

MECCANO



(TRADE MARK REG. U. S. PAT. OFF.)

INSTRUCTIONS

FOR OUTFITS Nos. 4 to 6.

Price 35 Cents

MECCANO COMPANY
INCORPORATED

No. 23.A

ELIZABETH

NEW JERSEY

AMERICAN EDITION

MECCANO

Instructions for Outfits Nos. 4-6

HAVING built the models shown in the 0-3 Manual, you are now ready to start on the more advanced models. Those shown in this book are larger and have more mechanical movements, but they are all constructed on the same simple Meccano principle. All the work and thought have been put into the parts when they were designed and all you have to do is to follow the instructions and screw the parts together.

IMPORTANT NOTICE

In some of the models throughout this Manual we have made use of the Meccano Braced Girder, large wheels, sprocket wheels and chain, etc., which are only supplied in the Inventor's Accessory Outfits, or as separate parts. We have employed these parts as they improve the appearance and working of the models and they also form a suggestion for the use of the Inventor's Accessory Outfits; but in every case the same models can be effectively built with the parts in the regular Meccano Outfits.

GRAND PRIZE CONTEST

Each year there is a big Meccano Prize Contest for boys who build new and original models. You are not getting full value from your Meccano Outfit until you begin to invent your own models, and many valuable prizes are offered to inventive boys. Each entry must be accompanied by an entry blank which can be obtained from your dealer or direct from Meccano Company, Inc., Elizabeth, N. J. There are no entry fees or restrictions of any kind—the Contest is open to all.

This Model Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model
No. 197

Dutch Windmill

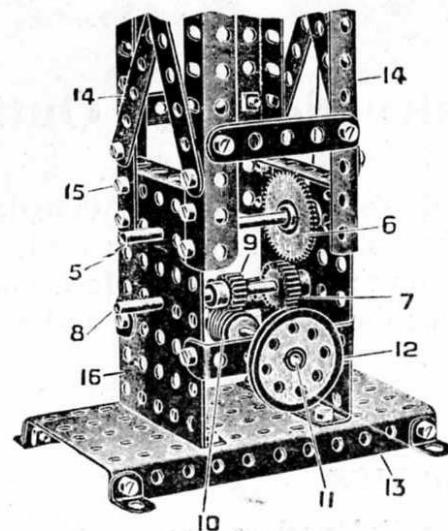
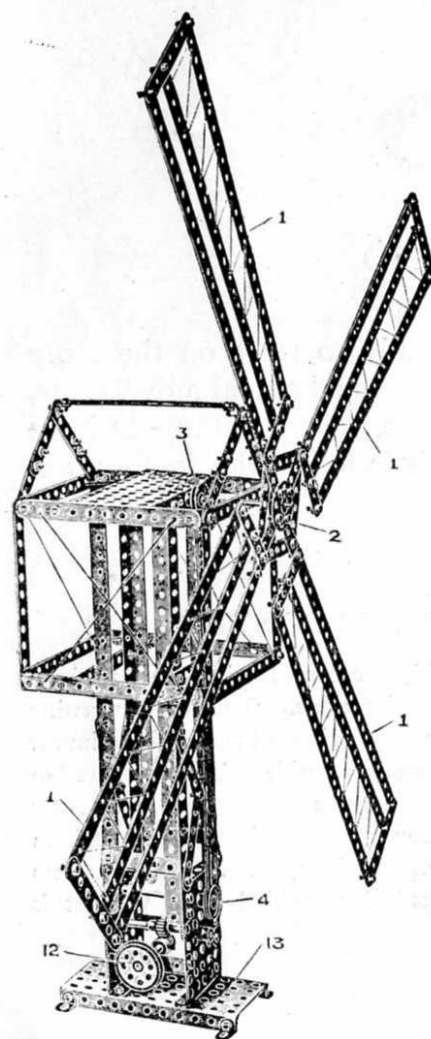


Fig. 197A

Parts Required *

| | |
|-----------|-----|
| 12 of No. | 1 |
| 19 " " | 2 |
| 4 " " | 3 |
| 4 " " | 4 |
| 14 " " | 5 |
| 4 " " | 8 |
| 22 " " | 12 |
| 1 " " | 14 |
| 3 " " | 16 |
| 1 " " | 21 |
| 2 " " | 22 |
| 1 " " | 24 |
| 2 " " | 26 |
| 1 " " | 27A |
| 1 " " | 32 |
| 120 " " | 37 |
| 2 " " | 52 |
| 2 " " | 53 |
| 3 " " | 59 |
| 2 " " | 60 |

The construction of the sails 1 of the mill will be readily followed from the illustration. They are bolted to an inner strip frame 2 and to a bush wheel fixed on a spindle, on which is also mounted a pulley wheel 3, the driving cord passing round this pulley wheel to a lower pulley wheel 4, the driving of which will be followed from the detail. The pulley wheel 4 is on the outer end of the shaft 5, on which is fitted a gear wheel 6 driven by a pinion $\frac{3}{4}$ " 7 on the axle 8, this axle also carrying a pinion $\frac{1}{2}$ " 9 engaged by a worm 10 on the driving shaft 11, which carries the driving pulley 12. This driving gear is enclosed in two small side flanged plates 16 bolted to a base plate 13, the vertical stroke of the mill being made from corner angle girders 14 bolted at 15 to the side plates 16

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

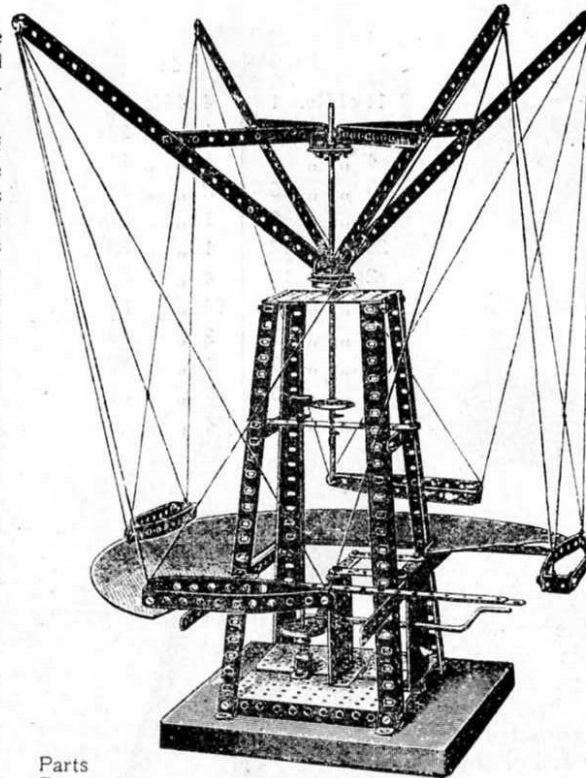
3

Model No. 198

Flying Machine

Most boys will have seen the Maxim Flying Machine at work, and will hardly fail to be interested in constructing a working model of it.

The main frame is composed of four angle girders connected at the bottom by two large flanged plates separated one hole apart and connected together by two small flanged plates carrying the crank handle, and at the top by a small flanged plate. Across the centre on opposite sides in the ninth hole down is attached a $3\frac{1}{2}$ " strip connected together by a $5\frac{1}{2}$ " strip. These transverse $3\frac{1}{2}$ " and $5\frac{1}{2}$ " strips and the small flanged plate at the top carry the perpendicular spindle upon which the upper structure revolves. A bush wheel is secured to this spindle to support the four arms, which are attached by four angle brackets. A pulley wheel is placed between this bush wheel and the perforated plate. The arms are supported by means of $5\frac{1}{2}$ " strips connected to a bush wheel secured on to the spindle, and the boats are connected to these by cord arranged as shown in the illustration. The platform is supported by four $12\frac{1}{2}$ " strips attached to the sides of the main framework. The manner of constructing the mechanism for operating the model is clearly shown in the illustration.

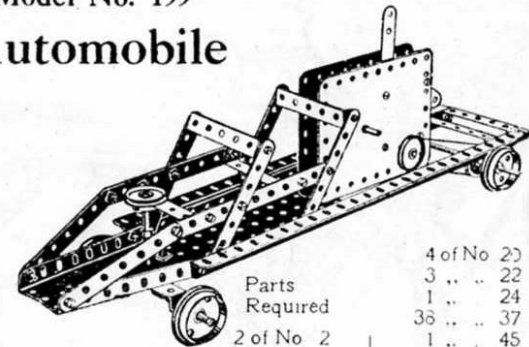


Parts Required

| | | |
|------------|--------------|-------------|
| 8 of No. 1 | 18 of No. 12 | 1 of No. 28 |
| 13 " " 2 | 2 " " 13 | 74 " " 37 |
| 2 " " 3 | 1 " " 19 | 1 " " 45 |
| 2 " " 5 | 2 " " 24 | 2 " " 52 |
| 4 " " 8 | 2 " " 26 | 3 " " 53 |
| 4 " " 11 | 1 " " 27A | 4 " " 59 |

Model No. 199

Automobile



| Parts Required | | |
|-------------------|--|--|
| 4 of No. 20 | | |
| 3 " " 22 | | |
| 1 " " 24 | | |
| 36 " " 37 | | |
| 1 " " 45 | | |
| 1 " " 46 | | |
| 1 " " 52 | | |
| 1 " " 54 | | |
| 3 " " 59 | | |
| 7 " " 60 | | |

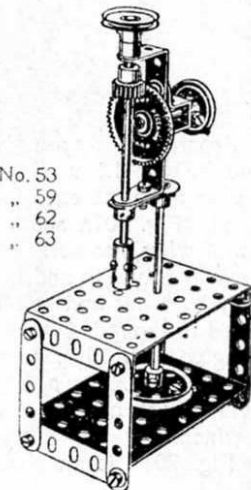
Model No. 200

Drilling Machine

Parts Required:

| | |
|------------|--|
| 4 of No. 5 | |
| 1 " " 15 | |
| 1 " " 15A | |
| 1 " " 17 | |
| 1 " " 21 | |
| 2 " " 22 | |
| 1 " " 26 | |
| 1 " " 28 | |
| 13 " " 37 | |
| 1 " " 45 | |
| 1 " " 46 | |

| | |
|-------------|--|
| 2 of No. 53 | |
| 2 " " 59 | |
| 1 " " 62 | |
| 1 " " 63 | |



This Model Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 201 Travelling Crane

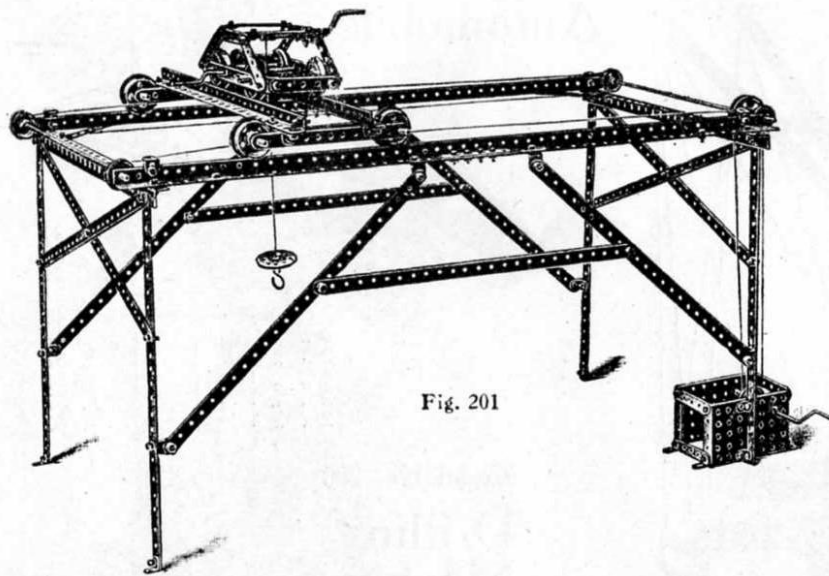


Fig. 201

Parts Required:

| | |
|-------------|-------------|
| 14 of No. 1 | 4 of No. 22 |
| 6 " " 2 | 1 " " 22A |
| 4 " " 4 | 1 " " 24 |
| 10 " " 5 | 2 " " 26 |
| 8 " " 8 | 1 " " 27A |
| 26 " " 12 | 1 " " 33 |
| 2 " " 13 | 4 " " 35 |
| 2 " " 15 | 98 " " 37 |
| 4 " " 17 | 2 " " 53 |
| 3 " " 19 | 1 " " 57 |
| 8 " " 20 | 5 " " 59 |
| 1 " " 21 | 4 " " 60 |

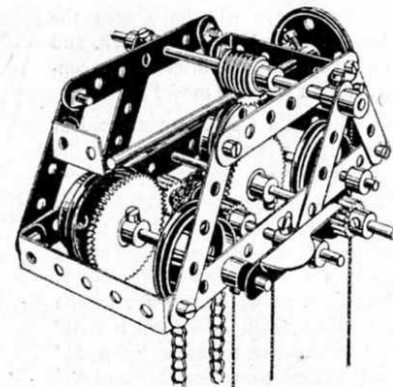


Fig. 201c

Separate views are given of two distinct parts composing the travelling crane. Fig. 201 is a complete view of the structure showing the braced gantry carrying a rail at each side. The rails are formed by angle girders butt-jointed. Fig. 201A shows the construction of the travelling gantry with two pairs of wheels so arranged as to fit the gauge of the rails. The gantry is caused to travel to and fro on the rails by a cord which is connected to the gantry by a nut and bolt 1 and passes over a pulley at each end of the rail, secured to the rod. On one of these rods is secured a $1\frac{1}{2}$ " pulley carrying the driving cord, which passes over a pulley wheel secured to the crank handle. The winch Fig. 201B again is arranged to run on the gantry rails of 201A, and is provided with a cranked hoisting axle 2 and another axle 3 for traversing the winch.

Fig. 201c is an alternative winch.

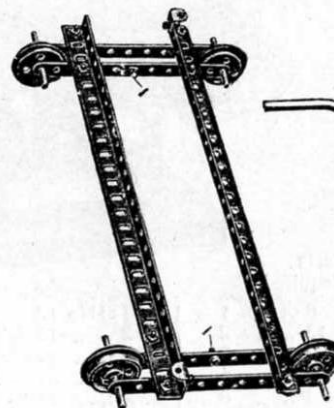


Fig. 201A

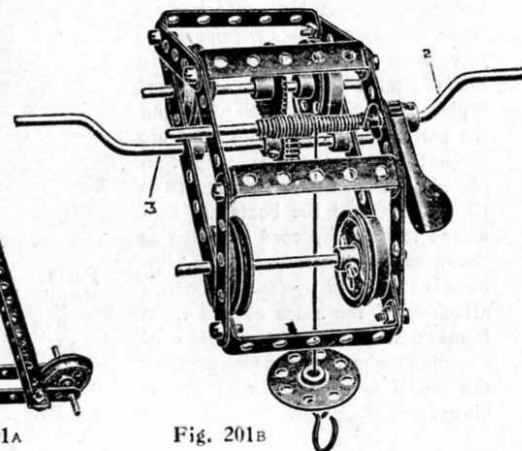
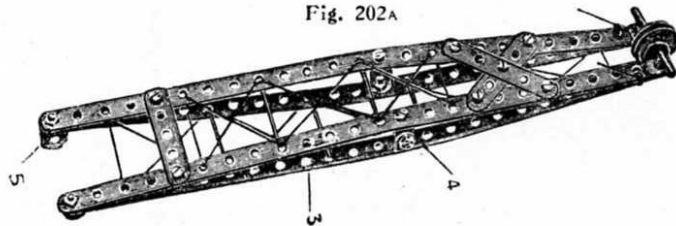


Fig. 201B

This Model Can be made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 202 Elevated Jib Crane

Fig. 202A



Parts Required :

| | |
|------------|-------------|
| 4 of No. 1 | 1 of No. 24 |
| 7 " " 2 | 2 " " 26 |
| 2 " " 3 | 1 " " 27A |
| 11 " " 5 | 1 " " 28 |
| 4 " " 8 | 9 " " 35 |
| 2 " " 11 | 64 " " 37 |
| 11 " " 12 | 1 " " 45 |
| 2 " " 13 | 1 " " 46 |
| 2 " " 15 | 2 " " 52 |
| 3 " " 17 | 3 " " 53 |
| 4 " " 20 | 1 " " 54 |
| 1 " " 21 | 1 " " 57 |
| 4 " " 22 | 5 " " 59 |
| 1 " " 22A | 4 " " 60 |

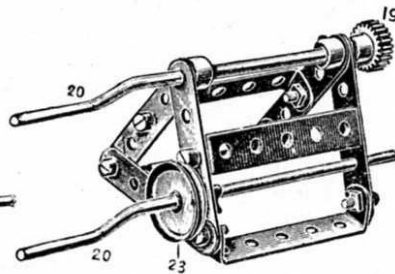


Fig. 202c

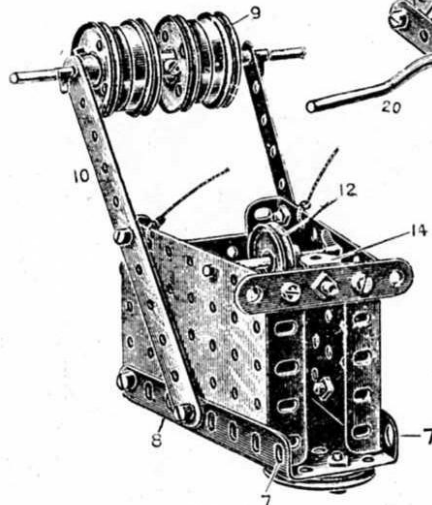
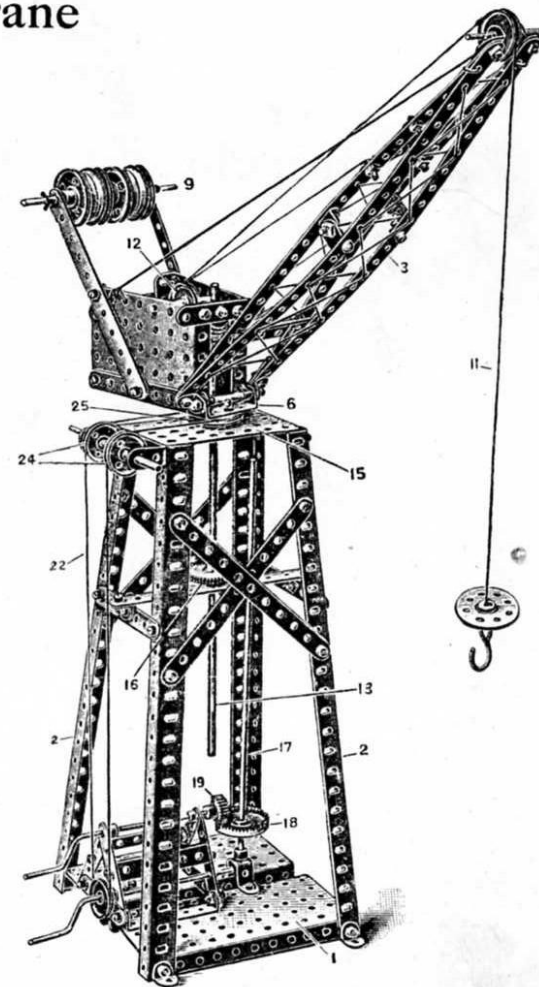


Fig. 202B

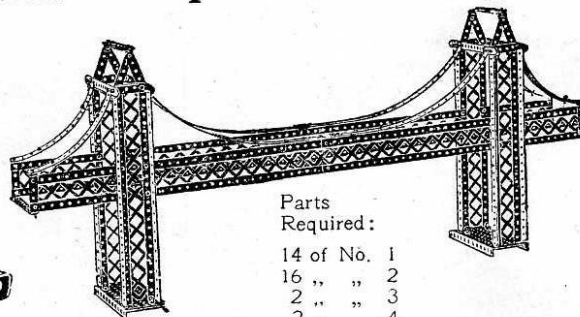
The base of the main frame is composed of two large flanged plates 1, to the outer corners of which are bolted the vertical angle girders 2. The jib, Fig. 202A, is made from 12½" strips 3 distended centrally by double brackets 4 and bolted together at the ends. Angle brackets 5 form the pivots for the jib about a spindle 6 mounted in the end holes 7 of the flanges of the sector plate 8 forming the base of the upper gear box, Fig. 202B. The balance weight 9 is composed of several flanged wheels carried from 5½" strips 10. The hoisting cord 11 passes over the jib end pulley to the guide pulley 12, and winds on the upper end of the vertical spindle 13, carried in the angle bracket 14, and the top plate 15. The vertical spindle 13 is operated by a gear wheel 16 meshing with a ½" pinion on the other vertical spindle 17, which is driven by a contrate wheel 18 from a ½" pinion 19, Fig. 202c, on the cranked spindle 20. The swivelling of the jib is effected from the cranked spindle 21 by the continuous cord 22 which passes round the pulley wheel 23 over the pulley wheel 24, and round the 1½" pulley wheel 25, bolted to the under surface of the base sector plate 8 of the upper gear box.



These Models Can be Made with MECCANO Outfit No. 4. or No. 3 and No. 3A

Model
No. 203

Suspension Bridge



Parts
Required:

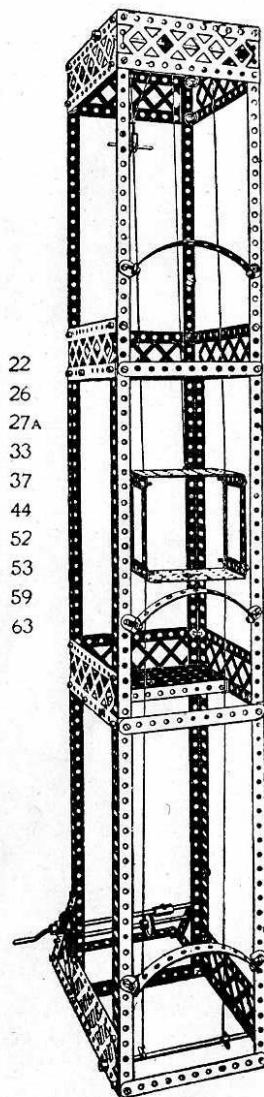
| | |
|-----------|----|
| 14 of No. | 1 |
| 16 " " | 2 |
| 2 " " | 3 |
| 2 " " | 4 |
| 12 " " | 5 |
| 8 " " | 8 |
| 4 " " | 11 |
| 22 " " | 12 |
| 98 " " | 37 |
| 2 " " | 52 |
| 3 " " | 53 |

Model
No. 205

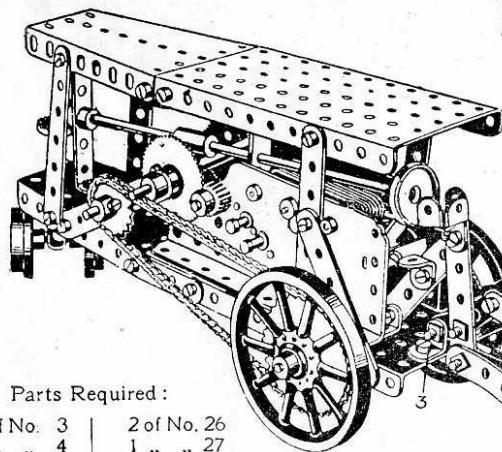
Elevator

Parts Required:

| | | | |
|----------|----|----------|-----|
| 4 of No. | 1 | 3 of No. | 22 |
| 20 " " | 2 | 1 " " | 26 |
| 4 " " | 3 | 1 " " | 27A |
| 2 " " | 4 | 1 " " | 33 |
| 2 " " | 5 | 74 " " | 37 |
| 8 " " | 8 | 1 " " | 44 |
| 9 " " | 12 | 2 " " | 52 |
| 2 " " | 14 | 2 " " | 53 |
| 1 " " | 15 | 5 " " | 59 |
| 2 " " | 17 | 1 " " | 63 |
| 1 " " | 19 | | |

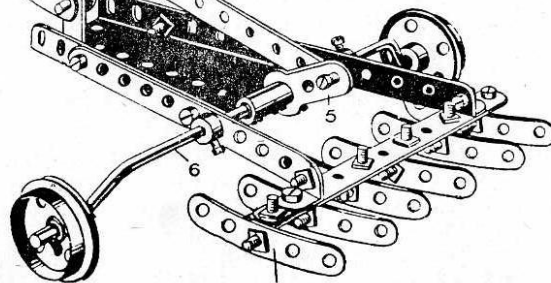


Model No. 204
Motor Plough



Parts Required:

| | | | |
|----------|-----|----------|-------|
| 8 of No. | 3 | 2 of No. | 26 |
| 2 " " | 4 | 1 " " | 27 |
| 12 " " | 5 | 1 " " | 29 |
| 2 " " | 10 | 4 " " | 35 |
| 1 " " | 11 | 65 " " | 37 |
| 15 " " | 12 | 2 " " | 52 |
| 2 " " | 15 | 3 " " | 54 |
| 4 " " | 16 | 8 " " | 59 |
| 1 " " | 17 | 2 " " | 60 |
| 1 " " | 18 | 2 " " | 62 |
| 2 " " | 19 | 4 " " | 63 |
| 2 " " | 19A | 2 " " | 95 |
| 4 " " | 20 | 2 " " | 96 |
| 1 " " | 22 | | Motor |



The ploughshares 1 are raised or lowered by the handle 2 pivoted to an angle bracket on the far side of the seat pillar, and connected by strips 4 to a crank 5 secured on the bent axle 6 of the wheels formed by crank handles.

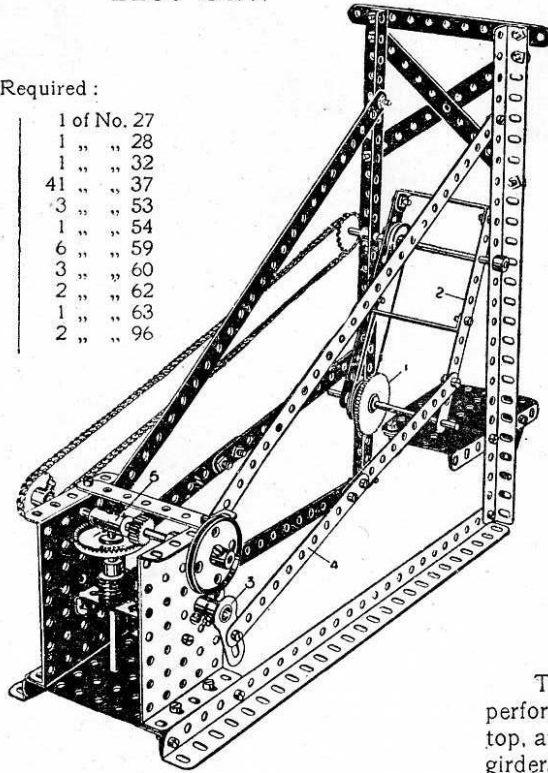
These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model
No. 206

Swinging Hot Saw

Parts Required :

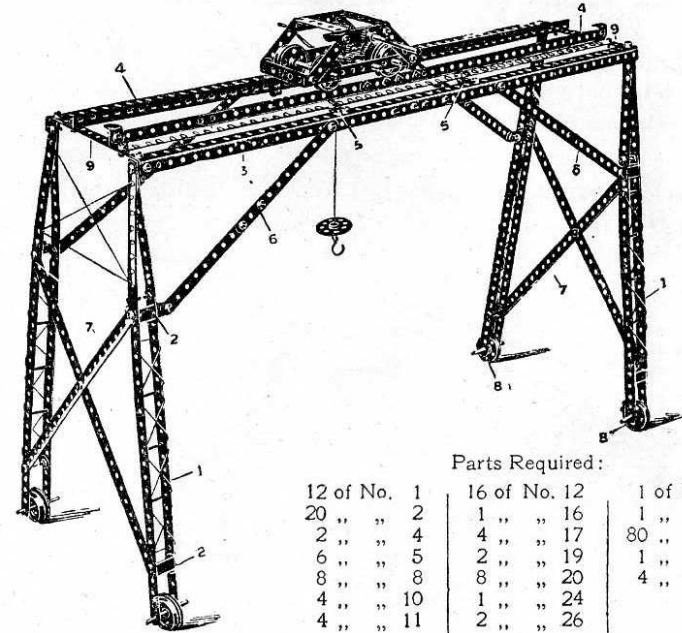
| | |
|------------|-------------|
| 2 of No. 1 | 1 of No. 27 |
| 9 " " 2 | 1 " " 28 |
| 2 " " 3 | 1 " " 32 |
| 1 " " 4 | 41 " " 37 |
| 4 " " 8 | 3 " " 53 |
| 1 " " 12 | 1 " " 54 |
| 2 " " 15 | 6 " " 59 |
| 3 " " 16 | 3 " " 60 |
| 1 " " 21 | 2 " " 62 |
| 2 " " 22 | 1 " " 63 |
| 2 " " 26 | 2 " " 96 |



The swinging frame 2 carrying the circular saw 1 is rocked to and fro by a continuous rotary movement of the crank 3 through the connecting strips 4. The coupling 5 is loose on the sprocket wheel spindle and forms a bearing for the spindle of the worm.

Model
No. 207

Travelling Crane



Parts Required :

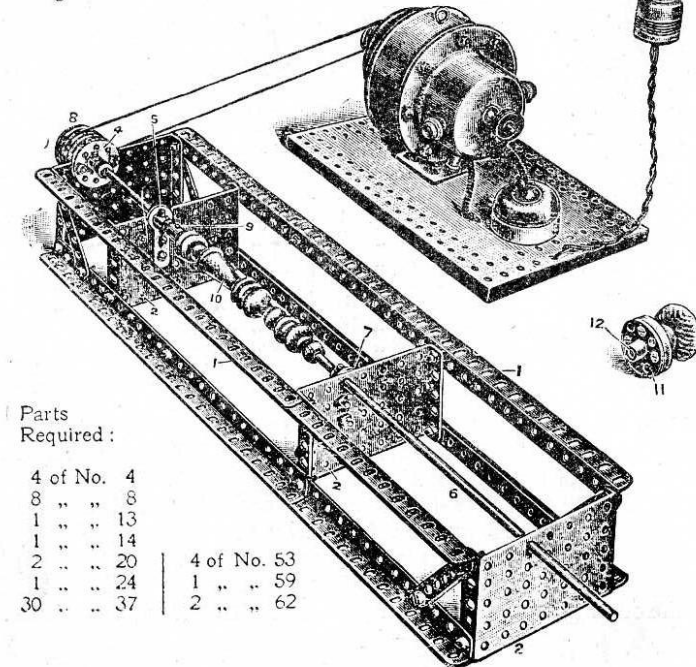
| | | |
|-------------|--------------|--------------|
| 12 of No. 1 | 16 of No. 12 | 1 of No. 27A |
| 20 " " 2 | 1 " " 16 | 1 " " 33 |
| 2 " " 4 | 4 " " 17 | 80 " " 37 |
| 6 " " 5 | 2 " " 19 | 1 " " 57 |
| 8 " " 8 | 8 " " 20 | 4 " " 60 |
| 4 " " 10 | 1 " " 24 | |
| 4 " " 11 | 2 " " 26 | |

The side frames of this model are similarly constructed. Each leg 1 is made of $12\frac{1}{2}$ " and $5\frac{1}{2}$ " perforated strips overlapped two holes and distended by double brackets 2 and bolted together at the top, and to angle brackets bolted to the ends of the outer horizontal angle girders 3. The inner angle girders 4 are reversed with their webs up, to form rails for the crane. The central parts of the girders 4 are supported by flat brackets 5, and the outer girders 3 are braced by the diagonal $5\frac{1}{2}$ " strips 6 bolted to the legs 1 and the girders 3. Each end pair of legs is also braced by the crossed $12\frac{1}{2}$ " strips 7. The whole gantry travels on the flanged wheels 8 carried on 2" rods passed through the lowest holes of the legs 1. $5\frac{1}{2}$ " strips 9 connect the outer girders 3 and inner girders 4. The winch is constructed as shown in Fig. 201B.

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 208 Lathe

This model is but one example of the great practical possibilities to which the Meccano system of construction may be applied. The illustration shows a model lathe, the framework of which is built very rigidly of overlapped angle girders 1, to which are bolted by their flanges four small flanged plates 2, the fast headstock of the lathe being provided by a rod 3, one end journalled in a bush wheel 4 bolted to the end plate, and the other journalled in the boss of a crank 5. The loose headstock is formed by an axle 6 journalled in



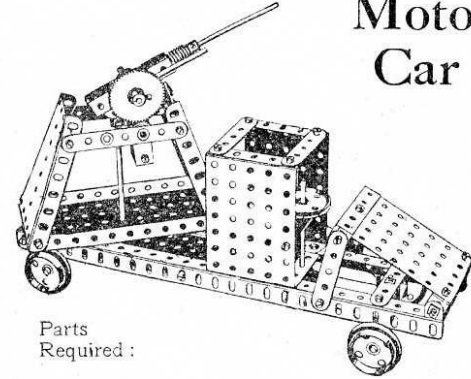
Parts
Required:

| | |
|-------------|--|
| 4 of No. 4 | |
| 8 " " 8 | |
| 1 " " 13 | |
| 1 " " 14 | |
| 2 " " 20 | |
| 1 " " 24 | |
| 30 " " 37 | |
| 4 of No. 53 | |
| 1 " " 59 | |
| 2 " " 62 | |

the end plate 2, and a crank 7 motor is carried round two spindle 3, on the other end of which is gripped a coupling 9 by one of its screws, this coupling being also secured to a centre fork driven into the article 10 to be turned. The detail view to the right shows how a knob or other article may be screwed to a bush wheel 11, the base 12 of which is gripped by its screw to the headstock spindle 3 to form a chuck or face plate. The electric motor shown in the illustration is one-thirtieth horse-power.

Model No. 209

Armoured Motor Car



Parts
Required:

| | |
|------------|--|
| 2 of No. 3 | |
| 2 " " 5 | |
| 2 " " 8 | |
| 2 " " 11 | |
| 2 " " 12 | |
| 2 " " 15 | |
| 2 " " 15A | |
| 1 " " 16 | |
| 3 " " 17 | |
| 4 " " 20 | |
| 1 " " 21 | |
| 4 " " 22 | |
| 1 " " 24 | |
| 1 " " 26 | |
| 1 " " 27 | |
| 1 " " 32 | |
| 43 " " 37 | |
| 1 " " 45 | |
| 2 " " 52 | |
| 3 " " 53 | |
| 2 " " 54 | |
| 1 " " 59 | |
| 7 " " 60 | |
| 1 " " 62 | |
| 1 " " 63 | |

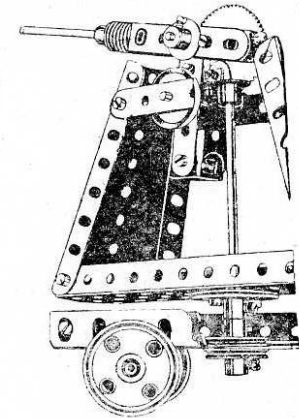


Fig. No. 209A

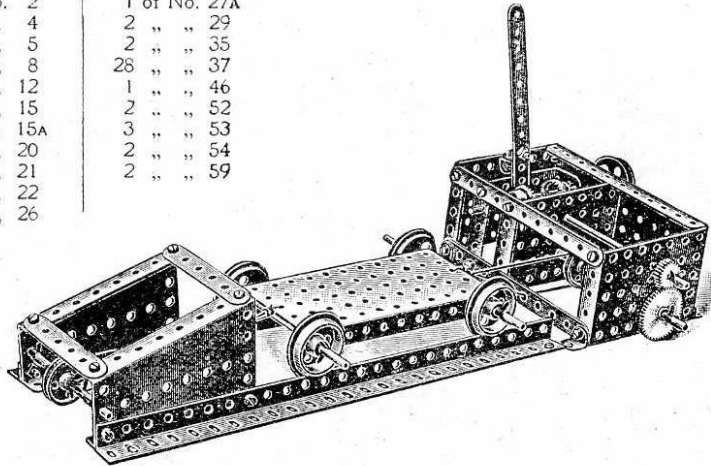
These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 210

Cable Railway

Parts Required :

| | |
|------------|--------------|
| 3 of No. 2 | 1 of No. 27A |
| 2 " " 4 | 2 " " 29 |
| 1 " " 5 | 2 " " 35 |
| 2 " " 8 | 28 " " 37 |
| 6 " " 12 | 1 " " 46 |
| 4 " " 15 | 2 " " 52 |
| 2 " " 15A | 3 " " 53 |
| 4 " " 20 | 2 " " 54 |
| 1 " " 21 | 2 " " 59 |
| 2 " " 22 | |
| 2 " " 26 | |



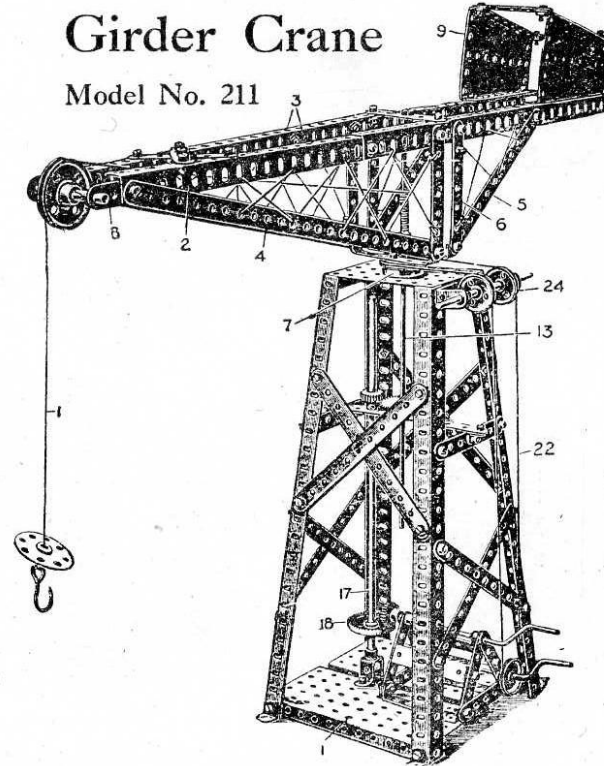
Our illustration hardly does this excellent model justice, owing to the parts having to be so crowded together. This is a very fine model, both instructive and highly interesting.

The driving power is received at the outer $1\frac{1}{2}$ " pulley, and is transmitted through the clutch mechanism and the pinion and gear wheels to the lower spindle on which the driving pulley is fixed, the driving rope passing round this pulley and the second pulley at the end of the rails, all as shown in the drawing.

In fixing the lever for operating the clutch mechanism, the nuts should be locked to prevent the screw working out. Only one section of rails is shown in the design, but they may be extended as desired.

Girder Crane

Model No. 211



Parts Required :

| | |
|------------|--|
| 2 of No. 1 | |
| 11 " " 2 | |
| 6 " " 3 | |
| 14 " " 5 | |
| 8 " " 8 | |
| 6 " " 12 | |
| 2 " " 13 | |
| 1 " " 16 | |
| 1 " " 17 | |
| 2 " " 19 | |
| 1 " " 20 | |
| 1 " " 21 | |
| 3 " " 22 | |
| 1 " " 24 | |
| 2 " " 26 | |
| 1 " " 27A | |
| 1 " " 28 | |
| 6 " " 35 | |
| 75 " " 37 | |
| 1 " " 45 | |
| 1 " " 46 | |
| 2 " " 52 | |
| 1 " " 53 | |
| 2 " " 54 | |
| 1 " " 57 | |
| 4 " " 59 | |
| 6 " " 60 | |

The lower structure of this model is identical with that of Fig. 202. The hoisting cord 1 after passing over the end jib pulley, winds on the $1\frac{1}{2}$ " rod 13, as described in Fig. 202. The jib is built up of horizontal angle girders 3, overlapped 8 holes and strengthened by the diagonal $12\frac{1}{2}$ " strips 4 and $5\frac{1}{2}$ " strips 5 connected to the vertical $3\frac{1}{2}$ " strips 6 bolted at the bottom to $2\frac{1}{2}$ " bent strips bolted to the flanged wheel 7. $2\frac{1}{2}$ " strips 8 extend from the angle girders 3 to carry the jib pulley. The balance weight is formed by two sector plates 9.

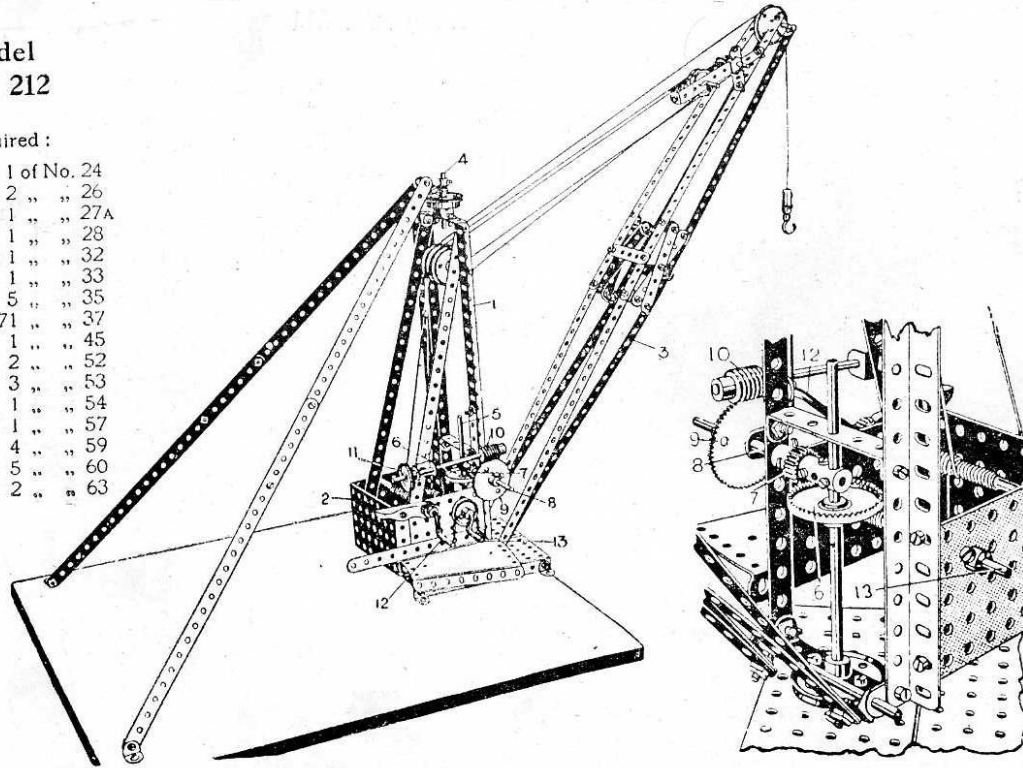
These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Swivelling and Luffing Jib Crane

Model
No. 212

Parts Required:

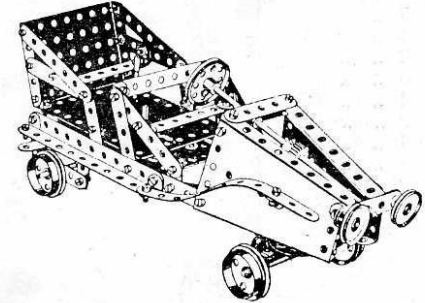
| | |
|-------------|-------------|
| 14 of No. 1 | 1 of No. 24 |
| 1 " " 2 | 2 " " 26 |
| 4 " " 3 | 1 " " 27A |
| 5 " " 5 | 1 " " 28 |
| 2 " " 8 | 1 " " 32 |
| 4 " " 10 | 1 " " 33 |
| 7 " " 11 | 5 " " 35 |
| 16 " " 12 | 71 " " 37 |
| 1 " " 15 | 1 " " 45 |
| 1 " " 15A | 2 " " 52 |
| 2 " " 16 | 3 " " 53 |
| 4 " " 17 | 1 " " 54 |
| 2 " " 19 | 1 " " 57 |
| 4 " " 20 | 4 " " 59 |
| 1 " " 21 | 5 " " 60 |
| 1 " " 22 | 2 " " 63 |
| 3 " " 22A | |



This is a model of a crane having a luffing action for the jib, that is raising or lowering, and a swivelling action for swinging the jib round. The whole frame 1, gearbox 2, and jib 3 swivel about the pivots 4 and 5, the lower rod 5 having a contrate wheel 6 fixed thereon engaged by a pinion 7 on the axle rod 8 which carries the worm wheel 9 driven by the worm 10 rotated by the pulley wheel 11, the pinion 7 riding on the fixed wheel 6 as on a rack. The jib is luffed from the crank handle 12, and the load raised or lowered from the handle 13.

Model No. 213

Automobile



Parts Required:

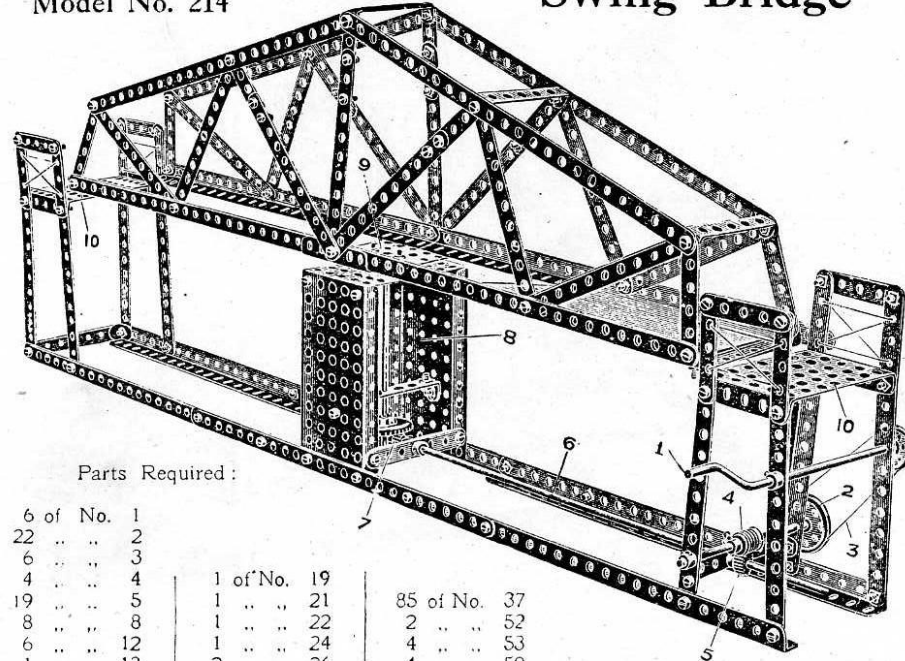
| | |
|------------|-------------|
| 8 of No. 2 | 1 of No. 21 |
| 5 " " 3 | 2 " " 22 |
| 4 " " 4 | 1 " " 24 |
| 9 " " 5 | 2 " " 26 |
| 6 " " 10 | 1 " " 28 |
| 28 " " 12 | 1 " " 29 |
| 1 " " 14 | 17 " " 37 |
| 1 " " 15 | 1 " " 45 |
| 1 " " 15A | 1 " " 53 |
| 1 " " 17 | 2 " " 54 |
| 4 " " 20 | 4 " " 59 |
| | 2 " " 60 |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

11

Model No. 214

Swing Bridge

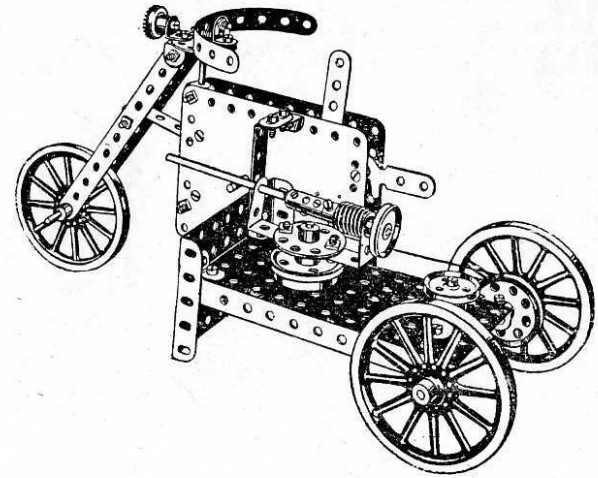


Parts Required :

| | | |
|------------|-------------|--------------|
| 6 of No. 1 | | |
| 22 " " 2 | | |
| 6 " " 3 | | |
| 4 " " 4 | 1 of No. 19 | |
| 19 " " 5 | 1 " " 21 | 85 of No. 37 |
| 8 " " 8 | 1 " " 22 | 2 " " 52 |
| 6 " " 12 | 1 " " 24 | 4 " " 53 |
| 1 " " 13 | 2 " " 26 | 4 " " 59 |
| 2 " " 15 | 1 " " 28 | 5 " " 60 |
| 1 " " 16 | 1 " " 32 | 1 " " 63 |

The construction of this model will be quite apparent from the illustration. The crank handle 1 drives a pulley 2 by means of the cord 3. On the pulley spindle 2 is fixed a worm 4 geared with a $\frac{1}{2}$ " pinion 5 on the axle 6, another $\frac{1}{2}$ " pinion on the end of which drives a contrate wheel 7 on the vertical spindle 8 which carries the bridge, this spindle being secured to a bush wheel fastened to the underside of the small flanged plate 9 in the centre of the bridge. By operating the handle 1 the bridge may be swung round to the open position, or its ends brought opposite to the landing platforms 10.

Model No. 215
Armoured Motor Tricycle



Parts Required :

| | | |
|------------|-------------|-------------|
| 4 of No. 2 | 1 of No. 20 | 2 of No. 45 |
| 1 " " 5 | 1 " " 21 | 1 " " 46 |
| 1 " " 10 | 4 " " 22 | 1 " " 52 |
| 3 " " 11 | 1 " " 22A | 1 " " 53 |
| 6 " " 12 | 2 " " 24 | 8 " " 59 |
| 2 " " 15 | 1 " " 29 | 1 " " 60 |
| 1 " " 17 | 1 " " 33 | 1 " " 62 |
| 1 " " 18 | 29 " " 37 | 1 " " 63 |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model
No. 216

Mechanical Cross Bow

The only part of this model requiring description is the release. To the inside of the angle girders is bolted a double bracket 1 through which slides the rod 2; at the other end of this rod are secured two collars between a double bracket threaded on to the rod, which slide down the channel of the girder strips when the bow is drawn back. The rod 3 of the small travelling frame 4 engages between the two set screws 5. As the frame 4 travels backwards, it is disengaged from the screws 5 by being lifted owing to the $5\frac{1}{2}$ " strips 6 being gradually inclined upwards to the rear.

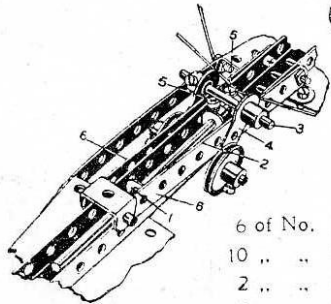


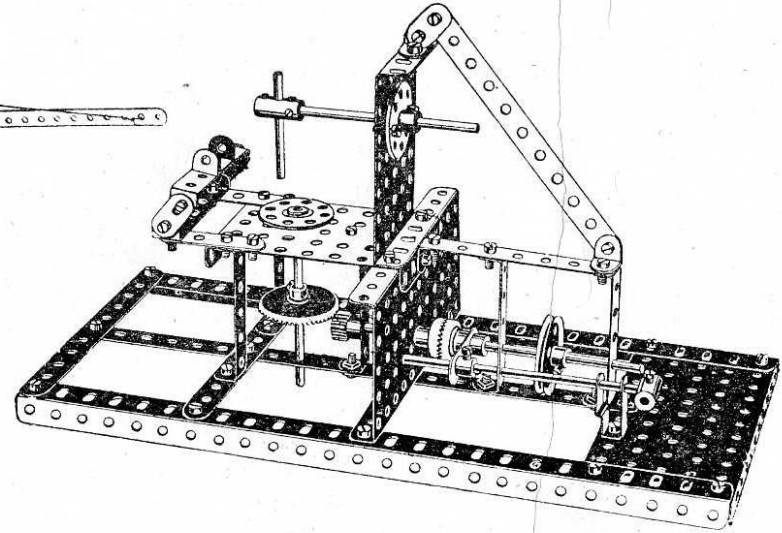
Fig. 216A

Parts Required:

| | | |
|------------|-------------|--------------|
| 6 of No. 1 | 1 of No. 11 | 53 of No. 37 |
| 10 " " 2 | 5 " " 12 | 2 " " 52 |
| 2 " " 3 | 1 " " 15 | 2 " " 54 |
| 5 " " 5 | 1 " " 17 | 4 " " 59 |
| 4 " " 8 | 1 " " 19 | 2 " " 62 |
| | 2 " " 22 | |

Model
No. 217

Clay Modelling Machine

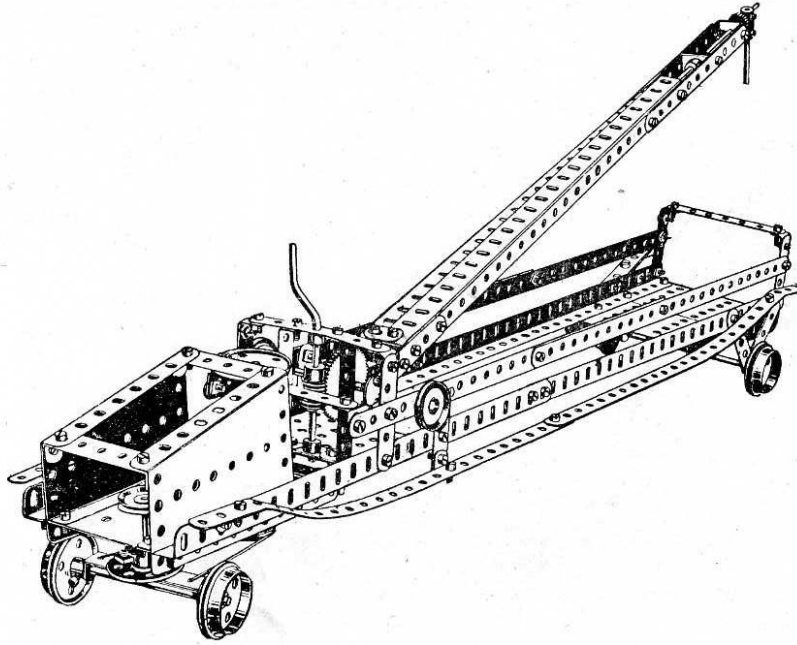


Parts Required:

| | | |
|------------|-------------|-------------|
| 4 of No. 2 | 1 of No. 15 | 2 of No. 29 |
| 1 " " 3 | 2 " " 16 | 41 " " 37 |
| 2 " " 5 | 1 " " 17 | 2 " " 52 |
| 2 " " 8 | 1 " " 21 | 2 " " 53 |
| 3 " " 10 | 2 " " 24 | 2 " " 59 |
| 1 " " 11 | 1 " " 26 | 7 " " 60 |
| 3 " " 12 | 1 " " 28 | 1 " " 62 |
| 1 " " 14 | | 2 " " 63 |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

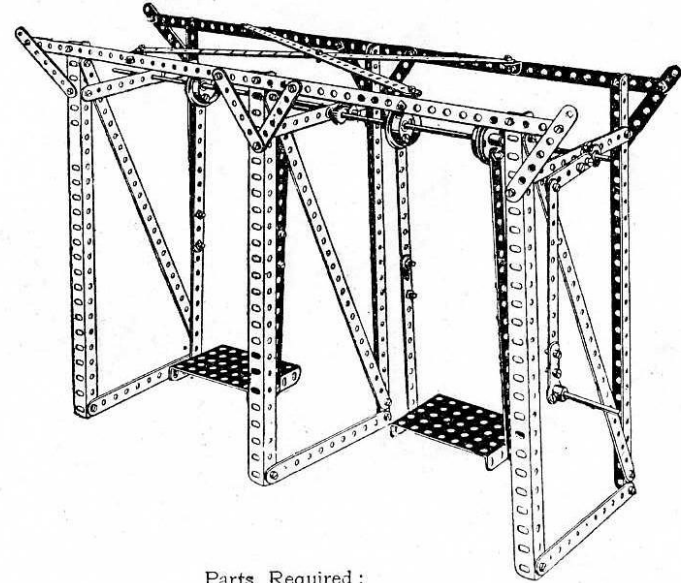
Model No. 218 Fire Watertower



Parts Required :

| | | |
|------------|-------------|--------------|
| 4 of No. 1 | 2 of No. 16 | 98 of No. 37 |
| 2 " " 2 | 2 " " 17 | 1 " " 45 |
| 5 " " 3 | 1 " " 19 | 1 " " 52 |
| 14 " " 5 | 4 " " 20 | 3 " " 53 |
| 8 " " 8 | 1 " " 21 | 2 " " 54 |
| 2 " " 10 | 4 " " 22 | 5 " " 59 |
| 2 " " 11 | 2 " " 24 | 3 " " 60 |
| 12 " " 12 | 1 " " 26 | 2 " " 62 |
| 3 " " 15A | 1 " " 27A | 1 " " 63 |
| | 1 " " 32 | |

Model No. 219 Alternating Swing



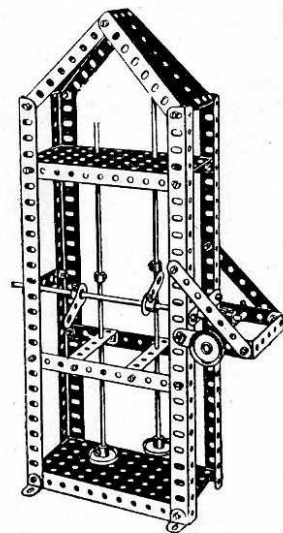
Parts Required :

| | |
|------------|-------------|
| 9 of No. 1 | 4 of No. 20 |
| 15 " " 2 | 2 " " 26 |
| 6 " " 3 | 68 " " 37 |
| 2 " " 4 | 2 " " 53 |
| 4 " " 12 | 2 " " 59 |
| 2 " " 13 | 2 " " 62 |
| 1 " " 17 | |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model
No. 220

Trip-Hammer

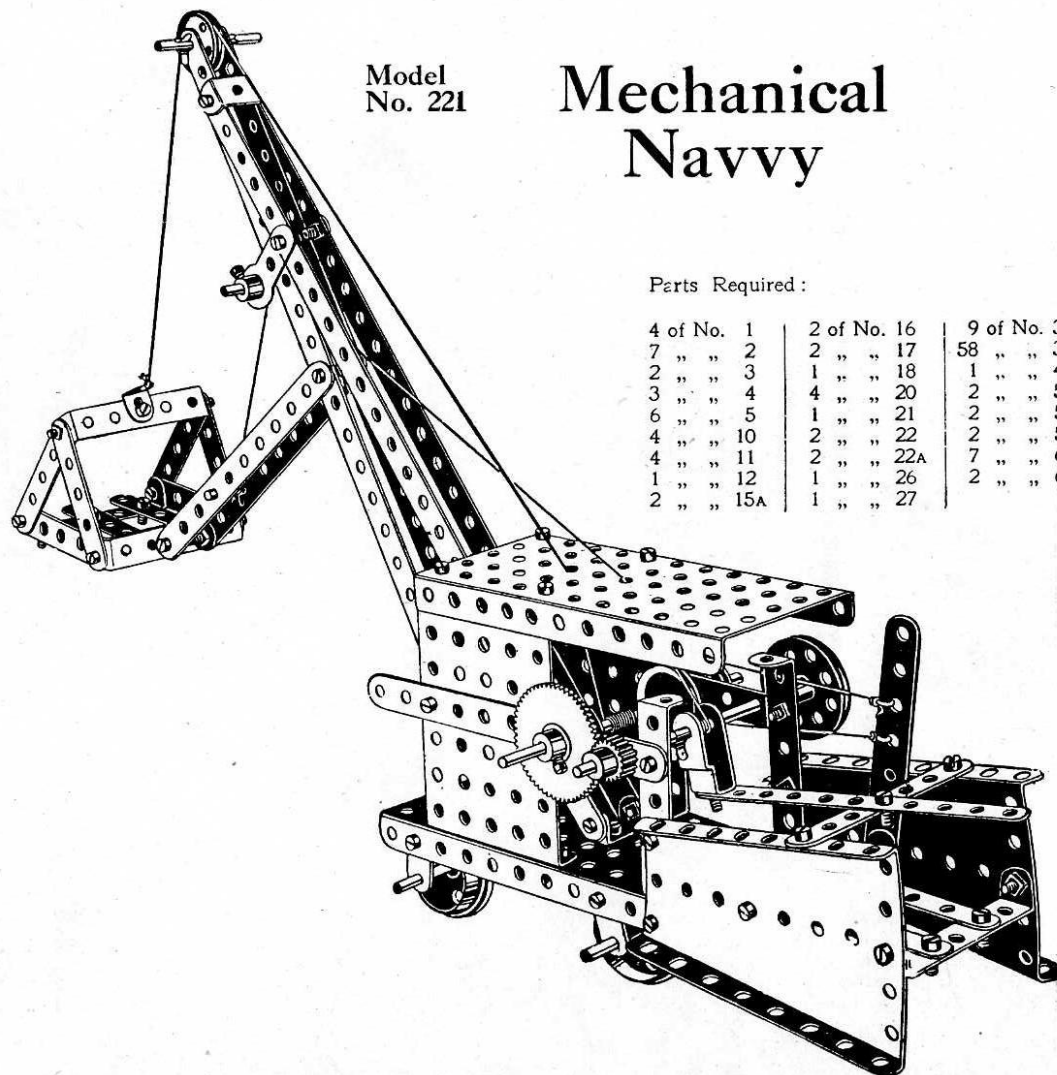


Parts Required :

| | |
|------------|-------------|
| 2 of No. 2 | 3 of No. 22 |
| 2 " " 3 | 1 " " 26 |
| 4 " " 5 | 1 " " 32 |
| 4 " " 8 | 32 " " 37 |
| 4 " " 12 | 2 " " 52 |
| 2 " " 13 | 2 " " 54 |
| 1 " " 14 | 4 " " 59 |
| 1 " " 16 | 3 " " 60 |
| 1 " " 17 | 2 " " 62 |
| | 1 " " 63 |

Model
No. 221

Mechanical Navy



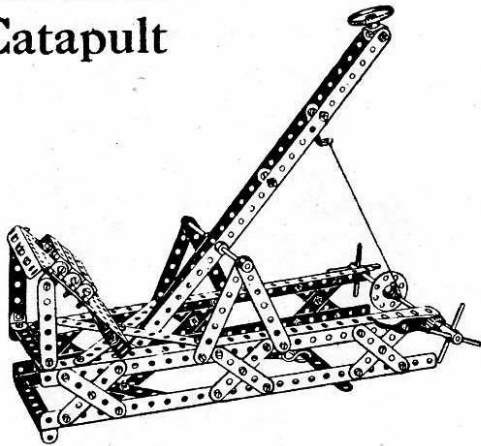
Parts Required :

| | | |
|------------|-------------|-------------|
| 4 of No. 1 | 2 of No. 16 | 9 of No. 35 |
| 7 " " 2 | 2 " " 17 | 58 " " 37 |
| 2 " " 3 | 1 " " 18 | 1 " " 44 |
| 3 " " 4 | 4 " " 20 | 2 " " 52 |
| 6 " " 5 | 1 " " 21 | 2 " " 53 |
| 4 " " 10 | 2 " " 22 | 2 " " 54 |
| 4 " " 11 | 2 " " 22A | 7 " " 60 |
| 1 " " 12 | 1 " " 26 | 2 " " 62 |
| 2 " " 15A | 1 " " 27 | |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 222

Catapult

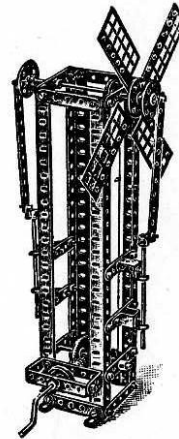


Parts
Required :

| | |
|----------|----|
| 2 of No. | 1 |
| 5 " | 2 |
| 6 " | 3 |
| 4 " | 4 |
| 12 " | 5 |
| 4 " | 8 |
| 2 " | 11 |
| 12 " | 12 |
| 1 " | 14 |
| 1 " | 15 |
| 4 " | 17 |
| 1 " | 24 |
| 1 " | 26 |
| 1 " | 28 |
| 1 " | 33 |
| 84 " | 37 |
| 1 " | 43 |
| 2 " | 53 |
| 4 " | 59 |
| 2 " | 63 |

Model No. 223

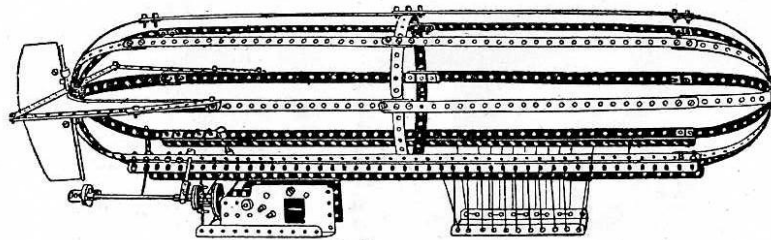
Double-action Windmill Pump



Parts Required :

| | | | |
|----------|----|----------|----|
| 2 of No. | 2 | 1 of No. | 24 |
| 14 " | 5 | 1 " | 26 |
| 4 " | 8 | 1 " | 28 |
| 2 " | 11 | 54 " | 37 |
| 10 " | 12 | 2 " | 45 |
| 3 " | 15 | 1 " | 46 |
| 1 " | 16 | 5 " | 59 |
| 1 " | 19 | 1 " | 60 |
| 1 " | 21 | 4 " | 61 |
| 2 " | 22 | 2 " | 62 |

Model No. 224 Airship

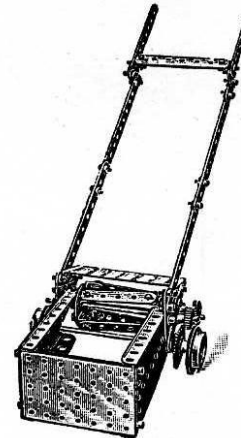


Parts Required :

| | | | | | | | |
|-----------|----|----------|----|----------|-----|----------|----|
| 12 of No. | 1 | 3 of No. | 15 | 1 of No. | 27A | 2 of No. | 52 |
| 20 " | 2 | 3 " | 17 | 1 " | 29 | 4 " | 59 |
| 4 " | 3 | 1 " | 21 | 2 " | 35 | 4 " | 60 |
| 6 " | 8 | 4 " | 22 | 2 " | 37 | 2 " | 62 |
| 2 " | 10 | 2 " | 24 | 108 " | 45 | 2 " | 63 |
| 2 " | 12 | 1 " | 26 | | | | |

Model No. 225

Lawn Mower

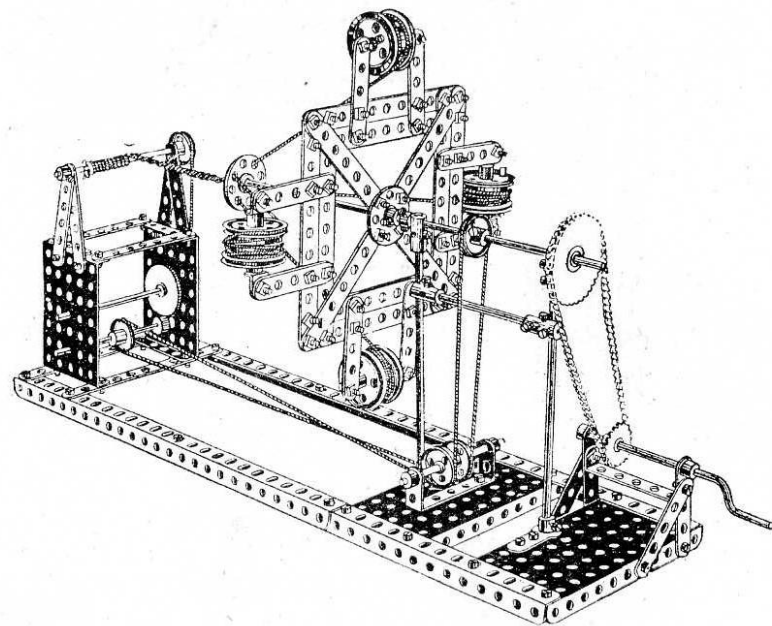


Parts Required .

| | | | |
|----------|----|----------|-----|
| 4 of No. | 2 | 1 of No. | 23 |
| 2 " | 3 | 2 " | 24 |
| 10 " | 5 | 1 " | 26 |
| 4 " | 10 | 1 " | 27A |
| 10 " | 12 | 50 " | 37 |
| 3 " | 15 | 3 " | 53 |
| 2 " | 20 | 2 " | 54 |
| 2 " | 22 | | |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 226 Wire Rope Maker



Parts Required :

| 10 of No. 2 | 2 of No. 14 | 2 of No. 22A |
|-------------|-------------|--------------|
| 6 " " 3 | 4 " " 15 | 1 " " 24 |
| 4 " " 4 | 1 " " 16 | 1 " " 26 |
| 12 " " 5 | 4 " " 17 | 1 " " 27A |
| 4 " " 8 | 1 " " 19 | 80 " " 37 |
| 8 " " 12 | 8 " " 20 | 2 " " 52 |
| 1 " " 13 | 4 " " 22 | 7 " " 59 |

Model No. 227

Delivery Van

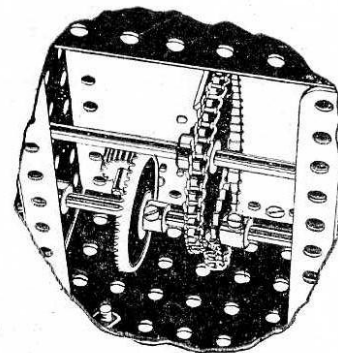
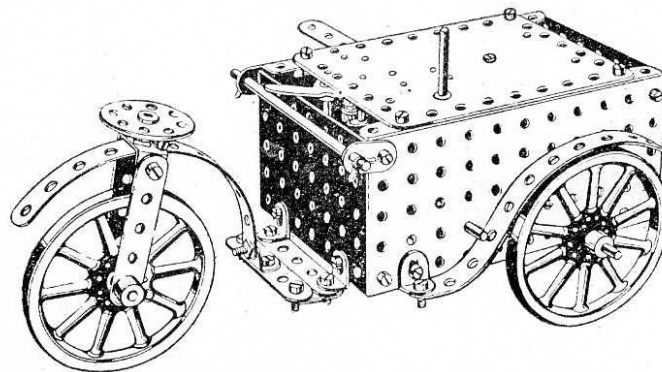


Fig. 227A

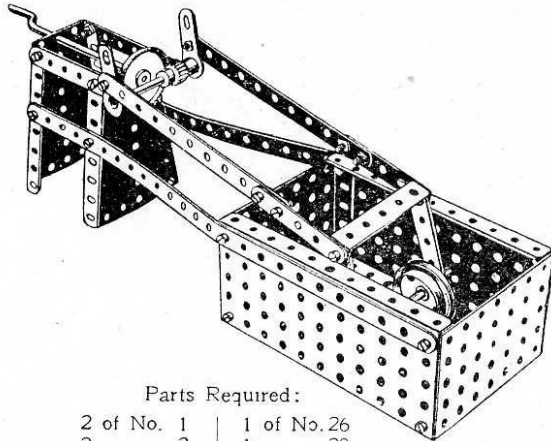
Parts Required :

| 3 of No. 2 | 1 of No. 28 |
|------------|-------------|
| 4 " " 5 | 2 " " 35 |
| 4 " " 10 | 27 " " 37 |
| 1 " " 11 | 2 " " 52 |
| 5 " " 12 | 2 " " 53 |
| 1 " " 15 | 6 " " 59 |
| 1 " " 15A | 9 " " 94 |
| 1 " " 18 | 1 " " 95 |
| 1 " " 24 | 1 " " 96 |
| 1 " " 25 | |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 228

Chocolate Mixer

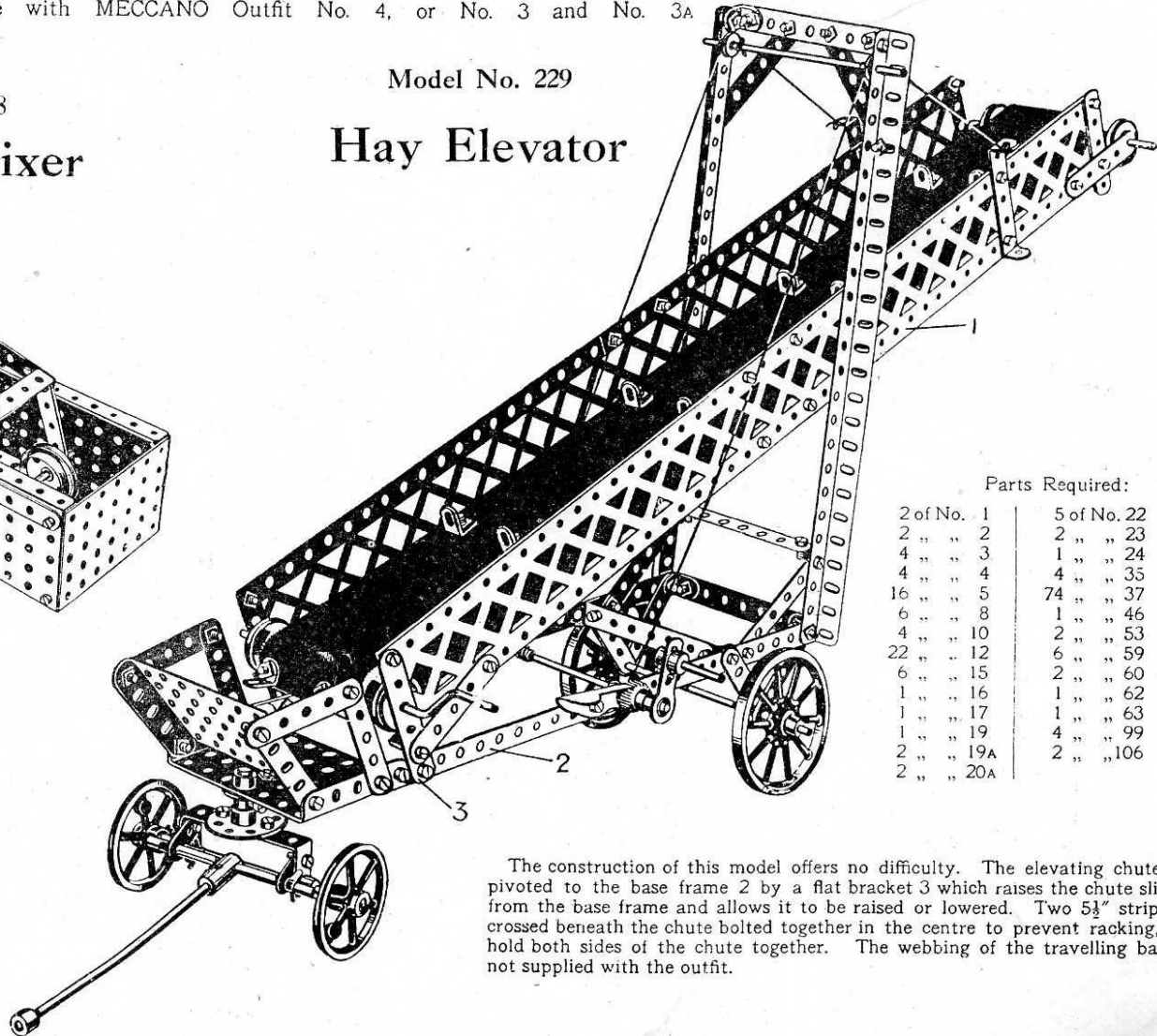


Parts Required:

| | |
|------------|-------------|
| 2 of No. 1 | 1 of No. 26 |
| 2 " 2 | 1 " 28 |
| 2 " 3 | 24 " 37 |
| 4 " 5 | 2 " 52 |
| 1 " 16 | 2 " 53 |
| 1 " 17 | 2 " 54 |
| 1 " 19 | 1 " 60 |
| 2 " 20 | 2 " 62 |

Model No. 229

Hay Elevator



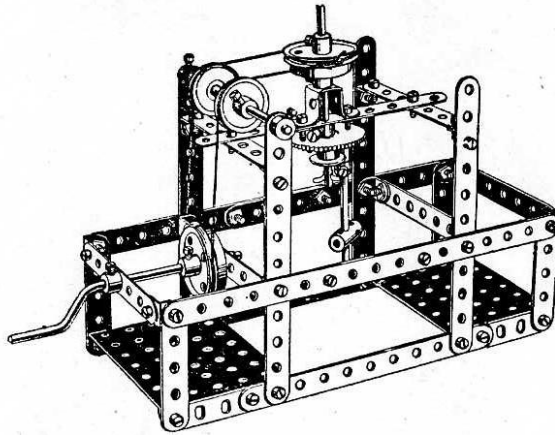
Parts Required:

| | |
|------------|-------------|
| 2 of No. 1 | 5 of No. 22 |
| 2 " 2 | 2 " 23 |
| 4 " 3 | 1 " 24 |
| 4 " 4 | 4 " 35 |
| 16 " 5 | 74 " 37 |
| 6 " 8 | 1 " 46 |
| 4 " 10 | 2 " 53 |
| 22 " 12 | 6 " 59 |
| 6 " 15 | 2 " 60 |
| 1 " 16 | 1 " 62 |
| 1 " 17 | 1 " 63 |
| 1 " 19 | 4 " 99 |
| 2 " 19A | 2 " 106 |
| 2 " 20A | |

The construction of this model offers no difficulty. The elevating chute 1 is pivoted to the base frame 2 by a flat bracket 3 which raises the chute slightly from the base frame and allows it to be raised or lowered. Two $5\frac{1}{2}$ " strips are crossed beneath the chute bolted together in the centre to prevent racking, and hold both sides of the chute together. The webbing of the travelling band is not supplied with the outfit.

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 230 Mixing Machine



Parts
Required :

| | |
|-----------|-----|
| 11 of No. | 2 |
| 6 " | 3 |
| 4 " | 5 |
| 12 " | 12 |
| 1 " | 15A |
| 2 " | 16 |
| 1 " | 19 |
| 2 " | 20 |
| 2 " | 22 |
| 1 " | 26 |
| 1 " | 27 |
| 43 " | 37 |
| 1 " | 45 |
| 2 " | 53 |
| 3 " | 59 |
| 2 " | 62 |
| 2 " | 63 |

Model No. 231 Distance Indicator

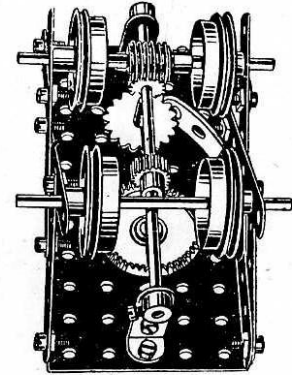
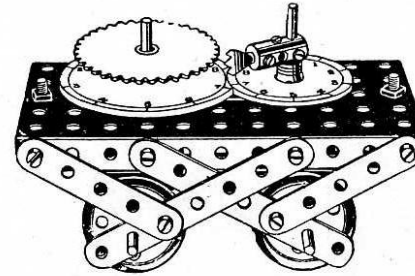
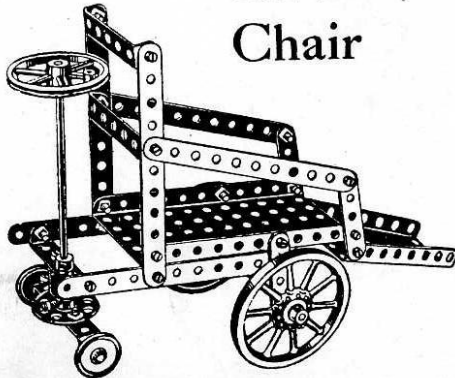


Fig. 231A

Parts Required :

| | | | |
|------------|-------------|-------------|-------------|
| 4 of No. 3 | 1 of No. 15 | 1 of No. 32 | 1 of No. 63 |
| 1 " " 4 | 2 " " 16 | 19 " " 37 | 1 " " 65 |
| 4 " " 5 | 4 " " 20 | 1 " " 52 | 1 " " 95 |
| 2 " " 10 | 2 " " 26 | 3 " " 59 | 1 " " 96 |
| 2 " " 12 | 1 " " 28 | 2 " " 62 | |

Model No. 232 Invalid Chair



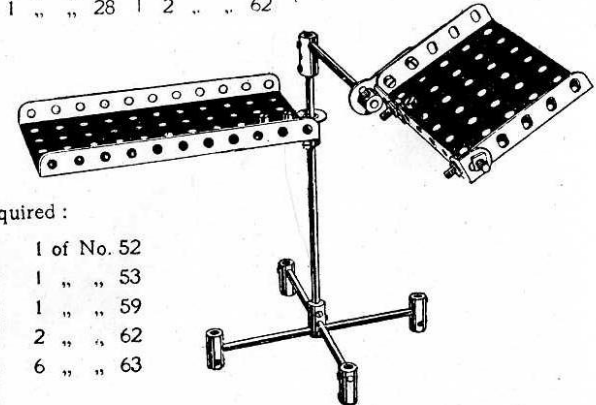
Parts
Required :

| | |
|----------|-----|
| 6 of No. | 2 |
| 4 " | 5 |
| 2 " | 15A |
| 1 " | 16 |
| 2 " | 19A |
| 1 " | 20A |
| 2 " | 22 |
| 1 " | 24 |
| 24 " | 37 |
| 1 " | 46 |
| 1 " | 52 |
| 1 " | 54 |
| 1 " | 59 |
| 4 " | 60 |

Model No. 233 Bed Table

Parts Required :

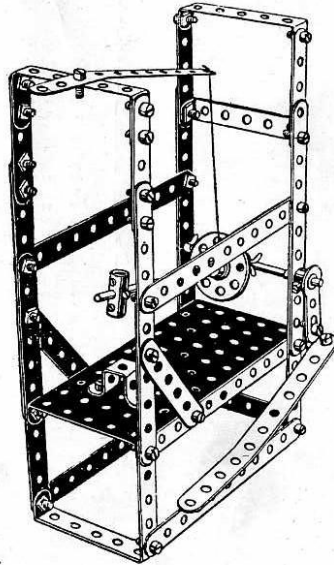
| | |
|------------|-------------|
| 1 of No. 3 | 1 of No. 52 |
| 2 " " 12 | 1 " " 53 |
| 1 " " 14 | 1 " " 59 |
| 2 " " 15A | 2 " " 62 |
| 1 " " 16 | 6 " " 63 |
| 8 " " 37 | |



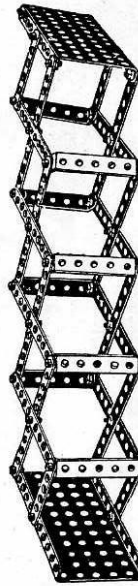
These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 234

Treadle Hammer



Parts
Required :
14 of No. 2
2 " " 4
4 " " 5
1 " " 15
1 " " 16
1 " " 24
4 " " 35
29 " " 37
1 " " 45
1 " " 52
5 " " 60
1 " " 62
2 " " 63



Model No. 235

Periscope

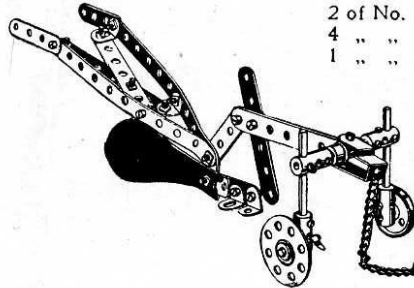
Parts Required :

16 of No. 2
4 " " 4
32 " " 37
2 " " 52
8 " " 60

Small pieces of
looking glass should
be inserted in the top
and bottom plates.

Model No. 237

Plough

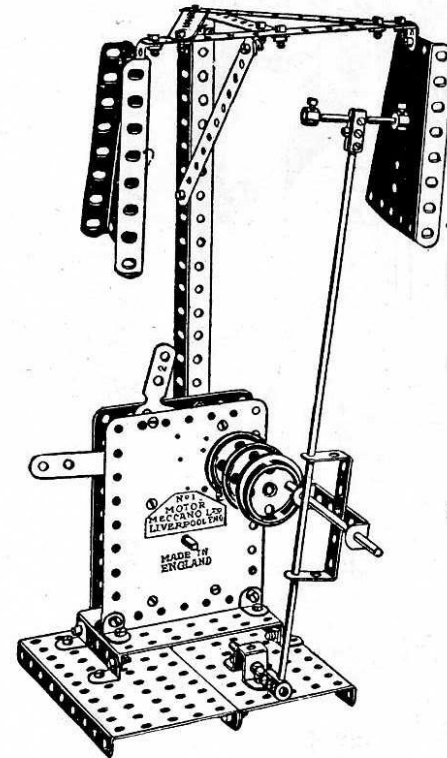


Parts Required

| | |
|------------|------------|
| 2 of No. 2 | 1 of No. 5 |
| 4 " " 3 | 4 " " 6 |
| 1 " " 4 | 6 " " 12 |
| | 2 " " 17 |
| | 1 " " 18 |
| | 1 " " 22 |
| | 1 " " 24 |
| | 15 " " 37 |
| | 1 " " 41 |
| | 1 " " 44 |
| | 2 " " 59 |
| | 4 " " 63 |
| | 3 " " 94 |

Model No. 236

Automatic Gong



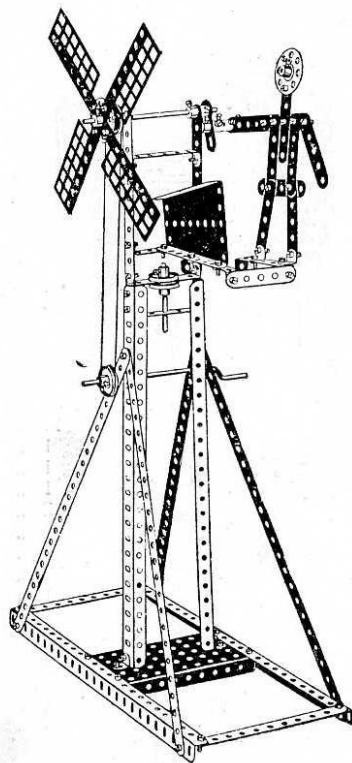
Parts
Required :

| | |
|------------|---|
| 5 of No. 2 | 2 |
| 1 " " 8 | |
| 11 " " 12 | |
| 1 " " 13 | |
| 1 " " 15 | |
| 1 " " 16 | |
| 2 " " 17 | |
| 3 " " 20 | |
| 2 " " 35 | |
| 29 " " 37 | |
| 1 " " 45 | |
| 1 " " 46 | |
| 2 " " 52 | |
| 2 " " 54 | |
| 3 " " 59 | |
| 1 " " 60 | |
| 2 " " 63 | |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 238

Windmill Scare

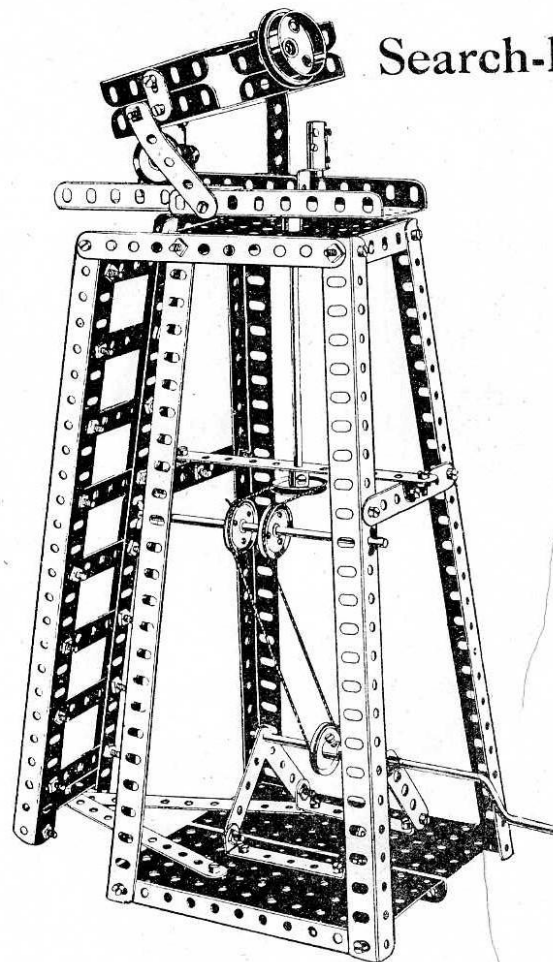


Parts
Required :

| | |
|----------|-----|
| 4 of No. | 1 |
| 4 " " | 2 |
| 10 " " | 5 |
| 4 " " | 8 |
| 4 " " | 12 |
| 1 " " | 15A |
| 2 " " | 17 |
| 1 " " | 19 |
| 4 " " | 22 |
| 2 " " | 24 |
| 49 " " | 37 |
| 1 " " | 52 |
| 1 " " | 54 |
| 4 " " | 59 |
| 6 " " | 60 |
| 4 " " | 61 |
| 1 " " | 62 |
| 1 " " | 63 |

Model No. 239

Search-light Tower



Parts
Required :

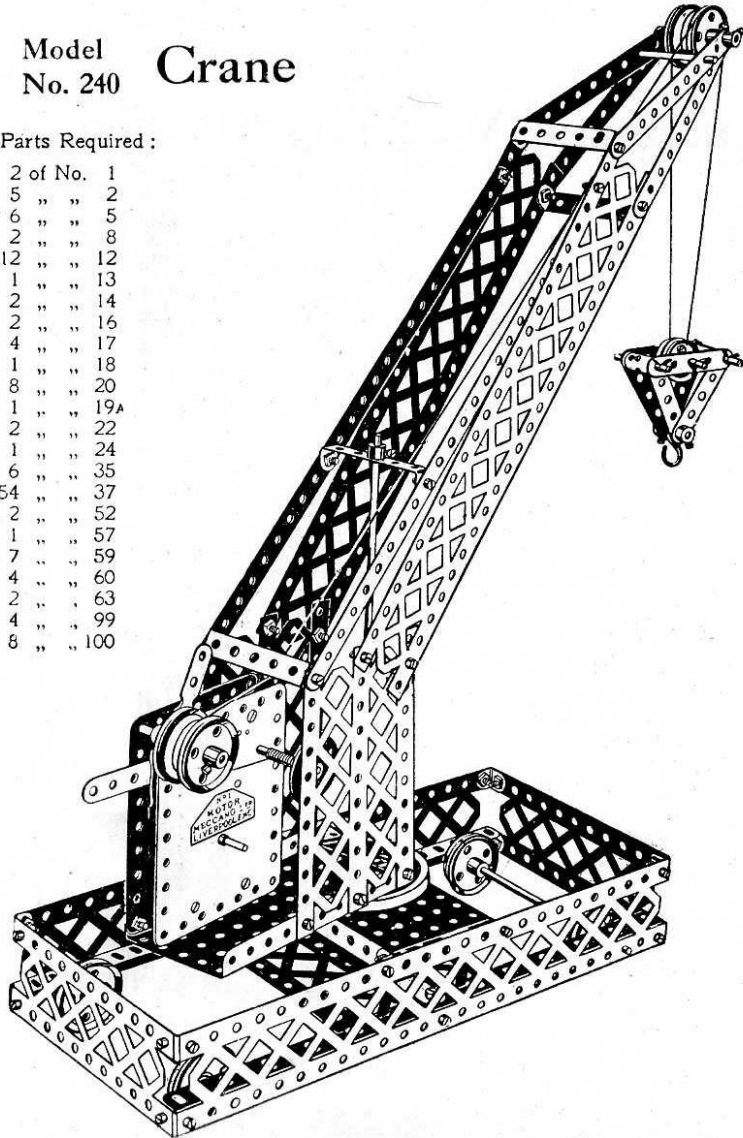
| | |
|----------|-----|
| 5 of No. | 2 |
| 2 " " | 3 |
| 15 " " | 5 |
| 6 " " | 8 |
| 2 " " | 10 |
| 1 " " | 11 |
| 4 " " | 12 |
| 1 " " | 14 |
| 1 " " | 15 |
| 1 " " | 18 |
| 1 " " | 19 |
| 1 " " | 20 |
| 3 " " | 22 |
| 2 " " | 22A |
| 1 " " | 24 |
| 4 " " | 35 |
| 64 " " | 37 |
| 1 " " | 44 |
| 2 " " | 52 |
| 2 " " | 53 |
| 2 " " | 54 |
| 1 " " | 59 |
| 2 " " | 60 |
| 1 " " | 63 |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 240 Crane

Parts Required :

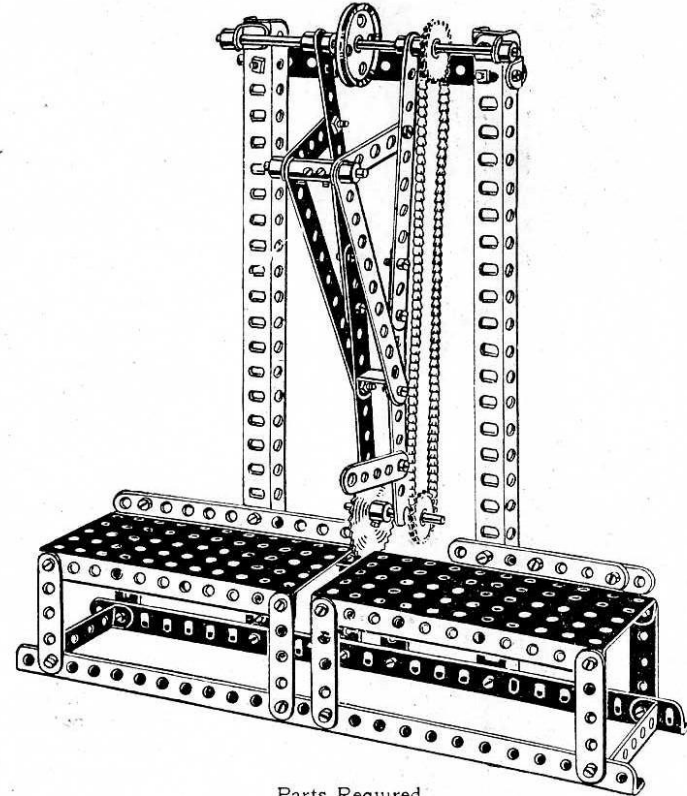
| | |
|----------|-----|
| 2 of No. | 1 |
| 5 " | 2 |
| 6 " | 5 |
| 2 " | 8 |
| 12 " | 12 |
| 1 " | 13 |
| 2 " | 14 |
| 2 " | 16 |
| 4 " | 17 |
| 1 " | 18 |
| 8 " | 20 |
| 1 " | 19A |
| 2 " | 22 |
| 1 " | 24 |
| 6 " | 35 |
| 54 " | 37 |
| 2 " | 52 |
| 1 " | 57 |
| 7 " | 59 |
| 4 " | 60 |
| 2 " | 63 |
| 4 " | 99 |
| 8 " | 100 |



Model No. 241 Swing Saw

Parts Required

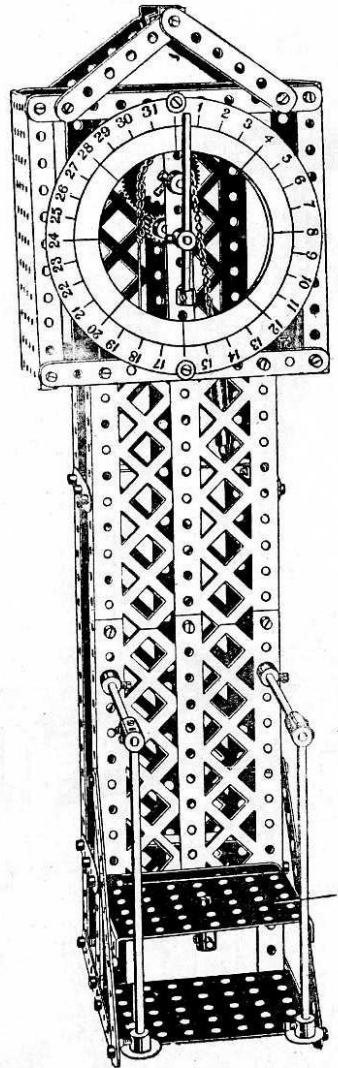
| | | | | | |
|----------|----|----------|----|----------|----|
| 8 of No. | 2 | 4 of No. | 12 | 8 of No. | 59 |
| 1 " | 3 | 1 " | 14 | 2 " | 60 |
| 12 " | 5 | 2 " | 17 | 1 " | 63 |
| 6 " | 8 | 1 " | 21 | 1 " | 94 |
| 1 " | 10 | 45 " | 37 | 1 " | 95 |
| 1 " | 11 | 2 " | 52 | 2 " | 96 |



This Model Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

Model No. 242

Automatic Weighing Machine



Parts Required

| | |
|------------|--------------|
| 9 of No. 2 | 61 of No. 37 |
| 4 " " 3 | 6" " 42 |
| 4 " " 4 | 1 " " 43 |
| 4 " " 5 | 2 " " 52 |
| 4 " " 8 | 2 " " 53 |
| 4 " " 12 | 6 " " 59 |
| 1 " " 13 | 1 " " 60 |
| 2 " " 15A | 2 " " 62 |
| 4 " " 16 | 3 " " 63 |
| 1 " " 24 | 1 " " 96 |
| 1 " " 26 | 2 " " 99 |
| 1 " " 27 | 6 " " 100 |

The platform 1 is connected by cross rod and coupling 2A to a rod 2 passing up the centre of the machine and guided in $3\frac{1}{2}$ " strips 3 connected to side strips 4. At the upper end of this rod 2 is a bush wheel 5, to which is connected a cord 6 and chain 7 which passes round the sprocket wheel 8 on the spindle of which is a gear wheel 9 engaging a pinion 10 on the spindle 12 carrying the pointer 13. The other end of the chain is coupled by a spring 14 to the frame, and the pointer is thus always returned to zero.

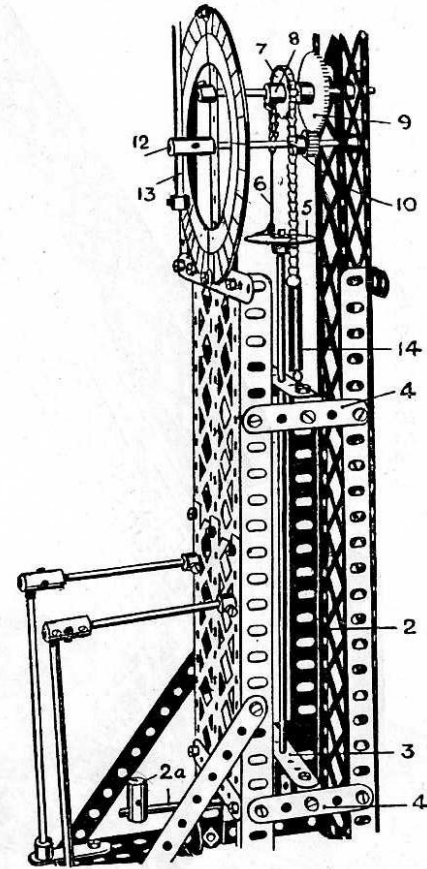
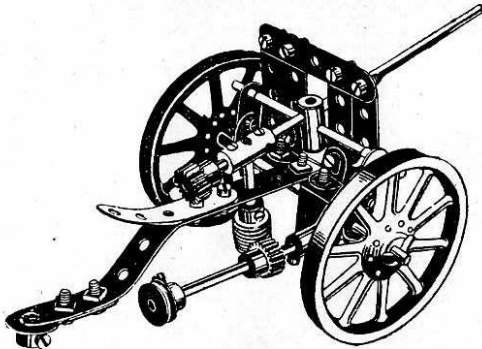


Fig. 242A.

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3r.

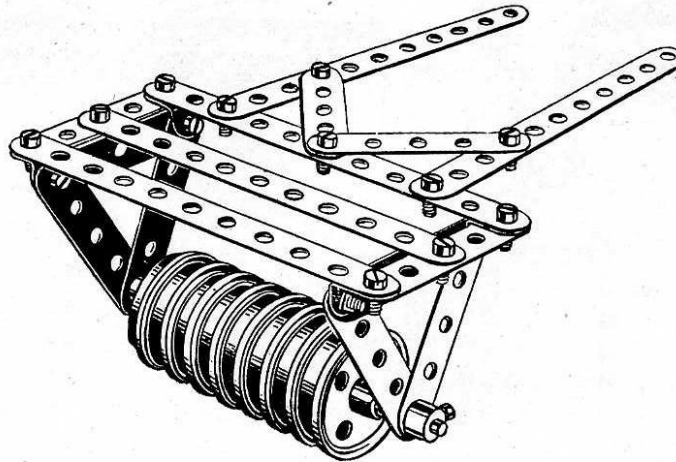
Model No. 243 Field Gun



Parts Required :

| | | |
|------------|-------------|--------------|
| 1 of No. 2 | 2 of No. 16 | 17 of No. 37 |
| 7 " " 5 | 1 " " 17 | 1 " " 44 |
| 2 " " 10 | 2 " " 19A | 2 " " 59 |
| 6 " " 12 | 1 " " 23A | 1 " " 60 |
| 1 " " 14 | 2 " " 26 | 1 " " 62 |
| 1 " " 15 | 1 " " 32 | 2 " " 63 |
| | 6 " " 35 | |

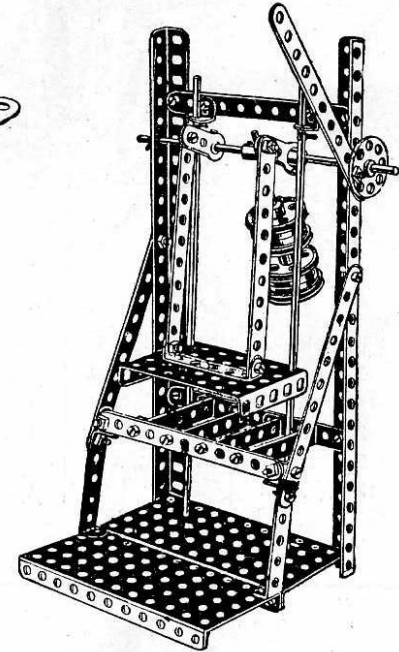
Model No. 244 Field Roller



Parts Required :

| | |
|------------|-------------|
| 5 of No. 2 | 8 of No. 20 |
| 10 " " 5 | 15 " " 37 |
| 4 " " 12 | 4 " " 59 |
| 1 " " 15 | |

Model No. 245 Potato Chopper

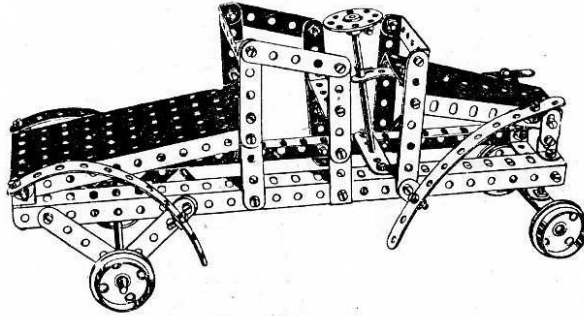


Parts Required :

| | | |
|---------------|-------------|-------------|
| 8 of No. 2 | 2 of No. 16 | 2 of No. 52 |
| 2 " " 8 | 4 " " 20 | 1 " " 53 |
| 4 " " 12 | 1 " " 24 | 6 " " 60 |
| 2 " " 13 | 5 " " 35 | 1 " " 63 |
| 1 " " 15A, 38 | " " 37 | |

These Models Can be Made with MECCANO Outfit No. 4, or No. 3 and No. 3A

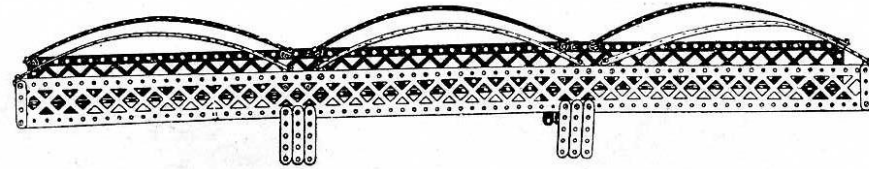
Model No. 246 Motor Car



Parts Required :

| | | |
|------------|-------------|--------------|
| 5 of No. 2 | 1 of No. 15 | 55 of No. 37 |
| 2 " " 3 | 2 " " 15A | 1 " " 45 |
| 14 " " 5 | 4 " " 20 | 1 " " 52 |
| 2 " " 8 | 1 " " 24 | 1 " " 54 |
| 2 " " 10 | 1 " " 35 | 6 " " 60 |
| 12 " " 12 | | 1 " " 62 |

Model No. 247 Bridge



Parts Required :

| | |
|------------|--------------|
| 6 of No. 1 | 12 of No. 12 |
| 12 " " 5 | 44 " " 37 |
| 4 " " 6 | 4 " " 53 |
| 6 " " 8 | 6 " " 99 |

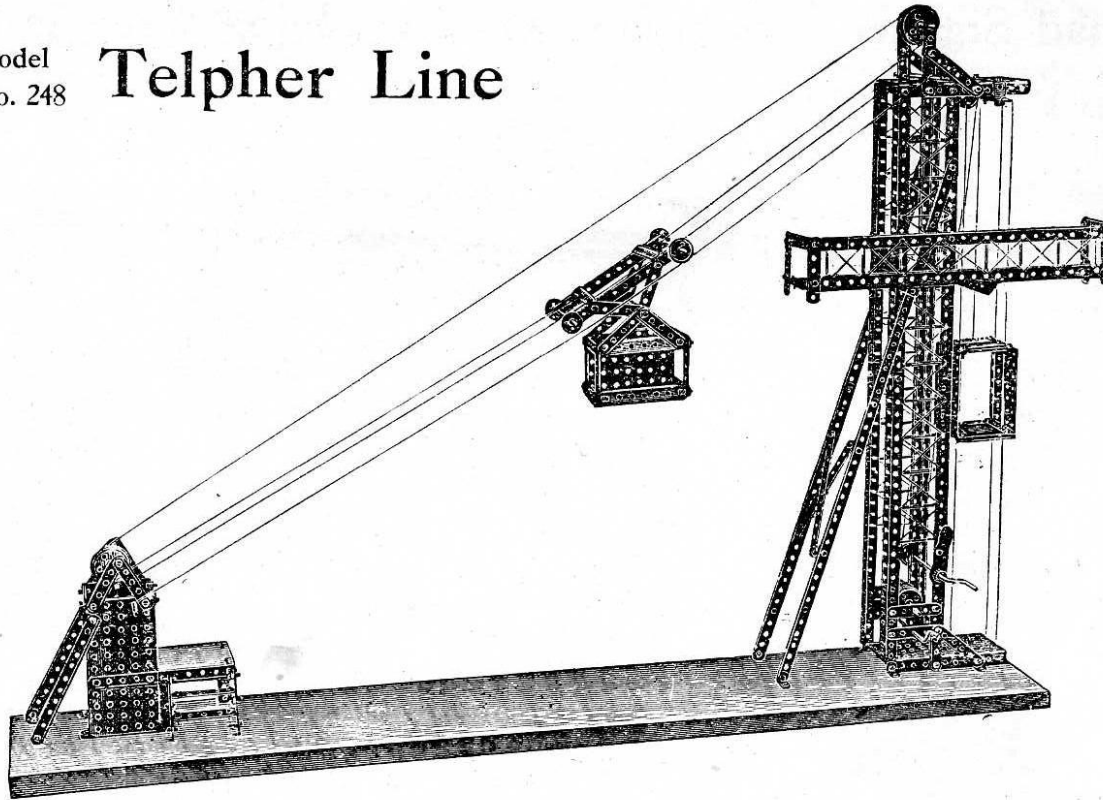
HOW TO CONTINUE

This completes the Models which may be made with MECCANO Outfit No. 4. The next Models are a little more advanced, requiring a number of extra parts to construct them. The necessary parts are all contained in a No. 4a Accessory Outfit, the cost of which will be found in the Price List at the end of the Manual.

This Model Can be Made with MECCANO Outfit No. 5. or No. 4 and No. 4A

Model
No. 248

Telpher Line



Parts
Required :

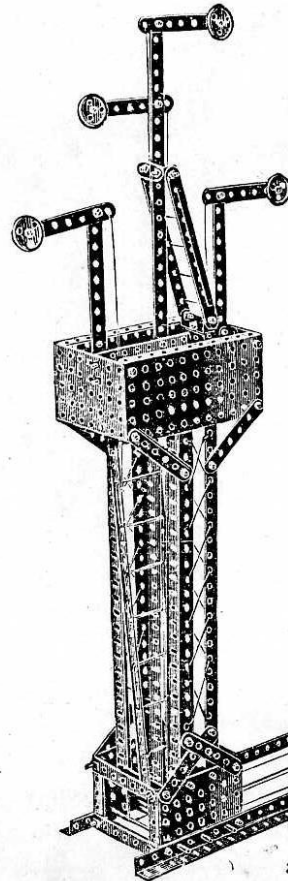
| | |
|----------|-----|
| 6 of No. | 1 |
| 10 " | 2 |
| 2 " | 3 |
| 8 " | 4 |
| 41 " | 5 |
| 9 " | 8 |
| 32 " | 12 |
| 4 " | 15 |
| 3 " | 15A |
| 2 " | 16 |
| 2 " | 19 |
| 4 " | 20 |
| 2 " | 21 |
| 4 " | 22 |
| 2 " | 22A |
| 2 " | 26 |
| 1 " | 27 |
| 1 " | 33 |
| 9 " | 35 |
| 141 " | 37 |
| 1 " | 46 |
| 4 " | 52 |
| 3 " | 53 |
| 7 " | 60 |

This figure represents a Telpher Line such as is used in hilly countries for transporting loads across intervening valleys. The travelling cage or bucket should be loosely pivoted from the roller cage, so that it may hang vertically when travelling down the inclined ropes. The drawing ropes should be wound once round the suspension pulleys of the bucket.

These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 249

Railroad Signals



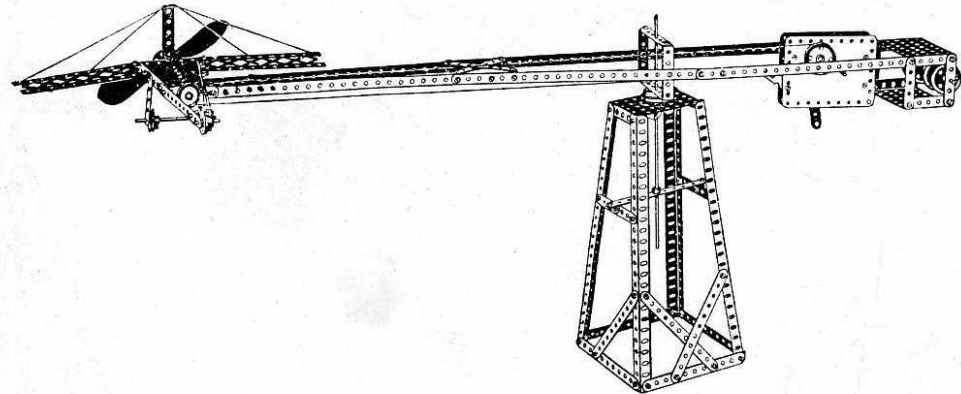
Parts
Required :

| | |
|----------|----|
| 3 of No. | 1 |
| 13 " | 2 |
| 16 " | 3 |
| 8 " | 4 |
| 8 " | 8 |
| 1 " | 11 |
| 31 " | 12 |
| 4 " | 15 |
| 4 " | 22 |
| 8 " | 35 |
| 137 " | 37 |
| 4 " | 52 |
| 5 " | 53 |

The gantry or upper signal box is made from two large and two small flanged plates carrying the signal standards. Guide pulleys are pivoted in the base box round which pass the operating cords for the signal arms to the hand levers, shown to the right.

Model No. 250

Revolving Aeroplane



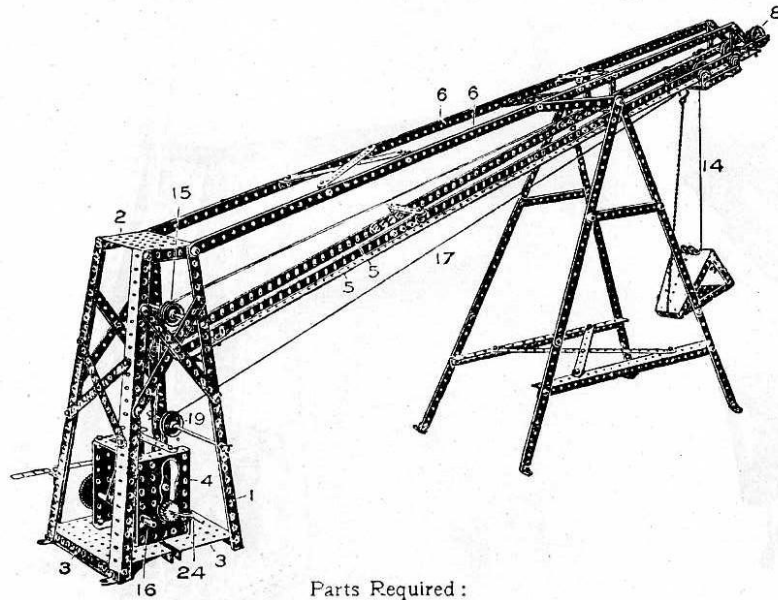
Parts Required :

| | | | | | |
|----------|----|----------|-----|----------|----|
| 6 of No. | 1 | 1 of No. | 15 | 1 of No. | 24 |
| 11 " | 2 | 1 " | 15A | 82 " | 37 |
| 6 " | 3 | 1 " | 16 | 2 " | 41 |
| 6 " | 5 | 1 " | 17 | 3 " | 53 |
| 4 " | 8 | 1 " | 18 | 1 " | 54 |
| 1 " | 11 | 5 " | 20 | 1 " | 59 |
| 14 " | 12 | 1 " | 21 | 3 " | 60 |
| 1 " | 13 | 4 " | 22 | | |

This Model Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

27

Model No. 251 Extended Tip



Parts Required:

| | | |
|-------------|-------------|--------------|
| 14 of No. 1 | 2 of No. 16 | 15 of No. 35 |
| 17 " " 2 | 2 " " 17 | 148 " " 37 |
| 7 " " 3 | 1 " " 19 | 1 " " 94 |
| 2 " " 4 | 1 " " 21 | 1 " " 44 |
| 8 " " 5 | 4 " " 22 | 2 " " 46 |
| 6 " " 6 | 1 " " 22A | 1 " " 50 |
| 12 " " 8 | 4 " " 23 | 2 " " 52 |
| 2 " " 11 | 2 " " 26 | 3 " " 53 |
| 26 " " 12 | 2 " " 27A | 2 " " 54 |
| 2 " " 14 | 1 " " 33 | 3 " " 59 |
| 2 " " 15 | | |

The main tower of the tip is made from four $12\frac{1}{2}$ " angle girders 1 bolted at the top to a small flanged plate 2 and at the bottom to two large plates 3; the side plates 4 of the gear box being bolted to the flanged base plates.

The jib (Fig. 251A) is made from sets of angle girders 5 butted together and coupled by strips, a pair of members 6 being formed from $12\frac{1}{2}$ " strips strengthened by diagonal ties 7. To the ends of the angle girders 5 are bolted two $3\frac{1}{2}$ " strips to carry the $1\frac{1}{2}$ " pulley wheel 8, and the 1" pulley wheel 9 is carried on an axle passed through the third holes from the end of the angle girders.

The trolley (Fig. 251B) carrying the tip bucket is made from two large bent strips 10, in the upper ends of which are lock-nutted $\frac{1}{2}$ " pulley wheels, the bent ends of the strips being connected by 3" strips 11, in one of the central holes of which is the axle 12 carrying the pulley 13 for the operating cord 14 of the tip bucket. This cord passes round the inner end pulley 9 and back to one of the pulleys 15 and then to the winding shaft 16. The cord 17 for traversing the trolley along the rails is continuous, being given a complete turn round the spindle 18 (Fig. 251C) then round the pulley 19 to the trolley, and again from the trolley round the outer pulley 8 back over one of the pulleys 15 to the winding spindle 18.

The tip bucket, as will be seen from Fig. 251B, is made from two sector plates 20 bolted together at their lower edges, and coupled by $2\frac{1}{2}$ " strips at their upper ends; the bucket is supported by a single bent strip 21 engaging the axle passed through the strips. A slack chain 22 connects the lower end of the tip bucket to a hook on the trolley, the chain passing between angle brackets 23.

This Model Can be Made with MECCANO Outfit No. 5, or No. 4 and No 4A

Model No. 251

Extended Tip (*continued*)

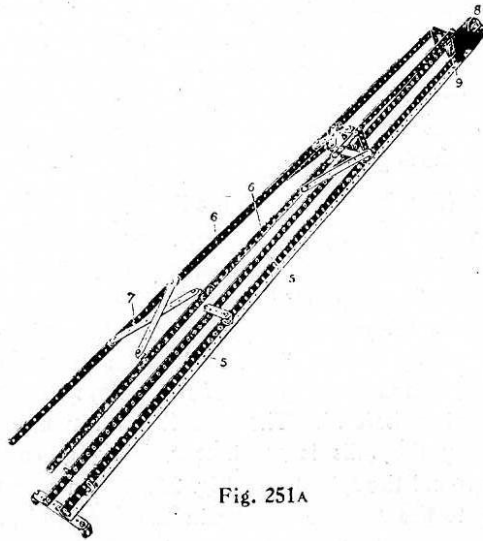


Fig. 251A

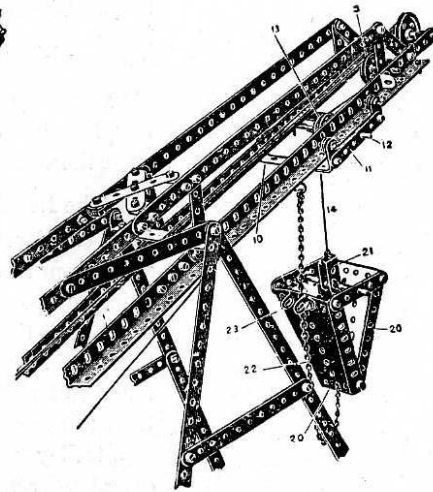


Fig. 251B

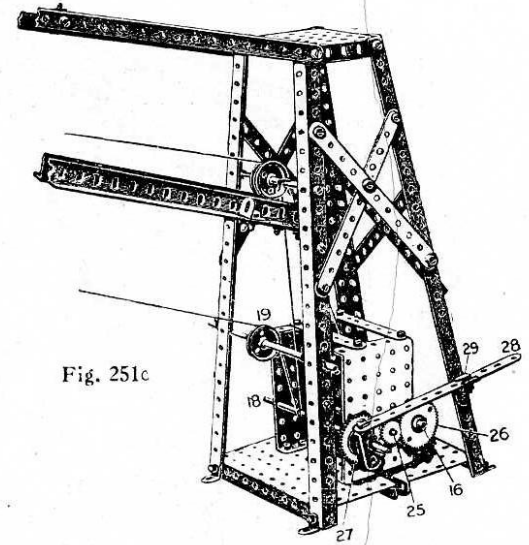


Fig. 251C

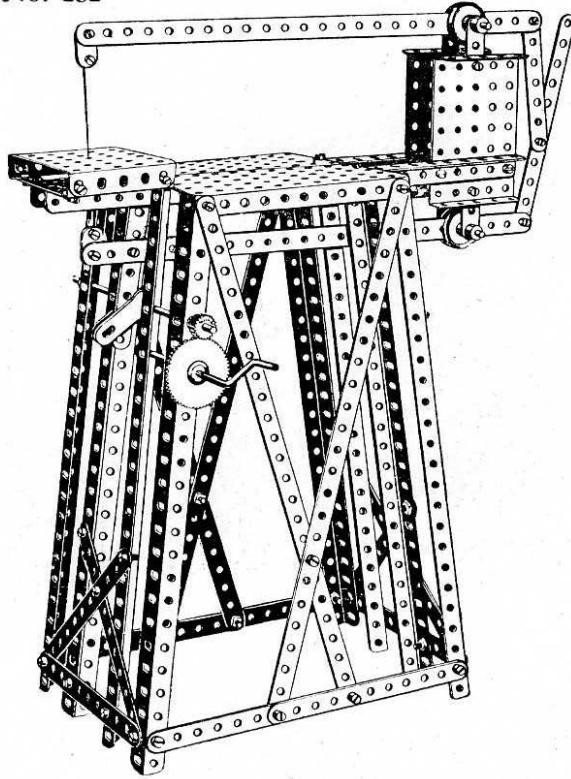
To tip the bucket, the cord 14 is lowered until the chain 22 becomes taut, further lowering of the cord 14 then allowing the bracket to swing over

The cranked spindle 24 is provided at its opposite end with a pinion 25 which is permanently in gear with a $1\frac{1}{2}$ " gear wheel 26 on the spindle 16 controlling the hoisting cord 14. Another gear wheel 27 is mounted on the spindle 18 and is so controlled by the lever 28 that it may be thrown in or out of gear with the pinion 25. The lever 28 is supported in an eye piece 29 carried from the corner girder 1.

To cause the bucket trolley to traverse the rails without raising or lowering the bucket, the gear wheel 27 is engaged with the pinion 25, but to lift or lower the bucket, the gear wheel 27 is disengaged, the hoisting wheel 26 only being operated.

These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

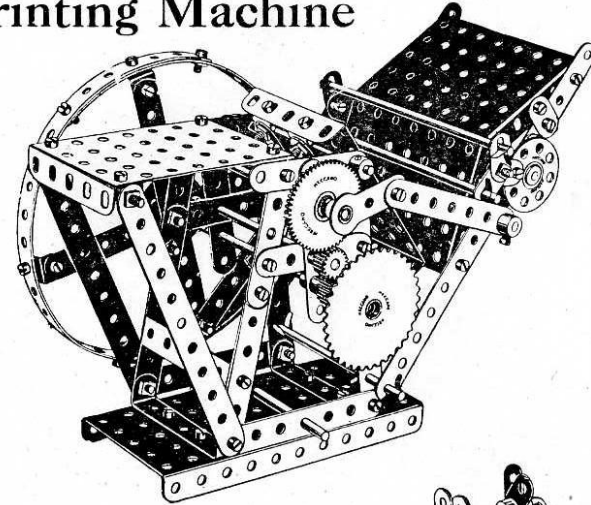
Model
No. 252 **Fret Saw**



Parts Required :

| | | | |
|------------|-------------|-------------|-------------|
| 8 of No. 1 | 10 of No. 8 | 1 of No. 19 | 2 of No. 52 |
| 13 " " 2 | 2 " " 10 | 4 " " 22 | 3 " " 53 |
| 1 " " 3 | 4 " " 12 | 1 " " 26 | 6 " " 59 |
| 2 " " 4 | 2 " " 16 | 1 " " 27A | 2 " " 62 |
| 1 " " 5 | 2 " " 17 | 65 " " 37 | |

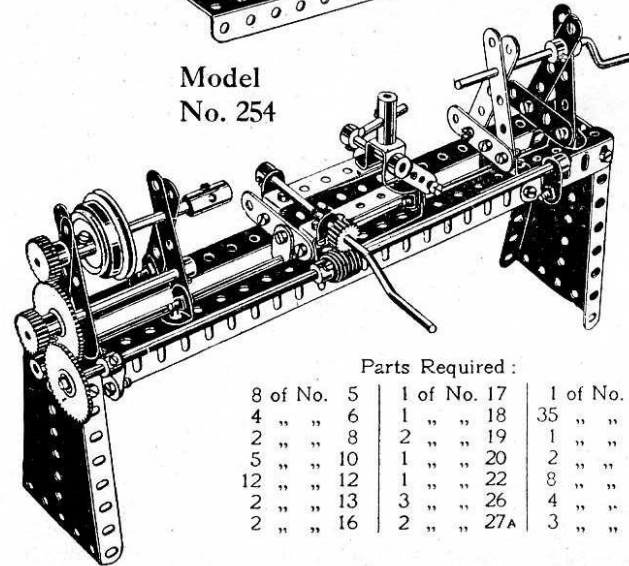
Model
No. 253 **Printing Machine**



Parts
Required :

| | |
|------------|-----|
| 2 of No. 1 | 1 |
| 9 " " 2 | 2 |
| 10 " " 3 | 3 |
| 2 " " 4 | 4 |
| 9 " " 5 | 5 |
| 10 " " 10 | 10 |
| 12 " " 12 | 12 |
| 1 " " 14 | 14 |
| 4 " " 15 | 15 |
| 3 " " 15A | 15A |
| 2 " " 16 | 16 |
| 1 " " 21 | 21 |
| 2 " " 24 | 24 |
| 2 " " 26 | 26 |
| 1 " " 27A | 27A |
| 12 " " 35 | 35 |
| 73 " " 37 | 37 |
| 1 " " 52 | 52 |
| 4 " " 53 | 53 |
| 6 " " 59 | 59 |
| 4 " " 60 | 60 |

Model
No. 254



**Screw-
Cutting
Lathe**

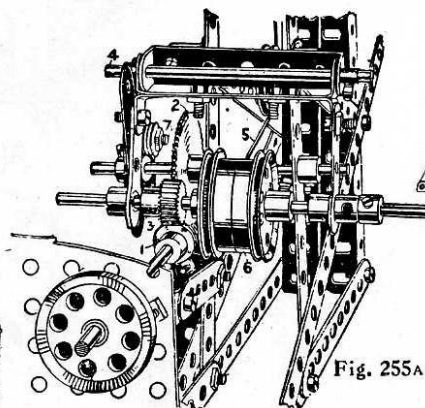
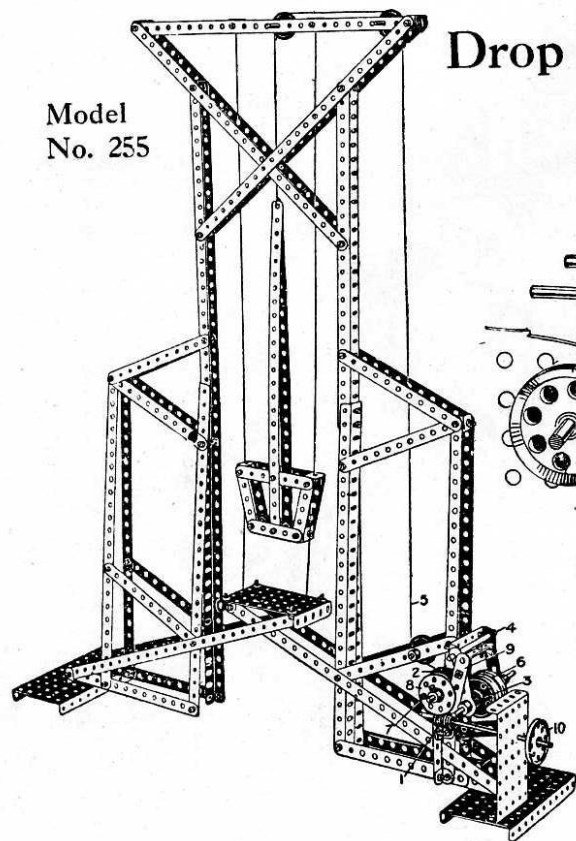
Parts Required :

| | | |
|------------|-------------|-------------|
| 8 of No. 5 | 1 of No. 17 | 1 of No. 32 |
| 4 " " 6 | 1 " " 18 | 35 " " 37 |
| 2 " " 8 | 2 " " 19 | 1 " " 45 |
| 5 " " 10 | 1 " " 20 | 2 " " 54 |
| 12 " " 12 | 1 " " 22 | 8 " " 59 |
| 2 " " 13 | 3 " " 26 | 4 " " 60 |
| 2 " " 16 | 2 " " 27A | 3 " " 63 |

These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model
No. 255

Drop Hammer



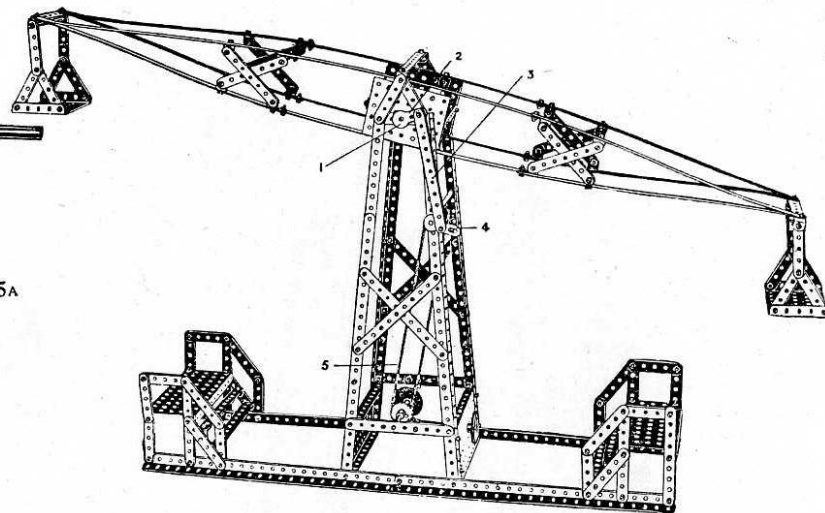
Parts Required :

| | |
|-------------|-------------|
| 14 of No. 1 | 1 of No. 21 |
| 16 " " 2 | 3 " " 22 |
| 2 " " 3 | 1 " " 24 |
| 1 " " 4 | 1 " " 26 |
| 11 " " 5 | 1 " " 27A |
| 8 " " 8 | 1 " " 32 |
| 8 " " 11 | 90 " " 37 |
| 17 " " 12 | 2 " " 52 |
| 1 " " 15 | 2 " " 53 |
| 1 " " 15A | 6 " " 59 |
| 2 " " 16 | 2 " " 60 |
| 3 " " 17 | 2 " " 62 |
| 2 " " 20 | |

The worm 1 on the driving spindle engages and rotates the gear wheel 2, which drives the pinion 3 on a spindle carried in crank bearings bolted to reversed $2\frac{1}{2}$ " bent strips, which hang from an upper rod 4. The winding rope 5 passing round the wheels 6 keeps the pinion in gear with the gear wheel 2 when raising the hammer. A $\frac{1}{2}$ " pulley 7 bolted to the bush wheel 8 eventually engages a strip 9 carried from the crank piece, and, by swinging the latter out, disengages the pinion 3 from the gear wheel 2, releasing the wheels 6 and permitting the rope to unwind and the hammer to drop. The driving pulley 10 must be driven anti-clockwise.

Model No. 256

Giant Auto Swing



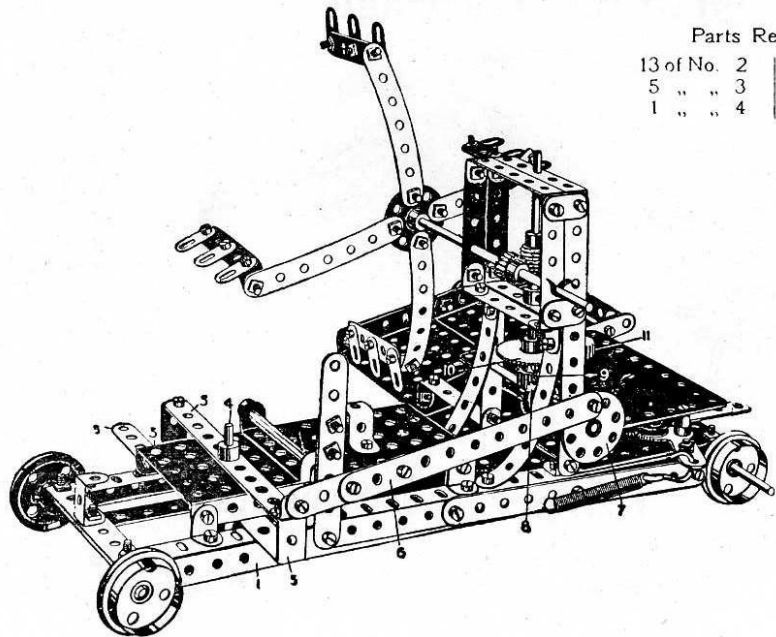
The spindle 1 of the swing frame is fitted with a crank 2 connected by a strip 3 to another crank 4, the spindle of which is journaled in the vertical supports and carries a sprocket wheel driven by the chain 5.

Parts Required :

| | |
|-------------|-------------|
| 12 of No. 1 | 1 of No. 21 |
| 10 " " 2 | 1 " " 24 |
| 12 " " 3 | 1 " " 27 |
| 8 " " 4 | 1 " " 32 |
| 42 " " 5 | 4 " " 35 |
| 12 " " 8 | 166 " " 37 |
| 46 " " 12 | 4 " " 52 |
| 2 " " 14 | 4 " " 53 |
| 2 " " 15 | 5 " " 59 |
| 2 " " 15A | 2 " " 62 |

These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 257 Mowing and Reaping Machine

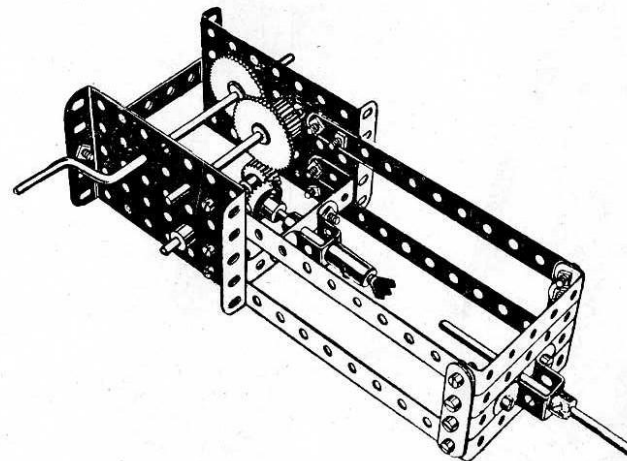


Parts Required :

| | |
|-------------|------------|
| 13 of No. 2 | 8 of No. 5 |
| 5 " " 3 | 2 " " 8 |
| 1 " " 4 | 16 " " 10 |
| | 4 " " 11 |
| | 15 " " 12 |
| | 1 " " 13 |
| | 7 " " 14 |
| | 3 " " 15 |
| | 2 " " 16 |
| | 1 " " 17 |
| | 1 " " 18 |
| | 4 " " 20 |
| | 1 " " 22 |
| | 2 " " 24 |
| | 3 " " 25 |
| | 1 " " 27 |
| | 1 " " 29 |
| | 1 " " 32 |
| | 100 " " 37 |
| | 1 " " 45 |
| | 2 " " 52 |
| | 3 " " 53 |
| | 7 " " 59 |
| | 5 " " 60 |
| | 1 " " 62 |

• Begin by building the base frame 1 from angle girders bolted to flanged plates 2, a flanged perforated plate 3 being also bolted by angle brackets on the top of frame 1. This forms the bearing for a short rod 4 which is the pivot of the cutter 5, which is oscillated by the strips 6 which form a connecting rod operated by the bush wheel 7. The spindle of this wheel is driven by a contrate wheel 8 from the pinion 9, which is on the same spindle as the gear wheel 10 driven by two pinions 11 on the driving spindle of the motor.

Model No. 258 Spooling Machine



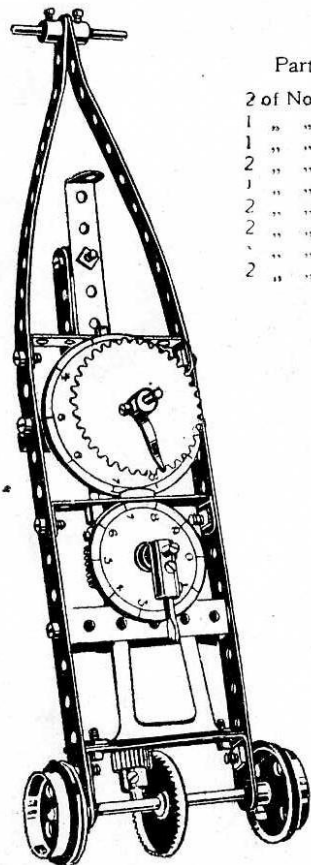
Parts Required :

| | | |
|------------|-------------|-------------|
| 4 of No. 2 | 2 of No. 27 | 1 of No. 46 |
| 1 " " 3 | 1 " " 29 | 2 " " 53 |
| 3 " " 16 | 26 " " 37 | 7 " " 59 |
| 1 " " 17 | 2 " " 45 | 4 " " 60 |
| 1 " " 19 | | 1 " " 63 |
| 2 " " 26 | | 1 " " 65 |

These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 259

Measuring Machine



Parts Required.

| 2 of No. | 1 | 1 of No. | 28 |
|----------|-----|----------|----|
| 1 | 5 | 1 | 32 |
| 1 | 12 | 16 | 37 |
| 2 | 15A | 2 | 46 |
| 1 | 16 | 4 | 59 |
| 2 | 17 | 5 | 60 |
| 2 | 20 | 1 | 63 |
| 2 | 22 | 1 | 65 |
| 2 | 26 | 1 | 95 |
| | | 1 | 96 |

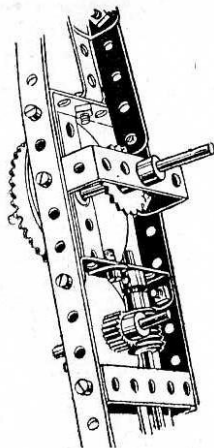
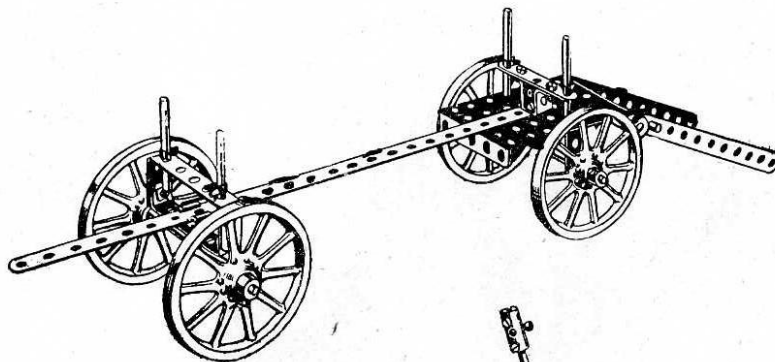


Fig. 259A

Model No. 260

Timber Carriage



| Parts Required. | 1 of No. | 1 |
|-----------------|----------|-----|
| 1 | 2 | 2 |
| 2 | 5 | 5 |
| 1 | 15A | 15A |
| 2 | 16 | 16 |
| 1 | 17 | 17 |
| 4 | 18 | 18 |
| 1 | 19A | 19A |
| 4 | 35 | 35 |
| 8 | 37 | 37 |
| 10 | 45 | 45 |
| 1 | 46 | 46 |
| 2 | 50 | 50 |
| 1 | 53 | 53 |
| 1 | 59 | 59 |
| 4 | 60 | 60 |
| 3 | | |

Carpet

Sweeper

Model No. 261

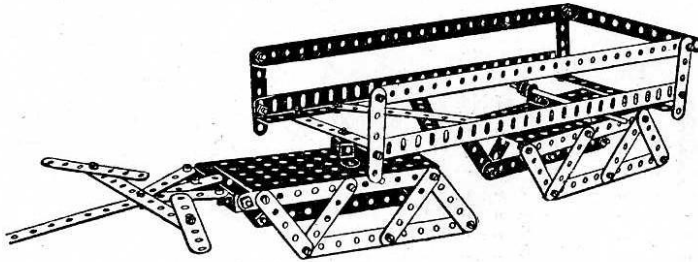
Parts Required:

| 6 of No. | 3 | 1 of No. | 26 |
|----------|-----|----------|----|
| 2 | 10 | 2 | 27 |
| 8 | 12 | 14 | 37 |
| 1 | 13 | 2 | 53 |
| 2 | 15 | 3 | 59 |
| 2 | 15A | 2 | 60 |
| 4 | 20 | 2 | 63 |
| 2 | 24 | | |



These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

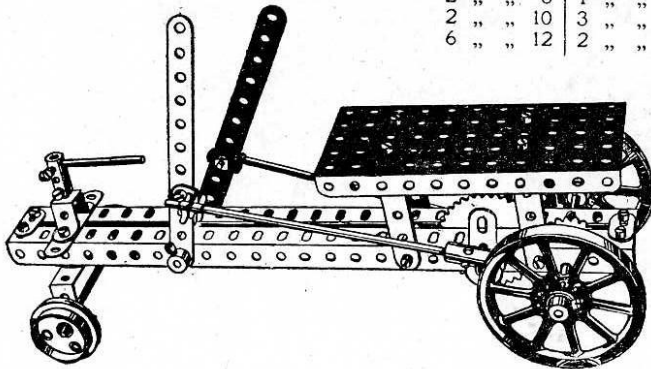
Model No. 262 Bob Sleigh



Parts
Required:

| | |
|----------|-----|
| 3 of No. | 1 |
| 10 " " | 2 |
| 4 " " | 3 |
| 22 " " | 5 |
| 2 " " | 8 |
| 7 " " | 12 |
| 1 " " | 15A |
| 60 " " | 37 |
| 1 " " | 45 |
| 2 " " | 52 |
| 2 " " | 59 |
| 2 " " | 60 |

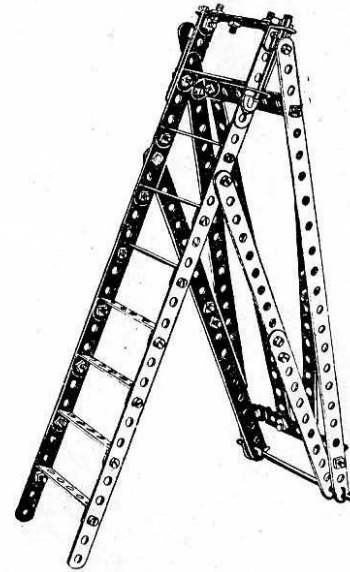
Model No. 263 Hand Car



Parts Required:

| | | | | | |
|----------|----|----------|-----|----------|----|
| 2 of No. | 2 | 2 of No. | 14 | 2 of No. | 20 |
| 5 " " | 5 | 1 " " | 15 | 1 " " | 24 |
| 2 " " | 8 | 1 " " | 15A | 4 " " | 35 |
| 2 " " | 10 | 3 " " | 17 | 26 " " | 37 |
| 6 " " | 12 | 2 " " | 19A | 1 " " | 45 |
| | | | | 1 " " | 46 |
| | | | | 1 " " | 52 |
| | | | | 6 " " | 59 |
| | | | | 2 " " | 62 |
| | | | | 3 " " | 63 |
| | | | | 1 " " | 95 |
| | | | | 1 " " | 96 |

Model No. 264 Ladder

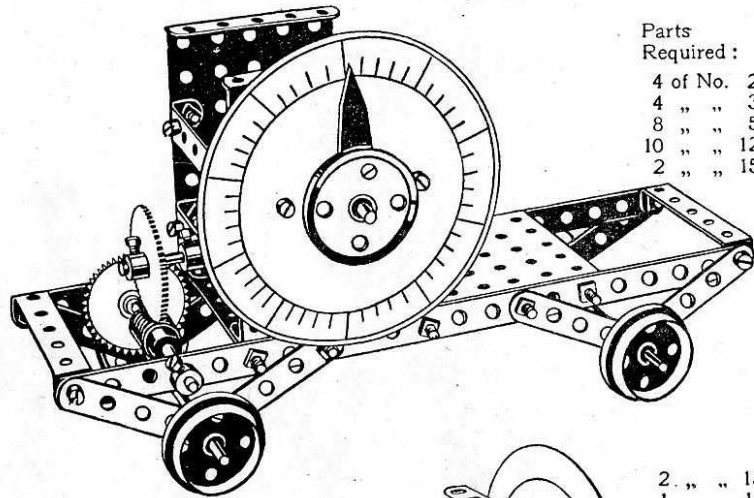


Parts Required:

| | | | |
|----------|----|----------|----|
| 4 of No. | 1 | 1 of No. | 16 |
| 8 " " | 2 | 2 " " | 17 |
| 2 " " | 3 | 10 " " | 35 |
| 3 " " | 5 | 44 " " | 37 |
| 2 " " | 10 | 2 " " | 59 |
| 8 " " | 12 | 9 " " | 60 |

These Models can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 265 Distance Indicator



Parts
Required:

| | |
|----------|----|
| 4 of No. | 2 |
| 4 " " | 3 |
| 8 " " | 5 |
| 10 " " | 12 |
| 2 " " | 15 |

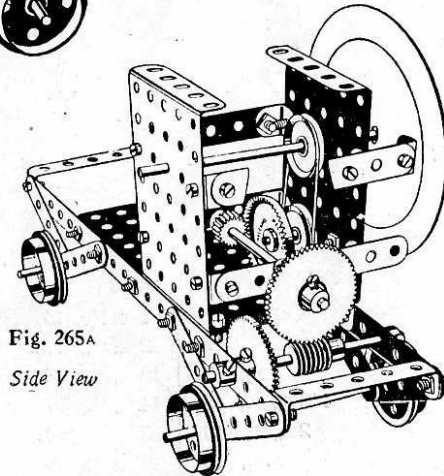


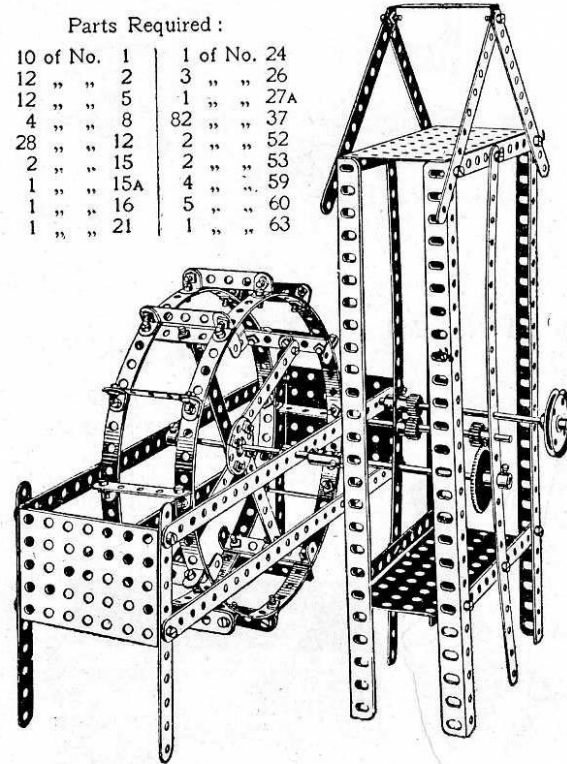
Fig. 265A
Side View

| | |
|--------|-----|
| 2 " " | 15A |
| 1 " " | 16 |
| 1 " " | 17 |
| 4 " " | 20 |
| 1 " " | 21 |
| 2 " " | 22 |
| 1 " " | 24 |
| 2 " " | 26 |
| 2 " " | 27A |
| 1 " " | 28 |
| 1 " " | 32 |
| 38 " " | 37 |
| 1 " " | 52 |
| 2 " " | 53 |
| 6 " " | 59 |
| 2 " " | 60 |

Model No. 266 Belgian Water Wheel

Parts Required:

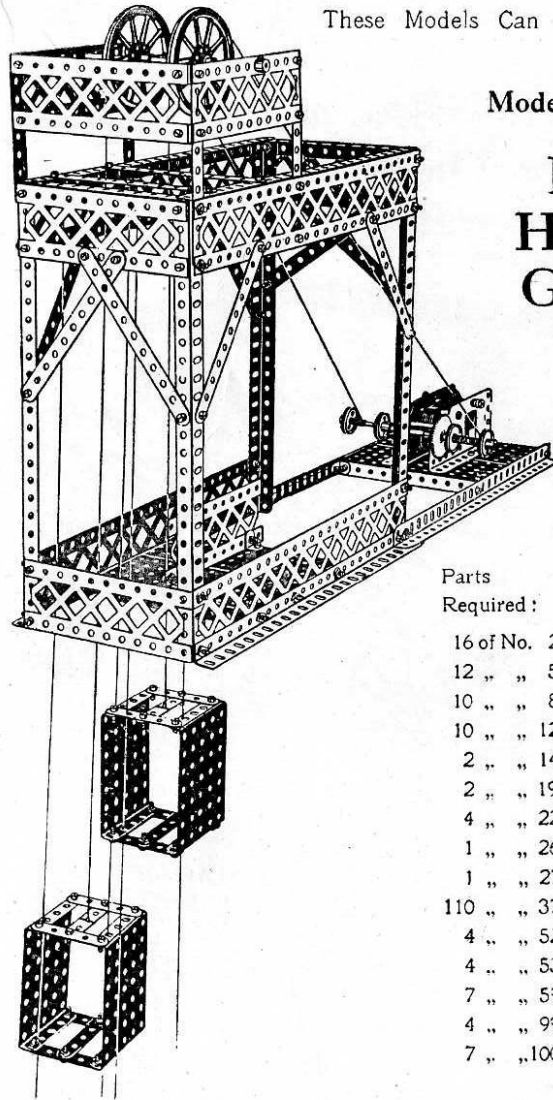
| | | | |
|-----------|-----|----------|-----|
| 10 of No. | 1 | 1 of No. | 24 |
| 12 " " | 2 | 3 " " | 26 |
| 12 " " | 5 | 1 " " | 27A |
| 4 " " | 8 | 82 " " | 37 |
| 28 " " | 12 | 2 " " | 52 |
| 2 " " | 15 | 2 " " | 53 |
| 1 " " | 15A | 4 " " | 59 |
| 1 " " | 16 | 5 " " | 60 |
| 1 " " | 21 | 1 " " | 63 |



These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 267

Pit Head Gear



Parts
Required :

| | |
|-----------|-----|
| 16 of No. | 2 |
| 12 " | 5 |
| 10 " | 8 |
| 10 " | 12 |
| 2 " | 14 |
| 2 " | 19A |
| 4 " | 22 |
| 1 " | 26 |
| 1 " | 27 |
| 110 " | 37 |
| 4 " | 52 |
| 4 " | 53 |
| 7 " | 59 |
| 4 " | 99 |
| 7 " | 100 |

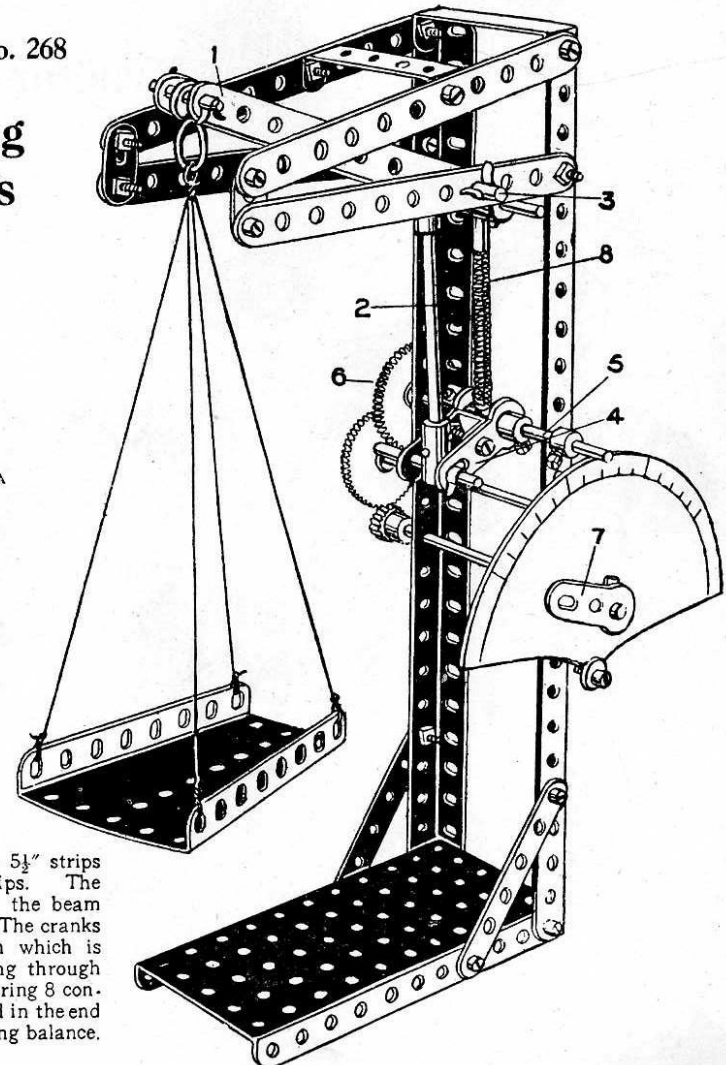
Model No. 268

Spring Scales

Parts
Required :

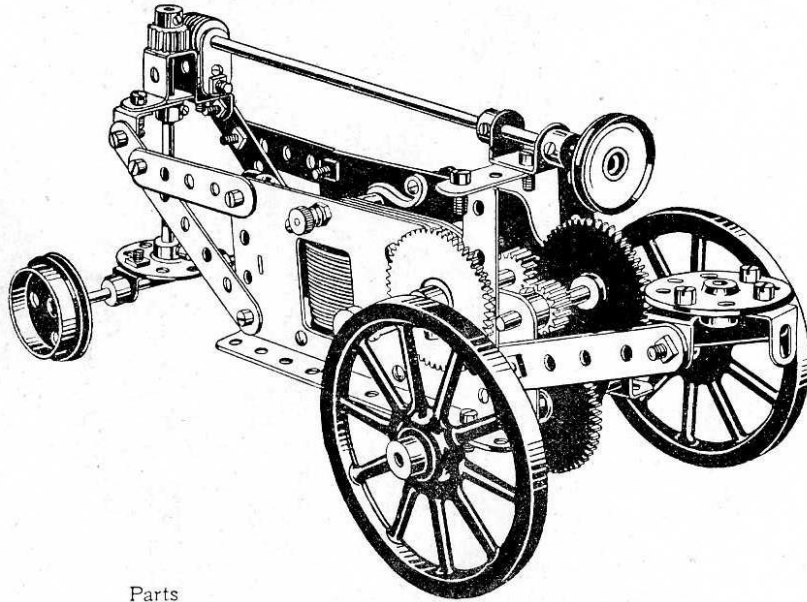
| | |
|----------|-----|
| 6 of No. | 2 |
| 2 " | 4 |
| 2 " | 8 |
| 2 " | 10 |
| 3 " | 11 |
| 2 " | 15 |
| 1 " | 15A |
| 2 " | 16 |
| 3 " | 17 |
| 1 " | 18 |
| 2 " | 26 |
| 2 " | 27 |
| 23 " | 37 |
| 1 " | 43 |
| 1 " | 52 |
| 1 " | 54 |
| 1 " | 57 |
| 2 " | 59 |
| 2 " | 60 |
| 2 " | 62 |
| 2 " | 63 |

The Scale beam 1 is made of two 5½" strips distanced by double bent strips. The vertical rod 2 is connected to the beam which is pivoted on the rod 3. The cranks 4 are gripped on an axle 5 on which is secured the gear wheel 6 actuating through a gear train the pointer 7. A spring 8 connected to a rod 5 and another rod in the end hole of the beam acts as the spring balance.



These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

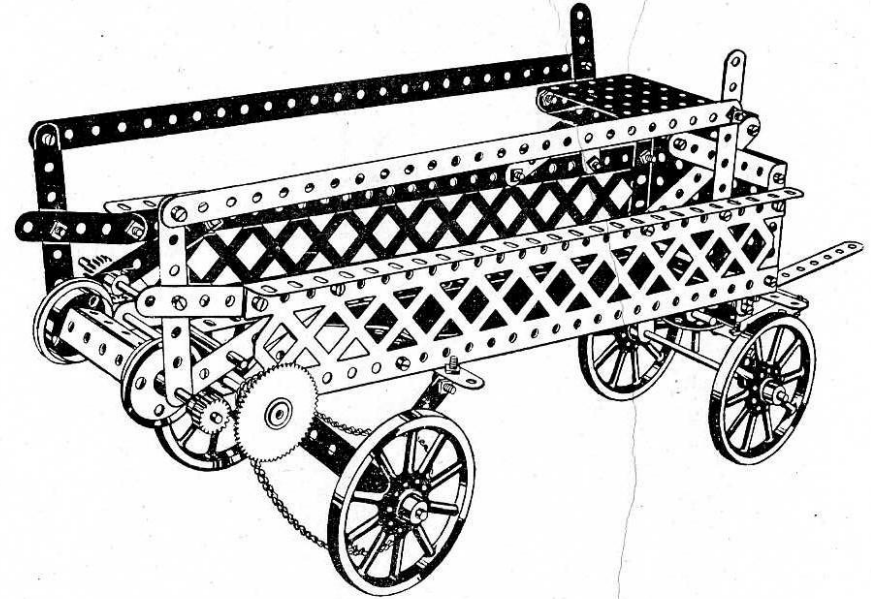
Model No. 269 Farm Tractor



Parts
Required :

| | | |
|------------|-------------|-------------|
| 2 of No. 3 | | |
| 5 " " 5 | | |
| 3 " " 10 | | |
| 1 " " 11 | | |
| 7 " " 12 | 2 of No. 20 | 1 of No. 32 |
| 1 " " 13 | 1 " " 22 | 24 " " 37 |
| 1 " " 15 | 2 " " 24 | 1 " " 45 |
| 2 " " 15A | 2 " " 26 | 8 " " 59 |
| 2 " " 19A | 2 " " 27 | 2 " " 60 |

Model No. 270 Manure Distributing Cart



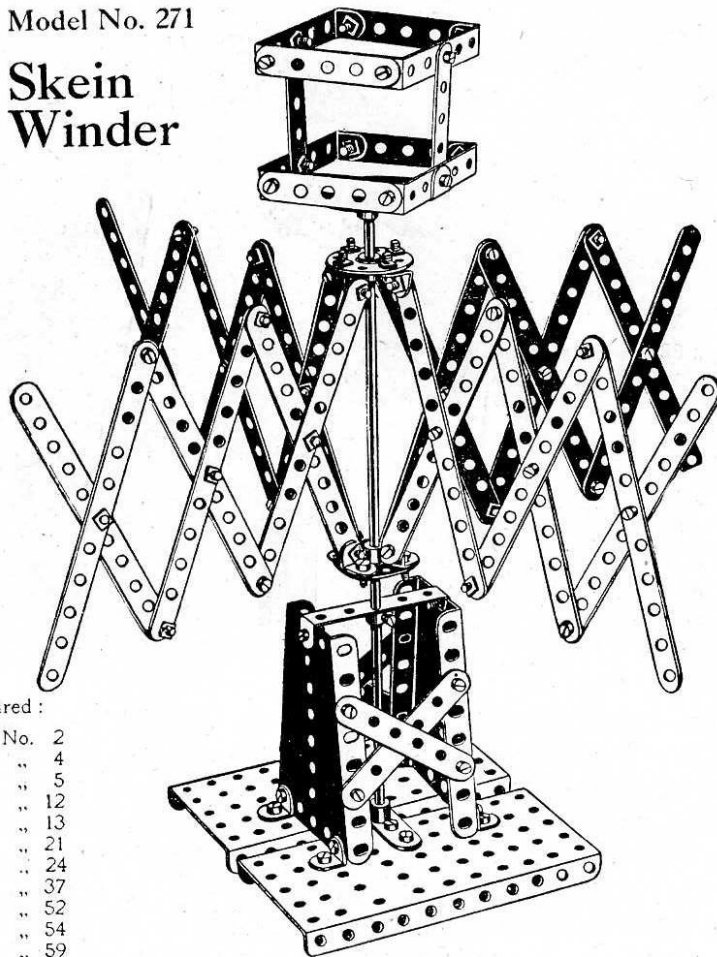
Parts Required :

| | | |
|------------|--------------|-------------|
| 2 of No. 1 | 2 of No. 15A | 1 of No. 46 |
| 3 " " 2 | 2 " " 17 | 2 " " 53 |
| 10 " " 3 | 4 " " 19A | 8 " " 59 |
| 9 " " 5 | 2 " " 20 | 4 " " 60 |
| 4 " " 8 | 1 " " 24 | 1 " " 94 |
| 6 " " 12 | 3 " " 26 | 1 " " 95 |
| 1 " " 14 | 1 " " 27A | 1 " " 96 |
| 3 " " 15 | 4 " " 35 | 2 " " 99 |
| | 57 " " 37 | |

These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 271

Skein Winder

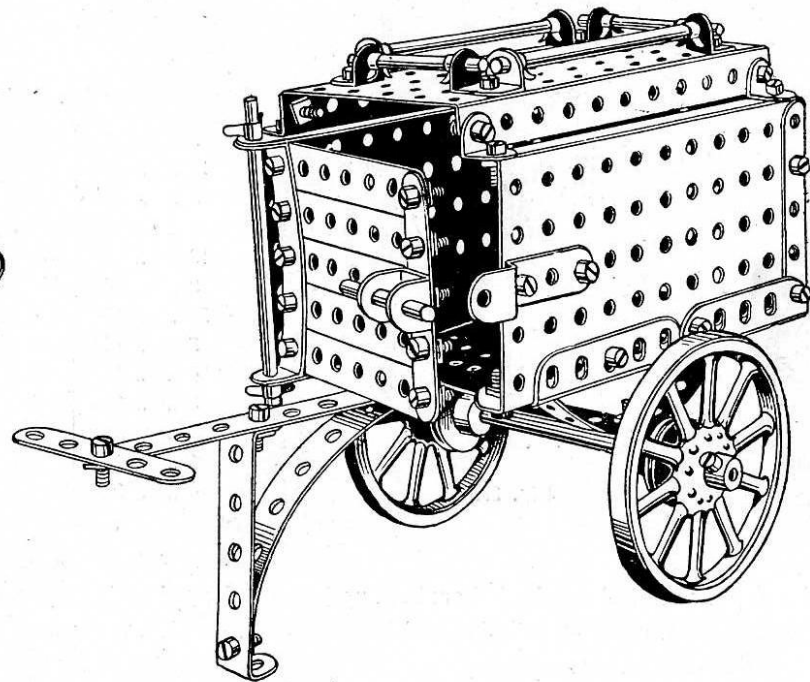


Parts
Required :

| | |
|-----------|----|
| 24 of No. | 2 |
| 4 " " | 4 |
| 7 " " | 5 |
| 8 " " | 12 |
| 1 " " | 13 |
| 1 " " | 21 |
| 2 " " | 24 |
| 2 " " | 37 |
| 2 " " | 52 |
| 2 " " | 54 |
| 2 " " | 59 |
| 6 " " | 60 |

Model
No. 272

Delivery Cart



Parts Required :

| | | | |
|------------|-------------|-------------|-------------|
| 4 of No. 2 | 1 of No. 11 | 3 of No. 17 | 3 of No. 52 |
| 5 " " 3 | 12 " " 12 | 2 " " 19A | 3 " " 53 |
| 3 " " 5 | 1 " " 15 | 2 " " 22 | 2 " " 59 |
| 2 " " 10 | 3 " " 16 | 41 " " 37 | 2 " " 60 |

This Model Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 273

Coal Tip

Parts Required :

| | |
|------------|--------------|
| 2 of No. 1 | 2 of No. 22A |
| 19 " " 2 | 3 " " 26 |
| 3 " " 3 | 1 " " 27A |
| 4 " " 4 | 1 " " 32 |
| 13 " " 5 | 15 " " 35 |
| 8 " " 8 | 110 " " 37 |
| 28 " " 12 | 1 " " 46 |
| 2 " " 14 | 2 " " 52 |
| 4 " " 15 | 3 " " 53 |
| 3 " " 15A | 1 " " 54 |
| 1 " " 16 | 4 " " 59 |
| 1 " " 19 | 4 " " 60 |
| 4 " " 22 | |

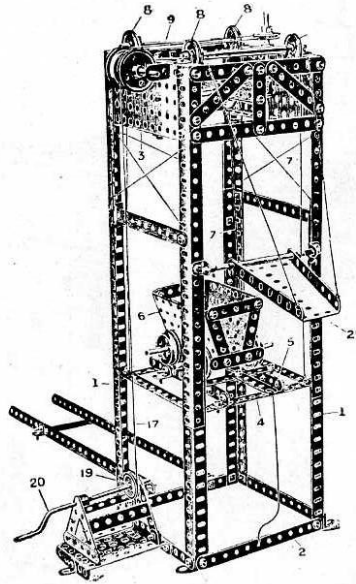


Fig. 273

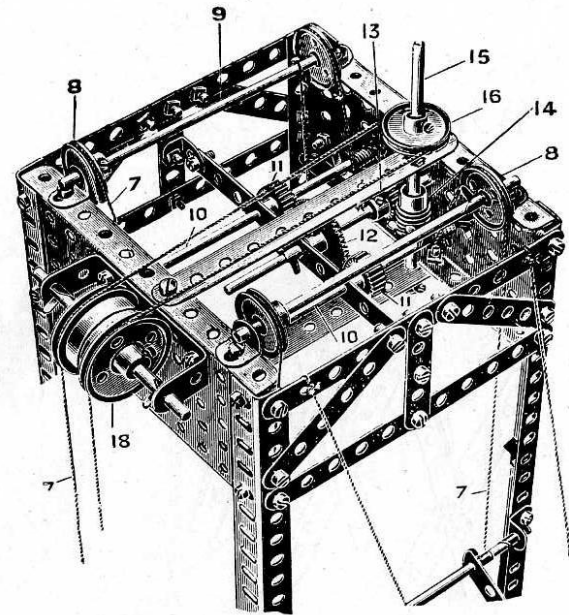


Fig. 273A

The vertical standards 1 are built up from overlapped angle girders, connected by cross strips 2 and flanged plates 3. The rising and falling platform 4, upon the rails 5 of which the truck 6 is carried, is arranged to be raised or lowered in the framework 1 by the suspension cords 7, one at each corner. These suspension cords are connected to the corners of the platform 4, and pass over four pulleys 8 carried in the head of the frame on spindles 9. The cords 7 after passing over the pulleys 8 are wound on lower spindles 10 (Fig. 273A), fitted with pinions 11 gearing with and being driven by a gear wheel 12. On the same spindle which carries the gear wheel 12 is a pinion 13, driven by a worm 14 on a vertical spindle 15 carrying a pulley 16. The operating cord 17 passes round the pulley 16 and the flange pulleys 18, to a pulley 19 on the crank spindle 20, by means of which the raising or lowering of the platform 4 is controlled. The chute 21, made from a sector plate, is carried from a spindle passed through its inner perforations and secured to the uprights 1, and is supported by cords from its outer perforations. The truck is held in position on the tipping platform as shown in Fig. 273.

These Models Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 274

Automatic Coin-Freed Machine

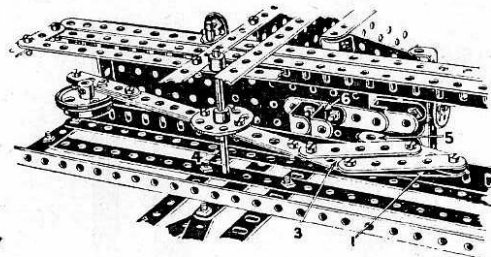
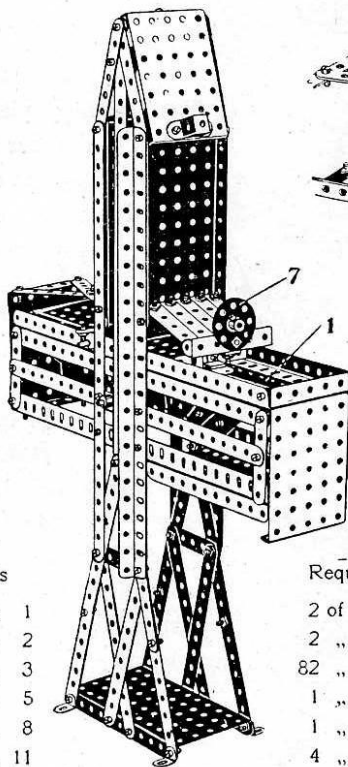
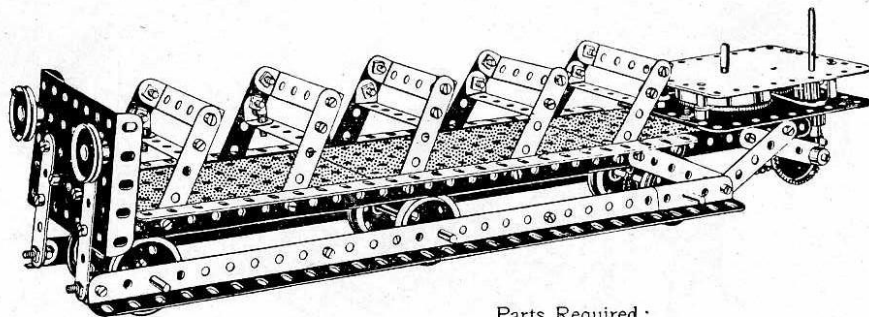


Fig. 274A

The release mechanism of this model is very clearly shown in the sectional underneath view. The coin on being placed in the slot pivots by its weight the lever 3 about the rod 4, moving the end of the strip 5 clear of the double brackets 6, beneath the sliding drawer, so that the drawer may then be pulled out by the bush wheel 7.

Model
No. 275

Touring Tram Car



Parts

| | |
|---------|----|
| 6 of No | 1 |
| 17 " " | 2 |
| 5 " " | 3 |
| 21 " " | 5 |
| 8 " " | 8 |
| 3 " " | 11 |
| 6 " " | 12 |
| 2 " " | 16 |
| 1 " " | 20 |

Required :

| | |
|----------|----|
| 2 of No. | 24 |
| 2 " " | 35 |
| 82 " " | 37 |
| 1 " " | 44 |
| 1 " " | 45 |
| 4 " " | 52 |
| 5 " " | 53 |
| 2 " " | 59 |
| 5 " " | 60 |

Parts Required :

| | | | | | |
|-----------|----|----------|----|----------|----|
| 20 of No. | 5 | 2 of No. | 22 | 3 of No. | 52 |
| 6 " " | 8 | 1 " " | 26 | 1 " " | 53 |
| 8 " " | 12 | 1 " " | 28 | 2 " " | 59 |
| 4 " " | 16 | 64 " " | 37 | 8 " " | 60 |
| 6 " " | 20 | | | | |

This Model Can be Made with MECCANO Outfit No. 5, or No. 4 and No. 4A

Model No. 276

Beam Scales

Parts Required :

| | | |
|----|--------|-----|
| 7 | of No. | 1 |
| 8 | " " | 2 |
| 8 | " " | 3 |
| 2 | " " | 4 |
| 10 | " " | 5 |
| 8 | " " | 8 |
| 3 | " " | 10 |
| 9 | " " | 12 |
| 2 | " " | 15 |
| 4 | " " | 15A |
| 2 | " " | 16 |
| 7 | " " | 20 |
| 2 | " " | 22 |
| 88 | " " | 37 |
| 2 | " " | 44 |
| 1 | " " | 46 |
| 1 | " " | 50 |
| 2 | " " | 52 |
| 2 | " " | 53 |
| 2 | " " | 54 |
| 2 | " " | 57 |
| 8 | " " | 59 |
| 5 | " " | 60 |

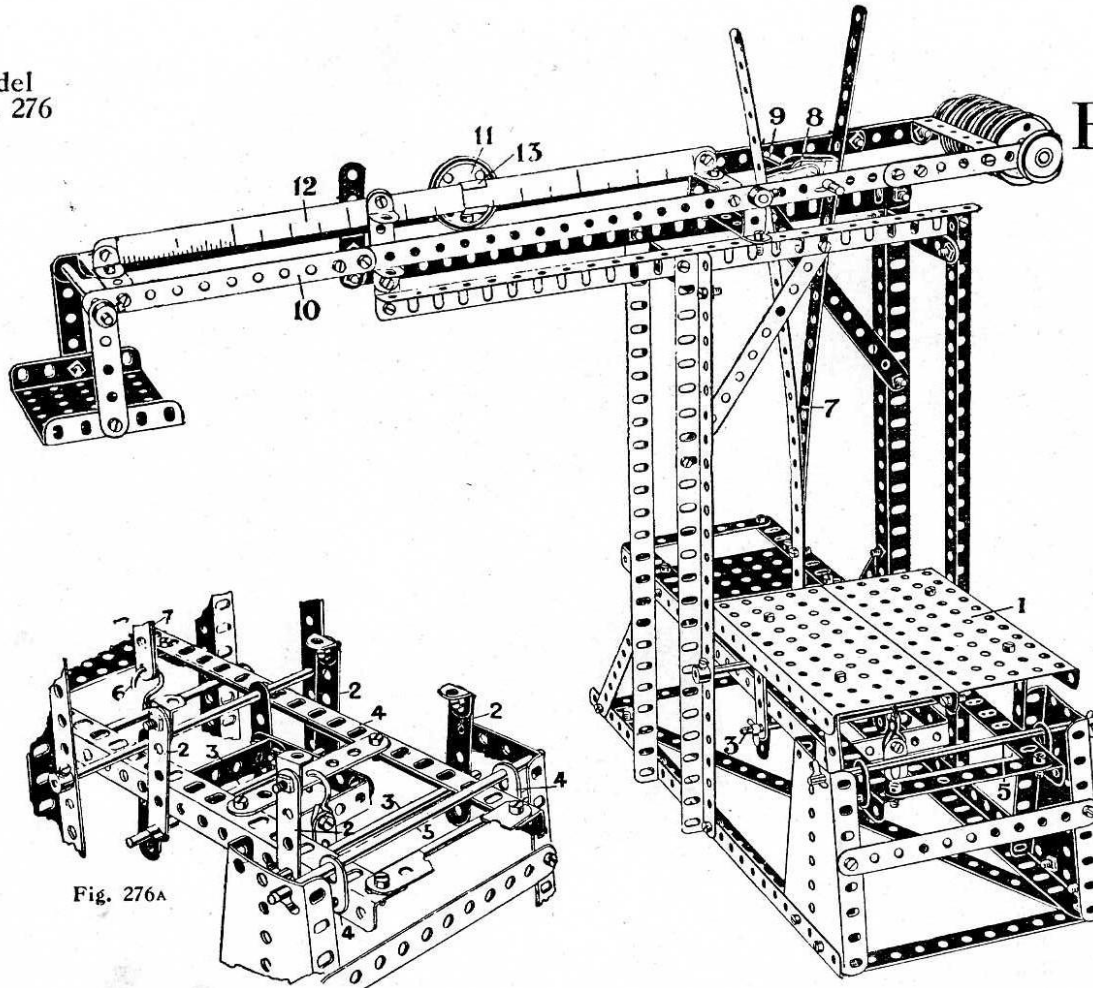
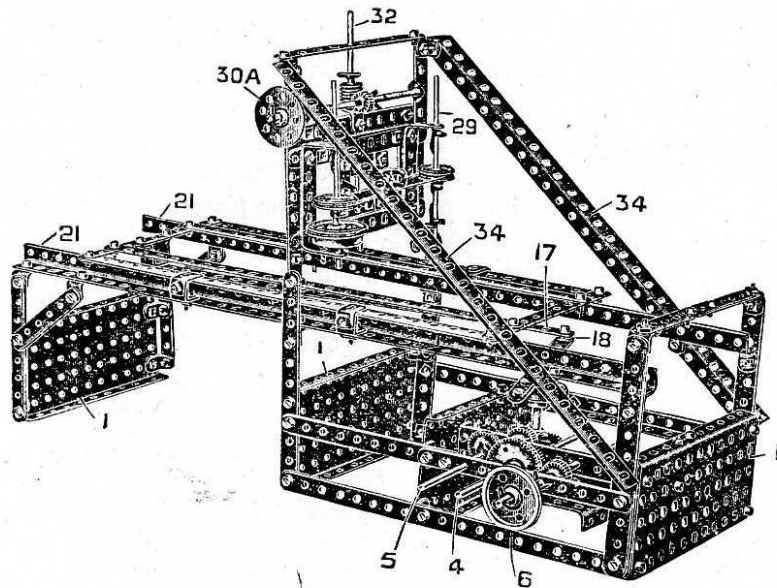


Fig. 276A

The weighing platform 1 is bolted to the four uprights 2, which engage over transverse rods 3, to permit of a parallel movement. The frame 4 of the platform is pivotally slung by flat brackets from the rod 5, and is coupled by hook 6, pull rods 7, which are connected by a pair of cranked bent strips 8 to a rod 9, passing through the side strips 10 to the main weight beam. The sliding weight 11 is adjustable on the graduated arm by an eye piece 13.

These Models Can be Made with MECCANO Outfit No. 5. or No. 4 and No. 4A

Model No. 277 Planing Machine



Parts Required :

| | |
|-----------|------------|
| 3 of No 1 | 2 of No 22 |
| 25 " " 2 | 1 " " 23 |
| 1 " " 3 | 1 " " 24 |
| 4 " " 4 | 4 " " 26 |
| 6 " " 5 | 2 " " 27A |
| 3 " " 6 | 1 " " 28 |
| 8 " " 8 | 1 " " 32 |
| 4 " " 11 | 4 " " 35 |
| 36 " " 12 | 127 " " 37 |
| 1 " " 14 | 1 " " 45 |
| 4 " " 15 | 2 " " 46 |
| 1 " " 15A | 4 " " 52 |
| 2 " " 16 | 1 " " 53 |
| 1 " " 17 | 5 " " 59 |
| 1 " " 20 | 1 " " 62 |
| 2 " " 21 | |

Begin by constructing the gear box, Fig. 277A, consisting of three large flanged plates 1 joined by pairs of $5\frac{1}{2}$ " strips 2 overlapped three holes. The strips 2 form bearings for the spindles 3, 4, and 5. The spindle 3, on which is the driving pulley 6, carries a pinion 7 meshing with the gear wheel 8 secured with the pinion 9 on the spindle 4. This pinion 9 meshes with the gear wheel 10 on the spindle 5, which also carries a pinion 11 engaging the contrate wheel 12 on the vertical spindle 13. A crank piece 14 is secured to the spindle 13, and is pivotally connected to the link 16, Fig. 277B, the other extremity of which is pivotally connected to the connecting rod 17 by a lock-nutted attachment 18. The rod 17 is coupled to the table 19 by the double bent strip 20. The table 19 runs upon the angle girders 21. The double brackets 22 forming guides for the table are first

Model No. 277 Planing Machine *(continued)*

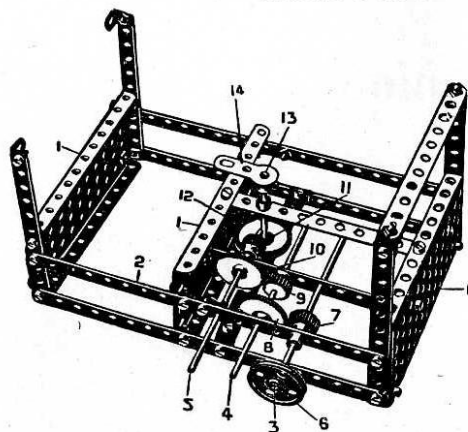


Fig. 277A

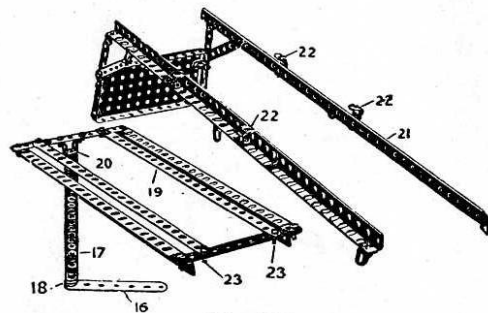


Fig. 277B

bolted in position, and the end nuts and bolts 23 of the table removed to enable the table to pass under the angle brackets initially.

Fig. 277c illustrates the mechanism for controlling the traversing and vertical movement of the tool 24. The tool is carried in the plate 25, to which are secured angle brackets 26 from which the operating cord 27 controlled by the flanged wheel 28a passes round the pulleys 28 on the spindles 29. The vertical movement of the plate is regulated through the bush wheel 30a by means of the pinion 30 engaging the worm 31 here acting as a rack, and secured to the vertically moving spindle 32 guided in the strip 33. The tool head is stayed to the rear plate 1 by the diagonal girders 34.

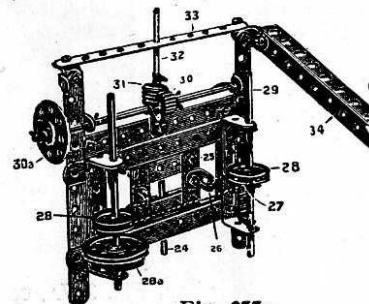


Fig. 277c

HOW TO CONTINUE

This completes the Models which may be made with MECCANO Outfit No. 5. The next Models are a little more advanced, requiring a number of extra parts to construct them. The necessary parts are all contained in a No. 5a Accessory Outfit, the cost of which will be found in the Price List at the end of the Manual.

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model
No. 278

Vertical Saw

Parts Required:

| | |
|-------------|-------------|
| 12 of No. 1 | 1 of No. 32 |
| 12 " " 2 | 2 " " 35 |
| 4 " " 3 | 99 " " 37 |
| 2 " " 4 | 1 " " 45 |
| 5 " " 5 | 2 " " 52 |
| 8 " " 8 | 3 " " 53 |
| 20 " " 12 | 1 " " 54 |
| 1 " " 14 | 6 " " 59 |
| 1 " " 15 | 2 " " 62 |
| 1 " " 15A | 1 " " 63 |
| 1 " " 16 | |
| 3 " " 17 | |
| 8 " " 20 | |
| 1 " " 21 | |
| 3 " " 22 | |
| 2 " " 25 | |
| 2 " " 26 | |
| 1 " " 27 | |
| 1 " " 28 | |

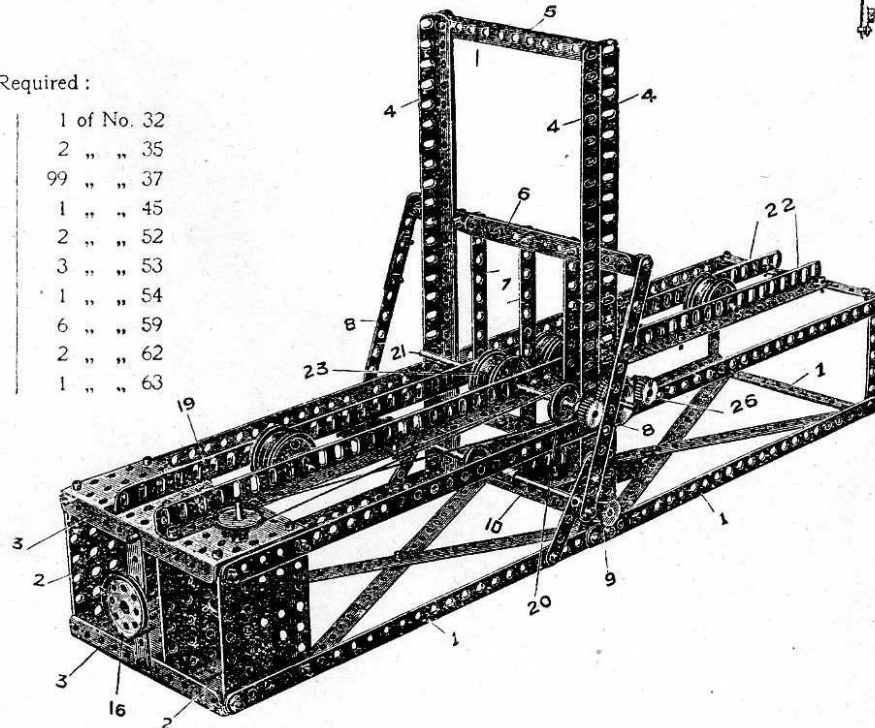


Fig. 278A

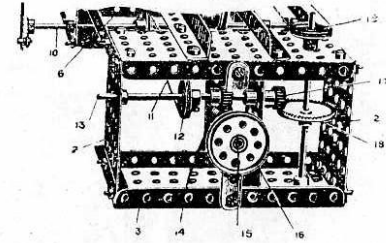
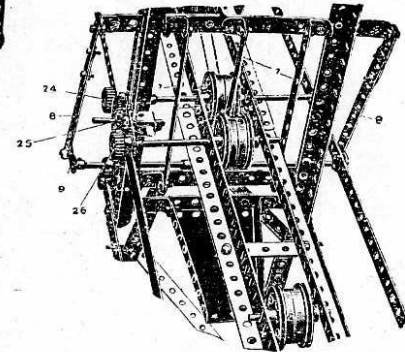


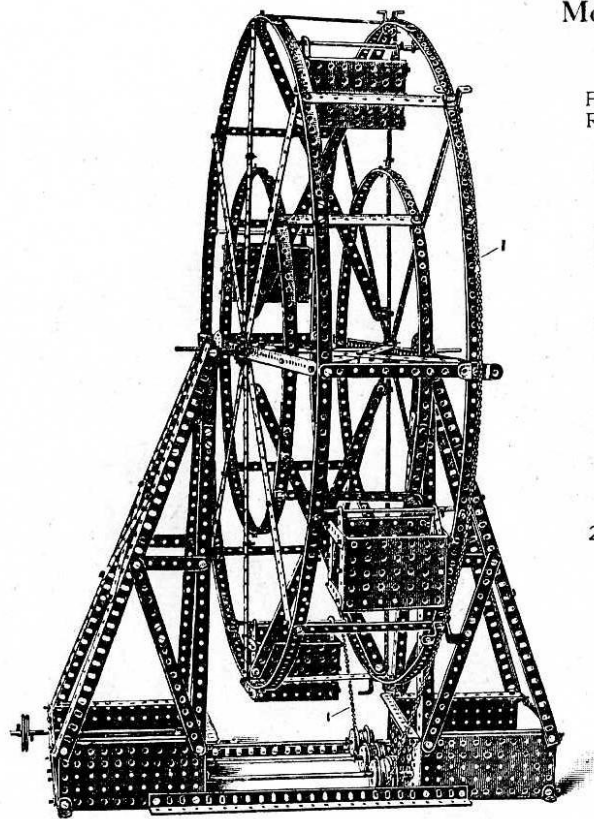
Fig. 278B



This model represents a log-sawing machine in which a number of saws are moved vertically up and down while the log is fed forward to the saws and cut into planks. The base framework of the model is formed of strips 1 connected to small flanged plates 2, forming the sides, and large flanged plates 3 forming the top and bottom of the gear box. Angle girders 4 are bolted to the strips 1 to form vertical guides for the saw frame, a strip 5 being bolted between the flanges and the angle girders to give clearance for the frame strips 6 carrying saws 7 which slide between the angle girders 4. The frame 6 is moved vertically up and down by the connecting rods 8 lock-nutted to the ends of the upper strips 6, and cranks 9 secured on the end of an axle rod 10. This rod 10 is driven by a cord 11 passing over a pulley wheel 12 on a rod 13, which is driven by a pinion 14 engaging with a worm on the driving shaft 15, this driving shaft being fitted with a driving pulley 16. To provide for the travel of the logs the other end of the rod 13 is fitted with a pinion 17 engaging a contrate wheel 18 on a vertical spindle, the upper end of which is fitted with a pulley wheel 19, the driving cord passing round this pulley 19 to a similar pulley 20 on an axle 21 journaled in the vertical webs of the angle girder rails 22. This rod 21 carries the flanged wheels 23 and is geared by a pinion 24 engaging a gear wheel 25 to another pinion 26 carrying another pair of flanged wheels. The log is carried along on these flanged wheels through the saws 7.

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 279 Big Wheel



Parts Required.

| | |
|----------|-----|
| 46 of No | 1 |
| 24 " " | 2 |
| 4 " " | 3 |
| 4 " " | 4 |
| 34 " " | 5 |
| 10 " " | 8 |
| 4 " " | 9 |
| 8 " " | 11 |
| 68 " " | 12 |
| 5 " " | 13 |
| 1 " " | 14 |
| 4 " " | 15 |
| 6 " " | 20 |
| 1 " " | 21 |
| 4 " " | 24 |
| 2 " " | 25 |
| 2 " " | 27A |
| 12 " " | 35 |
| 292 " " | 37 |
| 6 " " | 52 |
| 8 " " | 53 |
| 2 " " | 54 |
| 4 " " | 59 |
| 1 " " | 94 |

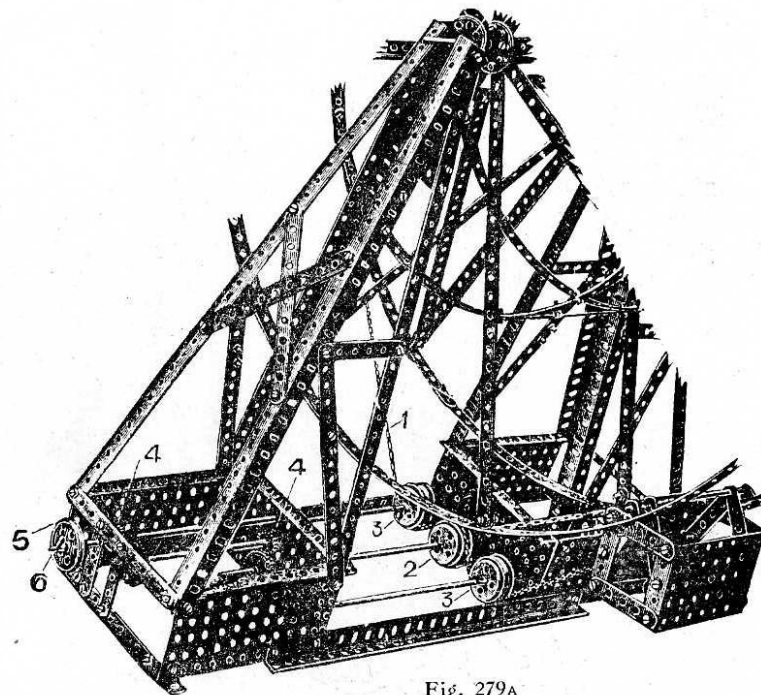


Fig. 279A

In constructing this model flanged plates are used to form the sides and inner part of the base of the side pedestals and also to form the suspended cages on the wheel.

The driving chain is conveniently kept in position round the periphery of one of the side elements of the wheel by a series of double angle brackets bolted on the ends of the spokes.

In Fig. 279A is shown how the driving chain 1, passing round the driving wheel 2, is held around the circumference thereof by the guide wheels 3. The driving wheel 2 is driven through the gear wheel 4 from a $1\frac{1}{2}$ " pulley wheel 5 carried on the spindle 6.

These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 280

Steam Shovel

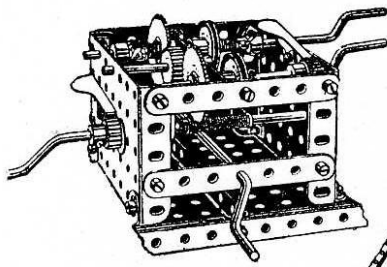
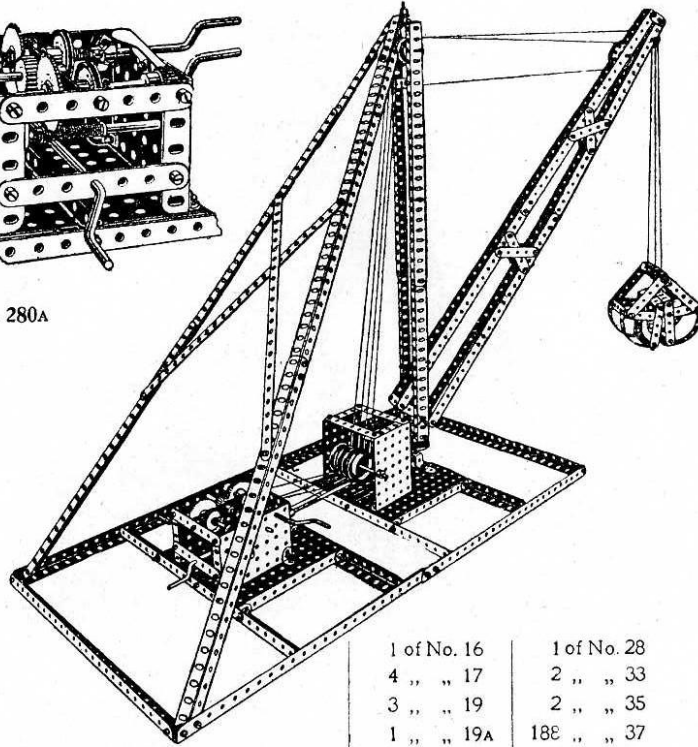


Fig. 280A



Parts
Required:

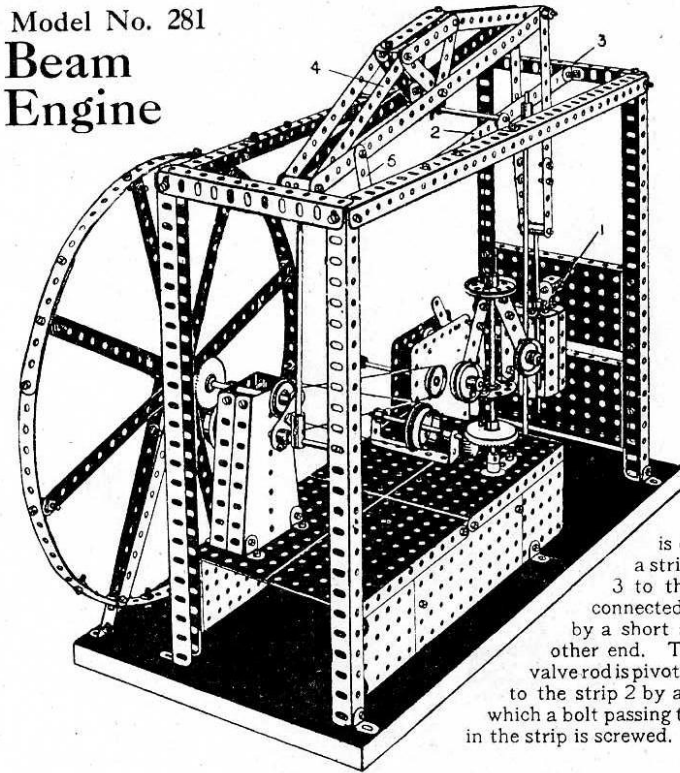
10 of No. 1
12 " " 3
4 " " 4
16 " " 5
4 " " 6

18 of No. 8
2 " " 9
3 " " 10
2 " " 11
28 " " 12
1 " " 13

1 of No. 16
4 " " 17
3 " " 19
1 " " 19A
8 " " 20
1 " " 21
2 " " 22
3 " " 22A
2 " " 24
4 " " 26
2 " " 27

1 of No. 28
2 " " 33
2 " " 35
18 " " 37
2 " " 45
3 " " 46
4 " " 52
4 " " 53
11 " " 59
6 " " 60
1 " " 63

Model No. 281
Beam
Engine



The valve 1 is operated from a strip 2 pivoted at 3 to the frame and connected to the beam 4 by a short strip 5 at the other end. The top of the valve rod is pivotally connected to the strip 2 by a coupling into which a bolt passing through a hole in the strip is screwed.

Parts Required:

7 of No. 1
18 " " 2
3 " " 4
10 " " 5
1 " " 6
8 " " 8
4 " " 9
6 " " 10
4 " " 11

27 of No. 12
1 " " 13
1 " " 13A
1 " " 14
3 " " 15
1 " " 16
2 " " 17
2 " " 18
2 " " 20

2 of No. 21
5 " " 22
2 " " 23
4 " " 24
2 " " 26
1 " " 27
1 " " 28
149 " " 37
1 " " 46

1 of No. 50
7 " " 52
4 " " 53
2 " " 54
7 " " 59
6 " " 60
3 " " 62
5 " " 63

These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

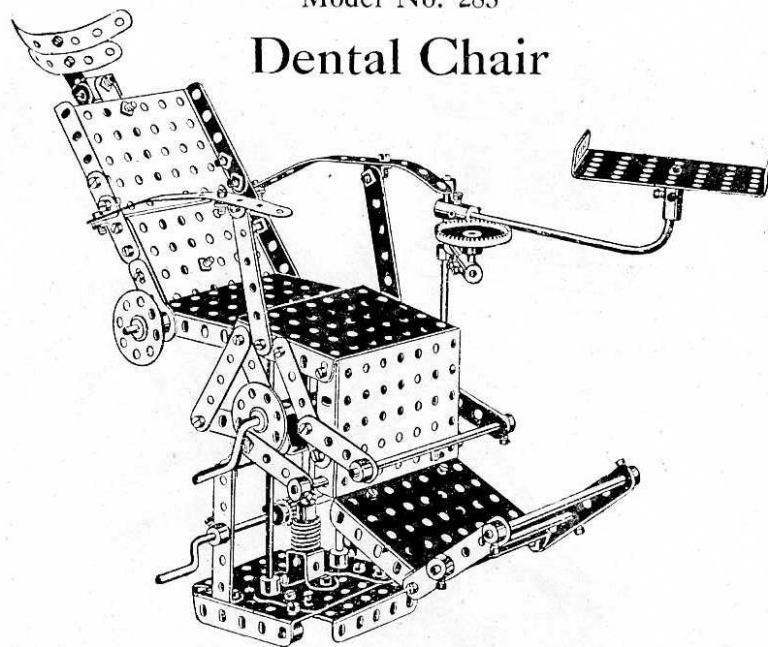
Model No. 282 Equatorial Mounting

Parts
Required :

20 of No. 2
6 " " 3
1 " " 5
4 " " 6
8 " " 12
1 " " 13

2 " " 14
1 " " 15A
2 " " 17
1 " " 21
3 " " 22
2 " " 24
2 " " 25
1 " " 27
1 " " 23
1 " " 32
60 " " 37
2 " " 46
3 " " 53
7 " " 59
6 " " 60
2 " " 63

Model No. 283 Dental Chair



Parts Required

| | | |
|------------|-------------|--------------|
| 3 of No. 2 | 1 of No. 14 | 63 of No. 37 |
| 2 " " 3 | 3 " " 15 | 1 " " 45 |
| 4 " " 4 | 5 " " 15A | 2 " " 50 |
| 7 " " 5 | 1 " " 16 | 10 " " 53 |
| 6 " " 6 | 2 " " 19 | 17 " " 59 |
| 2 " " 11 | 2 " " 24 | 2 " " 60 |
| 6 " " 12 | 1 " " 26 | 3 " " 62 |
| 1 " " 13A | 1 " " 28 | 4 " " 63 |
| | 1 " " 32 | |

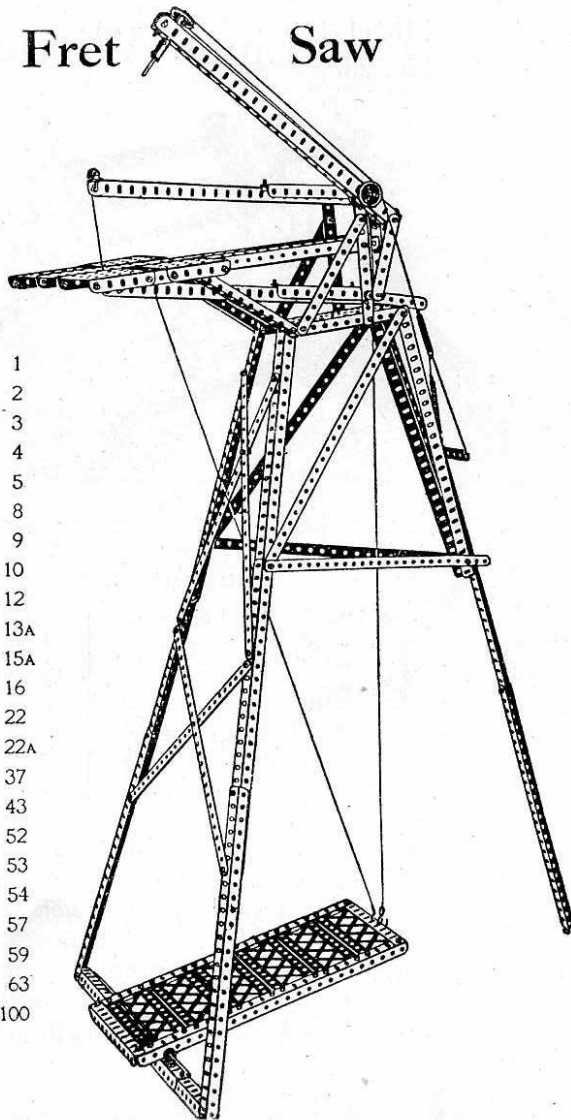
These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model
No. 284

Fret Saw

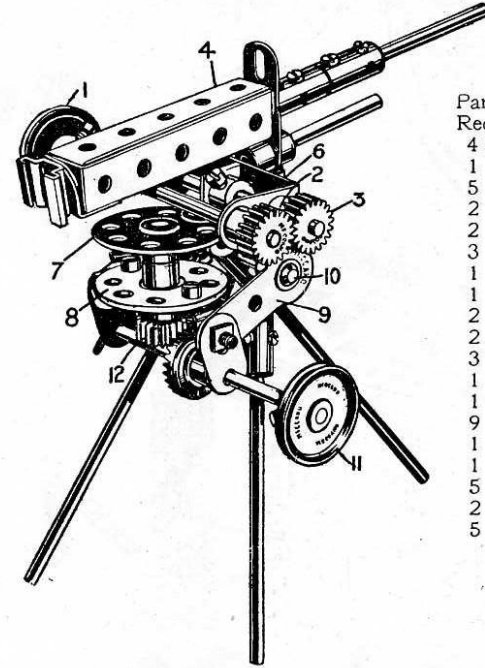
Parts
Required :

| | |
|----------|-----|
| 8 of No. | 1 |
| 6 " | 2 |
| 3 " | 3 |
| 1 " | 4 |
| 1 " | 5 |
| 20 " | 8 |
| 4 " | 9 |
| 2 " | 10 |
| 3 " | 12 |
| 1 " | 13A |
| 2 " | 15A |
| 1 " | 16 |
| 1 " | 22 |
| 2 " | 22A |
| 98 " | 37 |
| 2 " | 43 |
| 2 " | 52 |
| 4 " | 53 |
| 2 " | 54 |
| 2 " | 57 |
| 4 " | 59 |
| 1 " | 63 |
| 6 " | 100 |



Model No. 285

Maxim Gun

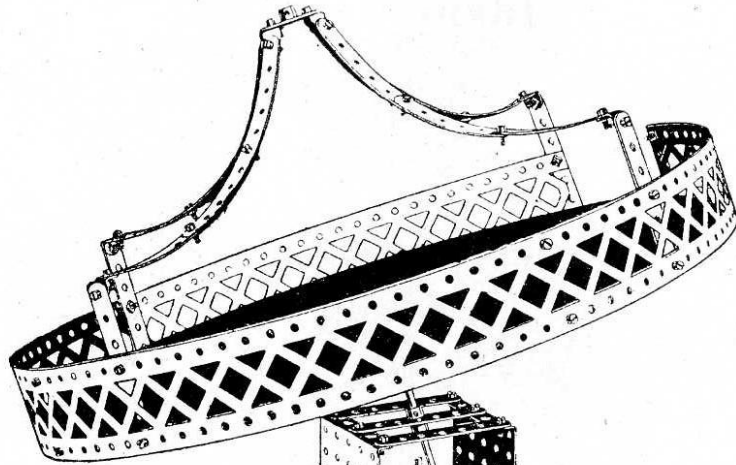


| | |
|---------------------|-----|
| Parts Required : | |
| 4 of No. | 10 |
| 1 " | 11 |
| 5 " | 12 |
| 2 " | 15 |
| 2 " | 15A |
| 3 " | 16 |
| 1 " | 17 |
| 1 " | 18 |
| 2 " | 22 |
| 2 " | 24 |
| 3 " | 26 |
| 1 " | 29 |
| 1 " | 35 |
| 9 " | 37 |
| 1 " | 46 |
| 1 " | 50 |
| 5 " | 59 |
| 2 " | 62 |
| 5 " | 63 |

The handwheel 1 operates the pinions 2 and 3; on the spindle of the latter the gun frame 4 is mounted, movement of the wheel 1 elevating the gun. The double bent strip 6 is bolted by an angle bracket to the upper bush wheel 7, the spindle of which passes loosely through the lower bush wheel 8, which is bolted by angle brackets to the cranks 9, a rod 10 joining the cranks to which the front leg of the tripod is secured, the other legs being bolted to a pair of angle brackets secured to a coupling at the top of the front leg. The gun is swivelled horizontally by means of the handwheel 11, on the spindle of which is the contrate wheel engaging the pinion 12 on the spindle of the bush wheel 7.

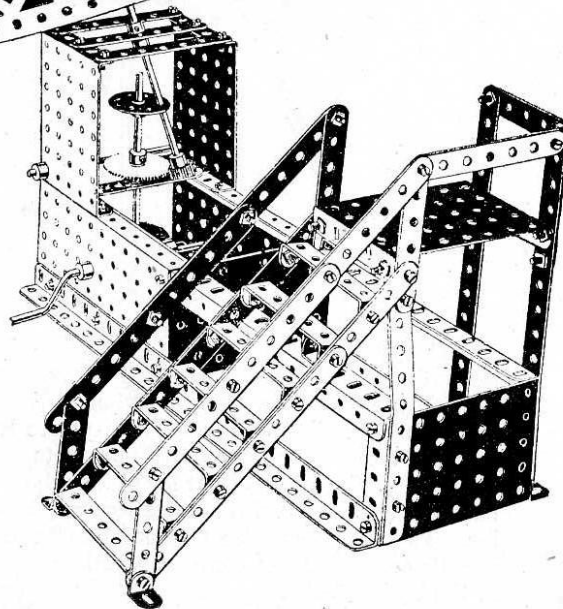
These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 286 Joy Wheel

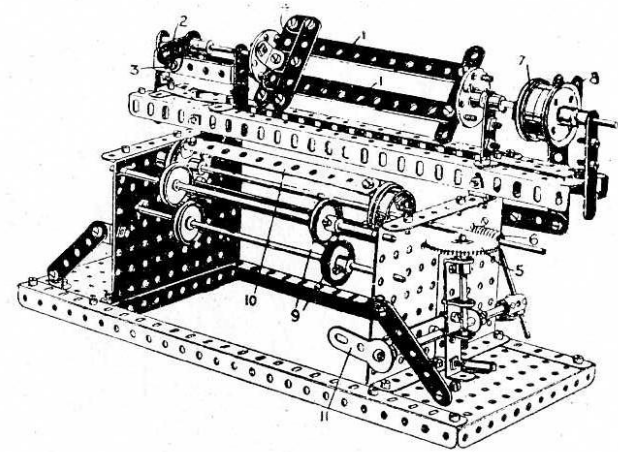


Parts
Required:

| | |
|----------|-----|
| 4 of No. | 1 |
| 23 " | 2 |
| 15 " | 3 |
| 4 " | 4 |
| 3 " | 5 |
| 1 " | 6 |
| 4 " | 8 |
| 10 " | 12 |
| 1 " | 14 |
| 1 " | 15 |
| 1 " | 15A |
| 1 " | 19 |
| 3 " | 24 |
| 1 " | 26 |
| 2 " | 27 |
| 1 " | 32 |
| 121 " | 37 |
| 2 " | 52 |
| 6 " | 53 |
| 8 " | 59 |
| 7 " | 60 |
| 4 " | 99 |



Model No. 287 Linen Winder



Parts Required:

| | | | | | |
|----------|-----|----------|----|-----------|----|
| 6 of No. | 2 | 1 of No. | 15 | 94 of No. | 37 |
| 2 " | 3 | 3 " | 16 | 1 " | 43 |
| 12 " | 5 | 1 " | 17 | 1 " | 44 |
| 4 " | 8 | 4 " | 20 | 2 " | 46 |
| 11 " | 10 | 4 " | 22 | 2 " | 52 |
| 2 " | 11 | 2 " | 24 | 7 " | 59 |
| 16 " | 12 | 1 " | 27 | 3 " | 60 |
| 1 " | 13 | 1 " | 32 | 2 " | 62 |
| 2 " | 13A | 5 " | 35 | 1 " | 63 |

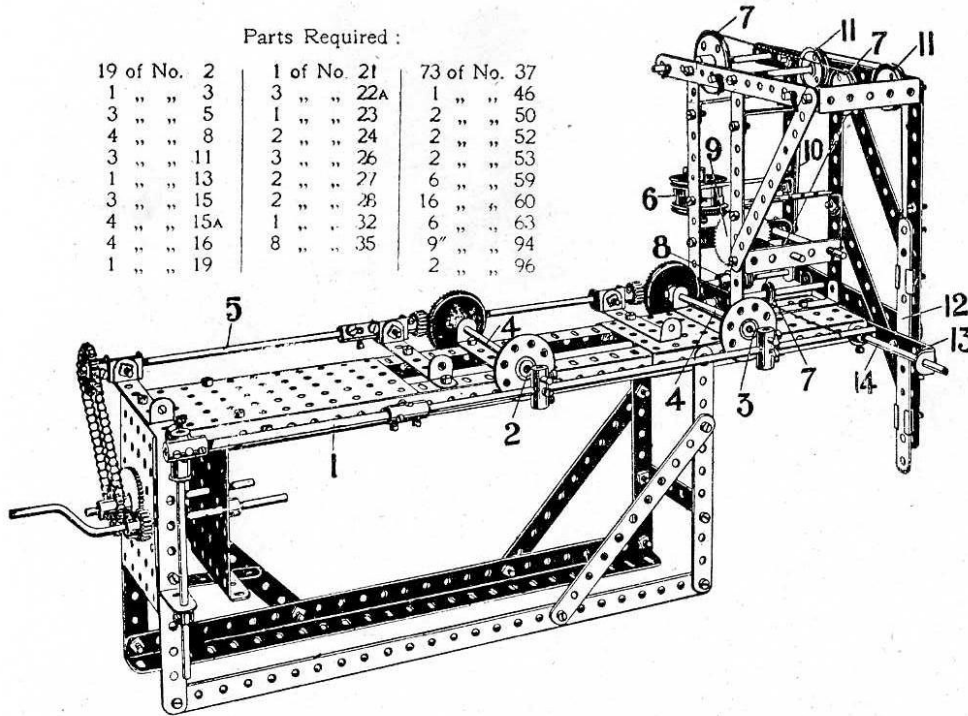
In order to disengage the winding frame bars 1 the crank 2 is lifted clear of the stop 3 and drawn back, this action disengaging the end cross strips 4 from the tips of the frame bars 1 and permitting the wound linen to be removed. The gear wheel 5 engaging the worm 6 forms a counter. 7 are the bell pulleys, and 8 the bell striker operated by crank 11; 9 are the guide pulleys for the main linen drums 10.

These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 288 Profiling Machine

Parts Required :

| | | |
|-------------|-------------|--------------|
| 19 of No. 2 | 1 of No. 21 | 73 of No. 37 |
| 1 " " 3 | 3 " " 22A | 1 " " 46 |
| 3 " " 5 | 1 " " 23 | 2 " " 50 |
| 4 " " 8 | 2 " " 24 | 2 " " 52 |
| 3 " " 11 | 3 " " 26 | 2 " " 53 |
| 1 " " 13 | 2 " " 27 | 6 " " 59 |
| 3 " " 15 | 2 " " 28 | 16 " " 60 |
| 4 " " 15A | 1 " " 32 | 6 " " 63 |
| 4 " " 16 | 8 " " 35 | 9 " " 94 |
| 1 " " 19 | | 2 " " 96 |



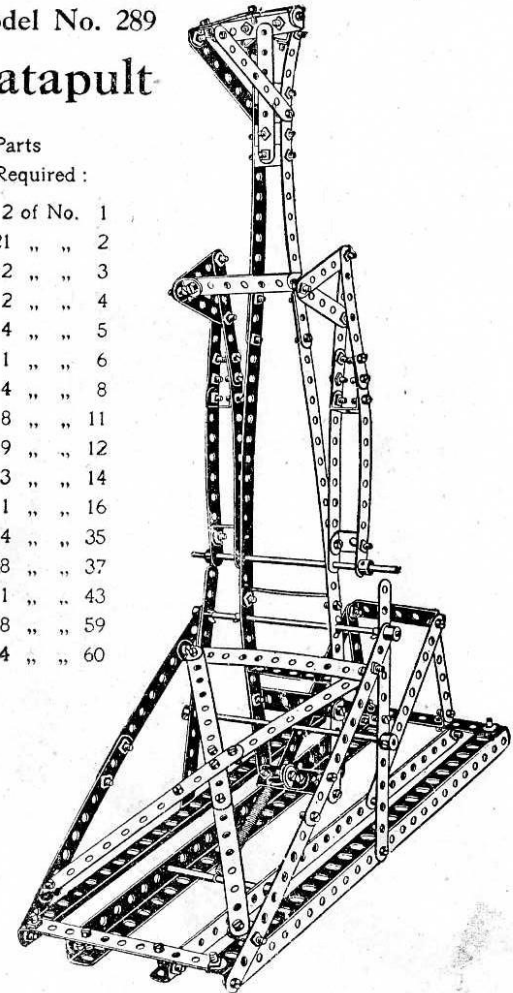
The side shaft 1 carries the follower tool 2 of the medal to be copied, and the cutting tool 3 for the work. The copy and work are rotated by the shafts 4 from the driving shaft 5, and resilient pressure is imparted to the cutting tool 3 by means of a weight 6, the cord of which passes over pulley 7 and is connected to shaft 1. The vertical traverse of the tool is effected by the worm 8 engaging the spur wheel 9, a cord winding on its spindle and passing over pulleys 11 and being connected to the girder strip 12 bolted to the double bent strip 13, which forms a bearing for a rod 14 on which the end of the shaft 1 rests.

Model No. 289 Catapult

Parts

Required :

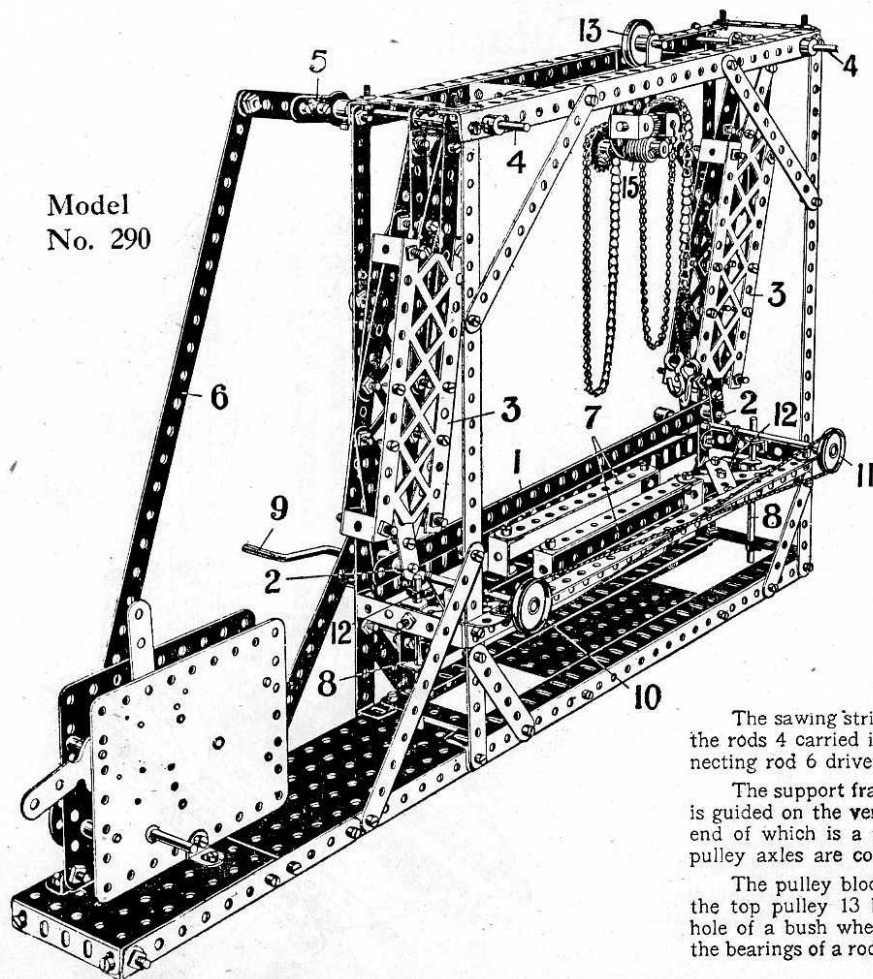
| |
|------------|
| 2 of No. 1 |
| 21 " " 2 |
| 12 " " 3 |
| 2 " " 4 |
| 4 " " 5 |
| 1 " " 6 |
| 4 " " 8 |
| 8 " " 11 |
| 19 " " 12 |
| 3 " " 14 |
| 1 " " 16 |
| 4 " " 35 |
| 98 " " 37 |
| 1 " " 43 |
| 8 " " 59 |
| 4 " " 60 |



These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Stone Sawing Machine

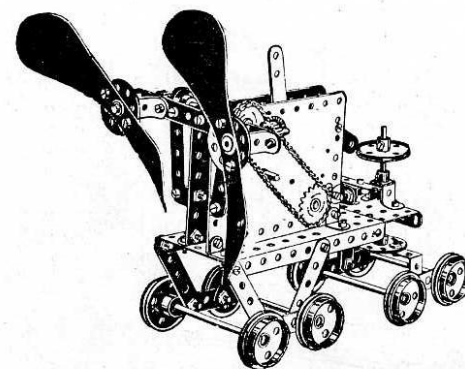
Model
No. 290



Parts
Required :

| | |
|----------|-----|
| 6 of No. | 1 |
| 14 " | 2 |
| 4 " | 3 |
| 12 " | 4 |
| 13 " | 5 |
| 8 " | 8 |
| 16 " | 11 |
| 9 " | 12 |
| 1 " | 14 |
| 3 " | 15A |
| 2 " | 16 |
| 2 " | 17 |
| 1 " | 19 |
| 3 " | 22 |
| 2 " | 24 |
| 1 " | 26 |
| 1 " | 32 |
| 6 " | 35 |
| 126 " | 37 |
| 1 " | 44 |
| 2 " | 52 |
| 1 " | 53 |
| 2 " | 57 |
| 10 " | 59 |
| 4 " | 60 |
| 2 " | 62 |
| 2 " | 63 |
| 2 " | 94 |
| 2 " | 96 |
| 4 " | 100 |

Model No. 291 Velocipede



Parts Required :

| | | | | | |
|----------|-----|----------|----|----------|----|
| 1 of No. | 2 | 8 of No. | 20 | 3 of No. | 45 |
| 1 " | 4 | 3 " | 24 | 1 " | 46 |
| 10 " | 5 | 2 " | 26 | 1 " | 52 |
| 10 " | 12 | 2 " | 29 | 1 " | 53 |
| 2 " | 15A | 47 " | 37 | 2 " | 59 |
| 4 " | 16 | 2 " | 41 | 2 " | 96 |
| 2 " | 17 | | | | |

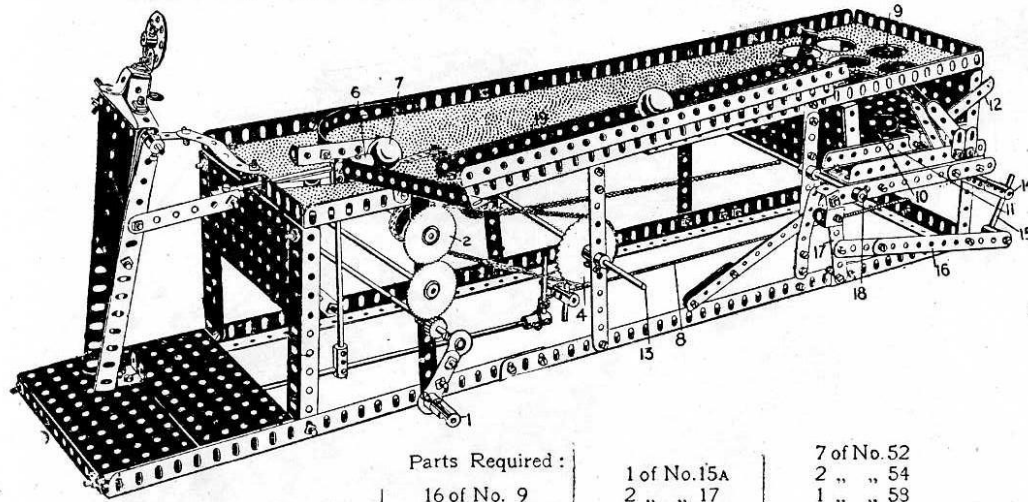
The sawing strip 1 is carried from the short rods 2 in the ends of the swinging frames 3 pivoted on the rods 4 carried in the frame. These swinging frames 3 are oscillated from the crank 5 and connecting rod 6 driven by the motor.

The support frame 7 for the stone blocks to be sawn is raised and lowered as follows: The frame 7 is guided on the vertical rods 8 and raised and lowered by the operation of the crank handle 9 on the end of which is a pulley 10 connected by a cord to another pulley 11. End cords 12 wound on the pulley axles are connected to the support frame 7 and raise or lower it as required.

The pulley block runs upon a rod supported by two 2½" bent strips across the upper framework, the top pulley 13 being carried in a cranked bent strip bolted by an angle bracket to the upper hole of a bush wheel, which forms the framework of the pulley block, two double brackets forming the bearings of a rod on which is the pinion 14 engaged by the worm 15.

These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

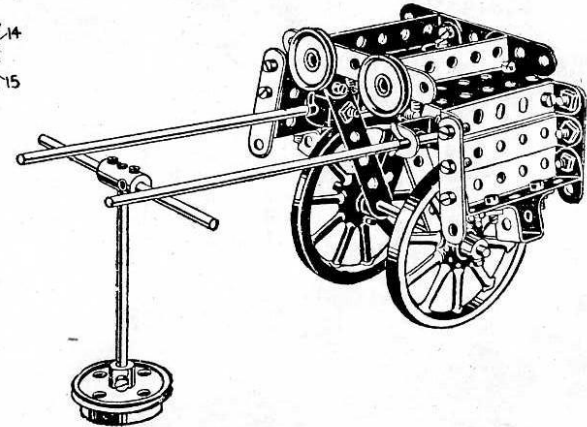
Model No. 292 Bagatelle



| Parts Required : | | | |
|------------------|-------------|--------------|-------------|
| 1 of No. 1 | 16 of No. 9 | 1 of No. 15A | 7 of No. 52 |
| 12 " " 2 | 9 " " 10 | 2 " " 17 | 2 " " 54 |
| 4 " " 4 | 3 " " 11 | 1 " " 18 | 1 " " 53 |
| 3 " " 5 | 12 " " 12 | 1 " " 24 | 11 " " 59 |
| 10 " " 6 | 1 " " 13 | 1 " " 26 | 4 " " 60 |
| 12 " " 8 | 4 " " 13A | 2 " " 27A | 2 " " 62 |
| | 3 " " 14 | 137 " " 37 | 9 " " 63 |
| | | 2 " " 45 | 3 " " 95 |
| | | | 1 " " 96 |

The operating handle 1 drives the gear wheel 2, a sprocket wheel on the spindle being coupled to a sprocket wheel 4. The spindle 5 of this carries a crank made by short rods and coupling, which crank engages at each revolution and pushes back a pusher-bar 6 by means of which the ball is driven forward. A spring cord 8 returns the pusher-rod. After the ball is driven forward, it drops down one of the holes 9 and is led by the guides into the lifting pocket. The ball is held back by a pivoted strip 12 which is caught and pulled down as the pocket 11 descends, permitting the ball to fall out. The pocket is raised by a chain passing over a 2" sprocket at the opposite end of rod 13, which is coupled to another 2" sprocket on spindle 14, which latter carries a rod 15 arranged as a crank coupled by strips 16 to an arm 17 on the pivot 18 of the lifting pocket 11. The ball is lifted by the pocket and deposited into the chute 19, by which it is returned to the pusher-arm 6.

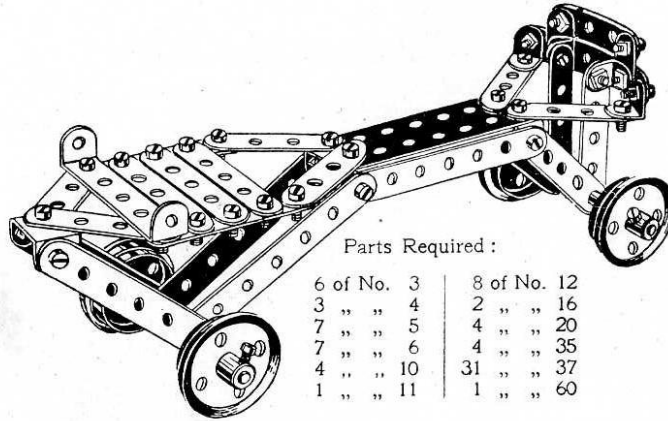
Model No. 293 Jaunting Car



| Parts Required : | | |
|------------------|-------------|--------------|
| 2 of No. 3 | 1 of No. 16 | 40 of No. 37 |
| 4 " " 4 | 2 " " 17 | 2 " " 45 |
| 4 " " 6 | 2 " " 19A | 1 " " 53 |
| 14 " " 12 | 1 " " 20 | 4 " " 59 |
| 2 " " 13A | 2 " " 22 | 8 " " 60 |
| 1 " " 15 | 4 " " 35 | 1 " " 63 |

These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

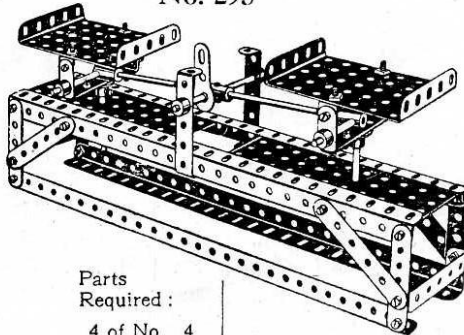
Model No. 294 Roller Skate



Parts Required :

| | |
|------------|-------------|
| 6 of No. 3 | 8 of No. 12 |
| 3 " " 4 | 2 " " 16 |
| 7 " " 5 | 4 " " 20 |
| 7 " " 6 | 4 " " 35 |
| 4 " " 10 | 31 " " 37 |
| 1 " " 11 | 1 " " 60 |

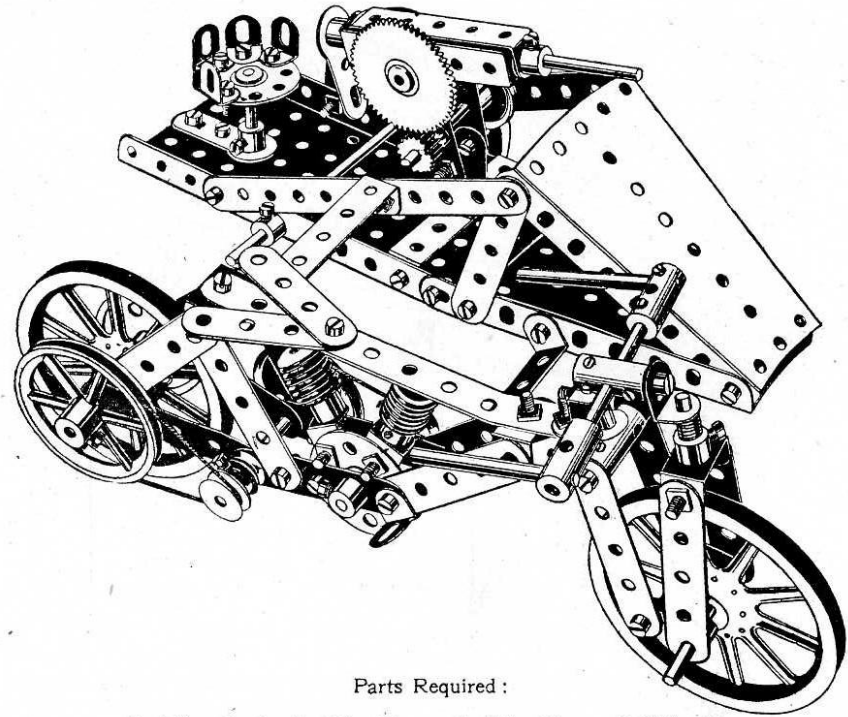
Model No. 295 Scales



Parts
Required :

| | |
|------------|-------------|
| 4 of No. 4 | 2 of No. 52 |
| 4 " " 5 | 2 " " 53 |
| 4 " " 8 | 6 " " 59 |
| 5 " " 16 | 6 " " 60 |
| 2 " " 17 | 3 " " 62 |
| 30 " " 37 | 3 " " 63 |
| 2 " " 46 | |

Model No. 296 Armed Motor Cycle

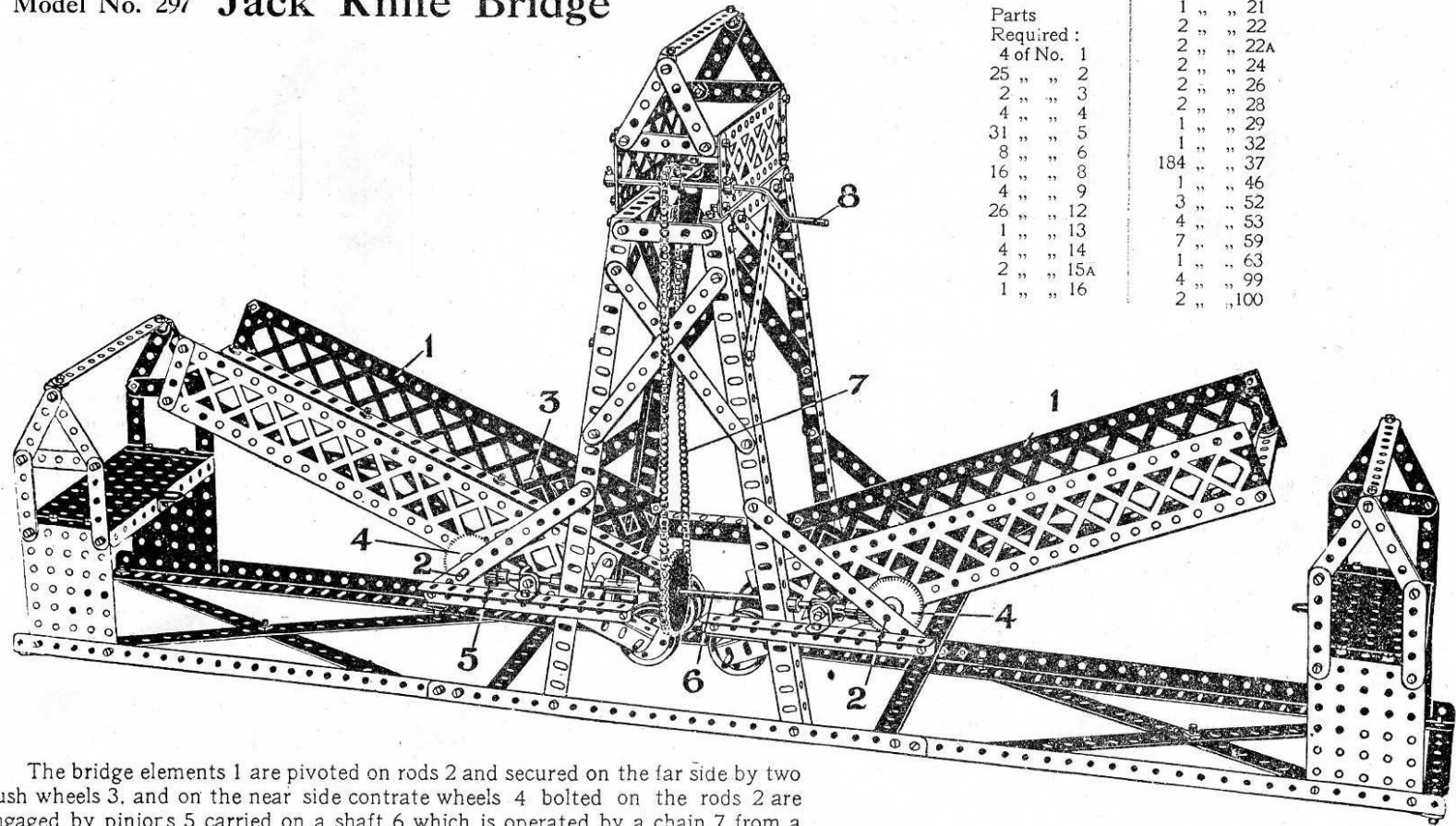


Parts Required :

| | | | |
|------------|-------------|--------------|-------------|
| 3 of No. 2 | 7 of No. 17 | 2 of No. 23A | 1 of No. 52 |
| 16 " " 5 | 3 " " 18 | 2 " " 24 | 2 " " 54 |
| 4 " " 6 | 3 " " 19A | 1 " " 26 | 10 " " 59 |
| 4 " " 10 | 1 " " 20A | 1 " " 27A | 2 " " 60 |
| 3 " " 11 | 2 " " 21 | 2 " " 32 | 2 " " 62 |
| 11 " " 12 | 1 " " 22 | 50 " " 37 | 4 " " 63 |
| 2 " " 15A | 1 " " 23 | 1 " " 44 | |

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

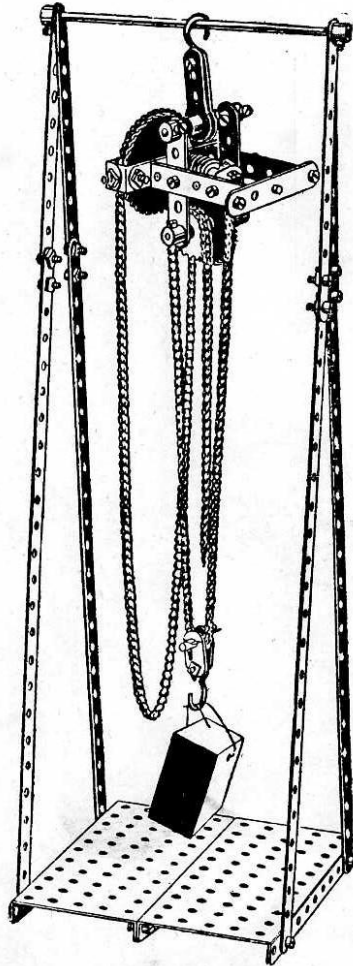
Model No. 297 Jack Knife Bridge



| Parts Required: | | 8 of No. 20 | |
|-----------------|-----|-------------|-----|
| 4 of No. 1 | 1 | 1 " | 21 |
| 25 " " | 2 | 2 " | 22 |
| 2 " " | 3 | 2 " | 22A |
| 4 " " | 4 | 2 " | 24 |
| 31 " " | 5 | 2 " | 26 |
| 8 " " | 6 | 2 " | 28 |
| 16 " " | 8 | 1 " | 29 |
| 4 " " | 9 | 1 " | 32 |
| 26 " " | 12 | 184 " | 37 |
| 1 " " | 13 | 1 " | 46 |
| 4 " " | 14 | 3 " | 52 |
| 2 " " | 15A | 4 " | 53 |
| 1 " " | 16 | 7 " | 59 |
| | | 1 " | 63 |
| | | 4 " | 99 |
| | | 2 " | 100 |

The bridge elements 1 are pivoted on rods 2 and secured on the far side by two bush wheels 3, and on the near side contrate wheels 4 bolted on the rods 2 are engaged by pinions 5 carried on a shaft 6 which is operated by a chain 7 from a sprocket wheel on the crank handle 8. In this way as the crank is rotated the shaft 6 swings the bridge elements 1 simultaneously.

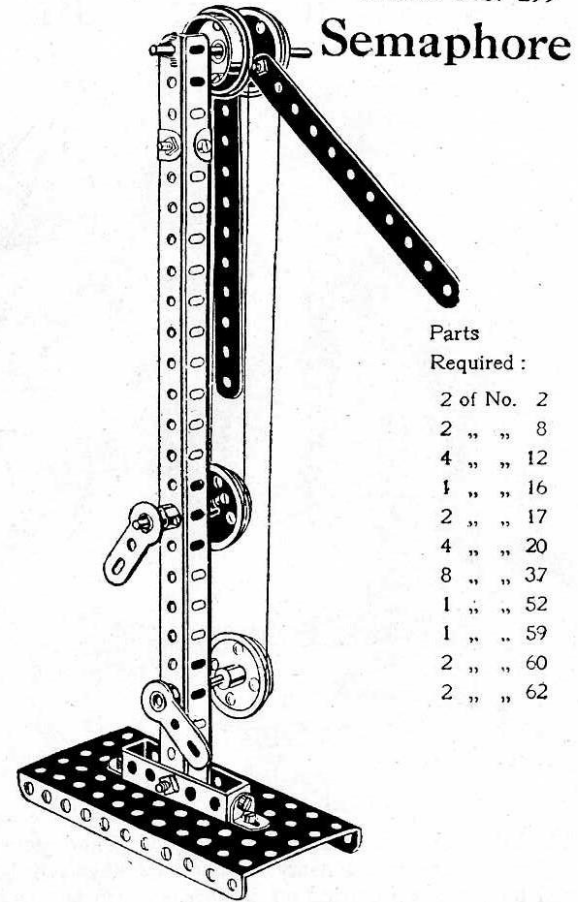
These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A



Model No. 298 Purchase Block

Parts
Required :

| | |
|----------|-----|
| 4 of No. | 1 |
| 4 " | 2 |
| 3 " | 5 |
| 2 " | 10 |
| 1 " | 12 |
| 1 " | 15 |
| 1 " | 16 |
| 2 " | 17 |
| 1 " | 18 |
| 1 " | 27A |
| 1 " | 32 |
| 2 " | 35 |
| 23 " | 37 |
| 2 " | 52 |
| 2 " | 57 |
| 7 " | 59 |
| 4 " | 60 |
| 2 " | 62 |
| 4 " | 94 |
| 1 " | 95 |
| 1 " | 96 |



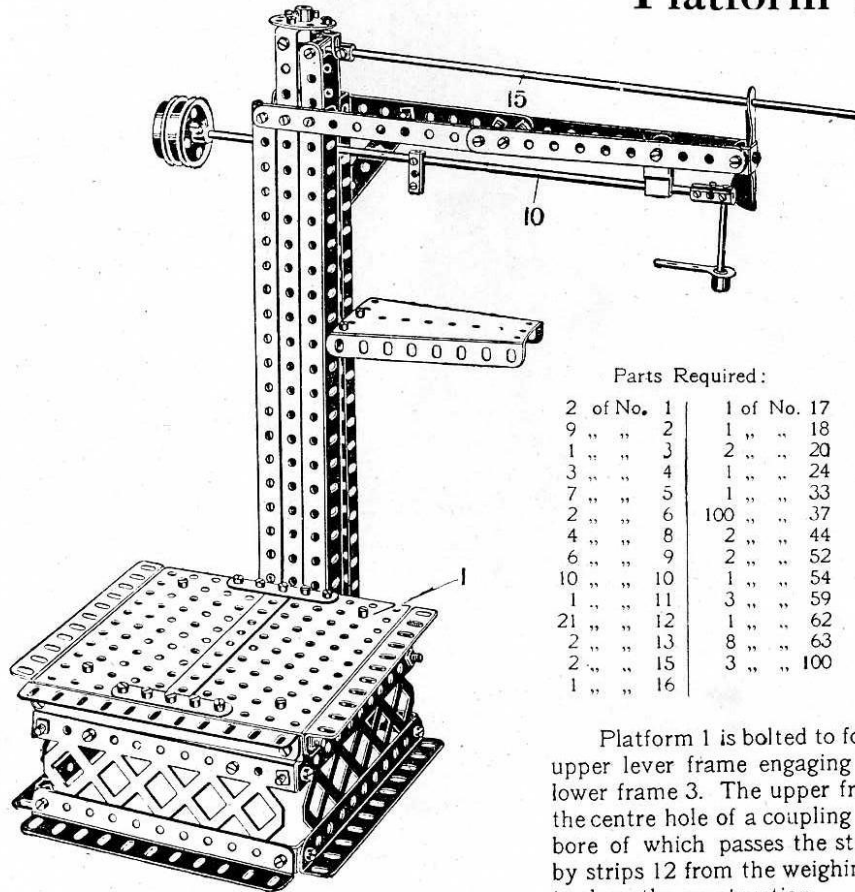
Model No. 299 Semaphore

Parts
Required :

| | |
|----------|----|
| 2 of No. | 2 |
| 2 " | 8 |
| 4 " | 12 |
| 1 " | 16 |
| 2 " | 17 |
| 4 " | 20 |
| 8 " | 37 |
| 1 " | 52 |
| 1 " | 59 |
| 2 " | 60 |
| 2 " | 62 |

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 300 Platform Scales



Parts Required:

| | |
|------------|-------------|
| 2 of No. 1 | 1 of No. 17 |
| 9 " " 2 | 1 " " 18 |
| 1 " " 3 | 2 " " 20 |
| 3 " " 4 | 1 " " 24 |
| 7 " " 5 | 1 " " 33 |
| 2 " " 6 | 100 " " 37 |
| 4 " " 8 | 2 " " 44 |
| 6 " " 9 | 2 " " 52 |
| 10 " " 10 | 1 " " 54 |
| 1 " " 11 | 3 " " 59 |
| 21 " " 12 | 1 " " 62 |
| 2 " " 13 | 8 " " 63 |
| 2 " " 15 | 3 " " 100 |
| 1 " " 16 | |

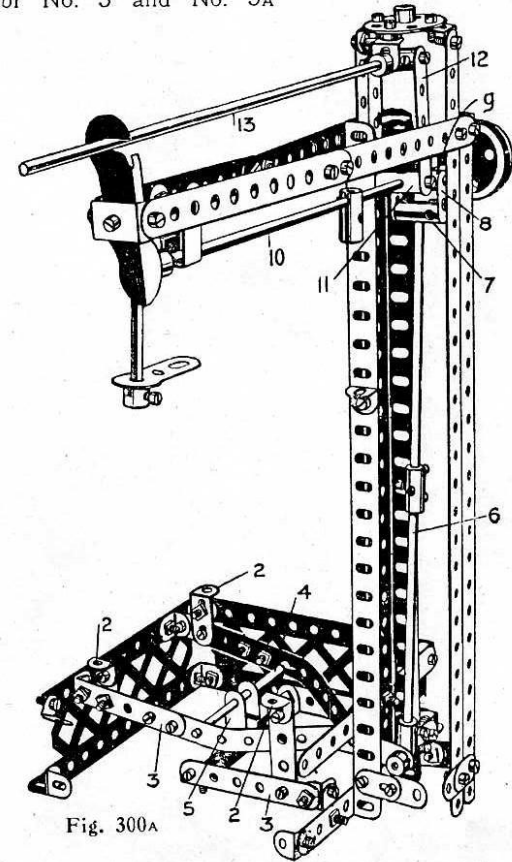
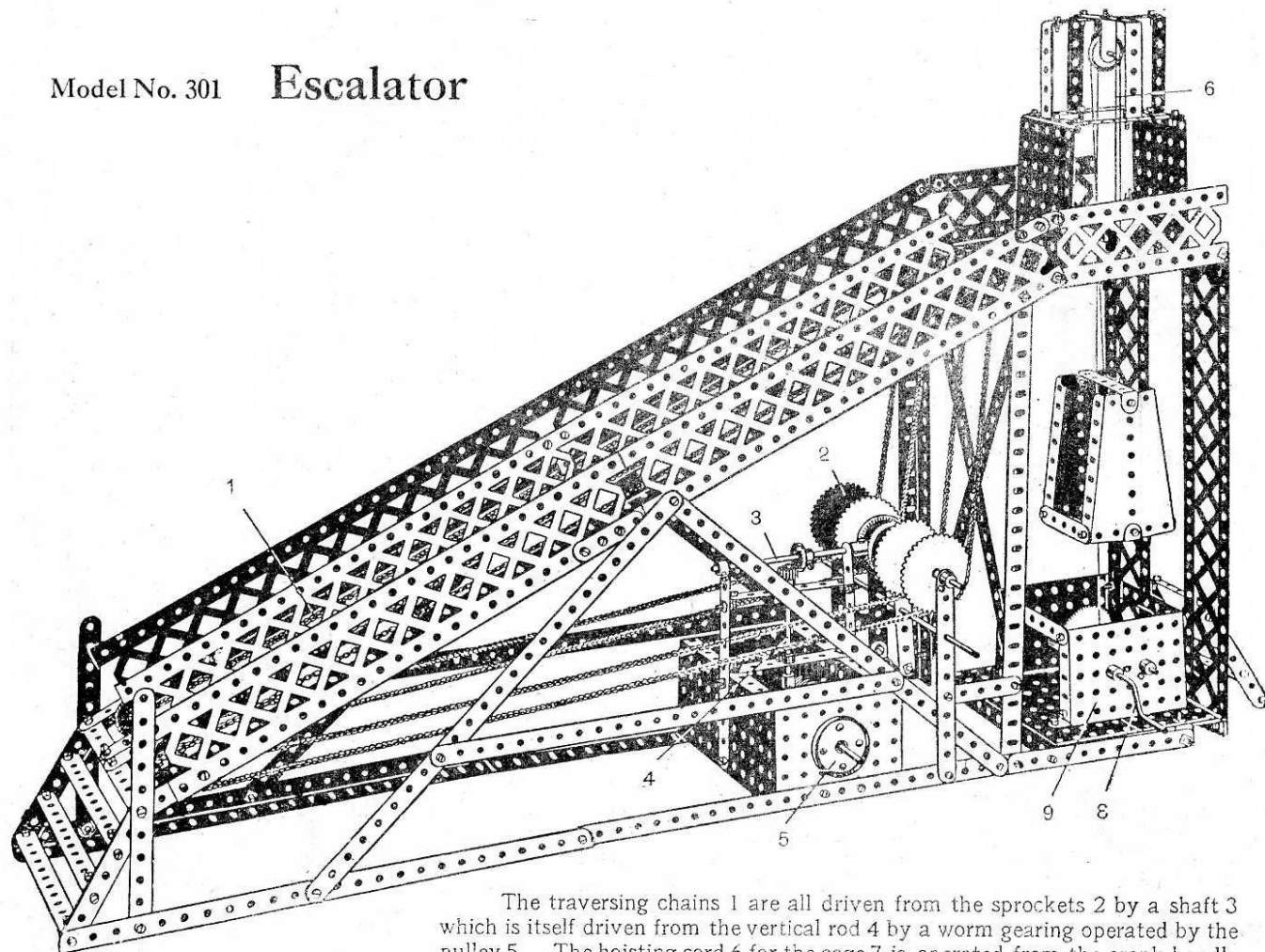


Fig. 300A

Platform 1 is bolted to four angle brackets 2, which are bolted to a pair of lever frames 3, the upper lever frame engaging a rod 4, which is also connected by a cranked bent strip 5 to the lower frame 3. The upper frame 3 is connected to the foot of a pull rod 6, the top of which engages the centre hole of a coupling 7, linked by flat brackets 8 to another coupling 9, through the centre bore of which passes the steelyard rod 10, which is pivotally suspended from another coupling 11 by strips 12 from the weighing lever 13. Sectional view shows the model slightly dismantled, better to show the construction.

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 301 Escalator



The traversing chains 1 are all driven from the sprockets 2 by a shaft 3 which is itself driven from the vertical rod 4 by a worm gearing operated by the pulley 5. The hoisting cord 6 for the cage 7 is operated from the crank handle 8 by gearing in the box 9. The cage traverses guide cords secured at top and bottom and which pass through the holes in the strips of the cage.

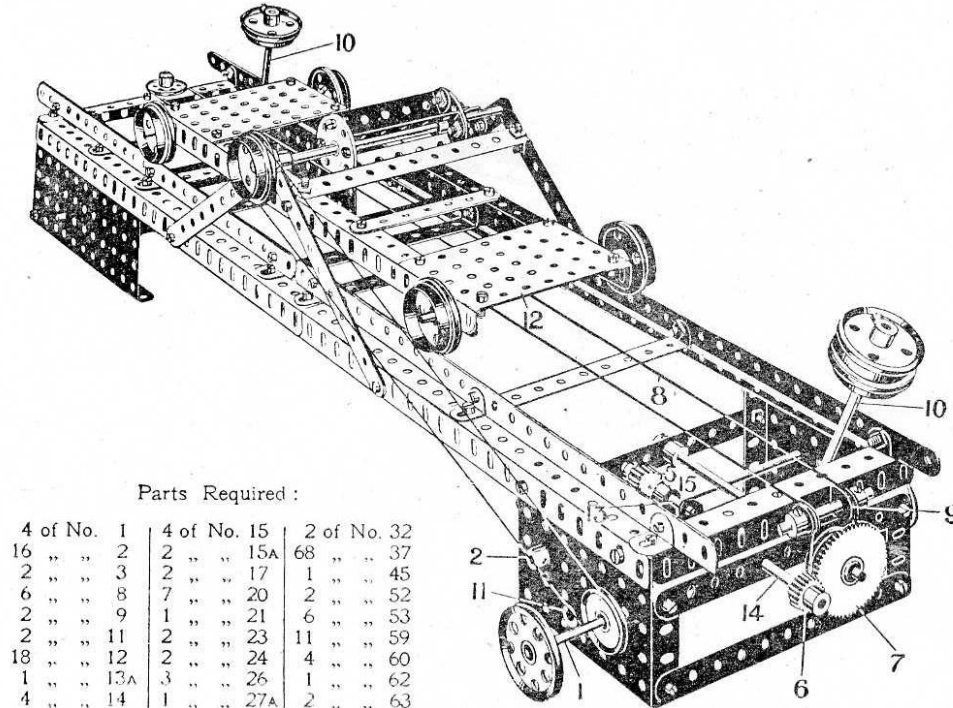
Parts Required:

| | |
|-----|----------|
| 8 | of No. 1 |
| 10 | " " 2 |
| 11 | " " 3 |
| 6 | " " 5 |
| 2 | " " 6 |
| 12 | " " 8 |
| 2 | " " 9 |
| 4 | " " 10 |
| 32 | " " 12 |
| 2 | " " 13A |
| 4 | " " 14 |
| 2 | " " 15A |
| 1 | " " 16 |
| 1 | " " 18 |
| 1 | " " 19 |
| 1 | " " 21 |
| 1 | " " 22 |
| 2 | " " 22A |
| 1 | " " 25 |
| 5 | " " 26 |
| 2 | " " 27A |
| 2 | " " 28 |
| 1 | " " 29 |
| 1 | " " 32 |
| 150 | " " 37 |
| 1 | " " 44 |
| 5 | " " 52 |
| 6 | " " 53 |
| 2 | " " 54 |
| 10 | " " 59 |
| 10 | " " 60 |
| 20 | " " 94 |
| 4 | " " 95 |
| 8 | " " 96 |
| 8 | " " 99 |
| 2 | " " 100 |

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 302

Planing Machine



Parts Required :

| | | |
|------------|-------------|-------------|
| 4 of No. 1 | 4 of No. 15 | 2 of No. 32 |
| 16 " " 2 | 2 " " 15A | 68 " " 37 |
| 2 " " 3 | 2 " " 17 | 1 " " 45 |
| 6 " " 8 | 7 " " 20 | 2 " " 52 |
| 2 " " 9 | 1 " " 21 | 6 " " 53 |
| 2 " " 11 | 2 " " 23 | 11 " " 59 |
| 18 " " 12 | 2 " " 24 | 4 " " 60 |
| 1 " " 13A | 3 " " 26 | 1 " " 62 |
| 4 " " 14 | 1 " " 27A | 2 " " 63 |

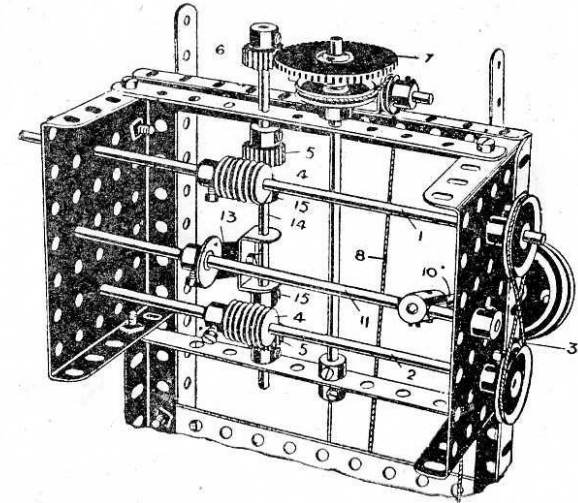
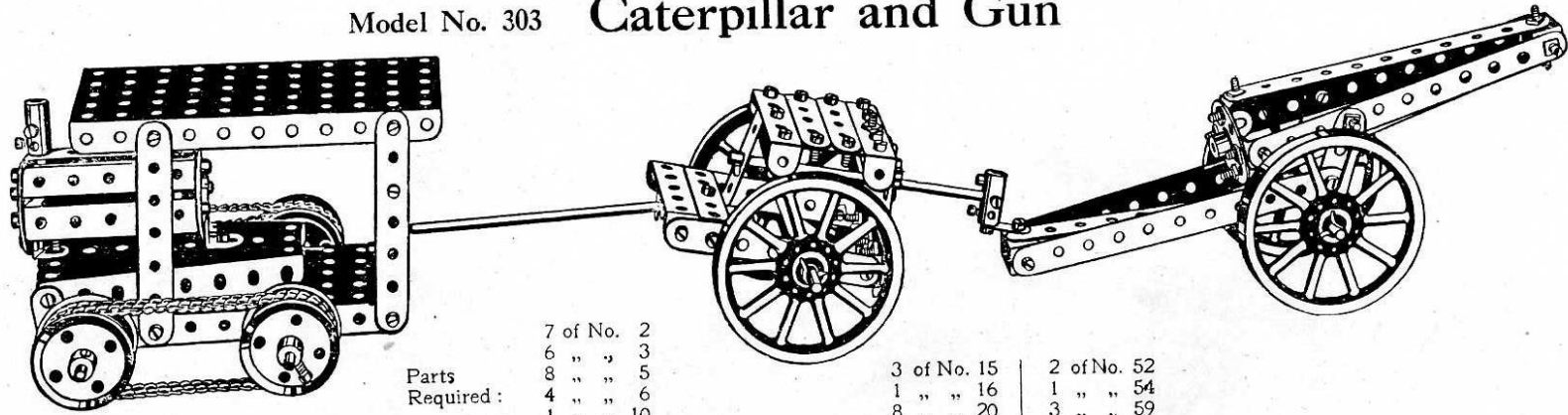


Fig. 302A

The driving spindle 1 and the spindle 2 are connected by a crossed rope 3, so that they rotate in opposite directions. These spindles carry worms 4, one or other of which engages with one of two pinions 5 on a spindle which also carries a pinion 6 engaging a gear wheel 7, which carries a 1" fast pulley round which the traversing cord 8 passes on to the $\frac{1}{2}$ " loose pulleys 9. The weighted spindles 10 at opposite ends of the apparatus are pivotally carried on spindles 11, and are engaged by the carriage 12 at the end of its travel. The spindle 11 carries a crank piece 13 to the end of which is bolted a double bracket sliding on the spindle 14, and engages collars 15 thereon, so that as the weighted spindle 10 is pushed over by the carriage the crank 13 disengages one pinion from its worm and engages the other worms and pinion, thus reversing the direction of rotation of the pinion 6, and consequently of the traversing rope 3.

These Models Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 303 Caterpillar and Gun

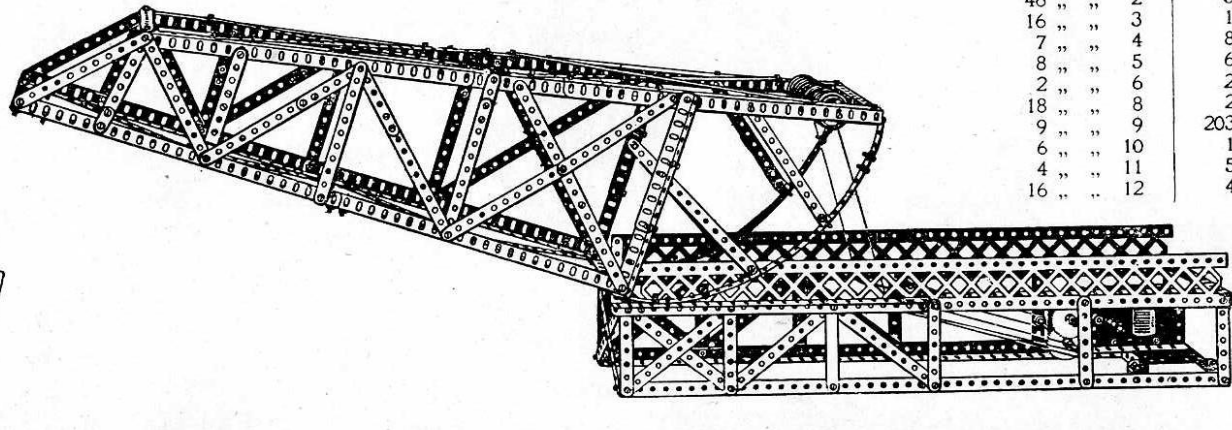


Parts
Required :

| | |
|----------|----|
| 7 of No. | 2 |
| 6 " " | 3 |
| 8 " " | 5 |
| 4 " " | 6 |
| 1 " " | 10 |
| 4 " " | 11 |
| 8 " " | 12 |
| 2 " " | 14 |

| | | | |
|----------|----|----------|----|
| 3 of No. | 15 | 2 of No. | 52 |
| 1 " " | 16 | 1 " " | 54 |
| 8 " " | 20 | 3 " " | 59 |
| 3 " " | 24 | 11 " " | 60 |
| 4 " " | 35 | 2 " " | 63 |
| 78 " " | 37 | 4 " " | 94 |

Model No. 304 Rolling Lift Bridge



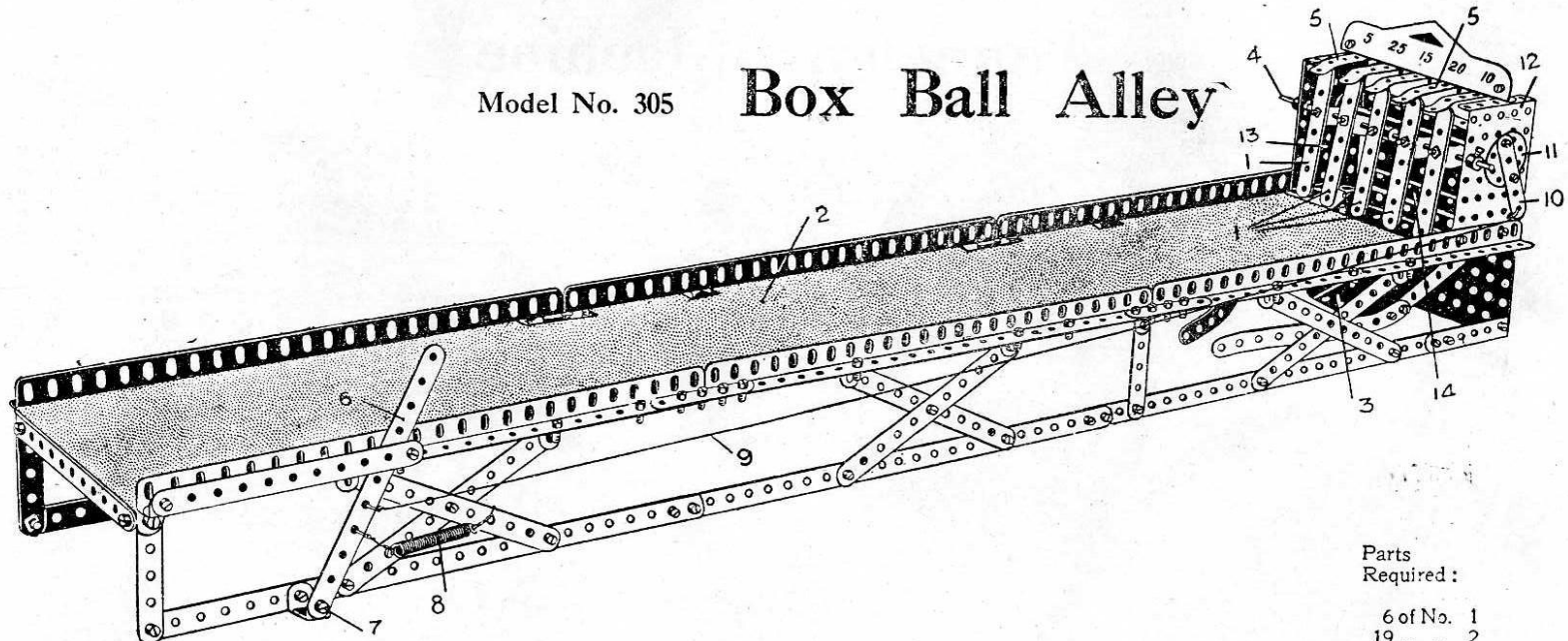
Parts Required :

| | | | |
|-----------|----|----------|----|
| 10 of No. | 1 | 2 of No. | 13 |
| 46 " " | 2 | 3 " " | 14 |
| 16 " " | 3 | 1 " " | 17 |
| 7 " " | 4 | 8 " " | 20 |
| 8 " " | 5 | 6 " " | 23 |
| 2 " " | 6 | 2 " " | 26 |
| 18 " " | 8 | 2 " " | 27 |
| 9 " " | 9 | 203 " " | 37 |
| 6 " " | 10 | 1 " " | 52 |
| 4 " " | 11 | 5 " " | 59 |
| 16 " " | 12 | 4 " " | 99 |

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 305

Box Ball Alley



This model gives endless amusement.

The object is to hit one of the strips 1, which have various number values, by means of a ball rolled along the platform 2, the ball after striking and tipping one of the strips being returned by the tray 3 to the player. The strips 1 are pivoted by double bent strips on to a rod 4, so that each strip may swing independently. The upper end of each strip is engaged by strips 5, the ends of which are bent slightly down, as shown, so that while the strips 1 are normally held in the position shown, when one of the strips is struck by the ball it is deflected backward and its upper end snaps outward past the bent end of its strip 5, which thus acts as a spring, the deflected strip being then retained in that position until it is reset. To reset any or all of the strips 1 a handle is formed by a strip 6 pivoted at 7 and controlled by a tension spring 8. A cord 9 connects the strip 6 to a short strip 10 forming a crank and bolted to a bush wheel 11 on an axle journalled in the side plates 12. This axle on its interior carries two further bush wheels to which are secured two short strips 13 forming cranks, a long double bent strip 14 being in turn bolted to the strips 13. When therefore the handle 6 is pulled out against the spring 8 the cord 9 rotates the bush wheel 11 and forces out the long double bent strip 14 which pushes out the strips 1 and resets them in their normal positions. During this resetting operation the upper ends of the strips 1 snap back beneath the bent ends of the spring strips 5.

Parts
Required :

| | |
|----------|----|
| 6 of No. | 1 |
| 19 " | 2 |
| 5 " | 3 |
| 2 " | 4 |
| 15 " | 5 |
| 6 " | 8 |
| 5 " | 11 |
| 27 " | 12 |
| 1 " | 14 |
| 1 " | 15 |
| 2 " | 16 |
| 1 " | 24 |
| 8 " | 35 |
| 132 " | 37 |
| 1 " | 43 |
| 2 " | 52 |
| 2 " | 53 |
| 2 " | 54 |
| 2 " | 59 |
| 2 " | 62 |
| 1 " | 63 |

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 306

Tunnelling Machine

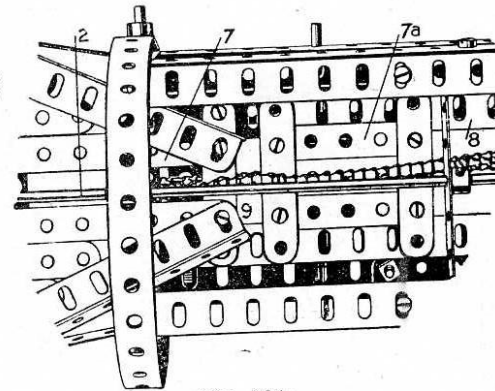
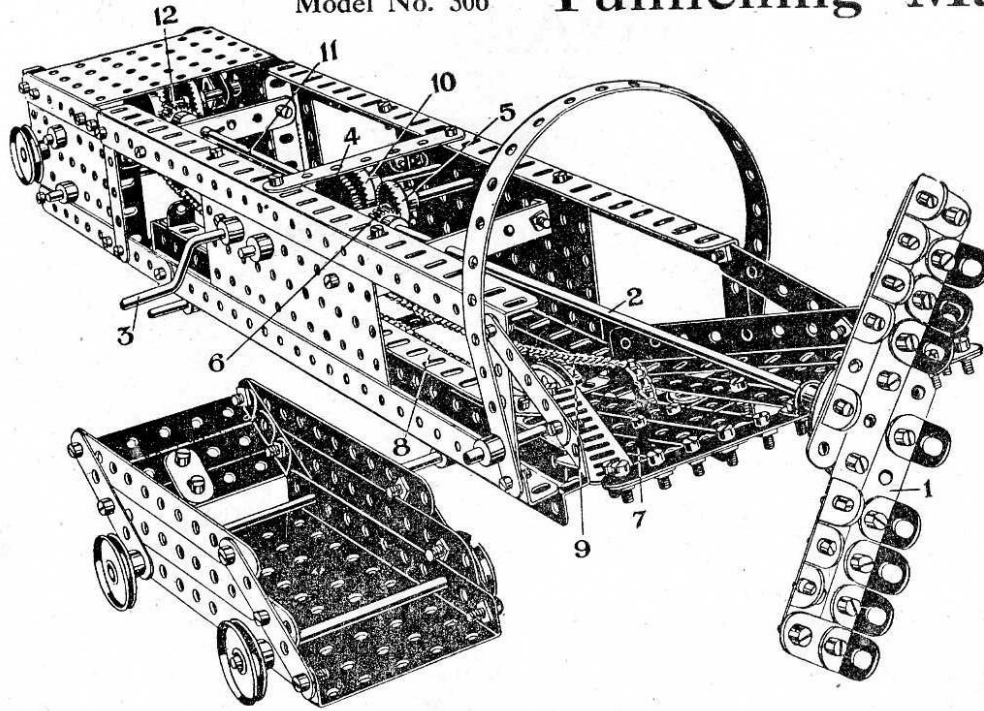


Fig. 306A

Parts
Required :

| | |
|----------|-----|
| 1 of No. | 1 |
| 12 " | 2 |
| 10 " | 3 |
| 2 " | 4 |
| 17 " | 5 |
| 8 " | 8 |
| 2 " | 9 |
| 5 " | 10 |
| 23 " | 12 |
| 1 " | 13 |
| 1 " | 14 |
| 4 " | 15 |
| 3 " | 15A |
| 2 " | 16 |
| 1 " | 19 |
| 4 " | 20 |
| 1 " | 21 |
| 5 " | 22 |
| 1 " | 25 |
| 4 " | 26 |
| 2 " | 27A |
| 2 " | 28 |
| 2 " | 29 |
| 4 " | 35 |
| 103 " | 37 |
| 1 " | 46 |
| 1 " | 52 |
| 3 " | 53 |
| 12 " | 59 |
| 3 " | 60 |
| 1 " | 62 |
| 216 " | 94 |
| 2 " | 96 |

The main boring head 1 is driven by the shaft 2 from the crank 3, on the spindle of which a pinion engages a gear wheel 4 which is fixed on the same spindle as the contrate wheel 5, which is geared with the pinion 6 on the shaft 2. The earth removed by the boring head falls down the slope 7 and is removed by a traversing carriage 7A running on the rails 8 and operated by the chain 9. As the carriage reaches the inner part of its travel it tips by meeting a stop. The carriage is traversed by a contrate wheel engaging a pinion on the shaft 11, another pinion 12 on this shaft engaging one or other of the contrate wheels which form a clutch for reversing the carriage, the contrate wheels spindle carrying a pinion which engages a gear wheel on the spindle of the rear sprocket wheel carrying the chain.

This Model Can be Made with MECCANO
Outfit No. 6, or No. 5 and No. 5A

Model No. 307 Crane

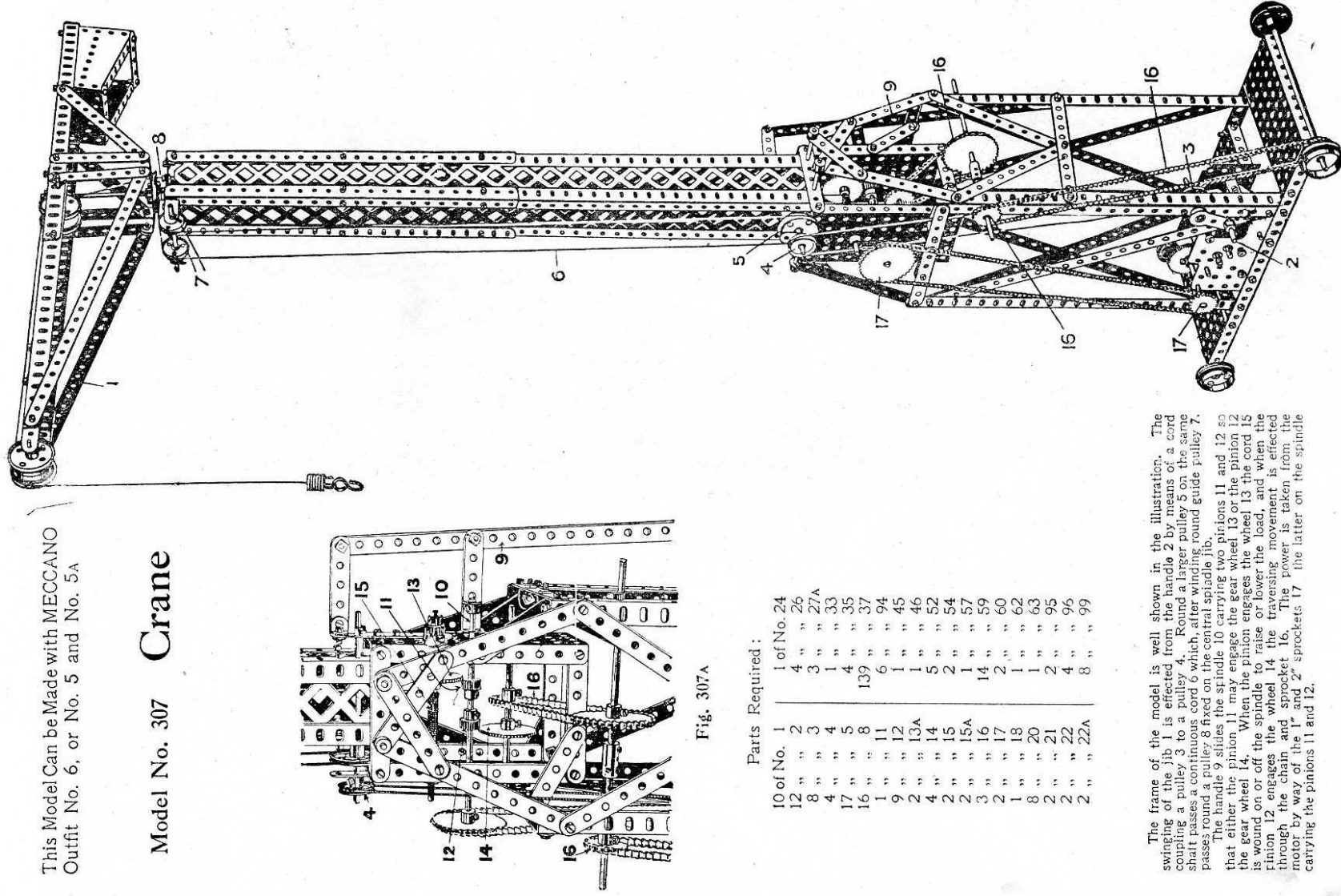


Fig. 307A

Parts Required :

| 10 of No. | 1 | 1 of No. | 24 |
|-----------|-----|----------|-----|
| 12 " | 2 | 4 " | 26 |
| 8 " | 3 | 3 " | 27A |
| 4 " | 4 | 1 " | 33 |
| 17 " | 5 | 4 " | 35 |
| 16 " | 8 | 139 " | 37 |
| 1 " | 11 | 6 " | 94 |
| 9 " | 12 | 1 " | 45 |
| 2 " | 13A | 1 " | 46 |
| 4 " | 14 | 5 " | 52 |
| 2 " | 15 | 2 " | 54 |
| 2 " | 15A | 1 " | 57 |
| 3 " | 16 | 14 " | 59 |
| 2 " | 17 | 2 " | 60 |
| 1 " | 18 | 1 " | 62 |
| 8 " | 20 | 1 " | 63 |
| 2 " | 21 | 2 " | 95 |
| 2 " | 22 | 4 " | 96 |
| 2 " | 22A | 8 " | 99 |

The frame of the model is well shown in the illustration. The swinging of the jib 1 is effected from the handle 2 by means of a cord coupling a pulley 3 to a pulley 4. Round a larger pulley 5 on the same shaft passes a continuous cord 6 which, after winding round guide pulley 7, passes round a pulley 8 fixed on the central spindle jib.

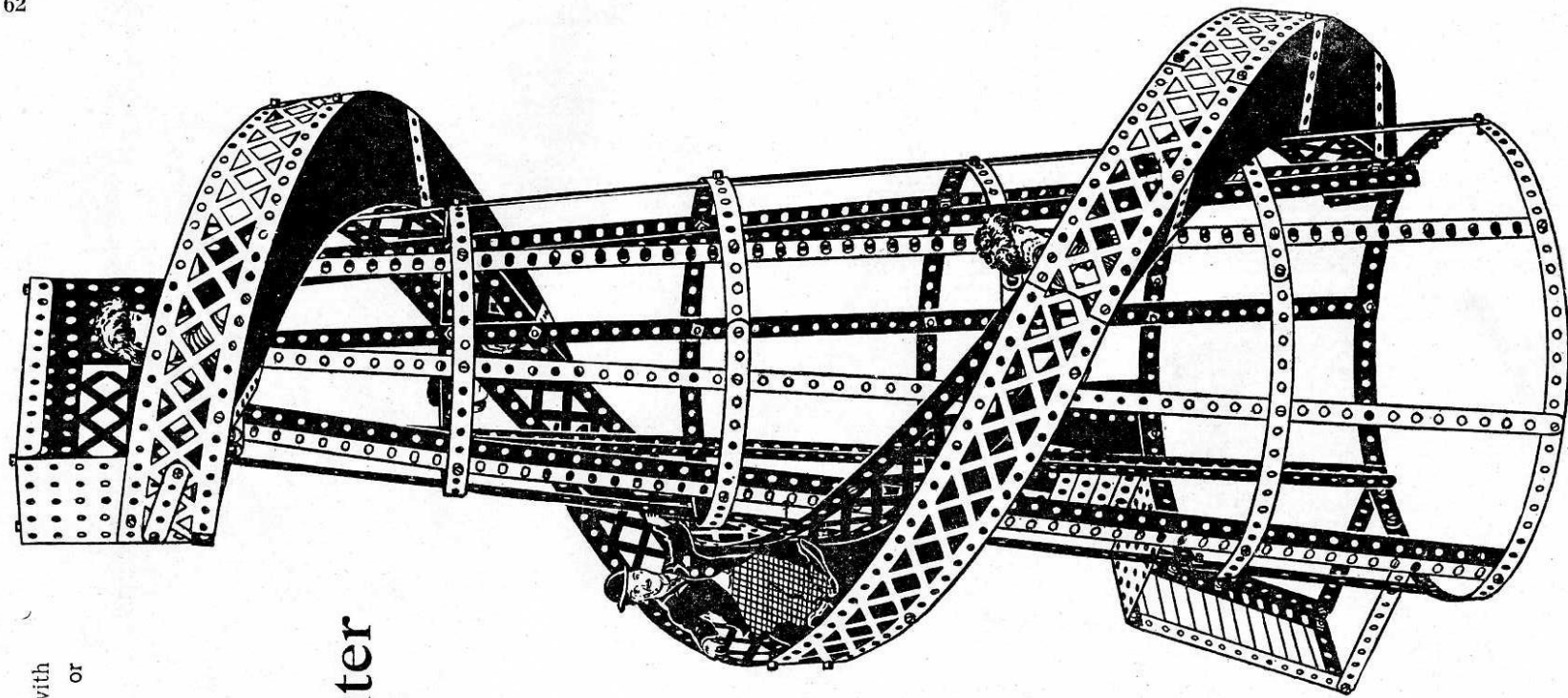
The handle 9 slides the spindle 10 carrying two pinions 11 and 12 so that either the pinion 11 may engage the gear wheel 13 or the pinion 12 the gear wheel 14. When the pinion engages the wheel 13 the cord 15 is wound on or off the spindle to raise or lower the load, and when the pinion 12 engages the wheel 14 the traversing movement is effected through the chain and sprocket 16. The power is taken from the motor by way of the 1" and 2" sprockets 17 the latter on the spindle carrying the pinions 11 and 12.

This Model Can be Made with
MECCANO Outfit No. 6, or
No. 5 and No. 5A

Model No. 308

Helter Skelter

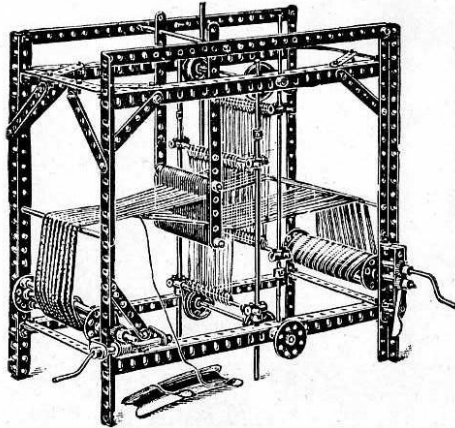
| | |
|------------|--|
| Parts | |
| Required : | |
| 21 of No. | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 |
| 7 " | 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 |
| 15 " | 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 |
| 8 " | 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 |
| 6 " | 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 |
| 2 " | 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 |
| 4 " | 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 |
| 157 " | 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 |
| 2 " | 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 |
| 4 " | 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 |
| 2 " | 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 |
| 9 " | 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 |
| 10 " | 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 |
| 2 " | 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 |
| 2 " | 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 |
| 2 " | 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 |
| 2 " | 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 |
| 2 " | 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 |
| 2 " | 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 |
| 2 " | 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 |
| 2 " | 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 |
| 2 " | 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 |
| 2 " | 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 |
| 2 " | 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 |
| 2 " | 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 |
| 2 " | 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 |
| 2 " | 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 |
| 2 " | 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 |
| 2 " | 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 |
| 2 " | 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 |
| 2 " | 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 |
| 2 " | 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 |
| 2 " | 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 |
| 2 " | 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 |
| 2 " | 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 |
| 2 " | 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 |
| 2 " | 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 |
| 2 " | 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 |
| 2 " | 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 |
| 2 " | 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 |
| 2 " | 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 |
| 2 " | 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 |
| 2 " | 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 |
| 2 " | 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 |
| 2 " | 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 |
| 2 " | 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 |
| 2 " | 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 |
| 2 " | 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 |
| 2 " | 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 |
| 2 " | 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 |
| 2 " | 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 |
| 2 " | 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 |
| 2 " | 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 |
| 2 " | 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 |
| 2 " | 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 |
| 2 " | 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 |
| 2 " | 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 |
| 2 " | 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 |
| 2 " | 1219 1220 1221 1222 1223 1224 1225 1226 1227 1228 1229 1230 1231 1232 1233 1234 1235 1236 1237 1238 1239 |
| 2 " | 1240 1241 1242 1243 1244 1245 1246 1247 1248 1249 1250 1251 1252 1253 1254 1255 1256 1257 1258 1259 1260 |
| 2 " | 1261 1262 1263 1264 1265 1266 1267 1268 1269 1270 1271 1272 1273 1274 1275 1276 1277 1278 1279 1280 1281 |
| 2 " | 1282 1283 1284 1285 1286 1287 1288 1289 1290 1291 1292 1293 1294 1295 1296 1297 1298 1299 1300 1301 1302 |
| 2 " | 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 |
| 2 " | 1324 1325 1326 1327 1328 1329 1330 1331 1332 1333 1334 1335 1336 1337 1338 1339 1340 1341 1342 1343 1344 |
| 2 " | 1345 1346 1347 1348 1349 1350 1351 1352 1353 1354 1355 1356 1357 1358 1359 1360 1361 1362 1363 1364 1365 |
| 2 " | 1366 1367 1368 1369 1370 1371 1372 1373 1374 1375 1376 1377 1378 1379 1380 1381 1382 1383 1384 1385 1386 |
| 2 " | 1387 1388 1389 1390 1391 1392 1393 1394 1395 1396 1397 1398 1399 1400 1401 1402 1403 1404 1405 1406 1407 |
| 2 " | 1408 1409 1410 1411 1412 1413 1414 1415 1416 1417 1418 1419 1420 1421 1422 1423 1424 1425 1426 1427 1428 |
| 2 " | 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 |
| 2 " | 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 |
| 2 " | 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 |
| 2 " | 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 |
| 2 " | 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 |
| 2 " | 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 |
| 2 " | 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 |
| 2 " | 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 |
| 2 " | 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 |
| 2 " | 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 |
| 2 " | 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 |
| 2 " | 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 |
| 2 " | 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 |
| 2 " | 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 |
| 2 " | 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 |
| 2 " | 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 |
| 2 " | 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 |
| 2 " | 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 |
| 2 " | 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 |
| 2 " | 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 |
| 2 " | 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 |
| 2 " | 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 |
| 2 " | 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 |
| 2 " | 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 |
| 2 " | 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 |
| 2 " | 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 |
| 2 " | 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 |
| 2 " | 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 |
| 2 " | 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 |
| 2 " | 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 |
| 2 " | 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 |
| 2 " | 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 |



Model No. 309

Loom

Made with MECCANO Outfit
No. 6, or No. 5 and No. 5A



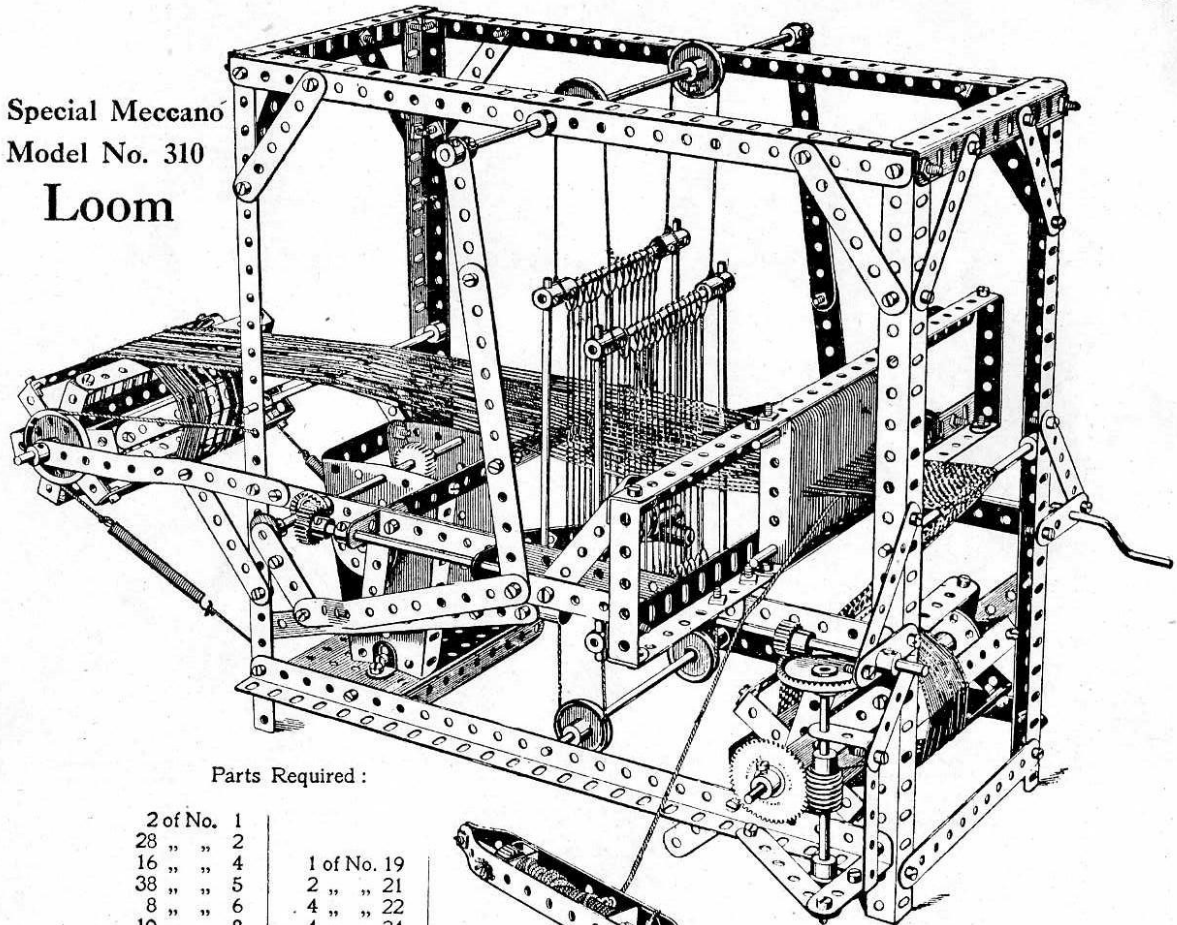
Parts Required :

| | |
|------------|-------------|
| 2 of No. 1 | 2 of No. 19 |
| 4 " " 2 | 4 " " 20 |
| 2 " " 3 | 4 " " 22 |
| 13 " " 4 | 5 " " 24 |
| 48 " " 5 | 3 " " 26 |
| 8 " " 8 | 1 " " 32 |
| 2 " " 9 | 1 " " 33 |
| 1 " " 10 | 16 " " 35 |
| 3 " " 12 | 64 " " 37 |
| 4 " " 13 | 2 " " 46 |
| 2 " " 13A | 2 " " 52 |
| 8 " " 14 | 12 " " 59 |
| 4 " " 15 | 8 " " 63 |
| 2 " " 15A | |

Special Meccano

Model No. 310

Loom



Parts Required :

| | |
|------------|-------------|
| 2 of No. 1 | 1 of No. 19 |
| 28 " " 2 | 2 " " 21 |
| 16 " " 4 | 4 " " 22 |
| 38 " " 5 | 4 " " 24 |
| 8 " " 6 | 3 " " 26 |
| 10 " " 8 | 2 " " 27 |
| 2 " " 9 | 2 " " 28 |
| 2 " " 11 | 1 " " 29 |
| 10 " " 12 | 1 " " 32 |
| 2 " " 13 | 150 " " 37 |
| 3 " " 13A | 2 " " 43 |
| 8 " " 14 | 3 " " 46 |
| 2 " " 15 | |
| 7 " " 16 | |

1 of No. 52

| |
|------------|
| 2 " " 54 |
| 20 " " 59 |
| 16 " " 60 |
| 2 " " 62 |
| 11 " " 63 |
| 30 " " 101 |

Model No. 311

Electric Loco

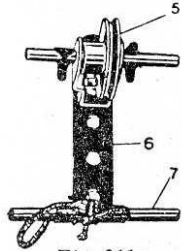


Fig. 311b

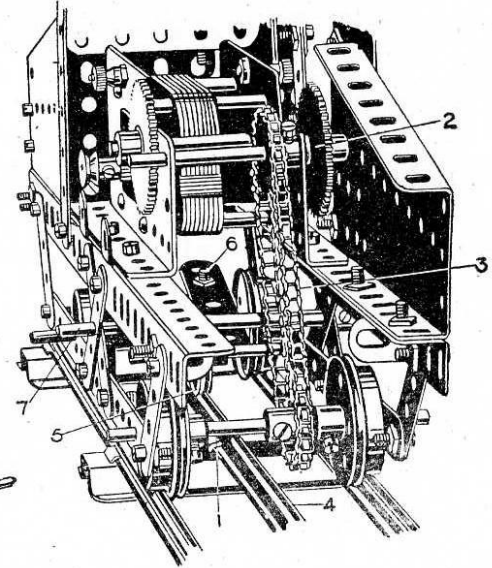
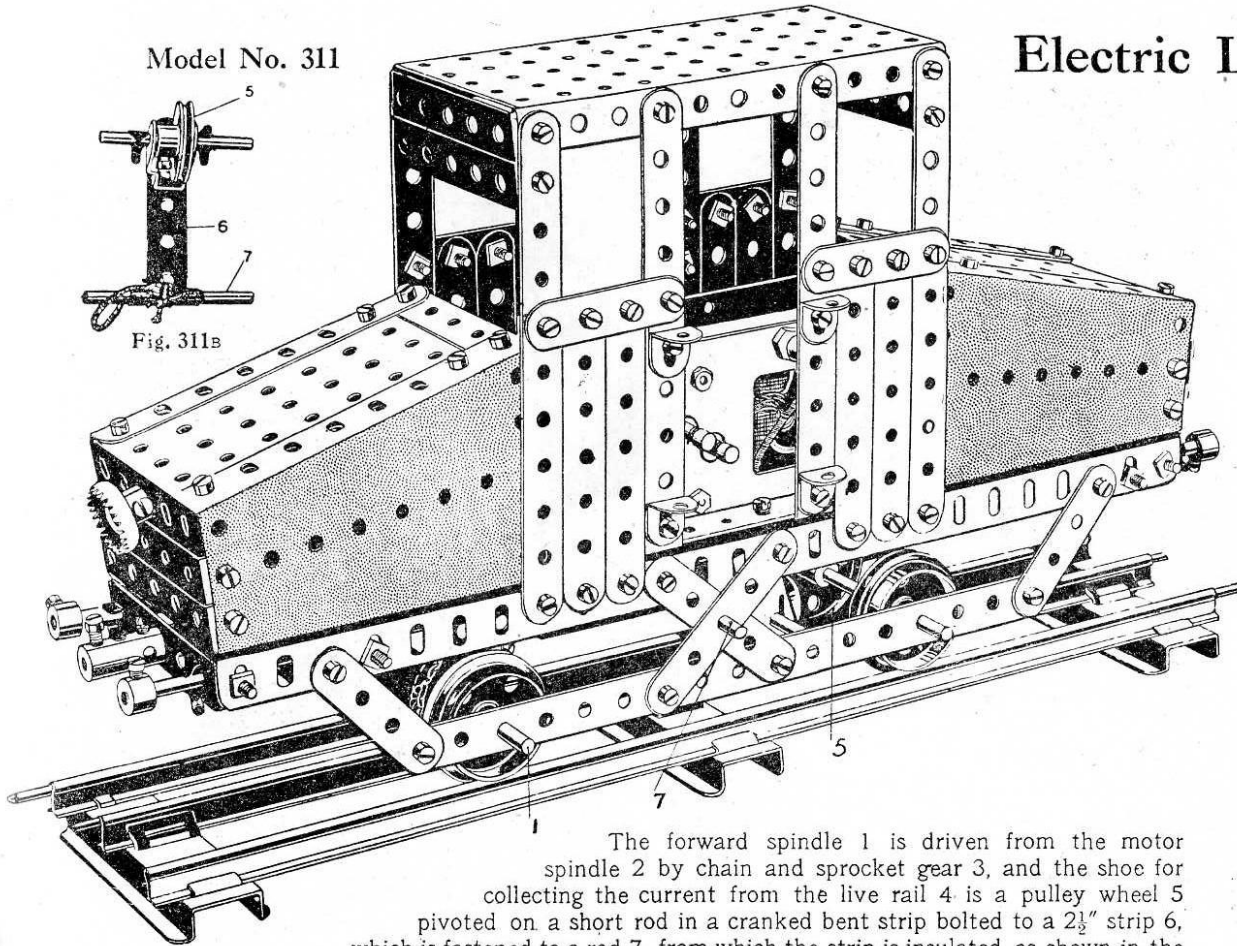


Fig. 311a

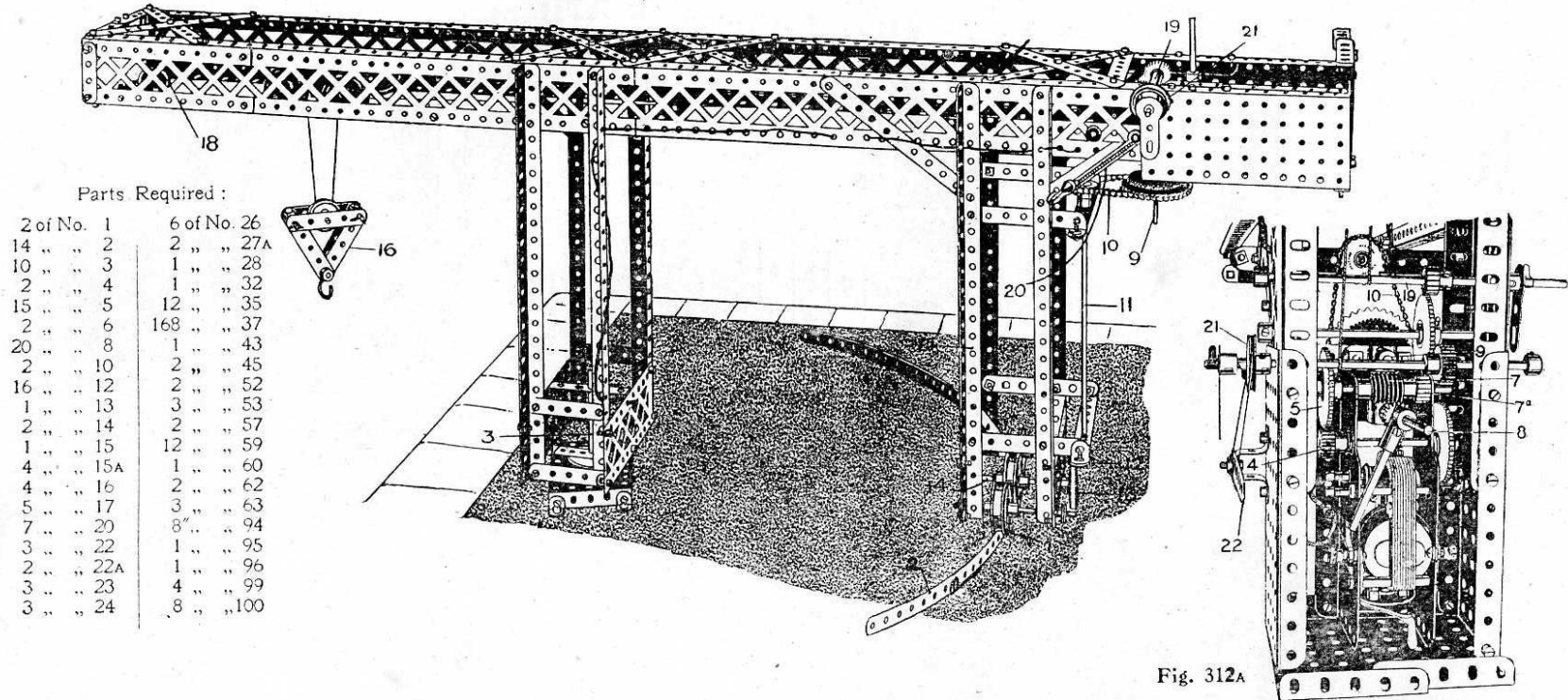
The forward spindle 1 is driven from the motor spindle 2 by chain and sprocket gear 3, and the shoe for collecting the current from the live rail 4 is a pulley wheel 5 pivoted on a short rod in a cranked bent strip bolted to a 2½" strip 6, which is fastened to a rod 7, from which the strip is insulated, as shown in the detail (Fig. 311b). The positive electric wire is led from the strip 6 to the motor terminal, the running wheels forming the negative return of the circuit.

Parts Required :

| | | |
|-------------|-------------|-------------|
| 12 of No. 2 | 3 of No. 17 | 1 of No. 52 |
| 8 " " 3 | 1 " " 18 | 2 " " 53 |
| 11 " " 5 | 4 " " 20 | 4 " " 54 |
| 8 " " 6 | 1 " " 22 | 5 " " 59 |
| 2 " " 8 | 1 " " 29 | 10 " " 60 |
| 12 " " 12 | 2 " " 35 | 1 " " 63 |
| 2 " " 15A | 97 " " 37 | 9 " " 94 |
| 4 " " 16 | 1 " " 44 | 2 " " 96 |

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

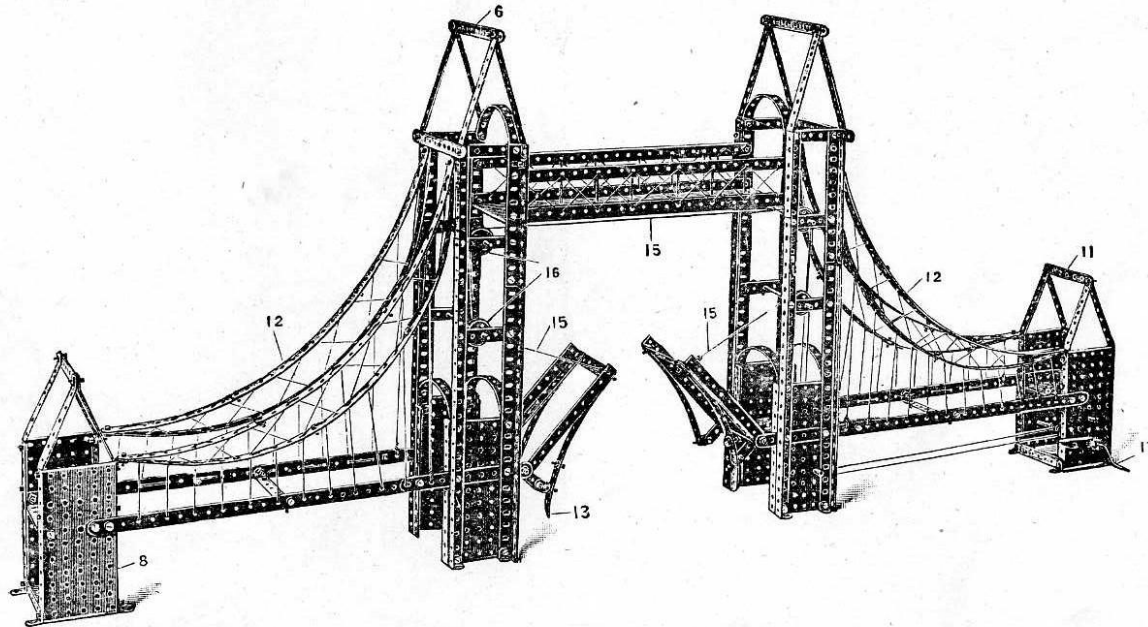
Model No. 312 Radial Travelling Crane



The structure of the crane runs on the rear wheels 1 on the circular rail 2 about the central pivot 3. The radial travelling movement is effected from the motor spindle, the pinion 4 of which gears from the secondary wheels 5 with a gear wheel driving a worm 7 which engages a pinion on a vertical spindle 8, at the foot of which is a pinion engaging with a gear wheel on the spindle 9, geared by chain and sprocket wheels 10 to a spindle 11, a pinion 12 on which drives a contrate wheel 13 keyed to the rod 14, on which is the central rolling spindle of the crane leg 15. If a few turns of cord are wound round this central pulley a better bite is obtained on the rail edge 2. The bearings of spindles 8 and 9 are carried in double bent strips secured to transverse strips bolted to the side flanged plates. The traversing mechanism of the carriage which supports the pulley block 16 is effected from the worm shaft 7, a $\frac{1}{2}$ " pinion 7a on which drives a $\frac{3}{4}$ " pinion 17, on the spindle of which is a continuous cord which traverses the frame. This cord passes round the pulley 18 at the extreme outer end of the crane jib. The hoisting rope is driven similarly from the pinion 7a, the hoisting cord winding on and off the rod 19. A brake for the spindle of the winding rod 19 is provided by a cord passing round a 1" pulley 21 and connected to a lever 22.

This Model Can be Made with MECCANO Outfit No. 6, or No 5 and No. 5A

Model No. 313 Tower Bridge



Parts
Required :

| | | | |
|-------------|-------------|-------------|-------------|
| 22 of No. 1 | 12 of No. 9 | 2 of No. 26 | 2 of No. 43 |
| 34 " " 2 | 28 " " 12 | 1 " " 27 | 2 " " 46 |
| 12 " " 3 | 6 " " 15 | 1 " " 33 | 8 " " 52 |
| 12 " " 5 | 1 " " 19 | 9 " " 35 | 4 " " 53 |
| 10 " " 8 | 6 " " 22 | 183 " " 37 | 1 " " 59 |

Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No 313 Tower Bridge (continued)

Begin by making the two main towers, the construction of one of which is shown in Fig. 313A. The four uprights 1 are made of angle girders, connected at their lower extremities by large flanged plates 2 and transverse strips 3. The sides of the tower are connected together by a small flanged plate 4 across the top of which and at the top of the tower are bolted bent $5\frac{1}{2}$ " strips.

The top gable 6, constructed as shown, is then bolted at its lower edges 7 to the top of the uprights.

The short end towers, one of which is shown to the right of the figure, are built up from two large flanged plates 8 connected together by a small flanged plate 9 and two $3\frac{1}{2}$ " strips 10, the gable 11 being then bolted on top.

The catenary member 12 is built up from four curved $12\frac{1}{2}$ " strips overlapped, the lower member by 12 holes and the upper member by 15 holes, so as to produce a longer sweep in the lower member, and are bolted to the vertical angle girders of the higher towers, and by angle brackets to the shorter towers.

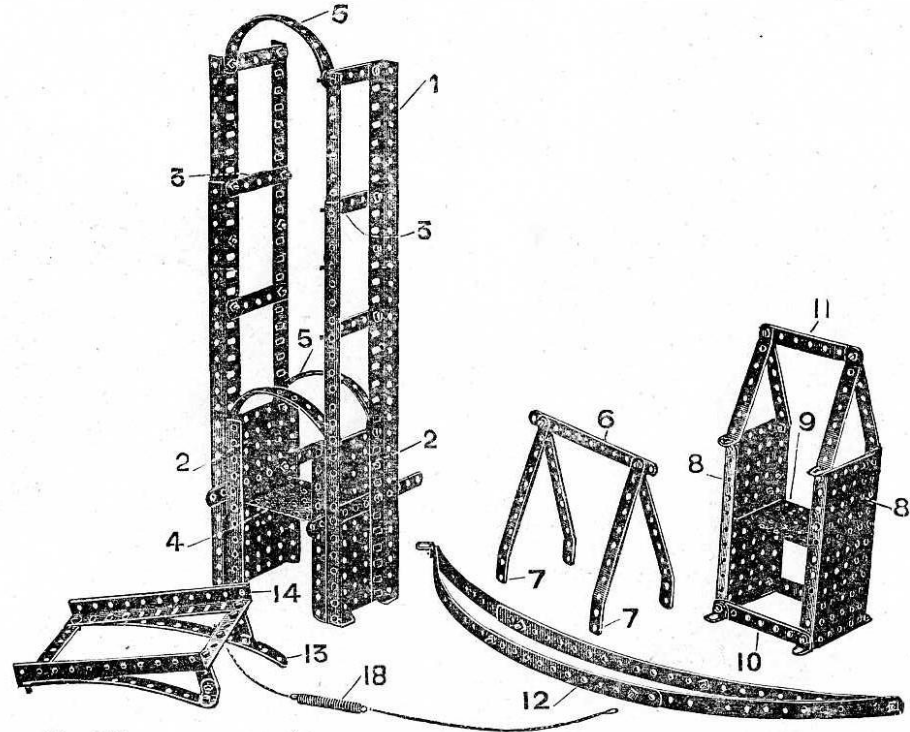


Fig. 313A

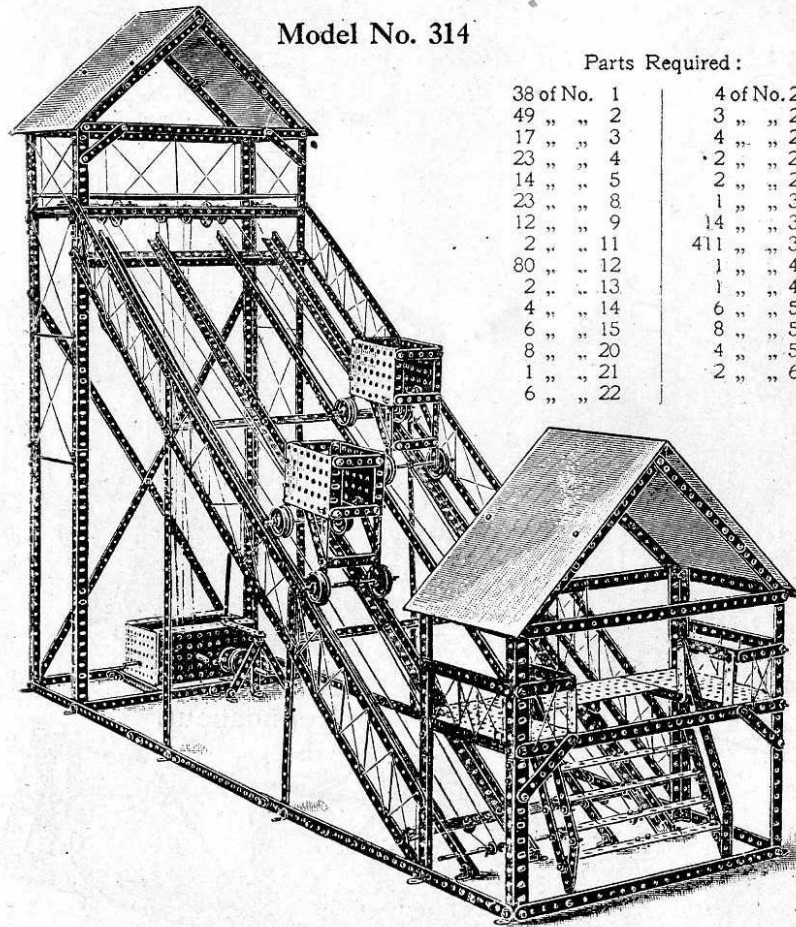
The bascules as illustrated in the left-hand corner of the picture are built up of two $5\frac{1}{2}$ " angle girders braced with transverse $3\frac{1}{2}$ " strips, and reinforced with bent $5\frac{1}{2}$ " strips, one of which is provided with a projecting $2\frac{1}{2}$ " strip 13, which bears against the main tower and acts as a stop when the bascules are horizontal. The bascules are hinged by fixing bolts in the end holes 14, and are opened by the cords 15 passing over the guide pulleys 16, and are controlled by the extension spring 18, which normally acts to return them to their closed position. In the right smaller tower is the operating handle 17, on which is secured a $\frac{3}{4}$ " pinion meshed with a gear wheel on the spindle, on which the operating cords 15 are wound.

This Model Can be Made with MECCANO Outfit No. 6, or No. 5 and No. 5A

Model No. 314

Parts Required :

| | |
|-------------|-------------|
| 38 of No. 1 | 4 of No. 23 |
| 49 " " 2 | 3 " " 24 |
| 17 " " 3 | 4 " " 26 |
| 23 " " 4 | 2 " " 27A |
| 14 " " 5 | 2 " " 29 |
| 23 " " 8 | 1 " " 32 |
| 12 " " 9 | 14 " " 35 |
| 2 " " 11 | 411 " " 37 |
| 80 " " 12 | 1 " " 45 |
| 2 " " 13 | 1 " " 46 |
| 4 " " 14 | 6 " " 52 |
| 6 " " 15 | 8 " " 53 |
| 8 " " 20 | 4 " " 59 |
| 1 " " 21 | 2 " " 60 |
| 6 " " 22 | |



Funicular Railway

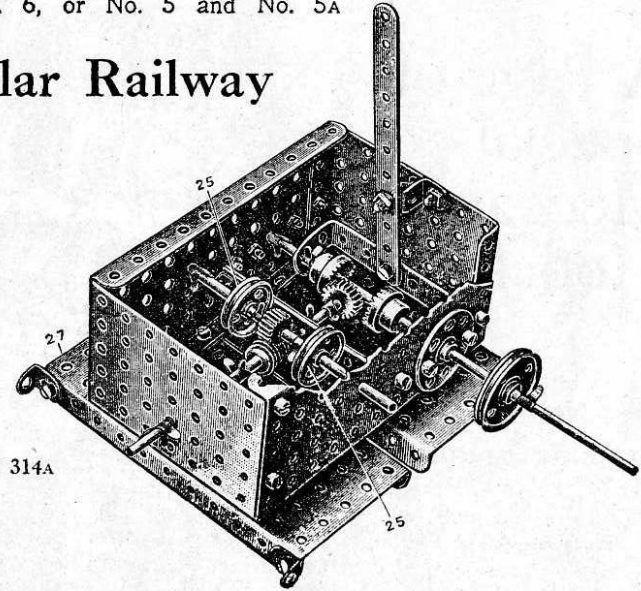


Fig. 314A

Begin by constructing the main tower, the corner pillars of which are made from two $12\frac{1}{2}$ " angle girders and a $5\frac{1}{2}$ " angle girder ; the $12\frac{1}{2}$ " girders overlapped three holes and the $5\frac{1}{2}$ " girders two holes. The rear diagonal ties are made from $12\frac{1}{2}$ " strips overlapped. The roof rafters consist of $5\frac{1}{2}$ " strips overlapped five holes.

The inclined rails are made from 4 sets of $12\frac{1}{2}$ " angle girders, butted together and connected by 3" strips. The rails rest on three upper crossing $12\frac{1}{2}$ " angle girders, and a lower $12\frac{1}{2}$ " strip to the ends of which are bolted the latticed side rails supported by the vertical members. The loading platform is built up from $5\frac{1}{2}$ " girder strips to which are bolted side flanged plates which are again connected by two small flanged plates. The other constructional details of this loading tower should present no trouble.

The main tower, inclined rails, and loading platform are now coupled together by a series of horizontal $12\frac{1}{2}$ " strips overlapped as shown.

The wagons are made as follows : Two small flanged plates are connected top and bottom by $2\frac{1}{2}$ " strips. The journals for the front axle are made by two $3\frac{1}{2}$ " strips bolted inside the flanged plates, the axle being threaded through their lower projecting holes. The rear axle journals are made by carrying down two $3\frac{1}{2}$ " strips bolted in their upper holes to the flanged plates, and braced with the diagonal strips to the sides of the wagon. The axle is again threaded through the lowest holes. One end of the operating cord as shown in this view is secured to this rear axle : the other end, after passing round the pulleys is secured to the front axle. The gear box for operating the main hauling shaft is very fully shown in Fig. 314A. the operating cords from the pulleys 25 passing round the pulleys in the upper gear platform.

The Gear Box is mounted on two perforated plates 27, the angle brackets on which are bolted to the transverse strips at the base of the tower.

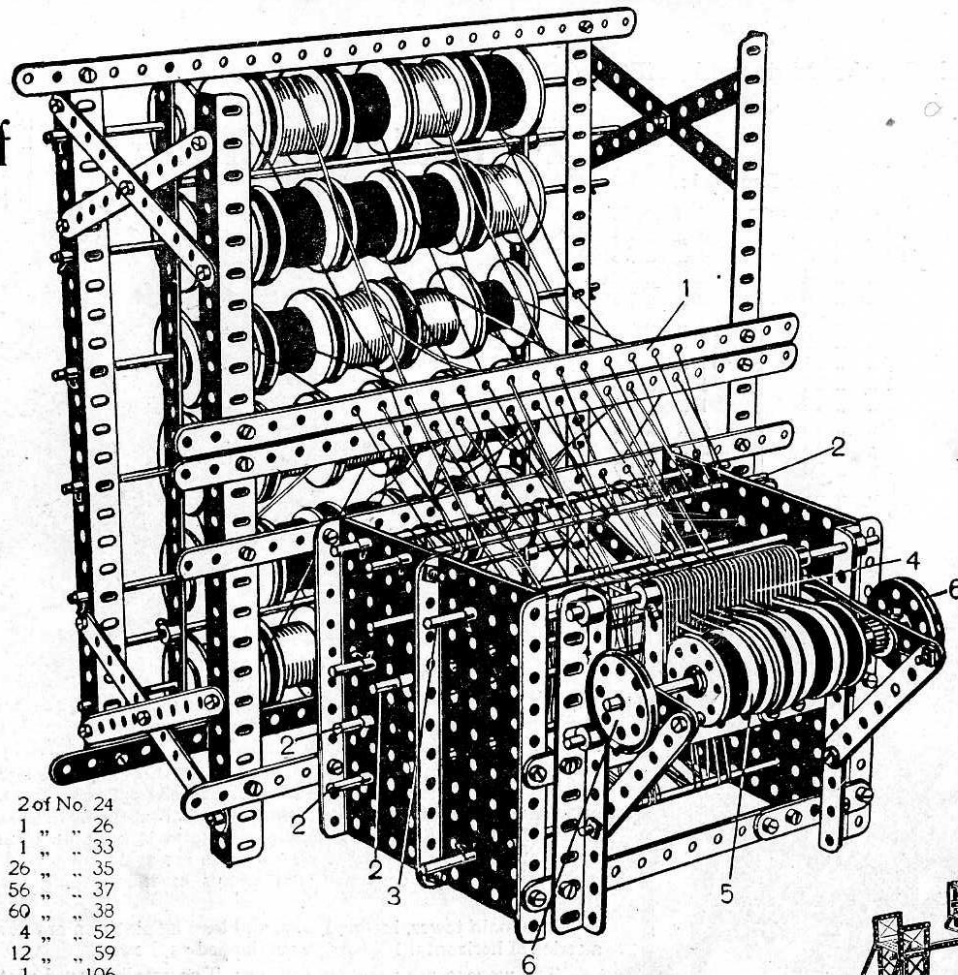
A Page of Special Meccano Models

No. 319.
Beaming Frame.

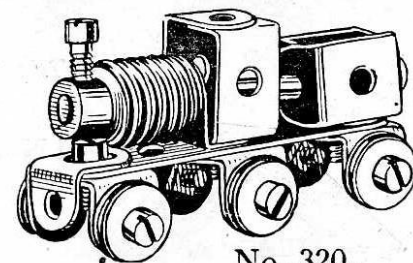
Parts Required:

| |
|------------|
| 8 of No. 1 |
| 10 " " 2 |
| 2 " " 3 |
| 35 " " 5 |
| 4 " " 8 |
| 2 " " 9 |
| 6 " " 13 |
| 7 " " 13A |
| 3 " " 14 |
| 2 " " 21 |

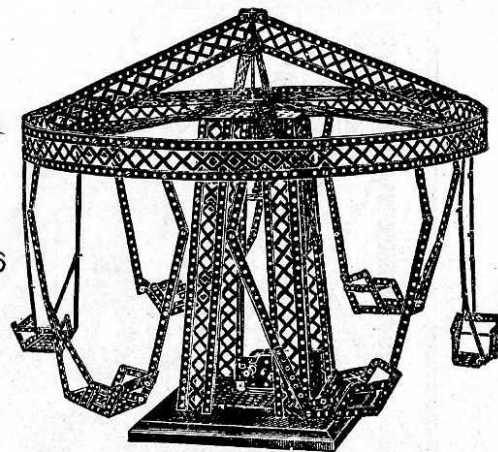
| |
|-------------|
| 2 of No. 24 |
| 1 " " 26 |
| 1 " " 33 |
| 26 " " 35 |
| 56 " " 37 |
| 60 " " 38 |
| 4 " " 52 |
| 12 " " 59 |
| 1 " " 106 |



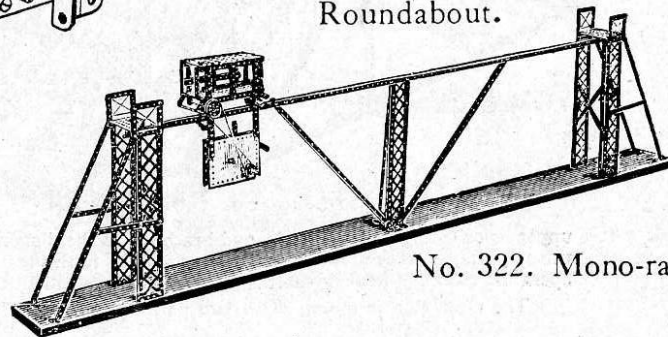
Before cloth can be woven in a loom the warp threads must be wound evenly and in order upon a beam roller. This operation is done in a beaming frame. The threads from the bobbins are passed through the perforations in the strips 1, and then in order to put a slight tension on the threads they are zig-zagged round a series of rods 2, and eventually pass over the rod 3 and then through the reed 4 on to the beam roller 5. As soon as sufficient warp threads are wound on the roller by turning the end pulley wheels 6, the beam roller is placed in the loom.



No. 320.
The Meccano Express.



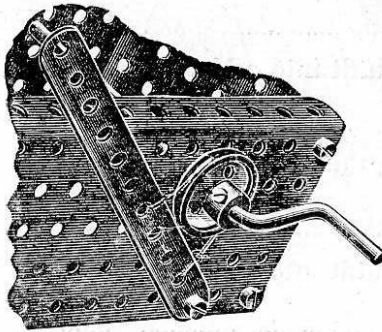
No. 321.
Roundabout.



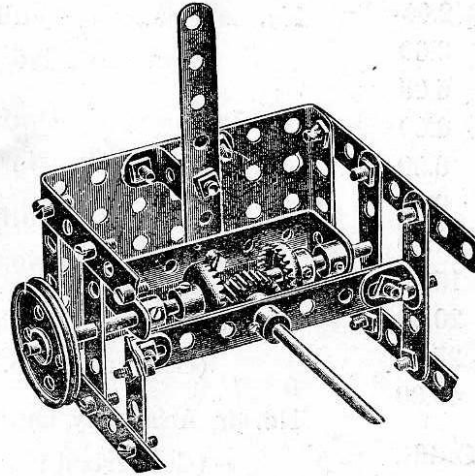
No. 322. Mono-rail.

Standard Details for use in the Construction of Models on the Meccano Principle

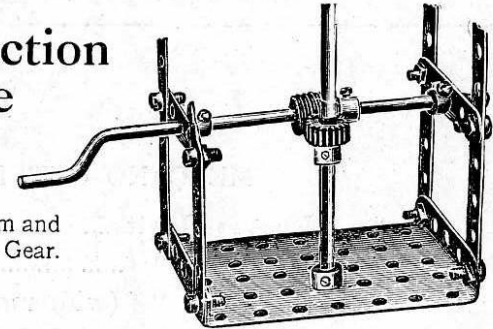
A—A Brake Mechanism suitable for controlling winding or similar spindles.



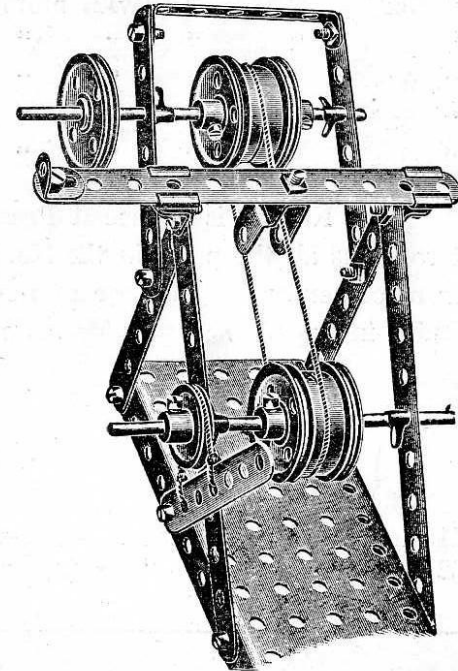
B—Type of Reversing Gear.



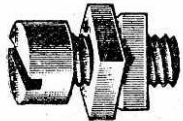
C—Worm and Worm Gear.



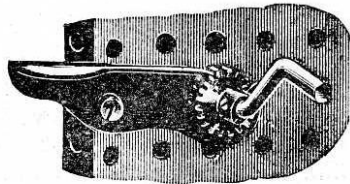
G—Method of operating a fast and loose pulley with a belt drive, one of the flanged wheels on the main shaft being secured whilst the other runs freely.



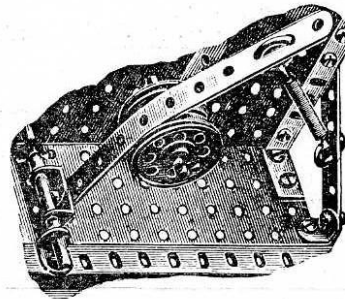
D—Method of locking swivelling connections with double nuts.



E—Pawl and Pinion or Ratchet Gear; used also as a brake.



F—Spring controlled Band Friction Brake.



MECCANO PRICE LIST

MECCANO OUTFITS

| | | |
|-------|-----------------------|---------|
| No. 0 | Meccano Outfit..... | \$ 2.00 |
| " 1 | " " | 3.00 |
| " 1x | " " (with motor)..... | 5.00 |
| " 2 | " " | 6.00 |
| " 2x | " " (with motor)..... | 8.50 |
| " 3 | " " | 9.00 |
| " 3x | " " (with motor)..... | 11.50 |
| " 4 | " " " " | 15.00 |
| " 5 | " " " " | 20.00 |
| " 5x* | " " " " | 25.00 |
| " 6 | " " " " | 40.00 |

*The No. 5x is a special Presentation Outfit. It contains all the parts in the No. 5 Outfit, also a Transformer and a number of new parts not included in any of the other Meccano Outfits.

Accessory Outfits do not contain Motors.

Meccano Motors and Transformer

| | | |
|----|--|---------|
| E1 | Meccano Electric Motor,—(one-way)..... | \$ 2.50 |
| E2 | " " " (reversing)..... | 3.50 |

ACCESSORY OUTFITS

| | | |
|--------|--|---------|
| No. 0a | Accessory Outfit..... | \$ 1.25 |
| | (Converts a No. 0 Outfit into a No. 1) | |
| No. 1a | Accessory Outfit..... | 3.00 |
| | (Converts a No. 1 Outfit into a No. 2) | |
| No. 2a | Accessory Outfit..... | 3.00 |
| | (Converts a No. 2 Outfit into a No. 3) | |
| No. 3a | Accessory Outfit..... | 6.00 |
| | (Converts a No. 3 Outfit into a No. 4) | |
| No. 4a | Accessory Outfit..... | 5.00 |
| | (Converts a No. 4 Outfit into a No. 5) | |
| No. 5a | Accessory Outfit..... | 20.00 |
| | (Converts a No. 5 Outfit into a No. 6) | |

| | | |
|--------|--|---------|
| S1 | Meccano Clockwork Motor, (reversing)..... | \$ 3.00 |
| Type B | Transformer,—(for 110v. 60c. A. C. only) | 2.50 |

MECCANO

Hornby's Original System, First Patented 1901

PATENTED IN THE UNITED STATES

| | | | |
|---------------|---------------|---------------|---------------|
| Jan. 16, 1906 | Jan. 4, 1916 | Oct. 24, 1916 | Oct. 19, 1920 |
| Nov. 18, 1913 | Feb. 15, 1916 | Oct. 9, 1917 | Dec. 14, 1920 |
| Nov. 23, 1915 | Aug. 1, 1916 | Dec. 24, 1918 | Apr. 11, 1922 |
| Dec. 21, 1915 | Aug. 29, 1916 | Feb. 11, 1919 | May 15, 1923 |

Design Patent July 4, 1916

PATENTED THROUGHOUT THE WORLD

Meccano is more than a Toy

IT is important to remember that when a boy is playing with MECCANO he is using engineering parts in miniature, and that these parts act in precisely the same way as do the corresponding engineering elements in actual practice. No other system of model construction can be correct, and other toys which attempt the same object by other methods must avail themselves of constructive elements which are not correct engineering elements. Consequently, though a boy may succeed in building playthings with them, they are merely toys and nothing else.