

The Meccano Log Saw

Special Features

Saw and feed carriage driven by Electric Motor.

The Saw slides in vertically-adjustable frame, the elevation of which may be altered on operation of hand wheel.

Feed carriage may be thrown out of gear with Motor whenever required, on operation of hand lever.

By substituting a hacksaw blade for the Rack Strips representing the saw, the model can be put to practical use.

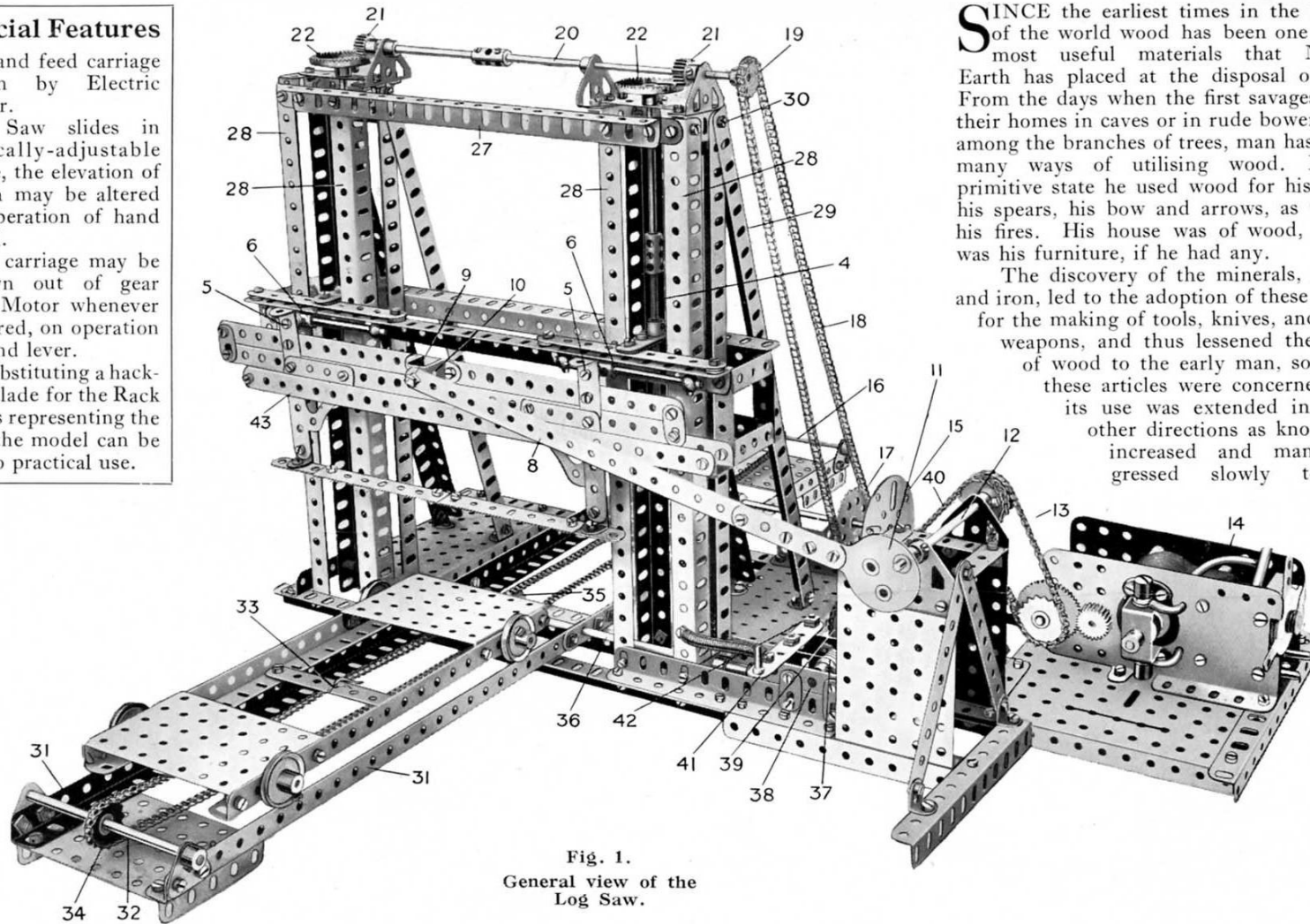


Fig. 1.
General view of the
Log Saw.

SINCE the earliest times in the history of the world wood has been one of the most useful materials that Mother Earth has placed at the disposal of man. From the days when the first savages made their homes in caves or in rude bowers built among the branches of trees, man has found many ways of utilising wood. In his primitive state he used wood for his clubs, his spears, his bow and arrows, as well as his fires. His house was of wood, as also was his furniture, if he had any.

The discovery of the minerals, copper and iron, led to the adoption of these metals for the making of tools, knives, and other weapons, and thus lessened the value of wood to the early man, so far as these articles were concerned, but its use was extended in many other directions as knowledge increased and man progressed slowly towards

civilisation. For very many centuries wood was used almost exclusively for building habitations, bridges and vessels.

Even in this age of coal and iron, timber is practically indispensable for many purposes. One cannot imagine domestic furniture being made of any other material than wood—certainly stone or metal would not be very satisfactory. Nor would Jack Hobbs be likely to score many centuries if he went out to the pitch carrying an iron bat! No satisfactory substitute has yet been found for wooden piles for supporting structures built in soft ground, and although the walls of houses and other buildings are now built of brick or stone, an enormous amount of timber is used in the construction of floors, walls, and roofs, etc. Railway sleepers, telegraph poles, wooden road-setting blocks—these are a few of the various ways in which to-day man adapts the product of the forest to serve him in his daily life and to provide for his material comfort.

One of the latest uses for wood is in the production of paper. It might be thought that the number of trees used for this purpose would not be very great, but when it is remembered that quite a number of modern newspapers publish over 1,000,000 copies every day, it will be realised that considerable quantities of timber are necessary. Some of the big newspaper companies own large tracts of forest land in various parts of the world, from which they draw their own supply of wood.

The wood-pulp industry is very extensive in Canada and thousands of men are employed in the numerous processes of paper-making.

Sources of Wood.

Apart from valuable woods such as mahogany, ebony, and cedar, etc., the majority of our timber is imported from countries around the Baltic Sea and from the Western parts of North America, particularly British Columbia. Whole fleets of timber-carrying vessels are engaged in its transportation.

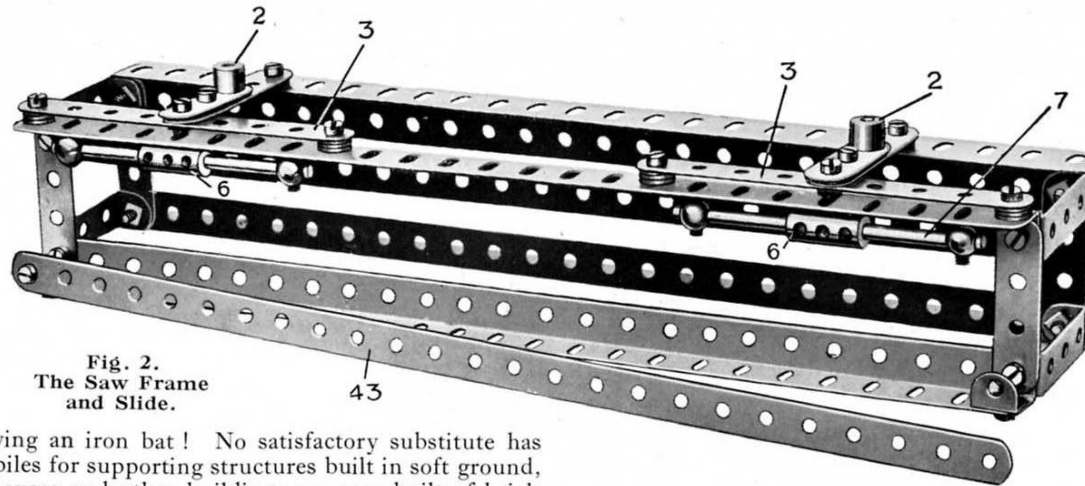


Fig. 2.
The Saw Frame
and Slide.

shall be assured of good supplies of this valuable material.

Logging Operations in America.

After the trees have been cut down and deprived of their branches they are dragged to the nearest river—fortunately, rivers are very numerous in Central and Western Canada—and chained together in huge rafts. These are allowed to float downstream until they reach the sawmills, where they are sawn up into beams or planks or prepared for shipping overseas. It is a common practice to trim the sides of the tree trunks into a square form so that they can be stacked together with more economy of space aboard ship.

The Meccano Log Saw illustrated in Fig. 1 is modelled on the actual machines used in sawmills. The cutting edge is represented by Rack Strips, but these may be replaced if desired by a hack saw or similar blade, with two holes drilled in it so that it may be secured to the Meccano framework.

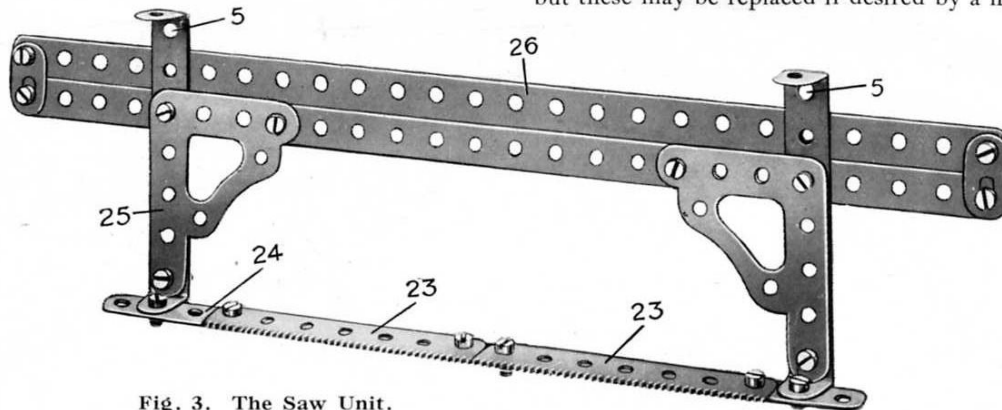


Fig. 3. The Saw Unit.

The magnitude of the logging operations in America is almost incredible. Hundreds of thousands of trees—measuring from six to twenty feet in diameter and growing to great heights—are cut down every year. So great is the demand for wood that the Canadian Government has had to set up a special forestry department, which supervises the logging operations, and by only allowing the mature trees to be cut down prevents unnecessary waste of timber. Meanwhile thousands of young trees are planted year by year to replace those cut down, so that future generations

The Meccano Model.

The general layout of the model is shown in Fig. 1, while details of the vertically-adjustable frame and saw slide are shown in Fig. 2 and of the saw unit in Fig. 3.

The construction of the model should be commenced by building the framework, as illustrated in Fig. 4. Each of the rails 31 consists of

two $12\frac{1}{2}$ " Angle Girders joined end to end by 2" Strips. If $24\frac{1}{2}$ " Girders are available they should of course be used here. The frame of the gear box is supported by an Architrave 44 and two $4\frac{1}{2}$ " Strips 45, attached to the gear box by means of Angle Brackets. The $2\frac{1}{2}$ " by 1" Double Angle Strip 46 is bolted between the two $12\frac{1}{2}$ " Girders 29. The Trunnions at the top of the main vertical members are bolted to $1\frac{1}{2}$ " Angle Girders. The construction of the rest of the frame should be obvious from the illustration.

Construction of the Saw Frame and Slide.

This part of the model is shown in Fig. 2. The box-like portion is made up of four $12\frac{1}{2}$ " Angle Girders connected at the ends by 2" Strips and $1\frac{1}{2}$ " by $\frac{1}{2}$ " Double Angle Strips. The $12\frac{1}{2}$ " Strip 43 should be secured at one end and the other end left free until the saw unit has been secured in place. The free end of the Strip 43 is then bolted to the Angle Bracket shown.

The Threaded Cranks 2 are bolted to $2\frac{1}{2}$ " Strips and the latter are secured to the frame in the following manner. One end of each Strip is attached by a $\frac{3}{8}$ " Bolt to one of the Angle Girders at the top of the saw frame, but the Strip is spaced away from the Girder by three or four Washers placed on the shank of the bolt. The other end of each Strip is secured to a $4\frac{1}{2}$ " Strip 3, the ends of which are bolted to the other Girder of the saw frame. It will be noticed that the Strips 3 are spaced away from the Girder by means of Washers: the object of this is to prevent the shanks of the bolts securing the Cranks 2 from fouling the Couplings 6, which must slide freely on the Rods 7.

When completed the saw frame is slipped over the tops of the vertical members

28 (see Fig. 6.) Then the $9\frac{1}{2}$ " Angle Girder 27 is bolted to the upper ends of the Girders 28, and the four $12\frac{1}{2}$ "

Angle Girders 29 (Fig. 1) are bolted at 30 to the uprights 28.

The Saw Unit.

Two $12\frac{1}{2}$ " Strips placed edge to edge and secured at the ends by Flat Brackets form the top of the saw unit. The $3\frac{1}{2}$ " by $\frac{1}{2}$ " Double Angle Strips 5 are mounted as shown and secured rigidly by means of the Architraves 25.

The saw is represented by two Rack Strips 23 bolted to a $9\frac{1}{2}$ " Strip 24 that, in turn, is bolted to the lower ends of the Double Angle Strips 5.

The saw unit is attached to the slide by means of the Double Angle Strips 5, which are bolted to the Couplings 6 of the slide (Fig. 2), but are spaced away from them by Washers so that the Couplings are free to move to and fro on the Rods 7. The saw frame is guided in its transverse movement by the $12\frac{1}{2}$ " Strip 43 (see Figs. 1 and 2), which passes in front of the Architraves 25 (Fig. 3) and so regulates the position of the saw.

The height of the saw is adjusted by turning the Face Plate 15 (Fig. 1), which is secured to a $4\frac{1}{2}$ " Rod journalled in the $2\frac{1}{2}$ " by 1" Double Angle Strip 46. A $1\frac{1}{2}$ " Sprocket Wheel 17 on the same Rod is connected by an endless Sprocket Chain to a $\frac{3}{4}$ " Sprocket Wheel on a shaft 20, which consists of a $6\frac{1}{2}$ " Rod and a $3\frac{1}{2}$ " Rod joined end to end by a Coupling. Two $\frac{1}{2}$ " Pinion Wheels 21 on this shaft 20 engage the teeth of $1\frac{1}{2}$ " Contrate Wheels 22, each of which is secured to a vertical $3\frac{1}{2}$ " Rod extended at its lower end by a Coupling and a $4\frac{1}{2}$ " Threaded Rod 4. The Threaded Rods pass through the bosses of the Threaded Cranks 2 (see Figs. 3 and 6). Hence, on rotation of the Threaded Rods the saw slide (Fig. 2) moves up or down as required.

Driving Mechanism.

The Electric Motor may be of either the high-voltage or the low-voltage type. A $\frac{1}{2}$ " Pinion on the armature spindle drives a 57-teeth Gear Wheel on a $2\frac{1}{2}$ " Rod journalled in the Motor frame. A $\frac{3}{4}$ " Pinion on the opposite end of this Rod meshes with a 50-teeth Gear Wheel on a $3\frac{1}{2}$ " Rod, to which is secured a 1" Sprocket Wheel that is connected with a similar Wheel on the Rod 12.

The reciprocating movement of the saw is caused

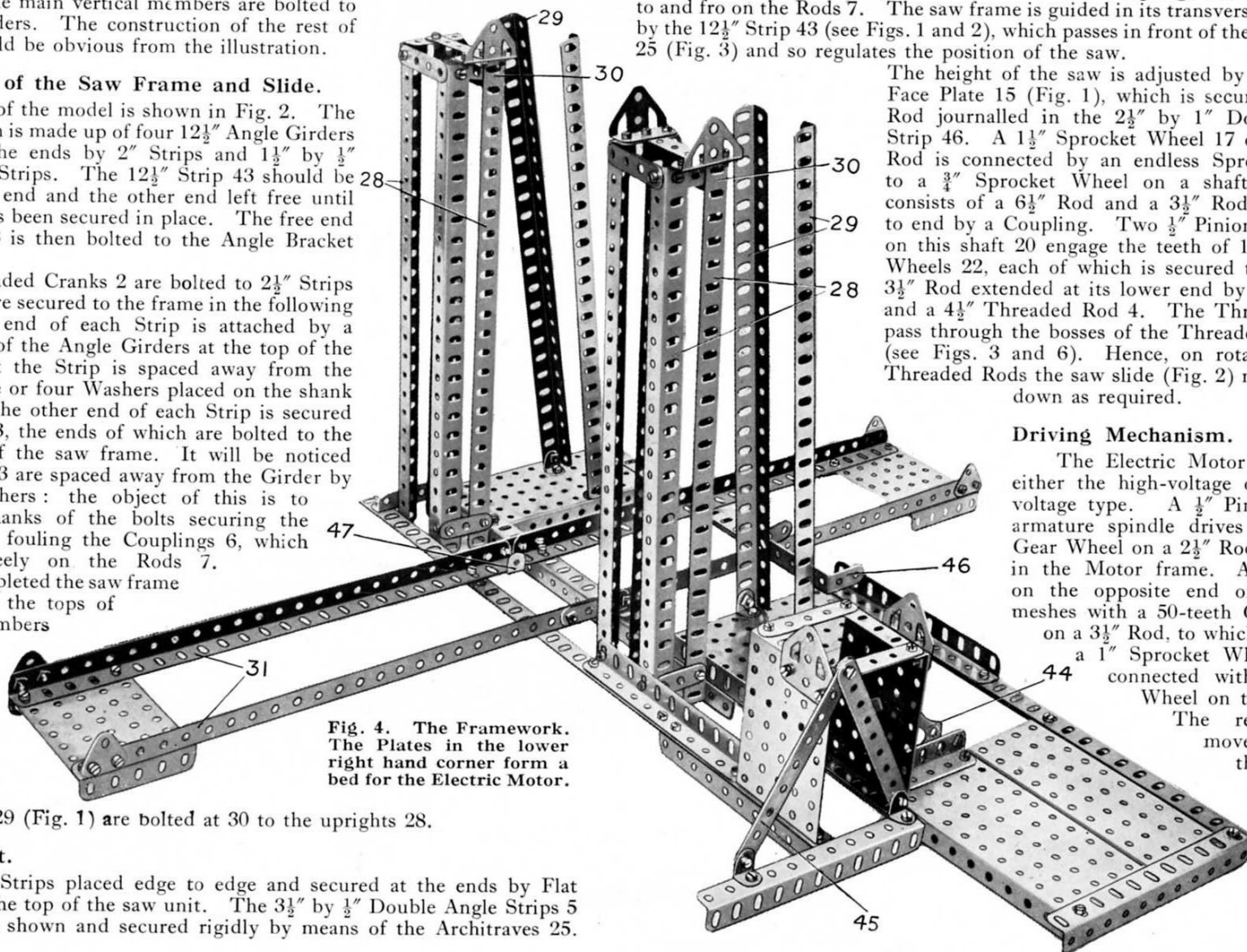


Fig. 4. The Framework. The Plates in the lower right hand corner form a bed for the Electric Motor.

by a Triple-throw Eccentric 11, which is made fast to the Rod 12 so as to give its maximum throw of 1", and joined by a 2½" Strip and a 9½" Strip 8 to a Double Bent Strip 10 attached to the saw frame. The bolt that pivots the Strip 8 to the Double Bent Strip is provided with lock-nuts (see Standard Mechanisms Manual, detail No. 263).

A second 1" Sprocket Wheel on the Rod 12 drives a 2" Sprocket Wheel on a 2" Rod 38 (Figs. 1 and 5), which is journalled in two 2½" Strips attached to the framework by means of Flat Brackets. A Worm secured to this Rod engages a ½" Pinion on a horizontal 3½" Rod. When desired, the latter may be connected to an 8" Rod 36 by means of a Dog Clutch. The Dog Clutch mechanism is shown in detail in Fig. 5. It is controlled by the hand lever 41, which is pivoted at 42 by means of a bolt and lock-nuts. A Single Bent Strip is pivoted to the lever by the same means, and serves to connect it to the 3½" Rod that carries a section of the Dog Clutch, being retained in position on the Rod by a Collar. The other section of the Clutch is secured to the 8" Rod 36, and the two Clutch members normally are kept in engagement by a Spring bolted to the lever 41 (Fig. 1). The movement of the feed carriage may be arrested by operating this hand lever.

The Feed Carriage.

The feed carriage, the construction of which is shown clearly in Fig. 1, slowly moves the logs against the saw while they are being cut. It runs on the rails 31, and is actuated by an endless Sprocket Chain 32 attached to the centre of the carriage at 33. The chain passes round a ¾" Sprocket Wheel 34 at each end of the rail, and is also carried over a 1" Sprocket Wheel secured to the Rod 36, by which the carriage is driven. The Rod 36 passes through 1½" Strips in the base of one of the upright members of the framework, its further end being journalled in the Angle Bracket 47 (see Fig. 4).

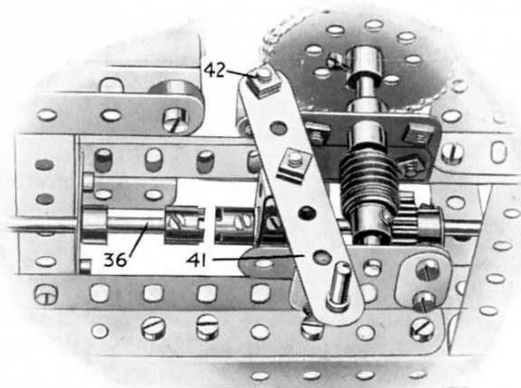


Fig. 5.

Clutch mechanism controlling the Feed Carriage.

The procedure to be adopted in operating the model is as follows. The Electric Motor is started, and the saw at once begins to work backward and forward while the feed carriage moves slowly towards it. By disengaging the Dog Clutch, the carriage may be stopped while the material to be sawn is placed in position, but its motion is resumed as soon as the clutch lever is released. The feed carriage is returned

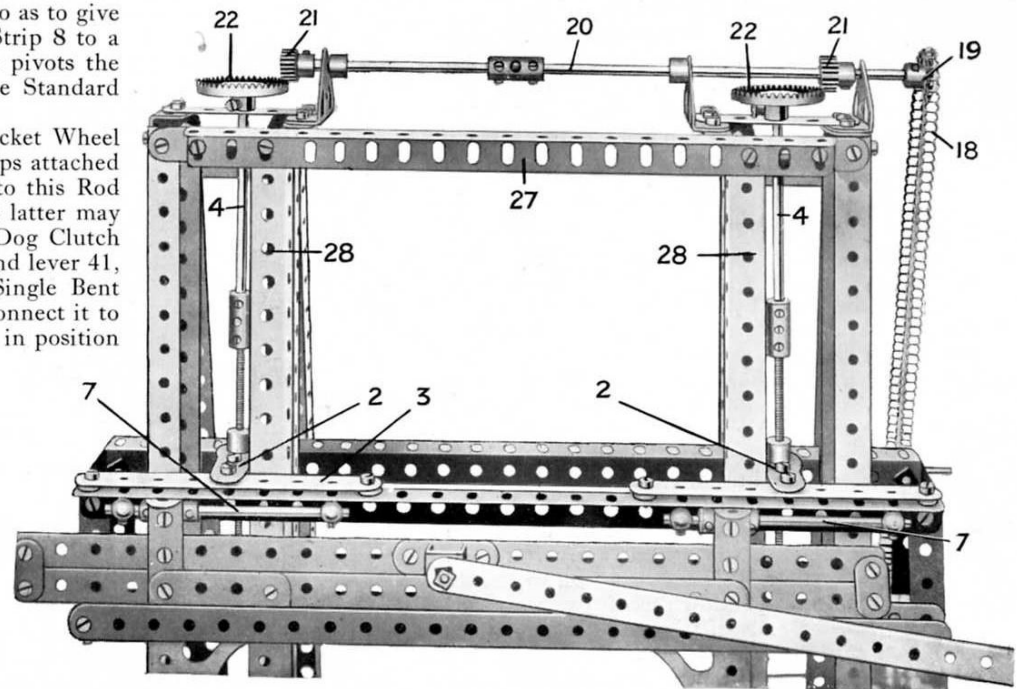


Fig. 6. View showing the elevating mechanism controlling the Saw Frame.

to its original position, of course, by reversing the Electric Motor.

Before the Log Saw is used, the height of the blade should be adjusted to the required position. Planks of any thickness are produced by making several cuts through the same log with the saw at varying heights.

Parts required to build the Meccano Log Saw :—

3 of No. 1	14 of No. 12	30 of No. 38	1 of No. 95
2 " 1a	1 " 12b	1 " 43	1 " 95a
4 " 2a	1 " 13	1 " 45	4 " 96
1 " 3	1 " 14	4 " 48	3 " 96a
1 " 4	6 " 15a	1 " 48a	3 " 108
8 " 5	5 " 16	2 " 48b	1 " 109
10 " 6	4 " 22	4 " 52	2 " 110
2 " 6a	2 " 25	6 " 53	2 " 115
23 " 8	3 " 26	13 " 59	3 " 126
4 " 8a	1 " 27	2 " 62a	2 " 126a
7 " 9	1 " 27a	5 " 63	1 " 130
2 " 9d	2 " 28	4 " 77	4 " 136
4 " 9f	1 " 32	2 " 80b	1 " 144
6 " 10	146 " 37	2 " 94	Electric Motor