

Easy Model-Building

Spanner's Special Section for Juniors

Swing Boat—Shipyard Crane

THE simple model Swing Boat shown in Fig. 1 can be built from parts in Outfit No. 1 and construction should begin by bolting a $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate to each of the longer flanges of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate. Then fix a $5\frac{1}{2}''$ Strip 1 to each side and connect their upper ends with a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. Now pass a Crank Handle 2 through the lower holes of the Strips 1 and the centre holes of the Flexible Plates, and fit a 1" Pulley to the plain end of the Crank Handle to hold it in place.

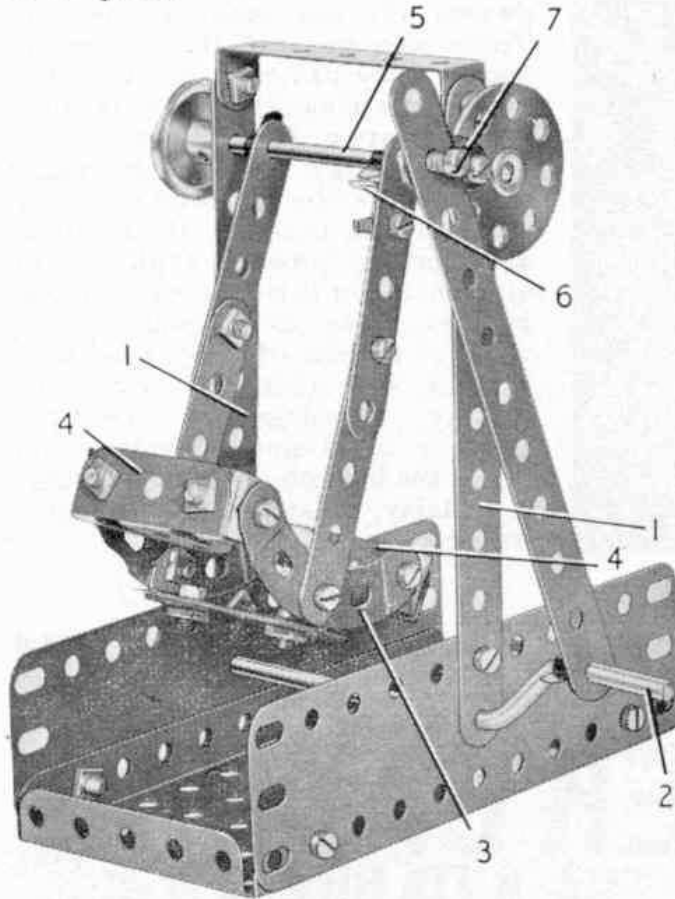


Fig. 1. This simple Swing Boat can be built from parts in Outfit No. 1.

Each of the arms supporting the Swing Boat is made from two $2\frac{1}{2}''$ Strips overlapped two holes. Bolt each arm to a $2\frac{1}{2}''$ Stepped Curved Strip 3, and connect the Curved Strips by Angle Brackets to Trunnions 4. The bottom of the Swing Boat is made

from two Flat Trunnions fixed to Angle Brackets attached to the Curved Strips by the same bolts that fix in place the arms.

Pass the upper ends of the arms over a $3\frac{1}{2}''$ Rod 5, and use Spring Clips to hold them in place. Now bolt an Angle Bracket 6 to one arm and press it against the lugs of one of the Spring Clips as shown. Fix a 1" Pulley and a Bush Wheel on the Rod and bolt a Fishplate 7 to the Bush Wheel. After this pivot a $5\frac{1}{2}''$ Strip on a $\frac{3}{8}''$ Bolt held in the Fishplate by two nuts, and pass the lower end of the Strip over the Crank Handle, using a Spring Clip and a Washer to prevent the Strip from sliding over the bend in the Crank Handle. The model is then complete.

A list of the parts required to build this model will be found on page 259.

Outfit No. 5 contains all the parts required to build the Shipyard Crane shown in Figs. 2 and 3. The main members of the Crane tower are four $12\frac{1}{2}''$ Angle Girders. These are connected at their upper ends by four $5\frac{1}{2}''$ Strips and four $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates. Four of the bolts used for this purpose support also Obtuse Angle Brackets, and to these are attached $5\frac{1}{2}''$ Strips 1. The lower ends of the Girders are connected by four $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates and two $5\frac{1}{2}''$ Strips, one of which is indicated at 2. A $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 3 is bolted between the Strips 2.

The Strips 1 are connected in pairs by $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips. Then $2\frac{1}{2}''$ Strips 4 are bolted to the lugs of the Double Angle Strips. A 3" Pulley 5 is fixed to Angle Brackets bolted to the Strips 4. Two bracing strips, each made from $2\frac{1}{2}''$ Strips, are attached to the Strips 1 as shown.

Each side of the boom or jib is formed by built up strips 6, 7 and 8. Strip 6 consists of a $5\frac{1}{2}''$ and two $12\frac{1}{2}''$ Strips. Strip 7 is made from two $12\frac{1}{2}''$ Strips and strip 8 is formed by a $5\frac{1}{2}''$ and a $2\frac{1}{2}''$ Strip. The outer ends of strips 6 and 7 are connected by a $1\frac{1}{2}''$ Strip, and a Flanged Sector Plate 9 is bolted in position. One half of a Hinged Flat Plate is bolted to the rear end of strip 6.

The sides of the boom are connected at the front by two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle

Strips, by two similar parts between the halves of the Hinged Flat Plate, and by a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate bolted between the Flanged Sector Plates. A 3" Pulley 10 is bolted to the lugs of Double Brackets attached to the $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate. A Rod fitted with a Road Wheel is passed through the Flanged Plate and the Pulley 10, and is fixed in the boss of the Pulley 5.

Two $12\frac{1}{2}''$ Strips 11 are bolted to a $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip fixed to the front of the boom, and they are connected by Double Brackets to the strips 6. The Strips 11 form rails for the travelling carriage, and stops are provided by Fishplates at the ends of the Strips. The carriage is formed by two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips connected by Fishplates, with 1" Pulleys fixed on 2" Rods. A 1" fixed Pulley 12 and a 1" loose Pulley 13 are placed on a $1\frac{1}{2}''$ Rod held in the carriage by a Spring Clip. A $3\frac{1}{2}''$ Rod held at the front end of the boom by Spring Clips, carries a $\frac{1}{2}''$ loose Pulley 14.

The carriage is traversed by turning a Bush Wheel fitted with a Threaded Pin. The Bush Wheel is fixed on a Rod 15 carrying a $\frac{1}{2}''$ Pinion that drives a 57-tooth Gear on a Rod 16. A length of Cord is tied to a Driving Band looped round the rear of the carriage, and is passed four or five times round Rod 16. The Cord is passed along the boom over the carriage, round Pulley 14 and then is tied to the front of the carriage, the Cord being pulled tight in order to stretch the Driving Band. Another length of Cord is tied to a Crank

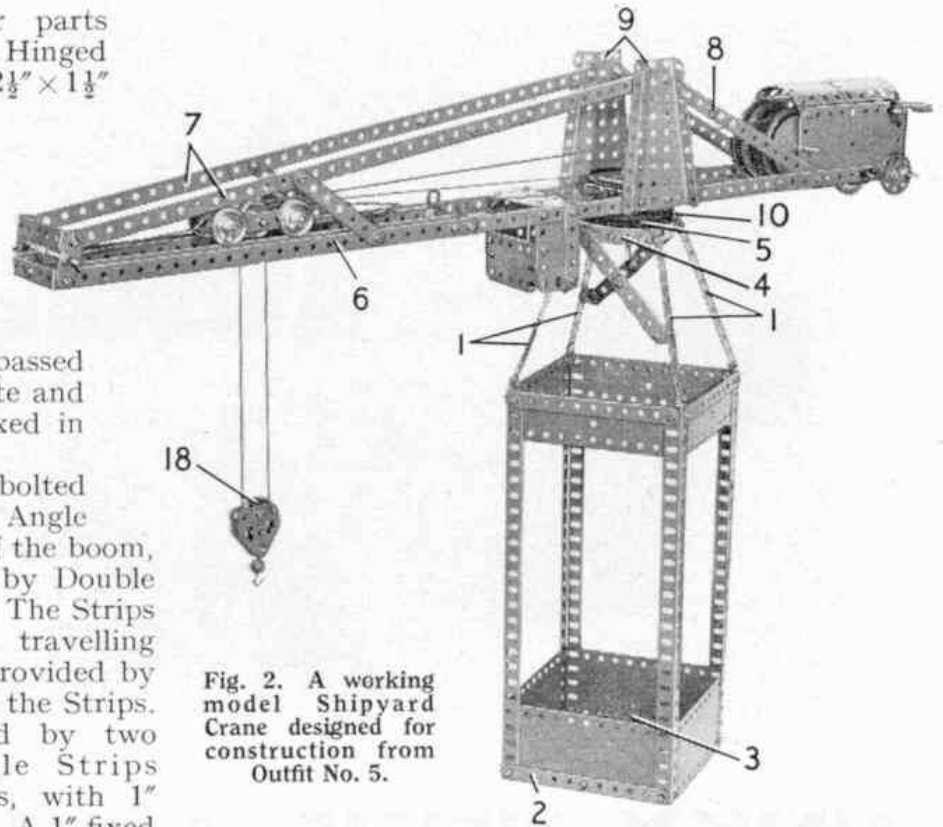


Fig. 2. A working model Shipyard Crane designed for construction from Outfit No. 5.

Handle 17, passed over Pulley 12, round a 1" loose Pulley 18, over Pulley 13, and then tied to the front of the boom. Pulley 18 is mounted on a $\frac{1}{2}''$ Bolt attached by nuts to two Flat Trunnions. A small Loaded Hook is similarly mounted on a second $\frac{1}{2}''$ Bolt.

The sides of the control cabin are $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates strengthened by $2\frac{1}{2}''$ Strips and bolted to the boom. The front and the floor are further $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates supported by Angle Brackets, and the back is a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate. The roof consists of two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Triangular Flexible Plates.

Three Road Wheels are fixed on a Rod mounted in the halves of the Hinged Flat Plate. A $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate, two Semi-Circular Plates and four Wheel Discs are bolted to the Double Angle Strips at the rear of the boom. The Road Wheels, Wheel Discs and Plates serve as ballast weights to balance the boom.

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Fig. 3. The Crane boom removed from the tower to show the carriage rails and details of the operating mechanism and cords.

