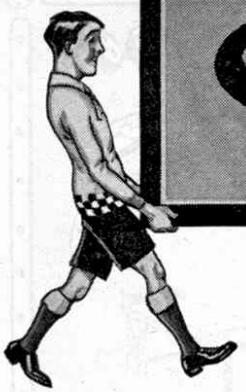

Suggestions Section

Edited by "Spanner"

The ideas printed in the "Suggestions Section" should prove a real help to thousands of Meccano enthusiasts. Often we receive letters from readers who describe how they have solved some knotty problem or evolved an interesting model after studying some of the ideas that have appeared. We shall always be pleased to receive further contributions for the "Suggestions Section." Cash payments are made for all Suggestions published (excluding those mentioned in the "Miscellaneous" Suggestions column). Contributions should be accompanied by clear photographs or drawings and should be addressed to "Spanner," c/o The "Meccano Magazine."

(192)—Automatic Infinitely Variable Speed Gear

(*J. Bennett, Buckhurst Hill, Essex*)

TO effect a change of speed in the usual type of gear box it is necessary to slide certain gears into or out of mesh by means of a lever, thus changing the ratio between certain shafts. This method has many disadvantages, apart from its complexity and the skill necessary for its operation, and many ingenious devices have been invented from time to time in an effort to replace it. Particular attention has been paid to motor car gear boxes, and there are now several mechanisms in existence that enable changes of speed to be carried out automatically or semi-automatically.

Several such mechanisms have been described from time to time in the Suggestions Section, and the apparatus shown in Fig. 192 is a further example. It embodies what is known as "friction disc" drive transmission. This type of transmission gear was clearly demonstrated in a model that appeared in the "Suggestions Section" for July, 1926, but for the benefit of those readers who are unable to refer to that number we may explain that it depends for its operation upon the friction existing between two discs, one revolving upon, and at right angles to, the other.

By sliding the driven disc towards or away from the centre of rotation of the other, the speed is decreased or increased. For example, when the driven disc is pressing upon the other at a point near the latter's circumference, i.e., at the farthest permissible point from the driving shaft, the driven disc will rotate at maximum speed. If now the latter is advanced towards the centre of the driving disc, its speed must automatically decrease. In the earlier model, a reverse movement was provided, merely by moving the driven disc from one side of the driving disc to the other. Also the change in speed was effected by operation of a hand lever, whereas in the present example the change is brought about by a centrifugal governor, so that the speed ratio varies automatically according to the resistance that is to be overcome.

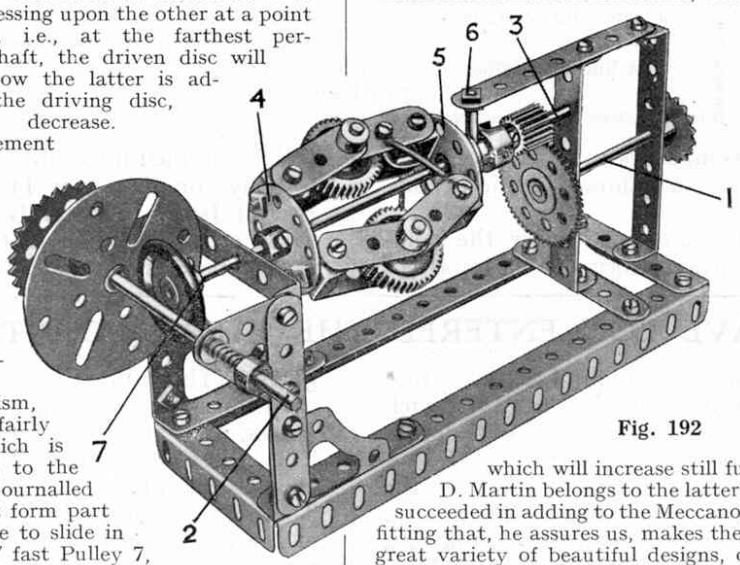

Fig. 192

The construction of the mechanism, as shown in Fig. 192, should be fairly clear. The driving shaft 2, which is connected by any suitable means to the Motor, carries a Face Plate, and is journalled freely in two Corner Brackets that form part of the frame. A 6½" Rod 3 is free to slide in its bearings and is fitted with a 1" fast Pulley 7, which is fitted with a 1" Rubber Ring that engages with the surface of the Face Plate and is kept in close contact therewith by a Compression Spring on the Rod 2.

The centrifugal governor consists of two Bush Wheels 4 and 5, to each of which two Double Brackets are bolted rigidly. The links carrying the governor weights are attached pivotally to the Double Brackets by means of lock-nutted bolts (see Standard Mechanism No. 262), and are passed on to 1½" Rods, on which are mounted the 1" Gears forming the governor weights. Short lengths of Spring Cord, attached to the links in the position indicated in the illustration, tend to prevent the governor functioning at too low a speed and also to return it to normal after operation.

The Bush Wheel 4 is secured to the Rod 3, but the Bush Wheel 5 is free thereon and is connected by a Socket Coupling to a ½" diam. ½" wide Pinion. A Threaded Pin 6, by engaging the groove of the Socket Coupling, prevents longitudinal movement of the Bush Wheel 5. The Pinion is in constant mesh with a 57-teeth Gear Wheel that is secured rigidly to the driven shaft 1.

The model functions in the following way: Assuming the shaft 1 to be running free without any retarding effect, the governor weights will fly out to their fullest extent owing to the centrifugal force that is developed by the speed of the rotating shaft 3. Since the Bush Wheel 5 cannot move longitudinally, wheel 4 must do so, carrying with it the Rod 3. This will result in the Pulley 7 being kept near the periphery of the Face Plate, and a step-up ratio is obtained.

When a retarding force is applied to the shaft 1, the speed of the Rod 3 diminishes and the governor weights fall inward, thus moving the Rod 3 and pushing the 1" Pulley 7 nearer the centre of the Face Plate. As the resistance on the shaft 1 increases so will the Pulley move nearer the centre of the Face Plate, thus compensating for the extra load by increasing automatically the reduction ratio between the shafts 2 and 3.

(193)—Improving the Meccanograph

(*D. Martin, Peterborough*)

If votes were taken amongst "*M.M.*" readers as to the most popular model in the Meccano series, we feel sure that the Meccanograph (Special Instruction Leaflet No. 13) would very nearly, if not quite, head the list. The reason for the popularity of this remarkable model lies, of course, in its ability to produce hundreds of intricate and beautiful designs merely on operation of a handle. In addition, it has a special appeal for the Meccano boy with an artistic temperament, for he may make the designs still more beautiful by the judicious use of coloured inks and water-colour paints. On the other hand, the mechanically-minded boy finds unlimited scope in the model for the use of various "gadgets" that he can construct and which will increase still further the range of designs.

D. Martin belongs to the latter category, evidently, for he has succeeded in adding to the Meccanograph an extremely interesting fitting that, he assures us, makes the model capable of producing a great variety of beautiful designs, over and above those already obtainable with the machine.

Instead of being attached pivotally by a Rod to the sliding carriage, the writing arm, to which the pencil is fastened, is mounted on a Threaded Pin that is secured to a Face Plate. The Face Plate is mounted on a Rod journalled in suitable bearings in the sliding carriage, and carries at its lower extremity a ½" Pinion, which is in mesh with a fixed Rack Strip. Hence it will be obvious, that, on motion being imparted to the sliding carriage, the Face Plate, together with the writing arm, is given a rotary motion and by this means a new series of designs is produced.

A point that may escape the attention of some Meccano boys is the importance of eliminating "play" or "back lash" in the moving parts of the Meccanograph. Particularly is this the case with the Designing Table, but here the undesirable effect may be eliminated by securing a large Pulley to the vertical Rod that carries the Table, and controlling the Pulley by a screw-operated band brake similar to Standard Mechanism No. 105.