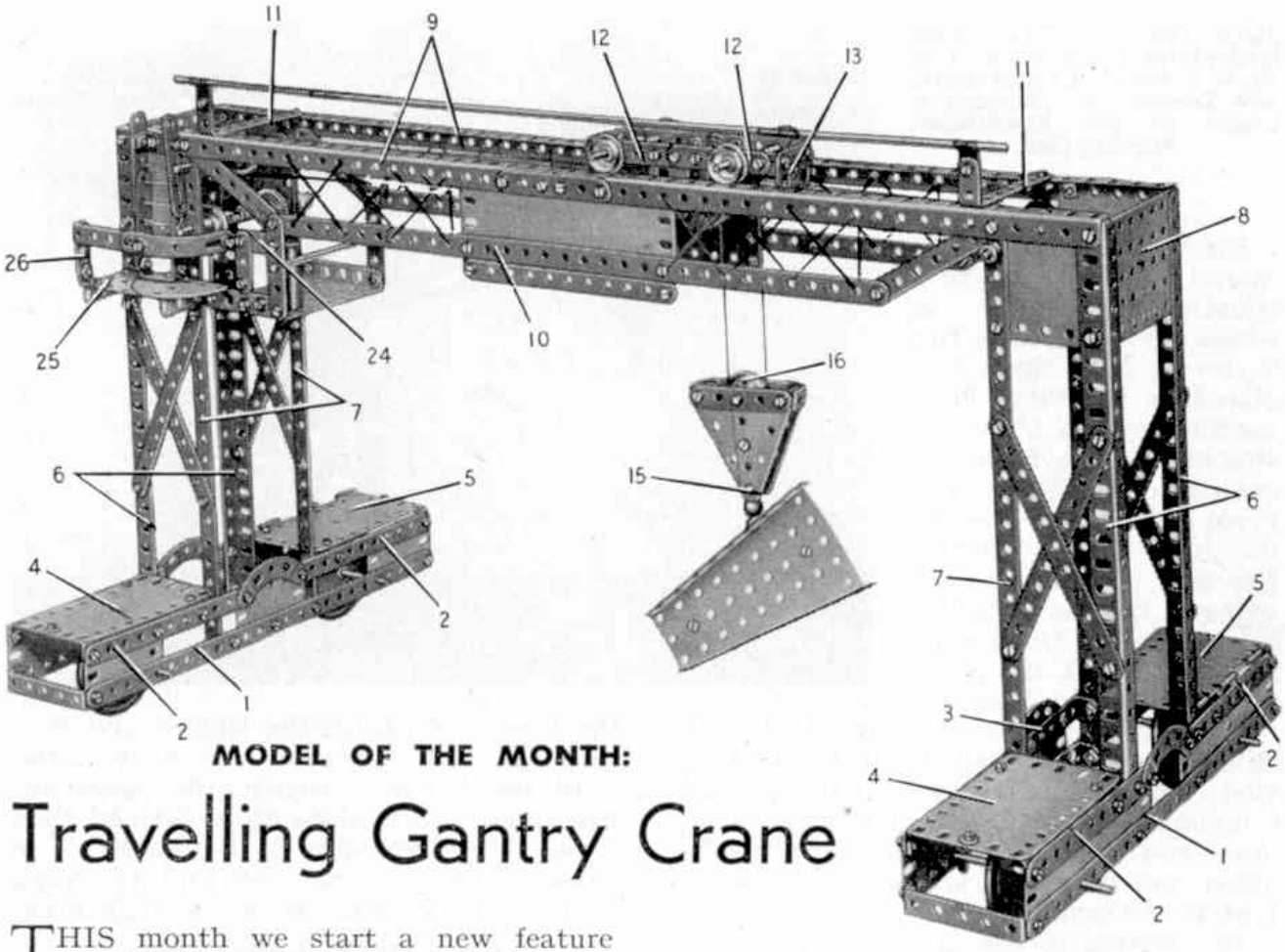

MODEL OF THE MONTH:

Travelling Gantry Crane

THIS month we start a new feature specially for the owners of fairly large Outfits, and for model-builders generally who have good stocks of parts at their disposal. In this we shall select each month an interesting subject and build a Meccano model of it in the usual way. Detailed illustrations, from photographs of the model, will be given, with a general explanation of the original, that is the actual vehicle, machine or structure on which it is based, and of its working. Full model-building instructions also will be prepared and Meccano enthusiasts who wish to build the model can obtain these and a list of parts required free of charge by writing to the Editor.

Fig. 1 (Above). A model of a typical tower Gantry Crane, which forms an excellent subject for the model-builder.

In the past the main problem in connection with describing models of the larger type in the *M.M.* has been to make the illustrations sufficiently large and clear to enable model-builders to pick out the details, and at the same time to include all the instructions necessary to build the model without difficulty. With the new arrangement it will be possible to make the pictures larger, and where necessary or advisable, to use more of them.

Some of the models included in the series may be designed for construction with a particular Outfit, while others will be non-Outfit models intended for model-builders who have large collections of parts.

The first model to be featured under the new arrangement is a fine Travelling Gantry Crane, a general view of which is reproduced as Fig. 1. This model is designed for construction with the parts included in Outfit No. 7, and it is particularly interesting to build and to operate.

In actual practice travelling gantry cranes have widespread uses and are applicable to many kinds of work. They are most valuable, however, in conditions such as those found in sheet metal stock yards, warehouses, coaling yards, foundries, etc. They require little head room, work speedily and are easily handled. They are frequently seen travelling from end to end of the long sheds and warehouses in large railway goods yards or lining quaysides and docks.

The Meccano model seen in Fig. 1 shows clearly the structural design of a typical gantry crane. Strongly-built end

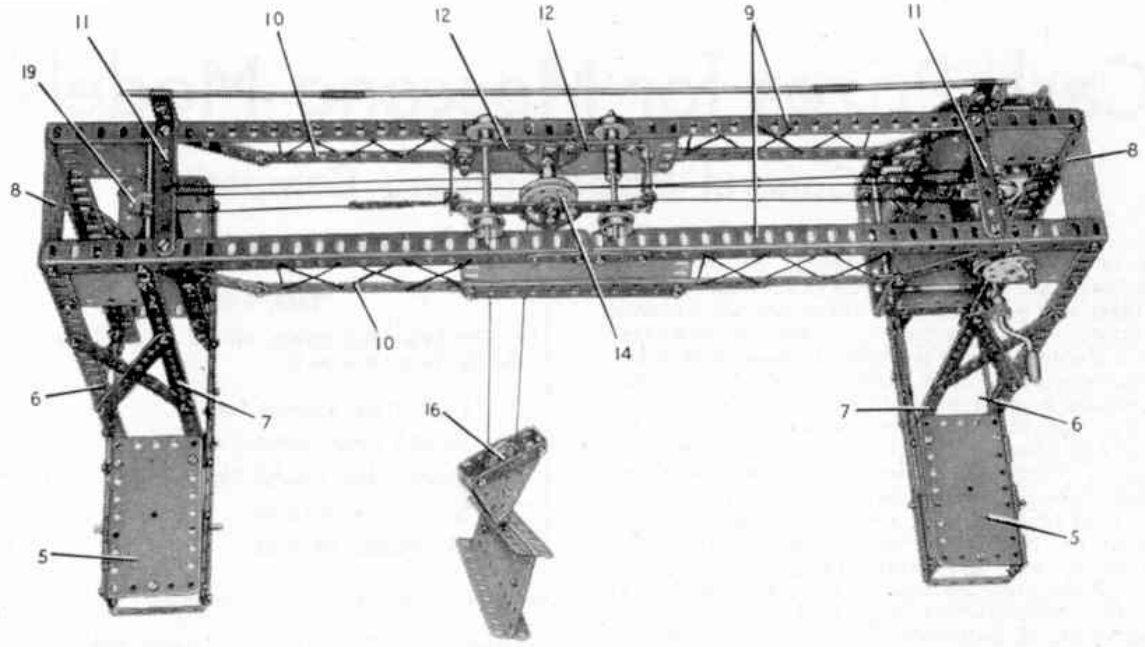

Fig. 2. A view of the top of the gantry.

towers support a large compound moving girder on which the hoisting trolley or traveller is mounted. In practice this type of crane usually is powered by electric motors. The Meccano model is hand-operated, but it can be made to carry out all the essential movements of a real gantry crane. On fairly small cranes the driving cabin may be located in one of the towers, but in larger and more powerful types the driver has a special cabin situated on or beneath the gantry trolley. The latter position enables the driver to see all that is taking place on the site over which the crane is working, an advantage that is very important when handling a heavy load. In the model the driver's cabin is placed at the top of one of the towers, as this is more convenient for working a hand-operated model.

A travelling gantry crane of the kind represented by the model is fitted with wheels that run on rails. There are other types, however, differing in constructional details. For example, in a crane used in a long narrow building it may be advantageous to dispense with the end towers and the ground rails, thus saving valuable space. To do this the gantry is mounted on rails attached to and arranged parallel with the long walls of the building and placed near the roof. This type of gantry crane is used extensively in steel works and other buildings, but tower supports are usually necessary in the open.

For constructional purposes the model can be divided into three convenient sections, consisting of the two end towers and the main girder or gantry. The towers are similar in general design and each is provided with a wheeled base so that the completed model can be moved over the load to be lifted. The next step is to assemble the trolley and the stout girder that forms the gantry. The girder can then be bolted to the upper ends of the towers. The final steps in the assembly of the model are to mount the winding handles and mechanism in one of the towers, and arrange the operating Cords.

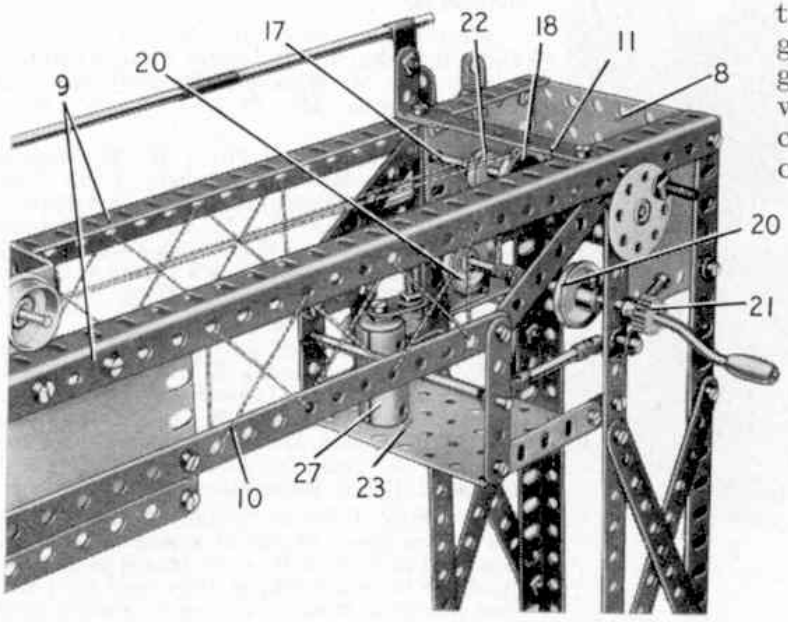

Fig. 3. The hoist and traveller operating mechanism.

MODEL OF THE MONTH (March 1956)

GANTRY CRANE

Construction of the Towers

The two towers are identical in construction. The base of each tower consists of a 12½" Strip 1 and two 5½" Strips 2 on each side (Fig. 1). The Strips 2 are joined at the centre by a 3½" x ½" Double Angle Strip 3 and a 2½" Stepped Curved Strip. The Strips 1 and 2 at the outer side of each base are connected by two 5½" x 1½" Flexible Plates, and those on the inner side are joined by three 2½" x 1½" Flexible Plates.

The sides of the base are connected at each end by two 2½" x ½" Double Angle Strips bolted between the Strips 1 and 2. The Double Angle Strip between the Strips 2 at one end supports a 4½" x 2½" Flexible Plate 4, and to the Double Angle Strip at the other end is bolted one half of a Hinged Flat Plate 5. The inner ends of the Plates 4 and 5 are connected to the Strips 2 by Angle Brackets.

The bases are mounted on Road Wheels fixed to one 4" and three 3½" Rods, which are held in the Strips 1 by Spring Clips.

Each tower is formed by two 12½" Angle Girders 6 and two 12½" Strips 7, (Fig. 1). The Strips 7 are bolted to the lugs of the Double Angle Strip 3 and are connected to one of the Strips 1 by Angle Brackets. The Girders 6 are joined at the top of the tower by a 3½" x 2½" Flanged Plate 8, and are connected to the Strips 7 by 2½" x 2½" Flexible Plates. The tower is braced by two crossed 5½" Strips on each side.

Assembly of the Gantry

Each side of the gantry consists of a built-up girder 9, made from two 12½" Angle Girders joined end-to-end at the centre by a 3" Strip (Fig. 1). The girders 9 are bolted to the tops of the towers, and built-up strips 10 are joined to the girders by 3½" Strips at each end. The built-up strips are each made from two 12½" Strips overlapped 18 holes, and they are connected to the girders 9, at the centre of the gantry, by 5½" x 2½" Flexible Plates. Each Plate is strengthened along its lower edge by a 5½" Strip.

Two 3½" Strips 11 are bolted to the girders 9 as shown in Fig. 2. The bolts holding these Strips at one end fix also 1" x 1" Angle Brackets, and to these Angle Brackets are bolted Right-Angle Rod and Strip Connectors that support the handrail. The handrail consists of an 11½", a 4½" and a 5" Rod joined by Rod Connectors.

Travelling Carriage and Pulley Block

The travelling carriage consists of two 2½" Strips 12 on each side, bolted at the centre to a Flat Trunnion. A Crank is fixed also to the Strips so that its boss coincides with the hole in the pointed end of the Flat Trunnion. The Strips 12 are connected to two 1½" x ½" Double Angle Strips, to each of which is bolted a Flat Trunnion 13. A 1½" Rod is fixed in the two Cranks, and at the centre of this Rod is mounted a built-up pulley 14, made from a 1" loose Pulley,

two Wheel Discs and two Collars. One of the axles carrying the carriage wheels is a 3½" Rod, and the other consists of a 2" and a 1½" Rod joined by a Coupling.

Each side of the pulley block is formed by two 2½" x 1½" Triangular Flexible Plates bolted together and edged at the top by a 2½" Strip. The sides are connected by two Double Brackets and by a ¾" Bolt 15. A small Loaded Hook is supported on this Bolt between two Spring Clips. A 1" loose Pulley 16 is mounted between two Collars on a 1" Rod.

The Operating Mechanism

Movement of the travelling carriage is controlled by turning a Bush Wheel fixed on a 4½" Rod 17 that carries a 1" Pulley 18, (Fig. 3). A length of Cord is tied to one of the Flat Trunnions 13, is passed round the Pulley 18 and through holes in both the Flat Trunnions 13. It is then taken round a 1" Pulley 19 on a 4½" Rod, and is tied to a Driving Band secured by a short piece of Cord to one of the Flat Trunnions 13. The Driving Band is stretched slightly to tension the Cord.

The Rod 17 is held in place by a ½" fixed Pulley inside the tower, and the Rod carrying the Pulley 19 is kept in position by Collars. A 5" Crank Handle is mounted at the top of one of the towers, and is fitted with two 1" Pulleys 20 and a ½" Pinion 21, (Fig. 3). A ½" Bolt is fixed in the Pinion, so that by sliding the Crank Handle this Bolt engages a Spring Clip on a ⅜" Bolt fixed by a nut in the hole below the Crank Handle. This forms a simple brake, which is released by pulling the Crank Handle outward.

A length of Cord is tied to a Cord Anchoring Spring placed on the Crank Handle between the Pulleys 20, and is taken over a ½" loose Pulley 22 on Rod 17. The Cord is passed through one of the Flat Trunnions 13, round the Pulleys 14 and 16, and over the 3½" Rod forming one of the carriage axles. The Cord is passed through the second Flat Trunnion 13 and is tied finally to one of the Strips 11.

Control and Inspection Platforms

A 3½" x 2½" Flanged Plate 23 is attached to one of the towers by Fishplates, and is connected by 2½" Strips to the ends of the strips 10. The handrail is formed by a 4" Rod and a 2" Rod fitted at each end with a Rod and Strip Connector, and arranged as shown in Fig. 1. At one side a 1½" Strip 24 is connected to the Flanged Plate 23 by a second 1½" Strip extended by a Fishplate.

A 2½" x 1½" Flanged Plate 25 is attached to one side of the tower by Angle Brackets, and a Semi-Circular Plate is bolted to it. The handrail consists of a 2½" x ½" Double Angle Strip and a Formed Slotted Strip. It is connected to the Strip 24 by an Angle Bracket, and is supported at the other end by a 1½" Strip 26 attached to the Flanged Plate 25 by an Angle Bracket (Fig. 1).

The ladder to the top of the tower consists of two 2½" Strips bolted to 1" x 1" Angle Brackets fixed to the Flanged Plate 25, and two similar Strips attached to one of the girders 9 by ½" x ½" Angle Brackets. The rungs are represented by Cord.

The controller attached to the Flanged Plate 23 is a Sleeve Piece 27 bolted to a ½" Reversed Angle Bracket, which is secured to a flange of the Flanged Plate. The control handle is a Fishplate, which is fitted with a Threaded Pin and lock-nutted to a Chimney Adaptor pressed into the end of the Sleeve Piece.

Outfit No. 7.

March 1956 "M.M."

GANTRY CRANE

Parts Required

12	of No.	1	2	of No. 22a	2	of No. 111a
18	" "	2	1	" " 23	2	" " 111c
6	" "	3	1	" " 23a	2	" " 115
2	" "	4	1	" " 24	1	" " 125
12	" "	5	2	" " 24a	4	" " 126a
3	" "	6a	1	" " 26	1	" " 163
8	" "	8	13	" " 35	1	" " 164
4	" "	10	177	" " 37a	1	" " 176
2	" "	11	173	" " 37b	1	" " 186
18	" "	12	33	" " 38	4	" " 187
4	" "	12a	1	" " 40	6	" " 188
1	" "	13	2	" " 48	4	" " 189
1	" "	15	9	" " 48a	4	" " 190
3	" "	15a	2	" " 48d	2	" " 191
2	" "	15b	1	" " 51	2	" " 192
4	" "	16	3	" " 53	1	" " 198
2	" "	17	1	" " 57c	2	" " 212
2	" "	18a	6	" " 59	2	" " 212a
1	" "	18b	2	" " 62	2	" " 213
1	" "	19h	1	" " 63	1	" " 214
4	" "	20b	4	" " 90a	1	" " 215
4	" "	22	1	" " 111	4	" " 221