Next Month: "THE SOVIET AIR FORCE." By John W. R. Taylor

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With the Editor

Vanished Irish Railways

The closing of much of the Belfast and County Down Railway referred to on page 201 of this issue, together with the suspension of services on the Giant's Causeway electric line that was recorded last month, cannot fail to strike a note of sadness for the railway observer.

Some of these vanished Irish railways had features of outstanding interest, quite peculiar to themselves. There was for instance the Listowel and Ballybunion line, closed in 1924. On this the track was a kind of continuous trestle, the upper member of which, supported on legs framed up like the letter A, formed the running rail and carried the load. Additional rails, one on each side by the cross member of the A-frame, were provided for guiding purposes. The engines and stock were arranged in pairs on each side of the central wheels. With this scheme balance obviously presented a problem, and we recall a story quoted by the late Mr. G. A. Sekon in an article in "*The Railway Magazine*" of November 1924: "It was one day required to send a cow from one end of the line to the other. Its conveyance raised the question of balancing, and accordingly another cow was borrowed to form a balancing load. On arriving at destination, the problem was how to return the borrowed animal. Two calves were obtained, and these together provided a balance for the cow to be returned. When the latter had arrived home it was an easy question to return the calves one on each side."

Then there was the Dublin and Blessington steam tramway. This was the longest roadside steam tramway in the British Isles and was the last of its type to remain in operation. It was a quaint survival that managed to exist until 1932. Here were found not only tramway type vehicles of the semi-open top variety, with outside stairs and garden seats on the top deck, but also an amusing collection of engines. Some of these were of the boxed-in tramway type, others were of more normal aspect except for the unusual provision of an additional cab at the smoke-box end. To add to the gaiety, advertisements seem to have been displayed on the car bodies and even on some of the engines. The unusual appearance of the trains was completed by the specially tall chimneys of the engines which were carried up to an astonishing height in order that the exhaust with its plentiful smoke and cinders might be carried above the car roofs.

The loss of these friendly little lines is one of the penalties of progress.

This Month's Special Articles

Using the Meccano Gears Outfit "A"

A Simple Meccanograph for Outfit No. 4

ONE of the most popular Meccano models is the Meccanograph, which was first introduced many years ago. The Meccanograph is a form of designing machine which, when set in motion, produces automatically hundreds of beautiful pattern drawings. Since the original machine appeared many modified versions of it have been built, some of which are more complicated and capable of producing a larger variety of designs, while others are of a more simple type. One of the latter kind is the model shown in Fig. 1, which can be built from Outfit No. 4, with the addition of a Gears Outfit "A."

The frame of the model is built by bolting 12½" Strips to 5½" × 2½" Flanged Plate 1 and to two 5½" Strips bolted upward from the Flanged Plate. The

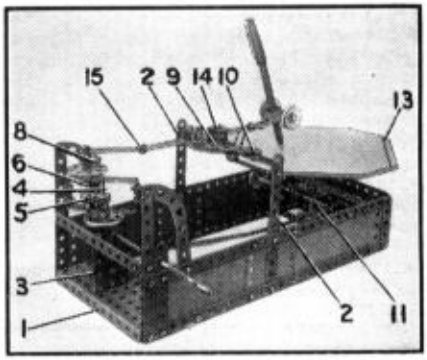


Fig. 1. A simple Meccanograph which produces a variety of interesting and beautiful designs. It can be built with a No. 4 Outfit and a Gears Outfit "A."

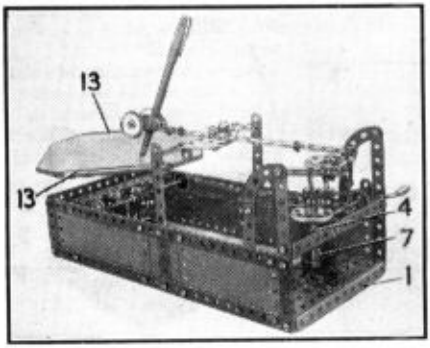


Fig. 2. Another view of the Meccanograph.

space between the 12½" Strips is filled in both sides by 5½" × 2½", 4½" × 2½" and 2½" × 2½" Flexible Plates. The end is filled by two 5½" × 1½" Flexible Plates strengthened by two 5½" Strips. A 2½" × ½" and a 1½" × ½" Double Angle Strip bolted to 5½" Strips 2 are connected by a Semi-Circular Plate.

The mechanism that produces the design is driven from a Crank Handle, which is mounted in a 3½" Strip and in the 2½" × 1½" Flanged Plate 3. A ½" Pinion on the Crank Handle meshes with a 1½" Contrate Wheel loose on the 3½" Rod 4. This Rod passes through a Double Bracket 7 bolted to the Flanged Plate 3. The Bolt that holds it also locks the Rod and prevents it from turning. Four Washers space the Contrate from the Flanged Plate. A ½" Pinion 5 on a 2" Rod 6 meshes with a second ½" Pinion inside a frame made from two 2½" × ½" Double Angle Strips connected by Fishplates.

The Rod 6 is journalled in the Contrate with sufficient space left for it to clear the Flanged Plate 3, and it carries a Bush Wheel at the other end. Fishplate 8 is bolted to the Bush Wheel but is spaced from it by two Washers.

A ¾" Sprocket Wheel on the Crank Handle is connected by a length of Chain to a similar part on a compound rod 11. This consists of a 4" and a 2" Rod joined by a Rod Connector, and it also carries a Worm Gear. The Worm engages with a 57-teeth Gear Wheel on a 3½" Rod, which is mounted in a 5½" Strip, and in a compound strip 12 consisting of two 2½" × ½" Double Angle Strips joined by a 2½" Strip.

The table on which the paper to take the design is placed is made from a piece of stiff cardboard about 6½" square and has a 3" Pulley bolted to its centre. The bolts holding the Pulley are sunk below the level of the cardboard and a piece of smooth paper is pasted over the surface of the board. Paper on to which the design is produced is held on the board by two rubber bands 13.

The pen arm consists of a 5½" and a 2½" Strip, and is pivotally attached to Fishplate 8. It passes through a Double Bracket, which is lock-nutted to a 2½" Strip 9 spaced from the 2½" × ½" Double Angle Strip by a ½" loose Pulley 10, as shown in Fig. 1. A ball type ink pen is held between a Stepped Bent Strip and attached to the Fishplate on the end of the pen arm by an Angle Bracket. The Stepped Bent Strip may be tightened on the pen by locking the 1" Pulleys tighter on the Rod.

(Continued on page 238)

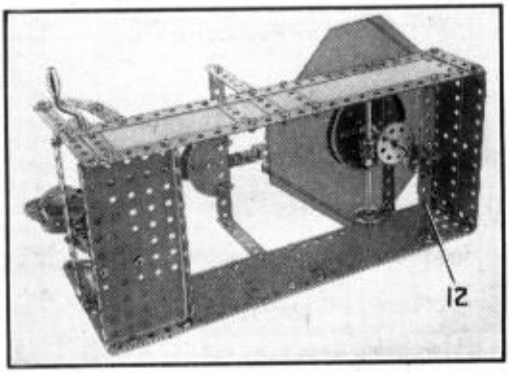


Fig. 3. The Meccanograph seen from underneath.

Among the Model-Builders

By "Spanner"

Another Differential Gear for Car Chassis

Differential gears of many different types have been described from time to time in the *"M.M."* and still another example is shown in Fig. 1. The mechanism is mounted in a framework consisting of two $2\frac{1}{2}" \times 1\frac{1}{2}"$ Double Angle Strips joined together by $2\frac{1}{2}"$ Strips. Three Double Bent Strips are bolted to the frame in the position shown, to form reinforced bearings for the rods of the gear.

The differential gear is built up as follows. The drive from the car engine is taken from Rod A, on the end of which

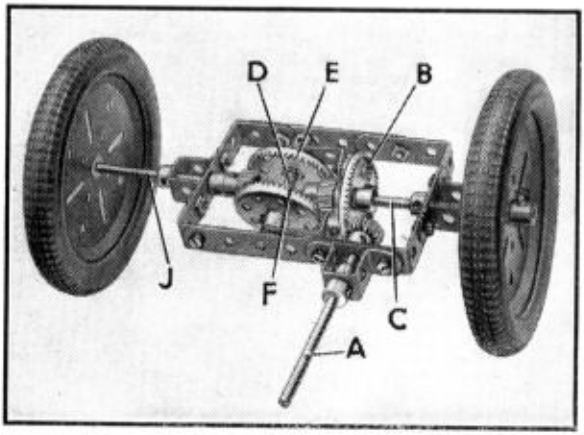


Fig. 1. One of the many methods of constructing differential gear in Meccano.

is a $\frac{1}{2}"$ Pinion that meshes with a $1\frac{1}{2}"$ Contrate Wheel B on Rod C. Two $1 \times \frac{1}{2}"$ Angle Brackets are spaced by Collars and bolted to Contrate Wheel B. A 2" Rod D is placed through the end holes of the $1 \times \frac{1}{2}"$ Angle Brackets and through Contrate Wheels E and F. These mesh with two $\frac{1}{2}"$ Pinions on the ends of Rods C and J, which form the halves of the back axle of the car.

Automatic Reversing for E20R Electric Motor

Fig. 3 shows a novel type of automatic reversing movement that can be fitted to the reversing lever of an E20R Electric Motor. The Motor could then be used in a model such as a transporter bridge, which is required to operate without attention for long periods. The mechanism will also be found useful in many instances where a model is required to perform a definite sequence of operations, and has the advantage that the period between each reversal of the mechanism can be adjusted as desired.

The Motor is suitably mounted on a base-plate and its sideplates are extended by $3" \times 1\frac{1}{2}"$ Flat Plates. A Worm on the armature shaft meshes with a 57-teeth Gear 1 fixed on a Rod journalled in a $2\frac{1}{2}" \times 1"$ Double Angle Strip. A $\frac{1}{2}"$ Bevel Gear on this Rod meshes with a similar Gear 2 on a horizontal $2\frac{1}{2}"$ Rod, which carries also on its other end a $\frac{1}{2}"$ Pinion. The Pinion meshes with a 57-teeth Gear on a 3" Rod, which carries also a $\frac{3}{4}"$ Sprocket Wheel 3 that is connected by Chain to a $\frac{3}{4}"$ Sprocket Wheel fastened on a $3\frac{1}{2}"$ Screwed Rod 4. Bearings for the Screwed Rod, which carries two Collars placed as shown, are provided by two Threaded Couplings fixed to the base-plate, and an End Bearing on it is connected by Springs 5 to a $\frac{3}{4}"$ Bolt lock-nutted to a $1\frac{1}{2}"$ Strip that is bolted to the centre arm of the reversing switch of the Motor. The drive to the model can be taken from any of the intermediate shafts journalled in the Motor sideplates.

When the Motor is set in operation the End Bearing traverses the Screwed Rod and extends the Springs. As the End Bearing nears the end of its travel the pull of the Springs overcomes the friction of the reverse lever and it snaps over, the Motor being immediately reversed. The End Bearing then travels to the opposite end of the Screwed Rod.

For efficient operation all the rotating shafts and screw mechanisms should be well lubricated.

A Fine Group of Models

Brian Singleton, Bournemouth, has recently completed a group of interesting

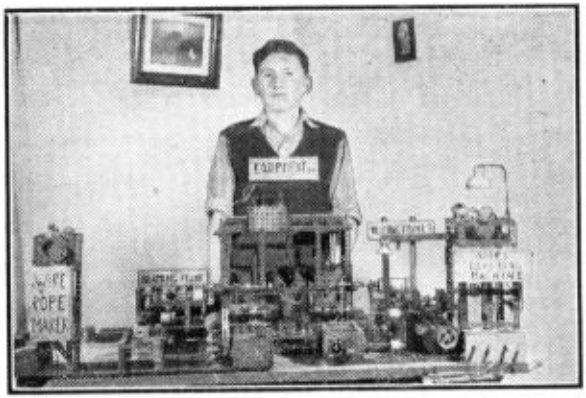


Fig. 2. Brian Singleton, Bournemouth, and his group of wire rope making and covering machines.

models representing machines used in the making of wire rope and wire covering. The models together with the builder, are illustrated on this page, and they are an excellent testimonial to this young model-builder's technical knowledge and ability.

A Novel Use for Spring Clips

G. Burns, Warragul, Australia, recently came across a problem very often met with in certain types of models, that of fastening a hoisting Cord securely to a Rod or Crank Handle. A Cord Anchoring Spring is of course the best solution to the difficulty, but very often a complicated model has several hoisting Cords and sufficient Anchoring Springs are not available. Burns overcame the difficulty in a neat and effective way by making use of Spring Clips. He placed about $\frac{1}{2}$" of the Cord along the Rod and pressed two or three Spring Clips over the Cord and Rod. The Cord was firmly gripped by the Spring Clips and wound neatly along the Rod when it was turned.

MODEL-BUILDING COMPETITION RESULTS

October General Contest (Overseas Section)

The Overseas Section of the October General Model-building Competition attracted a fine crop of entries from all parts of the world, and among them were several of a most interesting type. Prize-winners have already been notified of their success, and the list of awards is as follows—First Prize, £3/3/–: P. B. Henriksen, Bethlehem, Orange Free State. Second Prize, £2/2/–: G. Burns, Warragul, Australia. Third Prize, £1/1/–: D. R Heeramaneck, Bombay 7.

Five Prizes each of 10/6: R. Partridge, Lilongwe, Nyasaland; M. Johnston, Concord, Ontario; S. Reid, Quebec; J. Lowndes-Yates, Calgary, Canada; H. Kooy, Rotterdam.

Five Prizes each of 5/–: Yacoob I Bahemia, Port Louis, Mauritius; E. Flores, Birkirkara, Malta; L. Finner, Cork; J. M. Ferguson, Blackrock, Eire; J. Brown, Sydney.

An imposing model of the aircraft carrier "*Implacable*," which I am unfortunately not able to illustrate, won the First Prize for its builder P. B. Henriksen. This model is a mass of finely constructed detail, which includes four very realistic fighter aircraft, one of which has folding wings. The aircraft are about 5" long, while the carrier itself has a length of 7 ft. 1½ in. Apart from a full complement of armament, interesting details of the ship include two working lifts, cranes, and three radar aerials of different types. All of these, in conjunction with the finely flared hull, combine to form a very attractive and realistic model.

An unusually attractive entry was sent by Graham Burns, Warragul, Australia. His model was a street planer of a type used for smoothing down rough asphalt roads. The machine carries fuel oil burners which soften the asphalt, and planing blades that scrape off the high spots as the machine travels along.

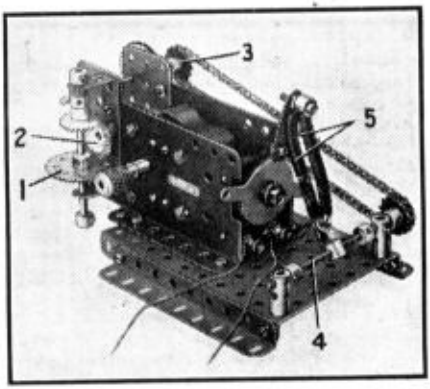


Fig. 3. A novel automatic reversing mechanism for an E20R type Electric Motor.

New Meccano Models

Bagatelle Table—Drilling Machine

THE bagatelle table that forms one of our two new models this month is shown in Figs. 1 and 2. It is very easy to build and requires only a small collection of parts for its construction.

The frame of the table consists of four long compound girders, which consist of 12½" and 5½" Angle Girders overlapped. They are connected at each end by 5½" Angle Girders and 5½"×2½" Flanged Plates. The slanting position of the table is produced by two Handrail Supports 9 attached to one end of the model.

The table is made from 5½"×2½" Flexible Plates and 2½" × 1½" Flexible Plates. Various sizes of Strips are arranged to provide five

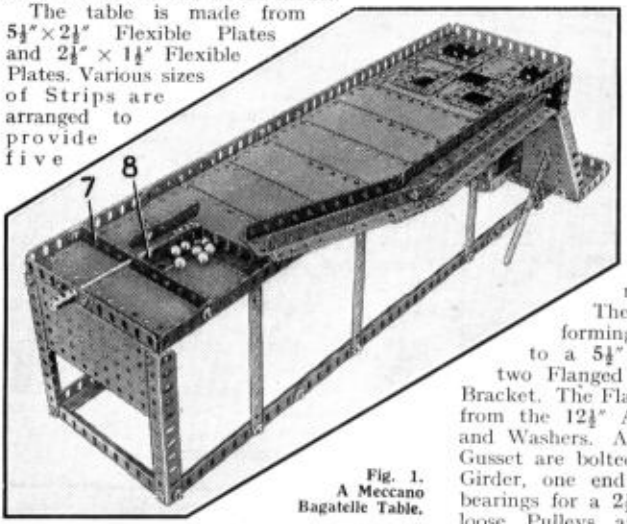


Fig. 1. A Meccano Bagatelle Table.

square holes in the table as shown. When the balls pass through these holes they fall on to a slide made by attaching two 5½"×2½" Flanged Plates 1 to the Flanged Plate at the end of the model and then connecting these to the table by a second Flanged Plate 2. Two 5½"×2½" Flexible Plates 3 are attached at one end to the Plates 1 by a Double Bracket 4 and to the other by a 1½"×½" Double Angle Strip. They are edged by 5½" Angle Girders 5, and these and 2" Strips 6 attached to the Plates by Angle Brackets form guides for the balls.

The balls fall into a tray made by attaching a 2½"×2½" Flat Plate to a Flanged Sector Plate, and bolting 2½" Angle Girders round the edge. The tray is attached by a Hinge 10 and when it is raised the balls roll down a chute and into a compartment so as to be ready for firing again. This chute is built from two 7½" Angle Girders and two 5½" Angle Girders, and is plated by three 5½"×1½" Flexible Plates and a 2½"×1½" Plate. The firing plunger, a 5" Rod, is journalled in a 5½"×½" Double Angle Strip 7 and carries three Compression Springs 8 and a Coupling at each end.

Parts required to build Bagatelle Game: 8 of No. 2; 1 of No. 2a; 1 of No. 4; 3 of No. 5; 18 of No. 6; 2 of No. 6a; 8 of No. 8; 2 of No. 8b; 14 of No. 9; 1 of No. 9c; 3 of No. 9d; 1 of No. 9e; 1 of No. 10; 1 of No. 11; 12 of No. 12; 1 of No. 15; 140 of No. 37; 2 of No. 37a; 20 of No. 38; 1 of No. 48; 1 of No 48d; 5 of No. 52; 1 of No. 55a; 2 of No. 62; 1 of No. 72; 1 of No. 111a; 1 of No. 114; 3 of No. 120b; 2 of No. 136; 4 of No. 188; 4 of No. 189; 10 of No. 192.

The other new model this month is the vertical drilling machine shown in Fig. 3. The two 12½" Angle Girders forming the column are attached to a 5½"×2½" Flanged Plate by two Flanged Brackets and an Angle Bracket. The Flanged Brackets are spaced from the 12½" Angle Girders by Collars and Washers. A 5½" Strip and a Corner Gusset are bolted across the top of each Girder, one end of the Strip providing bearings for a 2½" Rod on which two 1" loose Pulleys are placed. A 2½"×2½" Double Angle Strip 1 is attached to the Angle Girders and is braced by two 3" Strips bolted to the Double Angle Strip by a Double Bracket. A 6½" Rod 2 is locked in a Crank 3 and in a large Fork Piece fixed to a 2" Strip 4 and a 1½" Strip. The drilling table is a Face Plate attached to Rod 2 by a Crank which also carries a Threaded Pin.

The drilling spindle assembly is constructed from a 4½" and a 3½" Rod, each of which carries two Flanged Wheels. Two 3½" Rods are held firmly in the lower set of Flanged Wheels by Collars, but are free to move in the others. The lower Rod carries three Compression Springs. A 3½" Strip forming the feed lever is lock-nutted to the 2" Strip 4, and held

loosely on a Collar 5, which is free on the Rod. The drilling head is made by locking a Centre Fork in a Coupling 6 and is brought into the drilling position by the feed lever. When the lever is released the drill is raised from the work by the action of the Springs.

The Crank Handle by which the machine is operated is journalled in the Flat Trunnions and carries a 1" Pulley, which drives the drilling spindle by a continuous belt of Cord.

Parts required to build Vertical Drilling Machine: 2 of No. 2; 1 of No. 3; 2 of No. 4; 1 of No. 6; 1 of No. 6a; 2 of No. 8; 2 of No. 9; 1 of No. 11; 1 of No. 12; 1 of No. 14; 1 of No. 15; 3 of No. 16; 1 of No. 17; 1 of 19g; 4 of No. 20; 2 of No. 22; 2 of No. 22a; 2 of No. 35; 43 of No. 37; 35 of No. 37a; 11 of No. 38; 1 of No. 40; 1 of No. 48a; 1 of No. 52; 16 of No. 59; 2 of No. 62; 1 of No. 63; 1 of No. 65; 2 of No. 108; 1 of No. 109; 4 of No. 111a; 1 of No. 115; 2 of No. 116; 3 of No. 120b; 2 of No. 126a; 1 of No. 139; 1 of No. 139a.

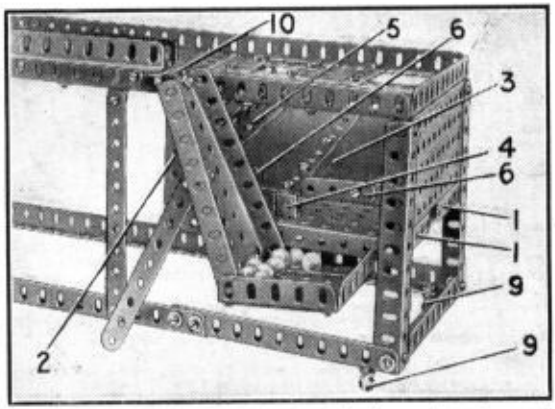


Fig. 2. Rear end of the Table showing the scoring traps and ball delivery chute.

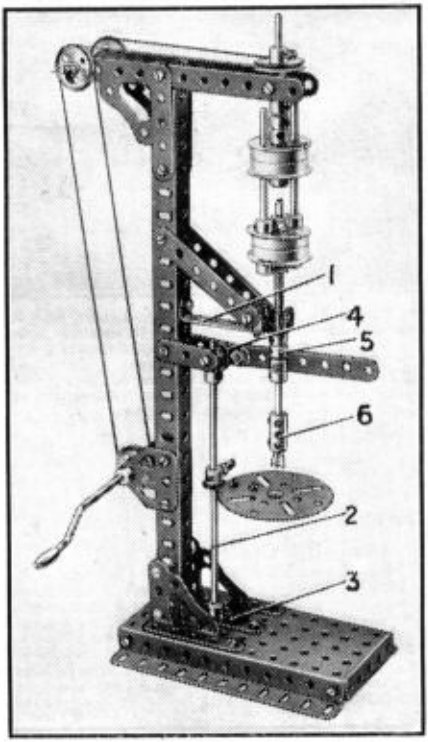


Fig. 3. Drilling Machine.

Fine Prizes for Meccano Models

Model-builders should not miss the opportunity of winning one of the fine prizes offered in the General Model-Building Contest first announced in last month's "*M.M.*" All that is necessary to take part in this competition is to build a Meccano model. There are no restrictions regarding the size or subjects of models, and every reader is eligible to compete no matter what his age may be. The only condition is that the model must be the competitor's own unaided work.

After the model is built the next job is to obtain a suitable illustration of it. This should be a photograph preferably, but a sketch will do quite well. The competitor must write his age, name and address on the back of the illustration and enclose it, together with a brief description of the model, in an envelope addressed "*April General Model-Building Contest, Meccano Ltd., Binns Road, Liverpool 13.*"

Entries will be grouped into two Sections, one for competitors living in the British Isles and the other for Overseas competitors. Those from competitors in the British Isles may be sent in at any time up to 31st May, 1950. Overseas entries from readers will be accepted until 30th September, 1950.

The following prizes will be awarded in each section of the Contest. First, Cheque for £2/2/–; Second, Cheque for £1/1/–; Third, P.O. for 10/6. There will be also five awards of 5/– each and Certificates of Merit.

Fighting Forest Fires—(*Continued from page 221*)

not spark up into flames again. Smouldering tree stumps have to be covered with earth or sand to put them completely out. During periods of acute danger in hot spells special patrols of foresters sometimes have to be maintained where conifer plantations border on railway lines, for the sparks from engines may easily set miles of forest ablaze.

The Forestry Commission, State guardian and extender of our national forests, plays its part by vigilantly watching for fire outbreaks all through the year, by constant experiment as to the best methods of defence, and by planting trees with wide lanes and rides between their stands to allow fire tenders to move close in. But it is still up to every member of the public to be careful with what is after all our own property. That 5,698 acres of Scottish forest could be destroyed in a single month, as they were recently, shows that the need for care is still great.

"Box-Kite" to "Brabazon"—

(*Continued from page 196*)

were joined by the "Beaufort" torpedo-carrier and minelayer, which was built in Britain and Australia.

Its fighter counterpart, the "Beaufighter," first Bristol type to use the powerful new "Hercules" sleeve-valve engine, was developed just in time to deal with the Luftwaffe's night blitz on London. In their first two months of action, with the aid of early forms of radar search equipment, "Beaufighter" squadrons destroyed more than 20 German raiders. A few months later, when the Germans abandoned the night blitz, the "Beaus" turned to the offensive, first attacking shipping in Western waters and then supporting Allied Armies in the Western Desert and the Far East, where they earned the name "Whispering Death" from the Japanese.

All these aircraft had Bristol engines. So had thousands of warplanes built by other firms, for the products of the Aero Engine Division powered every class of British front-line aircraft from fighters to heavy bombers. Altogether 101,200 Bristol engines went into war service, including over 57,000 "Hercules."

Nor did the end of the war bring any sudden switch in the company's activities. Development of the "Buckingham" bomber and its derivative the "Buckmaster" trainer was stopped, but production of the new "Brigand" continued, first as a torpedo-fighter replacement for the "Beaufighter," then as a light bomber, and, stripped of its armament, as a meteorological aircraft.

Emphasis had begun to shift, however, from military to civil types, and before 1945 was out the first Bristol civil project, the highly-practical "Freighter," was in the air. Its outstanding success on the Berlin Air Lift and in passenger and cargo operations throughout the world is too familiar to need recalling here. It has since been joined by the well-known Type 171 "Sycamore" helicopter and the giant "Brabazon I," the world's biggest air liner.

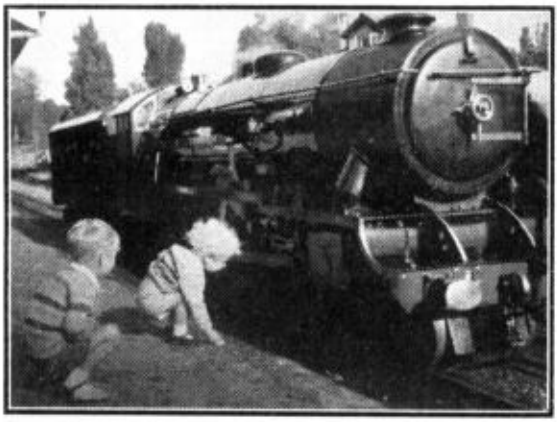
The Engine Division too has recorded many post-war achievements. While continuing production of the "Hercules" and the new 2,500 h.p. "Centaurus" piston engines for both military and civil use, it has produced several outstanding propjet engines, starting with the 2,000 h.p. "Theseus," first aero engine ever to complete a 500-hr. endurance test, and leading up to the 3,500 h.p. "Proteus." This type will power Britain's 100-passenger transatlantic "Brabazon 2" landplane and "Princess" flying boat air liners.

In so brief a record many famous Bristol products have inevitably been overlooked, for 171 aircraft types have been produced by the company since the 1914 "Bullet," quite apart from a long series of famous engines. Every one of these types contributed something to the experience of the company, enabling it to face with enthusiasm and confidence each new problem as it arose.

Using the Meccano Gears Outfit "A"—

(*Continued from page 223*)

The design that the model produces may be varied by moving the position of Strip 9 or the Fishplate 8. Further variety is obtainable by bolting two Reversed Angle Brackets 14 to the Semi-Circular Plate and lock-nutting Bolt 15. This arrangement is shown in Fig. 1. Either of the ½" Sprocket Wheels can be replaced by a 2" Sprocket and this also produces a change in the design.



"Green Goddess," No. 1 of the 15 in. gauge Romney, Hythe and Dymchurch Railway, looks massive beside these "small scale" locomotive men. Peter Neale (aged 4½) and his brother Kenneth (aged 2½) admire the highly-polished appearance of this well-known engine.

Parts required to build the Meccanograph: 4 of No. 1; 8 of No. 2; 2 of No. 3; 7 of No. 5; 4 of No. 10; 2 of No. 11; 8 of No. 12; 1 of No. 15b; 2 of No. 16; 1 of No. 17; 1 of No. 18a; 1 of No. 19b; 1 of No. 19g; 3 of No. 22; 1 of No. 23; 1 of No. 24; 1 of No. 35; 70 of No. 37; 8 of No. 37a; 8 of No. 38; 1 of No. 44; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 90a; 5 of No. 111c; 2 of No. 125; 2 of No. 189; 2 of No. 190; 2 of No. 191; 2 of No. 192; 1 of No. 213; 1 of No. 214; Meccano Gears Outfit "A."

Planning Ahead with Hornby-Dublo—

(*Continued from page 231*)

start on the slope with four coaches by careful work on the regulator handle—sorry, Controller—to avoid all wheel spin.

A further word about gradients; to prevent vehicles uncoupling the changes of gradient must be gradual. If you can spare further floor space, the easier the gradients are the more realistic is the appearance, but certainly the capabilities of Dublo locomotives needn't worry you.

Once the layout has attained a high level track you have scope for all kinds of civil engineering. The Meccano skew girder bridge on our system is but one example. Viaducts made of wood or cardboard with printed "brick paper" or embankments of green "art felt" can help. We hope to erect a further station at high level with, perhaps, its sidings and turntable.