(367) Automatic Overload Release (K. Anderson, Birkenhead)

In actual practice most cranes are fitted with a mechanism that makes it impossible to lift a load greater than that for which the crane was designed. These overload mechanisms vary considerably in design and application, and a model of one type, shown in Fig. 367, was recently submitted by K. Anderson (Birkenhead). This model is simple to construct, and is suitable for fitting into any fixed radius jib crane and gantry crane. It is not suitable for cranes capable of operating at varying radii, because no compensation to equalise load and radius is incorporated. The framework consists of three 3½″×2½″ Flanged Plates bolted together in the manner shown in the illustration. The two Plates that are arranged vertically are bridged at their upper ends by two 2½″ Strips.

The driving shaft 1 carries a 1″ Sprocket Wheel and a ½″ Pinion 2, this last part meshing with a 57-teeth Gear wheel 3 that is free on the Rod 4. This Gear is spaced away from the framework by a Collar, minus grub-screw. On the outer end of the Rod 4 is mounted a 1″ loose Pulley with Dunlop Tyre, and also a Bush Wheel 3. The Bush Wheel is gripped on the Rod and is held against the Dunlop Tyre by half a Compression Spring 6. A spring loaded clutch is formed in this way between the 57-teeth Gear 3 and Bush Wheel 5.

A Worm 7, on the end of the Rod 4, meshes with a ½″ Pinion on a Rod 8, and this carries a 1″ Sprocket Wheel that is connected to the winding barrel of the crane. When the Sprocket on the Rod 1 is rotated in an anti-clockwise direction, when looked at from the mechanism side, the driven shaft 8 is turned in a similar direction. If a load is placed on the shaft 8, the worm 7 tends to screw itself round its ½″ Pinion, and this slides the Rod 4, thus disengaging the clutch. The clutch may be held in its disengaged position by the Pawl 9.

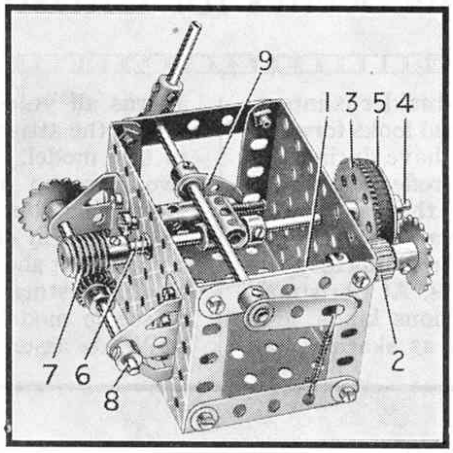

Fig. 367

(368) Simple Constantinesco Gear (A. W. Marshall, Kings Lynn)

On two previous occasions Meccano models of the Constantinesco Torque Converter have been described in the *"M.M.,"* but both of these were fairly complicated and made use of a considerable number of Meccano parts. They were therefore beyond the scope of many model-building enthusiasts. Mr. Marshall (Kings Lynn) has now designed a successful clockwork operated gear of this type, and as will be seen from Fig. 368 it is extremely compact.

A No. 2 Clockwork Motor is attached by a 3½″ Angle Girder to a 3½″×2½″ Flanged Plate that forms the base. The driving spindle of the Motor carries a Coupling that is mounted in position by passing the spindle through a centre plain hole. This part forms a crank, and in one of its end tapped holes is screwed a ⅜″ Bolt. This Bolt is locked in position by a Nut, and carries on its shank three Washers for spacing purposes and also a 1″ Triangular Plate 1. One hole of the Triangular Plate accommodates a 7/32″ Bolt, the shank of which is screwed into one of the threaded holes of the Collar 2.

The Rod 3 on which the Collar 2 is secured is gripped at its upper end in the longitudinal bore of a Coupling 4, that is pivotally mounted on a 1″ transverse rod. Two 1½″ Strips 5 are mounted on this Rod, together with the ends of two 2½″ large radius Curved Strips 6 and 7. These four Strips are secured in position by means of two Collars as shown in the photograph. The lower end of the Rod 3 has mounted on it a Bush Wheel 8 that forms a support for two Worms that are held in position by means of ⅜″ Bolts.

The upper holes of the 1½″ Strips 5 carry a 1½″ Rod, and on this Rod, between the 1½″ Strips, are mounted eight Washers. Two Collars are next added, and one end of the 1½″ Rod is gripped in the boss of a Crank 9. This Crank is bolted to a Flat Trunnion that in turn is bolted to one of the side plates of the Motor. Each end of the Strips 6 and 7 is lock-nutted to a Crank. The two Cranks are indicated at 10 and 11, and both bosses of these parts point inward towards the Motor. They are arranged on opposite sides of a 1″ Gear that is free to turn on the driven Rod 12.

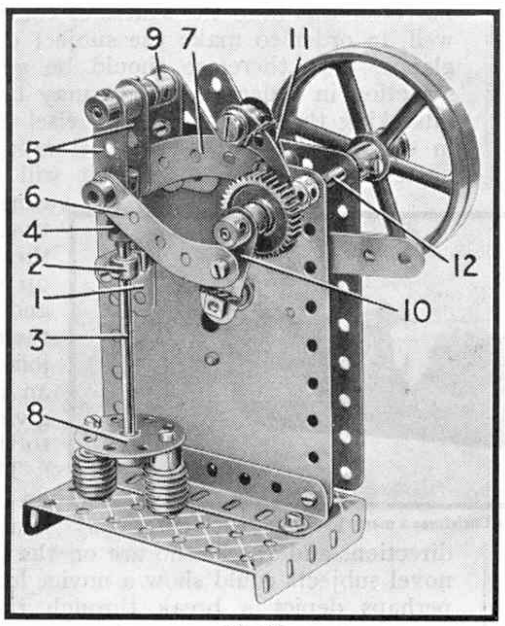

Fig. 368

(369) Off-Set Pawls

(A. Smiler, Leicester)

One of the difficulties associated with ratchet-operated mechanisms in Meccano models is that of obtaining a very small rotary movement for an equally small reciprocating movement of the driving mechanism. This can be overcome to a great extent by making use of large diameter Gears, having a great number of teeth, but unfortunately the necessary space is not always available. This problem has been solved successfully by A. Smiler (Leicester) who has conceived the idea of using two or more off-set Pawls. A simple two-pawl arrangement is shown in Fig. 369 and no doubt many Meccano model-builders will find use for the idea.

A Ratchet Wheel is mounted, together with two 2″ Strips, on the driving shaft, and the unoccupied ends of the Strips are joined together by a 1″ Threaded Rod. This Rod has locked on it two Flat Brackets, each of which forms a connecting point for a Pawl, without boss. This Pawl is mounted on a lock-nutted bolt, and is held in contact with the Ratchet Wheel by means of a short length of Spring Cord. One end of the Spring Cord passes through the unoccupied hole of the Pawl, and the other end is fastened round the 1″ Threaded Rod already mentioned. By sliding the lock-nutted bolts carrying the Pawls in the slotted holes of the Flat Brackets the tips of the Pawls can be off-set for half the distance between two teeth of the Ratchet Wheel.

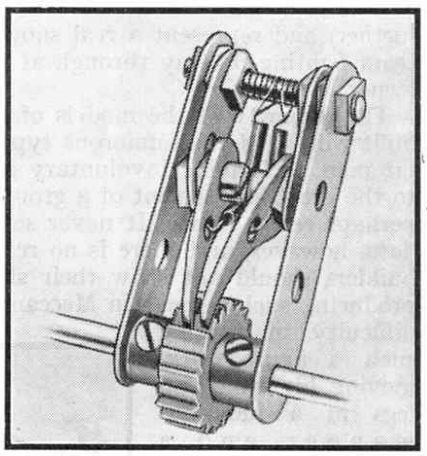

Fig. 369

(Continued from previous column)

of each Crank is fitted with a Pivot Bolt, lock-nutted in position and carrying on its shank a Pawl. This Pawl is held in contact with the 1″ Gear already mentioned by means of a light spring or short length of elastic.

Miscellaneous Suggestions

Under this heading "Spanner" replies to readers who submit interesting suggestions regarding new Meccano models or movements that he is unable to deal with more fully elsewhere. On occasion he offers comments and technical criticisms that, he trusts, will be accepted in the same spirit of mutual help in which they are advanced.

M.192. M. Howes, Stockport, has discovered that a 2″ Tyre mounted on a 2″ Pulley, forms an admirable gear wheel when used in conjunction with a ½″ Pinion. The treads of the Tyre are the exact pitch of Meccano Gears and form good teeth for light drives.