# The Meccano Log Saw

**SPECIAL FEATURES**

The illustrations to this leaflet show the model built in Red-Green Meccano parts. Its construction in the Blue - Gold Meccano parts is exactly the same.

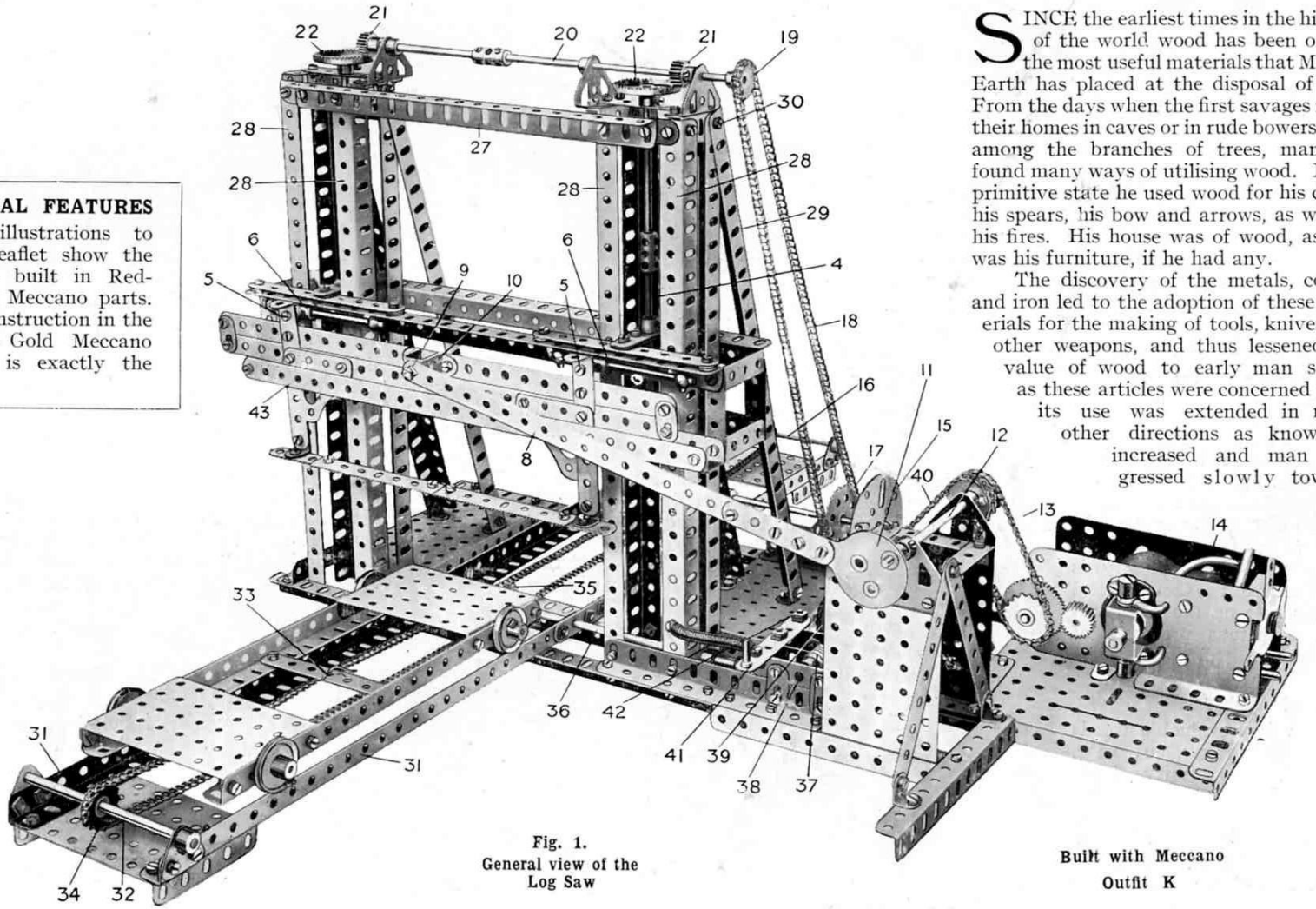


Fig. 1.
General view of the Log Saw

Built with Meccano Outfit K

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 metals, copper and iron led to the adoption of these materials for the making of tools, knives and other weapons, and thus lessened the value of wood to 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

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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 can scarcely imagine domestic furniture being made of any other material than wood—certainly stone 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.

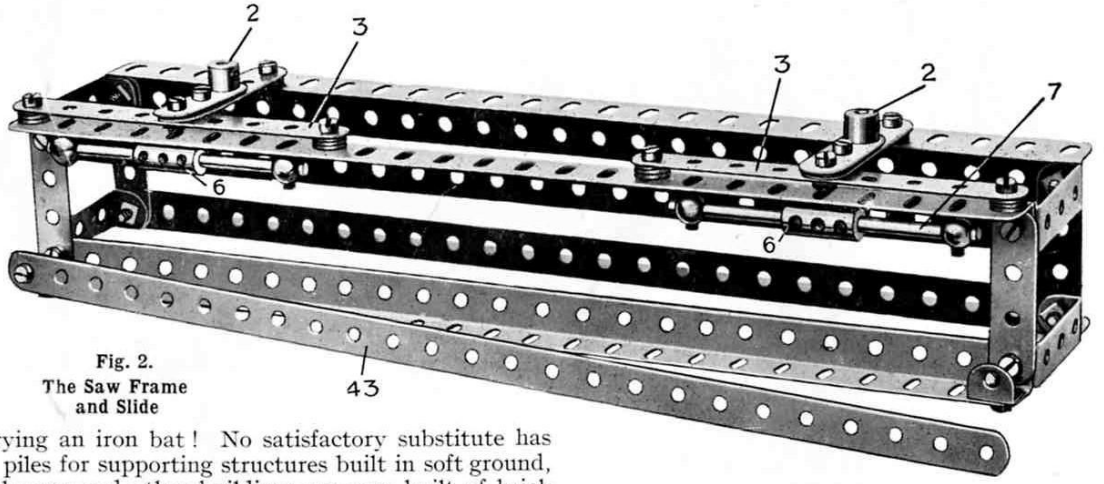


**Fig. 2. The Saw Frame and Slide**

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, 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.

The magnitude of the logging operations in America is almost incredible. Hundreds of thousands of trees—measuring from 6 ft. to 20 ft. 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 allowing only 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 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.

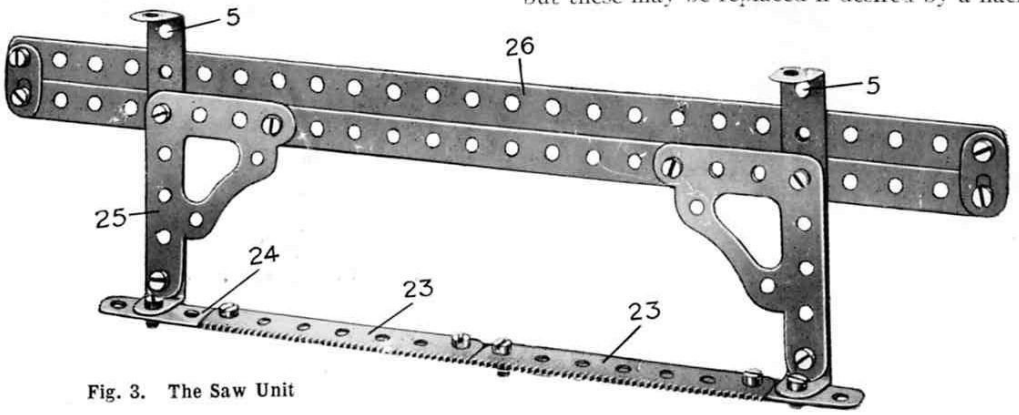


**Fig. 3. The Saw Unit**

### The 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 12½" Angle Girders joined end to end by 2" Strips. If 24½" Girders are available they should of course be used here. The frame of the gear box is supported by an Architrave 44 and two 4½" Strips 45, attached to the gear box by means of Angle Brackets. The 2½" × 1" Double Angle Strip 46 is bolted between the two 12½" Girders 29. The Trunnions at the top of the main vertical members are bolted to 1½" 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 12½" Angle Girders connected at the ends by 2" Strips and 1½" × ½" Double Angle Strips. The 12½" 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 2½" Strips and the latter are secured to the frame in the following manner. One end of each Strip is attached by a ⅜" Bolt to one of the Angle Girders at the top of the saw frame, but the Strip is spaced away from the Girder by means of those Washers placed on the shank of the Bolt. The other end of each Strip is secured to a 4½" 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 9½" Angle Girder 27 is bolted to the upper ends of the Girders 28, and the four 12½" Angle Girders 29 (Fig. 1) are bolted at 30 to the uprights 28.

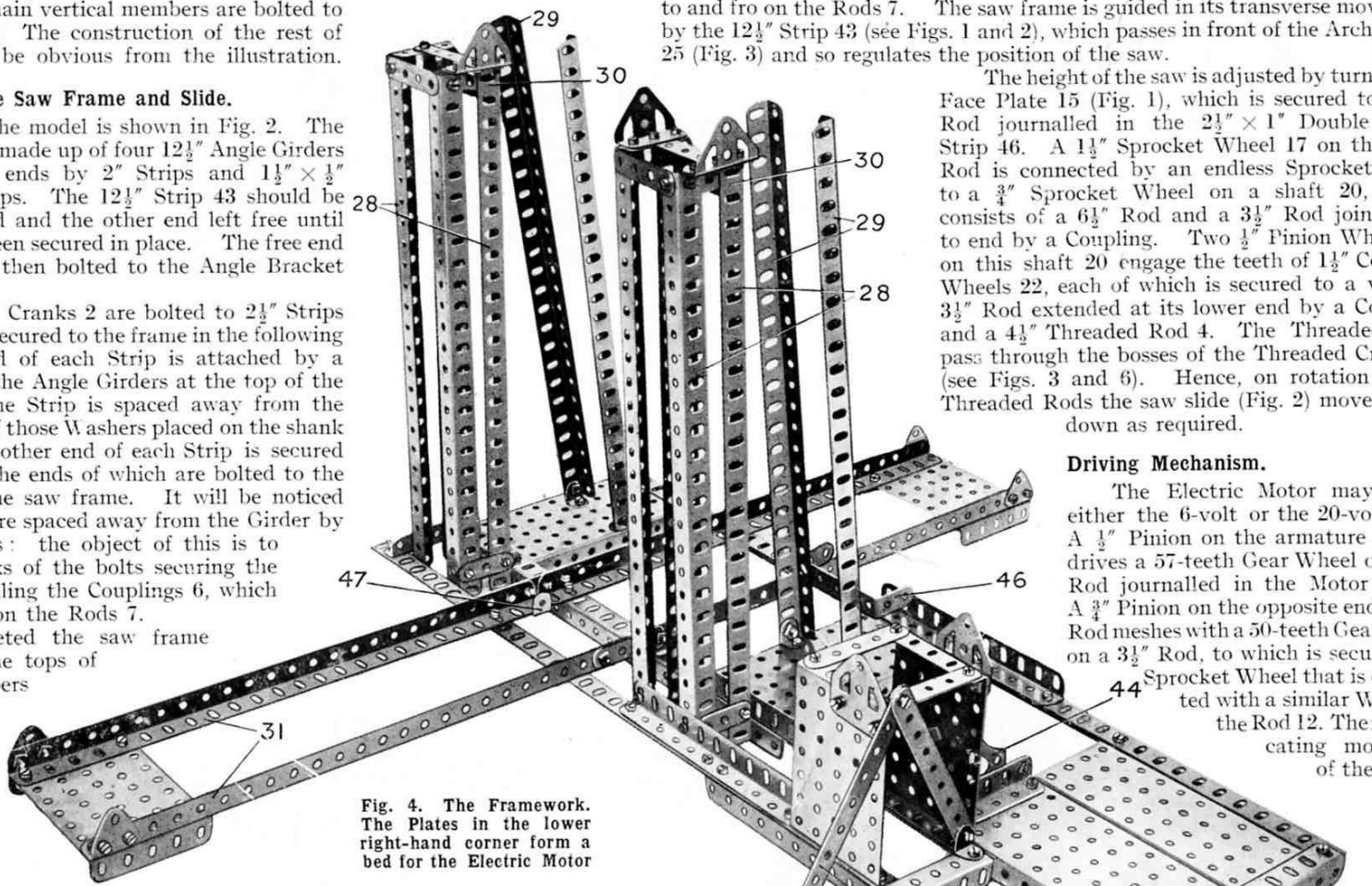


**Fig. 4. The Framework. The Plates in the lower right-hand corner form a bed for the Electric Motor**

**The Saw Unit.**

Two 12½" Strips 26 placed edge to edge and secured at the ends by Flat Brackets form the top of the saw unit. The 3½" × ½" 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 9½" 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 12½" 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 4½" Rod journalled in the 2½" × 1" Double Angle Strip 46. A 1½" Sprocket Wheel 17 on the same Rod is connected by an endless Sprocket Chain to a ¾" Sprocket Wheel on a shaft 20, which consists of a 6½" Rod and a 3½" Rod joined end to end by a Coupling. Two ½" Pinion Wheels 21 on this shaft 20 engage the teeth of 1½" Contrate Wheels 22, each of which is secured to a vertical 3½" Rod extended at its lower end by a Coupling and a 4½" 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 6-volt or the 20-volt type. A ½" Pinion on the armature spindle drives a 57-teeth Gear Wheel on a 2½" Rod journalled in the Motor frame. A ¾" Pinion on the opposite end of this Rod meshes with a 50-teeth Gear Wheel on a 3½" 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

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 Mechanism Manual, detail No. 1A).

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 held 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 35 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).

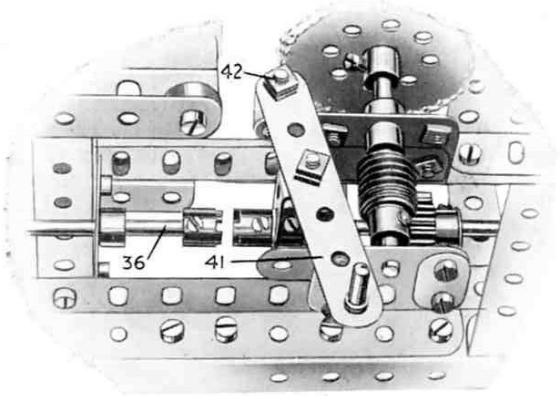


**Fig. 5.**
**Clutch mechanism controlling the Feed Carriage**

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 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.

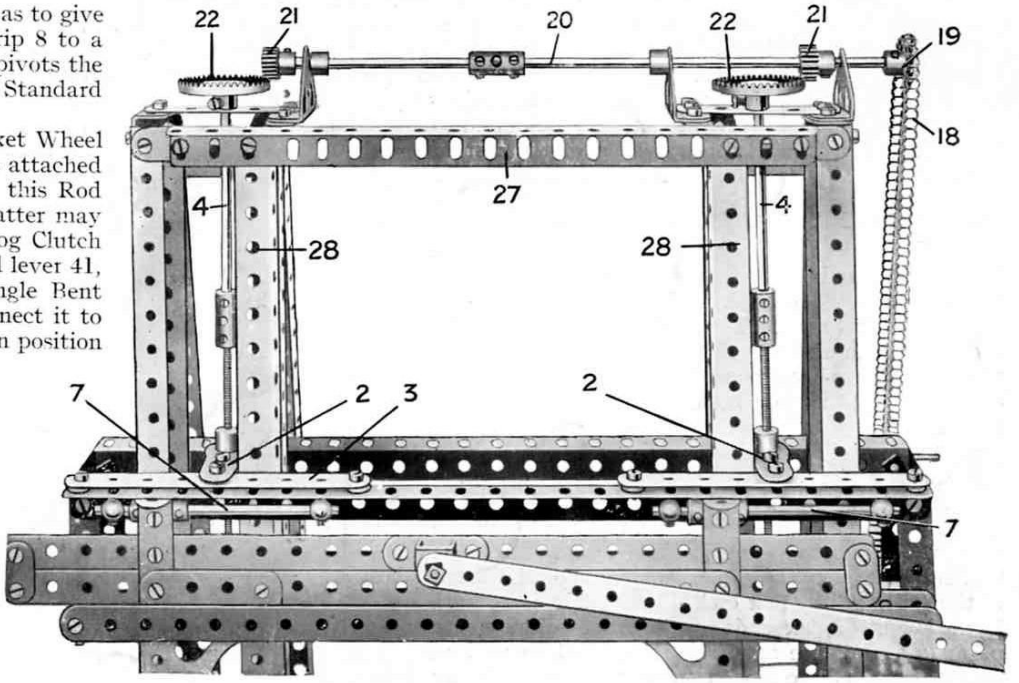


**Fig. 6. View showing the elevating mechanism controlling the Saw Frame**

**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 | E.6. | Electric | Motor. |