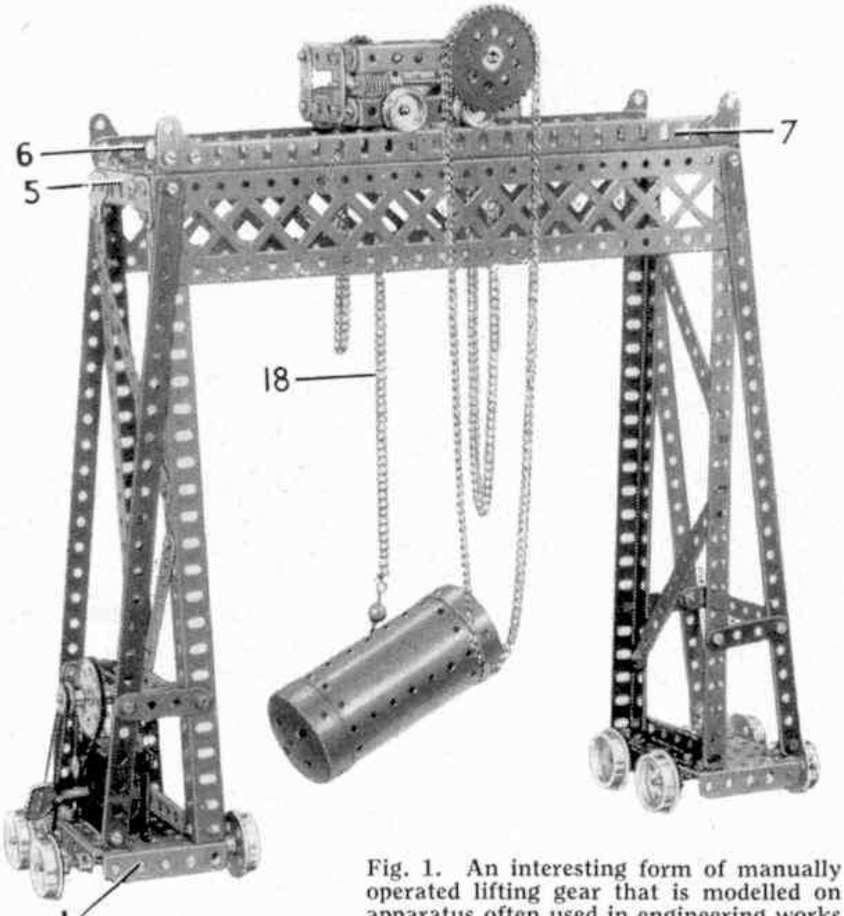


Fig. 1. An interesting form of manually operated lifting gear that is modelled on apparatus often used in engineering works for dealing with comparatively light loads.

Hand Operated Hoist and Gantry

THE Hand Operated Hoist and Gantry that is shown in Fig. 1 represents a useful type of lifting gear that is often employed in stockyards and engineering works for lifting and transporting light loads. In actual practice the Gantry is usually traversed along rails by means of a small motor, while the load lifting hoist is manually operated. In larger installations of this kind the hoist also is motor driven, but our model is a manually operated type. The hoisting gear is carried on a trolley that travels on rails on the gantry span.

It is best to commence construction of the model by building the two towers that support the gantry. As seen in Figs. 1 and 2, the left-hand tower consists of a base formed by a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 1 to which two $2\frac{1}{2}''$ Angle Girders are fixed along each side. These Girders provide the bearings for two $4\frac{1}{2}''$ Axle Rods that carry the travelling wheels, which are $1\frac{1}{8}''$ Flanged Wheels. One of the Rods carries also a 1″ Pulley with boss 2. A *Magic* Motor is now bolted to the Flanged Plate as shown and to the start and stop lever of the Motor a $\frac{1}{2}''$ Reversed Angle Bracket 3 is attached. At the other edge of the Flanged Plate a $3\frac{1}{2}''$ Angle Girder 4 is fixed.

The construction of the base for the other tower is similar except that the 1″ Pulley is omitted from the wheel axle and $3\frac{1}{2}''$ Rods are used instead of $4\frac{1}{2}''$ Rods. Also the *Magic* Motor is omitted.

The two inner legs of each tower consist of $12\frac{1}{2}''$ Angle Girders bolted at their lower ends to the $3\frac{1}{2}''$ Angle Girders 4. The two outer legs on each tower are $12\frac{1}{2}''$ Strips attached to the base by Angle Brackets. At the top ends the Strips are bolted to the $12\frac{1}{2}''$ Angle Girders, the same bolts holding in place also a $12\frac{1}{2}''$ Braced Girder on each side of the gantry.

The upper ends of the $12\frac{1}{2}''$ Angle Girders of each tower are joined by a $3\frac{1}{2}''$ Angle Girder 5, which is braced to the $12\frac{1}{2}''$ Girders by means of 1″ Corner Brackets. The top of the two towers are joined on each side by a $12\frac{1}{2}''$ Angle Girder 6 and 7. These form the running rails for the hoist trolley and they are provided with stops at each end formed by 1″ Corner Brackets as shown.

The two towers are braced by means of $5\frac{1}{2}''$ and 2″ Strips as shown.

The framework of the hoist trolley consists of four $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips, four $2\frac{1}{2}''$ Strips and four $1\frac{1}{2}''$ Strips. Through holes in the lower pair of Double Angle Strips two $3\frac{1}{2}''$ Axle Rods are passed and these carry the four $\frac{3}{4}''$ Flanged Wheels in which the trolley runs. One of the Rods carries also a 57-tooth Gear 8, which engages a $\frac{1}{2}''$ Pinion 9 mounted on a 4″

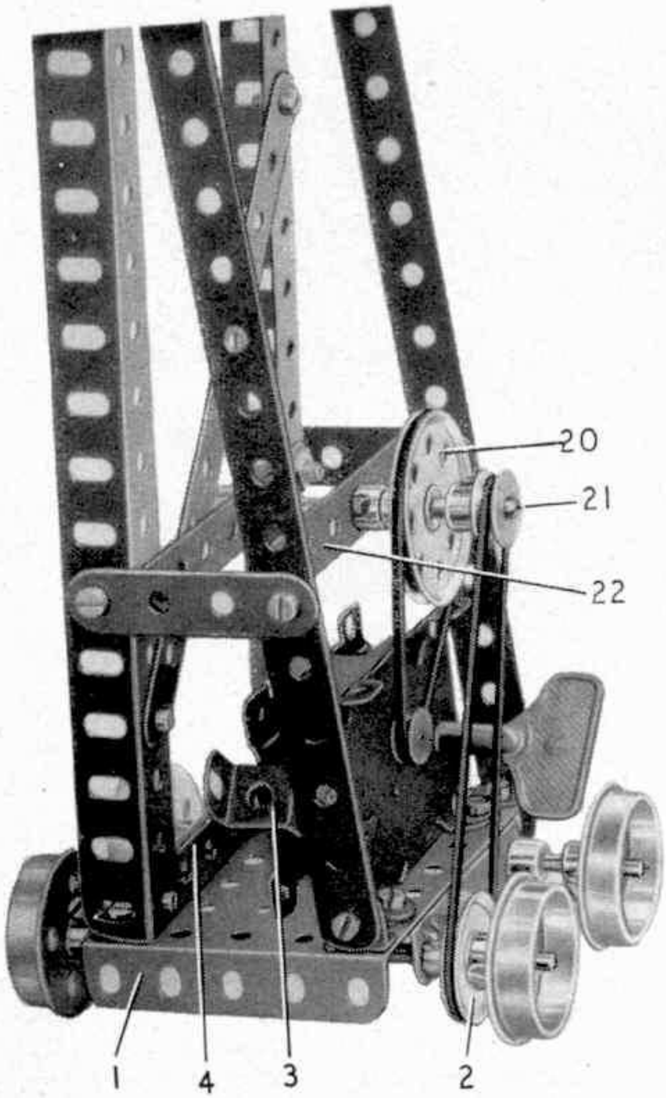


Fig. 2. The base of the gantry tower to which the Magic Motor is fitted.

Rod 10. This Rod carries also a 2″ Sprocket Wheel 11, and is retained in place in the framework by Collars arranged as shown.

A 4″ Rod 12 is mounted in one pair of $1\frac{1}{2}$″ Strips and on it is fixed a Worm 13 and a 1″ Sprocket Wheel 14. The Worm meshes with a $\frac{1}{2}$″ Pinion 15 fixed on a 3″ Rod 16 that carries also a $\frac{3}{4}$″ Sprocket Wheel 17. Endless belts of Sprocket Chain are fitted to each Sprocket 11 and 14. Another length of chain 18 is clamped at one end to the framework by means of a Fishplate held by bolt 19. It is then passed over the Sprocket 17 and to its free end a small Loaded Hook is attached by means of Cord.

The *Magic* Motor drive to the travelling wheels of the gantry is arranged as follows: The pulley of the *Magic* Motor is connected by a Driving Band to a $1\frac{1}{2}$″ Pulley 20 that is fixed on a $2\frac{1}{2}$″ Rod 21. This Rod is journalled in a $3\frac{1}{2}$″ × $\frac{1}{2}$″ Double Angle Strip 22 and in a $3\frac{1}{2}$″ Strip bolted to the $12\frac{1}{2}$″ Strips and $12\frac{1}{2}$″ Angle Girders respectively of the tower.

Care should be taken to see that the Driving Bands are not too tight, as this will cause excessive friction and so reduce the efficiency of the drive. A little oil on the working parts will also facilitate freedom of running and smoothness of operation.

Parts required to build the Hand Operated Hoist and Gantry:—4 of No. 1; 4 of No. 2; 1 of No. 3; 4 of No. 5; 4 of No. 6; 4 of No. 6a; 6 of No. 8; 4 of No. 9b; 4 of No. 9d; 4 of No. 12; 1 of No. 12c; 1 of No. 15a; 3 of No. 15b; 4 of No. 16; 1 of No. 16a; 1 of No. 16b; 8 of No. 20; 4 of No. 20b; 1 of No. 21; 1 of No. 22; 1 of No. 23a; 2 of No. 26; 1 of No. 27a; 1 of No. 32; 92 of No. 37a; 91 of No. 37b; 20 of No. 38; 6 of No. 48b; 2 of No. 53; 1 of No. 57c; 9 of No. 59; 1 of No. 94; 1 of No. 95; 1 of No. 96; 1 of No. 96a; 2 of No. 99; 1 of No. 111c; 1 of No. 125; 12 of No. 133a; 1 of No. 162; 2 of No. 186a; 1 *Magic* Clockwork Motor.

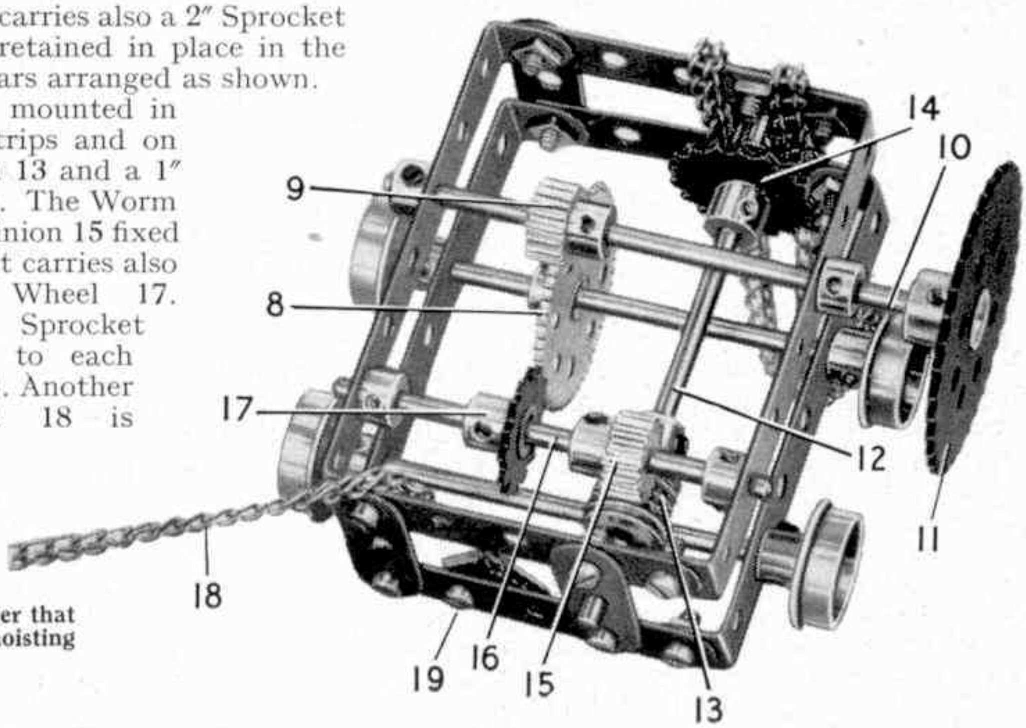


Fig. 3. The traveller that carries the load hoisting gear.

Among the Model-Builders

By "Spanner"

A Simple Flexible Coupling

Mr. J. F. Sharp, Huddersfield, contributes a suggestion for a simple flexible coupling unit for joining two shafts that should be of interest to advanced model builders. His idea is shown in the device illustrated in Fig. 1.

Two ½" × ½" Angle Brackets 1 are bolted through their slotted holes by Bolts 2, each carrying two Washers, to a Gear Wheel 3 on the driving shaft.

A 1" diam. Rubber Ring 4 is squeezed in and located between Bolts 2 and the Angle Brackets 1 by means of nuts and bolts 5. This forms the flexible link. A Bush Wheel 6 on the driven shaft is fitted with two ½" Bolts 7, each Bolt carrying a loose Washer 8.

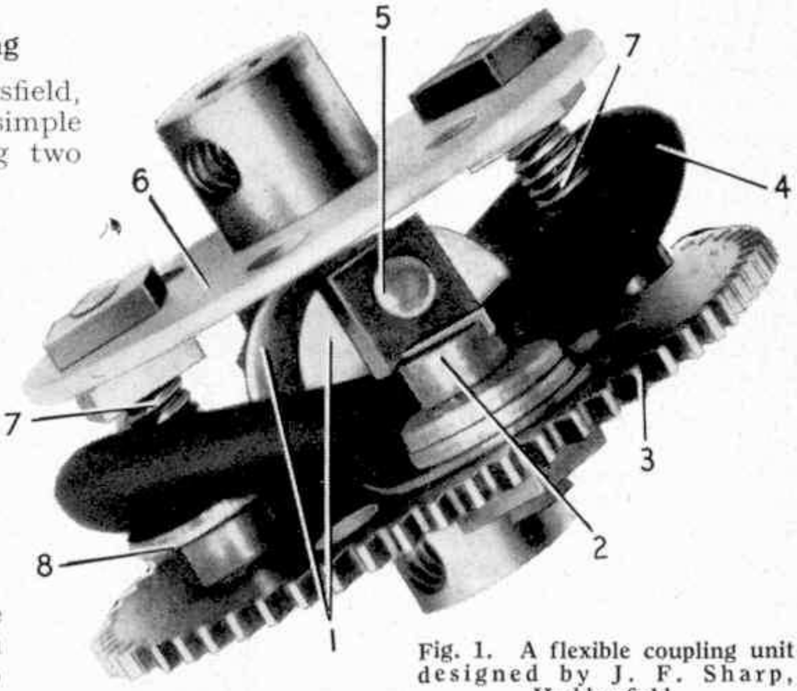
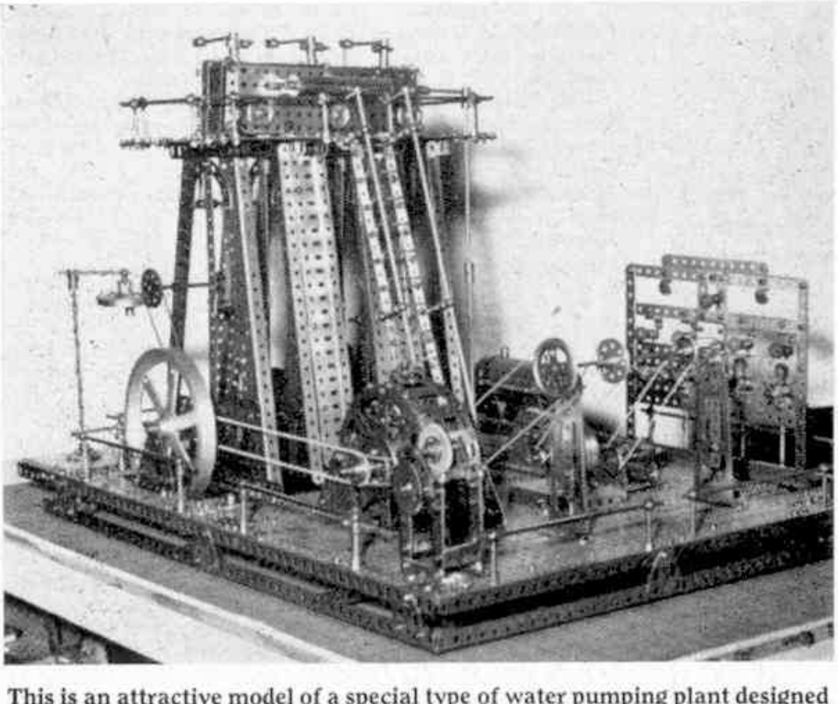


Fig. 1. A flexible coupling unit designed by J. F. Sharp, Huddersfield.

The Rubber Ring is looped around these Bolts so that the driven shaft is flexibly connected to the driving shaft.

Mr. Sharp used this device in connection with a very ingenious automatic transmission mechanism that will be illustrated and described in these pages in due course.



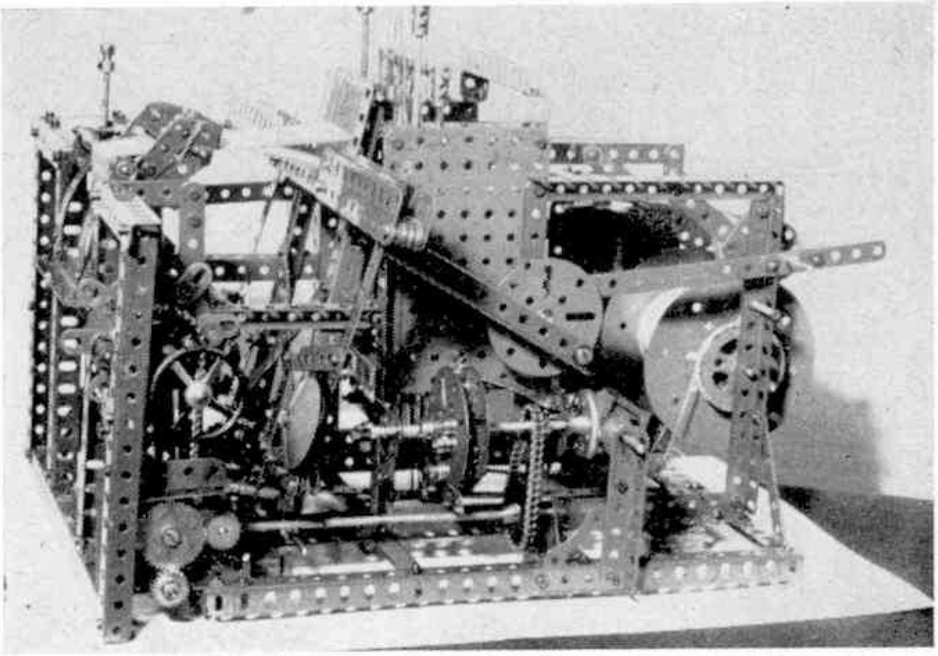
This is an attractive model of a special type of water pumping plant designed for raising excess water and discharging into irrigation canals. The model was built by Geom. Pietro Borsetto, Piove di Sacco, Padova, Italy.

Novel "Step-up" or "Step-down" Driving Gear

With the novel arrangement shown in Fig. 2 it is possible to obtain a "step-up" or "step-down" driving ratio of exactly 1 : 2 or 2 : 1. It is a version of a mechanism that was submitted by T. V. Vollenhoven, Eindhoven, Holland, as an entry for the "Meccano Mechanisms" Competition organised in the *Meccano Magazine* last year.

The mechanism is very simple to build but quite tricky to adjust correctly, and its construction should provide an interesting hour or so for those with the parts available to assemble it.

The general construction of the mechanism is shown quite well in the illustration



A fine loom, full of interesting details. It was built by Mr. L. Yeoman, Bolton and was an exhibit at an Exhibition in London recently.

so that a detailed description is not necessary and I will mention only one or two points that may not be quite apparent. The four 1" Corner Brackets are fixed to the Face Plate 1 by ½" Bolts, but each of them is spaced from the Face Plate by a Collar. Either of the shafts 2 or 3 can be used as the input shaft. Shaft 2 is mounted in the apex holes of two Flat Trunnions bolted to 1½" Angle Girders 7 and 8. The Double Arm Crank 4 on shaft 3 carries two Threaded Pins 5 and 6, which enter the gaps between the four Corner Brackets as the Face Plate rotates.

In order to make the device work smoothly and silently the Threaded Pins must move on exactly the circle that passes through the centre of the Face Plate. This can be adjusted by moving the Flat Trunnions that form the bearings for Rod 2, in the slotted holes of the 1½" Angle Girders 7 and 8.

While a device of this kind is of little practical use in actual model-building, owing to its bulk, it is nevertheless very fascinating to watch in operation and stimulating to those model-builders who are interested in curious mechanisms, as there is plenty of scope for experiment in this direction.

A Fine Model Loom

One of the exhibits at the "Education and Careers Exhibition" held in London this year was a fine model loom built by Mr. L. Yeoman, Bolton, Lancs. Mr. Yeoman is a textile student, who was awarded a Cotton Board Scholarship, and his model represents the spare-time work of several months. On hearing of his model the Cotton Board decided to include it as one of the exhibits on their Stand at the Exhibition, which included displays by schools, firms and various industrial organisations on a multitude of subjects from further education to careers in the Cotton industry.

The model was based on one that appeared in the *Meccano Magazine* some time ago, but Mr. Yeoman has modified this quite considerably in order to incorporate his own methods of construction and various improvements which he claims have resulted in a model that weaves with a high degree of efficiency. I congratulate Mr. Yeoman on his excellent workmanship.

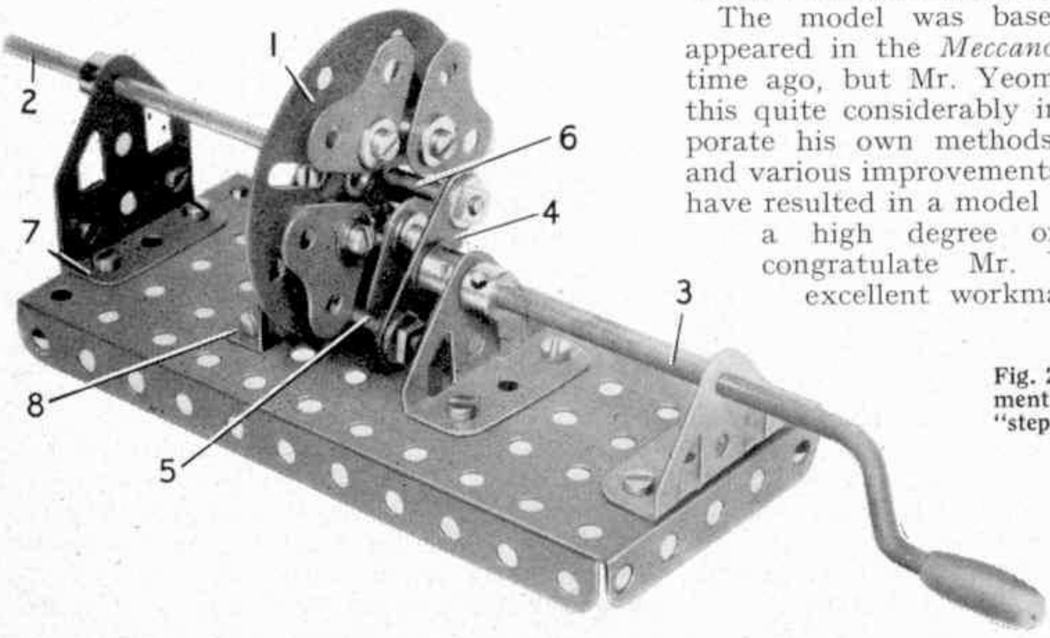


Fig. 2. The novel arrangement shown here gives a "step-up" or "step-down" driving ratio of exactly 1 to 2 or 2 to 1. It is based on a mechanism submitted by T. V. Vollenhoven, Eindhoven, Holland.