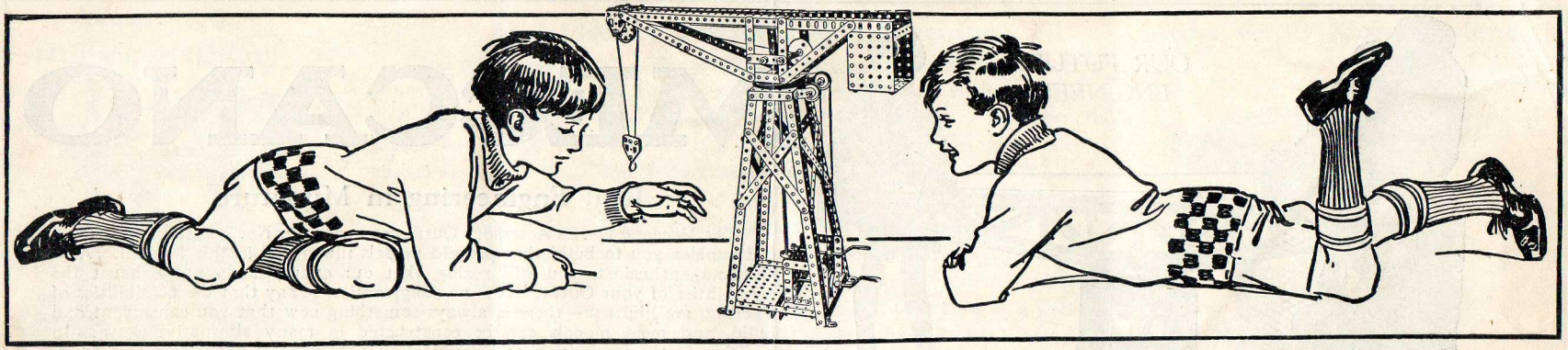


MECCANO

HORNBY'S ORIGINAL SYSTEM—FIRST PATENTED 1901

Accessory Outfit 2A

INSTRUCTIONS

FOR BUILDING No. 3 OUTFIT MODELS

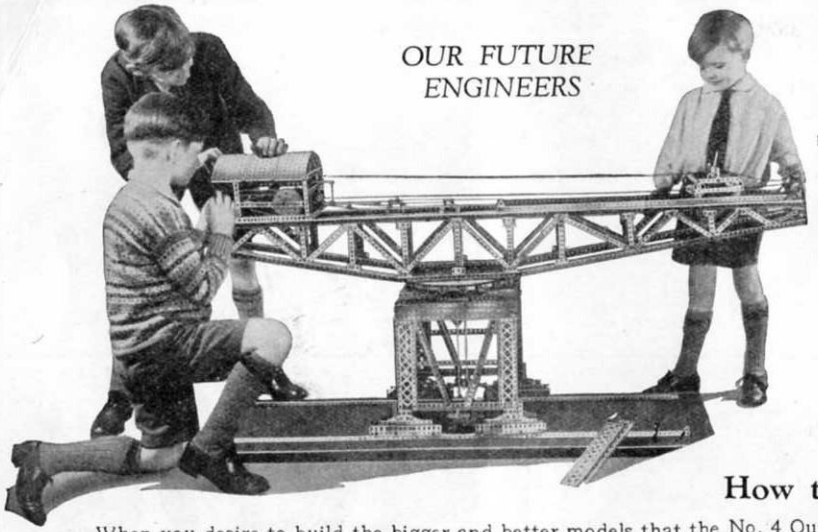
Price 9d.

No. 32.2A

N.Z./S.A.

2/632/.5 (1P)

Printed in England



OUR FUTURE ENGINEERS

MECCANO

Real Engineering in Miniature

The Meccano No. 2A Accessory Outfit converts your No. 2 Outfit into a No. 3, and enables you to build the splendid models illustrated in this Manual. As a Meccano enthusiast, you will realise that our examples do not exhaust the possibilities of your Outfit. It is no exaggeration to say that the possibilities of Meccano are limitless—there is always something new that you can invent and build, and most models can be constructed in many alternative ways. In addition to the fascination and satisfaction obtained by building new models, you can enter them in the model-building competitions that are a regular feature of the "Meccano Magazine." These competitions are open to all Meccano boys, and valuable prizes are offered.

How to Progress

When you desire to build the bigger and better models that the No. 4 Outfit makes, it is only necessary for you to purchase a No. 3A Accessory Outfit. In turn, a No. 4A Accessory Outfit will convert your equipment into a No. 5, and so on. As you progress by these easy stages, you will obtain an increasing variety of perfectly-made engineering parts—Gear Wheels, Pulleys, Worms, Couplings, Cranks and many others—until ultimately you attain the ambition of every Meccano enthusiast and possess a No. 7 Outfit.

Every keen and inventive Meccano model-builder should possess copies of the special Manuals "How to use Meccano Parts" and "Meccano Standard Mechanisms." In the former the principal uses of Meccano parts are outlined, while the latter shows a large number of real engineering mechanisms, built of Meccano parts, that can be incorporated in various models. You can obtain copies of these Manuals from your dealer, or direct from Meccano Ltd., Liverpool.

A complete list showing the contents of each Meccano Outfit and Accessory Outfit will be supplied on application to Meccano Limited, Liverpool, England.

The "Meccano Magazine"

The "Meccano Magazine" is essential to the full enjoyment of the Meccano hobby. A section of it is devoted to the Editor's replies to his readers' enquiries; the progress of Meccano clubs throughout the world is reported; and full details are given of the latest model-building achievements. In addition, a wealth of informative articles on all subjects of interest to boys is included in every issue. It is published in England on the first of each month. If you are not already a reader of the "Meccano Magazine" write to the Editor for full particulars, or order a copy from your Meccano dealer or from any newsagent.

Meccano Service

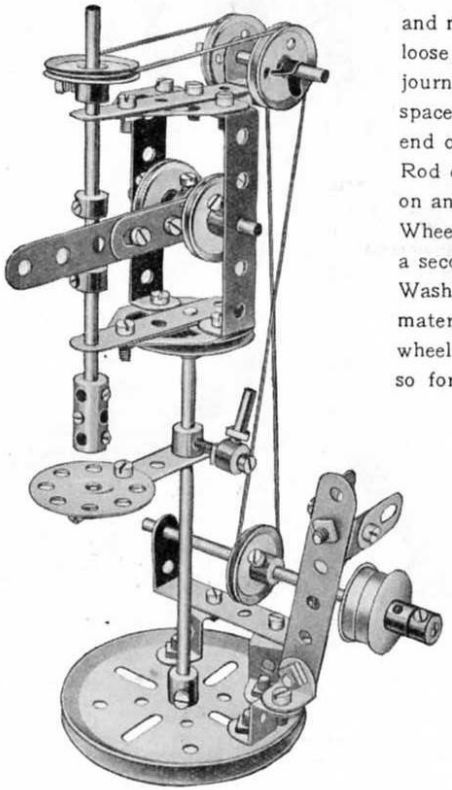
The service of Meccano does not end with selling an Outfit and an Instruction Manual. When you want to know something more about engineering than is now shown in our books, or when you strike a tough problem of any kind, write to us. We receive over 200 letters from boys every day all the year round. Some write to us because they are in difficulty, others because they want advice on their work or pleasures, or about the choice of a career. Others, again, write to us just because they like to do so and we are glad to know that they regard us as their friends.

Although all kinds of queries are put to us on all manner of subjects, the main interest is, of course, engineering. The wonderful knowledge of engineering matters possessed by our staff of experts is unique. This vast store of knowledge, gained only by many years of hard-earned experience, is at your service.

We want the Meccano boy of to-day to be the famous engineer of to-morrow.

IMPORTANT:—Meccano Parts may be bought separately at any time in any quantity from your Meccano dealer.

Model No. 3.1 Drilling Machine



Parts required :

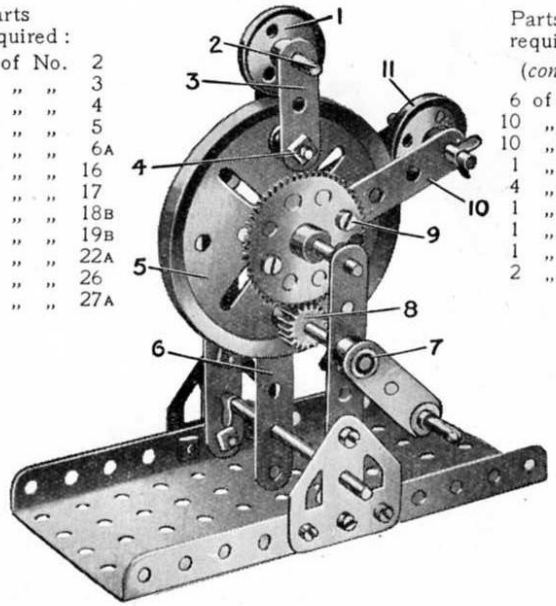
2	of	No.	4	1	of	No.	19B	1	of	No.	46
2	„	„	5	2	„	„	20B	2	„	„	48A
2	„	„	10	1	„	„	21	4	„	„	59
2	„	„	11	4	„	„	22	2	„	„	62
1	„	„	12	2	„	„	22A	1	„	„	63
1	„	„	15	1	„	„	24	1	„	„	111
2	„	„	15A	3	„	„	35	1	„	„	115
2	„	„	17	21	„	„	37	3	„	„	125
				1	„	„	40	2	„	„	126A

Model No. 3.2 Strip-Bending Machine

This model represents a device for bending bars or rods of metal to circular form, and may be put to practical purpose in shaping strips of tin or similar material. A loose Pulley 1 is spaced by a Collar and Washers in the centre of the short Rod 2 journalled in a 1½" Strip 3. The latter is secured to the end of a ¾" Bolt 4 and spaced away from the 3" Pulley 5 by means of a number of Washers. The opposite end of the Rod is supported by a 5½" Strip 6. The handle 7 is secured to a 3½" Rod carrying a ½" Pinion 8. This engages with a 57-teeth Gear Wheel 9 mounted on another 3½" Rod which is free to revolve in the boss of the wheel 5. The Gear Wheel 9 carries a 3" Strip 10 forming one of the bearings for a short Rod carrying a second 1" loose Pulley 11. The latter is also spaced by means of a Collar and Washers so that it lies immediately above the groove of the Pulley Wheel 5. The material to be shaped is passed between the two loose Pulleys at the top of the wheel 5, and on rotation of the handle 7 the arm 10 is caused to move downward, so forcing the object to the same curvature as the circumference of the wheel.

Parts required :

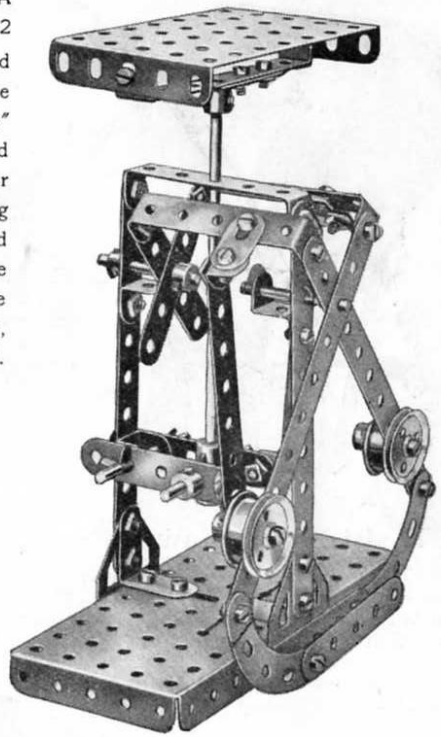
1	of	No.	2
2	„	„	3
1	„	„	4
1	„	„	5
1	„	„	6A
2	„	„	16
1	„	„	17
2	„	„	18B
1	„	„	19B
2	„	„	22A
1	„	„	26
1	„	„	27A



Parts required (*continued*) :

6	of	No.	35
10	„	„	37
10	„	„	38
1	„	„	52
4	„	„	59
1	„	„	62
1	„	„	111
1	„	„	115
2	„	„	126A

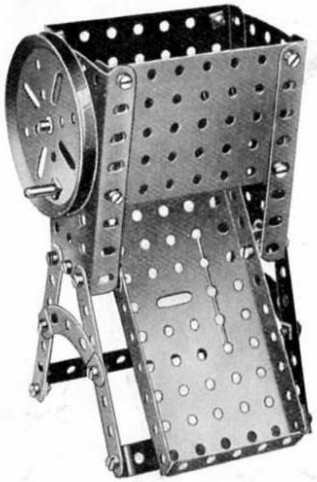
Model No. 3.3 Letter Balance



Parts required :

4	of	No.	2	2	of	No.	18A	1	of	No.	53
2	„	„	3	2	„	„	20B	4	„	„	59
5	„	„	5	2	„	„	22A	1	„	„	62
2	„	„	10	4	„	„	35	1	„	„	63
1	„	„	11	37	„	„	37	2	„	„	90A
4	„	„	12	6	„	„	37A	2	„	„	111
2	„	„	12A	2	„	„	48A	4	„	„	111C
1	„	„	15	1	„	„	48B	2	„	„	125
2	„	„	17	1	„	„	52	2	„	„	126A

Model No. 3.4 Oil Cake Chopper



Parts required :

4	of	No.	3	1	of	No.	52
6	„	„	10	2	„	„	53
1	„	„	15	2	„	„	54
1	„	„	19B	1	„	„	59
4	„	„	22	2	„	„	90A
24	„	„	37	1	„	„	115
2	„	„	48B	2	„	„	125

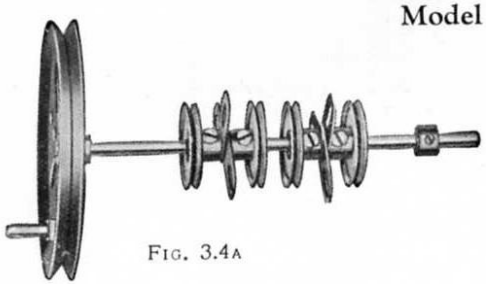
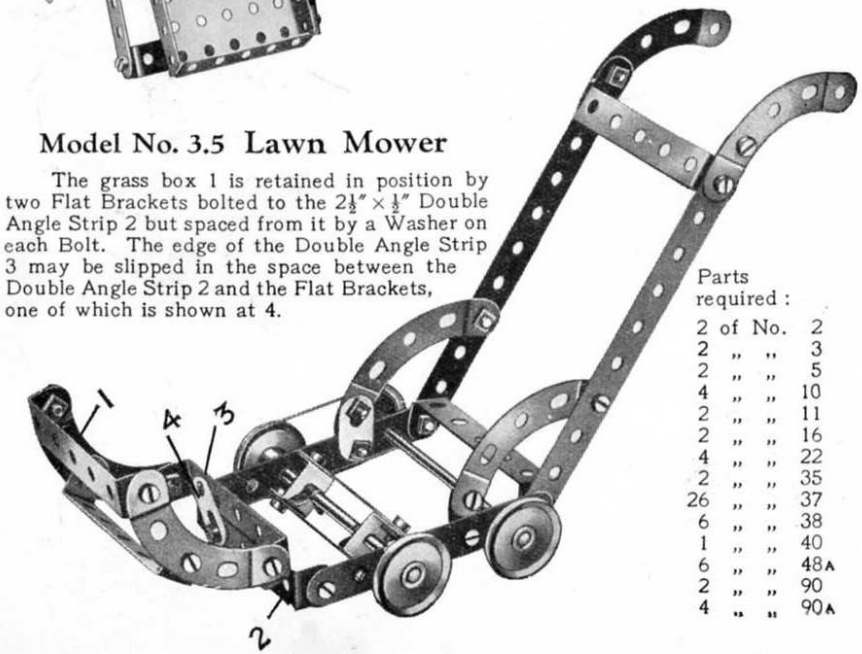


FIG. 3.4A

Fig. 3.4A shows the hand wheel and shaft removed from the model. It will be seen that the chopping mechanism is represented by Flat Brackets clamped between two pairs of 1" fast Pulley Wheels.

Model No. 3.5 Lawn Mower

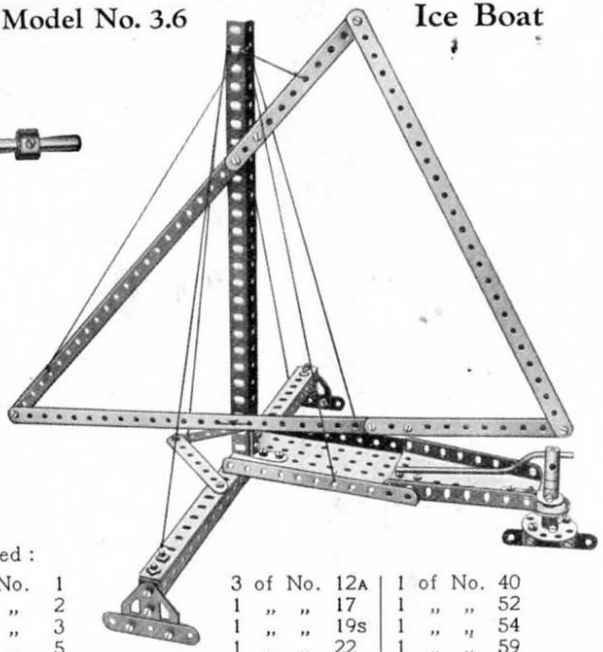
The grass box 1 is retained in position by two Flat Brackets bolted to the $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 2 but spaced from it by a Washer on each Bolt. The edge of the Double Angle Strip 3 may be slipped in the space between the Double Angle Strip 2 and the Flat Brackets, one of which is shown at 4.



Parts required :

2	of	No.	2
2	„	„	3
2	„	„	5
4	„	„	10
2	„	„	11
2	„	„	16
4	„	„	22
2	„	„	35
26	„	„	37
6	„	„	38
1	„	„	40
6	„	„	48A
2	„	„	90
4	„	„	90A

Model No. 3.6 Ice Boat



Parts required :

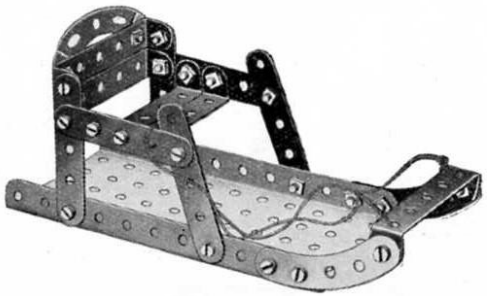
3	of	No.	1	3	of	No.	12A
2	„	„	2	1	„	„	17
2	„	„	3	1	„	„	19S
3	„	„	5	1	„	„	22
2	„	„	8	1	„	„	24
2	„	„	12	36	„	„	37

1	of	No.	40
1	„	„	52
1	„	„	54
1	„	„	59
1	„	„	62
1	„	„	63
2	of	No.	126A

Model No. 3.7 Toboggan

Parts required :

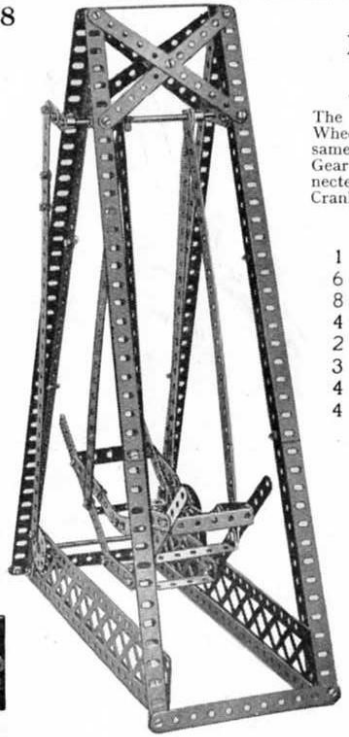
6	of	No.	5
22	„	„	37
1	„	„	40
5	„	„	48A
1	„	„	52
2	„	„	90
1	„	„	90A



Model No. 3.8 Swing

Parts required :

7	of	No.	1
10	„	„	2
1	„	„	3
8	„	„	5
8	„	„	8
1	„	„	10
2	„	„	15
1	„	„	19B
1	„	„	24
2	„	„	35
56	„	„	37
4	„	„	37A
6	„	„	48A
1	„	„	48B
2	„	„	59
2	„	„	62
4	„	„	90A
2	„	„	99
2	„	„	111C
1	„	„	115

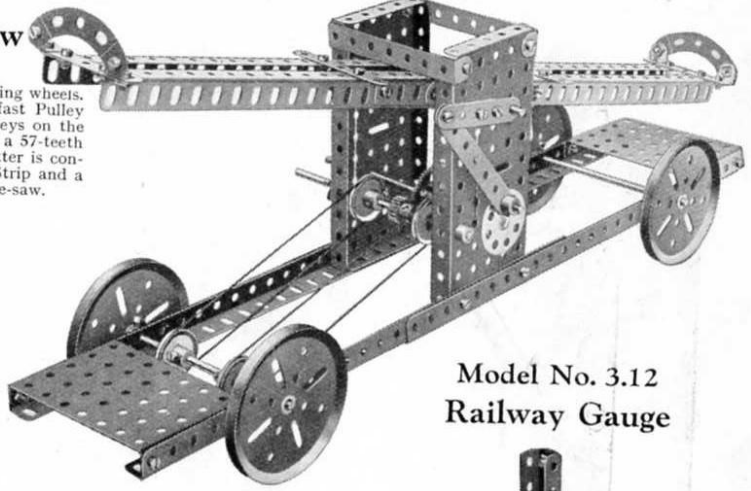


Model No. 3.10 Actuated See-Saw

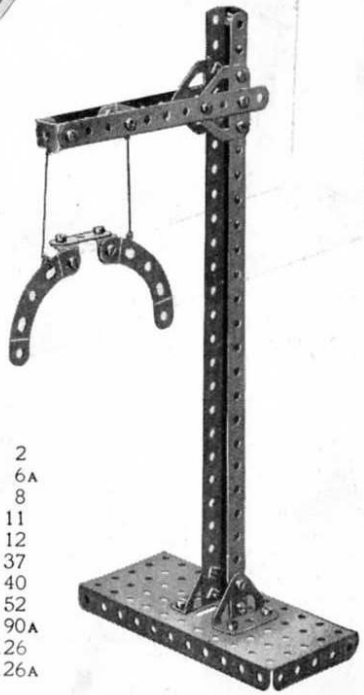
The model is actuated by the motion of one pair of travelling wheels. The axle to which these wheels are secured carries two 1″ fast Pulley Wheels, which are connected by endless cords to similar Pulleys on the same Rod as a ½″ Pinion Wheel. This ½″ Pinion meshes with a 57-teeth Gear Wheel secured to the Rod of a Bush Wheel, and the latter is connected by means of a 3½″ Strip to an extended crank (a 2½″ Strip and a Crank bolted together) secured to the pivotal Rod of the see-saw.

Parts required :

1	of	No.	3	1	of	No.	24	2	of	No.	52
6	„	„	5	1	„	„	26	2	„	„	53
8	„	„	8	1	„	„	27A	3	„	„	59
4	„	„	12	2	„	„	35	2	„	„	62
2	„	„	15	43	„	„	37	2	„	„	90A
3	„	„	15A	2	„	„	37A	1	„	„	111C
4	„	„	19B	1	„	„	40	1	„	„	115
4	„	„	22	2	„	„	48B				



Model No. 3.12 Railway Gauge



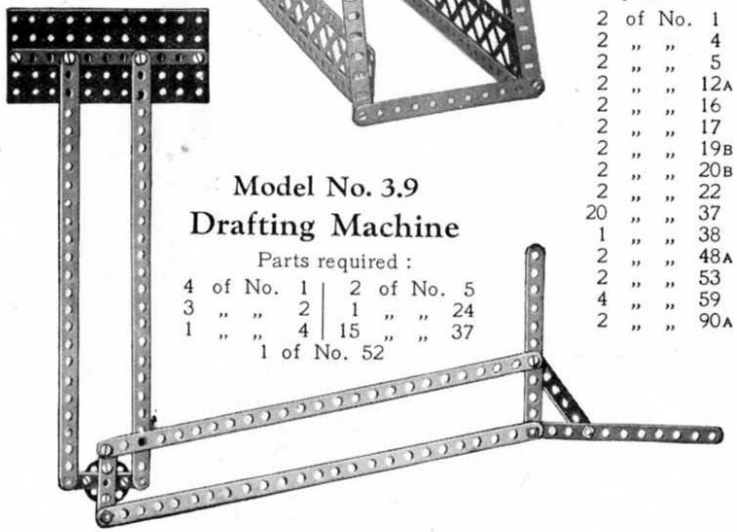
Parts required :

2	of	No.	2
1	„	„	6A
2	„	„	8
2	„	„	11
2	„	„	12
25	„	„	37
1	„	„	40
1	„	„	52
2	„	„	90A
2	„	„	126
2	„	„	126A

Model No. 3.9 Drafting Machine

Parts required :

4	of	No.	1	2	of	No.	5
3	„	„	2	1	„	„	24
1	„	„	4	15	„	„	37
			1 of No. 52				

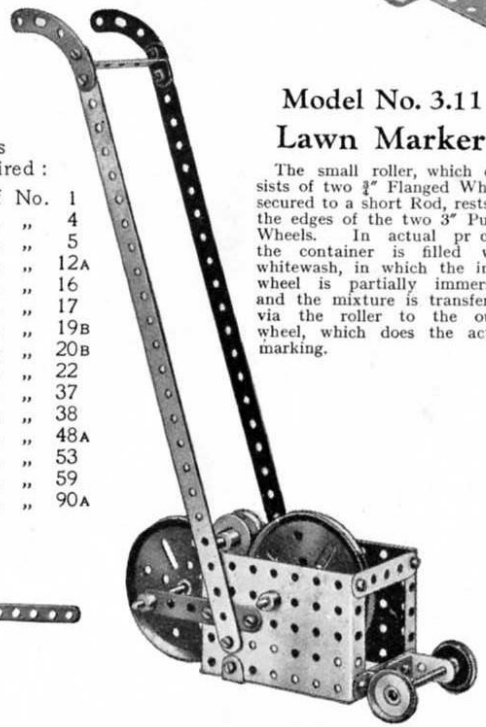


Parts required :

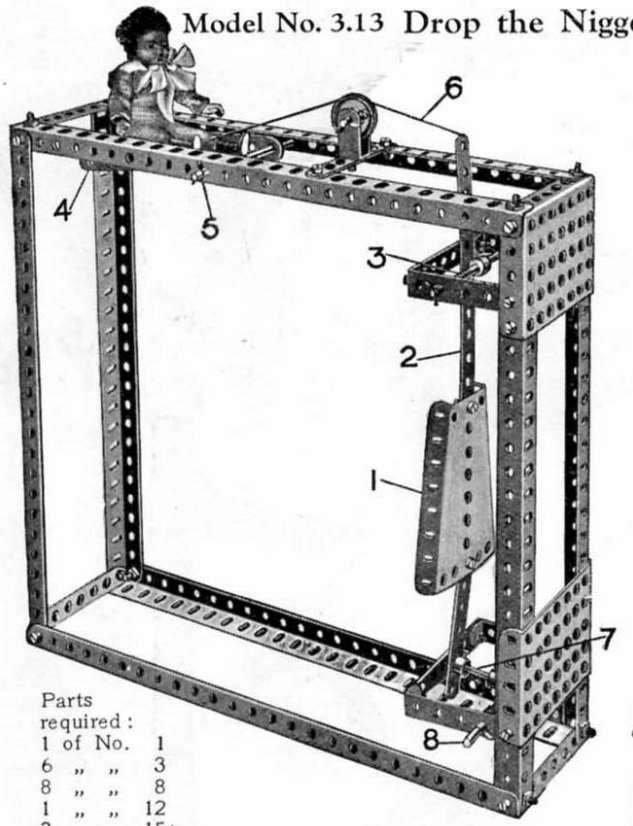
2	of	No.	1
2	„	„	4
2	„	„	5
2	„	„	12A
2	„	„	16
2	„	„	17
2	„	„	19B
2	„	„	20B
2	„	„	22
20	„	„	37
1	„	„	38
2	„	„	48A
2	„	„	53
4	„	„	59
2	„	„	90A

Model No. 3.11 Lawn Marker

The small roller, which consists of two ¾″ Flanged Wheels secured to a short Rod, rests on the edges of the two 3″ Pulley Wheels. In actual pr ctice the container is filled with whitewash, in which the inner wheel is partially immersed, and the mixture is transferred via the roller to the outer wheel, which does the actual marking.



Model No. 3.13 Drop the Nigger

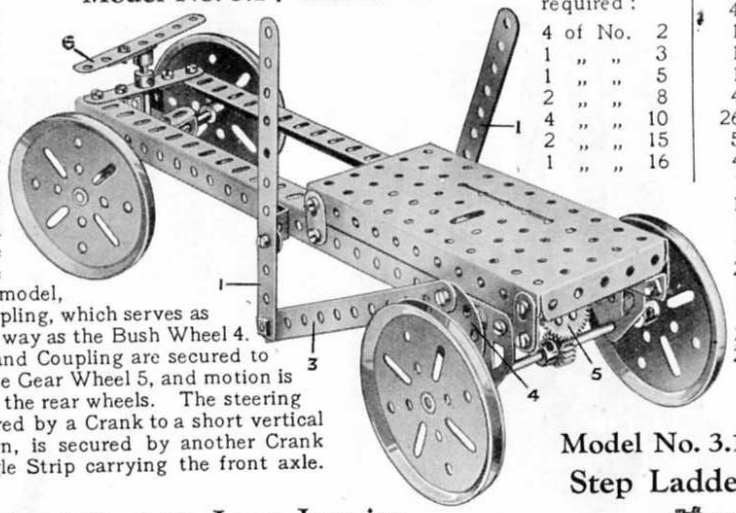


Parts required :

1	of No.	1
6	„ „	3
8	„ „	8
1	„ „	12
3	„ „	15A
2	„ „	17
1	„ „	22
6	„ „	35
33	„ „	37
1	„ „	40
1	„ „	44
4	„ „	48A
2	„ „	53
2	„ „	54
3	„ „	59
1	„ „	63

The Sector Plate 1 is a target, which, when hit, allows the nigger to be dropped. The Plate 1 is carried on the Strip 2 pivoted at 3, and the weight of the nigger supported on another Sector Plate 4 pivoted at 5 by means of the cord 6 keeps the lower end of the Strip 2 hard against a short Rod 7 pivoted at 8. When the target is hit and knocked back the Rod 7 is released and falls about its pivot, allowing the Sector Plate 4 with the nigger to drop.

Model No. 3.14 Hand Car

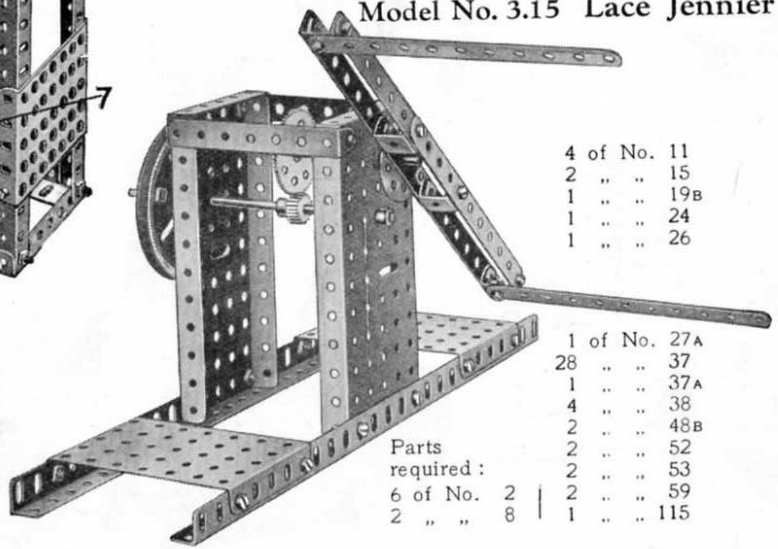


The hand levers 1 are each pivotally attached to the car by a Bolt and two Nuts (see Standard Mechanism No. 262) and are connected in a similar manner to two further levers, one of which, seen at 3, is pivoted to a Bush Wheel 4 while the other, on the further side of the model, is pivoted to a Coupling, which serves as a crank in the same way as the Bush Wheel 4. Both Bush Wheel and Coupling are secured to the Rod carrying the Gear Wheel 5, and motion is thus transmitted to the rear wheels. The steering foot lever 6 is secured by a Crank to a short vertical Rod which, in turn, is secured by another Crank to the Double Angle Strip carrying the front axle.

Parts required :

4	of No.	2
1	„ „	3
1	„ „	5
2	„ „	8
4	„ „	10
2	„ „	15
1	„ „	16
1	of No.	17
4	„ „	19B
1	„ „	24
1	„ „	26
1	„ „	27A
4	„ „	35
26	„ „	37
5	„ „	37A
4	„ „	38
1	„ „	45
1	„ „	48A
1	„ „	52
1	„ „	59
2	„ „	62
1	„ „	63
1	„ „	111C
2	„ „	125
2	„ „	126A

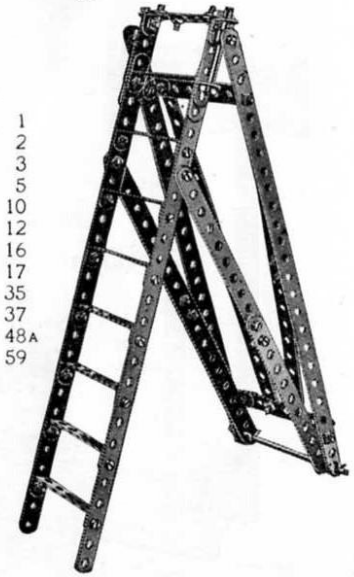
Model No. 3.15 Lace Jennier



Parts required :

6	of No.	2
2	„ „	8
4	of No.	11
2	„ „	15
1	„ „	19B
1	„ „	24
1	„ „	26
1	of No.	27A
28	„ „	37
1	„ „	37A
4	„ „	38
2	„ „	48B
2	„ „	52
2	„ „	53
2	„ „	59
1	„ „	115

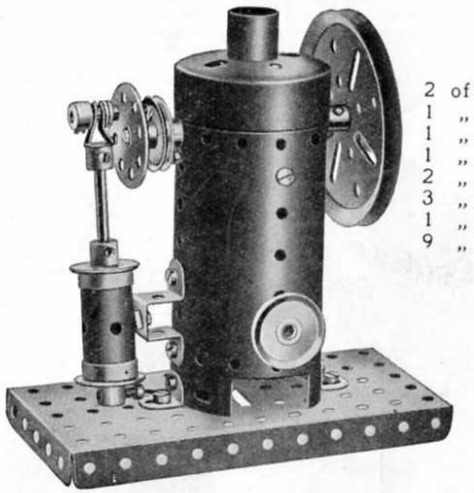
Model No. 3.16 Step Ladder



Parts required :

4	of No.	1
8	„ „	2
2	„ „	3
3	„ „	5
2	„ „	10
10	„ „	12
1	„ „	16
2	„ „	17
10	„ „	35
38	„ „	37
8	„ „	48A
2	„ „	59

Model No. 3.17 Vertical Steam Engine



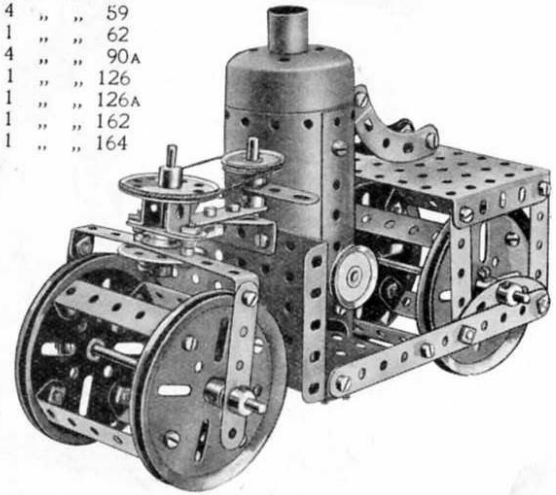
Parts required :

2	of	No.	12	2	of	No.	38
1	„	„	16	1	„	„	45
1	„	„	17	1	„	„	52
1	„	„	19B	1	„	„	59
2	„	„	20B	1	„	„	115
3	„	„	22	1	„	„	162
1	„	„	24	1	„	„	163
9	„	„	37	1	„	„	164
			1 of No. 166				

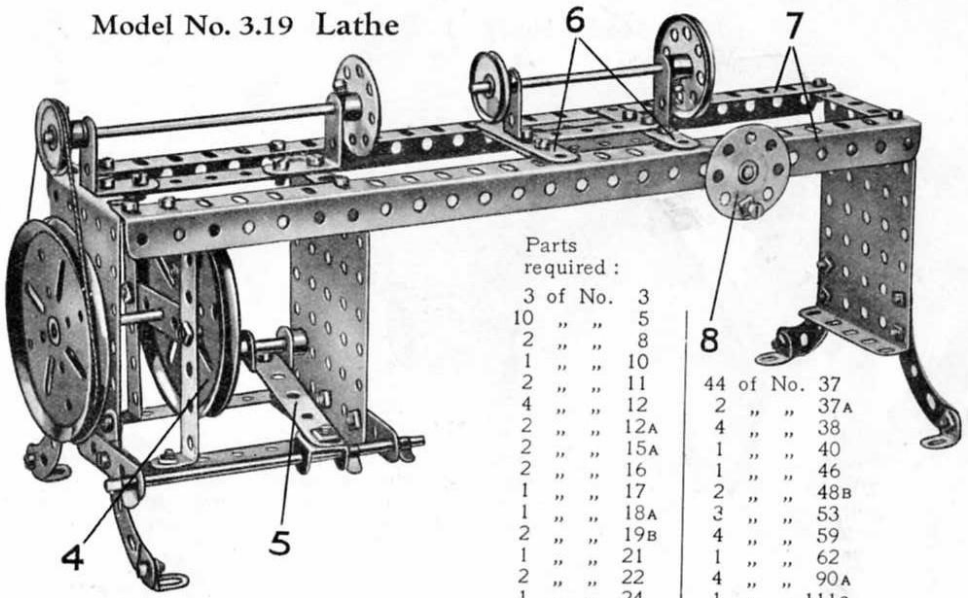
Model No. 3.18 Steam Road Roller

Parts required :

2	of	No.	2
7	„	„	5
2	„	„	11
1	„	„	12
2	„	„	12A
3	„	„	16
1	„	„	17
1	„	„	18A
4	„	„	19B
1	„	„	21
3	„	„	22
1	„	„	23
1	„	„	24
57	„	„	37
11	„	„	38
1	„	„	40
1	„	„	45
8	„	„	48A
2	„	„	48B
3	of	No.	53
4	„	„	59
1	„	„	62
4	„	„	90A
1	„	„	126
1	„	„	126A
1	„	„	162
1	„	„	164



Model No. 3.19 Lathe



Parts required :

3	of	No.	3
10	„	„	5
2	„	„	8
1	„	„	10
2	„	„	11
4	„	„	12
2	„	„	12A
2	„	„	15A
2	„	„	16
1	„	„	17
1	„	„	18A
2	„	„	19B
1	„	„	21
2	„	„	22
1	„	„	24
3	„	„	35
44	of	No.	37
2	„	„	37A
4	„	„	38
1	„	„	40
1	„	„	46
2	„	„	48B
3	„	„	53
4	„	„	59
1	„	„	62
4	„	„	90A
1	„	„	111c
1	„	„	115

The arrangement of the treadle is shown in detail in Fig. 3.19A. The Crank 1 is provided with a Flat Bracket, the round hole of which coincides with the elongated hole of the Crank, and receives the short Rod 2. The Crank 1 is free to turn about a Threaded Pin 3, secured to the 3" Pulley Wheel 4, and once the latter is set in motion it can be kept in rotation by working the treadle 5. The Strips 6 of the saddle (Fig. 3.19) are duplicated and their ends form slots to receive the flanges of the Angle Girders 7. The hand wheel 8 is a dummy one, but if desired it may be arranged to operate the saddle by an endless rope device.

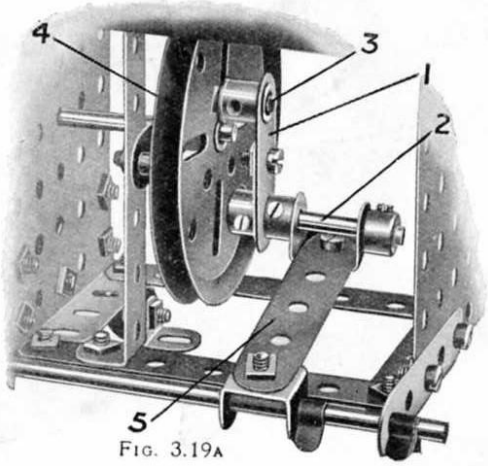
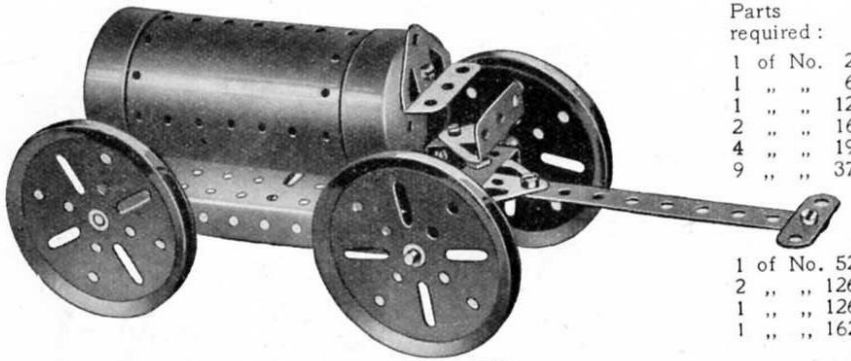


FIG. 3.19A

Model No. 3.20 Tank Wagon

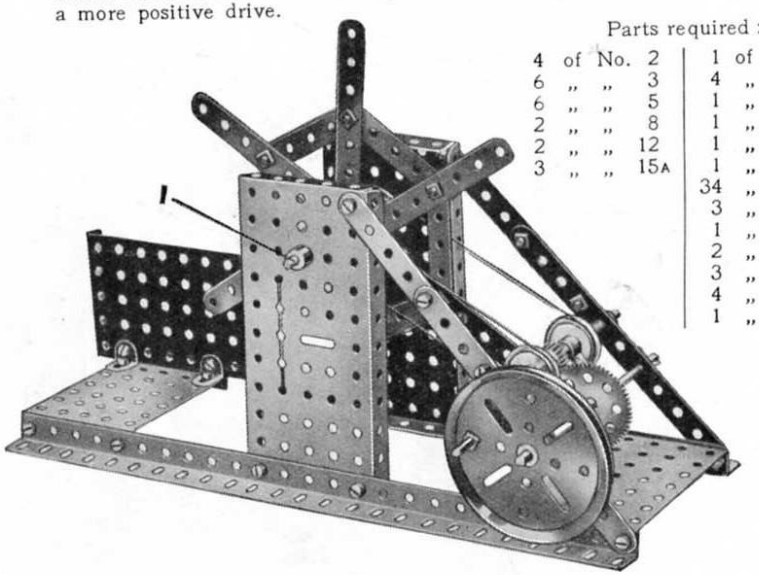


Parts required :

1	of	No.	2
1	„	„	6A
1	„	„	12
2	„	„	16
4	„	„	19B
9	„	„	37
1	of	No.	52
2	„	„	126
1	„	„	126A
1	„	„	162

Model No. 3.21 Flax Cleaner

The six 3½" Strips forming the rotating frame are fastened to a Bush Wheel that in turn is attached to the Rod 1. The 3½" Strips are braced by six 2½" Strips. The drive is transmitted from the operating shaft by means of endless cords. Two separate cords are used in order to secure a more positive drive.

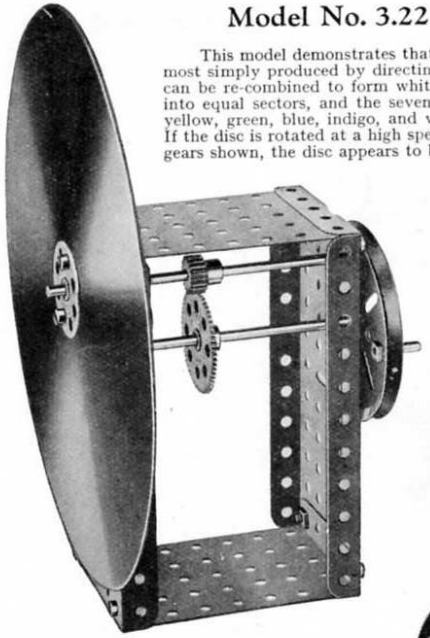


Parts required :

4	of	No.	2	1	of	No.	19B
6	„	„	3	4	„	„	22
6	„	„	5	1	„	„	24
2	„	„	8	1	„	„	26
2	„	„	12	1	„	„	27A
3	„	„	15A	1	„	„	35
				34	„	„	37
				3	„	„	38
				1	„	„	40
				2	„	„	52
				3	„	„	53
				4	„	„	59
				1	„	„	115

Model No. 3.22 Newton's Disc

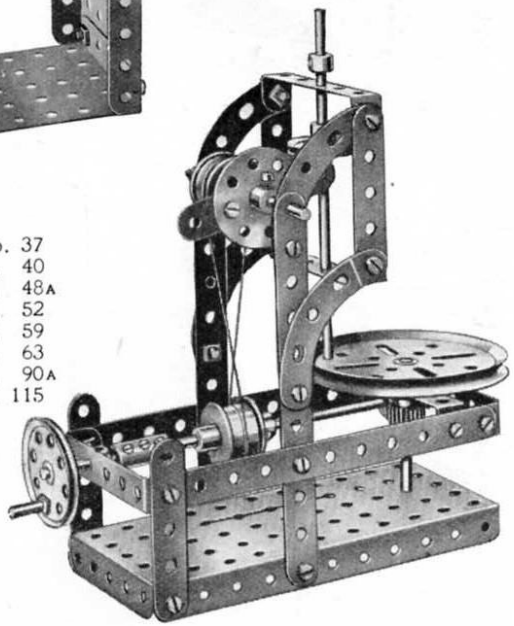
This model demonstrates that the colours of the spectrum, which are most simply produced by directing a ray of white light through a prism, can be re-combined to form white light. The cardboard disc is divided into equal sectors, and the seven colours of the spectrum—red, orange, yellow, green, blue, indigo, and violet—are painted on separate sectors. If the disc is rotated at a high speed by means of the hand wheel and the gears shown, the disc appears to be of a greyish-white colour.



Parts required :

2	of	No.	15	10	of	No.	37
1	„	„	19B	1	„	„	38
1	„	„	24	2	„	„	52
1	„	„	26	2	„	„	53
1	„	„	27A	2	„	„	59
				1	of	No.	115

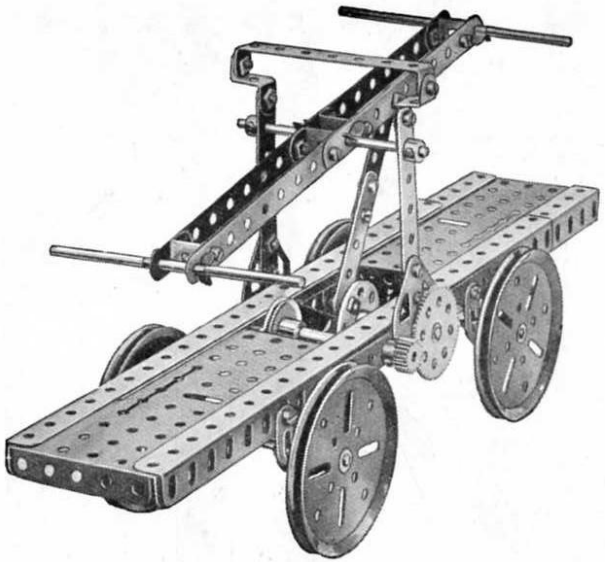
Model No. 3.23 Auto Dial Press



Parts required :

4	of	No.	2	22	of	No.	37
5	„	„	5	1	„	„	40
2	„	„	15	5	„	„	48A
1	„	„	16	1	„	„	52
1	„	„	17	3	„	„	59
1	„	„	18A	1	„	„	63
1	„	„	19B	4	„	„	90A
4	„	„	20B	1	„	„	115
1	„	„	21				
1	„	„	22				
1	„	„	24				
1	„	„	26				
1	„	„	32				

Model No. 3.24 Hand Trolley



Parts required :

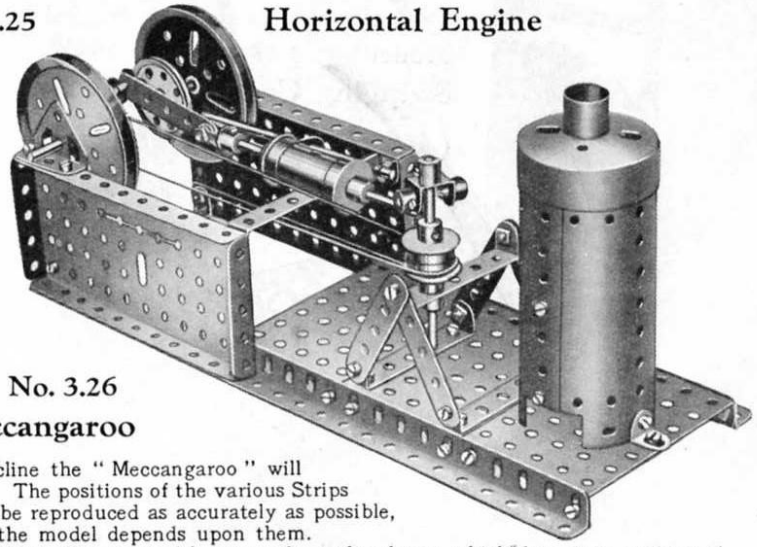
4	of	No.	2	1	of	No.	18A	1	of	No.	40
3	„	„	3	4	„	„	19B	1	„	„	45
2	„	„	5	2	„	„	22	1	„	„	48B
4	„	„	8	1	„	„	24	2	„	„	52
8	„	„	10	1	„	„	26	3	„	„	59
4	„	„	11	1	„	„	27A	4	„	„	90A
2	„	„	15A	6	„	„	35	2	„	„	125
4	„	„	16	40	„	„	37	2	„	„	126A

The connecting arm is pivoted at its lower end to the Bush Wheel and at its upper end to the hand lever, a bolt and two nuts being used to pivot the arm in each case. The drive is transmitted to a 1" Pulley Wheel on the axle of the road wheels by means of a crossed belt passing round another 1" Pulley that is secured to a Rod connected via a 3:1 gear ratio to the 1½" Rod carrying the Bush Wheel. This Rod is journalled in a 3½" Strip fastened to the side Angle Girder, and also in a Double Bent Strip secured to the inside of the Girder.

Model No. 3.25 Horizontal Engine

Parts required :

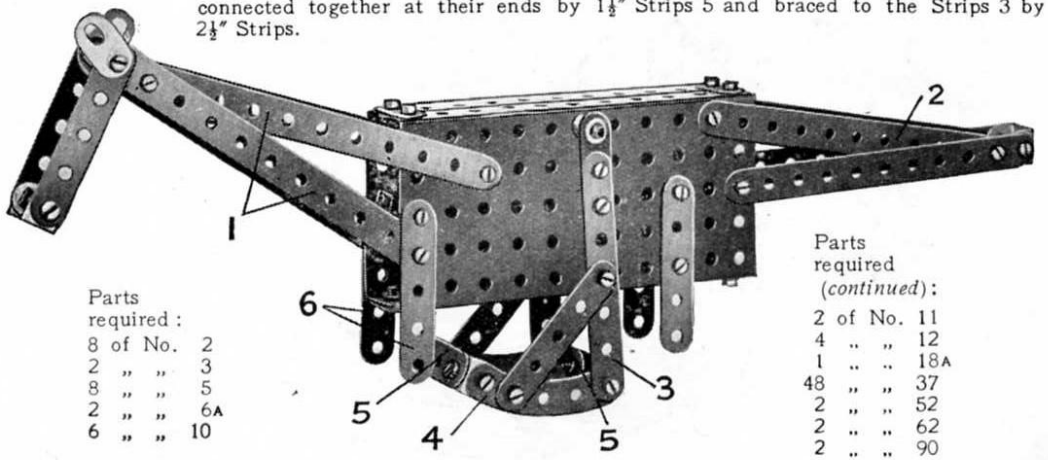
5	of	No.	5	3	of	No.	48A
2	„	„	8	2	„	„	48B
2	„	„	12	2	„	„	52
3	„	„	15A	3	„	„	53
3	„	„	18A	3	„	„	59
2	„	„	19B	1	„	„	63
1	„	„	19S	1	„	„	116
4	„	„	20B	1	„	„	125
1	„	„	21	2	„	„	126
1	„	„	22	1	„	„	162
2	„	„	35	1	„	„	163
32	„	„	37	1	„	„	164
1	„	„	40	1	„	„	166
1	„	„	48				



Model No. 3.26 The Meccangaroo

When placed upon an incline the " Meccangaroo " will " walk " with a quaint action. The positions of the various Strips in relation to the body should be reproduced as accurately as possible, for the successful working of the model depends upon them.

The animal rocks about a short Rod secured between the rocker-frame which does duty as " legs." This frame consists of two 3½" Strips 3 bolted at their upper ends to Cranks in which the short Rod is secured, and at their lower ends to two 2½" large radius Curved Strips 4, which are connected together at their ends by 1½" Strips 5 and braced to the Strips 3 by 2½" Strips.

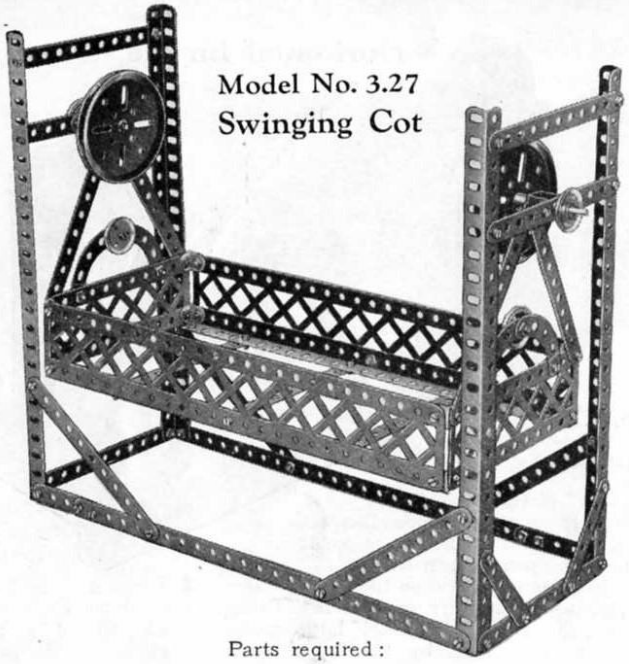


Parts required :

8	of	No.	2
2	„	„	3
8	„	„	5
2	„	„	6A
6	„	„	10

Parts required *(continued)* :

2	of	No.	11
4	„	„	12
1	„	„	18A
48	„	„	37
2	„	„	52
2	„	„	62
2	„	„	90



Model No. 3.27 Swinging Cot

Parts required :

2 of No.	1	6 of No.	8	2 of No.	22	2 of No.	45
17 " "	2	8 " "	12	2 " "	22A	4 " "	90A
2 " "	4	2 " "	17	64 " "	37	2 " "	99
2 " "	5	2 " "	19B	2 " "	37A	2 " "	100
						2 " "	111c

Model No. 3.28 Horse Sleigh

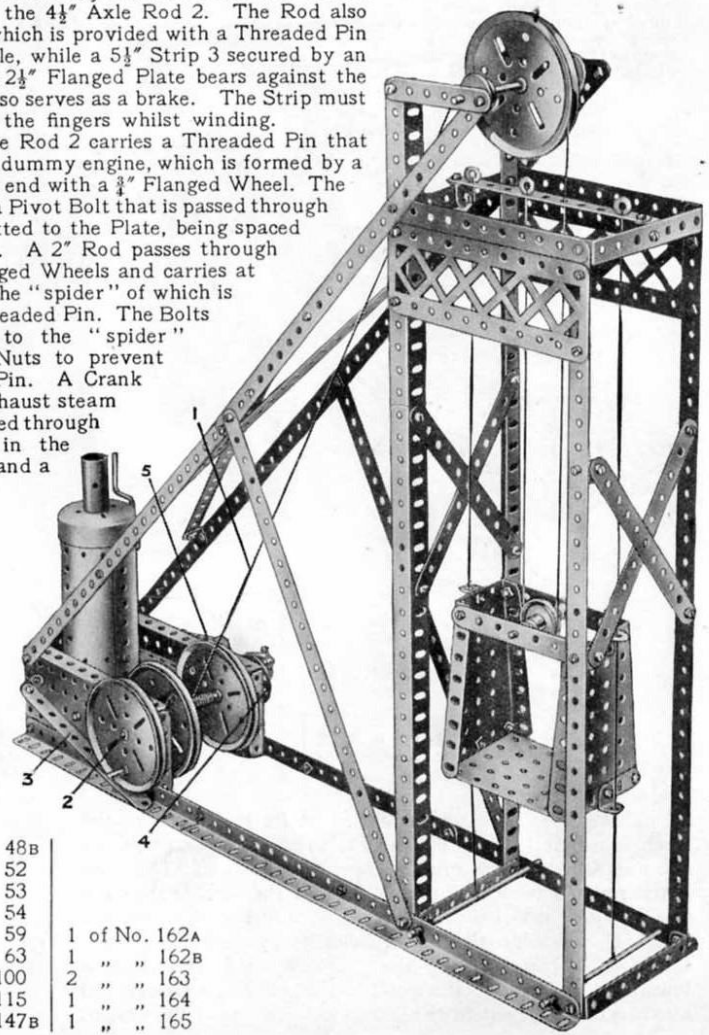
Parts required :

3 of No.	2	13 of No.	37	1 of No.	57c
4 " "	5	1 " "	48A	2 " "	90
1 " "	23	1 " "	52	1 " "	126A

Model No. 3.29 Pit Head Gear

The cage is raised and lowered by the cord 1 which is wound between two 3" Pulleys on the 4½" Axle Rod 2. The Rod also carries a further 3" Pulley which is provided with a Threaded Pin to form the operating handle, while a 5½" Strip 3 secured by an Angle Bracket to the 5½" × 2½" Flanged Plate bears against the periphery of the Pulley and so serves as a brake. The Strip must be depressed slightly with the fingers whilst winding.

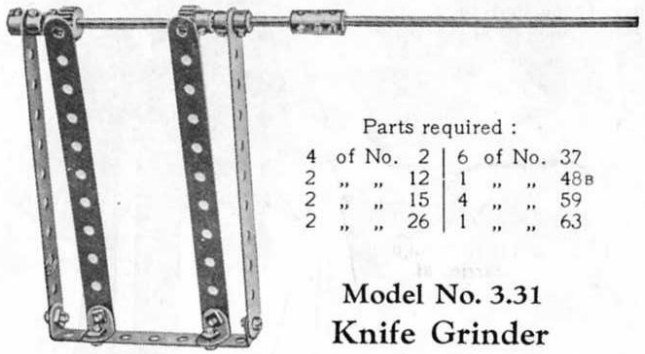
A Bush Wheel 4 on the Rod 2 carries a Threaded Pin that serves as the crank pin of a dummy engine, which is formed by a Sleeve Piece 5 fitted at each end with a ¾" Flanged Wheel. The Sleeve Piece is mounted on a Pivot Bolt that is passed through its centre hole and lock-nutted to the Plate, being spaced from the latter by a Collar. A 2" Rod passes through the boss of one of the Flanged Wheels and carries at one end a Swivel Bearing, the "spider" of which is mounted loosely on the Threaded Pin. The Bolts securing the Fork Piece to the "spider" should be provided with Nuts to prevent their shanks gripping the Pin. A Crank Handle representing the exhaust steam pipe is secured by Bolts passed through the Boiler, and inserted in the tapped holes of a Coupling and a Collar.



Parts required :

10 of No.	1	2 of No.	48B	1 of No.	162A		
8 " "	2	2 " "	52	1 " "	162B		
4 " "	3	3 " "	53	2 " "	163		
2 " "	4	2 " "	54	1 " "	164		
8 " "	8	4 " "	59	1 " "	165		
1 " "	11	1 " "	63				
14 " "	12	2 " "	100				
1 " "	12A	2 " "	115				
1 " "	15	1 " "	147B				
3 " "	15A						
2 " "	17						
4 " "	19B						
1 " "	19S						
4 " "	20B						
1 " "	22						
1 " "	24						
4 " "	35						
88 " "	37						
3 " "	38						
1 " "	40						

Model No. 3.30 Rattle

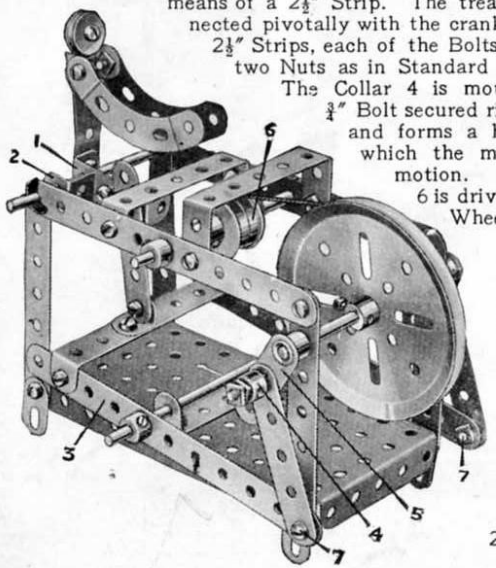


Parts required :

4	of	No.	2	6	of	No.	37
2	„	„	12	1	„	„	48B
2	„	„	15	4	„	„	59
2	„	„	26	1	„	„	63

Model No. 3.31 Knife Grinder

The body is a 2½" Strip, which is bolted at its lower end to a 1½" × ½" Double Angle Strip 1 and is held upright by a ½" Reversed Angle Bracket 2 secured to the Double Angle Strip. Both the latter parts are free to turn about a 3½" Axle Rod, and the Double Angle Strip is connected pivotally with the treadle 3 by means of a 2½" Strip. The treadle, in turn, is connected pivotally with the crankshaft by two further 2½" Strips, each of the Bolts 7 being secured by two Nuts as in Standard Mechanism No. 262. The Collar 4 is mounted loosely on a ¾" Bolt secured rigidly to the Crank 5, and forms a handle by means of which the model may be set in motion. The grinding wheel 6 is driven from the 3" Pulley Wheel by an endless belt.



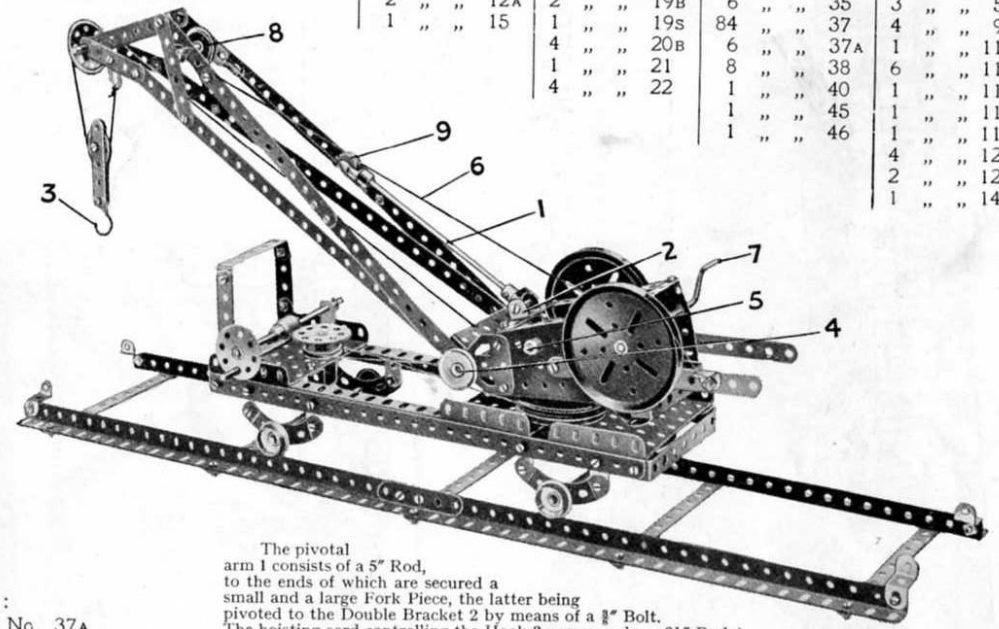
Parts required :

4	of	No.	2	9	of	No.	37A
4	„	„	3	1	„	„	38
4	„	„	5	1	„	„	40
4	„	„	10	1	„	„	46
1	„	„	11	1	„	„	48
1	„	„	12	2	„	„	48A
1	„	„	15A	1	„	„	48B
3	„	„	16	1	„	„	52
1	„	„	19B	4	„	„	59
2	„	„	20B	2	„	„	62
1	„	„	23	2	„	„	90A
3	„	„	35	1	„	„	111
27	„	„	37	1	„	„	125

Model No. 3.32 Railway Breakdown Crane

Parts required :

2	of	No.	1	12	of	No.	5	3	of	No.	15A	2	of	No.	22A	3	of	No.	48A
11	„	„	2	6	„	„	8	1	„	„	16	1	„	„	23	2	„	„	48B
2	„	„	3	10	„	„	10	2	„	„	17	1	„	„	24	3	„	„	53
2	„	„	4	2	„	„	11	2	„	„	18A	1	„	„	27A	2	„	„	54
				3	„	„	12	1	„	„	19	1	„	„	32	1	„	„	57C
				2	„	„	12A	2	„	„	19B	6	„	„	35	3	„	„	59
				1	„	„	15	1	„	„	19S	84	„	„	37	4	„	„	90A
								4	„	„	20B	6	„	„	37A	1	„	„	111
								1	„	„	21	8	„	„	38	6	„	„	111C
								4	„	„	22	1	„	„	40	1	„	„	115
												1	„	„	45	1	„	„	116
												1	„	„	46	1	„	„	116A
																4	„	„	125
																2	„	„	126A
																1	„	„	147B

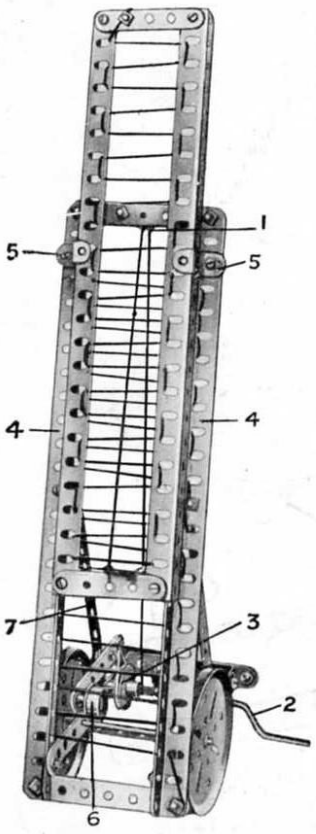


The pivotal arm 1 consists of a 5" Rod, to the ends of which are secured a small and a large Fork Piece, the latter being pivoted to the Double Bracket 2 by means of a ⅜" Bolt. The hoisting cord controlling the Hook 3 passes under a 3½" Rod 4 and is wound on a Crank Handle 5. The cord 6, which raises the jib, is operated by a second Crank Handle 7. It passes over the 1" loose Pulley Wheel 8, round the ½" loose Pulley 9 (which is mounted on a Pivot Bolt) and is then led back again and tied to a Flat Bracket on the 1½" Rod that carries the Pulley 8. Each Crank Handle 5, 7 is provided with a permanent band-and-pulley brake to prevent the jib or the load on the Hook 3 from falling when the handles are released. The method of rotating the crane about its pivot is as follows :

The hand wheel consisting of a Bush Wheel fitted with a Threaded Pin is fastened to a 3½" Rod journalled in two 1" × 1" Angle Brackets which are bolted to the 2½" × 3½" Flanged Plate. This Rod carries a Worm Wheel that meshes with a 57-teeth Gear Wheel fastened to a 2" Rod. The support for this Rod is formed by a Double Bent Strip. Connection between this Rod and the body of the crane is made by means of a 1" Pulley Wheel, a 3" Pulley Wheel fastened to the base of the crane, and a crossed belt joining these two wheels. On rotation of the hand wheel the jib of the crane is, therefore, slowly rotated.

The 3" Pulley to which the swivelling portion of the crane is attached, slides on the rim of a second 3" Pulley secured to the base of the model by means of ⅜" Bolts. These Bolts have Washers on their shanks to prevent damage to the rim of the Pulley.

Model No. 3.33 Fire Escape



Parts required :

4	of	No.	2
3	„	„	3
1	„	„	4
2	„	„	5
4	„	„	8
3	„	„	12
1	„	„	16
1	„	„	19S
2	„	„	19B
1	„	„	20B
1	„	„	22
1	„	„	23
26	„	„	37
6	„	„	37A
5	„	„	38
2	„	„	40
2	„	„	48A
3	„	„	59
5	„	„	111c
2	„	„	125
1	„	„	126A

The moving portion of the escape slides on the 12½" Angle Girders 4 of the fixed ladder and is guided by two ½" Reversed Angle Brackets 5. The cord for extending the ladder passes over the ½" loose Pulley 1 and is wound on the Crank Handle 2. The Pulley 1 revolves freely on a ¾" Bolt that is secured by two Nuts to an Angle Bracket bolted to the 3½" Strip.

A 3" Strip, weighted with a ¾" Flanged Wheel 6 to form a brake lever, is pivoted by a ⅜" Bolt to the 5½" Strip 7, and a piece of cord is passed round the 1" Pulley 3 on the hoisting shaft, and tied to the Strip. The pressure of the weighted lever is sufficient to keep the ladder raised in any position.

Model No. 3.34 Auto Swing Boat

The connecting Strip 1 is attached pivotally at one end to a Threaded Pin secured to the Bush Wheel 2 on the driving spindle of the motor, and at the other end by means of Bolt and Lock-Nuts to a Crank 3 mounted on the shaft 4, which operates the swing boat.

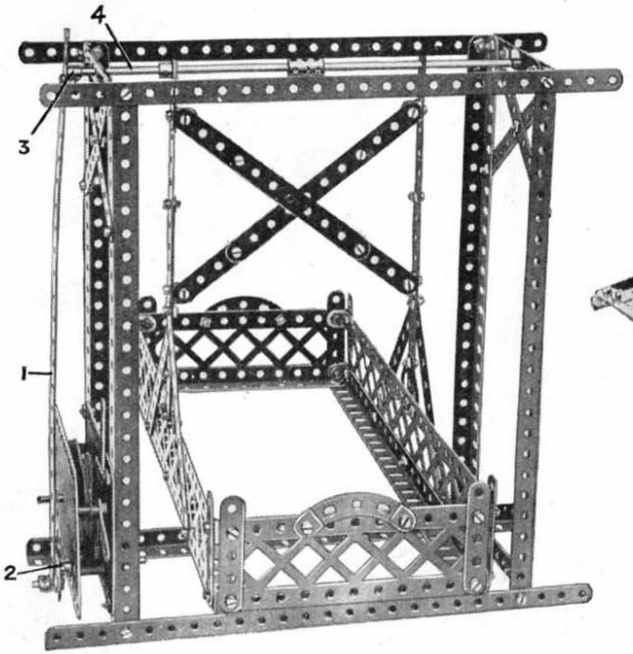
Parts required :

3	of	No.	1	1	of	No.	10	86	of	No.	37
16	„	„	2	12	„	„	12	2	„	„	37A
6	„	„	3	2	„	„	15	1	„	„	59
8	„	„	5	1	„	„	24	2	„	„	62
8	„	„	8	2	„	„	35	1	„	„	63

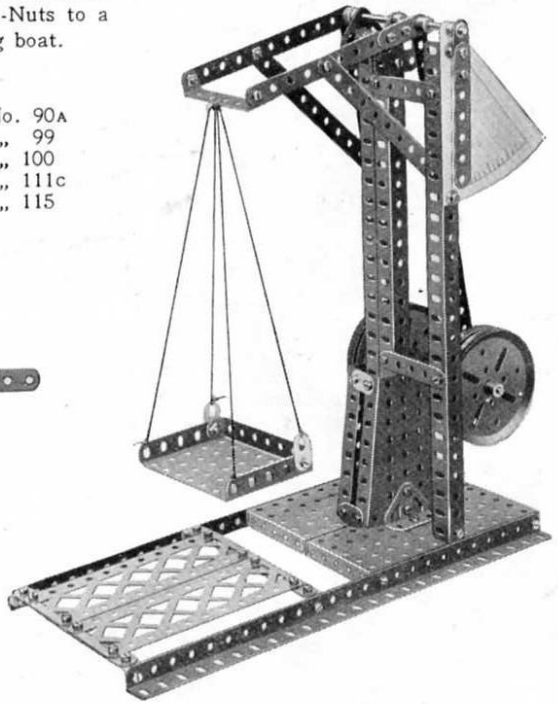
2	of	No.	90A
2	„	„	99
2	„	„	100
1	„	„	111c
1	„	„	115

2 of No. 126A

Clockwork Motor (not included in Outfit)



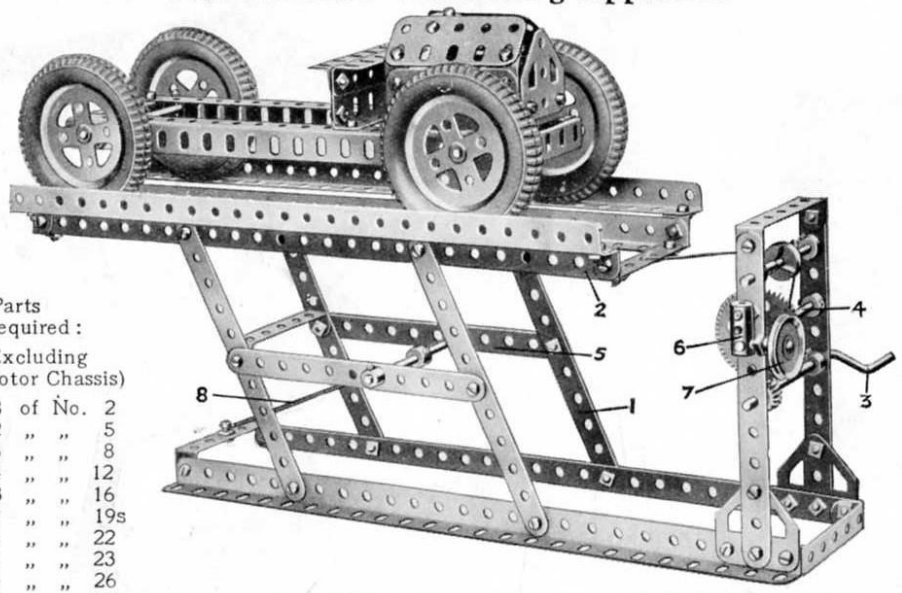
Model No. 3.35 Scales



Parts required :

10	of	No.	2	2	of	No.	48A
1	„	„	3	1	„	„	48B
2	„	„	5	2	„	„	52
5	„	„	8	1	„	„	53
7	„	„	10	2	„	„	54
5	„	„	12	4	„	„	59
2	„	„	15A	2	„	„	62
4	„	„	19B	2	„	„	100
67	„	„	37	2	„	„	126
2	„	„	38	2	„	„	126A

Model No. 3.36 Car Lifting Apparatus

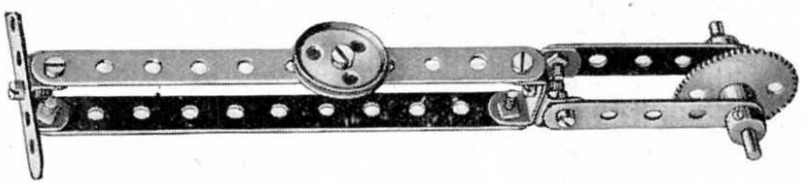


Parts required :
(Excluding Motor Chassis)

8	of	No.	2
2	„	„	5
6	„	„	8
4	„	„	12
3	„	„	16
1	„	„	19s
1	„	„	22
1	„	„	23
1	„	„	26
1	„	„	27A
5	„	„	35
36	„	„	37
12	„	„	37A
1	„	„	40
4	„	„	48A
4	„	„	59
1	„	„	63
2	„	„	115
2	„	„	126A

Four 5½" Strips 1 are attached pivotally by lock-nutted Bolts to the 12½" Angle Girders, which form the base of the model. and to the carrier 2, which receives the car. The Crank Handle 3 carries a ½" Pinion meshing with a 57-teeth Gear on the Rod 4, which forms a drum for a length of cord attached to the carrier. The Rod runs freely in the transverse hole of a Coupling 6 that is secured to the upright Strip by a ⅜" Bolt. A Threaded Pin carries the 1" Pulley 7 and its shank is inserted in the tapped hole of the Coupling, so that when the Pulley is rotated clockwise the Pin nips the Rod. The carrier 2 is returned to its original position by a length of elastic or Spring Cord 8.

Model No. 3.37 Pastry Designer



Parts required :

2	of	No.	2
3	„	„	5
3	„	„	11
1	„	„	17
1	„	„	22A
1	„	„	27A
9	„	„	37
2	„	„	59

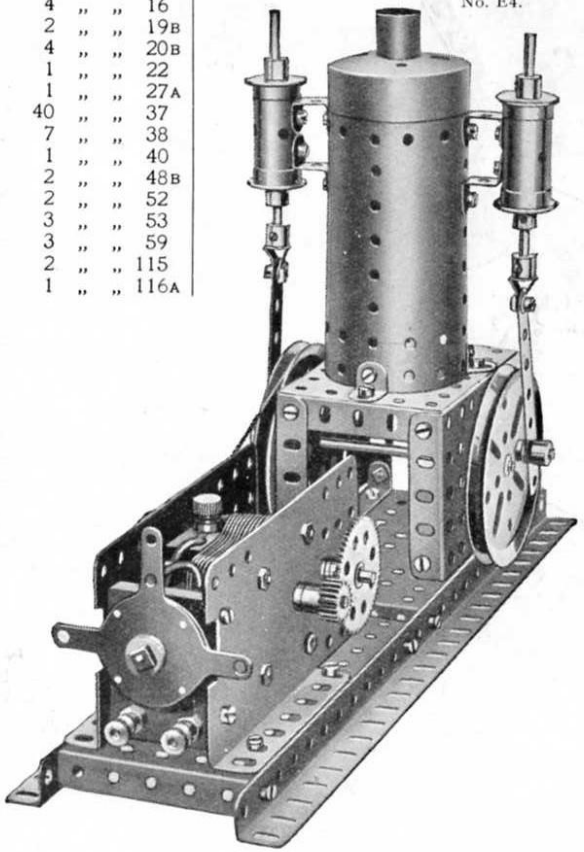
Model No. 3.38
Two-Cylinder Vertical Steam Engine

Parts required :

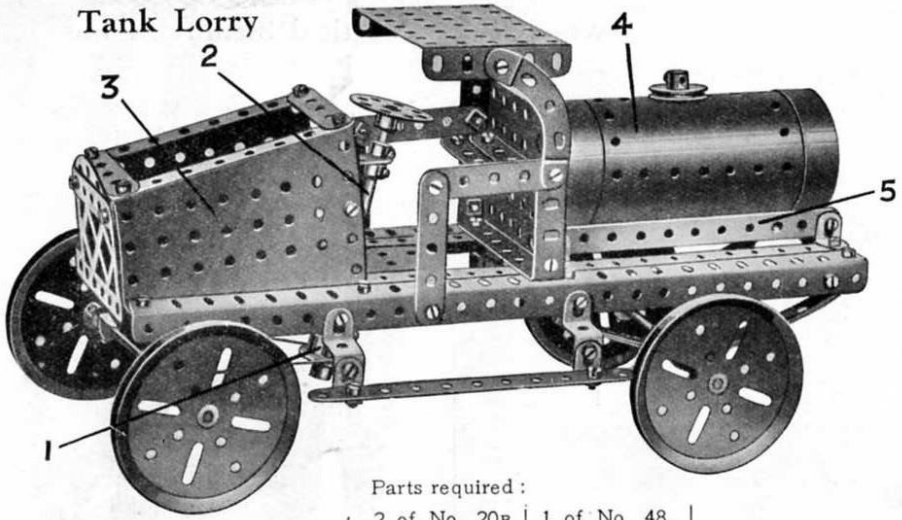
2	of	No.	3
2	„	„	8
2	„	„	11
3	„	„	12
4	„	„	16
2	„	„	19B
4	„	„	20B
1	„	„	22
1	„	„	27A
40	„	„	37
7	„	„	38
1	„	„	40
2	„	„	48B
2	„	„	52
3	„	„	53
3	„	„	59
2	„	„	115
1	„	„	116A
2	of	No.	125
1	„	„	162
2	„	„	163
1	„	„	164
1	„	„	166

Electric Motor

The No. E1 Motor included in the No. 3M Outfit will drive this model satisfactorily, although the motor shown in the illustration is the No. E4.



Model No. 3.39 Tank Lorry



Parts required :

2	of	No.	1	2	of	No.	11	2	of	No.	20B
8	„	„	2	14	„	„	12	1	„	„	22
3	„	„	3	2	„	„	12A	1	„	„	24
6	„	„	5	2	„	„	15	4	„	„	35
1	„	„	6A	1	„	„	15A	60	„	„	37
2	„	„	8	4	„	„	19B	1	„	„	37A
								4	„	„	38

1	of	No.	48	3	of	No.	90A				
1	„	„	48A	1	„	„	98				
2	„	„	48B	2	„	„	111c				
1	„	„	52	4	„	„	125				
2	„	„	53	2	„	„	126				
2	„	„	54	1	„	„	162				
4	„	„	59								

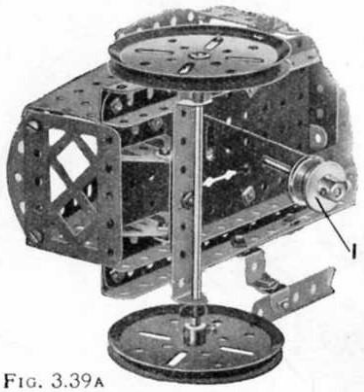


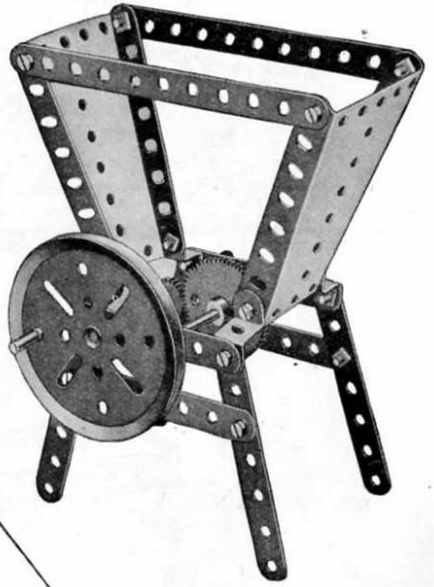
FIG. 3.39A

It should be noted that the steering cord is given a complete turn around the two ¾″ Flanged Wheels 1 to prevent slipping. The steering column 2 is journalled in the end of a 1½″ Strip, the other end of which is bolted to a 2½″ × ½″ Double Angle Strip secured between the two Sector Plates 3. The front road wheels are secured to a 5″ Rod that is journalled in the end holes of a 3½″ × ½″ Double Angle Strip. The ends of the steering cord are tied to this Strip, which is pivoted by means of a Bolt and Lock-nuts (S.M. 263) to the central hole of a 1½″ × ½″ Double Angle Strip. The latter is bolted between a pair of Trunnions attached to the underside of the 5½″ × 2½″ Flanged Plate. The tank 4 merely rests on the 5½″ Strips 5.

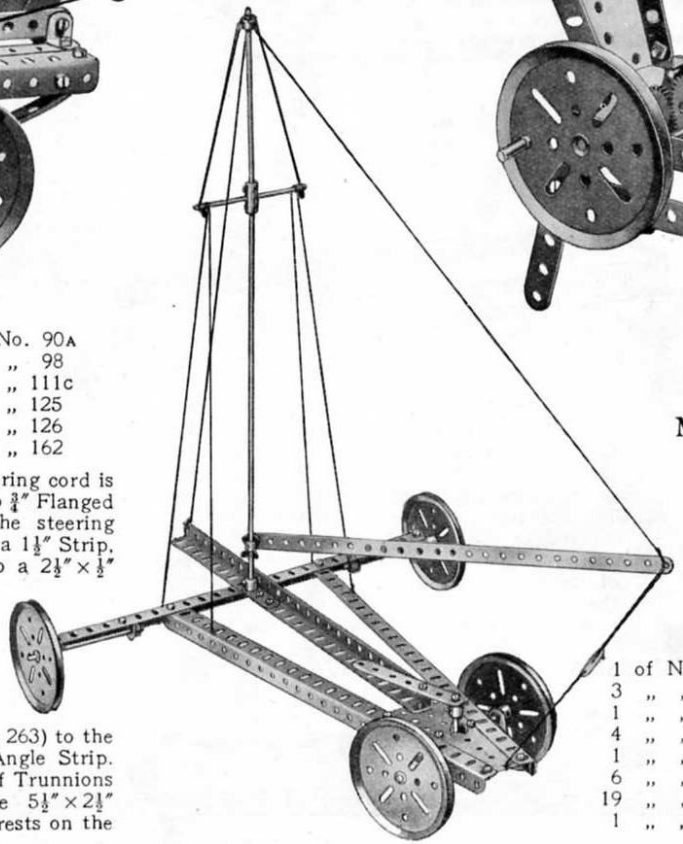
Model No. 3.40 Coffee Grinder

Parts required :

2	of	No.	2	1	of	No.	27A
6	„	„	3	16	„	„	37
2	„	„	4	2	„	„	54
2	„	„	16	3	„	„	59
1	„	„	19B	1	„	„	115
1	„	„	26	4	„	„	125



Model No. 3.41 Land Yacht

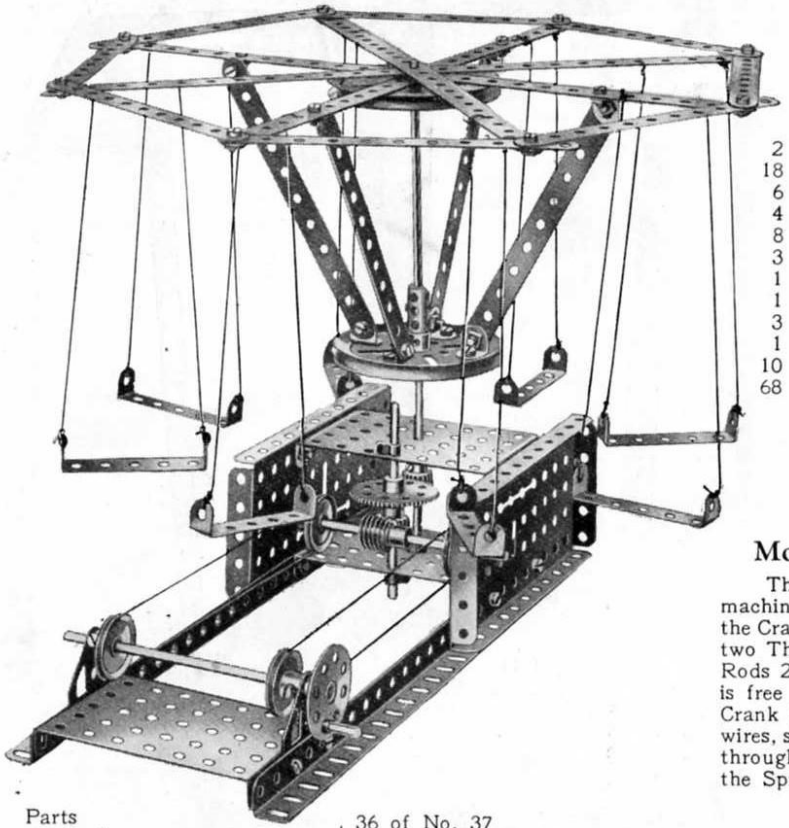


Parts required :

1	of	No.	1	1	of	No.	15	1	of	No.	40
1	„	„	3	3	„	„	16	1	„	„	45
4	„	„	8	1	„	„	18A	2	„	„	48A
1	„	„	10	4	„	„	19B	1	„	„	48B
1	„	„	13	1	„	„	24	1	„	„	54
				6	„	„	35	4	„	„	59
				19	„	„	37	2	„	„	62
				1	„	„	37A	1	„	„	63

2 of No. 111c

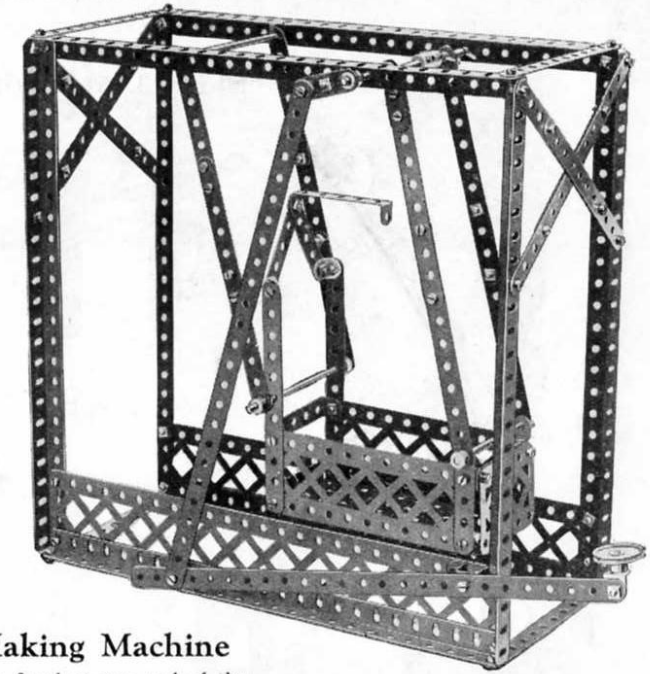
Model No. 3.42 Roundabout



Parts required :

4	of	No.	1	2	of	No.	19B	36	of	No.	37
12	„	„	2	4	„	„	22	2	„	„	40
2	„	„	8	1	„	„	24	8	„	„	48A
8	„	„	12	2	„	„	26	2	„	„	52
1	„	„	15	1	„	„	27A	2	„	„	59
3	„	„	15A	1	„	„	32	1	„	„	63
1	„	„	16	2	„	„	35	1	„	„	115
								2	„	„	126A

Model No. 3.43 Swing Boat

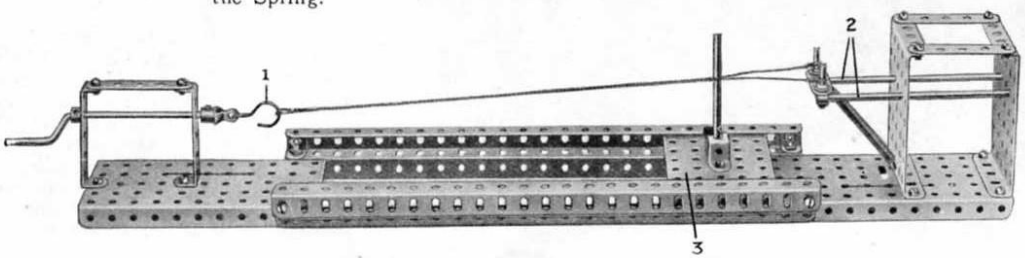


Parts required :

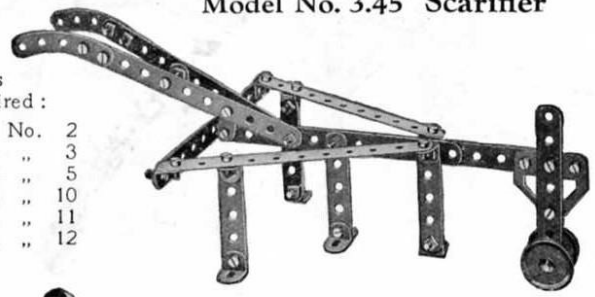
2	of	No.	1	6	of	No.	37A	3	of	No.	5
18	„	„	2	8	„	„	38	1	„	„	6A
6	„	„	3	1	„	„	45	4	„	„	8
4	„	„	5	3	„	„	48A	4	„	„	12
8	„	„	8	1	„	„	52	2	„	„	15A
3	„	„	12	4	„	„	59	1	„	„	16
1	„	„	15	2	„	„	62	1	„	„	19S
1	„	„	15A	1	„	„	63	2	„	„	35
3	„	„	16	1	„	„	98	32	„	„	37
1	„	„	22	2	„	„	99	2	„	„	38
10	„	„	35	2	„	„	100	1	„	„	40
68	„	„	37	4	„	„	111C	1	„	„	43
								1	„	„	45
								2	„	„	48A
								2	„	„	52
								3	„	„	53
								1	„	„	57C
								3	„	„	59
								2	„	„	115
								1	„	„	166

Model No. 3.44 Flex Making Machine

The two wires to be twisted are fixed at one end of the machine to a Hook 1 which is attached by an End Bearing to the Crank Handle. At the other end the wires are looped over two Threaded Pins fixed by Collars to the spring controlled Rods 2. The $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 3 carrying a $3\frac{1}{2}''$ Rod is free to slide in the built-up channel girders, and as the Crank Handle is turned it is pushed ahead of the twisting wires, so keeping the finished flex even. As the wires shorten through twisting, the Rods 2 slide longitudinally, extending the Spring.



Model No. 3.45 Scarifier



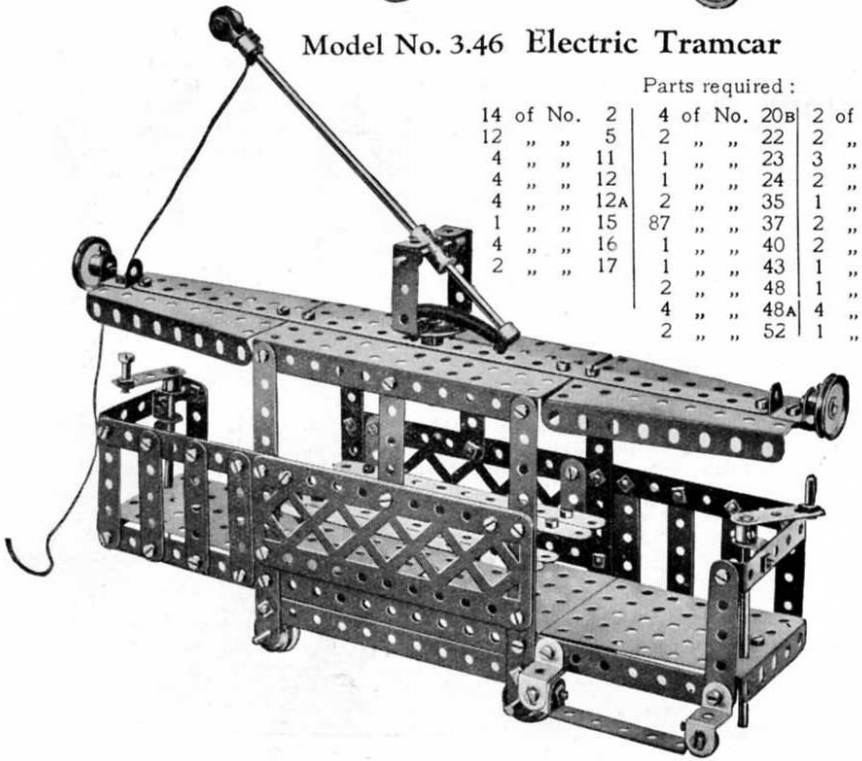
Parts required :

7	of	No.	2
1	„	„	3
4	„	„	5
1	„	„	10
1	„	„	11
11	„	„	12

Parts required (*continued*) :

1	of	No.	18A
2	„	„	22
29	„	„	37
2	„	„	38
2	„	„	90
1	„	„	126A

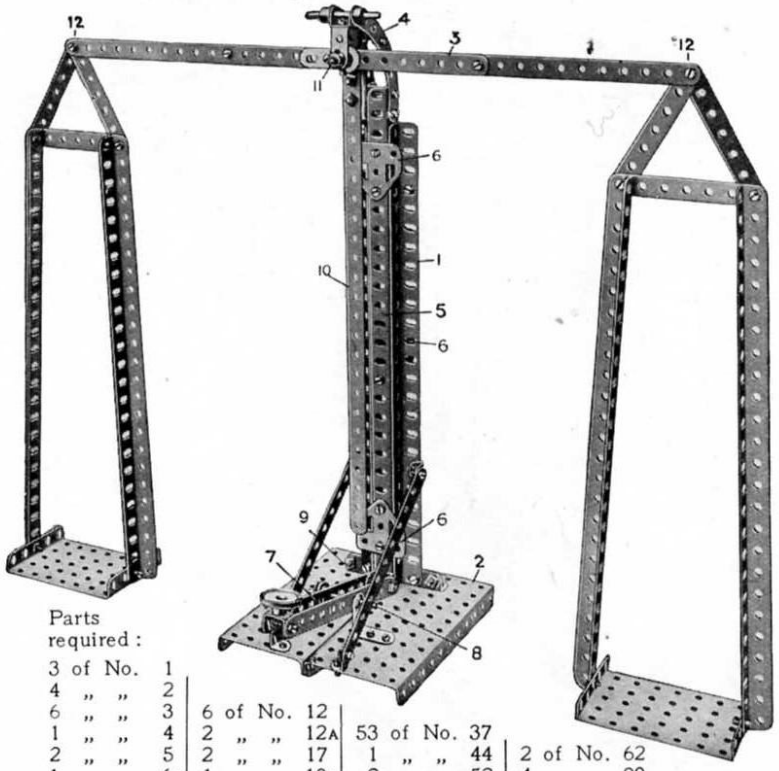
Model No. 3.46 Electric Tramcar



Parts required :

14	of	No.	2	4	of	No.	20B	2	of	No.	53
12	„	„	5	2	„	„	22	2	„	„	54
4	„	„	11	1	„	„	23	3	„	„	59
4	„	„	12	1	„	„	24	2	„	„	62
4	„	„	12A	2	„	„	35	1	„	„	63
1	„	„	15	87	„	„	37	2	„	„	100
4	„	„	16	1	„	„	40	2	„	„	111C
2	„	„	17	1	„	„	43	1	„	„	115
				2	„	„	48	1	„	„	116A
				4	„	„	48A	4	„	„	125
				2	„	„	52	1	„	„	147B

Model No. 3.47 Demonstration Scales



Parts required :

3	of	No.	1								
4	„	„	2								
6	„	„	3	6	of	No.	12				
1	„	„	4	2	„	„	12A	53	of	No.	37
2	„	„	5	2	„	„	17	1	„	„	44
1	„	„	6A	1	„	„	18A	2	„	„	52
8	„	„	8	1	„	„	22	2	„	„	53
4	„	„	11	2	„	„	35	2	„	„	59

2	of	No.	62
4	„	„	90
1	„	„	125
2	„	„	126A

The only feature of this model which needs description is the standard, which is built up of two Angle Girders 1 bolted to the base 2 by Angle Brackets and spaced apart at the top by a 2½" Strip obliquely disposed. The balance lever 3 is pivotally carried in Curved Strips 4 bolted to the top of two Angle Girders 5 sliding between the Girders 1. The Girders 5 are themselves bolted together and in order to guide them as they slide vertically two Flat Trunnions 6 and two 1½" Strips are bolted at the front and rear. The balance is raised by depressing the lever 7 pivoted at 8 and pivotally connected at 11 to the vertically sliding Girders 5. The indicator 10 is bolted to a Crank at the rear, the boss of which is fitted on the pivot Rod 11. The connections at 12 are lock-nutted to allow free action.

Model No. 3.48 Fire Truck

The front axle is journalled in a 2½" Double Angle Strip that is pivoted through its centre hole to a Double Bent Strip secured to the Flanged Plate 15. Steering is effected from the Pulley 13 secured on a 3½" Rod that is passed through the 3½" × 2½" Flanged Plate 16, and held in position by Collars. On the lower end of the Rod is a Bush Wheel 14, which is connected to the pivoted Double Angle Strip by cords tied to opposite holes in the Bush Wheel and to the ends of the Double Angle Strip.

The lower part of the escape is mounted pivotally on Bolts 10 passed through the upturned ends of a 2½" × 1" Double Angle Strip that is bolted to a 3½" × ½" Double Angle Strip which, in turn, is supported on two vertical 2½" × ½" Double Angle Strips. The upper or moving portion of the escape slides between the 12½" Angle Girders 9 and is held freely in position by the Nuts of the Bolts 11.

The ladder is extended from the Crank Handle 2 (Fig. 3.48A) that is journalled in a 2½" × ½" Double Angle Strip bolted to a 5½" Strip that, in turn, is bolted across the flanges of the Sector Plates. A Cord 7 is wound on to the Crank Handle and one of its ends is tied to a 2½" Strip that spans the inner end of the 12½" Strips forming the sides of the extending ladder. Its other end 7A is then led towards the outer end of the fixed ladder, round a ½" loose Pulley held on a Bolt in the centre hole of a 2½" Double Angle Strip that spans the outer ends of the 12½" Girders 9, and finally is tied to the same 2½" Strip to which the end 7 is already attached. Thus by turning the handle 2 the escape is pulled inward or outward.

The Crank Handle 1 carries a ½" Pinion 3 that engages a 57-teeth Gear 4 secured to a Rod 12. A Cord 8 is wound a few turns round the Rod 12 and is then led to the 2½" Strip 5 where it is secured. By turning the Crank Handle the Cord is wound in, thus raising the pivoted escape. On turning the handle in the opposite direction, the escape is lowered by its own weight.

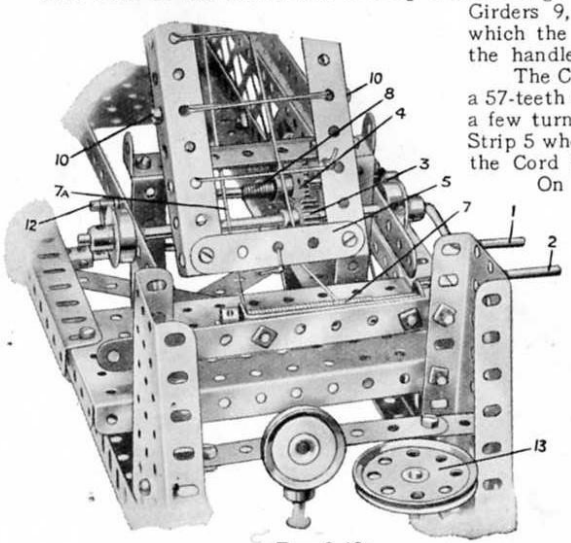
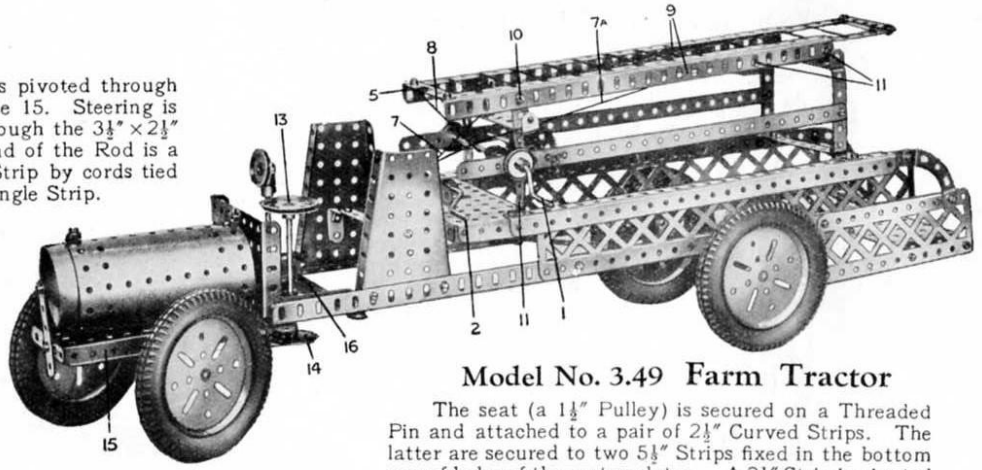


FIG. 3.48A

Parts required

4	of No.	1	3	of No.	20B	2	of No.	48B
6	" "	2	1	" "	21	2	" "	52
3	" "	3	2	" "	22	2	" "	53
4	" "	5	1	" "	23	2	" "	54
8	" "	8	1	" "	24	4	" "	59
4	" "	11	1	" "	26	1	" "	63
1	" "	12	1	" "	27A	2	" "	90A
2	" "	12A	4	" "	35	2	" "	99
2	" "	15	87	" "	37	2	" "	100
2	" "	15A	8	" "	37A	4	" "	111C
2	" "	16	10	" "	38	2	" "	126A
1	" "	18A	2	" "	40	1	" "	162A
1	" "	19	1	" "	45	1	" "	162B
4	" "	19B	1	" "	46	1	" "	165
1	" "	19S	8	" "	48A			

4 3" Dunlop Tyres (not included in Outfit)



Model No. 3.49 Farm Tractor

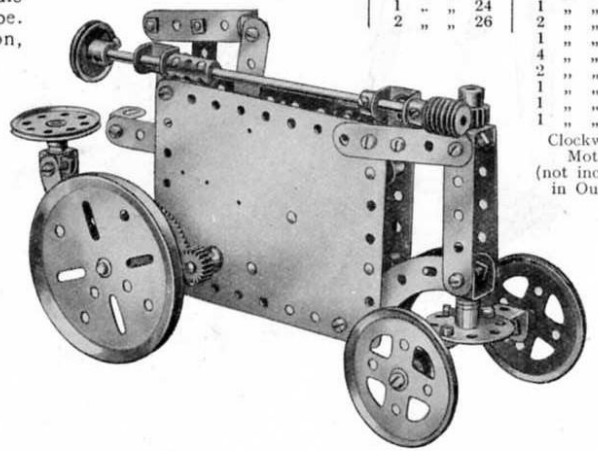
The seat (a 1½" Pulley) is secured on a Threaded Pin and attached to a pair of 2½" Curved Strips. The latter are secured to two 5½" Strips fixed in the bottom row of holes of the motor plates. A 2½" Strip is pivoted to the Motor reversing lever by means of a Reversed Angle Bracket, and is supported by a 1½" Strip which is attached pivotally to the Motor.

Parts required:

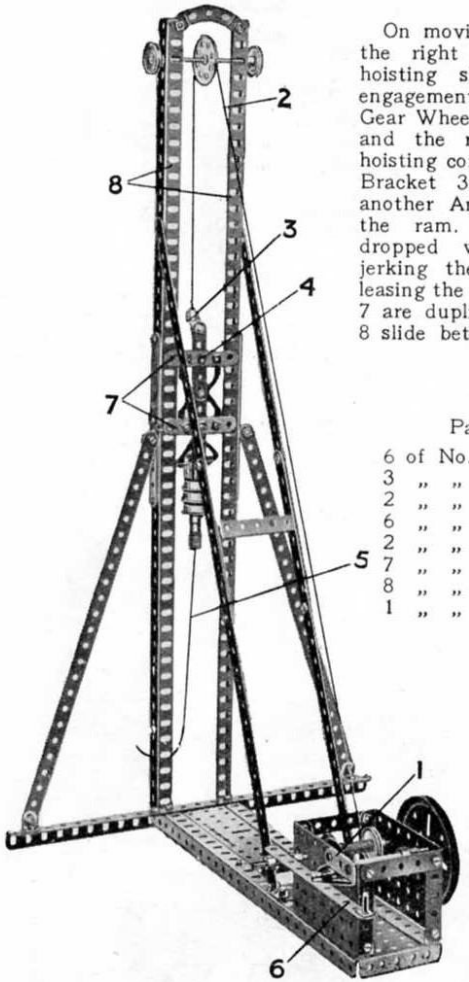
2	of No.	2	4	of No.	11	1	of No.	17
5	" "	5	5	" "	12	2	" "	19B
1	" "	6A	1	" "	15	2	" "	20A
2	" "	10	2	" "	16	1	" "	21
						1	" "	22
						1	" "	24
						2	" "	26

1	of No.	27A	
1	" "	32	
28	" "	37	
7	" "	37A	
5	" "	38	
1	" "	48A	
2	" "	59	
1	" "	63	
4	" "	90A	
2	" "	111	
1	" "	111C	
1	" "	115	
1	" "	125	

Clockwork Motor (not included in Outfit)



Model No. 3.50 Pile Driver



On moving the hand lever 6 to the right a ½" Pinion on the hoisting shaft is brought into engagement with the 57-teeth Gear Wheel 1 on the driving shaft and the ram 4 is raised. The hoisting cord 2 is tied to an Angle Bracket 3, which lodges under another Angle Bracket bolted to the ram. The latter may be dropped whenever required by jerking the cord 5, thereby releasing the Brackets 3. The Strips 7 are duplicated, and the Girders 8 slide between their ends.

Parts required :

6	of	No.	1	3	of	No.	16
3	„	„	2	1	„	„	19B
2	„	„	3	3	„	„	20B
6	„	„	5	1	„	„	21
2	„	„	6A	2	„	„	22
7	„	„	8	1	„	„	26
8	„	„	12	1	„	„	27A
1	„	„	15A	1	„	„	32
				2	„	„	35
				60	„	„	37
				2	„	„	37A
				1	„	„	38
				1	„	„	40
				1	„	„	45
				1	„	„	46
				1	„	„	48A
				2	„	„	48B
				2	„	„	52
				2	„	„	53
				4	„	„	59
				1	„	„	90A
				1	„	„	111C
				1	„	„	115
				2	„	„	126
				2	„	„	126A

Model No. 3.51 Railway Wagon Swivel Crane

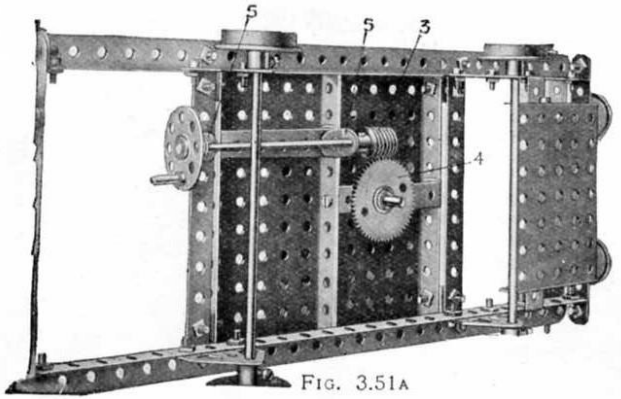
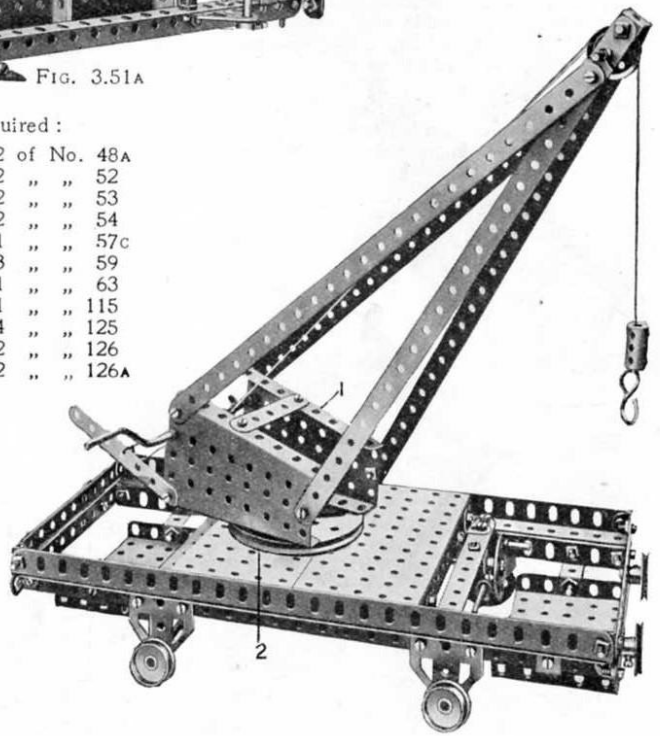


FIG. 3.51A

The flanges of the Sector Plates 1 are bolted to the 3" Pulley Wheel 2 upon which the crane swivels, and the spindle of the Pulley Wheel is rotated by the Worm 3 engaging the Gear Wheel 4 (Fig. 3.51A). In order to bring the Worm centrally over the teeth of the Gear Wheel 4, Washers are placed beneath the Angle Brackets 5 in which the spindle of the Worm is journalled.

Parts required :

4	of	No.	1	2	of	No.	48A
6	„	„	2	2	„	„	52
1	„	„	3	2	„	„	53
2	„	„	5	2	„	„	54
4	„	„	8	1	„	„	57C
3	„	„	11	3	„	„	59
14	„	„	12	1	„	„	63
2	„	„	15	1	„	„	115
1	„	„	15A	4	„	„	125
2	„	„	17	2	„	„	126
1	„	„	19	2	„	„	126A
1	„	„	19B				
4	„	„	20B				
4	„	„	22				
1	„	„	22A				
1	„	„	24				
1	„	„	27A				
1	„	„	32				
3	„	„	35				
70	„	„	37				
2	„	„	38				
1	„	„	40				

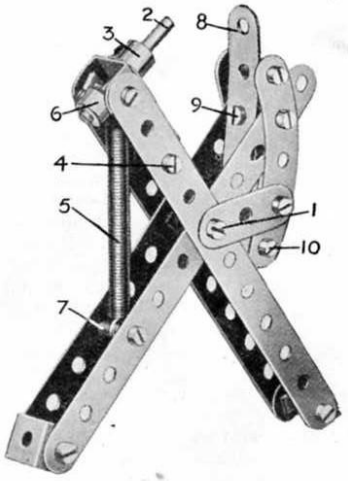


Model No. 3.52 Hand Punch

Parts required :

4	of No.	2	21	of No.	37
1	„ „	5	3	„ „	37A
2	„ „	6A	1	„ „	43
4	„ „	11	1	„ „	59
4	„ „	12	1	„ „	62
1	„ „	18A	2	„ „	90

1 of No. 111c



Two pairs of 5½″ Strips are connected loosely towards their centres by means of Nuts and Bolts 1. The punch 2 consists of a 1½″ Rod secured in the boss of a Crank 3, which is bolted to a Double Bracket secured at 4. A Spring 5 serves to open the handles after the punch has been used ; it is placed on the Rod 2 and held in position by means of a Collar 6, while its other end is attached to a ⅜″ Bolt 7 passed through one pair of 5½″ Strips. After passing through the paper the punch enters the end hole of a 3″ Strip 8. The latter is bolted at 9 to a Double Bracket, while its other end passes beneath a similar bracket at 10.

Model No. 3.53 Paddle Steamer

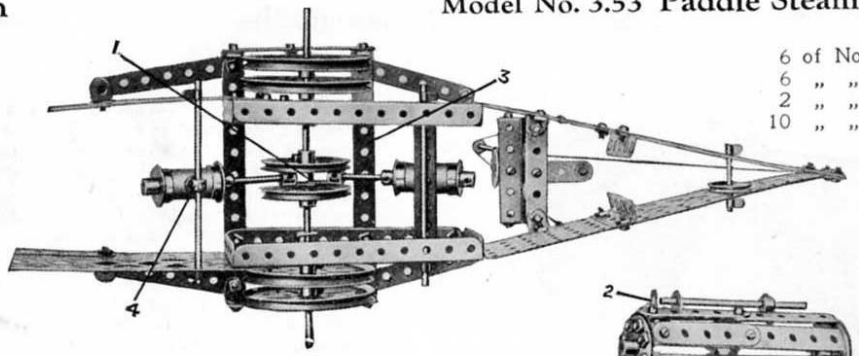


FIG. 3.53A

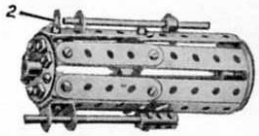


FIG. 3.53B

The 3″ Pulley Wheels forming the paddles are attached to 3½″ Rods, to the inner ends of which 2″ Pulleys are fixed (Fig. 3.53A), and the 2″ Pulleys are connected together rigidly by a ¾″ Bolt 1 that is locked in position by nuts. The Bolt 1 forms also a pivot for two small Fork Pieces (one of which is taken from a Swivel Bearing) to which the piston rods of the oscillating cylinders are fixed. The cylinders pivot about 4½″ Rods, one cylinder being mounted on a 3½″ × ½″ Double Angle Strip while the other is attached rigidly to a Collar 4 by a Bolt on which are placed two Washers. The Collar is secured, of course, to the Rod.

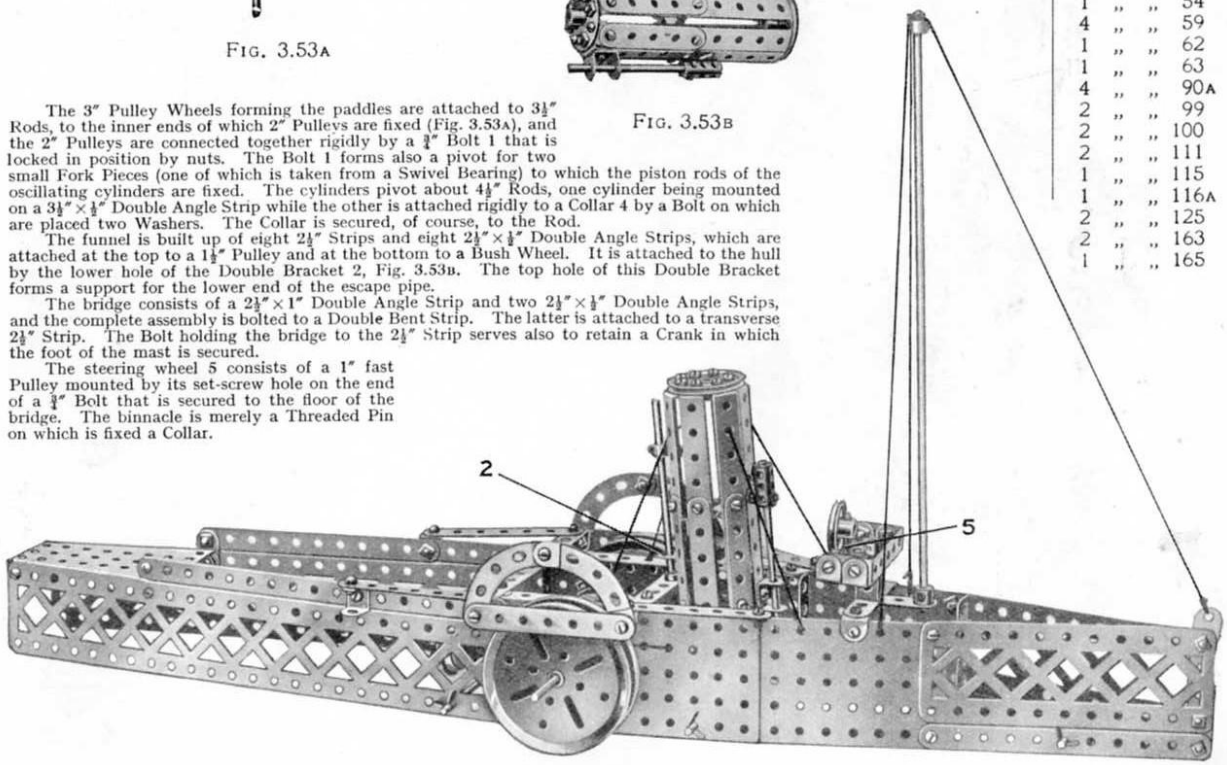
The funnel is built up of eight 2½″ Strips and eight 2½″ × ½″ Double Angle Strips, which are attached at the top to a 1½″ Pulley and at the bottom to a Bush Wheel. It is attached to the hull by the lower hole of the Double Bracket 2, Fig. 3.53B. The top hole of this Double Bracket forms a support for the lower end of the escape pipe.

The bridge consists of a 2½″ × 1″ Double Angle Strip and two 2½″ × ½″ Double Angle Strips, and the complete assembly is bolted to a Double Bent Strip. The latter is attached to a transverse 2½″ Strip. The Bolt holding the bridge to the 2½″ Strip serves also to retain a Crank in which the foot of the mast is secured.

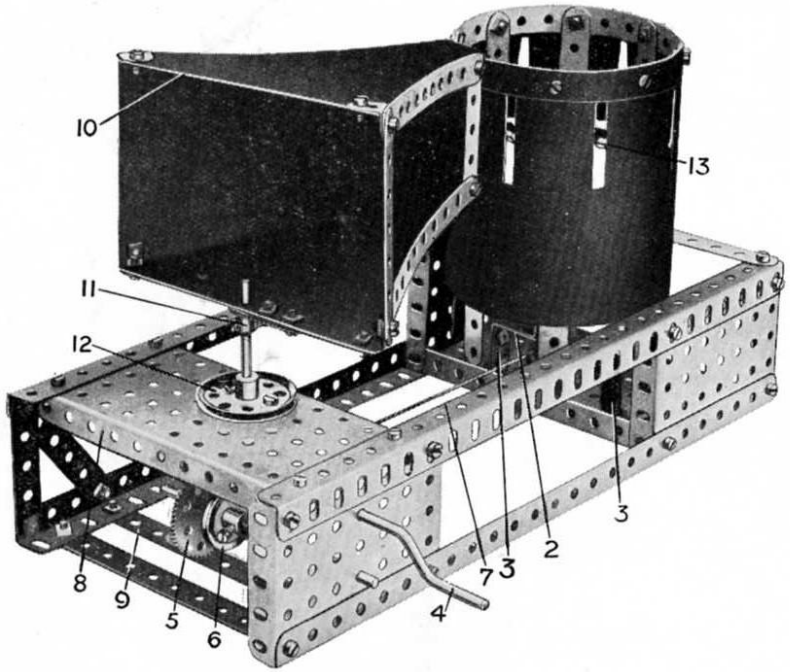
The steering wheel 5 consists of a 1″ fast Pulley mounted by its set-screw hole on the end of a ¾″ Bolt that is secured to the floor of the bridge. The binnacle is merely a Threaded Pin on which is fixed a Collar.

Parts required :

6	of No.	2	5	of No.	10	1	of No.	22A
6	„ „	3	4	„ „	11	1	„ „	24
2	„ „	4	14	„ „	12	6	„ „	35
10	„ „	5	1	„ „	13	93	„ „	37
			2	„ „	15A	4	„ „	37A
			4	„ „	16	14	„ „	38
			2	„ „	17	1	„ „	40
			1	„ „	18A	1	„ „	45
			4	„ „	19B	1	„ „	46
			2	„ „	20A	10	„ „	48A
			4	„ „	20B	1	„ „	48B
			1	„ „	21	2	„ „	52
			1	„ „	22	2	„ „	53
						1	„ „	54
						4	„ „	59
						1	„ „	62
						1	„ „	63
						4	„ „	90A
						2	„ „	99
						2	„ „	100
						2	„ „	111
						1	„ „	115
						1	„ „	116A
						2	„ „	125
						2	„ „	163
						1	„ „	165



Model No. 3.54 Kinetograph



Most Meccano boys probably are aware of the principles of the Kinetograph, but for the benefit of those who have not seen one in action, we may mention that it is a device which imparts an appearance of animation to a series of pictures, each differing slightly from the other and passed in rapid succession before the eyes. In this respect it resembles the remarkable principle upon which the modern cinematograph is based.

In constructing the Meccano model the following details will prove useful:—The drum consists of a 12½" Strip bent to form a circle, with its ends overlapping one hole, and bolted to eight vertical 5½" Strips forming the sides. Two pairs of opposite 5½" Strips are connected by 3½" Strips and Angle Brackets bolted in the third holes from their lower ends. The 3½" Strips cross at right angles to one another and are bolted in the centre to a Bush Wheel, in the boss of which is secured a short Rod forming the pivot of the revolving drum. This Rod is journalled in a Double Bent Strip bolted to a 2½" × 1" Double Angle Strip 2. This, in turn, is secured to the base of the model by two 1" × 1" Angle Brackets 3. A further bearing for the short Rod consists of a Crank bolted to the base of the model.

The drum is rotated from the Crank Handle 4, on which is mounted a ½" Pinion engaging a 57-teeth Gear Wheel 5 secured to a 3½" Rod carrying a Pulley Wheel 6. The latter is connected by means of a cord 7 to a similar wheel nipped to the vertical spindle of the drum. Bearings are provided for the inner ends of the Crank Handle and 3½" Rod by a Double Angle Strip bolted between the Plate 8 and 5½" Strip 9. The sighting box 10 is built up from a framework of Strips and is secured by means of a Crank 11 to a short vertical Rod rigidly mounted in the boss of the 1¼" Pulley 12. The four sides of the framework 10 are covered with some black material; stiff black paper suitable for this purpose may be obtained from any stationers. The drum is enclosed in the same way, but the covering paper should be cut in a strip measuring 12½" × 4½" and pierced with slots spaced 1½" apart (from centre to centre) so that they fall exactly between the upright 5½" Strips. The slots should measure 1½" × ¼".

The type of drawing suitable for use in this model is shown in Fig. 3.54A, and the dimensions indicated therein should be followed carefully. No doubt Meccano boys will be able to devise numerous amusing pictures of a similar kind for themselves. The strip of stout white paper carrying the sketches is inserted in the bottom of the drum, as indicated at 13. The model is now ready for operation. Placing the frame 10 over the eyes, the line of vision is directed through the narrow end, where the Strips are held apart by means of Double Brackets, and through the slots in the drum. The latter should be rotated rapidly by operating the handle 4, and as it revolves, the little dog shown in Fig. 3.54A will be seen jumping over the fence with a most realistic and amusing action.

Parts required:

1	of No.	1	1	of No.	15A	12	of No.	38
17	„ „	2	2	„ „	16	1	„ „	40
6	„ „	3	1	„ „	19S	1	„ „	45
1	„ „	4	1	„ „	21	1	„ „	46
3	„ „	5	2	„ „	22	1	„ „	48A
4	„ „	8	1	„ „	24	2	„ „	52
2	„ „	11	1	„ „	26	3	„ „	53
12	„ „	12	1	„ „	27A	4	„ „	59
2	„ „	12A	60	„ „	37	2	„ „	62

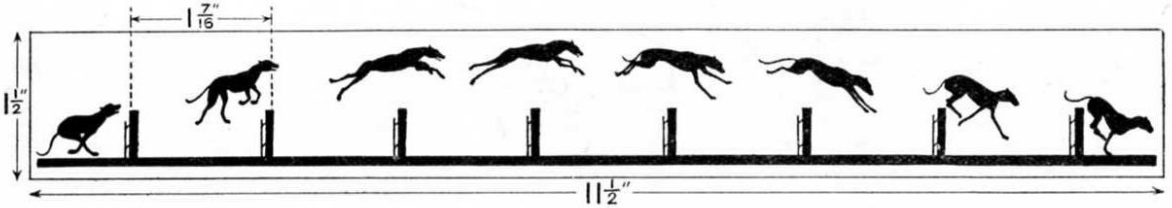
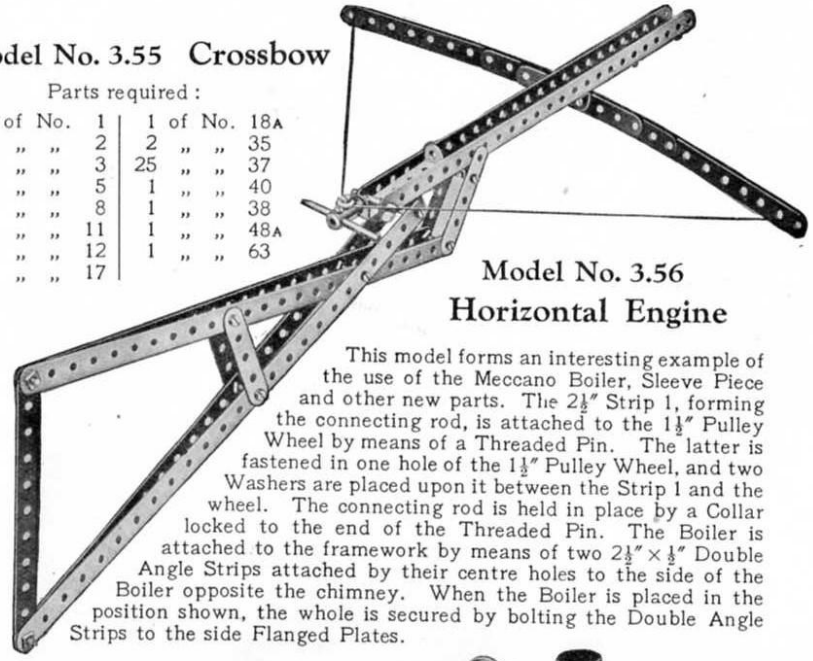


FIG. 3.54A

Model No. 3.55 Crossbow

Parts required :

5	of No.	1	1	of No.	18A
2	„ „	2	2	„ „	35
1	„ „	3	25	„ „	37
4	„ „	5	1	„ „	40
2	„ „	8	1	„ „	38
2	„ „	11	1	„ „	48A
1	„ „	12	1	„ „	63
1	„ „	17			

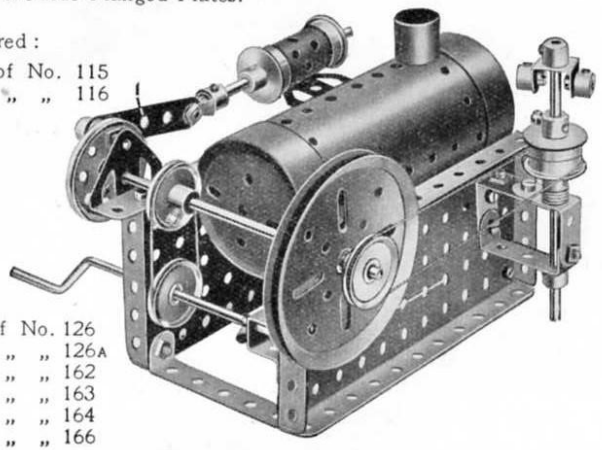


Model No. 3.56 Horizontal Engine

This model forms an interesting example of the use of the Meccano Boiler, Sleeve Piece and other new parts. The 2½" Strip 1, forming the connecting rod, is attached to the 1½" Pulley Wheel by means of a Threaded Pin. The latter is fastened in one hole of the 1½" Pulley Wheel, and two Washers are placed upon it between the Strip 1 and the wheel. The connecting rod is held in place by a Collar locked to the end of the Threaded Pin. The Boiler is attached to the framework by means of two 2½" × ½" Double Angle Strips attached by their centre holes to the side of the Boiler opposite the chimney. When the Boiler is placed in the position shown, the whole is secured by bolting the Double Angle Strips to the side Flanged Plates.

Parts required :

1	of No.	5	1	of No.	115
2	„ „	12A	1	„ „	116
2	„ „	15A			
1	„ „	16			
1	„ „	19B			
1	„ „	19S			
4	„ „	20B			
1	„ „	21			
3	„ „	22			
1	„ „	35			
25	„ „	37			
7	„ „	38			
1	„ „	40	2	of No.	126
1	„ „	45	1	„ „	126A
1	„ „	48	1	„ „	162
4	„ „	48A	1	„ „	163
2	„ „	52	1	„ „	164
4	„ „	59	1	„ „	166

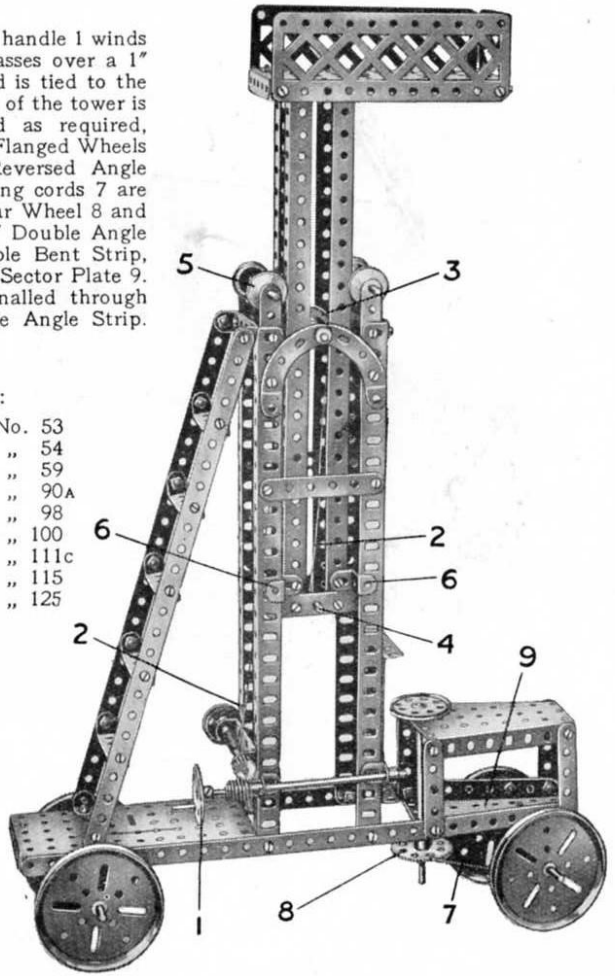


Model No. 3.57 Tower Wagon

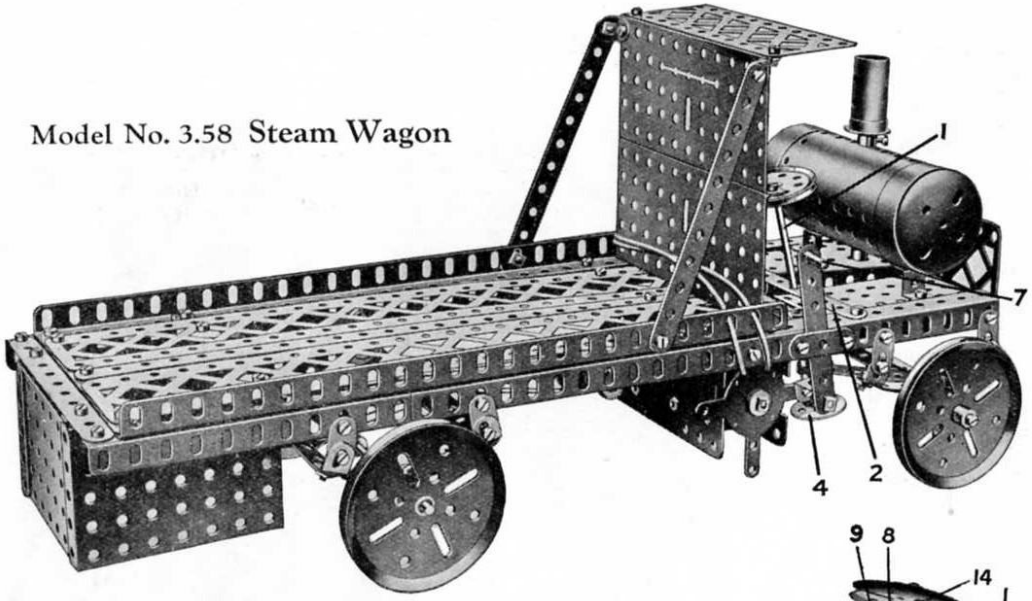
When operated the handle 1 winds in the cord 2, which passes over a 1" fast Pulley Wheel 3 and is tied to the Rod 4. The upper part of the tower is thus raised or lowered as required, being guided by the ¾" Flanged Wheels 5 and two pairs of Reversed Angle Brackets 6. The steering cords 7 are tied to the 57-teeth Gear Wheel 8 and to the end of a 2½" × ½" Double Angle Strip bolted to a Double Bent Strip, which is pivoted to the Sector Plate 9. The front axle is journalled through the ends of the Double Angle Strip.

Parts required :

4	of No.	1	1	of No.	53
2	„ „	4	2	„ „	54
6	„ „	5	3	„ „	59
2	„ „	6A	4	„ „	90A
8	„ „	8	1	„ „	98
8	„ „	12	2	„ „	100
1	„ „	15	1	„ „	111c
3	„ „	15A	1	„ „	115
4	„ „	16	4	„ „	125
1	„ „	17			
4	„ „	19B			
4	„ „	20B			
1	„ „	21			
2	„ „	22			
1	„ „	24			
1	„ „	26			
1	„ „	27A			
1	„ „	32			
3	„ „	35			
84	„ „	37			
2	„ „	37A			
1	„ „	40			
1	„ „	45			
8	„ „	48A			
2	„ „	52			



Model No. 3.58 Steam Wagon



Parts required :

14	of No.	2	4	of No.	19B	2	of No.	54
6	„ „	3	3	„ „	20B	4	„ „	59
6	„ „	5	1	„ „	21	2	„ „	62
2	„ „	6A	4	„ „	22	1	„ „	63
6	„ „	8	1	„ „	23	2	„ „	99
8	„ „	10	1	„ „	24	2	„ „	100
3	„ „	11	1	„ „	26	2	„ „	111
10	„ „	12	79	„ „	37	1	„ „	115
2	„ „	12A	10	„ „	38	4	„ „	125
1	„ „	15	2	„ „	48B	1	„ „	147B
3	„ „	16	2	„ „	52	1	„ „	162
2	„ „	18A	3	„ „	53	1	„ „	163

Electric Motor

The No. E1 Motor included in the No. 3M Outfit will drive this model satisfactorily, although the motor shown in the illustration is the No. E4.

The steering column 1 is journalled in bearings consisting of a 5½" Strip 2 and two 2½" Strips 3 (Fig. 3.58A), and carries the Bush Wheel 4, which is secured rigidly to it. A ¾" Flanged Wheel 5 supports the weight of the steering column 1. The stub axles of the front road wheels consist of ¾" Bolts, on which the road wheels are spaced by Washers 14. These Bolts serve in the place of set screws to secure two collars to the 1" Rods 8. A pair of Cranks 9, 9a secured to the Rods 8 are joined by two 5½" Strips 15 overlapped eight holes. A 1½" Strip 10, bolted to the face of the Bush Wheel 4, is connected pivotally by a composite 4½" Strip 11 (a 3½" Strip and a 2½" Strip overlapped three holes) to the end of the Crank 9. When the steering wheel is turned, the Strip 11 moves the Cranks 9 9a, thereby deflecting the front road wheels.

The electric motor 6 is controlled by raising and depressing the handle 7. Duplicate drive transmission belts 12 and 13 are used in order to secure a more dependable drive to the rear axle.

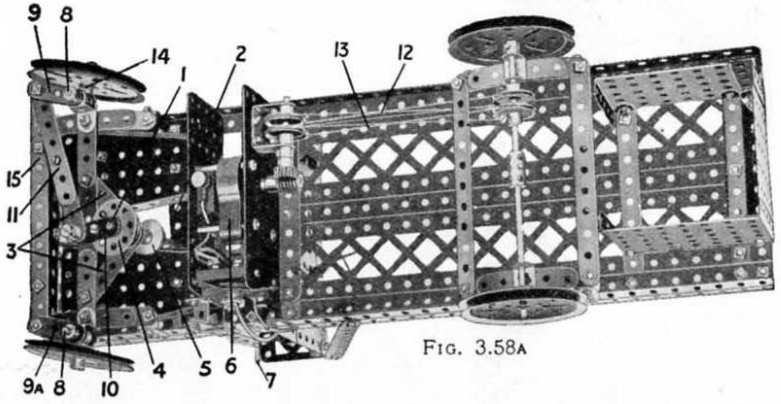


FIG. 3.58A

HOW TO CONTINUE

This completes our examples of models that may be made with Outfits No. 3 (or No. 2 and No. 2A) or No. 3M. The next models are a little more advanced, requiring extra parts to construct them. The necessary parts are all contained in a No. 3A Accessory Outfit, the price of which may be obtained from any Meccano dealer.

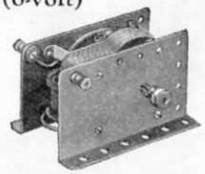
MECCANO

MOTORS AND ACCESSORIES

In order to obtain the fullest possible enjoyment from the Meccano hobby the models should be operated with a Meccano power unit. The side plates and bases are pierced with the standard Meccano equidistant holes, which enable the motors or the steam engine to be built into any Meccano model in the position that is most suitable.

MECCANO ELECTRIC MOTOR

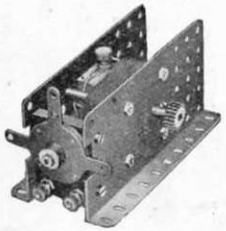
No. E. 1 (6-volt)



This is a highly efficient electric motor (non-reversing) that will give excellent service. A 6-volt Accumulator will operate it, but it may also be driven from the mains (alternating current only) through the Transformer described on this page.

MECCANO ELECTRIC MOTOR

No. E. 6 (6-volt)



This powerful and reliable 6-volt Motor may be run from a 6-volt accumulator or by employing the Transformer described on this page, from the mains. It is fitted with a control mechanism that enables the motor to be started, stopped or reversed as desired.

NOTE.—The above Electric Motors will not run satisactorily from dry cells.

MECCANO ACCUMULATOR

The Meccano Accumulator (6-volt, 20 amps.), is of substantial construction and is specially recommended for running the Meccano 6-volt Electric Motors.

MECCANO RESISTANCE CONTROLLER

By employing this variable resistance the speed of the Meccano 6-volt Electric Motors may be regulated as desired.

MECCANO 20-volt ELECTRIC MOTORS

No. 20a—Non-Reversing

No. 20b—Reversing

These motors are similar in design to the No. E. 6 Motor. They are intended to be run from the mains through a 20-volt Meccano Transformer.

MECCANO STEAM ENGINE

Strong - Powerful

Safe - Reversing

On actual test this powerful steam unit has lifted over 56 lbs. Operation of the reversing lever enables the crankshaft, which is fitted with a special compensating flywheel, to run in either direction. The spirit container for the lamp is placed well outside the boiler-casing, eliminating all risk of the spirit becoming heated. There is no danger whatever of the boiler exploding.

TRANSFORMER

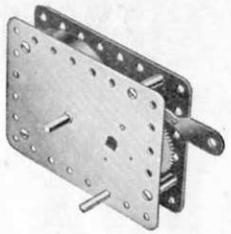
By means of this transformer the Meccano 6-volt Electric Motors may be driven from the main supply (alternating current only). It is available for all standard supply voltages, from 100 to 250 inclusive, at all standard frequencies.

MECCANO 20-volt TRANSFORMERS

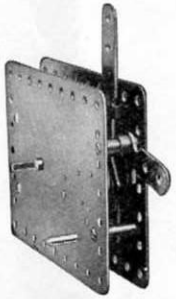
The Meccano 20-volt Transformers have been specially made for use with the Meccano 20-volt Motors. They can be obtained with either 20 watts or 35 watts output, 50 to 60 cycles only.

MECCANO CLOCKWORK MOTOR No. 1

(Non-Reversing)



A long-running and highly efficient clockwork motor (non-reversing), fitted with a brake lever by means of which it may be stopped and started, as desired.



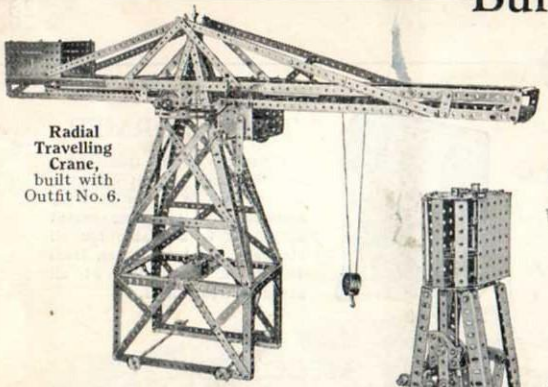
MECCANO CLOCKWORK MOTOR No. 2

(Reversing)

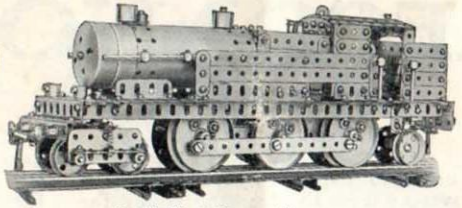
This strongly-built clockwork motor is a compact self-contained power unit. Brake and reverse levers enable the motor to be stopped, started and reversed, as required.

Ask your dealer for a Meccano price list, and keep it by you for reference.

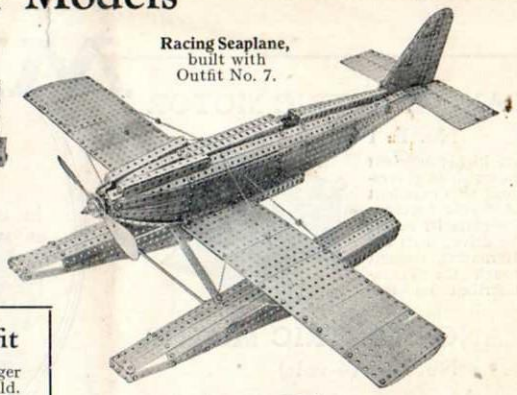
Build Bigger and Better Models



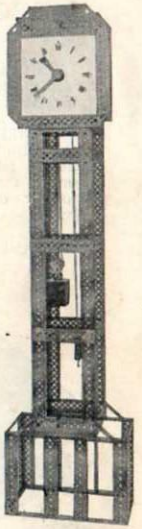
Radial Travelling Crane, built with Outfit No. 6.



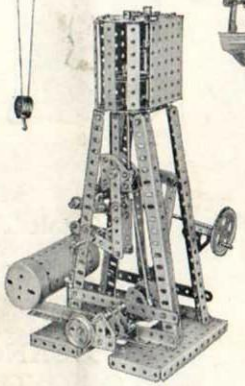
Pacific Tank Locomotive, built with Outfit No. 7.



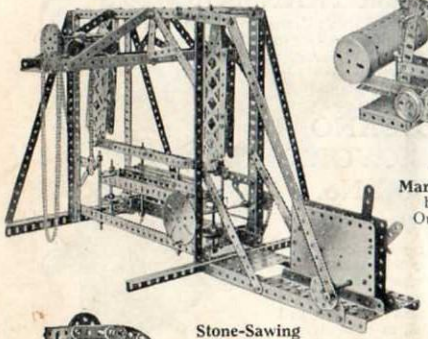
Racing Seaplane, built with Outfit No. 7.



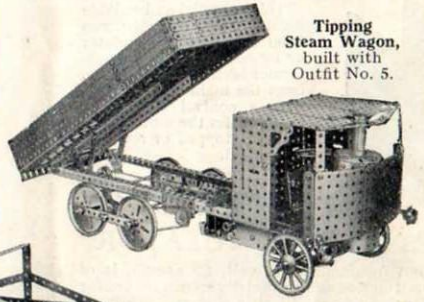
Grandfather Clock, built with Outfit No. 7.



Vertical Marine Engine, built with Outfit No. 5.



Stone-Sawing Machine, built with Outfit No. 6.



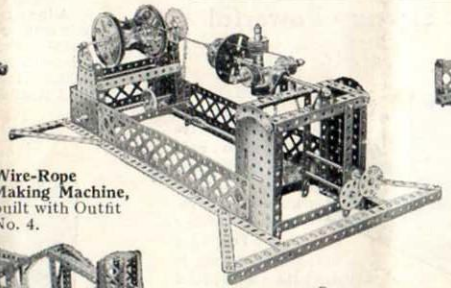
Tipping Steam Wagon, built with Outfit No. 5.

Keep Adding to your Outfit

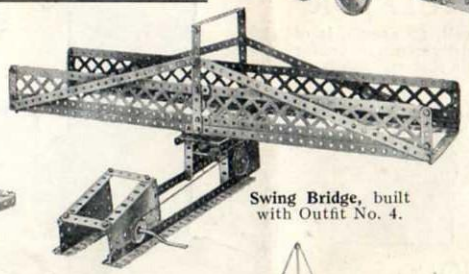
The more Meccano parts you have, the bigger and better the models you are able to build. Keen and enthusiastic model-builders keep adding to their Outfits, until they are able to build all the wonderful models shown in the Meccano Manuals.

The model-building possibilities of the Meccano System are limitless. All the fine models illustrated on this page are examples of the types you will be able to build as your Outfit develops.

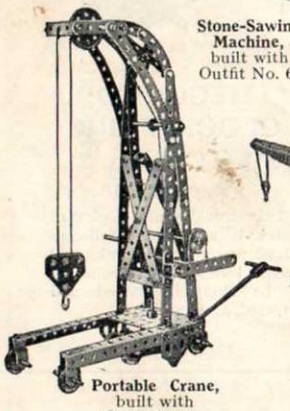
You can purchase separate Meccano parts as you require them, or, if you prefer, you can purchase Accessory Outfits that connect all the main Outfits.



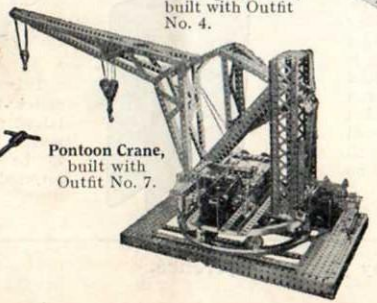
Wire-Rope Making Machine, built with Outfit No. 4.



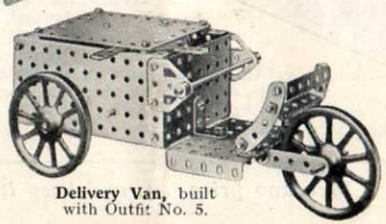
Swing Bridge, built with Outfit No. 4.



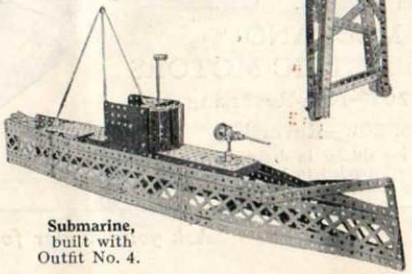
Portable Crane, built with Outfit No. 6.



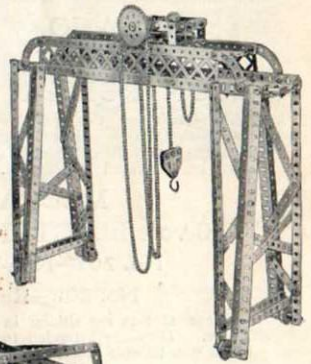
Pontoon Crane, built with Outfit No. 7.



Delivery Van, built with Outfit No. 5.



Submarine, built with Outfit No. 4.



Gantry Crane, built with Outfit No. 5.

Ask your dealer for complete illustrated price lists of Meccano Parts and Accessory Outfits and keep these by you for reference.