

MECCANO

MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

Vol. XXXV
No. 2
February 1950

With the Editor

Cab Comfort for Enginemen

The British Railways photographs reproduced on page 61 of this issue, showing the proposed arrangement of cab and footplate for B.R. standard locomotives, reminded me of some of the pictures of the driving arrangements of the locomotives of the earliest days of railways. Then, and for many years afterwards, engines really had no cab at all, and the footplate arrangements were extremely crude. It is quite evident that the early designers thought only of their engine and its pulling power and had little consideration for the comfort of the driver.

On some of the earliest engines the driver rode on an unprotected platform perched up at one side of the boiler, while his mate fired the boiler from the open front of a very elementary tender. Even when the footplate as we know it had become a feature at the fire-box end of the engine, the men were still fully exposed to the weather. There might be side panels to their footplate, or they might have merely a more or less ornamental railing; but there was not even a weatherboard to ward off wind and rain when on the run.

It is difficult to imagine the feelings of a present-day top-link driver if he were asked to work under such conditions.

When the cab did develop from the weatherboard by the addition of side panels and a roof, it was all too often a very skimpy affair. The roof was short, and the side openings were such that little real protection was afforded.

Old engines are still in use to-day on which it is possible to see, on stormy days, a sheet stretched from the cab roof to some point on the front of the tender. This is not a convenient arrangement, but it is better than nothing if there is

tender-first work to be done. How much better it is to have a properly-designed cab with extended roof, and a tender front that gives protection.

Control arrangements on the early engines seem to have been extremely simple. There would be a plain steam valve to start the engine, one or two cocks and handles but no engine brakes, no pressure and water gauges, the injector had not yet arrived, and continuous power brakes and steam heating for the train belonged to the distant future.

This Month's Contents

	Page
Bertram Mills Circus	50
by Halgar Harte	
Rubber-Tyred Trains in France ..	53
Some Unusual Models	54
by W. J. Bassett-Lowke, M.I.Loco.E.	
Making Escalator Handrails Fit ..	55
by T. R. Robinson	
Sugar from Beet	56
by W. H. Owens	
Pennine Way	62
by Arthur Nettleton	
World's Biggest Refrigerator ..	66
by John W. R. Taylor	
Luxury Bus Travel in South Africa ..	69
by Frank Dickinson	
Great New Zealand Power Scheme ..	72
"A.T.C." on the Southend Line ..	74
by J. Brooks	
Using the Meccano Gears Outfit ..	78

Air News, 70. Books to Read, 58. Club and Branch News, 84. Competitions and Results, 92-3. Fireside Fun, 95. From Our Readers, 77. H.R.C. Pages, 85-7. New Meccano Model, 82. Among the Model-Builders, 89. Model-Building Competition, 83. Photography, 65. Railway Notes, 60. Stamp Pages, 88, 91.

Using the Meccano Gears Outfit A

Models for Outfits Nos. 2 and 4

THE new Meccano Gears Outfit A which was introduced recently is a very important addition to the Meccano System. When used with a standard complete Meccano Outfit, especially Outfits Nos. 3 to 6, it greatly increases the interest of the models that can be built. During the next few months we shall describe a number of special working models, each built from a specified Meccano Outfit with the addition of a Gears Outfit A.

Two models are dealt with this month. The first is a Tractor, shown in Figs. 1 and 2, built from Outfit No. 2; the second is the Elevated Jib Crane seen in Figs. 3 and 4, built from Outfit No. 4. In each model Gears from a Gears Outfit A have been included in the construction.

Assembly of the Tractor is begun by bolting a *Magic* Motor into a corner of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 1. A $2\frac{1}{2}''$ Strip is bolted to the Motor lever. A Bush Wheel 2 and a Flat Trunnion are fixed at each end of the Flanged Plate and are connected by three $5\frac{1}{2}''$ Strips. A $1\frac{1}{4}''$ radius Curved Plate and a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate are curved round the front of the Tractor, and space is left between these and a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate to allow the

Motor to be wound. Two $2\frac{1}{2}''$ Strips connect these Plates. A headlamp is represented by a $\frac{1}{4}''$ Contrate Wheel locked on a $\frac{1}{8}''$ Bolt.

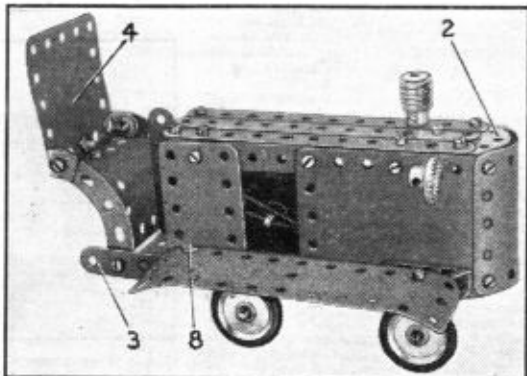


Fig. 1. A gear-driven tractor that can be built from Outfit No. 2 and a Gears Outfit A.

The driver's chair consists of two $2\frac{1}{2}''$ Curved Strips bolted to Strips 3 and attached by Angle Brackets to a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 4. The seat is represented by a U-section Curved Plate and is attached to Plate 4 by a Reversed Angle Bracket. A $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 5 is bolted one hole from the end of the Flanged Plate and Strips 3 are attached to it.

A Driving Band takes the drive from the Motor to 2" Rod 6. This Band is twisted once, otherwise the model will move backward. Rod 6 carries also a $\frac{1}{2}''$ Pinion which meshes with a 57-tooth Gear on Rod 7. The drive from this Rod is taken through $\frac{3}{8}''$ Sprocket Wheels and Chain to the back axle. The front wheels are mounted in a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip.

Two $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates form the track guards and are attached by Trunnions and Angle Brackets. The bolt that holds the guard at 8 is first bolted fairly loosely to the Angle Bracket, the Plate is then placed on the Bolt and finally a second nut is locked in position against

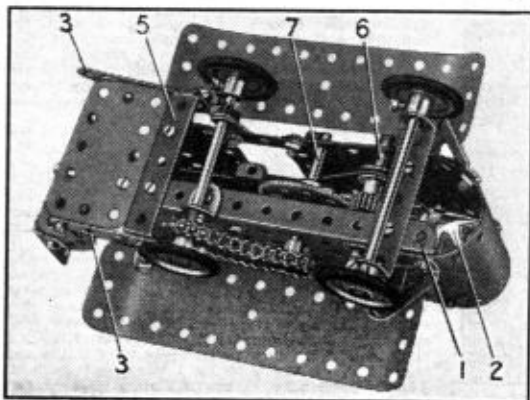


Fig. 2. Underneath view of the tractor.

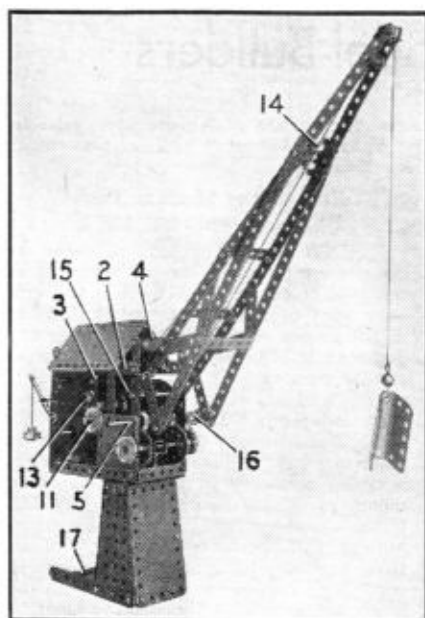


Fig. 3. Outfit No. 4 plus a Gears Outfit A provides all the parts required to build this working model crane. Raising and lowering of the jib and the load are operated through gearing.

it. This allows the guard to be moved aside to permit winding of the Motor.

Parts required to build model Tractor: 3 of No. 2; 5 of No. 5; 1 of No. 10; 8 of No. 12; 2 of No. 16; 2 of No. 17; 4 of No. 22; 1 of No. 23a; 1 of No. 24; 2 of No. 35; 42 of No. 37; 2 of No. 37a; 4 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 111c; 1 of No. 125; 2 of No. 126; 1 of No. 126a; 4 of No. 155; 1 of No. 176; 1 of No. 186a; 2 of No. 188; 2 of No. 189; 1 of No. 190; 1 of No. 191; 1 of No. 199; 2 of No. 200; 1 Magic Motor; 1 Gears Outfit "A."

The crane shown in Figs. 3 and 4 is begun by building the cab. A $5\frac{1}{2} \times 2\frac{1}{2}$ " Flanged Plate forms the floor and a No. 1 Clockwork Motor and a $2\frac{1}{2} \times 2\frac{1}{2}$ " Flexible Plate form one side. The other side and the back are filled in with $4\frac{1}{2} \times 2\frac{1}{2}$ " Flexible Plates. Two $5\frac{1}{2}$ " Strips 2 are connected to two similar Strips bolted vertically to the Flanged Plate. The Strips are connected by Angle Brackets to the Plate at the back of the cab and to the Motor by a Fishplate 3. They are braced by two Double Angle Strips, one of which is shown at 4.

The drive from the Motor is taken by 1" Pulleys to Rod 5 which also carries a $\frac{3}{4}$ " and a $\frac{1}{2}$ " Pinion. These mesh with either of the Gears 6 and 7, each of which is

mounted on a 2" Rod mounted in the sides of the cab, and in a bearing made by bolting a Reversed Angle Bracket to a $1\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strip 8. A Rod Connector 9 is attached to the end of Rod 5.

Gear 6 operates the raising and lowering of the load. The drive from Gear 7 is taken to a 3" Pulley 10 on a 4" Rod 11.

To prevent the jib from overrunning, a simple strap brake is made by tying a length of Cord to a $\frac{3}{8}$ " Bolt 13 and taking it round a 1" Pulley. It is then tied to a weighted lever held in a Rod and Strip Connector lock-nutted to the Motor.

The Strips forming the jib are joined at the head by a Double Bracket and Trunnions 14. The jib pivots on $3\frac{1}{2}$ " Rod 15, and Angle Bracket 16 limits its downward travel.

Parts required to build the model Elevated Jib Crane: 4 of No. 1; 8 of No. 2; 1 of No. 3; 9 of No. 5; 3 of No. 10; 1 of No. 11; 7 of No. 12; 4 of No. 12c; 2 of No. 15b; 1 of No. 16; 2 of No. 17; 2 of No. 18a; 1 of No. 18b; 1 of No. 19b; 5 of No. 22; 1 of No. 23; 4 of No. 35; 80 of No. 37; 5 of No. 37a; 6 of No. 38; 1 of No. 40; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 1 of No. 57c; 4 of No. 111c; 1 of No. 125; 2 of No. 126; 1 of No. 176; 1 of No. 186a; 4 of No. 190; 2 of No. 191; 2 of No. 192; 1 of No. 198; 1 of No. 212; 1 of No. 213; 1 No. 1 Clockwork Motor; 1 Gears Outfit "A."

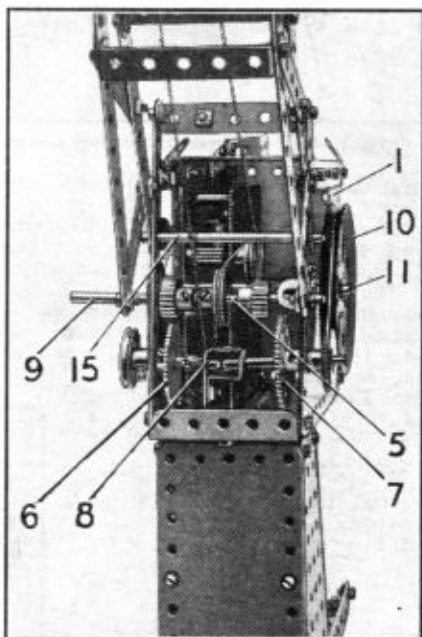


Fig. 4. A close-up view of the crane, showing the gear mechanism.

Among the Model-Builders

By "Spanner"

Epicyclic Transmission Gear

The device shown in Fig. 1 is an interesting mechanism designed to provide a

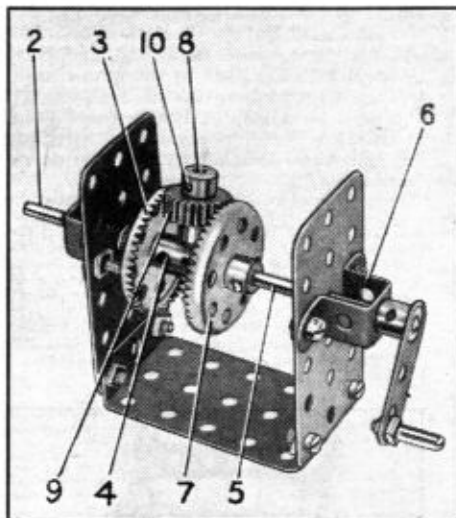


Fig. 1. Compact epicyclic transmission gearing.

gear ratio of two to one between two shafts. Its chief merits lie in the compactness of its construction and in the fact that the driving and driven shafts can be mounted in direct line with each other.

The handle is secured to a Rod 5 mounted in reinforced bearings 6. A second Rod 2 is free to rotate in the boss of a $1\frac{1}{2}$ " Contra-rotate Wheel 3, and is secured in one end of the Coupling 4. Rod 5 runs freely in the other end of the Coupling and carries a $1\frac{1}{2}$ " Contra-rotate Wheel 7 fixed in the position shown.

A $1\frac{1}{2}$ " Rod 8, gripped in the central transverse hole of the Coupling 4, carries a $\frac{3}{4}$ " Pinion 9, which is free to rotate about the Rod, but is retained in position by a Collar 10. The Pinion is engaged by the teeth of the Contra-rotate Wheels 3 and 7. The Double Bent Strip forming the bearings for the driven Rod is bolted to the Plate by two $\frac{1}{4}$ "

Bolts, the shanks of which enter holes in the Contra-rotate Wheel 3 and so prevent it from rotating.

How to Use Meccano Parts

Toothed Segment (Part No. 129)

The Meccano Toothed Segment is intended principally for use where it is required to rotate a mechanism through only part of a complete revolution, as in the device seen in Fig. 2. To use the Segment it is bolted to a Face Plate or similar part capable of rotating about a centre, and a $1\frac{1}{2}$ " Gear Wheel is engaged with its teeth. The Segment has 28 teeth and a radius of $1\frac{1}{2}$ ", so that four Segments can be placed together to form a circle, as shown in Fig. 2. The circle measures 3" in diameter and has 112 teeth. Care should be taken, when joining the segments together, to see that the adjoining teeth are spaced correctly, otherwise they will fail to mesh properly with the driving Gear.

An application for a Toothed Segment is illustrated in Fig. 3, where it is used as

a ratchet for a hand brake lever. The Toothed Segment is fixed to the model by means of a Trunnion in the bottom hole of which a Rod is journaled. The other

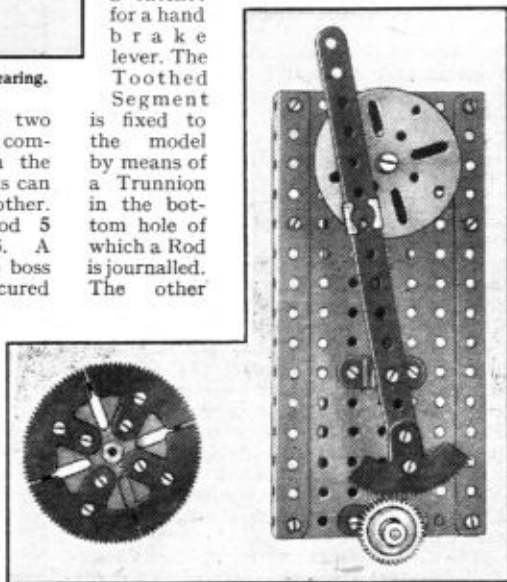


Fig. 2. A Meccano Toothed Segment used to rotate a shaft through part of a revolution.

end of this Rod is carried in a suitable bearing bolted to a convenient part of the model.

A Useful Ratchet Brake or Gear Control Lever

The device shown in Fig. 3 is designed to provide a positive method of retaining brake or gear control levers in any required position, and it can be adapted to many models such as cranes and motor vehicles.

It consists of a Toothed Segment 1 bolted to a Trunnion fixed to a baseplate. A Rod 2 passes through this Trunnion, through the end hole of a Strip 3 and through a second Trunnion 4. The Strip 3 forms the control lever. Mounted freely on the Strip is a Slide Piece 5, in the boss of which is fixed a Rod 6. The Rod passes also through a Collar 7 fixed to the Strip but spaced from it by a Washer. A Coupling 8 fixed to the Rod holds a Centre Fork 9. Between the Coupling and the Collar 7 are a Compression Spring 10 and a few Washers. Normally the prongs of the Centre Fork are pressed in contact with the teeth of

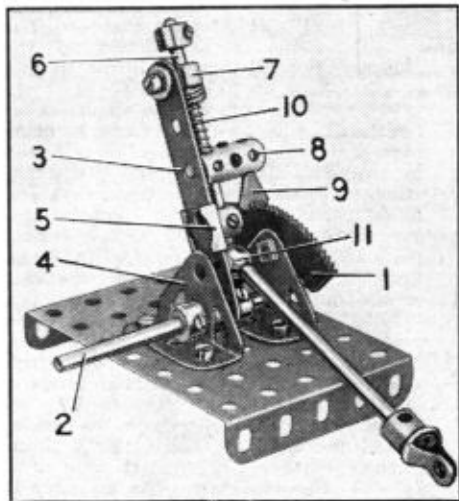


Fig. 3. A novel ratchet brake or gear control lever.

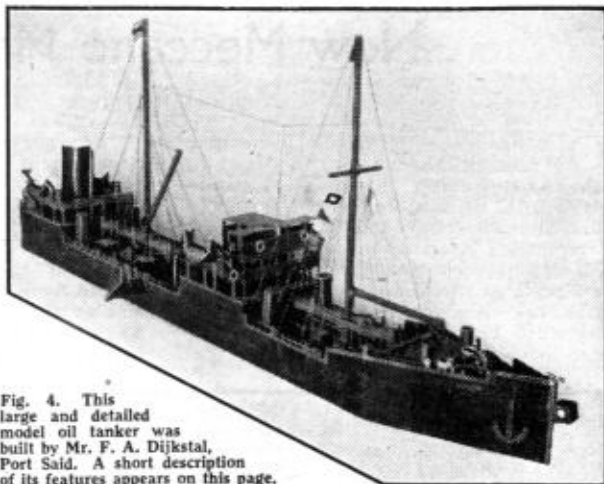


Fig. 4. This large and detailed model oil tanker was built by Mr. F. A. Dijkstal, Port Said. A short description of its features appears on this page.

the Toothed Segment by the action of Spring 10, so that the Strip forming the lever is held in position; but they can be withdrawn by pulling the Rod 6 upward slightly and the lever is then freely movable.

Connection between the control lever and the gear-box or brake gear can be made by means of a Rod fixed in a Hand-rail Support 11 freely lock-nutted to the Strip 3.

Egyptian Reader's Model Oil Tanker

From Port Said comes news of an Egyptian reader, Mr. F. A. Dijkstal, who has been busy building the large model oil tanker shown in Fig. 4 on this page. A striking feature of the model is the great amount of detail it incorporates, among the numerous fittings being a steering wheel and compass on the bridge, oil pipes along the decks, navigation lights, anchors, and deck cranes. Many other items of interest also are included and most of them are shown in the illustration. The square box that can be seen at the front of the vessel represents a very powerful search-light of the kind used by ships when voyaging through the Suez Canal by night. Another feature of the model, and one often overlooked by model ship builders, is the inclusion of flags and signals made out in the correct markings.

This model was displayed in the shop window of a Meccano dealer in Port Said, and it attracted considerable attention.

New Meccano Model

Fork Lift Truck

OUR new model this month, the realistic Fork Lift Truck shown in Fig. 1 on this page, is built with a No. 6 Outfit. It is fitted with a simple castor steering unit controlled from the driving position. The hoist is operated by turning a Crank Handle mounted at the front of the model.

The chassis is assembled by connecting two $12\frac{1}{2}$ " Angle Girders together by a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plate 1 at the front, and by a $5\frac{1}{2}$ " Strip 2 at the rear. The

The lower part of the body on each side is assembled on two compound strips 5 and 6. Strip 5 consists of two $5\frac{1}{2}$ " Strips overlapped three holes, and strip 6 is made from two $5\frac{1}{2}$ " Strips overlapped four holes. Both compound strips are bolted at the front to a small radius Curved Strip attached to Flanged Plate 1, and at the rear they are connected by Angle Brackets to the Strip 2. The space between Strips 5 and 6 is filled in by a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " and two $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates. One of the $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Plates overlaps the compound strips and is used for the lower part of the curved back of the model. The edges of the Plates are braced by two Formed Slotted Strips.

The bolt attaching strip 5 to the Angle Bracket on Strip 2 holds also a vertical $2\frac{1}{2}$ " Strip that extends two holes above strip 5. A $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate forming the upper side is attached to the $2\frac{1}{2}$ " Strip, and also to a 3" Strip 7 at the front. The $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates on each side are extended by $1\frac{1}{2}$ " radius Curved Plates 8, and the latter are connected by two $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates 9. The Plates 9 are linked to the Formed Slotted Strips at the rear by $2\frac{1}{2}$ " Strips 10.

The top of the engine cover underneath the operator's seat is made from a Hinged Flat Plate. This is bolted to two $5\frac{1}{2}$ " Strips, and the Strips are attached to the sides by Angle Brackets. A $3\frac{1}{2}$ " Strip 11 is used to complete this part of the model, and a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate 12 is attached to the sides by Angle Brackets. The raised dome to the rear of the operator's seat is made from a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " and a $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate curved to shape and bolted to the sides. A division 13 consisting of a $5\frac{1}{2}$ " Strip, a $1\frac{1}{2}$ " Strip and two $2\frac{1}{2}$ " Curved Strips is attached to the centre of the dome by an Angle Bracket. The top of the model behind the dome is filled in by a Semi-Circular Plate bolted to each side of a $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate. The assembly is bolted to a $3\frac{1}{2}$ " \times $1\frac{1}{2}$ " Double Angle Strip 14 fixed to the rear of the model and to

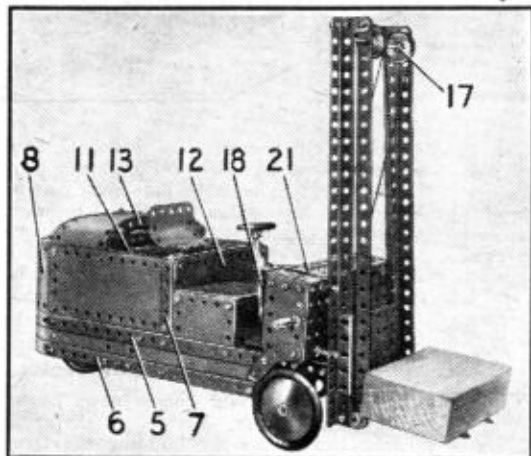


Fig. 1. A fork lift truck that can be built with Outfit No. 6.

front wheels are fixed on a $6\frac{1}{2}$ " Rod mounted in Flat Trunnions bolted to the chassis, and a support for the rear castor unit is provided by a $3\frac{1}{2}$ " \times $1\frac{1}{2}$ " Double Angle Strip 3 bolted between the chassis Girders.

The castor unit is made by bolting a Flat Trunnion to each flange of a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flanged Plate 4. The Flat Trunnions are fixed at the lowest limit of the slotted holes of the Flanged Plate in order to provide clearance for the twin rear wheels. These wheels are fixed on a $3\frac{1}{2}$ " Rod mounted in the Flat Trunnions and held in position by Spring Clips. The unit is pivoted to the chassis by a $\frac{3}{8}$ " Bolt passed through the centre of the Flanged Plate 4 and attached by two nuts to the Double Angle Strip 3. Two Washers are placed on the $\frac{3}{8}$ " Bolt for spacing purposes.

the Hinged Flat Plate.

The floor of the driving compartment is a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate bolted at one end to a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate fixed to the side. A $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 15 and a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 16 are bolted direct to the chassis, and a U-Section Curved Plate, opened out slightly, is used to connect the $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate to the Plate 16.

The hoist rails on each side are made by joining a $12\frac{1}{2}''$ Strip to a $12\frac{1}{2}''$ Angle Girder by Fishplates. The back of the hoist, a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, slides between the $12\frac{1}{2}''$ Girders and Strips. The rails are attached to the Flanged Plate 1 by $\frac{1}{4}''$ and $\frac{3}{4}''$ Bolts. These Bolts are fixed to the rails by nuts, and then attached to the Flanged Plate by two nuts on each Bolt. The upper ends of the rails are joined by a compound $4\frac{1}{2}''$ strip consisting of two $2\frac{1}{2}''$ Strips overlapped one hole.

A $5\frac{1}{2}''$ Crank Handle is mounted in one of the shorter flanges of Flanged Plate 1, and in a Trunnion bolted to the Flanged Plate. Spring Clips are used to keep the Crank Handle in position, and two lengths

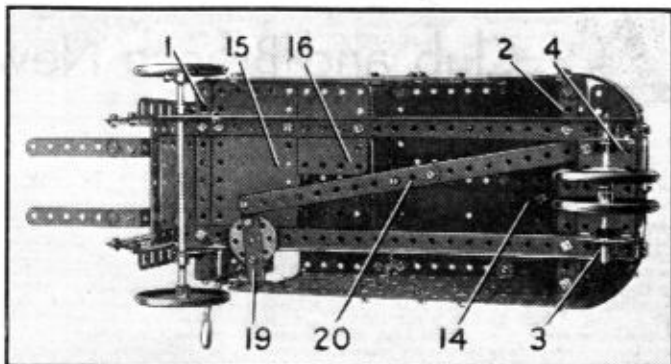


Fig. 2. Underneath view of truck.

of Cord are fastened to it. These Cords are led over $1''$ Pulleys on a Rod 17, and then fastened to the back of the hoist. It is important to make sure that both Cords are the same length so that the hoist operates evenly.

The steering column is mounted in the chassis and in a Fishplate bolted to a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 18. The lower end of the steering column is fitted with a Bush Wheel, and a $2\frac{1}{2}''$ Strip 19 is bolted across the Bush Wheel. Strip 19 is connected by a compound strip 20 to the castor unit, and lock-nuts (Cont. on page 94)

OUTFIT No. 3 MODEL-BUILDING CONTEST

The winter model-building season is now in full swing, and we hope every reader will take the opportunity of sending in an entry for our latest model-building competition. One of the most successful of last year's competitions was the Outfit No. 4 Contest first announced in the March issue of the "M.M."; this month we announce a similar Contest for models built with Outfit No. 3. Entrants are free to choose any subject they wish for their models, but they must not use any parts other than those included in a No. 3 Outfit, and models must be the unaided work of competitors.

Each competitor is asked to send a photograph or a sketch of his completed model, together with a list of parts used in its construction. A few brief notes covering any points not shown fully in the illustration should also be sent, and the competitor's age, name and address must be written clearly on the back of each illustration submitted.

Entries should be addressed: "Outfit No. 3 Model-Building Contest, Meccano Ltd., Binns Road, Liverpool 13."

There will be two sections to this Contest, for Home and Overseas readers respectively. Entries in the Home Section must reach us by 31st March; Overseas entries will be accepted up to 31st July next.

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

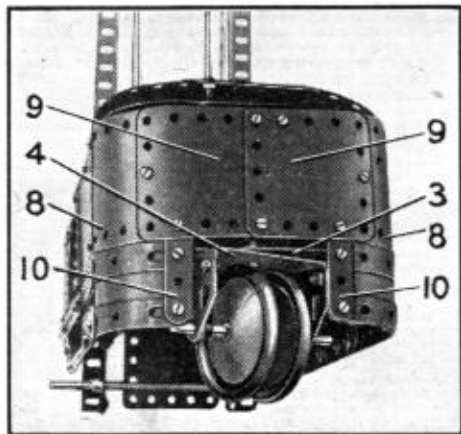


Fig. 3. End view of the truck.

The Pennine Way—(Continued from page 64)

scheme, declaring that such a project would be a boon in linking up the National Parks. The stumbling block to the adoption of the idea is that new tracks will have to be opened, particularly along the southern section of the proposed route. In that region existing footpaths are few, and in some parts of the Peak District restrictions on the use of the open spaces by walkers have long been zealously applied by landowners.

Yet the Pennine Way may be said to exist to a big degree. There are rights of way along 180 of the 250 miles, and only 16 of the remaining 70 miles have been the subject of controversy between landowners and hikers. Thus, it is already possible to tramp from Malham, in Airedale, to Wooler, in Northumberland, using only trodden tracks along England's backbone.

Energetic walkers are striving to complete the scheme which will enable them to hike along the whole 250 miles, covering it in stages of 15-20 miles or less. The Way in its entirety would introduce many people to new scenic charms, for it would help to refute the fairly widespread notion that the Pennine region is completely sullied by towns and smoke.

Luxury Bus Travel in South Africa—

(Continued from page 69)

driver's seat. At the rear of the bus is a luggage compartment almost 8 ft. wide and 4 ft. high.

External lights, green at the front and red behind, indicate the height and width of the vehicle and render identification easy on the road at night. Massive front and rear bumpers are part of the design. Their utility was proved on one occasion when a Pretoria-bound bus was unable to leave Johannesburg station owing to a jammed starter. Another bus came up behind and pushed it along until the starter was freed.

In all, more than 100 of these super-saloons have been ordered by the South African Railways, at a cost of just under £7,000 each. The department offers a choice of many delightful round trips, such as that between Durban and Cape Town, via the Garden Route. The excellence of the main roads has made possible these lengthy tours, of which full advantage is taken by South Africans and overseas visitors. Small wonder that travellers prefer this service to that of the trains, and even, in many cases, to a journey by private car. In the heat of summer few cars can equal the comfort of these air-conditioned buses; only one train, the famous "Blue Train" of the Cape-Jo'burg run, is similarly equipped.

New Meccano Models—(Continued from page 83)

fitted on the bolts used for the purpose allow the steering to operate freely. Double Angle Strip 18 is braced by a 2½" Strip 21 fixed to the Flanged Plate 1.

Parts required to build the model Fork Lift Truck: 2 of No. 1; 14 of No. 2; 3 of No. 3; 2 of No. 4; 10 of No. 5; 1 of No. 6a; 4 of No. 8; 7 of No. 10; 9 of No. 12; 2 of No. 12a; 1 of No. 14; 1 of No. 15; 1 of No. 15b; 1 of No. 16; 1 of No. 19b; 3 of No. 22; 1 of No. 24; 4 of No. 35; 120 of No. 37; 10 of No. 37a; 10 of No. 38; 5 of No. 48a; 2 of No. 48b; 1 of No. 51; 1 of No. 52; 2 of No. 53; 4 of No. 59; 2 of No. 90; 2 of No. 90a; 2 of No. 111; 2 of No. 111a; 3 of No. 111c; 1 of No. 126; 4 of No. 126a; 1 of No. 155; 4 of No. 187; 4 of No. 188; 4 of No. 189; 6 of No. 190; 2 of No. 191; 4 of No. 192; 2 of No. 199; 2 of No. 200; 2 of No. 214; 4 of No. 215.

SPRING BACK BINDERS FOR THE "M.M."

There is no better way of keeping copies of the "M.M." clean and tidy than by using the spring back binder designed for the purpose. This has strong stiff backs and has the name "Meccano Magazine" in gilt on the front. It holds 12 copies, and the issues can readily be inserted or taken out. The price is 3/6 including postage.

"A.T.C." on the Southend Line—

(Continued from page 76)

automatic train control is very good indeed, mechanical instruments may sometimes go wrong, and perhaps during a fog at night-time there might come a rare occasion when the "A.T.C." gives a wrong indication. This of course does not often happen, but there is a possibility that it might.

Every driver to whom I have spoken about "A.T.C." liked it and agreed what a blessing it was to him in foggy weather. When you consider that during the winter time in one week the "A.T.C." makes over 60,000 correct indications of the distant signals you can well imagine what a wonderful thing is automatic train control.

Sugar from Beet—(Continued from page 57)

process is perhaps the most fascinating to watch. At first, the inside of the revolving drum contains a brownish substance, but gradually this turns as white as snow as the sugar is separated.

Molasses is used as a cattle food, and also is distilled into commercial alcohol for a great variety of purposes, including the manufacture of plastics. About 120,000 tons of molasses leave our sugar factories every year.

Finally, the pure refined sugar is dried, cooled and poured into bags. These are filled automatically by hopper, and after sealing are stacked in the vast air-conditioned stores of the factory. The actual time taken in the complete transformation of raw beet into granulated sugar is only about eighteen hours.

"BRITISH RAILWAYS TO-DAY AND TO-MORROW"

An illustrated booklet under this title that has been issued by the Railway Executive gives a brief account of our railways at the present time. The progress that has been made in the two years of nationalisation is recorded and the aims of British Railways in regard to improvements and services, stock, plant and equipment are detailed, while reference is made to many varied aspects of modern railway work.

From the booklet we can sense the importance of the railways to the life of the country. On the passenger side special attention is drawn to travel facilities of all kinds, and a wealth of interesting details are given of freight working in general and of the special measures taken to deal with heavy traffic such as the transport of coal, for home use and for export, collection and delivery methods, and warehousing and steamship services.

A particularly interesting chapter deals with railway workers and arrangements for their welfare and training. What British Railways are doing with regard to motive power and rolling stock also is dealt with, after which permanent way and stations engage attention. There are accounts of improved methods of track laying and maintenance, signalling schemes and new works generally. A list is given of named expresses and a table of mileposts in the history of British railways gives readers a summary of their growth.

With its many illustrations and a folding map, the booklet forms a compact and useful work of reference.

A SCHOOLBOY'S EXHIBITION DEMONSTRATION

At the Schoolboy's Exhibition at the Royal Horticultural Hall, which was open from 31st December 1949 to 14th January 1950 a large exhibit, sponsored by our advertisers Johnsons of Hendon Ltd., the photographic chemical manufacturers, showed by practical demonstrations how easy it is for boys to start Home Photography.

The process of developing films was explained and contact prints, exposed by the boys were developed on the spot. An enlarger was in operation, and after a demonstration on toning and tinting every boy present received a free copy of a book on photography.