLENHEIM BOMBER (Camouflaged)



Dinky Toys No. 62d
Realistic model of the "Bristol" Blenheim Bomber extensively used by the Royal Air Force.

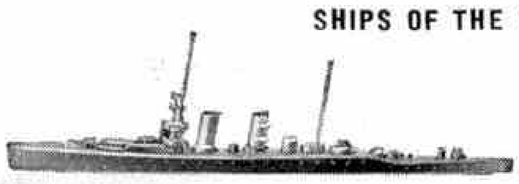
No. 62d Camouflaged
List Price **1/0½** Price with Tax **1/3**

No. 62b Aluminium Finish
List Price **1/0½** Price with Tax **1/3**

FAIREY "BATTLE" BOMBER (Camouflaged)

Dinky Toys No. 60s
Scale model of the well-known medium bomber used in large numbers by the Royal Air Force.
List Price **11½d.** Price with Tax **1/2**

SHIPS OF THE BRITISH NAVY



50c

50e

Dinky Toys No. 50
No. 50a Battle Cruiser "Hood"; No. 50b Battleships, "Nelson" Class (2); No. 50c Cruiser; No. 50d Cruiser "York"; No. 50e Cruiser "Delhi"; No. 50f Destroyers, "Broke" Class (3); No. 50g Submarine, "K" Class; No. 50h Destroyers "Amazon" Class (3); No. 50k Submarine, "X" Class.

50a	Price	**10d.**	with Tax **1/-**	50f	Price	**1½d.**	with Tax **2d.**
50b	,,	**8d.**	,, **10d.**	50g	,,	**1½d.**	,, **2d.**
50c	,,	**7½d.**	,, **9d.**	50h	,,	**1½d.**	,, **2d.**
50d	,,	**7½d.**	,, **9d.**	50k	,,	**1½d.**	,, **2d.**
50e	,,	**5½d.**	,, **7d.**				

Complete Set Price **4/11** with Tax **6/-**

18-POUNDER QUICK-FIRING FIELD GUN UNIT

Dinky Toys No. 162
Comprises scale models of an 18-pounder Quick-Firing Field Gun, Trailer and "Light Dragon" Motor Tractor.

162a "Light Dragon" Tractor Price **2/8** with Tax **3/3**
162b Trailer Price **10d.** with Tax **1/-**
162c Gun ,, **10d.** ,, **1/-**

Complete Set Price **4/4** with Tax **5/3**

ROYAL TANK CORPS LIGHT TANK SET

152a

150d

152b

152c

Dinky Toys No. 152
This set consists of a Light Tank, Reconnaissance Car, Austin Seven Car, and a Driver.

152a Light Tank	... ...	Price **2/0½**	with Tax	**2/6**
152b Reconnaissance Car	... ,,	**2/0½**	,,	**2/6**
152c Austin Seven Car	... ,,	**8d.**	,,	**10d.**
150d Driver	... ,,	**3d.**	,,	**3½d.**

Complete Set Price **4/11** with Tax **6/-**

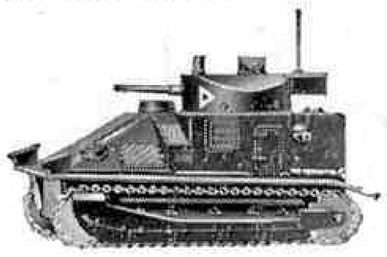
ROYAL TANK CORPS MEDIUM TANK SET

151d

150d

151c

151b



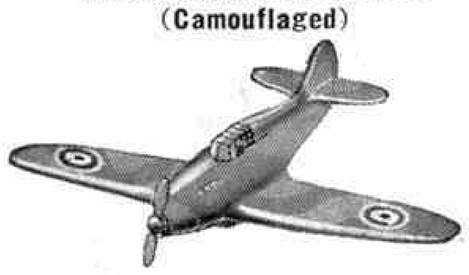
151a

Dinky Toys No. 151
This fine set comprises a Medium Tank, Transport Wagon, Cooker Trailer, Water Trailer, and a Driver.

151a Medium Tank	...	Price **2/10½**	with Tax	**3/6**
151b Transport Wagon	...	,, **1/10**	,,	**2/3**
151c Cooker Trailer	...	,, **1/0½**	,,	**1/3**
151d Water Tank Trailer	...	,, **8d.**	,,	**10d.**
150d Driver ...	...	,, **3d.**	,,	**3½d.**

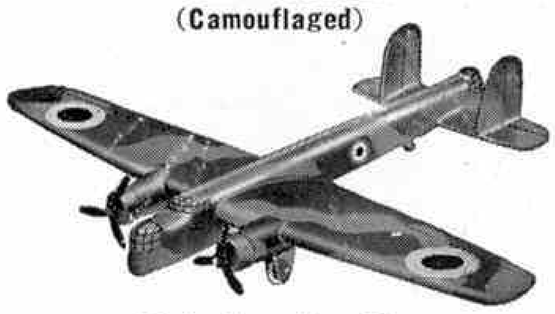
Complete Set Price **6/7** with Tax **8/-**

HAWKER "HURRICANE" SINGLE-SEATER FIGHTER (Camouflaged)



Dinky Toys No. 62h
Scale model of the Hawker "Hurricane" single-seater Fighter extensively used by the R.A.F.
List Price **9d.** Price with Tax **11d.**

ARMSTRONG WHITWORTH "WHITLEY" BOMBER (Camouflaged)

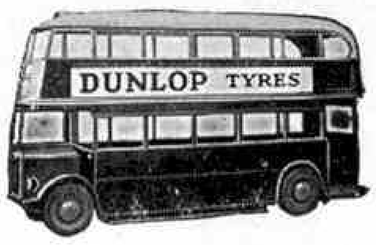


Dinky Toys No. 62t
Scale model of the "Whitley" long-range heavy bomber adopted by the R.A.F.
List Price **1/7½** Price with Tax **2/-**

BOEING "FLYING FORTRESS" BOMBER

Dinky Toys No. 62g
Scale model of Boeing B-17 "Flying Fortress," one of the fastest bombers in the world, and extensively used by the United States Army Air Corps.
List Price **1/10** Price with Tax **2/3**

DOUBLE DECKER BUS



Dinky Toys No. 29c
Assorted colours.
Fitted with detachable rubber tyres.
List Price **2/1½** Price with Tax **2/7**

RAILWAY MECHANICAL HORSE AND TRAILER VAN

Dinky Toys No. 33R
No. 33Ra Railway Mechanical Horse. Price **1/0½** with Tax **1/3**
No. 33Rd Trailer Van. Price **1/3** with Tax **1/6**
Complete Set, L.M.S., L.N.E.R., G.W.R., or S.R. Price **2/3** with Tax **2/9**

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Dinky Toys No. 60y
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Dinky Toys No. 36g
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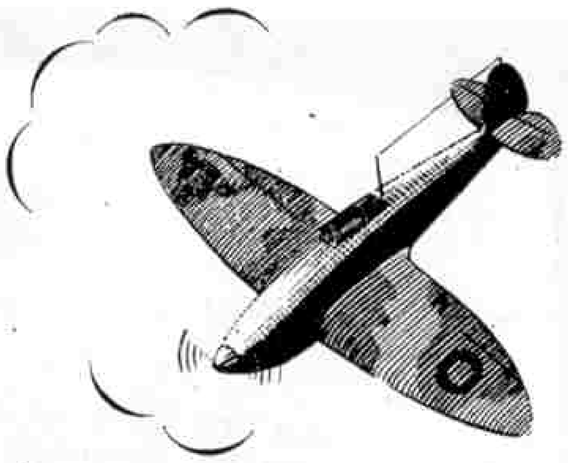

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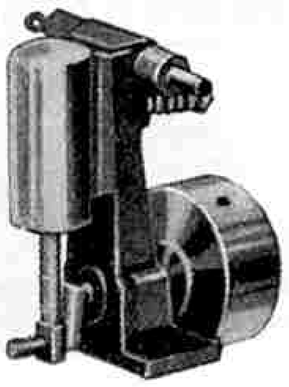

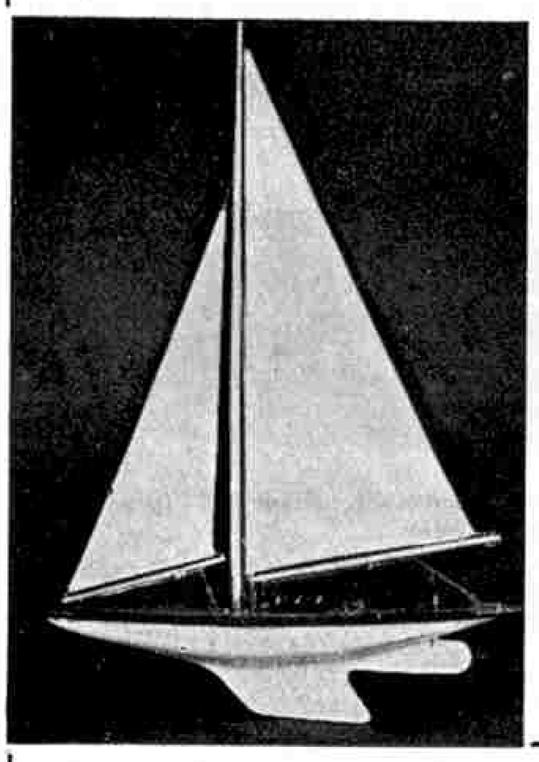

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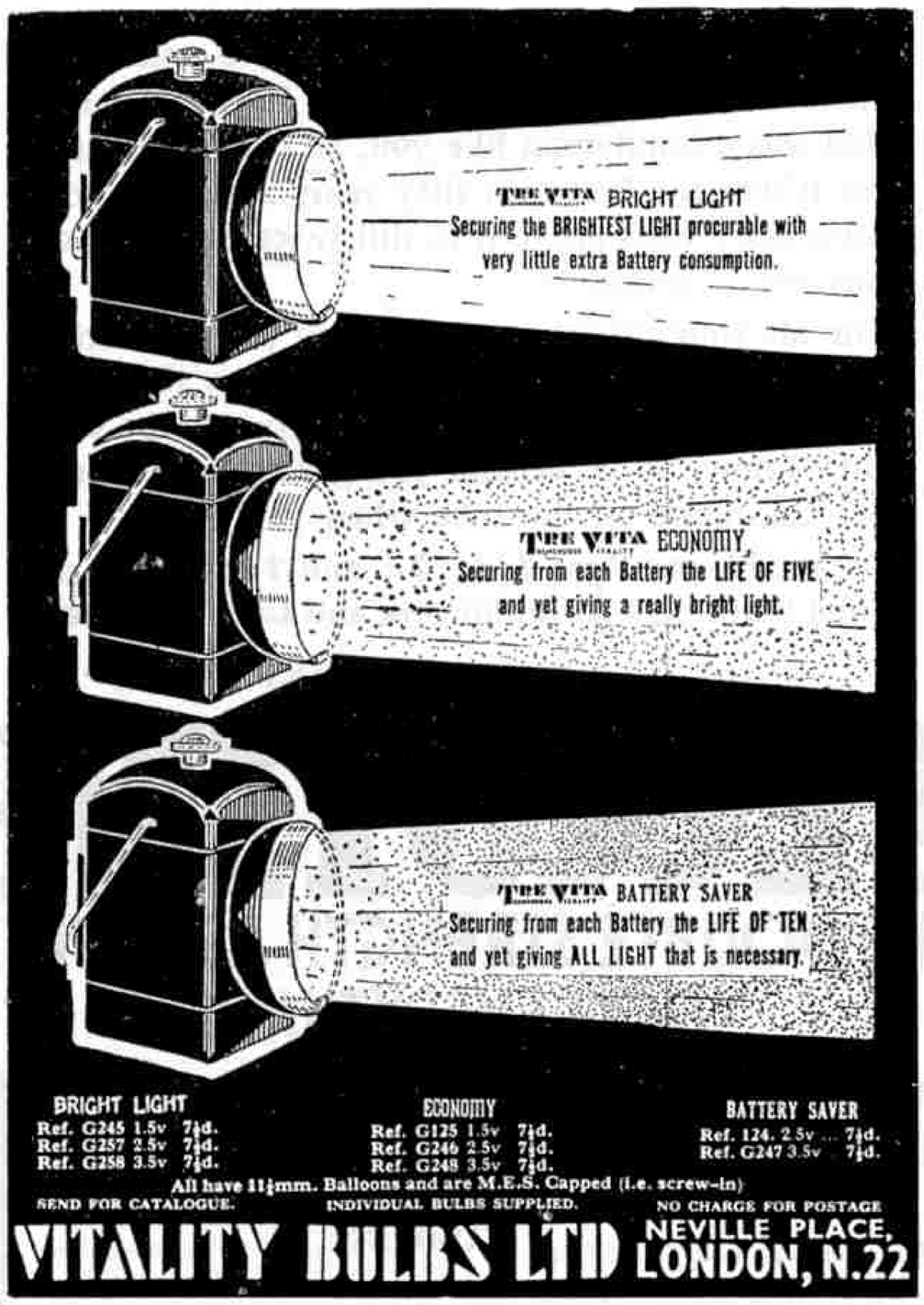

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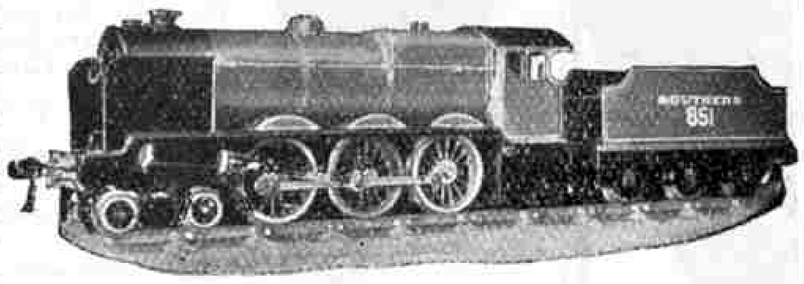

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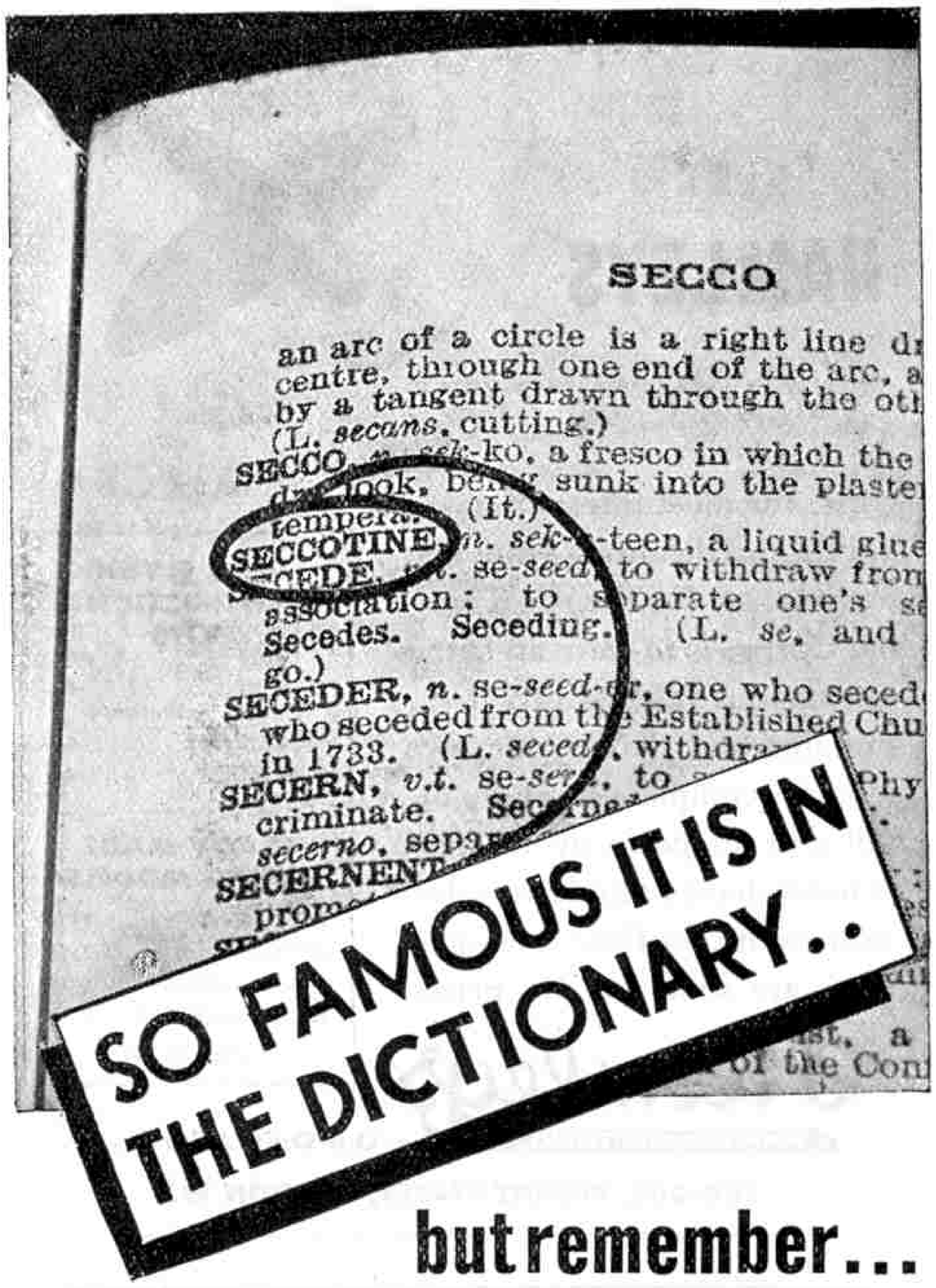

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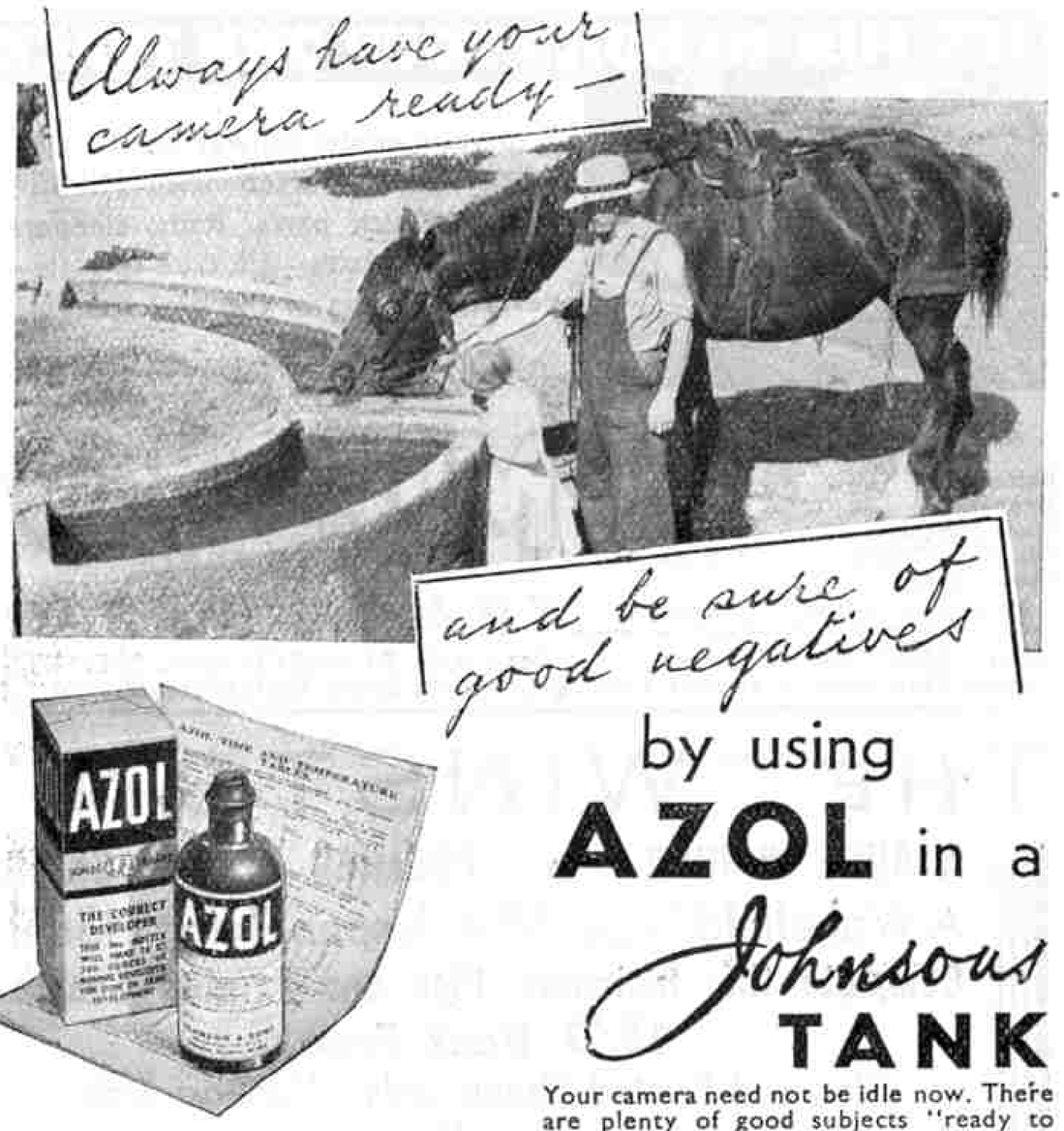

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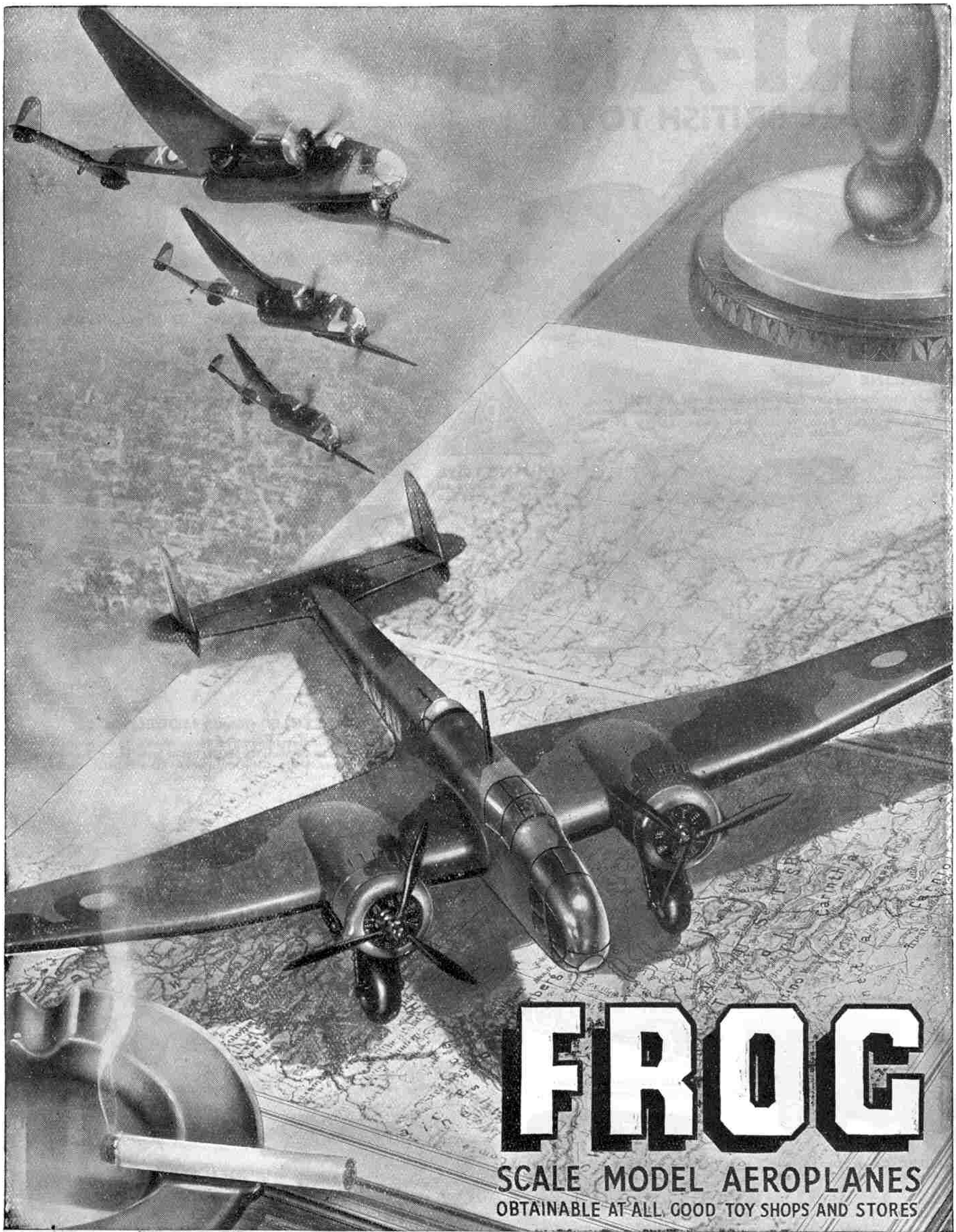
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TRI-ANG

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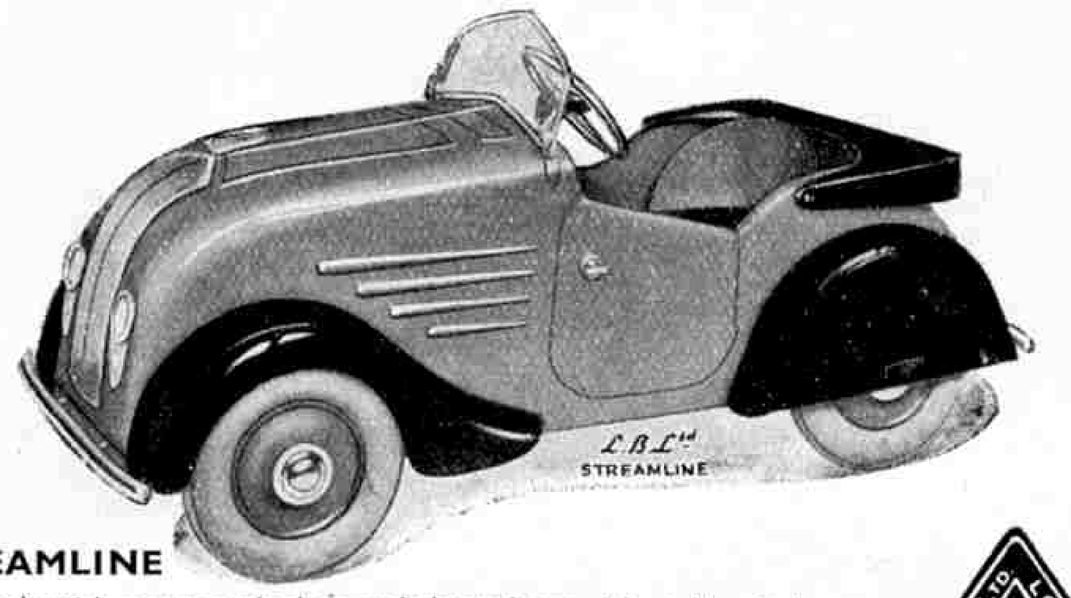

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MINIC

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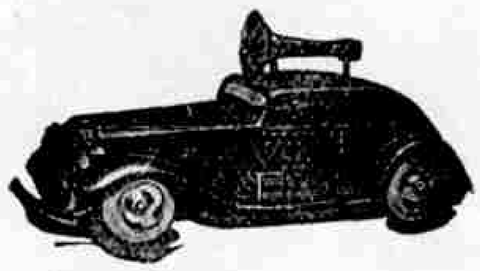
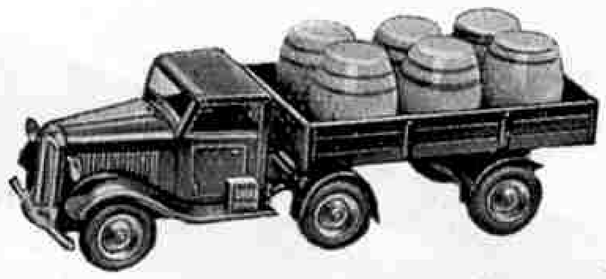
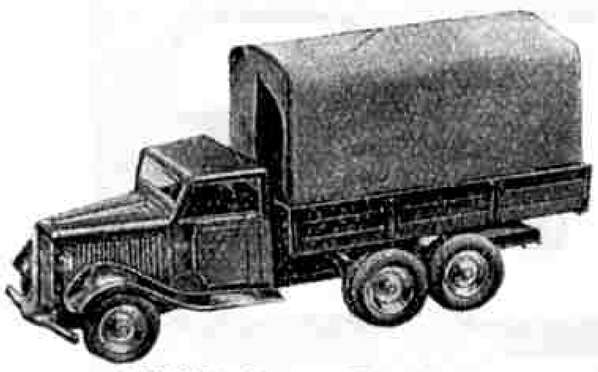


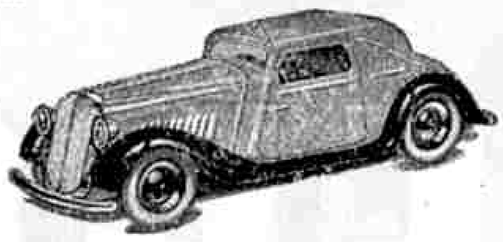
MINIC Traffic Control Car.



MINIC Mechanical Horse and Lorry with Barrels.



MINIC Canvas Tilt Lorry. Obtainable in camouflage colours.



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MINIC Six Wheel Army Lorry.

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Editorial Office:
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England

Vol. XXVI. No. 5
May 1941

With the Editor

Sir Nigel Gresley

The death of Sir Nigel Gresley on 5th April last, at the age of 64, is a serious loss to the profession of railway mechanical engineering. I always regarded Sir Nigel as being in a very special sense the descendant of the great locomotive engineers of the past, whose names are familiar to every reader. I only met him personally twice, the first time at Doncaster Works as far back as 1914, and the second in 1937 in his office at King's Cross. On each occasion I was struck with the strength of personality of the man; I felt instinctively that he was a leader in every sense of the word. His personality was not in the least alarming, however, for it was accompanied by the most friendly courtesy. It was easy to realise the admiration, respect and personal regard in which he was held by those who came under his direction in any capacity.

Sir Nigel's very outstanding gifts were united with a tremendous capacity for taking pains. He tackled each problem as it came along with the utmost energy, and pursued it to the end no matter what the cost. Instances of his thoroughness are given in Mr. Nock's article on page 152. His outlook was broad, and he was always ready to try out in his own engines any ideas of others that seemed to him good. His one concern at all times was always to secure the best.

A Message to the "M.M."

Many readers will remember the friendly message sent by Sir Nigel to the "*M.M.*" in October 1937 when the Magazine reached its 21st birthday: "I congratulate the '*Meccano Magazine*' on attaining its majority. Its popularity with boys, young and old, is well deserved, and I trust it may long continue to provide its readers with accurate and interesting information regarding railway activities."

The name of Sir Nigel Gresley will long be remembered and honoured wherever railways are spoken of.

Leaders in the War

XVIII.—Admiral John C. Tovey

Admiral John C. Tovey was born in 1885. During most of his 40 years in the Royal Navy he has been associated with the destroyer branch, and he earned high praise for the part he played in the battle of Jutland on 31st May 1916, when he was in command of H. M. destroyer "*Onslow*." At one period in the battle "*Onslow*" dashed forward from her station near the "*Lion*," Admiral Beatty's flagship, to launch a torpedo attack on the "*Wiesbaden*," and in spite of being struck amidships by a heavy shell just at the moment of making the attack she got close to the "*Wiesbaden*" and scored a hit below the conning tower. Then a line of German battleships appeared through the mist, and although the crippled "*Onslow*" was unable to steam at more than 10 knots, Tovey risked destruction to launch his two remaining torpedoes at them, at a range of 8,000 yds. In 1919 he was awarded the D.S.O. in recognition of his war services.

Admiral John C. Tovey, C.B., D.S.O., Commander-in-Chief, Home Fleet.

Tovey was Naval Assistant to the Second Sea Lord from 1930 to 1932, and during the next two years he commanded H.M.S. "*Rodney*." Then followed a shore appointment and from 1935 to 1937 he was Commodore of the Royal Naval Barracks at Chatham. In 1938 he was sent to sea again, this time as Rear Admiral (D) Commanding Destroyer Flotillas, Mediterranean Fleet. Several of the destroyers that were under him during his Mediterranean Command have become famous in the present war. One of them was the "*Cossack*," which played such a thrilling part in the Altmark prison ship affair; and two others were the "*Hardy*" and "*Hostile*," which did so well at Narvik.

On 2nd December last year Vice-Admiral Tovey was promoted to Commander-in-Chief of the Home Fleet, with the acting rank of Admiral.

This fine sailor who so far has been little known to the general public is a worthy successor to Jellicoe and Beatty.

The Story of Malta

A Great Mediterranean Naval Base

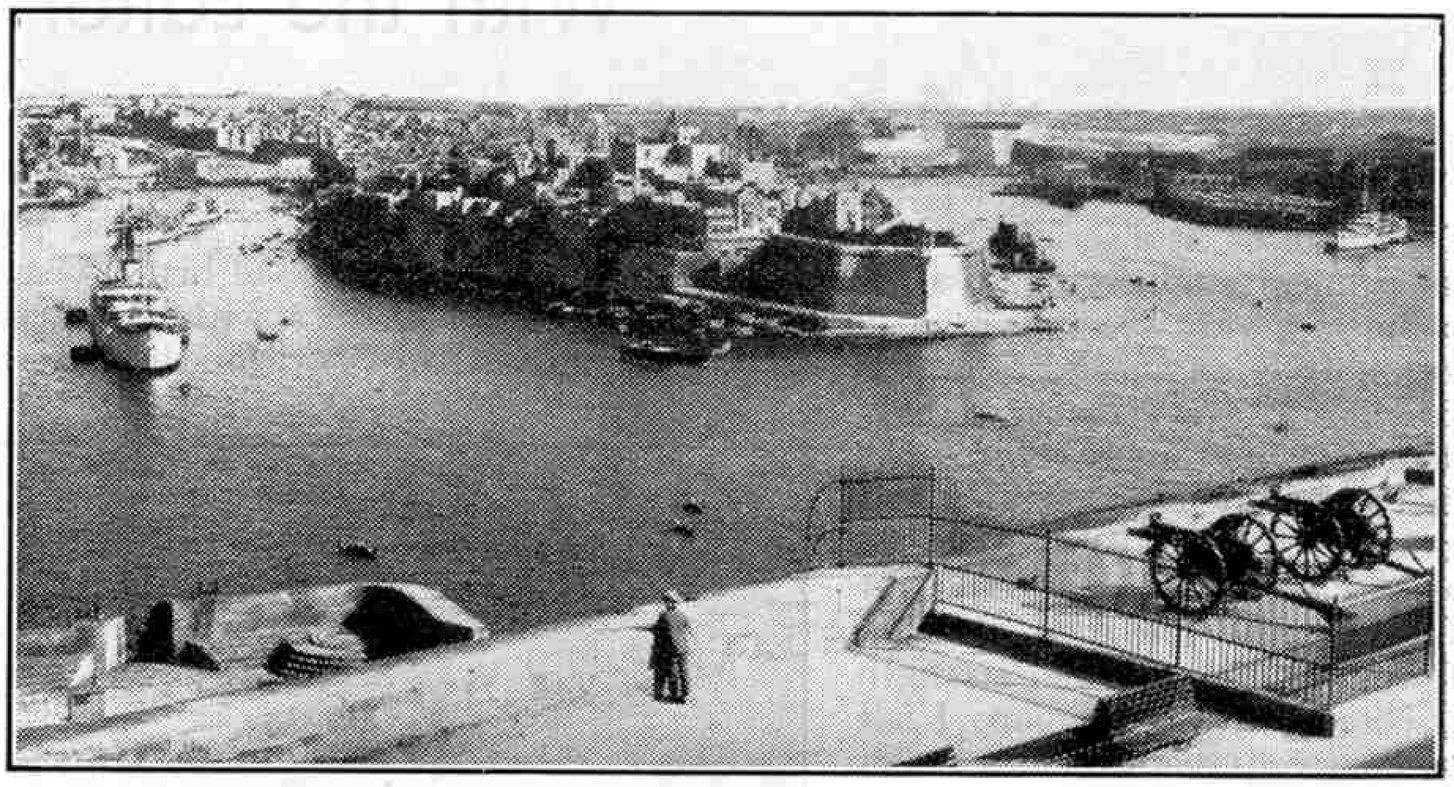
By Harold J. Shepstone, F.R.G.S.

THE history of Malta has been a chequered one. The island has had many rulers and has been called upon to endure terrible sieges. To-day it is putting up a magnificent defence against Italian and German bombers and is prepared to meet any attempt at invasion.

Malta has been coveted by the nations in the past—as it is to-day by Italy—because of its unique geographical position and its possession of one of the finest natural harbours in the world. Actually it is little more than a barren rock, without so much as a stream or a lake and very few trees. Its importance lies solely in its position. Situated in the narrowest part of the Mediterranean between Italy and the African coast, Malta lies on the direct shipping route through that land-locked sea. Our occupation of the island, together with Gibraltar at the entrance to the Mediterranean and Aden at the southern end of the Red Sea, assures safe passage to our ships voyaging to and from India and the Far East by way of the Suez Canal. Our policy has always been that the Mediterranean should be free to the ships of all nations, a great international waterway open to all. It has been the work of the British fleet in the Mediterranean to maintain that freedom. Not only is Malta a great naval and air base and the headquarters of the British Fleet in these waters, but it is an important port of call and coaling station.

The Colony of Malta comprises a group of three islands and several islets. Malta is the largest of the islands, being about 17 miles long and 9 miles wide, with an area of 91 square miles. It is less than half the size cf the Isle of Man and two-thirds that of the Isle of Wight. The next largest island is Gozo, with an area of 25 square miles. Then comes Comino, one square mile in extent, lying between Malta and Gozo. Among the islets is Filfa, used as a target for the guns of the British warships.

Geologists tell us that in the distant past the islands formed part of a land bridge by which man and animal passed between Africa and Europe. Throughout the islands there is evidence of a neolithic civilization in the form of strange underground prehistoric temples. Malta's recorded history opens with its occupation by the Phoenicians some 1400 years before the birth of Christ. The Phoenicians were followed by the Greeks. Then came the Carthaginians, Romans, Arabs, Normans, the Knights of St. John, the French, and finally the British, who took over the islands in 1800 at the wish of its inhabitants and with the sanction of the European powers.



The pride of Malta is its Grand Harbour, two miles long and sheltered on three sides by steep hills.

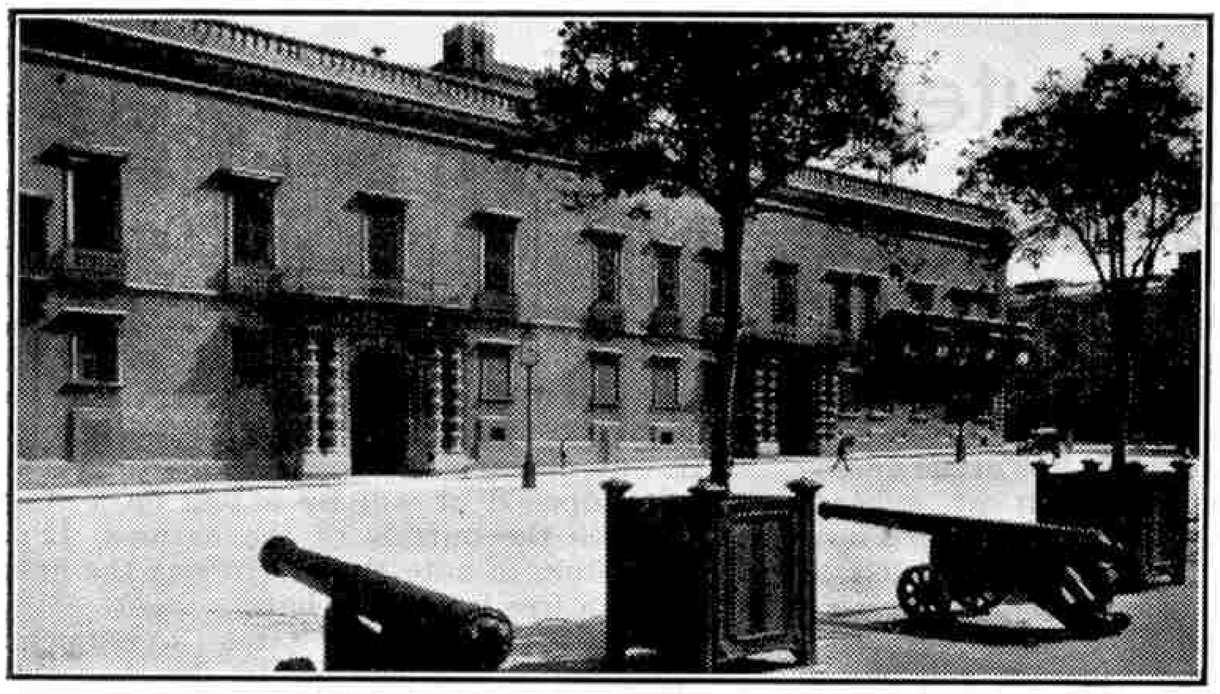
The pride of Malta is the Grand Harbour, an intensely blue sheet of water two miles long, with a long quay and wharves on one side, and inlet after inlet on the other. To-day the harbour presents an animated scene with warships of all kinds, from submarines to the latest type of battleship, liners, cargo steamers and oil tankers, many of these vessels being camouflaged in an extraordinary manner. Fussy little naval craft dart here and there in addition to a couple of score of native boats, the Dghaisa, a gondola-like craft, manned by Maltese boatmen, who stand and push their oars instead of sitting and pulling them, carrying officials and others to and from the various ships.

A street of steps. The town of Valetta is reached from the harbour by hundreds of steps between rows of shops and houses.

Overlooking the harbour on one side is Valetta and Floriana, and on the other side the "three cities" of Vittoriosa, Cospicua, and Senglea, their massive fortifications being quite conspicuous. Valetta, built by the Knights of St. John of Jerusalem can be reached from the harbour by long flights of steps or by lift. It is an historic and interesting little town, the seat of the Civil Government and the headquarters of the Commander-in-Chief of the Mediterranean Fleet. In normal times the streets are thronged with a cosmopolitan crowd in every style of dress and speaking many languages. To-day the streets are full of sailors, soldiers, airmen and men of the merchant service, for convoys make a halt at Malta. Then there are the Maltese themselves proudly displaying their uniforms. Thousands have joined the King's Own Malta Rifles and the Royal Malta Artillery, anxious to play their part in the defence of their beloved island.

The ordinary Maltese is easily detected by his brightly-coloured sash worn round his waist. The women of the middle and lower classes still favour the *faldetta*, the national head-dress, a black material covering stiffened in front by a hoop, hanging down at each side and falling at the back to the waist. The face, partly shrouded in shadow, is framed against a black background, the hard outlines of which do not enhance the wearer's beauty. It is not now being worn to the extent it was a decade ago. The fact is it has been found too awkward for comfortable travelling in modern motor buses, the island's popular mode of travel.

Goats are encountered in the streets. With tinkling bells around their necks, they roam about in small herds in charge



The Governor's Palace, showing the Palace square.

of a Maltese. At a customer's doorstep they stop, and one of them is captured to be milked.

The principal places of interest in Valetta are those buildings erected by the Knights. There is the Governor's Palace, now divided into two stories the upper one the Governor's residence, the lower reserved for government offices. Several of the halls in the great building are open to the public, and they are among the show places of the city. The Armoury Gallery contains nearly 6,000 genuine pieces of armour—pikes, helmets, cuirasses and suits of armour worn by past Masters of the Order. There are also old culverins and other strange old guns. Of particular interest is the Tapestry Chamber, formerly the Council Chamber of the Grand Masters, now the Parliament Hall of Malta, where the sittings of the Council of Government are held.

Then there are the "Auberges" or hostels, where the Knights messed, dwelt and transacted the affairs of their Order. There are seven of them, representing the seven languages or nations into which the Order was divided. All these buildings are magnificent structures and for the most part retain their original architectural features. They are all in use to-day; one as the city's post-office, another as a school, a third as a public library, and so on.

The most famous of the buildings for which the Knights were responsible is St. John's Cathedral, one of the most ornate churches in Christendom. The vast interior has a gorgeously painted ceiling, and walls and pilasters are covered with rich marbles and gilt carvings. The floor is adorned with over 400 memorial mosaic slabs. The altar railings are of solid silver, as are also the statues of the Apostles. A feature of the choir is a colossal group in white marble depicting the Baptism of Christ. During Whitsun and on special feast days both sides of the nave are hung with beautiful Gobelin tapestries, 25 in all, said to be the most valuable tapestries in the world.

The Knights were given Malta in 1530, after they had been driven out of the island of Rhodes. Some 35 years later Suleiman the Magnificent, the Turkish Sultan, sent a vast armada to attack the island, and then followed one of the most terrible sieges Malta has been called upon to endure. The invading force numbered 30,000 strong, the Knights and their fighting men only 9,000. They occupied the island's two fortresses, St. Elmo on one side of the harbour and St. Anglio on the other side. St. Elmo was attacked first and the firing went on for weeks. Only the fact that the fortress was built on a foundation of solid rock saved it from being swept away. At last the besiegers managed to get a foothold and scaling the walls surged into the fortress. Those Knights who still survived clustered together in a tiny chapel at the foot of the fortress gate. There they celebrated Mass for the last time and waited, sword in hand, for the invaders, those of them who were wounded and unable to stand being placed in chairs with swords by their sides. For four hours the courageous little band held off the yelling hordes, only in the end to succumb and fall one by one.

Despite the fall of St. Elmo the siege continued unabated. Food and water became scarce. Repeated pleas for reinforcements went unanswered, and though more and more men fell, the Knights refused to acknowledge themselves beaten. Imagine their joy when news was brought that the Viceroy of Sicily had sent a large relief force which, landing on the other side of the island, turned the scale, and victory awarded the gallant Knights. Of the 30,000 Turks who had landed on the island only 15,000 got away, while of the 9,000 stalwart defenders only 600 remained unwounded.

It was in commemoration of this victory that the Knights built the city of Valetta, which has not greatly changed since their day. Their Order was founded during the Crusades. At first it was a religious order, but later added military duties to its other functions. The English Order of St. John of Jerusalem is derived from the original Order. It exists to-day and works in conjunction with the British Red Cross Society.

Under the rule of the Grand Masters Malta developed an oversea trade and became a vast clearing house between East and West. Luxurious living and lack of military enterprise, however, sapped the power and prestige of the Knights and they became cordially hated by the Maltese.

In 1798 Napoleon, profiting by the temporary absence of the British Fleet in the Mediterranean, seized Malta on his way to Egypt. He expelled all the Knights, confiscated their property and pillaged the churches. After his departure a French governor was appointed, but the French continued to pillage the churches to pay for Napoleon's army in Egypt. This caused the inhabitants to rise in revolt and brought Nelson to their aid; and thus the islands passed, at the request of the Maltese themselves, under British rule.

It has been said that it is impossible to stand at any outdoor spot on the island without detecting the dome or spire of a church. Religion plays a very important part in the life of the people. The Apostle Paul was shipwrecked at Malta while on his way to Rome in the year 58. The place where he came ashore is marked by a massive statue, showing the saint bareheaded with his right arm uplifted as he faces the open sea. At Notabile, the old capital, stands one of the most ancient churches in Christendom. According to tradition it marks the spot where St. Paul performed his first miracle, the healing of Publius's father, who lay sick of a fever. At Musta there is a church built by voluntary contributions of labour and money which claims to possess the third largest dome in the world, and has seating capacity for 10,000 worshippers. Only St. Peter's in Rome and St. Sophia in Istanbul have domes of greater dimensions.

Malta has a population of just over 240,000—over 200 to the square mile; it is not surprising therefore to learn that it is far from being self-supporting. There are 10,000 farms on the islands, but they are quite small holdings, given over to the cultivation of a little wheat, vegetables and fruit and oranges. The farms are watered from springs and the precious soil has to be protected from the winds by walls and terraces. Whereas Malta's exports amount only to some £250,000, her imports total about £4,000,000. The fact is Malta depends for its existence upon the Royal Navy which, in ordinary times, spends about £1,000,000 a year in wages to dockyard workers, skilled craftsmen, merchants and store-keepers.

A religious procession in Valetta.

The Maltese have the highest respect for the British Navy and unbounded faith and confidence in the wisdom, courage and leadership of the Commander-in-Chief, Lieut.-Colonel W. G. S. Dobbie, who has proved to be one of the most popular governors the islands have had.

The Irvin Air Chute in Action

How Airmen Parachute to Safety

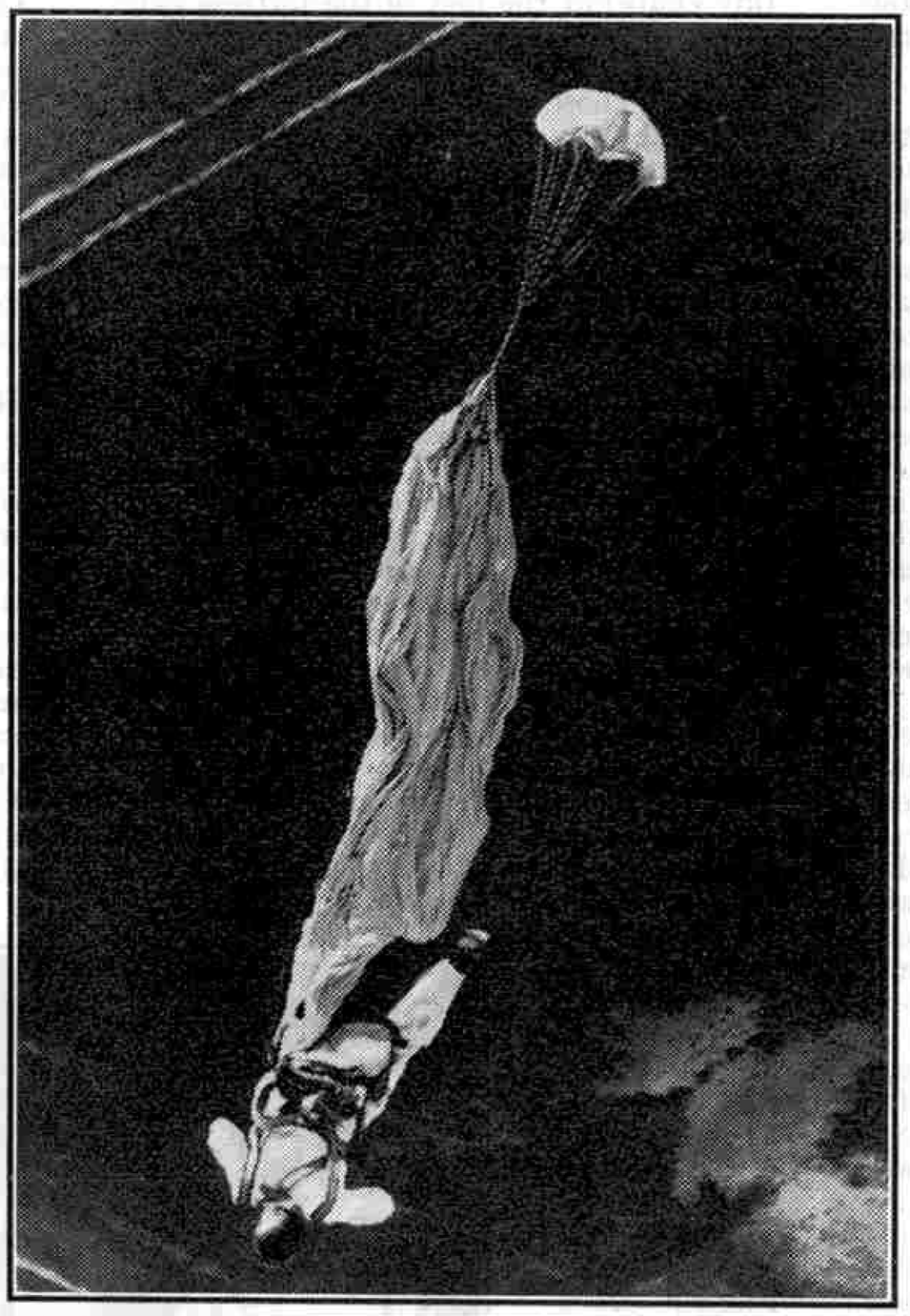
"IN the air fighting to-day six enemy aircraft were destroyed. Two of our fighters are missing, but the pilots of both are safe." Official war bulletins often include statements on these lines, which illustrate at once the superiority of R.A.F. pilots and their machines, and the effectiveness of the life-saving parachute with which every pilot is provided. Sometimes an R.A.F. fighter pilot has to "bale out" during a fierce air battle. As he parachutes gently earthward he is a tempting target for the enemy, and on several occasions Nazi airmen have not scrupled to fire upon these defenceless men. Our cover this month, which is based upon a drawing kindly provided by Irving Air Chute of Great Britain Ltd., shows "Hurricane" pilots defending a "baled-out" colleague from an attack of this kind by circling round his as he descends.

There are now so many remarkable escapes by parachute that we are apt to forget that parachute jumping was still only in the experimental stage at the time the war of 1914-18 ended. For well over a century previously inventors had been toying with the idea of leaping to safety from a great height. As far back as 1785 Jean Pierre Blanchard, a French inventor who had turned his attention from experiments with flying machines to balloons, saw in the parachute a means of descending safely from a balloon wrecked in mid-air. He constructed a silk parachute with which he carried out successful trials from his balloon, using dogs and other animals as passengers. Encouraged by the success of his experiments he attempted a similar jump himself during a balloon ascent at Basle in 1793, but unfortunately on this occasion the parachute failed to work properly, and his fall broke one of his legs.

The first safe descent by parachute from a balloon was accomplished in 1797 by Andre Garnerin, also a Frenchman. The early parachutes used by this man had an air vent at the apex to reduce the shock of opening and to prevent him being swung about by air currents as he descended to earth. He gave a successful demonstration in London in 1802, jumping from a balloon at a height of 8,000 ft., but for some reason used a parachute that lacked a vent and in consequence he suffered a descent that was very unpleasant, both for himself and for those who watched him. The parachutes of later experimenters also lacked an air vent until the value of this simple provision was rediscovered about 1880 by Major Thomas Baldwin, an American parachutist.

The modern use of parachutes was developed in the United States, the first successful jump from an aeroplane being made in 1912 at St. Louis, Missouri, by Capt. Berry. The first successful descent of this kind in England was made in May 1914 by the late William Newell, at Hendon. During the war of 1914-18 the parachute proved a satisfactory means of escaping from observation balloons set on fire by enemy aircraft, and from airships. It did not prove reliable as a method of escaping from an aeroplane wrecked in the air, and the avoidable loss of life among airmen drew the attention of military authorities to the need for parachute equipment to be designed as accurately as the aircraft and engines themselves.

Many inventors took up the matter, both in Europe and America, and one of the earliest and most successful of them was Mr. Leslie L. Irvin, an American. He had begun his experiments about 1911, and his amazingly risky trials of the parachutes he constructed had earned him the nickname of "Sky-Hi Irvin." He persevered, every idea for improving these crude parachutes being put to practical test, and with every descent he learned something new.



Falling headlong after jumping from an aeroplane. The pilot chute has been released and is pulling the main canopy away from the airman's body, thus avoiding risk of entanglement. Photograph by courtesy of the "Melbourne Argus."

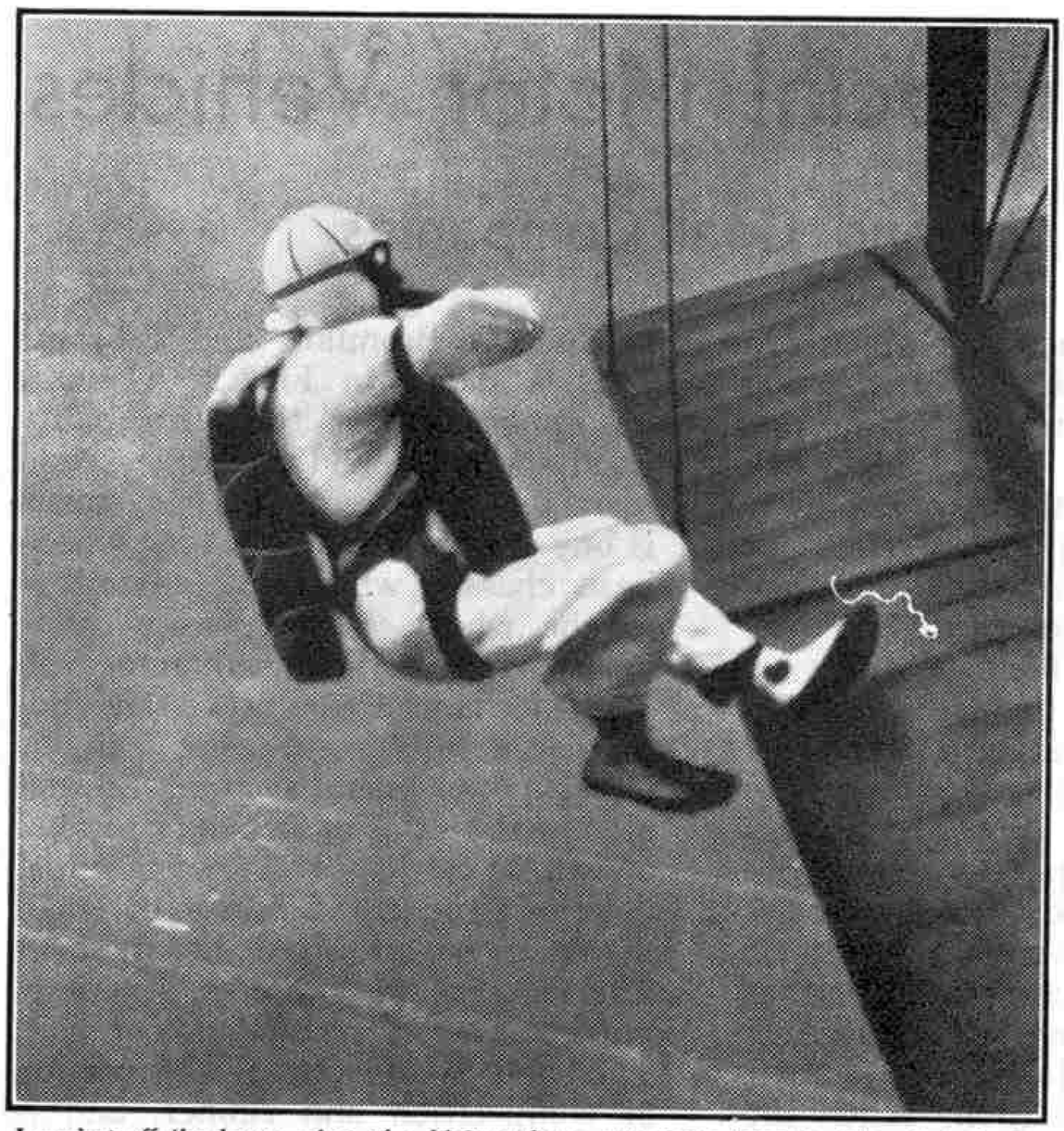
Irvin made many successful jumps from balloons and aircraft before turning his attention to the different problems of getting clear from a disabled machine. Obviously, a parachute attached to the machine or loosely folded in a sack was of no value to the occupant of a fast-flying aeroplane that had become unmanageable, and until the manual, or free, type of parachute was designed no progress was made towards the essential reliability of this form of life-saver. Irvin's invention was a "free-type" parachute, so called because it was carried complete in one unit, attached to the body of the wearer. It was also a "manually operated" type, being opened at will by a pull on a ring fitted on the outside of the harness. It is interesting to note that Irvin was the first to use a free-type parachute.

In 1918 the United States Government organised a competition to discover the most efficient parachute. Irvin was ready for this opportunity, and submitted his "free type" parachute. It was chosen by the authorities as the nearest to perfection at the time, and early in 1919 it was adopted as the standard life-saving equipment for the United States Air Service. Six years later it was similarly adopted by the British Air Ministry for the Royal Air Force.

The Irvin Air Chute, as this parachute is called, is now in regular use in 42 countries, in most of which it is the standard equipment of the naval and military flying services. It has been the means of saving more than 3,000 lives in emergencies that have included practically every form of accident and every variety of weather condition. The accidents have included fire in the air, wing collapse, collision, control failure even at such a low altitude as 150 ft., engine failure at night, persistent spins, and nose dives. Unusual proofs of efficiency have been given by jumps made from aircraft travelling at or around 300 m.p.h., and by descents made from heights of up to 30,000 ft.

The canopy of the Irvin Air Chute is made of very fine but strong silk. At intervals around its edges are sewn a large number of silk cords, or shroud lines, of 400 lb. tensile strength, that are connected at their lower ends to the harness worn by the airman. The cords are continuous from their point of attachment on one side of the harness to the other, passing through and over the top of the 'chute proper, so that throughout their length there are no knots or splices. This form of suspension results in a network of cords that gives the greatest possible strength to the Air Chute as a whole. A vent is incorporated in the apex of the 'chute. A miniature parachute, called the "pilot chute," is attached to this apex by means of a short, strong silk cord. The pilot chute is about 3 ft. in diam. and is constructed with steel ribs and a spring, so that it can be folded up under tension and packed in the main Air Chute container.

In order to prepare the Irvin Air Chute for use it is carefully folded, the pilot parachute being uppermost, and placed inside a canvas container or pack. This pack is the smallest and safest of any such equipment in existence, and a great deal of experimental work has been carried out to bring it to its present stage of perfection. It is fitted with pockets into which the shroud lines are stowed to keep them separated from the main 'chute,



Jumping off the lower wing of a biplane for a parachute descent. The photographs on this page are by courtesy of Irving Air Chute of Great Britain Ltd.

and also with flaps to keep the pilot chute separate from the other one. The sides of the pack are then folded over, and when it is closed two pins are inserted to hold it together.

The pack containing the parachute is easily and quickly fastened to the harness, and thus equipped the airman is ready for all emergencies. The pack is quite out of the way, as it hangs so low that it forms a cushion on which he sits. Most of the Irvin parachute harnesses in use to-day are of the "Quick-Release" type, in which the leg and shoulder straps are held together and locked in a special central fitting worn in front of the body. All the airman has to do to free himself from the parachute and "Quick-Release" harness is to turn this special fitting through a right angle. This unlocks the release, and pressure upon it frees all the straps simultaneously, and the parachute and harness fall aside. Accidental release is impossible as the fitting must be unlocked deliberately before it will act.

The "rip-cord" that secures the Air Chute in its pack is a length of flexible cable with locking pins at one end and a chrome nickel steel ring of ample size at the other end. The ring is secured in a convenient position at the left side of the harness.

As soon as the airman who has "baled out" finds himself clear of the aeroplane he can safely jerk the ring to open the Air Chute. In an emergency, however, as when there is danger that the aeroplane is falling in the same line as himself, or he is being followed down by enemy aircraft, he can delay opening the parachute until he is within a few hundred feet of the ground. There is no tendency to become stifled or lose consciousness during a delayed drop, but of course it is usually safer to bring the parachute into operation as soon as possible after leaving the machine in order to prepare for the landing. The simple act of pulling the ring extracts the locking pins and so opens the pack. The pilot chute springs out, catches the air, and draws the main Air Chute into the line of flight. So neatly are the two packed, and so carefully is the parachute designed, that from pulling the ring to the complete opening takes only 1 3/5th sec. The normal rate of descent when the Air Chute is fully opened is 21 ft. per sec.

"Baling out" is always a dramatic process. When the captain of an R.A.F. bomber damaged during a successful raid upon enemy objectives decides that in spite of careful "nursing" his machine will not manage to complete the homeward flight he warns his crew "Prepare to abandon aircraft." He then signals to the tail gunner by making a magnesium loaded bulb flash in the rear turret. This is acknowledged both vocally and by a small signal lamp. The crew then wait for the final order "Abandon aircraft . . . Ready . . . Ready . . . Go."

They leave the machine either through the escape hatch or the side door. The tail gunner is the first to go. He reaches behind him for his parachute pack and clamps it on to his harness, takes off his helmet so as to free himself of the flex of the intercommunication system, and lifts the escape hatch or opens the side door, according to which exit has been chosen.

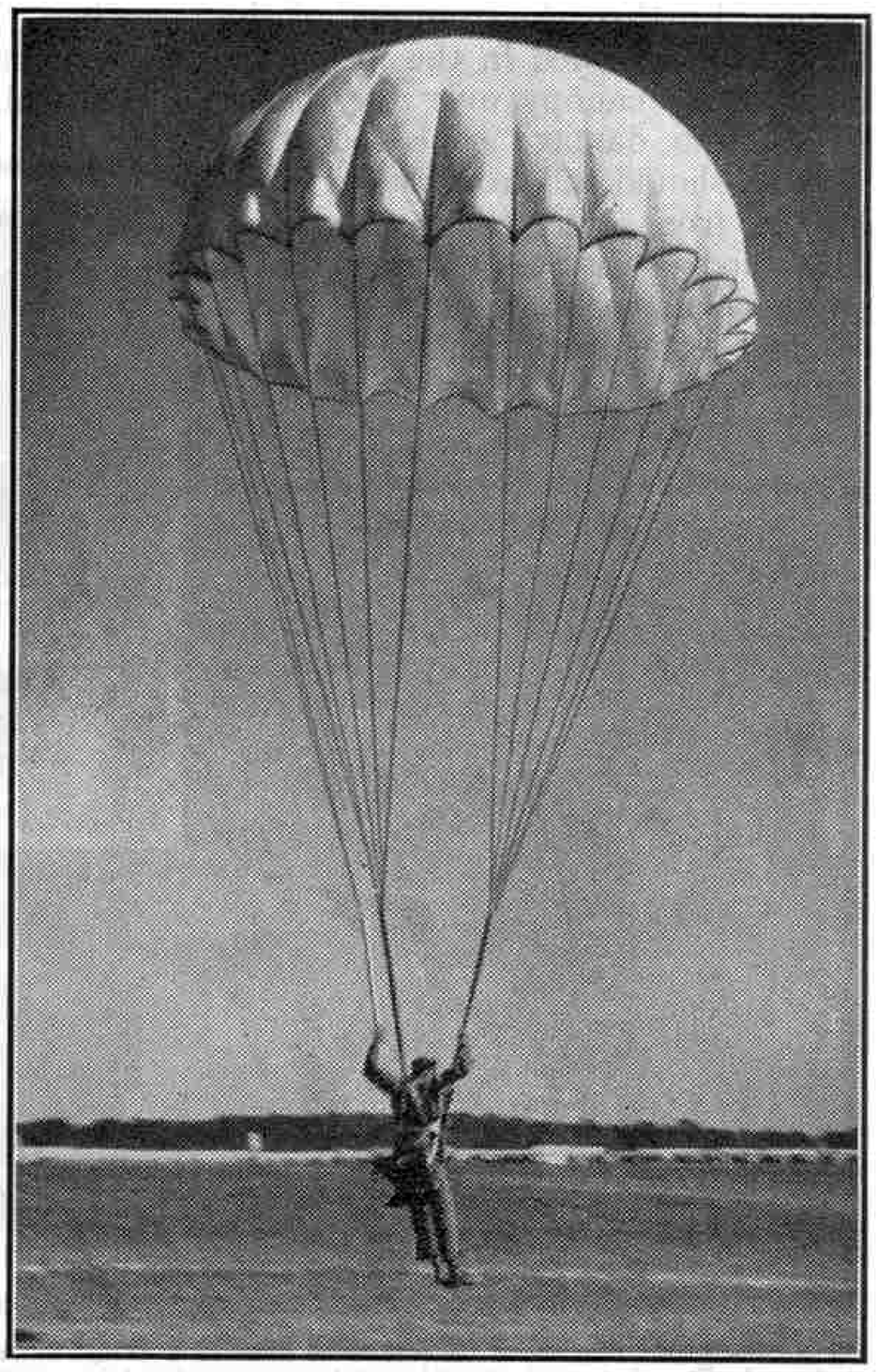
As the tail gunner drops through the air he has no sensation of falling. Immediately the rip-cord is pulled the pilot chute flies out, is caught by the wind, and drags out the main parachute. A jerk on his shoulders tells him that the parachute is open. There is still hardly any sensation of movement, and he feels suspended in the air, but the noise of the engines has gone, and there is complete silence. By reaching up and manipulating the cords he can "spill" the air from one side or other of the parachute, and so guide his descent. When he reaches the ground he feels about as much shock as would be felt after jumping from a 10 ft. wall. The other members of the crew land soon afterward.

A parachute descent into the sea needs skill and presence of mind. The feet hit the water first and the body goes straight down, and the jumper must act swiftly to get his harness off and dive from underneath the canopy of the parachute. Then there will be either a swim to land or a long cold wait until he is picked up.

Although demonstrations have shown time after time that descents by parachutes are quite safe, the first drop from an aeroplane through space has some terror for practically everybody who does it. In order to reduce the severity of the ordeal a special training outfit is made by the Irvin company. It consists of two Air Chutes on one harness, a 28-ft. parachute that is carried on the back and gives a very slow rate of descent, and a 24-ft. "Quick Connector" parachute carried on the chest and used as an auxiliary to the larger one. They can be operated either independently or together.

The "Quick Connector" type of Irvin Air Chute was designed primarily for use in cabin transport aircraft, rigid airships, and any type of aeroplane in which parachutes cannot be worn with convenience and comfort at all times while in flight. The parachute is hung in the cabin in much the same way as a lifebelt is placed in a ship's cabin and when required it can be easily and quickly hooked on to the harness. This type has been extensively adopted for air gunners and air photographers.

Another type, suitable for air liners or private cabin aircraft, is the Irvin Chair Chute, in which the parachute equipment is built into the seats, and although out of sight is instantly at hand in emergency and can be put on easily and quickly. If they prefer, the passengers can wear the Chair Chute harness throughout their flight in perfect comfort.



Descending by Irvin Air Chute. This picture gives a good impression of how gently the landing is made.

Unusual Types of Commercial Motor Vehicles

II.—Devices Used by Big Oil and Coal Companies

THIS month we continue our description of a remarkable series of mechanically-operated motor vehicles.

Fig. 1 shows an interesting Bromilow and Edwards mechanism. This is a special double-side tipping equipment that was fitted to a large number of vehicles forming a fleet for one of the big gold companies. These vehicles have to operate under exceedingly difficult conditions, and for them power-operated double-side tipping hydraulic mechanism was built, and fitted to the chassis, together with steel bodies for discharging the loads off the sides of the vehicles.

Owing to the fact that the load was gold-bearing rock, discharged into each body by grab, there was a grave danger that large lumps of rock might fall on to the engine or on to the driver, and therefore a special cowl was built over the engine bonnet to give extra protection. Further, the front end of the body was extended in the form of a heavy duty canopy over the driver so that no damage could occur if rocks should fall from the grab at the front side of the body. This body was of exceedingly strong construction, built of a channel section rectangular underframe with heavy duty floor of $\frac{3}{8}$ in. steel plate on top of which was fitted a $\frac{3}{8}$ in. thick rubber insertion insulation pad. On the top of this pad were fitted $1\frac{1}{2}$ in. thick oak boards, and over them were $\frac{1}{4}$ in. × 3 in. wide wearing strips spaced at 3 in. intervals. The whole was then sandwiched together, forming a very strong and yet resilient flooring.

As a result of the fact that the vehicles were operating a very short distance from the load hoppers to the gold crushers it was not practicable for the operator to release the doors of the body in the orthodox manner. Therefore special automatic mechanism was incorporated, so that when the body was in its loading position the side doors were in their normal vertical position. When the body started to tip to one side, the door on that particular side automatically began to open until, when the body was at its full angle of tip, the door was fully opened level with the floor of the body. Similarly, when the body was lowered to the horizontal, the side door automatically closed. Provision was made so that if a lump of material lodged in the door no damage could occur when the door was closed.

Another product of Bromilow and Edwards Ltd. is shown in Fig. 2, which is an application of the Principality hand-operated end-discharge commercial moving floor. This mechanism is one that is fitted to a long wheelbase chassis, where full advantage of the whole of the chassis frame length is to be taken advantage of. The mechanism comprises an end-discharge equipment that can be either power-operated from the engine of the vehicle, or hand-operated at will. It consists of a floor framing, incorporating three banks of small diameter rollers fixed at frequent intervals in the framing, and supporting a special moving floor belt. This belt is of special construction of composition and rubber, and is exceedingly strong. It is attached at the front and rear ends of the floor to a driving roller built into the framing. A gear-box is built at each end of the floor, incorporating a train of gears, so that a detachable operating handle enables the operator by hand power to wind the belt either to the rear for discharge purposes or forward for loading. The belt can be fitted in such a way and of such material that hot slag or ashes can be carried without injury to the belt.

With this form of mechanism not only can loads be discharged very rapidly, but with certain commodities such as sacks of flour or other bag or box loads, each load can be

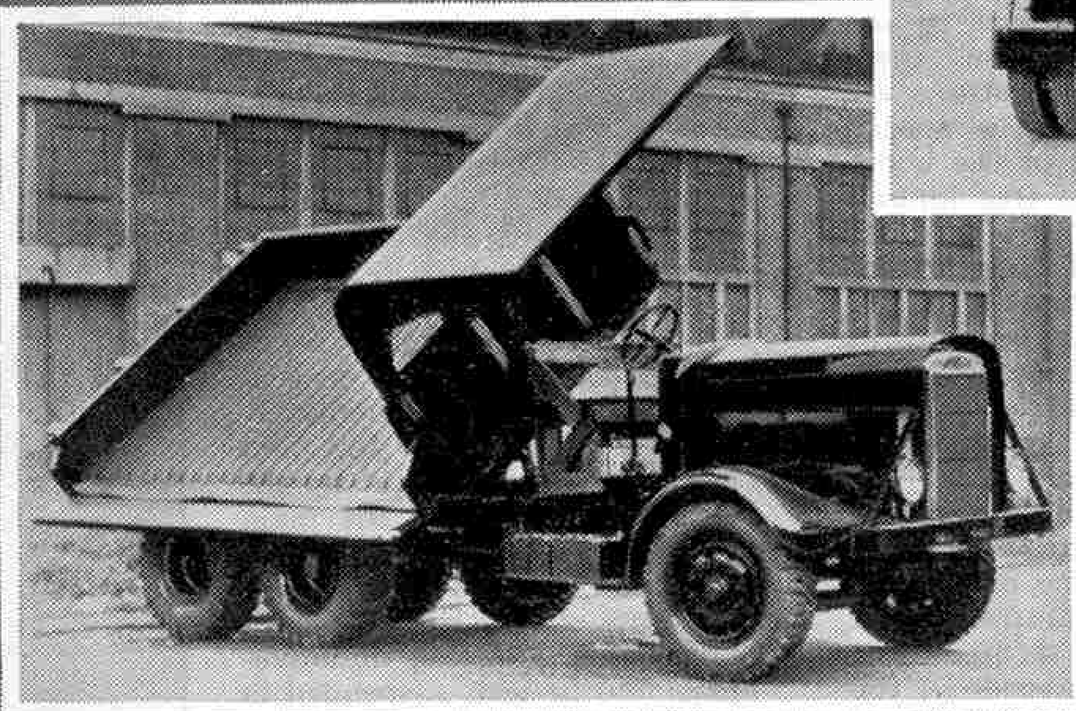


Fig. 1. A specially strengthened vehicle for one of the big gold companies.

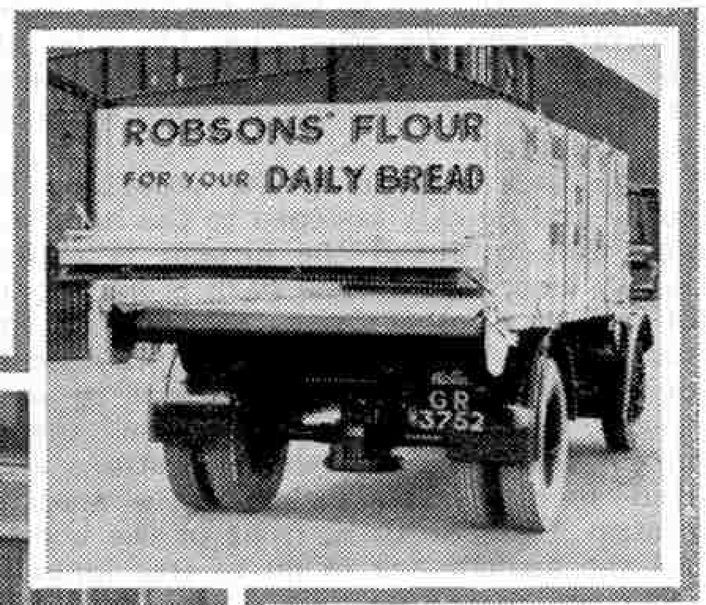


Fig. 2. A lorry fitted with hand-operated end discharge moving floor.

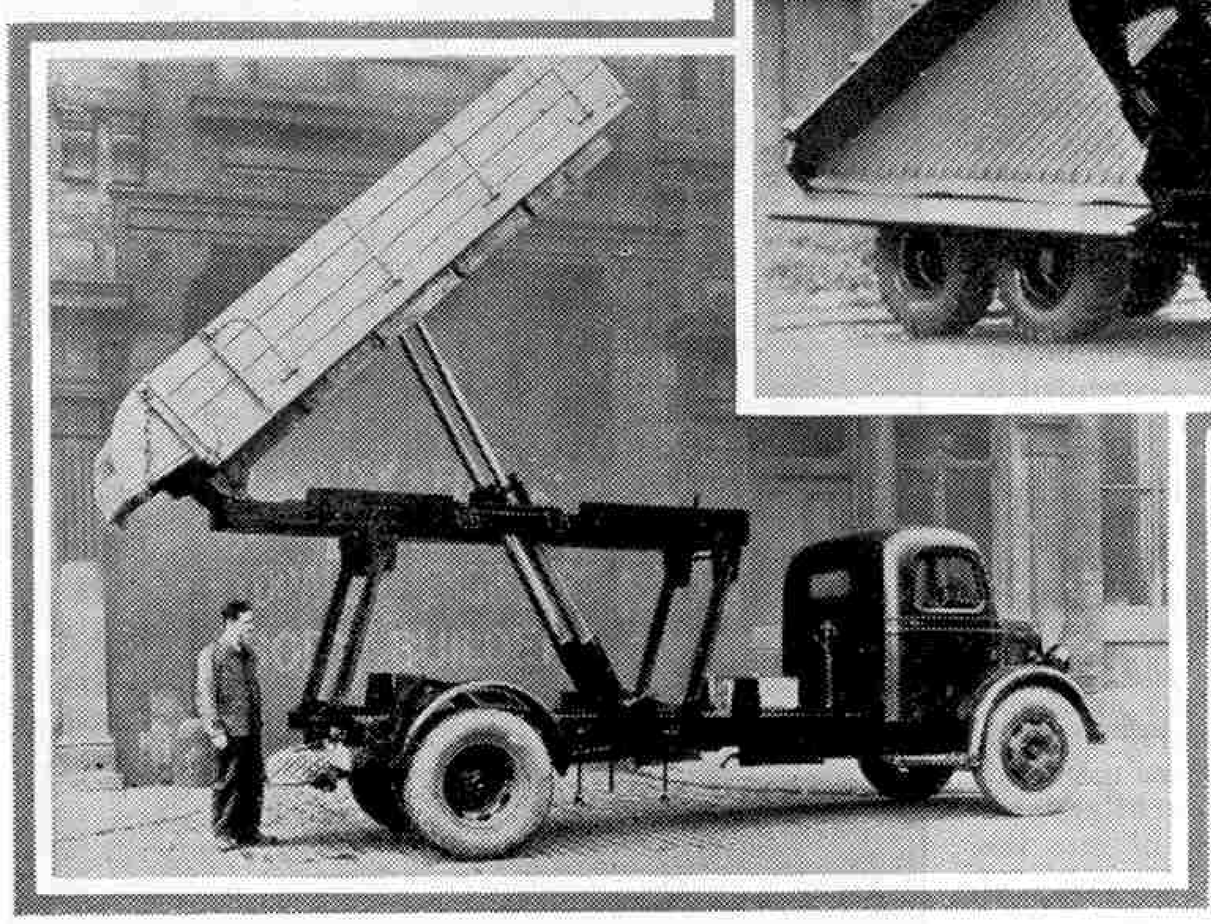


Fig. 3. Mechanism that allows the load to be lifted to a predetermined height before being discharged. The photographs to this article are reproduced by courtesy of Bromilow and Edwards Ltd., Bolton.

Fig. 5. Repair tower for maintaining overhead wiring and lighting equipment.

held on to the vehicle from the rear end of the moving floor, and the belt then wound forward to accommodate another load or portion of a load. With power operation, very fast discharge can be accomplished for such commodities as bulk grain, a 6-ton load of which could be discharged in some 25 seconds. On the other hand, if it should so be desired for, say, parcel delivering or collection, the floor can be made to operate relatively slowly so that the operator can load or unload from door to door.

A tremendous amount of labour used to be employed in man-handling loads under certain conditions. For instance, if a load of coal had to be discharged over a wall into a boiler house, it had to be tipped on to the ground and then shovelled over the wall. Similarly, for storing coal in colliery yards during the summer months the load had to be tipped into the yard and then shovelled up to a stacked pit. This work can now be accomplished through the Bromilow and Edwards' mechanism shown in Fig. 3. This is a power-operated elevating and end-tipping mechanism that allows the load to be elevated to a predetermined height before it is discharged from the body. This mechanism derives its power through a pump and power drive unit from the engine of the vehicle. The rams are very similar to the ordinary end-tipping under-body rams, but in this case are of triple and even quadruple telescopic type. The mechanism is so constructed with holding-down devices that if operators want to use the vehicle as an ordinary end tipper the elevating mechanism can be locked down and thus rendered ineffective.

Fig. 4 shows special equipment adapted and fitted to commercial vehicles for handling drilling mechanism, pumping machinery, pipelines, etc., for use in oil fields. The body is steel of U-shaped construction, with an aperture built into the loading board on each side of the driver's cab. This allows long pipes to be carried through the body and to pass at each side of the driver's cab, and away out at the front end of the vehicle. The tail door is hinged at the bottom and falls level with the floor of the body on chains to form an extended platform for the support of long pipes. At the front end of the radiator of the vehicle the chassis frame members are extended, and special bolsters built up, so that when long pipes are being carried on either side of the driver's cab the front end of the pipes can be supported by these bolsters from the chassis frame members. Clamps are fitted to rest over the outside of the pipes to stop them from rolling off the front end. A power-operated hydraulic crane was fitted to each of these vehicles, the drive being derived from the engine through an oil pump.

We come now to another speciality equipment manufactured by the Wood Hoist Company, and shown in Fig. 5. This takes the form of a hydraulically-operated repair tower for maintaining overhead wiring and lighting equipment, etc. Here the ram can be of either triple or quadruple telescopes, and the upper end is fitted with a rotating platform that is insulated so that when men are operating on live wires there is no danger. The ram is a special solid-drawn large diameter tube, and is operated by an extremely high-speed smooth flow oil pump driven from the vehicle engine. The operator can control the power either from the driver's seat or from the upper end of the tower platform. The particular type of power-operated mechanism takes up a very small proportion of the chassis frame, and thus allows a workshop van body to be built round it, as shown in the illustration.

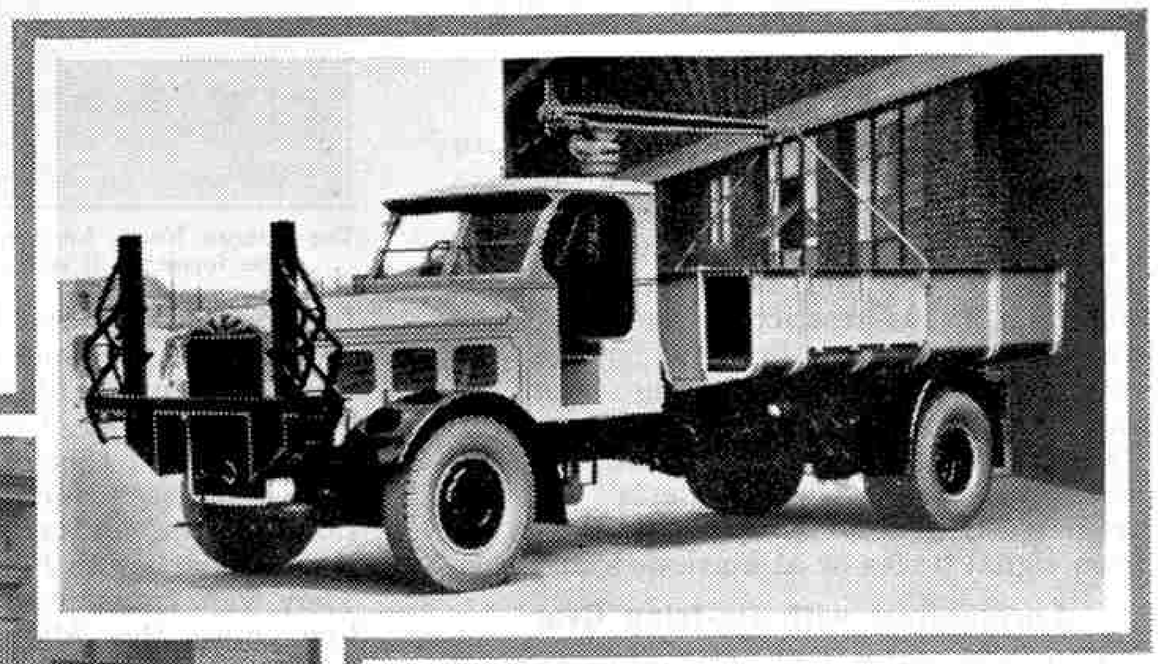


Fig. 4. Vehicle with special equipment for use in oil fields.

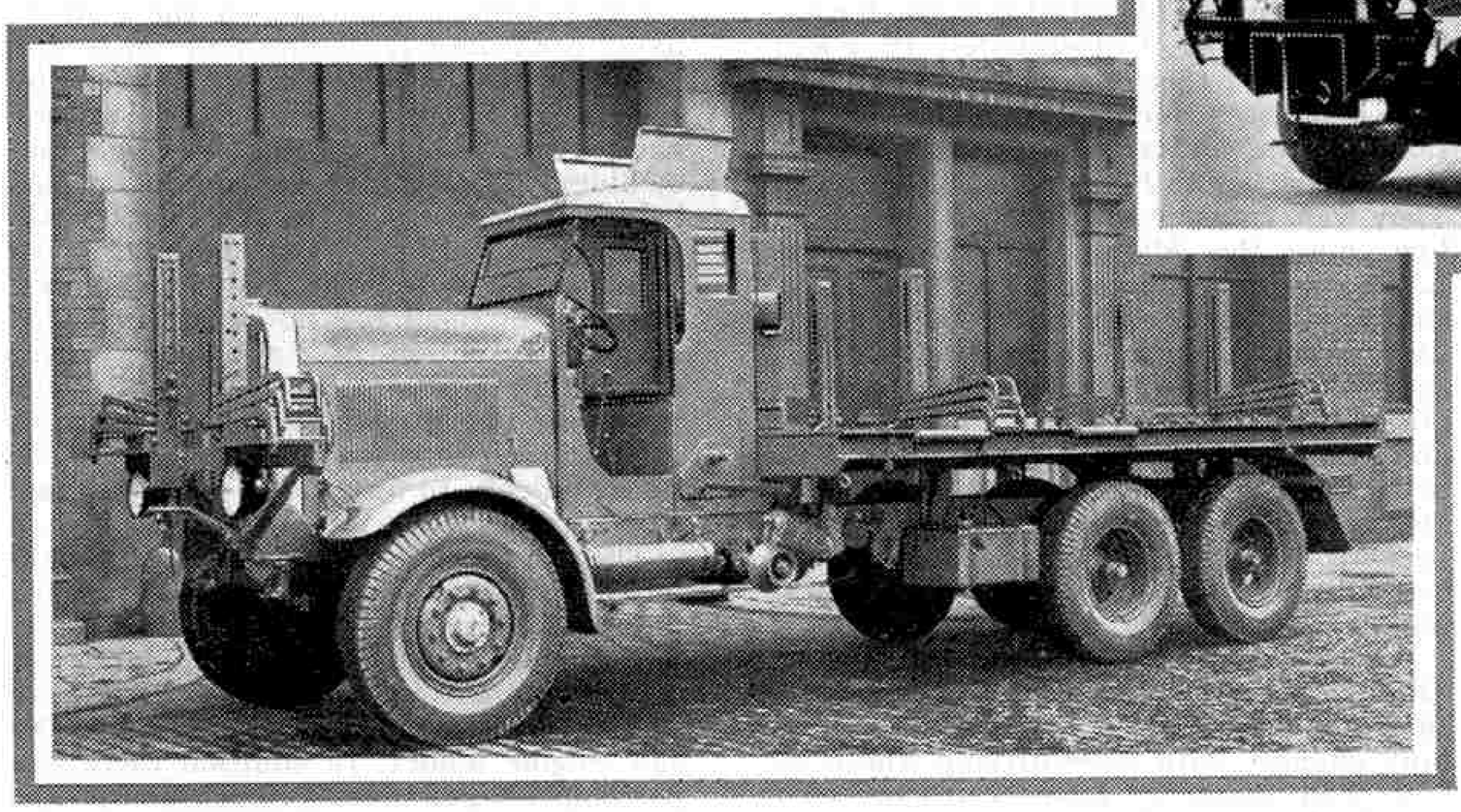


Fig. 6. An unusual vehicle to carry plant and machinery across wild country to the point of oil supply.

Finally, we show in Fig. 6 one of many vehicles operated by the leading oil companies. These vehicles are required to carry pipelines, drilling plant, pumping machinery, etc., from the great storing centres through the desert and bush country as far as 400 miles to the point of oil supply. The cab of this vehicle has an unusual appearance. It is very narrow, being only the actual chassis width; this is to allow the (Continued on page 170)

RAILWAY NEWS

North London Railway Locomotives

The North London Railway was a busy and enterprising local system that was merged for operating purposes into the former L.N.W.R. over 30 years ago, though its tank engines lasted well into L.M.S. days.

The interesting illustration reproduced on this page shows the last survivor of a class of inside-cylinder tank locomotives, which originated between 1865 and 1869. The engine was about 55 years old when the photograph was taken on the former G.N.R. line, the train being of ex-L.N.W. stock working through from Broad St. (City of London) to Potters Bar. The locomotive is shown carrying the L.N.W. number 2874. It had been overhauled at Crewe in 1909.

The driving wheels were 5 ft. 9 in. diameter, and a curious "open splasher" was placed centrally in the lower section of the side tank. The boiler pressure at 160 lb. per sq. in. was the highest in use in Great Britain when the engines were built, and it remained the standard N.L. figure.

The company owned also a numerous and sturdy class of small 4–4–0Ts, having two inclined outside cylinders. These too were very long-lived, but many were much rebuilt or completely renewed. Most of the passenger services they used to work are now merged into L.M.S. suburban electrified routes.

Higher Speeds in "Alerts"

During the past autumn and winter an order has been in force on British railways restricting the speed of passenger trains while air raid warnings have been in progress to 15, and subsequently 25 or 30 m.p.h. This restriction has now been withdrawn during daylight, while the maximum permissible during hours of darkness has been raised to 30 m.p.h. Freight trains still travel at reduced speed when necessary when "alerts" are in progress. Instructions to drivers are given from signal boxes or at stations and yards.

Locomotives with De-Icing Gear

In last month's *"M.M."* we mentioned the electric sleet locomotives and sleet vans respectively put into service by the London Transport Board and L.M.S. For the purpose of keeping electric conductor rails clean of ice or frozen snow during severe weather, certain S.R. steam locomotives also have de-icing gear fitted. This consists of a steam lead from the dome to sprays alongside the bogie wheels on each side, so that, under control from the footplate, steam may be sprayed with considerable force closely along the live rails. The apparatus was seen recently on No. 169 Western Section "L11" 4–4–0; as well as on Central Section "I3" 4–4–2T Nos. 2083 and 2088.

"Baltic" Locomotive Type Disappearing

There have never been many 14-wheeled engines, as represented by the "Baltic" or 4–6–4T type, in Britain, but the number is now much reduced. In the earlier years of this century really large main line tank engines of this type were built for several of the smaller busy pre-grouping lines, which could carry enough coal and water to cover the longest likely non-stop runs and yet be within the length of certain turntables or sidings that it might be desired to use.

The first "Baltics" were built for the London, Tilbury and Southend Railway in 1912, about the time when that important small system was absorbed into the former Midland Railway. Unfortunately they had little scope on their native tracks, as they were too heavy for certain bridges in the London area, and awkward to handle over the approaches to Fenchurch St. terminus. They were transferred to the main Midland line, now the Midland Section of the L.M.S., but all were scrapped by 1934. A similar fate at the same hands has met the five Furness Railway inside cylinder, non-superheater 4–6–4Ts within 15–20 years of building, as well as the six large Glasgow and South Western tanks, which had 6 ft. driving wheels, cylinders 22 in. in diameter, and 180 lb. per sq. in. boiler pressure, because they were non-standard engines of less all-round capacity than the general service classes then being standardised.

After several years' good work, the "Remembrance" class of seven London, Brighton and South Coast 4–6–4 express tank engines, with large driving wheels of 6 ft. 9 in. diameter, have been converted to S.R. 4–6–0 "N15X" tender locomotives for the Western Section.

The sole remaining "Baltics" are five of the original 10 4-cylinder passenger tanks built in 1924 for the Central Division of the L.M.S. to the design of Mr. George Hughes. These are similar in several respects to that locomotive engineer's well known 4-cylinder 4–6–0 tender express class.

Air-Smoothed "Pacifics" on the S.R.

"Pacific" locomotives have now made their appearance on the Southern Railway, the first of a series of 10 engines of this type having completed running trial trips. It was named *"Channel Packet"* by Lt.-Colonel J. T. C. Moore Brabazon, Minister of Transport, on 10th March.

The new engines are to form the "Merchant Navy" class, and the remaining nine are to be given the names *"Union Castle," "Royal Mail," "Cunard-White Star," "Canadian Pacific," "P and O," "Aberdeen and Commonwealth," "Orient," "Shaw-Savill,"* and *"Blue Star."* They are "air-smoothed," a description that is claimed to be more accurate than the usual "streamlined."

Details of the new engines will be given in an illustrated article in next month's *"M.M."*

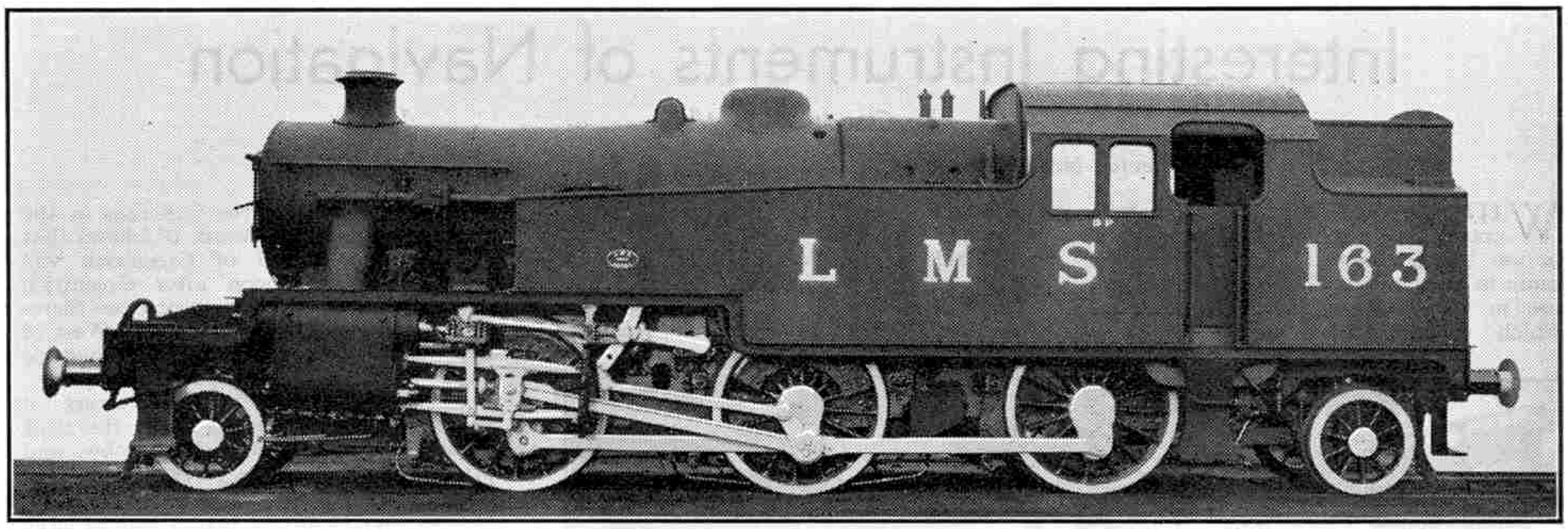
The veteran North London Railway inside cylinder 4-4-0T referred to on this page. The line was merged with the former L.N.W.R. more than 30 years ago, and the engine is shown with its L.N.W.R. number.

G.W.R. Fire-Fighting Trains

Fire-fighting appliances on the G.W.R. have been largely augmented since the outbreak of war by the provision of many special A.R.P. fire appliances. These include hand stirrup pumps, together with light and medium petrol trailer fire pumps, which have capacities of 120-180 and 350-500 gall. per min. respectively. The trailer pumps can be hauled by motor lorry or by hand power.

This equipment has now been extended by the formation of fire-fighting trains manned by trained crews, three of which have been put into service. They are placed at strategic points from which they can be taken quickly to any place on the system where assistance is required.

The trains are painted scarlet, and lettered "Fire Train" very prominently. Each pump is completely equipped with hose, including a length of 400 ft. for main delivery, nozzles and adaptors, and a reserve supply of water will be carried in a 4,000-gall. engine tender. In addition there is a portable 400-gall. dam for each pump. The crew of each train numbers eight.



L.M.S. 2-6-2T locomotive No. 163, Class 3P, one of two that have been fitted with a new type of boiler with greater heating surface. Photograph by courtesy of the L.M.S.

Larger Boilers for L.M.S. 2-6-2 Tanks

While both the L.N.E. and Southern Railways have recently introduced important new types of main line locomotives, the L.M.S. also is in the news of locomotive affairs. By courtesy of Mr. W. A. Stanier, Chief Mechanical Engineer, we illustrate herewith one of two locomotives of his well-known 2–6–2 tank design, Class 3P, which have just been fitted with a new type of boiler having greater heating surface. These engines, which are employed mainly on stopping passenger services and similar duties, are a development of the 2–6–2T design introduced by the late Sir Henry Fowler in 1930; the original engines, with parallel boilers, are Nos. 1-70, and the Stanier taper-boilered locomotives are Nos. 71-209. The two engines so far fitted with the improved type of boiler are Nos. 163 and 169, but as the new boilers are interchangeable with the earlier type of coned boiler, they will be fitted when further locomotives require new boilers.

Readers who are familiar with the earlier type of taper boiler, which may be seen in most parts of the L.M.S. system, will note that the modified locomotive illustrated here presents a considerably more handsome and attractive appearance, making the engines look rather like a smaller edition of the 2–6–4 tanks. Apart from the larger heating surfaces, the boiler has less taper than in the earlier coned version, the outside diameter at the smoke-box end being now 4 ft. 6 in. instead of 4 ft. 2 in., while the diameter at the fire-box end remains unchanged at 4 ft. 9 in. The length of the boiler barrel is increased from 10 ft. 5¾ in. to 10 ft. 10 in. Another noticeable change is the provision of top-feed in front of the dome instead of in combination with it; this alteration has already been made in the case of other of Mr. Stanier's designs.

In the heating surfaces, that of the boiler tubes is increased from 939 sq. ft. to 996.4 sq. ft.; that of the fire-box from 106.9 sq. ft. to 111.2 sq. ft.; and that of the super-heater from 80 sq. ft. to 145 sq. ft. The new superheater contains 14 elements of 1¼ in. diameter compared with 7 of 1⅜ in. The grate area and boiler pressure remain unaltered at 19.2 sq. ft. and 200 lb. per sq. in. respectively. Cylinders are 17½ in. diameter by 26 in. stroke and the coupled wheels 5 ft. 3 in. in diameter; while the tractive effort is 21,486 lb.

Perhaps the most noteworthy feature of this interesting locomotive modification is that the substantial increase in boiler power has been achieved with only a trifling increase in weight, the new weight in working order, with 3 tons of coal and 1,500 gallons of water, being 72 tons 10 cwt. compared with 71 tons 5 cwt.

D. S. BARRIE.

The Fastest Trains of 1940

In the United States, one of the few great countries with a highly-developed railway system that were able to continue high-speed progress under peace conditions, a remarkable total of very fast start-to-stop runs was scheduled last summer. The size and weight of motive power units is very much greater than the maximum allowable here. Locomotives are frequently enormous and fuel consumptions are heavy, but so frequently are the loads.

The world's fastest booked start-to-stop runs all in the U.S.A., with three forms of traction, were as follows: Diesel: Burlington *"Zephyr,"* 54½ miles in 39 min., an average of 84 m.p.h. Steam: The Milwaukee *"Hiawatha,"* Sparta to Portage, 78¼ miles, in 58 min., an average of 81 m.p.h. with some passing times requiring a mean speed of well over 90 m.p.h. Electric: North Philadelphia to Newark, on the Pennsylvania Railroad, 76 miles in 64 min., giving an average of 71.3 m.p.h.

Two Thousand Million Gallons of Water

G.W.R. engines consume more than 2,000 million gall. of water annually; the rate of evaporation by each locomotive when running is frequently 30 or more gallons per mile. The company purchase 220 million gall. a year from the London Metropolitan Water Board, 266 million gall. from the Cardiff Corporation, and many smaller quantities from other local or district authorities. Huge quantities are taken from canals adjacent to different parts of the system, some of which are under the company's control, and other sources of supply are wells and bore-holes, mostly situated on railway property.

About 180 pumping stations are kept in operation in connection with supplies to track troughs, stations, buildings and locomotive depots.

OUTSTANDING VIGILANCE

On the arrival of an express passenger train at Leicester Central recently, a lengthman, or permanent way platelayer, called the attention of the driver to a flaw in the left-hand piston crosshead. A fresh locomotive had to be attached to the train, and the lengthman has been commended for his keen sense of observation in detecting a defect that was not readily apparent.

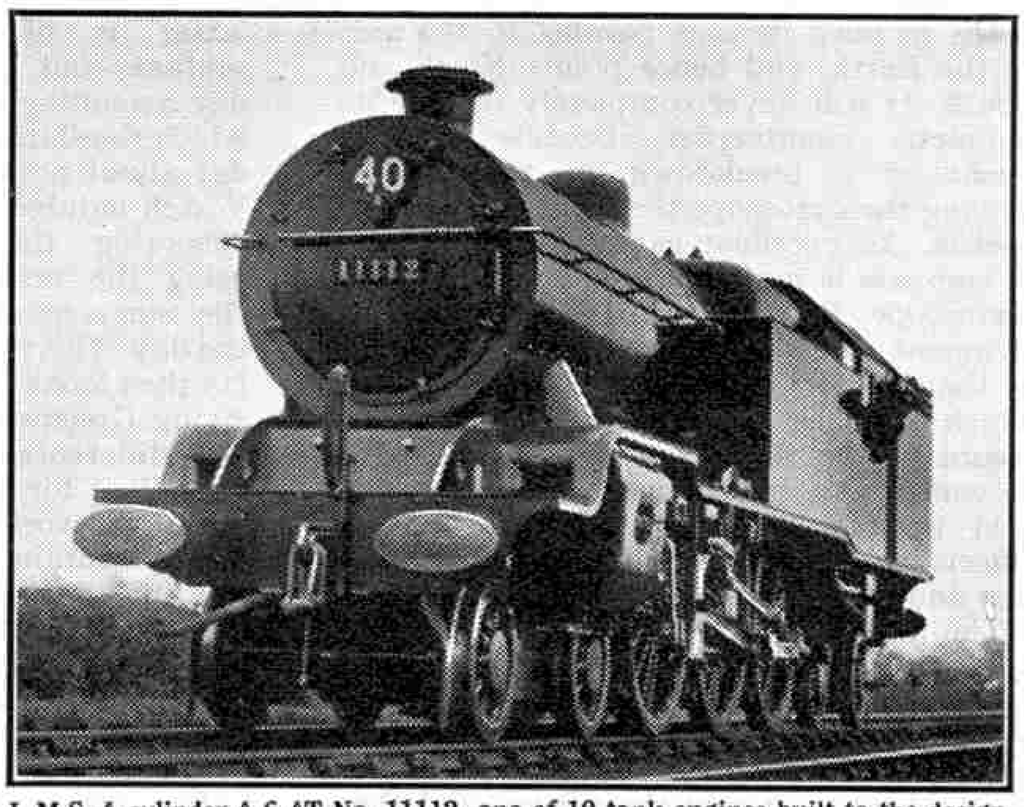
CABOOSES UP-TO-DATE

The name "Caboose" is given throughout the North American Continent, as well as in other countries abroad, to guards' brake vans, and also to dormitory vehicles run behind the engine in areas where depots are far apart, to enable relief crews to sleep during part of the journey. Sometimes one vehicle combines the two functions, cooking and heating facilities being provided.

Some remarkably modern cabooses have recently been placed in service in the United States on the Chicago, Milwaukee, St. Paul and Pacific Railroad. They are of welded steel construction, streamlined and provided with side observation bay windows that give the brakeman a view along the train. They are bogie vehicles 35 ft. long, and are fitted with such equipment as lockers, stove, cushioned seats, toilet and washing facilities, coal bin, sink and ice box, with tools, oil cans, lanterns and brake valve. The journeys involved of course may be very long, but it sounds as if train crews making their trips in the latest streamlined cabooses may be regarded as comparatively lucky.

L.N.E.R. LOCOMOTIVE'S FINE RECORD

Streamlined L.N.E.R. locomotive No. 2859, *"East Anglian,"* which last left Doncaster repair shops on 13th April 1939, returned there on 19th February 1941 after running 82,241 miles. During the whole of the time that she was actually in traffic *"East Anglian"* was working on her "home ground" between London and Norwich, hauling loads varying from 392 tons to 424 tons in each direction daily, a total mileage of 230 every day. Only one minor mechanical failure occurred throughout the period, causing a delay of 36 min. *"East Anglian"* was driven in turn by the 18 leading passenger locomotive crews of Norwich Depot.



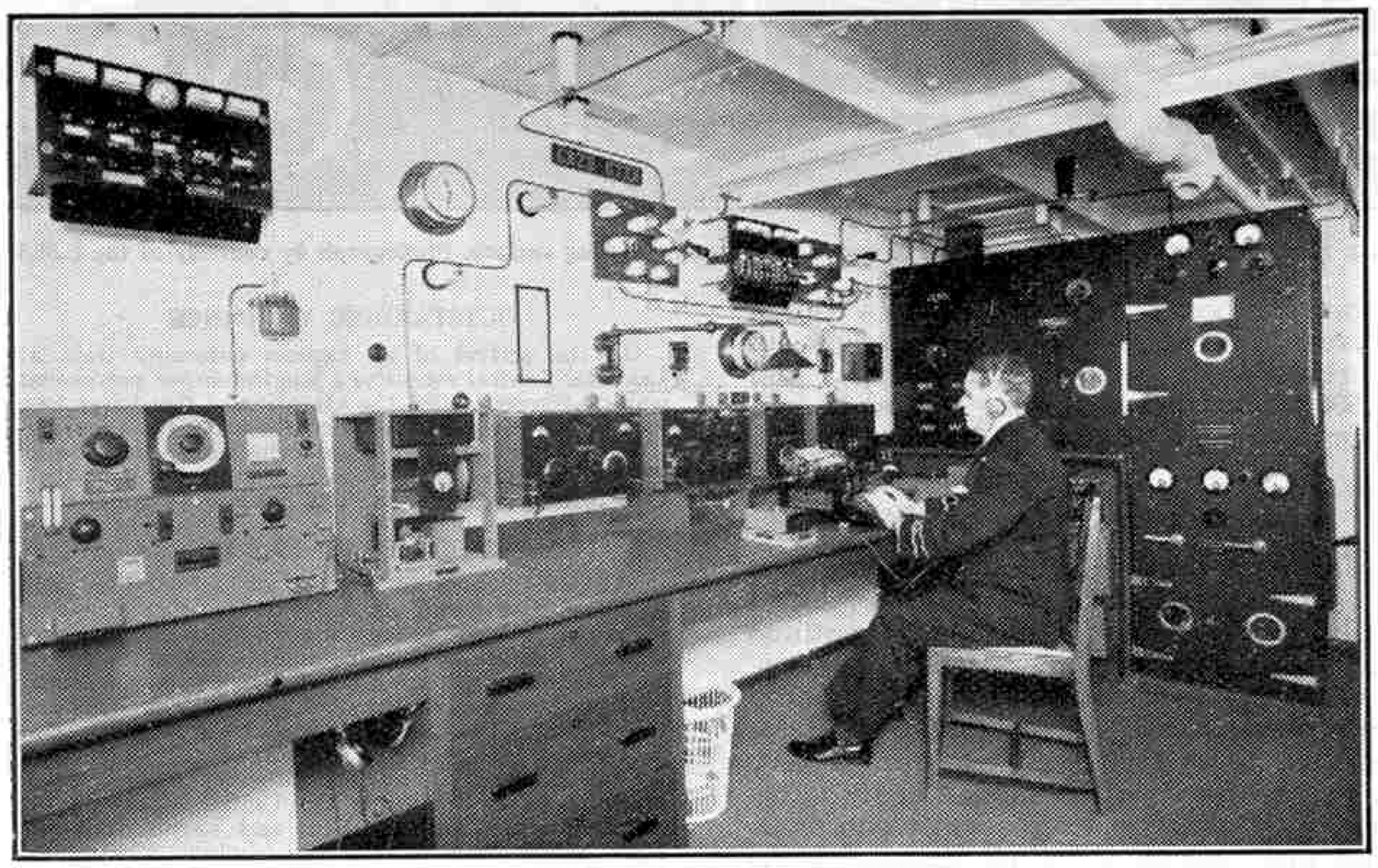
L.M.S. 4-cylinder 4-6-4T No. 11112, one of 10 tank engines built to the design of Mr. G. Hughes for the Central Division of the L.M.S.

Interesting Instruments of Navigation

By Claude H. F. White

Special Note: This article refers entirely to pre-war conditions

WITH the exception of wireless telegraphy, the instruments of navigation in use by the seamen of to-day are the same in principle as those that came into use in the "Age of Great Discoveries" which commenced about 1450. These consist of a chart on which to lay his course and compass with which to keep that course; a log to indicate the distance travelled through the water; instruments to tell him the depth of water beneath the ship's keel; a sextant with which to determine his position, and a ship's chronometer.



A typical Marconi wireless installation on a passenger liner.

The compass needs little description, except to state that in British warships the well-known finely balanced Kelvin compass has been replaced by the Chetwynd liquid compass, which is surrounded by water in order to better resist the shock of gunfire.

The Gyro compass is a modern development, and depends for its action upon the fact that a rapidly revolving gyroscope tends to keep its axis parallel to the axis of the Earth, and hence points North and South. It will never completely replace its magnetic counterpart, because in the event of a breakdown in the motion driving the gyroscope the compass becomes useless. An excellent example of this type of compass is manufactured by the Sperry Gyroscope Co. Ltd. Another useful instrument put out by the same company is the Sperry Automatic Course Record, which supplies an accurate chronological record of the ship's heading and changes of course. An instructional school is also held by this company at which marine officers are instructed in the theory, operation and maintenance of the Gyro compass.

The log is known to all who have made even a short voyage on a ship. It can be seen in the shape of a length of rope to which is attached a propeller or "rotor" trailing over the stern. It is attached to a small wheel to steady the action, and this in turn is fixed to an indicating dial similar to that of a gas meter, which registers the distance travelled.

Soundings are taken by Kelvin's sounding machine and by the hand lead line. The former consists of a length of piano wire attached to the drum of an electric motor. At one end is attached a glass tube coated with a chemical that is white in colour but changes to red on contact with sea water. This is enclosed in a metal tube open at one end and the whole is thrown into the water. The deeper it goes the further the water is forced up the tube; and the consequent length of red coloration, which is measured off afterwards on a boxwood rule, is an index of the depth of water to which the instrument has sunk.

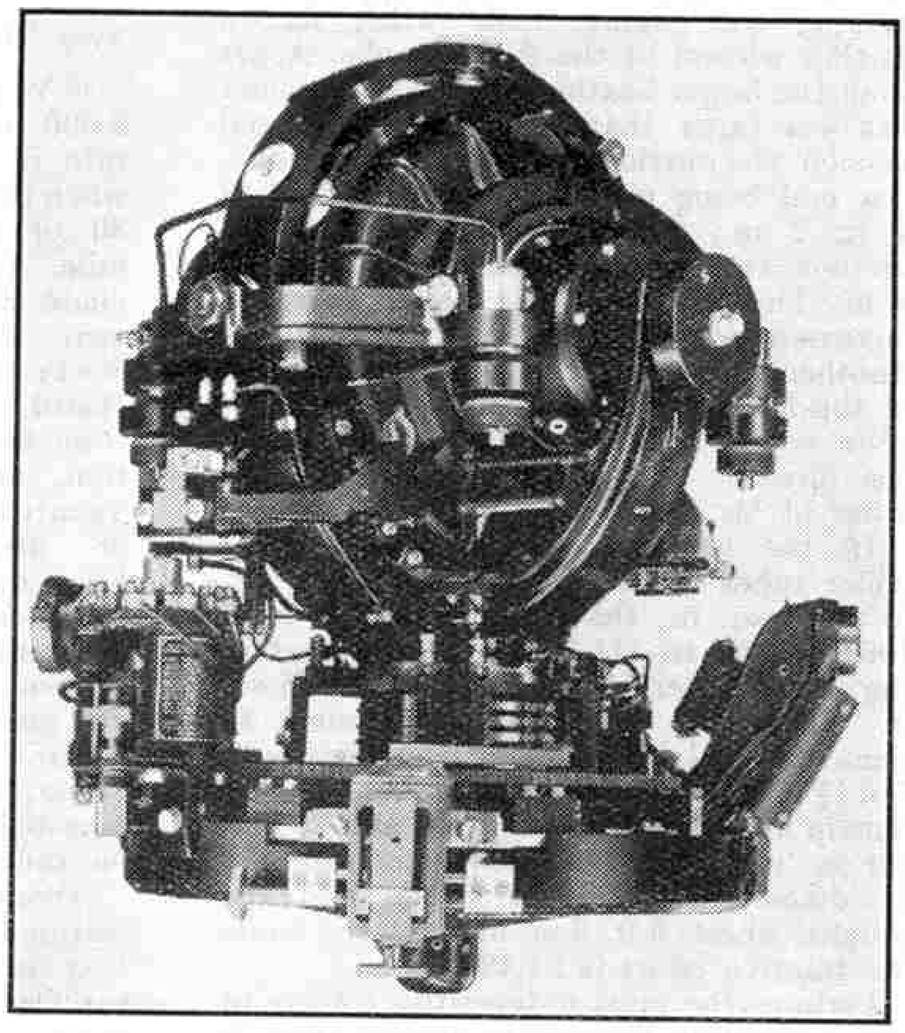
The chronometer and the sextant are used together. There are always two timepieces on board ship; one, the chronometer, registers Greenwich time, and the other local or ship's time. The latter is determined by the sextant, and alters from day to day according to the direction in which the ship is travelling. Every day about noon the Officer of the Watch indulges in the practice of "shooting the Sun," that is, using the sextant to determine the Sun's maximum altitude for the day. This is then "local noon." He then looks at the chronometer giving Greenwich time and notes the difference. Greenwich time may be, for example, 2 p.m. Since the world is round and all circles contain 360 degrees, and the Sun takes 24 hours to travel round the Earth, it follows that in two hours it will have travelled 30 degrees. Thus it is seen that the ship is 30 degrees from Greenwich.

The officer now has to find whether it is East or West, which is easily done. Since the Sun rises in the East and travels westward, it follows that all places westward of Greenwich will have their local noon after Greenwich itself. This is so in the present case; therefore the ship must be 30 degrees West of Greenwich. This of course is longitude only.

This brief survey of instruments of modern navigation brings us to the most modern of all—wireless telegraphy; and pride of place must be given to this as a navigational instrument of general utility. It is as easy to-day to take a ship as large as a small town from one continent to another, across thousands of miles of ocean, as it is for a man to cross a busy street, and it is often a great deal safer. In the old days, once a ship was "hull down" she was in a sphere of her own and cut off completely from the outside world. Nowadays she can communicate beyond the visible horizon to the furthermost corner of the Earth. The first ship to be fitted with wireless telegraphy apparatus was the East Goodwin lightship in 1898, and by this means it was able to keep in constant touch with the South Foreland lighthouse. The new science proved its worth when, in the following year, the lightship was rammed by the steamship "*Matthew*" and all hands were saved.

It will be admitted that the main use of wireless telegraphy at sea is to prevent disaster, save life and summon assistance. This is known to us all; but there are other less known uses—its service to navigation.

In the first place time signals are radiated at intervals by Greenwich Observatory and by this means the ship's chronometer may be checked. This is most important. Regular information issued by the Meteorological office is broadcast by Coastal Stations and by the B.B.C.



The Sperry Mk.XIV Gyro compass.

concerning the approach of bad weather conditions and gale warnings. Around the coasts of the British Isles there are 25 automatic wireless beacons, and about 200 in the whole world. They are usually placed in lighthouses, and they broadcast a characteristic signal on 1,000 metres by means of which a ship can find her position without having recourse to the usual method of obtaining bearings from a coastal station. It is the smaller ships, which are not fitted with direction-finding (D.F.) apparatus that ask for bearings, and these are sent accurately to within 2 degrees. However, it is worthy of note that over 4,000 ships—1,300 of them British—are now fitted with D.F. apparatus. As a further help to small ships some coastal stations send out a rotating beam synchronised with which is a special signal when the beam is, for example, due North. Bearing in mind that a wireless signal comes in strongest when the receiving aerial is pointing directly to the transmitting station, it can be realised that with the aid of a stop-watch a small ship can obtain her direction.

Normally the automatic radio beacons send out a signal every half hour, but in foggy weather it is sent every 6 minutes. They are equivalent to lighthouses, but are just as reliable in foggy weather as in a crystal clear atmosphere.

The 25 British Isles stations are operated by Trinity House, the Northern Lighthouse Board and the Irish Light Commissioners. Five of these stations transmit a sound signal simultaneously with the wireless signal, and by noting the time elapsing between receiving the one and hearing the other—for sound travels at the rate of 1,100 ft. per second—the distance of the ship from the beacon can be estimated.

The radio bids fair to replace the various sounding devices still in use. The principle of the reflection of wireless waves is embodied in the echometer or sonic sounding apparatus. A signal is transmitted from the ship and is reflected from the sea bed. The time taken for the "echo" to be heard is an indication of the depth of water.

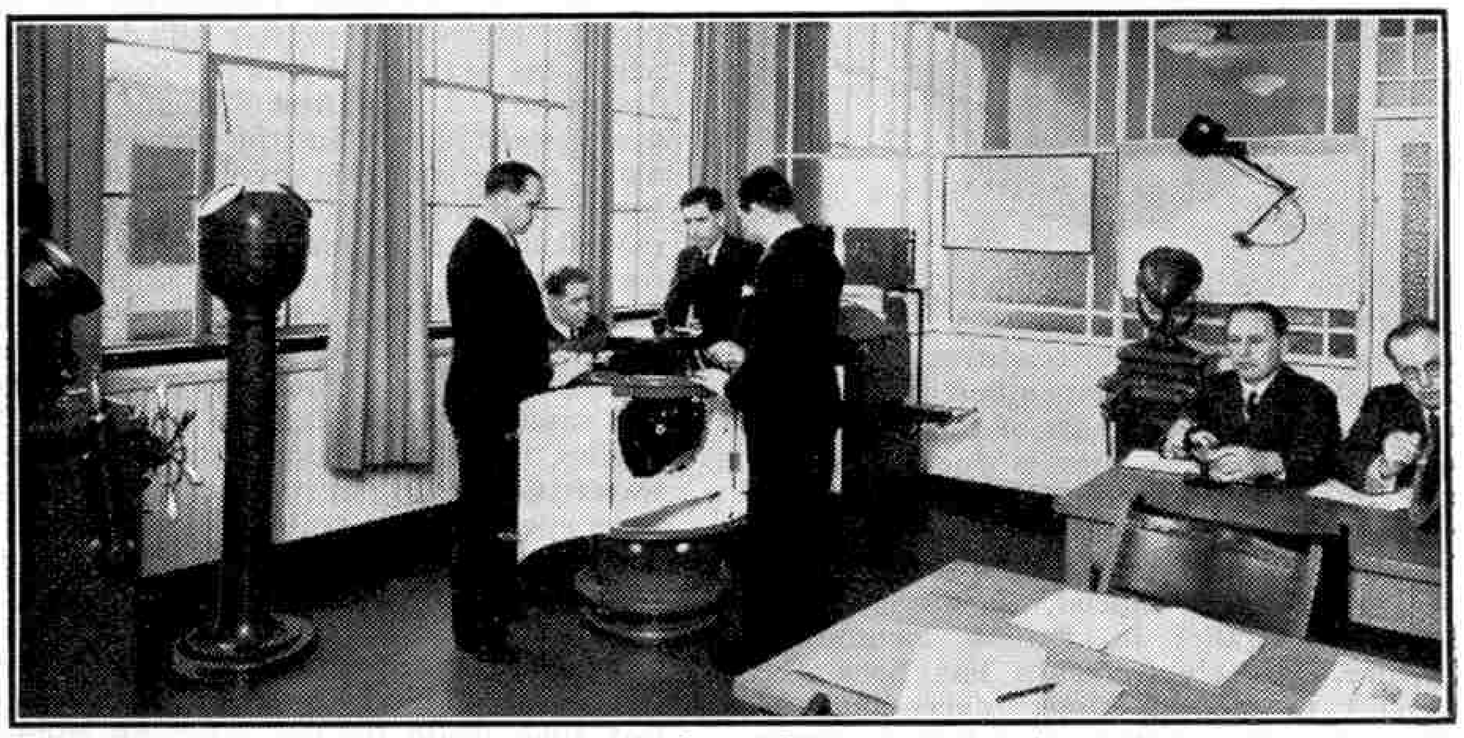
The wireless automatic alarm device is another useful adjunct to the list of apparatus found on a modern seagoing vessel. This is used when a continuous wireless watch is not kept on board, as in the case of ships carrying only one operator. This device responds to one particular signal only; that is, a series of 12 dashes each of 4 seconds duration, separated by intervals of one second. Under these conditions a bell is rung in the wireless cabin and another on the bridge. It is a reversible device and can also send out such a signal. It has proved an immense boon to small ships and has eased the burden of the singlehanded wireless operator. About 1,200 ships of the British Mercantile Marine are so fitted, and its use was legalised in 1929 by the International Convention for the Saving of Life at Sea.

In 1919 the Marconi Company devised wireless telegraphic apparatus for lifeboats and by 1924 this became compulsory for certain types of ships. The navigation of a lifeboat so fitted becomes comparatively easy and she is able also to "convoy" a number of other boats.

Prior to the year 1919 all ships were fitted with the old-fashioned broadly tuning spark apparatus. However since the International Radio-telegraph Conference at Washington in 1907 all transmitters over 300 watts have to be of the valve type.

It has already been stated that wireless telegraphy is the most important navigational asset possessed by a ship; but this must be taken to include also telephony, of which so far nothing has been said. Telephony usually benefits the passenger more than the navigation officer. On the North Atlantic route, for example, communication can be held with friends in Canada and the U.S.A. while the ship is still in Southampton water. This service applies also of course to communication between a ship in English waters and her owners in America.

Telephony is used also by small trawlers, for the skipper usually operates the set himself, and not being a trained man he has no knowledge of the Morse code.



Compass instruction room at the Sperry Gyroscope company's school.

Some Items From My "Bag"

By Gerald W. Spink, Ph.D.

THE collecting instinct is one of the strongest in the human race and ranges from cigarette cards to elephants' tusks. The other day I met a young collector who had noted almost every L.N.E.R. "Pacific." In this respect he had far outstripped me.

But I believe that my own "bagful" of experiences is not without interest, so I pick out a few items. First, you have all heard of "out of course" or special stops. Well, on two occasions I have had a train specially stopped for my benefit! On one of these the train was the imposing *"Queen of Scots"* Pullman. I had a rather important appointment at Ripon, and owing to a breakdown north of Newcastle the connecting train at Darlington could not be kept. My suggestion on arriving at Darlington, that the Pullman following a few minutes later should stop at Ripon, was not at first welcomed, but at the last moment I was hustled in, permission having been sought from and granted by the authorities at York.

A quaint experience of a different kind happened in the early days of grouping. A late Sunday night train from Leeds to York used to make a number of conditional stops between Leeds and Micklefield, and then run express to connect with main line trains at York. For some reason we failed to make the Micklefield stop and had to back over half a mile, with the consequent loss of connection at York. I once enjoyed several miles of free travel on the *"Queen of Scots"* coming north from King's Cross; owing to a derailment we were diverted via Lincoln, yet our arrival at Leeds was not unduly belated.

We occasionally hear of three or more engines per train, but it is a comparatively rare happening. One Christmas the *"Harrogate Pullman"* was piloted into Leeds and both engines acted as "bankers" to the N.E. "Atlantic" which came on at the other end for the run on to Newcastle. There were thus three "Atlantics" to one train for the distance of about ¼ mile. I have travelled in a 3-engined train from Queen Street, Glasgow, up to Cowlairs. A banking tank engine is usual, but on this day the 4 p.m. Edinburgh and South was so heavy (370 tons for a "Shire") that at the last moment a 0-6-0 goods locomotive was attached at the head of the train chimney to chimney and detached at Cowlairs. Including a stop of 2 minutes for this purpose we made Haymarket, 46.1 miles in 59¾ minutes.

Once I saw a Gresley "Pacific" in the strange dilemma of being unable to leave its train after its run from King's Cross to Newcastle. I always understood that a 3-cylinder locomotive could not "dead-centre," but this had happened, and another engine was requisitioned to give the 4-6-2 a friendly push and all was well. Another time at another station I saw a couple of "Shires" unable to move a train on receiving the "right away," but the explanation was that the train engine was still in reverse gear and was pulling against the other!

How many readers have had the experience of being stopped on Beattock Bank on an unpiloted and unbanked train? About 1927 the L.M.S. were running a direct service from Bradford to Glasgow; the 3-cylinder Midland compound employed on this train was stopped in the way indicated, but restarted on the bank without trouble. But the train amounted to no more than six cars.

I had the pleasure of mounting the footplate of L.N.E.R. No. 10000 during her first week of service in her present streamlined form and with all the glory of floodlighting. It was not so long ago, yet the months of "blackout" make it seem very far in the past.

My "bag" concludes with the "catching" of a "Pacific" hauling 20 coaches and a van—some 630 tons—unpiloted *north* of Newcastle! They think nothing of this south of York, but it is a distinct rarity twixt Tyne and Tweed.

Sir Nigel Gresley

By O. S. Nock, B.Sc., D.I.C.

BY the death of Sir Nigel Gresley, on 5th April last, the railway world lost one of its greatest personalities. Although he will be best remembered by the spectacular achievements of the last seven or eight years, his fame is due no less to the conspicuous success of his earlier work, when the basic principles of what was to be his standard practice were well and truly laid down. Indeed, his whole career has no parallel in British locomotive history. His chieftainship has been the longest in modern times, exceeding the 29-year *régime* of that other famous Great Northern chief, Patrick Stirling, by one year, and extending from the spacious days before the first Great War to the thrilling era of streamlined trains and speeds of over 100 m.p.h.

In this age of vast loads, and locomotives weighing with their tenders 150 tons or so, it is not easy to visualise traffic conditions as they were on the Great Northern 30 years ago, when Gresley was appointed Locomotive Superintendent. Then some of the fastest expresses were light enough to be regularly hauled by 2–2–2 "singles," and important goods trains were taken by "Atlantics" or 4–4–0s. His heritage was a truly great one. Patrick Stirling's glorious eight-foot singles had earned for the Great Northern its reputation for speed, and following that Ivatt had enhanced Doncaster's already high prestige in the locomotive world by building his remarkable "Atlantics," with boilers that, for the period, were prodigious. At the time of his appointment Gresley was only in his 36th year, and one can well imagine that so young an engineer, however talented, would only with some diffidence assume so distinguished a mantle.

Yet time has shown that Gresley was, in many ways, the greatest of them all; and on looking back on his career it is delightful to see how loyal he has been to the traditions he inherited. In his very latest design, the splendid little "*Bantam Cock*," a surprising number of Great Northern characteristics are apparent, yet by this it should not be imagined that he was conservative in ideas. Under his direction constant progress was being made, though amidst his own resounding successes one could frequently discern a real affection for older engines, particularly for the Ivatt "Atlantics," which he modernised so successfully, and for the old Stirling eight-footer No. 1.

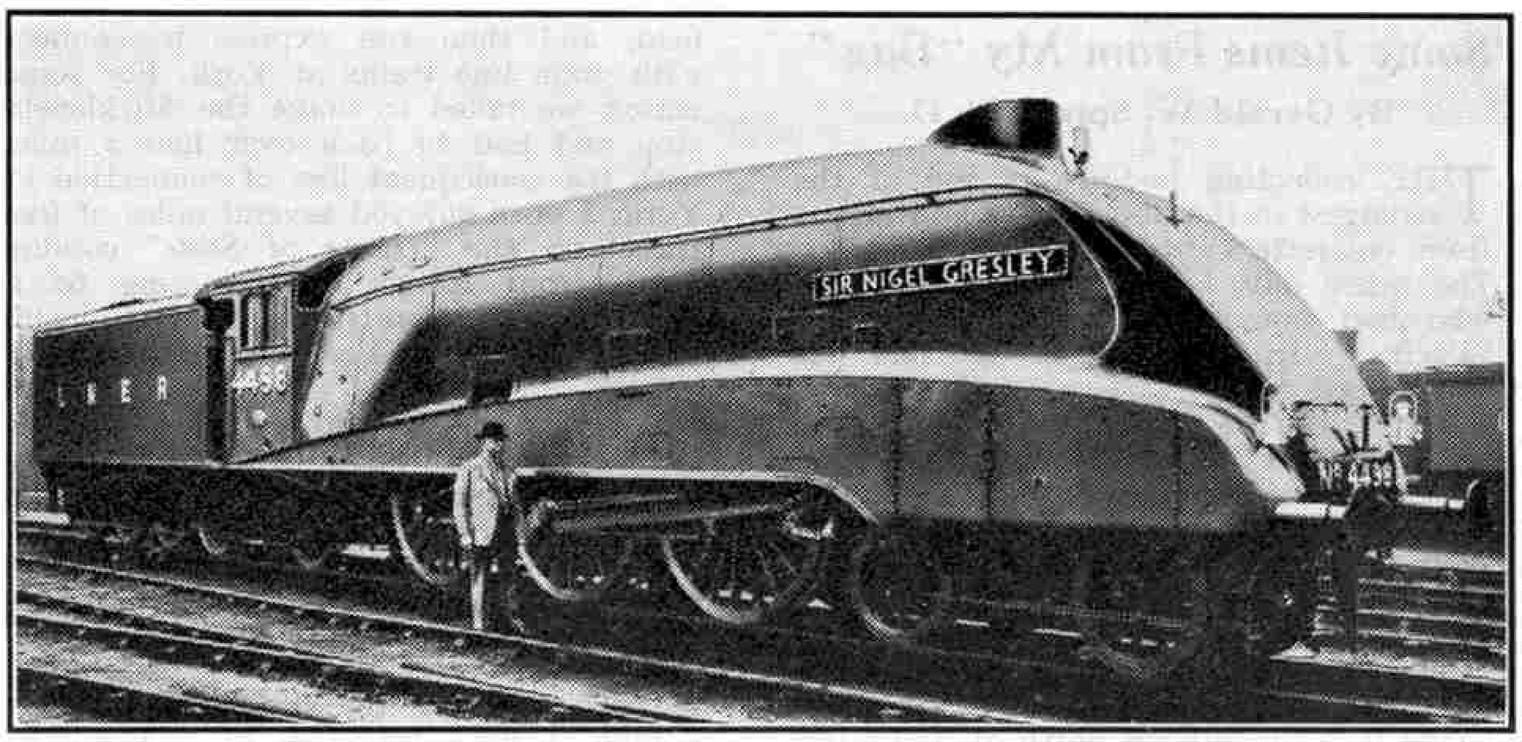
His own engines held many records, including that of the most powerful of each category running in Great Britain. The rebuilt No. 10000 is the most powerful express engine; the Class P1 "Mikados," among long-distance freight types, and the "Green Arrows" among mixed traffic locomotives, are supreme; while mightiest of all is the 2–8–0+0–8–2 Garratt bank engine. Another outstanding design is that of "*Cock o' the North*," of which no exact counterpart exists on any other British railway. But in all these great machines, so bold in their general conception, Gresley proved himself a master of detail. On what was perhaps the most epoch-making design of all, the first "Pacifics," three years were spent in the drawing office alone; every part that involved a departure from previous Doncaster practice was modelled, and remodelled, and not incorporated in the final plan until he was absolutely satisfied. We all know the outcome of these labours, and what a great success the first "Pacifics" were. It was the same with the famous "Hush-Hush" engine, the high-pressure 10000, with its water-tube boiler; in its design three years were spent on the boiler alone!

The care lavished in designing reaped a rich reward in the reliability of the engines on the road; indeed, some of the rare recorded instances of failure have become famous through the amazing recoveries of lost time made by the relieving engines. Possibly the most outstanding case of all occurred when the streamlined engine of the up "*Coronation*" ran hot and had to be detached; the non-streamlined Pacific "*Singapore*" was commandeered at a moment's notice, and duly made the fastest run *ever known* from Newcastle to King's Cross, setting up a net average of 72½ m.p.h. from start to stop. In so doing she beat, by five minutes, the record time of "*Papyrus*," made on a very special occasion, when that engine was prepared and tuned up to the last degree; what is more, "*Singapore*" had the full winter load of the "*Coronation*," 290 tons, whereas "*Papyrus*" was hauling a test load of 217 tons.

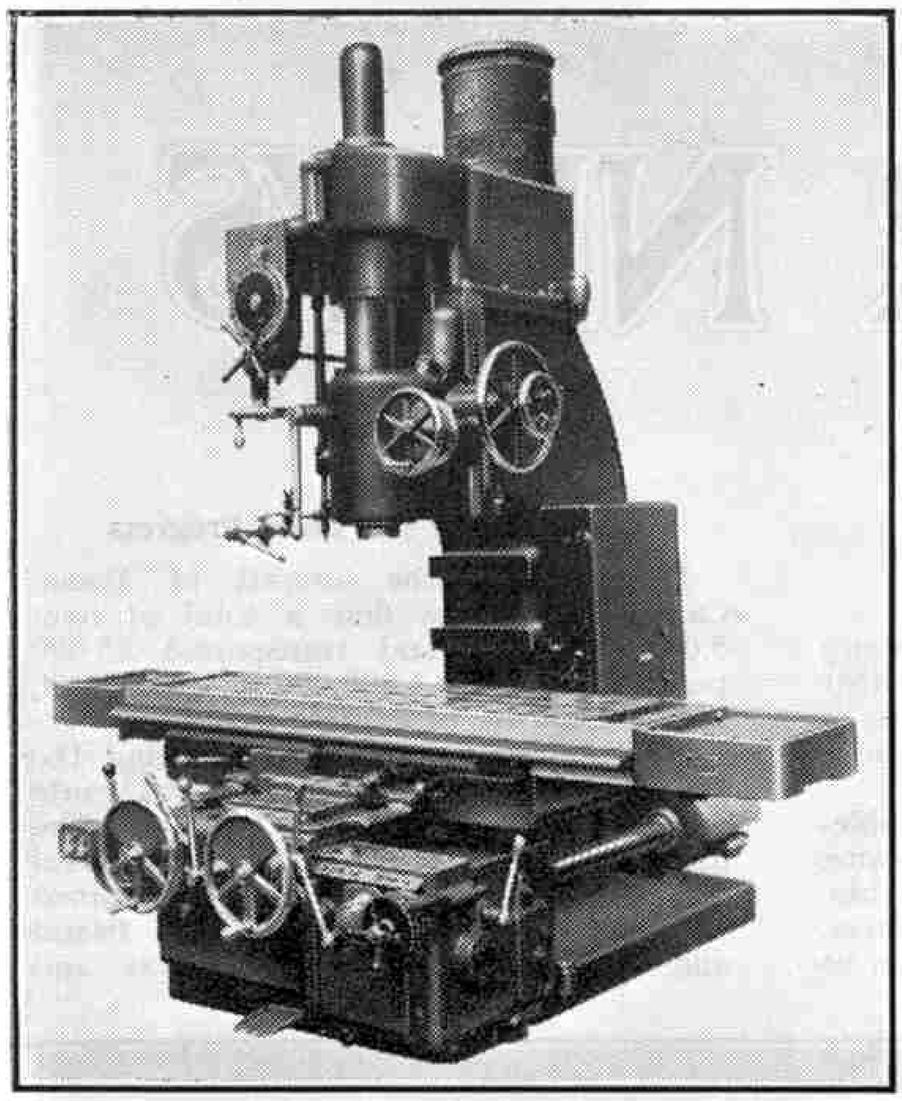
Gresley's locomotives have featured on many great occasions. There was the inaugural trip of the "*Silver Jubilee*" express, when 112½ m.p.h. was attained; several great runs in the early days of the "*Coronation*" service, when with a load 50 per cent. heavier than that of the "*Jubilee*," speeds between 105 and 109 m.p.h. were attained; and finally the record-shattering trial trip when "*Mallard*," of the double-chimney, captured the world record for railway speed, with steam, by attaining 126 m.p.h. in the descent of the Stoke bank. But though the "Pacifics" naturally feature in all the most spectacular achievements, Gresley will long be remembered, no whit less, by his mixed-traffic and freight types. Engines like the K3 "Moguls," and the "Green Arrows," capable of hauling anything from a coal train to a fast express, are of inestimable value, especially at the present time; while for the heaviest coal and mineral traffic his 2–8–0s of Class 02 are second to none.

Gresley was not only a great engineer; he was also a great artist. Even in locomotives in which he was building to the utmost limits of the loading gauge he contrived to introduce graceful lines that imparted a nicely-proportioned look. But his artistry was best displayed in his main line passenger rolling stock, in the exquisite interior decoration schemes used in the dining cars of the Scottish expresses, and later, in the streamlined trains. The external appearance of the "*Silver Jubilee*" created a profound sensation, only to be equalled two years later by the "*Coronation*," with its unique beaver-tailed observation car. Thus in an age of propaganda he rendered the L.N.E.R. yet another valuable service by making its trains and their running "front page news."

In 1936, in the Birthday Honours of King George V, Gresley was knighted. "*The Times*" happily summed up his whole career by calling him "Engineer and Speeder-up to the L.N.E.R." In 1938 his own company bestowed upon him a rarer distinction. Many famous locomotive engineers have in the past been honoured after either their retirement, or their death, by having a locomotive named after them; it is, therefore, significant of the heights of achievement to which Gresley attained that this honour should have been conferred upon him while he was still in harness. The naming ceremony took place at Marylebone Station. Mr. William Whitelaw, then chairman of the L.N.E.R., unveiled the nameplate in the presence of directors and officers of the company, and also presented to Sir Nigel a silver replica of the engine. Though Sir Nigel himself has passed on, his hundredth "Pacific," No. 4498, remains—"*Sir Nigel Gresley*," the most vivid memorial imaginable to one of the greatest locomotive engineers the country has ever known.



Sir Nigel Gresley standing alongside the streamlined "Pacific" locomotive No. 4498 that was named after him.



A fine vertical milling machine manufactured by Alfred Herbert Ltd., Coventry, to whom we are indebted for our illustration.

ENGINEERING NEWS

A New Lifting Truck

A new lifting truck is shown in use in the three illustrations at the foot of this page. One of its outstanding features is that the load platform can be lowered to within 1½ in. of ground level, so that practically any load can be rolled on to it and lifting tackle need not be used. The truck is easily manœuvrable, and can be turned completely round in its own length.

Of our three illustrations, the one on the left shows a vertical milling machine resting on a roller 2 in. in diameter, and an operator who has lowered the truck platform is seen pushing it underneath the base of the machine. The truck is carried on wheels fitted with solid rubber tyres, the front pair being on fixed axles while the axles of the two rear wheels are mounted on castors.

The load platform is mounted at the front end on four radius links, two on each side, and at the rear on two pins, placed one on each side of the quadrant forming the short arm of the U-shaped lever used for lowering and raising the platform, and for manœuvring the truck. This quadrant is not rigidly attached to the lever, but is provided with a lug with which the lever makes contact when the platform is lifted by pressing down the handle, that is the longer arm of the U-shaped lever, as shown in the centre illustration. The ratio between the long and short arms of the lever is large, so that the effort required of the operator is reasonably small; and there is a device that locks the platform in its raised position, so that the handle can be used at any angle without risk of the load being lowered during transport. This freedom of movement of the handle is necessary to allow it to be inclined at a convenient angle for pushing or pulling the truck, or to be folded back towards the load when passing round awkward corners often met in factories and workshops.

The platform locking device is released by the operation of a foot pedal. To provide against accidental lowering while loads are being transported, the pedal is interlocked with the handle so that raising or lowering of the platform is possible only when the two controls are used in conjunction.

A Fine Machine Tool

The upper illustration on this page shows what is known as a kneeless type vertical milling machine, which is among the many different kinds of machine tools manufactured by Alfred Herbert Ltd., Coventry. In this machine the height of the worktable is fixed, and work of different heights and variations in depth of cut are accommodated by moving the spindle head carrying the cutter up or down the column on which it is mounted. The raising and lowering of the head on the column is easily effected by means of the two handwheels seen on the right of the column. Fine adjustment for putting on the cut is made by the handwheel at the front of the spindle head.

The cutting tool is carried on a casehardened chrome-nickel steel spindle that runs on precision-type ball and roller bearings. This spindle may be driven at any one of eight fast speeds or eight slow speeds to suit the particular job in hand, so that all work within the capacity of the machine can be done at the most suitable rate. Changes of speed are effected rapidly.

The table is driven by a rotating nut that engages a stationary screw, and can be operated at 24 different rates.

HOT AIR GIVES NEW LIFE TO OLD OIL WELLS

It is believed that only about one quarter of the oil in a well is extracted by ordinary methods, and the Russians are now trying to obtain a larger proportion from old wells by following a plan worked out at the Mineral Fuel Institute of the Academy of Sciences of the U.S.S.R. The process consists of heating compressed air to about 600 deg. C., and blowing it into the oil stratum. The hot air stream easily separates the oil from sand and then carries it to the working well, 300 ft. to 650 ft. away, where it is sucked up to the surface by a vacuum pump. With a small experimental installation 20,000 tons of oil, more than 353 million cub. ft. of gas and about 500 tons of benzine were extracted during the past few months from an area of about 75 acres.

CANADIAN "COAST TO COAST" HIGHWAY NEARLY COMPLETED

Canadian engineers, pushing their way through entirely undeveloped country, where they are working amid some of the grandest scenery in the world, are now busily engaged in constructing the final link in the great All-Canadian highway across the North American continent. This link, which will close the gap between the already completed portions of the highway, connects Geraldton and Hearst, in northwest Ontario, and will be completed by the end of this year. Some idea of the great cost of the highway is given by the fact that the Geraldton-Hearst link alone is costing about £1,250,000.

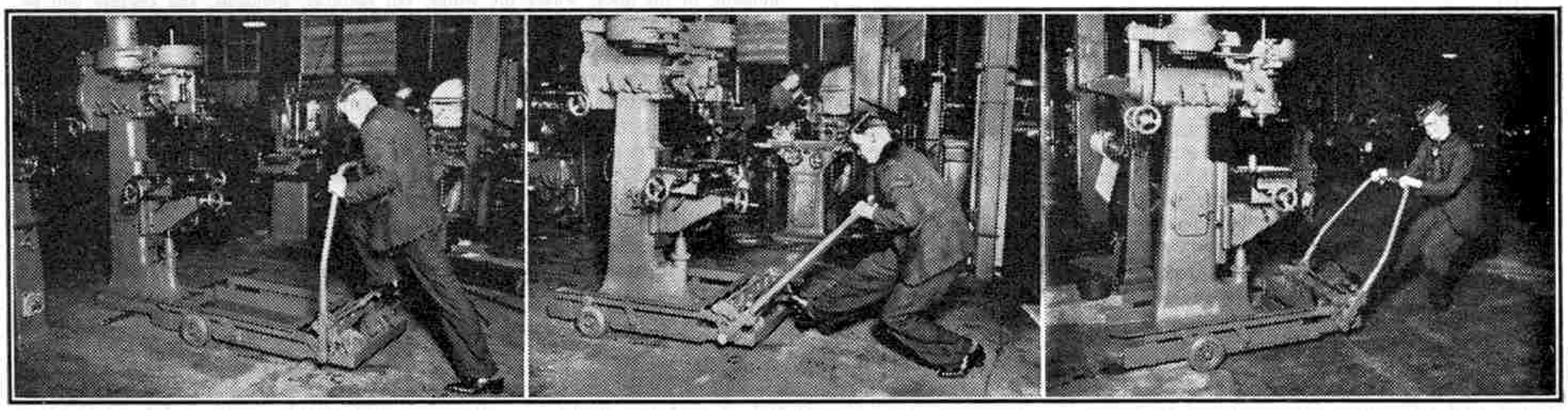
DISCHARGING 6,000 TONS OF COAL AN HOUR

A fine electrically-operated coal shipping plant has been built at Sandusky in the United States for loading the vessels that distribute coal to various points at the head of the Great Lakes. The plant is owned by the Pennsylvania Railroad, and is used to unload coal from railway trucks and discharge it into the holds of the ships. This new plant, which supplements two earlier plants, will discharge 60 wagons an hour, each wagon holding from 50 to 100 tons of coal. An electric locomotive or barney pushes the wagons from the railway sidings up an incline to the platform of a cradle or lift working in a steel tower 118 ft. high. The wagon is automatically locked in position, raised to the top of the tower at a speed of 200 ft. per minute, and then tilted sideways to discharge its contents. It is then tilted back to the vertical, lowered, pushed off the cradle by the next loaded truck, and finally runs down an incline to the empty wagon sidings, where its speed is checked by track brakes.

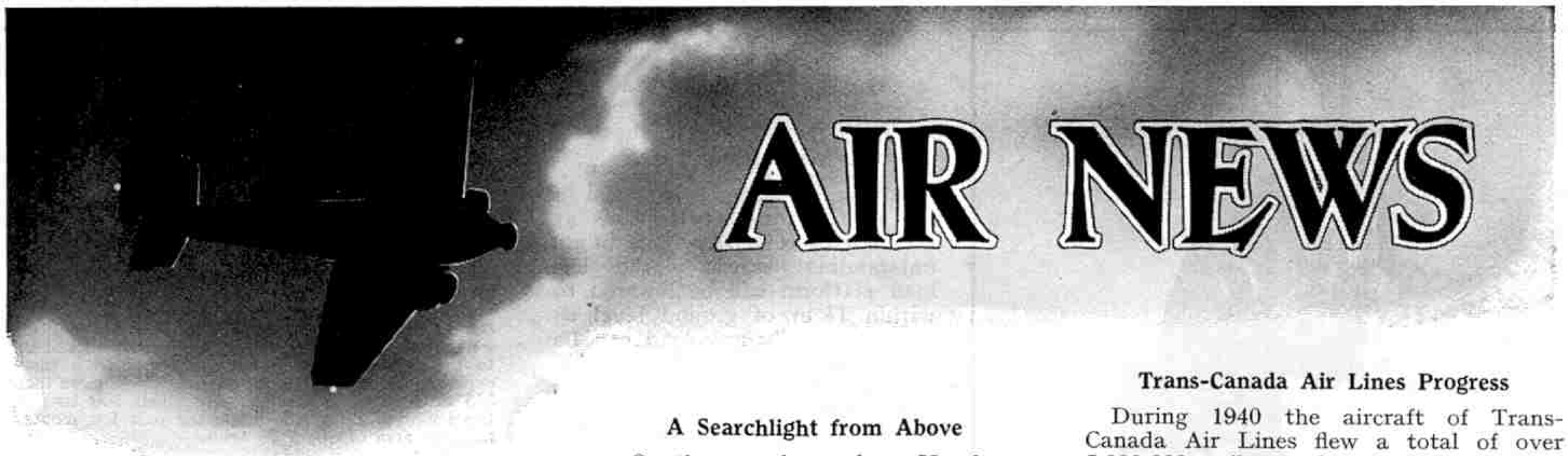
The coal from the wagon falls into an inclined triangular pan, 67 ft. wide at its base on the tower and 5 ft. at its apex, from which it passes through a telescopic chute extending to the bottom of the ship's hold. This pipe is fitted with an automatic coal trimmer. To prevent the coal being broken into small pieces the triangular pan is fitted with baffles faced with rubber, and the chute is kept full so that the coal is really discharged in a continuous flow rather than a series of falls. There are three operators, one near the tower to control the barney that pushes the wagons up the incline and the starting of the lifting cradle; one in the tower to control the cradle, and one in a cabin at the apex of the pan to control the chute and coal-trimming device.

SWEDISH OIL RECLAIMING DEVICE

A device for reclaiming lubricating oil from ships' bilge water has been invented by two Swedish engineers. When tested in connection with three tug boats the device is stated to have effected a saving in oil of 75 per cent. over a period of four months. A further good feature of this new device is that its use avoids the fouling of the water in docks and harbours by the discharge of oil-contaminated bilge water.



The "Lo-Load" lifting truck described on this page. In the illustration on the left the truck operator has lowered the platform and is pushing it under a machine. The centre picture shows the platform raised, while on the right the truck is seen being hauled away with its load. Illustrations by courtesy of E. H. Jones (Machine Tools) Ltd., London.



Boeing Flying Boats for British Airways

Three of the six Boeing 314A flying boats ordered by Pan American Airways are being transferred to the British Government, and five British Airways pilots, Captains Kelly Rogers, Shakespeare, Rotherham, Alderson, and Lorraine, have been sent to the United States to fly the aircraft to England. It is expected that these aircraft will be used for the British transatlantic service this year.

The photograph on this page shows the huge hull of the first of the six new flying boats being moved out of the too-small assembly building to the dock, where the wings, tail unit, sponsons, and engines, will be fitted into place. Work on these aircraft has been speeded up, and it is hoped to complete and deliver all of them by the middle of this summer instead of early in 1942, as originally planned. This accelerated production will help to clear the Boeing factory for work on national defence orders.

The Boeing 314A flying boats are identical in size and design with the 314 type "Clippers" operating Pan American Airways services across the Atlantic and Pacific Oceans, but have important improvements. The engines of the new flying boats are Wright "Cyclone" 14s, each developing 1,600 h.p. for take-off instead of the 1,500 h.p. of the engines in the earlier "Clippers," and the Hamilton airscrews are of larger diameter and improved blade design. The sponsons of both series of flying boats are the same size, but the fuel tanks in those of the new aircraft have been enlarged to hold an additional 1,200 gall., which increases the total fuel capacity to 5,400 gall. These changes result in improved performance of the flying boats, quicker take-off, greater carrying capacity, and increase of cruising range to more than 4,000 miles.

Although Pan American Airways will now receive only half of the new equipment they had ordered they expect, with the help of their re-conditioned flying boats *"Yankee Clipper," "Dixie Clipper,"* and *"Atlantic Clipper,"* to be able to operate a non-stop transatlantic service six times weekly. These older aircraft have been modified to enable them to cope with the greater traffic on the transatlantic service, and they now have engines, airscrews, and fuel tanks like those in the new flying boats. About 1,700 lb. in weight has been saved by removing certain internal equipment.

* * * *

American Airlines, Inc., one of the big air transport operators in the United States, claims to be the first air company to have carried 3,000,000 passengers. Their first passenger was flown on the 1st April, 1927.

A Searchlight from Above

On the way home from Hamburg the other night an R.A.F. bomber ran into heavy A.A. fire and the blaze of many searchlights near the Elbe entrance to the Kiel Canal.

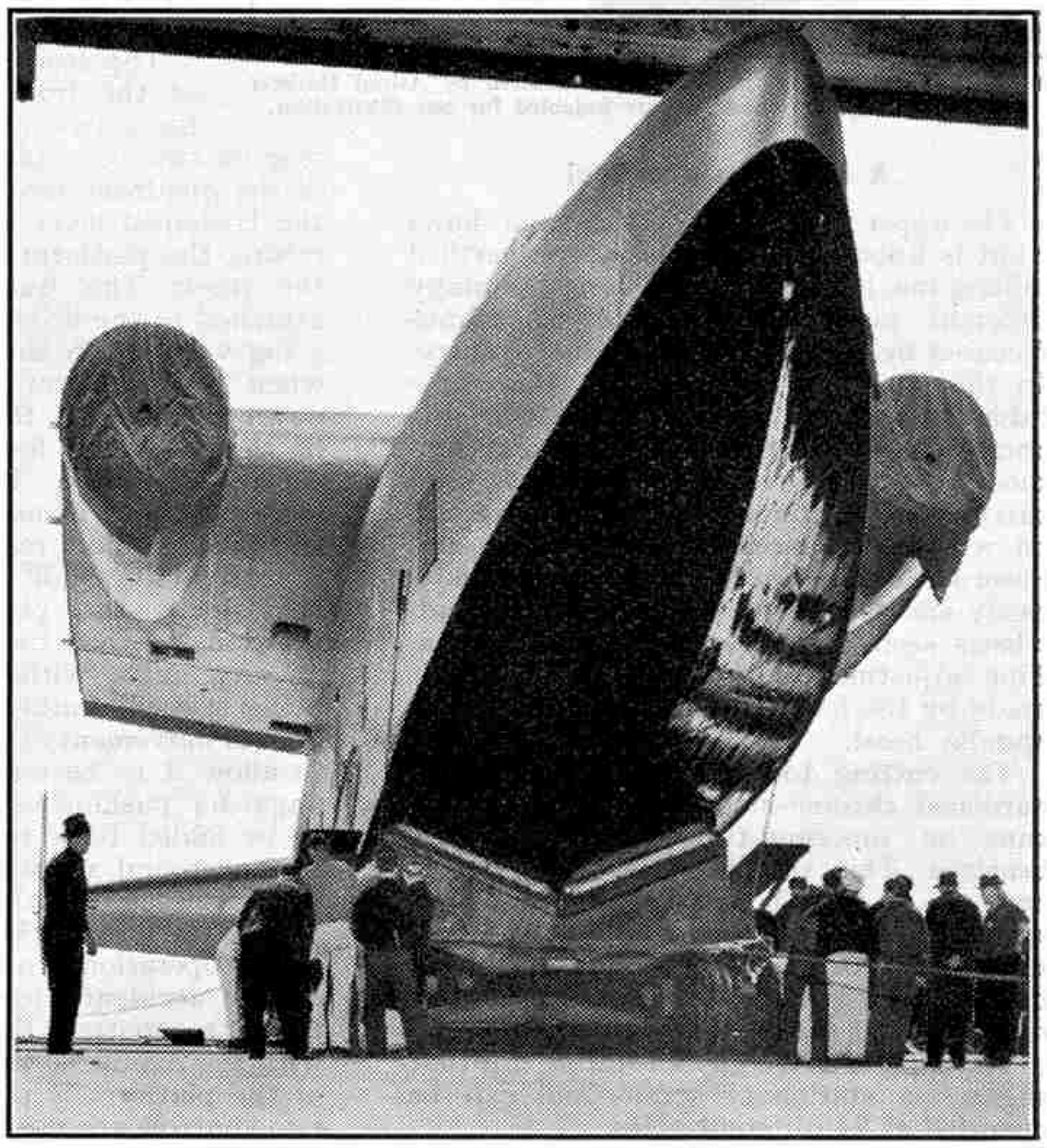
"As the defences were being so troublesome," said the pilot afterwards, "we came down to 200 ft. to machine-gun the lights. We all took a hand, the two rear gunners, the navigator, and myself, and between us we let off 1,350 rounds. Three of the lights were blotted out, but the others still held us; we were all lit up. So we came down lower still—to 50 ft.—and for a time that foxed both the lights and the guns. Just as we were congratulating ourselves a searchlight shone down on us from above. It was on a hill well above our own height, and I must say it startled us for a few moments, but we got clear in the end.

"The next thing was a very unpleasant smell of petrol. The rear gunner reported that petrol was splashing against the outside of his turret. I thought at first that one of the starboard petrol tanks had been torn open, and I told the wireless operator to find out where the leak was, but within a few moments it was obvious that all the starboard tanks were rapidly emptying and that the main tank feeding the starboard engine had been hit.

"So I opened up both engines to get as far as possible before the starboard engine gave out. It failed when we were just south of Scharhorn Island, and for the rest of the way we had to fly on one engine. We jettisoned some of our stuff to lighten the aircraft, and the one engine took us faithfully home across the North Sea."

* * * *

China National Aviation Corporation, a company associated with Pan American Airways, has completed a survey flight between Chungking, China, and Delhi, India. A Douglas DC-2 air liner was used.



The large hull of a Boeing 314A flying boat being transferred from the assembly building to the dock, where the wings, tail surfaces, sponsons, and engines will be added. Photograph by courtesy of the Boeing Aircraft Corporation, U.S.A.

Trans-Canada Air Lines Progress

During 1940 the aircraft of Trans-Canada Air Lines flew a total of over 5,000,000 miles and transported 55,000 passengers, nearly 1,000,000 lb. of air mail, and 100,000 lb. of express freight.

New air routes introduced during the year brought the company's total route mileage up to nearly 4,000 miles. The first of the new services linked Montreal and Moncton, where connection is obtained with air liners for Prince Edward Island and the Atlantic ports of Halifax and St. John. In July 1940 a service between Toronto, London, and Windsor, Ontario, was inaugurated. On the Montreal, Toronto, Vancouver air route the frequency of the service was increased to two flights daily, and on the Montreal, Toronto, Ottawa route to four flights each way.

Record Aircraft Diving Speed

A new "Airacobra" interceptor pursuit aeroplane produced by the Bell Aircraft Corporation, U.S.A., is stated to have attained a speed of 620 m.p.h. when diving during a recent test flight. The previous highest recorded speed for an aeroplane dive was 575 m.p.h., achieved by a Curtiss Hawk 75 fighter. The "Airacobra" is a low wing monoplane.

Another New R.A.F. Bomber

The upper photograph on this page is a fine broadside view of one of the new Douglas "Boston" twin-engined bombers for the Royal Air Force. This high-speed day bomber normally carries a crew of three, consisting of a pilot, who occupies an enclosed cockpit just forward of the wings, a bomb aimer, whose station is in the transparent nose of the fuselage, and a wireless operator, who also acts as rear gunner and occupies a position to the rear of the wings. The latest version of this machine, the "Boston III," is fitted with two 1,600 h.p. Wright "Cyclone" engines and has a top speed of 350 m.p.h. This version of the bomber will follow the "Boston IIs," which have 1,050 h.p. Pratt and Whitney "Twin Wasp" engines and are now being delivered to the R.A.F.

British Airways Coat of Arms

The illustration at the foot of this column shows the Coat of Arms designed by the College of Heralds for the British Overseas Airways Corporation.

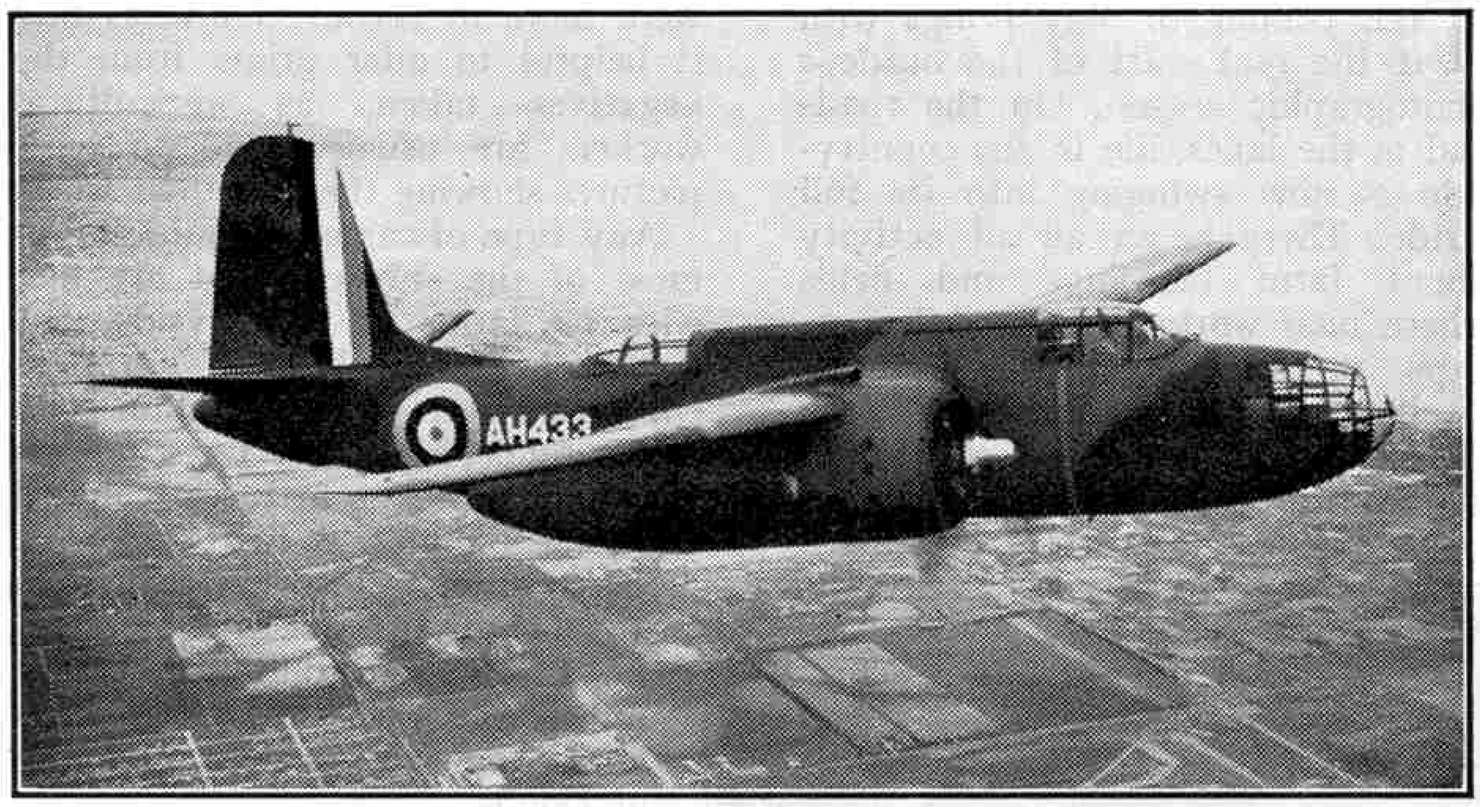
In this Coat of Arms the Supporters are two winged lions, one standing on the ground and the other on the sea, representing our land and sea services respectively. These two winged lions are wearing collars, denoting control, that is, controlled flying as well as some form of official control.

The Shield is composed of a winged lion's face wearing an astral crown that symbolises achievement in the realm of the air. It has four pointed stars, each one between two wings conjoined at the base. The Helmet resting on the shield is that used in heraldry by Corporations and Public Utility Companies. The Crest is placed on a wreath of the Corporation's "livery" colours, which are gold and blue. The clouds above the crest are represented in the usual heraldic manner.

The Mantling below the wreath is a decorative addition, and has no special significance.

The Latest "Spitfire" Fighter

Details of the latest version of the famous Vickers-Supermarine "Spitfire" single-seater fighter are now available for publication. It is equipped with shell-firing cannon, and already in service has proved to be even more deadly to the enemy than the earlier "Spitfires." Modifications to the airframe and the boosting of the Rolls-Royce "Merlin" engine have greatly improved the performance of the machine, and it now has a top speed of about 400 m.p.h. R.A.F. pilots who have flown the improved "Spitfire" have been delighted with it, and have demonstrated that its powers of manœuvre are greater than ever.



A fine view of one of the Douglas "Boston" twin-engined bombers for the Royal Air Force. Photograph by courtesy of the Douglas Aircraft Company, U.S.A.

At first these new "Spitfires," called the Mark III type, were produced with the wings clipped by the removal of the detachable wing tips, a modification that reduced the wing span to 33 ft. 8 in. and changed the appearance of the machine completely. The wing tips have now been restored.

Arctic Survey Flight

On the 6th March last the *"U.S.S.R. N.169,"* a 4-engined Soviet aeroplane, began a long survey flight over the eastern part of the Arctic, during which aerial photographs will be taken of the outline of the icefields. The crew of 10 aboard the machine includes three scientists, and a general study of ice conditions in the area surveyed will be made. The information gathered will be used in forecasting ice conditions in the Arctic navigation season this year. The route planned for the survey flight is via Archangel, Rudolf Island, Cape Molotov, Wrangel Island and territory to the north of the island, and includes areas that have never been flown over before.

The Coat of Arms of the British Overseas Airways Corporation, to whom we are indebted for this photograph.

Indian Air Service Developments

Good progress is being made with a £1,500,000 scheme for developing civil aviation in India. The Bombay-Cochin section of a trans-Indian air route is to be put in hand. A preliminary survey has been made of an air route to link Bombay and Calcutta, and the preparation of this route will follow completion of the Bombay-Cochin air line. Good sites for aerodromes have been chosen at Nagpur and Jubbulpore, and proposed improvements at Lahore, Cawnpore, and other important aerodromes are being considered.

Training the Night Fighter Pilot

Night fighter pilots, whose successes have been an encouraging feature of recent official bulletins, are adopting every possible device to aid them in their search for the elusive Nazi raider between dusk and dawn.

The proverbial "black cat in a coal cellar" is not more difficult to spot than an aircraft on a starless night. Pilots whose duty it is to find the raider and bring him down must develop eyesight as sensitive to shadows of varying intensity as are those of sailors watching in the dark for the loom of an unlit reef. The pilots therefore sit in a dimly-lit room wearing green goggles for some time before they go on patrol, to accustom their eyes to seeing with the minimum of light. By this and other means they induce their eyes to become receptive to illumination so faint as to be invisible to ordinary sight.

So trained the night fighter pilot patrols overhead with eyes as quick as a cat's to spot a moving shadow. He must have speed as well as clearness of vision, as both he and the raider are moving fast, and the fighter pilot has his controls to watch as well as the sky.

One of these pilots relates that while in the air one night of shifting cloud he saw what he thought was the flicker of an enemy exhaust. He gave chase, the light winking and vanishing ahead of him. Just as he fancied he was coming within range a wider gap in the clouds revealed the light as that of a rising star. Disgusted he swung round and came back home.

Curtiss "Tomahawks" in Service with the R.A.F.

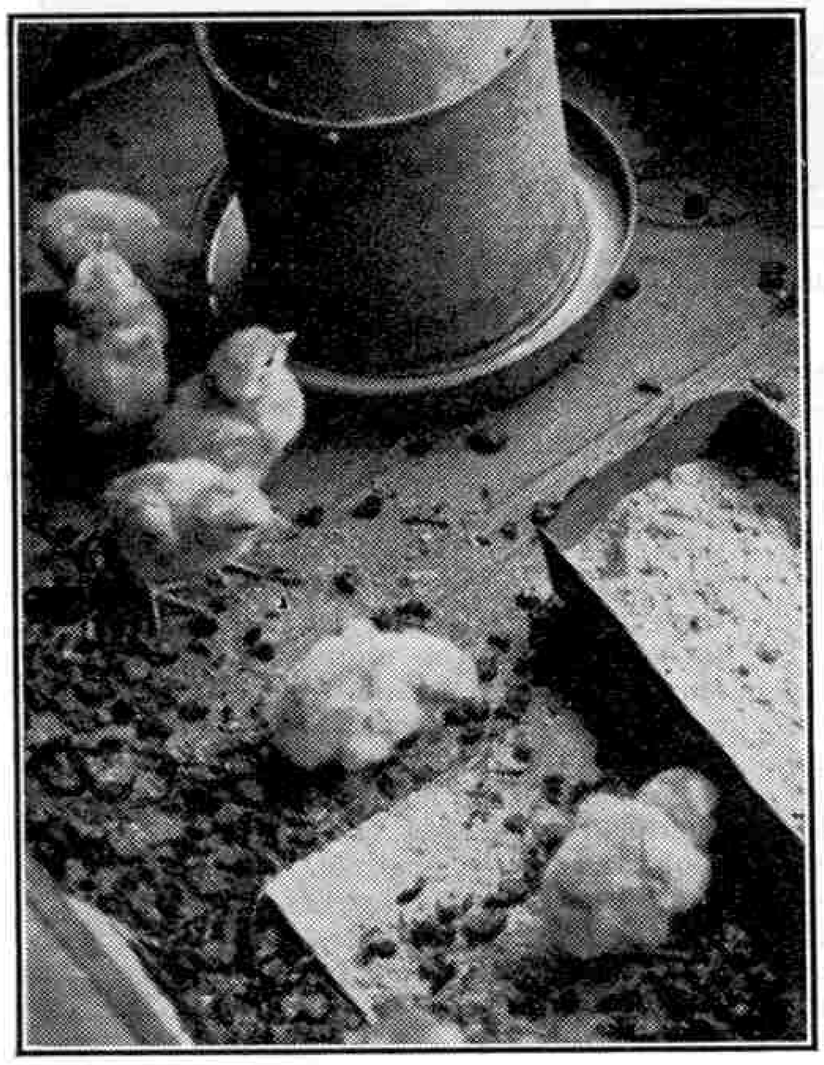
Large numbers of Curtiss "Tomahawk" single-seater fighters have reached this country for the Royal Air Force. In test flights here this American fighter has compared favourably with the "Hurricane." It is a low wing monoplane of 37 ft. 3½ in. span and is the first American aeroplane to be delivered to Britain equipped with the Allison 12-cylinder liquid-cooled Vee engine. This engine gives the machine a top speed of about 330 m.p.h. The undercarriage is retractable, and when drawn up the wheels lie flat in the wings.

The "Tomahawk" is armed with six machine guns, four of them in the wings. The other two guns are mounted on top of the engine cowling and fire through the airscrew disc, through interrupter gear.

Photography

Down on the Farm

THE coming of May brings with it the real start of the outdoor photographic season. On the roads and in the lanes, life in the countryside is now swinging into its full stride. There is an air of activity about farm buildings and fields where men work, which, while perhaps unnoticed by the country dweller, is full of interest to the photographer, and will provide him with splendid material for exposures that will keep him occupied for a long time.



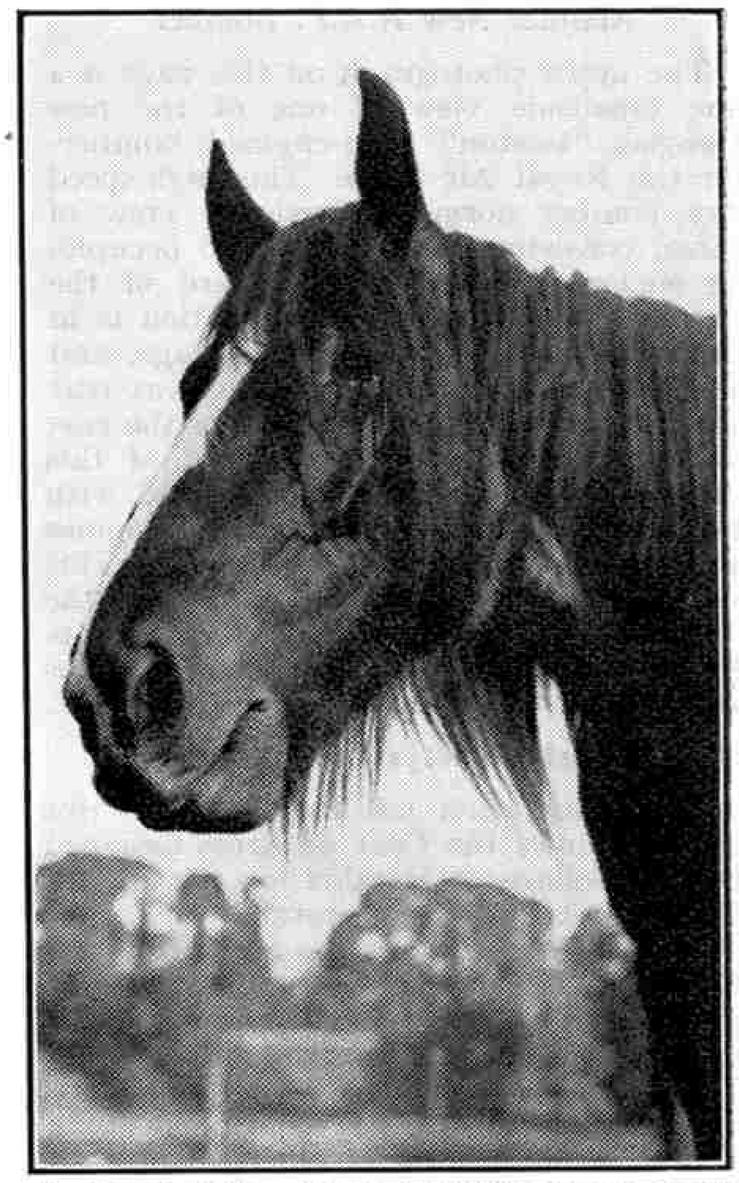
"Spring Chickens." A novel "snap" by J. Taylor, Bradford.

Most farmers if approached in a proper manner will give permission to take photographs on their premises, and once this permission is obtained there will be no difficulty in finding ample material for an extensive collection of prints. Now is the right time to start making pictures of this type, and a further advantage is that the nature of farm work varies greatly with the seasons, so that further visits, say in mid-summer and again in the autumn, will produce completely different sets of pictures.

Usually one finds country workers very willing to assist by posing at their jobs, and sometimes they are very picturesquely dressed, although this feature is not so common now as it was when beards and smocks were more in favour. I always find it helpful to offer prints from the negatives taken, as agricultural workers are usually glad to have pictures showing them at their work.

Any type of camera is suitable for most of the subjects that are met with on farms or countryside, but it will be found best to use panchromatic films so as to obtain good colour rendering of any trees, flowers or other landscape features included in the pictures. A light yellow or green filter is also a useful item to include in one's equipment, but this is not absolutely necessary unless one wishes to photograph landscapes with a good rendering of clouds.

As to the subjects to be photographed, these obviously must depend very largely upon individual choice and the particular farm or locality concerned. The best plan is to prowl around making exposures as interesting pictures crop up, at the same time making mental notes of subjects that seem likely material for attention at a later visit. I also find it a wise plan whenever I come across a really good subject, to make two exposures on it, though not necessarily from exactly the same viewpoint. My reason for mentioning this is that so many little things may happen in the excitement of taking the picture, such as incorrect focussing, camera wobble or slight movement of subject, which might ruin the picture. I remember particularly an occasion when a picture I had tried many times to obtain suddenly came my way. Lighting conditions and viewpoint were perfect, and eagerly I made an exposure. Imagine my disgust and disappointment to find when the film was developed that my prized picture was ruined owing to the fact that the film had not been wound on after the previous exposure!



A typical farm subject photographed by J. M. Demanuele, Valetta, Malta.

Pictures of animals naturally demand a prominent place in a collection of prints designed to illustrate life and work on a farm. Most of these can be photographed outdoors in the fields, where light conditions will usually be good enough to allow "snap" exposures to be made even with a lens aperture no larger than F.8.

As farm work is now of such great national importance owing to the war, even more care than usual should be taken to avoid getting in the way of the farm workers or causing damage of any kind.

These sheep were quite unconcerned by the presence of the photographer, H. Rawcliffe, Huddersfield.

New Meccano Models

A Roman Ballista and a Windmill Pump

BEFORE gunpowder was invented, opposing armies used machines for hurling large stones and flaming materials at each other, particularly in siege warfare. The Romans were past masters in this kind of warfare and one of the best known of their machines was the ballista. How this worked is shown by the operation of the attractive model seen in Fig. 1. This model can be used for shooting paper pellets or other light missiles, and will provide real fun as well as excellent practice in Meccano construction.

Construction of the model is begun by building the chassis, which consists of two 12½″ Angle Girders 1 bolted together to form a channel girder. Two such girders are secured at the forward end to a 4½″ Angle Girder, to which also is attached a Girder Frame 2. At the rear the channel girders are bolted to 4½″ and 5½″ Strips. Travelling wheels are mounted on 6½″ Rods journalled in the Girders 1.

The throwing arm 4 is built of two 7½″ Angle Girders, which are pivoted at their lower ends on a 5″ Rod journalled in the chassis. A length of Cord is tied to one end of the bow 3 and its other end is passed through corresponding holes in the arm 4 and then tied to the other end of the bow.

The throwing arm is drawn back by means of a winding drum 5, which is rotated by a capstan at each end. A 6″ Screwed Rod 6 is inserted in the rear end of the chassis and two Sleeve Pieces are held on this Rod between ¾″ Discs by Nuts, so that a Rod inserted in the capstan at one end is at right angles to a similar Rod inserted at the other end. A Chimney Adaptor is bolted to each of the Sleeve Pieces by Bolts 7, and to these are tied the ends of a length of cord.

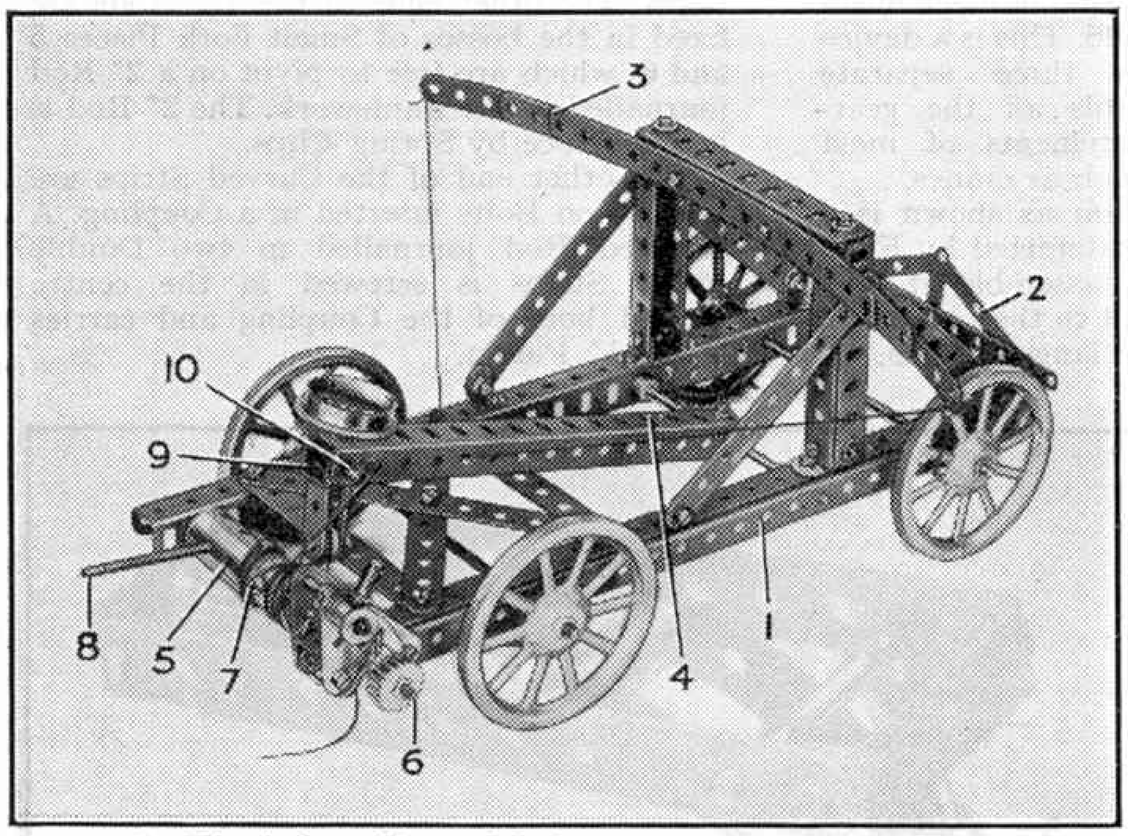


Fig. 1. A working model of a Roman military machine.

Two Couplings are fixed on the Rod 6 between the outer ¾″ Discs and the Chimney Adaptor, Washers being used for spacing purposes. The outer end bores of the Couplings coincide with the outer holes of the Sleeve Pieces, so that a 2″ Rod 8 can be inserted in them. A Ratchet Wheel is fixed between two Nuts on one end of the Rod 6. A Pawl fixed on a 1½″ Rod that is journalled in two 1½″ Corner Brackets bolted to the chassis engages the teeth of the Ratchet Wheel.

A handle is provided for disengaging the Pawl and the Ratchet Wheel when the machine is to be prepared for operation. This consists of a Threaded Pin secured in the tapped bore of the boss of the Pawl, which is kept in close contact with the teeth of the Ratchet by a length of Spring Cord. The cord attached to the winding drum by the Bolts 7 is passed over a loose ½″ Pulley that is free to pivot on a ½″ Bolt, which is journalled in the end holes of a Single Bent Strip bolted to a Double Bracket 9. This Double Bracket is fixed to the end of the arm 4 by a release pin 10, which consists of a 1″ Rod that carries a Cord Anchoring Spring. A length of cord is tied to this Spring.

To operate the machine the throwing arm is pulled backward by turning the winding drum, and the missile is then placed in the cup formed by the 1⅛″ Flanged Wheel. The Cord attached to the release pin 10 is then pulled sharply so that the arm is released. To reset the machine, the Pawl is disengaged from the Ratchet Wheel, and the Double Bracket 9 is placed in position at the upper end of the arm 4 and held in place by the release pin 10.

Parts required to make model ballista: 1 of No. 1; 1 of No. 1a; 1 of No. 1b; 2 of No. 2; 6 of No. 2a; 4 of No. 8; 2 of No. 8b; 3 of No. 9a; 4 of No. 9b; 1 of No. 11; 8 of No. 12; 2 of No. 14; 1 of No. 15; 1 of No. 17; 1 of No. 18a; 1 of No. 18b; 4 of No. 19a; 1 of No. 20; 1 of No. 23; 55 of No. 37a; 44 of No. 37b; 17 of No. 38; 1 of No. 40; 1 of No. 58; 2 of No. 58b; 5 of No. 59; 2 of No. 63; 1 of No. 79a; 1 of No. 102; 2 of No. 111a; 2 of No. 111c; 1 of No. 113; 1 of No. 115; 2 of No. 133; 1 of No. 147a; 1 of No. 148; 2 of No. 163; 2 of No. 164; 1 of No. 176; 3 of No. 217b.

The model windmill pump shown in Fig. 2 is constructed from the parts in Outfit No. 4. It is begun by building the base, to form which two 5½″×2½″ Flexible Plates are bolted to the ends of two 4½″×2½″ Flexible Plates, which in turn are bolted to the ends of half a Hinged Flat Plate.

A No. 2 Clockwork Motor 3 is secured to a 5½″×2½″ Flanged Plate 4 by two ⅜″ Bolts, but is spaced from it by Washers. The Flanged Plate is secured to the left-hand side of the base, and a 3½″ and a 2½″ Strip, bolted to its long flanges, are attached to the right-hand side by a 2½″×½″ Double Angle Strip.

Four 12½″ Strips are bolted to the Flanged Plate 4 and are joined at their upper ends to 2½″×½″ Double Angle Strips, the right-hand pair of Strips being secured to Flat Brackets bolted to the Double Angle Strips. The roof is formed from two

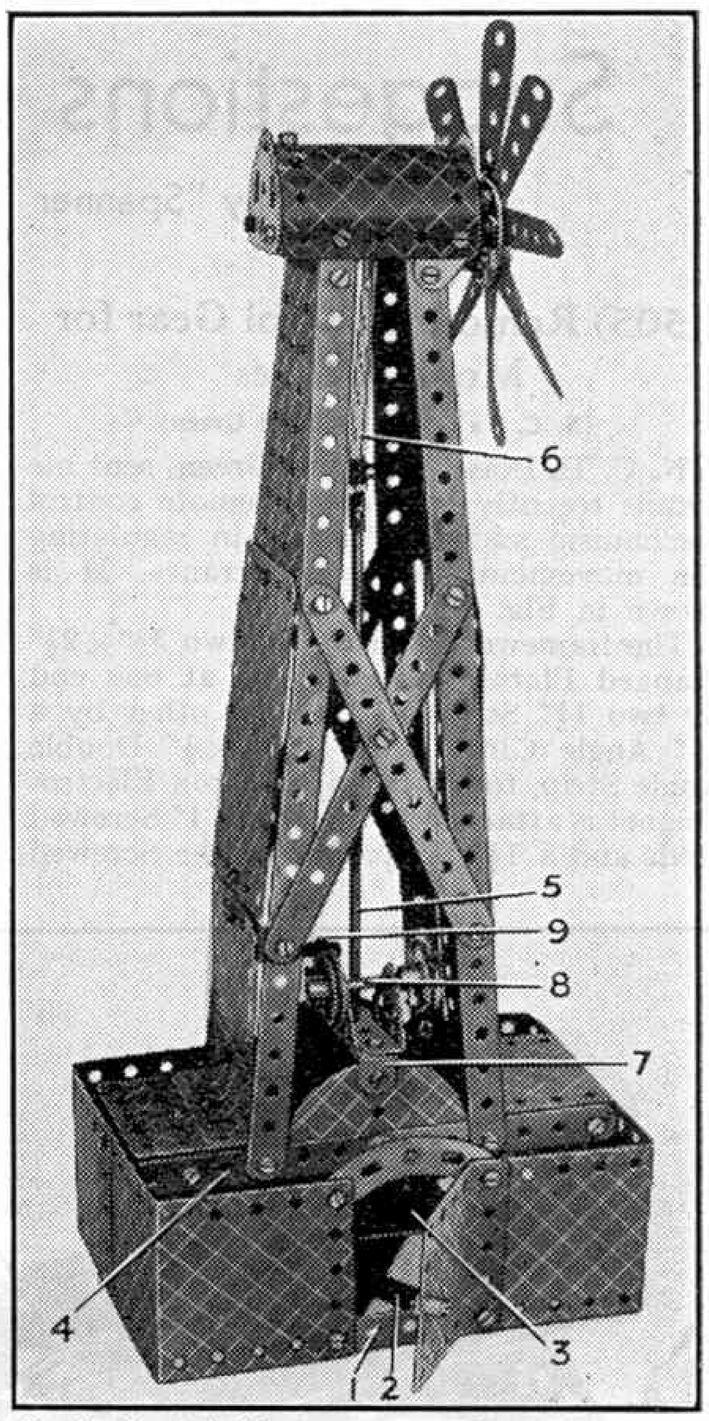


Fig. 2. A windmill pump operated by a No. 2 Clockwork Motor. It is built from parts in Outfit No. 4.

U-section Curved Plates overlapped and attached to the Double Angle Strips, the turned-up ends of which are bolted to Flat Trunnions.

The tower is braced by 5½″ Strips, and the front and back are filled in with Flexible Plates, Sector Plates and half a Hinged Flat Plate. The sails are mounted on a 1½″ Rod journalled in one of the Flat Trunnions and a ½″ Reversed Angle Bracket.

The pumping shaft 5 and its crank are now built up and placed in position. The crank is a ½″×½″ Angle Bracket, one arm of which is bolted to the boss of a 1″ Pulley, a 3½″ Strip 6 being lock-nutted to the other arm of the Angle Bracket. The 3½″ Strip 6 is pivotally connected to a Rod and Strip Connector that carries a 4″ Rod. This Rod is journalled in the 2½″×½″ Double Angle Strip bridging the 5½″ Strips, and its other end is attached to another 4″ Rod by a Rod Connector.

The second 4″ Rod is supported in a 2½″×½″ Double Angle Strip 7 bolted to two Semi-Circular Plates, and Trunnions attached to the Double Angle Strip provide bearings for a 1½″ Rod 8 that carries two 1″ Pulleys. The crank unit is secured on the axle of the sails, and a length of cord is passed around the Pulley of the crank unit and one of the Pulleys on Rod 8.

The driving shaft of the Motor is replaced by a 3½″ Rod 9.

Parts required to make model windmill pump: 4 of No. 1; 8 of No. 2; 2 of No. 3; 9 of No. 5; 4 of No. 10; 6 of No. 12; 2 of No. 15b; 1 of No. 16; 2 of No. 18a; 3 of No. 22; 1 of No. 24; 1 of No. 35; 81 of No. 37a; 75 of No. 37b; 8 of No. 38; 1 of No. 40; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54a; 1 of No. 90a; 3 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 176; 1 of No. 186; 1 of No. 188; 4 of No. 190; 2 of No. 191; 2 of No. 192; 1 of No. 198; 2 of No. 199; 1 of No. 212; 1 of No. 213; 2 of No. 214. 1 No. 2 Clockwork Motor.

Suggestions Section

By "Spanner"

(505) Remote Control Gear for Model Cranes

(N. C. Ta'Bois, Woodford Green)

N. C. Ta'Bois, Woodford Green, sent me details recently of a novel remote control mechanism suitable for use in regulating the movements of model cranes. It is shown in Fig. 505.

The framework consists of two $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plates, spaced apart at one end by two $1\frac{1}{2}''$ Strips and at the other by a $1\frac{1}{2}''$ Angle Girder and a $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip, to which an Elektron Electromagnet is attached by means of 1″ Screwed Rods and a $1\frac{1}{2}''$ Strip. One of the Screwed Rods carries a further $1\frac{1}{2}''$ Strip to which is fixed an Angle Bracket, which in turn carries a $\frac{3}{8}''$ Bolt fixed in place by two Nuts and hence adjustable.

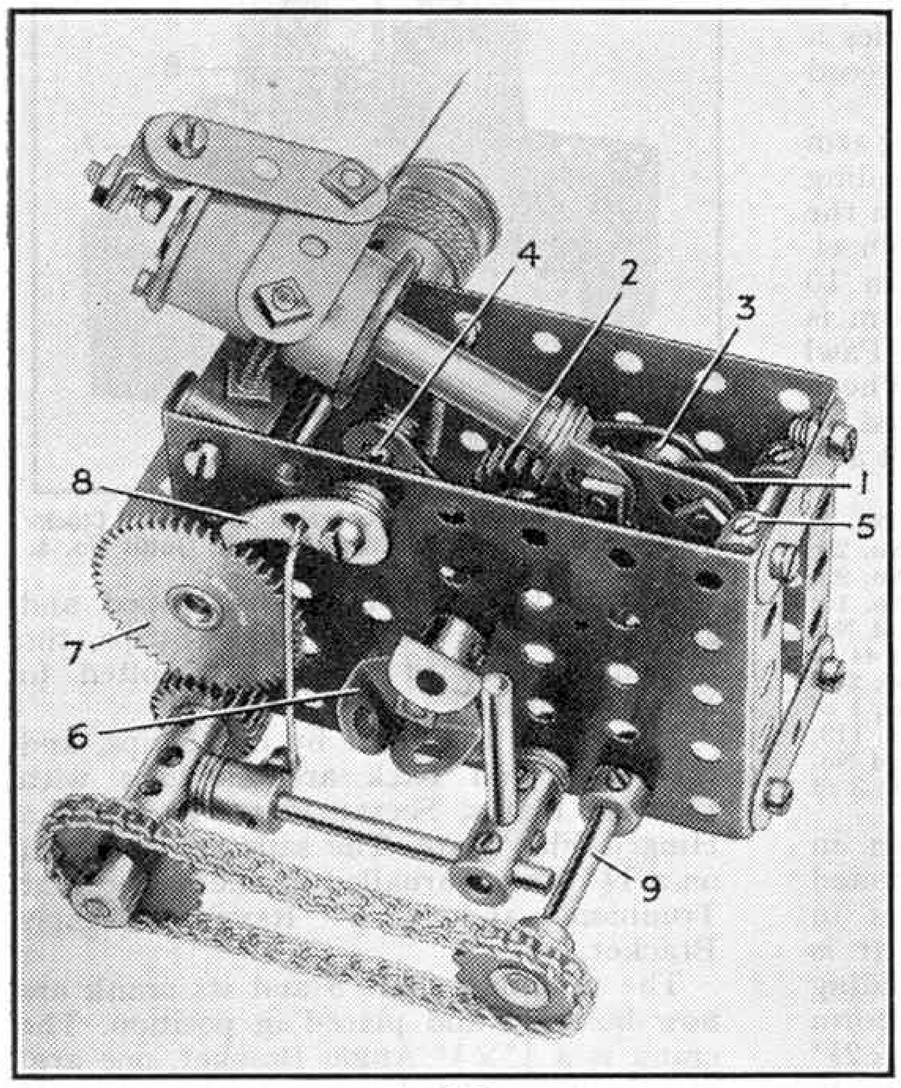


Fig. 505.

The core carries a $\frac{1}{2}'' \times \frac{1}{2}''$ Angle Bracket, which is pivotally attached to a 2″ Strip 1 bolted to a Crank that is free on a 2″ Rod. This Rod carries a Rod Socket, a Collar, two Washers, the Crank already mentioned and a Ratchet Wheel 2. A Pawl 3 pivoted to the 2″ Strip engages the Ratchet Wheel. It must be arranged that every time the core is drawn into the Magnet the Ratchet Wheel 2 turns through a distance equal to two of its teeth, no more and no less. As there are 20 teeth, the Ratchet Wheel turns through 1/10th of a revolution, and it is prevented from a retrograde movement by a Pawl without boss 4. A length of Spring Cord is fixed to the boss of the Crank and to the $1\frac{1}{2}''$ Angle Girder at the rear, and serves to return the Core to its original position when no current flows through the Magnet.

The Rod Socket already mentioned forms the basis for a five-face cam 6, which consists of three $\frac{1}{2}'' \times \frac{1}{2}''$ Angle Brackets bolted to the Rod Socket by their elongated holes and arranged as shown. The cam has in effect five faces, and as it turns through 1/10th of a revolution each time, a $1\frac{1}{2}''$ Rod touching the cam bears alternately against the face and the corner of an Angle Bracket.

The $1\frac{1}{2}''$ Rod is journalled in a Coupling that also carries a 2″ Rod, which in turn supports a $1\frac{1}{2}''$ Rod carrying a 1″ Sprocket Wheel and a $\frac{1}{2}''$ Pinion Wheel. A Pawl without boss 8 engages the 50-teeth Gear 7 only when it is out of mesh with the $\frac{1}{4}''$ Pinion. A stout piece of wire fixed to the Pawl as shown automatically lifts it free of the 50-teeth Gear.

To form the control lever a $3\frac{1}{2}''$ Rod is pivotally mounted at its lower end. When the lever is pushed forward it momentarily touches an insulated Flat Bracket and completes the electromagnetic circuit, the Magnet being energised just long enough to bring the Gear and Pinion into mesh. On pulling the lever back the circuit is again momentarily completed and the Gear and Pinion are brought out of mesh.

(506) Simple Gear-Box for Model Cranes

(E. L. Barras, Richmond, Yorks.)

Readers who are unable to assemble the more complicated types of gear-boxes will be interested in the simple mechanism shown in Fig. 506. This is a device that provides three separate drives and fulfils all the gear-changing requirements of most small models such as cranes.

The mechanism as shown is a modification of an idea submitted by E. L. Barras, Richmond. To assemble it two Flat Trunnions are bolted to the turned-up flanges of a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate, to provide the bearings for the driving shaft 1 and also for the shafts 2 and 3, which if the device is to be used in a crane, form the luffing and hoisting barrels. The drive is transmitted to the travelling wheels by a slideable $2\frac{1}{2}''$ Rod 4, carrying a $\frac{1}{2}''$ Pinion that moves in and out of mesh with a Worm 5 on the driving shaft. Rod 4 is journalled in the Plate and a Double Bent Strip bolted to the Plate.

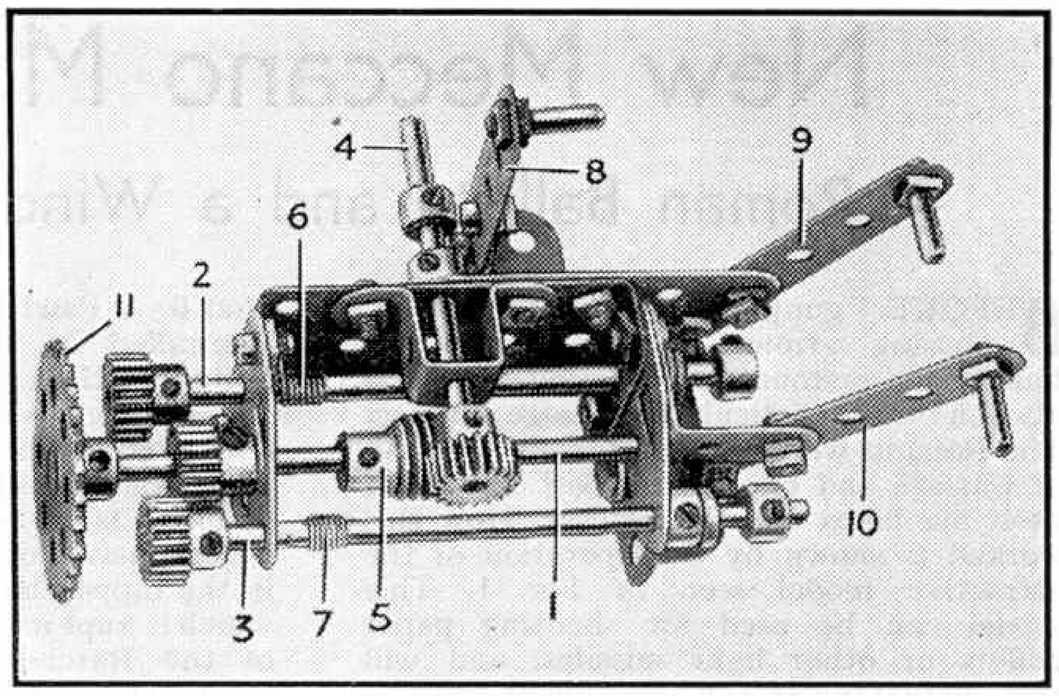


Fig. 506.

The hoisting and luffing shafts are 4″ Rods slideable in their bearings, and they carry $\frac{1}{2}''$ Pinions and Cord Anchoring Springs 6 and 7, to which the hoisting and luffing cords are tied. The Pinions on Rods 2 and 3 can be moved into or out of mesh with the $\frac{1}{2}''$ Pinion on the Rod 1, and that on Rod 4 into or out of mesh with the Worm 5, their movements being controlled by levers consisting of $2\frac{1}{2}''$ Strips 8, 9 and 10.

(507) A Retractable Undercarriage

(A. F. Brown, Oldbury)

Fig. 507 shows a small retractable undercarriage designed by A. F. Brown, Oldbury. This can be used in constructing model aeroplanes, either for the landing wheels or for the tailwheel.

The framework of the device consists of two Strips of suitable length that are spaced apart by three $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips. The wheel, a 1″ Pulley fitted with a Tyre, is free to pivot on a 1″ Screwed Rod that is inserted in the tapped bores of two Collars 1 and 2. A $1\frac{1}{2}''$ Rod is inserted in each Collar, and two further Collars 3 and 4 fixed on these Rods are pivotally secured to $2\frac{1}{2}''$ large radius Curved Strips by Bolts secured in their tapped bores. The other ends of the $1\frac{1}{2}''$ Rods are fixed in the bosses of Small Fork Pieces 5 and 6, which are free to pivot on a 2″ Rod journalled in the framework. The 2″ Rod is held in place by Spring Clips.

The other end of the Curved Strips are pivoted on Bolts inserted in a Coupling. A Screwed Rod journalled in two Double Angle Strips is screwed in the centre tapped bore of the Coupling and carries a $\frac{1}{2}'' \times \frac{1}{2}''$ Pinion.

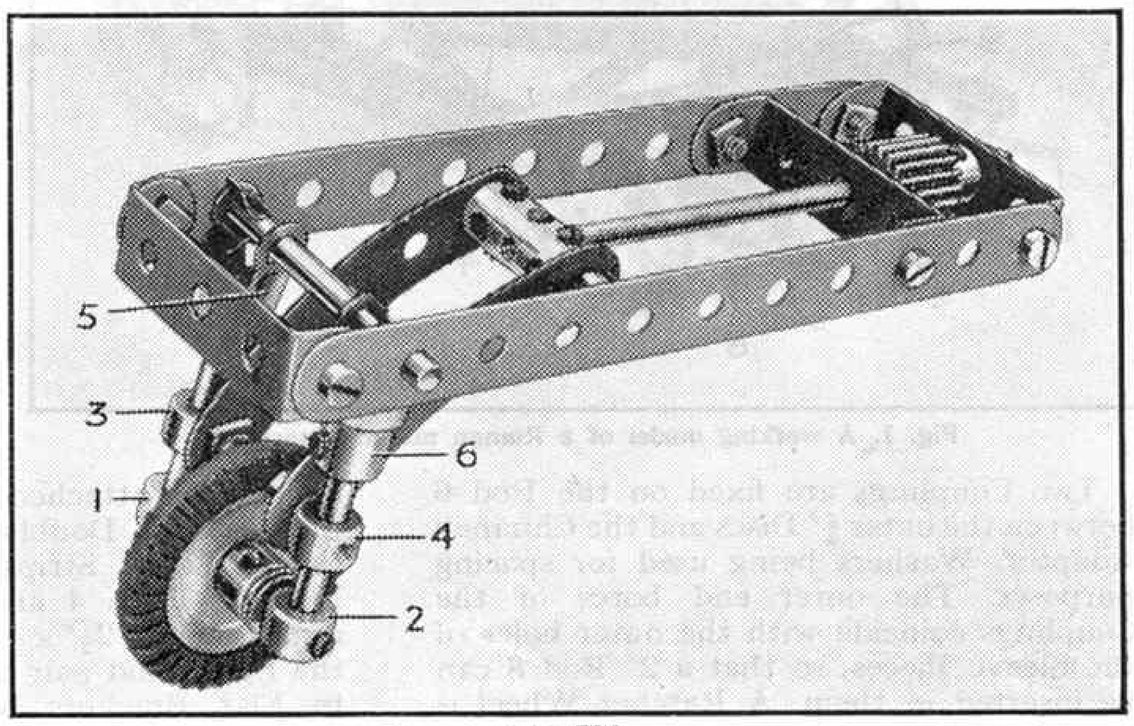


Fig. 507.

Meccano Competitions

By "Spanner"

"Birds and Beasts" Model-Building Contest

With the object of providing model-builders with a change from the usual type of construction we are organising this month a novel contest to which we have given the title *"Birds and Beasts"* Competition. Under this title we include fish, reptiles, insects, and in fact all living things, except human beings! Curiously life-like models of this kind can be constructed from Meccano parts, and as there are great possibilities for ingenuity in devising working models reproducing animal movements, the competition offers very wide scope for originality. Some creatures lend themselves specially well to model-building, and many of them are particularly suitable subjects for caricature or humorous construction.

In order to take part in this Contest competitors should make Meccano models of any birds or beasts, and then secure either photographs or good drawings of their models and send them to this office. Neither photographs nor drawings need be the competitor's own work, but the model itself must be the result of his own efforts.

Competitors may build their models either solid or in the flat, to resemble a drawing, according to their wishes and the quantity of Meccano parts available. Any number of parts may be used and a competitor may submit more than one entry, provided that all his entries are sent in the same envelope.

The Contest will be divided into two sections: A, for competitors of all ages living in the British Isles; B, for competitors of all ages living overseas. The closing date for Section A is 30th June, and for Section B 31st October. Each competitor must write his age, name and address on the back of each photograph or drawing sent in, and envelopes should be addressed *"Birds and Beasts Contest,"* Meccano Ltd., Binns Road, Liverpool 13.

The prizes offered in each section for the most interesting and ingenious models received are as follows: First, Cheque for £2/2/-; Second, Cheque for £1/1/-; Third, Cheque for 10/6. There will be also several consolation awards.

We intend to illustrate a selection of the best entries received in the *"M.M."*

Results of the "Christmas" Model-Building Competition

The annual "Christmas" Competition always produces a fine crop of models, and the 1940 Contest, announced in the December *"M.M."*, attracted as good a collection of entries as any of the preceding competitions, in spite of the difficulties and disturbances due to evacuation and wartime conditions generally. I congratulate all the prize-winners on their fine work, and hope that those who were not successful this time will continue their efforts to obtain a place in the prize-lists of future contests.

The full list of awards in the "Christmas" Contest (Home Section) is as follows:

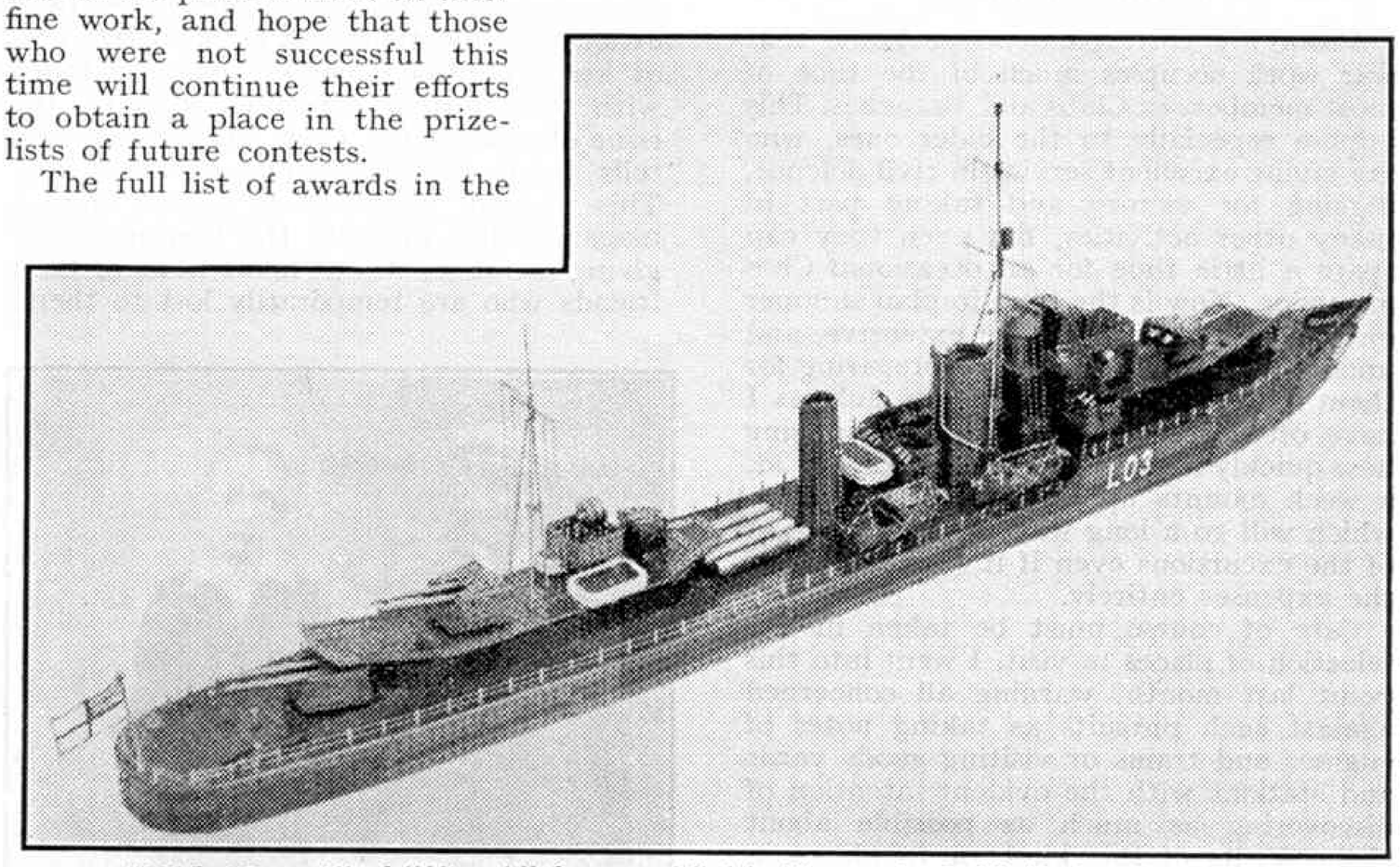
First Prize, Cheque for £3/3/-: C. W. Hughes, Doncaster; 2nd, Cheque for £2/2/-: J. Matthews, Fillongley; 3rd, Cheque for £1/1/-: H. F. Gibbs, Liverpool 19.

Postal Order for 10/6: J. Nowlan, Dagenham; S. Hall, Bingley; R. Hearne, Annesley; M. Reed, Woodford Green; C. Howard Pendlebury, Hinckley; R. Phillips, Doncaster; A. Booth, Manchester; O. Roberts, Wolverhampton; A. Smith, Rotherham; P. Stoner, Hull.

Postal Order for 5/-: P. Wickham, Leicester; E. Collins, Ely; M. Allen, Morecambe; A. Davies, Wrexham; R. Barker, Liverpool; O. Stevens, Lincoln; G. Freeman, Connah's Quay; C. Forshaw, Blackpool; B. Raven, Nottingham; D. Rowe, Leicester.

One of the most famous units of the Royal Navy is the subject of the fine model that won the First Prize. This is the "Tribal" Class destroyer H.M.S. *"Cossack,"* which intercepted the German prison ship *"Altmark"* last year. Her many characteristic features are splendidly reproduced in the model, which is work of C. W. Hughes, Doncaster, and is shown in the upper illustration. It has an overall length of 7 ft. 2 in., and is rigidly constructed on a framework of Girders extending the length of the ship. The characteristic lines of the hull and the sweep of the bows of the prototype are modelled with Strips, as these were found more adaptable for the purpose than Flexible Plates.

H.M.S. *"Cossack"* carries eight 4.7 in. guns, and in the model these are represented by ⅝" diam. steel tubes attached to rotating gun turrets so that they can be raised and lowered. Multiple machine guns, consisting of Threaded Pins inserted in Strips, are pivotally mounted in the wings of the bridge. Pom-pom guns on the after superstructure are made from Couplings, Collars and Rods. Quadruple torpedo tubes are represented by Sleeve Pieces joined together by Strips and attached to a 3" Pulley that is pivotally secured to the deck.



H.M.S. "Cossack" of "Altmark" fame, modelled in Meccano by C. W. Hughes, Doncaster.

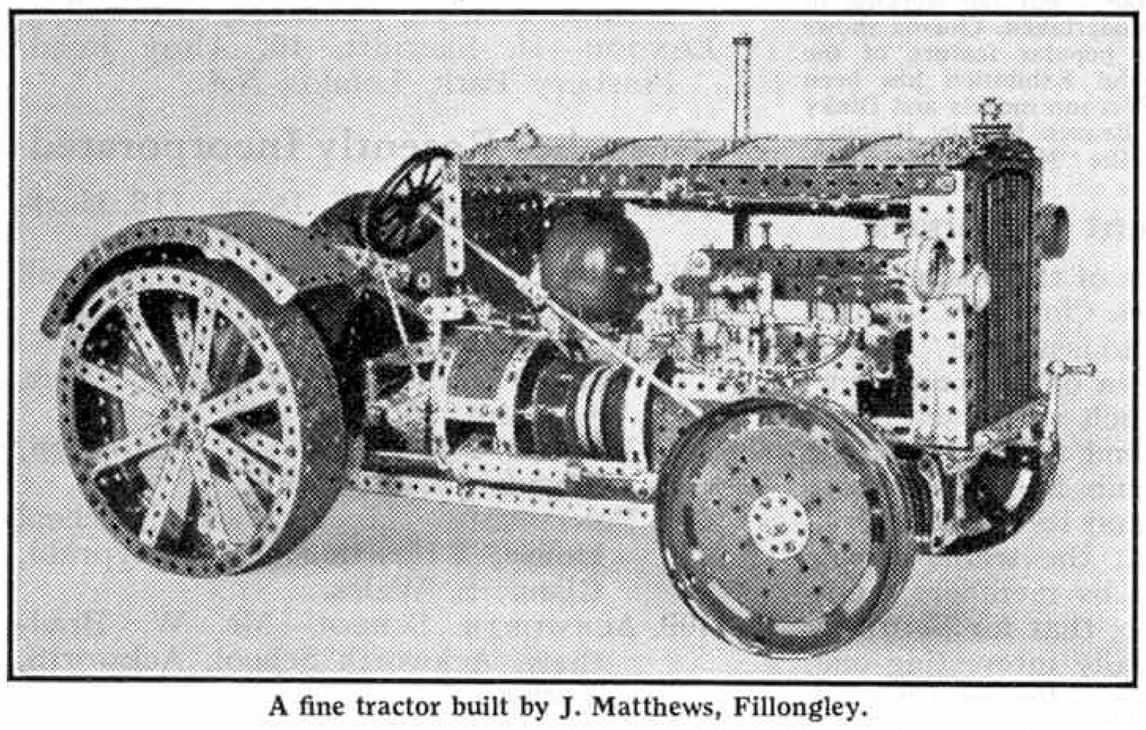
Among the many other interesting and well-modelled details in this model are a motor boat and floats. Stanchions and railings are represented by Spring Buffers.

The realistic model of a Fordson Industrial Tractor shown in the lower illustration was awarded Second Prize. It was built by J. Matthews, Fillongley. Some idea of the scale of this model may be gathered from the facts that an Artillery Wheel is used as the steering wheel and that the rear wheels consist of 7½" Circular Strips attached to the rear axle by 3½" and 3" Strips.

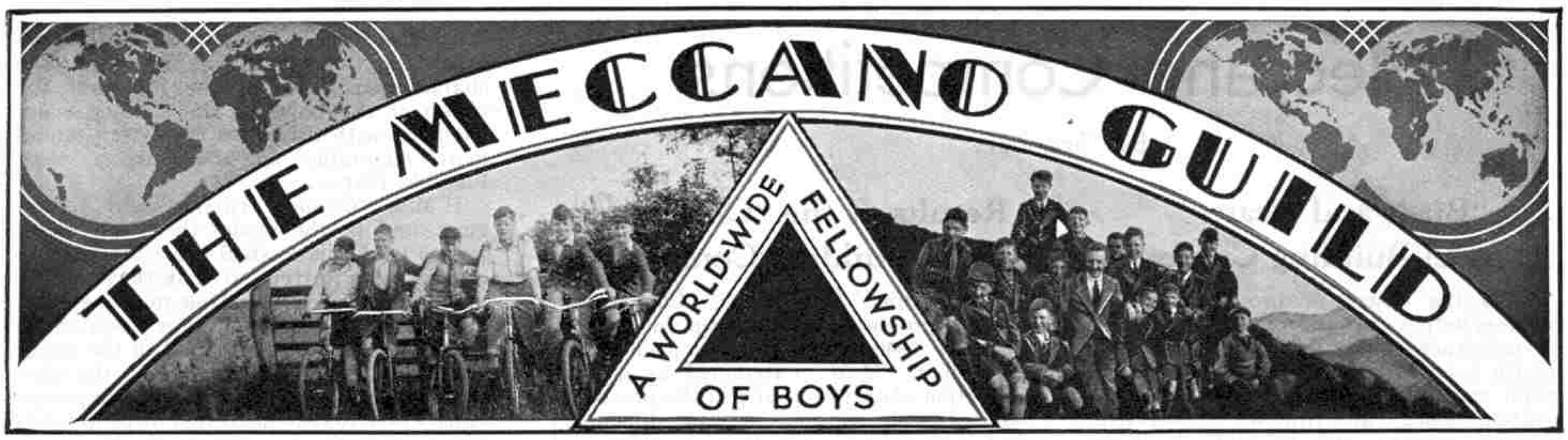
H. F. Gibbs, Liverpool, was awarded Third Prize for a model of a heavy duty electric mobile crane 22 in. long. A three-plate clutch and a three-speed forward and reverse gear-box are incorporated in the chassis and these are mounted on rubber shock absorbers.

The front and rear axles are slung from springs and the propeller shaft is fitted with a built-up universal coupling to allow for oscillation of the rear axle. The wheel brakes are of the internal expanding type and are operated by foot and hand levers situated in the cab. A novel feature is introduced by lining the drums with adhesive insulating tape, which forms a friction surface.

Immediately the brakes are applied, a red rear lamp is lighted. This consists of a Pea Lamp secured together with the normal rear lamp in a Chimney Adaptor. Side, head and fog lamps also are fitted, and these are controlled by individual switches in the cab.



A fine tractor built by J. Matthews, Fillongley.



Summer Outings

From my correspondence I know that war work occupies much of the time of most members of Clubs and Branches. This applies especially to the older ones, who are giving excellent service in civil defence, digging for victory and taking part in many other activities, but even they can spare a little time for an occasional Club excursion. Now is the time to plan summer outings. These need not be extensive, and undoubtedly the best way of preparing for them is to start a small savings club, as I have often recommended. It is surprising how quickly a small subscription of say 3d. a week mounts up to a respectable sum, which will go a long way towards the cost of the excursions even if it does not cover the expenses entirely.

Care of course must be taken in the selection of places to visit. I went into this point last month, warning all concerned against such pursuits as taking notes of engines and trains or visiting goods yards and stations with the evident intention of discovering as much as possible about them. Visits of this kind, or to places in the neighbourhood of camps or munition works, must be left out of the programme, but no difficulty will be experienced in discovering other places to go to, and of course opportunities for spending jolly afternoons and evenings of various kinds still occur. There need be no hesitation in undertaking an occasional excursion for pure pleasure and recreation, from which everybody returns better fitted for the more serious tasks that nowadays confront practically all of us.

A Fine Branch Magazine

I have just been reading *"The Monthly Express"* the magazine of the Monkstown (Co. Dublin) Branch of the H.R.C. This interesting publication has celebrated its first birthday by appearing for the first time in type. It began as a small written production, duplicated by the use of carbon paper, and proved so popular that it has now grown to eight large pages, full of interest and variety. Its contents include Branch news, chiefly of coming events, that will arouse the interest of all its readers, whether members of the Club or not, and other features include accounts of railway journeys, notes on railway matters of local interest, humorous items, including clever verses, and a crossword puzzle. There is even a serial story. The Magazine undoubtedly is of the utmost value to the Monkstown Branch, providing matter of real interest to members and friends of the Club alike.

It seems to me that such Magazines as this are more useful to-day than at any previous period. Many members of Clubs and Branches, especially in Great Britain, have joined the Forces or have been evacuated, and there can be no better way of keeping these members in close touch with their former comrades than by the issue of a magazine, even a small one, that tells them what is happening at home. This indeed works both ways, for a magazine also provides the best means of giving members still at home news of their friends who are temporarily lost to them.

Mr. F. Bainbridge, Chairman and W. Duncan, secretary of the Kinglassie Branch of the H.R.C. No. 386. This Branch was incorporated in January 1940. Operations on the Branch track chiefly consist of the running of passenger trains, headed by such locomotives as "Eton" and "Bramham Moor," but the working of express goods trains also is undertaken. Cinema shows given by a member are a popular feature of the programme. A very successful Exhibition has been held, the display including Meccano models and Dinky Toys scenes as well as the Branch Hornby Railway. The proceeds were devoted to the "M.M." Radio Fund.

News for Absent Members

An excellent example of this comes from the Edinburgh Hobbies Club M.C., which early in the war began to issue the *"E.H.C. Newsletter"* with the idea of keeping members of the Club in touch with each other wherever they might find themselves. The Edinburgh Hobbies Club M.C. is a large and enterprising one, and its *"Newsletters"* are excellently printed, the whole of the work being carried out by members themselves. The eighth issue, that for February of this year, is a specially interesting one, for its chief feature is *"Personalities on Parade"* a series of photographs of members, most of them now in the Services, with notes on their Club activities in the past and their present pursuits. News of the doings of members, of railway, stamp, and other sections of the Club also are given, and there is an interesting article on colour television by the leader of the Club Radio Section. A Club puzzle, in which clues point to the identity of 12 leading lights of the Club, is an interesting novelty, and altogether the publication is one of which the Edinburgh Hobbies Club is to be heartily congratulated.

Smaller Clubs may not be able to produce a magazine of the same character as the *"E.H.C. Newsletter."* Paper shortage also makes large magazines impossible, but even a small single sheet typed or reproduced by means of a simple jellygraph will play its part in keeping members together until the day comes when they can again gather in the Club room regularly in full strength. Whatever activities may have to be suspended during the war and in the blackout, no Club or Branch magazine should be stopped, and where none exists efforts should be made to produce one.

Proposed Branches

The following new Branches of the Hornby Railway Company are at present in process of formation, and any boys who are interested should communicate with the promoters, whose names and addresses are given below.

COVENTRY—J. Kirk, 98, Harnall Lane East, Coventry.

READING—P. Gadsden, 20, Adelaide Road, Reading, Berks.

OXFORD—M. L. Ferrar, 255, Woodstock Road, Oxford.

CROYDON—B. Hollidge, 26, Greenwood Road, W. Croydon.

PENZANCE—J. Lea, and D. Job, 3, Antoine Terrace, Newlyn, Penzance, Cornwall.

LONDON—H. Skerratt, 10, Alroy Road, Finsbury Park, London N.4.

Branches Recently Incorporated

404. COVENTRY—Mrs. E. Dewis, 118, Hartland Avenue, Wyken, Coventry.
405. BATLEY—Mr. H. Arran, 7, Purlwell Hall Road, Batley, Yorks.
406. CLYDE COLLEGE—Mr. J. B. W. Robertson, Clyde College, Largs, Ayrshire.
407. TOTNES—Mr. Harvey, Hartington, Station Road, Totnes.
408. PONTYPRIDD—Mr. D. Gwilym, School House, Hawthorn, Pontypridd, Glam., S. Wales.
409. ACKWORTH SCHOOL—Mr. W. Bradshaw, Ackworth School, Ackworth, Yorks.

Club and Branch News

Branch News

Dumpton House School.—Track meetings are held twice weekly. Enjoyable operations are carried out on the Branch Hornby-Dublo layout, on which Electrically-operated Points are used to advantage. Separate rooms are used for the Hornby Gauge 0 and Hornby-Dublo railways, and members entertain many visitors interested in their train working. A Film Show has been held, at which pictures of Branch operations taken by Mr. R. E. F. Tendall, Chairman, were shown. *Secretary:* J. P. Oboussier, Crickel House, Nr. Wimborne, Dorset.

Loughton.—The usual Saturday afternoon meetings have been continued, members enjoying excellent operations on the Branch track. Special attention is paid to the maintenance of track and rolling stock, and one meeting has been devoted entirely to ensuring that everything is in good order. This plan ensures smooth running at track meetings. *Secretary:* G. W. Ruffell, 10, Elmhurst Way, Loughton, Essex.

Whitgift Middle School.—This Branch has developed along very successful lines, with sections for Hornby-Dublo and Hornby Trains, both clockwork and electric. Plans are being made for the production of a Branch Magazine and for the exhibition of films. A large Exhibition also is being planned, to be held on 3rd May in the Crusader Hall, Wallington. Part of the proceeds are to be devoted to the "*M.M.*" Radio Fund, and full details can be obtained from the secretary. All interested are invited to attend. *Secretary:* B. F. B. Tatford, "Hillside, 20, Ingleby Way, Wallington, Surrey.

Barnard Castle School.—A small fire made it impossible to use the Branch room for a time, but when it became available a new track was quickly laid down and put into operation. Layouts of various types have been tried out, all giving rise to interesting operations, the Branch stock of locomotives being hard-worked. An Exhibition was arranged for the end of term. *Secretary:* R. Churchill, The School, Barnard Castle, Co. Durham.

Hornsea.—The Branch track, specially designed for the running of "*The Flying Scotsman*" in miniature, has been extended by providing more passenger tracks, and the goods yard has been re-arranged. Operations on the new track suggested other improvements, such as the provision of a supplementary engine yard at one of the stations, and these changes were put into effect. At one meeting special attention was given to goods traffic, and the younger members were given valuable practice in shunting. A visitor present on this occasion complimented officials and members on their track and operations. *Secretary:* D. E. Parker, 8, Burton Road, Hornsea.

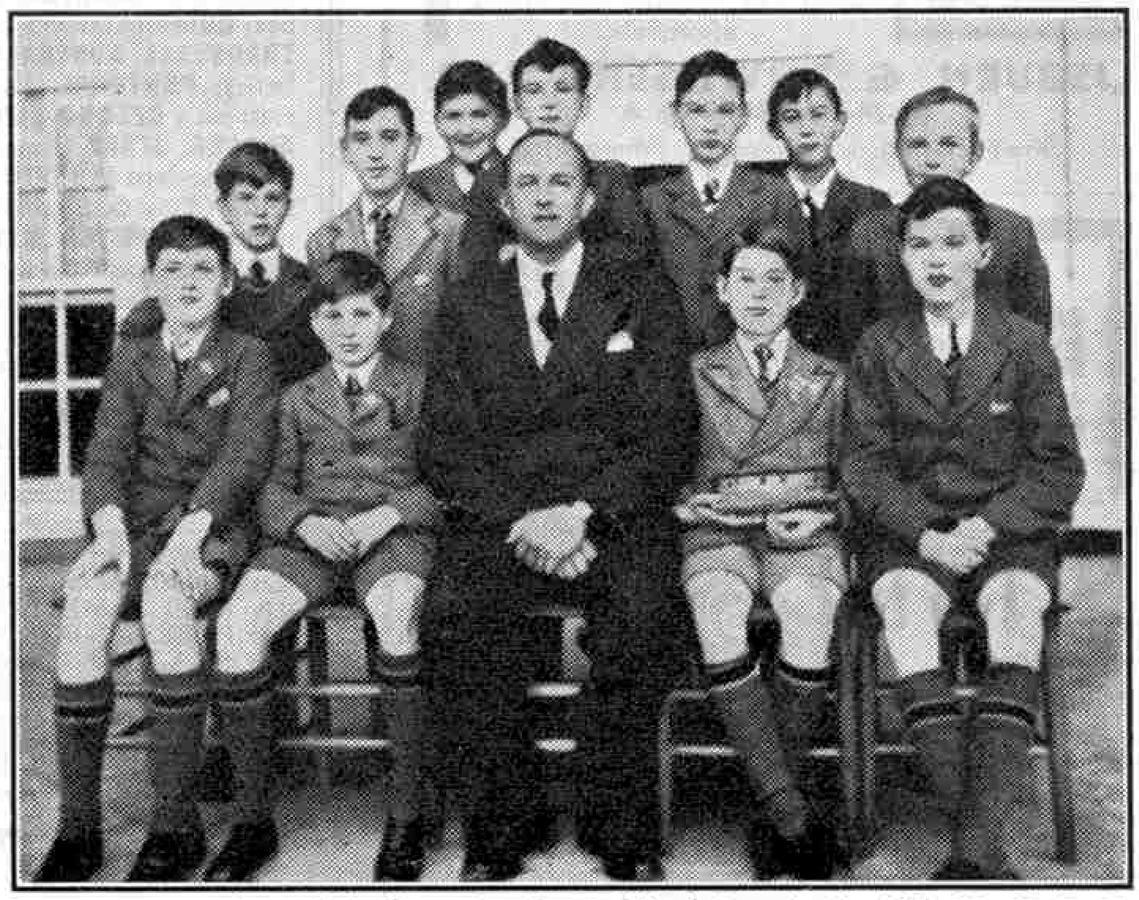
Rockport (Co. Down).—Excellent train running has been enjoyed at recent meetings. The goods yard has been redesigned, and is now self-contained. Shunting can be carried out without making use of the main line, and tank engines are exclusively used for this purpose. A useful accessory, which adds greatly to the interest of proceedings, is a machine built of Meccano Parts for loading coal and stones. The layout is to be photographed during track operations. *Secretary:* T. W. V. McMullan, Rockport School, Craigavad, Co. Down.

Wallington.—A new semi-permanent layout has been designed for use either indoors or outdoors, and at one recent meeting there were 30 locomotives in use on it. A special feature of operations is the running of the "*Coronation Scot*" in miniature. Two timber trucks have been constructed by the secretary, and other members also are building rolling stock. Members are making a list of Branch locomotives, and a collection of railway tickets has been started. *Secretary:* B. F. B. Tatford, "Hillside," 20, Ingleby Way, Wallington, Surrey.

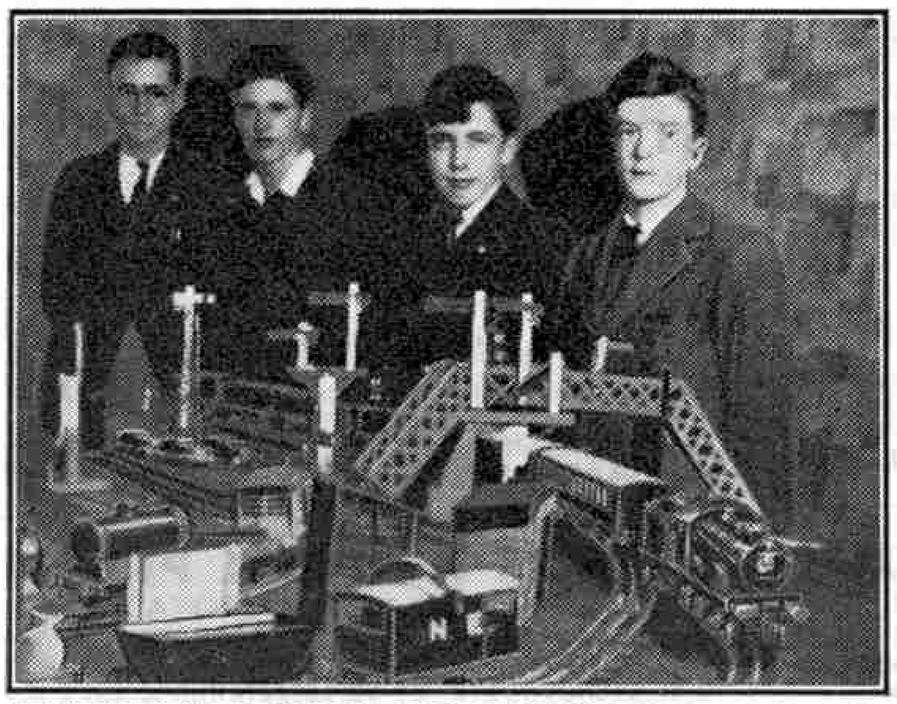
Acton.—Excellent progress has been made with the construction of the new layout, the first section having been completed and strengthened with battens. Altogether there are to be seven sections, each on its own trestles. The scheme is an ambitious one, but members are very keen and are speeding up the work of construction. Film Shows continue to be popular, and Meccano Model-building has been carried on in addition to line construction and operations. *Secretary:* S. W. Simmons, 37, Derwentwater Road, Acton, London W.3.

Selly Oak (Birmingham).—The construction of a new station and locomotive accommodation is being undertaken. This will be part of the G.W.R. section of the layout and will be built in modern style. Boat trains have been run to timetable with great success. Outings for the summer months have been arranged. *Secretary:* G. C. Jones, 12, Blackthorn Road, Bourneville, Birmingham 30.

Monkstown (Co. Dublin).—The track has been relaid, and locomotives have been overhauled. Electric lighting is now installed in two stations and in the engine shed. Games meetings have been held and Visits to railway works are being arranged. "*The Monthly Express,*" the Branch magazine, has celebrated its first birthday. *Secretary:* R. D. Pierce, 20, Monkstown Road, Monkstown, Co. Dublin.



A group of members of the Dumpton House School Branch, No. 366. Mr. R. E. F. Tendall, Chairman, is in the centre of the front row, with J. P. Oboussier, secretary, on his right. This Branch was incorporated in February 1939. Both Hornby and Hornby-Dublo trains are run on special layouts. Visitors are allowed at track meetings, and these are always intensely interested in operations. Successful Exhibitions have been held. At one of these a member gave an interesting address on the working of Hornby Electric Locomotives, which was followed by a special demonstration on the Branch layout.



Members of the York M.C., Leader, Mr. Pickering, secretary, G. Hodgson, with part of the Club's Hornby Railway. This Club was affiliated in February 1937. The programme includes large scale model-building, many fine working Super Models having been constructed. Hornby Railway operations also are carried on. The Club layout is a very extensive one, with a wealth of accessories, and excellent timetable working is a special feature.

Club Notes

Hillside M.C.—Meetings have been held regularly, with good attendances. Competitions are arranged at intervals, and successful models in recent contents have included a novel electric tank trap and a breakdown lorry. Lectures also have been included in the programme, and members have been given instruction in dealing with fire bombs. Club roll: 12. *Secretary:* D. Johnson, 27, Burkewood, Hillside Avenue, Whitefield.

Tynecastle School M.C.—The construction of miniature aeroplanes for pole-flying has been continued, and all members in turn have been given opportunities for practice in this interesting pursuit, details of which were given in the "*M.M.*" for December 1940. Model-building Competitions are now being organised, and a comprehensive programme is being planned. Club roll: 20. *Secretary:* J. Morgan, Enterkin Cott, Lanark Road, Juniper Green.

Hornsea M.C.—Senior members held a microphone talk at the home of Mr. R. W. Shooter, Leader. Games, including Battleships and Monopoly, have been played by all sections. A Lecture has been given on "*Food Fakes — Ancient and Modern*" and at other meetings photographs of British, American, German and Italian aeroplanes were shown and described by one of the members. Scientific Talks and Demonstrations also have been given. Model-building is carried on regularly at meetings, and recent models constructed have included a battleship and submarine, while Junior members constructed a trip hammer model under the guidance of a Senior member. Club roll: 22. *Secretary:* P. Richardson, 14, Grosvenor Terrace, Hornsea.

Exeter M.C.—Energy and enterprise continue to be shown by members. Model-building is carried on as actively as ever, and construction records are expected for 1941. Indoor games also have been enjoyed, but the chief interest now is Model-building and Hornby Train operations. A fifth football team has been formed, and all the Club teams enjoy their games, win or lose. Club roll: 90. *Secretary:* B. Hackett, 3, Hanover Close, Heavitree, Exeter.

Hornsea Evacuee M.C.—Talks have been given by Mr. R. W. Shooter, Leader, on "*Aeroplanes and How They Fly*" and on "*Current Affairs.*" Games also have been played. Mrs. Barnfather kindly gave a party to members and other evacuees in Hornsea, at which the Chairman of the Urban District Council was present. Tea was followed by a Film Show given by Mr. Shooter, conjuring and a short entertainment. Club roll: 6. *Secretary:* D. E. Parker, 8, Burton Road, Hornsea.

Islington M.C.—Although enemy action deprived this Club of its official meeting place members are still keeping together, meetings being arranged for Saturday afternoons. Visits are paid to members in their homes. Stamp Collecting and Fretwork are carried on, and a successful party has been held. The Club's Hornby Railway track fortunately is intact, and the lighter evenings are giving opportunities for resuming activities on the Club's usual scale. An unknown friend of the Club has kindly presented rolling stock and other railway material. Club roll: 12. *Leader:* V. Miller, 541, Liverpool Road, London N.7.

Kingston (Surrey) M.C.—Meetings have now been resumed after an interval due to winter conditions and air raids. An Exhibition is to be arranged, and this will include operations on the Club's Hornby Railway. An interesting feature of the track is the use of small lamps placed at points to warn the operator of the approach of a train, the aim being to make operations as certain and free from error as possible. Club roll: 16. *Secretary:* P. Avis, 16, Willoughby Road, Kingston-on-Thames, Surrey.

Pettit's Senior Boys' School (Romford) M.C.—Regular meetings were restarted after an interval. Unfortunately the Club room suffered from enemy action. The room can still be used, but Meccano Outfits and models built by members were destroyed. In spite of these difficulties successful meetings are being held, at which some members carry on model-building, others operate the Club's Hornby Railway, while sections for photography, wireless and similar scientific pursuits are active. Enjoyable meetings are expected now that the evenings are lighter. Club roll: 25. *Secretary:* K. Powell, Pettit's Senior Boys' School, Romford.

Oakfield School (Newquay) M.C.—More successful meetings have been held. Interesting models constructed have included an Armstrong-Whitworth "Whitley" bomber and model aeroplanes generally are popular with members. A Talk on aeroplanes has been arranged and miniatures of new types are made as soon as information becomes available. Club roll: 12. *Secretary:* T. L. Higgins, Endsleigh Hotel, Bay View Terrace, Newquay, Cornwall.

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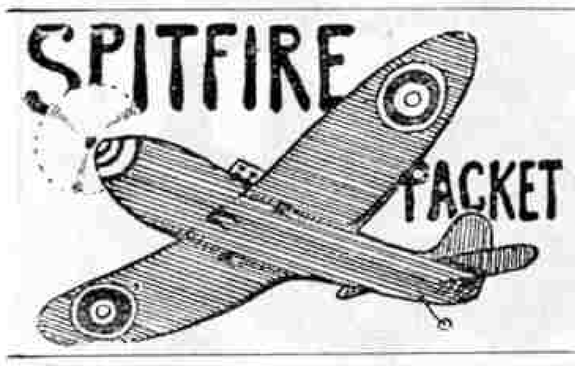

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STAMP COLLECTING

War Stamps of the Allies: Greece

IN our next few issues we intend to give our readers some of the interesting facts about Allied war stamps of other days. Attention is now largely concentrated on developments in the Balkan and Mediterranean territories, and naturally we give gallant little Greece pride of place in our series.

There is something significant in the Greek resistance to the aggression of the dictator states. Ancient Greece was the home of all that was great in human courage and skill, and modern Greece is proving itself worthy of those high traditions. It would be fitting to include in a Greek war stamp series some of those inexpensive stamps from Greece's Olympic Games series of 1897 and 1906 in which the Greek Gods are shown at play. Hermes, the God of flight, after whom a great British aircraft carrier is named, is depicted on several of those early stamps.

An Englishman played no small part in the Greek rising against the Turkish Government that began in 1821 and ended with the achievement of independence in 1830. Lord Byron, the great poet, was one of the main sources of inspiration in the struggle, and a great tribute was paid to him by Greece when special stamps were issued on 24th April 1924 to commemorate the centenary of his death. He is shown at Missolonghi, later the scene of a great Greek victory, addressing Greek patriots. This design was on a 2 dr. stamp, which is illustrated on this page, and a second design, on an 80 l. value also reproduced here, gives a portrait of Lord Byron, one of three instances of Britons being honoured by a Balkan stamp issue. The others were a Bulgarian issue in 1921 celebrating the great work of J. D. Bourchier, the Bulgarian correspondent of *"The Times,"* and another Greek stamp, to which we refer later in this story, that bears a portrait of Admiral Sir Edward Codrington.

Missolonghi ultimately fell to the Greeks in April 1826, and a 25 l. stamp issued on the centenary date bears a design showing the grave of Marco Botzaris, a leader of the Greek revolutionary movement. The liberation of Athens, the Greek capital city, came in 1827, and that too was commemorated in 1927 by a centenary issue of three stamps, each showing a view of the ancient Acropolis with a portrait of the Greek leader General Favier inset in a wreath of laurel, the victor's crown in Ancient Greece.

The next incident in the war for Greek independence was the great naval battle in Navarino Bay, when the combined fleets of Britain, France, Holland and Russia almost destroyed the Turkish and Egyptian fleets. The brunt of the fight was borne by the British ships under the command of Admiral Sir Edward Codrington.

This battle was celebrated by a centenary issue of five stamps, showing a view of Navarino Bay, a representation of the battle, and portraits of Sir Edward Codrington, the French Admiral de Rigny, and the Dutch Admiral, Van der Heyden. Two of these, the scene during the battle and the portrait of Sir Edward Codrington, are reproduced here. An interesting error occurred on the stamp bearing the British Admiral's portrait, his name appearing as *"Sir Codrington."* Later the stamp was re-issued with the name line corrected to read *"Sir Edward Codrington."* Our illustration shows the earlier of the two issues.

April 1930 brought a centenary issue of 18 stamps to commemorate the Act of Independence. Of the designs 15 were portraits of various Greek leaders. The others showed a map of Greece, illustrating the growth of the country's territory in the 100 years of independence, the scene at the formal declaration of independence, and a scene at the key battle of Missolonghi. A few months later another stamp was issued to commemorate the defence of the monastery of Arcadi, Crete, by the Abbot Gabriel against the Turks in 1866. Crete was then still under Turkish rule, and a long insurrection broke out in that year. This stamp and the one showing graphically the expansion of Greece are illustrated on this page.

The coming of independence did not bring complete peace, however, and a long series of minor struggles with Turkey culminated in the Balkan War of 1912-13, as the outcome of which Greece regained important portions of Macedonia and the Epirus. There followed the great European War of 1914-18. In this Greece joined the Allies against Germany, Austria, Turkey and Bulgaria, and in consequence received the islands of Imbros and Tenedos, and further territory in Thrace, and was given a mandate over the Turkish province of Smyrna in Asia Minor. Greek possession of Smyrna was brief, for in September 1922 Turkish forces under the late Kemal Ataturk recovered the province. A subsequent peace treaty awarded Eastern Thrace, Imbros and Tenedos to Turkey.

It is unfortunate that these later incidents are not recorded in stamps, other than by the map stamp to which we have already referred. Some reference to them might be improvised, however, by the inclusion in a collection of Greek war stamps of specimens of the stamps issued by the British military authorities at Salonika in January 1916, and by the Civil Administrator appointed by the British Navy when Turkish islands in the Gulf of Smyrna were occupied in May of that year. We say "might" advisedly, for we fear all of these stamps are too far beyond the pocket of the average boy collector to enable him to make any use of the idea.

The remaining stamps to which we have referred are all easily obtainable at small cost and, since the number is not big, readers who contemplate building a collection of war histories of the allies will not find it difficult to create a comprehensive and fascinating story.

Issues during the present war will add to the interest of such a collection, and on page 164 we give details of the first of these produced by the Greeks.

Stamp Gossip

and Notes on New Issues

Four Interesting Issues

Two of the stamps illustrated on this page are of special interest now that Greece is fighting on the side of Great Britain. They were issued last August in connection with the National Youth Movement. One of them, the 3d. value, illustrates the Greek Youth badge, while the 50d. issue shows Greek Youths on parade. The badge is printed in blue and red on silver; the Youths on parade stamp is in lake and black.

From Spain comes a series of stamps celebrating the 19th centenary of the apparition of the Virgin of Pilar at Saragossa. She is said to have alighted on a pillar of jasper, which became one of the most venerated objects in Spain and gave

its name to the later of Saragossa's two cathedrals, the Cathedral of the Pillar. There are various attractive designs, each in two colours, and three of these are illustrated here.

Of the other issues illustrated, two come from the New World and two from Japan. The Japanese stamp is one of a series showing views of the National Parks of the country. The four included in the new issue are concerned with Kirishima Park, the 10s chosen for illustration showing the Kirishima Shrine. The New World

stamps are from Cuba and the Argentine. The former shows a portrait of Dr. M. G. Gutierrez, and was issued in October of last year to celebrate the centenary of the publication of the first Cuban Medical review. Two values were included in the issue, the 5c. in bright blue and the 2c. in scarlet. The Argentine example suggests by its design the modern use of the aeroplane to speed the mails, for both an envelope and an aeroplane are included in it. The 1p. value shown is in carmine, and the same design is used for the 2p. 50 value, which is in blue. Other designs in the same series show Mercury, herald and messenger of the gods of ancient Greece and Rome, and an aeroplane in cloud respectively.

We are indebted to the courtesy of Stanley Gibbons Ltd. for the loan of the stamps from which our illustrations on this page have been made.

Belgium's Christmas Charity Issue

A significant pointer to conditions in Belgium, now that it is under Nazi control, is provided by the annual Christmas charity issue that appeared early in December. For many years the premiums collected from the sale of this issue have been devoted to Anti-Tuberculosis Funds, but this time they have gone to "Winter Relief."

The set comprised eight values, ranging from 10c. to 5 fr., with premiums over face value of from 5c. to 5 fr. The designs showed the arms of various towns and cities, with borders depicting local features, and were as follows: 10c.+5c., Mons (collieries); 30c. +5c., Ghent (flowers); 40c.+10c., Arlon (hunting scenes); 50c.+ 10c., Bruges (lace and embroideries); 75c.+15c., Namur (plums); 1 fr.+25c., Hasselt (wrought iron); 1 fr. 75+50c. Brussels (churchyards); 2 fr. 50+2 fr. 50 Antwerp (shipping); 5 fr.+5 fr., Liege (blast furnaces).

Jugoslavian Commemoratives

A set of four pictorial commemoratives has been issued in Jugoslavia to commemorate the memory of soldiers who fell in the last war at Ljubljana. Each stamp bears a premium in aid of military charities. The designs are as follows: 50 paras+50p., St. Peter's Memorial at Ljubljana; 1 dinar+1d., Serbian, Croatian and Slovene women in national costume; 1.50d. +1.50d., Serbian Memorial Chapel; 2d.+ 2d., Bresje Memorial.

Colour Changes

Readers who collect British Colonial stamps should be on the watch for colour changes in the current series. Already several Colonies have announced new issues, principally among values that do duty for foreign postage. For example, Northern Rhodesia and Sierra Leone have altered the colours for their 1½d. and 2d. values. In the former Colony, the 1½d. red has become brown and the 2d. brown has become red; in Sierra Leone the 1½d. red has become mauve and the 2d. mauve has become red.

Sarawak has changed the colours for six of its low values, and Bahamas, Barbados, Bermuda and the Falkland Islands also have made changes.

Even more interesting is the possibility that Great Britain itself will make certain modifications in the colours of her stamps. These will not be colour changes in the strict sense, but will consist of a lightening of the shades of the existing colours to secure an economy in the use of dyestuffs in wartime. It is unlikely that these changes will be officially announced in advance; they are likely to happen unexpectedly, and we offer the news as a suggestion of a future trend of events.

The Greek Albanian Stamps

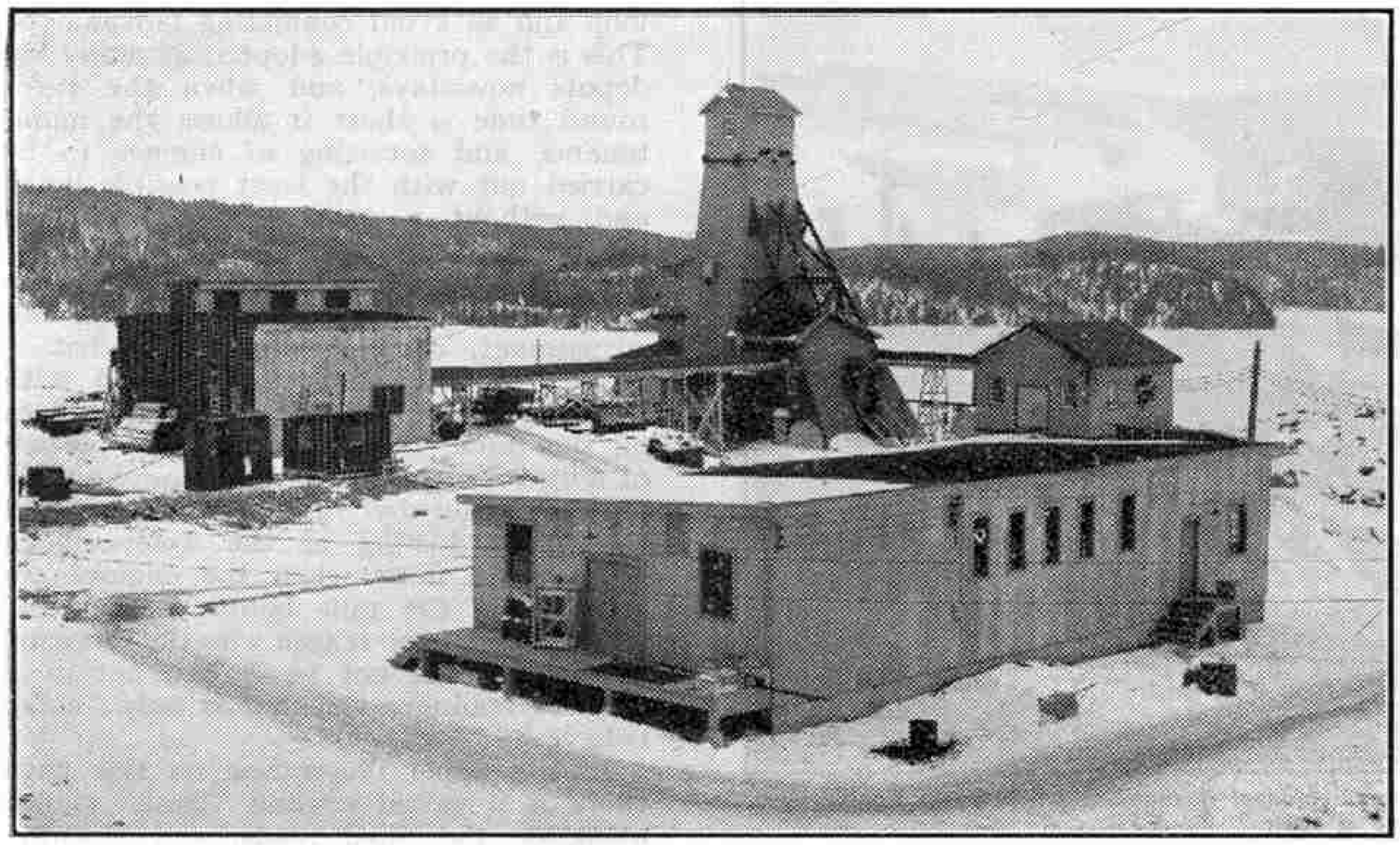
The Greek stamps overprinted for use in the occupied areas of Albania are not yet available for illustration, but specimens have reached England. The set consists of 17 stamps of the current Greek series, 1 lepton to 30 drachmae, and the three charity stamps of 1939, overprinted with a two-line inscription similar to that used for the occupation issues produced by Greece for use in the conquered areas of Bulgaria during the Balkan wars of 1912-13. Five postage due stamps also have been overprinted, making a total of 25 stamps for use in Albania.

Minor Varieties

Not infrequently we receive from readers specimens of current stamps showing some flaw in the design. We are asked whether these are not great rarities because no reference to the particular flaws they show can be found in the stamp catalogues, and these flaws have not been seen before. Our advice invariably is to forget about it. Nine times out of ten the flaw is an inconstant one, the result of a simple isolated mishap in printing.

It may puzzle some readers to understand why a flaw that occurs only once in a printing is not more valuable than

a flaw that appears on every sheet of stamps printed. It certainly is rarer. The explanation is that the constant flaw tells something of philatelic interest, such as the condition of the printing plate, or the nature of the printing process.



The iron ore mine described in this article, and its first shaft which goes down 800 ft. on the shore of Steep Rock Lake, Ontario, as it appeared early in 1940.

Science Finds Underwater Mine

Important Canadian Iron Ore Discovery

By James Montagnes

SCIENTIFIC prospecting with electrically operated instruments has found for Canada an iron ore field in the unsettled section of western Ontario. With the country requiring more and more iron ore as war industries expand, the find of an ore field is of importance to Canada, which has mined little iron ore since 1923, and has always had to import it from the United States and Newfoundland. Now an iron ore field has been discovered under a small secluded lake 135 miles west of Port Arthur on Lake Superior.

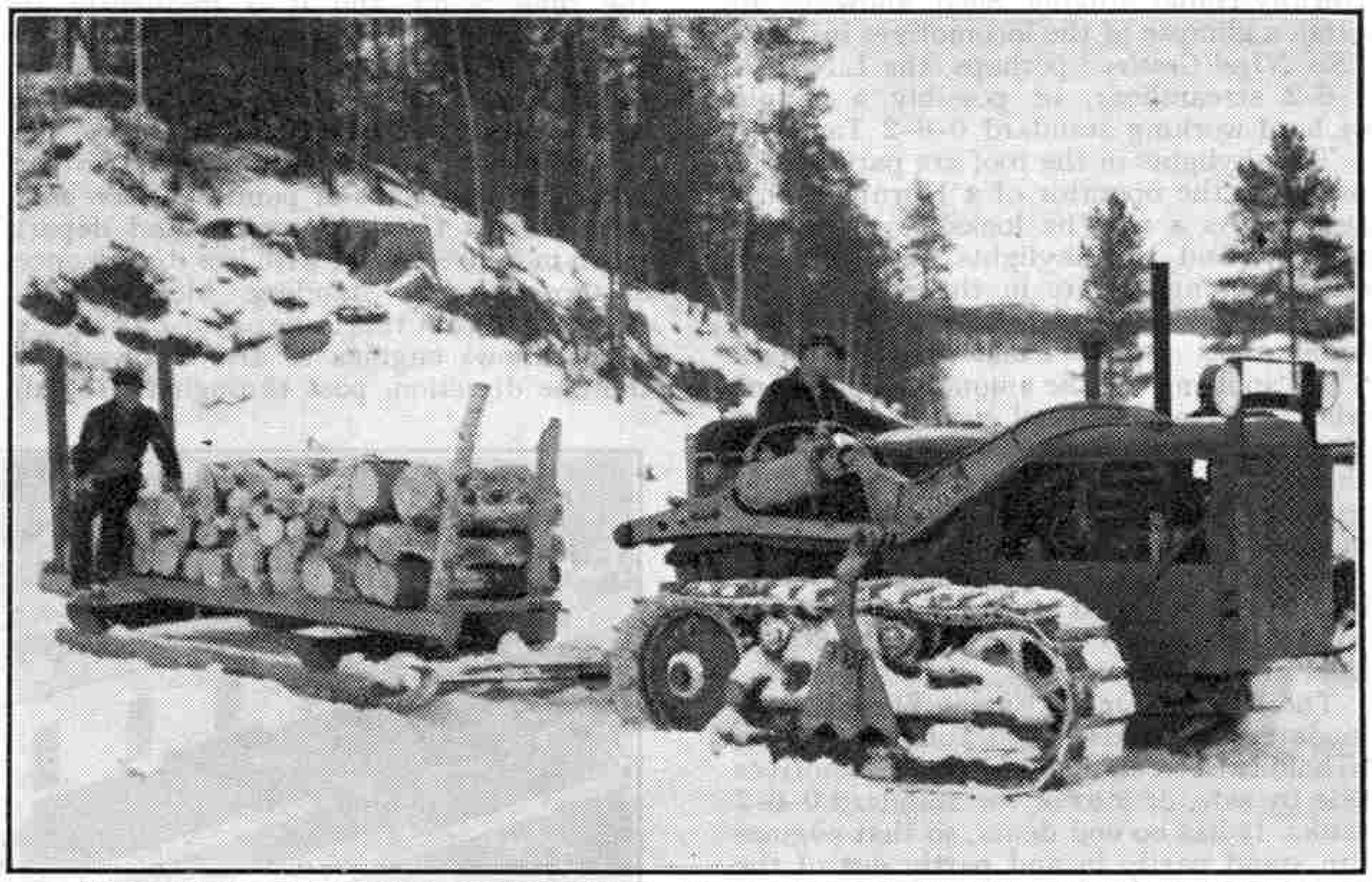
Working only the past two winters when there was from two to three feet of ice on Steep Rock Lake, a number of geophysicists of the University of Toronto drilled holes in the ice, inserted metal rods through the ice and into the water, sent current from a portable electric power plant on the ice through the rods, and measured on meters the current as it passed from rod to rod under water. The variations in the current as the rods were brought closer together told the geophysicists the nature of the iron content in the rock hundreds of feet below the lake bottom. In this way they plotted the location of the iron ore fields under water.

To prove their accuracy, diamond drilling rigs weighing four tons were set up on the ice, and the drills shot through the ice and water, through lake bed clay and bedrock to the iron ore deposits. Not all the drills get through that combination of ice, water, clay and rock. Some drill holes could not be located because of water current and ice forming constantly; others, because of the strong water current, did not get near where the electrical measurements had shown they should go. But enough of the drills got through to prove the accuracy of the electrical measurements, and to make the mining engineers feel that they had at the bottom of this small lake the largest and richest iron body yet discovered in Canada.

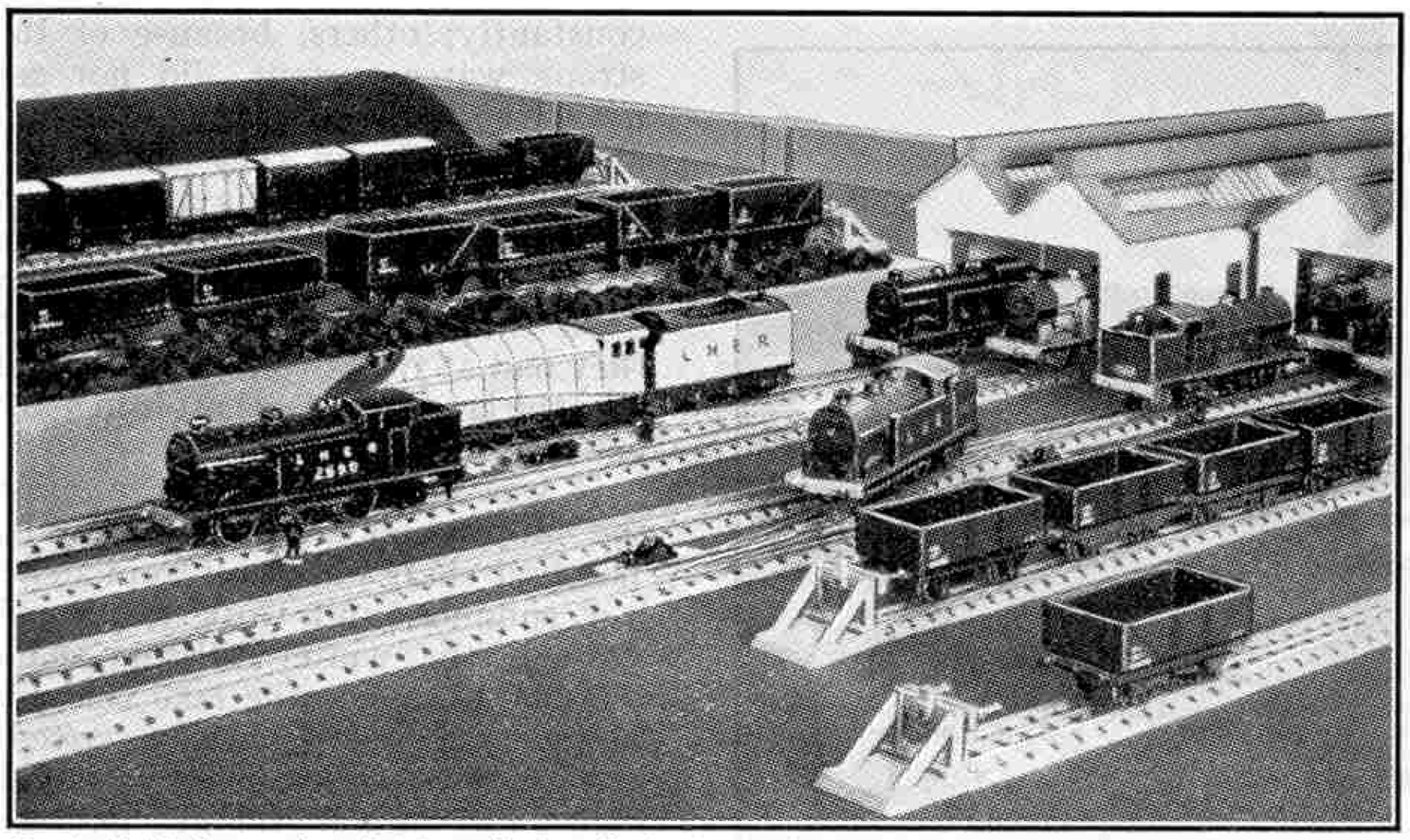
It was at first planned to mine the ore by underground methods. The first shaft was sunk from shore last summer, and work continued through the winter till the shaft was 800-ft. below the lake surface.

Since the first shaft was started, war needs required a faster method than this underground manner to reach the ore body. Accordingly in 1941 a dam is being built across the small lake, its waters are being diverted, and the lake will be drained at a cost of approximately $2,000,000. Test shipments of the ore have proven its high iron content, making the drainage operations economically feasible. When the lake has been drained, electrical instruments will once more check for the location of the bodies, drill holes will be located on the bottom, and open pit mining started.

It is expected that with the open pit method in use upwards of 2,000 tons of ore will be mined daily, shipped by a specially built railway to the nearest rail point, and taken the 135 miles to Port Arthur, where the ore will be loaded on to Great Lakes freighters for shipment to iron smelters in Canada and the United States.



Tractor hauling wood for the heating of buildings at the new iron ore mine at Steep Rock Lake, Ontario.



Hornby-Dublo Locomotives "at home." An effective locomotive depot incorporating two Dublo Engine Sheds and a raised coaling bank.

Hornby-Dublo Locomotives "At Home"

IN previous articles we have referred to the Hornby-Dublo Engine Shed and its value in a layout. This month we deal with this attractive accessory in more detail, and make practical suggestions for its use.

Like the other buildings in the Hornby-Dublo range, the Engine Shed is simple in general design and modern in appearance and style of finish. The side walls are pierced with windows, and a feature of the roof, which is in two bays, is the provision of skylights and smoke ventilators. It is always fascinating to see parts of real engines through any side openings there may be in the walls of a shed as our train passes them. The side windows in the Hornby-Dublo Engine Shed allow us to catch a glimpse of the locomotives inside—"*Sir Nigel Gresley*" perhaps, the L.N.E.R. 4–6–2 streamliner, or possibly a couple of hard-working standard 0–6–2 Tanks.

The skylights in the roof are particularly useful to the operator of a Hornby-Dublo system. As a rule he looks down on the railway, and the skylights allow him to see what engines are in the shed and in addition allow him to work in arriving locomotives to the exact spot required. This "spotting" of the engines is important where an Isolating Rail is placed midway along each of the Shed tracks, thus dividing the tracks into separate sections and making it possible to move any engine independently of the others. This is done by "switching out" the sections on which engines not required are standing; then the wanted locomotive can be run out without interfering with them.

The Hornby-Dublo Engine Shed accommodates two roads and is sufficiently long to hold two streamlined express locomotives side by side, or four of the standard 0–6–2 tanks. It has no end doors, so that engines can stand partly in and partly out of the Shed, as they are often seen in real practice. The Shed is of the "through" type, that is the rails can be laid right through it and are not terminated by an end wall. This is an advantage, for a shed that can be entered from one end only is not so convenient as one where engines can arrive or leave at either end. There is also another point that arises. Where a single Shed is not sufficient to accommodate all the engines in use when they are "off duty," two sheds can be placed end to end, as frequently suggested in these pages. The roof projects only slightly at each end, so that between two Sheds put together in this way there is only a slight gap in the walls.

Whether a single Shed is used, or whether there are two placed end to end, it is usually an advantage to allow each of the two roads to project beyond the end of the building for an engine length at least before the Buffer Stops are fitted to terminate the tracks. This allows more Locomotives to be left in the depot out of the way when they are not required for the time being, and it is frequently an advantage when engines are being marshalled in position according to their programme of duties.

The ideal arrangement is to have the engine depot as a whole connected to the main line by means of points at each end. Locomotives then can arrive and depart much more freely and with less disturbance of those already standing. Alternatively, a loop line from the Buffer Stop end of the depot allows engines to arrive always in the one direction, pass through the Shed, and then "run round" it by means of the loop and so avoid conflicting movements. This is the principle adopted at many big depots nowadays, and when the turn-round time is short it allows the maintenance and servicing of engines to be carried out with the least possible delay and without a great deal of shunting to and fro.

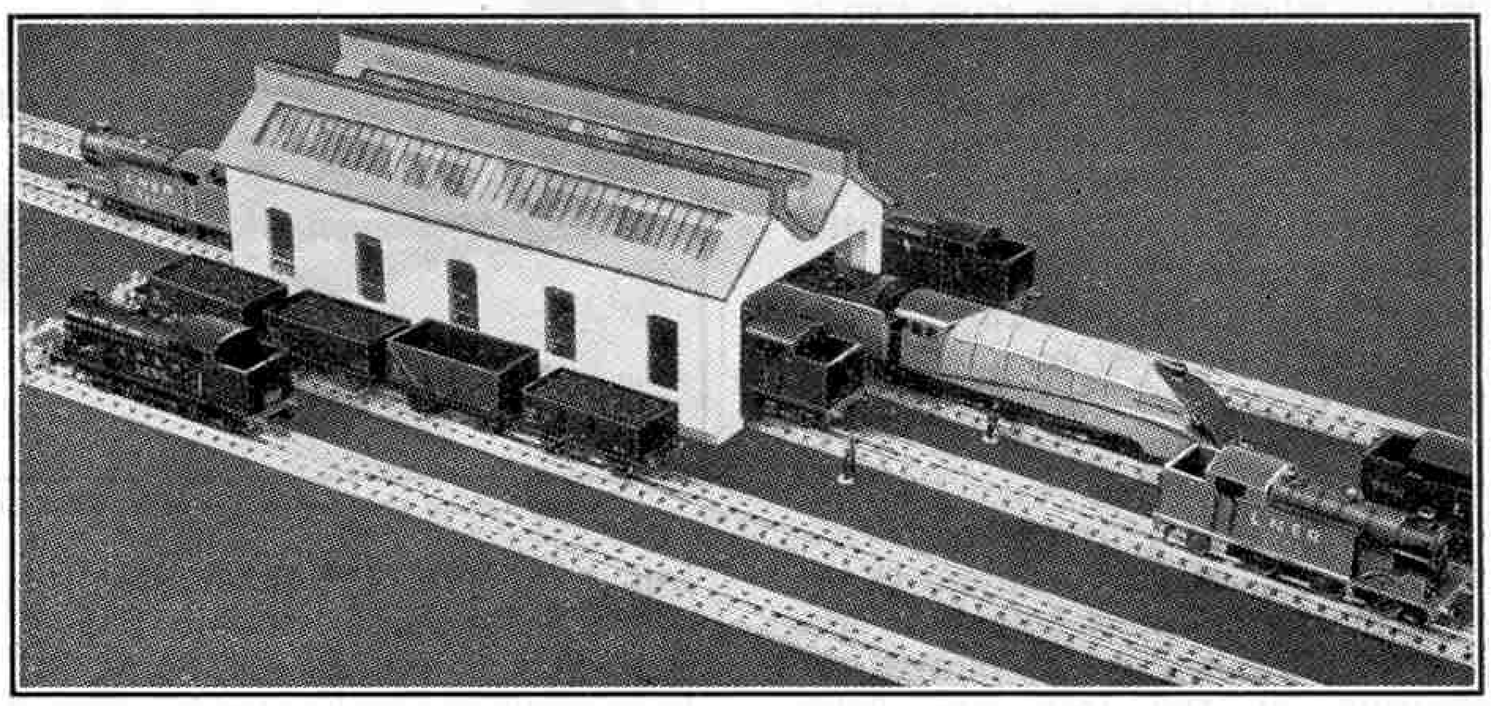
Actual maintenance work on miniature locomotives, such as the examination and adjustment, cleaning and oiling that is advised in the instruction packed with them, has to be done with the engines off the track. Details such as the placing of a tiny drop of oil on the coupling rod pins of a Hornby-Dublo Locomotive and the usual dusting of the exterior can however be done when the engines are actually on the rails before leaving the depot. There is no reason why the servicing of them should not be carried out in a realistic manner even if it is only "make believe."

In the upper illustration on this page there is a raised coaling "bank" shown alongside the Shed roads, and Hornby-Dublo Coal Wagons loaded with "loco-coal" are standing there ready for their contents to be transferred to the tenders or bunkers of waiting engines. The vehicles in the foreground of the scene represent empties that are waiting to be collected into a complete train and hauled away for a further supply of "Fuel."

The illustration just referred to shows a further method of arranging a locomotive depot. Here two Engine Sheds are situated alongside one another, this being the most convenient arrangement where the length of the space available for the depot is restricted but there is plenty of width.

A simpler scheme showing the Engine Shed arranged as a "through" depot is shown in the lower illustration. Here there is no coal bank, but the wagons containing the locomotive fuel are accommodated on a track outside the shed at the same level as the shed roads.

For "water supplies" it is necessary for the Hornby-Dublo railway owner, for the time being, to improvise his accessories, as war conditions have prevented developments of this kind being carried out. However, the large storage type of tank that is in use at many depots can be represented by a shallow rectangular tin. The building invariably found supporting the tank can be built up in wood, or perhaps formed from a cardboard box. Another plan is to use the components of the building constructional sets of various types that are sold at most toyshops.



A Hornby-Dublo Engine Shed arranged with the rails running through it. Note the Coal Wagons on the track alongside the Shed itself.

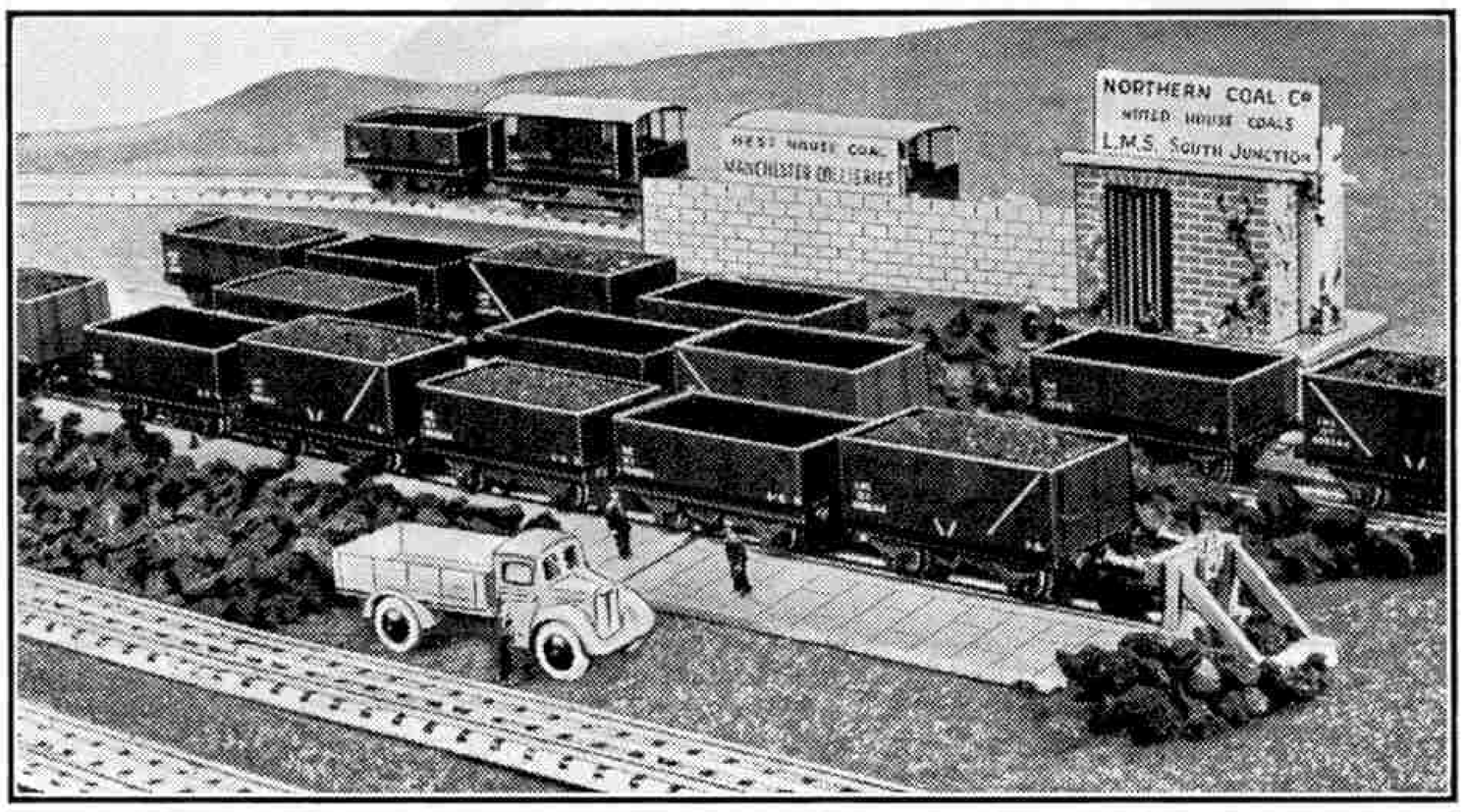
Fun With Your Hornby-Dublo Railway

Running Coal Trains

ALL of us are familiar with coal trains from our earliest years, and as a rule the first thing that the very youngest model railwayman thinks of loading into his wagons is coal. In this article we devote special attention to the fun that is to be had from the operation of coal traffic on Hornby-Dublo railways.

Actual coal can be used if it is handled carefully. Small pieces of suitable size for the wagons should be selected, preferably square or rectangular in shape; and these should be soaked in water to remove all dust. These pieces will then be clean to handle so long as they are not broken. It is possible to use the Hornby Imitation Coal, but unfortunately it is too large to be really suitable for Hornby-Dublo wagons. The load problem is solved very well in the Hornby-Dublo Coal Wagons, however, which are fitted with a dummy load of moulded material that looks very like the real thing.

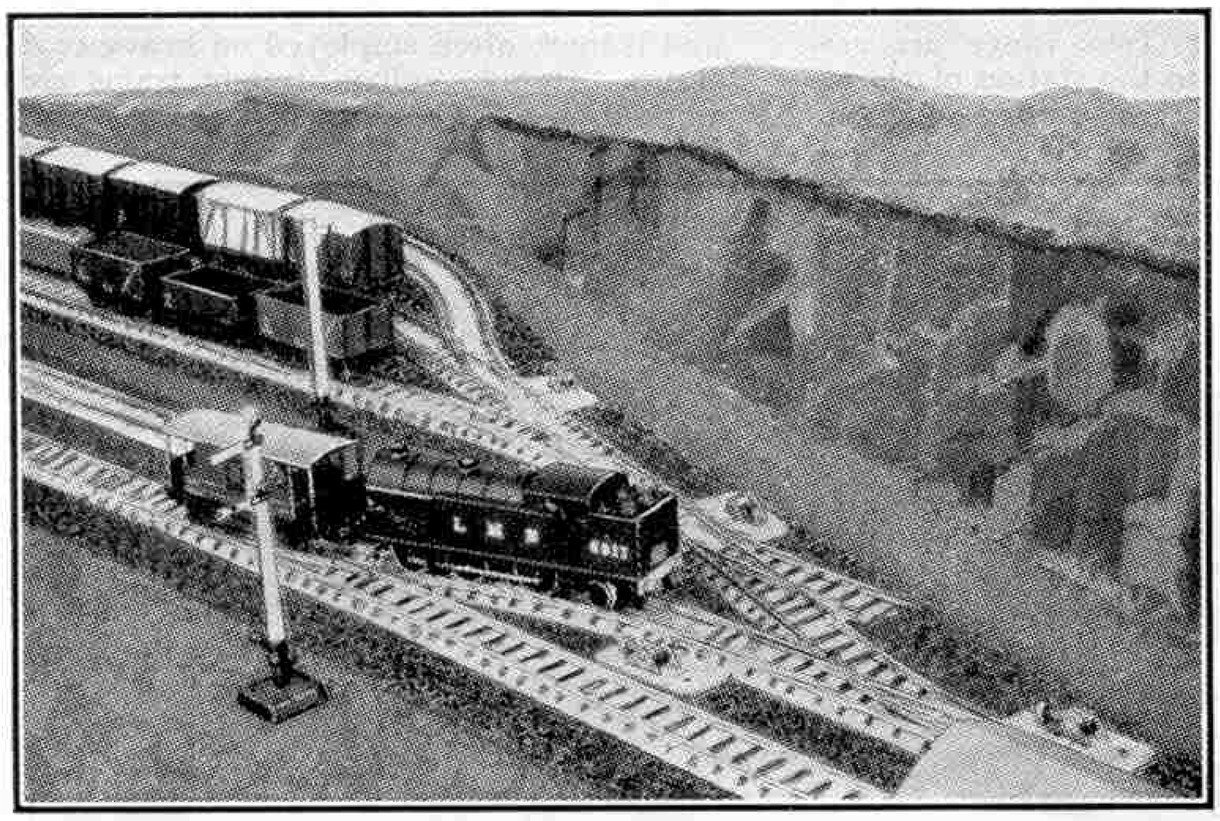
The two types of Hornby-Dublo Coal Wagons are known respectively as D1 and D2. The D1 type is the standard Dublo Open Wagon with sides of medium height, into which a load of the "coal" just referred to has been fitted. It is made to represent the wagons of each of the four main line companies. The D2 type is a High-Sided Wagon, and represents the standard 12-ton vehicle developed specially for coal and mineral traffic. This pattern is used in great numbers on the L.M.S. and the L.N.E.R., and the stock of each of these companies is represented in the Dublo vehicles. The details are the same in each case with regard to the planking, strapping and so on, but the L.M.S. vehicle is finished in bauxite brown, while the L.N.E.R. one is in the standard grey of that company.



A coal depot on a Hornby-Dublo layout. Dinky Toys vehicles can be used effectively to carry out the road transport side of the operations.

Wagons of this kind in actual practice are fitted with end doors for tipping, and the tinprint design of the models includes this feature. End-tipping wagons are specially marked with a white diagonal stripe on each side, and the latest method of carrying out this marking is shown on the Hornby-Dublo High-Sided Coal Wagon. Another similar item is the special marking, low down on the sides, that indicates the provision of bottom doors. Such wagons in real practice can be handled by coal-tipping plants where end tipping is required, and they are suitable also for use where the bottom discharge of their loads is necessary.

Quite a representative coal train can be assembled with the two types of Hornby-Dublo Coal Wagons, the train being completed by means of one of the standard Goods Brake Vans according to the company whose practice is being followed.



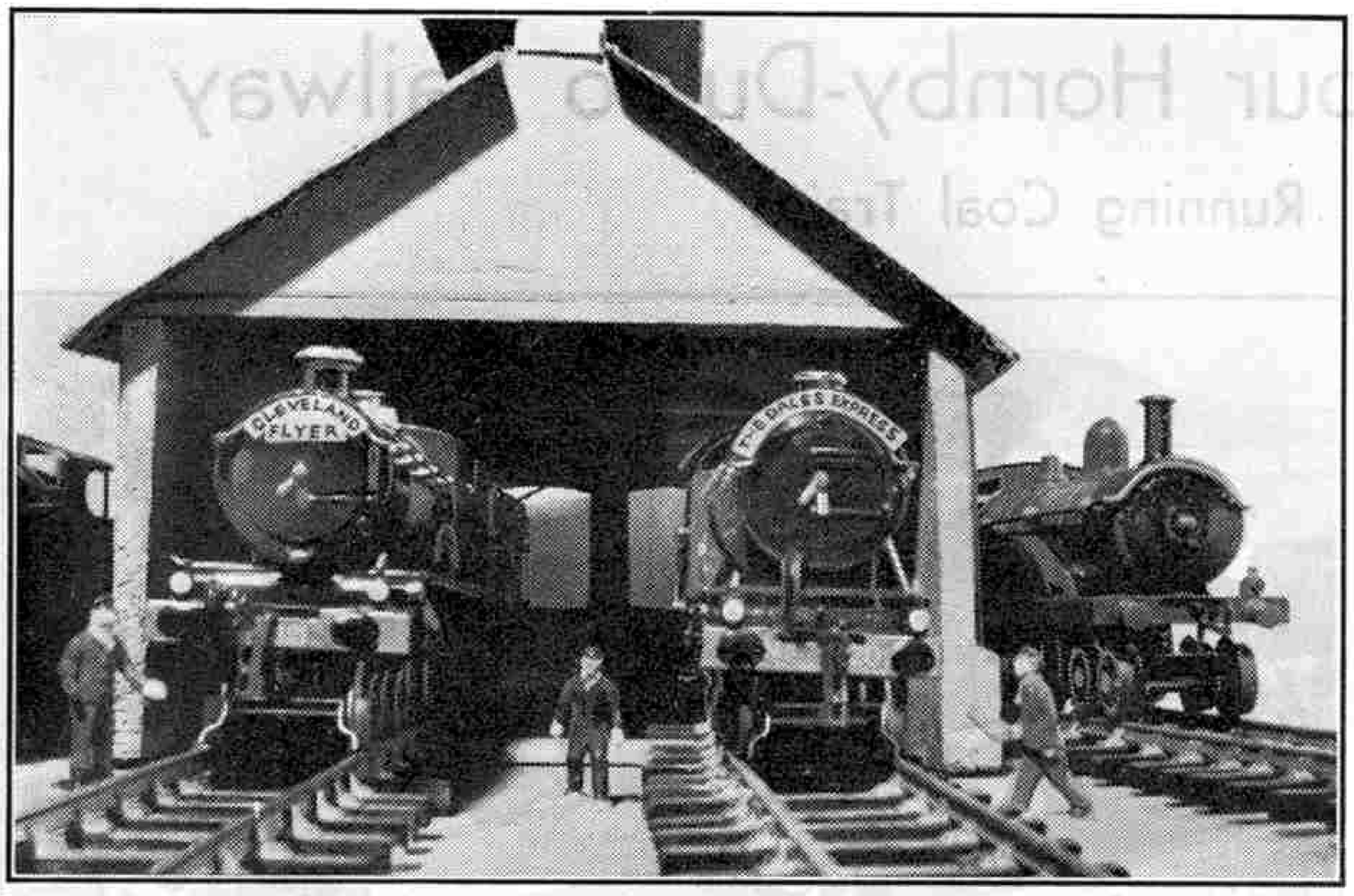
The Locomotive and Brake Van are manœuvring to pick up the Coal Wagons waiting in the siding. Note the "catch points" at the end of the loop line.

In working the trains a similar operating scheme to that described in our March issue for pick-up freight trains can be followed. In actual practice a pick-up service to various colliery sidings is often worked, an engine and brake van starting off from a main depot and calling at different points in turn, picking up loaded wagons until a complete train is made up. This is then worked to a concentration yard where the wagons are sorted out according to their destination. Whenever possible complete trains from the concentration points to distant destinations are arranged, and the main line journey is then made without "breaking bulk" or altering the make-up of the train on the way. From the destination, local distributing services are run, a train putting off wagons here and there until its complete load is disposed of; this is the opposite process to the picking-up operations followed before the main journey.

For the local journeys, and for marshalling operations, the Hornby-Dublo Standard 0–6–2 Tank is ideal. On a simple layout it can make several circuits of the main track, calling at the same siding each time actually, and picking up different wagons each time, in order to give the impression that a number of different stops are made. On an extensive layout, of course, with several sets of sidings calls can really be made at different points. Several loaded Coal Wagons waiting on the sidings here and there always look realistic, and the actual making of a trip of this kind by an engine is a fascinating operation.

There is no reason why the 4–6–2 streamliner "*Sir Nigel Gresley*" should not take a turn in coal train operation. On a long main line train the running of a Dublo High-Capacity Wagon, or possibly more if available, next to the engine can be followed. This vehicle represents a brake-fitted prototype, and similar wagons are sometimes used behind the engine to increase the braking power, a useful advantage on a long loose-coupled train.

Local yards dealing with coal traffic alone are a feature of many cities and towns, and it is interesting, where space allows, to incorporate such a feature on a Dublo system. The upper illustration on this page shows a miniature coal depot. Invariably these premises have offices and buildings belonging to various coal merchants, and there are often boards erected bearing their names and advertising their particular brands of fuel. The illustration referred to includes some suggestions on this point. Apart from any special boards that the miniature railway owner may construct for himself from cardboard or wood, the standard Hornby Station Hoarding can be used for this purpose, suitable notices taking the place of the usual advertisements.



At the sheds; the engines of the "Cleveland Flyer" and "The Dales Express" being prepared for duty. One of the old "Hebble Valley" 4-4-0s is on the right-hand side of the illustration.

Realism in Hornby Gauge 0

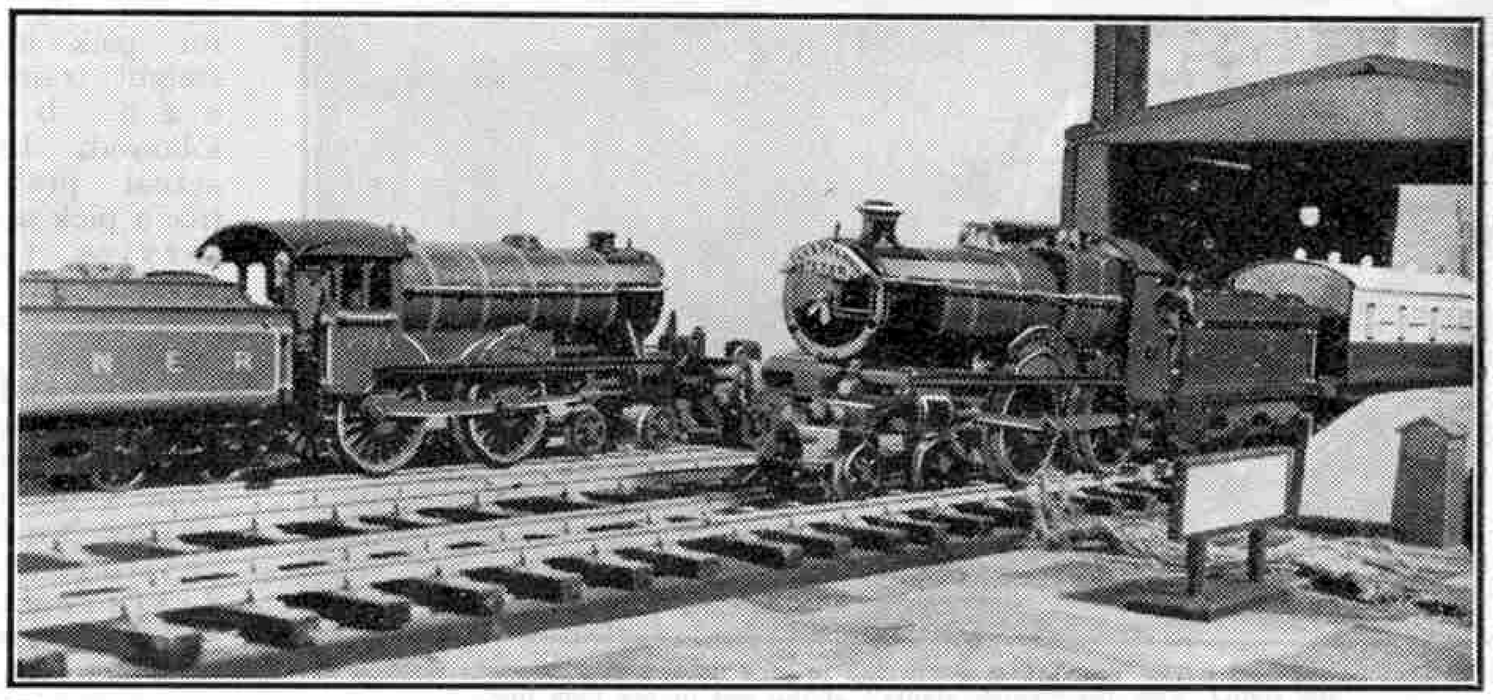
The "Hebble Valley Railway" and its Locomotives

MANY miniature railway systems represent a main line route, or part of one, belonging to one of the big companies, and try to carry on as far as possible operations and services that correspond to those found in actual practice. Others have quite an imaginary location, and may be worked by a variety of locomotives and carriages, "running powers" and joint working arrangements being held to account for these; in addition there may be stock belonging to the supposed "company" finished, maybe, in a special livery.

An interesting example of the latter type of railway is described on this page. This is operated by our reader, A. R. Wilson of Halifax, who has worked out quite a realistic "case" for his "Hebble Valley Railway," as the line is called. The central and most important station served by the line is in the heart of the West Riding of Yorkshire. Consequently the line is worked over by the L.N.E.R., and there are also locomotives and coaches of "Hebble Valley" stock. In addition, through trains from the G.W.R. are found worked throughout by that company's engines.

Unfortunately the layout is not a permanent one, but can only be put down when required. This does not prevent realistic effects being obtained, however, as the illustrations on this page show; and running operations are equally successful. Passenger traffic is heavy, and two of the principal trains running over the line are known respectively as *"The Dales Express"* and the *"Cleveland Flyer."* Goods traffic is varied, and a special feature is made of the carriage of coal in both railway and privately-owned wagons.

The track in use is of various kinds, but very good running is made over Hornby Tinplate Rails of the Double-Track type. The layout is normally arranged as an oval continuous main line, and in addition to the tinplate track there is sufficient small-scale "permanent way" on wooden sleepers to form another oval track. Stations, bridges, tunnels and buildings generally are each complete in themselves and are put in position as required when the railway is laid down. It is not possible, of course, to do much in the way of scenery, but as realistic effects as possible are obtained from the use of the usual lineside accessories, notice boards, huts and so on. Miniature figures from the well-known Dinky Toys range are employed to give life to the station platforms and railway premises generally.



The "Cleveland Flyer" on the "Hebble Valley Railway" of A. R. Wilson, Halifax. This through train is distinguished by a special name-board carried on the front of the engine.

Actual "Hebble Valley" stock is miscellaneous in character, as is often the case with independent subsidiary companies in real practice. Such variety adds to the fascination of the line, and it is interesting to note that Hebble Valley passenger engines are finished in the same livery—blue with yellow lining—that was once used by a separate joint concern that was worked by its own engines, the Somerset and Dorset Joint Railway. "Hebble Valley" coaches, however, are finished in red, similar to the L.M.S. colour scheme; local stock is distinguished by white upper panels, a pleasing arrangement that no doubt appeals to short-distance passengers.

"Hebble Valley" fast trains are worked by two 4–4–0s of the old Hornby No. 2 type, originally built about 1923! These veterans have recently had tall chimneys and domes fitted in order to enhance their "old" appearance. Both engines are named, one being *"Empress"* and the other *"Jervis Bay."* These engines are used on trains made up of American type Pullmans finished in "Hebble Valley" colours, or else of Hornby Metropolitan vehicles. The latter represent joint "Hebble Valley" and L.N.E.R. stock. There are also one or two Hornby Pullmans of old type.

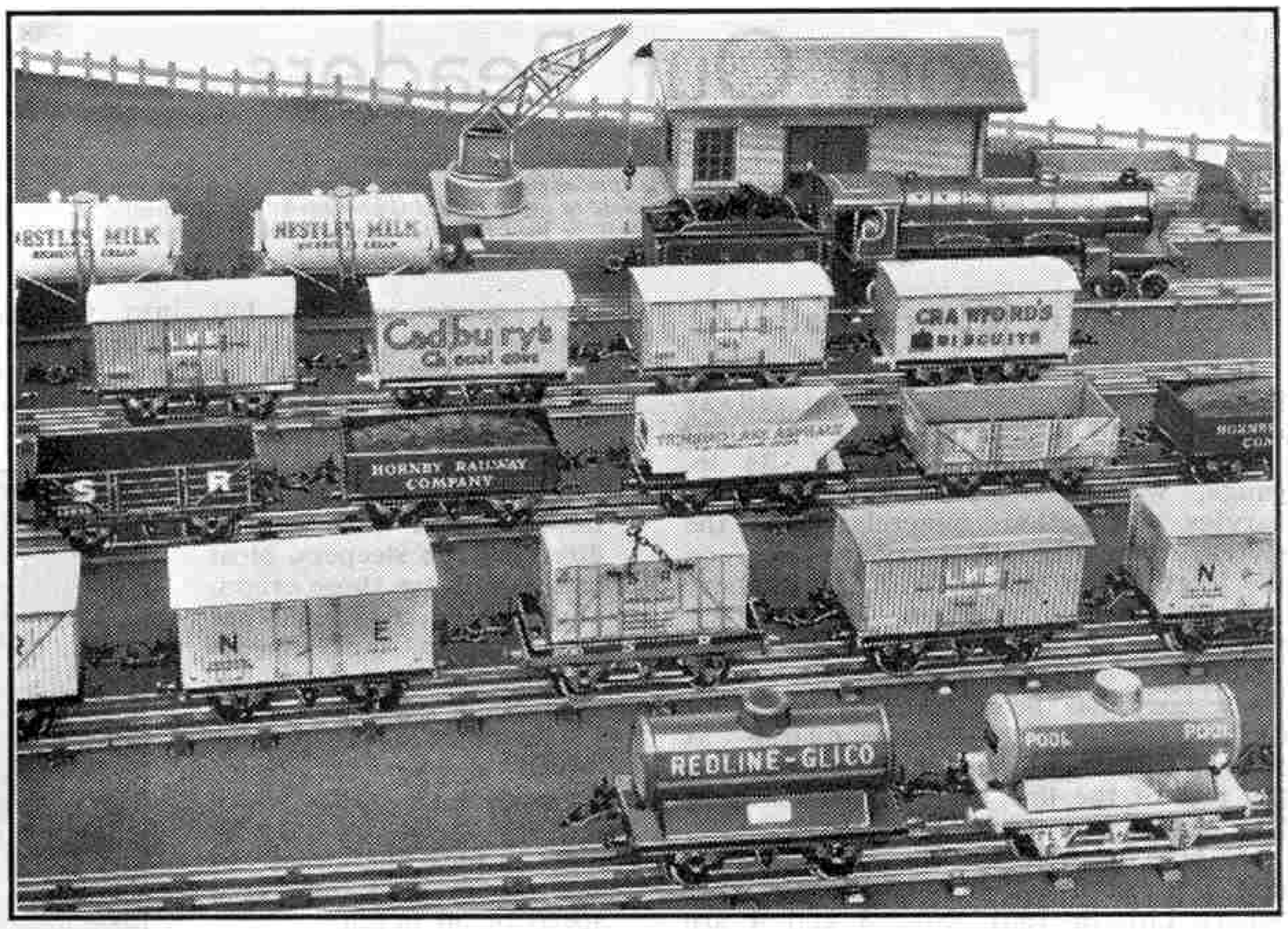
Local trains are worked by a Hornby 0–4–0 Tank of the M3 type. This is named *"Terrier,"* as a compliment to the handy little Brighton tanks that were known by this title. Short-distance traffic is carried by an American type Diesel-electric streamlined unit of three articulated cars.

The principal L.N.E.R. express working over the line is *"The Dales Express."* This is made up of Hornby No. 2 Corridor Coaches in L.N.E.R. finish, and the usual engine until recently has been No. 201, *"The Bramham Moor,"* of the well-known Hornby No. 2 Special type. Now, however, there is an additional engine of the similar but earlier *"Yorkshire"* pattern. The engine working the *"Dales Express"* carries the title of the train on a semi-circular head-board of the kind used on the L.N.E.R.

L.N.E.R. short-distance services are worked by a local set of articulated vehicles of the type so popular on the G.N. section. For these trains an 0–6–0 tender goods engine is sometimes used, and there is in addition a large "Baltic" or 4–6–4 tank, very like the "Remembrance" class of the Brighton section of the S.R., although finished in L.N.E.R. style. This engine, however, is powerful and is more often employed on heavy coal trains. "Hebble Valley" freight trains are worked by a 4–4–0 of the former L.N.W.R. *"George the Fifth"* class. They consist mostly of Hornby vehicles.

The through service from the G.W.R. is worked by a corridor train of typical G.W.R. stock, which arrives behind a Hornby No. 2 Special *"County of Bedford"* locomotive. This train is the *"Cleveland Flyer,"* referred to earlier.

Hornby Goods Rolling Stock (III)



An effective assembly of Hornby Goods Rolling Stock. Many of the vehicles dealt with on this page are illustrated here.

THIS month we resume our articles dealing with Hornby Goods Rolling Stock and its uses; the two previous articles in this series appeared in the January and February issues of this year respectively. Before concluding our description of the various Vans in the Hornby Series there are one or two more interesting specimens to be noticed.

There is first the No. 1 Banana Van; in construction this is similar to the No. 1 Luggage Van dealt with in a previous article. The No. 0 Banana Van, like all the No. 0 Vans, is a tinprinted vehicle and is finished in the L.M.S. style. Characteristic vertical boarding is shown on the sides, and at the ends are represented the ventilators by means of which, in the real vans, the temperature of the interior is regulated.

The various Biscuit Vans, the Chocolate Van and the Palethorpe's Sausage Van are all good representatives of privately-owned vehicles for special traffic. Each is of the No. 1 enamelled finish type and has sliding doors.

We now come to what is probably the best known type of railway goods vehicle, the ordinary open wagon. In the Hornby Series there are several patterns of this, all of the same general design, but each varying in design and style of finish in the ways about to be described. The No. 0 Hornby Wagon represents the standard open truck that is used by all railway companies. The details included in the tinprint design of the body include practically everything to be seen on real wagons in the way of corner plates, hinges, bolt heads and strapping, and each of the four main lines companies is represented. The No. 1 Hornby Wagon is similar but has the additional refinement of printed tinplate strips attached to the underframe, on which are represented the boltheads, number plate and so on.

The Hornby Open Wagon can be converted temporarily into what becomes virtually a covered vehicle, when the nature of the load demands it, by means of a Hornby Tarpaulin. There is, however, another wagon in the Hornby Series that is specially adapted to the use of a wagon tarpaulin, and this is known as Open Wagon "B." It has a bar running from end to end of its body; this can be raised up to support a Tarpaulin if required, or it can be swung down to rest along the top of one or other of the sides.

A vehicle similar in construction and in type of finish is the Hornby Coal Wagon. This has an embossed body, painted red and lettered "Hornby Railway Company," and so represents the standard type of wagon used for coal traffic by private owners of all kinds. It is complete with a "load" representing coal so that the miniature railway owner has not to worry about providing this vehicle with a suitable load.

A specialised form of open wagon is represented by the Hornby Hopper Wagon. This is typical of the real all-steel vehicles that have "hopper" or bottom doors for the discharge of their loads between the rails. The bottom of the Hornby Hopper Wagon has two doors, and the opening of these doors is controlled by a handle projecting at one side of the vehicle.

Another special form of open wagon is represented by the various Tipping Wagons in the Hornby Series, of which there are two main types, the Side-Tipping Wagon and the Rotary Tipping Wagon. The Side-Tipping Wagon represents a type in great use among contractors, and its purpose is exactly described by its name. It has a special pivoted body that can be tilted to either side of the track.

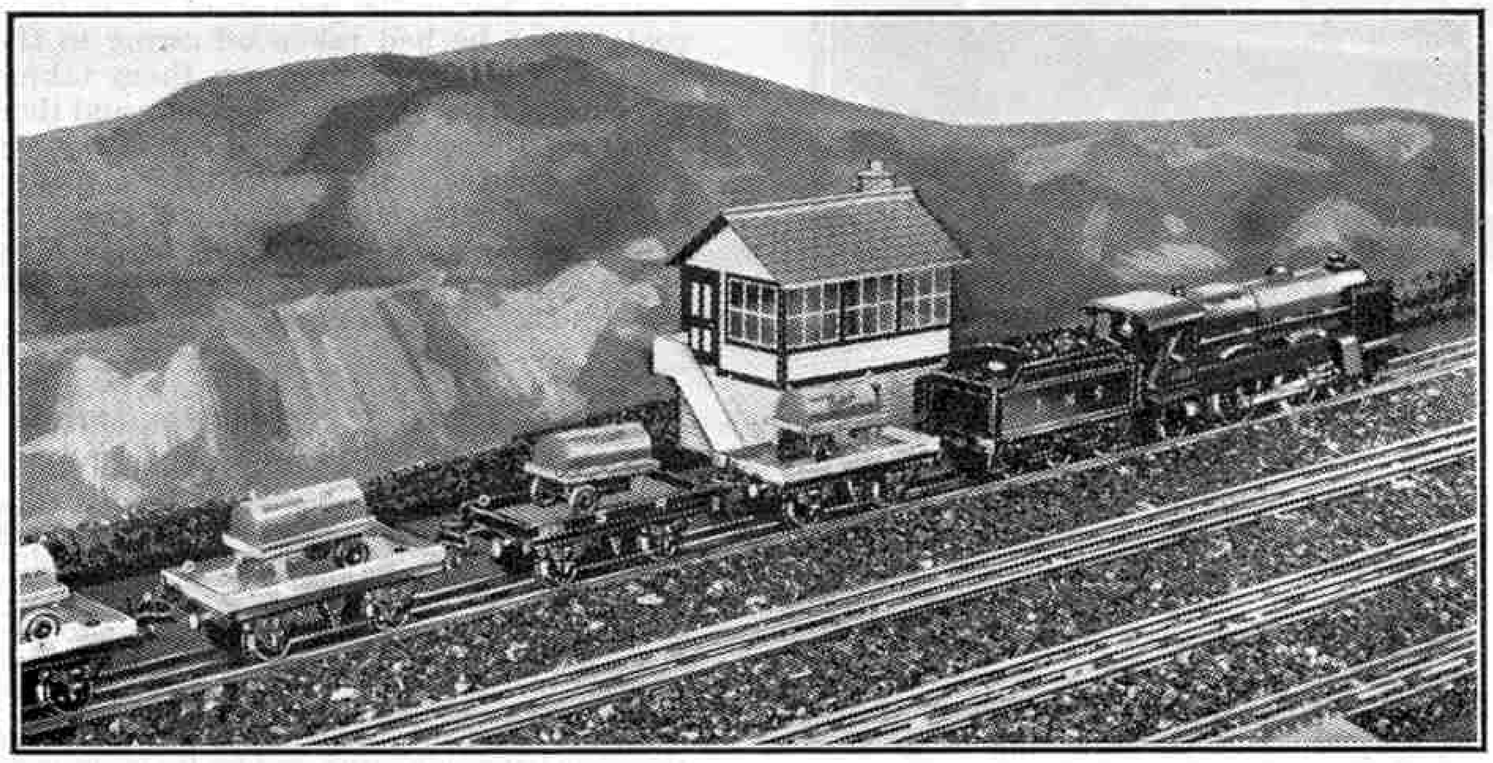
There are two patterns of Rotary Tipping Wagons, the No. 0 and the No. 1. In each case the body of the Wagon is scoop-shaped, and is mounted on a turntable frame fitted on the wagon base. The turntable allows the body to be turned to any point round the wagon. The body of the No. 0 Rotary Tipping Wagon is rounded in shape; that of the No. 1 type Wagon is square-built.

Either type of Tipping Wagon is suitable for use in "Engineering Department" trains; where the line is to be ballasted these vehicles can be employed to tip the material in the "six-foot way" between the tracks and along the "four-foot way" between the rails.

The Flat Truck is a simple form of open wagon and it has a great number of uses. It is specially suited to the carriage of miniature Cable Drums and Containers, and it can be used to transport road vehicles, Motor Cars, Tractors or Mechanised Army equipment from the Dinky Toys range.

A specially interesting use to which the Flat Truck can be put in conjunction with a Dinky Toys component is shown in the lower illustration on this page. Here several Flat Trucks are shown carrying Petrol Tank Trailers No. 33f. These are used to represent the road-rail tank trailers that are used extensively nowadays for the transport of various liquids in bulk.

A useful feature of the Flat Truck is found in the fitting of small rings, two to each side, to make it possible to secure loads by miniature "ropes" or chain.



"Liquids in bulk" transport in miniature; a train of Hornby Flat Trucks loaded with Dinky Toys Petrol Tank Trailers representing the real road-rail tanks used in actual practice.

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.

A Shropshire Mineral Railway

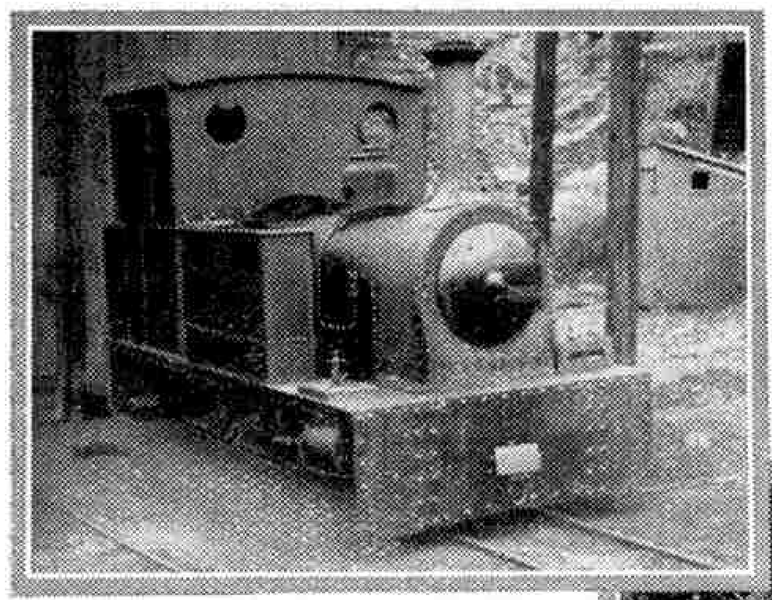
In the lead-mining district of Shropshire there is a narrow-gauge mineral railway known as the "Snailbeach District Railways." This line, of 2 ft. 3¾ in. gauge, was opened in 1875 to carry barytes and other minerals from the mines at Snailbeach to Pontesbury, on the joint L.M.S. and G.W.R. Shrewsbury—Minsterley line, a distance of 3½ miles. Since the closing of the mines some years ago only 1¼ miles of line near Pontesbury has been regularly used, for carrying granite from a quarry at Kelvil, although the locomotives use the rest of the line to reach the shed at Snailbeach.

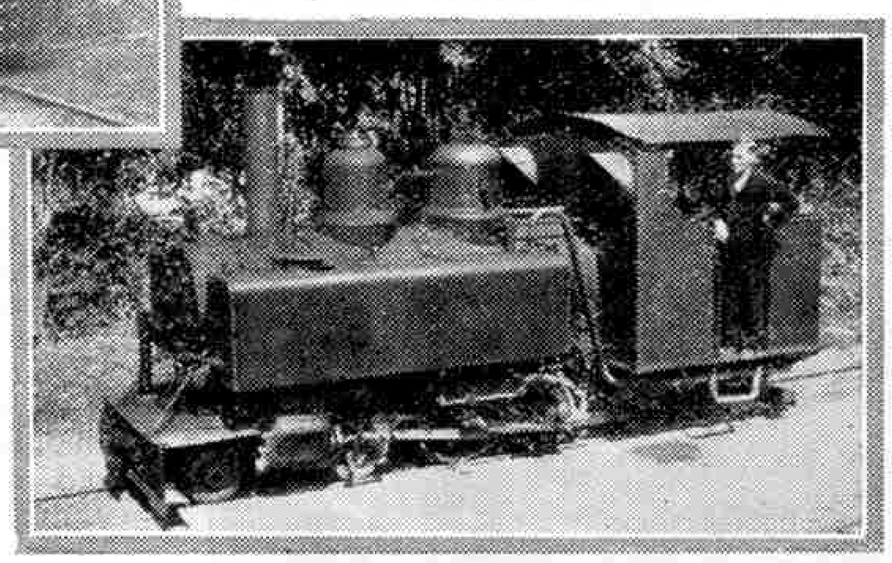
At present there are three locomotives. No. 2 is an 0–4–2 tank, built by Kerr Stuart Ltd. in 1901. Nos. 3 and 4 are 4–6–0 tanks, built by Baldwin, Philadelphia, U.S.A., in 1917, for use on the 60 cm. gauge lines on the Western Front during the Great War. Several of these locomotives were brought to this country in 1918, and used on the Ashover, Welsh Highland, Glyn Valley and Snailbeach Railways, with gauge altered where necessary. They have a decidedly American appearance.

I arrived at Pontesbury one morning last summer to find No. 3 just about to leave for Kelvil with a train of 15 empty hopper wagons. I was invited on to the footplate, and with a long blast on the whistle, the engine started slowly up the steep gradient. For the first ¼-mile the line runs on an embankment bordered with tall trees. It then enters a cutting, which extends as far as Kelvil, and from there onward it runs along the hillside to Snailbeach, climbing 400 ft. in the 3½ miles. Kelvil was reached in about 15 minutes, and here the wagons were run into a loop for re-filling. As soon as three or four were ready, the brakes were taken off, and the wagons rolled down toward Pontesbury by gravity, in charge of a brakesman. There they were unloaded, not into standard gauge wagons, but into County Council lorries. The standard gauge exchange siding is seldom used now, except for the delivery of coal for the locomotives and sleepers for track repairs.

The track is laid with flat-bottomed rails spiked direct to the sleepers. Most of the rails are those originally laid in 1875, and are nearly worn out. Speeds therefore do not often exceed eight miles per hour. In its early days the line owned a passenger coach for workmen's trains, which it is said could cover the 3½ miles from Snailbeach to Pontesbury in 4 min. at a speed of 50 m.p.h.!

J. G. VINCENT (Shrewsbury).





Locomotives of the Snailbeach Railway, described on this page. No. 2, above, is a Kerr Stuart product, and No. 3, on the right, is of American origin. Photographs by J. G. Vincent, Shrewsbury.

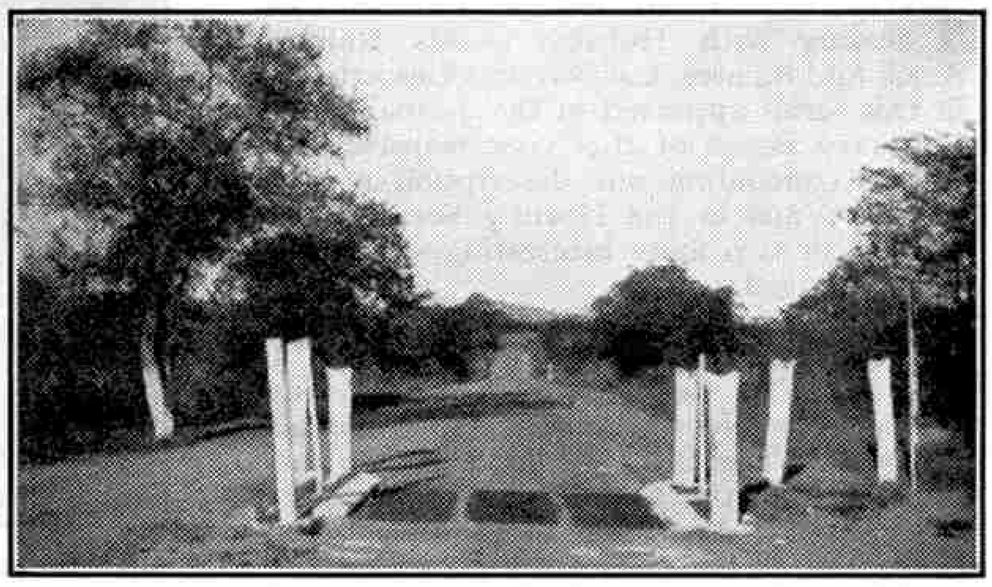
Road Features of Southern Rhodesia

I was interested to see in the *"M.M."* for May 1940 a description of road grids in use in the New Forest, because in Southern Rhodesia they are a usual feature of our main roads. Some years ago gates were the rule, but these were so frequently damaged or left open by motorists that they were replaced by grids.

The accompanying snap shows a typical grid, and exhibits an interesting feature peculiar to Southern Rhodesia. In addition to the usual motor traffic, we still use the ox-wagon for farm transport, and it is accordingly necessary to have ordinary gates wherever there are grids. In the photograph the wagon gate is open, and therefore not in the picture, but the wagon road itself is visible.

A further reason for the use of separate wagon roads is our strip construction of main roads. In this sparsely populated country of immense distances, full-width macadam is out of the question on account of the cost, and some years ago the engineers of the Government Roads Department hit upon the idea of laying tarred strips to provide a good surface for motor traffic. These strips have proved an unqualified success, giving us good all-weather roads where before, in the rainy seasons, there were only boggy tracks, which as often as not were impassable. Cars meeting each other naturally take the left-hand strip, and in practice this novel construction has made for a high degree of road safety.

Another feature of our road communications is our use of low-level bridges. In the rainy season Rhodesian rivers come down in spate with a force that must be seen to be believed. The roaring, muddy torrents, thundering down in swirling masses and carrying great trees with them, make the use of ordinary high bridges too dangerous in many cases. The difficulty has been overcome by employing a special type of low bridge with a deck only a few feet above the ordinary river bed. When the river is in flood it flows over the bridge, meeting with little resistance from the low obstruction, whereas a high bridge would be swept away.



A cattle grid on a motor road in Rhodesia. The ox-wagon road on the left can be closed by a gate. Photograph by I. M. H. Goodenough, Buluwayo.

IAN M. H. GOODENOUGH (Buluwayo).

The Apes of Gibraltar

The article on Gibraltar in the January issue of the *"M.M."* aroused my interest, as I lived there until quite recently. My home was near the street scene shown in one of the illustrations to the article.

I have seen the well-known Gibraltar apes many times, and once I had an amusing encounter with them. I was up the Rock on a picnic with my father, my mother and my brother when a band of apes came up and sat round us begging for food. We offered them bread and butter, which they would not take, but they loved the cake we had.

In the meantime a few others were trying to open the windows of our car, and some were searching in the pockets of my father's coat, which he had taken off owing to the heat. It was amusing to see them taking out papers, examining them closely and then throwing them away in disgust. They ate most of our tea, and when all the food was finished, the bigger apes came closer to examine the wrapping papers, apparently to make quite sure there was nothing left.

P. DEALE (Blackrock, Co. Dublin).

UNUSUAL TYPES OF COMMERCIAL MOTOR VEHICLES (*Continued from page 147*)

necessary pipes to be carried alongside the cab. There are no side doors because climatic conditions would make the cab unbearably hot if doors were fitted. To ensure that the driver has a means of escape in the event of the vehicle catching fire, a door is built into the back of the cab, and trap doors are fitted in the roof. This form of vehicle is now standardised by most of the oil companies, and is one of the accepted means of handling loads in the oil fields.

For the information contained in this article and the one in last month's issue, and for the photographs used as illustrations, we are indebted to Bromilow and Edwards Ltd., of Bolton, Lancs.

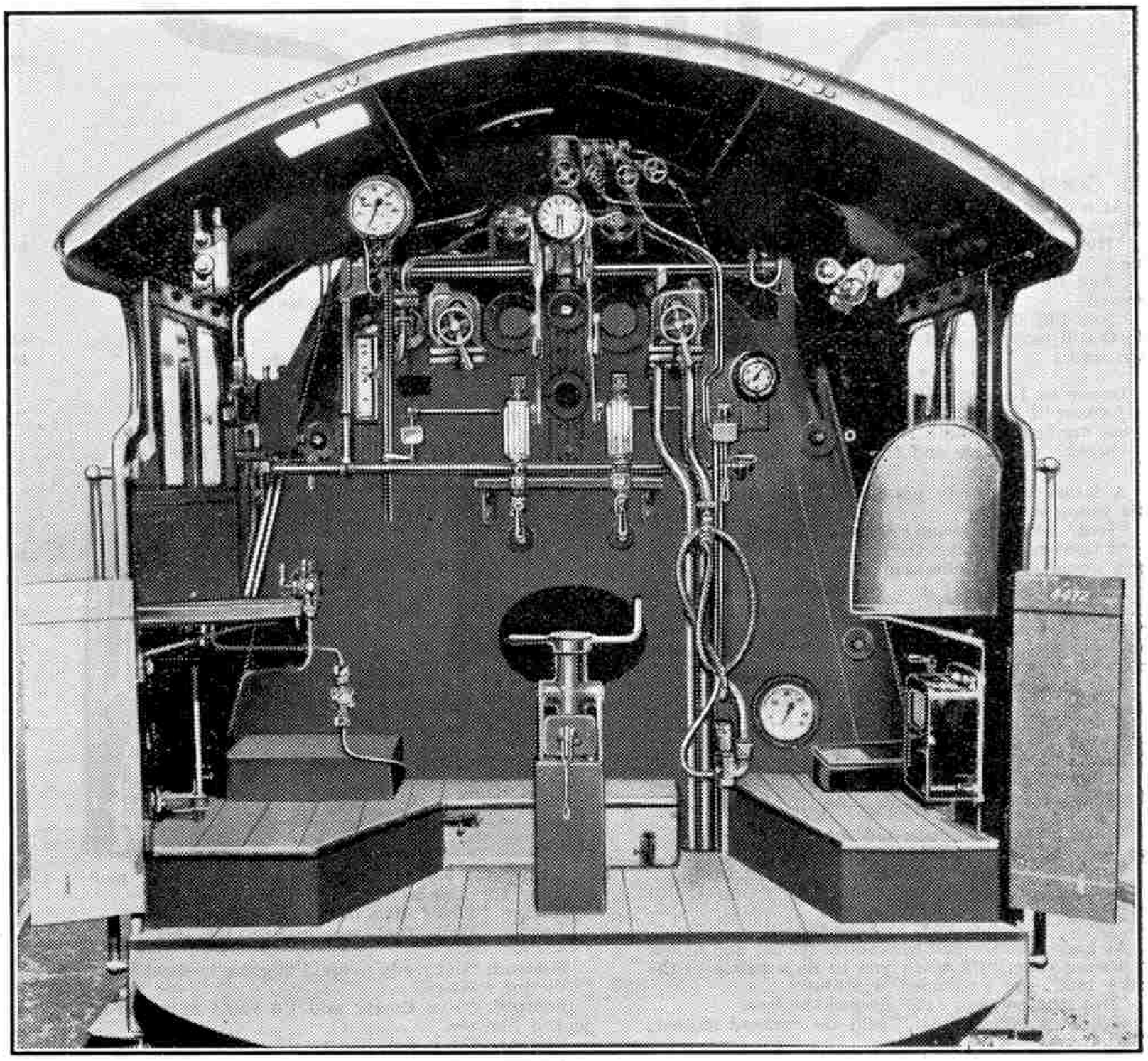
COMPETITIONS! OPEN TO ALL READERS

Spot the Mistakes!

Our illustration shows an impressive view of the cab of a large express locomotive. At a glance it looks normal, but when details are examined more closely it soon appears that everything is not quite in order. For instance, the reversing gear is clearly in the wrong position. Indeed, there are many things that are wrong, and we are sure that our readers will revel in the task of detecting the mistakes that have been deliberately made in producing the illustration.

All that entrants have to do in this competition is to make a list of the errors that have been introduced into the picture and to send this to *"May Errors Contest," Meccano Magazine, Binns Road, Liverpool 13.* Every reader of the Magazine, whether he is a member of the H.R.C. or not can enter the contest.

There will be two sections, Home and Overseas, and in each section there will be prizes of 21/–, 15/–, 10/6 and 5/– for the best list of errors. In addition there will be consolation prizes for good efforts. Closing dates, Home section 31st May, Overseas section 30th September.



"Doublets" Word Puzzle

Readers of the *"M.M."* will enjoy another Doublet competition, a type that has always attracted very large entries indeed. For the benefit of new readers we may explain that two words containing the same number of letters form a doublet, and that one is to be changed into the other by forming new words, each new word differing from the one before it by one letter only. Thus COLD may be changed to HEAT with three links, HOLD, HELD, and HEAD. The idea is to effect the change in as few steps as possible.

The Doublets that are to be solved are as follows: Remove HEAD from BODY; Pour TEA into CUP; make BIRD SING; take DIVE into POOL; drain WATER from TANKS; make TOPS SPIN; give ROLL on DRUM; watch BEAR climb TREE; fit LAMP on WALL; turn LOVE into HATE; hang BEEF on SPIT; make BELL RING.

There will be the usual two sections in the contest, for Home and Overseas readers respectively, and prizes of 21/–, 15/–, 10/6 and 5/– will be awarded for the entries showing the lowest totals of links in the 12 Doublets given.

The closing dates are Home section 31st May, Overseas section 30th September.

May Photographic Contest

This is the second of our 1941 series of competitions. In this competitors are asked simply to submit photographs of any kind that they have taken themselves. An entry may consist of more than one photograph, but each print submitted must have on the back of it a title, with the competitor's name, address and age. It is not necessary that the printing and developing should be his own efforts so long as he has made the exposure himself, and we remind competitors that they should take care not to photograph objects of military, naval or Air Force interest. Useful hints on this matter were given in last month's Editorial and Meccano Guild Secretary's notes.

Entries will be divided into two sections, A for readers aged 16 and over. and B for those under 16, and in each section prizes of 15/– and 7/6 respectively will be awarded. There will be two similar sections with prizes of the same value for Overseas readers.

Entries in this month's competition should be addressed *"May Photo Contest, Meccano Magazine, Binns Road, Liverpool 13."* The closing date in the Home section is 31st May and that in the Overseas section is 30th September.

COMPETITION RESULTS

HOME

January "Cover Voting" Contest.—1. B. Innes (Torphins); 2. R. Powell (Edgware); 3. N. Hailstone (Hitchin); 4. B. Newton (Bristol 4). Consolation Prizes: D. Chalmers (Inverkeithing); K. Jones (Harrow); R. Oley (South Shields).

February "Cipher" Contest.—1. T. Hill (Bolton); 2. W. K. Cocking (Redruth); 3. R. H. Dickinson (New Barnet); 4. L. W. Chitty (Kingston-on-Thames). Consolation Prizes: F. E. R. Hogg (Burgess Hill); J. F. Marsh (Birmingham).

February "Railway Journey" Contest.—1. J. L. Makins (Buxton); 2. G. K. Sewell (Leicester); 3. A. G. Ford (Leicester). Consolation Prizes: G. S. Rowland (Birmingham 2); A. J. Bryant (Banbury, Oxon).

March Crossword Puzzle Contest.—1. W. K. Cocking (Redruth); 2. T. Hill (Bolton); 3. V. Knill (Leicester); 4. T. D. Tasker (Barnsley). Consolation Prizes: G. Laing (Edinburgh); J. Lorimer (Bradford); D. Shepherd (Harrow).

OVERSEAS

October "Feature Voting" Contest.—1. L. Wood (Johannesburg); 2. G. Myburgh (Claremont); 3. G. Ball (Wellington); 4. B. Bunbury (Quebec). Consolation Prizes: W. R. Collyer (Natal, S.A.); R. N. M. Lea (Otaki, N.Z.).

November Crossword Puzzle Contest.—1. L. D. Pershad (Delhi, India); 2. E. Chircop (Rabat, Malta); 3. S. V. Nilakanta (Madras, S. India); 4. E. C. Neser (Transvaal, S. Africa).

November "Locomotive Pie" Contest.—1. V. Galea (Valetta, Malta); 2. F. J. Harrison (Bulawavo, S.A.); 3. R. Hughes (Wellington, N.Z.). Consolation Prizes: D. A. Hynd (Pretoria, S.A.); D. Wood (Melbourne, Australia).

FIRESIDE FUN

COOL, CALM AND COLLECTED

At a Scout Dance three small Scouts were serving refreshments when the air raid siren sounded.

"Hurry up with that coffee," said one, "it'll help to keep 'em calm."

"And the ice cream will make 'em cool," said the second.

"And Bill, if you collect the cups, make a row about it, that'll make us cool, calm and collected," added the leader.

* * * *

Owner to Jockey: "Can't you reduce some more?"

Jockey: "I haven't eaten for two weeks, and to-day I cut my finger-nails."

Owner: "Go home and shave."

* * * *

A father was sorely pestered by the questions of his young son.

"Dad," said the youngster, "am I made of dust?"

"I think not," replied the patient parent; "otherwise you would dry up now and then."

* * * *

Conjurer: "Now to help me with this next trick, I want the services of a boy—just any boy in the audience—yes, you will do my little man: come along. Now, you have never seen me before, have you?"

Boy (innocently): "No, father."

* * * *

Diner: "I'll have apple-pie for dessert."

Waiter: "Apple pie's off, sir!"

Diner: "Then give me the raspberry."

Waiter: "Sorry, sir, but we are not allowed to be rude to the guests."

* * * *

Judge: "What can you tell me about the person you saw on the scene of the crime?"

Witness: "He had freckles on his face."

Judge: "Nothing else?"

Witness: "Yes, pimples."

* * * *

An angry mother had her son by the ear and held a menacing cane. "I'll teach you to tie a kettle to the cat's tail!" she exclaimed wrathfully.

"But it wasn't our cat," gasped the boy.

"No, it wasn't our cat," said the enraged mother, "but it was our kettle!"

* * * *

Guide: "These are the ruins of a castle of the earliest invaders."

Tourist: "Why did they build it so far away from the station?"

* * * *

Policeman (to old lady looking ill and holding on to railings): "What's the matter, ma'am? Have you vertigo?"

Old Lady: "About four miles, constable."

* * * *

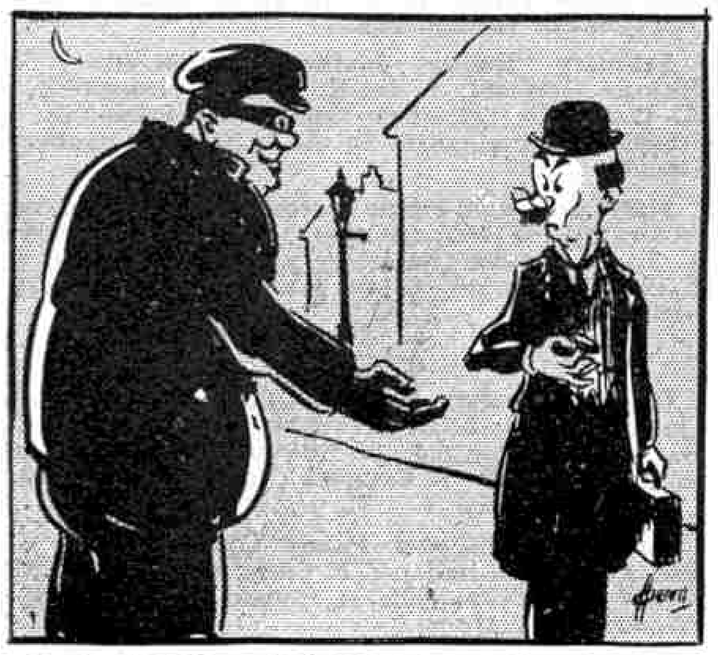
"I call to make an appointment with the dentist."

"He's out now."

"Good, when will he be out again?"

* * * *

TIME PLEASE!



Footpad: "What is the time guv'nor?"

Gentleman: "Half-past eleven, my man."

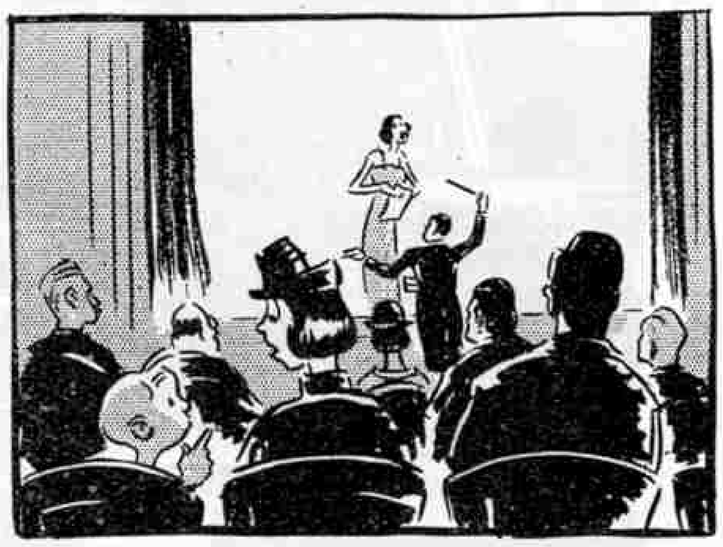
Footpad: "I'll never remember that; lend us your watch!"

HOUGH DO YOUGH SPELL IT?

The wind was rough,
And cold and blough,
She kept her hands within her mough.
It chilled her through
Her nose grew blough,
And still the squall the faster flough.
And yet, although
There was no snough,
The weather was a cruel fough.
It made her cough—
Pray, do not scough—
She coughed until her hat blough ough.

* * * *

CAUSE AND EFFECT



Jimmy (at his first concert): "Why is that man shaking his stick at the lady on the stage?"

Mother: "Sh-sh! He's not shaking it at her."

Jimmy: "Well, what's she hollerin' for, then?"

* * * *

Footpad: "Get ready to die. I'm going to shoot you."

Victim: "Why?"

Footpad: "I've always said I'd shoot anyone who looked like me."

Victim: "Do I look like you?"

Footpad: "Yes."

Victim: "Then shoot."

* * * *

A Scotsman who had been playing golf in Florida was seen leading a crocodile home on a rope.

"What's the idea?" asked a friend who met him.

"Weel," he replied, "the hungry beast swallowed my ball."

* * * *

After a hectic time of dealing with fires during an air raid the firemen were packing up, dog-tired but triumphant. One man had been groping in the road in the black-out and grumbling vigorously.

"What's the matter, Bill?" enquired a mate.

"Matter? I must be crackers, I've been trying to roll up the white line; thought it was the hose."

* * * *

She was going out for the afternoon and so scribbled a note, intended for the tradesmen, saying: "All out. Don't leave anything." Then she pinned it to the front door.

When she returned she found the door ajar. On the back of her note was, "Thanks! We haven't!"

* * * *

A salesman was dismissed because of lack of courtesy to customers. A month later the sales manager saw him strutting about in a police uniform.

"I see you've joined the force, Jones," said the sales manager.

"Yes," replied Jones. "This is the job I've been looking for all my life. On this job the customer is always wrong."

* * * *

The Latin for madness is "furor."

Hence the German Führer!

* * * *

"The man who says he's absolutely certain of anything is a fool."

"Are you sure of that?"

"Absolutely certain."

* * * *

THIS MONTH'S HOWLER

The minister of war is the clergyman who preaches to the soldiers in barracks.

SERVICE

"There's a wonderful echo from these rocks," said the guide to the tourist, "but you have to shout very loud. Now you just yell, 'Two bottles of pop'."

The tourist shouted and then listened.

"I hear no echo at all," said he.

"Oh, well," said the guide, "here comes the inn-keeper with our pop, anyway."

* * * *

Workman (to Manager): "I've now been here for over 12 months working my inside out, and doing the work of three men for the pay of one, and I want a rise."

Manager: "I canna afford tae gie ye a rise in pay, but if ye'll tell me the names of the other two men I'll sack them."

* * * *

Proprietor: "Didn't the waiter give you a menu, sir?"

Neglected Patron: "Certainly; but I ate that an hour ago."

* * * *

Specialist: "Could you pay for an operation if I thought one was necessary?"

Patient: "Would you find one necessary if I could not pay for it?"

* * * *

"Watch the dickey-bird!" said the photographer.

The modern child looked annoyed.

"Just pay attention to your exposure and your shutter speeds, or you will ruin the plate," he admonished, sternly.

* * * *

A teacher called for sentences using the word "beans."

"My father grows beans," said the bright boy of the class.

"My mother cooks beans" said another pupil.

Then a third popped up: "We are all human beans."

* * * *

An American applied at a Canadian recruiting office to enlist.

"I suppose you want a commission," said the officer.

"No, thanks," was the reply, "I'm such a poor shot I'd rather work on straight salary."

* * * *

Visitor: "I'm collecting for the suffering poor."

Housewife: "Are you sure they suffer?"

Visitor: "Quite sure. Why, I go into their homes and talk to them for hours on end!"

* * * *

"I wish the boys wouldn't call me Big Bill."

"Why?"

"These college names stick. And I'm studying to be a doctor."

* * * *

"A man called while you were out. He didn't leave his name."

"What was he like? Tall or short?"

"Both."

"How could he be both?"

"Well, he was over six feet, and he wanted to borrow some petrol.

* * * *

"Where be going, Jarge?"

"Bain't going nowhere."

"But ee must be going somewhere."

"No I bain't. I be coming back."

* * * *

A portly woman had, by mistake, taken a seat in a railway coach reserved for smokers. With unconcealed indignation she saw the man next to her fill his pipe.

"Sir," she said in frigid tones, "smoking always makes me ill."

The man calmly lit his pipe and puffed contentedly before replying: "Does it, ma'am? Well, take my advice and give it up."

* * * *

In the middle of a law suit brought against a neighbour a peppery old colonel was called away on a long journey. He left his counsel with instructions that the verdict should be wired to him.

When the telegram arrived it read, "Right has triumphed."

Back came the reply, "Appeal immediately!"

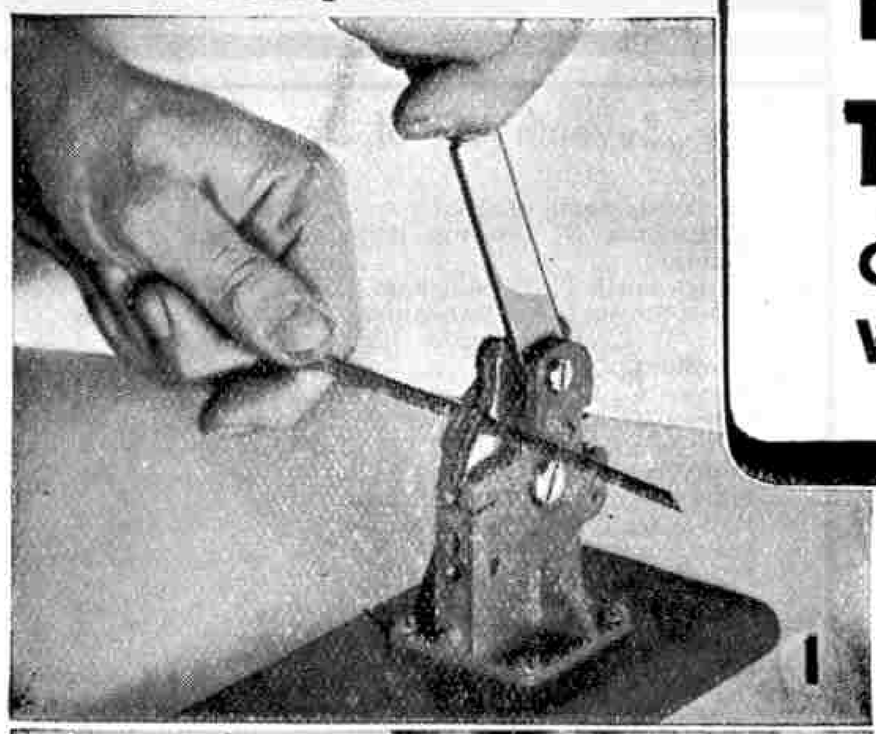
* * * *

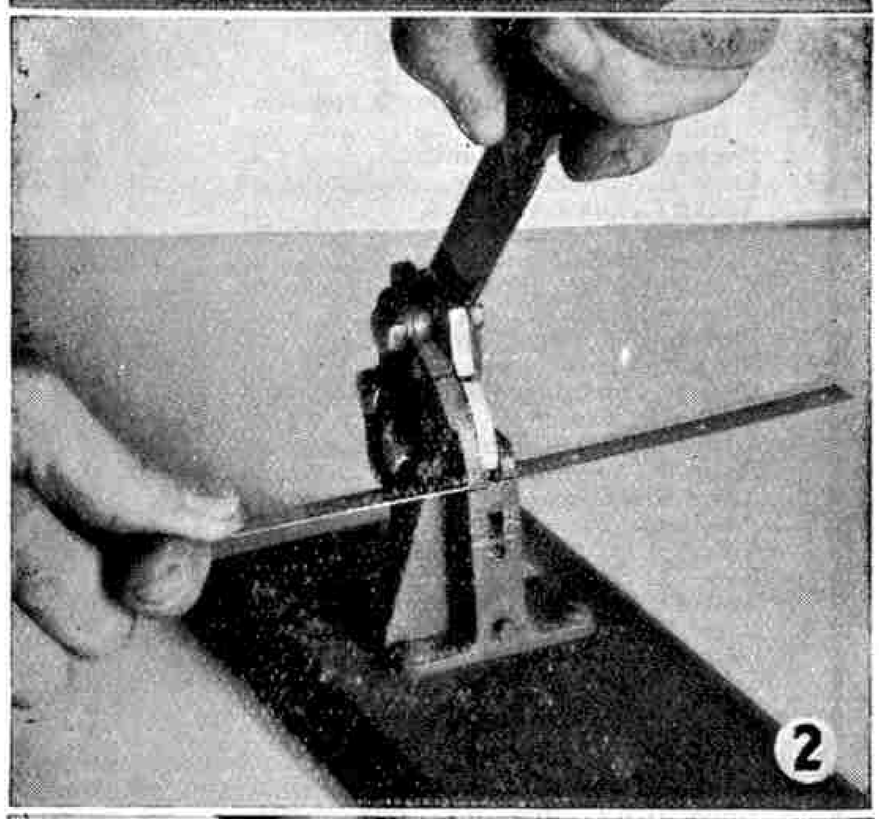
HOT NEWS

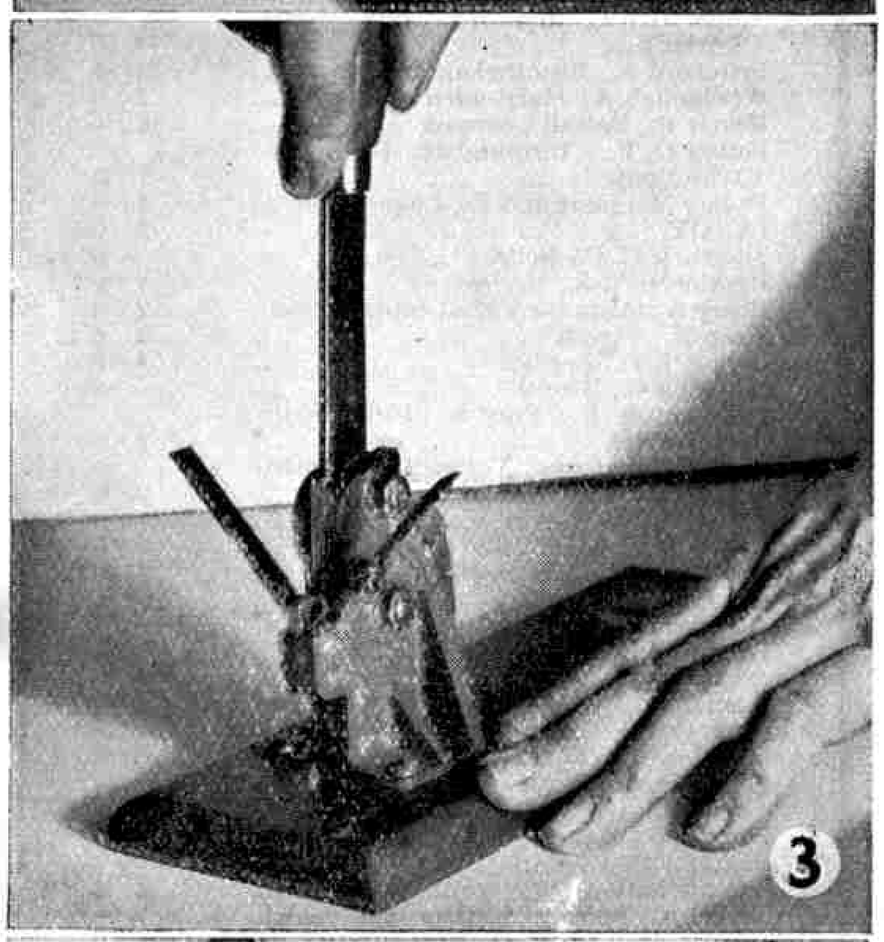
Contractor: "Does the foreman know that the trench has fallen in?"

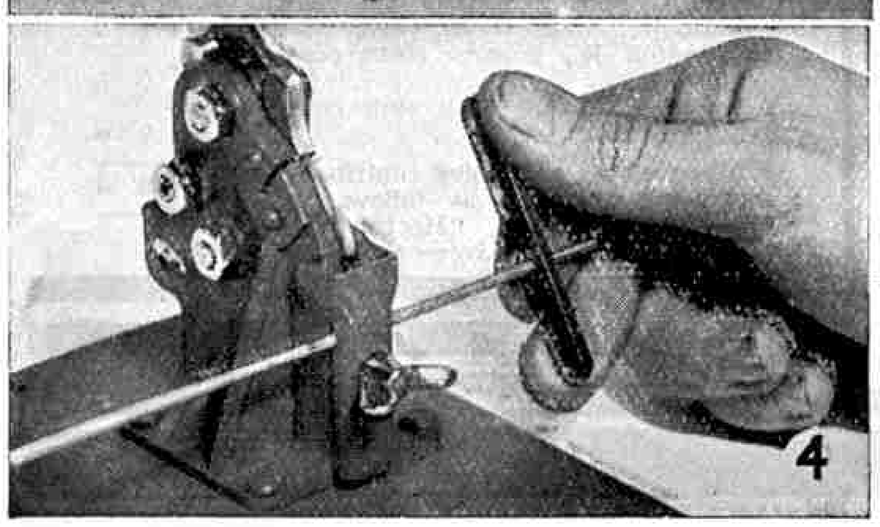
Navvy: "No sir, we're diggin' 'im out to tell 'im."

JUNEERO IN ACTION—1. Shearing Strip. 2. Punching Strip. 3. Bending Strip. 4. Threading Rod.









THE SHAPE OF THINGS TO COME . . .

CONSTRUCTED WITH JUNEERO

THESE are thrilling days—all sorts of new mechanical ideas and gadgets are in demand. Perhaps you have some bright ideas yourself, ideas for something new or for improving something. Try it out, make it yourself in metal to see if it works.

The photos show how versatile is the ingenious Juneero multi-purpose tool which will do almost anything with Juneero strip and rod! With this tool and Juneero materials you can make a host of useful and interesting things—models, utility articles and repairs. Numerous designs sheets are now available at 1d. each from your Juneero dealer.

JUNEERO SETS are supplied by Juneero dealers at the following prices, ranging in size from the multi-purpose tool and essential materials in No. 1 set to the wealth of tools and materials in the Engineers Set. No. 1 Set 15/–. No. 2 Set 30/–. Workshop Set 60/–. Engineers Set 84/–. If owing to war conditions you have any difficulty in obtaining, send remittance to us plus 1/– for packing and postage on Nos. 1 and 2 sets, 2/– for larger sets (abroad 5/6 and 10/6 extra).

MANY FAMOUS ENGINEERING FIRMS now using JUNEERO

THIS ENGINEERS' SET

containing magnificent variety of tools and materials is the Juneero outfit par excellence. Packed in a heavy gauge metal box, price, complete

84/-

JUNEERO IS FREE OF PURCHASE TAX

COUPON: Write Name and Address in Margin BLOCK LETTERS

To JUNEERO LTD., Stirling Corner, Boreham Wood, Herts.
Please send me particulars of Juneero Sets and name of nearest dealer.

THE MECCANO MAGAZINE

R·A·F

RADIO FUND

★

A Message from the Editor

The object of this Fund is to provide portable radio sets for the isolated units of the R.A.F., who are in urgent need of this means of keeping in touch with current events and hearing the programmes of the B.B.C. These units, which include the Observer Corps and outlying detachments of all kinds, are on watch unceasingly, day and night, for enemy activities. The conditions in which they work cut them off almost entirely from any form of amusement, and their off-duty hours are apt to become very monotonous. For these units a radio set will come as the most welcome of all gifts.

The Fund is in direct association with the R.A.F. Comforts Committee, and all money received will be forwarded to this Committee *without any deduction whatever for working expenses*. The Committee will buy suitable radio sets, and distribute them where they are most needed.

I appeal to every one of you to look on this Fund as your own special way of making things more cheerful for the men of the R.A.F. Tell your parents, uncles and all other relations about the Fund, and gather in their subscriptions.

THE EDITOR.

The sum of £130 has already been sent to the R.A.F. Comforts Committee. Help me to make this £150 within the next few weeks!

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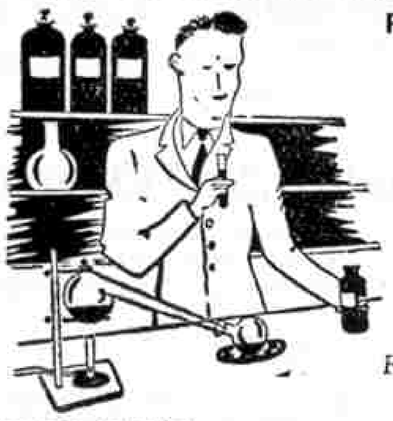

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READERS' SALES AND WANTS

Readers should note that all advertisements of Hornby Trains and other Meccano products included in this column relate to items no longer featured in the catalogue. Advertisements of current products cannot be accepted for this column.

Model Steam Engine; 14 inch boiler; governor regulated, 2 flywheels with power take off, adjustable valve, pump, manometer, other fitments; perfect order; also few model parts, £4. 8-day Motor Clock, perfect, 12/6. S.A.E.—V. Ward, 3, Dawson Road, Handsworth, Birmingham 21.

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Wanted. "Hobbies" 1938 Annual. State price.—D. Upton, "Glenavon," Colvill Avenue, Shoreham.

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Sale. "Bowman" Stationary Steam Engine, model M101. Hardly used. 17/6 or nearest.—Taft, 28, St. George's Terrace, Kidderminster.

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EDITORIAL AND ADVERTISING OFFICE:
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Telegrams: "Meccano, Liverpool."

Publication Date. The "*M.M.*" is published on the 1st of each month and may be ordered from any Meccano dealer, or from any bookstall or newsagent, price 6d. per copy. It will be mailed direct from this office, 4/– for six issues and 8/– for twelve issues.

To Contributors. The Editor will consider articles and photographs of general interest and payment will be made for those published. Whilst every care will be taken of articles, etc., submitted, the Editor cannot accept responsibility for any loss or damage. A stamped addressed envelope of the requisite size should be sent where the contribution is to be returned if unacceptable.

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Readers Overseas may order the "*Meccano Magazine*" from regular Meccano dealers or direct from this office. The price and subscription rates are as above, except in Australia, where the price is 1/– per copy (postage extra), and the subscription rates 7/– for six months and 14/– for 12 months (post free), and Canada, where the price is 10c. per copy, and the subscription rates 65c. for six months, and $1.25 for 12 months (post paid).

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Overseas readers are reminded that the prices shown throughout the "*M.M.*" are those relating to the United Kingdom and Northern Ireland. Current Overseas Price Lists of Meccano products will be mailed free on request to any of the undermentioned agencies. Prices of other goods advertised may be obtained direct from the firms concerned.

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SOUTH AFRICA: Mr. A. E. Harris (P.O. Box 1199), 142, Market Street, Johannesburg.
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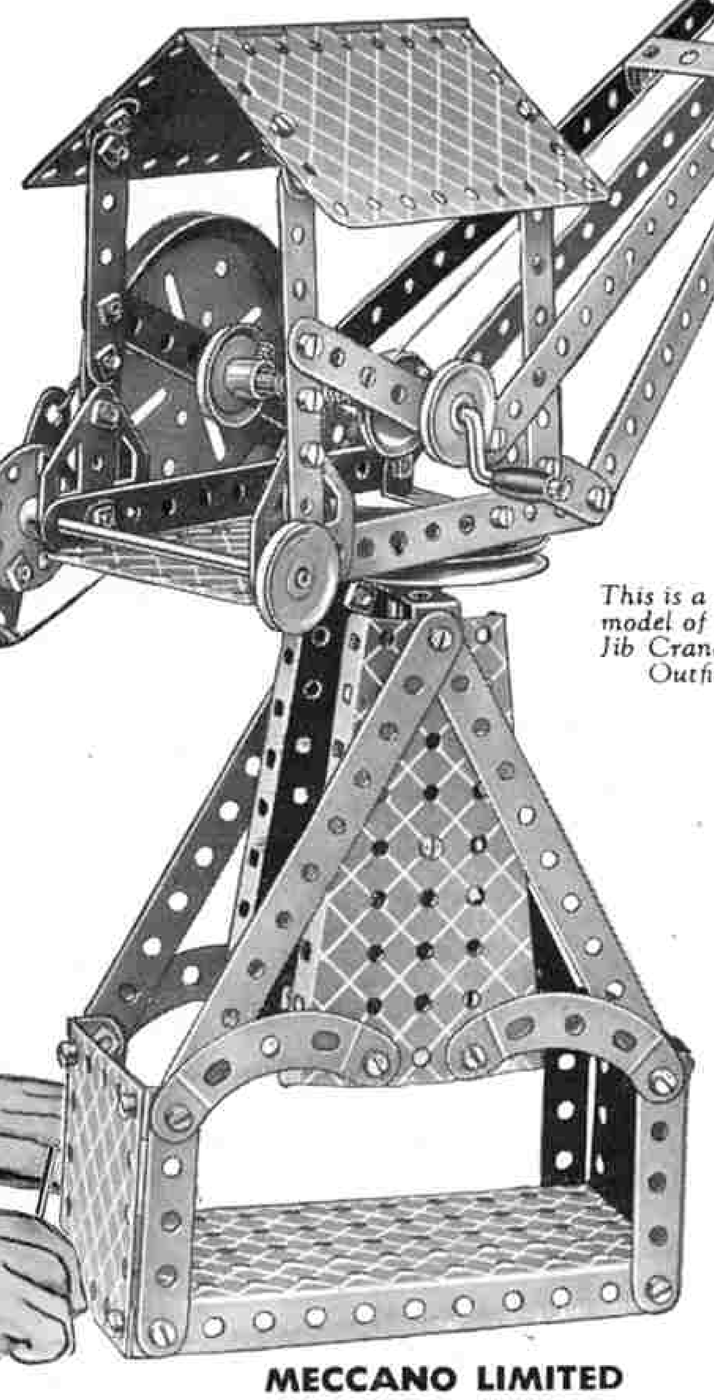

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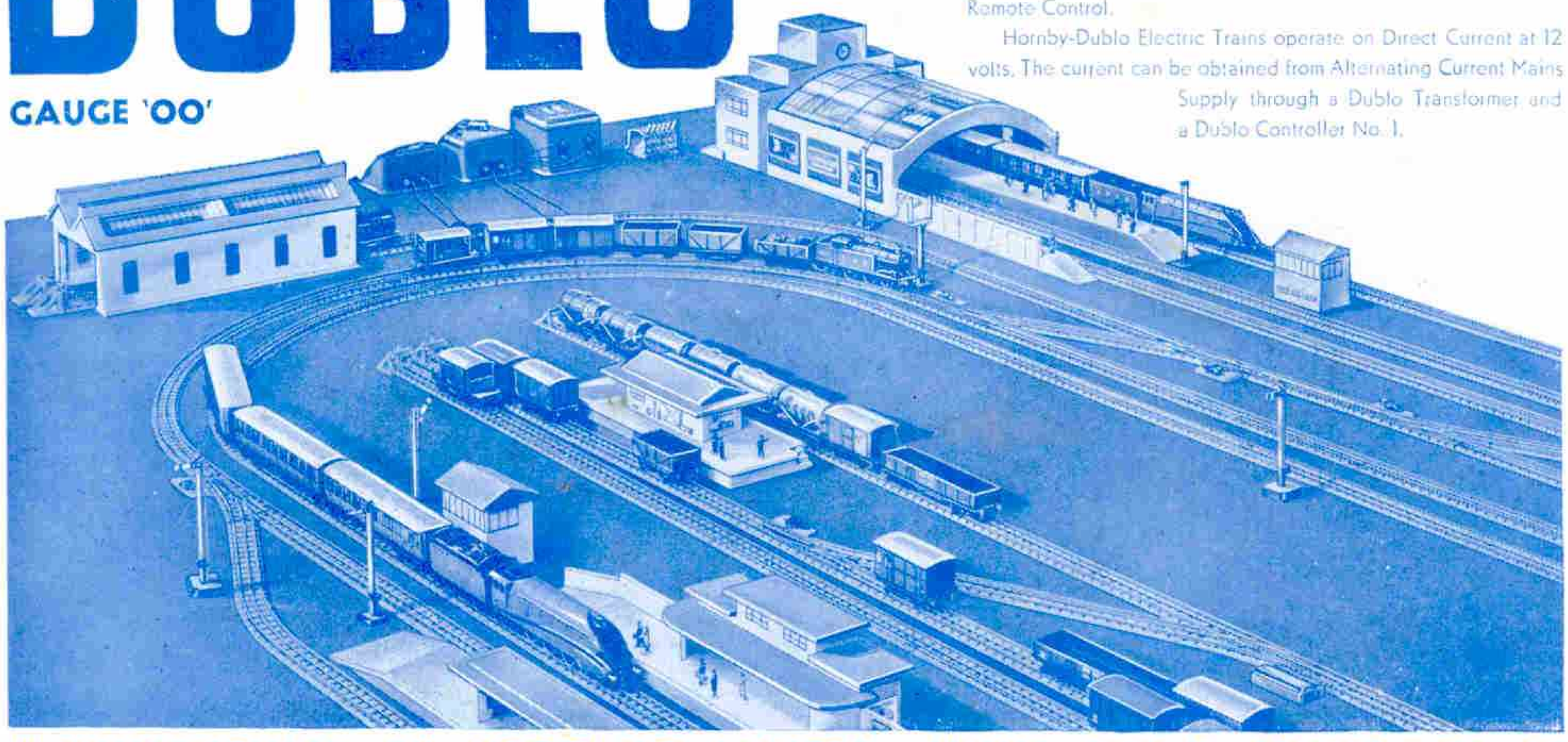

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PUBLISHED BY MECCANO LTD., BINNS ROAD, LIVERPOOL 13, ENGLAND.
Printed by John Waddington Ltd., Leeds and London.