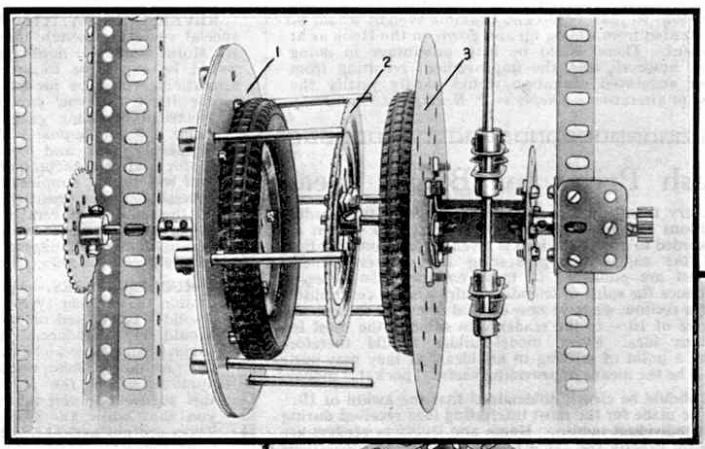
Suggestions Section

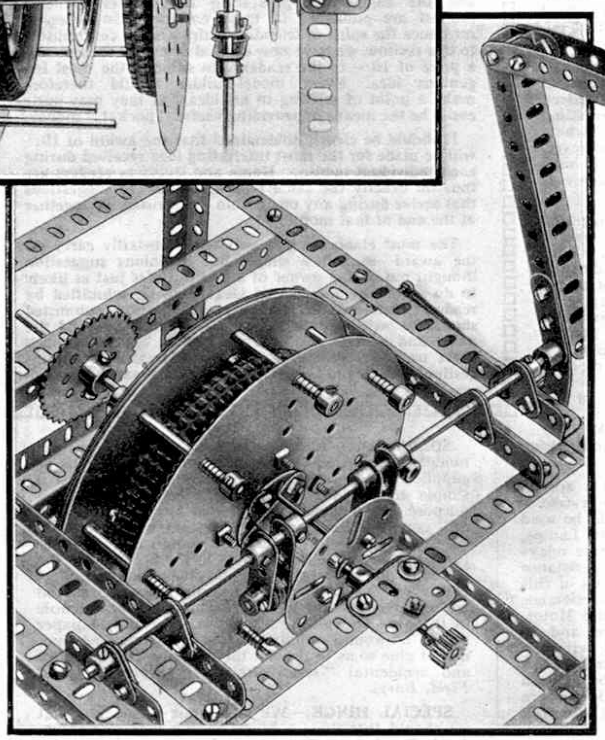
Edited by "Spanner"

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."

(211)—Demonstration Model of Single Plate Clutch

From a very early stage in the history of the motor car, clutches of various types have been standard fittings to all models. It was found at the outset by the pioneers of motoring that a gearbox was necessary in order to obtain increased speed and efficiency from the engines then in use; and, to facilitate a change from one gear ratio to another, some means had to be provided for disengaging the motive power for a short time while the operation was effected. This was accomplished by means of a clutch. Like every other part of a motor car, the clutch has undergone improvement and the leather-faced clutches formerly used have been replaced by more efficient devices in which metal plates are employed. Modern clutches may have one or more plates that are pressed forcibly into contact with each other in order to transmit the movement of the engine, but the present model is one of a typical single-plate clutch that is very interesting to build and operate, and is specially useful for demonstration purposes.





(Top) Fig. 211. Single Plate Clutch dismantled. (Bottom) Fig. 211a. General view of Clutch.

A suitable framework should first be built on which to mount the clutch unit, and its construction should be easy to follow from Fig. 211a. The unit itself embodies several important parts, the main ones being the flywheel 1, the floating plate 2, and the withdrawal plate 3. These are shown, in Fig. 211, separated from each other in order to make matters clearer. The flywheel is built up from five 6″ diam. Circular Plates, with a Bush Wheel as a boss; and to the flywheel is bolted a 3″ Pulley Wheel with Dunlop Tyre that represents the " Ferodo " disc of the actual clutch. The flywheel is secured rigidly to the crankshaft, which is a Meccano Rod driven by an Electric Motor through a Sprocket Chain drive. It should be noted that the 3″ Pulley must be bolted very tightly to the flywheel in order to provide a space in which the floating plate 2 can move freely when necessary.

The floating plate consists of the geared portion of a Ball Race (part No. 168b) attached to a Bush Wheel with ⅜″ Bolts in such a manner that it is able to slide longitudinally for a short distance. The Bush Wheel is secured to the secondary or driven shaft, the tip of which runs freely in the boss of the 3″ Pulley Wheel that is bolted to the flywheel.

The withdrawal plate consists of a 6″ diam. Circular Plate to the centre of which a Face Plate is attached by means of 1½″ Double Angle Strips, so that both rotate freely upon the Rod as a single unit. A second 3″ Pulley Wheel with Dunlop Tyre, which is bolted on to the plate, forms a second " Ferodo " disc.

The flywheel and the withdrawal plate revolve as one. They are connected as shown by 2″ Axle Rods fixed to the former by means of Cranks and passed through corresponding holes of the withdrawal plate, Compression Springs on the rods serving to keep the plate normally hard up against the driving member of the clutch. The Springs are retained in place by Collars.

The withdrawal mechanism should now receive attention. An efficient clutch pedal is made from 5½″ Angle Girders and Curved Strips, together with two 2½″ Flat Girders, as shown in the illustration. The pedal is fixed rigidly to an 11½″ Axle Rod, which is journalled in four bearings formed by as many pairs of 1″ Triangular Plates. The withdrawal forks are secured very rigidly by double grub-screws to the same Rod, and each consists of a pair of Cranks fitted with a roller in the shape of a ½″ loose Pulley. The Pulleys are mounted on Threaded Pins secured to the Cranks, and they are spaced centrally by Washers. When the pedal is depressed, the forks press against the edge of the Face Plate and bring the withdrawal plate out of contact with the floating plate, thus freeing the latter from the drive.

It should be noted that to limit the movement of the clutch pedal this member is extended below the 11½″ Rod by means of a 2½″ large radius Curved Strip, which is restricted in its movement by Threaded Pins secured to the framework. A Spring, which is attached to the bottom of the 2½″ Curved Strip and to a ¾″ Bolt affixed to the framework, assists the clutch pedal to return to the normal position after operation. Owing to the fact that the withdrawal mechanism is subject to very great strain in operation, it is advisable to use two grub-screws in each of the Cranks.

It will be realised, of course, that this model cannot be incorporated in a Meccano Chassis on account of its large dimensions, and it is, therefore, only suitable as a demonstration model for showing the working principles of a single plate clutch.