New Meccano Model

Mobile Revolving Crane

ACTUAL cranes of the type that forms the subject of our new model this month are used extensively for such jobs as loading and unloading railway wagons and lorries in railway sidings, warehouses and stockyards. In a crane of this kind the entire structure revolves on its own axis, and in the larger types some mechanical means is provided to effect this swivelling movement. In the lighter types, however, the structure is swivelled manually, and it is a crane of this type that is represented by the Meccano model illustrated.

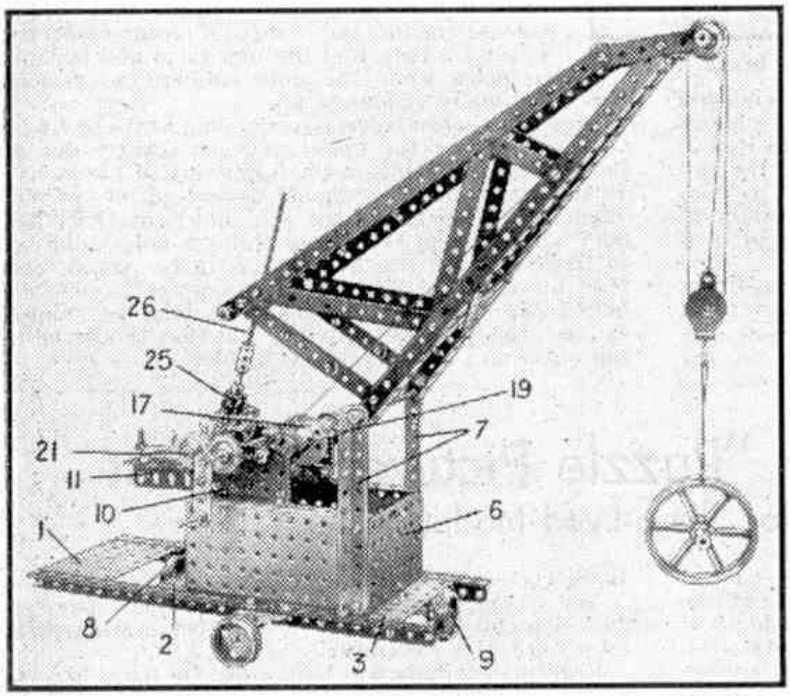

Fig. 1. A revolving crane, equipped with a screw-operated luffing jib, and reversible hoisting motions, all controlled from one handle.

The base of the model consists of two 12½" Angle Girders bolted to and spaced apart by three 3½" × 2½" Flanged Plates 1, 2 and 3, Fig. 1. Bolted to each Angle Girder is a 5½" × 3½" Flanged Plate, 4 and 5, Fig. 2, that together form the sides of the superstructure. At the front end these Plates are bridged by a compound 3½" × 2½" Flat Plate 6, Fig. 1, formed from two 2½" × 2½" Flat Plates overlapped, and to each of them a 5½" Angle Girder is bolted vertically as shown at 7.

Two of the 3½" × 2½" Flanged Plates of the base are fitted with 2½" Double Angle Strips, in the lugs of which are journalled short Rods that carry 1⅛ Flanged Wheels 8 and 9. The other two wheels, one at each side of the crane, are mounted on a Rod that revolves in Angle Brackets bolted to Trunnions fixed to each 12½" Angle Girder.

The mechanism is mounted on Rods journalled in two 3" × 1½" Flat Plates, one of which is seen at 10 Fig. 1. These Plates are bolted to 3" Angle Girders fixed to the upper flanges of the Flanged Plates 4 and 5. To each of the 3½" × 1½" Flat Plates is bolted a 3½" Angle Girder, one of which is seen at 11, Fig. 1, and these support a 2½" × 2½" Flat Plate 12, Fig. 2. The construction of the jib is shown in Figs. 1 and 3 and it carries two 1" Pulleys at its head, these being mounted freely on a 2" Rod. The jib is pivoted on a Rod passed through the upper end holes of the Angle Girders 7. At the rear top side of the jib is a second compound Rod consisting of two 2" Rods 28, the inner ends of which are held in a Coupling 27.

The mechanism is arranged as follows. A Rod 13 mounted as shown carries a 1" Gear 14 and a ½" Pinion 15, and is arranged to slide about ¼" in its bearings. It is also fitted with a handle consisting of two Cranks bolted back to back, one of the Cranks carrying a 1" Rod in its boss. A Spring 16 is placed on one end of the Rod as shown in Fig. 2, and is retained in place by a Collar. The purpose of the Spring is to keep the Rod normally in such a position that the ½" Pinion engages a 57-teeth Gear 17 on a Rod that carries the winding drum and a 1" Pulley 18. The winding drum 19 is a Sleeve Piece inside which is a Chimney Adaptor and at one end a ¾" Flanged Wheel. Mounted on the Rod immediately behind the Pulley 18 is a Socket Coupling 20. This Rod also is slidable in its bearings and can be moved about ¼" endways by operating a lever 21. This consists of a Threaded Pin held in a Collar on one end of a Rod, the other end of which carries a Handrail Coupling. A 1" Rod fixed in the Handrail Coupling engages the groove of the Socket Coupling.

The jib is raised and lowered by turning the crane handle that is used to hoist

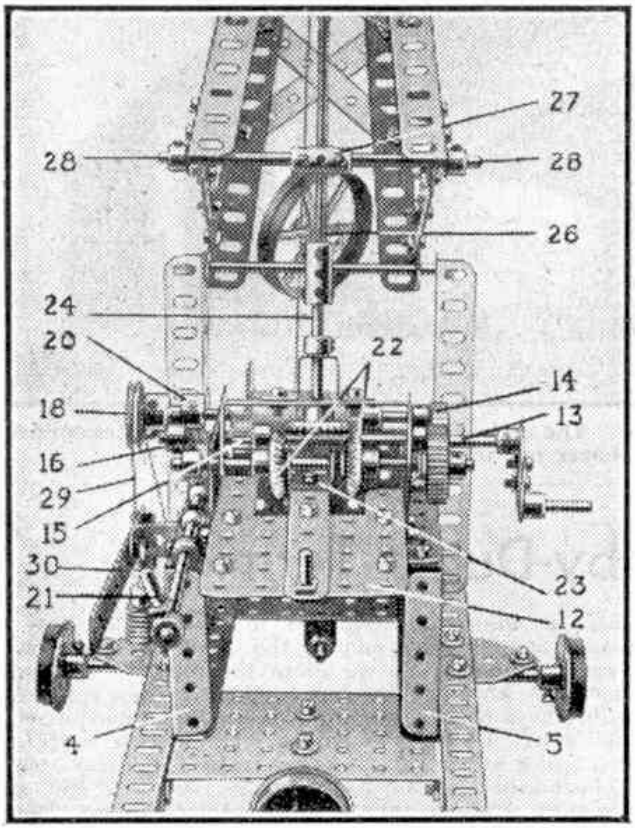

Fig. 2. The mechanism of the revolving crane.

and lower the load, but for this purpose a different train of gears is brought into use. A second 1″ Gear mounted on the rear Rod of the gear-box is engaged with the 1″ Gear 14 on the handle shaft. Also mounted on this Rod are a 2½″ × 1″ Double Angle Strip and two ⅞″ Bevels 22 with a Double Bracket 23 between them. The Rod is free to slide endways about ¼″ and is retained in its bearings by Collars. The Bevels are fixed to their Rod about 1″ apart so that by sliding the Rod either of them can be brought into mesh with a third similar Bevel fixed on the lower end of a short Rod 24. This Rod is journalled in a Double Bent Strip 25 and the 2½″ × 1″ Double Angle Strip. At the upper end of Rod 24 is a Coupling, which grips in its longitudinal bore a Threaded Rod 26 that is screwed into the centre tapped hole of the Coupling 27 mounted at the rear end of the jib.

To prevent the load falling when the hoisting gears are disengaged while luffing the jib, a band brake is fitted to the shaft of the winding drum. This consists of a Cord 29, Fig. 2, which is tied at one end to the framework of the model and then passed around the Pulley 18. The other end of the Cord is then tied to a pivoted and weighted lever 30 mounted on the side of the superstructure.

The hoisting cord is tied to the winding barrel, then passed over one of the Pulleys at the jib head and around the pulley of a single sheave Pulley Block. Then it is taken up and over the second 1″ Pulley at the jib head and finally is tied to the lug of the Pulley Block.

If a Clockwork or Electric Motor is available it may be fitted to drive the model and if this is possible its operation will be even greater fun. When a Motor is used a simple lever arrangement must be fitted to slide the Rod 13 endways in its bearings so that the different motions can be obtained. An arrangement similar to that used for sliding the rear Rod of the gear-box is suitable.

Parts required to build model Revolving Crane: 5 of No. 2; 9 of No. 3; 2 of No. 4; 2 of No. 5; 2 of No. 6a; 6 of No. 8; 2 of No. 9; 4 of No. 9c; 2 of No. 11; 2 of No. 12; 2 of No. 15; 2 of No. 15a; 1 of No. 15b; 2 of No. 16b; 6 of No. 17; 3 of No. 18b; 4 of No. 20; 1 of No. 20b; 2 of No. 22; 1 of No. 22a; 1 of No. 26; 1 of No. 27a; 3 of No. 30; 2 of No. 31; 1 of No. 32; 84 of No. 37; 16 of No. 38; 1 of No. 40; 1 of No. 45; 1 of No. 46; 2 of No. 48a; 2 of No. 52; 3 of No. 53; 14 of No. 59; 2 of No. 62; 2 of No. 63; 2 of No. 72; 2 of No. 73; 2 of No. 115; 1 of No. 120b; 2 of No. 136; 1 of No. 136a; 1 of No. 151; 1 of No. 163; 1 of No. 164; 1 of No. 166; 1 of No. 171.

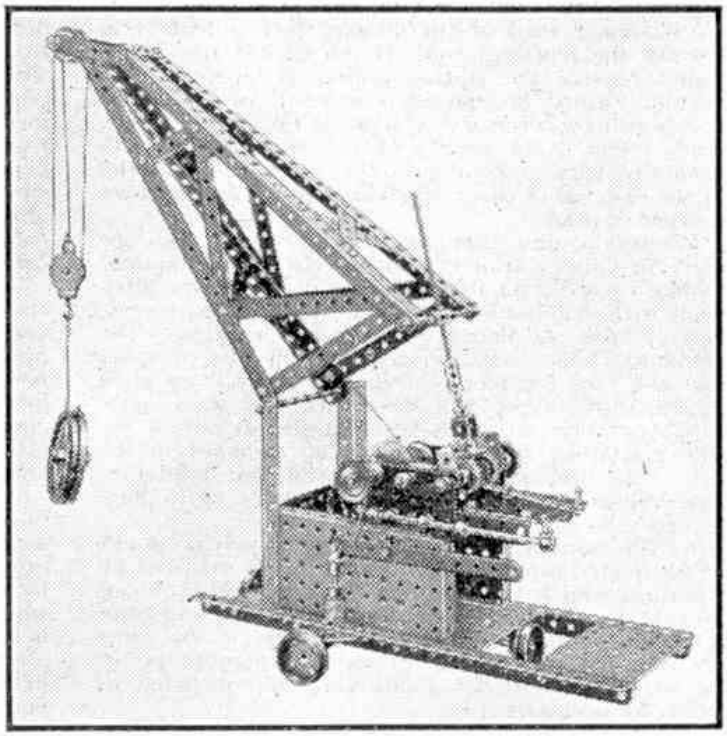

Fig. 3. Another view of the revolving crane showing the side opposite to that seen in Fig. 1.