(291)—Electric Roulette Wheel (D. Currie, Manchester)

An interesting variation of the usual form of Roulette Wheel is shown in Fig. 291. In this model eight electric bulbs are provided, each one being allotted a certain score value; and as the wheel is spun round the bulbs light up in turn. The winning number is indicated by the bulb remaining lit after the wheel has come to rest.

The external features of the model can be seen clearly from Fig. 291. Each side of the frame is made by bolting two $12\frac{1}{2}''$ Angle Girders along the edges of a $12\frac{1}{2}''$ Braced Girder, and the ends are joined together by $5\frac{1}{2}''$ Braced Girders and Angle Girders. The top is filled in by means of four $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates and $5\frac{1}{2}''$ Strips, but the Plate 4 is insulated from the Angle Girders and adjacent Plates by means of Insulating Bushes and Washers on 6 B.A. Bolts. One of these Bolts is inserted with the shank upward and carries a nut that is in metallic contact with the Plate, and also the Terminal 2. Eight Lamp Holders are placed in the positions shown and held down by 6 B.A. Bolts, each of which is insulated from the Plate by an Insulating Bush placed on the underside.

The wheel consists of two 6″ diameter Circular Plates bolted to a Bush Wheel, two being used to give better running. The Rod, carrying the Bush Wheel carries also the Coupling 1, by means of which the Plates are spun, and is journalled in one of the Flat Plates and a $5\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. Fig. 291a shows the Double Angle Strip, complete with the Rod, removed from the frame. It will be seen that a Bush Wheel is fixed in the centre, but is insulated from the Strip by Insulating Washers, an extra one being provided on each bolt for spacing purposes. The remaining holes in the Bush Wheel are also provided with insulated 6 B.A. Bolts. A Double Arm Crank fixed on the Rod 7 is fitted with a Pendulum Connection 5 bent as shown to make contact with the heads of the 6 B.A. Bolts 6. Each of the Bolts is connected to one of the Lamps.

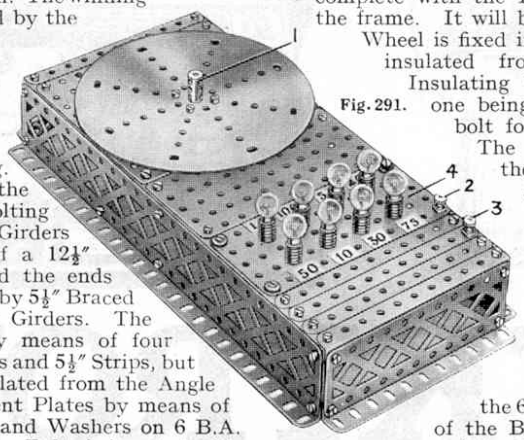

Fig. 291.

To connect up the model, one wire from the Accumulator goes to the Terminal 2, which makes contact with the Plate 4 only; and the other wire is fitted to the Terminal 3, which is in direct contact with the frame. The Rod 7, collects the current that passes along the Pendulum Connection 5 to one of the Bolts 6, and thence to one of the lamps.

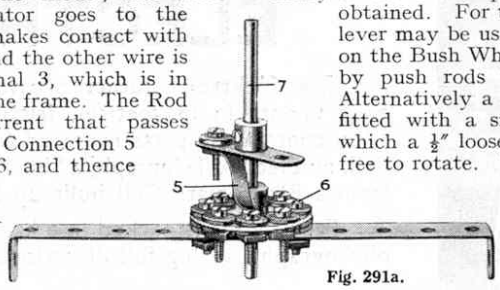

Fig. 291a.

(292)—Compact Reduction Gear

(A. Marrs, Dagenham, Essex)

Gear-boxes always provide plenty of scope for the designer, and the possibilities of Meccano parts in this connection are almost without limit. Reduction gearing plays a very important part in almost all power-driven models, especially those driven by the Meccano Electric Motors. These should always be allowed to "rev" at a fairly high speed, so that in all slow-moving models, and models requiring a powerful drive, reduction gearing is essential. An excellent example of the results achieved by the use of a large gear reduction ratio is to be found in the super model Traction Engine. In low gear this model has a total reduction ratio of 567 : 1 between the Motor and road wheels, and will haul with ease any boy of average weight.

In a previous issue of the "*M.M.*" we gave details of a remarkable gear-box giving a ratio of approximately $2\frac{1}{2}$ million to 1 between driving and driven shafts, and housed in a frame measuring only $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times 1\frac{1}{2}''$. The results were obtained by an ingenious arrangement of worm gearing. This device is scarcely of any practical use in Meccano model-building, however, although it serves to illustrate the possibilities of worm gearing. A very compact gear-box is shown in Fig. 292, and this will be found of utility in many instances where a fairly large reduction ratio is required. A ratio of 243 : 1 is provided between the driving shaft 1 and driven shaft 2, yet spur gearing is used throughout and only two shafts are necessary.

The Rod 1 carries a fixed Pinion 3 that engages a 57 teeth Gear loose on the Rod 2. The Gear is provided with two Bolts, the shanks of which are arranged on each side of the $\frac{3}{8}''$ Bolt 4. This Bolt is inserted in the boss of a $\frac{1}{2}''$ Pinion, but a nut prevents it gripping the Rod. In this way the Gear and Pinion rotate freely on the Rod as one unit. The Pinion engages a second 57 teeth Gear coupled in a similar manner to another $\frac{1}{2}''$ Pinion. The final gear 5 is fixed on its Rod, and a glance at the illustration will show that the drive can be taken from either end of the Rod 2. In like manner the Rod 1 may be driven from whichever end is most convenient in the model.

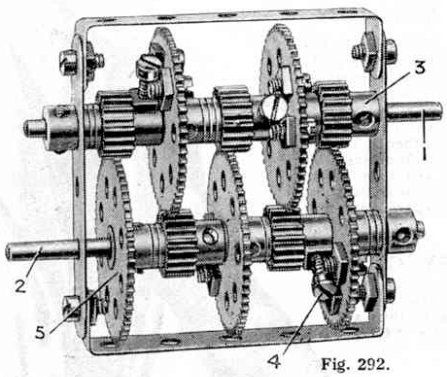

Fig. 292.

The framework of the gear-box, which is only of a simple form, may readily be replaced by the frame of almost any Meccano model such as a Traction Engine or Crane.

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.163.) A Useful Cam.—P. W. Bradley (Kingsbury, N.W.9) suggests a method of making a cam that should be of use in a variety of different models requiring a reciprocating movement. As most readers are aware, a cam is utilised for converting rotary motion into a to-and-fro motion, the movement of the tappet being dependent on the shape of the cam. The type suggested by Bradley is used where a quick up-and-down movement of the tappet is required, with a slight dwell at the top of its stroke, and a longer period of dwell between each stroke. The valves of an internal combustion engine are operated in this manner.

The cam is made by bolting a 1″ Corner Bracket to a Bush Wheel, so that it forms a projection on one side of the Wheel. As the Bush Wheel rotates this "bulge" raises the tappet once for every revolution, but by adding more Corner Brackets as many as four strokes per revolution can be obtained. For the tappet a pivoted lever may be used and made to rest on the Bush Wheel, being connected by push rods to the mechanism. Alternatively a sliding Rod may be fitted with a small Fork Piece in which a $\frac{1}{2}''$ loose Pulley or Collar is free to rotate. The Pulley bears on the rim of the Bush Wheel, and the Rod is made to slide in its bearings each time the Wheel mounts the Corner Bracket.

(M.164.) Illuminating Miniature Searchlights, Headlamps, etc.—The small pea lamps used in the Motor Car Lighting Set can be put to a number of useful purposes in Meccano models. L. Watson (Oxford) points out that one of these lamps can be inserted in the hole of a Chimney Adapter to form a very neat searchlight suitable for use in warships, etc. The lamp is held in place by a 6 B.A. fibre Washer at the back, and the complete searchlight is mounted in a Small Fork Piece. Headlamps and side-lamps can be made from large and small Flanged Wheels, the pea lamps being lightly gripped by grub screws in the Wheel bosses. The Wheels can be mounted on Screwed Rods, also inserted in the bosses.

(M.165.) Rack Quadrant for Hand Lever.—For brake levers and gear-change levers, etc., that require to be locked in different positions, the following device suggested by H. Chapman (Egham, Surrey) will be found useful. The lever consists of a pivoted Strip fitted with a sliding Eye Piece, the boss of which carries an Axle Rod sliding parallel to the Strip. The upper end of the Rod is free to slide in a Collar, and its lower end carries a Coupling to which a $\frac{1}{2}''$ Pinion is rigidly fixed. A Compression Spring normally holds the Pinion in engagement with a Rack Segment fixed to the frame, but when the Axle Rod is depressed the Pinion is released and the lever can be moved.

A neater method would be to substitute a Screwed Rod for the Axle Rod, thus dispensing with the Coupling.