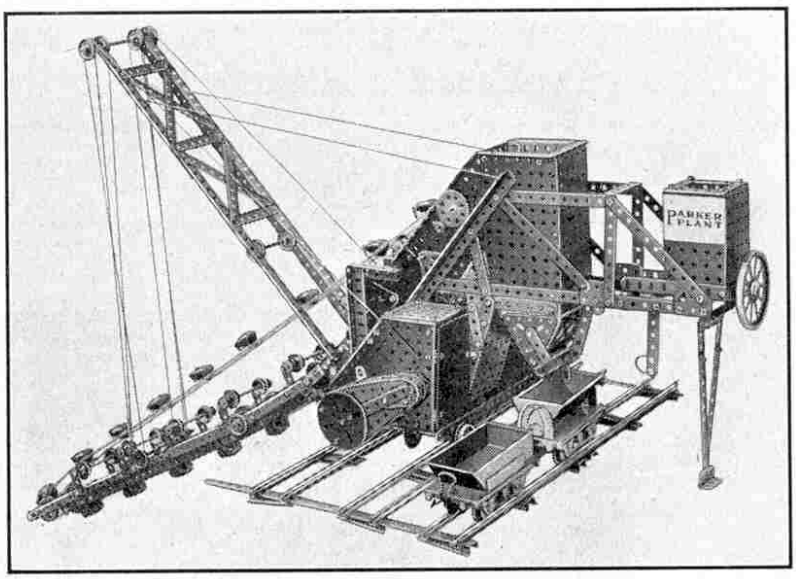
A Multi-Bucket Excavator

"M.M." Reader's Fine Model

MODEL-BUILDERS on the look-out for new subjects, and who have a good assortment of Meccano parts at their disposal, will be keenly interested in the fine working model shown on this page. It is a scale reproduction of a multi-bucket chain excavator and was built by K. J. Parker, Leicester.

Excavators of this kind are used for a variety of tasks, including the dredging of gravel and sand from the beds of rivers and making canals and irrigation channels. For dredging and similar work the machine travels on rails laid parallel with the banks of the river, and the material to be moved is dug out by buckets or scoops, with tough cutting edges. The buckets are attached to an endless chain running round rollers mounted on a stout arm, and bite into the ground as they move round the outer end of the arm. With their loads they continue along the upper side of the arm, and tip their contents into a separator when they turn over at the inner end of the arm. In the separator sand, gravel and other useful materials are sorted out and delivered into a hopper, while the waste is discharged.



A neatly-built working model of a multi-bucket Parker type excavator, constructed entirely from Meccano parts by K. J. Parker, Leicester.

In the model the bucket arm is suspended from a strong jib by means of cords, and is provided with hinged sections so that it can be placed at any desired angle in order to carry out special section excavations, such as canals or irrigation channels. The entire structure is mounted on a travelling chassis made from two $9\frac{1}{2}$" Angle Girders spaced by $5\frac{1}{2}$" Angle Girders. Flat Trunnions bolted to the $9\frac{1}{2}$" Angle Girders form bearings for Axle Rods carrying Flanged Wheels, which run on two sets of Hornby Straight Rails.

A Meccano E6 Electric Motor is fastened at one end of the chassis and drives a special gearbox that is provided with three levers. One lever is used for engaging the traversing mechanism, a second for setting the bucket mechanism in play, and the third for bringing into operation a winch that raises or lowers the bucket arm. All these operations can be reversed simply by reversing the Motor, but for the sake of realism imitation controls are fitted to the model in the positions they occupy in the actual machine.

The hopper for holding the excavated material and the channel up which the loaded buckets slide are built of Flat Plates and Angle Girders, and Strips are used for strengthening purposes. The bottom of the hopper has a hinged door, which can be opened or closed as required.

Two horizontal Angle Girders project from the hopper, on the opposite side from the bucket arm, and they support two $4\frac{1}{2}$" Angle Girders that form rails on which travels a large balance weight. The weight may be moved either towards or away from the machine by a screw-feed mechanism actuated by turning a hand wheel.

At the opposite end of the chassis from the Motor is a representation of the engine house. Although this does not contain any mechanism, it adds considerably to the realism of the model.

The bucket conveyor consists of three sections, one of which, at the inner end of the assembly, is the fixed trough up which the buckets slide to the hopper. The other two sections are pivoted and comprise a short centre section and a longer outer one. The sides of their framework consist of Angle Girders and to these are bolted vertically 2" Strips at intervals of $3\frac{1}{2}$". To the ends of the 2" Strips $12\frac{1}{2}$" Strips are bolted, and $\frac{1}{2}$"$\times\frac{1}{2}$" Reversed Angle Brackets fixed to the ends of the 2" Strips provide bearings for $3\frac{1}{2}$" Rods that support $\frac{3}{4}$" Flanged Wheels. These wheels form rollers over which the bucket chains pass. Two large Flanged Wheels are provided at the end of the bucket arm and Eye Pieces mounted on their shaft form slides by means of which the conveyor chain can be tightened or slackened as required. The two movable sections of the arm are linked together by a Rod, which serves as a hinge, and the centre section is fitted with two Eye Pieces that slide to and fro on a framework of Strips and Angle Girders.

The bucket chain itself consists of two lengths of Sprocket Chain with Double Bent Strips secured between them at intervals of 3". The Double Bent Strips are held in place by Dredger Bucket Clips, and to them are fixed Dredger Buckets.

The upper return part of the chain rests on rollers and after passing around the two large Flanged Wheels slides along the Angle Girders that form the under part of the bucket arm. Additional rollers are fitted at the junctions between the two movable sections of the bucket arm and the trough. At the top the chains pass around two 2" Sprocket Wheels driven from the gearbox.

The jib is fitted at its outer end with two fast Pulleys and two loose Pulleys, and a corresponding set of fast Pulleys is fitted to the outer section of the bucket arm to take the operating cords.