

# New Meccano Model

## A Meccano Plaiting Machine

THE attractive model we are describing this month is designed specially for experienced model-builders having a fairly wide range of parts at their disposal. But although it incorporates a variety of ingenious mechanisms, it is not really a difficult model to construct or operate.

Most of us at some time or other have

machine, and it is most interesting to watch in motion when completed. Essentially it consists of three carriers, each of which holds a reel of coloured thread. By means of cleverly thought out mechanism these carriers are manipulated in such a manner that threads drawn from the reels are interwoven in the usual plaited fashion, the plaited strand then being wound up automatically by a neat "take-up" device.

In constructing the model it is best to commence by building the main framework, which is seen in Figs. 1 and 2.

Two  $12\frac{1}{2}$ " Angle Girders 1 and 2 are bolted to two  $5\frac{1}{2}$ " Angle Girders 3 and 4, supported with a Corner Gusset at the rear. A further  $12\frac{1}{2}$ " Angle Girder 5 is secured to the  $5\frac{1}{2}$ " Angle Girders 3 and 4. This complete side is attached to another similar side with  $5\frac{1}{2}$ " Angle Girders and two Flat Plates. To the  $5\frac{1}{2}$ " Angle Girders 6 and 7 are bolted two  $12\frac{1}{2}$ " Angle Girders 8 and 9, secured at the top with a  $2\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strip and two Corner Gussets extended with a  $4\frac{1}{2}$ " Strip.

Two  $5\frac{1}{2}$ " Strips 10 and 11 are bolted to the  $12\frac{1}{2}$ " Angle Girders 5 as shown in Fig. 3, and two  $5\frac{1}{2}$ " Angle Girders 12 and 13 are bolted to the Angle Girders 1 as shown in Fig. 4. A  $2\frac{1}{2} \times 2\frac{1}{2}$ " Flat Plate 14, Fig. 3, is bolted to the strips 10 and 11, and one  $2\frac{1}{2} \times 2\frac{1}{2}$ " Flat Plate 15, Fig. 2, to the  $5\frac{1}{2}$ " Angle Girders 12 and 13.

On a 3" Rod 16, Fig. 4, is secured a Bush Wheel with two Set Screws bolted in adjacent holes. Collars are used to hold the Rod in position, and a  $1\frac{1}{2}$ " Helical Gear Wheel 17 is fastened to its lower end.

On a  $2\frac{1}{2}$ " Rod 18, Fig. 4, a Bush Wheel with Set Screws in each of its eight holes is secured, also a 50-tooth Gear Wheel 19, which drives a  $\frac{3}{4}$ " Pinion Wheel on a  $2\frac{1}{4}$ " Rod 20. A 1" Gear Wheel on Rod 20 drives a 1" Gear Wheel on a  $4\frac{1}{2}$ " Rod 21. The  $1\frac{1}{2}$ " Strips 22 are placed so that the 1" Gear Wheels engage each other.

Rod 23, Fig. 4, is driven similarly to Rod 21, but  $\frac{3}{4}$ " Sprocket Wheels are used in place of the 1" Gear Wheels. At the lower ends of the Rods 21 and 23, Fig. 4, a Coupling fitted with two Threaded Pins is secured, Fig. 3. Two  $5\frac{1}{2}$ " Strips 24 are bolted to

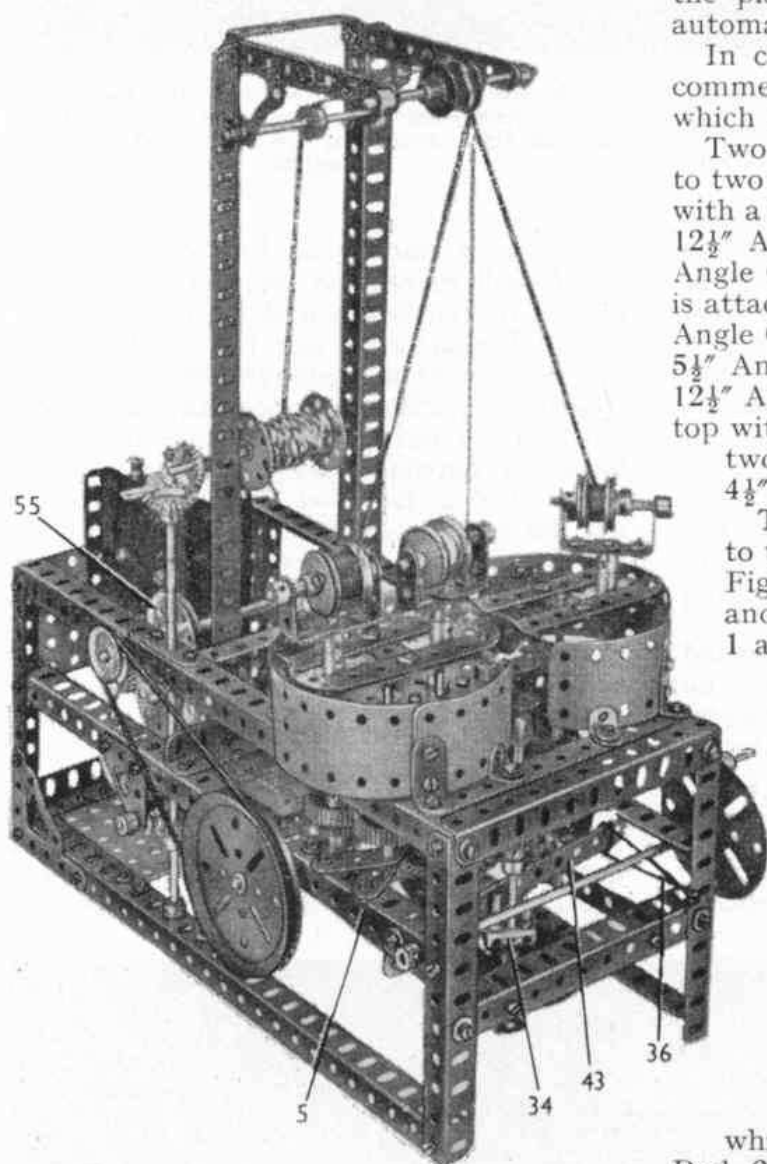


Fig. 1. This ingenious Plaiting Machine makes an unusual and interesting subject for experienced model-builders.

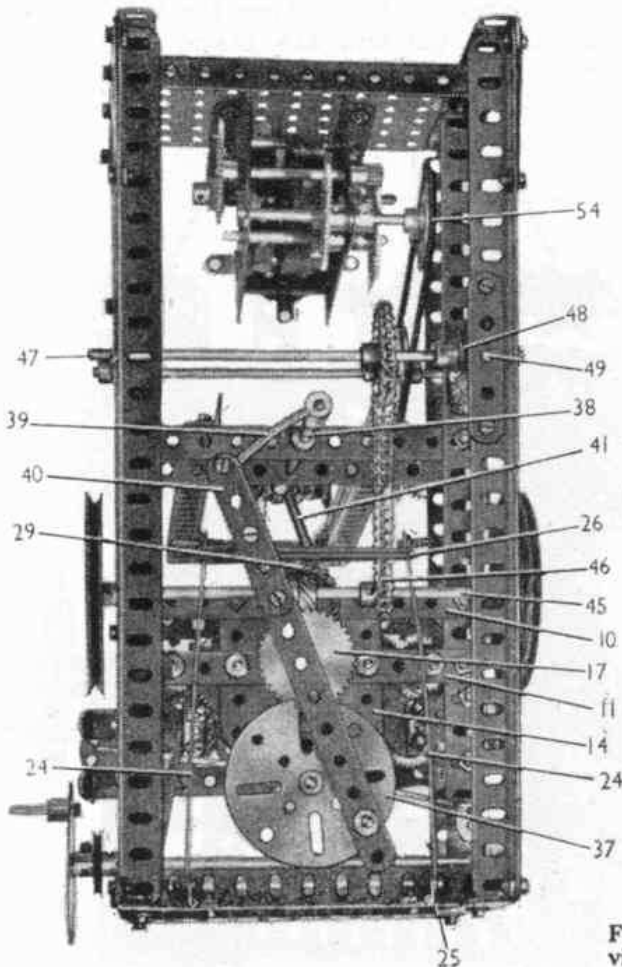
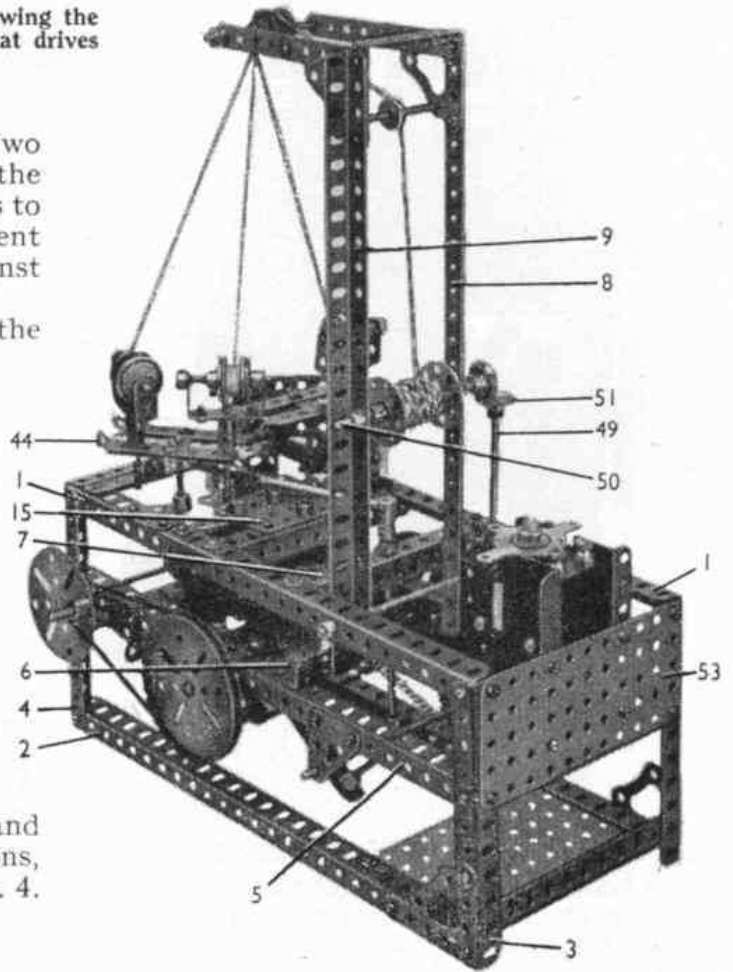
tried our hands at plaiting three strands of string, and this machine is designed to carry out automatically and continuously all the movements involved in hand plaiting. Really it is a simple version of a braiding

**Fig. 2.** A rear view of the Plaiting Machine, showing the method of mounting the E20R Electric Motor that drives the mechanism.

Hinges fixed to a  $5\frac{1}{2}$ " Angle Girder 25. Two  $2\frac{1}{2}$ " Driving Bands 26 are placed over the other ends of the Strips with two  $\frac{1}{2}$ " Bolts to hold them in position. By this arrangement the  $5\frac{1}{2}$ " Strips are made to press against the Threaded Pins.

Before securing the Couplings on the Rods 21 and 23, the centre Rod 16 must be rotated to drive the Bush Wheels and secured when the two Set Screws in the centre Bush Wheel strike the spaces in the two outer Bush Wheels. These must operate like gear wheels, turning the Rods 21 and 23 half a revolution. On a further two  $2\frac{1}{2}$ " Rods 27 and 28, Bush Wheels with Set Screws are secured, also 50-tooth Gear Wheels. On the lower Wheels with Set Screws are secured also 50-tooth Gear Wheels. On the lower ends of the Rods 1" Sprocket Wheels are fastened and are connected with Chain 29, Fig. 3.

The  $2\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plates 15, Fig. 2, and 30, Fig. 4, are extended with Flat Trunnions, to form the bearings for  $4\frac{1}{2}$ " Rod 31, Fig. 4.



A  $\frac{3}{4}$ " Pinion Wheel 32 is fixed to engage the 50-tooth Gear Wheel 33, Fig. 4. A  $5\frac{1}{2}$ " Strip 43 pivoted by a Hinge and secured to the  $12\frac{1}{2}$ " Angle Girders 5 with a Corner Angle Bracket, is held against Threaded Pins in a Coupling 34 by a  $2\frac{1}{2}$ " Driving Band 36, Fig. 1.

A Face Plate 37 is bolted to the lower end of Rod 31. In the centre of the  $5\frac{1}{2}$ " Angle Girders 6 and 7, Fig. 2, a  $4\frac{1}{2}$ " Rod 38 is placed, with a Coupling at each end. At the lower end a Flexible Coupling Unit 39 is attached to a compound  $6\frac{1}{2}$ " Strip 40 with a Collar and Set Screw, whilst the other end of the Strip is connected to the Face Plate with a Threaded Pin and a Collar.

A 5" Rod 41 is fastened in the Coupling 42, Fig. 4. This is so adjusted that after each half turn of the Face Plate 37 the Rod 41 rests on Rods 21 and 23 alternately; the Strip 43, Fig. 5, pressing against the Threaded Pins after each movement, holds the Rod 41 stationary.

The carrier slides are built from four  $3\frac{1}{2}$ " Strips 44, spaced apart with a  $1\frac{1}{2}$ " Strip and a double Arm Crank. The ends of the Strips are bent as shown in Fig. 2. These

**Fig. 3.** The Plaiting Machine seen from underneath. This view shows clearly the ingenious drive to the shaft that controls the movement of the bobbins carrying the threads.

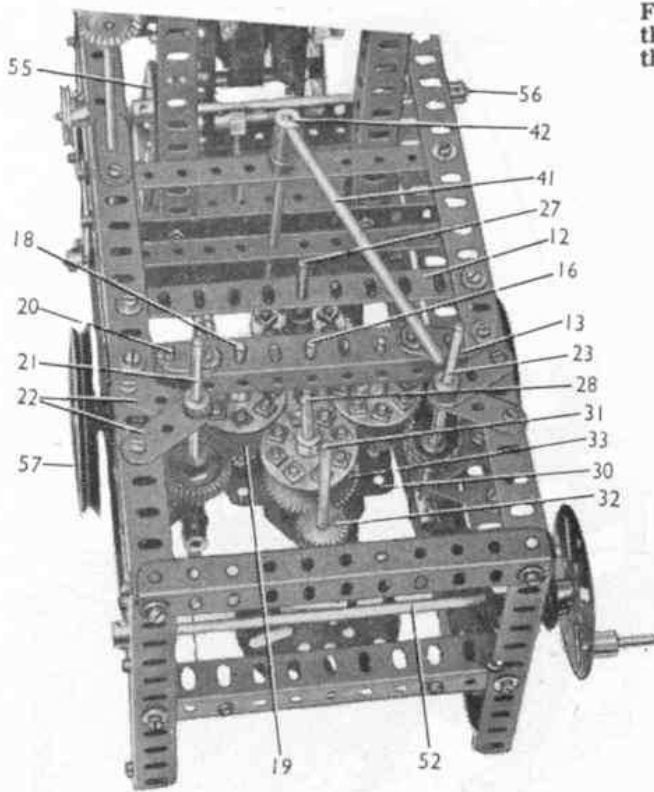


Fig. 4. A close-up of the novel intermittent drive used in the Machine. The plate forming the upper bearings for the shafts is removed to reveal the arrangement of the built-up gears.

are secured to the Rods 21 and 23, Fig. 4, care being taken to arrange the slots in line with each other so that the carriers can move from one to the other quite freely.

The carriers are built from a Bush Wheel mounted on a 2" Rod. Two 1" x 1" Angle Brackets are bolted to a Double Arm Crank, which is secured to the top of the 2" Rod. Two 1" Pulley Wheels are fixed to a further 2" Rod mounted in the Angle Brackets and a Compression Spring is placed between one of the Pulleys and its Angle Bracket to act as a Brake.

A 5½" x 1½" and a 2½" x 1½" Flexible Plate are bent to a circular shape and bolted to the framework. These keep the carriers in the carrier slides while they are in motion. A 3" Formed Strip is bolted to the rear of the 5½" x 1½" Flexible Plates but must be clear of the Rod 41.

Two 1" Corner Brackets are bolted to the 12½" Angle Girders 5, Fig. 1, to form the bearing for Rod 45, Fig. 3. This Rod has a 3" Pulley Wheel at each end and a ½" Helical Gear Wheel at the centre. A ¼" Sprocket Wheel 46 drives a 1½" Sprocket Wheel on Rod 47, on which is secured also a Worm Wheel 48 that drives a ½" Pinion on an 8" Rod 49. A drum, built from a Sleeve Piece, a

Socket Coupling, a Bush Wheel and a Wheel Disc, is mounted on a 4½" Rod 50 driven by the 7/8" Bevel Wheels 51, Fig. 2.

On a 6½" Rod 52 is mounted a 1" Pulley Wheel and a Face Plate for the hand drive. By turning the Face Plate the right hand carrier slide will rotate through half a revolution and Rod 41 will move over from right to left. Then the left hand carrier slide will rotate through half a revolution, and the Rod 41 will move from left to right to complete the cycle of operation.

An E2OR Electric Motor is bolted to the 5½" x 2½" Flat Plate 53, Fig. 2. The Motor sideplates are extended with 1½" Corner Brackets. By the use of three ½" Pinions and three 1½" Gear Wheels a gear reduction ratio of 27-1 is provided from the motor shaft. A 1½" Pulley Wheel 54, Fig. 3, drives another 1½" Pulley Wheel 55, on Rod 56, Fig. 4. The 1" Pulley Wheel on Rod 56 drives a 3" Pulley Wheel 57.

Each carrier is now ready to be filled up with thread or cord. Then the three threads from the carriers are taken over the ¾"

(Continued on page 692)

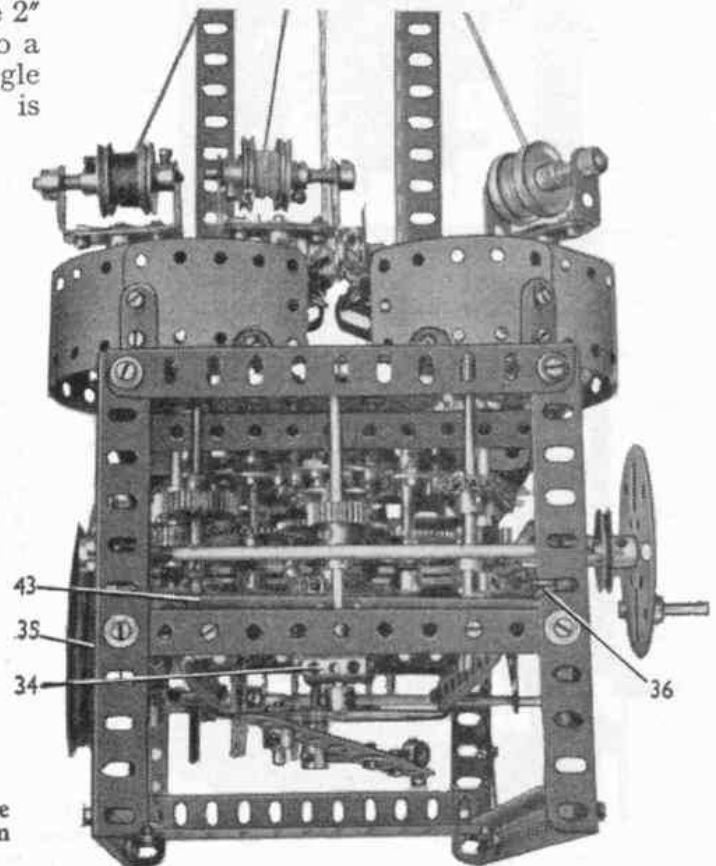


Fig. 5. This end view of the model shows the general layout of the gears that drive the bobbin carriers.



**Was "Farnborough" Disappointing?**—(Cont. from p. 647)

helicopters all made first appearances, some of them only a few weeks or even days after their first flight.

Whatever our own feelings about the Display, we can be certain that visitors from overseas were not disappointed. In the air and on the ground they were given the finest possible proof of the engineering skill, craftsmanship and achievement that make "Farnborough" not just the greatest of all flying displays but a super-market for the aviation world.

**The Heart of the Engine**—(Continued from page 652)

Needless to say, a gap can be created in it at the very beginning of the operation, so that the former can be placed in position, after which the ring is again closed. The end of the wire from the shuttle ring is threaded through a hole in the former, after which the ring is rotated rapidly, while of course the ceramic former itself turns more slowly. In this rotation the wire is carried up the outside of the former and down the inside as it is unwound from the ring, the result of course being the close and even winding seen in the illustration.

The machine is automatic. The length of wire wound on to the shuttle ring is determined by a special mechanism, and when the winding on the ceramic former is complete the machine stops automatically.

The shuttle ring can then be opened again and the completed winding removed. Nuts and screws are inserted in the two holes in the former, and the ends of the winding are looped under the heads of the screws before these are tightened. Then the resistance is ready, after testing and balancing the resistance into two electrical halves, for assembly into the controller for which it is intended.

Earlier on I pointed out that testing is of the greatest importance in the production of Hornby-Dublo locomotives, and this applies also to other electrical equipment of all kinds. A good example is illustrated in the lower picture on page 652. Here you will recognise the part under test as the Diamond Crossing, which for the purpose is fitted into a special rail layout.

There are two locomotives, each with a vehicle behind it, and these are run successively over the Crossing in both directions, journeys that they must complete smoothly and easily. A Diamond Crossing is regarded as suitable for Hornby-Dublo enthusiasts only when the operators are completely satisfied—and they are not only expert, from long practice, but also very critical of performance!

**Unusual Jobs for Railway Engines**—(Cont. from p. 644)

In Australia many obsolete locomotives were dumped into a hollow intact to help fill it up for goods yard extensions, but when scrap metal became scarce they were reclaimed piece by piece and wagoned to the steel furnaces. A further lot that had been dumped into a harbour were found to be too corroded even for this, but their remains were recovered as it was said that the presence of so much steel in the water affected ship's compasses.

Upon the occasion of Queen Victoria's Jubilee in 1887, the Great Western authorities were faced at Swindon with the problem of brewing tea for some 15,000 people celebrating the occasion with a great fete. Some old tenders were cleaned out—more or less—and three or four of them filled with clean water into which steam was blown from a goods engine. The boiling water was then extracted by carriers of tea urns from various special taps and the event was voted a great success. But it is also on record that the tea had a "tang"—and the men who had had to clean out the old tenders could not be induced to sample it!

Mention of old tenders reminds me that an ancient four-wheeled specimen is still to be seen trundling along the lines of the one-time Midland and Great Northern Joint system, working in local goods trains and conveying fresh water to signal-boxes and crossing keepers who have no suitable supply of their own. Beneath its rusty grey can still be found traces of the

chocolate-coloured paint of the long defunct Eastern and Midlands Railway, and until recently the old vehicle bore the lettering *M. & G.N. Jt. Railway... Fresh Water Tank No. 13A*. So far it has not been honoured with any other inscription, much less a wheel-and-lion badge! It was originally one of a series of diminutive tenders supplied by a private firm for attachment to a number of small tank engines purchased from the Cornwall Minerals Railway about 80 years ago for service in East Anglia.

**New Meccano Model**—(Continued from page 680)

Flanged Wheels, over the  $\frac{1}{2}$ " loose Pulley and fixed to the drum side.

When the machine is set in motion the threads will weave under and over each other and the plaited cord resulting will wind around the drum.

Any thickness of thread may be used, of course, but the  $\frac{1}{4}$ " Bevel Gears should be replaced with  $\frac{1}{8}$ " and  $1\frac{1}{2}$ " Bevels when very thin thread is used.

Parts required to build the Meccano Plaiting Machine: 7 of No. 2; 2 of No. 2a; 8 of No. 3; 2 of No. 5; 11 of No. 6a; 8 of No. 8; 11 of No. 9; 2 of No. 10; 2 of No. 12; 6 of No. 12a; 4 of No. 12b; 1 of No. 13a; 4 of No. 14; 2 of No. 15; 4 of No. 15a; 3 of No. 16; 8 of No. 16a; 3 of No. 16b; 6 of No. 17; 2 of No. 19b; 2 of No. 20b; 2 of No. 21; 8 of No. 22; 1 of No. 23; 9 of No. 24; 1 of No. 24a; 3 of No. 25; 4 of No. 26; 3 of No. 27; 3 of No. 27a; 2 of No. 30; 2 of No. 31; 1 of No. 32; 2 of No. 35; 156 of No. 37a; 120 of No. 37b; 28 of No. 38; 1 of No. 48a; 1 of No. 52a; 30 of No. 59; 5 of No. 62b; 5 of No. 63; 34 of No. 69; 1 of No. 70; 2 of No. 72; 1 of No. 94; 1 of No. 95a; 2 of No. 96; 3 of No. 96a; 4 of No. 108; 2 of No. 109; 2 of No. 111a; 3 of No. 114; 7 of No. 115; 3 of No. 120b; 2 of No. 126a; 4 of No. 133; 2 of No. 133a; 1 of No. 154a; 1 of No. 163; 1 of No. 164; 1 of No. 171; 1 of No. 173a; 1 of No. 175; 3 of No. 186a; 2 of No. 186c; 3 of No. 69c; 2 of No. 188; 2 of No. 189; 1 of No. 211a; 1 of No. 211b; 2 of No. 215; 1 E20R Electric Motor.

**SOLUTIONS TO CHRISTMAS BRAIN TEASERS**

(See page 695)

**Christmas Quiz**—(1) Decorations; (2) Crackers; (3) Stocking; (4) Holly; (5) Nuts; (6) Christmas Tree Fairy; (7) Star of Bethlehem; (8) Turkey.

**How many boys?**—There were 17 boys and they each spent  $4\frac{1}{2}$ d.

**Missing Letters**—(1) Zebra; (2) Polka; (3) Reindeer; (4) Meccano; (5) Ghost Stories; (6) Santa Claus.

**NOVEMBER EDITORIAL PHOTOGRAPH**

The photograph reproduced on the editorial page of last month's *M.M.* was taken from a train crossing the Forth Bridge, and shows cars waiting to cross to North Queensferry by ferry boat.

**A NEW GAMAGE BOOK**

This 128-page publication, *Gamages Book of Model Trains, Boats, Cars, etc.*, is best described as a handbook that will appeal specially to boys and not a few grown-ups. Miniature trains and equipment of various makes, including of course Hornby and Hornby-Dublo Trains, appear in the railway section, which occupies more than half the book.

Model aircraft complete and in kit form and the miniature engines and accessories necessary for them are dealt with, and there are, too, details of radio control apparatus both for aircraft and model ships. Miniature stationary steam engines, electric motors, workshop kits and modelling appliances are also listed.

Motor vehicles have a section to themselves and among the many models shown are Dinky Toys and kits and parts for the construction of vintage cars.

The book has a striking coloured cover and is fully illustrated. The price is 1/- from Gamages, Holborn, London E.C.1.

**CORRECTION**

In our review last month of the latest edition of *The Commonwealth Catalogue of Queen Elizabeth Stamps* the price was given as 1/-; this should be 4/-.