New Meccano Models

Beam Engine—Fret-Machine

CONSTRUCTION of the model Beam Engine shown in Figs. 1 and 2 is begun by building up two rectangles from 18½" and 7½" Angle Girders. For these the ends of two 18½" Girders are bridged by two 7½" Girders, the four being securely bolted together. When the two rectangles are built they are connected together by four 5½" Angle Girders 1 placed one at each corner as shown in Fig. 1. Two further 5½" Angle Girders 2, Fig. 2, serve as supports for a 5½" × 3½" Flat Plate that forms a base for the governor mechanism. The beams are carried on supports consisting of four 18½" Angle Girders, which are bolted two on each side of the base as shown, and at their upper ends are bolted to 4" Circular Plates. These Plates each carry a Bush Wheel in which the axle on which the beams pivot is journalled. The construction of the beams will be clear from Fig. 1 The Rod on which the beams pivot is passed through the centre holes of two 4½" Angle Girders, which form the centre vertical member of the beams. The 9½" Strips of the beams are bolted to the ends of these Girders.

The cylinders are Meccano Boilers, complete with Ends, which are secured to a 5½" × 3½" Flat Plate 3 bolted between the lower 18½" Angle Girders of the base.

The crankshaft webs are formed by four 2½" Triangular Plates 4 and 5, to each of which two Cranks are bolted as shown with their bosses facing in opposite directions. The crankshaft carries between the two cranks a Sprocket Wheel that takes the drive from an Electric Motor, which may be bolted in any convenient position inside the base of the model. On the left-hand end of the crankshaft there is another Sprocket, connected by Chain to a Sprocket on the shaft of the governor. The connecting rods 7 and 8 are coupled to the crank pins at their lower ends by means of Handrail Couplings, one of which is shown at 9; and connection to the beams is made by means of further Handrail Couplings at their upper ends. The Handrail Couplings pivot on 1" Rods held in place in the ends of the beams by Collars.

The opposite ends of the beams also carry 1" Rods on each of which pivot two pairs of 9½" Strips 10 and 11, Fig. 1, which form the links between the beams and the piston rods 12 and 13. Connection between the Strips and the Rods is made by means of large Fork Pieces.

The flywheel 14 consists of two Ring Frames, bolted back to back and fitted with spokes consisting of 4½" Strips. The hub of the wheel is a Face Plate.

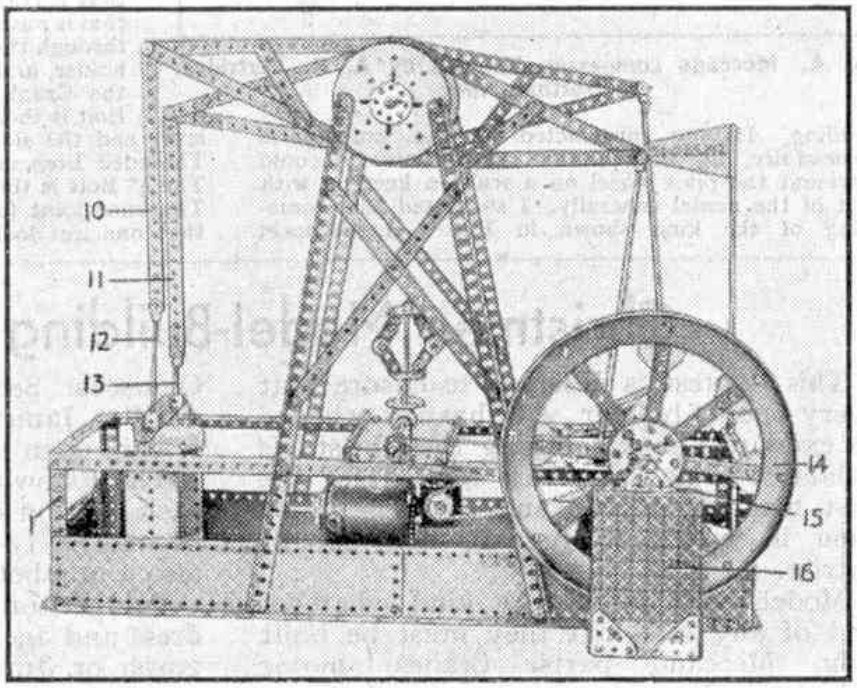

Fig. 1. A fine working model Twin Beam Engine.

The crankshaft is journalled in Trunnions fixed to the frame in the positions shown in Fig. 2, and at the flywheel end there is an outrigger bearing consisting of a further Trunnion bolted to a 3½" Angle Girder 15. This Girder is supported between the ends of two 5½" Angle Girders that in turn are attached at their lower ends to the 12½" Angle Girders of the base by means of two 3½" Angle Girders. The 5½" Girders are also joined at their lower ends by a second 3½" Angle Girder, and the rectangular frame so formed is filled in with a 5½" × 3½" Flat Plate 16.

The construction of the governor is

shown clearly in the illustrations. Its shaft is journalled in the Flat Plate and also in a Double Bent Strip 17 bolted to the Plate; and a 1½" diam. Contrate fixed to it is meshed with a 1" Gear carried on a Rod journalled in a 2½" × 1" Double Angle Strip bolted to the Plate.

Parts required to build model Beam Engine: 24 of No. 1a; 8 of No. 2a; 8 of No. 3; 4 of No. 6a; 8 of No. 7a; 16 of No. 9; 4 of No. 9a; 4 of No. 9b; 6 of No. 12; 3 of No. 13a; 1 of No. 14; 3 of No. 15; 1 of No. 15b; 1 of No. 16; 2 of No. 18a; 6 of No. 18b; 4 of No. 23; 4 of No. 24; 1 of No. 28; 1 of No. 31; 174 of No. 37; 10 of No. 37a; 3 of No. 45; 1 of No. 46; 3 of No. 52a; 21 of No. 59; 8 of No. 62; 2 of No. 95; 1 of No. 96; 1 of No. 109; 2 of No. 111; 2 of No. 116; 4 of No. 126; 8 of No. 126a; 4 of No. 133; 4 of No. 136a; 2 of No. 146a; 2 of No. 162; 2 of No. 167b; 2 of No. 190; 2 of No. 192; 4 of No. 197, 1 Electric Motor.

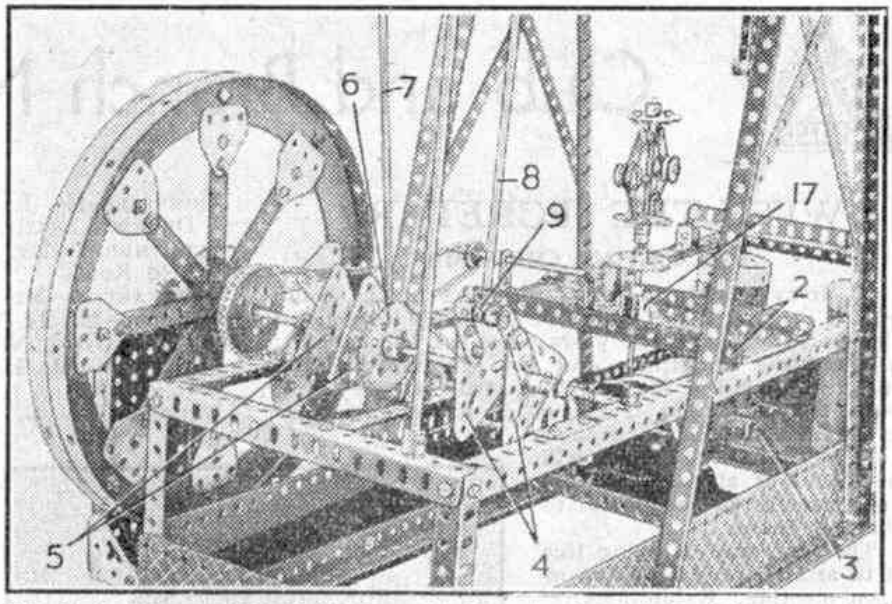

Fig. 2. A close-up view of the Beam Engine showing details of the crankshaft and governor.

The simple and attractive model of a fret-machine shown in Fig. 3 can be worked either by hand or by a *Magic* Motor.

The table of the machine is built from four 5½" Strips and a 4½" Flanged Sector Plate and braced by two 5½" Strips, as shown in the illustration. The reciprocating arm consists of two 5½" Strips, one above the table and the other underneath it, joined together by two 2½" Strips 1 bolted to the 5½" Strips in the manner illustrated.

The arm is pivoted on a lock-nutted bolt through the holes of two Reversed Angle Brackets, which are spaced from the 1½" × ½" Double Angle Strip 2 by two Washers, and also through the centre holes of the 2½" Strips 1.

The bracing of the table legs carries a 3½" Crank Handle. On this is a cam built by bolting two Flat Brackets spaced by a Washer on each side of a Bush Wheel, together with a Road Wheel and a 1" fixed Pulley. The positions of these will be clear from the illustration. A piece of wire is stretched from the end hole of the upper 5½" Strip to that of the 5½" Strip under the table, and passes through the appropriate hole in a 4½" Flanged Sector Plate. This represents the saw blade.

A quick return stroke is effected by doubling a small Driving Band 3 over the arm and looping it on to a Cranked Bent Strip 4, through which the 1½" Rod 5 is pushed. If desired, the *Magic* Motor can be bolted to the front leg of the fret-machine and the Driving Band fitted around the 1" Pulley. If a Motor is used, it is advisable to strengthen the front legs by connecting them together with a Double Angle Strip bolted near their lower ends.

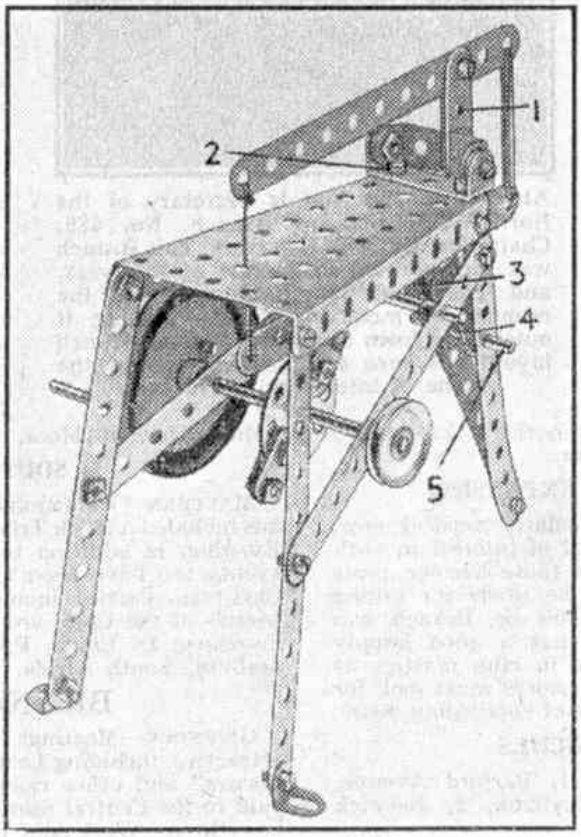

Fig. 3. A simple fret-machine that operates realistically.

Parts required to build Fret-machine: 8 of No. 2; 2 of No. 5; 4 of No. 10; 2 of No. 12; 1 of No. 17; 1 of No. 17a; 1 of No. 19s; 1 of No. 22; 1 of No. 24; 2 of No. 35; 21 of No. 37; 1 of No. 37a; 8 of No. 38; 1 of No. 44; 1 of No. 48; 1 of No. 54a; 1 of No. 111c; 2 of No. 125; 2 of No. 180; 1 of No. 187.