

# New Meccano Model

## Shipyard Crane

THE top of the crane tower is a square framework made from four  $9\frac{1}{2}$ " Angle Girders. A further  $9\frac{1}{2}$ " Angle Girder is bolted across the centre of the framework and is extended on each side by a  $9\frac{1}{2}$ " Strip Plate 1. The outer edge of each of these Strip Plates is braced by a  $9\frac{1}{2}$ " Angle Girder, and a Hub Disc 2, fitted at the centre with a Bush Wheel, is bolted to the framework. A 3" Rod 3 is fixed in the Bush Wheel.

Each leg of the tower consists of three  $18\frac{1}{2}$ " Angle Girders. These are connected together at their lower ends, and are attached at the top to  $1\frac{1}{2}$ " and 1" Corner Brackets as shown in Fig. 3. The legs are braced by Strips of various lengths, Trunnions are fixed to their lower ends so that the completed model can be screwed to a suitable baseboard.

The spider of the roller bearing is shown separately in Fig. 2. It is made by bolting eight  $1\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Brackets radially to a Face Plate, and each carries a 2" Rod fitted with a  $\frac{3}{4}$ " Flanged Wheel. The Rods are held in place by Collars, and the complete spider is slipped over Rod 3.

The base of the cab is made by connecting two  $9\frac{1}{2}$ " Angle Girders at each end by  $7\frac{1}{2}$ "

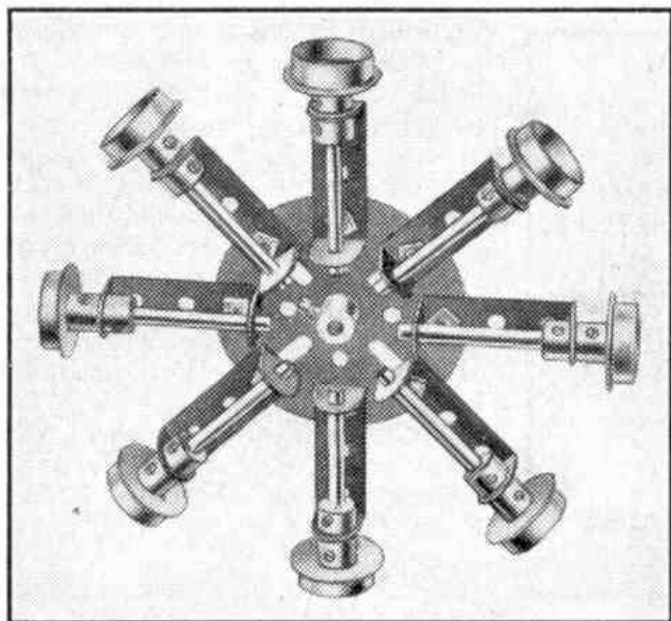


Fig. 2. The spider of the roller bearing on which the superstructure rotates.

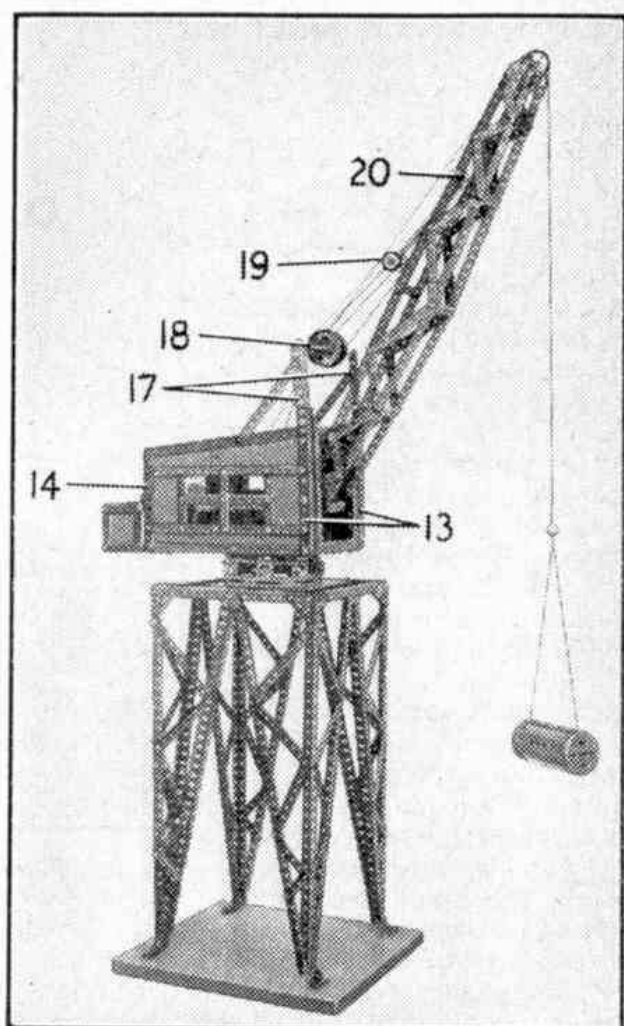


Fig. 1. A working model shipyard crane driven by a 20-volt Electric Motor.

Angle Girders, and the joints are braced by  $1\frac{1}{2}$ " Corner Brackets. A further  $9\frac{1}{2}$ " Angle Girder 4 and two similar Girders 5 are bolted to the base. A Hub Disc 6, forming the upper ring of the roller bearing, is bolted to Girders 4 and 5, and the assembly is then passed over Rod 3 and held in place by a Collar.

The cab base is extended at the rear by a box made from  $2\frac{1}{2}$ " and  $7\frac{1}{2}$ " Angle Girders as shown. The floor of the box is plated by  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plates, and the power unit, an E20R Electric Motor, is attached to  $\frac{1}{2}$ " Reversed Angle Brackets bolted to the floor.

A  $\frac{1}{2}$ " Pinion on the Motor shaft meshes with a 57-tooth Gear 6, and a  $\frac{1}{2}$ " Pinion on the same Rod as the Gear meshes with a further 57-tooth Gear on a Rod 7. A  $\frac{3}{4}$ " Sprocket on Rod 7 is connected by Chain to a 2" Sprocket on the gear-box input shaft.

The sides of the gear-box are  $2\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plates, and they are bolted to the Girders 5. The input shaft carries a  $\frac{1}{2}$ " Pinion 8, and is held in position by a

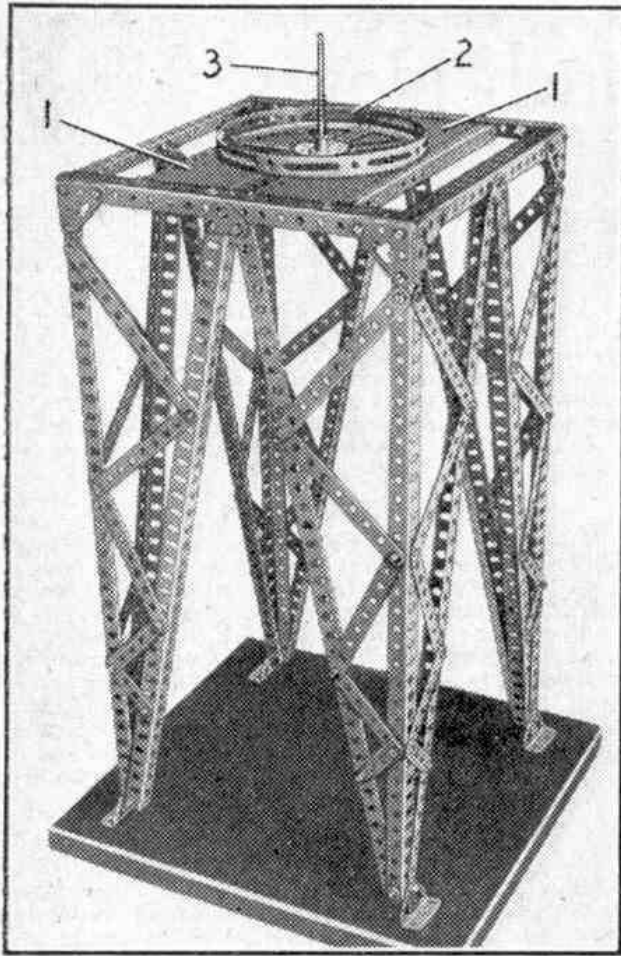


Fig. 3. Tower and lower race of the bearing for the swivelling superstructure.

the shafts. The Collars are loosely mounted, and the Bolts are prevented from unscrewing by nuts tightened against the Collars. A fixed Collar is locked on the shafts on each side of the loose Collar, so that by operating the levers the shafts can be slid in their bearings.

Each side of the jib consists of four  $12\frac{1}{2}$ " Strips arranged as shown in Fig. 1. The Strips are bolted to Flat Trunnions at their outer ends, and the sides are linked across by a series of  $2\frac{1}{2}$ "  $\times$   $\frac{1}{2}$ " Double Angle Strips. The jib is braced by Strips of various lengths, and it pivots about a Rod mounted in Corner Gussets bolted to Girders 5.

The Girders 13 are extended upward by  $4\frac{1}{2}$ " Angle Girders 17, braced to the cab sides by  $5\frac{1}{2}$ " Strips. A  $6\frac{1}{2}$ " Rod 18 fitted with a 1" loose Pulley and two 2" Pulleys, is mounted in the end holes of Girders 17. Two 1" loose Pulleys 19 are mounted between Collars on a Rod fixed in two Couplings. These Couplings are fitted with 5" Rods held in Rod Sockets that are screwed into a Coupling 20. The Coupling 20 is fixed on a Rod mounted across the jib.

The luffing Cord is tied to its drum and is taken over one of the 2" Pulleys and round one of the 1" loose Pulleys 19. It is then passed round (Continued on page 334)

Collar. A sliding shaft 9 is mounted on each side of the input shaft. Each sliding shaft carries a Collar 10, two Bush Wheels 11, and a 57-tooth Gear 12. The operating Cords wind between the Bush Wheels, and the Gears are arranged so that either can be moved into mesh with the Pinion 8 by operation of a control lever. Each shaft is braked when the Gears are out of mesh by a  $\frac{3}{8}$ " Bolt screwed into the Collar 10, engaging a similar Bolt held by a nut in the side of the gear-box.

The cab side uprights are formed by a  $7\frac{1}{2}$ " Girder 13 at the front and a  $5\frac{1}{2}$ " Girder 14 at the rear. The sides are plated, using Flexible Plates of various lengths arranged as shown and edged by Strips to form windows.

The control levers are  $2\frac{1}{2}$ " Strips 15 attached to Cranks pivoted on a Rod 16. Rod 16 is mounted in a  $2\frac{1}{2}$ "  $\times$  1" Double Angle Strip bolted to the side of the cab. The levers are linked to their respective shafts by  $\frac{3}{8}$ " Bolts screwed into Collars on

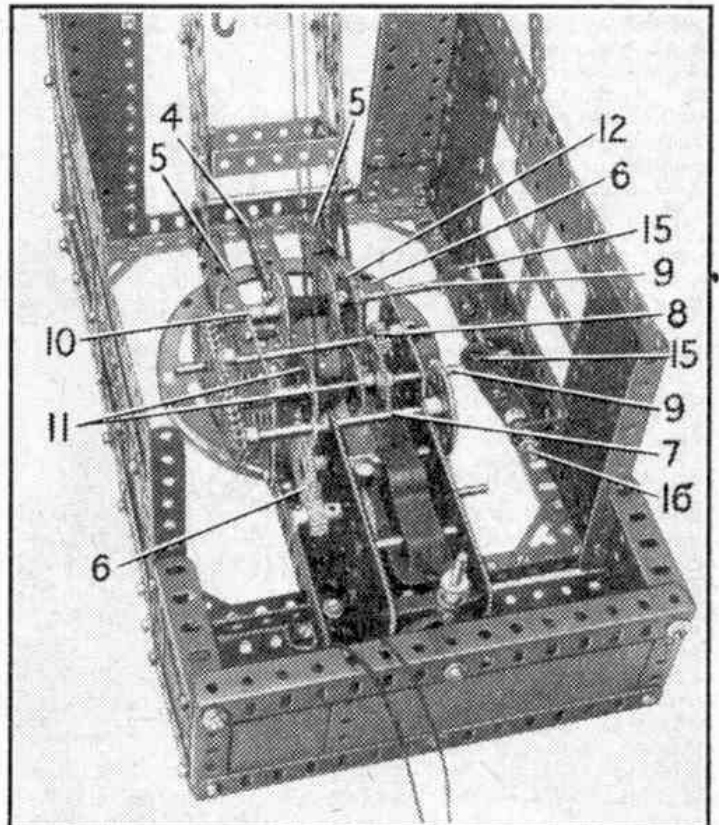


Fig. 4. The mechanism and Motor inside the driver's cab, the roof of which has been removed.

**Exploring the Menai Strait—***(Continued from page 297)*

part floats, with the remainder suspended below.

The fishermen now divide into two teams and start hauling in the net, with the hope that there is at least one salmon in it. This heavy work calls for great skill as well as much muscular effort. Although a salmon may be trapped in the net, he will jump out of his trap if his suspicion is aroused. If no fish happens to be present, then with a sigh the net is carefully repacked into the boat. One man again remains behind, with his rope attached to one end of the net, while the others go out on their circular course to spread their net for another attempt.

H.M.S. "Conway," moored in midstream just off Port Dinorwic, is a nautical training school for Merchant Navy Officers. This illustrious frigate, formerly the "Nile," saw service in many parts of the world before the Admiralty placed her at the disposal of the Council of the Mercantile Marine Service Association for use as a training ship. She reached the Mersey in 1876, and remained there until 1941, when two tugs and a destroyer brought her to the Menai Strait to seek refuge from the German bombs that were then falling on Merseyside. She was first anchored off Bangor, but on 12th April 1949 another move took place, this time the short but hazardous journey of three or four miles from Bangor to new moorings at Plas Newydd, off the Anglesey shore.

**Giant Overhead Travelling Crane—***(Continued from page 301)*

being sufficient to allow one of the main trolleys to be lifted between them. This was raised high enough to clear the main girders, which were then closed in to the required distance, so that the trolley could be lowered on to its track. The second trolley frame was assembled complete, without its mechanical gear. It was then lifted endways between the girders, righted and set down, after which the mechanical gear was assembled. Lastly the derrick used in these operations was dismantled.

The crane is of substantial construction throughout, and special care has been taken to allow access to all parts for inspection and lubrication. The trolleys and the motors and mechanism installed on them, can easily be reached from timber platforms on the top level of the girders of the crane, and platforms along the bottom level of one girder unit give access to the long travel gear. The driver is provided with a cabin slung under one end of the girders, a position that allows him an unobstructed view of crane loads in any position; and a steel rung ladder from his cabin leads to the compartment carrying the electric control equipment.

**The Battery Electric Vehicle—***(Continued from page 308)*

which then drives the vehicle in the first half-speed position. If extra speed is then required the batteries can be automatically connected in series simply by pressing a push button on the steering column. This doubles the voltage applied to the motor and increases the speed correspondingly. A starting resistance is still used to limit the initial current surge, but this is only in circuit momentarily while starting and does not needlessly waste energy. All the automatic control is carried out by a panel of six small electrically operated contactors, mounted in a cabinet in the cab.

Electric vehicles are moderately slow compared to the petrol type, their speed being of the order of 15 to 18 m.p.h., but many tests have shown that an electric truck can cover a normal delivery round, with say 200 stops, much more quickly than can a petrol van capable of travelling at twice the speed. This is due to the remarkable nippiness and very rapid acceleration of the electric, and of course the

lack of gear changes associated with the petrol vehicle. Again, in towns the latter is never able to reach maximum speed, traffic streams usually travelling at about 10 to 15 miles per hour.

The range of an electrically propelled vehicle varies according to the service conditions and the nature of the district, and is naturally reduced in hilly areas. In the best conditions the available range on each charge is from 25 miles up to a maximum of 35 or 40 miles. While this distance may sound rather limited, it is a remarkable fact that delivery rounds rarely exceed 30 miles or so and are therefore well within the capacity of the battery electric. A greater mileage can only be provided by fitting a larger battery, but this is uneconomic, as the increased weight of the battery drastically reduces the load that can be carried. For this reason an electric is not recommended for long-distance work, or as a private car, attractive as this may seem in view of the high cost of petrol and the long delivery on other types of private and commercial vehicles.

Apart from the trades mentioned above, there are other more specialised services for which the modern electric vehicle is ideally suited and is being increasingly used. These are the collection of household refuse and street sweepings, repair and maintenance of overhead lines and street lamps, and the work of all kinds that involves short runs and frequent stops within a limited radius.

**"Forewarned is Forearmed"—***(Continued from page 315)*

in our factories. Volunteers from the Corps served as aircraft spotters aboard Allied assault and supply ships during the D-Day landings in Normandy, so earning the right to wear the coveted "Seaborne" shoulder flash. Last, but by no means least in importance, the Corps earned the undying gratitude of every branch of the Royal Air Force by maintaining a constant vigil to nurse home our own crippled bombers and fighters, and other aircraft lost or in distress, a service which saved the lives of countless young airmen.

To-day the Royal Observer Corps is again in the forefront of our defence forces, for experience in war and peace has shown that radar has serious limitations, whereas no enemy could hope to elude the alert watchfulness of the 15,000 unpaid men and women in R.A.F. blue who form the present R.O.C. That certainty might help to prevent another war; it could also mean the difference between survival or defeat if war came.

**New Meccano Model—***(Continued from page 323)*

the other 2" and 1" loose Pulleys, and is tied finally to Rod 18. The hoisting Cord is passed over the 1" loose Pulley on Rod 18, and round a 1½" Pulley at the jib-head.

The roof is assembled from two 9½" and two 7½" Angle Girders, and is plated by two 9½" Strip Plates and two 5½" x 2½" Flexible Plates arranged to leave a gap for the operating Cords.

Parts required to build model Shipyard Crane: 8 of No. 1; 4 of No. 1a; 16 of No. 2; 22 of No. 2a; 15 of No. 3; 8 of No. 4; 11 of No. 5; 8 of No. 6; 12 of No. 7a; 14 of No. 8a; 8 of No. 8b; 2 of No. 9; 2 of No. 9a; 8 of No. 9d; 1 of No. 13a; 4 of No. 15; 1 of No. 15a; 1 of No. 15b; 3 of No. 16; 2 of No. 16a; 2 of No. 16b; 8 of No. 17; 1 of No. 18b; 2 of No. 20a; 8 of No. 20b; 1 of No. 21; 2 of No. 22a; 6 of No. 24; 3 of No. 26; 4 of No. 27a; 268 of No. 37; 14 of No. 37a; 51 of No. 38; 1 of No. 40; 1 of No. 46; 8 of No. 48; 13 of No. 48a; 1 of No. 57b; 37 of No. 59; 2 of No. 62; 3 of No. 63; 2 of No. 70; 2 of No. 72; 9 of No. 94; 1 of No. 95; 1 of No. 96a; 2 of No. 108; 1 of No. 109; 15 of No. 111c; 2 of No. 118; 4 of No. 125; 4 of No. 126; 4 of No. 126a; 12 of No. 133; 4 of No. 133a; 1 of No. 162; 1 of No. 166; 2 of No. 179; 12 of No. 189; 2 of No. 190; 4 of No. 191; 4 of No. 192; 4 of No. 196; 1 E20R Electric Motor.