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Meccano Synchronous Electric Clock

THE Electric Clock shown in Fig. 1 is driven by a synchronous motor, and apart from the wire used for the motor field windings it is made entirely from Meccano parts. The clock operates from a Meccano 20-volt Transformer, and its accurate timekeeping and neat appearance make it an unusually interesting subject.

The framework for the clock mechanism is made by bolting two 7½″ Strips 1 across a 5½″×3½″ Flat Plate. Two further 7½″ Strips are connected to the Strips 1 by 1½″×½″ Double Angle Strips, and a 3½×1½″ Flat Plate 2 is bolted in position. Two 5½″ Strips 3 are connected to the 5½″×3½″ Flat Plate by 1½″×½″ Double Angle Strips, and the ends of the Strips are joined by 3½″ Strips. A 3½″×½″ Double Angle Strip 4 is bolted between 1½″ Angle Girders fixed to the 5½″×3½″ Flat Plate, and three 3½″ Strips 5 face-to-face are bolted across the Strips 3. Two 1½″ Flat Girders 6 are attached to 1½″×½″ Double Angle Strips fixed between the Strips 3 and the 5½″×3½″ Flat Plate. Two 3½″ Strips 7 face-to-face are bolted across the Strips 3.

The rotor consists of two Bush Wheels, each fitted with eight Rod and Strip Connectors arranged radially. It is very important to space the Rod and Strip Connectors accurately, so that the angles between them are exactly the same in each case. The Bush Wheels are fastened on a 2½″ Rod 8, which is supported in the 5½″×3½″ Flat Plate and the Flat Plate 2. The bearings for the Rod are strengthened by two 1½″ Strips bolted to each of the Flat Plates. The inner Bush Wheel is placed with its boss facing the 5½″×3½″ Flat Plate, and it is spaced from it by three Washers. The second Bush Wheel is then fixed so that its Rod and Strip Connectors just touch and are exactly parallel to those of the first Bush Wheel.

The reduction gearing to the minute hand has a ratio of 45000:1 and is arranged as follows. A ½″ Pinion is fixed to the inner end of the Rod 8, and it meshes with a 57-tooth Gear on a 2″ Rod that carries a ½″ Pinion 9. This meshes with a 57-tooth Gear on a 4″ Rod 10, which is fitted also with a Worm 11. Two 3½″ Strips bolted across the 5½″×3½″ Flat Plate strengthen the bearings for the 2″ Rod and Rod 10. The Worm engages a 50-tooth Gear on a 4″ Rod 12 supported in the Flat Girders 6. The slotted holes of the Flat Girders are used to adjust the mesh of the Worm and the 50-tooth Gear.

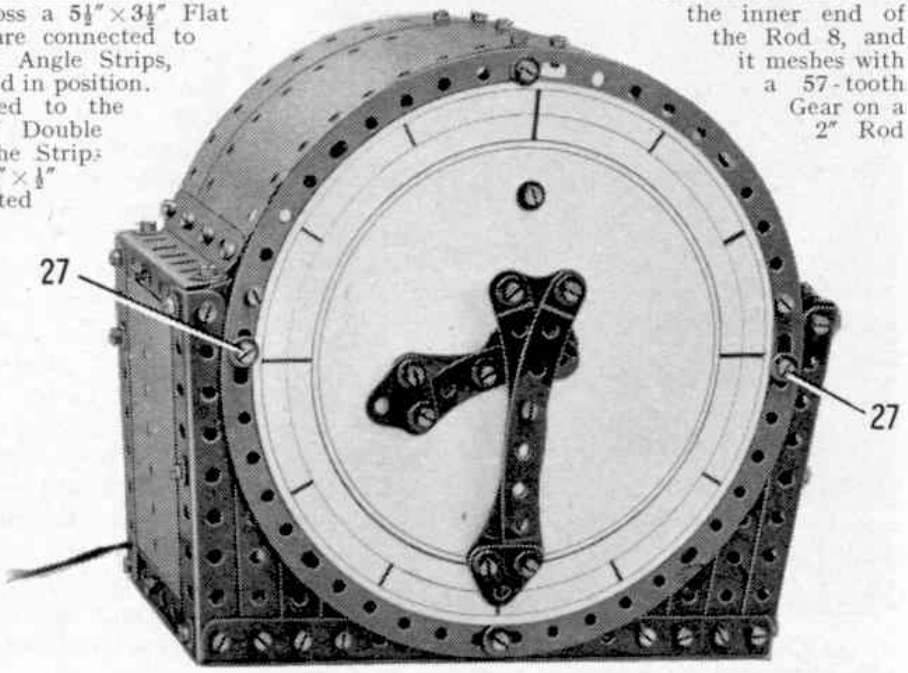

Fig. 1. This fine Electric Clock is operated by an easy-to-make synchronous motor, and is a good subject for the more experienced model-builder.

Rod 12 carries a Worm 13, and this drives a 50-tooth Gear 14 on a 1½″ Rod mounted in the 5½″×3½″ Flat Plate and in the Strips 5. A ¾″ Pinion is fixed on the 1½″ Rod, and this engages a 50-tooth Gear 15 that is loosely mounted on a 2″ Rod supported in a 1½″ Flat Girder 16, the Double Angle Strip 4 and the 5½″×3½″ Flat Plate. A 1″ Pulley fitted with a Rubber Ring is pressed against the Gear 15 to provide a light friction drive. This allows the hands to be turned without affecting the drive from the motor. A 1″ Gear 17 is fixed on the same Rod as the Gear 15, between the Double Angle Strip 4 and the Flat Plate. The Gear 17 drives a similar Gear on a 4½″ Rod 18, which carries the minute hand.

The drive to the hour hand is taken from a ¾″ Pinion 19, fixed on the same Rod as the Gear 15. Pinion 19 drives a 50-tooth Gear on a 2″ Rod supported in the 5½″×3½″ Flat Plate and in the Strips 7. The Rod carries also a ¾″ Pinion 20, which is meshed with a 50-tooth Gear 21 on a 2″ Rod. A ½″ Pinion on the same Rod engages a 57-tooth

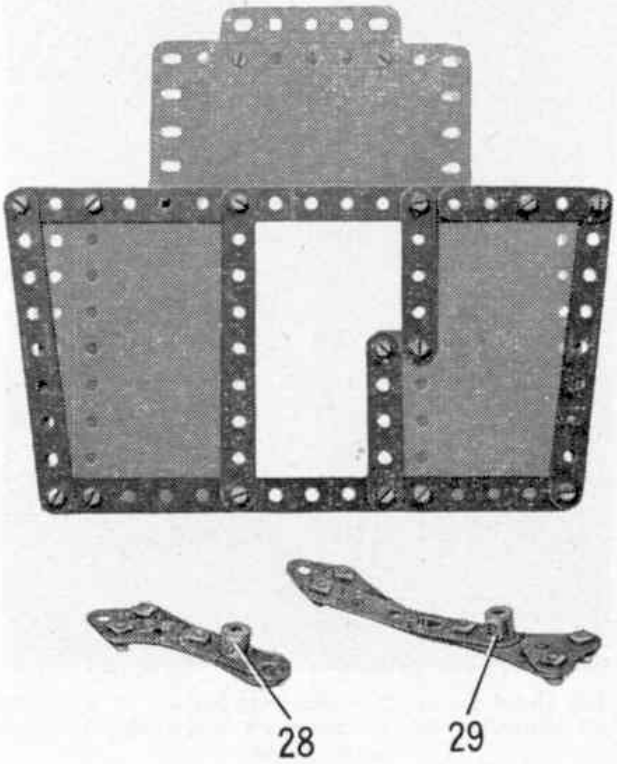

Fig. 2. The removable back of the clock case and the hands are shown clearly in this view.