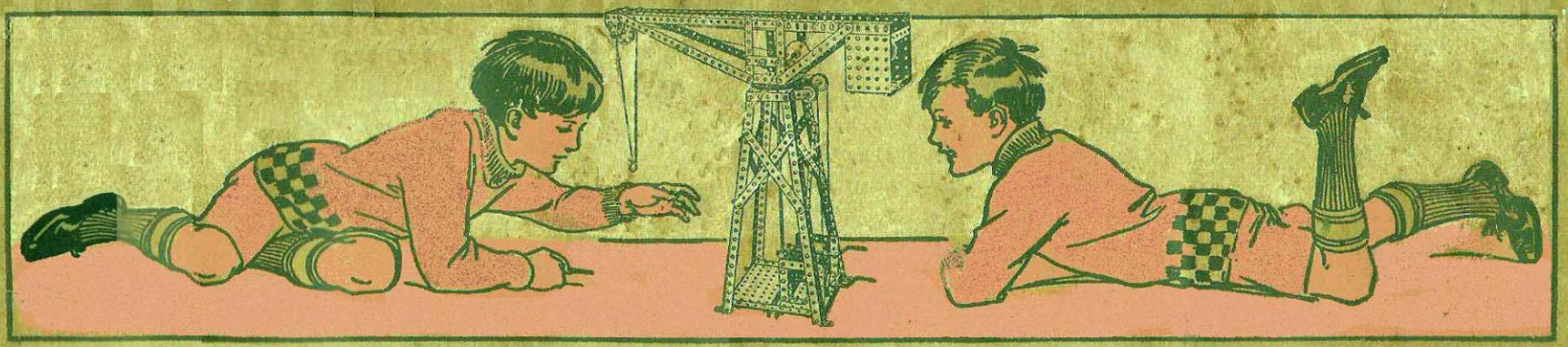


MECCANO

(TRADE MARK 296321)

INSTRUCTIONS

BOOK No. 1

3/6

No. 24

OVERSEAS EDITION

724/2.5

A TALK WITH NEW MECCANO BOYS

MECCANO OUTFITS contain accurately-made and highly-finished engineering parts with which every movement known to mechanism may be reproduced in model form. With Meccano you can accomplish more than with any other constructional toy, for no other system has its possibilities. No study is needed to enable you to build models with Meccano—the genius is in the Meccano parts.

You never come to the end of Meccano fun. There is always more ahead—always some new, ingenious and interesting model to build. Each one, as it is completed, " tuned up," and set going, brings a joy and satisfaction beyond anything that you have ever previously experienced.

As you progress in Meccano you obtain a greater variety of parts, Gear-Wheels, Pulley-Wheels, Worm-Wheels, Couplings, Cranks, and all manner of perfectly-made real engineering parts. These enable you to construct complicated mechanical movements without any difficulty. The most wonderful feature of Meccano is that it is *real engineering ;* it is fascinating and delightful and yet so simple that even an inexperienced boy may join in the fun without first having to study or learn anything.

THE LIFE OF A MECCANO BOY

A MECCANO boy is the happiest boy in the world. He builds models from the Meccano Instruction books ; invents new models ; joins the Meccano Guild and a Meccano Club and by wearing the Guild badge proclaims himself to be the friend of millions of other Meccano boys all over the world. He reads the *Meccano Magazine* regularly and corresponds with his friend the Editor when he feels like it. Time never hangs heavily on his hands and he is too busy and happy to grumble.

The *Meccano Magazine* is the Meccano boy's newspaper. It tells him of the latest Meccano models ; what Meccano Clubs are doing ; how to correspond with other Meccano boys ; the Competitions that are running, etc. It contains interesting articles on engineering and electrical subjects, and deals with many other topics of interest to boys, including suggestions from Meccano boys for new Meccano parts and correspondence columns in which the Editor replies to his readers' enquiries. Write to the Editor, *Meccano Magazine*, Binns Road, Liverpool, England, and he will send you a copy FREE. It is sent regularly to subscribers at the rate of 2/- for six issues, or it may be purchased from any Meccano dealer, price 3d. per copy.

THE MECCANO GUILD

MECCANO GUILD CLUB CERTIFICATE.

THE MECCANO GUILD is an organisation for boys, started at the request of boys and conducted as far as possible by boys. The Guild is a great fraternal organisation of which all Meccano boys should become members, for its primary object is to bring them together. The Guild makes these boys feel that they are all members of a great brotherhood, each trying to help the others to get the very best out of life and it cannot fail to have a profound effect for good on the lives of its members.

MECCANO CLUBS

MECCANO CLUBS are founded and established under the guidance of the Guild Secretary at Headquarters and at the present time there are active Clubs in over one hundred towns and villages in the United Kingdom and in many countries Overseas. Each Club has its Leader, Secretary, Treasurer, and other officials all of whom, with the exception of the Leader, are boys. Write for information how to form a club, if there is no club near you.

SPECIAL MERIT MEDALLIONS.

Special awards are given to Club members for good work in connection with their Club and medallions are awarded in connection with the Recruiting Campaign, full particulars of which will be sent on request.

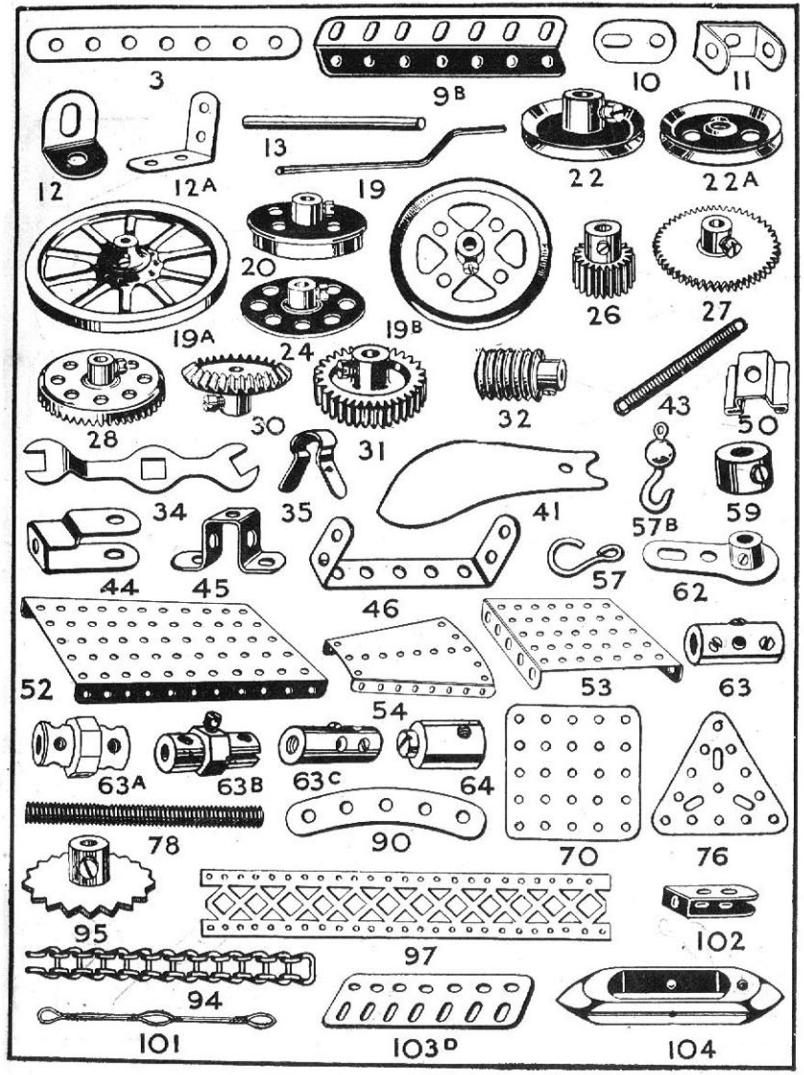
HOW TO BUILD WITH MECCANO

FOLLOW the instructions closely at first, and build the models just as you see them. Then take each model and try to improve our design. Every model can be made in a dozen different ways. Screw up all the nuts and bolts firmly and you will find that you can play with the trucks, cranes, signals, etc., and obtain many hours of fun.

RECRUITING MEDALLION.

Meccano is sold in nine different Outfits, numbered 00 to 7. All parts are of the same high quality and finish, the larger Outfits containing a greater quantity and variety.

Each Outfit may be converted into the one next higher by the purchase of an Accessory Outfit. Thus, a No. 2 may be converted into a No. 3 by adding to it a No. 2A. A No. 3A would then convert it into a No. 4, and so on. In this way, no matter with which Outfit you commence, you may by degrees build up your Outfit to a No. 7.



Particulars and Prices of Meccano Parts

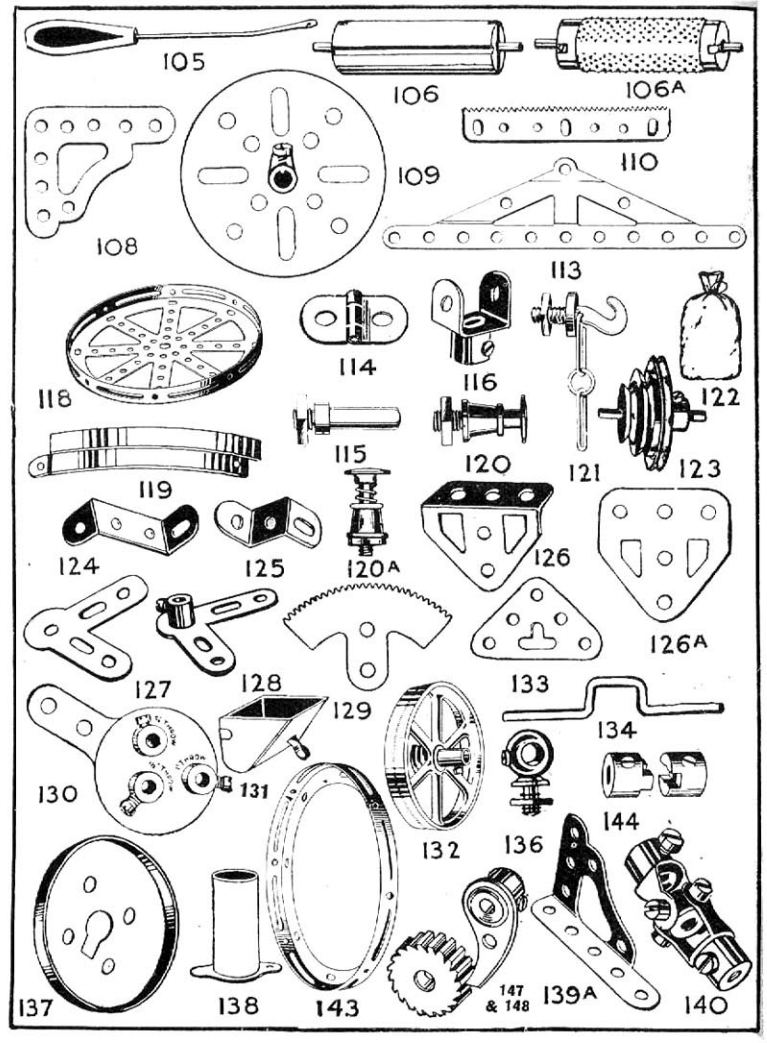
No.		s.	d.
1.	Perforated Strips, 12½″ long ... .. ½ doz.	1	6
1a.	„ „ 9½″ „	1	3
1b.	„ „ 7½″ „	1	0
2.	„ „ 5½″ „	0	9
2a.	„ „ 4½″ „	0	8
3.	„ „ 3½″ „	0	6
4.	„ „ 3″ „ ... ... „	0	5
5.	„ „ 2½″ „ ... ... „	0	5
6.	„ „ 2″ „ ... ... „	0	5
6a.	„ „ 1½″ „ ... ... „	0	5
7.	Angle Girders, 24½″ long ... ... each	1	0
7a.	„ „ 18½″ „ ... ... „	0	9
8.	„ „ 12½″ „ ... ... ½ doz.	2	9
8a.	„ „ 9½″ „ ... ... „	2	0
8b.	„ „ 7½″ „ ... ... „	1	9
9.	„ „ 5½″ „ ... ... „	1	6
9a.	„ „ 4½″ „ ... ... „	1	3
9b.	„ „ 3½″ „ ... ... „	1	0
9c.	„ „ 3″ „ ... ... „	1	0
9d.	„ „ 2½″ „ ... ... „	1	0
9e.	„ „ 2″ „ ... ... „	0	9
9f.	„ „ 1½″ „ ... ... „	0	9
10.	Flat Brackets ... ... „	0	3
11.	Double Brackets ... ... each	0	1½
12.	Angle Brackets, ½″×½″ ... ... doz.	0	9
12a.	„ „ 1″×1″ ... ... each	0	1½
12b.	„ „ 1″×½″ ... ... „	0	1½
13.	Axle Rods, 11½″ long ... ... „	0	5
13a.	„ „ 8″ „ ... ... „	0	5
14.	„ „ 6½″ „ ... ... „	0	3
15.	„ „ 5″ „ ... ... „	0	3
15a.	„ „ 4½″ „ ... ... „	0	2
16.	„ „ 3½″ „ ... ... „	0	2
16a.	„ „ 2½″ „ ... ... „	0	2
16b.	„ „ 3″ „ ... ... „	0	2
17.	„ „ 2″ „ ... ... „	0	2
18a.	„ „ 1½″ „ ... ... „	0	2
18b.	„ „ 1″ „ ... ... „	0	1½
19.	Crank Handles... ... ... „	0	5
19a.	Wheels, 3″ diam., with set screws „	1	0
20.	Flanged Wheels ... ... „	0	9
	Pulley Wheels.		
19b.	3″ dia. with centre boss and set screw „	1	0
19c.	6″ „ „ „ „ „ „	3	9
20a.	2″ „ „ „ „ „ „	0	9
21.	1½″ „ „ „ „ „ „	0	9
22.	1″ „ „ „ „ „ „	0	6
23a.	½″ „ „ „ „ „ „	0	6
22a.	1″ „ without „ „ „ „	0	3
23.	½″ „ „ „ „ „ „	0	3

No.		s.	d.
24.	Bush Wheels ... ... each	0	9
25.	Pinion Wheels, ¾″ diam. ... ... „	0	9
26.	„ „ ½″ „ ... ... „	0	6
	Gear Wheels.		
27.	50 teeth to gear with ¾″ pinion ... „	1	3
27a.	57 „ „ „ ½″ „ ... „	1	3
27b.	133 „ „ „ ½″ (3½″ diam.) „	2	3
28.	Contrate Wheels, 1½″ diam. ... „	1	3
29.	„ „ ¾″ „ ... „	0	9
30.	Bevel Gears ... ... „	1	3
31.	Gear Wheels, 1″, 38 teeth ... „	1	6
32.	Worm Wheels ... ... „	0	9
33.	Pawls (complete) ... ... „	0	6
33a.	Pivot Bolts with Nuts ... ... „	0	3
34.	Spanners ... ... „	0	3
34b.	Box Spanners ... ... „	0	5
35.	Spring Clips ... ... per box (doz.)	0	5
36.	Screw Drivers ... ... each	0	5
36a.	„ „ Extra Long... ... „	0	9
37.	Nuts and Bolts ... ... per box (doz.)	0	9
37a.	Nuts ... ... „ „	0	5
37b.	Bolts ... ... „ „	0	5
38.	Washers ... ... „	0	2
40.	Hanks of Cord ... ... each	0	3
41.	Propeller Blades ... ... per pair	0	6
43.	Springs ... ... each	0	3
44.	Cranked Bent Strips ... ... „	0	2
45.	Double Bent Strips ... ... „	0	2
46.	Double Angle Strips, 2½″×1″ ... ½ doz.	0	9
47.	„ „ „ 2½″×1½″ ... „	1	3
47a.	„ „ „ 3″ ×1½″ ... „	1	6
48.	„ „ „ 1½″×½″ ... „	0	6
48a.	„ „ „ 2½″×½″ ... „	0	8
48b.	„ „ „ 3½″×½″ ... „	0	9
48c.	„ „ „ 4½″×½″ ... „	1	3
48d.	„ „ „ 5½″×½″ ... „	1	3
50.	Eye Pieces ... ... each	0	3
52.	Perforated Flanged Plates, 5½″×2½″ „	0	8
52a.	Flat Plates, 5½″×3½″ ... ... „	0	8
53.	Perforated Flanged Plates, 3½″×2½″ „	0	5
53a.	Flat Plates, 4½″×2½″ ... ... „	0	5
54.	Perforated Flanged Sector Plates... „	0	5
55.	Perforated Strips, slotted, 5½″ long „	0	3
55a.	„ „ „ 2″ „ „	0	2
56.	Instruction Manuals, Complete ... „	3	6
56a.	„ „ No. 0-3 ... „	1	6
56b.	„ „ No. 0 ... ... „	0	6
57.	Hooks ... ... „	0	2
57a.	„ (scientific) ... ... „	0	2
57b.	„ Loaded ... ... „	0	8
58.	Spring Cord ... ... per length	1	3

Particulars and Prices of Meccano Parts (*continued*)

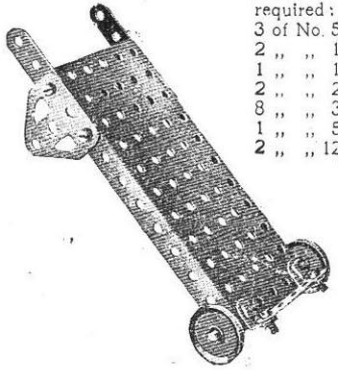
No.			s.	d.
59.	Collars with Set Screws	each	0	3
61.	Windmill Sails	„	0	3
62.	Cranks	„	0	5
62a.	Threaded Cranks	„	0	6
63.	Couplings	„	0	9
63a.	Octagonal Couplings	„	1	0
63b.	Strip Couplings	„	1	0
63c.	Threaded Couplings	„	0	9
64.	Threaded Bosses	„	0	3
65.	Centre Forks	„	0	3
66.	Weights, 50 gramme	„	1	6
67.	„ 25 „	„	1	6
68.	Woodscrews, ½″	doz.	0	5
69.	Set Screws	„	0	6
69a.	Grub Screws, 5/32″	„	0	6
69b.	„ „ 7/32″	„	0	9
70.	Flat Plates, 5½″×2½″	each	0	5
72.	„ „ 2½″×2½″	„	0	3
76.	Triangular Plates, 2½″	„	0	3
77.	„ „ 1″	„	0	2
78.	Screwed Rods, 11½″	„	0	9
79.	„ „ 8″	„	0	8
79a.	„ „ 6″	„	0	6
80.	„ „ 5″	„	0	5
80a.	„ „ 3½″	„	0	5
80b.	„ „ 4½″	„	0	5
81.	„ „ 2″	„	0	3
82.	„ „ 1″	„	0	2
89.	Curved Strips, 5½″	„	0	3
90.	„ „ 2½″	„	0	2
94.	Sprocket Chain	per length	0	9
95.	Sprocket Wheels, 2″ diam.	each	0	8
95a.	„ „ 1½″ „	„	0	6
95b.	„ „ 3″ „	„	0	9
96.	„ „ 1″ „	„	0	5
96a.	„ „ ¾″ „	„	0	5
97.	Braced Girders, 3½″ long	½ doz.	1	3
98.	„ „ 2½″ „	„	0	9
99.	„ „ 12½″ „	„	2	9
99a.	„ „ 9½″ „	„	2	6
100.	„ „ 5½″ „	„	1	6
101.	Healds, for looms	doz.	1	3
102.	Single Bent Strips	each	0	2
103.	Flat Girders, 5½″ long	½ doz.	1	6
103a.	„ „ 9½″ „	„	2	3
103b.	„ „ 12½″ „	„	3	0
103c.	„ „ 4½″ „	„	1	3
103d.	„ „ 3½″ „	„	1	0
103e.	„ „ 3″ „	„	0	9
103f.	Flat Girders, 2½″ long	½ doz.	0	8
103g.	„ „ 2″ „	„	0	6
103h.	„ „ 1½″ „	„	0	5
103k.	„ „ 7½″ „	„	2	0
104.	Shuttles, for looms	each	6	0
105.	Reed Hooks, for looms	„	0	6
106.	Wood Rollers	„	2	0
106a.	Sand Rollers	„	2	3
107.	Tables for Designing Machines	„	1	6
108.	Architraves	„	0	3
109.	Face Plates, 2½″ diam.	„	0	6
110.	Rack Strips, 3½″	„	0	3
111.	Bolts, ¾″	„	0	1½
111a.	„ ½″	2 for	0	1½
111b.	„ 7/32″	doz.	0	6
113.	Girder Frames	each	0	3
114.	Hinges	per pair	0	6
115.	Threaded Pins	each	0	3
116.	Fork Pieces	„	0	5
117.	Steel Balls, ⅜″ diam.	doz.	0	9
118.	Hub Discs, 5½″ diam.	each	1	9
119.	Channel Segments (8 to circle, 11½″ diam.)	„	0	6
120.	Buffers	„	0	3
120a.	Spring Buffers	per pair	1	0
121.	Train Couplings	each	0	6
122.	Miniature Loaded Sacks	„	0	3
123.	Cone Pulleys	„	2	0
124.	Reversed Angle Brackets, 1″	½ doz.	1	3
125.	„ „ ½″	„	0	9
126.	Trunnions	each	0	4
126a.	Flat Trunnions	„	0	3
127.	Simple Bell Cranks	„	0	4
128.	Boss Bell Cranks	„	0	6
129.	Rack Segments, 3″ diam.	„	0	9
130.	Triple Throw Eccentrics	„	2	0
131.	Dredger Buckets	„	0	3
132.	Flywheels, 2⅜″ diam.	„	3	6
133.	Corner Brackets	„	0	5
134.	Crank Shafts, 1″ stroke	„	0	5
135.	Theodolite Protractors	„	0	4
136.	Handrail Supports	„	0	5
137.	Wheel Flanges, 2″ diam.	„	0	6
138.	Ship's Funnels	„	0	6
139.	Flanged Brackets (right)	„	0	3
139a.	„ „ (left)	„	0	3
140.	Universal Couplings	„	1	3
141.	Wire Lines (for suspending clock weights)	„	1	0
142.	Rubber Rings	„	0	6
143.	Circular Girders, 5″ diam. (over all)	„	1	6
144.	Dog Clutches	„	0	9
145.	Circular Strips, 7″ diam. (over all)	„	1	6
146.	„ Plates, 6″ „	„	1	9

As new parts are frequently added to the Meccano system the foregoing list is not necessarily complete. The latest illustrated list should be obtained from your dealer, or from Meccano, Ltd., Liverpool, England.



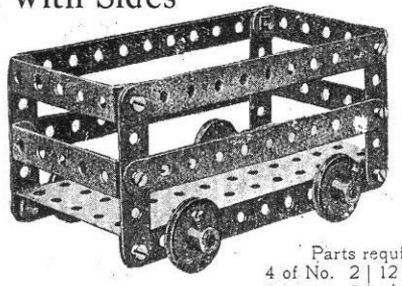
Trucks and Luggage Carts

Model No. 1
Flat Truck



Parts required :
3 of No. 5
2 ,, ,, 12
1 ,, ,, 16
2 ,, ,, 22
8 ,, ,, 37
1 ,, ,, 52
2 ,, ,, 126A

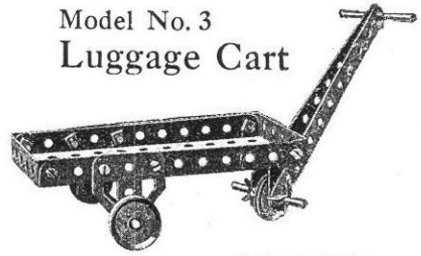
Model No. 2
Truck with Sides



Parts required :

4 of No. 2	12 of No. 37
4 ,, ,, 5	4 ,, ,, 48A
2 ,, ,, 16	1 ,, ,, 52
4 ,, ,, 22	

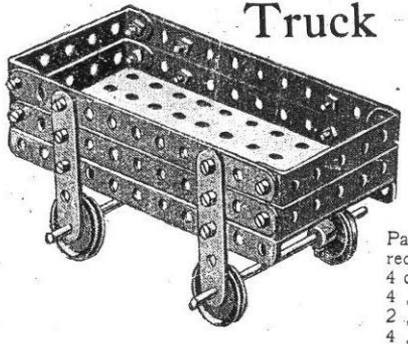
Model No. 3
Luggage Cart



Parts required :

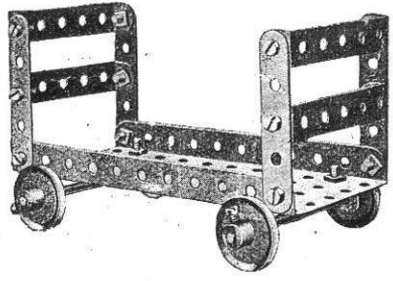
2 of No. 2	9 of No. 37
1 ,, ,, 16	1 ,, ,, 44
2 ,, ,, 17	2 ,, ,, 48A
3 ,, ,, 22	1 ,, ,, 52
4 ,, ,, 35	2 ,, ,, 126A

Model No. 4
Truck



Parts required :
4 of No. 2
4 ,, ,, 5
2 ,, ,, 16
4 ,, ,, 22
16 ,, ,, 37
4 ,, ,, 48A
1 ,, ,, 52

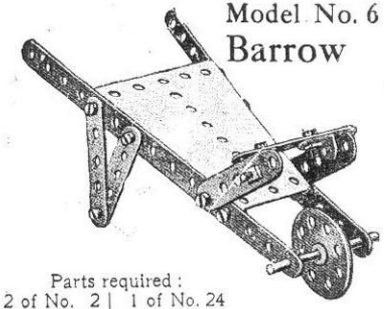
Model No. 5
Luggage Truck



Parts required :

4 of No. 5	16 of No. 37
2 ,, ,, 16	4 ,, ,, 48A
4 ,, ,, 22	1 ,, ,, 52

Model No. 6
Barrow

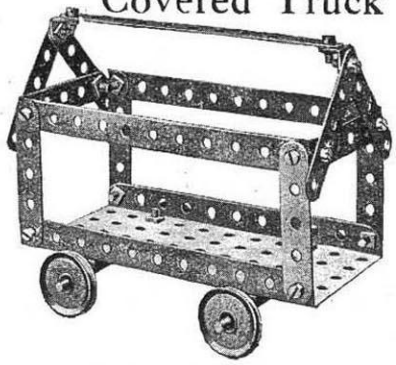


Parts required :

2 of No. 2	1 of No. 24
9 ,, ,, 5	2 ,, ,, 35
2 ,, ,, 12	14 ,, ,, 37
1 ,, ,, 17	1 ,, ,, 54

Trucks and Luggage Carts *(continued)*

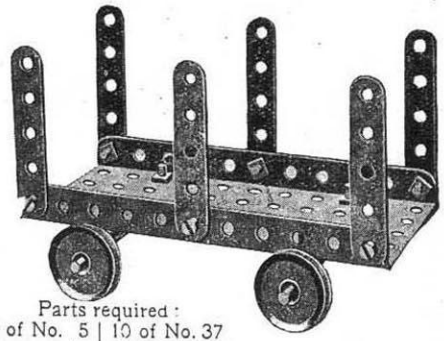
Model No. 7 Covered Truck



Parts required

3 of No. 2	2 of No. 12	4 of No. 22	
8 „ „ 5	2 „ „ 16	20 „ „ 37	
		4 „ „ 48A	
		1 „ „ 52	

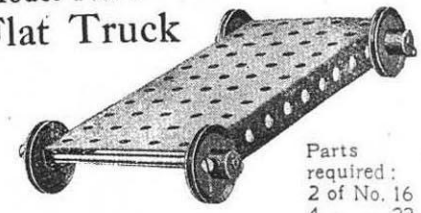
Model No. 8—Timber Truck



Parts required :

6 of No. 5	10 of No. 37	
2 „ „ 16	2 „ „ 48A	
4 „ „ 22	1 „ „ 52	

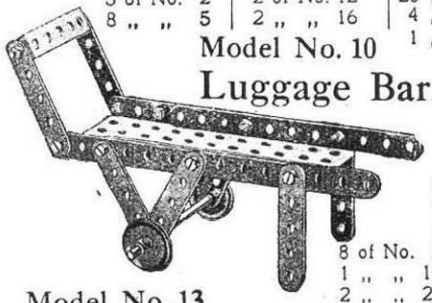
Model No. 9 Flat Truck



Parts required :

2 of No. 16
4 „ „ 22
1 „ „ 52

Model No. 10 Luggage Barrow

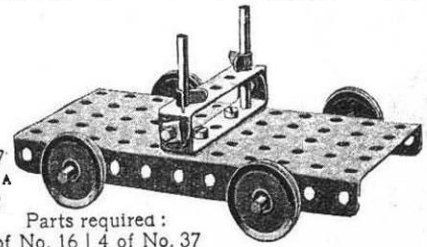


Parts required :

2 of No. 2

8 of No. 5	10 of No. 37
1 „ „ 16	1 „ „ 48A
2 „ „ 22	1 „ „ 52

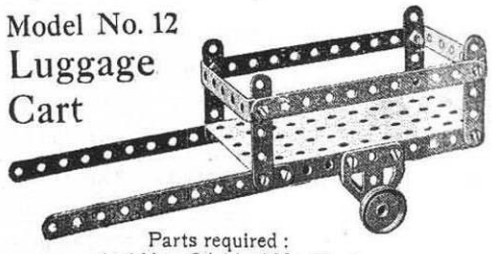
Model No. 11—Timber Truck



Parts required :

2 of No. 16	4 of No. 37
2 „ „ 17	2 „ „ 48A
4 „ „ 22	1 „ „ 52
4 „ „ 35	

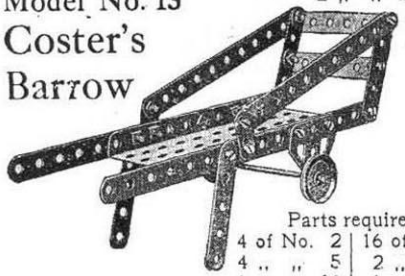
Model No. 12 Luggage Cart



Parts required :

4 of No. 2	14 of No. 37
4 „ „ 5	2 „ „ 48A
1 „ „ 16	1 „ „ 52
2 „ „ 22	2 „ „ 126A

Model No. 13 Coster's Barrow



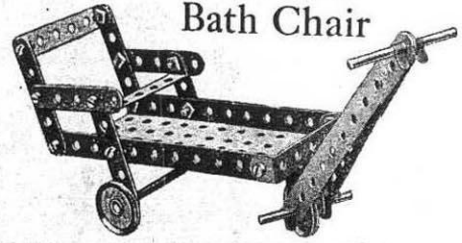
Parts required :

4 of No. 2	16 of No. 37
4 „ „ 5	2 „ „ 48A
1 „ „ 16	1 „ „ 52
2 „ „ 22	2 „ „ 126A

Model No. 14—Timber Drag

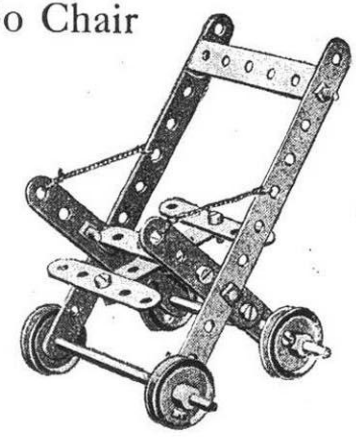
Parts required :		
	2 of No. 11	8 of No. 37
	2 „ „ 16	4 „ „ 48A
4 of No. 2	4 „ „ 22	

Model No. 15 Bath Chair



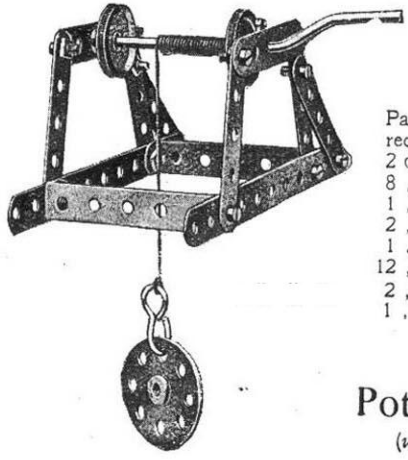
Parts required :		
	1 of No. 16	13 of No. 3
2 of No. 2	2 „ „ 17	1 „ „ 4
6 „ „ 5	3 „ „ 22	1 „ „ 5
	4 „ „ 35	3 „ „ 6

Model No. 16
Go Chair



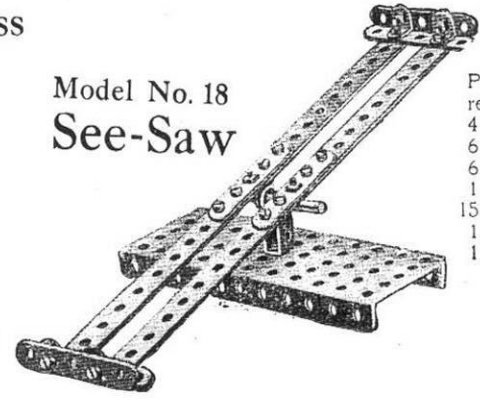
Parts required :
2 of No. 2
7 „ „ 5
2 „ „ 16
4 „ „ 22
11 „ „ 37
2 „ „ 48A

Model No. 17—Well Windlass



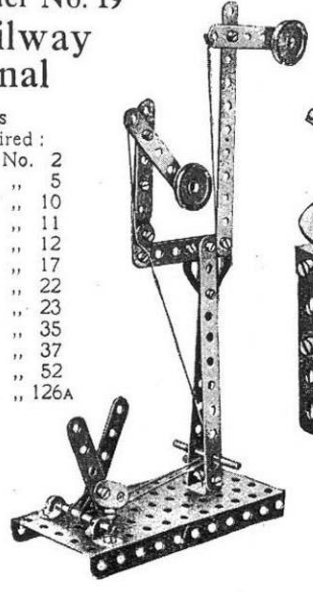
Parts required :
2 of No. 2
8 „ „ 5
1 „ „ 19
2 „ „ 22
1 „ „ 24
12 „ „ 37
2 „ „ 48A
1 „ „ 57

Model No. 18
See-Saw



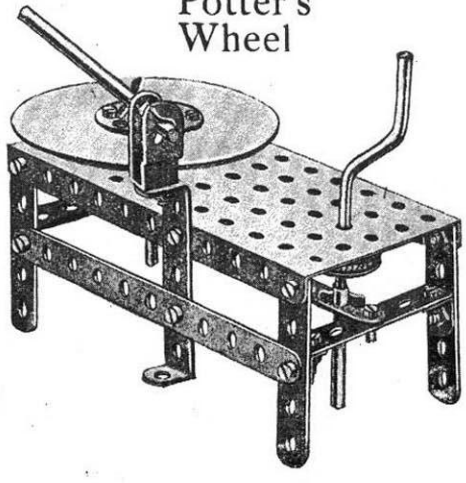
Parts required :
4 of No. 2
6 „ „ 5
6 „ „ 12
1 „ „ 17
15 „ „ 37
1 „ „ 44
1 „ „ 52

Model No. 19
Railway Signal



Parts required :
3 of No. 2
7 „ „ 5
2 „ „ 10
2 „ „ 11
2 „ „ 12
2 „ „ 17
2 „ „ 22
1 „ „ 23
4 „ „ 35
21 „ „ 37
1 „ „ 52
1 „ „ 126A

Model No. 20
Potter's Wheel



Potter's Wheel
(underneath view)

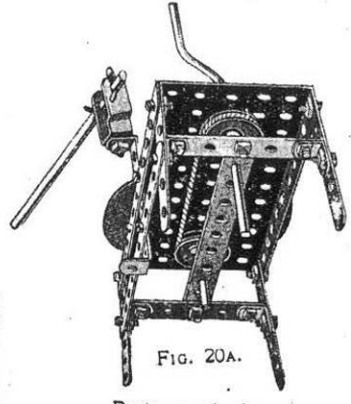
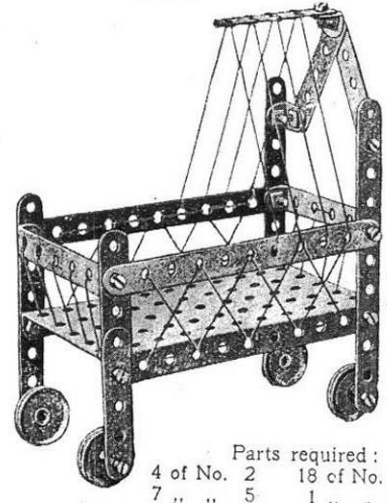


FIG. 20A.

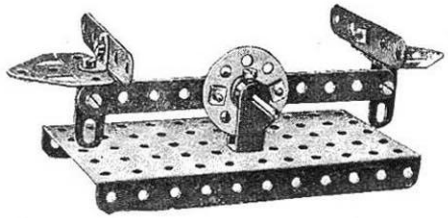
Parts required :
3 of No. 2
4 „ „ 5
1 „ „ 16
1 „ „ 19
2 „ „ 22
1 „ „ 24
2 of No. 35
17 „ „ 37
1 „ „ 44
3 „ „ 48A
1 „ „ 52

Model No. 21
Cot



Parts required :
4 of No. 2
7 „ „ 5
3 „ „ 12
4 „ „ 22
18 of No. 37
1 „ „ 52
2 „ „ 48A

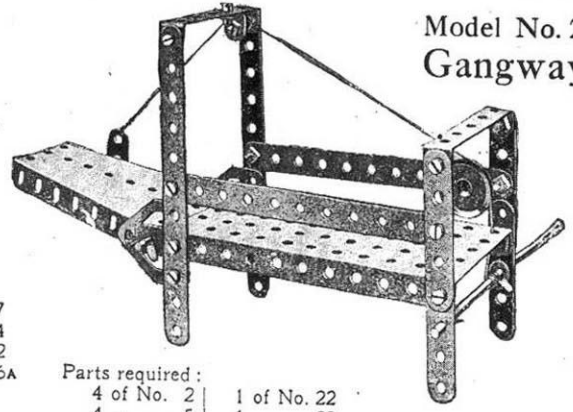
Model No. 22—Scales



Parts required :

1 of No. 2	2 of No. 12	9 „ „ 37
2 „ „ 5	1 „ „ 17	1 „ „ 44
2 „ „ 10	1 „ „ 24	2 „ „ 126A

Model No. 23 Gangway

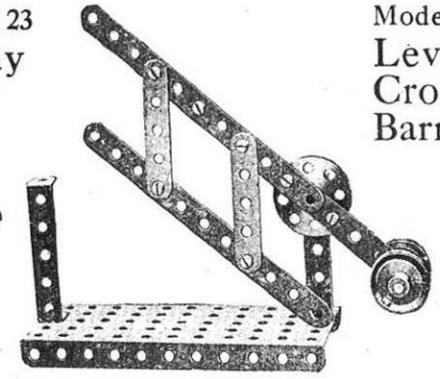


Parts required :

4 of No. 2	1 of No. 22
4 „ „ 5	1 „ „ 23
1 „ „ 10	4 „ „ 35
1 „ „ 12	18 „ „ 37
1 „ „ 16	2 „ „ 48A
1 „ „ 19	1 „ „ 52

1 of No. 54
2 „ „ 126A

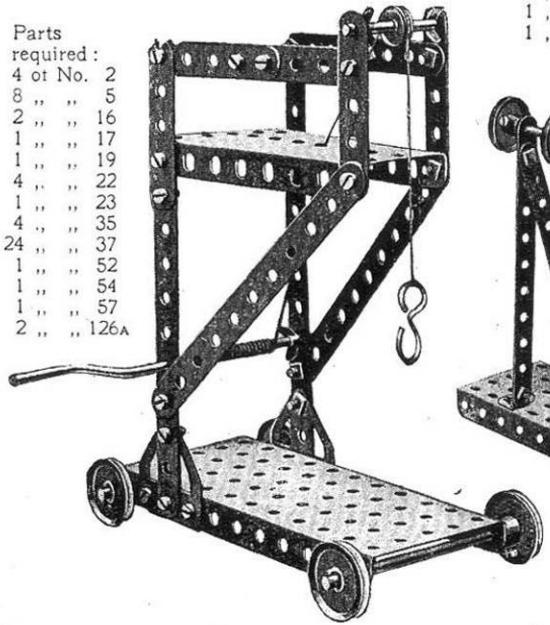
Model No. 24 Level Crossing Barrier



Parts required :

3 of No. 2
2 „ „ 5
1 „ „ 17
4 „ „ 22
1 „ „ 24
10 „ „ 37
2 „ „ 48A
1 „ „ 52

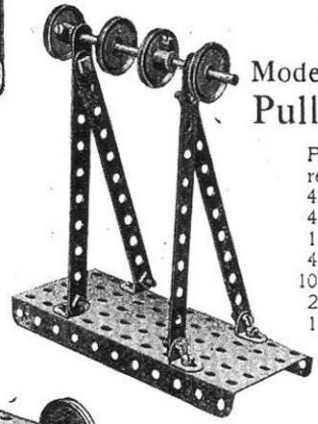
Model No. 25—Tower Wagon



Parts required :

4 of No. 2
8 „ „ 5
2 „ „ 16
1 „ „ 17
1 „ „ 19
4 „ „ 22
1 „ „ 23
4 „ „ 35
24 „ „ 37
1 „ „ 52
1 „ „ 54
1 „ „ 57
2 „ „ 126A

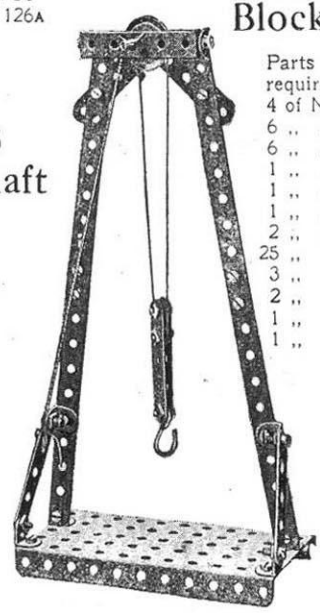
Model No. 26 Pulley Shaft



Parts required :

4 of No. 2
4 „ „ 12
1 „ „ 16
4 „ „ 22
10 „ „ 37
2 „ „ 38
1 „ „ 52

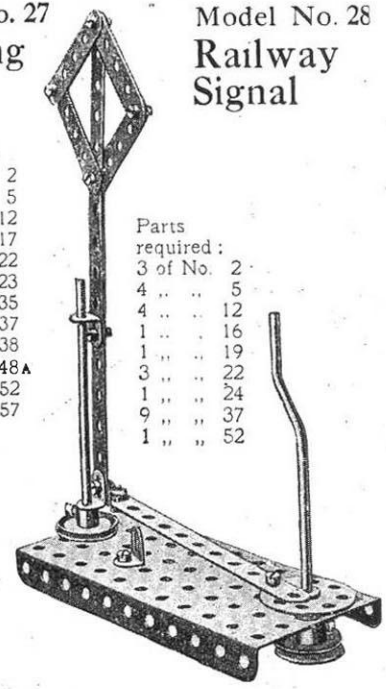
Model No. 27 Hoisting Block



Parts required :

4 of No. 2
6 „ „ 5
6 „ „ 12
1 „ „ 17
1 „ „ 22
1 „ „ 23
2 „ „ 35
25 „ „ 37
3 „ „ 38
2 „ „ 48A
1 „ „ 52
1 „ „ 57

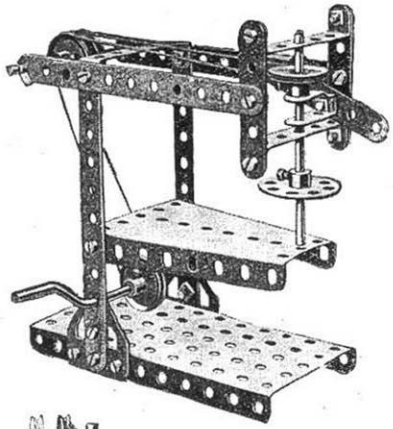
Model No. 28 Railway Signal



Parts required :

3 of No. 2
4 „ „ 5
4 „ „ 12
1 „ „ 16
1 „ „ 19
3 „ „ 22
1 „ „ 24
9 „ „ 37
1 „ „ 52

Model No. 29—Drilling Machine



Parts required :

4 of No.	2
3 ,, ,,	5
1 ,, ,,	11
2 ,, ,,	16
1 ,, ,,	19
4 ,, ,,	22
1 ,, ,,	24
4 ,, ,,	35
19 ,, ,,	37
1 ,, ,,	44
3 ,, ,,	48A
1 ,, ,,	52
1 ,, ,,	54
2 ,, ,,	126A

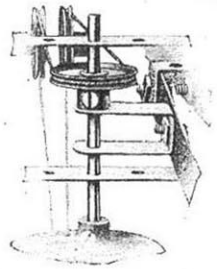


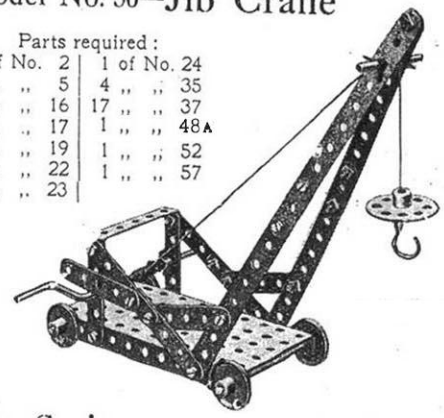
FIG. 29A

Detail of Drilling Machine.

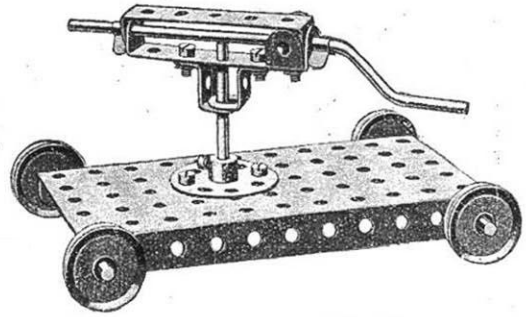
Model No. 30—Jib Crane

Parts required :

4 of No.	2	1 of No.	24
9 ,, ,,	5	4 ,, ,,	35
2 ,, ,,	16	17 ,, ,,	37
1 ,, ,,	17	1 ,, ,,	48A
1 ,, ,,	19	1 ,, ,,	52
4 ,, ,,	22	1 ,, ,,	57
1 ,, ,,	23		



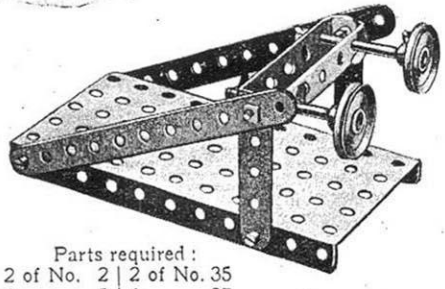
Model No. 31—Rock Drill



Parts required :

1 of No.	19	4 of No.	37
4 ,, ,,	22	2 ,, ,,	48A
1 ,, ,,	24	1 ,, ,,	52
2 ,, ,,	35	2 ,, ,,	125

Model No. 32 Buffers



Parts required :

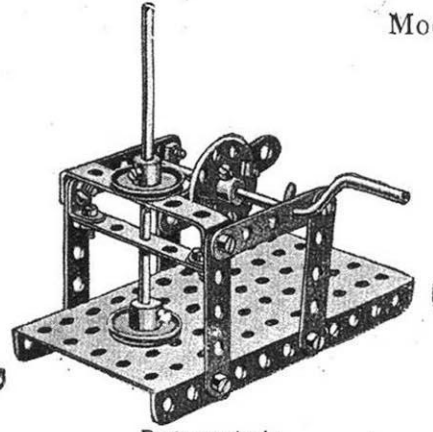
2 of No.	2	2 of No.	35
2 ,, ,,	5	6 ,, ,,	37
2 ,, ,,	17	2 ,, ,,	48A
2 ,, ,,	22	1 ,, ,,	52

Model No. 33—Swing

Parts required.

4 of No.	2	20 of No.	37
4 ,, ,,	5	1 ,, ,,	48A
6 ,, ,,	12	1 ,, ,,	52

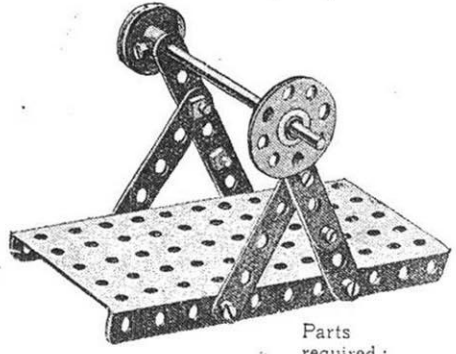
Model No. 34 Ore Crusher



Parts required :

6 of No.	5	1 of No.	24
2 ,, ,,	10	2 ,, ,,	35
1 ,, ,,	16	10 ,, ,,	37
1 ,, ,,	19	2 ,, ,,	48A
2 ,, ,,	22	1 ,, ,,	52

Model No. 35—Buffing Spindle

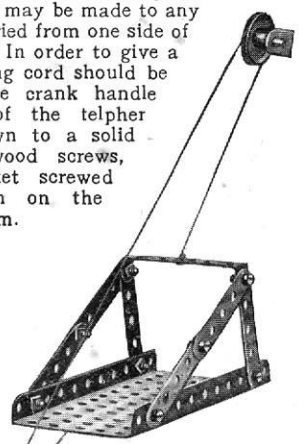


Parts required :

6 of No.	5
1 ,, ,,	16
1 ,, ,,	22
1 ,, ,,	24
8 ,, ,,	37
1 ,, ,,	52

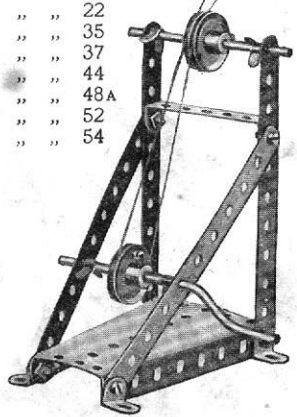
Model No. 36 Telpher Span

Many hours of enjoyment may be obtained from this model. The illustration shows exactly how it is worked. The cords may be made to any length, and the load carried from one side of the room to the other. In order to give a better grip, the operating cord should be wound twice round the crank handle pulley. The body of the telpher should be screwed down to a solid base with ordinary wood screws, and the pulley bracket screwed in a suitable position on the opposite side of the room.



Parts required :

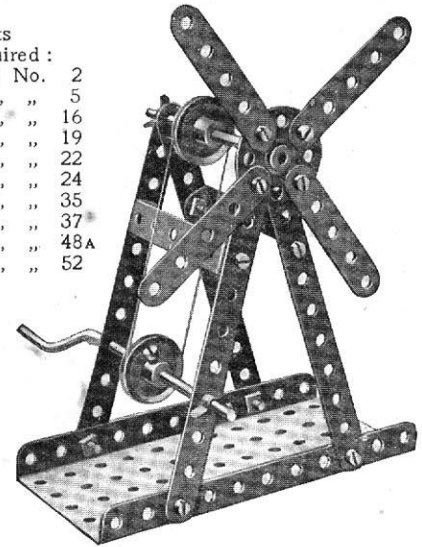
4	of No.	2
6	„ „	5
4	„ „	12
1	„ „	16
1	„ „	17
1	„ „	19
4	„ „	22
6	„ „	35
14	„ „	37
1	„ „	44
2	„ „	48A
1	„ „	52
1	„ „	54



Model No. 37 Windmill

Parts required :

4	of No.	2
4	„ „	5
1	„ „	16
1	„ „	19
2	„ „	22
1	„ „	24
4	„ „	35
12	„ „	37
2	„ „	48A
1	„ „	52

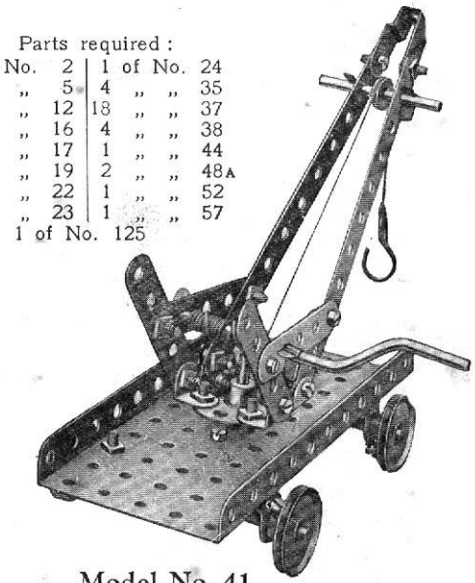


Model No. 38 Swivelling Crane

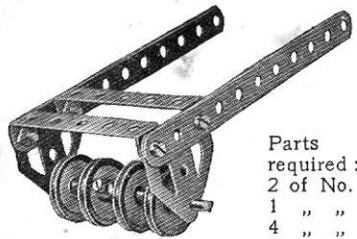
Parts required :

2	of No.	2	1	of No.	24
4	„ „	5	4	„ „	35
4	„ „	12	18	„ „	37
2	„ „	16	4	„ „	38
2	„ „	17	1	„ „	44
1	„ „	19	2	„ „	48A
4	„ „	22	1	„ „	52
1	„ „	23	1	„ „	57

1 of No. 125



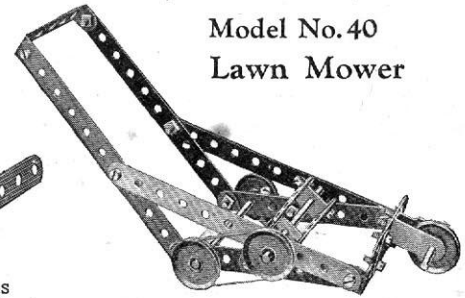
Model No. 39 Furrow Roller



Parts required :

2	of No.	2
1	„ „	16
4	„ „	22
4	„ „	37
2	„ „	48A
2	„ „	126A

Model No. 40 Lawn Mower

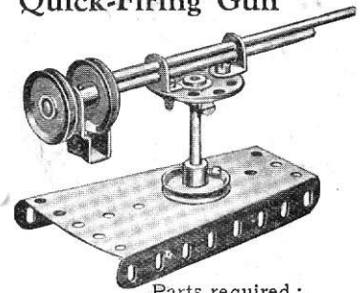


Parts required :

4	of No.	2	1	of No.	17
7	„ „	5	4	„ „	22
2	„ „	11	19	„ „	37
2	„ „	16	1	„ „	44

3 of No. 48A

Model No. 41 Quick-Firing Gun



Parts required :

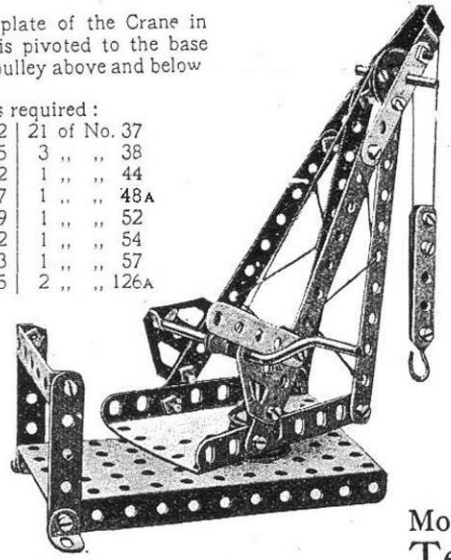
2	of No.	12	1	of No.	24
2	„ „	16	4	„ „	37
1	„ „	17	1	„ „	44
2	„ „	22	1	„ „	54

Model No. 42—Swivelling Crane

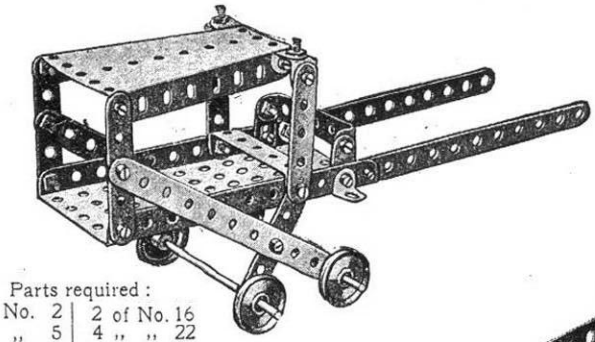
he sector plate of the Crane in
iis model is pivoted to the base
ith a fast pulley above and below

Parts required :

4 of No.	2	21 of No.	37
7 ,, ,,	5	3 ,, ,,	38
2 ,, ,,	12	1 ,, ,,	44
2 ,, ,,	17	1 ,, ,,	48A
1 ,, ,,	19	1 ,, ,,	52
4 ,, ,,	22	1 ,, ,,	54
1 ,, ,,	23	1 ,, ,,	57
2 ,, ,,	35	2 ,, ,,	126A



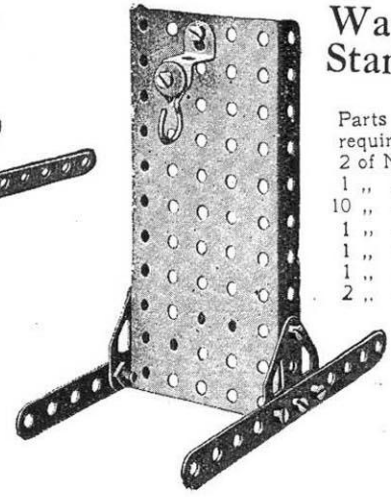
Model No. 43—Ticca Gharry



Parts required :

4 of No.	2	2 of No.	16
6 ,, ,,	5	4 ,, ,,	22
2 ,, ,,	10	22 ,, ,,	37
6 ,, ,,	12	1 ,, ,,	52
1 of No. 54			

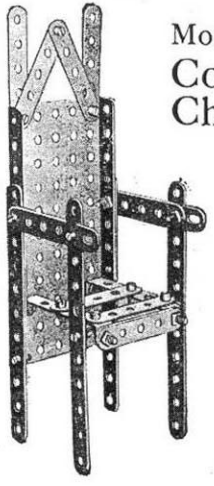
Model No. 44 Watch Stand



Parts required :

2 of No.	2
1 ,, ,,	23
10 ,, ,,	37
1 ,, ,,	52
1 ,, ,,	57
1 ,, ,,	125
2 ,, ,,	126A

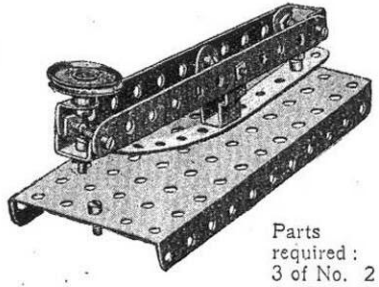
Model No. 45 Coronation Chair



Parts required :

4 of No.	2
9 ,, ,,	5
2 ,, ,,	10
2 ,, ,,	12
19 ,, ,,	37
2 ,, ,,	48A
1 ,, ,,	52

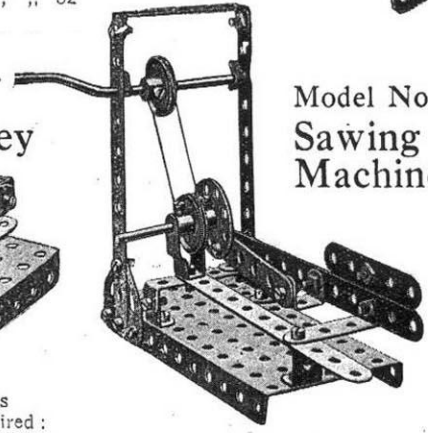
Model No. 46 Telegraph Key



Parts required :

3 of No.	2
1 ,, ,,	10
2 ,, ,,	11
1 ,, ,,	12
1 ,, ,,	22
11 ,, ,,	37
1 ,, ,,	44
1 ,, ,,	52

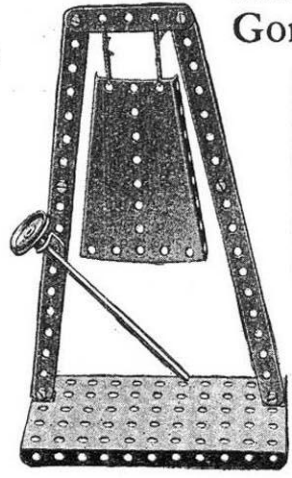
Model No. 47 Sawing Machine



Parts required :

4 of No.	2	1 of No.	24
3 ,, ,,	5	2 ,, ,,	35
4 ,, ,,	12	23 ,, ,,	37
1 ,, ,,	17	1 ,, ,,	44
1 ,, ,,	19	2 ,, ,,	48A
2 ,, ,,	22	1 ,, ,,	52
2 of No. 126A			

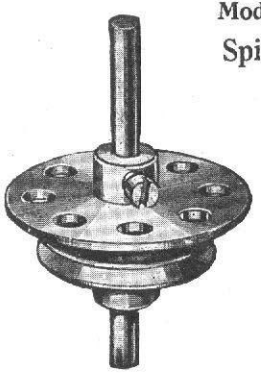
Model No. 48 Gong



Parts required :

4 of No.	2
1 ,, ,,	5
3 ,, ,,	12
1 ,, ,,	16
1 ,, ,,	22
7 ,, ,,	37
1 ,, ,,	52
1 ,, ,,	54

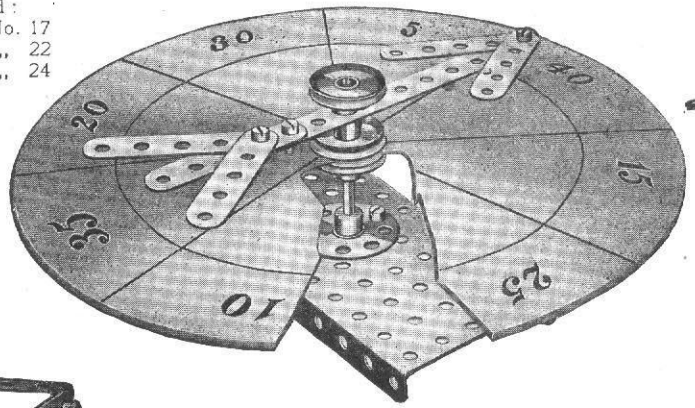
Model No. 49
Spinning Top



Parts required :
1 of No. 17
1 „ „ 22
1 „ „ 24

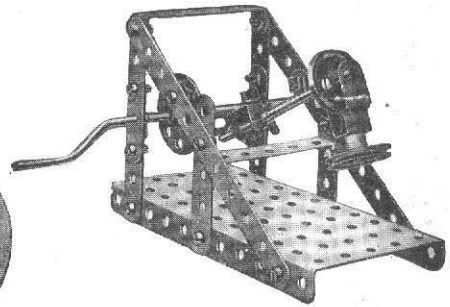
Model No. 50 Roulette Wheel

Parts required :
1 of No. 2 | 5 of No. 5 | 1 of No. 24
1 „ „ 16 | 5 „ „ 37
3 „ „ 22 | 1 „ „ 52



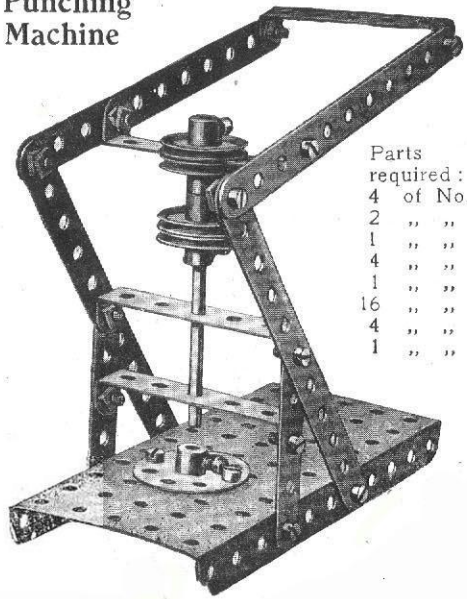
Cut out a circular piece of cardboard and mark as shown to form scoring board. This is clamped between two 1" pulley wheels. The pointer revolves freely on the upright spindle and is held in position by another 1" pulley wheel.

Model No. 51
Mechanical Hammer



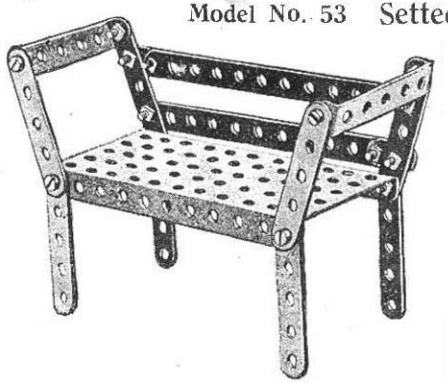
Parts required :
2 of No. 2
6 „ „ 5
1 „ „ 11
1 „ „ 12
1 „ „ 16
1 „ „ 19
2 „ „ 22
1 „ „ 24
4 „ „ 35
18 „ „ 37
1 „ „ 44
3 „ „ 48A
1 „ „ 52

Model No. 52
Punching Machine



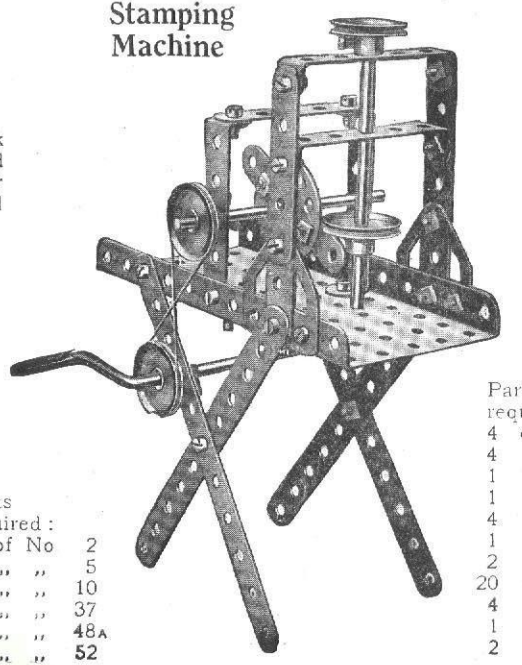
Parts required :
4 of No. 2
2 „ „ 5
1 „ „ 16
4 „ „ 22
1 „ „ 24
16 „ „ 37
4 „ „ 48A
1 „ „ 52

Model No. 53 Settee



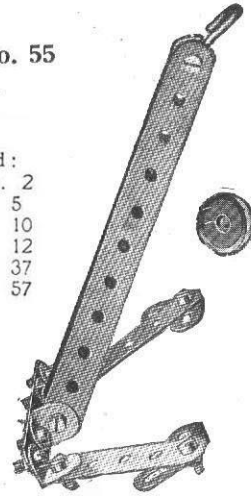
Parts required :
2 of No 2
8 „ „ 5
3 „ „ 10
15 „ „ 37
2 „ „ 48A
1 „ „ 52

Model No. 54
Stamping Machine



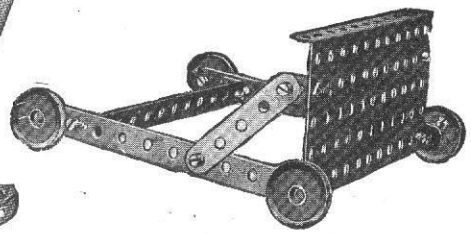
Parts required :
4 of No 2
4 „ „ 5
1 „ „ 16
1 „ „ 19
4 „ „ 22
1 „ „ 24
2 „ „ 35
20 „ „ 37
4 „ „ 48A
1 „ „ 52
2 „ „ 126A

Model No. 55
Anchor



Parts required :
2 of No. 2
3 „ „ 5
4 „ „ 10
4 „ „ 12
11 „ „ 37
1 „ „ 57

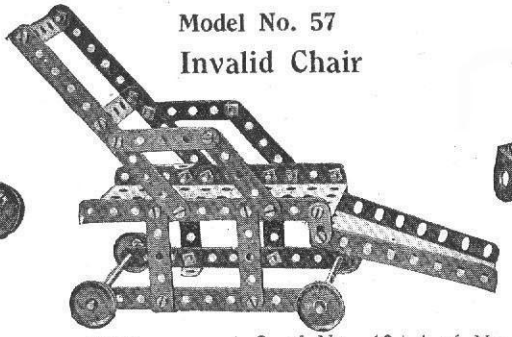
Model No. 56
Devil Wall



Parts required :

3 of No. 2		4 of No.	22
2 „ „ 5		18 „ „	37
6 „ „ 12		1 „ „	52

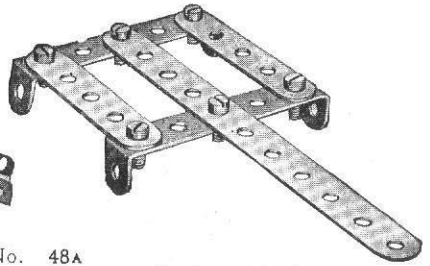
Model No. 57
Invalid Chair



Parts required :

4 of No. 2		2 of No.	10
6 „ „ 5		2 „ „	16
		4 „ „	22
		24 „ „	37
		4 of No.	48A
		1 „ „	52
		1 „ „	54

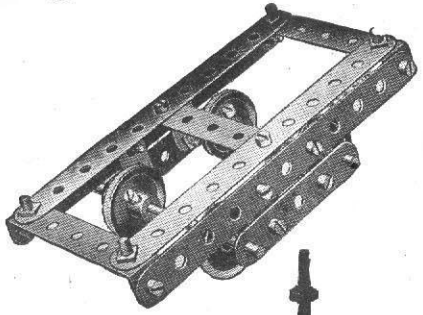
Model No. 58
Grill



Parts required :

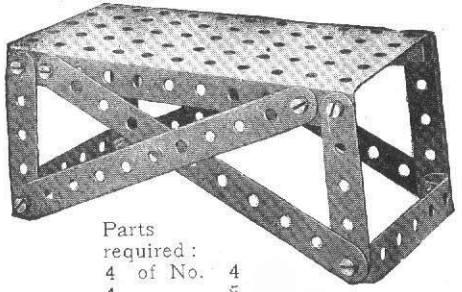
1 of No. 2		6 of No.	37
2 „ „ 5		2 „ „	48A

Model No. 59
Bogie Car



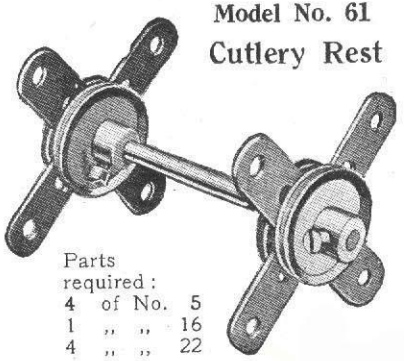
Parts required :
4 of No. 2
3 „ „ 5
4 „ „ 10
2 „ „ 16
4 „ „ 22
18 „ „ 37

Model No. 60 Fire Stand



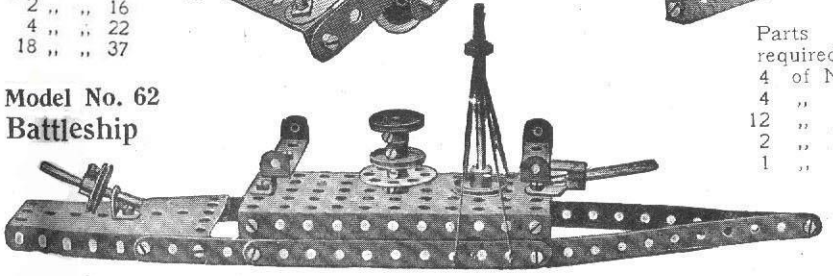
Parts required :
4 of No. 4
4 „ „ 5
12 „ „ 37
2 „ „ 48A
1 „ „ 52

Model No. 61
Cutlery Rest



Parts required :
4 of No. 5
1 „ „ 16
4 „ „ 22

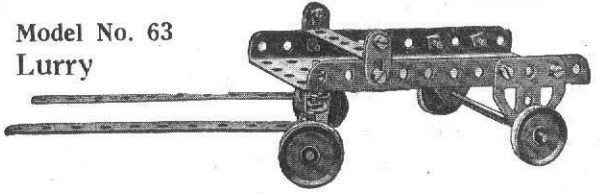
Model No. 62
Battleship



Parts required :

4 of No. 2	1 of No. 16	1 of No. 24	2 of No. 48A
3 „ „ 5	2 „ „ 17	3 „ „ 35	1 „ „ 52
4 „ „ 10	4 „ „ 22	19 „ „ 37	1 „ „ 54
1 „ „ 12	1 „ „ 23	1 „ „ 44	1 „ „ 125

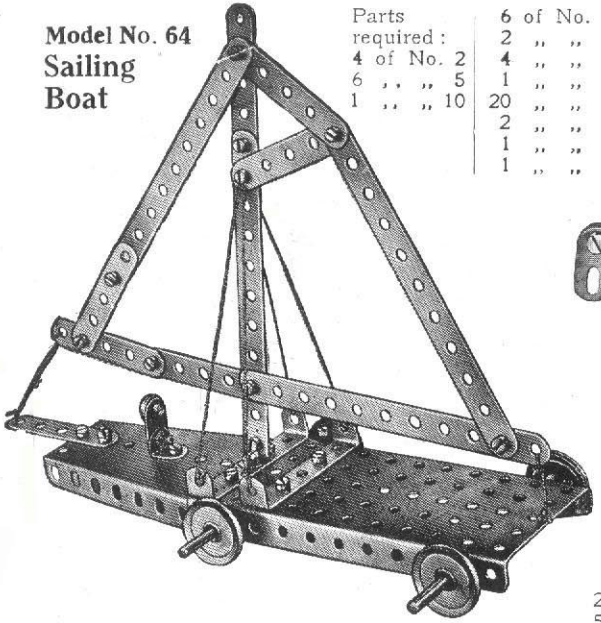
Model No. 63
Lurry



Parts required :

2 of No. 2	2 of No. 16	2 of No. 48A
2 „ „ 10	4 „ „ 22	1 „ „ 52
1 „ „ 11	12 „ „ 37	2 „ „ 126A

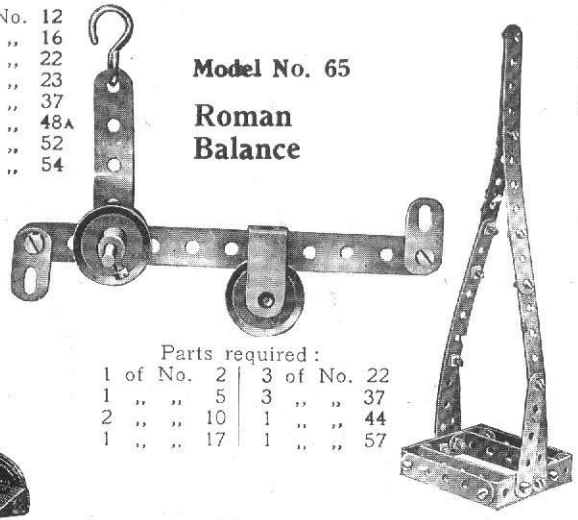
Model No. 64 Sailing Boat



Parts required:

4	of No.	2	
6	,, ,,	5	
1	,, ,,	10	
6	of No.	12	
2	,, ,,	16	
4	,, ,,	22	
1	,, ,,	23	
20	,, ,,	37	
2	,, ,,	48A	
1	,, ,,	52	
1	,, ,,	54	

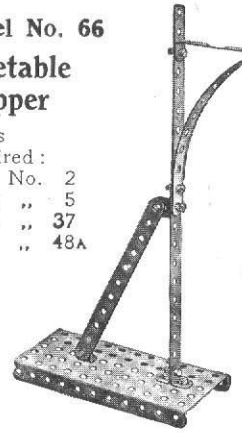
Model No. 65 Roman Balance



Parts required:

1	of No.	2	
1	,, ,,	5	
2	,, ,,	10	
1	,, ,,	17	
3	of No.	22	
3	,, ,,	37	
1	,, ,,	44	
1	,, ,,	57	

Model No. 66 Vegetable Chopper



Parts required:

4	of No.	2	
4	,, ,,	5	
18	,, ,,	37	
4	,, ,,	48A	

Model No. 67 Mail-Bag Hanger

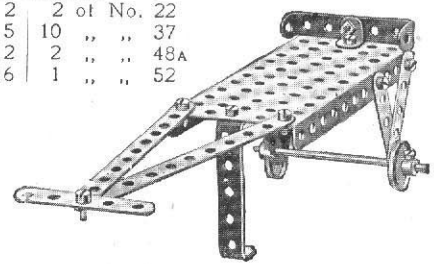
Parts required:

4	of No.	2	
4	,, ,,	12	
10	,, ,,	37	
1	,, ,,	48A	
1	,, ,,	52	
1	,, ,,	57	

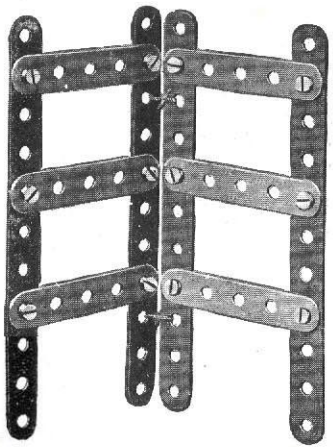
Model No. 68 Shipyard Bogie

Parts required:

2	of No.	2	
5	,, ,,	5	
1	,, ,,	12	
1	,, ,,	16	
2	of No.	22	
10	,, ,,	37	
2	,, ,,	48A	
1	,, ,,	52	



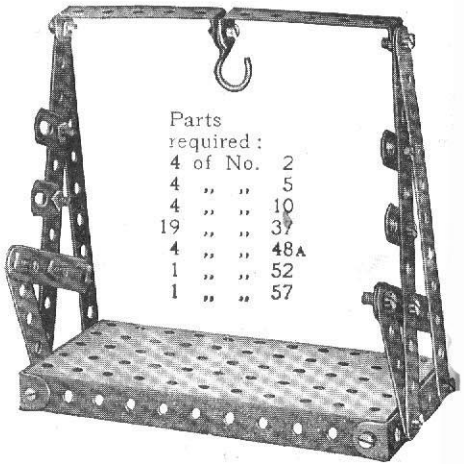
Model No. 69 Clothes Horse



Parts required:

4	of No.	2	
6	,, ,,	5	
12	,, ,,	37	

Model No. 70 Pen Rack



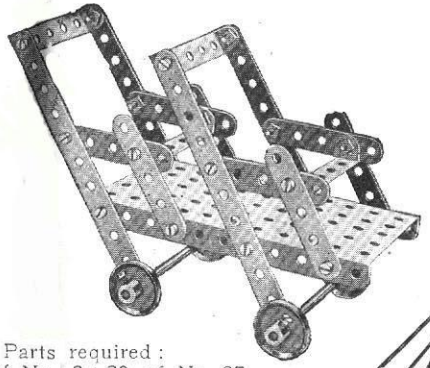
Parts required:

4	of No.	2	
4	,, ,,	5	
4	,, ,,	10	
19	,, ,,	37	
4	,, ,,	48A	
1	,, ,,	52	
1	,, ,,	57	

HOW TO CONTINUE

This completes the Models which may be made with MECCANO Outfit No. 0. 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. 0A Accessory Outfit, the price of which will be found in the list at the end of the Manual.

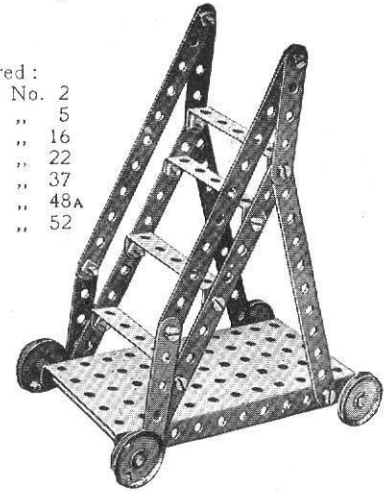
Model No. 101
Tandem Car



Parts required :

4	of No.	2	20	of No.	37
8	,, ,,	5	4	,, ,,	48A
2	,, ,,	16	1	,, ,,	52
4	,, ,,	22			

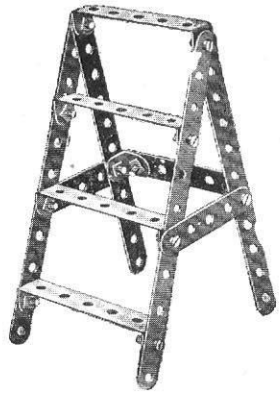
Model No. 102
Travelling Ladder



Parts required :

6	of No.	2
4	,, ,,	5
2	,, ,,	16
4	,, ,,	22
16	,, ,,	37
4	,, ,,	48A
1	,, ,,	52

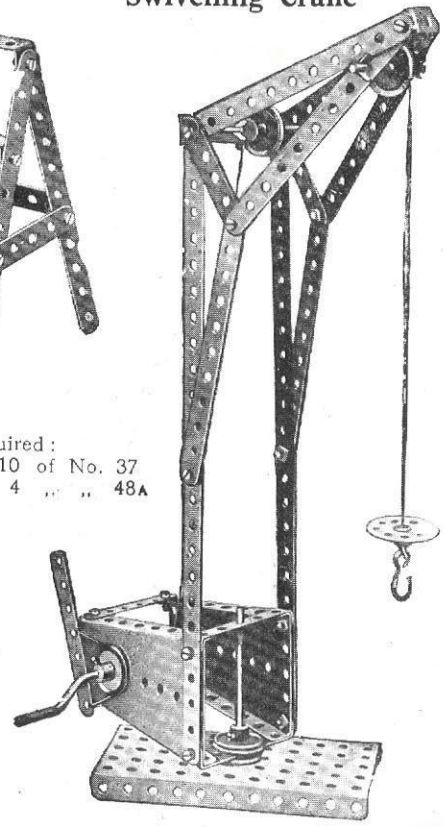
Model No. 103
Step Ladder



Parts required :

4	of No.	2	10	of No.	37
3	,, ,,	5	4	,, ,,	48A
2	,, ,,	12			

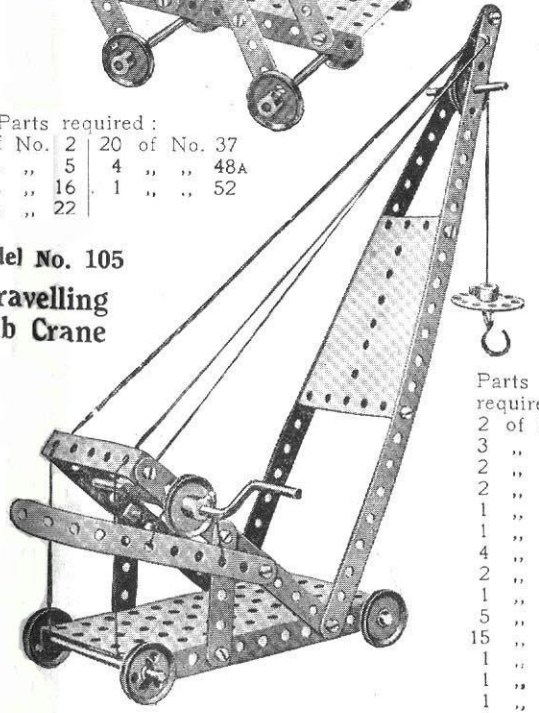
Model No. 104
Swivelling Crane



Parts required :

2	of No.	1	2	of No.	17	18	of No.	37
6	,, ,,	2	1	,, ,,	19	1	,, ,,	44
1	,, ,,	3	4	,, ,,	22	3	,, ,,	48A
4	,, ,,	5	2	,, ,,	22A	1	,, ,,	52
1	,, ,,	11	1	,, ,,	24	2	,, ,,	54
1	,, ,,	16	4	,, ,,	35	1	,, ,,	57

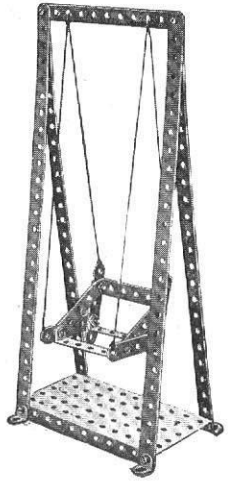
Model No. 105
Travelling Jib Crane



Parts required :

2	of No.	1
3	,, ,,	2
2	,, ,,	5
2	,, ,,	16
1	,, ,,	17
1	,, ,,	19
4	,, ,,	22
2	,, ,,	22A
1	,, ,,	24
5	,, ,,	35
15	,, ,,	37
1	,, ,,	48A
1	,, ,,	52
1	,, ,,	54
1	,, ,,	57

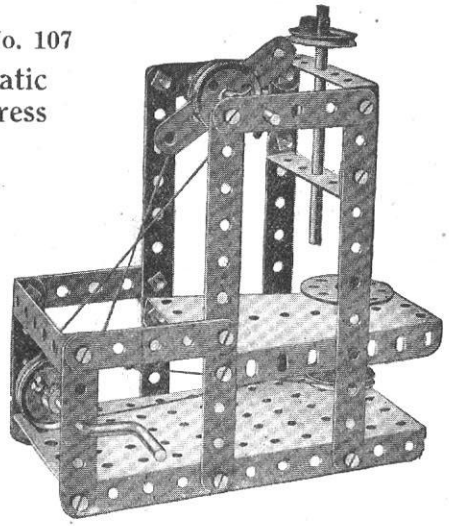
Model No. 106
Swing



Parts required :

4	of No.	1
1	,, ,,	2
6	,, ,,	5
4	,, ,,	12
12	,, ,,	37
3	,, ,,	48A
1	,, ,,	52

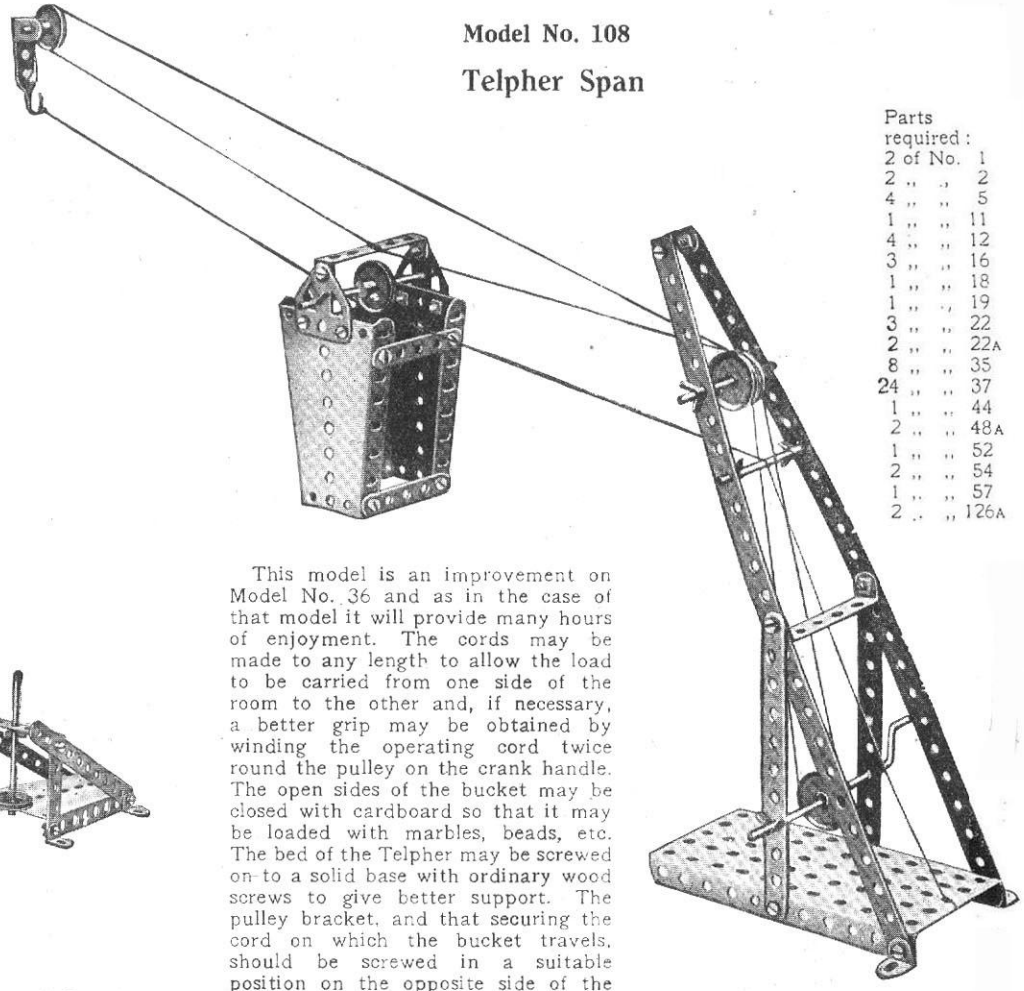
Model No. 107
Automatic Dial Press



Parts required :

4	of	No. 2	1	of	No. 19	18	of	No. 37
7	,,	,, 5	4	,,	,, 22	3	,,	,, 48A
2	,,	,, 16	2	,,	,, 22A	1	,,	,, 52
1	,,	,, 17	1	,,	,, 24	1	,,	,, 54
			7	,,	,, 35			

Model No. 108
Telpher Span

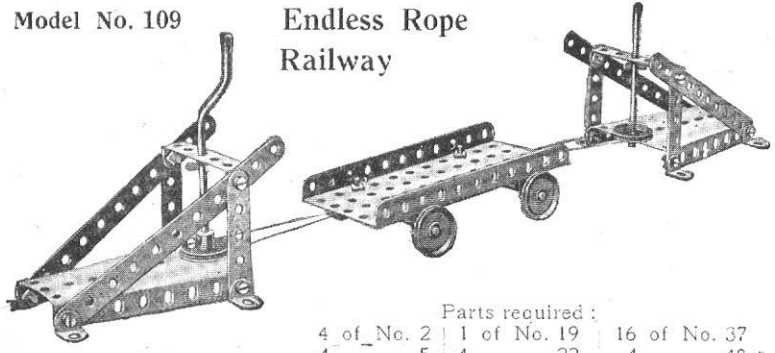


Parts required :

2	of No.	1
2	,, ,,	2
4	,, ,,	5
1	,, ,,	11
4	,, ,,	12
3	,, ,,	16
1	,, ,,	18
1	,, ,,	19
3	,, ,,	22
2	,, ,,	22A
8	,, ,,	35
24	,, ,,	37
1	,, ,,	44
2	,, ,,	48A
1	,, ,,	52
2	,, ,,	54
1	,, ,,	57
2	,, ,,	126A

This model is an improvement on Model No. 36 and as in the case of that model it will provide many hours of enjoyment. The cords may be made to any length to allow the load to be carried from one side of the room to the other and, if necessary, a better grip may be obtained by winding the operating cord twice round the pulley on the crank handle. The open sides of the bucket may be closed with cardboard so that it may be loaded with marbles, beads, etc. The bed of the Telpher may be screwed on to a solid base with ordinary wood screws to give better support. The pulley bracket, and that securing the cord on which the bucket travels, should be screwed in a suitable position on the opposite side of the room.

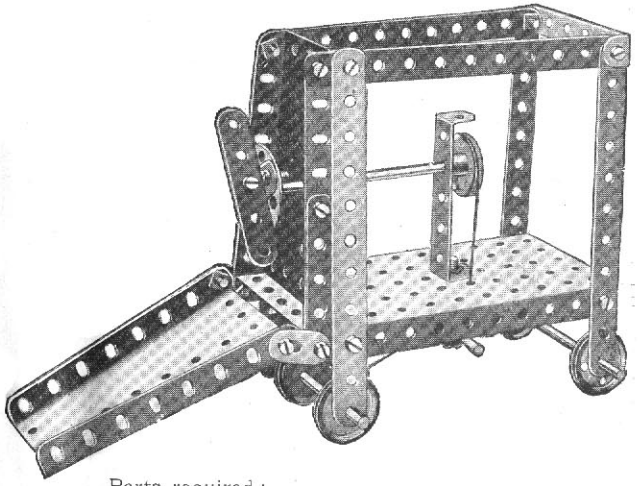
Model No. 109
Endless Rope Railway



Parts required :

4	of	No. 2	1	of	No. 19	16	of	No. 37
4	,,	,, 5	4	,,	,, 22	4	,,	,, 48A
8	,,	,, 12	2	,,	,, 22A	1	,,	,, 52
3	,,	,, 16	4	,,	,, 35	2	,,	,, 54

Model No. 110 Snow Plough



Parts required :

6	of	No.	2	1	of	No.	24
3	,,	,,	5	4	,,	,,	35
2	,,	,,	10	19	,,	,,	37
1	,,	,,	12	1	,,	,,	44
3	,,	,,	16	2	,,	,,	48A
1	,,	,,	17	1	,,	,,	52
4	,,	,,	22	2	,,	,,	54
2	,,	,,	22A				

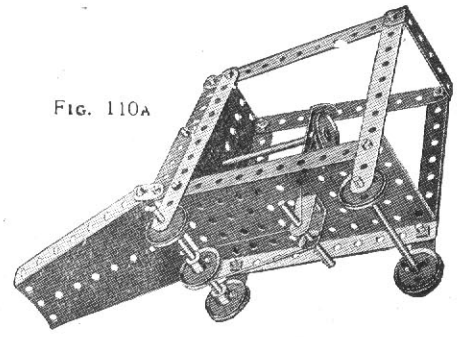
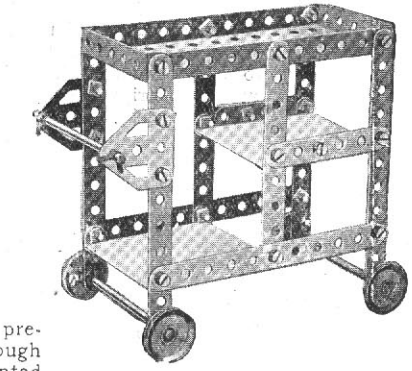


FIG. 110A

The construction of the framework of this model presents no difficulty. The sector plate forming the plough is loosely pivoted on the bolts (1). The axle (2) is mounted in the front sector plate and the 2½" double angle strip (3). A 2½" strip (4) is bolted by angle brackets to a bush wheel on the front of the axle and forms a dispersing propeller for the snow after it has risen up the inclined sector plate. A continuous cord (5) is passed round a 1" pulley (6) and round the short axle (7) and a 1" pulley on the propeller axle. In this way, as the plough is moved along the ground, the propeller is revolved.

Model No. 111 Dinner Wagon

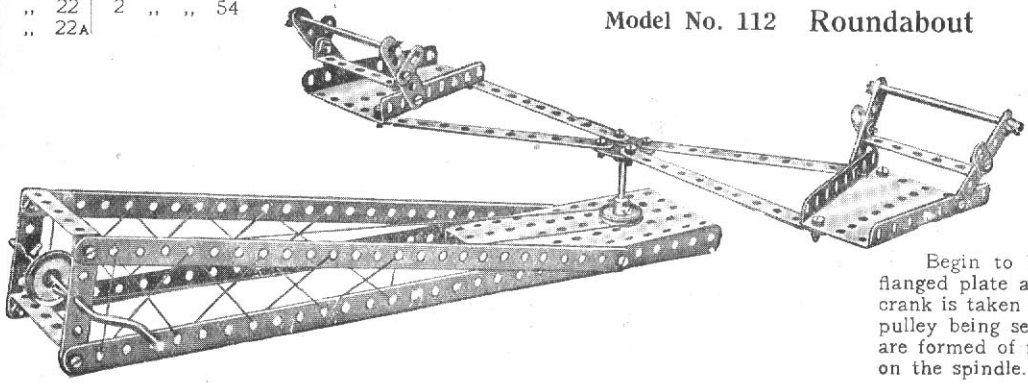


Parts required :

6	of	No.	2	2	of	No.	35
8	,,	,,	5	22	,,	,,	37
4	,,	,,	12	4	,,	,,	48A
3	,,	,,	16	1	,,	,,	52
4	,,	,,	22	2	,,	,,	126A

The two lower platforms are constructed out of pieces of ordinary cardboard, their outer edges resting on 2½" bent strips and their inner edges on angle brackets.

Model No. 112 Roundabout



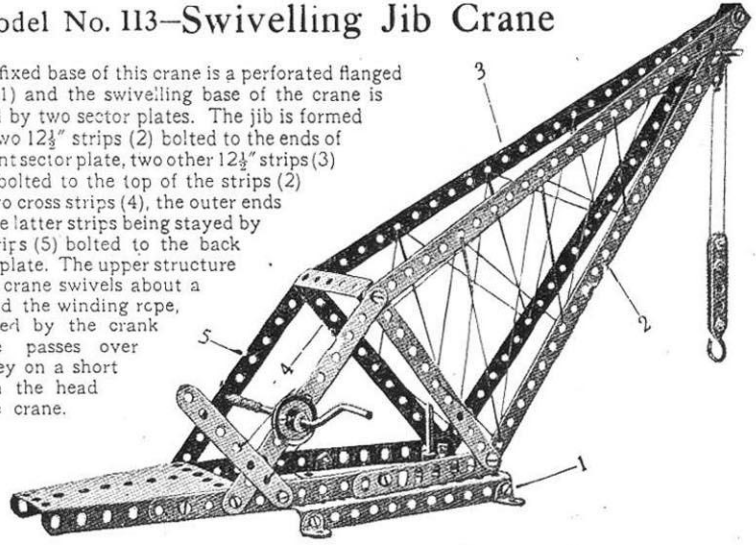
Parts required :

4	of	No.	1	1	of	No.	17	22	of	No.	37
4	,,	,,	2	1	,,	,,	19	4	,,	,,	48A
6	,,	,,	5	3	,,	,,	22	1	,,	,,	52
4	,,	,,	10	1	,,	,,	24	2	,,	,,	54
2	,,	,,	16	6	,,	,,	35				

Begin to build this model by making the platform from a flanged plate and 12½" strips. The drive from the pulley on the crank is taken to a 1" pulley fast on a spindle (2), another similar pulley being secured to the spindle beneath the plate. The arms are formed of four 5½" strips and bolted to a bush wheel (1) fast on the spindle.

Model No. 113—Swivelling Jib Crane

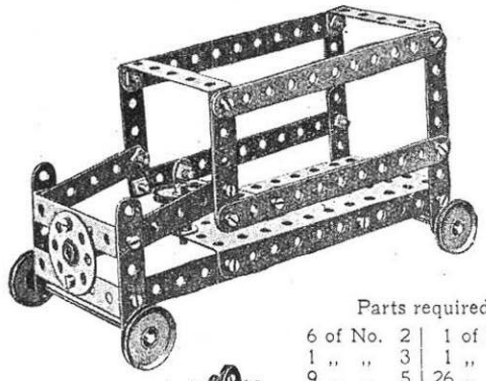
The fixed base of this crane is a perforated flanged plate (1) and the swivelling base of the crane is formed by two sector plates. The jib is formed from two 12½" strips (2) bolted to the ends of the front sector plate, two other 12½" strips (3) being bolted to the top of the strips (2) and two cross strips (4), the outer ends of these latter strips being stayed by the strips (5) bolted to the back sector plate. The upper structure of the crane swivels about a rod and the winding rope, operated by the crank handle passes over a pulley on a short rod in the head of the crane.



Parts required:

4	of No.	1
6	,, ,,	2
1	,, ,,	3
2	,, ,,	5
1	,, ,,	10
1	,, ,,	11
4	,, ,,	12
2	,, ,,	17
1	,, ,,	19
3	,, ,,	22
1	,, ,,	22A
1	,, ,,	23
3	,, ,,	35
20	,, ,,	37
3	,, ,,	38
1	,, ,,	48A
1	,, ,,	52
2	,, ,,	54
1	,, ,,	57

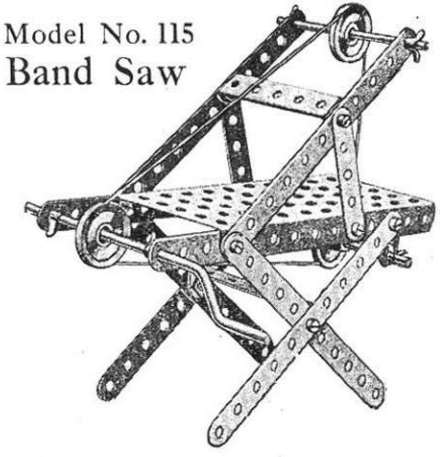
Model No. 114—Motor Van



Parts required:

6	of No.	2	1	of No.	22A
1	,, ,,	3	1	,, ,,	24
9	,, ,,	5	26	,, ,,	37
1	,, ,,	11	5	,, ,,	48A
2	,, ,,	16	1	,, ,,	52
4	,, ,,	22			

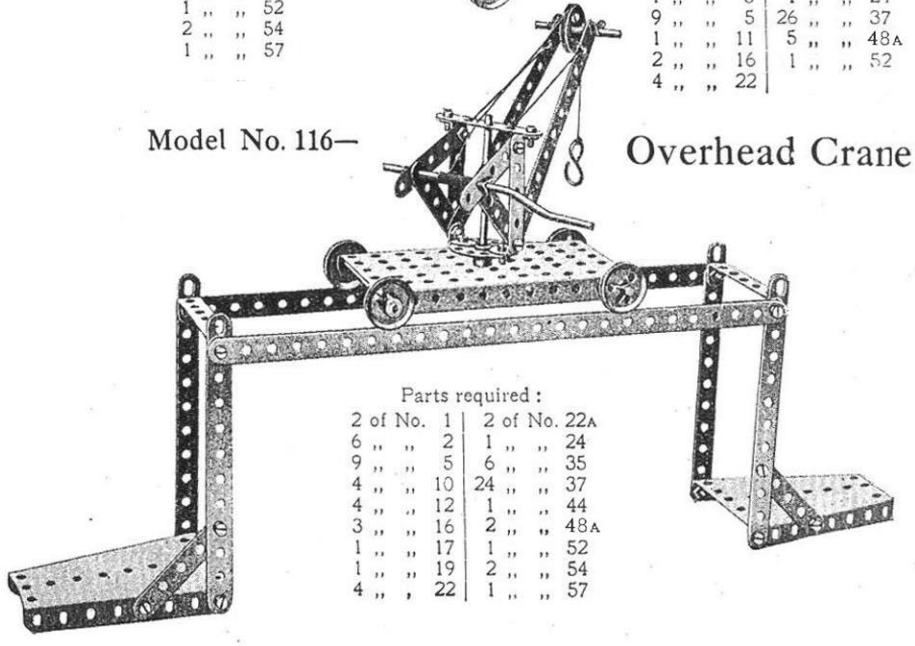
Model No. 115 Band Saw



Parts required:

6	of No.	2
4	,, ,,	5
2	,, ,,	10
2	,, ,,	16
1	,, ,,	19
3	,, ,,	22
6	,, ,,	35
10	,, ,,	37
2	,, ,,	48A
1	,, ,,	52

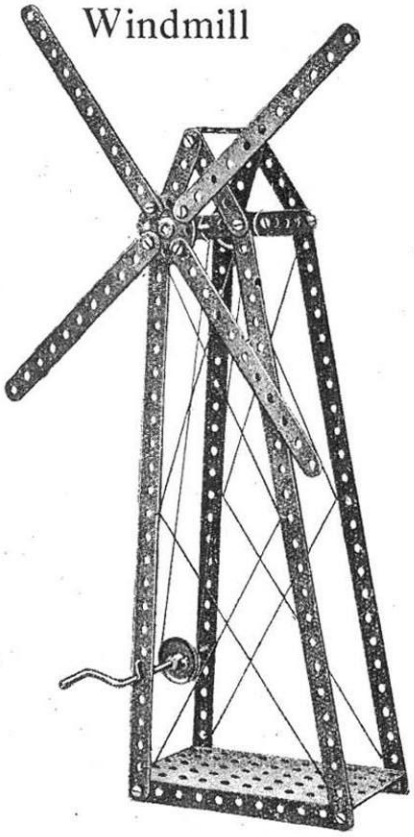
Model No. 116— Overhead Crane



Parts required:

2	of No.	1	2	of No.	22A
6	,, ,,	2	1	,, ,,	24
9	,, ,,	5	6	,, ,,	35
4	,, ,,	10	24	,, ,,	37
4	,, ,,	12	1	,, ,,	44
3	,, ,,	16	2	,, ,,	48A
1	,, ,,	17	1	,, ,,	52
1	,, ,,	19	2	,, ,,	54
4	,, ,,	22	1	,, ,,	57

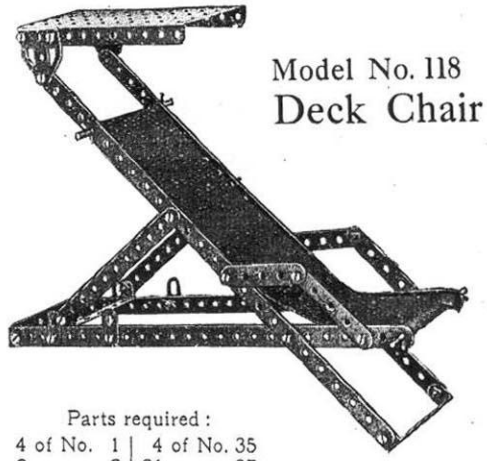
Model No. 117
Windmill



Parts required :

4 of No.	1	2 of No.	22
4 „ „	2	1 „ „	24
7 „ „	5	4 „ „	35
2 „ „	12	20 „ „	37
1 „ „	16	3 „ „	48A
1 „ „	19	1 „ „	52

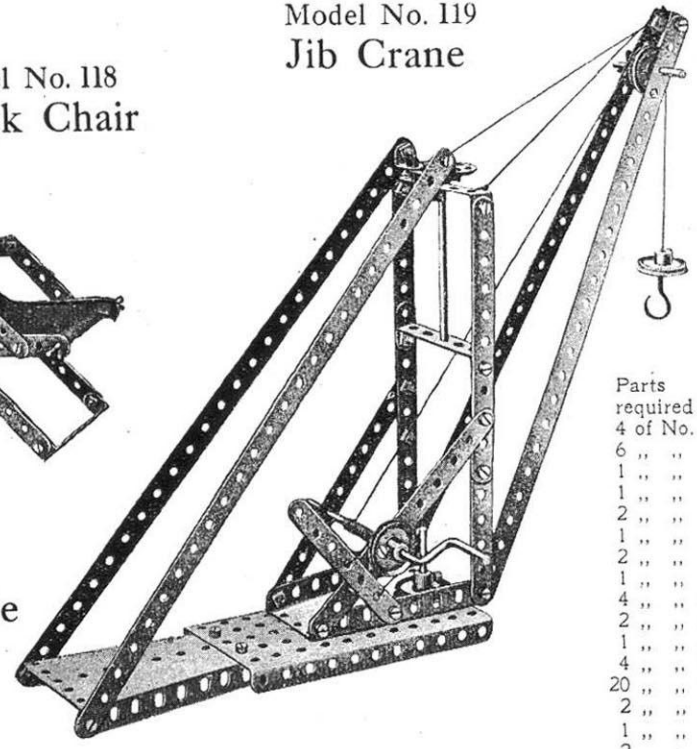
Model No. 118
Deck Chair



Parts required :

4 of No.	1	4 of No.	35
2 „ „	2	26 „ „	37
4 „ „	5	1 „ „	52
4 „ „	10	3 „ „	60
2 „ „	16	2 „ „	126A

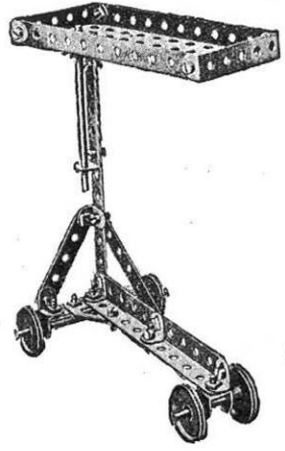
Model No. 119
Jib Crane



Parts required :

4 of No.	1
6 „ „	2
1 „ „	3
1 „ „	11
2 „ „	12
1 „ „	16
2 „ „	17
1 „ „	19
4 „ „	22
2 „ „	22A
1 „ „	24
4 „ „	35
20 „ „	37
2 „ „	48A
1 „ „	52
2 „ „	54
1 „ „	57

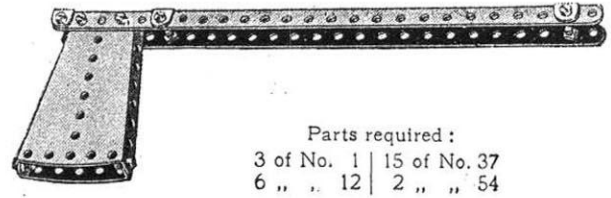
Model No. 120—Bed Table



Parts required :

3 of No.	2
1 „ „	3
1 „ „	5
1 „ „	11
5 „ „	12
2 „ „	16
1 „ „	17
4 „ „	22
1 „ „	24
21 „ „	37
4 „ „	48A
1 „ „	52
1 „ „	126A

Model No. 121—Hatchet

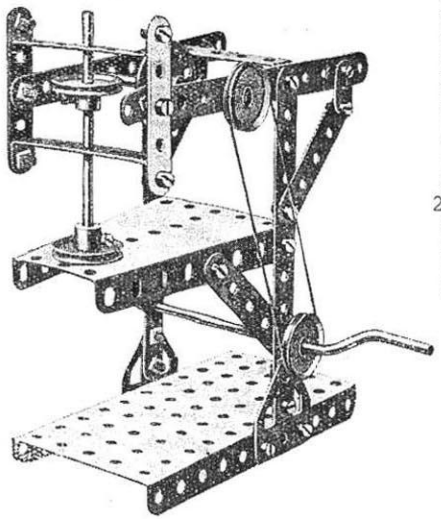


Parts required :

3 of No.	1	15 of No.	37
6 „ „	12	2 „ „	54

Model No. 122

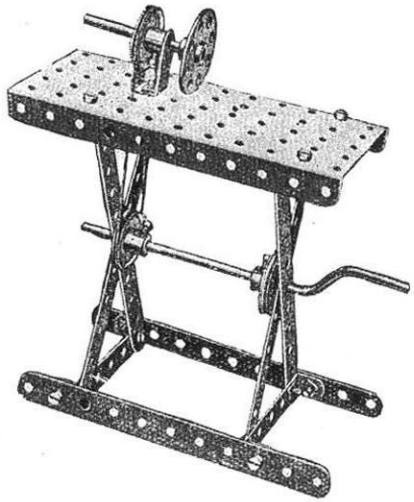
Drop Stamp



Parts required:

4 of No.	2
6 „ „	5
3 „ „	10
2 „ „	16
1 „ „	19
4 „ „	22
1 „ „	24
2 „ „	35
27 „ „	37
3 „ „	48A
1 „ „	52
1 „ „	54
2 „ „	126A

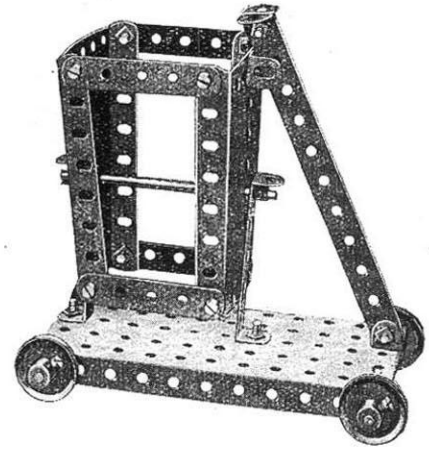
Model No. 123—Lathe



Parts required:

6 of No.	2	1 of No.	24
4 „ „	12	17 „ „	37
1 „ „	17	1 „ „	44
1 „ „	19	2 „ „	48A
3 „ „	22	1 „ „	52

Model No. 124—Tip Wagon

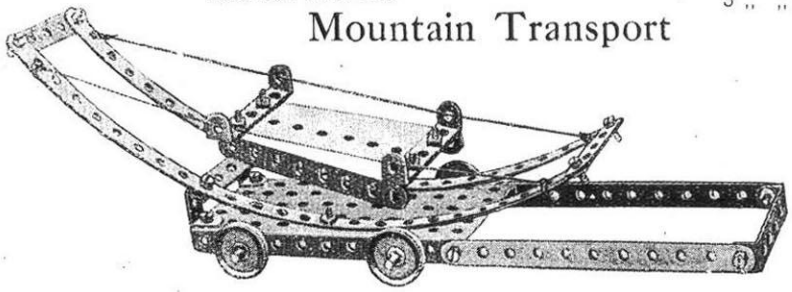


Parts required:

1 of No.	2
4 „ „	5
5 „ „	12
3 „ „	16
4 „ „	22
2 „ „	35
14 „ „	37
2 „ „	48A
1 „ „	52
2 „ „	54

Model No. 125

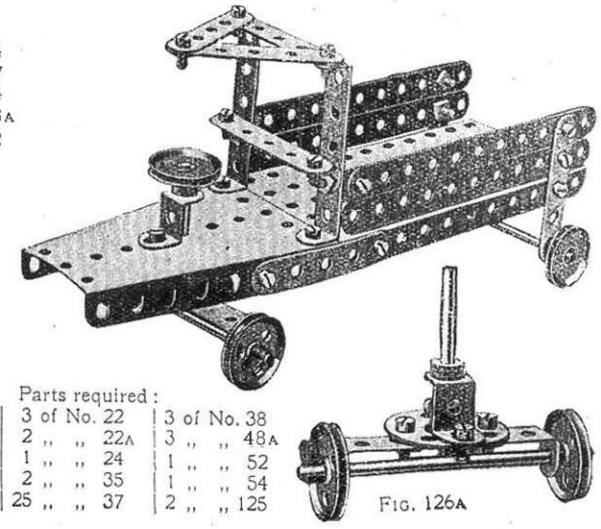
Mountain Transport



Parts required:

2 of No.	1	3 of No.	5	2 of No.	16	18 of No.	37	1 of No.	52
2 „ „	2	4 „ „	12	4 „ „	22	2 „ „	48A	1 „ „	54

Model No. 126—Motor Lurry



Parts required:

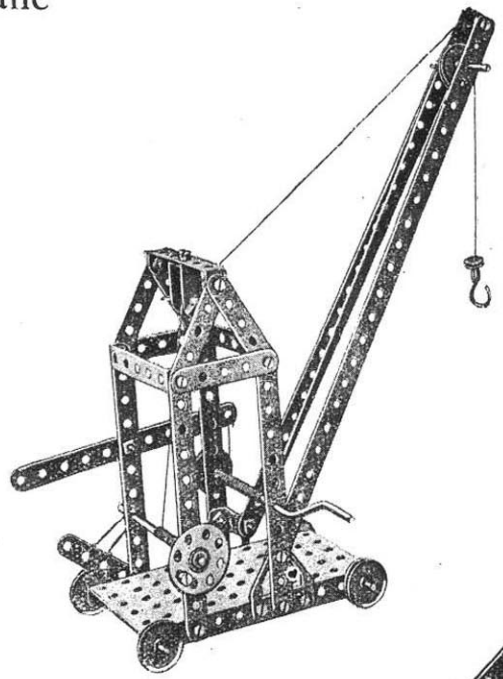
4 of No.	2	3 of No.	22	3 of No.	38
8 „ „	5	2 „ „	22A	3 „ „	48A
4 „ „	12	1 „ „	24	1 „ „	52
2 „ „	16	2 „ „	35	1 „ „	54
1 „ „	17	25 „ „	37	2 „ „	125

FIG. 126A

Model No. 127
Jib Crane

Parts required :

2	of No.	1
5	,, ,,	2
7	,, ,,	5
1	,, ,,	11
3	,, ,,	16
1	,, ,,	17
1	,, ,,	18A
1	,, ,,	19
4	,, ,,	22
2	,, ,,	22A
1	,, ,,	23
1	,, ,,	24
6	,, ,,	35
22	,, ,,	37
2	,, ,,	38
1	,, ,,	44
1	,, ,,	52
1	,, ,,	57
3	,, ,,	60
2	,, ,,	125
2	,, ,,	126A

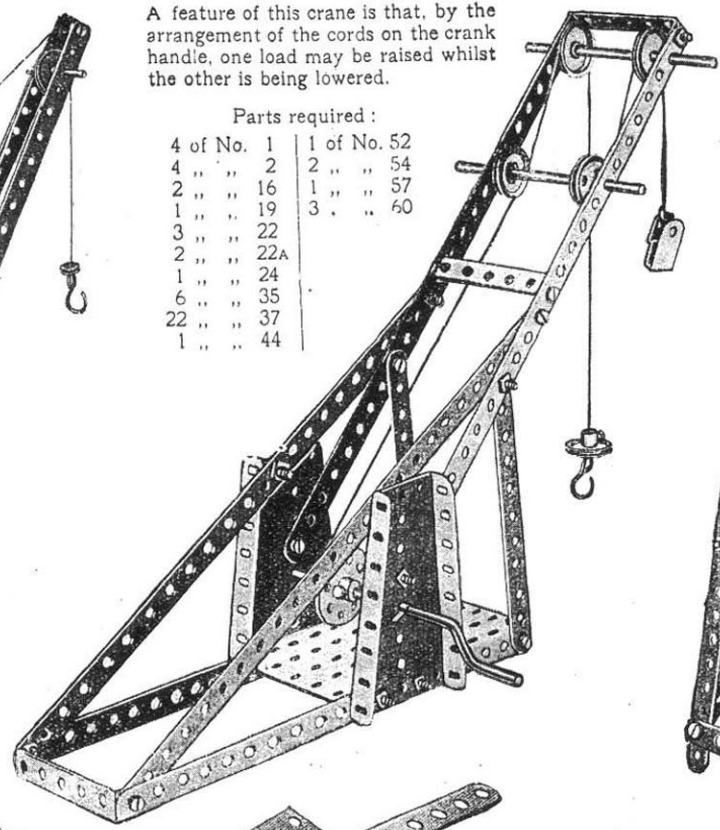


Model No. 128—Double Action Crane

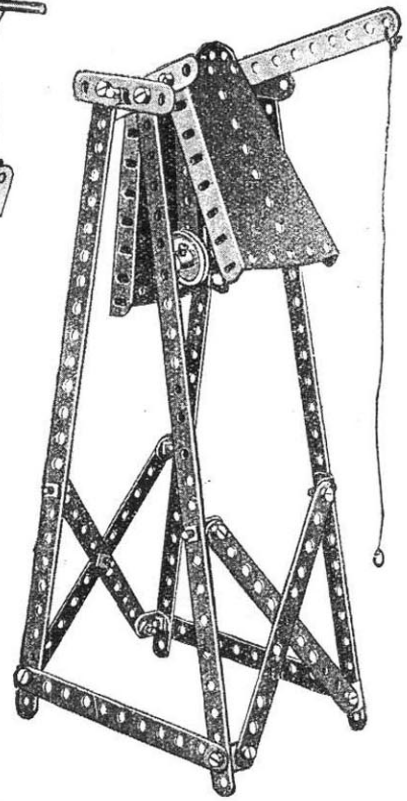
A feature of this crane is that, by the arrangement of the cords on the crank handle, one load may be raised whilst the other is being lowered.

Parts required :

4	of No.	1	1	of No.	52
4	,, ,,	2	2	,, ,,	54
2	,, ,,	16	1	,, ,,	57
1	,, ,,	19	3	,, ,,	60
3	,, ,,	22			
2	,, ,,	22A			
1	,, ,,	24			
6	,, ,,	35			
22	,, ,,	37			
1	,, ,,	44			



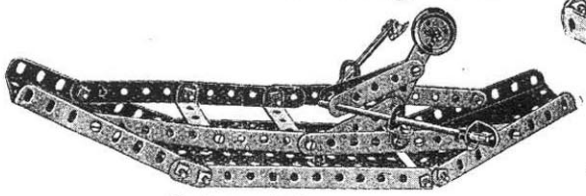
Model No. 129
Fire Alarm



Parts required :

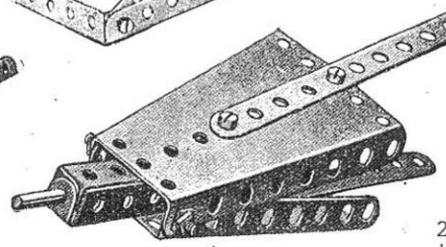
4	of No.	1	1	of No.	22
7	,, ,,	2	1	,, ,,	24
1	,, ,,	3	4	,, ,,	35
3	,, ,,	5	27	,, ,,	37
8	,, ,,	12	2	,, ,,	54
1	,, ,,	16			

Model No. 130—Rowing Boat



Parts required :

4	of No.	2	2	of No.	16
5	,, ,,	5	1	,, ,,	18A
4	,, ,,	10	2	,, ,,	22A
7	,, ,,	12	4	,, ,,	35
			24	,, ,,	37
4	of No.	38			
1	,, ,,	52			
2	,, ,,	54			
3	,, ,,	60			



Model No. 131
Bellows

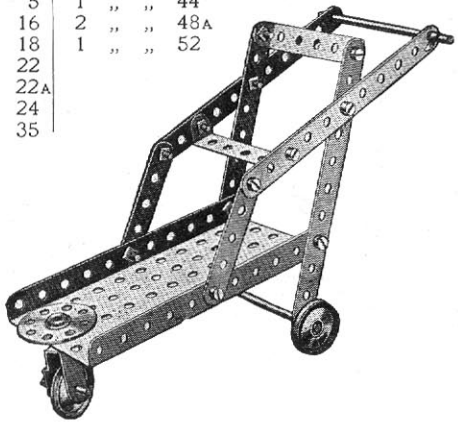
Parts required :

2	of No.	2	2	of No.	54
1	,, ,,	17	4	,, ,,	60
9	,, ,,	37			

Model No. 132 Invalid Chair

Parts required:

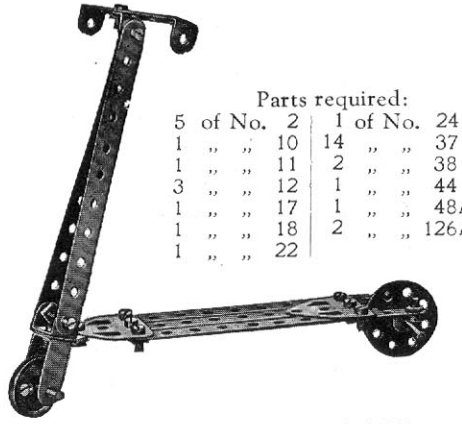
4	of No.	2	13	of No.	37
2	„	„ 5	1	„	„ 44
2	„	„ 16	2	„	„ 48A
1	„	„ 18	1	„	„ 52
2	„	„ 22			
1	„	„ 22A			
1	„	„ 24			
4	„	„ 35			



Model No. 133 Foot Cycle

Parts required:

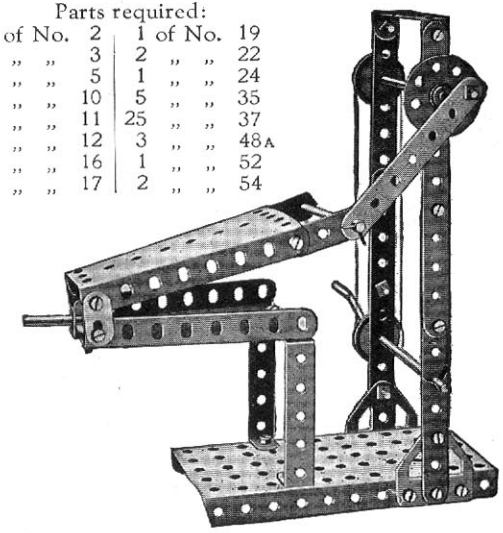
5	of No.	2	1	of No.	24
1	„	„ 10	14	„	„ 37
1	„	„ 11	2	„	„ 38
3	„	„ 12	1	„	„ 44
1	„	„ 17	1	„	„ 48A
1	„	„ 18	2	„	„ 126A
1	„	„ 22			



Model No. 134 Forge Bellows

Parts required:

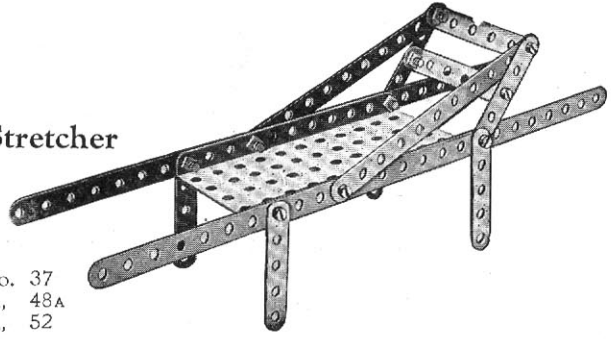
4	of No.	2	1	of No.	19
1	„	„ 3	2	„	„ 22
2	„	„ 5	1	„	„ 24
2	„	„ 10	5	„	„ 35
1	„	„ 11	25	„	„ 37
2	„	„ 12	3	„	„ 48A
2	„	„ 16	1	„	„ 52
1	„	„ 17	2	„	„ 54



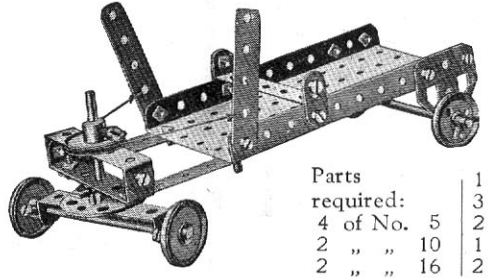
Model No. 135 Stretcher

Parts required:

2	of No.	1	10	of No.	37
2	„	„ 2	2	„	„ 48A
6	„	„ 5	1	„	„ 52



Model No. 136 Steering Truck



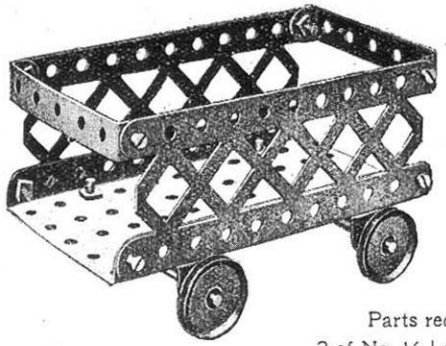
Parts required:

4	of No.	5	1	of No.	17
2	„	„ 10	3	„	„ 22
2	„	„ 16	2	„	„ 22A
			1	„	„ 24
			2	„	„ 35
			18	of No.	37
			2	„	„ 38
			4	„	„ 48A
			1	„	„ 52
			2	„	„ 126A

HOW TO CONTINUE

This completes the Models which may be made with MECCANO Outfit No. 1. 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. 1A Accessory Outfit, the price of which will be found in the List at the end of the Manual.

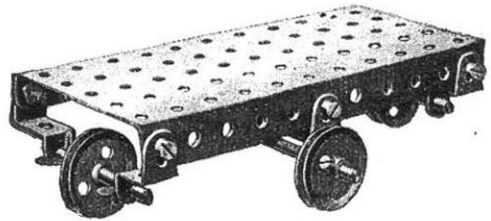
Model No. 201
Truck



Parts required :

2 of No. 16	4 of No. 48A
4 „ „ 22	1 „ „ 52
12 „ „ 37	2 „ „ 100

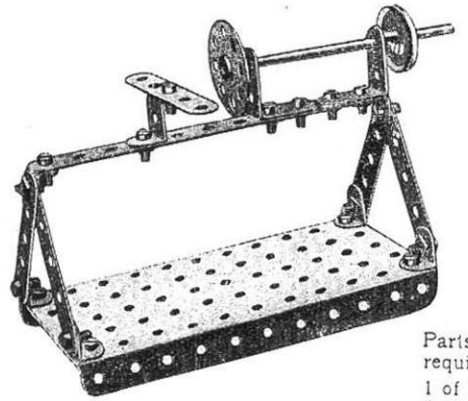
Model No. 202
Revolving Truck



Parts required :

2 of No. 10	2 of No. 22	6 of No. 37
1 „ „ 16	2 „ „ 22A	1 „ „ 52
2 „ „ 17	4 „ „ 35	4 „ „ 125

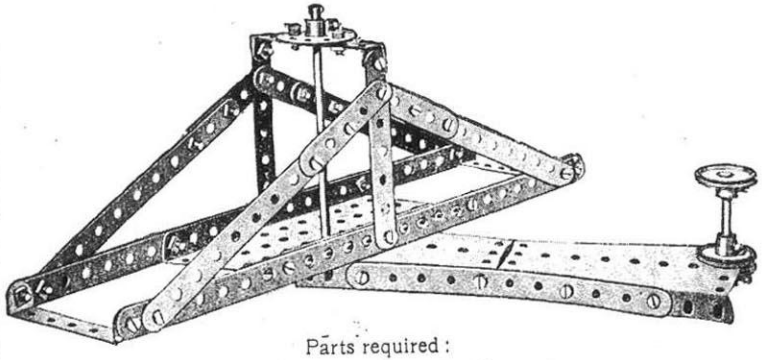
Model No. 203—Lathe



Parts required :

1 of No.	2
5 „ „	5
6 „ „	12
2 „ „	12A
1 „ „	16
1 „ „	22
1 „ „	24
17 „ „	37
1 „ „	52
1 „ „	125

Model No. 204—Turntable Gangway



Parts required :

2 of No. 1	4 of No. 22
6 „ „ 2	1 „ „ 24
2 „ „ 3	34 „ „ 37
4 „ „ 5	3 „ „ 48A
1 „ „ 15A	1 „ „ 52
1 „ „ 17	2 „ „ 54

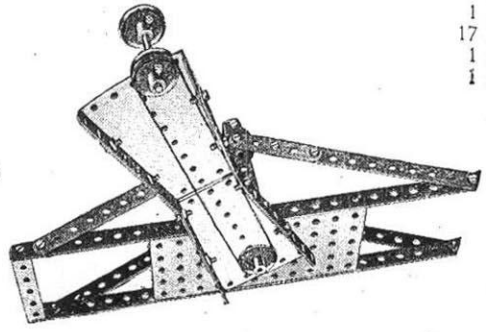
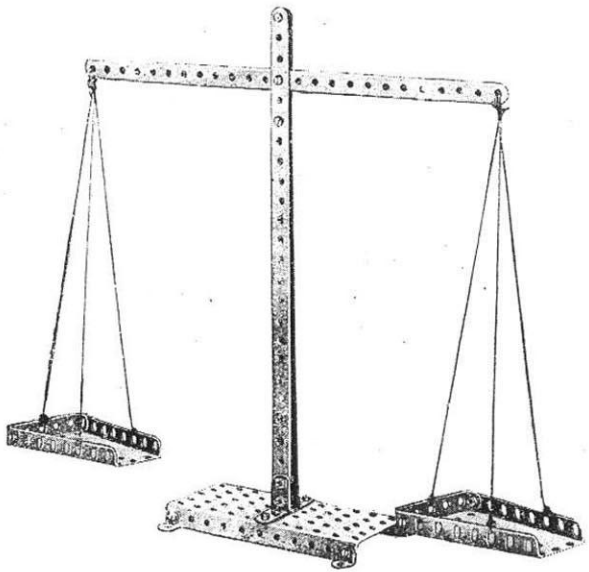


FIG. 204A
(underneath view)

The side frames of the gangway are made of 12½" strips bolted by means of 2½" bent strips to parallel strips below. The side frames are connected by a perforated flanged plate to the underside of which is bolted a bush wheel fitted with a rod on which is mounted a 1" pulley (See Fig. 204A.) The rod passes through one of the end holes of the sector plate which is connected by diagonal strips to another sector plate. Through the end hole of the latter a rod is threaded carrying two 1" pulleys from one of which an operating cord passes through the pulley mounted on the under side of the flat plate. In this way the Gangway may be rotated by an operating spindle.

Model No. 205—Scales



Parts required :

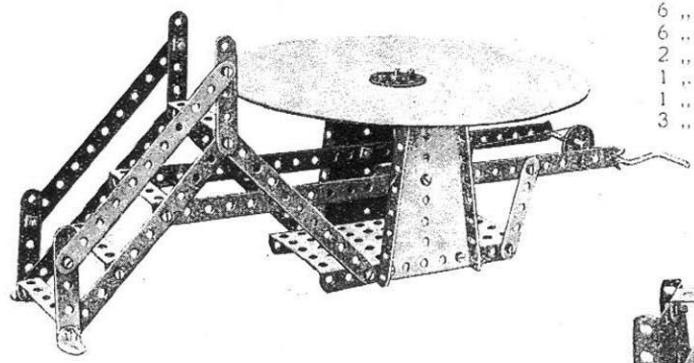
3 of No.	1	4 of No.	38
4 ,, ,,	12	2 ,, ,,	48A
2 ,, ,,	12A	1 ,, ,,	52
19 ,, ,,	37	2 ,, ,,	54

The slot is formed by inserting 2 washers in the bolts above and below the beam. These washers hold the strips composing the standard at the required distance apart to give the beam free play.

Model No. 206—Joy Wheel

Parts required :

2 of No.	1	1 of No.	22A
6 ,, ,,	2	1 ,, ,,	24
6 ,, ,,	5	2 ,, ,,	35
2 ,, ,,	12	28 ,, ,,	37
1 ,, ,,	15A	5 ,, ,,	48A
1 ,, ,,	19	1 ,, ,,	52
3 ,, ,,	22	2 ,, ,,	54



The driving mechanism and construction of the framework of this model are clearly brought out in Fig. 206A. Cut out a circular piece of cardboard, 8" in diameter, and in the centre of the disc fix a bush wheel by nuts and bolts. The eye of the bush wheel is then threaded over the top of a vertical spindle, and secured by its set-screw.

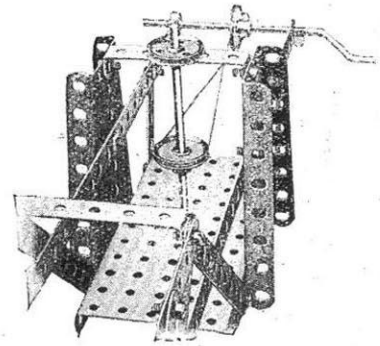
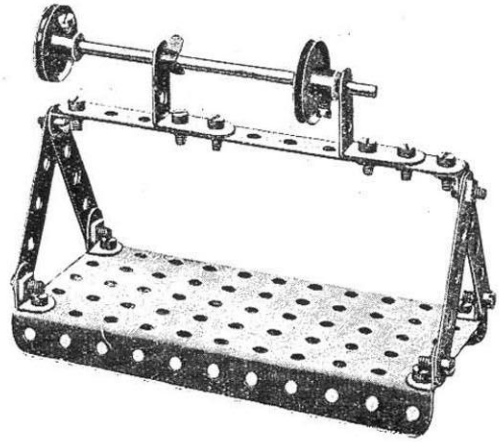


FIG. 206A.

Model No. 207
Polishing Spindle



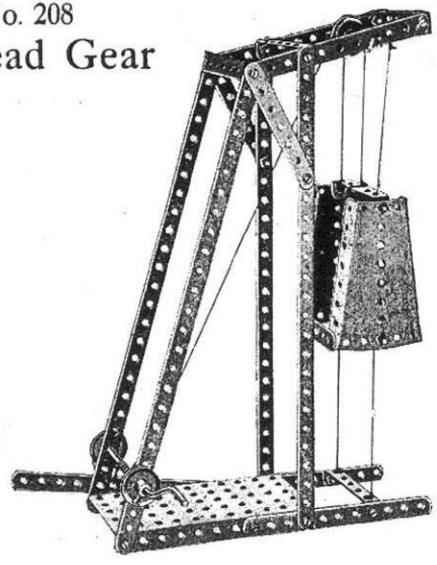
Parts required :

1 of No.	2	1 of No.	15A
4 ,, ,,	5	2 ,, ,,	22
6 ,, ,,	12	1 ,, ,,	35
2 ,, ,,	12A	16 ,, ,,	37
		1 ,, ,,	52

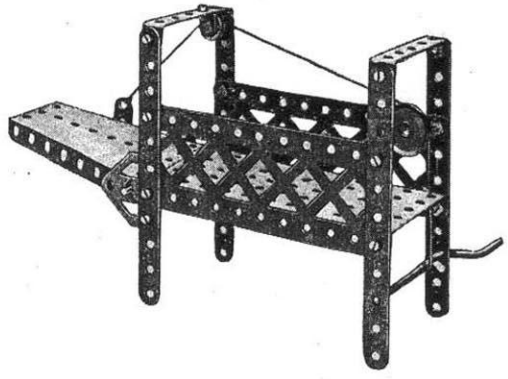
Model No. 208
Pit Head Gear

Parts required :

4	of No.	1
5	,, ,,	2
2	,, ,,	3
2	,, ,,	5
2	,, ,,	12
1	,, ,,	16
1	,, ,,	19
3	,, ,,	22
2	,, ,,	35
25	,, ,,	37
5	,, ,,	48A
1	,, ,,	52
2	,, ,,	54



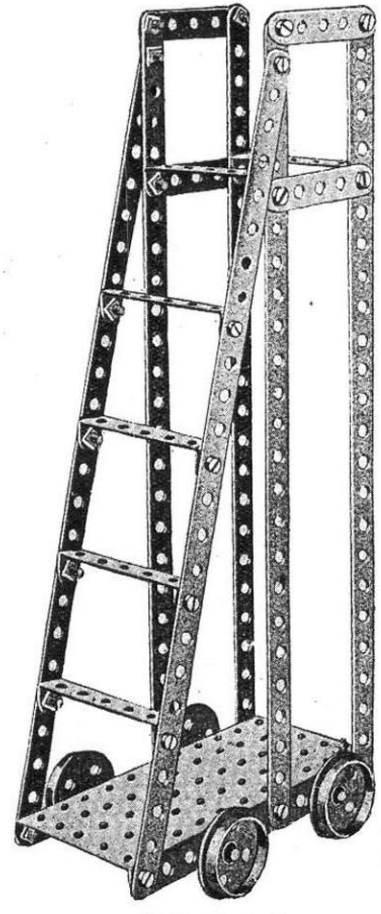
Model No. 209
Gangway



Parts required :

4	of No.	2	1	of No.	22	1	of No.	52
1	,, ,,	10	1	,, ,,	23	1	,, ,,	54
1	,, ,,	12	4	,, ,,	35	2	,, ,,	100
1	,, ,,	16	17	,, ,,	37	2	,, ,,	126A
1	,, ,,	19	2	,, ,,	48A			

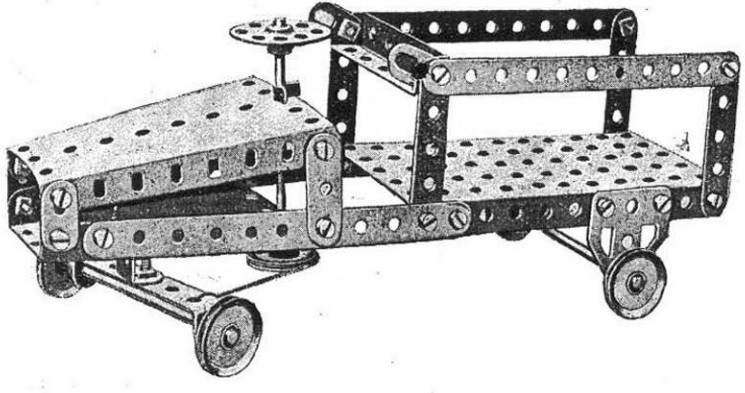
Model No. 210
Ladder on Wheels



Parts required :

6	of No.	1	24	of No.	37
4	,, ,,	5	6	,, ,,	48A
2	,, ,,	16	1	,, ,,	52
4	,, ,,	20			

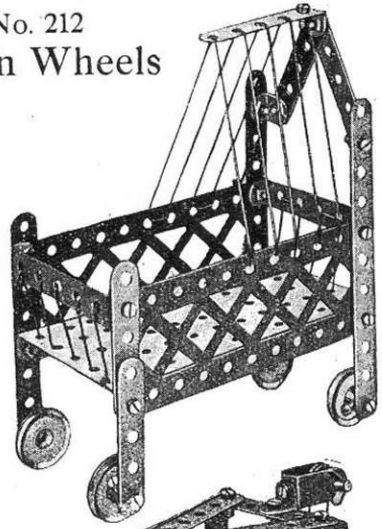
Model No. 211—Motor Cart



Parts required :

4	of No.	2
4	,, ,,	5
2	,, ,,	6A
4	,, ,,	10
1	,, ,,	11
3	,, ,,	16
3	,, ,,	22
2	,, ,,	22A
1	,, ,,	24
3	,, ,,	35
26	,, ,,	37
3	,, ,,	48A
1	,, ,,	52
2	,, ,,	54
2	,, ,,	126A

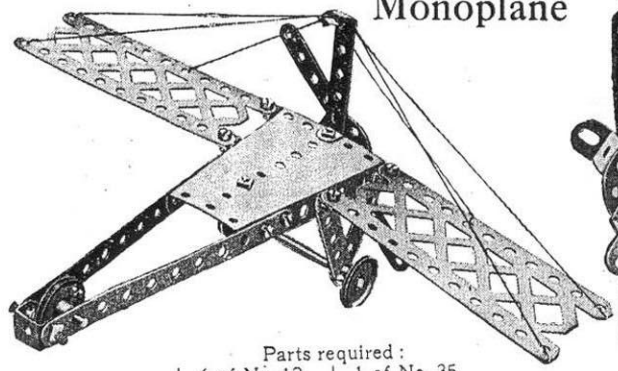
Model No. 212
Cot on Wheels



Parts required :

2 of No.	2
7 ,, ,,	5
3 ,, ,,	12
4 ,, ,,	22
18 ,, ,,	37
2 ,, ,,	48A
2 ,, ,,	100

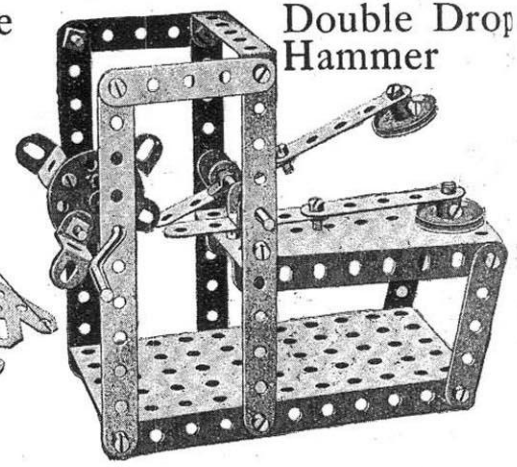
Model No 213
Monoplane



Parts required :

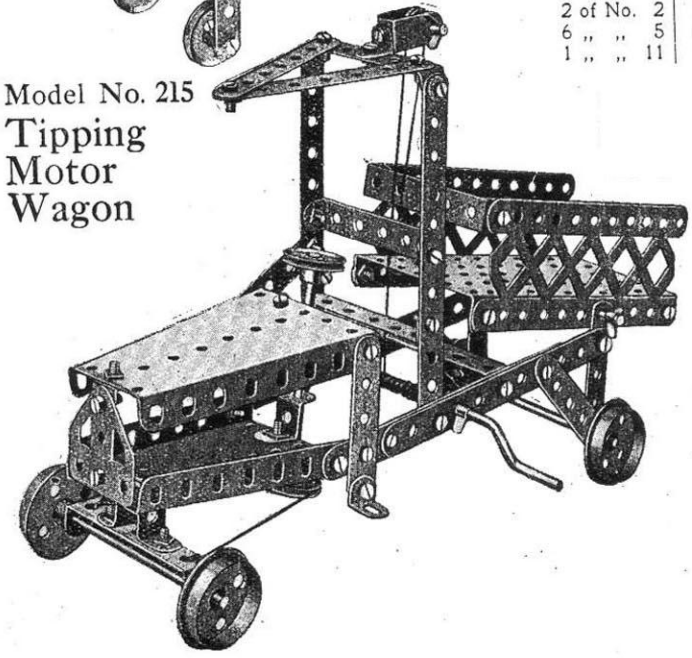
	6 of No. 12	1 of No. 35
	2 ,, ,, 16	18 ,, ,, 37
2 of No. 2	1 ,, ,, 18A	1 ,, ,, 48A
6 ,, ,, 5	3 ,, ,, 22	1 ,, ,, 54
1 ,, ,, 11	1 ,, ,, 24	2 ,, ,, 100

Model No. 214
Double Drop Hammer



Parts required :		
	1 of No. 16	25 of No. 37
	1 ,, ,, 19	2 ,, ,, 48A
4 of No. 2	2 ,, ,, 22	1 ,, ,, 52
8 ,, ,, 5	1 ,, ,, 24	1 ,, ,, 54
2 ,, ,, 11	6 ,, ,, 35	4 ,, ,, 125

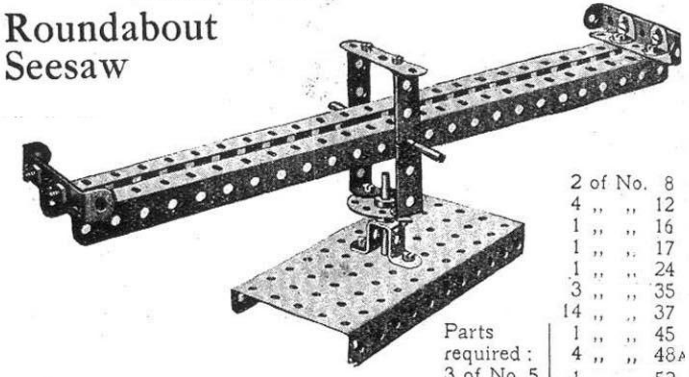
Model No. 215
Tipping Motor Wagon



Parts required :

6 of No.	2
2 ,, ,,	3
7 ,, ,,	5
1 ,, ,,	10
4 ,, ,,	12
4 ,, ,,	16
1 ,, ,,	18A
1 ,, ,,	19
4 ,, ,,	20
2 ,, ,,	22
1 ,, ,,	23
7 ,, ,,	35
43 ,, ,,	37
2 ,, ,,	38
1 ,, ,,	44
1 ,, ,,	45
6 ,, ,,	48A
1 ,, ,,	52
2 ,, ,,	54
2 ,, ,,	100
2 ,, ,,	125
1 ,, ,,	126A

Model No. 216
Roundabout Seesaw

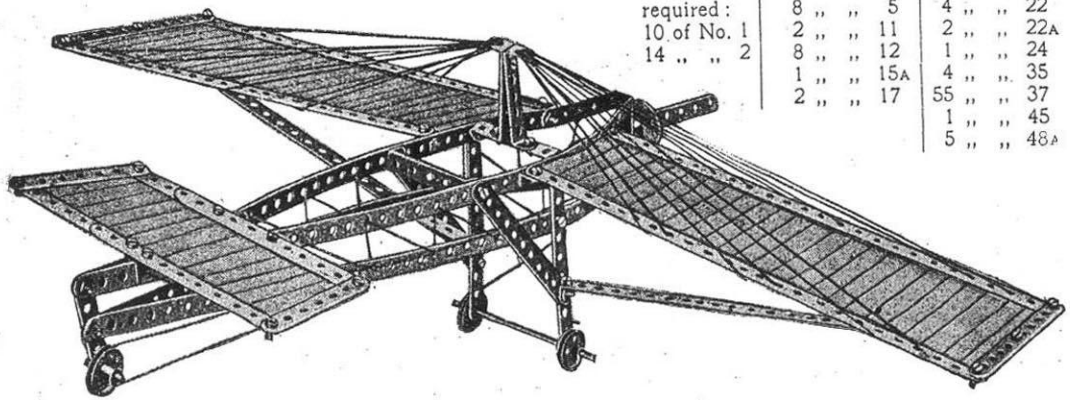


Parts required : 3 of No 5	
	2 of No. 8
	4 ,, ,, 12
	1 ,, ,, 16
	1 ,, ,, 17
	1 ,, ,, 24
	3 ,, ,, 35
	14 ,, ,, 37
	1 ,, ,, 45
	4 ,, ,, 48A
	1 ,, ,, 52

Model No. 217—Monoplane

Parts required :

10 of No. 1	2 of No. 3	1 of No. 18A	
14 „ „ 2	8 „ „ 5	4 „ „ 22	
	2 „ „ 11	2 „ „ 22A	
	8 „ „ 12	1 „ „ 24	
	1 „ „ 15A	4 „ „ 35	
	2 „ „ 17	55 „ „ 37	
		1 „ „ 45	
		5 „ „ 48A	



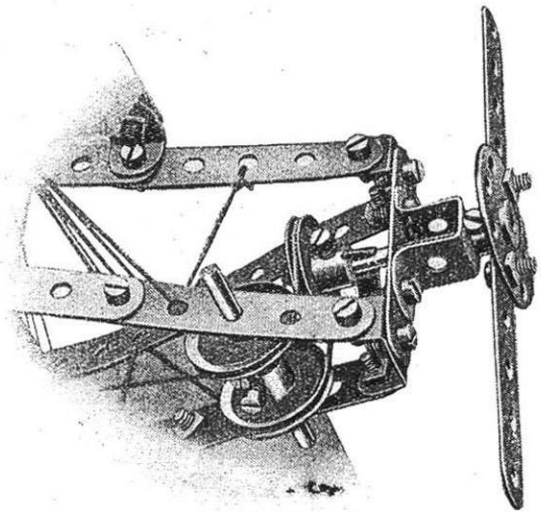
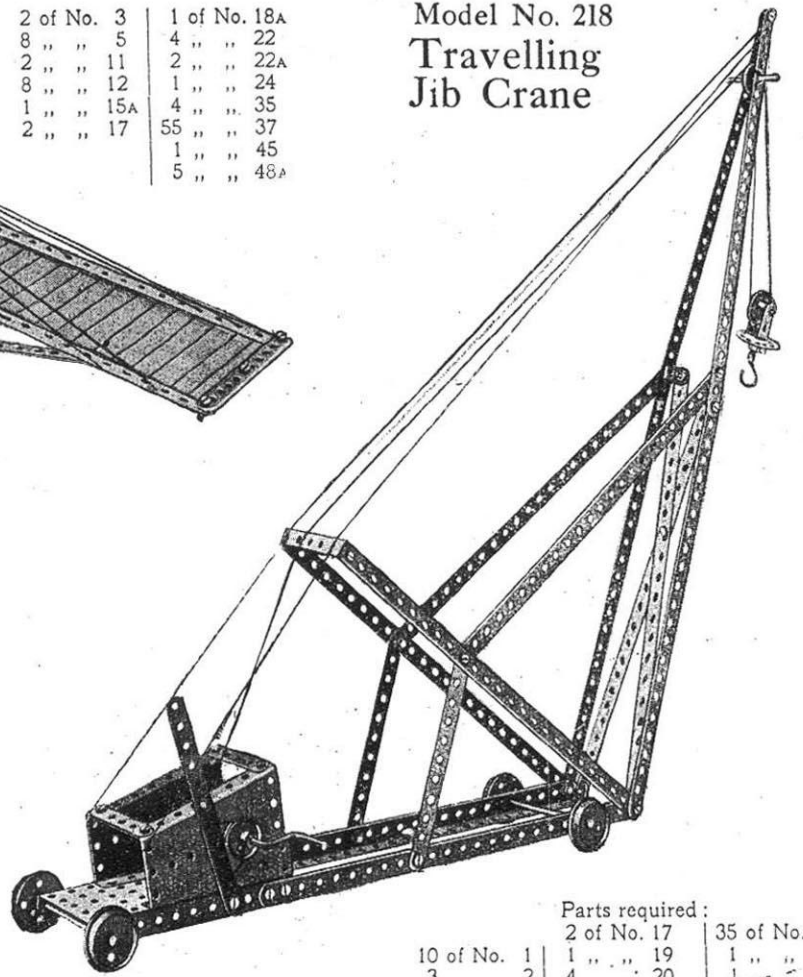


FIG. 217A

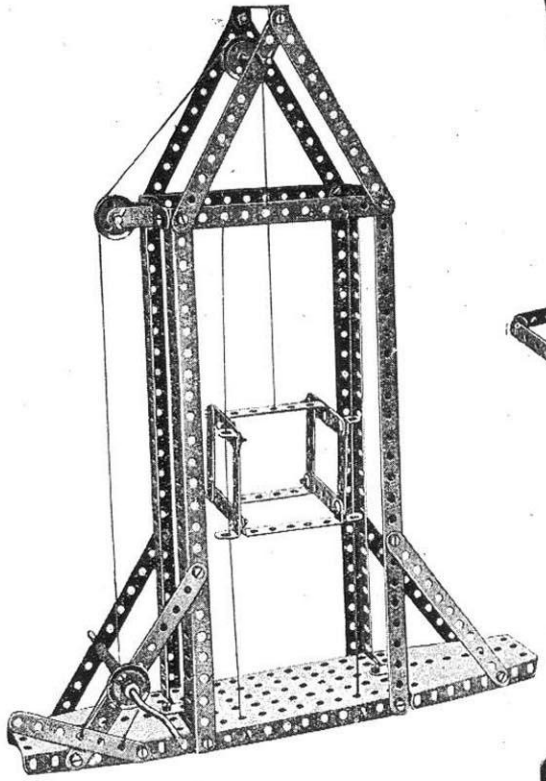
Model No. 218
Travelling Jib Crane



Parts required :

10 of No. 1	2 of No. 17	35 of No. 37	
3 „ „ 2	1 „ „ 19	1 „ „ 44	
3 „ „ 5	4 „ „ 20	1 „ „ 48A	
2 „ „ 8	2 „ „ 22	1 „ „ 52	
4 „ „ 12	1 „ „ 22A	2 „ „ 54	
2 „ „ 16	1 „ „ 24	1 „ „ 57	
	5 „ „ 35		

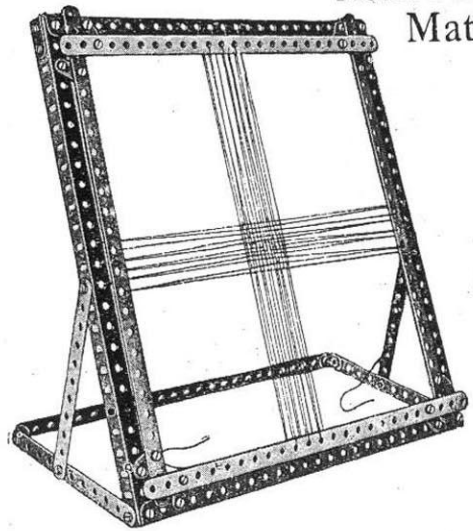
Model No. 219
Elevator



Parts required :

10 of No. 2	1 of No. 16	
1 ,, ,, 3	1 ,, ,, 18A	38 of No. 37
10 ,, ,, 5	1 ,, ,, 19	1 ,, ,, 44
4 ,, ,, 8	1 ,, ,, 22	4 ,, ,, 48A
2 ,, ,, 10	2 ,, ,, 22A	1 ,, ,, 52
4 ,, ,, 12	5 ,, ,, 35	2 ,, ,, 54

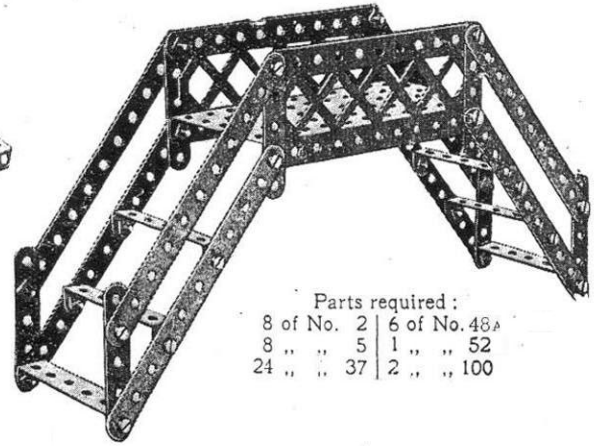
Model No. 220
Mat Frame



Parts required :

5 of No. 1
4 ,, ,, 2
4 ,, ,, 8
8 ,, ,, 10
2 ,, ,, 12
2 ,, ,, 12A
36 ,, ,, 37

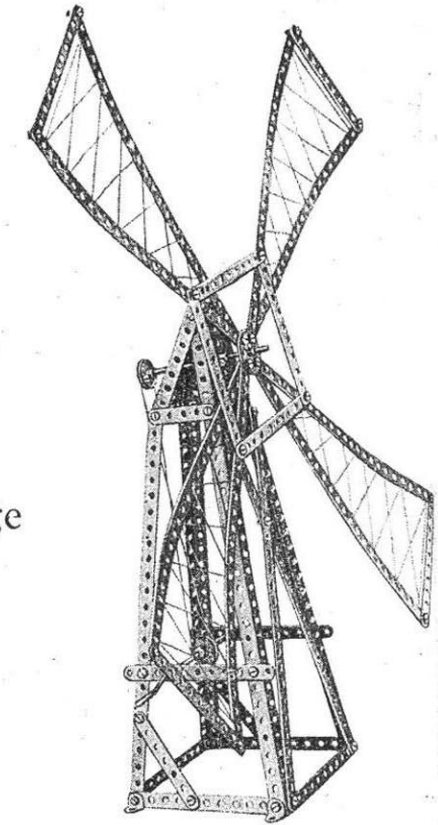
Model No. 222—High-level Bridge



Parts required :

8 of No. 2	6 of No. 48A
8 ,, ,, 5	1 ,, ,, 52
24 ,, ,, 37	2 ,, ,, 100

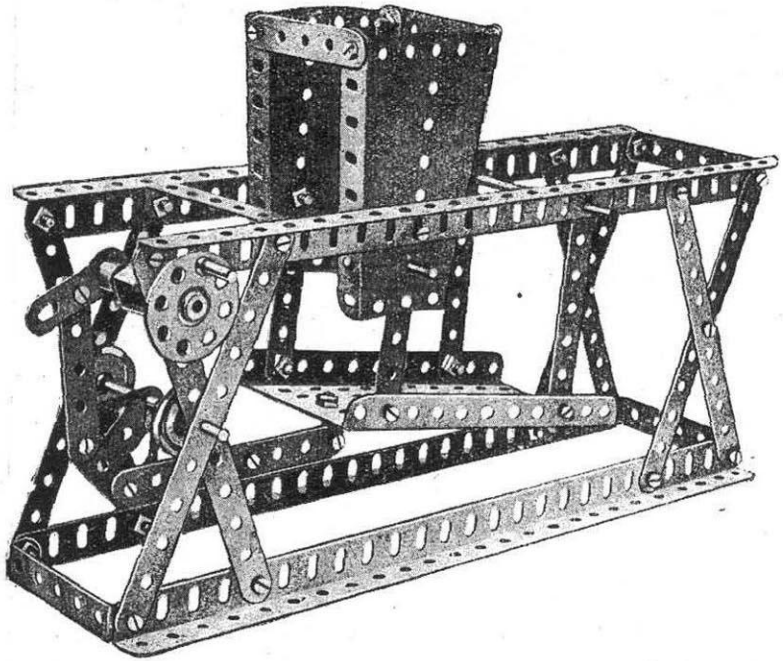
Model No. 221
Windmill



Parts required :

4 of No. 8	
10 of No. 1	4 ,, ,, 12	1 of No. 24
14 ,, ,, 2	1 ,, ,, 15	4 ,, ,, 35
2 ,, ,, 3	1 ,, ,, 19	45 ,, ,, 37
2 ,, ,, 5	2 ,, ,, 22	2 ,, ,, 54

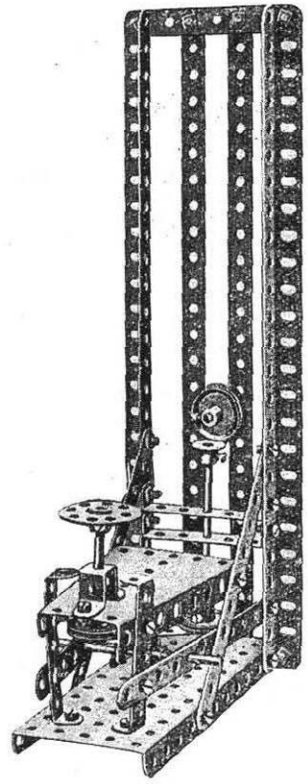
Model No. 223—Coal Sifter



Parts required :

8 of No.	2
2 ,, ,,	3
7 ,, ,,	5
4 ,, ,,	8
1 ,, ,,	12
3 ,, ,,	16
1 ,, ,,	17
2 ,, ,,	22
1 ,, ,,	24
6 ,, ,,	35
38 ,, ,,	37
1 ,, ,,	45
4 ,, ,,	48A
1 ,, ,,	52
2 ,, ,,	54
1 ,, ,,	62
1 ,, ,,	115
1 ,, ,,	126A

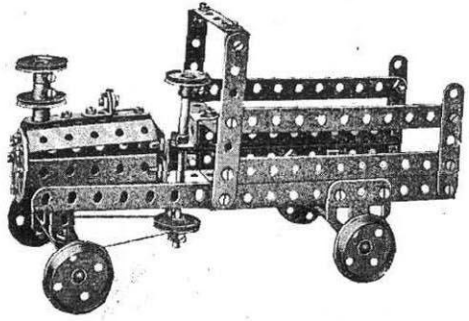
Model No. 224
Try-your-strength Machine



Parts required :

2 of No.	1	1 of No.	17	12 of No.	38
5 ,, ,,	2	1 ,, ,,	18A	1 ,, ,,	45
2 ,, ,,	3	4 ,, ,,	22	4 ,, ,,	48A
2 ,, ,,	8	1 ,, ,,	24	1 ,, ,,	52
1 ,, ,,	11	4 ,, ,,	35	1 ,, ,,	54
2 ,, ,,	16	30 ,, ,,	37	1 ,, ,,	126A

Model No. 225—Locomotive

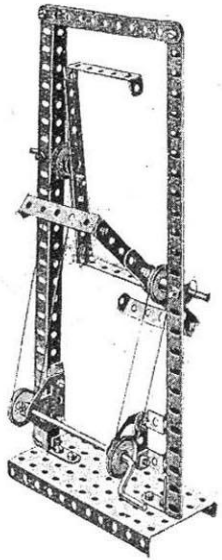


Parts required :

4 of No.	2	1 of No.	24
2 ,, ,,	3	2 ,, ,,	35
6 ,, ,,	5	47 ,, ,,	37
3 ,, ,,	10	1 ,, ,,	45
7 ,, ,,	12	6 ,, ,,	48A
3 ,, ,,	16	1 ,, ,,	52
1 ,, ,,	17	1 ,, ,,	54
4 ,, ,,	20	1 ,, ,,	62
4 ,, ,,	22	2 ,, ,,	125
1 ,, ,,	23	2 ,, ,,	126A

Model No. 226

Candy Puller



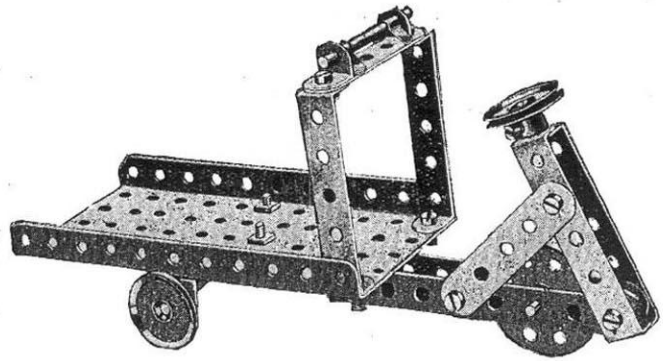
Parts required :

3	of No. 2
2	„ „ 8
2	„ „ 12
2	„ „ 12A
2	„ „ 17
1	„ „ 19
4	„ „ 22
2	„ „ 35
26	„ „ 37
10	„ „ 38
4	„ „ 48A
1	„ „ 52
2	„ „ 62
4	„ „ 125
2	„ „ 126

Model No. 227—Carrier Tricycle

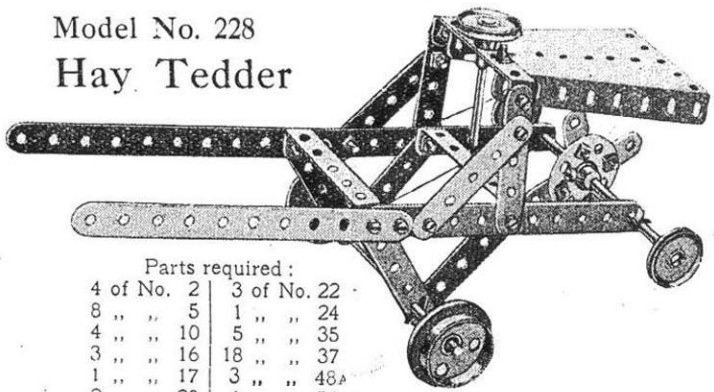
Parts required :

2	of No. 2
3	„ „ 5
1	„ „ 11
2	„ „ 12
1	„ „ 16
1	„ „ 17
1	„ „ 18A
3	„ „ 22
1	„ „ 24
2	„ „ 35
15	„ „ 37
5	„ „ 48A
1	„ „ 52



Model No. 228

Hay Tedder

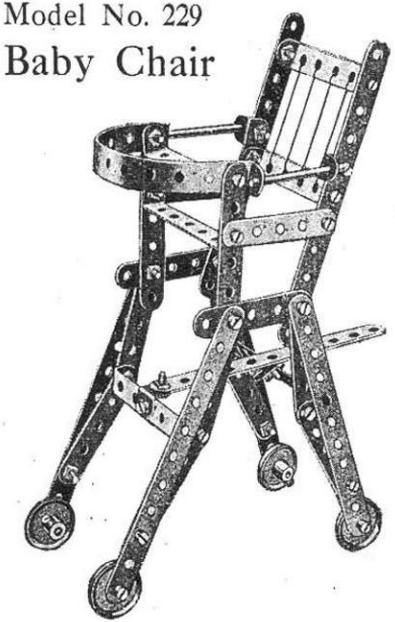


Parts required :

4	of No. 2	3	of No. 22
8	„ „ 5	1	„ „ 24
4	„ „ 10	5	„ „ 35
3	„ „ 16	18	„ „ 37
1	„ „ 17	3	„ „ 48A
2	„ „ 20	1	„ „ 54

Model No. 229

Baby Chair



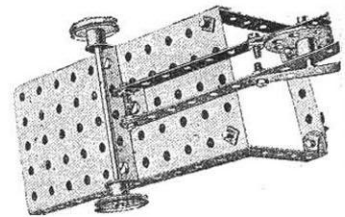


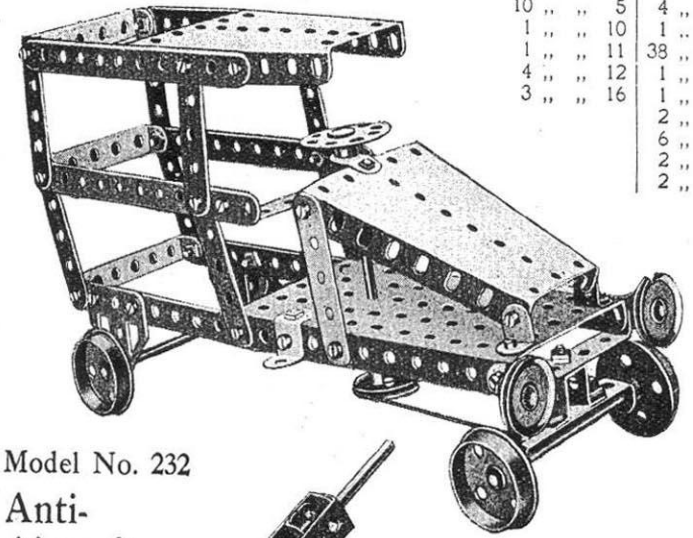
FIG. 227A

Carrier Tricycle, underneath view

Parts required :

8	of No. 2
2	„ „ 3
12	„ „ 5
6	„ „ 12
2	„ „ 17
4	„ „ 22
31	„ „ 37
6	„ „ 48A

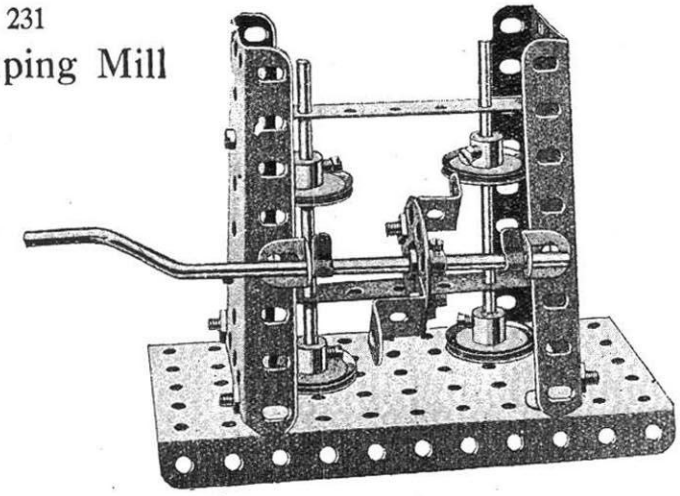
Model No. 230—Motor Van



Parts required :

6 of No.	2	4 of No.	20
10 ,, ,,	5	4 ,, ,,	22
1 ,, ,,	10	1 ,, ,,	24
1 ,, ,,	11	38 ,, ,,	37
4 ,, ,,	12	1 ,, ,,	44
3 ,, ,,	16	1 ,, ,,	52
		2 ,, ,,	54
		6 ,, ,,	48A
		2 ,, ,,	125
		2 ,, ,,	126A

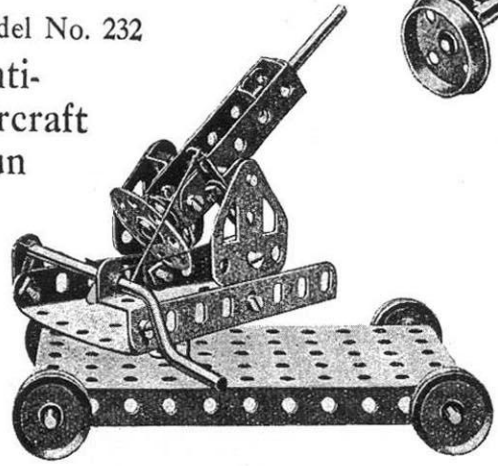
Model 231
Stamping Mill



Parts required :

2 of No.	3	4 of No.	22	1 of No.	52
10 ,, ,,	12	1 ,, ,,	24	2 ,, ,,	54
2 ,, ,,	16	2 ,, ,,	35	2 ,, ,,	125
1 ,, ,,	19	16 ,, ,,	37		

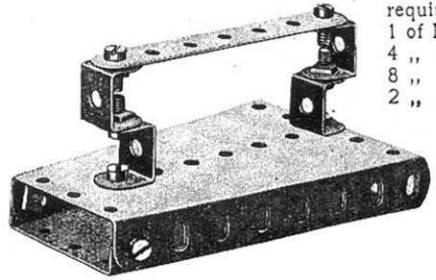
Model No. 232
Anti-Aircraft Gun



Parts required :

5 of No.	10	4 of No.	22	1 of No.	52
2 ,, ,,	11	1 ,, ,,	24	1 ,, ,,	54
2 ,, ,,	16	4 ,, ,,	35	4 ,, ,,	125
2 ,, ,,	17	12 ,, ,,	37	2 ,, ,,	126A
1 ,, ,,	19	2 ,, ,,	48A		

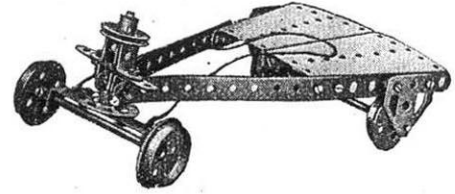
Model No. 233
Smoothing Iron



Parts required :

1 of No.	3	
4 ,, ,,	11	
8 ,, ,,	37	
2 ,, ,,	54	

Model No. 234
Coaster

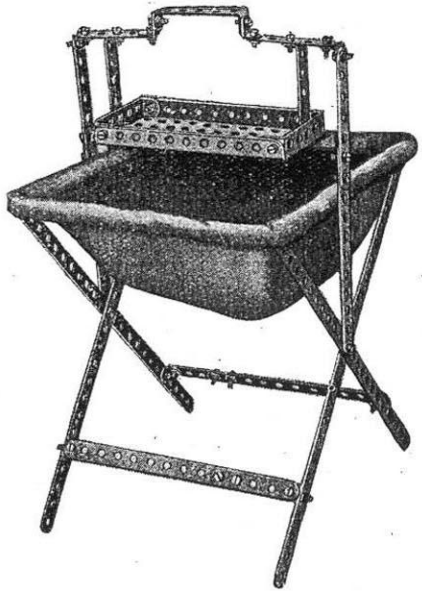


Parts required :

2 of No.	2	1 of No.	17	6 of No.	38
1 ,, ,,	5	4 ,, ,,	20	1 ,, ,,	45
2 ,, ,,	12	1 ,, ,,	22	1 ,, ,,	48A
1 ,, ,,	15	1 ,, ,,	24	2 ,, ,,	54
1 ,, ,,	16	16 ,, ,,	37	2 ,, ,,	126A

Model No. 235

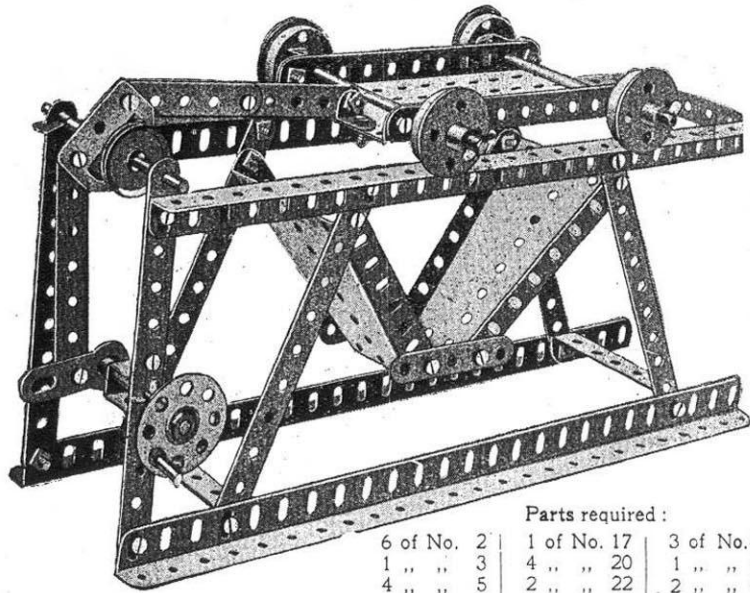
Needlework Basket



Parts required :

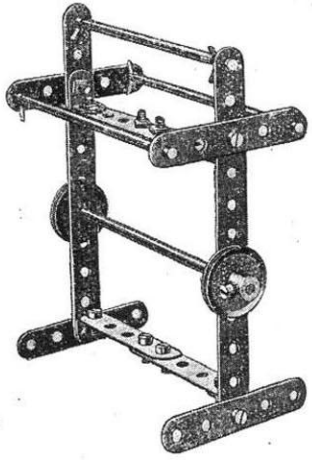
6	of No.	1
6	,, ,,	2
2	,, ,,	3
6	,, ,,	5
12	,, ,,	12
46	,, ,,	37
3	,, ,,	48A
1	,, ,,	52

Model No. 236 -Sifter



Parts required :

6	of No.	2	1	of No.	17	3	of No.	48A
1	,, ,,	3	4	,, ,,	20	1	,, ,,	52
4	,, ,,	5	2	,, ,,	22	2	,, ,,	54
4	,, ,,	8	1	,, ,,	24	1	,, ,,	62
1	,, ,,	12	7	,, ,,	35	1	,, ,,	115
2	,, ,,	15	34	,, ,,	37	4	,, ,,	125
1	,, ,,	16	1	,, ,,	45	1	,, ,,	126A



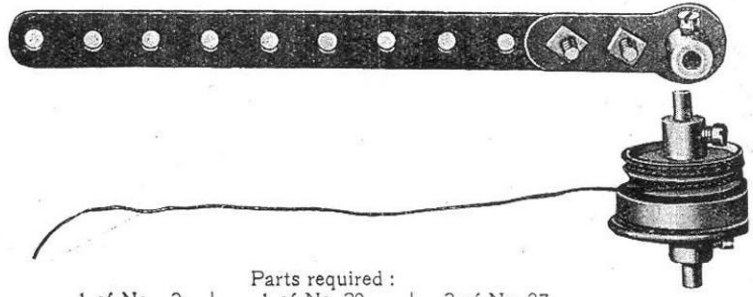
Model No. 237

Towel Rail

Parts required :

2	of No.	2
8	,, ,,	5
4	,, ,,	12
1	,, ,,	15
4	,, ,,	16
2	,, ,,	22
6	,, ,,	35
12	,, ,,	37

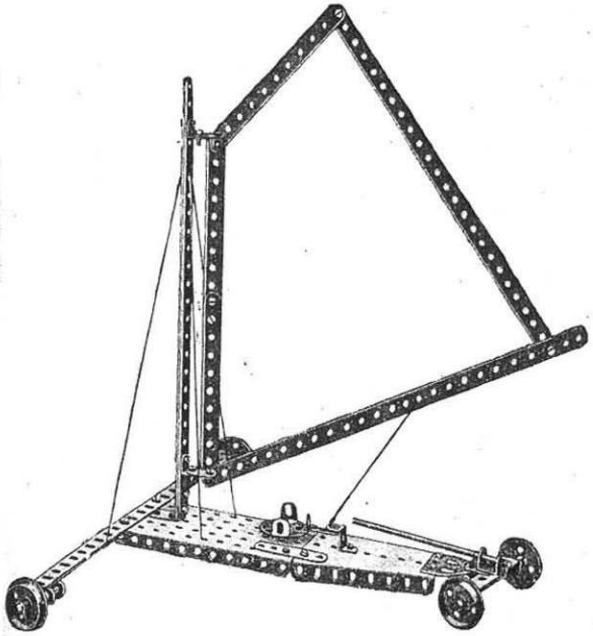
Model No. 238—Spinning Top



Parts required :

1 of No. 2	1 of No. 20	2 of No. 37
1 ,, ,, 17	2 ,, ,, 22	1 ,, ,, 62

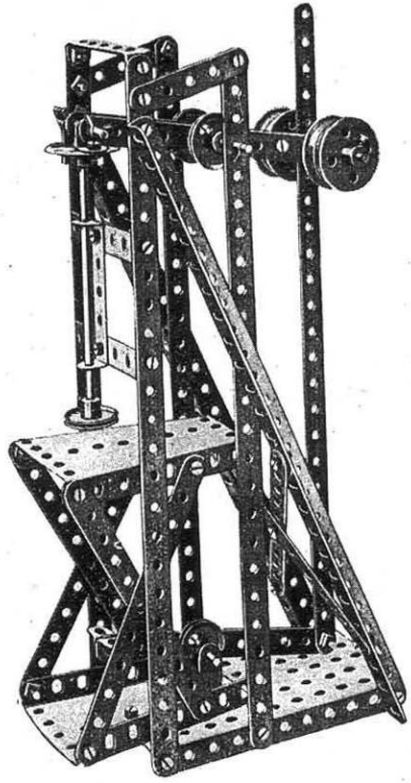
Model No. 239—Seashore Aeroplage



Parts required :

4 of No. 1	1 of No. 12A	33 of No. 37
3 „ „ 2	1 „ „ 15	1 „ „ 38
2 „ „ 5	1 „ „ 16	1 „ „ 48A
1 „ „ 8	2 „ „ 17	1 „ „ 52
3 „ „ 10	4 „ „ 20	1 „ „ 54
3 „ „ 11	1 „ „ 24	1 „ „ 125
7 „ „ 12	6 „ „ 35	1 „ „ 126A

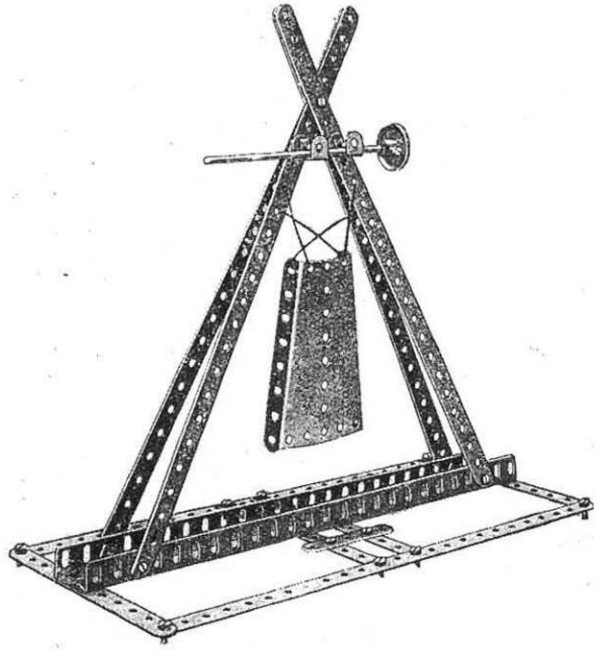
Model No. 240—Embossing Machine



Parts required :

5 of No. 1	2 of No. 16	44 of No. 37
9 „ „ 2	1 „ „ 17	1 „ „ 44
2 „ „ 5	1 „ „ 18A	4 „ „ 48A
2 „ „ 8	4 „ „ 20	1 „ „ 52
2 „ „ 11	4 „ „ 22	2 „ „ 54
4 „ „ 12	1 „ „ 24	
1 „ „ 15	4 „ „ 35	

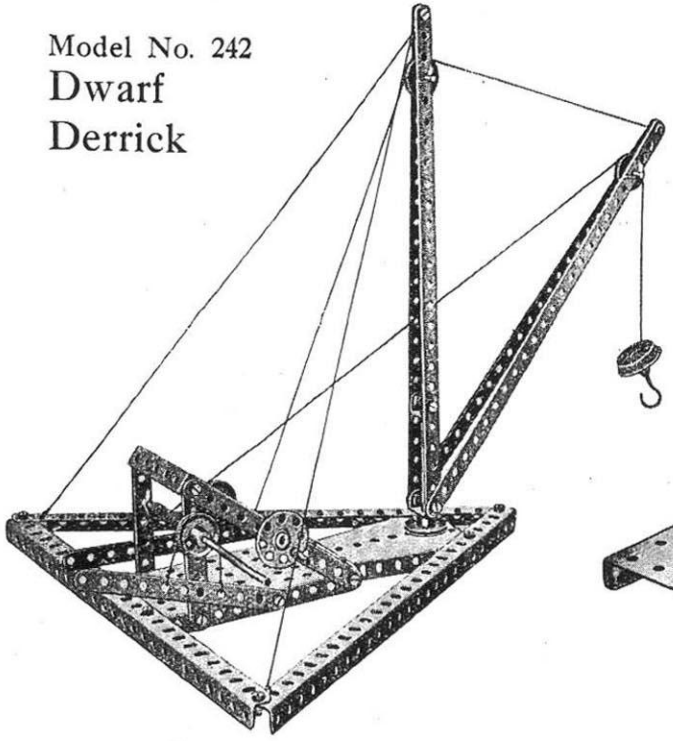
Model No. 241—Dinner Gong



Parts required :

6 of No. 1	1 of No. 15
4 „ „ 2	1 „ „ 22
2 „ „ 5	27 „ „ 37
2 „ „ 8	1 „ „ 54
2 „ „ 11	

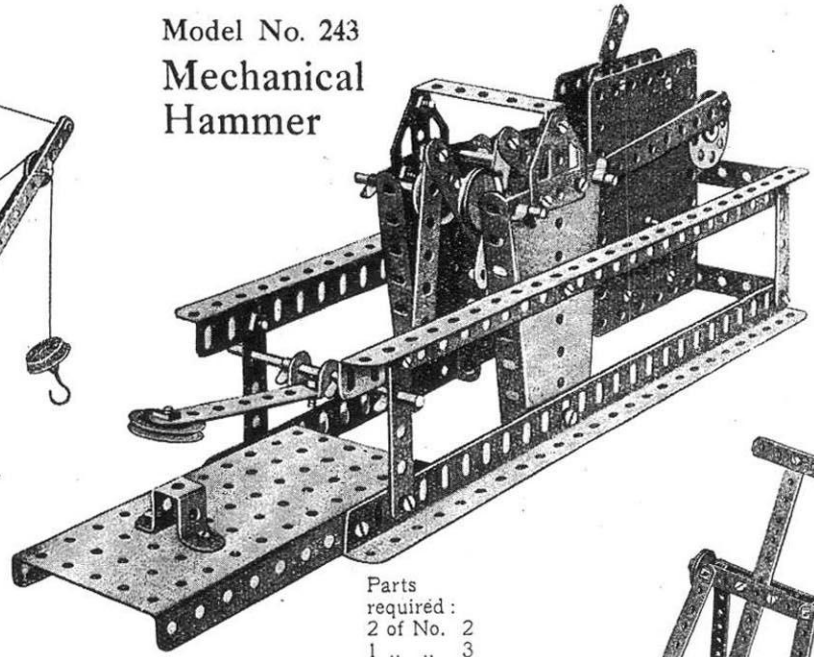
Model No. 242
Dwarf Derrick



Parts required :

4	of No. 1	2	of No. 22A
4	,, ,, 2	1	,, ,, 24
2	,, ,, 3	6	,, ,, 35
3	,, ,, 8	23	,, ,, 37
2	,, ,, 11	4	,, ,, 38
2	,, ,, 16	1	,, ,, 48A
2	,, ,, 18A	1	,, ,, 52
1	,, ,, 19	1	,, ,, 54
1	,, ,, 20	1	,, ,, 57
4	,, ,, 22	1	,, ,, 115

Model No. 243
Mechanical Hammer



Parts required :

2	of No. 2	1	,, ,, 126A
1	,, ,, 3	2	,, ,, 52
6	,, ,, 5	1	,, ,, 54
4	,, ,, 8	2	,, ,, 59
1	,, ,, 11	1	,, ,, 111
1	,, ,, 12	1	,, ,, 111A
3	,, ,, 16	1	,, ,, 125
4	,, ,, 22	1	,, ,, 126
1	,, ,, 22A		
1	,, ,, 24		
8	,, ,, 35		
32	,, ,, 37		
1	,, ,, 45		
3	,, ,, 48A		
1	,, ,, 52		
2	,, ,, 54		
2	,, ,, 126A		

Clockwork Motor.

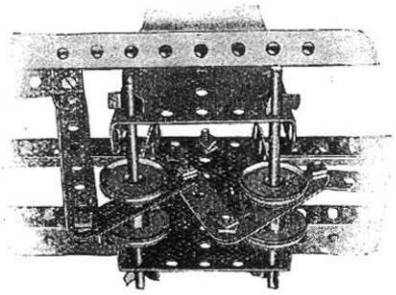
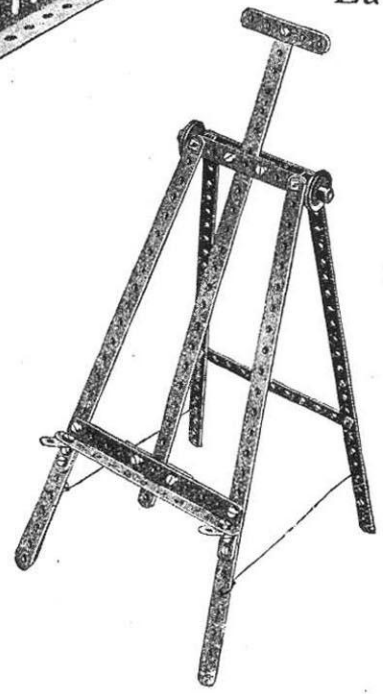


FIG. 243A.

Model No.
Easel



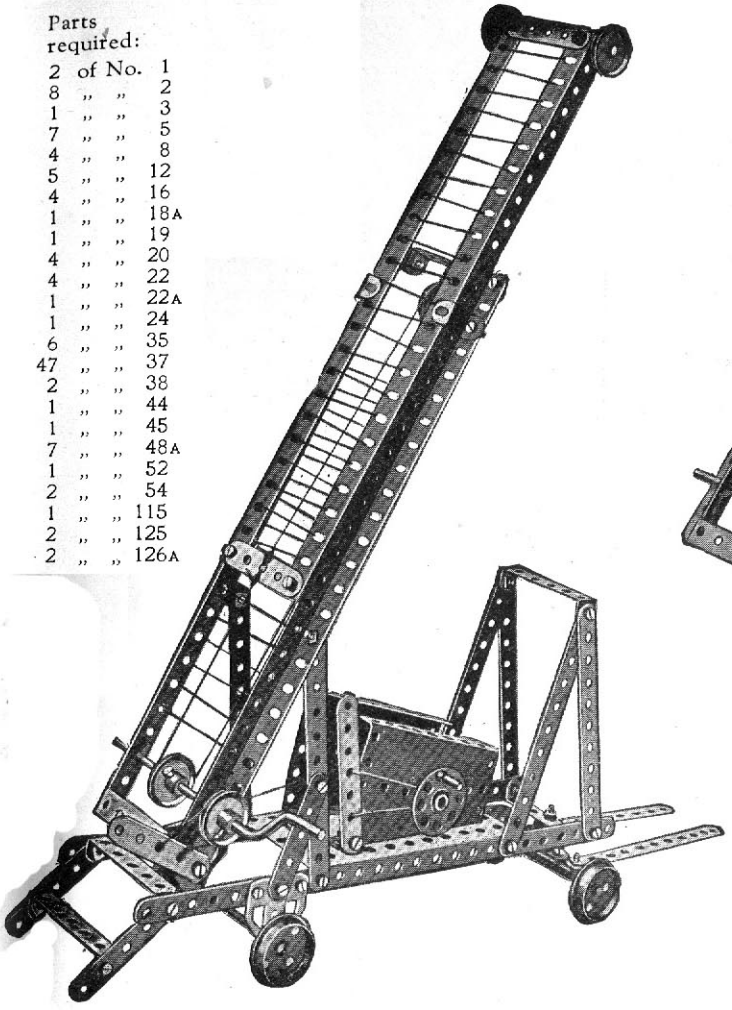
Parts required :

5	of No. 1	1	,, ,, 15
3	,, ,, 2	2	,, ,, 22
2	,, ,, 3	19	,, ,, 37
3	,, ,, 5	4	,, ,, 38
4	,, ,, 12		
2	,, ,, 12A		

Model No. 245 Extending Ladder on Running Carriage

Parts required:

2	of No.	1
8	„ „	2
1	„ „	3
7	„ „	5
4	„ „	8
5	„ „	12
4	„ „	16
1	„ „	18A
1	„ „	19
4	„ „	20
4	„ „	22
1	„ „	22A
1	„ „	24
6	„ „	35
47	„ „	37
2	„ „	38
1	„ „	44
1	„ „	45
7	„ „	48A
1	„ „	52
2	„ „	54
1	„ „	115
2	„ „	125
2	„ „	126A



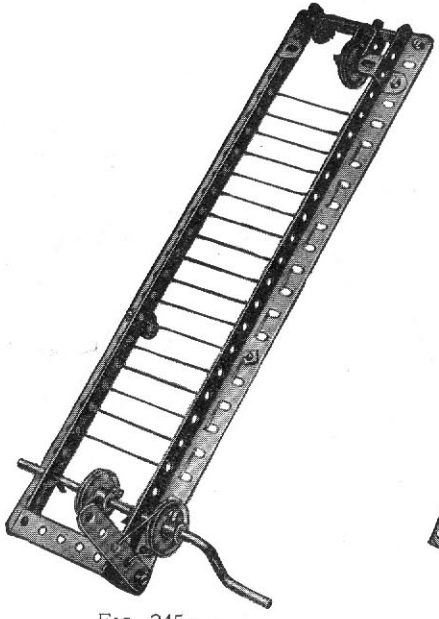


FIG. 245A

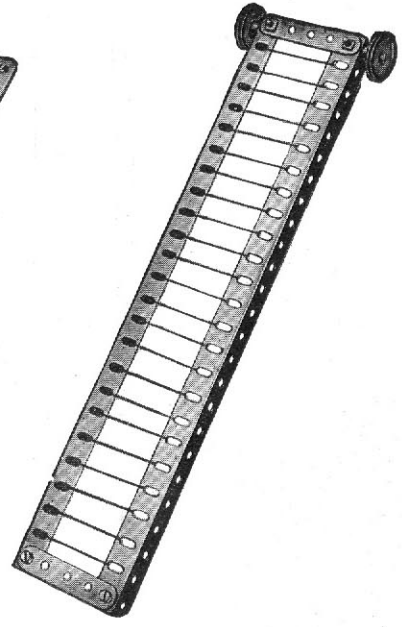
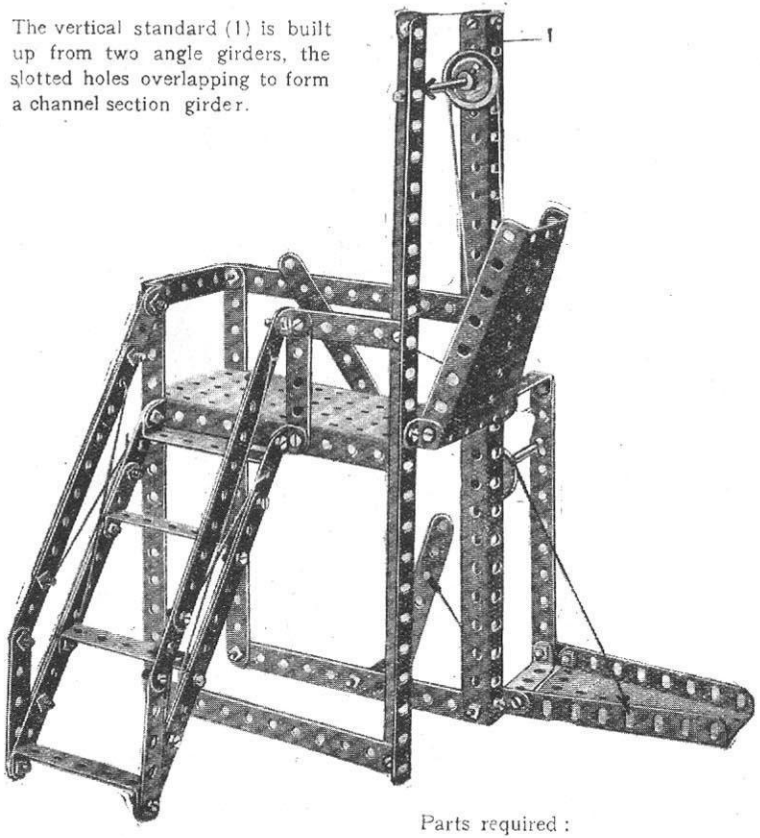


FIG. 245B

The bed of the lower carriage framework is formed by bolting two 12½" strips to the sides of a large flanged plate, and two sector plates bolted to the flanged plate by their flanges to form the sides, and a bearing for the spindle carrying the operating cord attached to the bottom of the ladder to raise it from a horizontal position; and the strips 1 form a support for the ladder when in this horizontal position. Angle brackets 2, Fig. 245A, form pivots for the lower part of the ladder, and are carried from the supports 3. The upper part of the ladder, Fig. 245, is slideably guided and retained on the lower ladder by reversed brackets 4. The extension of the ladder is effected by the cranked spindle round a pulley on which (and another pulley at the top of the framework) the cord is passed, the ends being secured to the lower part of the slideable ladder.

Model No. 246 Ferry Gangway

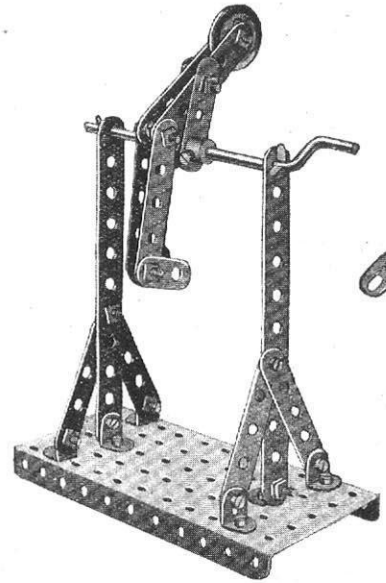
The vertical standard (1) is built up from two angle girders, the slotted holes overlapping to form a channel section girder.



Parts required :

14 of No. 2	6 of No. 12	1 of No. 45
2 ,, ,, 3	2 ,, ,, 16	8 ,, ,, 48A
6 ,, ,, 5	2 ,, ,, 22	1 ,, ,, 52
3 ,, ,, 8	2 ,, ,, 35	2 ,, ,, 54
2 ,, ,, 10	54 ,, ,, 37	

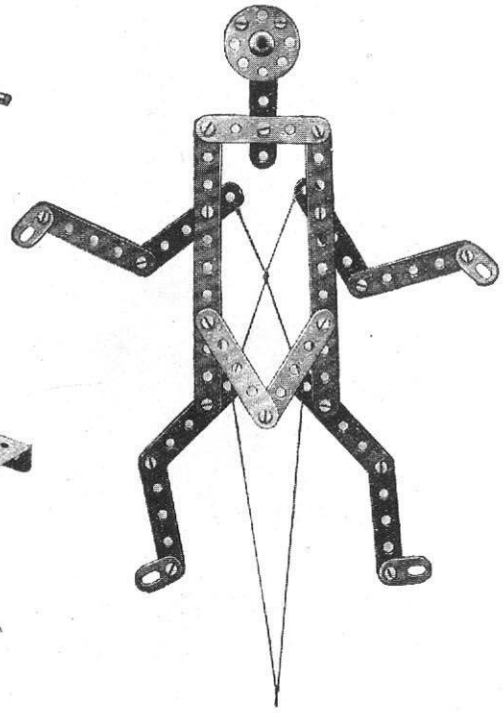
Model No. 247 The Acrobat



Parts required

2 of No. 2	1 of No. 22A
8 ,, ,, 5	2 ,, ,, 35
2 ,, ,, 10	21 ,, ,, 37
6 ,, ,, 12	1 ,, ,, 52
1 ,, ,, 19	2 ,, ,, 62

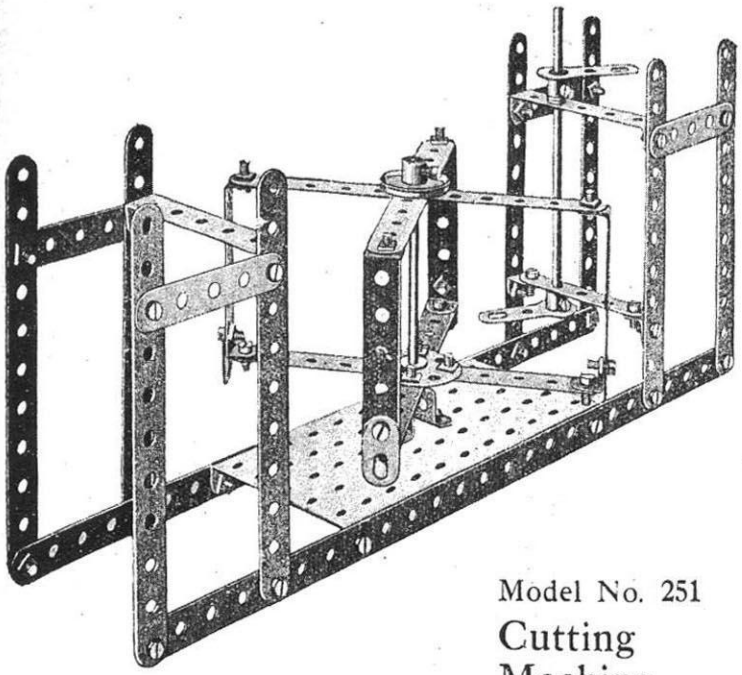
Model No. 248 Jumping Jack



Parts required :

2 of No. 2
12 ,, ,, 5
4 ,, ,, 10
1 ,, ,, 24
18 ,, ,, 37

Model No. 249 Turnstile



Parts required :

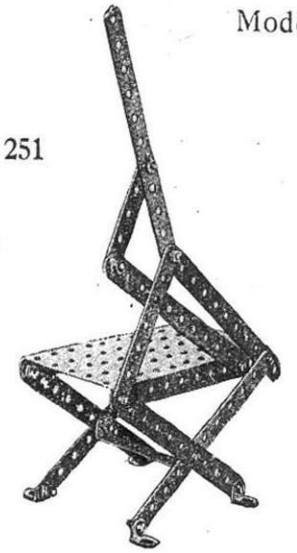
2 of No.	1	1 of No.	24
10 ,, ,,	2	42 ,, ,,	37
9 ,, ,,	5	2 ,, ,,	38
4 ,, ,,	10	1 ,, ,,	45
2 ,, ,,	12	6 ,, ,,	48A
1 ,, ,,	15	1 ,, ,,	52
1 ,, ,,	15A	2 ,, ,,	62
2 ,, ,,	22		

Model No. 250 Chair for Wounded

Parts required :

6 of No.	2
2 ,, ,,	3
10 ,, ,,	5
2 ,, ,,	11
2 ,, ,,	16
4 ,, ,,	22
21 ,, ,,	37
2 ,, ,,	48A
1 ,, ,,	52

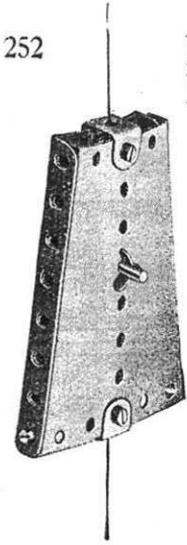
Model No. 251 Cutting Machine



Parts required :

7 of No.	2
1 ,, ,,	3
1 ,, ,,	5
4 ,, ,,	12
14 ,, ,,	37
1 ,, ,,	48A
1 ,, ,,	52

Model No. 252 Magic Sector Plates

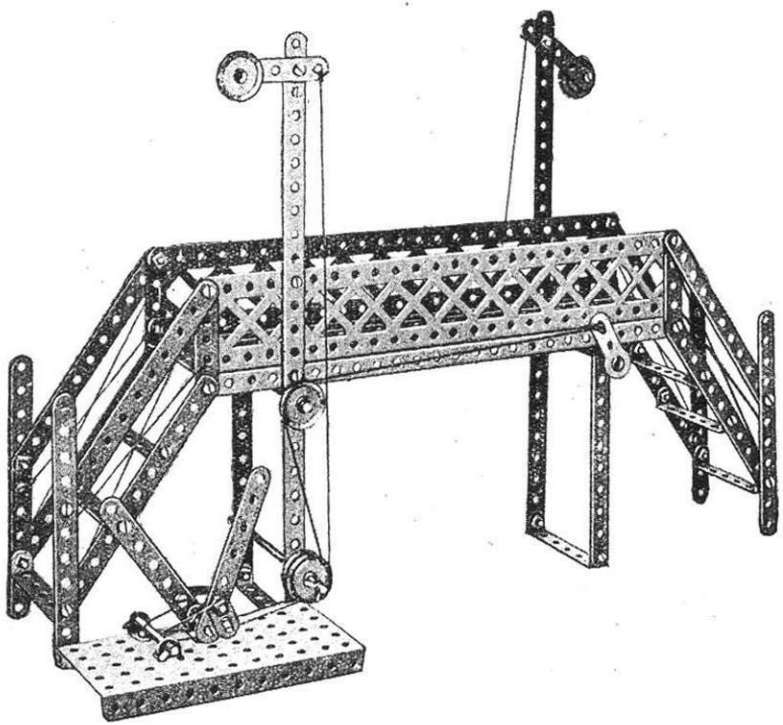


Parts required :

2 of No.	11
1 ,, ,,	17
2 ,, ,,	35
6 ,, ,,	37
2 ,, ,,	54

When the cord is held vertically the magic sector plates will fall or stop at the bidding of the owner. If the cord is held without tension the plates will fall, but the instant the cord is tightened they will stop dead. The cord is wrapped once around the rod which passes through the centre holes of the sector plates.

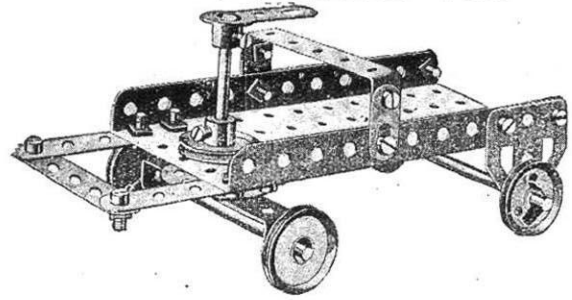
Model No. 253
Railway Foot Bridge and Signals



Parts required :

4 of No. 1	1 of No. 11	2 of No. 22A
14 ,, ,, 2	2 ,, ,, 12	6 ,, ,, 35
2 ,, ,, 3	1 ,, ,, 15A	50 ,, ,, 37
8 ,, ,, 5	2 ,, ,, 16	8 ,, ,, 48A
2 ,, ,, 8	1 ,, ,, 17	1 ,, ,, 52
2 ,, ,, 10	3 ,, ,, 22	1 ,, ,, 62

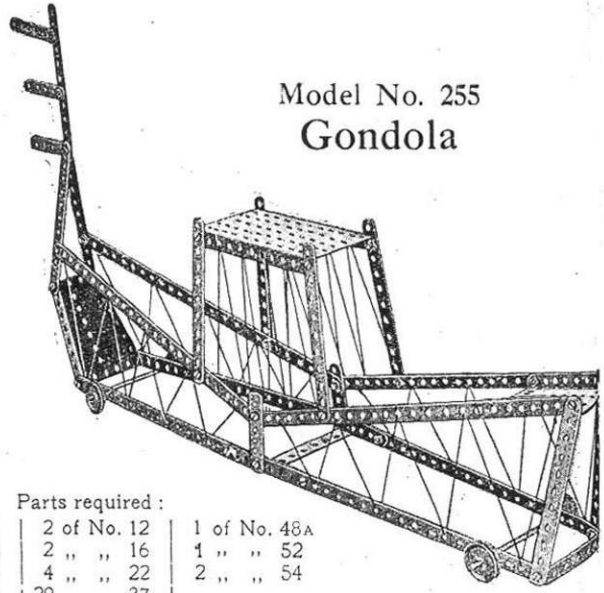
Model No. 254 Motor Van



Parts required :

3 of No. 5	2 of No. 22A	2 of No. 48A
2 ,, ,, 10	1 ,, ,, 24	1 ,, ,, 52
2 ,, ,, 16	2 ,, ,, 35	1 ,, ,, 62
1 ,, ,, 17	16 ,, ,, 37	2 ,, ,, 126A
3 ,, ,, 22	2 ,, ,, 38	

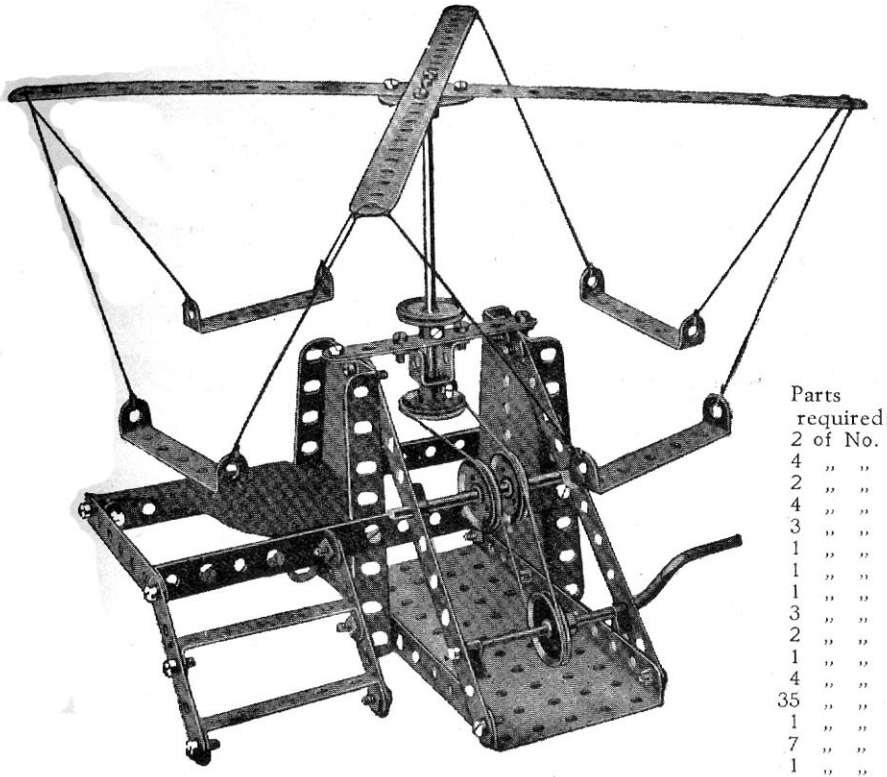
Model No. 255
Gondola



Parts required :

8 of No. 1	2 of No. 12	1 of No. 48A
9 ,, ,, 2	2 ,, ,, 16	1 ,, ,, 52
1 ,, ,, 3	4 ,, ,, 22	2 ,, ,, 54
5 ,, ,, 5	29 ,, ,, 37	

Model No. 256 Roundabout



Parts required:

2	of	No.	1
4	„	„	2
2	„	„	3
4	„	„	5
3	„	„	12
1	„	„	15
1	„	„	16
1	„	„	19
3	„	„	22
2	„	„	22A
1	„	„	24
4	„	„	35
35	„	„	37
1	„	„	45
7	„	„	48A
1	„	„	52
2	„	„	54

Model No. 257 Beam Scales

Parts required:

5	of	No.	1
6	„	„	2
7	„	„	5
4	„	„	8
6	of	No.	12
2	„	„	17
2	„	„	22A
6	„	„	35
48	„	„	37
5	of	No.	48A
1	„	„	52
2	„	„	54
2	„	„	126A

HOW TO CONTINUE

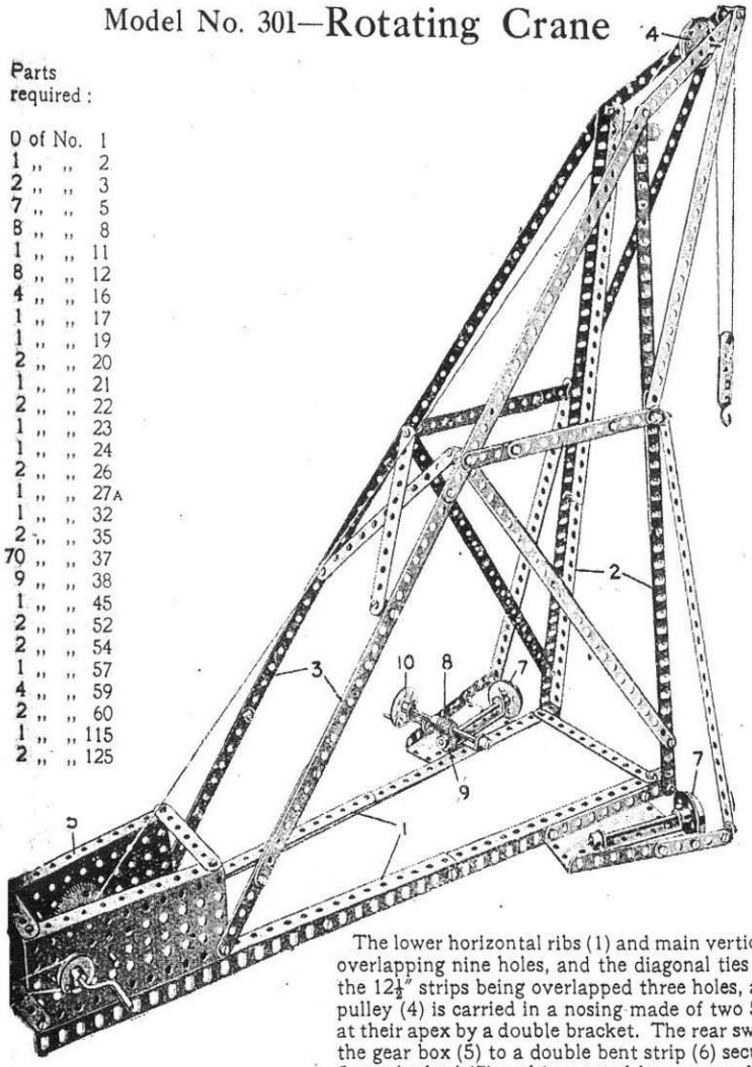
This completes the Models which may be made with MECCANO Outfit No. 2. The next Models are a little more advanced, requiring a number of extra parts to construct them. The necessary parts are all contained in a No. 2A Accessory Outfit, the price of which will be found in the List at the end of the Manual.

These Models can be made with MECCANO Outfit No. 3, or No. 2 and No. 2A

Model No. 301—Rotating Crane

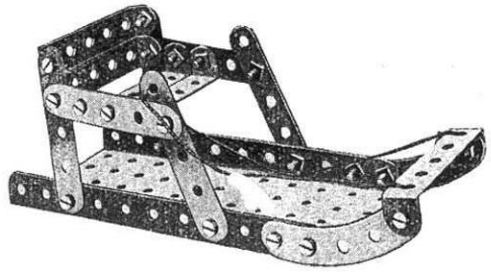
Parts required :

0	of No.	1
1	,, ,,	2
2	,, ,,	3
7	,, ,,	5
8	,, ,,	8
1	,, ,,	11
8	,, ,,	12
4	,, ,,	16
1	,, ,,	17
1	,, ,,	19
2	,, ,,	20
1	,, ,,	21
2	,, ,,	22
1	,, ,,	23
1	,, ,,	24
2	,, ,,	26
1	,, ,,	27A
1	,, ,,	32
2	,, ,,	35
70	,, ,,	37
9	,, ,,	38
1	,, ,,	45
2	,, ,,	52
2	,, ,,	54
1	,, ,,	57
4	,, ,,	59
2	,, ,,	60
1	,, ,,	115
2	,, ,,	125



The lower horizontal ribs (1) and main vertical members (2) are made of angle girders overlapping nine holes, and the diagonal ties (3) of two 12½" strips and one 5½" strip, the 12½" strips being overlapped three holes, and the lower 5½" strip seven holes. The pulley (4) is carried in a nosing made of two 5½" strips and two 12½" strips connected at their apex by a double bracket. The rear swivel point of the crane is made by bolting the gear box (5) to a double bent strip (6) secured to the floor. The crane runs on the flanged wheel (7) and is rotated by means of the worm (8) which enages a pinion (9) on the spindle of one of the flanged wheels and is rotated by the hand wheel (10).

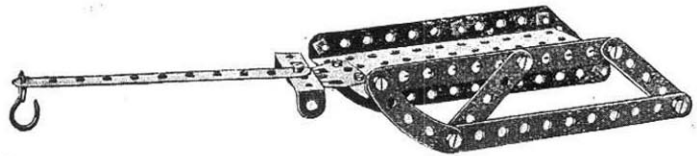
Model No. 302—Toboggan



Parts required :

6	of No.	5
20	,, ,,	37
1	,, ,,	52
5	,, ,,	60
2	,, ,,	90

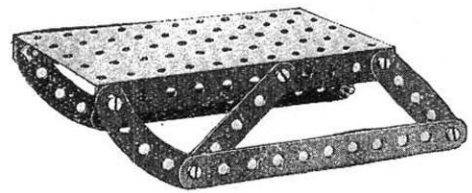
Model No. 303—Horse Sleigh



Parts required :

3 of No. 2	13 of No. 37	1 of No. 60
4 ,, ,, 5	1 ,, ,, 52	2 ,, ,, 90
1 ,, ,, 23	1 ,, ,, 57	1 ,, ,, 126A

Model No. 304—Sleigh



Parts required :

2 of No. 2		
4 ,, ,, 5	1 ,, ,, 52	
10 ,, ,, 37	2 ,, ,, 90	

Model No. 305—Tower Wagon

Parts required:

6	of No.	1
2	,, ,,	4
10	,, ,,	5
8	,, ,,	8
2	,, ,,	12
2	,, ,,	15a
4	,, ,,	16
4	,, ,,	20
1	,, ,,	22a
1	,, ,,	24
1	,, ,,	26
1	,, ,,	32
4	,, ,,	35
72	,, ,,	37
8	,, ,,	38
2	,, ,,	52
3	,, ,,	59
10	,, ,,	60
1	,, ,,	93
2	,, ,,	100
1	,, ,,	115
2	,, ,,	126a

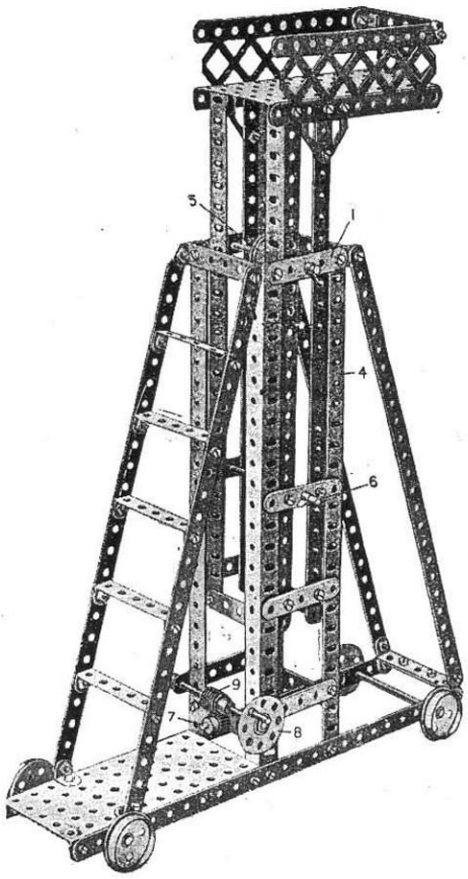


FIG. 305

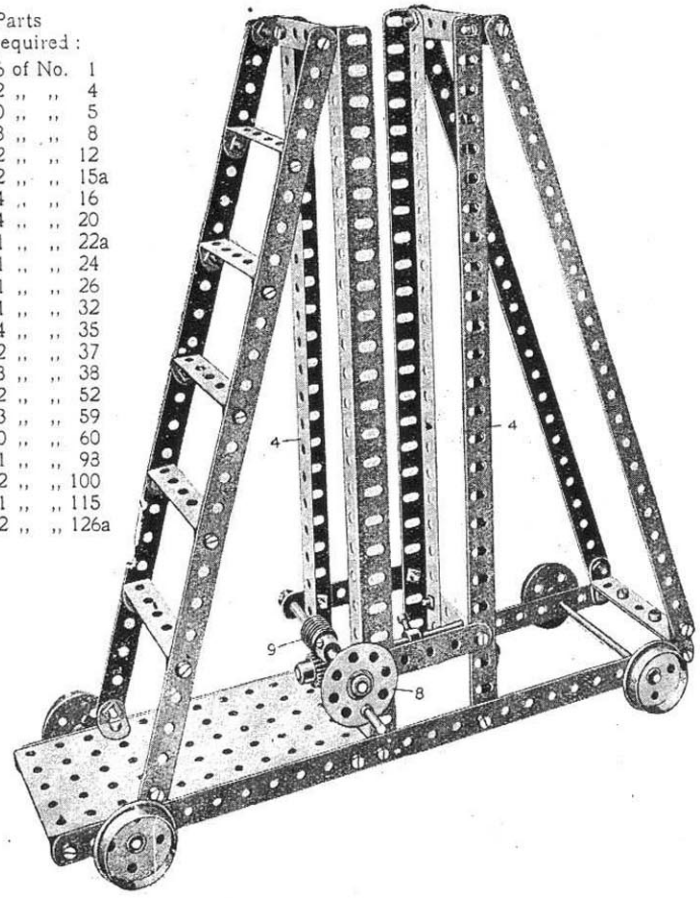


FIG. 305A

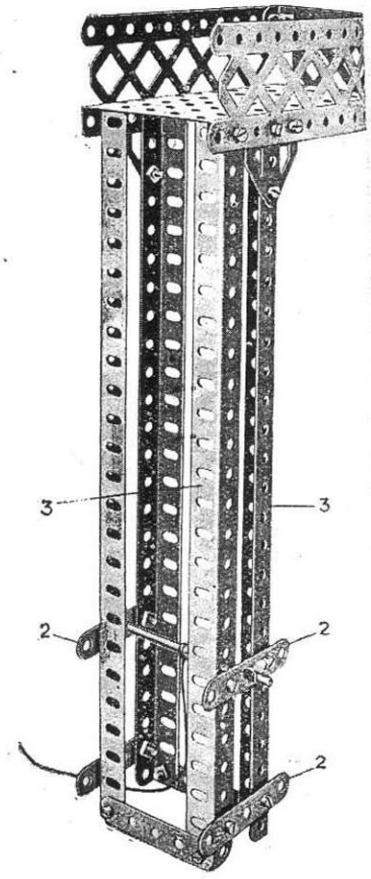
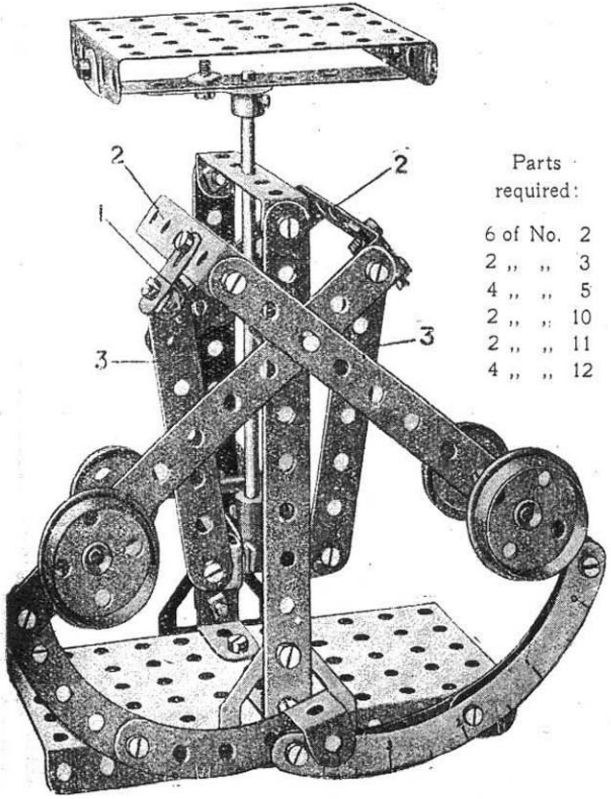


FIG. 305B

Begin the construction of this model by building up the platform, Fig. A, the tie strips (1) being left off as shown in order to be able to insert the rising and falling tower, Fig. B. The strips are then bolted on. The guide strips (2) are bolted to the girder (3) of the tower with washers beneath the strips. This gives the necessary clearance and enables the strips to rise easily up the faces of the girders (4) of the fixed lower part of the tower. The tower is raised by means of a cord which passes over a pulley (5) and is fastened to a rod (6), the other end of the cord winding on a rod (7) rotated by a hand wheel (8) on the spindle of the worm (9).

Model No. 306 Letter Balance



Parts required:

6 of No. 2
2 ,, ,, 3
4 ,, ,, 5
2 ,, ,, 10
2 ,, ,, 11
4 ,, ,, 12

The connection at (1) of the rocking arms (2) to the thrust strips (3) is locknutted to give a free pivotal action and similarly the pivotal connections (5) of the strips (3) to the lever strips (4) are locknutted to give free play.

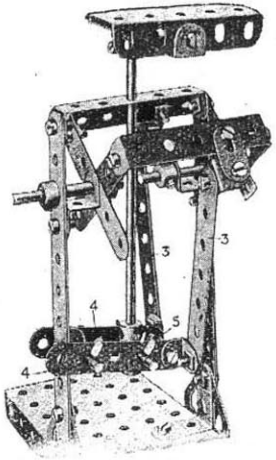
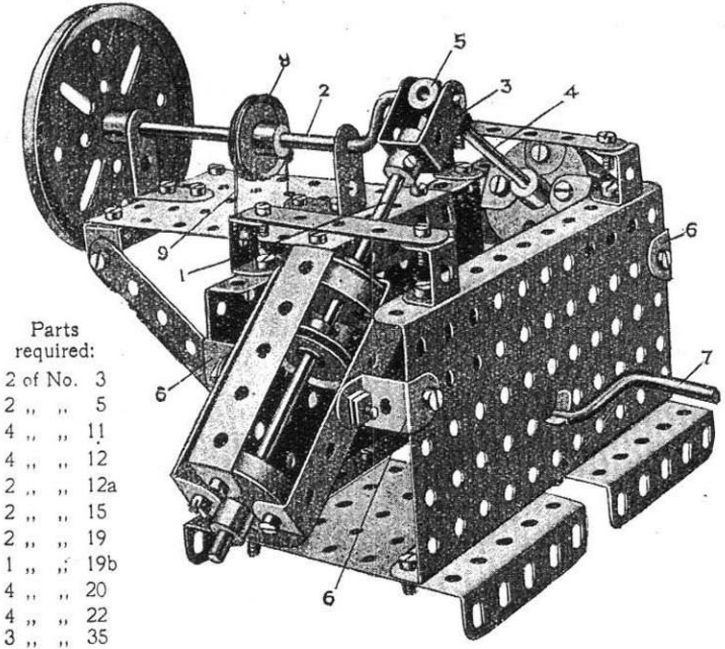


FIG. 306A

2 of No. 12a
1 ,, ,, 15
2 ,, ,, 17
2 ,, ,, 18a
2 ,, ,, 20
2 ,, ,, 22
4 ,, ,, 35
40 ,, ,, 37
6 ,, ,, 38
1 ,, ,, 52
1 ,, ,, 53
4 ,, ,, 59
3 ,, ,, 60
1 ,, ,, 60b
1 ,, ,, 62
1 ,, ,, 63
4 ,, ,, 90
2 ,, ,, 125
2 ,, ,, 126

Model No. 307 Oscillating Steam Engine



Parts required:

2 of No. 3
2 ,, ,, 5
4 ,, ,, 11
4 ,, ,, 12
2 ,, ,, 12a
2 ,, ,, 15
2 ,, ,, 19
1 ,, ,, 19b
4 ,, ,, 20
4 ,, ,, 22
3 ,, ,, 35
50 ,, ,, 37
2 ,, ,, 52
3 ,, ,, 53
2 ,, ,, 59
6 ,, ,, 60
1 ,, ,, 63
1 ,, ,, 102
4 ,, ,, 125

The piston rod (1) of one cylinder is pivotally connected to the crank rod (2) by means of a small double angle strip (3), and the piston rod (4) of the other cylinder is pivoted to the crank rod by a coupling (5). The cylinders consisting of four strips are enclosed by flanged wheels at the ends, and are pivoted on ½" reversed brackets (6). The model is operated from the handle rod (7), a pulley on the rear end of which is coupled to the pulley (8) by a cord (9).

Model No. 308—Railway Wagon Swivel Crane

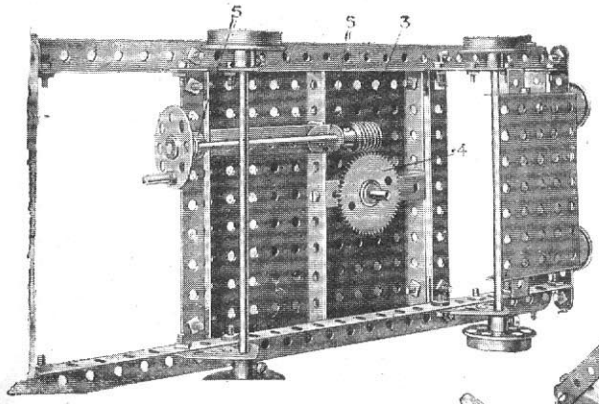
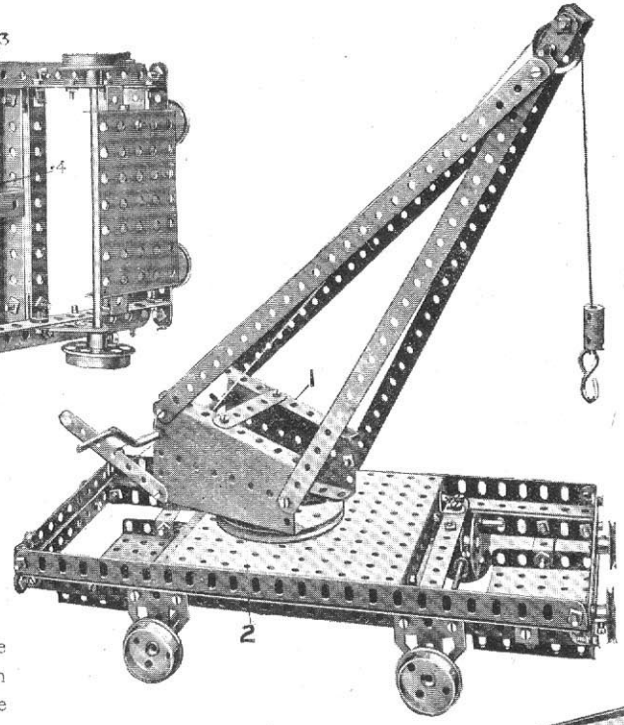


Fig. 308A.

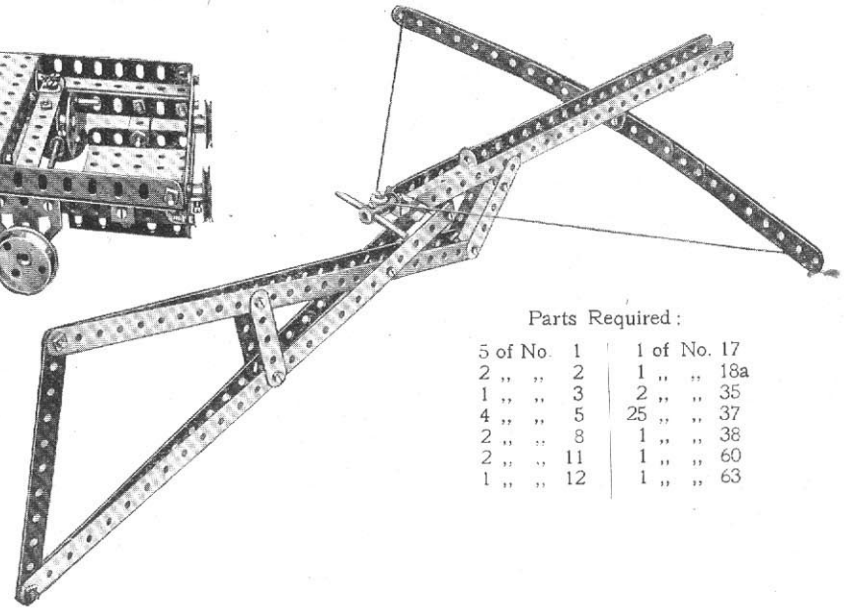


The flanges of the sector plates (1) are bolted to the 3" pulley wheel (2) upon which the crane swivels, and the spindle of the pulley wheel is rotated by the worm (3) engaging the gear wheel (4) on the spindle. In order to bring the worm centrally over the teeth of the gear wheel (4), washers are placed between the angle brackets (5) in which the spindle of the worm is journalled.

Parts required:

4 of No.	1	1 of No.	19	2 of No.	38
6 „ „	2	1 „ „	19b	2 „ „	52
1 „ „	3	4 „ „	20	2 „ „	53
2 „ „	5	4 „ „	22	2 „ „	54
4 „ „	8	1 „ „	22a	1 „ „	57
1 „ „	11	1 „ „	24	3 „ „	59
14 „ „	12	1 „ „	27a	2 „ „	60
2 „ „	15	1 „ „	32	1 „ „	63
1 „ „	15a	3 „ „	35	1 „ „	115
2 „ „	17	70 „ „	37	4 „ „	125
				4 „ „	126a

Model No. 309—Crossbow

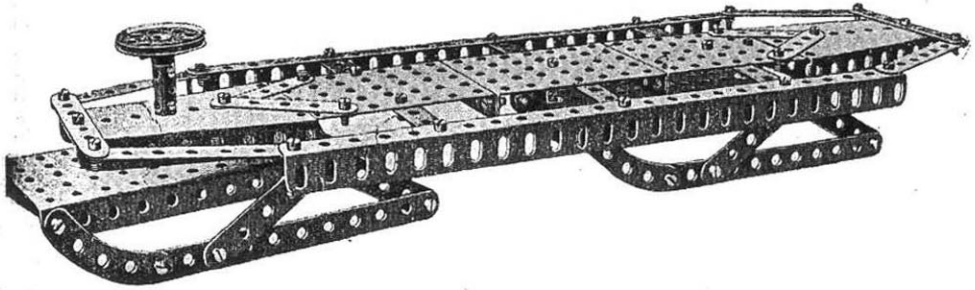


Parts Required:

5 of No.	1	1 of No.	17
2 „ „	2	1 „ „	18a
1 „ „	3	2 „ „	35
4 „ „	5	25 „ „	37
2 „ „	8	1 „ „	38
2 „ „	11	1 „ „	60
1 „ „	12	1 „ „	63

These Models can be made with MECCANO Outfit No. 3, or No. 2 and No. 2A

Model No. 310 Bob Sleigh



Parts required:

7 of No.	2	55 of No.	37
6 „ „	3	2 „ „	38
12 „ „	5	1 „ „	45
2 „ „	8	2 „ „	52
2 „ „	11	3 „ „	53
1 „ „	17	2 „ „	54
1 „ „	21	1 „ „	63
1 „ „	24	4 „ „	90

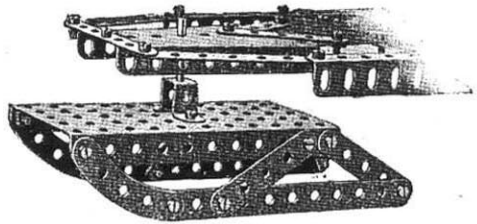
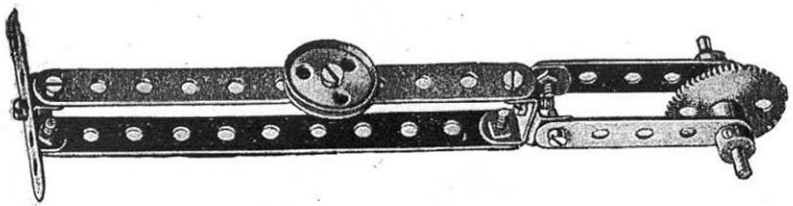


Fig. 310A.

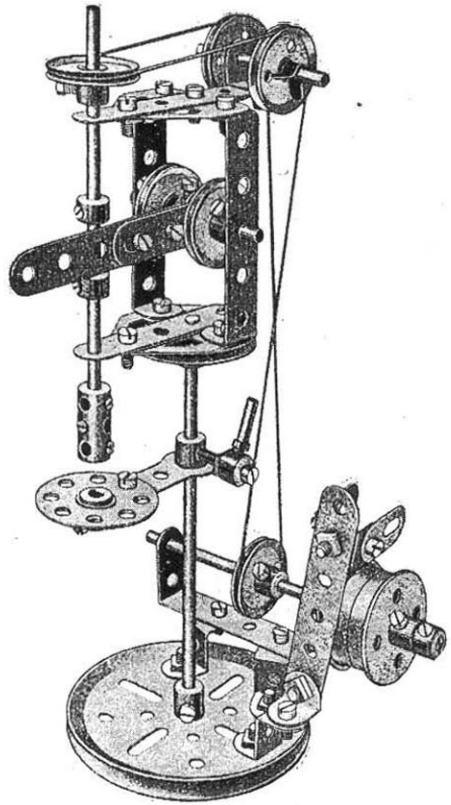
Model No. 311 Pastry Designer



Parts required:

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

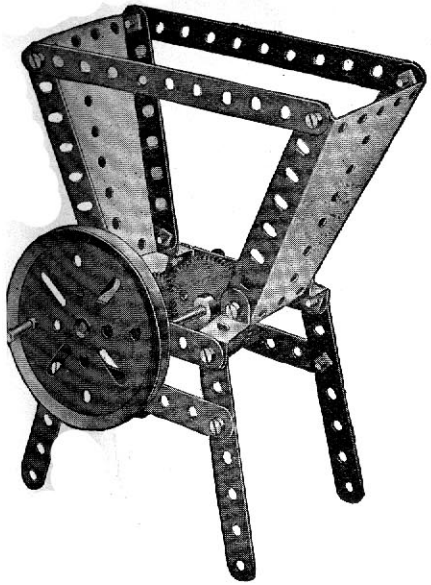
Model No. 312 Drilling Machine



Parts required:

2 of No.	4	2 of No.	20	5 of No.	59
2 „ „	5	1 „ „	21	2 „ „	60
2 „ „	10	4 „ „	22	2 „ „	62
2 „ „	11	2 „ „	22A	1 „ „	63
1 „ „	12	1 „ „	24	1 „ „	111
1 „ „	15	2 „ „	35	1 „ „	115
2 „ „	15A	21 „ „	37	3 „ „	125
2 „ „	17	1 „ „	44	2 „ „	126A
1 „ „	19B	1 „ „	46		

Model No. 313 Coffee Grinder



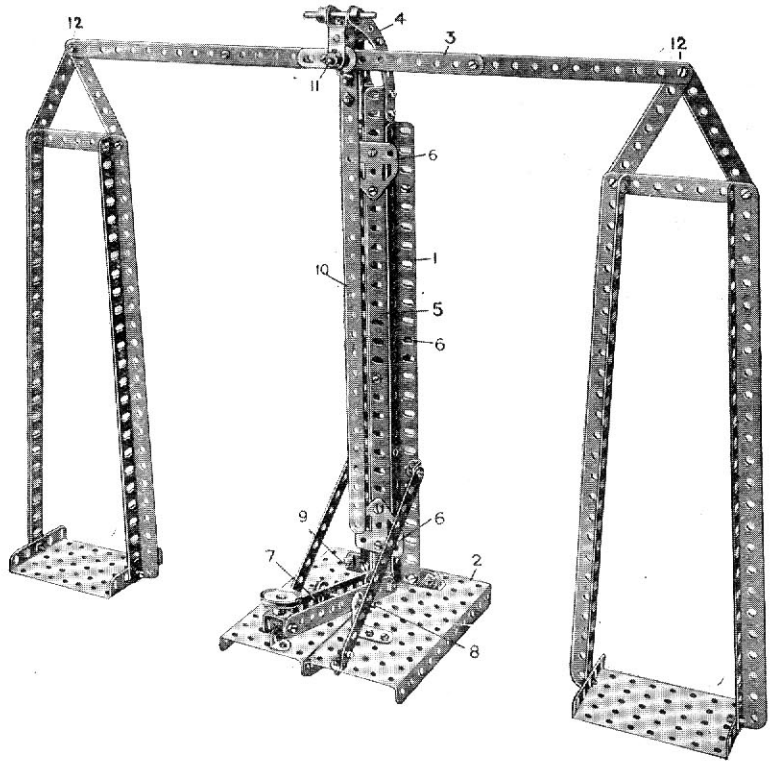
Parts required:

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

Model No. 314 Demonstration Scales

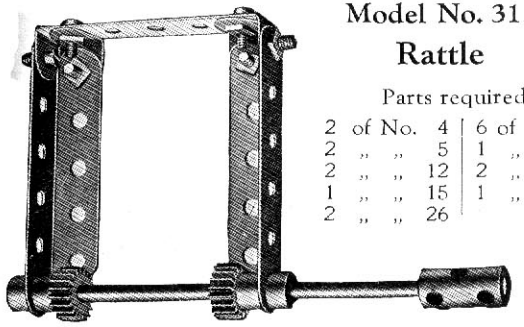
Parts required:

3	of No.		1
4	„	„	2
6	„	„	3
1	„	„	4
2	„	„	5
8	„	„	8
4	„	„	11
6	„	„	12
2	„	„	12A
2	„	„	17
1	„	„	18A
1	„	„	22
2	„	„	35
58	„	„	37
1	„	„	44
2	„	„	52
2	„	„	53
2	„	„	59
2	„	„	62
4	„	„	90
1	„	„	125
3	„	„	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 flat trunnions 6 are bolted at the front and rear. The balance is raised by depressing the lever 8 pivoted at 9 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.

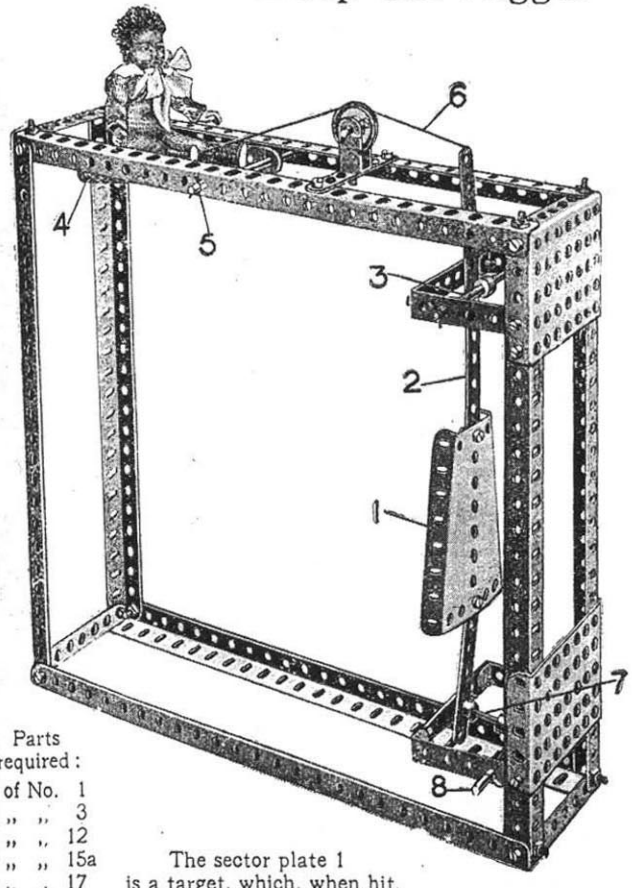
Model No. 315 Rattle



Parts required:

2	of No.		4	6	of No.		37
2	„	„	5	1	„	„	48A
2	„	„	12	2	„	„	59
1	„	„	15	1	„	„	63
2	„	„	26				

Model No. 316—Drop the Nigger

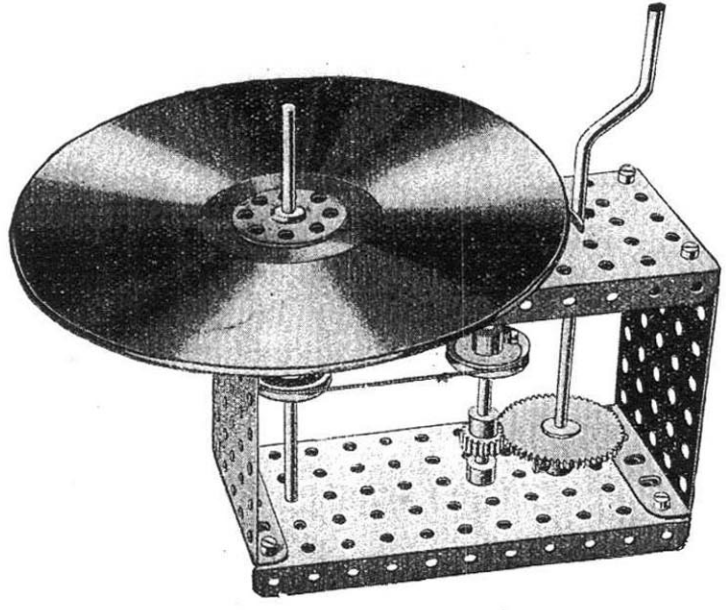


Parts required :

1	of No.	1
6	,, ,,	3
1	,, ,,	12
3	,, ,,	15a
1	,, ,,	17
1	,, ,,	22
6	,, ,,	35
33	,, ,,	37
1	,, ,,	44
2	,, ,,	53
2	,, ,,	54
3	,, ,,	59
4	,, ,,	60
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. 317—Newton's Disc



This is a model to show that white light is made up of the three primary colours—red, yellow, blue. Sectors of these three colours are mounted or painted on the disc, which, if then quickly rotated, shows as white.

Parts required :

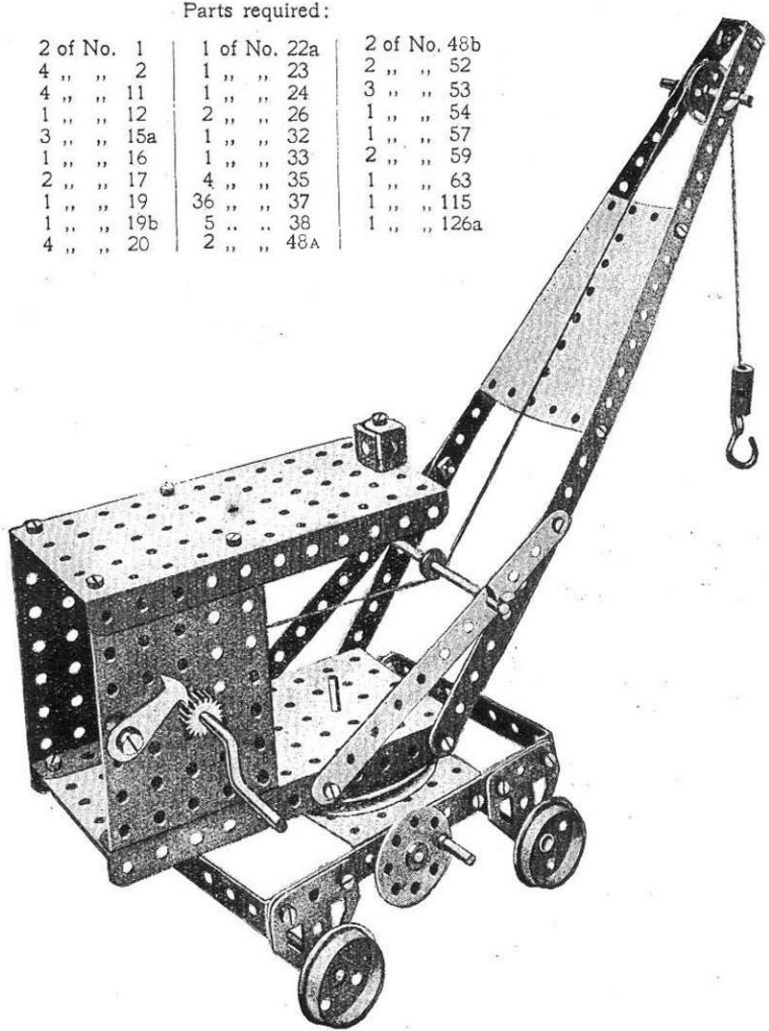
1 of No. 15	1 of No. 24	8 of No. 37
1 ,, ,, 15A	1 ,, ,, 26	2 ,, ,, 52
1 ,, ,, 19	1 ,, ,, 27A	2 ,, ,, 53
2 ,, ,, 22	2 ,, ,, 35	4 ,, ,, 59

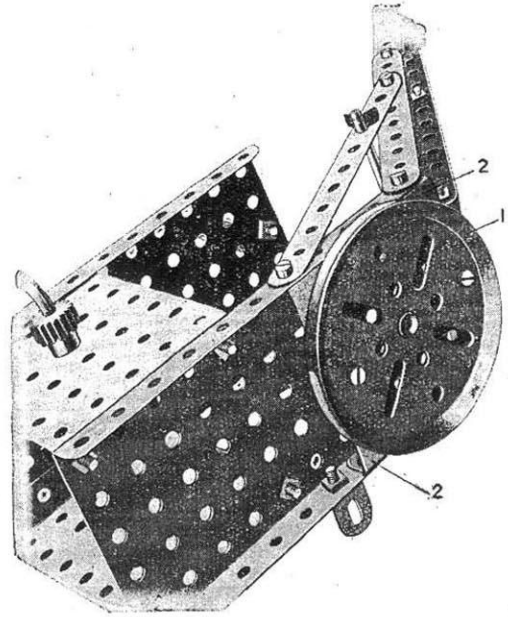
These Models can be made with MECCANO Outfit No. ,3 or No. 2 and No. 2A

Model No. 318—Railway Breakdown Crane

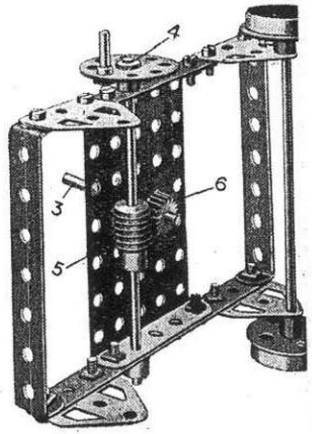
Parts required:

2 of No. 1	1 of No. 22a	2 of No. 48b
4 „ „ 2	1 „ „ 23	2 „ „ 52
4 „ „ 11	1 „ „ 24	3 „ „ 53
1 „ „ 12	2 „ „ 26	1 „ „ 54
3 „ „ 15a	1 „ „ 32	1 „ „ 57
1 „ „ 16	1 „ „ 33	2 „ „ 59
2 „ „ 17	4 „ „ 35	1 „ „ 63
1 „ „ 19	36 „ „ 37	1 „ „ 115
1 „ „ 19b	5 „ „ 38	1 „ „ 126a
4 „ „ 20	2 „ „ 48A	





FIG, 318A.



Fig, 318B.

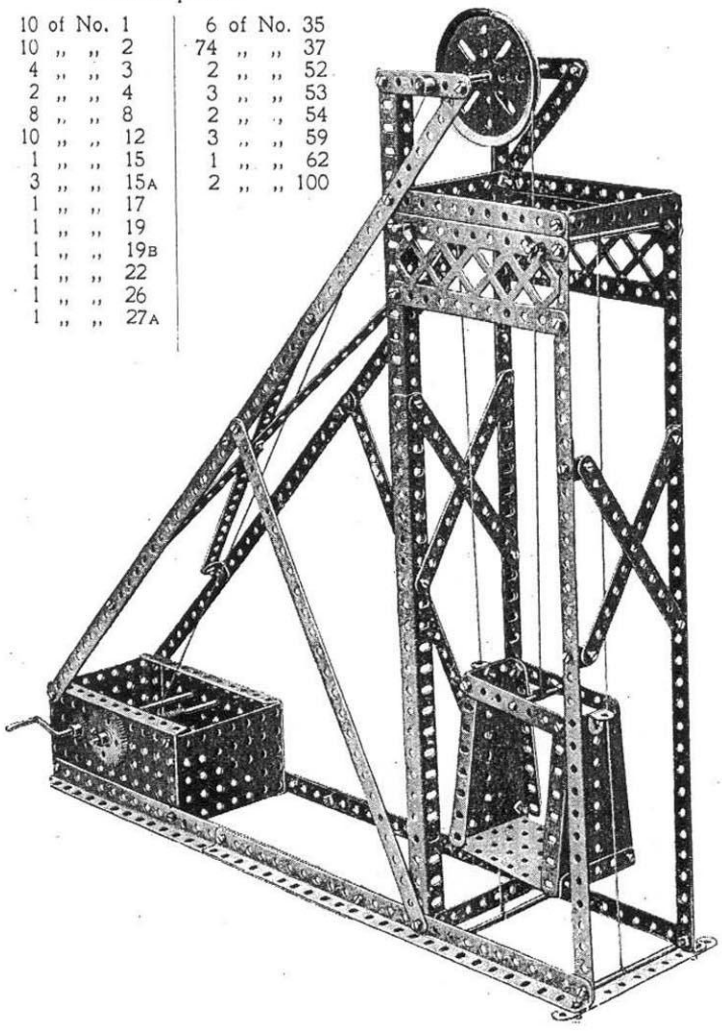
The swivelling action is obtained by bolting a 3" pulley (1) to double angle strips (2) on the jib frame. The boss of this wheel fits over the rod (3) and is secured to the rod. The hand wheel (4) rotates the worm (5), engaging the pinion (6) to swivel the jib.

These Models can be made with MECCANO Outfit No. 3, or No. 2 and No. 2A

Model No. 319
Pit Head Gear

Parts required:

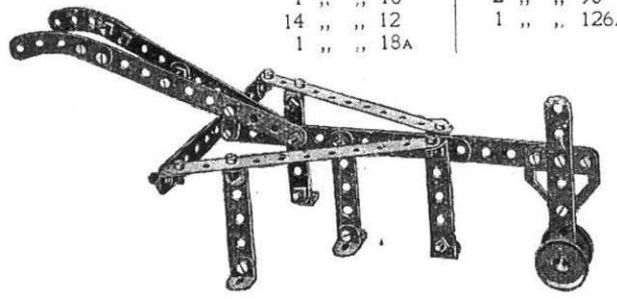
10	of	No. 1	6	of	No. 35
10	,,	,, 2	74	,,	,, 37
4	,,	,, 3	2	,,	,, 52
2	,,	,, 4	3	,,	,, 53
8	,,	,, 8	2	,,	,, 54
10	,,	,, 12	3	,,	,, 59
1	,,	,, 15	1	,,	,, 62
3	,,	,, 15A	2	,,	,, 100
1	,,	,, 17			
1	,,	,, 19			
1	,,	,, 19B			
1	,,	,, 22			
1	,,	,, 26			
1	,,	,, 27A			



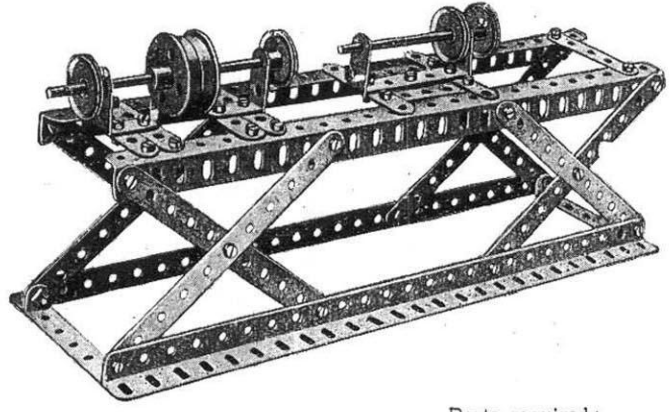
Model No. 320
Scarifier

Parts required;

7	of	No. 2	2	of	No. 22
1	,,	,, 3	31	,,	,, 37
4	,,	,, 5	2	,,	,, 38
1	,,	,, 10	2	,,	,, 90
14	,,	,, 12	1	,,	,, 126A
1	,,	,, 18A			



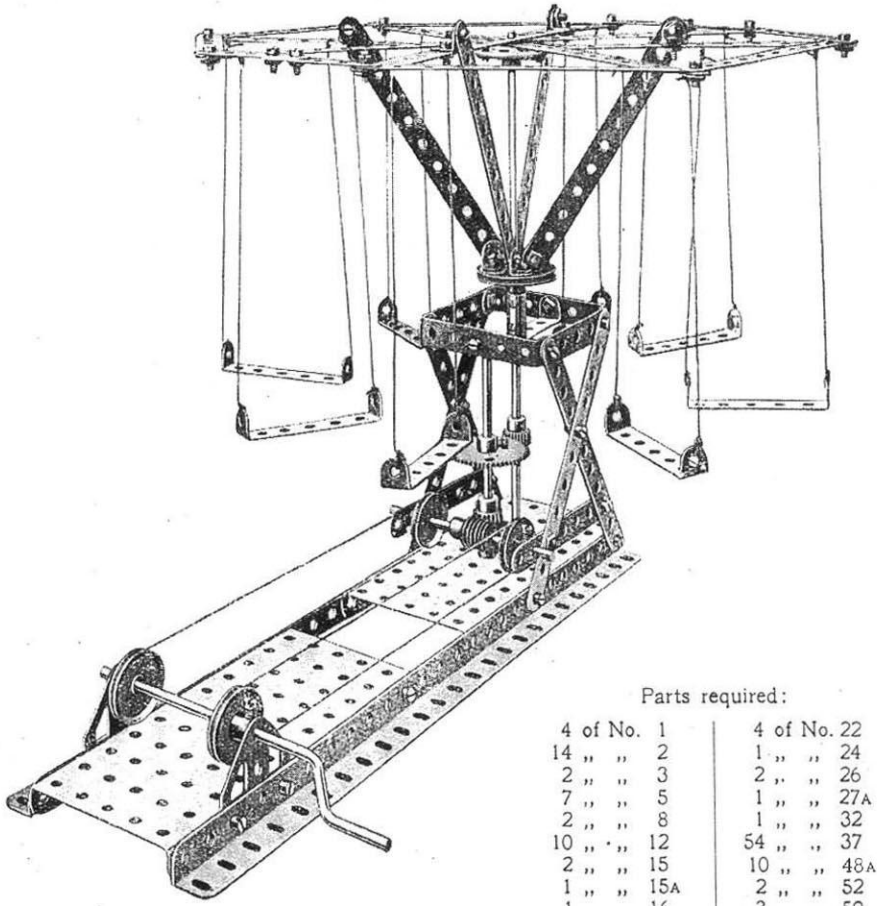
Model No. 321
Lathe



Parts required:

8	of	No. 2	2	of	No 20
10	,,	,, 5	1	,,	,, 22
4	,,	,, 8	41	,,	,, 37
2	,,	,, 12A	1	,,	,, 46
1	,,	,, 15A	2	,,	,, 48A
1	,,	,, 16			

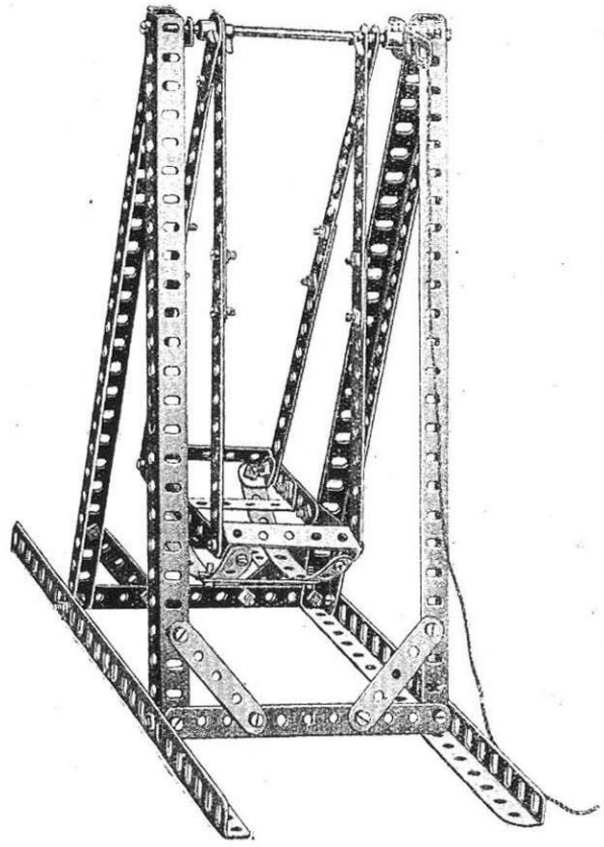
Model No. 322 Roundabout



Parts required:

4 of No.	1	4 of No.	22
14 „ „	2	1 „ „	24
2 „ „	3	2 „ „	26
7 „ „	5	1 „ „	27A
2 „ „	8	1 „ „	32
10 „ „	12	54 „ „	37
2 „ „	15	10 „ „	48A
1 „ „	15A	2 „ „	52
1 „ „	16	3 „ „	59
1 „ „	19	1 „ „	63
1 „ „	21	2 „ „	126A

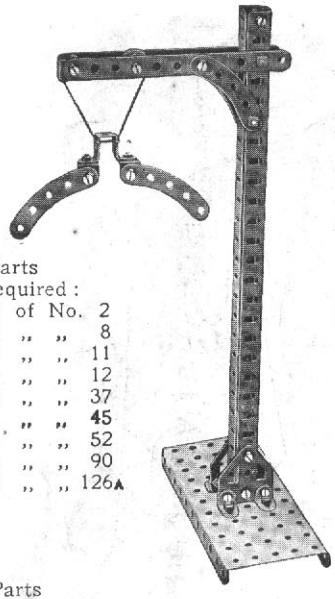
Model No. 323 Swing



Parts required:

12 of No.	2	1 of No.	15
9 „ „	5	2 „ „	35
6 „ „	8	43 „ „	37
2 „ „	11	4 „ „	48A
4 „ „	12	2 „ „	62

Model No. 324
Railway Gauge



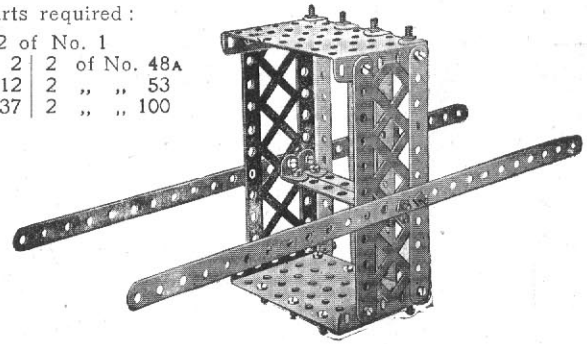
Parts required:

2	of	No. 2
2	,,	,, 8
3	,,	,, 11
6	,,	,, 12
28	,,	,, 37
1	,,	,, 45
1	,,	,, 52
4	,,	,, 90
2	,,	,, 126A

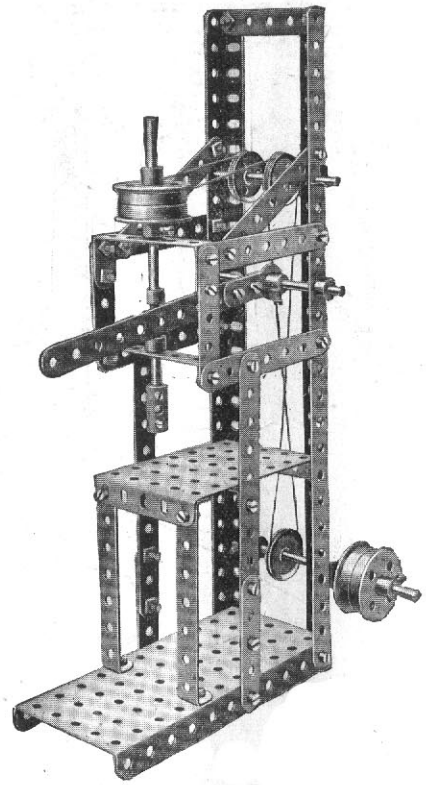
Model No. 325 Chinese Palanquin

Parts required:

2	of	No. 1			
4	of	No. 2	2	of	No. 48A
8	,,	,, 12	2	,,	,, 53
30	,,	,, 37	2	,,	,, 100



Model No. 326
Hand Punch

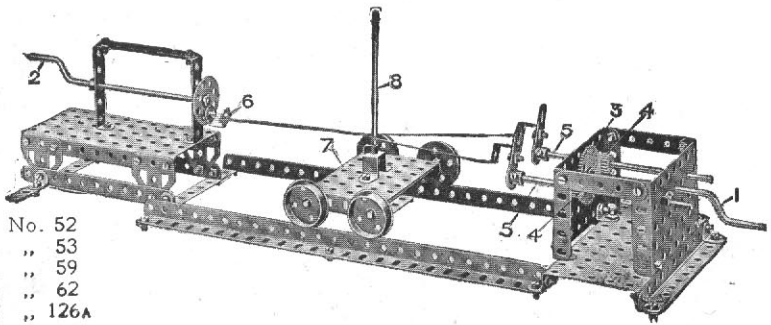


Parts required:

3	of	No. 2	4	of	No. 20	2	of	No. 48B
6	,,	,, 3	1	,,	,, 22	1	,,	,, 52
5	,,	,, 5	2	,,	,, 22A	1	,,	,, 53
2	,,	,, 8	3	,,	,, 35	4	,,	,, 59
2	,,	,, 11	38	,,	,, 37	1	,,	,, 62
2	,,	,, 15	1	,,	,, 46	1	,,	,, 63
2	,,	,, 16	2	,,	,, 48A			

Model No. 327 Wire Rope Maker

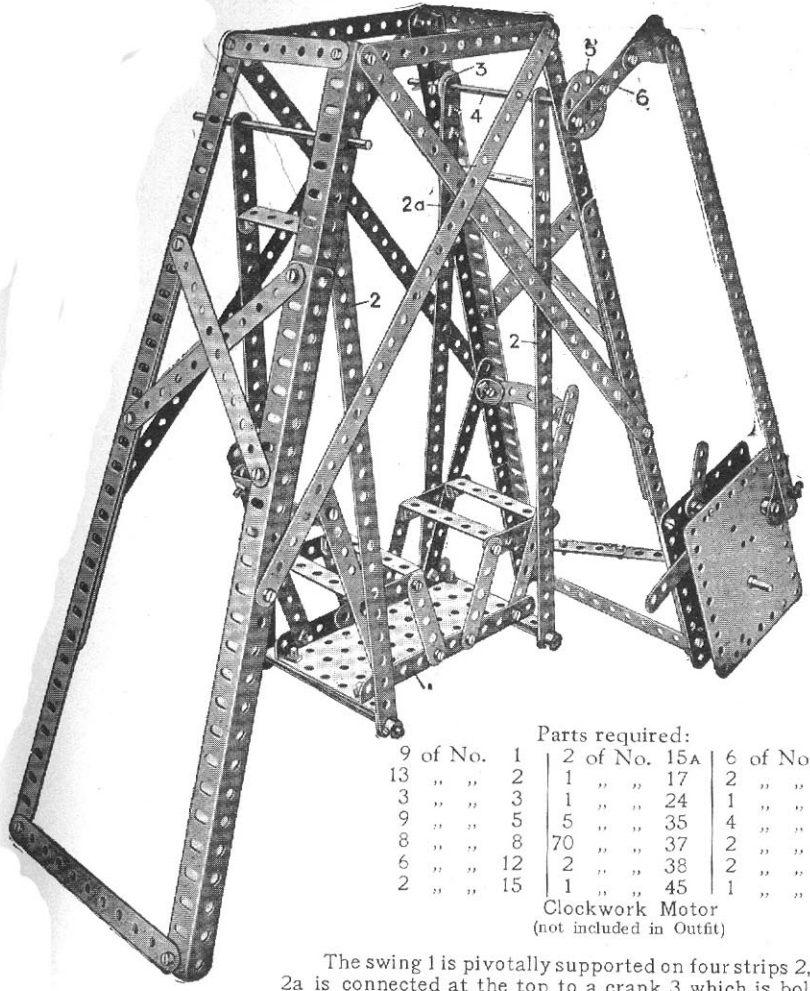
The strands are twisted from both ends by the handles (1) and (2) of the fixed parts. The handle (1) rotates through a large gear wheel (3) two pinions (4) on the rods (5) carrying cranks to which the strands are attached. The other ends of the strands are connected to a double bent strip (6) on a bush wheel which is rotated in the opposite direction by a crank handle (2). The carriage (7) runs on rails and the vertical rod (8) is kept just at the formation of the twisted rope and so controls the tightness of the twist.



Parts required:

6	of	No. 2			
1	,,	,, 3			
2	,,	,, 5			
2	,,	,, 8			
3	,,	,, 11			
12	,,	,, 12			
2	,,	,, 15			
3	,,	,, 15A			
2	,,	,, 19			
4	,,	,, 20			
1	,,	,, 24			
2	,,	,, 26			
1	,,	,, 27A	2	of	No. 52
3	,,	,, 35	3	,,	,, 53
50	,,	,, 37	4	,,	,, 59
1	,,	,, 45	2	,,	,, 62
2	,,	,, 48A	4	,,	,, 126A

Model No. 328 Lawn Swing



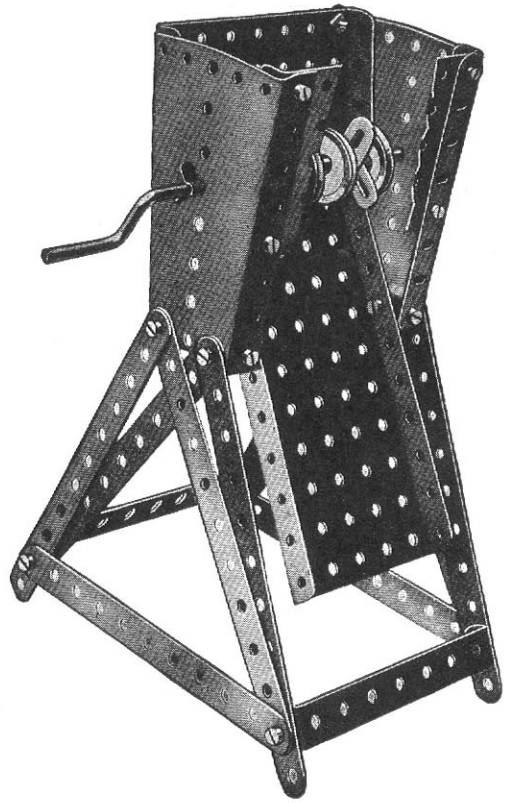
Parts required:

9	of No.	1	2	of No.	15A	6	of No.	48A
13	„ „	2	1	„ „	17	2	„ „	48B
3	„ „	3	1	„ „	24	1	„ „	52
9	„ „	5	5	„ „	35	4	„ „	59
8	„ „	8	70	„ „	37	2	„ „	62
6	„ „	12	2	„ „	38	2	„ „	90
2	„ „	15	1	„ „	45	1	„ „	115

Clockwork Motor
(not included in Outfit)

The swing 1 is pivotally supported on four strips 2, the far strip 2a is connected at the top to a crank 3 which is bolted to a rod 4 and at the front end of this rod is a wheel 5 to which is bolted a strip 6 to the motor spindle.

Model No. 329 Oil Cake Chopper

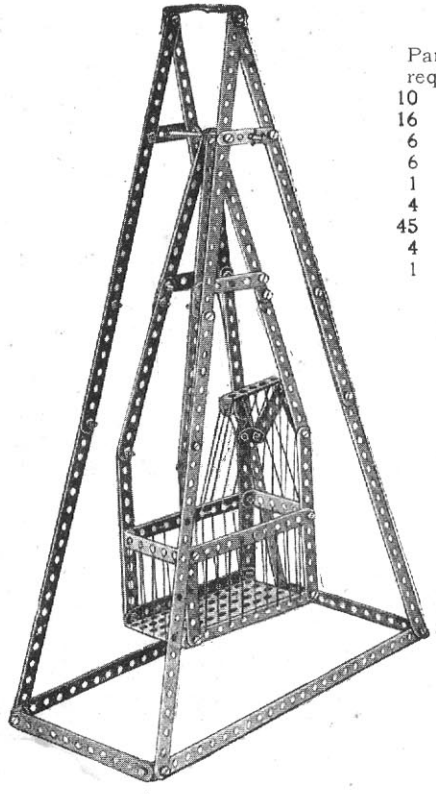


Parts required:

10	of No.	2	2	of No.	35
4	„ „	10	20	„ „	37
2	„ „	12	2	„ „	48B
1	„ „	19	1	„ „	52
4	„ „	22	2	„ „	53

2 of No. 54

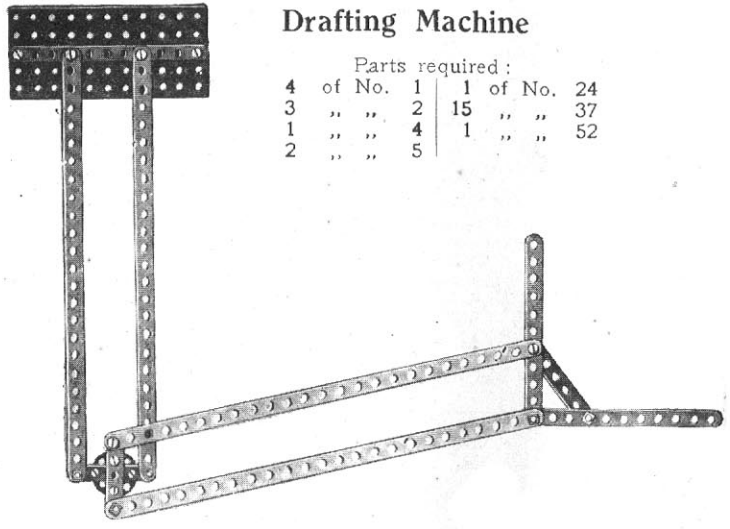
Model No. 330 Swinging Cot



Parts required :

10	of	No.	1
16	,,	,,	2
6	,,	,,	5
6	,,	,,	12
1	,,	,,	15A
4	,,	,,	35
45	,,	,,	37
4	,,	,,	48A
1	,,	,,	52

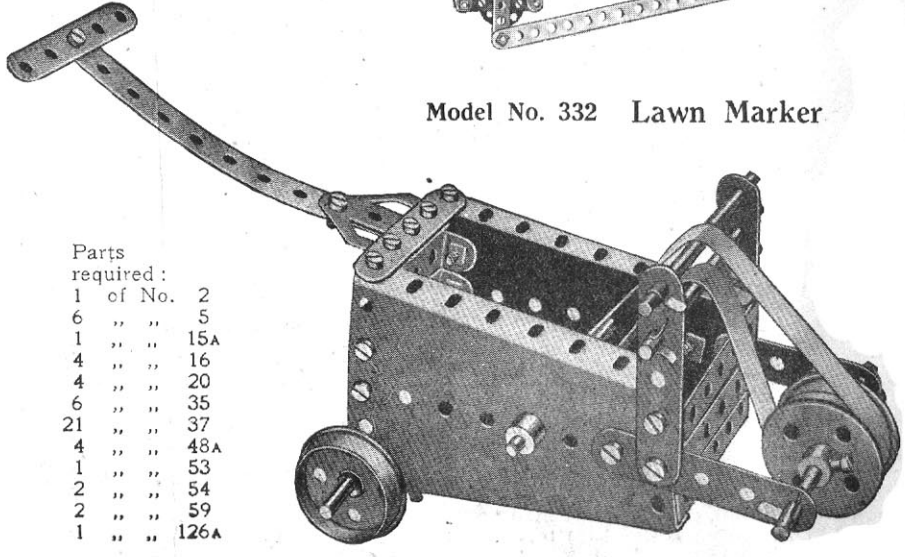
Model No. 331 Drafting Machine



Parts required :

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

Model No. 332 Lawn Marker



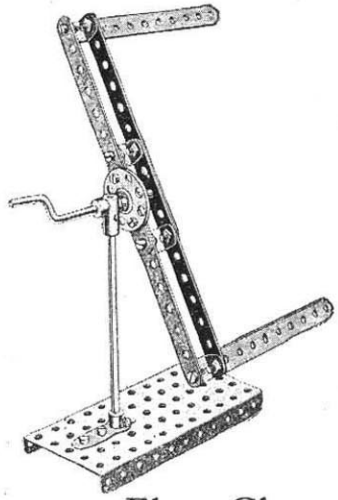
Parts required :

1	of	No.	2
6	,,	,,	5
1	,,	,,	15A
4	,,	,,	16
4	,,	,,	20
6	,,	,,	35
21	,,	,,	37
4	,,	,,	48A
1	,,	,,	53
2	,,	,,	54
2	,,	,,	59
1	,,	,,	126A

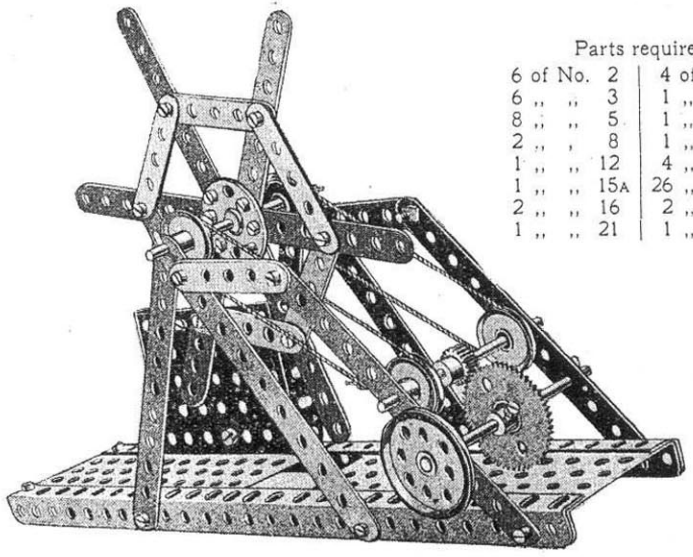
Model No. 334—Lace Jennier

Parts required :

8	of No.	2
4	,, ,,	11
1	,, ,,	15
1	,, ,,	19
1	,, ,,	24
14	,, ,,	37
1	,, ,,	52
1	,, ,,	59
1	,, ,,	62
1	,, ,,	63



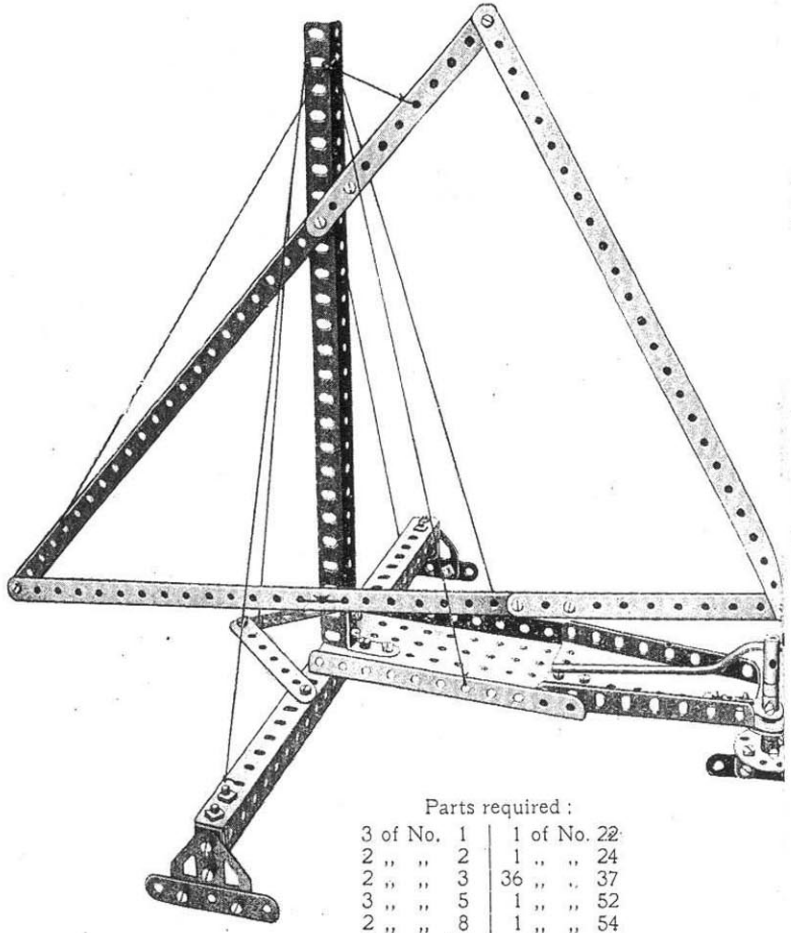
Model No. 335—Flax Cleaner



Parts required :

6	of No.	2	4	of No.	22
6	,, ,,	3	1	,, ,,	24
8	,, ,,	5	1	,, ,,	26
2	,, ,,	8	1	,, ,,	27A
1	,, ,,	12	4	,, ,,	35
1	,, ,,	15A	26	,, ,,	37
2	,, ,,	16	2	,, ,,	52
1	,, ,,	21	1	,, ,,	53

Model No. 336—Ice Boat



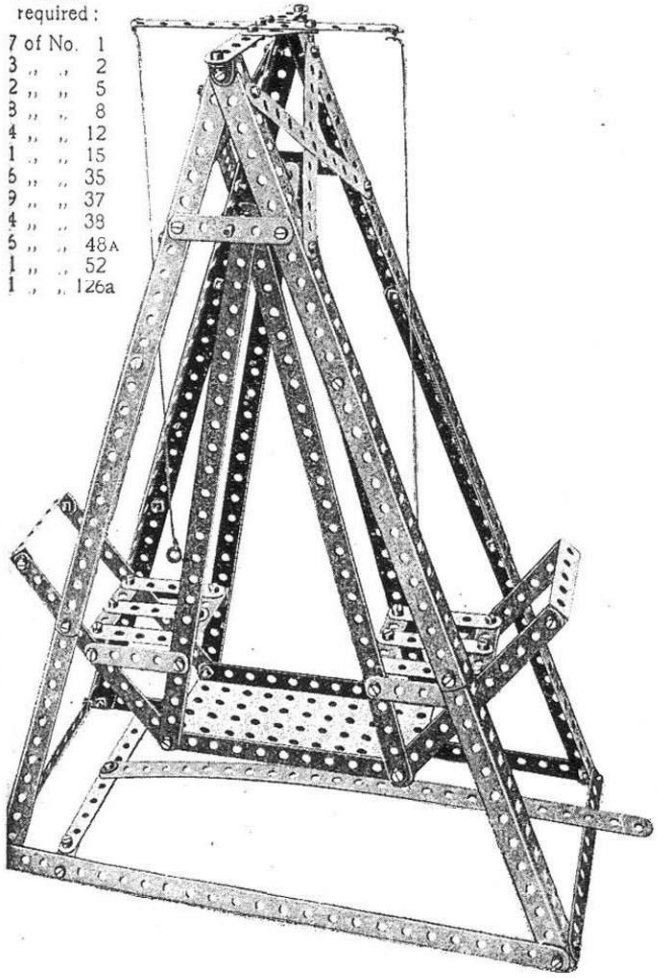
Parts required :

3	of No.	1	1	of No.	22
2	,, ,,	2	1	,, ,,	24
2	,, ,,	3	36	,, ,,	37
3	,, ,,	5	1	,, ,,	52
2	,, ,,	8	1	,, ,,	54
2	,, ,,	12	1	,, ,,	59
3	,, ,,	12A	1	,, ,,	62
1	,, ,,	17	1	,, ,,	63
1	,, ,,	19	2	,, ,,	126A

Model No. 337—Swing

Parts required:

7	of No.	1
3	,, ,,	2
2	,, ,,	5
3	,, ,,	8
4	,, ,,	12
1	,, ,,	15
6	,, ,,	35
9	,, ,,	37
4	,, ,,	38
5	,, ,,	48A
1	,, ,,	52
1	,, ,,	126a

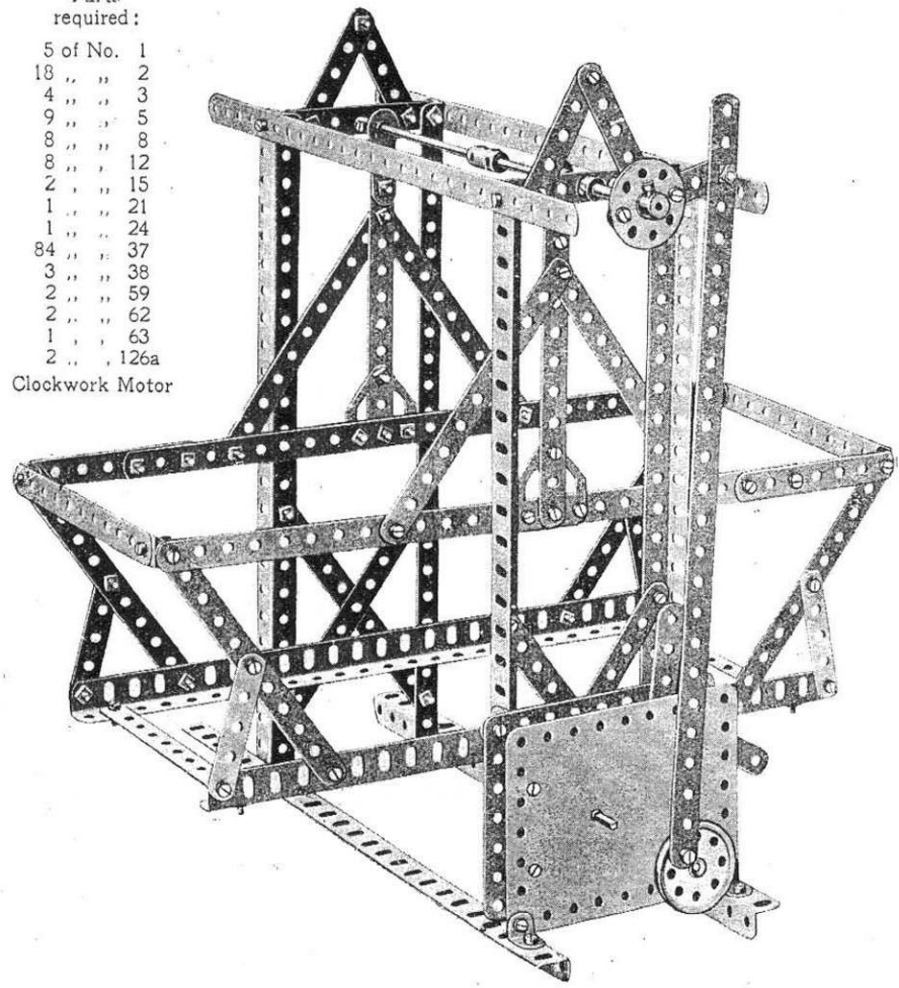


Model No. 338—Automatic Swing Boat

Parts required:

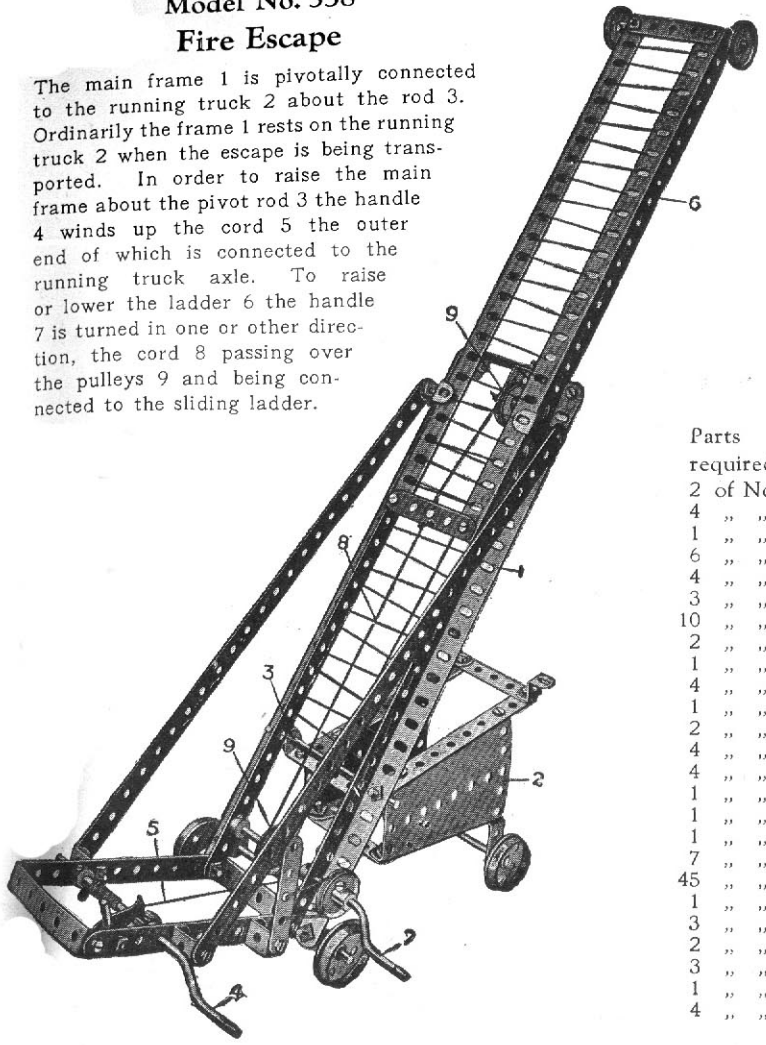
5	of No.	1
18	,, ,,	2
4	,, ,,	3
9	,, ,,	5
8	,, ,,	8
8	,, ,,	12
2	,, ,,	15
1	,, ,,	21
1	,, ,,	24
84	,, ,,	37
3	,, ,,	38
2	,, ,,	59
2	,, ,,	62
1	,, ,,	63
2	,, ,,	126a

Clockwork Motor



Model No. 338
Fire Escape

The main frame 1 is pivotally connected to the running truck 2 about the rod 3. Ordinarily the frame 1 rests on the running truck 2 when the escape is being transported. In order to raise the main frame about the pivot rod 3 the handle 4 winds up the cord 5 the outer end of which is connected to the running truck axle. To raise or lower the ladder 6 the handle 7 is turned in one or other direction, the cord 8 passing over the pulleys 9 and being connected to the sliding ladder.

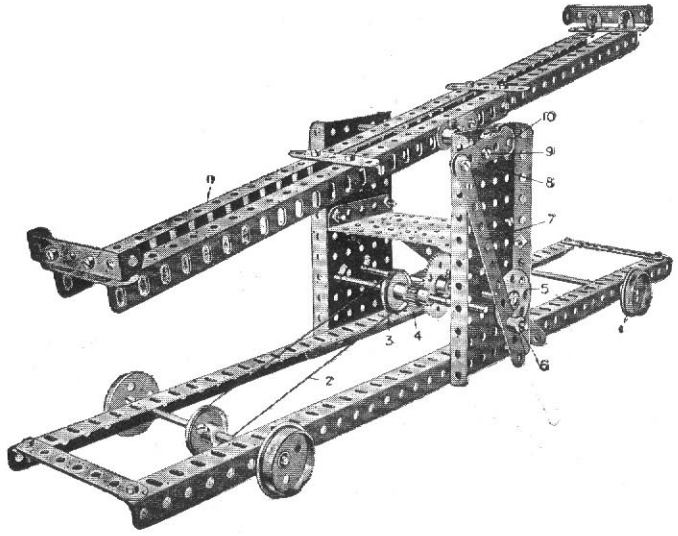


Parts required:

2	of No.		1
4	„	„	2
1	„	„	3
6	„	„	5
4	„	„	8
3	„	„	11
10	„	„	12
2	„	„	12A
1	„	„	15A
4	„	„	16
1	„	„	18A
2	„	„	19
4	„	„	20
4	„	„	22
1	„	„	22A
1	„	„	26
1	„	„	33
7	„	„	35
45	„	„	37
1	„	„	44
3	„	„	48A
2	„	„	54
3	„	„	59
1	„	„	115
4	„	„	125

Model No. 339 Actuated See-Saw

The see-sawing is actuated by the travelling action of the wheels 1. The spindle of the wheels is connected by the cord 2 to the pulley 3 on the spindle of the pinion 4 which drives a gear wheel on the spindle of the bush wheel 5. A threaded pin 6 on this wheel engages the strip 7 coupled to a lever strip 8 pivoted at 9 which rocks the pivot rod 10 of the see-saw 11.

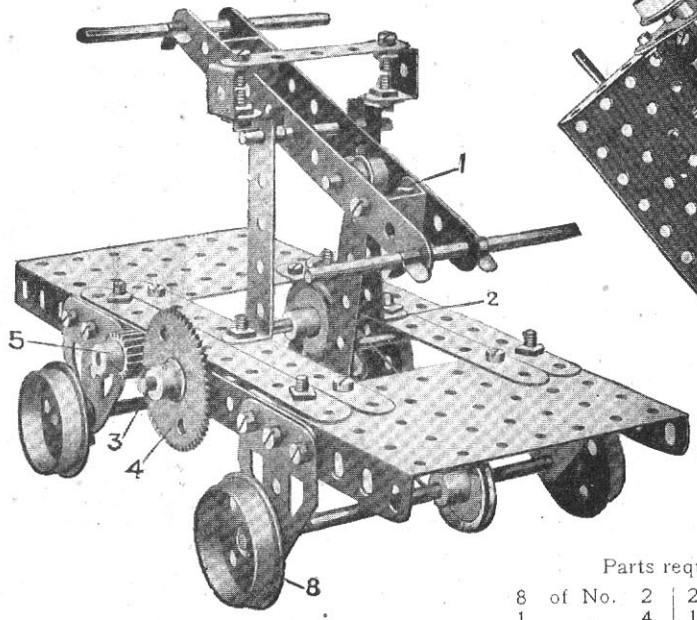


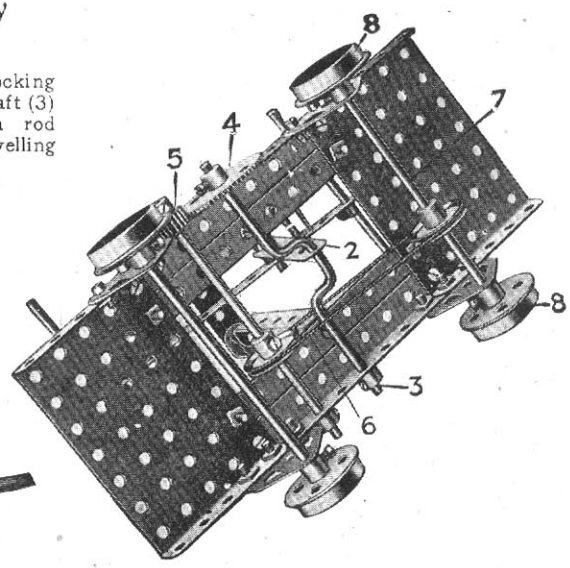
Parts required:

3	of No.		2	4	of No.		20	2	of No.		48A
2	„	„	3	2	„	„	22	2	„	„	52
5	„	„	5	1	„	„	24	1	„	„	53
8	„	„	8	1	„	„	26	3	„	„	59
4	„	„	12	1	„	„	27A	2	„	„	62
2	„	„	15	4	„	„	35	1	„	„	115
3	„	„	15A	36	„	„	37				

Model No. 340 Hand Trolley

The trolley is caused to travel by working the rocking lever (1) which is connected by a strip (2) to a crank shaft (3) a gear wheel (4) which meshes a pinion (5) on a rod coupled by a cord (6) to an axle rod (7) of the travelling wheels (8).





Parts required :

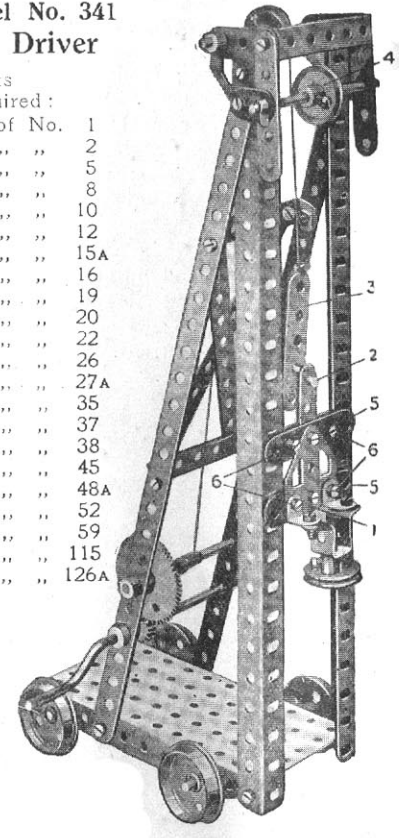
8	of	No.	2	2	of	No.	22
1	,,	,,	4	1	,,	,,	26
1	,,	,,	5	1	,,	,,	27A
4	,,	,,	11	6	,,	,,	35
3	,,	,,	15A	30	,,	,,	37
2	,,	,,	16	2	,,	,,	48A
1	,,	,,	17	2	,,	,,	53
1	,,	,,	18A	4	,,	,,	59
4	,,	,,	20	4	,,	,,	126A

1 of No. 134

Model No. 341 Pile Driver

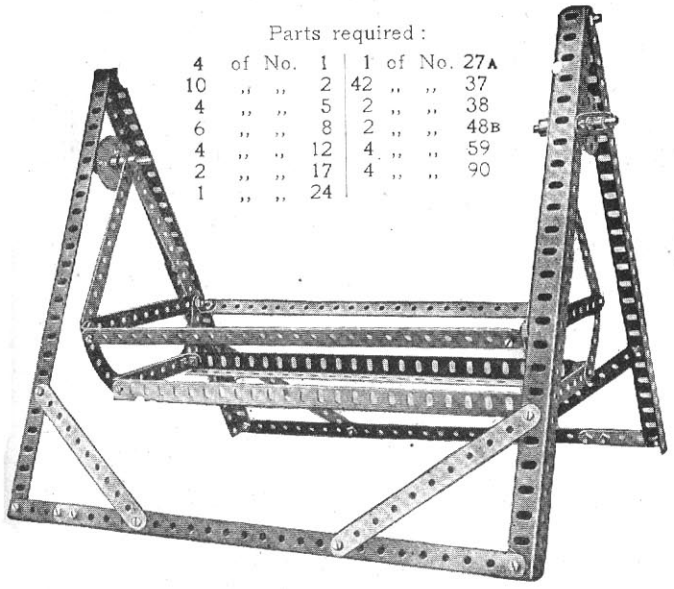
Parts required :

2	of	No.	1
2	,,	,,	2
10	,,	,,	5
2	,,	,,	8
2	,,	,,	10
2	,,	,,	12
2	,,	,,	15A
3	,,	,,	16
1	,,	,,	19
4	,,	,,	20
3	,,	,,	22
1	,,	,,	26
1	,,	,,	27A
2	,,	,,	35
26	,,	,,	37
4	,,	,,	38
1	,,	,,	45
3	,,	,,	48A
1	,,	,,	52
4	,,	,,	59
1	,,	,,	115
3	,,	,,	126A



The driving head (1) is raised by means of a threaded pin (2) on two 2½" strips (3), the pin engaging in the first hole of the driving head. As the head is raised, the strip (3) makes contact with a pulley (4) and the latter pushes the strip rearwardly, disengaging the pin from the hole on the driving head, permitting it to fall. The cross strips (5) of the driving head are duplicated behind, spacing washers being inserted between them on the bolts (6) to allow free movement up and down the guide girders.

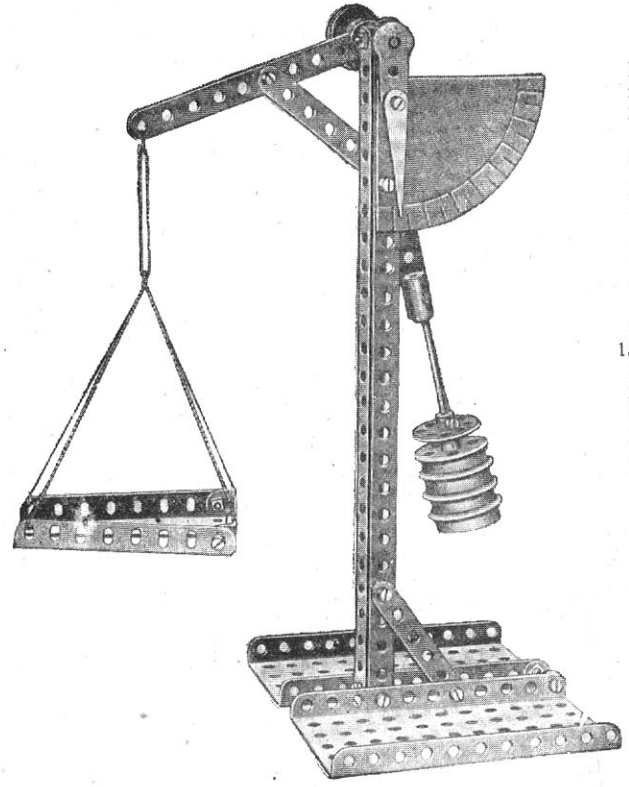
Model No. 342 Swing Cot



Parts required :

4	of	No.	1	1	of	No.	27A
10	,,	,,	2	42	,,	,,	37
4	,,	,,	5	2	,,	,,	38
6	,,	,,	8	2	,,	,,	48B
4	,,	,,	12	4	,,	,,	59
2	,,	,,	17	4	,,	,,	90
1	,,	,,	24				

Model No. 343 Scales



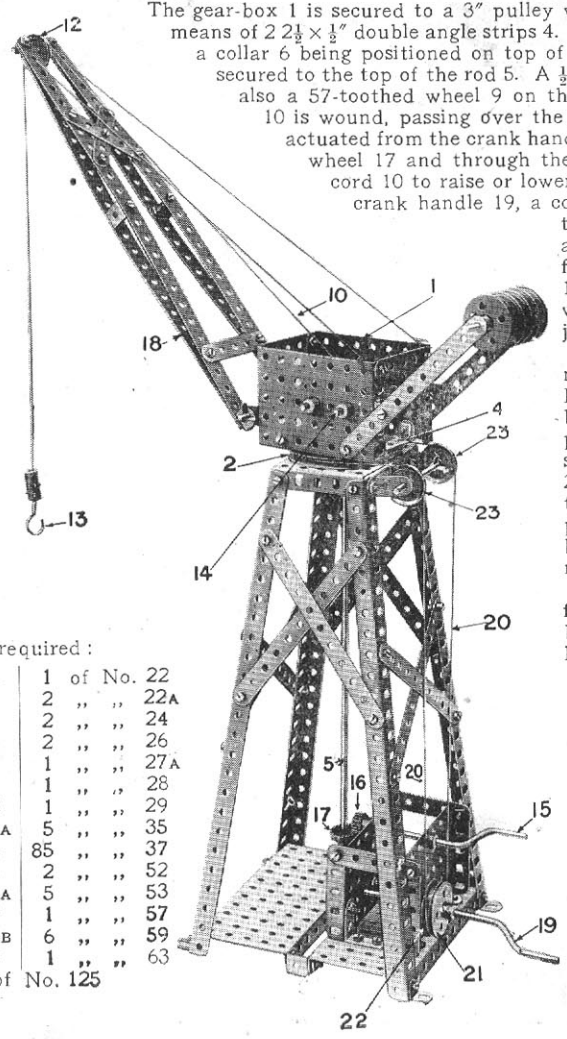
Parts required :

2	of	No.	2
1	,,	,,	3
2	,,	,,	4
1	,,	,,	5
2	,,	,,	8
1	,,	,,	11
1	,,	,,	15
1	,,	,,	17
4	,,	,,	20
1	,,	,,	22
1	,,	,,	24
15	,,	,,	37
1	,,	,,	48A
2	,,	,,	52
1	,,	,,	54
2	,,	,,	62
1	,,	,,	63
1	,,	,,	90

HOW TO CONTINUE

This completes the Models which may be made with MECCANO Outfit No. 3. 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. 3A Accessory Outfit, the price of which will be found in the List at the end of the Manual.

Model No. 401 Elevated Jib Crane



The gear-box 1 is secured to a 3″ pulley wheel 2 (the boss 3 of which stands up), by means of 2 $2\frac{1}{2} \times \frac{1}{2}$″ double angle strips 4. The $11\frac{1}{2}$″ rod 5 passes up through the boss 3, a collar 6 being positioned on top of the boss within, the contrate wheel 7 being secured to the top of the rod 5. A $\frac{1}{2}$″ pinion 8 engages the contrate wheel 7 and also a 57-toothed wheel 9 on the rod 14 on which latter the hoisting cord 10 is wound, passing over the 1″ pulley 12 to the hook 13. The rod 5 is actuated from the crank handle 15 by the pinion 16 engaging a $\frac{3}{4}$″ contrate wheel 17 and through the gear wheels 7, 8, and 9, and operates the cord 10 to raise or lower the load. The jib 18 is swivelled from the crank handle 19, a continuous cord 20 being wound twice round the flange wheel 21, against which is butted a bush wheel 22 to make it into a double flange pulley. A cord 20 passes round 1″ guide pulleys 23 round the 3″ pulley wheel 2. By turning the handle 19 the jib is swivelled.

Alternative Construction. In order to make the jib swivel more freely, a ball-race, Fig. 401B, may be fitted. This is made by bolting to the top of the frame a 3″ pulley wheel 24 by bolts 25 which also secure in the pulley wheel 24 a wheel flange 26. This provides a circular groove for the reception of the ball bearings 27. The pulley wheel 2 which is bolted to the gear-box 1 is then placed over the rod 5 and rests on the ball bearings 27 to form a race.

(N.B.—The wheel flange and the balls for the bearing are not provided in this Outfit but can be bought separately. See parts list page).

Parts required :

4	of	No.	1	1	of	No.	22
10	,,	,,	2	2	,,	,,	22A
1	,,	,,	3	2	,,	,,	24
7	,,	,,	5	2	,,	,,	26
4	,,	,,	8	1	,,	,,	27A
4	,,	,,	11	1	,,	,,	28
12	,,	,,	12	1	,,	,,	29
3	,,	,,	12A	5	,,	,,	35
2	,,	,,	14	85	,,	,,	37
5	,,	,,	16	2	,,	,,	52
1	,,	,,	18A	5	,,	,,	53
2	,,	,,	19	1	,,	,,	57
1	,,	,,	19B	6	,,	,,	59
6	,,	,,	20	1	,,	,,	63
			4 of No. 125				

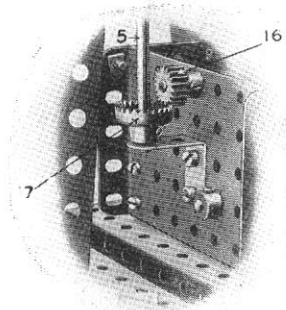


FIG. A.

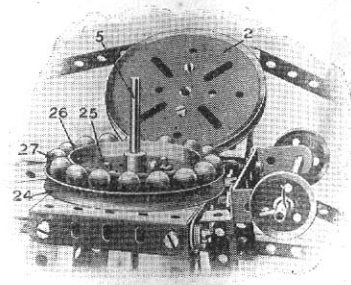


FIG. B.

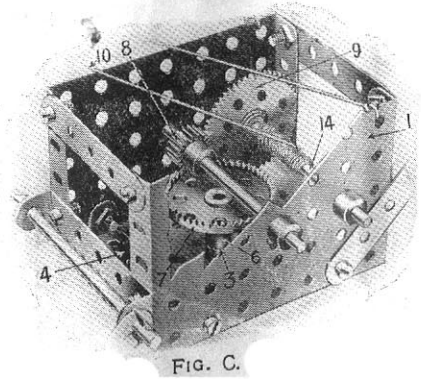


FIG. C.

Model No. 402

Alternating Swing

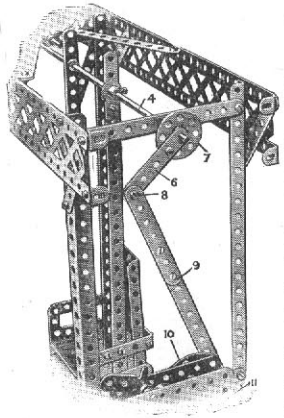
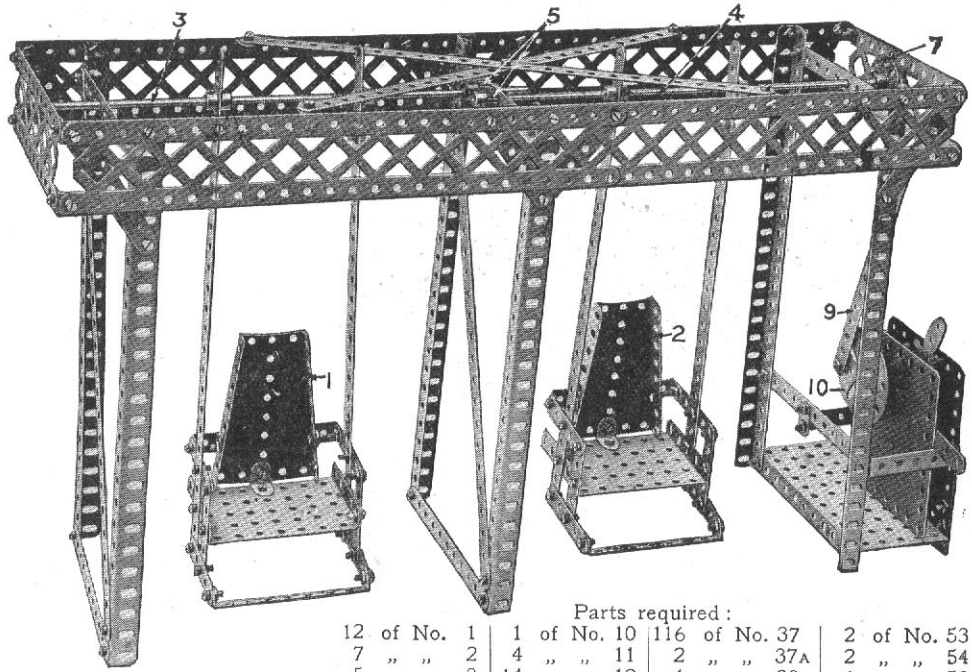


FIG. A

The chairs 1, 2, are pivoted on 11½" rods 3, 4, these rods being geared together by pinions 5, so that they turn in opposite directions. The rod 4 is turned to and fro by means of a 2½" strip connected to a bush wheel 7. The strip 6 is pivotally connected at 8 to a 7½" strip 9 loosely bolted to a face plate 10 on the driven spindle 11 of the motor. As the spindle 11 rotates continuously in one direction, the swings are rocked in opposite directions.



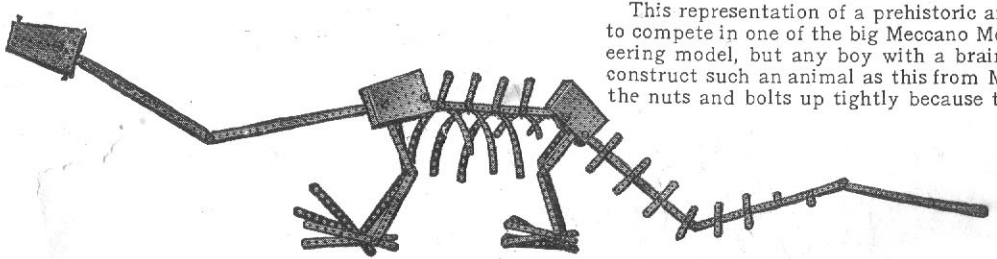
Parts required :

12	of	No.	1	1	of	No.	10	116	of	No.	37	2	of	No.	53
7	„	„	2	4	„	„	11	2	„	„	37A	2	„	„	54
5	„	„	3	14	„	„	12	1	„	„	38	6	„	„	59
4	„	„	4	2	„	„	13	2	„	„	48A	2	„	„	62
15	„	„	5	1	„	„	24	2	„	„	48B	4	„	„	99
6	„	„	8	2	„	„	26	1	„	„	52	2	„	„	100

1 of No. 109

Clockwork Motor
(not included in Outfit).

Model No. 403 # Diplodocus



This representation of a prehistoric animal is a most extraordinary effort sent in by a young French boy to compete in one of the big Meccano Model Building Competitions. We could scarcely class it as an engineering model, but any boy with a brain clever enough and an imagination lively enough to conceive and construct such an animal as this from Meccano parts deserved a good prize, so we awarded him one. Screw the nuts and bolts up tightly because the Diplodocus looks most dejected when he droops.

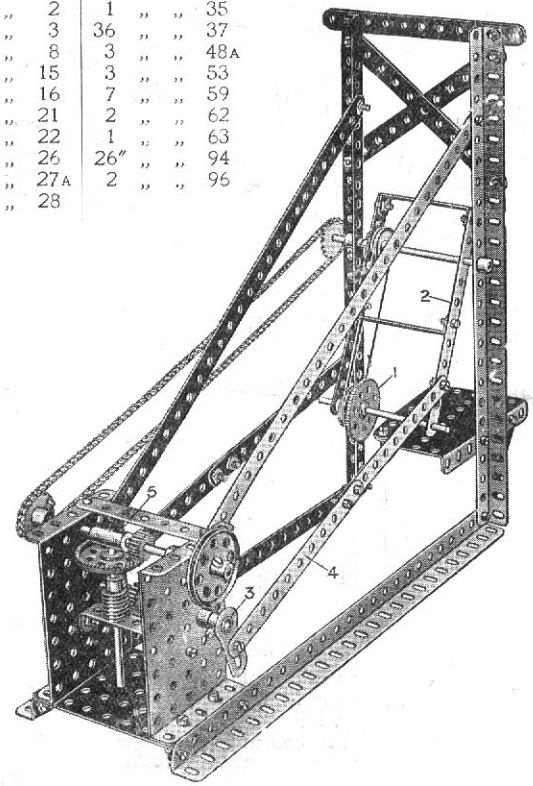
Parts required :

1	of	No.	1	1	of	No.	8	2	of	No.	22
7	„	„	2	4	„	„	10	40	„	„	37
4	„	„	3	1	„	„	16	4	„	„	53
8	„	„	5	4	„	„	17	2	„	„	54
				8	„	„	59				

Model No. 404 Swinging Hot Saw

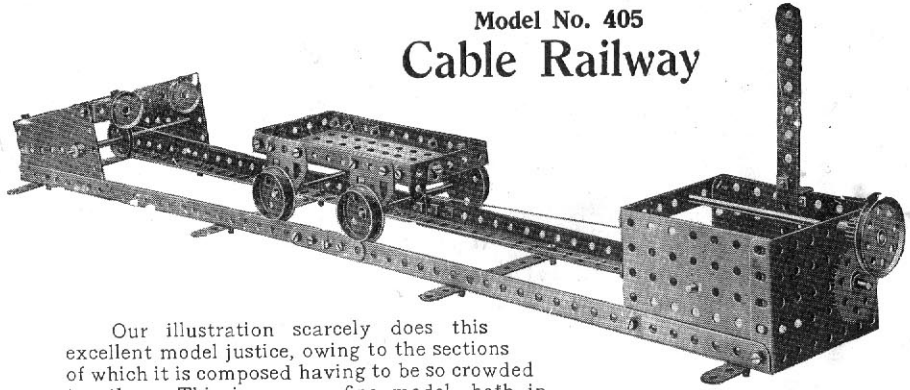
Parts required :

2	of	No.	1	1	of	No.	32
9	„	„	2	1	„	„	35
1	„	„	3	36	„	„	37
4	„	„	8	3	„	„	48A
2	„	„	15	3	„	„	53
3	„	„	16	7	„	„	59
1	„	„	21	2	„	„	62
2	„	„	22	1	„	„	63
2	„	„	26	26″	„	„	94
1	„	„	27A	2	„	„	96
1	„	„	28				



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. 405 Cable Railway



Our illustration scarcely does this excellent model justice, owing to the sections of which it is composed 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 1½″ 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.

Parts required :

5	of	No.	2	1	of	No.	27A
3	„	„	3	2	„	„	29
2	„	„	5	2	„	„	35
4	„	„	8	51	„	„	37
1	„	„	15	3	„	„	38
2	„	„	15A	1	„	„	46
2	„	„	16	2	„	„	48A
1	„	„	17	2	„	„	48C
4	„	„	20	1	„	„	52
1	„	„	21	3	„	„	53
3	„	„	22	2	„	„	54
1	„	„	22A	6	„	„	59
2	„	„	26	3	„	„	125
				4	of	No.	126A

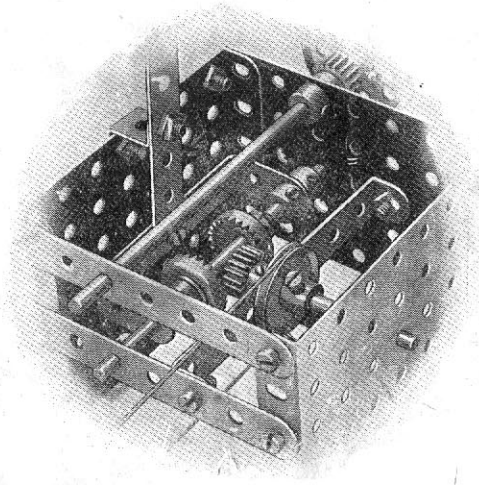


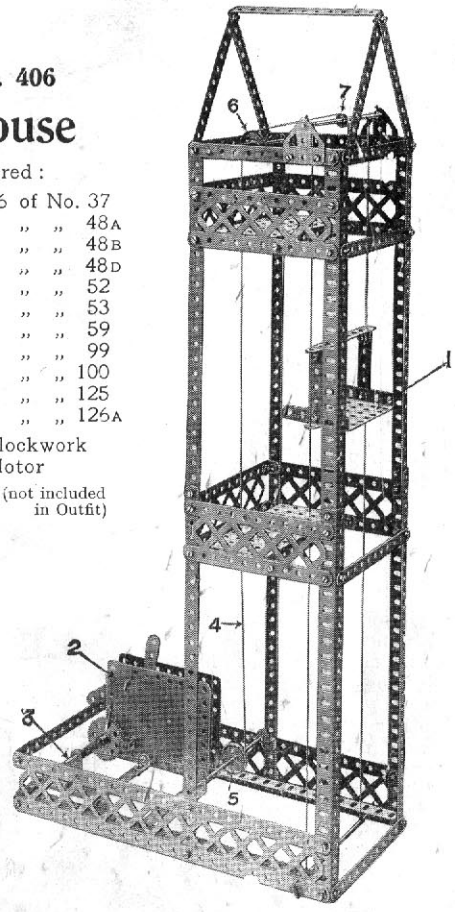
FIG. A

Model No. 406

Warehouse

Parts required :

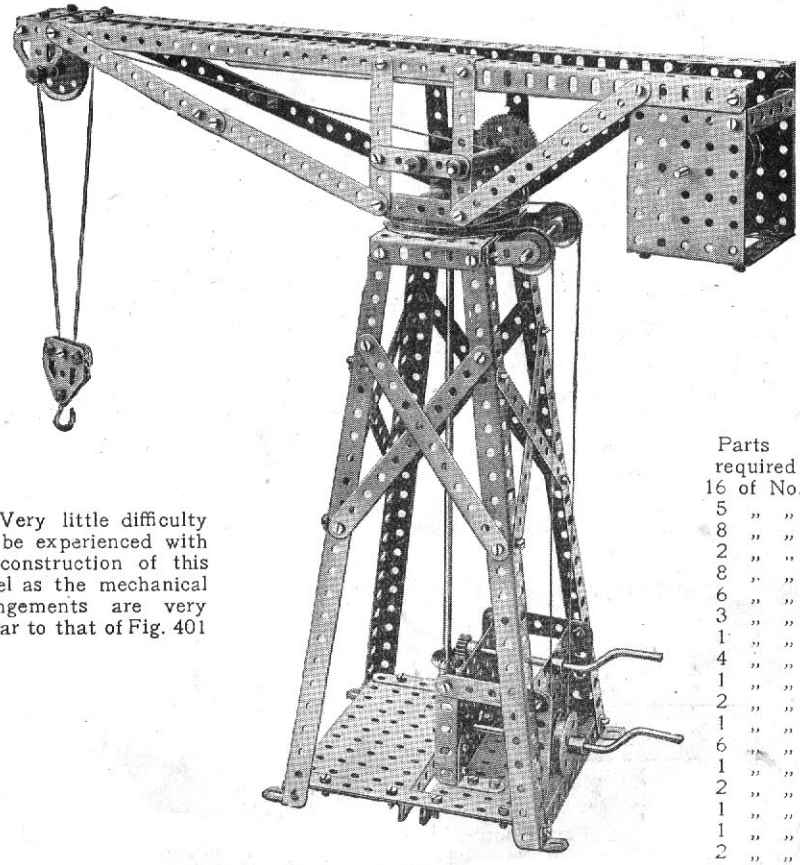
4	of	No.	1	126	of	No.	37
18	„	„	2	2	„	„	48A
2	„	„	4	1	„	„	48B
6	„	„	8	2	„	„	48D
4	„	„	11	2	„	„	52
14	„	„	12	1	„	„	53
1	„	„	12A	2	„	„	59
3	„	„	14	2	„	„	99
1	„	„	15	6	„	„	100
1	„	„	16	2	„	„	125
1	„	„	17	2	„	„	126A
2	„	„	22A	Clockwork Motor (not included in Outfit)			
1	„	„	23				
1	„	„	26				
1	„	„	27A				
10	„	„	35				



The cage 1 is raised or lowered to the several floors from the motor 2 driving a rod 3 from which passes the hoisting cord 4 round a 1″ pulley 5 and another 6 at the top, and thence over a ½″ pulley 7 to the cage 1. The construction of the floors and frame should be clear from the illustration.

Model No. 407

Girder Crane



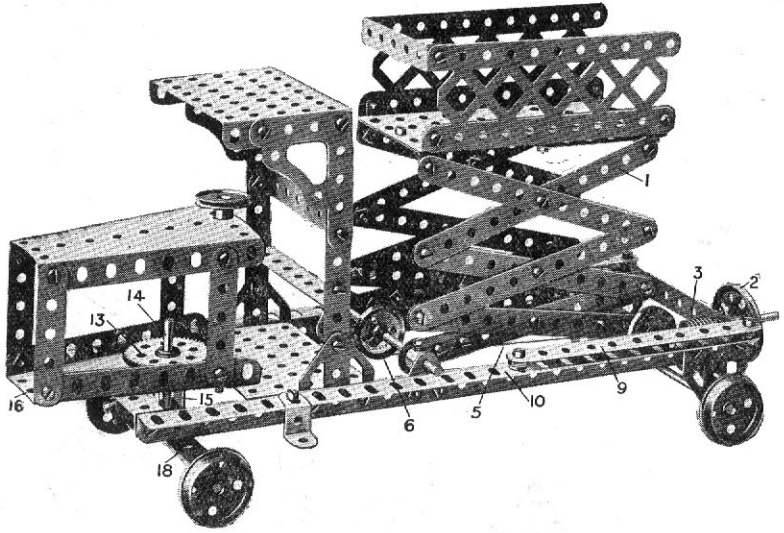
Very little difficulty will be experienced with the construction of this model as the mechanical arrangements are very similar to that of Fig. 401

Parts required :

16	of	No.	2
5	„	„	3
8	„	„	5
2	„	„	6A
8	„	„	8
6	„	„	12
3	„	„	12A
1	„	„	13
4	„	„	16
1	„	„	17
2	„	„	19
1	„	„	19B
6	„	„	20
1	„	„	21
2	„	„	22
1	„	„	23
1	„	„	24
2	„	„	26
1	„	„	27A

1	of	No.	28	10	of	No.	38	2	of	No.	52	9	of	No.	59
1	„	„	29	1	„	„	46	5	„	„	53	1	„	„	115
92	„	„	37	3	„	„	48A	1	„	„	57	4	„	„	126A

Model No. 408 Tower Wagon



Parts required:

16	of No.	2	78	of No.	37
2	„ „	4	22	„ „	37A
4	„ „	5	24	„ „	38
2	„ „	8	1	„ „	45
2	„ „	15	4	„ „	48A
5	„ „	15A	6	„ „	48B
1	„ „	16	1	„ „	52
2	„ „	17	2	„ „	53
4	„ „	20	2	„ „	54
1	„ „	21	3	„ „	59
3	„ „	22	2	„ „	62
1	„ „	22A	2	„ „	77
1	„ „	24	2	„ „	100
2	„ „	26	2	„ „	103
1	„ „	27A	1	„ „	115
1	„ „	32	2	„ „	125
2	„ „	35	4	„ „	126A

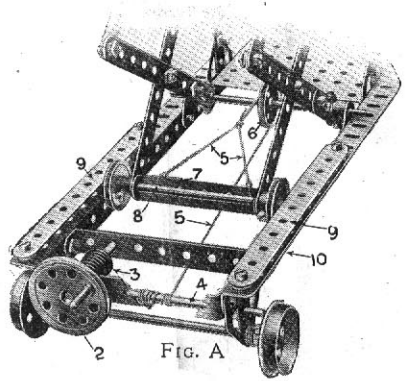
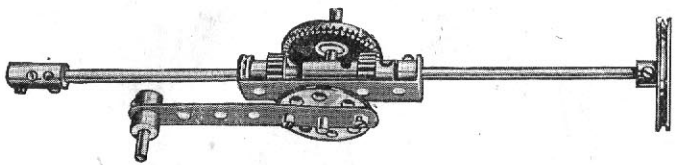


FIG. A

The Lazy Tongs 1 are extended by turning the hand wheel 2, a worm 3 on which engages a ½" pinion, not shown, on the rod 4. On this rod winds a cord 5 which passes round a pulley 6 and is secured to a 2½" × ½" double angle strip 7 on the rod 8, the ends of which slide in guides on either side formed by the strips 9 spaced by washers and the angle girders 10 of the carriage. The Lazy Tongs collapse by their own weight. The steering is effected from the rod 11, a pinion 12 on which engages a 57-toothed gear wheel 13, the 2" rod 14 of which passes through a double bent strip 15 bolted to the under-side of the sector plate 16. The rod 14 is secured to the bush wheel 17 which carries the double angle strip 3½" × ½" 18.

Model No. 409 Breast Drill



Parts required:

1	of No.	3	1	of No.	21	1	of No.	28
2	„ „	15	1	„ „	23	2	„ „	37
2	„ „	17	1	„ „	24	1	„ „	48A
1	„ „	18A	2	„ „	26	3	„ „	59
			2	„ „	63			

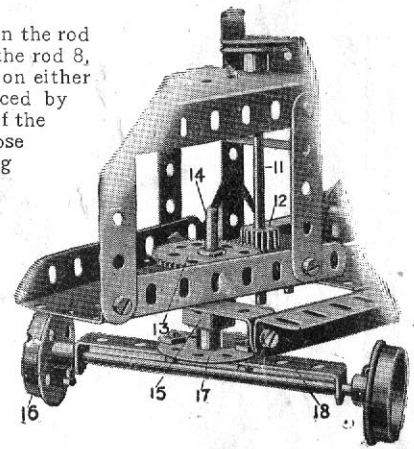
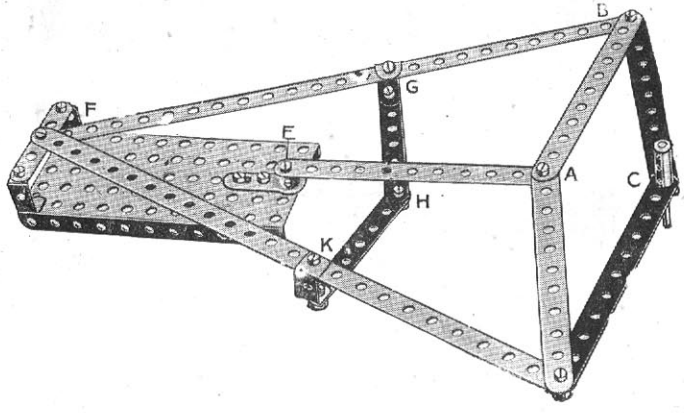


FIG. B

Model No. 410 Geometrical Apparatus



Parts required:

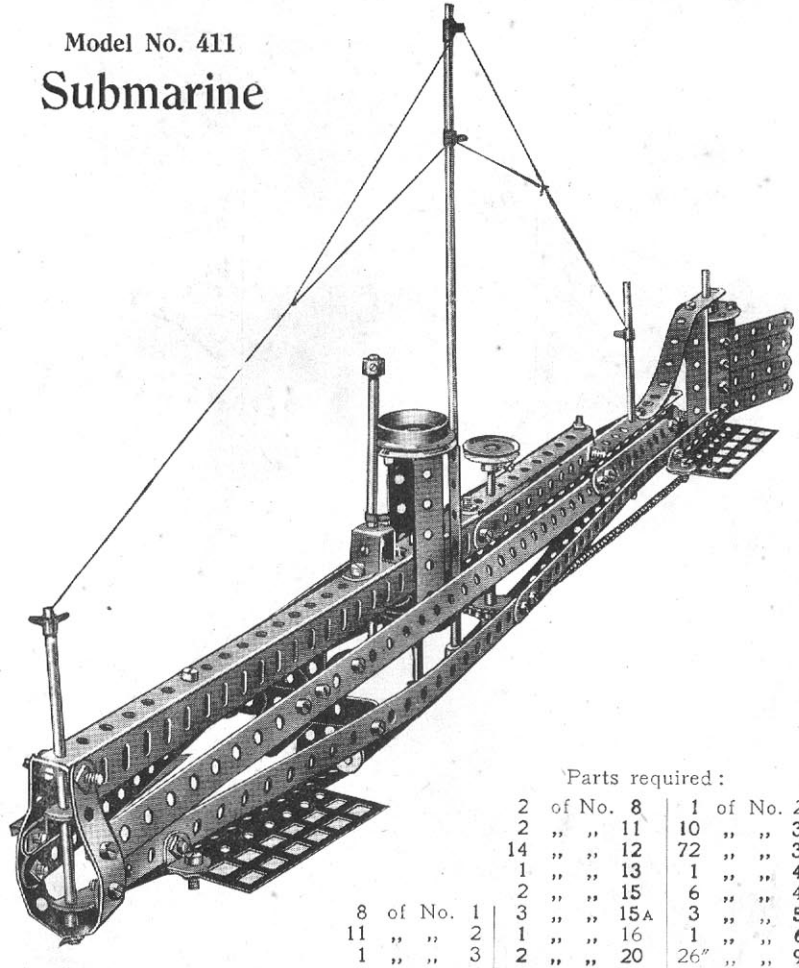
2	of	No.	1
5	,,	,,	2
2	,,	,,	3
1	,,	,,	5
4	,,	,,	11
1	,,	,,	17
16	,,	,,	37
1	,,	,,	52
7	,,	,,	59
1	,,	,,	62
1	,,	,,	63

This most ingenious model for transforming a circular movement into a rectilinear movement was designed by M. Pierre-Th. Dufour, who used it in his Thesis (presented to the Faculty of Science in Paris) to obtain his degree of Doctor of the University of Paris. He required an instrument which would transform a circular movement into a movement rigorously rectilinear and he states in his published work that he was able to do this "with the aid of Meccano parts, which permit of making experiments so easily in mechanisms of the most varied types."

The point F is fixed, and is situated at a distance from the fixed point E, equal to AE, the two arms FB and FD being together equal to the four sides of the lozenge ABCD. The trajectory of the point C is then at right angles to EF. It will be found that whilst the point C is moving in a straight line at right angles to EF, the point A is describing a circle round the fixed point E.

Every Meccano boy should make up this very interesting model and experiment with it.

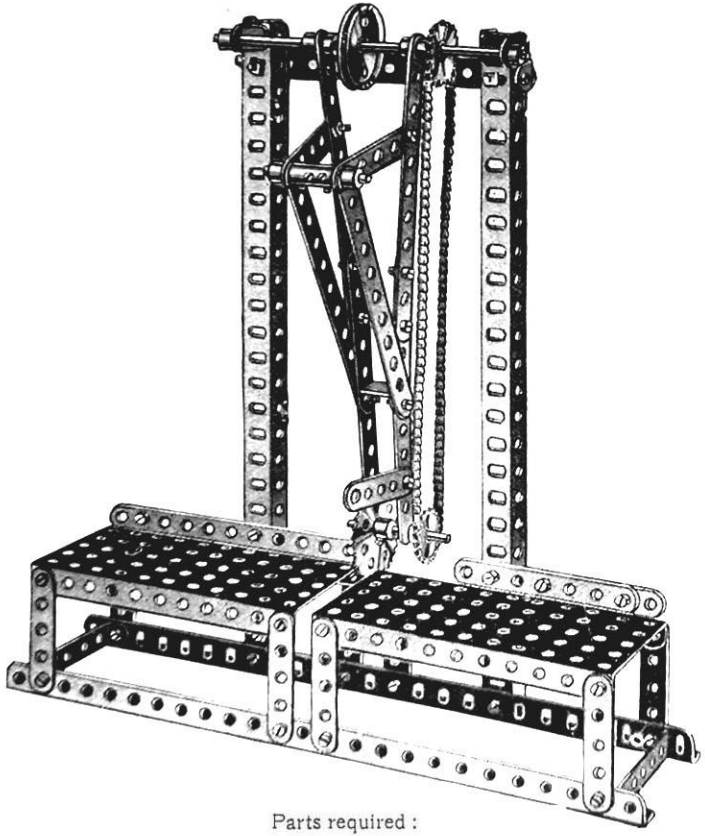
Model No. 411 Submarine



Parts required:

8	of	No.	1	2	of	No.	8	1	of	No.	24
11	,,	,,	2	2	,,	,,	11	10	,,	,,	35
1	,,	,,	3	14	,,	,,	12	72	,,	,,	37
8	,,	,,	5	1	,,	,,	13	1	,,	,,	45
				2	,,	,,	15	6	,,	,,	48A
				3	,,	,,	15A	3	,,	,,	59
				1	,,	,,	16	1	,,	,,	61
				2	,,	,,	20	26″	,,	,,	94
				1	,,	,,	22	2	,,	,,	96

Model No. 412 Swing Saw



Parts required :

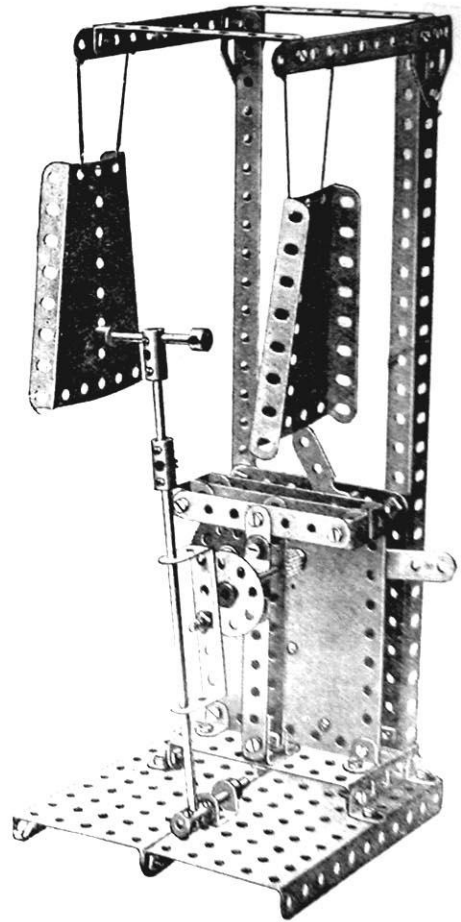
8	of No. 1	8	of No. 2	4	of No. 12	2	of No. 52
1	„ „	1	„ „ 3	1	„ „ 14	8	„ „ 59
12	„ „	12	„ „ 5	2	„ „ 17	1	„ „ 63
6	„ „	6	„ „ 8	1	„ „ 21	1	„ „ 94
1	„ „	1	„ „ 10	45	„ „ 37	1	„ „ 95
		1	„ „ 11	2	„ „ 48A	2	„ „ 96

Model No. 413 Automatic Gong

Parts required:

2	of No.		2
2	„	„	2A
2	„	„	3
2	„	„	8
5	„	„	11
9	„	„	12
1	„	„	12A
1	„	„	14
5	„	„	17
1	„	„	24
1	„	„	26
1	„	„	27A
43	„	„	37
2	„	„	37A
2	„	„	38
1	„	„	45
1	„	„	46
2	„	„	48B
2	„	„	52
1	„	„	53
2	„	„	54
3	„	„	59
3	„	„	63
1	„	„	111
2	„	„	126A

Clockwork Motor
(not included in Outfit)

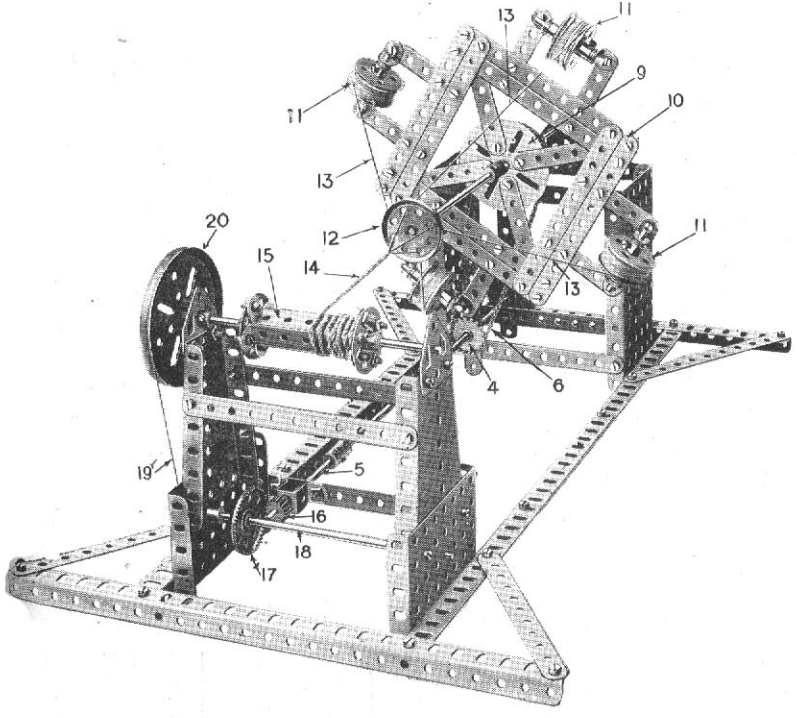


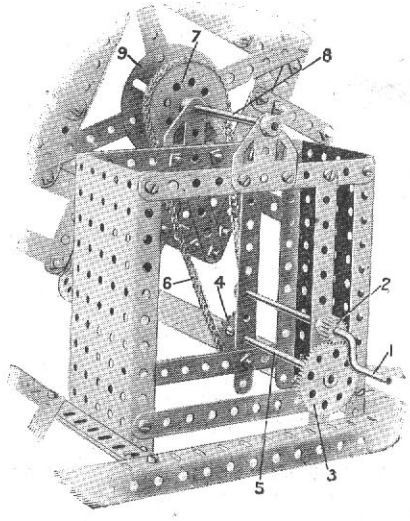
Model No. 414 Wire Rope-making Machine

Parts required :

21	of	No.	2	1	of	No.	13	4	of	No.	17	1	of	No.	22	104	of	No.	37
4	,,	,,	3	2	,,	,,	14	1	,,	,,	19	2	,,	,,	24	16	,,	,,	38
8	,,	,,	5	1	,,	,,	15	1	,,	,,	19B	2	,,	,,	26	1	,,	,,	45
6	,,	,,	8	1	,,	,,	15A	8	,,	,,	20	1	,,	,,	27A	4	,,	,,	48A
8	,,	,,	12	1	,,	,,	16	1	,,	,,	21	1	,,	,,	28	2	,,	,,	52

2	of	No.	53	1	of	No.	95												
2	,,	,,	54	1	,,	,,	96												
4	,,	,,	59	1	,,	,,	109												
2	,,	,,	63	4	,,	,,	126A												
16"	,,	,,	94																





The machine is operated from the crank handle 1, a pinion 2 on which engages a 57-toothed wheel 3. A 1" sprocket wheel 4 on the rod 5 of the toothed wheel 3 drives through a chain 6 a 2" sprocket wheel 7, bolted on the rod 8. To this rod is bolted a face plate 9 which carries a framework 10 in which are mounted the wire spools 11 made from two flanged pulley wheels. At the front of the rod is bolted a 1½" pulley wheel 12, through alternate holes in which the wires 13 from the spools 11 are threaded. By operating the handle 1 the frame 10 is rotated and the wires stranded to form a twisted rope 14 which is taken up on a drum formed of 4 2½" double angle strips 15. This drum is rotated from the rod 5 by a pinion 16 engaging a contrate wheel 17 on the rod 18 of which a 1" pulley wheel, not shown, drives through a cord 19 a 3" pulley wheel, 20 on the drum spindle. The cord 19 may be wound twice round the smaller pulley wheel to get a better grip.

Model No. 415

Swivelling and Luffing Jib Crane

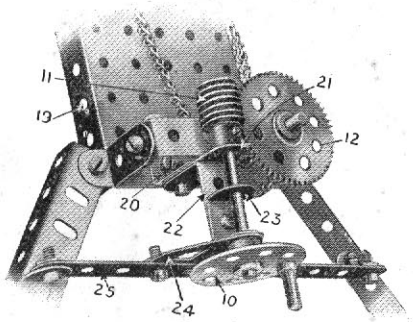
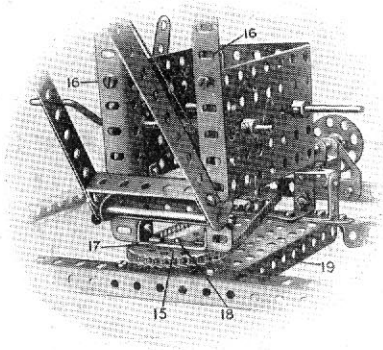


FIG. A

In this model three separate actions are provided, for raising the load, raising the jib, and swivelling the jib. The load is raised by means of a crank handle 1 on which the cord 2 is wound and passes over the 1" pulley 3, thence round the ½" pulley in the block 4 (spacing washers being used to give clearance to the ½" pulley), the end of the cord 2 being made fast to the top of the jib. By turning the handle 1 the load is raised or lowered. The jib itself is raised or lowered by the operation of the crank handle 5 on the rod of which a cord is wound, and passes over one of two pulleys 7 to and round another 1" pulley 8 in the jib, whence it returns to and passes round the other pulley 7, being finally made fast to the double bracket 9 bolted to the jib.

As the handle 5 is turned the cord 6 is wound round the pulleys and the angle of the jib varied. The jib is swivelled by the hand-wheel 10, a worm 11 on which engages a 57-toothed wheel 12 on the rod of which a 1" sprocket wheel 13 is mounted. A sprocket chain 14 passes round this wheel 13 and round a 2" sprocket wheel 15 secured to the standard 16 of the crane. The bearing for the rod of the worm 11 is made by bolting a 1" angle bracket 20 to the rectangular plate 19, and to the angle bracket 20 is secured a 1½" strip 21 and a 1" bracket 22. To the bracket 22 is bolted a double bracket 23. A flat trunnion 24 is bolted to the 5½" strip 25 which forms with the bracket 23 the front bearing for the rod. The standard is built up of 2 12½" girders 16 which are connected at the base by a 1½" double angle strip 17 which is bolted to the 2" sprocket wheel 15. The 1" rod 18 is secured in the bush of the sprocket wheel 15 and fitted with a collar below the rectangular plate 19, Fig. 415B.



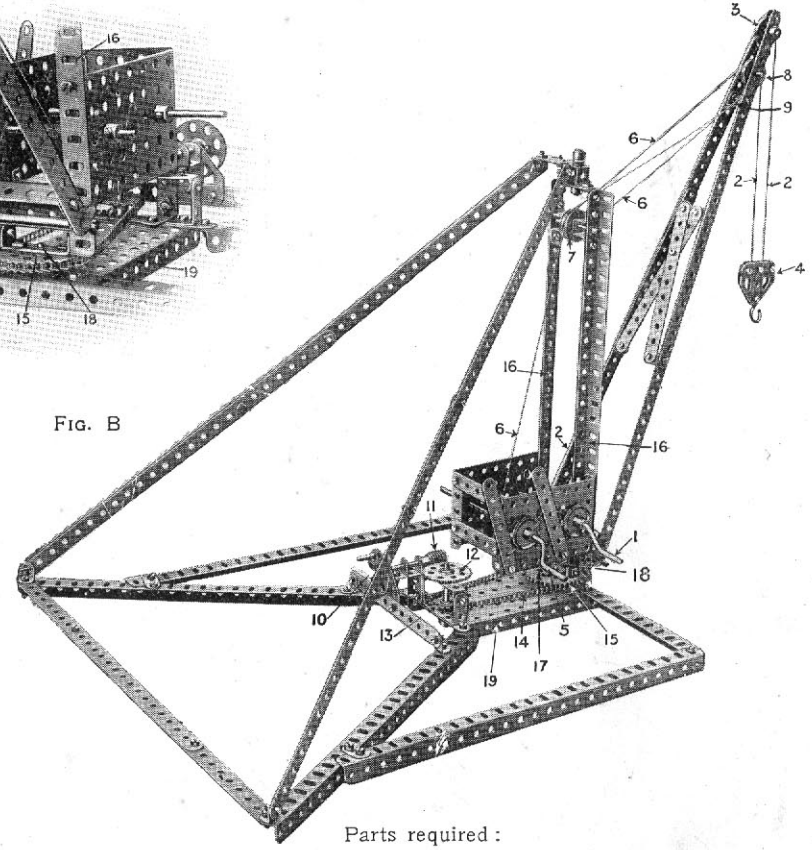


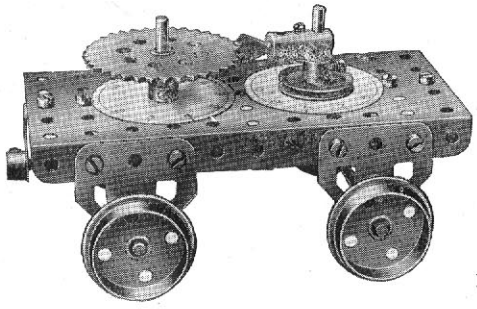
FIG. B

Parts required :

10	of	No.	1	2	of	No.	12A	1	of	No.	27A
3	„	„	2	1	„	„	16	1	„	„	32
3	„	„	3	3	„	„	17	2	„	„	35
2	„	„	5	4	„	„	18A	80	„	„	37
1	„	„	6A	2	„	„	19	2	„	„	37A
7	„	„	8	3	„	„	22	13	„	„	38
2	„	„	10	3	„	„	22A	3	„	„	45
2	„	„	11	1	„	„	23	1	„	„	46
10	„	„	12	1	„	„	24	2	„	„	48

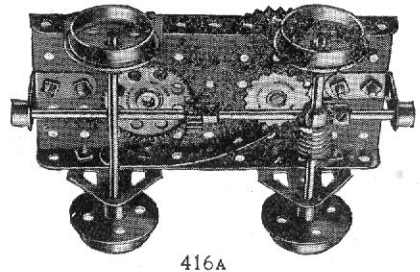
3	of	No.	48A
2	„	„	52
2	„	„	53
1	„	„	57
8	„	„	59
1	„	„	95
1	„	„	96
1	„	„	115
4	„	„	126A

Model No. 416 Distance Indicator



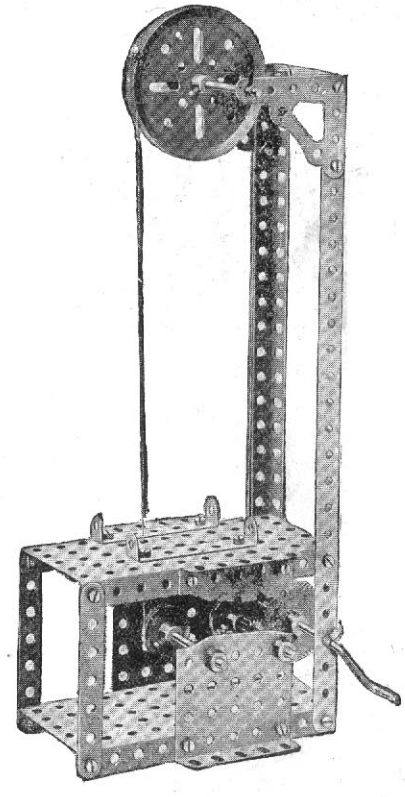
Parts required :

1	of	No.	4	1	of	No.	37A
4	„	„	10	3	„	„	38
2	„	„	12	1	„	„	52
1	„	„	15	3	„	„	59
2	„	„	16	2	„	„	62
2	„	„	17	1	„	„	63
4	„	„	19A	1	„	„	65
2	„	„	26	1	„	„	95
1	„	„	28	1	„	„	96
1	„	„	32	4	„	„	126A
16	„	„	37				



416A

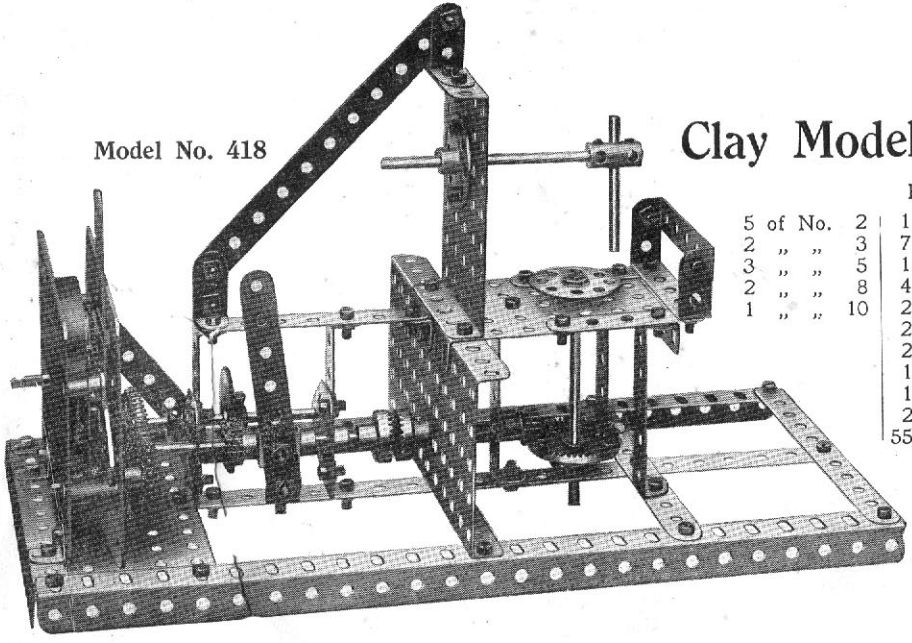
Model No. 417 Band Saw



Parts required :

2	of	No.	3	2	of	No.	22
1	„	„	5	1	„	„	26
2	„	„	8	1	„	„	27A
3	„	„	16	4	„	„	35
1	„	„	19	26	„	„	37
1	„	„	19B	2	„	„	48A
2	of	No.	52				
2	„	„	53				
4	„	„	59				
2	„	„	108				

Model No. 418 Clay Modelling Machine

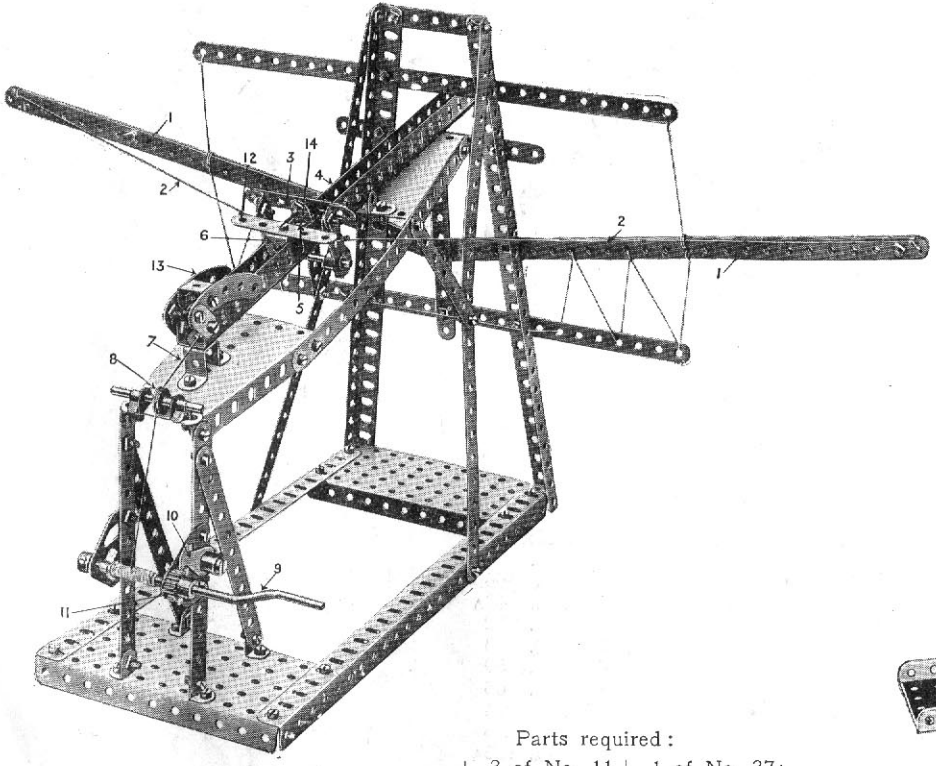


Parts required :

5	of	No.	2	1	of	No.	11
2	„	„	3	7	„	„	12
3	„	„	5	1	„	„	12A
2	„	„	8	4	„	„	16
1	„	„	10	2	„	„	17
				2	„	„	24
				2	„	„	26
				1	„	„	27A
				1	„	„	28
				2	„	„	29
				55	„	„	37
				2	of	No.	37A
				2	„	„	38
				1	„	„	46
				6	„	„	48A
				2	„	„	52
				2	„	„	53
				4	„	„	59
				1	„	„	63
				6″	„	„	94
				2	„	„	96
				2	„	„	126A

Clockwork Motor
(not included in Outfit).

Model No. 419 Mechanical Cross Bow



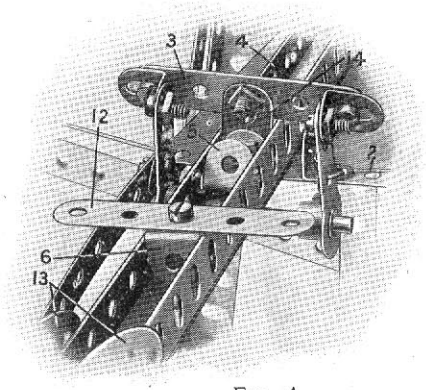


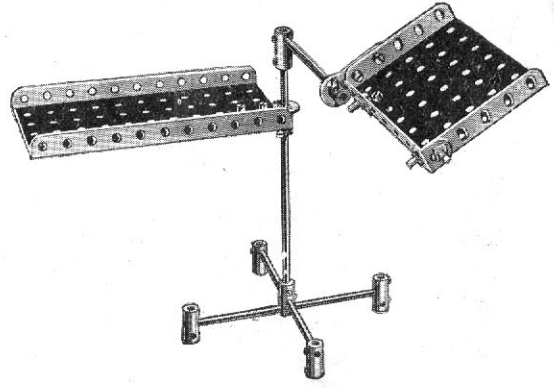
FIG. A

The only part of this model that requires description is the release of the bow. This is obtained by the following mechanism: the bow is made of three 12½" strips, 1, on each side, from the outer ends of which the cords 2 of the bow are connected to a frame 3, sliding on the angle girders 4. To this frame is bolted a double bracket 5 and a flat bracket 14, and this is engaged by another double bracket 6, forming the trigger. A cord 7 is connected to the double bracket 6 and passes over the pulley wheel 8 to the winding handle 9, controlled by a pawl 10 engaging a pinion 11. As the handle 9 is turned to bend the bow, the double bracket 6 is drawn back, and eventually the cross strip 12 engages and rides up the curved strips 13, disengaging the bracket 6 from the bracket 5 and releasing the bow.

Parts required:

10	of	No.	1	3	of	No.	11	1	of	No.	37A
8	„	„	2	12	„	„	12	1	„	„	45
2	„	„	3	2	„	„	17	2	„	„	52
3	„	„	5	1	„	„	19	2	„	„	54
4	„	„	8	1	„	„	23	1	„	„	59
3	„	„	10	1	„	„	26	2	„	„	62
				1	„	„	33	2	„	„	90
				3	„	„	35	1	„	„	111
				73	„	„	37	2	„	„	126A

Model No. 420 Bed Table

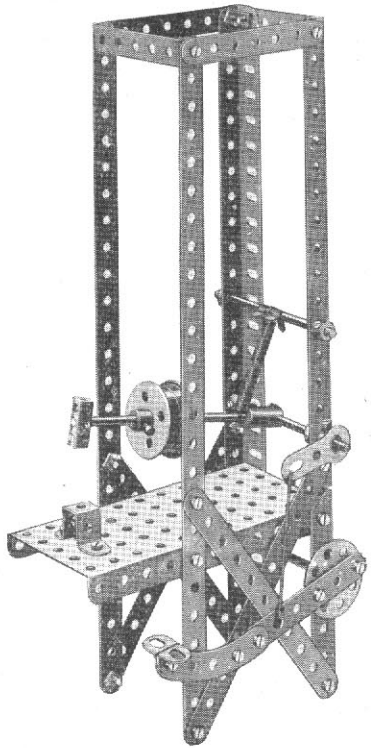


Parts required:

1	of	No.	3
1	„	„	12
1	„	„	14
2	„	„	15A
1	„	„	16
8	„	„	37
1	„	„	52
1	„	„	53
2	„	„	62
6	„	„	63

Model No. 421

Treadle Hammer



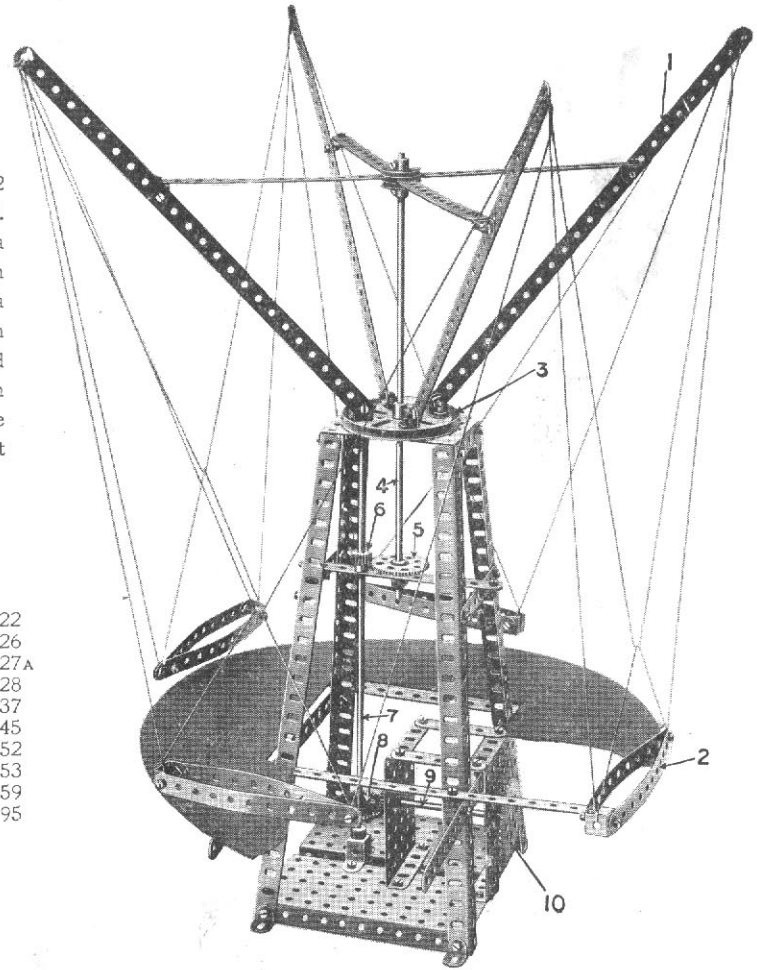
Parts required :

2	of	No.	1	3	of	No.	16	1	of	No.	45
4	„	„	2	2	„	„	20	1	„	„	48A
3	„	„	3	1	„	„	24	1	„	„	52
1	„	„	5	2	„	„	35	5	„	„	59
2	„	„	8	23	„	„	37	1	„	„	62
2	„	„	12	2	„	„	38	2	„	„	63
1	„	„	15A	1	„	„	43	1	„	„	90

Model No. 422

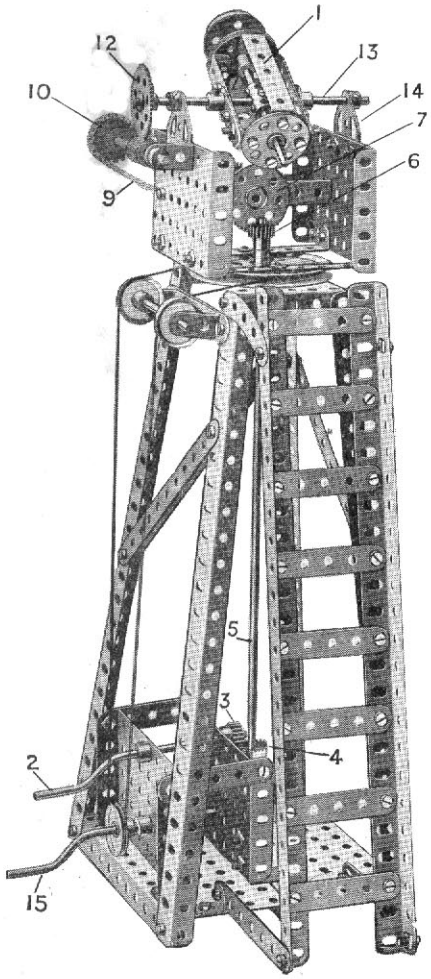
Flying Machine

The arms 1 carrying the boats 2 are driven from the 3" pulley 3. This is connected by the rod 4 to a gear wheel 5 driven by a pinion 6 on a rod 7. At the foot of this rod is a contrate wheel 8 driven by a pinion on the end of another rod 9. This rod carries the sprocket wheel 10 driven by a chain from the motor. As the arms 1 rotate the boats 2 fly out centrifugally.



Parts required :

10	of	No.	1	2	of	No.	22
9	„	„	2	2	„	„	26
2	„	„	3	1	„	„	27A
2	„	„	5	1	„	„	28
4	„	„	8	66	„	„	37
4	„	„	11	1	„	„	45
22	„	„	12	2	„	„	52
2	„	„	13	3	„	„	53
1	„	„	16	2	„	„	59
1	„	„	19B	1	„	„	95



Model No. 423 Searchlight Tower

The elevation of the search-light 1 is obtained through the crank handle 2 a pinion 3 on which engages a ¾" contrate wheel 4 on an 11½" rod 5 at the top of which a ½" pinion 6 engages a 1½" contrate wheel 7. On the rod of this contrate wheel at the rear end a 1" sprocket wheel 8 drives through a chain 9 another sprocket wheel 10. A worm 11 on the rod of the latter sprocket engages and drives a 57-toothed gear wheel 12, bolted to a 5" rod 13 which forms the pivot of the search-light 1. The rod 13 is journalled in two flat brackets 14. The search-light is swivelled from a crank handle 15 in the same manner as Model No. 401.

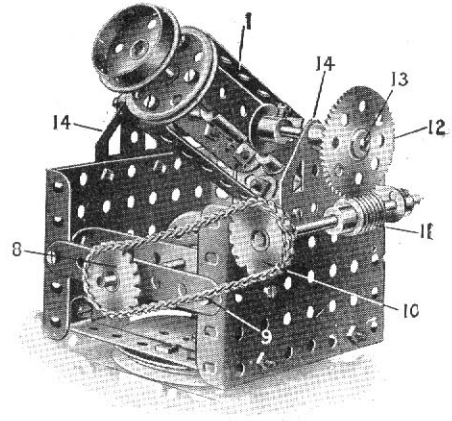
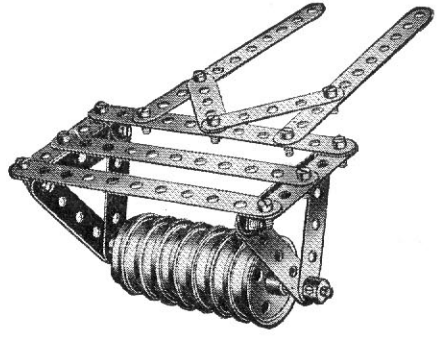


FIG. A

Parts required :

3	of	No.	2	2	of	No.	26
4	„	„	3	1	„	„	27A
10	„	„	5	1	„	„	28
6	„	„	8	1	„	„	29
4	„	„	12	1	„	„	32
3	„	„	12A	88	„	„	37
1	„	„	13	4	„	„	38
1	„	„	15	2	„	„	46
2	„	„	16	4	„	„	48A
3	„	„	17	3	„	„	48B
2	„	„	19	2	„	„	52
1	„	„	19B	5	„	„	53
1	„	„	20	6	„	„	59
1	„	„	21	2	„	„	62
3	„	„	22	1	„	„	63
1	„	„	22A	2	„	„	90
1	„	„	24	2	„	„	126A

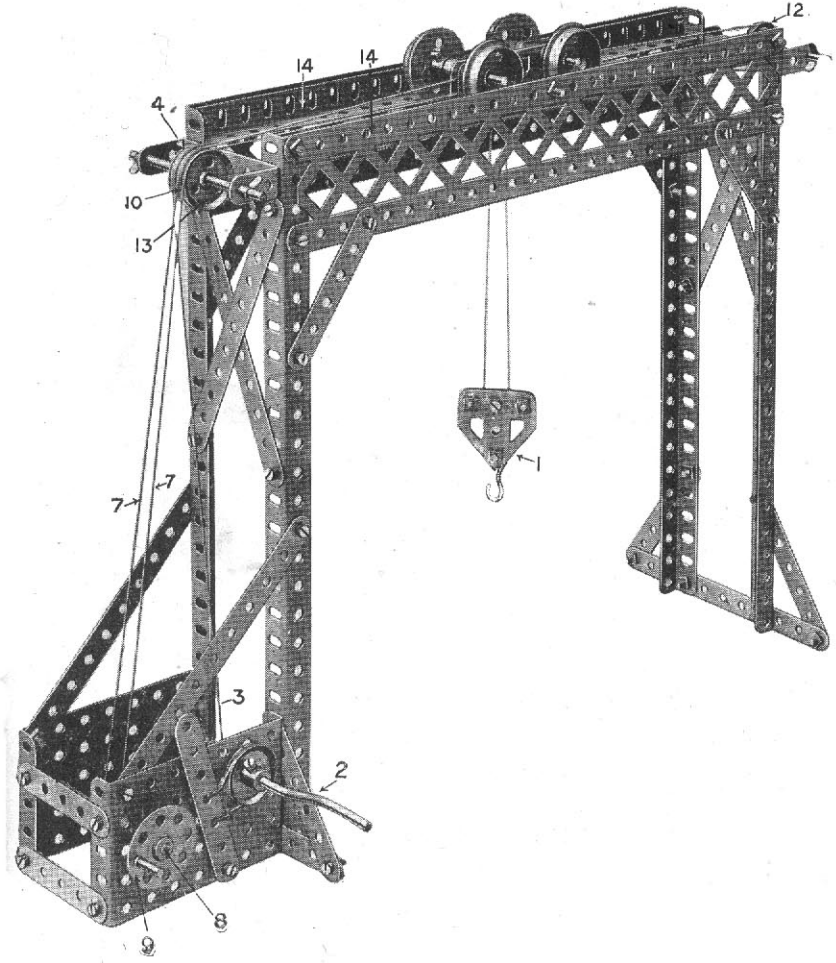
Model No. 424 Field Roller



Parts required :

5	of	No.	2
10	„	„	5
4	„	„	12
1	„	„	15
8	„	„	20
15	„	„	37
4	„	„	59

Model No. 425 Gantry



Parts required :

2	of	No.	1	1	of	No.	24
8	,,	,,	2	6	,,	,,	35
3	,,	,,	3	59	,,	,,	37
6	,,	,,	4	1	,,	,,	37A
2	,,	,,	5	12	,,	,,	38
6	,,	,,	8	2	,,	,,	46
3	,,	,,	16	2	,,	,,	53
2	,,	,,	17	1	,,	,,	57
1	,,	,,	19	4	,,	,,	59
4	,,	,,	20	2	,,	,,	103F
3	,,	,,	22	1	,,	,,	115
2	,,	,,	22A	2	,,	,,	126A
3	,,	,,	23				

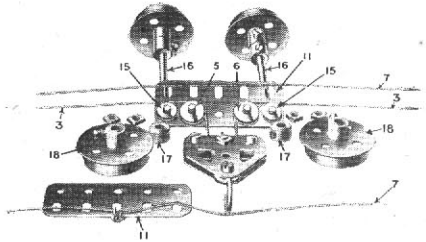


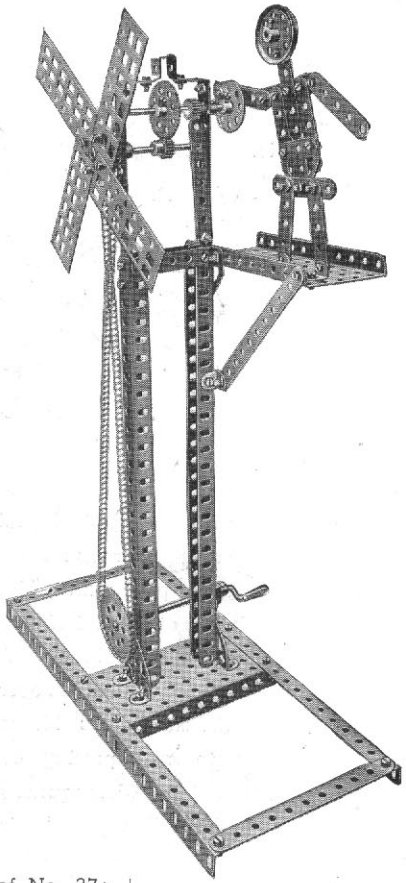
FIG. 425A

The pulley 1 is capable of being hoisted to raise the load, or traversed. In order to raise the load the crank handle 2 is operated, which winds the cord 3 passing over the rear pulley wheel 4 round the ½" pulley 5 and a corresponding pulley in the block, thence round another ½" pulley 6 and is made fast at the end of the gantry. For traversing, a continuous cord 7 is wound several turns on the 3½" rod 8 to which is secured a hand wheel 9. The cord passes over the pulley wheel 10 and is secured to one of the side plates 11, and continues round the pulley 12 returning to and passing over the nearest pulley wheel 13 back to the rod 8. Consequently by turning the hand wheel 8 in one or other direction, the carriage is traversed to and fro along the top angle girders 14, which form the travelling rails. The construction of the travelling carriage is shown in Fig. 425A, three washers 15 being placed on each of the outer bolts, passed through the two plates 11 ; and ½" pulley wheels 5, 6, on the inner bolts. The outer plates being then bolted together, the rods 16 of the flange wheels are passed through both plates in the end elongated holes, and collars 17 secured on the exterior. After which the remaining flange wheels 18 are secured on the ends of the rods 16.

These Models can be made with MECCANO Outfit No. 4, or No. 3 and No. 3A.

Model No. 426

Windmill Scare

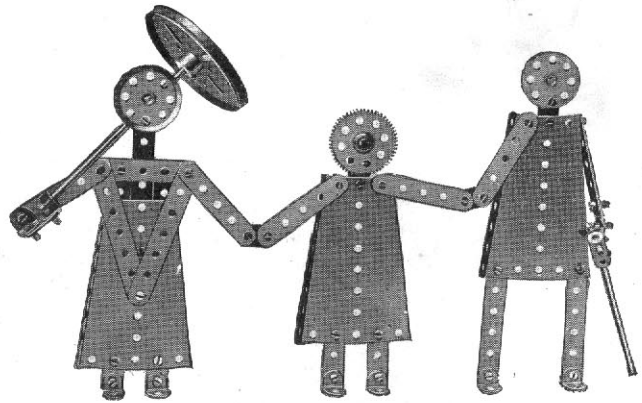


Parts required :

5	of	No.	2	2	of	No.	37A	1	of	No.	95
1	„	„	3	3	„	„	38	1	„	„	96
11	„	„	5	1	„	„	45	1	„	„	115
6	„	„	8	2	„	„	52	2	„	„	125
8	„	„	12	4	„	„	59	3	„	„	126A
2	„	„	12A	20″	„	„	94				
2	„	„	16								
1	„	„	19								
1	„	„	21								
2	„	„	24								
2	„	„	26								
1	„	„	27A								
61	„	„	37								

Model No. 427

The Meccano Family

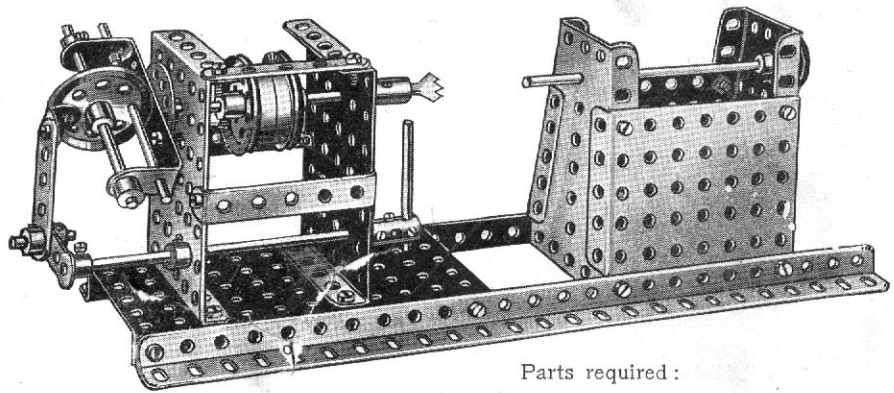


Parts required :

1	of	No.	2	1	of	No.	19B
2	„	„	3	1	„	„	21
2	„	„	4	1	„	„	24
12	„	„	5	1	„	„	27A
7	„	„	10	3	„	„	35
9	„	„	12	36	„	„	37
1	„	„	15	3	„	„	54
1	„	„	15A	1	„	„	63
1	„	„	18A				

Model No. 428

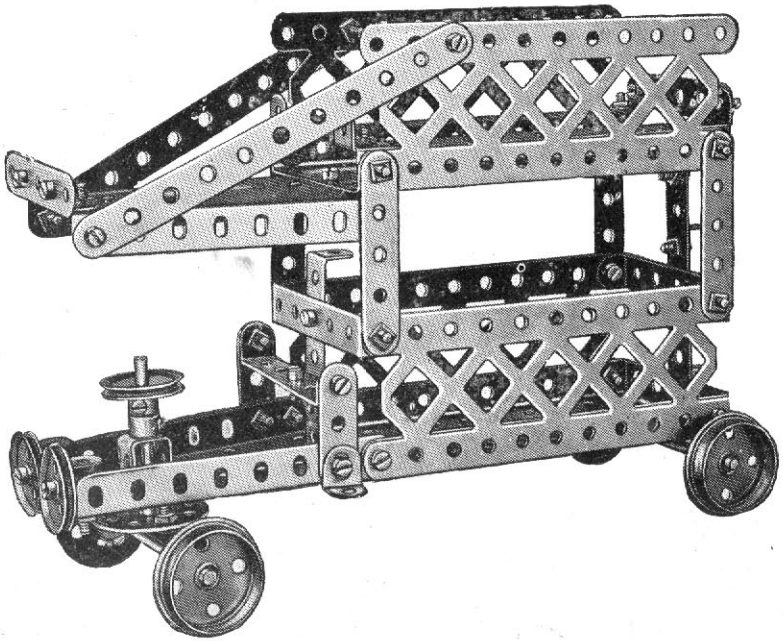
Elliptic Lathe



Parts required :

2	of	No.	5	1	of	No.	17	2	of	No.	35	2	of	No.	54
2	„	„	8	1	„	„	18A	26	„	„	37	8	„	„	59
1	„	„	12	2	„	„	20	1	„	„	46	1	„	„	62
2	„	„	15	1	„	„	21	2	„	„	48A	2	„	„	63
1	„	„	15A	1	„	„	22	1	„	„	52	1	„	„	65
2	„	„	16	1	„	„	24	4	„	„	53				

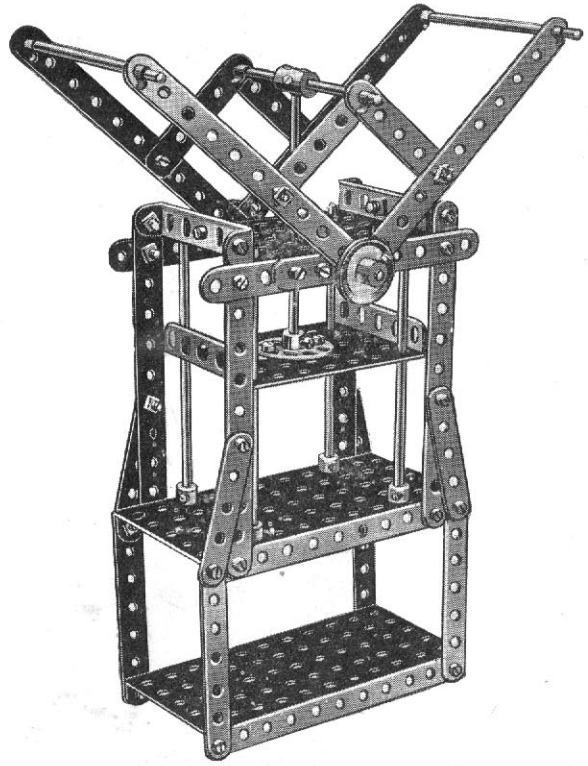
Model No. 429 Motor Bus



Parts required :

2	of No.	2	12	of No.	12	2	of No.	22A	2	of No.	52
1	„ „	3	2	„ „	16	1	„ „	24	1	„ „	54
6	„ „	5	1	„ „	17	48	„ „	37	1	„ „	59
2	„ „	6A	4	„ „	20	1	„ „	45	4	„ „	100
3	„ „	11	1	„ „	22	7	„ „	48A			

Model No. 430 Bale Press

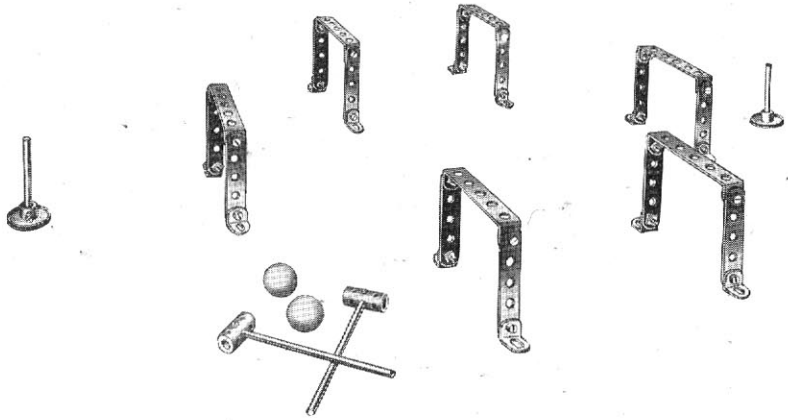


Parts required :

10	of No.	2	1	of No.	15A	44	of No.	37	2	of No.	52
4	„ „	3	2	„ „	17	14	„ „	37A	2	„ „	53
8	„ „	5	1	„ „	24	2	„ „	38	4	„ „	59
4	„ „	15	8	„ „	35	2	„ „	48A	1	„ „	63

2 of No. 111

Model No. 431 Table Croquet

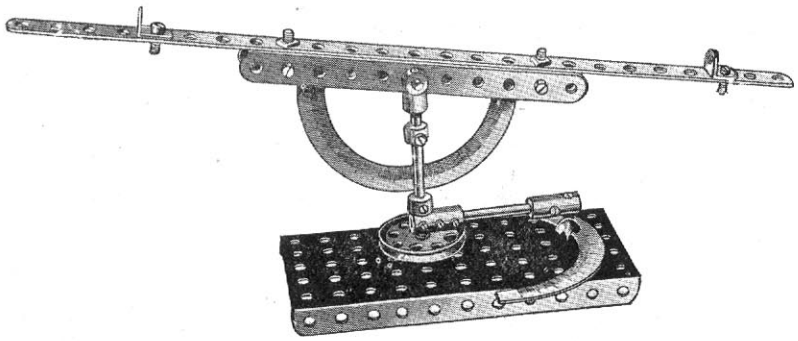


A most diverting game. Coloured marbles may be used for the balls. Full instructions for playing croquet may be obtained from any sports or games dealer.

Parts required :

12	of	No.	5	2	of	No.	22
12	„	„	12	24	„	„	37
2	„	„	16	2	„	„	63
2	„	„	17				

Model No. 433 Sextant and Theodolite



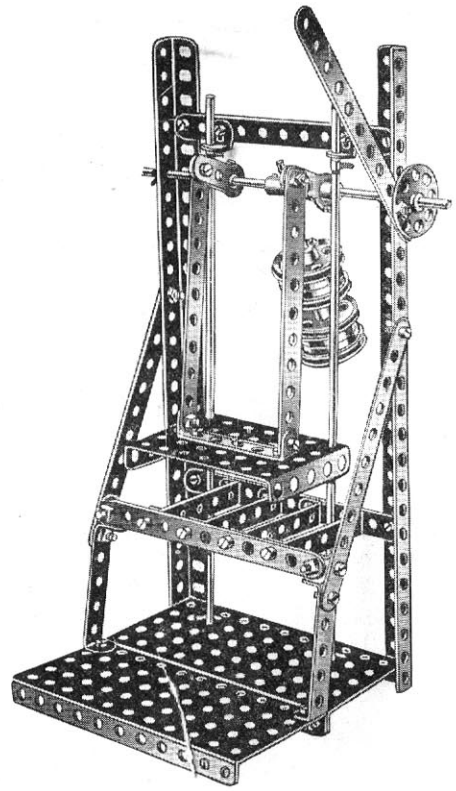
Parts required :

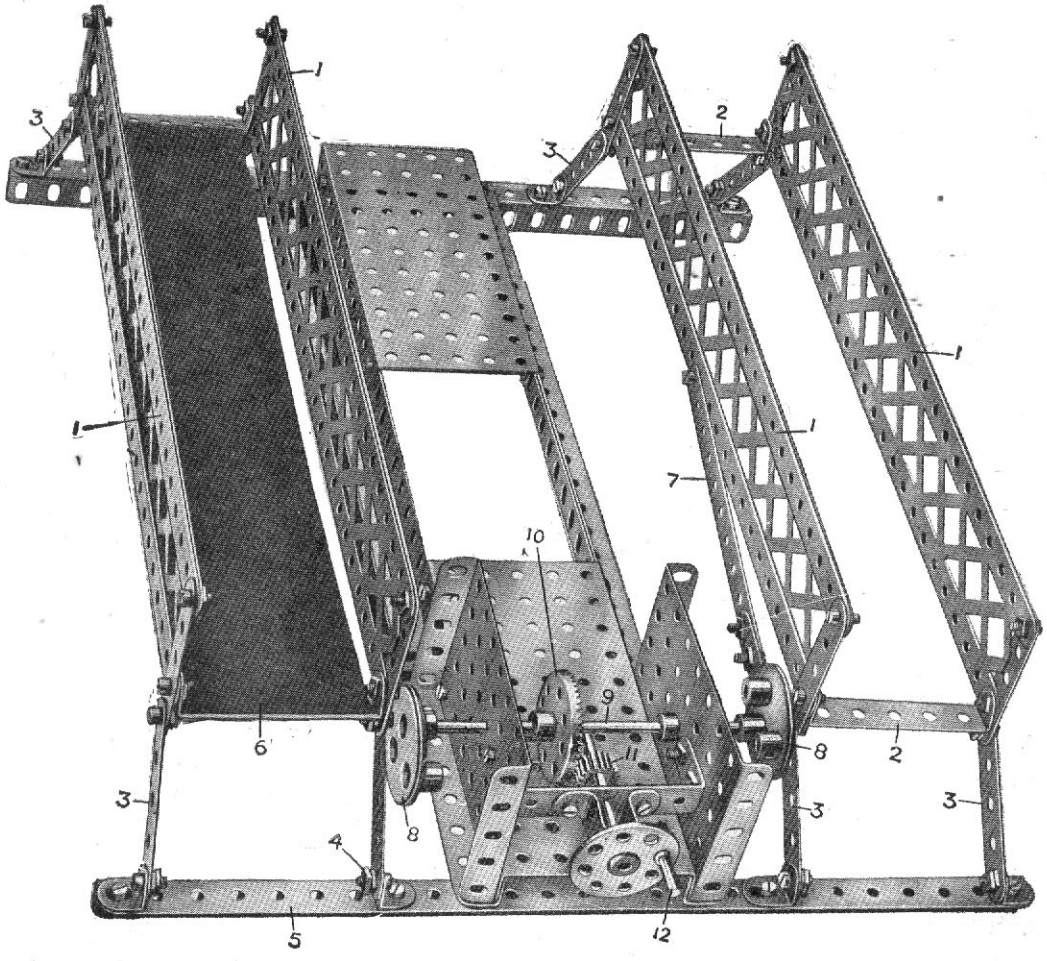
1	of	No.	1	1	of	No.	21
2	„	„	2	1	„	„	22
2	„	„	11	8	„	„	37
2	„	„	12	1	„	„	52
1	„	„	16	4	„	„	59
1	„	„	17	3	„	„	63
2	„	„	18A	1	„	„	65

Model No. 432 Potato Chopper

Parts required :

8	of	No.	2	1	of	No.	24
2	„	„	8	5	„	„	35
4	„	„	12	38	„	„	37
2	„	„	13	6	„	„	48A
1	„	„	15A	2	„	„	52
2	„	„	16	1	„	„	53
4	„	„	20	1	„	„	63





Model No. 434

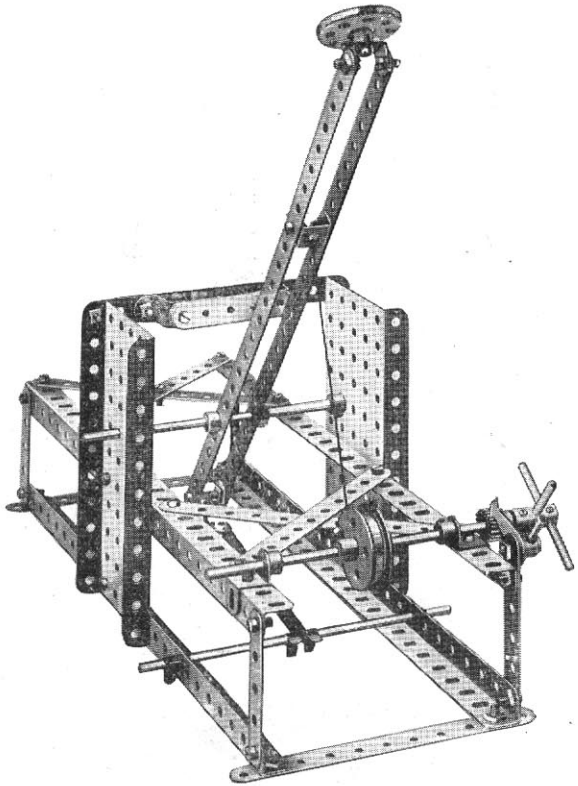
Cake Walk

Parts required :

8	of	No.	1
2	„	„	2
16	„	„	5
6	„	„	8
1	„	„	10
8	„	„	12
1	„	„	15
1	„	„	24
1	„	„	26
1	„	„	28
66	„	„	37
1	„	„	38
1	„	„	45
1	„	„	46
4	„	„	48A
2	„	„	52
2	„	„	53
2	„	„	59
1	„	„	77
4	„	„	99
1	„	„	115
2	„	„	130

The rocking platforms are built up of braced girders 1 connected by the end strips 2 and pivotally bolted and lock-nutted to the strips 3 forming rocking links. These latter are bolted and lock-nutted at 4 to the angle girders 5. Strips 6 of cardboard are secured to the end strips 2. The platforms are rocked by means of strips 7 one of which is connected to each rocking platform and to eccentrics 8 fixed on the rod 9 on which is secured a contrate wheel 10 driven by a pinion 11 from the handle 12. As the handle 12 is turned the platforms are rocked to and fro on the strips 3. The eccentrics 8 should be so arranged that the platforms rock in opposite directions.

Model No. 435 Catapult

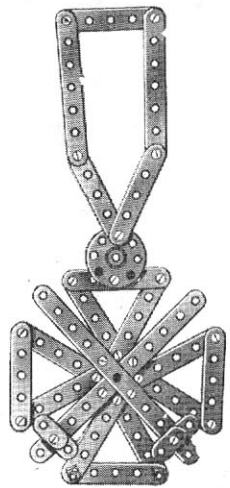


Parts required :

2	of	No.	1	3	of	No.	14	1	of	No.	33
7	„	„	2	2	„	„	17	4	„	„	35
1	„	„	4	1	„	„	20	44	„	„	37
6	„	„	5	1	„	„	24	1	„	„	43
4	„	„	8	1	„	„	26	2	„	„	52
3	„	„	11	1	„	„	28				

1	of	No.	57
6	„	„	59
1	„	„	62
1	„	„	115
4	„	„	125

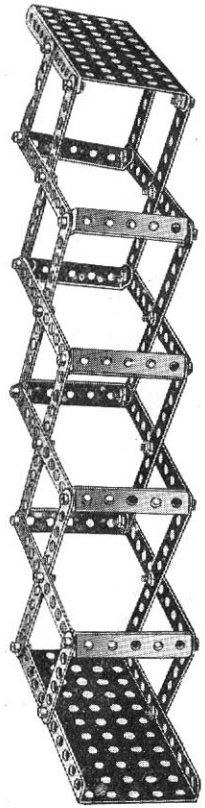
Model No. 436 Croix de Guerre



Parts required :

2	of	No.	2
2	„	„	3
15	„	„	5
4	„	„	10
2	„	„	24
24	„	„	37

Model No. 437 Periscope

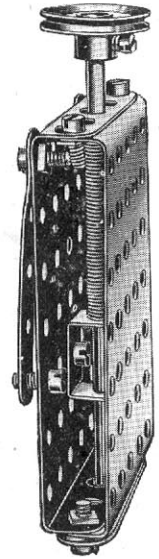


Parts required :

16	of	No.	2
4	„	„	4
32	„	„	37
8	„	„	48A
2	„	„	52

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

Model No. 438 Conductor's Punch



Parts required :

3	of	No.	5	9	of	No.	37
1	„	„	11	1	„	„	43
1	„	„	15A	2	„	„	53
1	„	„	22				

This is just the thing for your younger brother, and he only needs a strap to hang it over his shoulder with to make him into a tram conductor. Note the 2½" strip at the bottom, spaced a little away from the body of the punch to allow the ticket to pass in to be punched.

Model No. 439

Speed Indicator

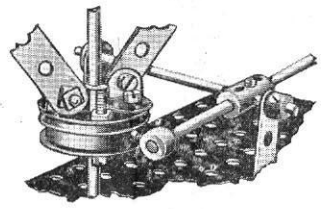
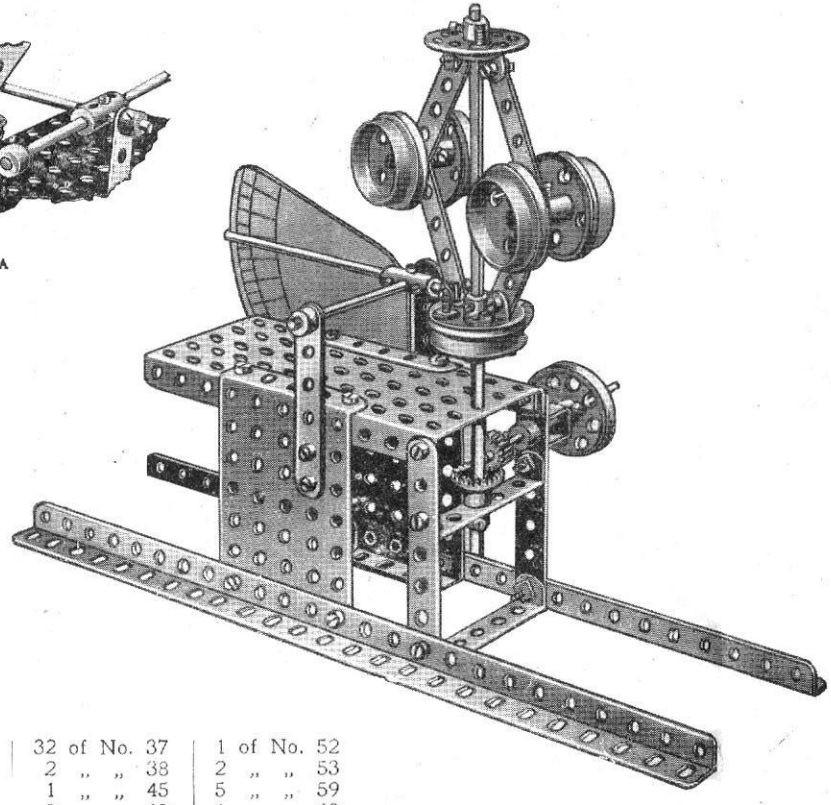


FIG. 439A

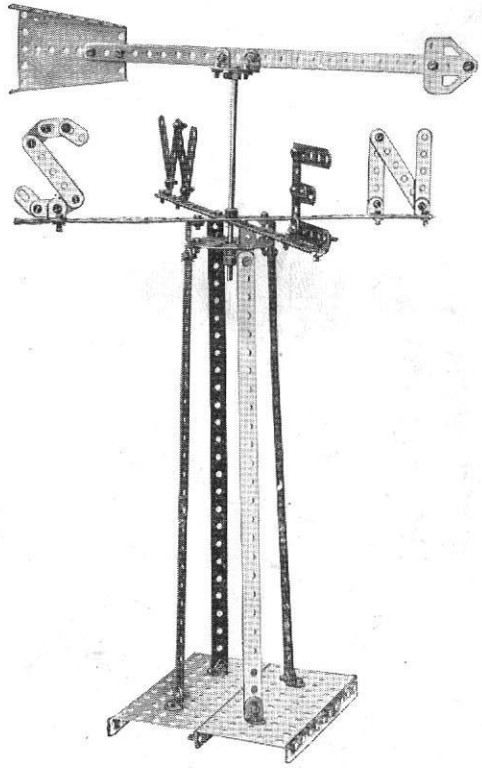


Parts required :

2	of	No.	3	32	of	No.	37	1	of	No.	52
2	„	„	4	2	„	„	38	2	„	„	53
4	„	„	5	1	„	„	45	5	„	„	59
2	„	„	8	3	„	„	48A	1	„	„	63
4	„	„	12								
1	„	„	13A								
3	„	„	16								
2	„	„	18A								
5	„	„	20								
1	„	„	21								
2	„	„	24								
1	„	„	26								
1	„	„	29								

Model No. 440

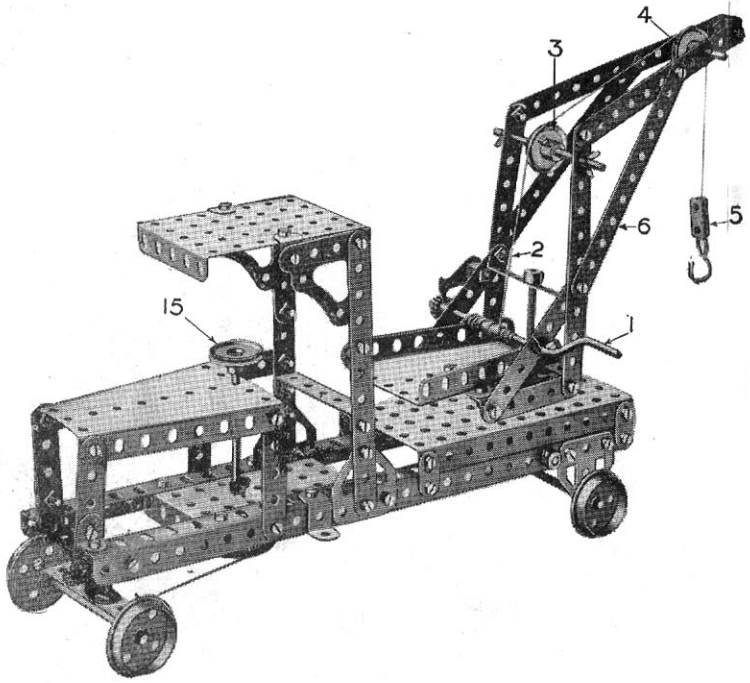
Weather Vane



Parts required :

7	of	No.	1	1	of	No.	14	1	of	No.	54
11	„	„	5	1	„	„	24	2	„	„	59
8	„	„	10	54	„	„	37	1	„	„	109
4	„	„	11	2	„	„	38	1	„	„	126A
17	„	„	12	2	„	„	52				

Model No. 441 Travelling Swivel Crane



Parts required :

8	of	No.	2	1	of	No.	32
2	„	„	3	1	„	„	33
9	„	„	5	6	„	„	35
2	„	„	8	69	„	„	37
4	„	„	10	3	„	„	37A
1	„	„	11	1	„	„	45
8	„	„	12	5	„	„	48A
2	„	„	15A	1	„	„	52
4	„	„	16	2	„	„	53
1	„	„	17	2	„	„	54
1	„	„	19	1	„	„	57
4	„	„	20	3	„	„	59
1	„	„	21	1	„	„	63
4	„	„	22	2	„	„	108
1	„	„	24	1	„	„	115
2	„	„	26	1	„	„	125
1	„	„	27A	4	„	„	126A

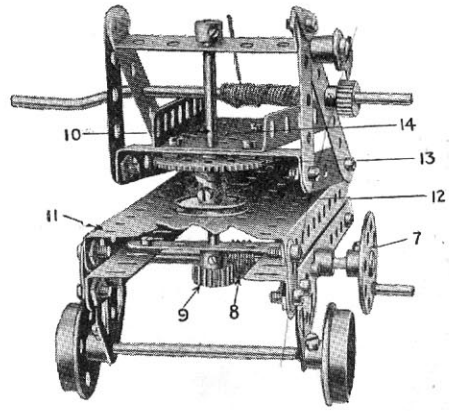
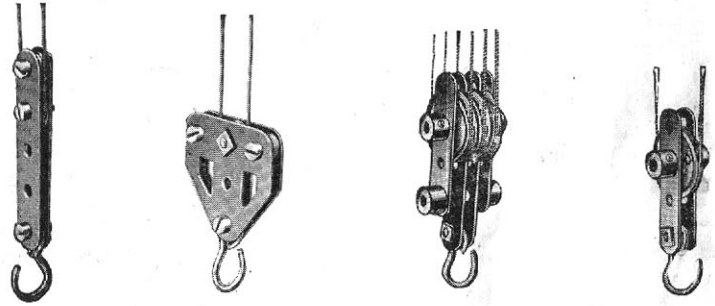


FIG. A

The load is raised from the crank handle 1, a cord 2 winding on which passes over the 1" pulleys 3 and 4 to the block 5. The jib 6 is swivelled from the hand-wheel 7 on the rod of which is a worm 8 engaging a pinion 9 bolted to a vertical rod 10, to which is secured beneath the platform 11 a 1" pulley wheel 12 and a 57-toothed wheel 13 which carries the swivel platform 14. The steering of the crane is effected from the 1" pulley wheel 15 in the same way as Model No. 230.

Model No. 442 Pulley Blocks

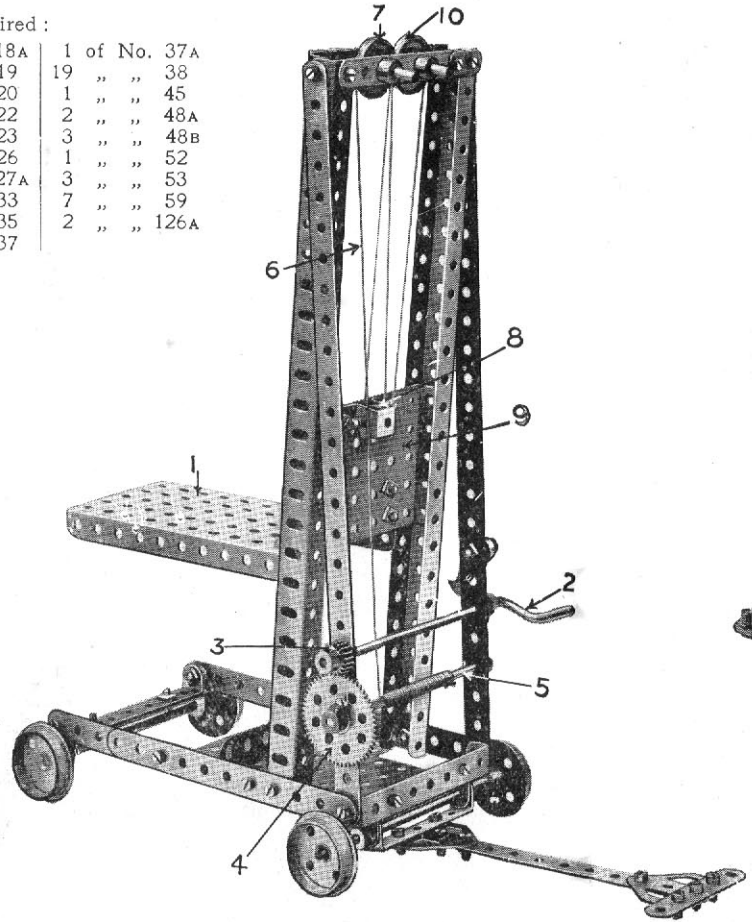


Model No. 443 Bale-lifter

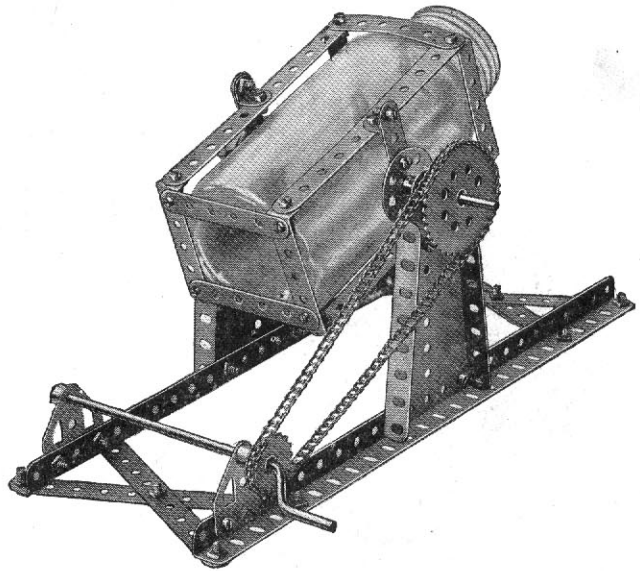
Parts required :

2	of No.	1	1	of No.	18A	1	of No.	37A
5	„ „	2	1	„ „	19	19	„ „	38
2	„ „	3	4	„ „	20	1	„ „	45
1	„ „	5	2	„ „	22	2	„ „	48A
4	„ „	8	1	„ „	23	3	„ „	48B
3	„ „	10	2	„ „	26	1	„ „	52
2	„ „	12A	1	„ „	27A	3	„ „	53
1	„ „	15	1	„ „	33	7	„ „	59
2	„ „	15A	2	„ „	35	2	„ „	126A
2	„ „	17	46	„ „	37			

The bale platform 1, consisting of a large rectangular plate, is raised by operating a crank handle 2, a pinion 3 on which engages a 57-toothed wheel 4 on a rod 5, upon which is wound a cord 6, passing over a pulley 7, in the head of the framework, round a ½" pulley 8, pivoted in a double bent strip bolted to the plate 9, up over another pulley 10, and made fast to the plate 9. The rectangular plate 1 is connected to the plate 9 by 1" angle brackets, and the plates 1 and 9 thus slide together in the vertical framework formed by 12½" angle girders doubled.



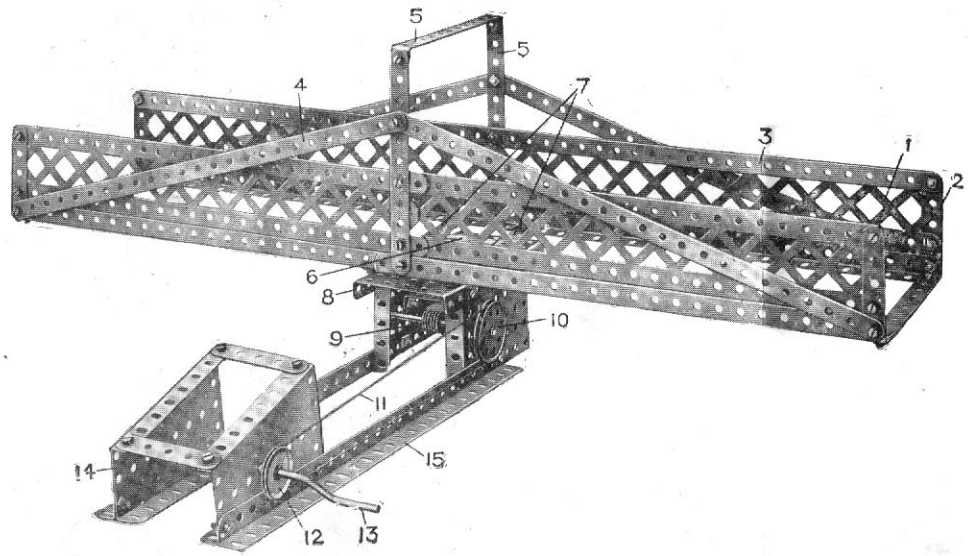
Model No. 444 Butter Churn



Parts required :

8	of No.	2	1	of No.	19	2	of No.	62
2	„ „	3	2	„ „	24	16"	„ „	94
4	„ „	4	42	„ „	37	1	„ „	95
2	„ „	8	4	„ „	48A	1	„ „	96
4	„ „	12	2	„ „	54	2	„ „	126A
2	„ „	17	3	„ „	59			

Model No. 445 Swing Bridge



Parts required :

8	of	No.	1	1	of	No.	17	1	of	No.	27A	1	of	No.	52
6	„	„	2	1	„	„	19	1	„	„	32	2	„	„	53
6	„	„	5	1	„	„	19B	50	„	„	37	2	„	„	54
6	„	„	8	1	„	„	21	1	„	„	48A	2	„	„	59
1	„	„	16	1	„	„	22	1	„	„	48D	4	„	„	99

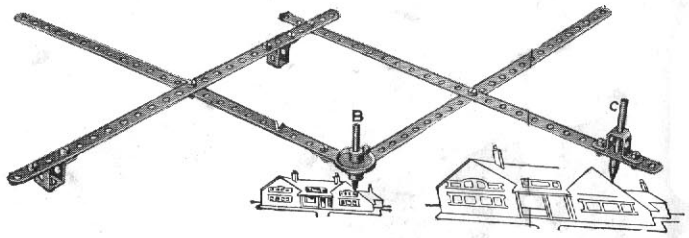
The sides of this model, as shown in the illustration, are made of the braced girders 1 secured to the upright strips 2 and reinforced by the inner strips 3. Other diagonal strips 4 brace the side girders to the top structure 5 forming a stay for the sides 1. The swing base of the bridge is composed of a 3" pulley wheel 6 which is bolted to two cross 5½" strips 7 which in turn are secured to the main base side girders. The bridge swings on the perforated plate 8 on a short rod, on the lower end of which is secured a gear wheel engaged and driven by a worm 9 on the spindle of which is the grooved pulley 10 driven by the cord 11 which is operated from the smaller grooved pulley 12 on the crank handle 13. The crank handle is journalled in two sector plates 14 secured to the base angle girder 15.

Model No. 446

Pantograph

Parts required :

4	of	No.	1	10	of	No.	37
2	„	„	17	3	„	„	45
1	„	„	22	2	„	„	62



Most boys have heard of the Pantograph but not many have had an opportunity of seeing its principles demonstrated. It is an instrument for copying plans, etc., on the same or on a reduced or enlarged scale.

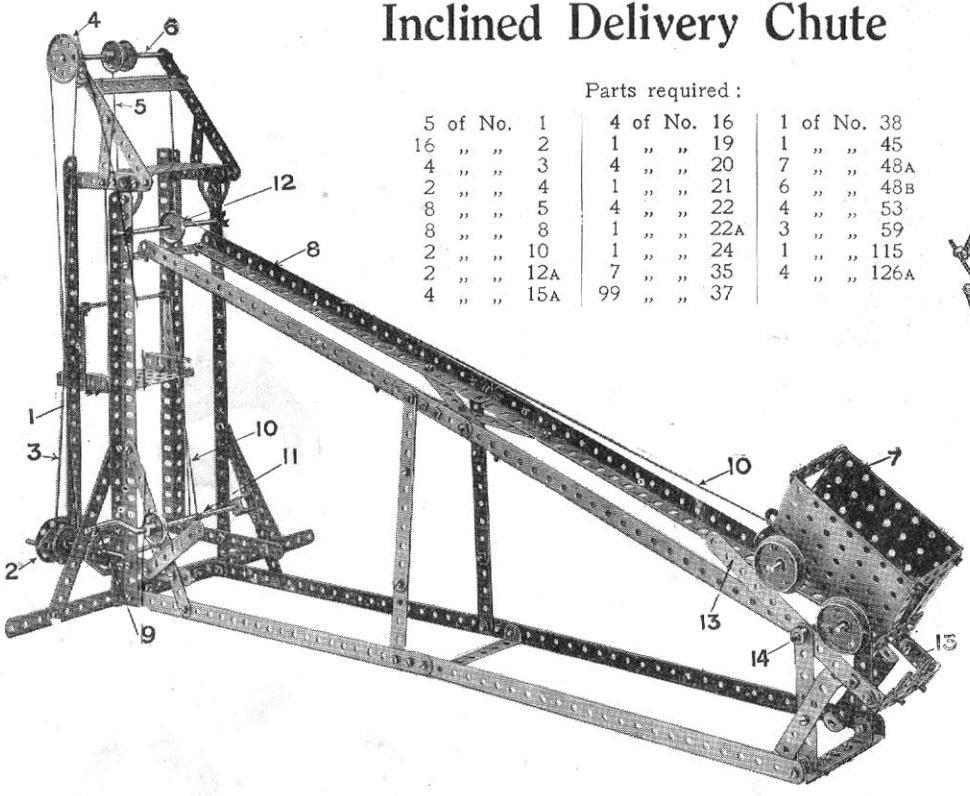
The apparatus is fixed at the point A. If an enlarged sketch is to be made, the point B is traced round the outlines, the writing point C reproducing the sketch on a larger scale. When a reduced drawing is to be made, the point C traces the outline, whilst the point B reproduces the sketch on a smaller scale. The degree of enlargement or reduction varies according to the position in which point C is fixed on the perforated arm.

Model No. 447

Inclined Delivery Chute

Parts required :

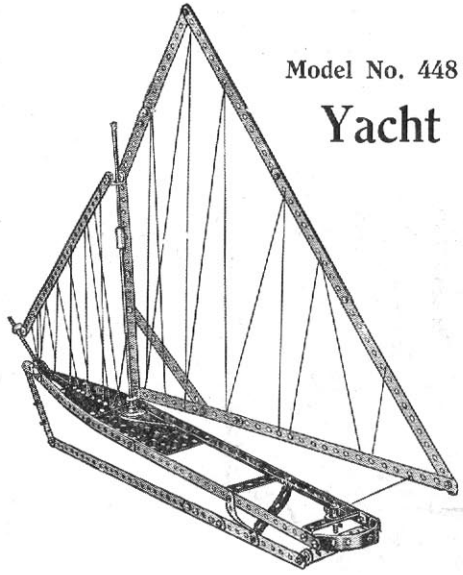
5	of	No.	1	4	of	No.	16	1 of No. 38
16	„	„	2	1	„	„	19	1 „ „ 45
4	„	„	3	4	„	„	20	7 „ „ 48A
2	„	„	4	1	„	„	21	6 „ „ 48B
8	„	„	5	4	„	„	22	4 „ „ 53
8	„	„	8	1	„	„	22A	3 „ „ 59
2	„	„	10	1	„	„	24	1 „ „ 115
2	„	„	12A	7	„	„	35	4 „ „ 126A
4	„	„	15A	99	„	„	37	



The cage 1 is raised from the hand-wheel 2 by means of an endless cord 3 which passes over the upper 1½" pulley 4. A cord 5 winding on rod 6 between two 1½" fast pulleys raises or lowers the cage. The truck 7 is raised or lowered along the inclined rails 8 by a crank handle 9, a cord 10 being wound on the rod 11, passing over a pulley 12, and connected to the truck 7. When the truck reaches the end of the inclined rails 10 it rests upon two 5½" strips 13 pivoted at 14, the weight of the truck depressing these pivoted strips and tipping the load.

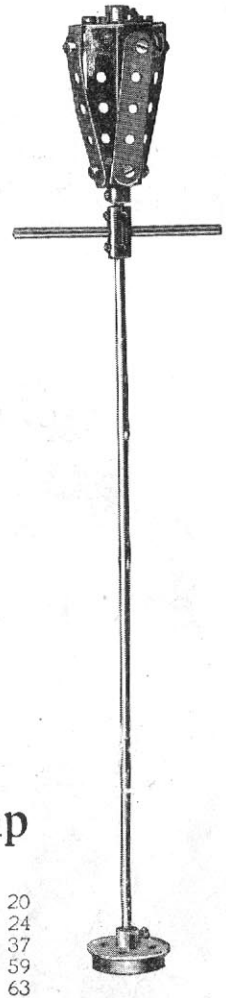
Model No. 448

Yacht



Parts required :

9	of	No.	1	2	of	No.	18A	
7	„	„	2	1	„	„	22	
4	„	„	3	51	„	„	37	
2	„	„	4	1	„	„	44	
2	„	„	5	2	„	„	48A	
1	„	„	10	1	„	„	52	
5	„	„	12	1	„	„	54	
1	„	„	13A	1	„	„	63	
2	„	„	15					



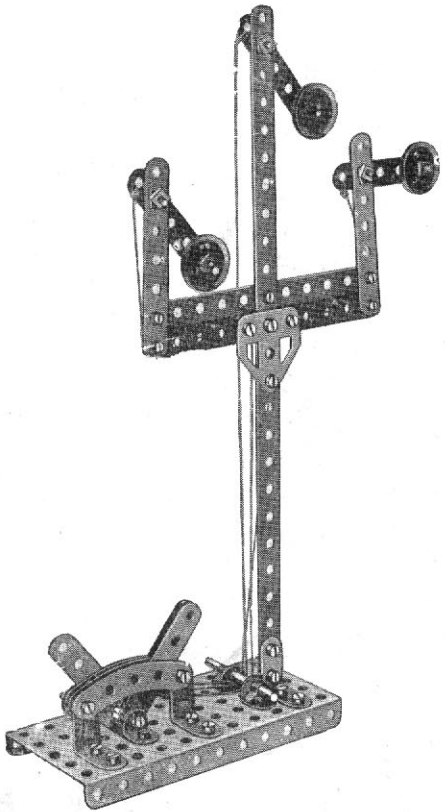
Model No. 449

Street Lamp

Parts required :

4	of	No.	5	1	of	No.	20	
2	„	„	11	1	„	„	24	
4	„	„	12	12	„	„	37	
1	„	„	13	1	„	„	59	
2	„	„	16	1	„	„	63	

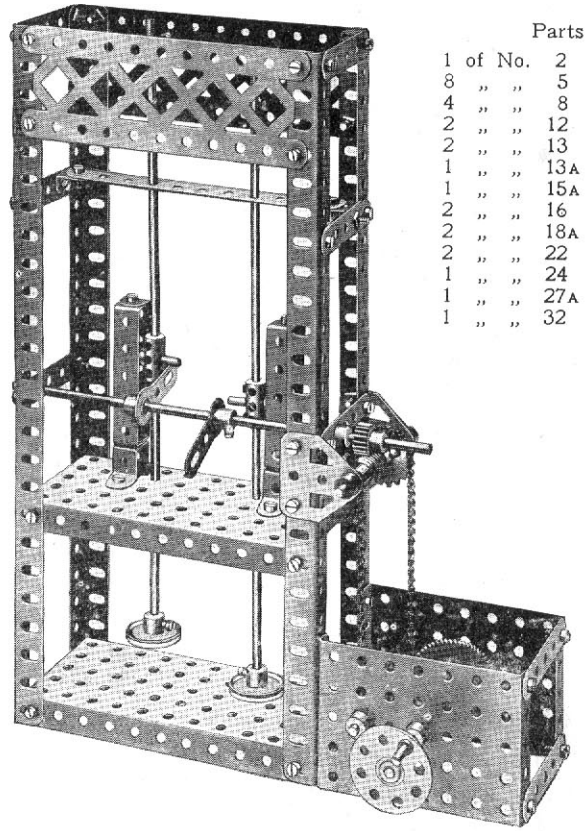
Model No. 450 Three-arm Signal



Parts required :

1	of	No.	1
3	„	„	2
2	„	„	3
6	„	„	5
4	„	„	12
23	„	„	12A
1	„	„	17
1	„	„	22
2	„	„	22A
2	„	„	35
7	„	„	37
26	„	„	37A
3	„	„	38
1	„	„	52
4	„	„	90
3	„	„	111
1	„	„	126A

Model No. 451 Trip Hammer



Parts required :

1	of	No.	2	52	of	No.	37
8	„	„	5	2	„	„	45
4	„	„	8	4	„	„	48A
2	„	„	12	2	„	„	52
2	„	„	13	2	„	„	53
1	„	„	13A	10	„	„	59
1	„	„	15A	2	„	„	62
2	„	„	16	2	„	„	63
2	„	„	18A	12	„	„	94
2	„	„	22	2	„	„	96
1	„	„	24	2	„	„	100
1	„	„	27A	1	„	„	115
1	„	„	32	2	„	„	126A

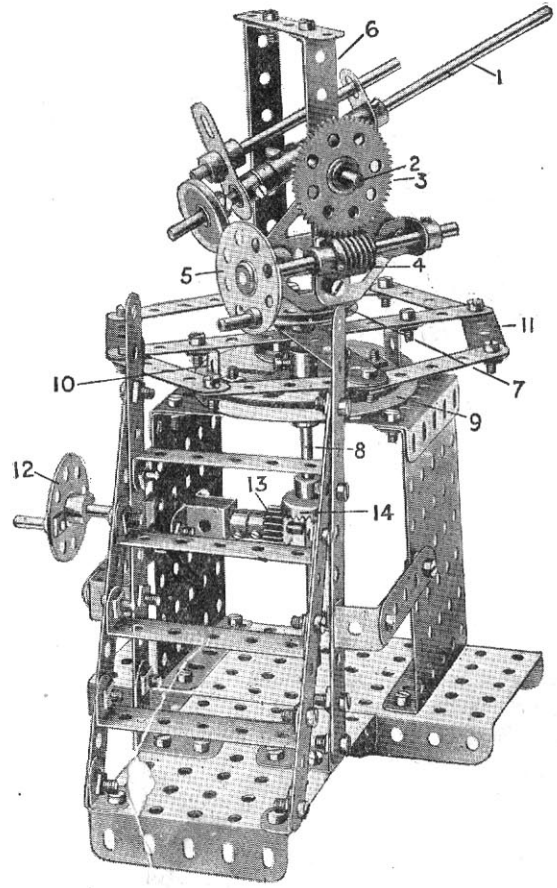
Model No. 452

Anti-Aircraft Gun

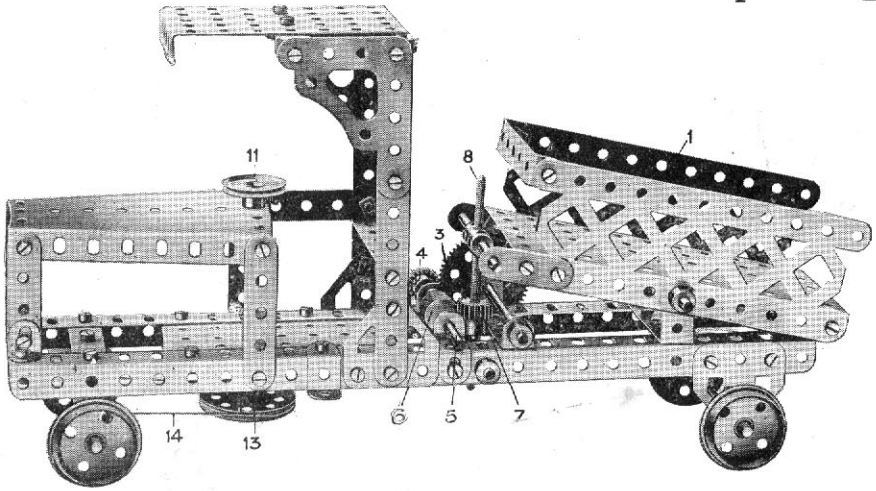
Parts required:

6 of No. 2	1 of No. 21	4 of No. 48A
11 „ „ 5	2 „ „ 22	2 „ „ 48B
1 „ „ 10	2 „ „ 24	1 „ „ 52
2 „ „ 11	1 „ „ 26	4 „ „ 53
4 „ „ 12	1 „ „ 27A	8 „ „ 59
2 „ „ 12A	1 „ „ 29	1 „ „ 62
1 „ „ 15	1 „ „ 32	2 „ „ 63
1 „ „ 15A	64 „ „ 37	2 „ „ 115
4 „ „ 16	12 „ „ 38	4 „ „ 125
1 „ „ 17	2 „ „ 45	2 „ „ 126A
1 „ „ 19B		

The gun represented by the rod 1 is pivoted upon a transverse rod 2 which passes through a coupling on the rod 1. A 57-toothed wheel 3 on the pivot rod 2 is engaged by a worm 4 operated from the hand-wheel 5. By turning this wheel 5 the gun is lifted or lowered. The two vertical strips forming the framework for the pivot rod 2 are bolted to a 1½" pulley 7 which is secured on a vertical rod 8. A 3" pulley wheel 9 is also bolted to a rod 8 and from the pulley wheel is carried by reversed angle brackets 10 a framework 11. The rod 8 with the framework is rotated from the hand-wheel 12, a pinion 13 on the spindle of which engages a ¾" contrate wheel 14 on the rod 8. By turning the wheel 12 the gun is swivelled round.



Model No. 453 Tip Wagon



The tipping of the wagon 1 is effected by the handle 2 secured on a 57-toothed wheel 3 which engages a ½" pinion 4 mounted on the rod 5. On the same rod is secured a worm 6 which engages a ½" pinion 7 secured to the upright threaded rod 8. The threaded rod 8 revolves freely in the coupling 9, being retained in position by the collar 10. As the handle 2 is operated, the wagon 1 is tipped or restored to its original position. The steering is effected by a ½" pulley wheel 11 on a rod 12, at the lower end of which is secured a 1½" pulley wheel 13, a cord 14, wound twice round this pulley wheel, being connected to a double angle strip 15 in which the steering axle 16 is journalled.

Parts required:

2	of	No.	2
1	„	„	3
9	„	„	5
2	„	„	6A
2	„	„	8
10	„	„	12
5	„	„	16
1	„	„	19
4	„	„	20
1	„	„	21
1	„	„	22
1	„	„	24
1	„	„	26
1	„	„	27A
2	„	„	35
59	„	„	37
2	„	„	37A
1	„	„	38
4	„	„	48A
1	„	„	52
2	„	„	53
1	„	„	54
3	„	„	59
2	„	„	62
1	„	„	63
1	„	„	80A
2	„	„	100
2	„	„	108
1	„	„	125
4	„	„	126A

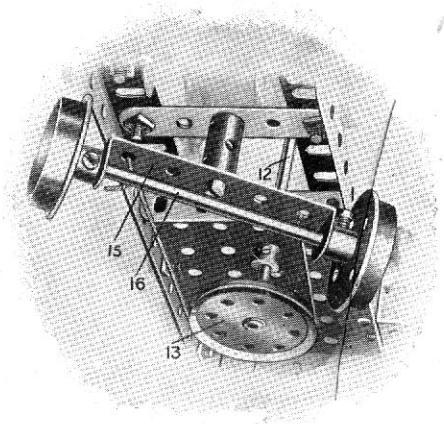


FIG. 453A

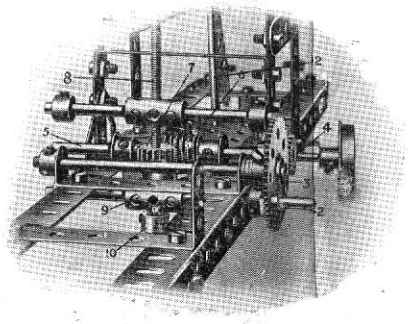


FIG. 453B

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 price of which will be found in the List at the end of the Manual.

Model No. 501

Beam Scales

Parts required:

7	of No.	1	2	of No.	22
8	„ „	2	88	„ „	37
8	„ „	3	2	„ „	44
2	„ „	4	1	„ „	46
10	„ „	5	5	„ „	48A
8	„ „	8	1	„ „	50
2	„ „	10	2	„ „	52
9	„ „	12	2	„ „	53
2	„ „	15	2	„ „	54
4	„ „	15A	2	„ „	57
2	„ „	16	8	„ „	59
7	„ „	20			

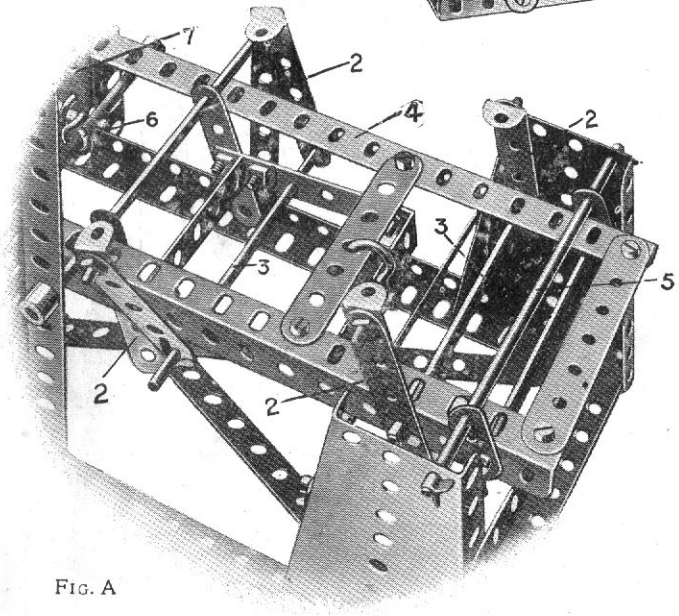
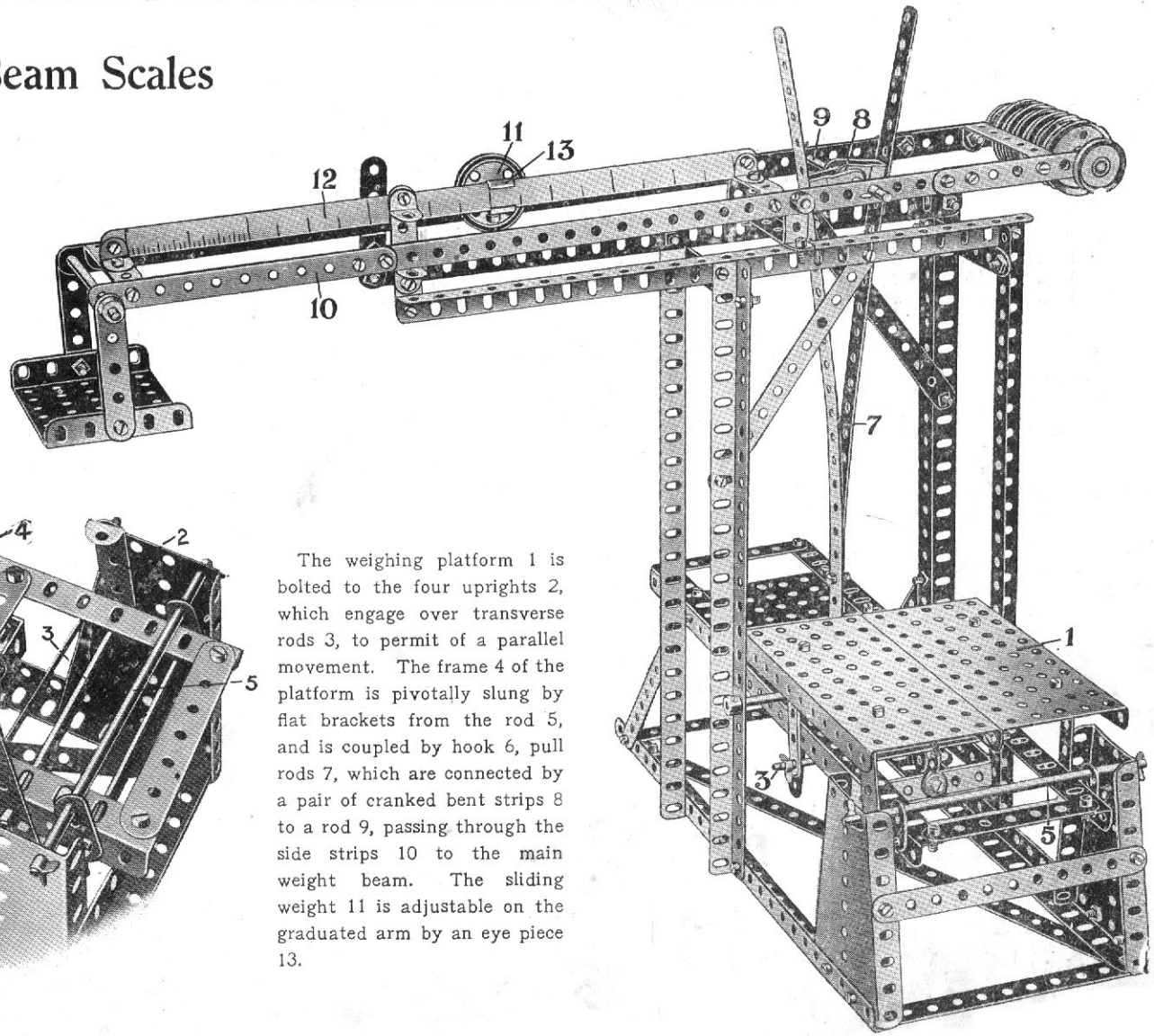


FIG. A

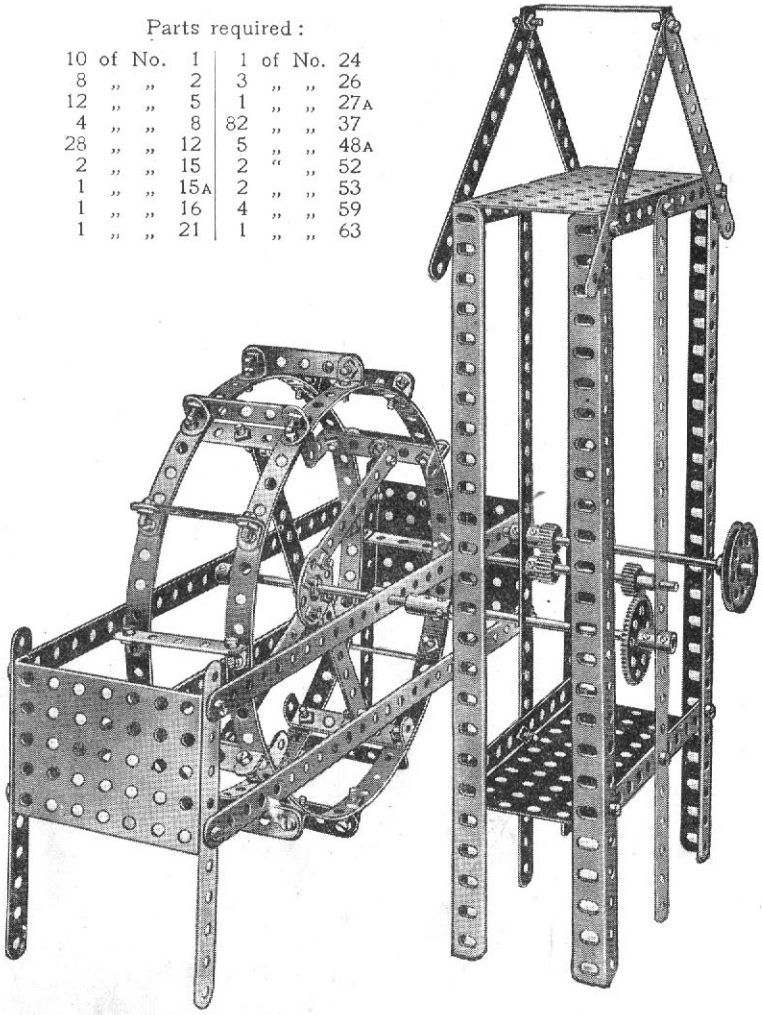


The weighing platform 1 is bolted to the four uprights 2, which engage over transverse rods 3, to permit of a parallel movement. The frame 4 of the platform is pivotally slung by flat brackets from the rod 5, and is coupled by hook 6, pull rods 7, which are connected by a pair of cranked bent strips 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.

Model No. 502 Belgian Water Wheel

Parts required :

10	of	No.	1	1	of	No.	24
8	„	„	2	3	„	„	26
12	„	„	5	1	„	„	27A
4	„	„	8	82	„	„	37
28	„	„	12	5	„	„	48A
2	„	„	15	2	„	„	52
1	„	„	15A	2	„	„	53
1	„	„	16	4	„	„	59
1	„	„	21	1	„	„	63



Model No. 503 Hand Car

Parts required :

4	of	No.	2	1	of	No.	26
2	„	„	6A	1	„	„	27A
2	„	„	8	32	„	„	37
1	„	„	9D	4	„	„	37A
4	„	„	11	2	„	„	45
2	„	„	14	1	„	„	46
1	„	„	15A	7	„	„	59
1	„	„	16	2	„	„	63
1	„	„	17	1	„	„	70
4	„	„	19A	2	„	„	126A
2	„	„	24				

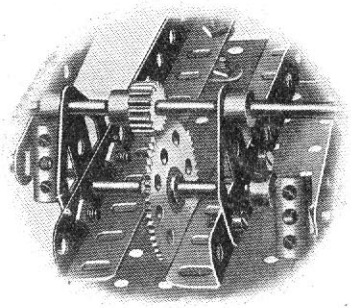
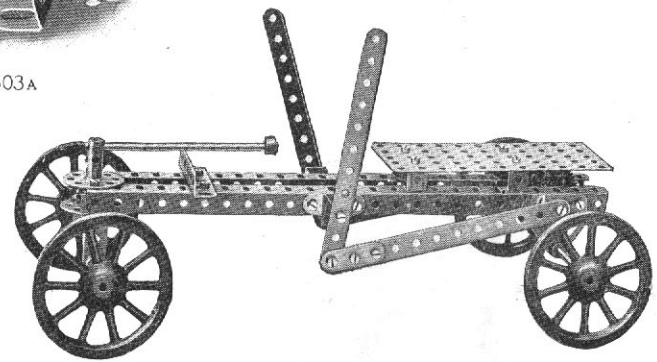
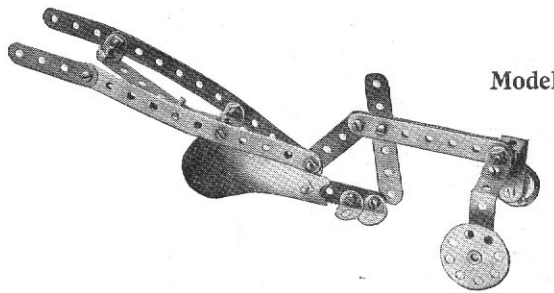


FIG. 503A



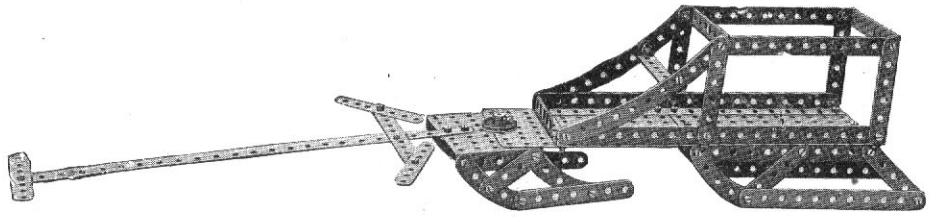


Model No. 504 Plough

Parts required :

2	of	No.	2	1	of	No.	22
4	„	„	3	1	„	„	24
1	„	„	4	19	„	„	37
3	„	„	6	1	„	„	41
1	„	„	10	1	„	„	47
8	„	„	12				

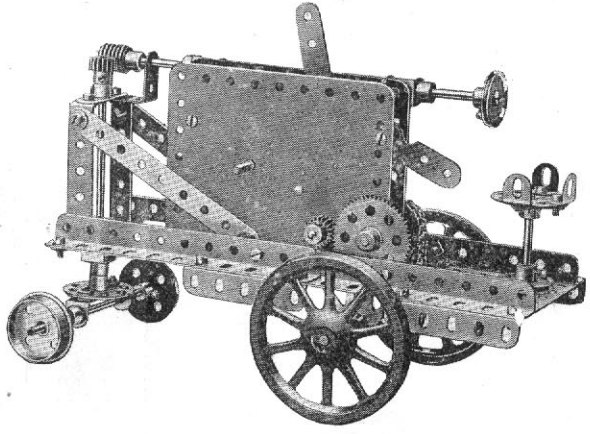
Model No. 505 Bob Sleigh



Parts required :

1	of	No.	1	2	of	No.	22
5	„	„	2	50	„	„	37
5	„	„	3	3	„	„	48B
4	„	„	4	1	„	„	52
4	„	„	5	2	„	„	52A
2	„	„	6	1	„	„	53
2	„	„	8A	2	„	„	89
1	„	„	9D	6	„	„	90
1	„	„	18A				

Model No. 506 Farm Tractor



Parts required :

2	of	No.	2A	1	of	No.	27A
1	„	„	3	1	„	„	32
1	„	„	6A	38	„	„	37
4	„	„	9	6	„	„	38
2	„	„	11	1	„	„	45
7	„	„	12	1	„	„	48
1	„	„	12A	2	„	„	48A
1	„	„	13A	2	„	„	53
1	„	„	15	9	„	„	59
1	„	„	15A	6″	„	„	94
2	„	„	17	2	„	„	96
2	„	„	19A	2	„	„	126A
2	„	„	20				
2	„	„	22				
2	„	„	24				
2	„	„	26				

Clockwork Motor (not included in Outfit)

Model No. 507 Step Ladder

Parts required :

4	of	No.	1
8	„	„	2
2	„	„	3
3	„	„	5
2	„	„	10
8	„	„	12
1	„	„	16
2	„	„	17
10	„	„	35
44	„	„	37
9	„	„	48A
2	„	„	59

Model No. 508 Sighting Apparatus

This model is for determining the heights of buildings, towers, etc. The pointer 11½" rod 1 is pivoted on the 2" rod 2 and controlled by a spring 3, the pointer 1 being adjusted by the cord 4 which passes round a guide pulley 5 and on to the axle 6 upon which it is wound by the crank handle 7 which operates the gear wheel and pinion 8. A graduated scale of degrees 9 made of cardboard, or a protractor, is mounted in order to read off the angle of inclination of the pointer.

In finding the height of a building, measure out a number of feet or yards from the foot of the building, and set this out to some scale corresponding to the line *a b* (Fig. B). Then standing at the point *a* furthest from the building, and keeping the angle girders 10 horizontal, move the pointer 1 until it is directed towards the top of the building. Then read off the angle on the scale 9, and draw a line *a c*, making the angle *b a c* equal to the angle read off. Then draw a vertical line *b c* from the point *b*, and with the same scale used for setting off the distance *a b* measure the height *b c*, which will be the height of the building.

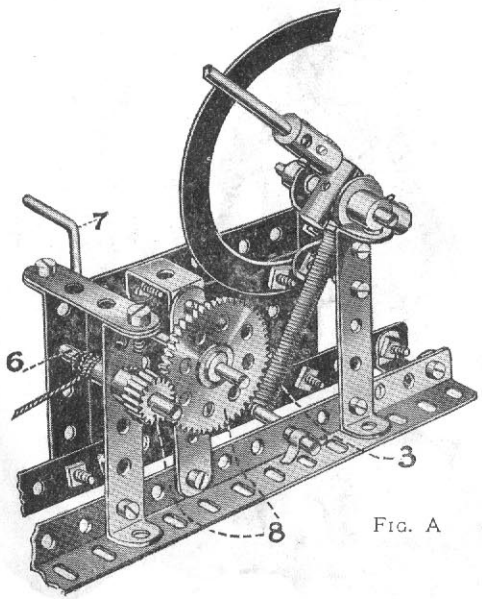
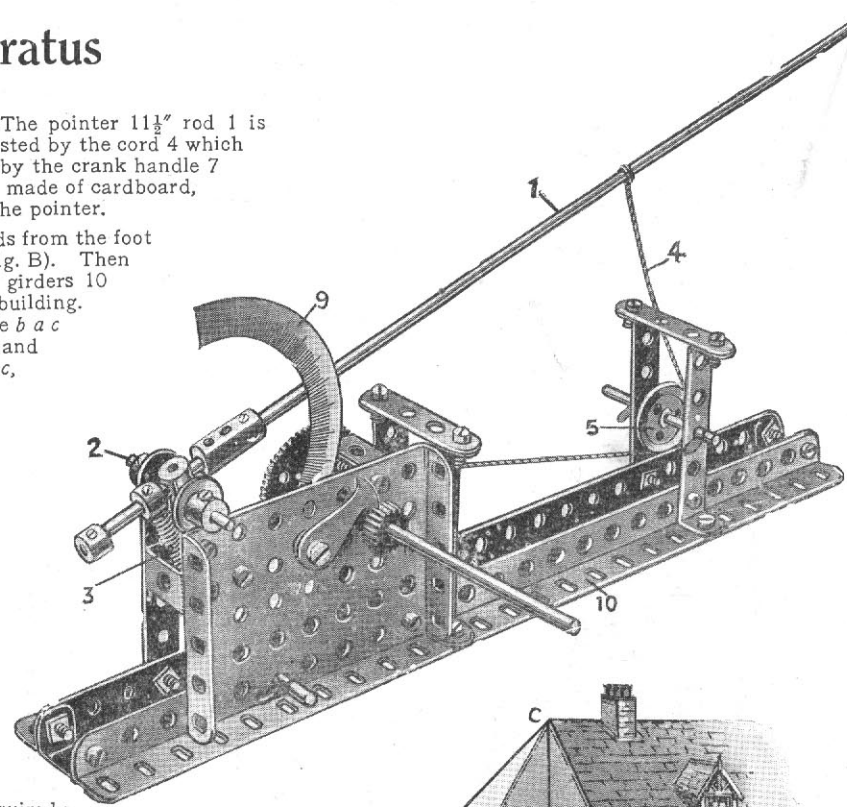


FIG. A



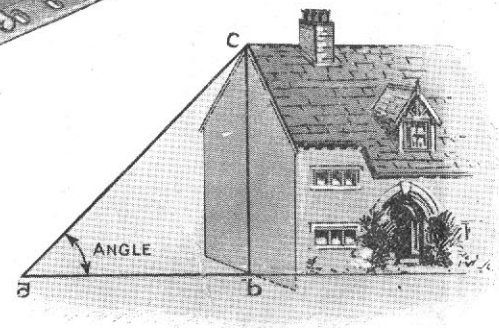
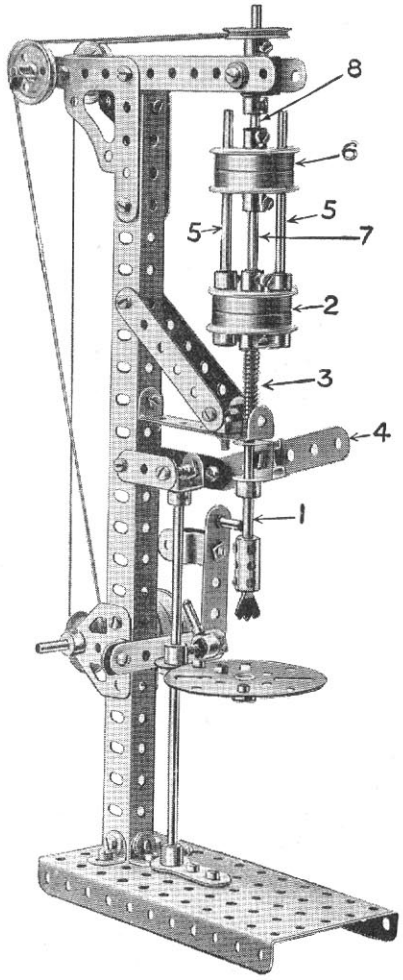


FIG. B

Parts required:

1	of	No.	5	1	of	No.	33
2	„	„	6	2	„	„	35
2	„	„	8	24	„	„	37
4	„	„	11	1	„	„	43
1	„	„	13	5	„	„	48A
4	„	„	17	1	„	„	53
1	„	„	19	3	„	„	59
1	„	„	22	2	„	„	62
2	„	„	26	2	„	„	63
1	„	„	27A				



Model No. 509

Vertical Drill

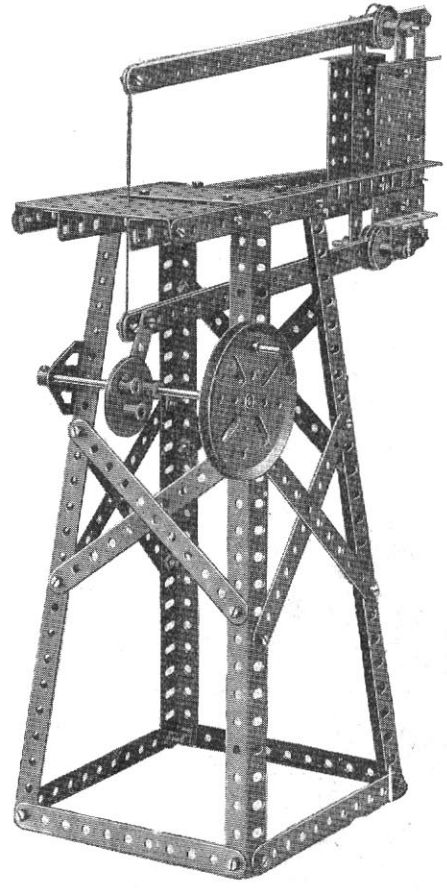
Parts required :

2	of	No.	2	4	of	No.	16	1	of	No.	48A
3	„	„	4	1	„	„	17	1	„	„	50
2	„	„	5	6	„	„	20	10	„	„	59
1	„	„	6	2	„	„	21	2	„	„	62
1	„	„	6A	2	„	„	22A	1	„	„	65
2	„	„	8	4	„	„	35	2	„	„	108
5	„	„	11	39	„	„	37	1	„	„	109
6	„	„	12	6	„	„	38	1	„	„	111
1	„	„	14	1	„	„	43	2	„	„	115
1	„	„	15A	1	„	„	44	2	„	„	126A

The drill rod 1 is connected to the boss of the lower pair of flanged wheels 2 which are reversed, a spring 3 round the rod raising the drill after it has been depressed by the handle strip 4. Bolted in the wheels 2 are two outer rods 5 which slide in the upper flanged wheels 6. The central rod 7 is bolted in the upper wheels and slides in the centre bosses of the lower wheels 2. The upper wheels 6 are bolted to the driving spindle 8 and consequently the drill is driven by the rods 5 when the drill is depressed by the handle 4 against the spring.

Model No. 510

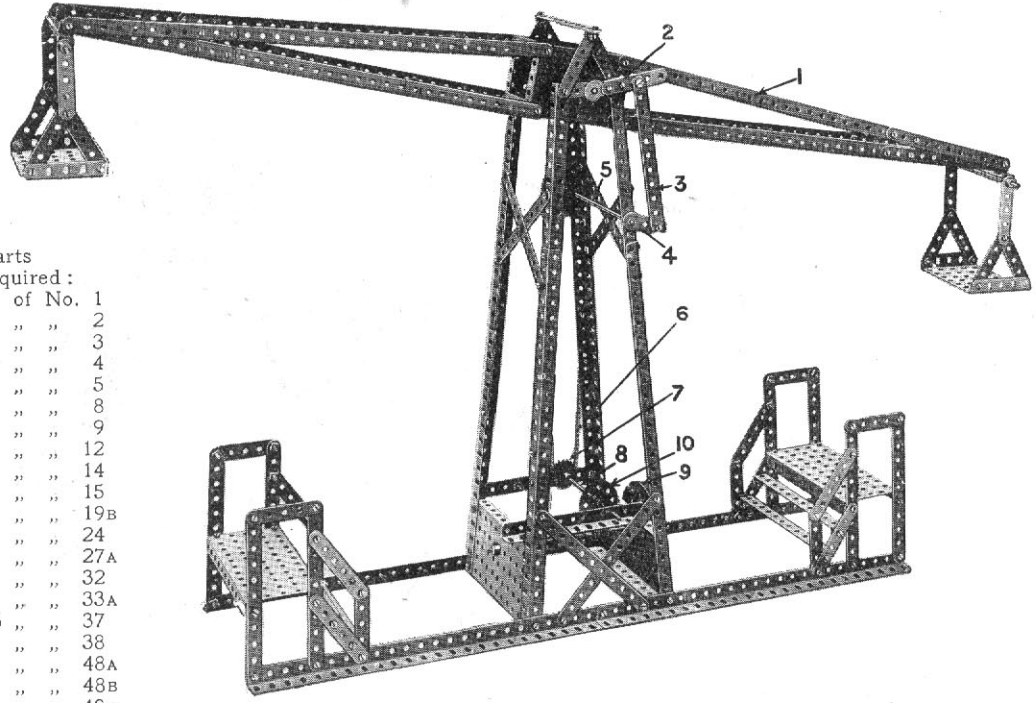
Fret Saw



Parts required :

4	of	No.	1
17	„	„	2
6	„	„	8
1	„	„	15
2	„	„	17
1	„	„	19B
4	„	„	22
53	„	„	37
4	„	„	53
5	„	„	59
1	„	„	115
2	„	„	126A
1	„	„	130

Model No. 511 Giant Auto Swing



Parts required:

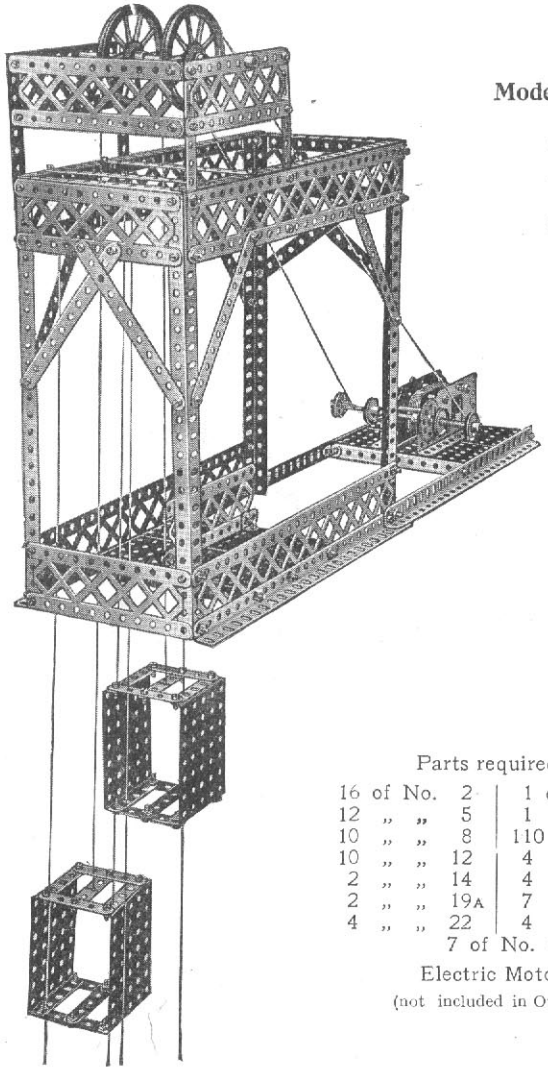
8	of No.	1	
26	„ „	2	
2	„ „	3	
8	„ „	4	
31	„ „	5	
12	„ „	8	
1	„ „	9	
18	„ „	12	
2	„ „	14	
4	„ „	15	
1	„ „	19B	
1	„ „	24	
1	„ „	27A	
1	„ „	32	
1	„ „	33A	
165	„ „	37	
2	„ „	38	
2	„ „	48A	
2	„ „	48B	
4	„ „	48D	
4	„ „	52	
4	„ „	53	
9	„ „	59	
2	„ „	62	
28″	„ „	94	
1	„ „	95	
1	„ „	96	

The beam 1 is rocked by means of a crank 2 secured on the end of a rod which forms the beam pivot and which is bolted in a bush wheel secured to the beam. This crank 2 is connected by a strip 3 to another crank 4 on a rod 5. On the end of this is a large sprocket wheel driven by a chain 6 from a small sprocket wheel 7 on a rod 8. This rod is driven by means of a worm on the rod of the 3″ pulley 9 which worm engages and drives the gear wheel 10 on the rod 8. As the crank 4 continuously rotates the link 3 causes the upper crank 2 to oscillate and also the beam 1.

Model No. 512 Rocking Chair

Parts required:

9	of No.	2	2	of No.	48A
8	„ „	5	1	„ „	48B
2	„ „	10	2	„ „	53
3	„ „	12	4	„ „	89
44	„ „	37			



Model No. 513

Pit Head Gear

Parts required :

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

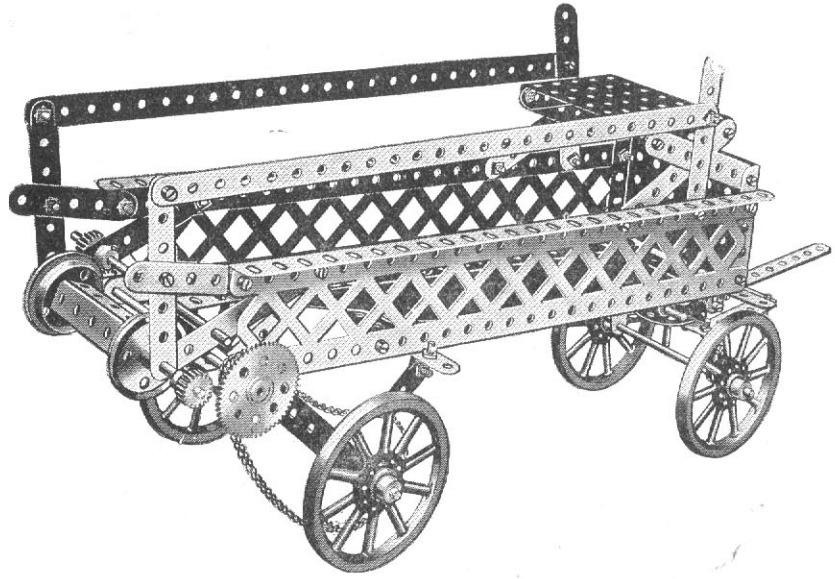
7 of No. 100

Electric Motor

(not included in Outfit).

Model No. 514

Manure Distributing Cart



Parts required :

2	of No.	1	3	of No.	15	3	of No.	26	2	of No.	53
3	„ „	2	2	„ „	15A	1	„ „	27A	8	„ „	59
10	„ „	3	2	„ „	17	4	„ „	35	1′	„ „	94
9	„ „	5	4	„ „	19A	57	„ „	37	1	„ „	95
4	„ „	8	2	„ „	20	1	„ „	46	1	„ „	96
6	„ „	12	1	„ „	24	4	„ „	48A	2	„ „	99
1	„ „	14									

Model No. 515 Travelling Gantry Crane

The travelling gantry 1 is traversed along the rails by a hand wheel 2, a sprocket chain 3 driving the rod 4 round the pulleys 5 on which pass the cords 6 which are connected to the travelling gantry. The load is raised or lowered by operating the crank handle 7 on which a cord 8 is wound, passing round a ½" pulley in the block 9 and being secured to a rod 10. The winch is traversed along the rails of the gantry 1 by means of the crank handle 11, a pinion 12 on which engages a 57-toothed gear wheel 13, on the axle of the travelling wheels. The travelling gantry is built up of the rails of the angle girders 1 bolted at each end to two 5½" angle girders 14 butted together. The flange wheels 15 are carried upon their axles 16 passed through the end holes of the angle girders 14.

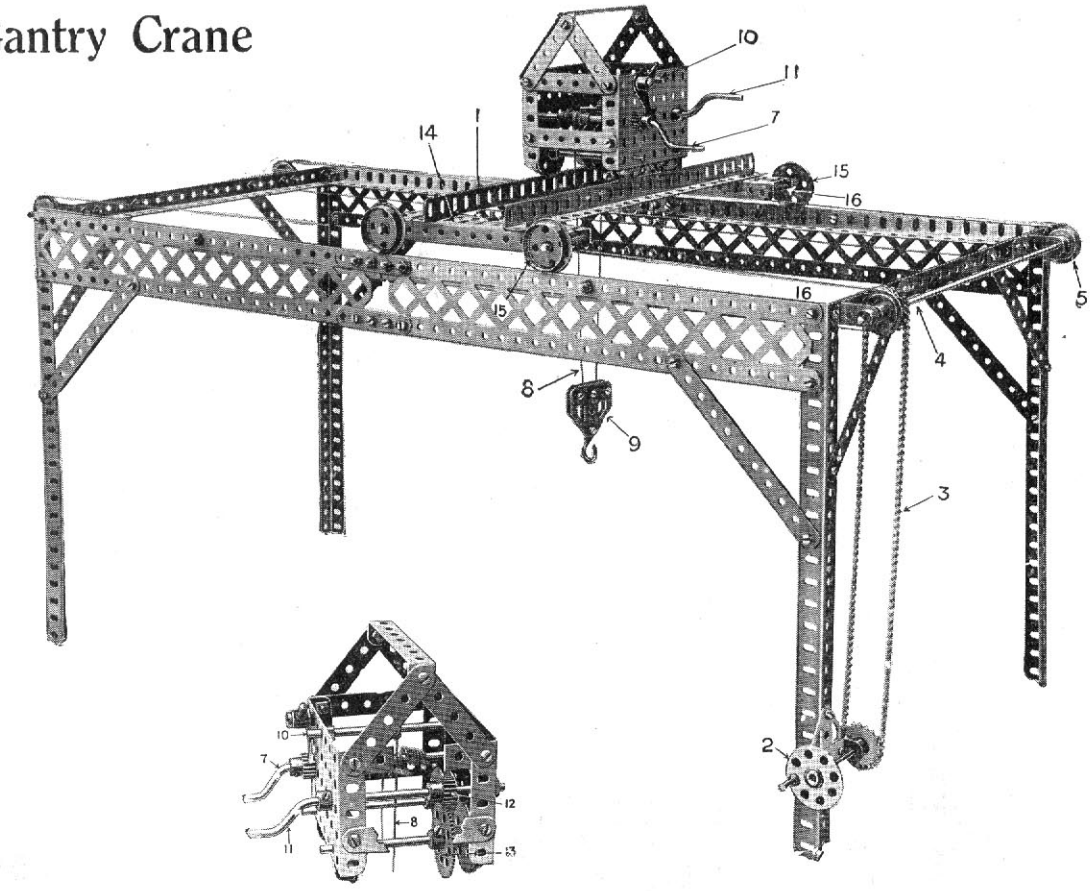
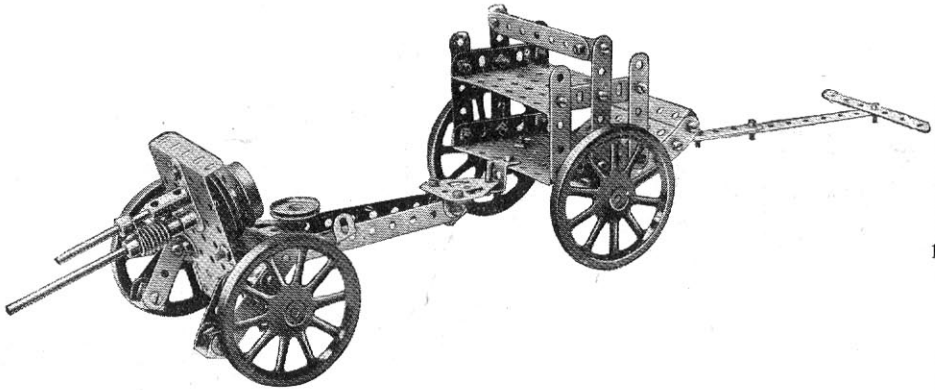


FIG. A

Parts required :

4	of	No.	1	2	of	No.	19	1	of	No.	48
8	„	„	2	8	„	„	20	1	„	„	48B
4	„	„	4	4	„	„	22	2	„	„	53
10	„	„	5	1	„	„	23	1	„	„	57
12	„	„	8	1	„	„	24	8	„	„	59
4	„	„	9	2	„	„	26	24"	„	„	94
2	„	„	11	1	„	„	27A	2	„	„	96
4	„	„	12A	1	„	„	33	4	„	„	99
2	„	„	13	2	„	„	35	4	„	„	100
3	„	„	16	26	„	„	37	2	„	„	115
5	„	„	17	6	„	„	38	3	„	„	126A

Model No. 516 Field Gun and Carriage



Parts required :

4	of	No.	2	1	of	No.	22
2	„	„	3	1	„	„	24
2	„	„	4	1	„	„	32
6	„	„	5	62	„	„	37
2	„	„	6A	2	„	„	38
3	„	„	10	3	„	„	48A
3	„	„	11	2	„	„	48B
14	„	„	12	2	„	„	53
2	„	„	15	3	„	„	59
1	„	„	15A	1	„	„	62
1	„	„	16	1	„	„	63
1	„	„	18A	2	„	„	90
4	„	„	19A	1	„	„	115
1	„	„	20	2	„	„	125
1	„	„	21	2	„	„	126A

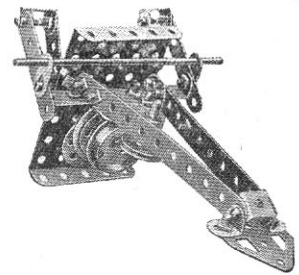
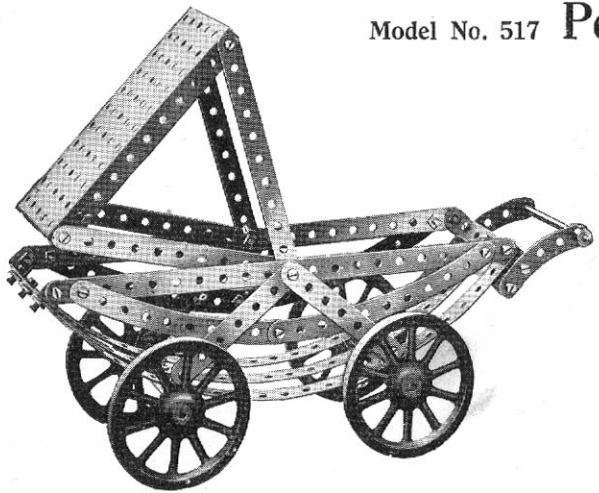


FIG. 516A

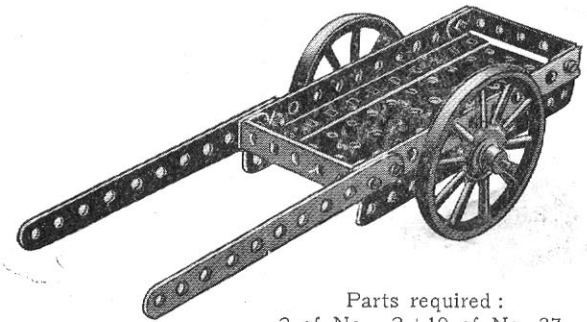
Model No. 517 Perambulator



Parts required :

3	of	No.	1	37	of	No.	37
8	„	„	2	5	„	„	48A
4	„	„	3	1	„	„	52
6	„	„	12	2	„	„	59
3	„	„	16	4	„	„	89
4	„	„	19A	2	„	„	90

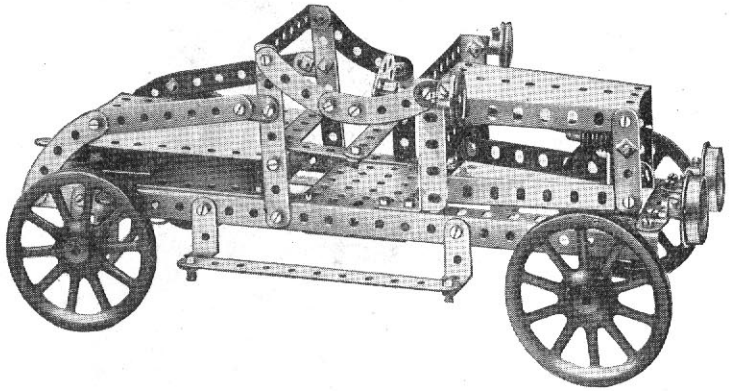
Model No. 518 Station Cart



Parts required :

2	of	No.	2	10	of	No.	37
2	„	„	9	2	„	„	48A
1	„	„	15A	1	„	„	52
2	„	„	19A				

Model No. 519 Motor Car

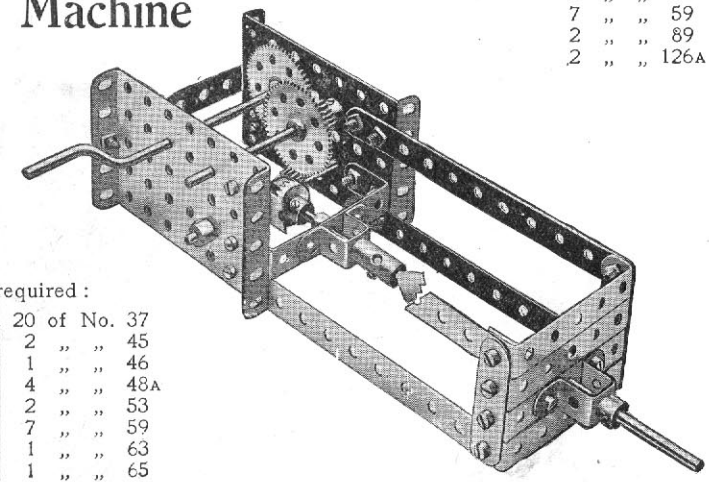


Parts required :

2	of	No.	2
8	„	„	3
1	„	„	5
4	„	„	6
2	„	„	8
2	„	„	10
8	„	„	12
6	„	„	12A
1	„	„	14
2	„	„	15
1	„	„	16A
4	„	„	19A
2	„	„	20
2	„	„	22
2	„	„	24
2	„	„	26
1	„	„	28
1	„	„	32
75	„	„	37
4	„	„	38
3	„	„	48B
2	„	„	53
2	„	„	54
7	„	„	59
2	„	„	89
2	„	„	126A

Model No. 520

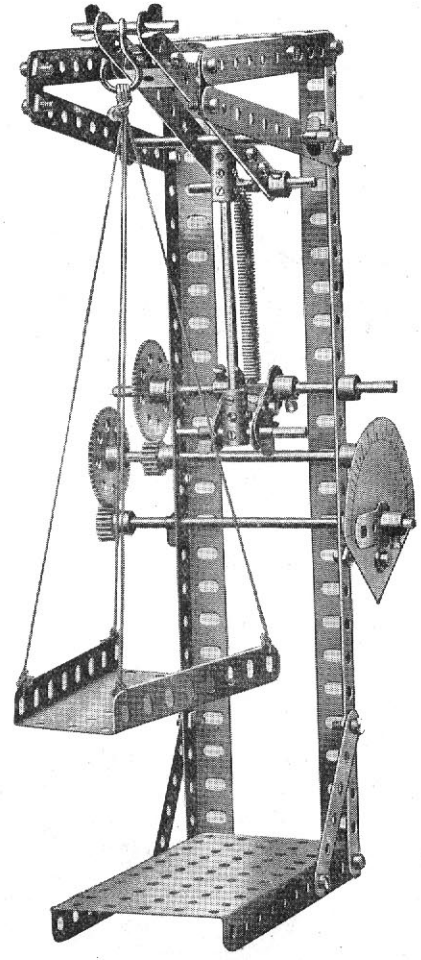
Spooling Machine



Parts required :

4	of	No.	2	20	of	No.	37
1	„	„	3	2	„	„	45
3	„	„	16	1	„	„	46
1	„	„	17	4	„	„	48A
1	„	„	19	2	„	„	53
2	„	„	26	7	„	„	59
2	„	„	27A	1	„	„	63
1	„	„	29	1	„	„	65

Model No. 521 Spring Scales

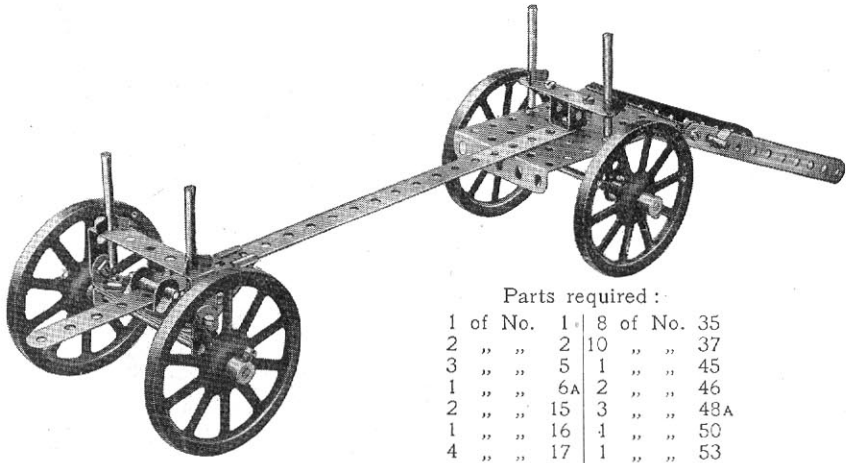


Parts required :

6	of	No.	2
2	„	„	4
2	„	„	8
2	„	„	10
3	„	„	11
2	„	„	15
1	„	„	15A
2	„	„	16
2	„	„	17
1	„	„	18A
2	„	„	26
2	„	„	27A
23	„	„	37
1	„	„	43
2	„	„	48A
1	„	„	52
1	„	„	54
1	„	„	57
2	„	„	59
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.

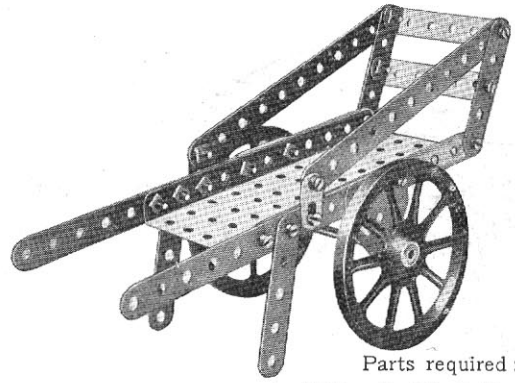
Model No. 522 Timber Carriage



Parts required :

1	of	No.	1	8	of	No.	35
2	„	„	2	10	„	„	37
3	„	„	5	1	„	„	45
1	„	„	6A	2	„	„	46
2	„	„	15	3	„	„	48A
1	„	„	16	1	„	„	50
4	„	„	17	1	„	„	53
1	„	„	18B	4	„	„	59
4	„	„	19A	1	„	„	111

Model No. 523 Coster's Barrow



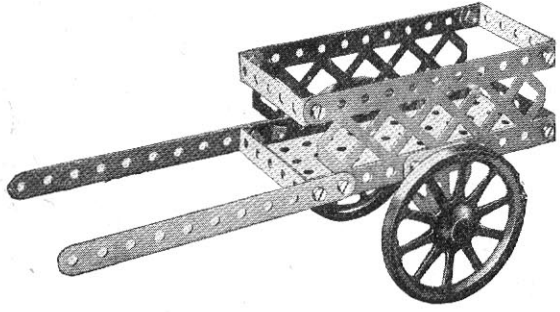
Parts required :

4	of	No.	2	18	of	No.	37
4	„	„	5	2	„	„	48A
2	„	„	10	1	„	„	52
1	„	„	16	2	„	„	126A
2	„	„	19A				

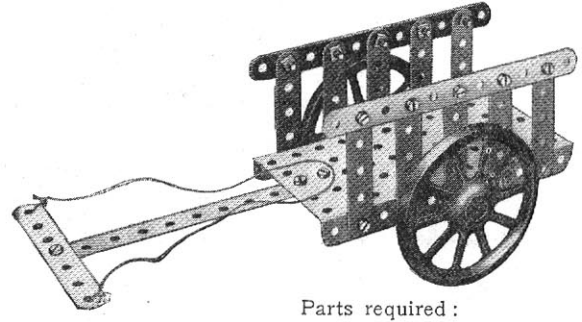
Model No. 524 Cart

Parts required :

2	of	No.	2
1	„	„	16
2	„	„	19A
14	„	„	37
4	„	„	48A
1	„	„	52
2	„	„	100
2	„	„	126A



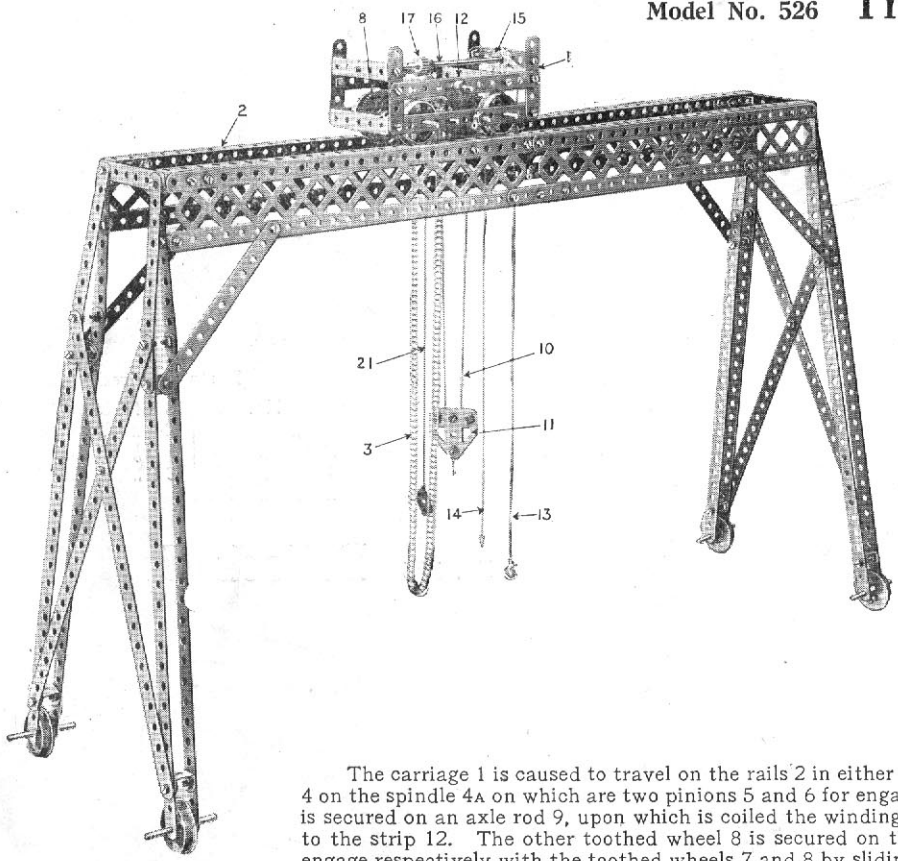
Model No. 525 Bullock Cart



Parts required :

3	of	No.	2	2	of	No.	19A
1	„	„	3	21	„	„	37
10	„	„	5	1	„	„	52
1	„	„	16				

Model No. 526 Travelling Crane



Parts required :

16	of	No.	1	2	of	No.	27A
16	„	„	2	1	„	„	32
6	„	„	5	86	„	„	37
4	„	„	8	8	„	„	38
2	„	„	9	2	„	„	47A
8	„	„	11	5	„	„	48A
4	„	„	12	1	„	„	57
1	„	„	14	6	„	„	59
1	„	„	15A	1	„	„	62
4	„	„	16	1	„	„	63
4	„	„	17	30″	„	„	94
8	„	„	20	1	„	„	96
1	„	„	22	4	„	„	99
1	„	„	23	2	„	„	126A
3	„	„	26	1	„	„	128

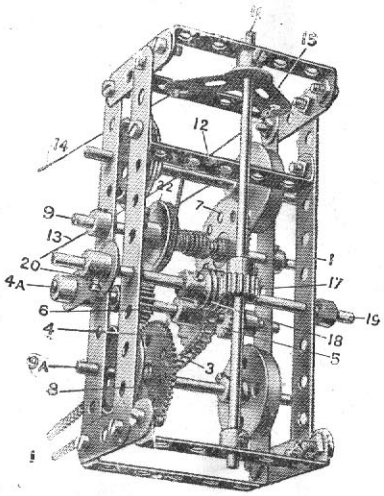
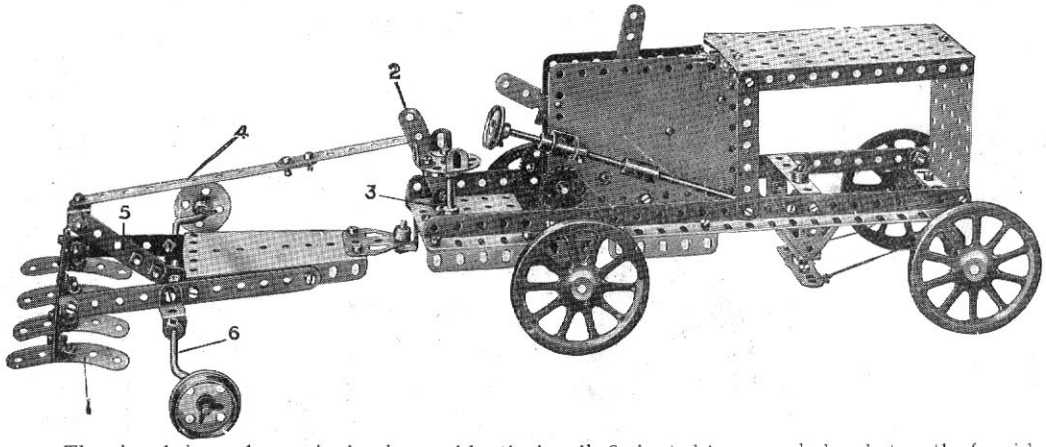


FIG. A

The carriage 1 is caused to travel on the rails 2 in either direction by the sprocket chain 3, which passes over a 1″ sprocket wheel 4 on the spindle 4A on which are two pinions 5 and 6 for engagement respectively with toothed wheels 7 and 8. The toothed wheel 7 is secured on an axle rod 9, upon which is coiled the winding cord 10 passing round a ½″ pulley in the block 11, and being made fast to the strip 12. The other toothed wheel 8 is secured on the axle of the travelling wheels 9A. The pinions 5 and 6 are caused to engage respectively with the toothed wheels 7 and 8 by sliding the pinion axle 4A in the carriage frame 1. This is effected by means of two cords 13 and 14 connected to a boss bell crank 15 on a rod 16, a pinion 17 which engages a worm 18 in the manner of a rack. This worm is secured to a rod 19, which is connected by a crank piece 20 to the pinion rod 4A. The latter revolving freely in the crank 20, being held in position by a collar on each side of the crank. Consequently, by pulling on one or other of the cords 13, 14, the bell crank is racked and the pinions caused to engage with one or other of the toothed wheels 7 or 8. When engaging the toothed wheel 7 the load may be raised or lowered by pulling the sprocket chain 3, but when the pinion 6 engages the toothed wheel 8, the carriage travels on the rails. The cord 21 passes round a pulley 22 on the winding axle and acts as a brake.

Model No. 527 Motor Plough



Parts required :

5	of	No.	2	2	of	No.	26	1	of	No.	54
3	„	„	3	1	„	„	27A	9	„	„	59
3	„	„	5	1	„	„	29	1	„	„	62
2	„	„	8	4	„	„	35	2	„	„	63
2	„	„	10	24	„	„	37	4	„	„	90
1	„	„	11	6	„	„	38	6″	„	„	94
19	„	„	12	1	„	„	45	2	„	„	96
3	„	„	15A	1	„	„	46	1	„	„	115
1	„	„	16	4	„	„	48A	3	„	„	125
3	„	„	17	1	„	„	52	5	„	„	126A
2	„	„	19	3	„	„	53	Clockwork Motor (not included in Outfit)			
4	„	„	19A								
2	„	„	20								
3	„	„	22								
1	„	„	24								

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. The plough is driven by a Meccano Clockwork Motor.

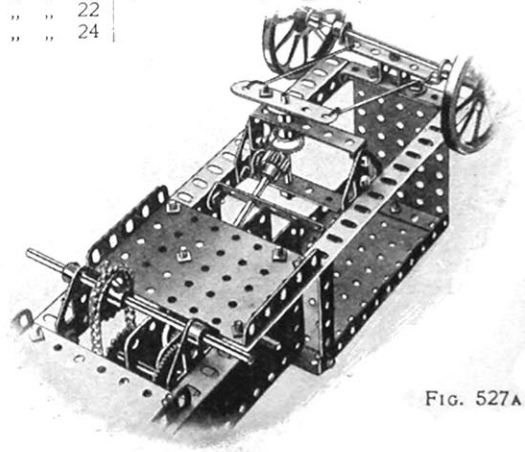
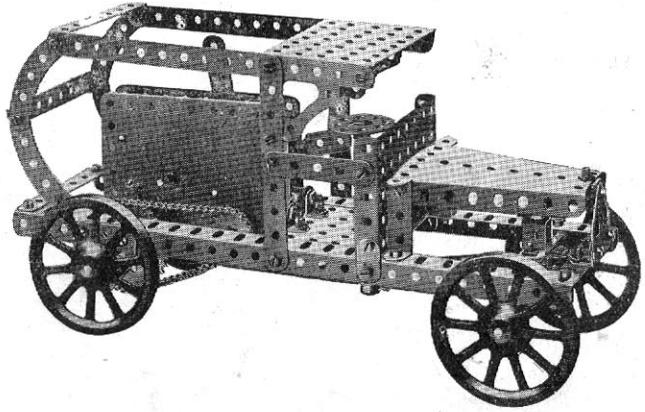


FIG. 527A

Model No. 528 Automobile



Parts required :

3	of	No.	2	2	of	No.	45				
4	„	„	3	2	„	„	48				
5	„	„	5	2	„	„	48B				
2	„	„	8	3	„	„	53				
2	„	„	10	1	„	„	54				
11	„	„	12	3	„	„	59				
2	„	„	15A	1	„	„	62				
1	„	„	16	4	„	„	90				
1	„	„	17	12″	„	„	94				
4	„	„	19A	1	„	„	95				
2	„	„	24	1	„	„	96				
63	„	„	37	2	„	„	108				
2	„	„	38	1	„	„	125				
3 of No. 126A											
Clockwork Motor (not included in Outfit).											

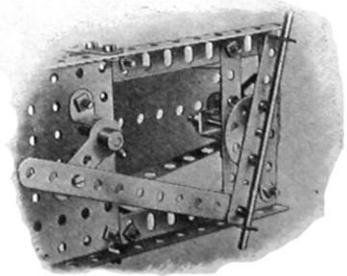
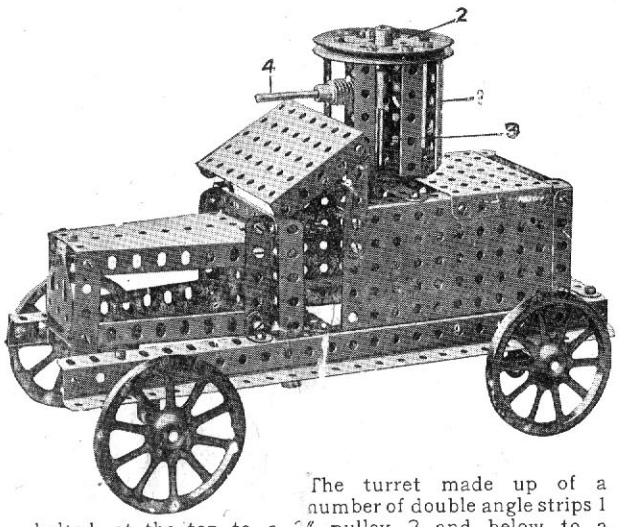


FIG. 528A

Model No. 529 Armoured Motor Car

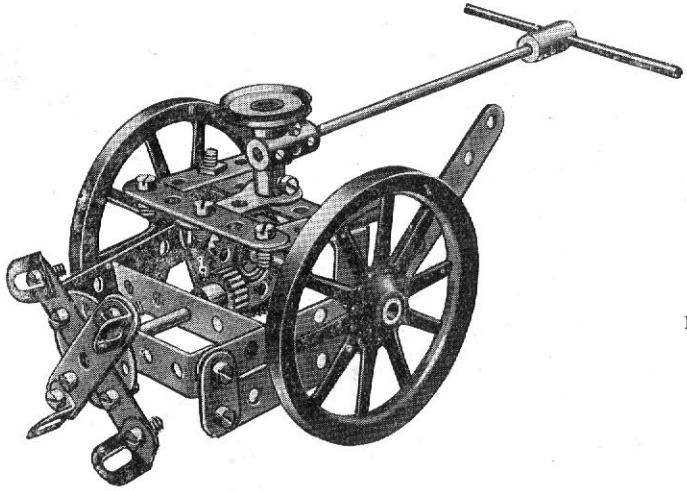


The turret made up of a number of double angle strips 1 bolted at the top to a 3" pulley 2 and below to a face plate is bolted on a rod 3 passing up the centre which forms the pivot of the turret so that it may freely turn. The gun 4 is bolted in a coupling on this pivot rod.

Parts required :

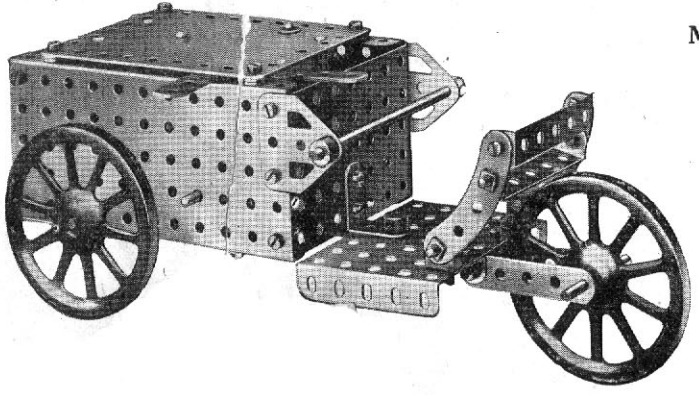
5	of	No.	3
6	„	„	5
4	„	„	8
5	„	„	12
1	„	„	12A
2	„	„	14
1	„	„	15
2	„	„	16
2	„	„	18A
4	„	„	19A
1	„	„	19B
2	„	„	22
2	„	„	24
1	„	„	32
77	„	„	37
2	„	„	38
2	„	„	45
7	„	„	48A
1	„	„	48B
2	„	„	52
4	„	„	53
2	„	„	54
8	„	„	59
1	„	„	63
1	„	„	109
3	„	„	126A

Model No. 530 Potato Reaper



Parts required :

1	of	No.	3
8	„	„	5
2	„	„	10
4	„	„	12
1	„	„	15
2	„	„	16
1	„	„	17
1	„	„	18A
2	„	„	19B
1	„	„	22
1	„	„	24
1	„	„	26
1	„	„	28
19	„	„	37
1	„	„	46
2	„	„	48A
1	„	„	59
1	„	„	62
2	„	„	63



Model No. 531 Delivery Van

Parts required :

1	of	No.	3	1	of	No.	28
3	„	„	5	31	„	„	37
4	„	„	12	9	„	„	38
1	„	„	12A	2	„	„	48A
1	„	„	15	2	„	„	52
2	„	„	15A	3	„	„	53
1	„	„	17	7	„	„	59
1	„	„	18A	2	„	„	90
3	„	„	19A	9"	„	„	94
1	„	„	26	2	„	„	95

2 of No. 126A
Clockwork Motor
(not included in Outfit)

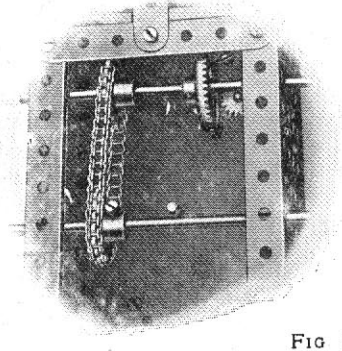
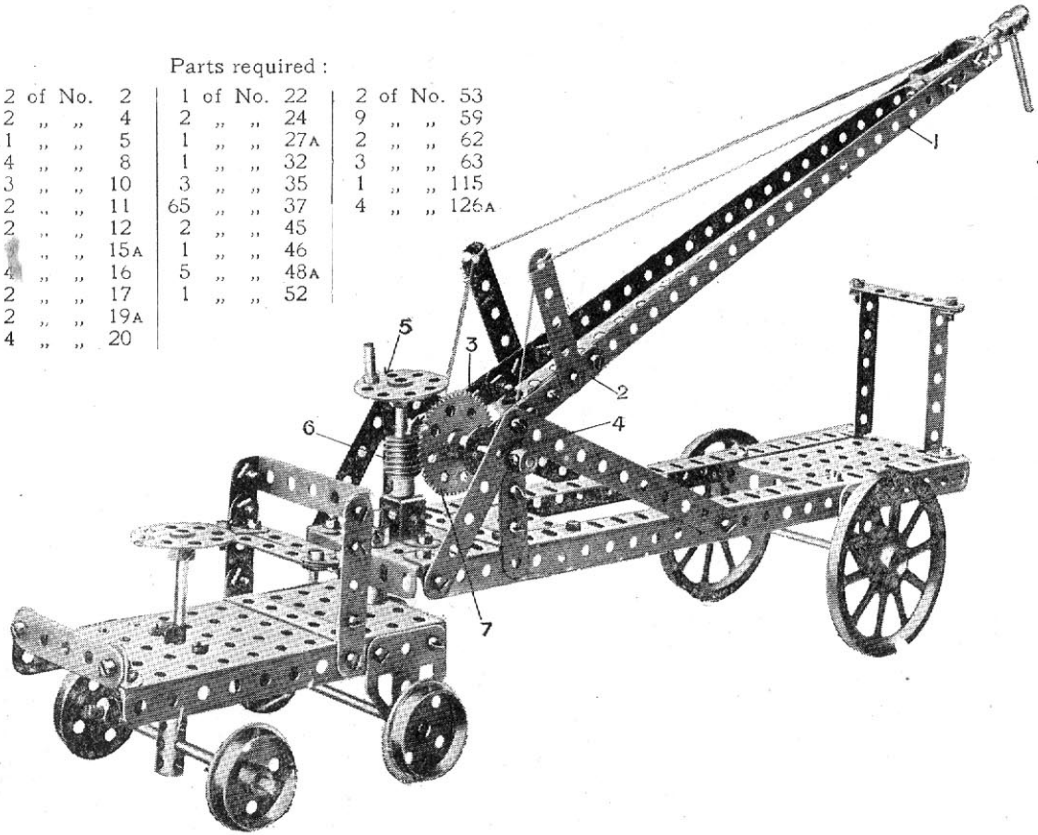


FIG 531A

Model No. 532 Fire Watertower

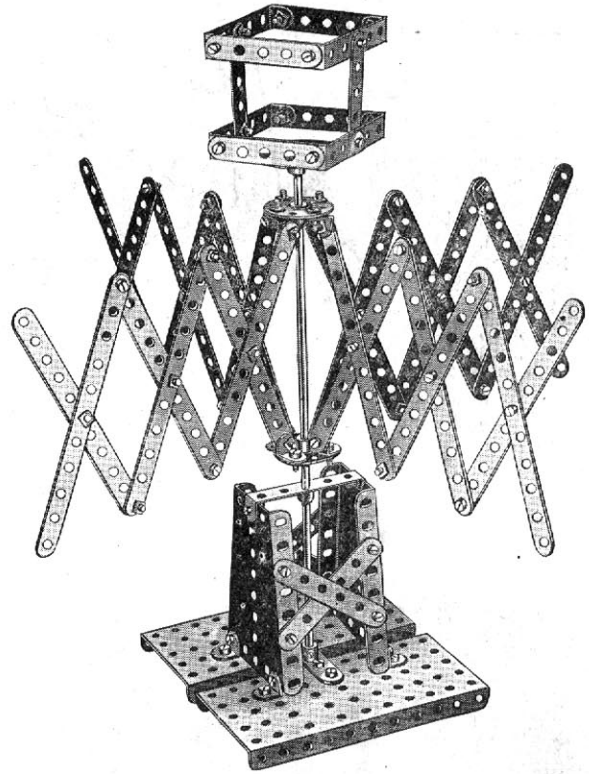
Parts required :

2	of No.	2	1	of No.	22	2	of No.	53
2	„ „	4	2	„ „	24	9	„ „	59
11	„ „	5	1	„ „	27A	2	„ „	62
4	„ „	8	1	„ „	32	3	„ „	63
3	„ „	10	3	„ „	35	1	„ „	115
2	„ „	11	65	„ „	37	4	„ „	126A
2	„ „	12	2	„ „	45			
1	„ „	15A	1	„ „	46			
4	„ „	16	5	„ „	48A			
2	„ „	17	1	„ „	52			
2	„ „	19A						
4	„ „	20						



This is an apparatus for raising a water-hose and directing the nozzle towards high buildings. The hose is led along the support 1, formed of two 12½″ angle girders, secured by strips 2 and cranks 3 to the rod 4, forming a pivot for the support. The support is raised or lowered about the pivot by turning the hand-wheel 5, a worm 6 on the spindle of which engages a 57-toothed wheel 7 on the rod 4.

Model No. 533 Skein Winder



Parts required :

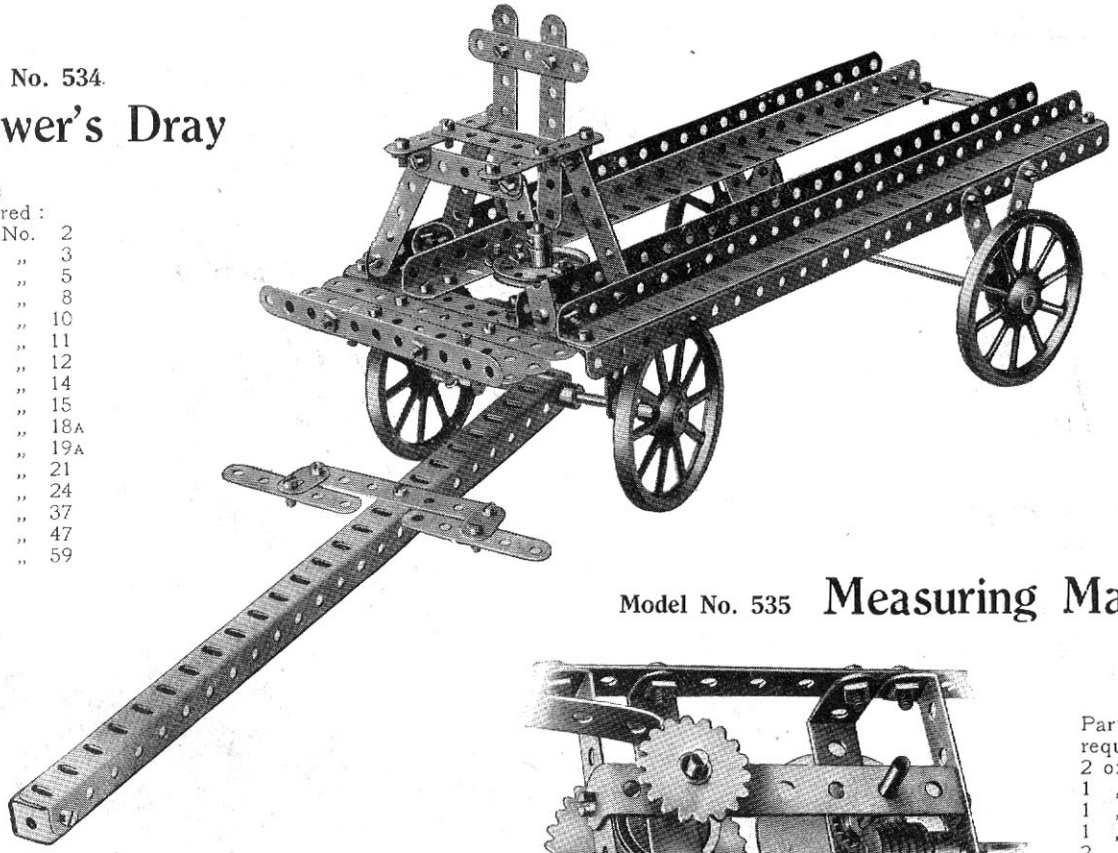
24	of No.	2	2	of No.	24
4	„ „	4	86	„ „	37
7	„ „	5	5	„ „	48A
8	„ „	12	2	„ „	52
1	„ „	13	2	„ „	54
1	„ „	21	2	„ „	59

Model No. 534

Brewer's Dray

Parts required :

6	of No.	2
3	„ „	3
19	„ „	5
8	„ „	8
2	„ „	10
1	„ „	11
10	„ „	12
1	„ „	14
1	„ „	15
1	„ „	18A
4	„ „	19A
1	„ „	21
1	„ „	24
62	„ „	37
1	„ „	47
6	„ „	59



Model No. 535 # Measuring Machine

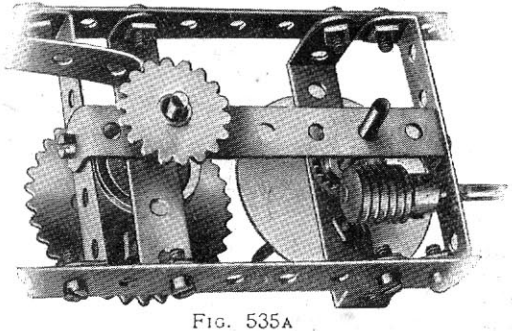
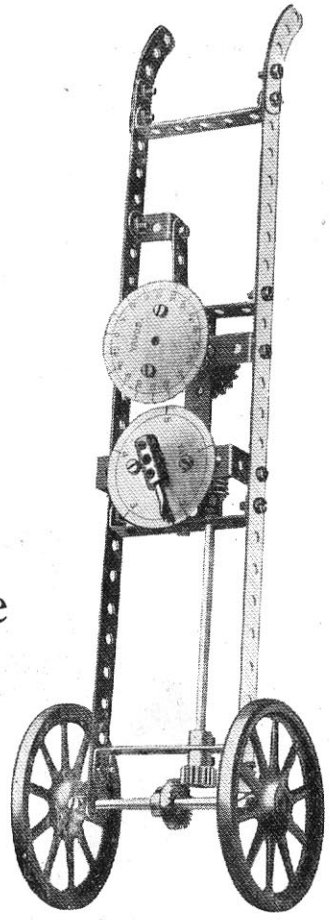


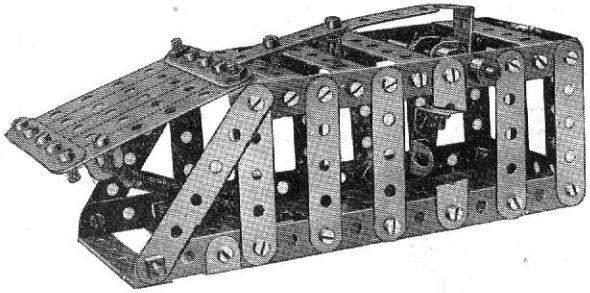
FIG. 535A



Parts required :

2	of No.	1
1	„ „	5
1	„ „	15
1	„ „	16
2	„ „	17
2	„ „	19A
1	„ „	22
1	„ „	26
2	„ „	29
1	„ „	32
22	„ „	37
1	„ „	46
5	„ „	48A
1	of No.	48B
1	„ „	59
1	„ „	63
1	„ „	65
2	of No.	90
1	„ „	95
1	„ „	96
1	„ „	125

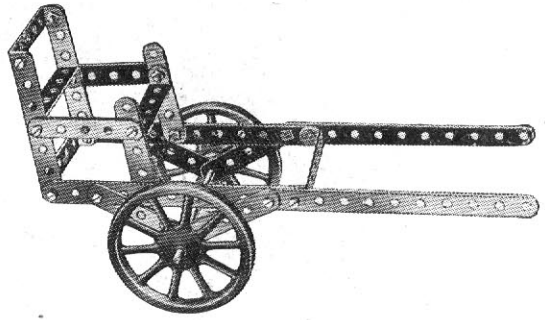
Model No. 536 Mouse Trap



Parts required :

3	of	No.	2
8	„	„	4
18	„	„	5
1	„	„	10
1	„	„	11
4	„	„	12
1	„	„	16
59	„	„	37
5	„	„	38
1	„	„	43
1	„	„	48
9	„	„	48A
1	„	„	52
4	„	„	59

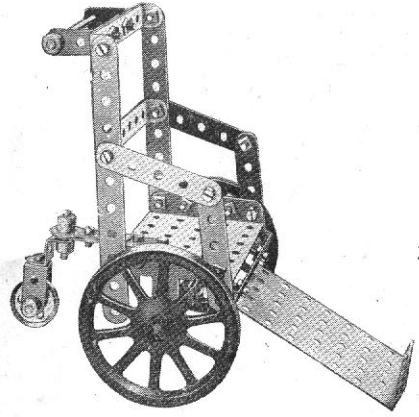
Model No. 537 Ducking Chair



Parts required :

4	of	No.	2
2	„	„	3
8	„	„	5
1	„	„	15A
2	„	„	19A
4	„	„	35
16	„	„	37
5	„	„	48A

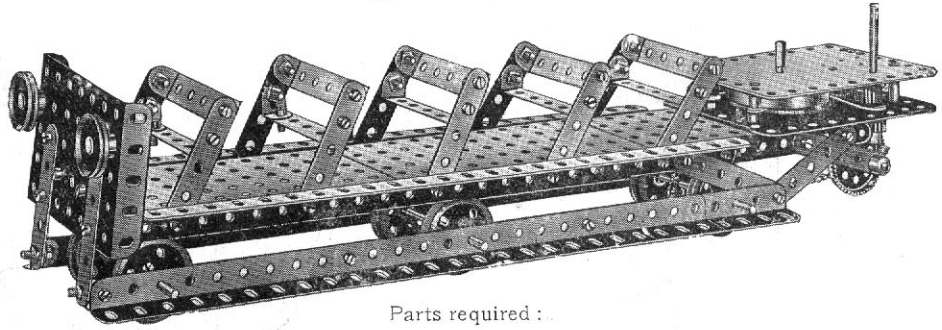
Model No. 538 Invalid Chair



Parts required :

2	of	No.	2
5	„	„	5
1	„	„	10
1	„	„	15A
1	„	„	16
2	„	„	18A
2	„	„	19A
1	„	„	22A
25	„	„	37
5	„	„	38
1	„	„	46
3	„	„	48B
2	„	„	53
5	„	„	59
1	„	„	62
1	„	„	102
1	„	„	125
2	„	„	126A

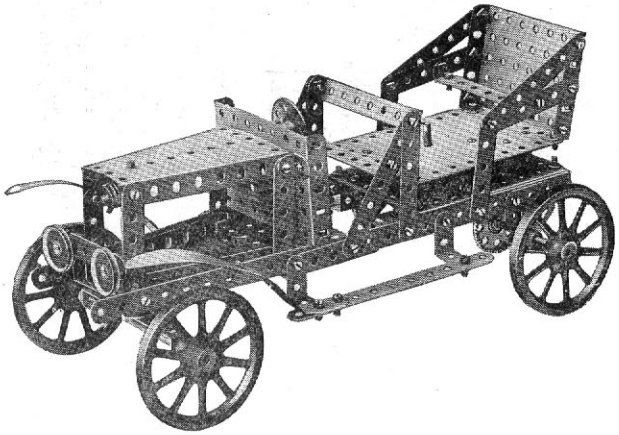
Model No. 539 Touring Tram Car



Parts required :

20	of	No.	5	6	of	No.	20	64	of	No.	37
6	„	„	8	2	„	„	22	8	„	„	48A
8	„	„	12	1	„	„	26	3	„	„	52
4	„	„	16	1	„	„	28	1	„	„	53
				2	„	„	59				

Model No. 540 Automobile



Parts required:

2	of No.	1	2	of No.	24
2	„ „	2	2	„ „	26
7	„ „	3	1	„ „	28
4	„ „	4	1	„ „	32
7	„ „	5	67	„ „	37
2	„ „	9	3	„ „	38
9	„ „	12	2	„ „	41
4	„ „	12A	1	„ „	48A
1	„ „	14	3	„ „	48B
2	„ „	15	3	„ „	53
1	„ „	16	2	„ „	54
4	„ „	19A	7	„ „	59
2	„ „	22	2	„ „	126A

Clockwork Motor (not included in Outfit)

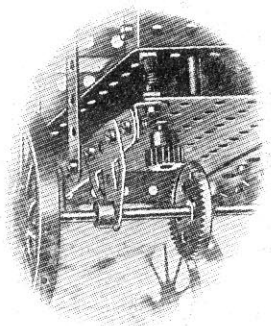
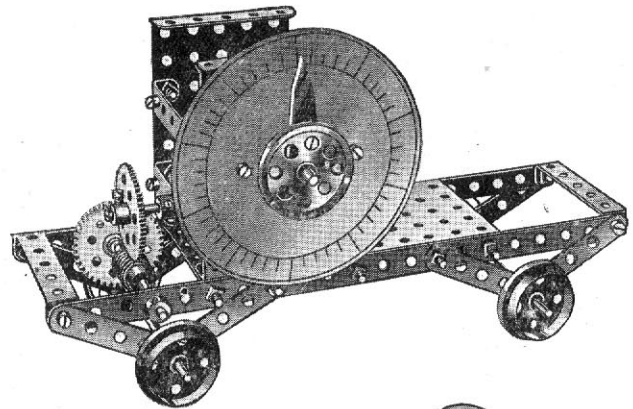


FIG. 540A

Model No. 541 Distance Indicator



Parts required:

4	of No.	2	
4	„ „	3	
8	„ „	5	
10	„ „	12	
2	„ „	15	
2	„ „	15A	
1	„ „	16	
1	„ „	17	
4	„ „	20	
1	„ „	21	
2	„ „	22	
1	„ „	24	
2	„ „	26	
2	„ „	27A	
1	„ „	28	
1	„ „	32	
38	„ „	37	
2	„ „	48A	
1	„ „	52	
2	„ „	53	
6	„ „	59	

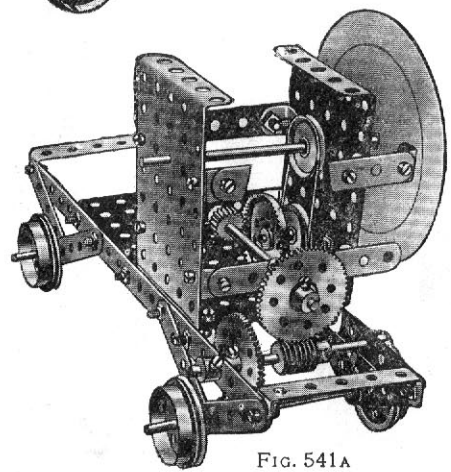


FIG. 541A

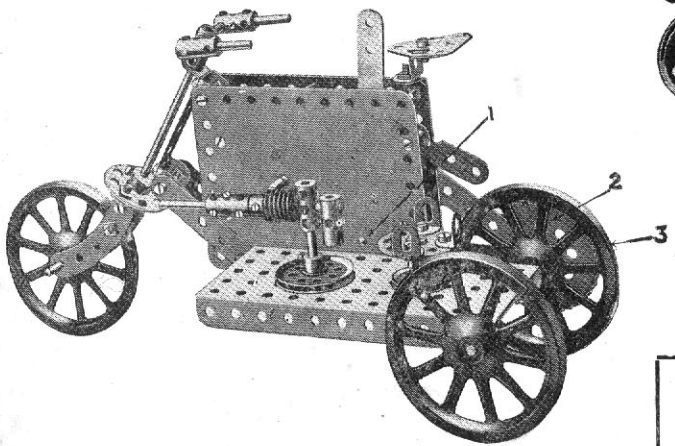
Model No. 542

Armoured Motor Tricycle

Parts required :

2	of No.	2	4	of No.	18A	1	of No.	52
2	„ „	5	3	„ „	19A	1	„ „	59
1	„ „	9D	1	„ „	21	6	„ „	63
2	„ „	11	3	„ „	22	2	„ „	90
4	„ „	12	2	„ „	24	1	„ „	95
2	„ „	12B	1	„ „	32	1	„ „	96
1	„ „	15A	22	„ „	37	1	„ „	125
2	„ „	16	10	„ „	38	1	„ „	126A
2	„ „	17	1	„ „	48A			

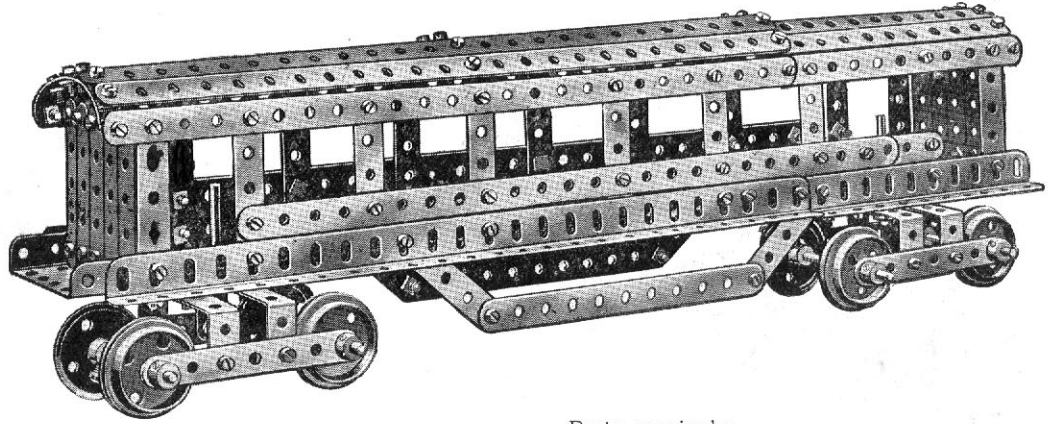
Clockwork Motor
(not included in Outfit).



This is driven from the motor spindle 1, a small sprocket wheel at the rear, not shown in the illustration, being geared by a chain to the larger sprocket wheel 2 bolted on the axle rod of the rear wheels 3.

Model No. 543

Pullman Car



Parts required :

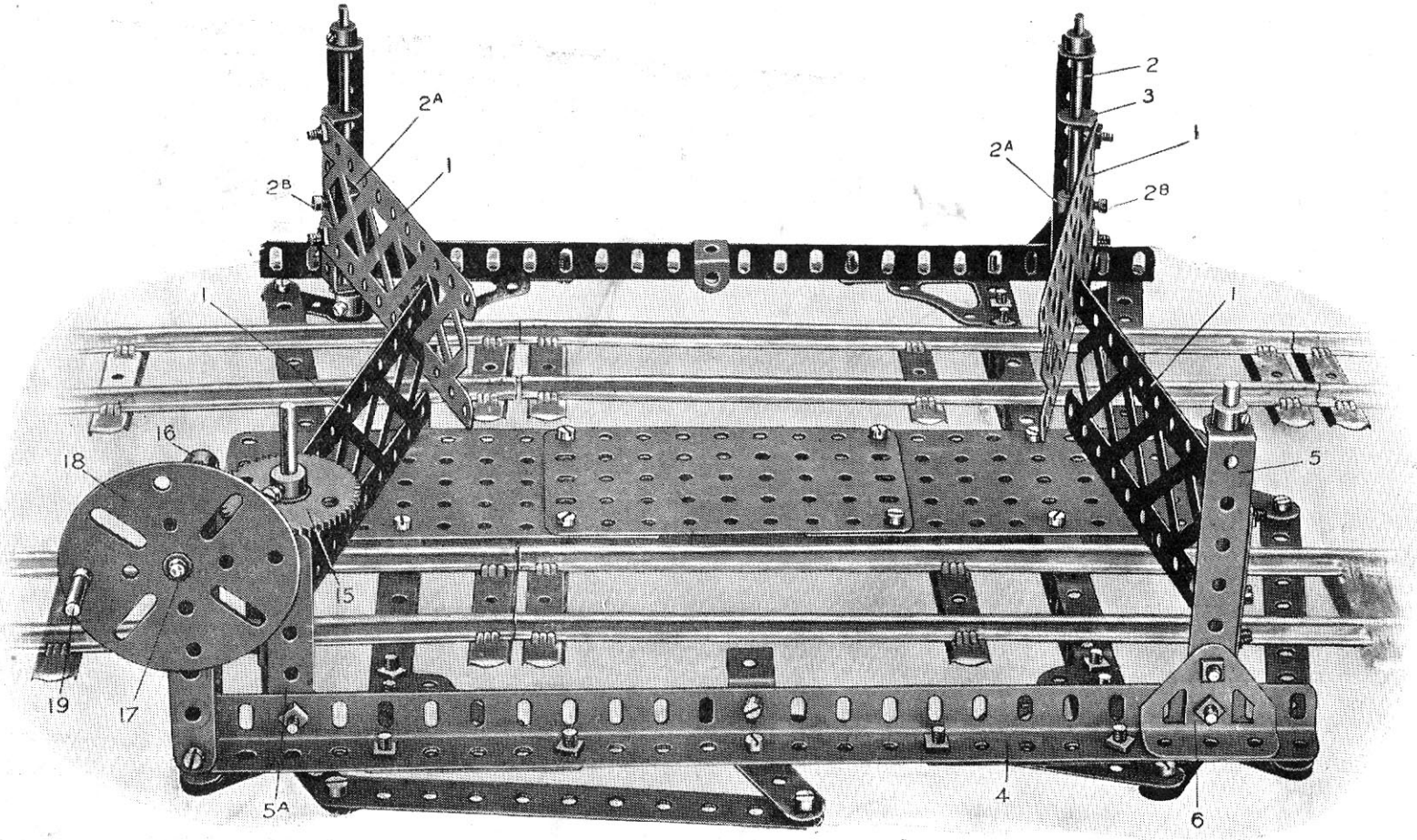
9	of No.	1	4	of No.	8	2	of No.	21
9	„ „	2	4	„ „	16	116	„ „	37
8	„ „	3	2	„ „	17	4	„ „	46
34	„ „	5	8	„ „	20	3	„ „	52
			10	„ „	59			

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 price of which will be found in the 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. 601 Level Crossing Gates



Model No. 601 Level Crossing Gates *(continued)*

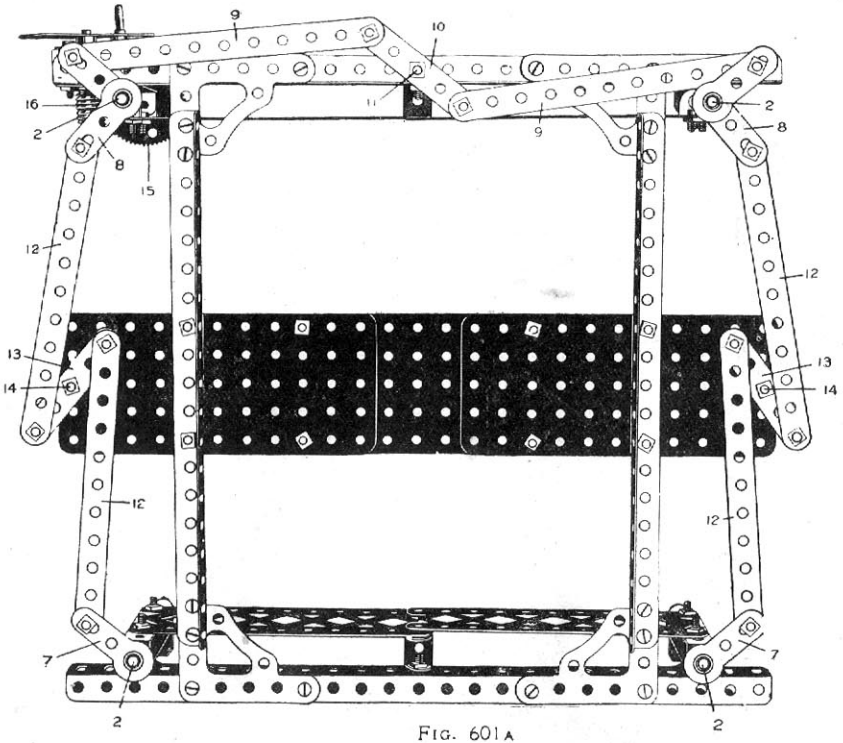


FIG. 601A

Parts required:

6	of	No.	2
2	,,	,,	4
3	,,	,,	5
1	,,	,,	6A
2	,,	,,	8
2	,,	,,	8A
4	,,	,,	11
4	,,	,,	15A
1	,,	,,	17
1	,,	,,	27A
1	,,	,,	32
53	,,	,,	37
16	,,	,,	37A
4	,,	,,	48A
3	,,	,,	48B
1	,,	,,	53A
7	,,	,,	59
2	,,	,,	62
3	,,	,,	70
4	,,	,,	100
4	,,	,,	108
1	,,	,,	109
1	,,	,,	115
3	,,	,,	126
2	,,	,,	128

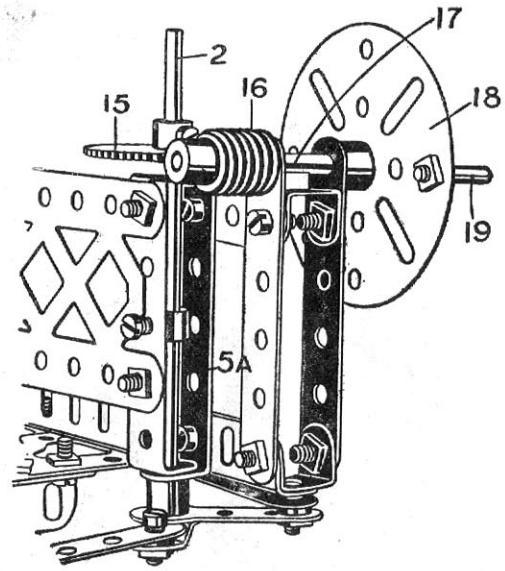


FIG. 601B

The gates consist of 5½" braced girders 1 and are pivotally carried on the rods 2 being bolted to 2½" by ½" double angle strips 3. On each rod 2 is threaded a collar 2A, Fig. 601, and a bolt 2B is passed through the centre hole of the double angle strips 3 and screwed into the thread hole of the collar 2A, nipping the collar to the rod 2, thus ensuring that the braced girders 1 shall turn with the rods 2. Three of the rods 2 are carried from the lower angle girders 4 in 3½" by ½" double angle strips 5, and one in a 2½" by ½" double angle strip 5A, the feet of the strips 5 being reinforced to the angle girders 4 by the trunnions 6. The rods 2 are coupled together by cranks 7 on the rear rods, and bell cranks 8 on the other rods, the ends of the two bell cranks being connected by strips 9 to 2½" strip 10 pivoted on the bolt 11, Fig. 601A, while the bell cranks 8 are connected to the cranks 7 by other strips 12, pivotally connected to 2½" strips 13, pivoted on the bolts 14. Consequently, all the rods 2 are inter-connected. As will be seen from the Figs. 601 and 601B, a 56-toothed gear wheel 15 is secured on one of the rods 2, and is engaged by a worm 16 on a rod 17 to which is secured a face plate 18, fitted with a threaded pin 19, as an operating handle. By turning the face plate 18 the spindles 2 are all rotated, and the gates caused to open or close.

This Model can be made with MECCANO Outfit No. 6, or No. 5 and No. 5A.

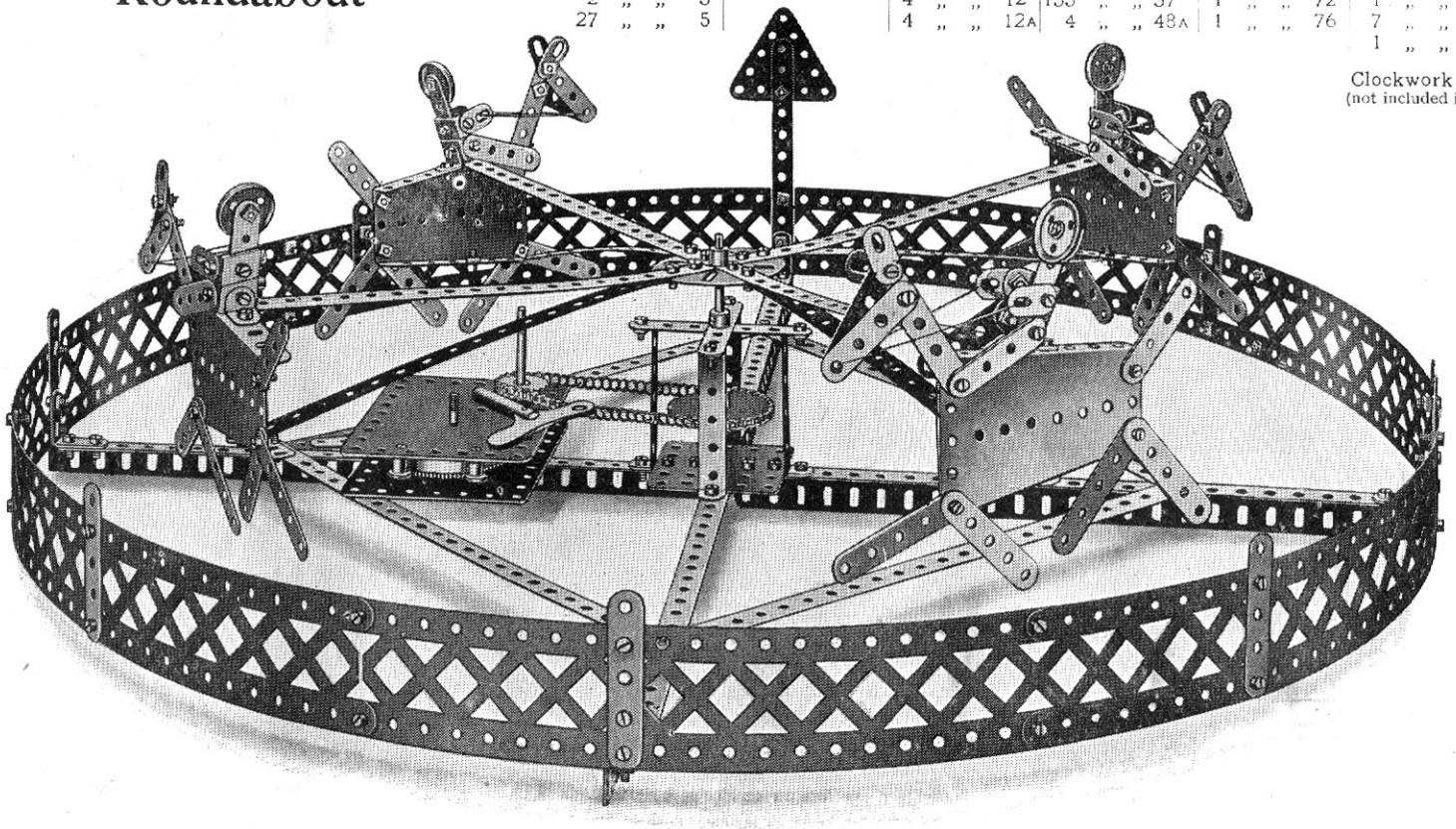
Model No. 602

Roundabout

Parts required:

12	of No.	1	24	of No.	6	16	of No.	10	1	of No.	15	4	of No.	54	14″	of No.	94
1	„ „	2	4	„ „	8	8	„ „	11	4	„ „	22A	2	„ „	59	1	„ „	95
2	„ „	3				4	„ „	12	135	„ „	37	1	„ „	72	1	„ „	96
27	„ „	5				4	„ „	12A	4	„ „	48A	1	„ „	76	7	„ „	99
															1	„ „	109

Clockwork Motor
(not included in Outfit).



In this model the animals, built up from sector plates and short strips to represent the limbs, are carried from 9½″ strips bolted to a face plate, which is rotated from the centre rod by means of a chain and a 1″ sprocket wheel connected to the spring motor.

The centre rod, by means of which the rotating figures are driven, is supported below the face plate by a light framing to give rigidity.

The model is surrounded by braced girder strips bolted together, and strengthened by 12½″ cross angle girders, connected in the centre by a 2½″ by 2½″ flat plate. The centre hole of this plate carries the lower end of the vertical rod upon which the animals are mounted.

Model No. 603 Portable Crane

Parts required:

12	of No.	2	16	of No.	12	1	of No.	21	1	of No.	40
3	„ „	3	1	„ „	15	5	„ „	22	2	„ „	44
6	„ „	5	5	„ „	16	2	„ „	22A	1	„ „	45
2	„ „	9	4	„ „	17	2	„ „	23	1	„ „	48
			2	„ „	18A	1	„ „	24	2	„ „	48A
			1	„ „	19	1	„ „	26	1	„ „	53
						1	„ „	27A	1	„ „	57
						74	„ „	37	10	„ „	59
						16	„ „	38	2	„ „	62
									2	„ „	63
									2	„ „	89
									2	„ „	90
									4	„ „	126A

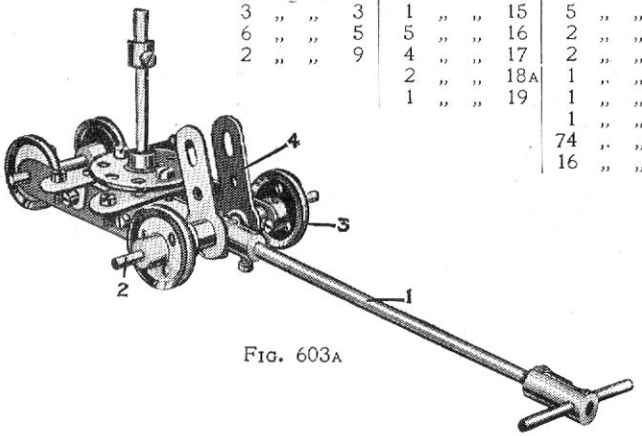
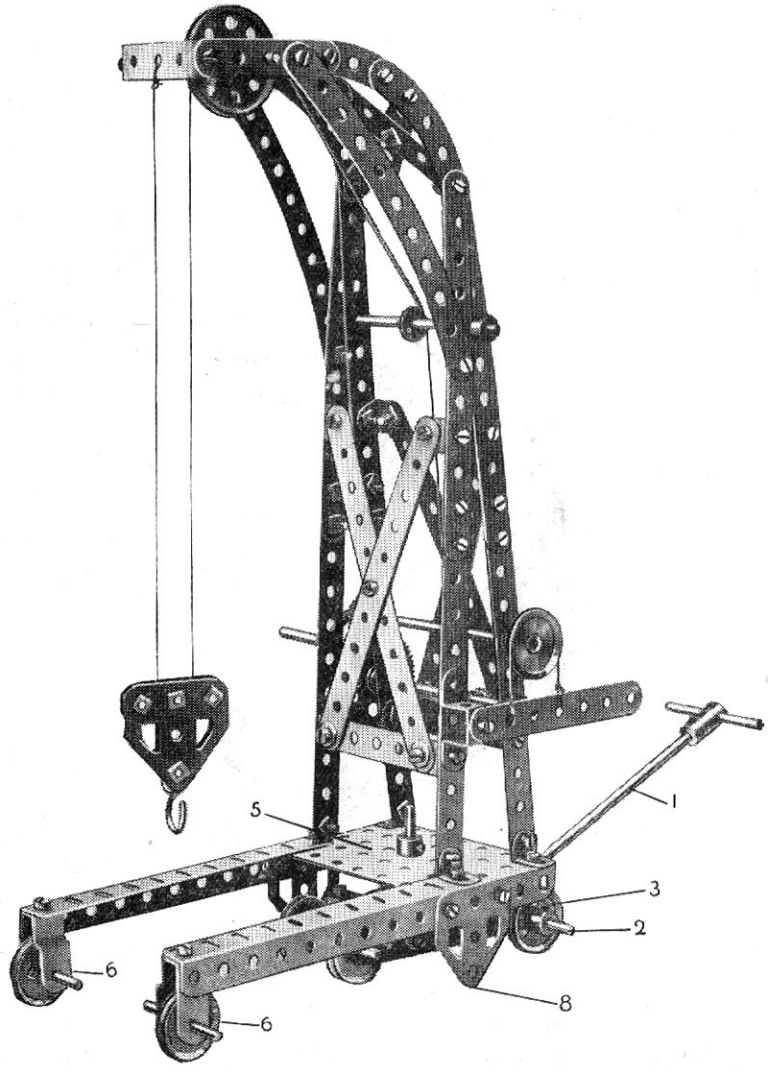


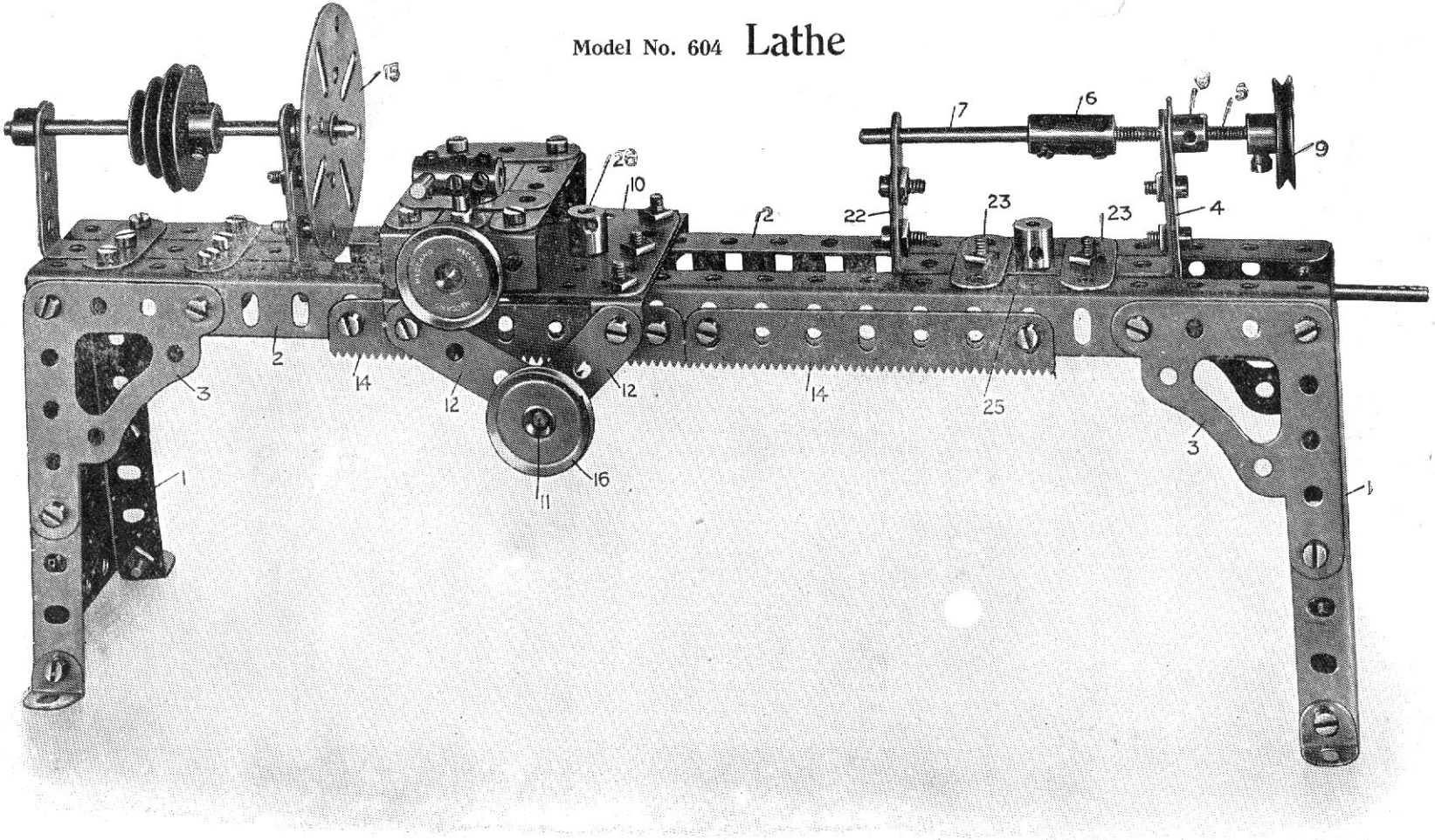
FIG. 603A



The construction of the tower is quite clear from the illustration. The crane is moved about by depressing the handle 1 carrying an axle 2 for the 1" loose pulley wheels 3, which are secured in position by collars and set screws. A pair of cranks 4 are secured to the axle 2 and are arranged when the handle is depressed to bear against the underface of the small rectangular plate 5 and lift the crane so that it then runs on the wheels 3 and 6. When the crane is brought to rest its weight forces down the cranks 4 which raises the handle 1, and the tips 8 of the flat trunnions together with front wheels 6 then support the crane.

This Model can be made with MECCANO Outfit No. 6, or No. 5 and No. 5A.

Model No. 604 Lathe



Parts required:

3 of No.	5	2 of No.	8	1 of No.	13	3 of No.	22	3 of No.	38	2 of No.	54	2 of No.	63	1 of No.	80A	1 of No.	109
3 „ „	6	4 „ „	11	2 „ „	16	1 „ „	26	2 „ „	47	3 „ „	59	3 „ „	64	1 „ „	81	2 „ „	110
14 „ „	6A	4 „ „	12	1 „ „	17	53 „ „	37	4 „ „	48A	1 „ „	62A	1 „ „	72	4 „ „	108	1 „ „	115

1 of No. 123

Model No. 604 Lathe *(continued)*

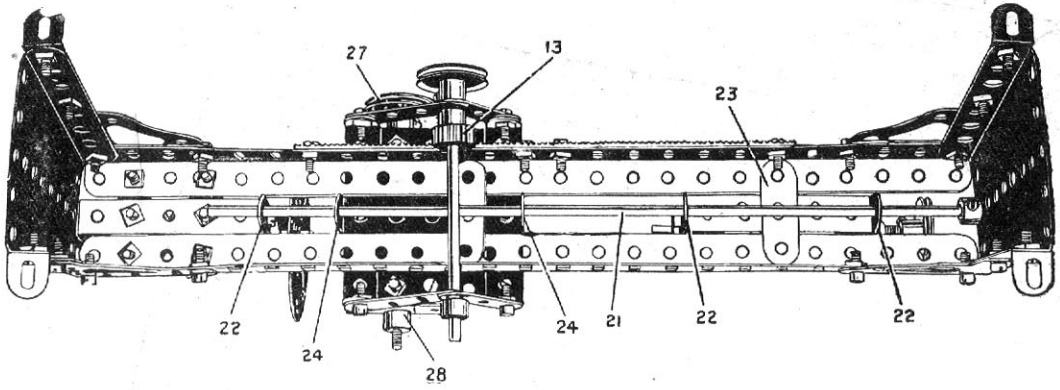


FIG. 604A

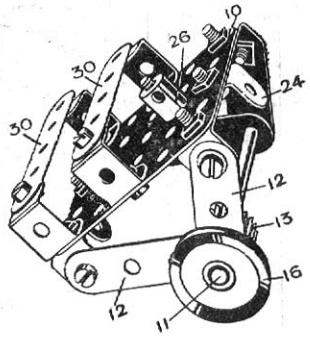


FIG. 604B

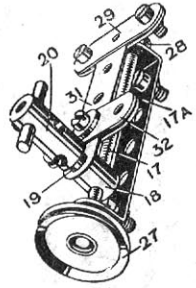
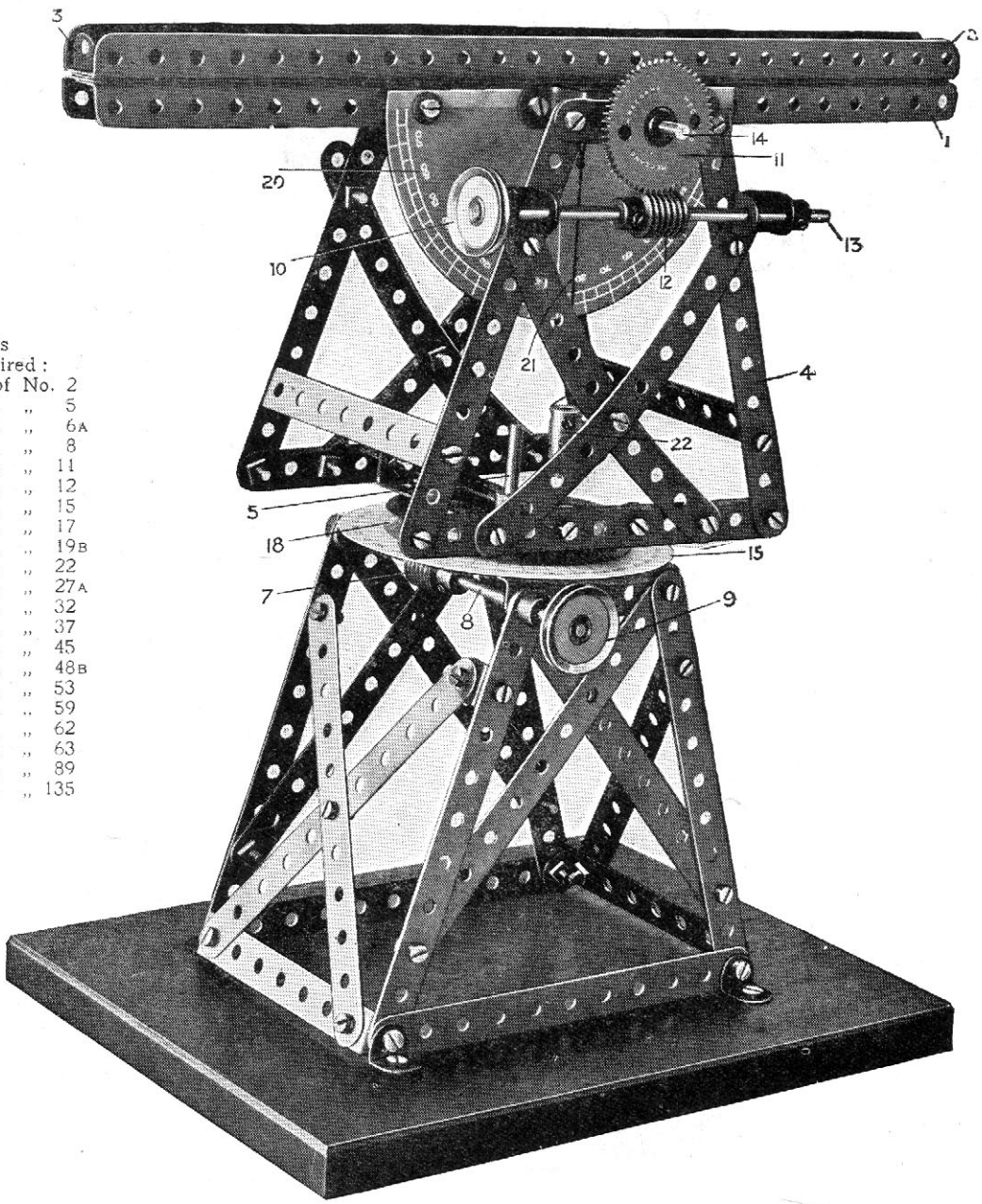


FIG. 604C

The lathe frame is built up from sector plates 1, at each end bolted to 12½" angle girders 2, forming the bed, by means of architraves 3. The tail stock 4, slides between the angle girders 1, and has a screw adjustment 5, the screw of which is connected by the threaded coupling 6 to the rod 7; the screw 5 is threaded into a threaded crank 8, and is operated by the 1" pulley wheel 9. The tail stock is locked by turning the threaded boss 25, which engages the bolt holding the underneath cross strip 23, thus gripping it beneath the lathe bed. The saddle 10, consisting of a 2½" by 2½" flat plate, carries the rod 11, journalled in the strips 12, and carries a pinion 13, Fig. 604B. which engages the racks 14, so that the saddle may be moved to or from the face plate 15, by turning the pulley wheel 16. The traversing movement is obtained by means of the screw 17, which engages a threaded boss 18, into the end of which is screwed a threaded pin 19, carrying the coupling 20, which forms the tool post. The saddle is locked by the threaded boss 26, similar to the tail stock. The screwed rod 17, is held against end movement in the 2½" by ½" bent strip 17A, by the pulley wheel 27 at one side and the collar 28 on the other.

The construction of the saddle is shown in Figs. 604B and 604C, where the 1½" strips 29, of Fig. 604C are shown removed from Fig. 604B; these strips 29 are bolted at the end of the guide strips 30, Fig. 604B, and form guides for the 2½" strip 31, carrying the tool post. They are spaced apart by the thickness of the strips 30, and the 1½" strips 32, bolted to the strip 31, slide on the strips 30. As will be seen from the underneath view, Fig. 604A, a guide rod 21, is fixed beneath the bed plates, and is engaged by the end holes of the 1½" strips 22, secured to the sides of the head and tail stocks; 1½" strips 23, being bolted above and below to retain the tail stock in position. The saddle engages the rod 21 by means of a 2½" by ½" double angle strip 24.

Model No. 605 Theodolite



Parts required:

20	of	No.	2
2	„	„	5
6	„	„	6A
4	„	„	8
2	„	„	11
0	„	„	12
3	„	„	15
1	„	„	17
1	„	„	19B
2	„	„	22
2	„	„	27A
2	„	„	32
0	„	„	37
1	„	„	45
6	„	„	48B
1	„	„	53
6	„	„	59
1	„	„	62
1	„	„	63
4	„	„	89
1	„	„	135

Model No. 605 Theodolite *(continued)*

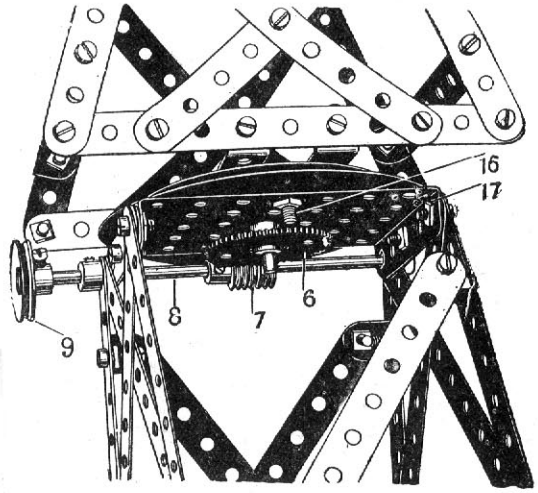


FIG. 605A

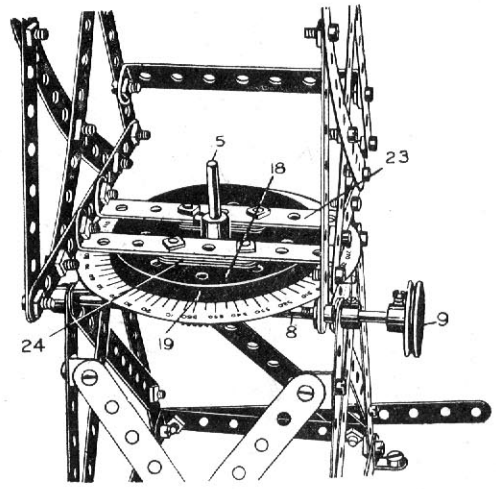


FIG. 605B

The Theodolite is represented by two reverse pairs of angle girders 1 and 2, which form a " sighting arm," an angle bracket 3 being bolted at one end to form an eye piece. A small piece of gummed paper is fastened over the aperture in the angle bracket, and a fine pin-hole made in the paper at the centre of the aperture. Two crossed threads are gummed across the aperture of the angle bracket bolted at the other end of the sighting arm.

The upper framework 4 swivels horizontally with the vertical spindle 5 as a pivot. On the lower end of this rod is a gear wheel 6, Fig. 605A, engaged by a worm 7 on a rod 8, operated by the 1" pulley 9. This gives the horizontal traverse of the upper frame 4, in which the sighting arm is pivotally mounted upon a rod 14, on which is a gear wheel 11 engaged by a worm 12 on a rod 13 operated by a 1" pulley 10. This mechanism gives the vertical traverse or inclination of the sighting arm.

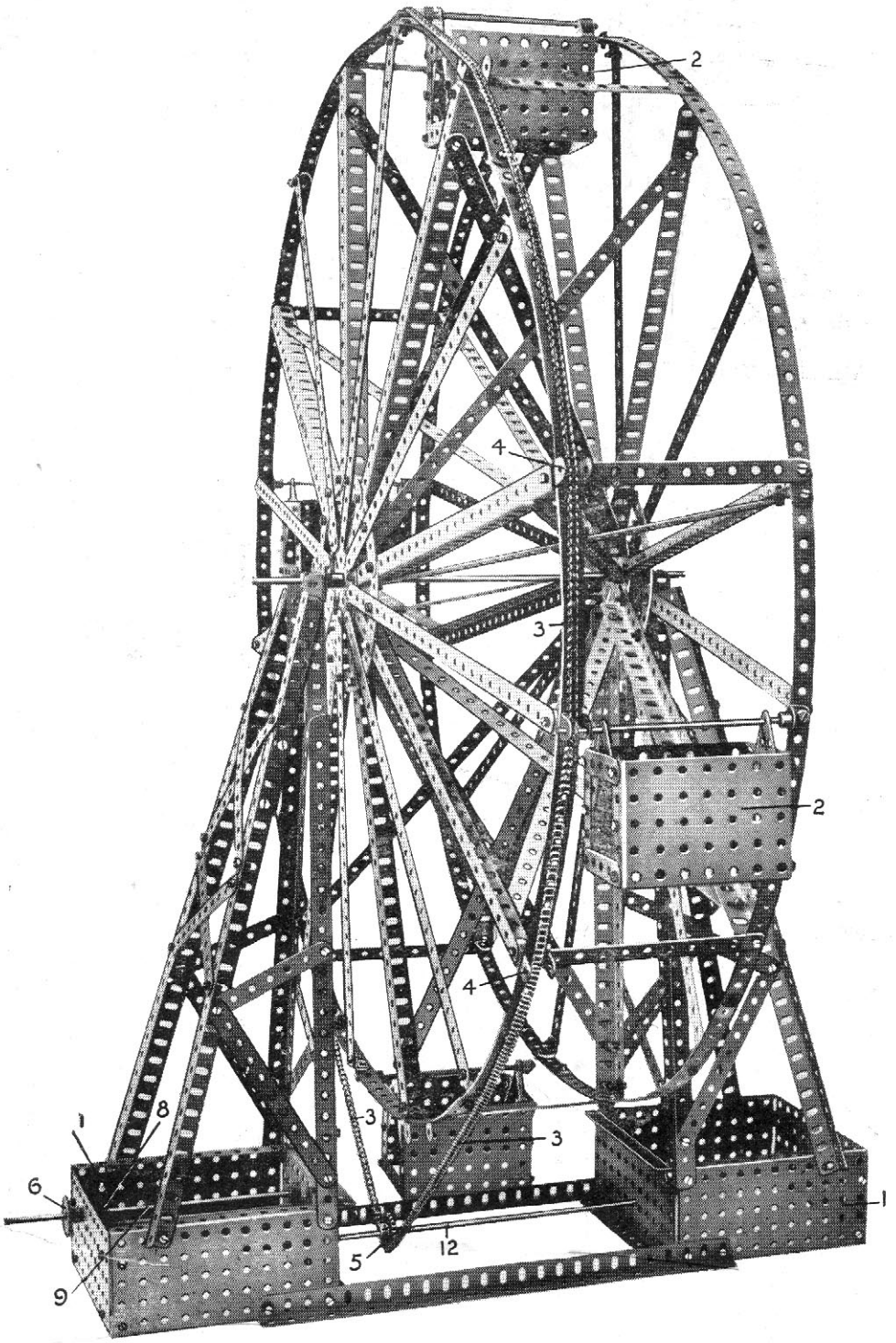
A protractor for the horizontal angular movement of the upper frame 4 consists of a graduated cardboard disc 15, which is bolted by a bolt 16 to a perforated flanged plate 3½" by 2½" 17, the head of the bolt 16 being above the cardboard disc, and beneath the 3" pulley wheel 18. The cardboard disc is thus held against movement by the bolt 16, its centre hole engaging round the pivot rod 5. An index mark or pointer 19 is made on the pulley wheel 18. The movement of this pointer round the graduated scale on the disc shows the horizontal angular traverse.

Similarly, the vertical traverse of the sighting arm is indicated by means of a semi-circular protractor 20, bolted to the lower angle girder 1 of the sighting arm, a cord 21 carrying a weight 22, being hung from the rod 14, the position of the thread 21 over the protractor 20 indicating the vertical angular adjustment of the sighting arm. The thread 21 has a loop by which it is hung on the rod 14, so that its direction always points truly radially to the rod 14, and this gives the correct angular reading. In order to bring the double angle strips 23 flush with the outer rim of the pulley wheel 18, three 1½" packing strips 24 are bolted beneath the double angle strips, as shown in Fig. 605B.

The sighting arm is secured to the rod 14 by a crank bolted to the arm on the opposite side to the protractor and nipped by the set screw to the rod 14.

This Model can be made with MECCANO Outfit No. 6, or No. 5 and No. 5A.

Model No. 606 Big Wheel



Model No. 606 Big Wheel *(continued)*

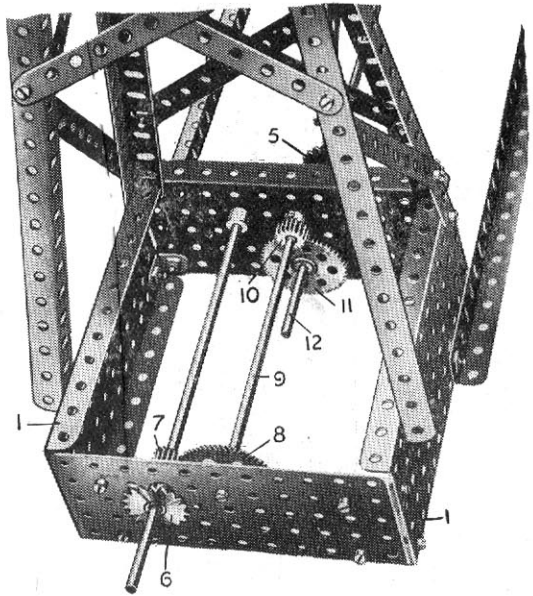


Fig. 606A

Parts required :

46	of	No.	1	2	of	No.	26
24	„	„	2	2	„	„	27A
4	„	„	3	308	„	„	37
32	„	„	5	6	„	„	38
26	„	„	8	4	„	„	48D
4	„	„	9	6	„	„	52
8	„	„	11	8	„	„	53
44	„	„	12	2	„	„	54
2	„	„	13	13	„	„	59
1	„	„	13A	2	„	„	70
1	„	„	14	16	„	„	90
4	„	„	15	2	„	„	96
2	„	„	24	2	„	„	109

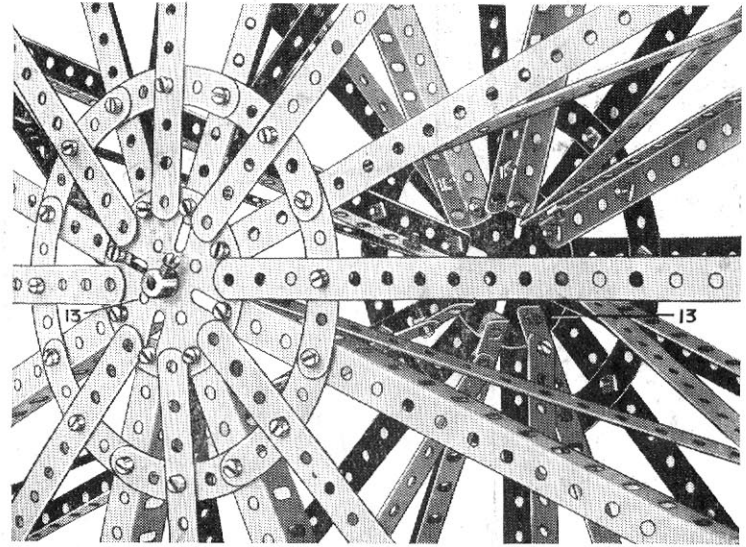
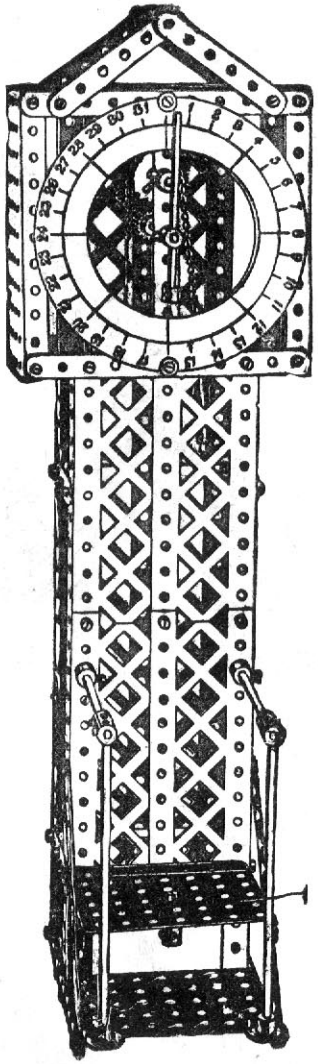


Fig. 606B

In constructing this model, flanged plates 1 are used to form the sides and inner part of the base of the side pedestals, and also to form the suspended cages 2 on the wheel. The driving chain 3 is conveniently kept in position round the periphery of one of the side elements of the wheel by a series of double angle brackets 4, bolted on the ends of the spokes.

Fig. 606A shows how the driving chain 3 is actuated from the sprocket wheel 5. On the axle of the driving sprocket 6 is a $\frac{1}{2}$" pinion 7 driving a $1\frac{1}{2}$" gear wheel 8 on an axle 9. On the other end of this axle 9 is a $\frac{1}{2}$" pinion 10 engaging a $1\frac{1}{2}$" gear wheel 11 on the rod 12 of the sprocket wheel 5.

Fig. 606B shows how the wheel is built up from the centre face plates 13.



Model No. 607

Automatic Weighing Machine

Parts required :

9	of	No.	2	61	of	No.	37
4	„	„	3	1	„	„	43
4	„	„	4	1	„	„	48A
4	„	„	5	2	„	„	52
4	„	„	8	2	„	„	53
4	„	„	12	6	„	„	59
1	„	„	13	2	„	„	62
2	„	„	15A	3	„	„	63
4	„	„	16	6″	„	„	94
1	„	„	24	1	„	„	96
1	„	„	26	2	„	„	99
1	„	„	27A	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 3½″ 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 pass 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.

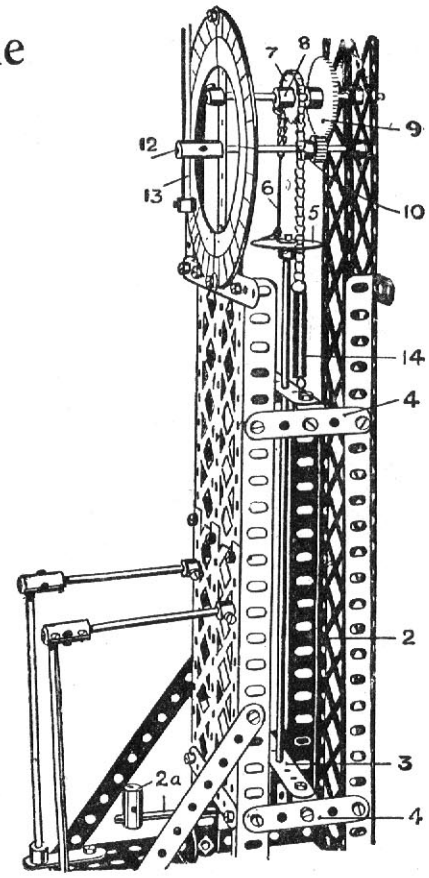


FIG. 607A

Model No. 608 Derricking Crane

The grab 1 is suspended by the cords 2 which pass over the pulleys 3 and round the outer pulleys of a set of four 4 at the head of the standard 5. The cords continue down and under the outer pulleys of a set of smaller pulleys 6 and are wound on a crank handle 7 at the centre of which they are connected by a spring clip. (Care should be taken to see that, when winding up, the double lapping of each cord on the rod occurs simultaneously, as otherwise the grab will cant over).

The grab is opened or closed by the cord 8 which, after passing over one of two inner pulleys at the end of the jib 9, then passes over another of the four pulleys 4 and one of the pulleys 6 to the crank handle 10.

The jib 9 is raised or lowered by the cord 11 which is secured to the standard 5, and having passed around the other of the two inner pulleys at the jib-end is passed back and around one of the four pulleys 4 and one of the pulleys 6 to the crank handle 12. The swinging of the jib is effected from the crank handle 13 on the end of a rod, on which is a ½" pinion 14 engaging a contrate wheel 15 at the foot of the standard 5.

Gear wheels 16 and 17 are bolted on the crank handles 10 and 7 and are connected by the pinion 18. The crank handle 7 is fixed against longitudinal movement, but the crank handle 10 may be slid clear of the pinion 18, and the handle 7 turning the grab is raised or lowered. If the handle 10 is slid to disengage its gear wheel from the pinion 18 and the handle turned, the grab is opened or closed.

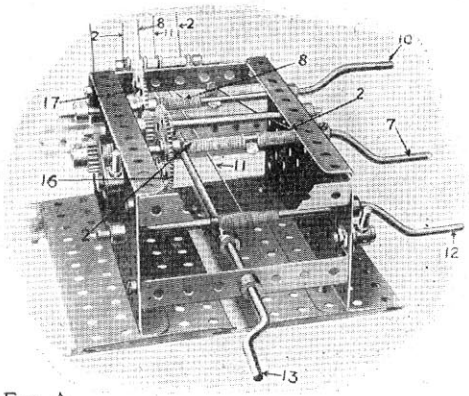
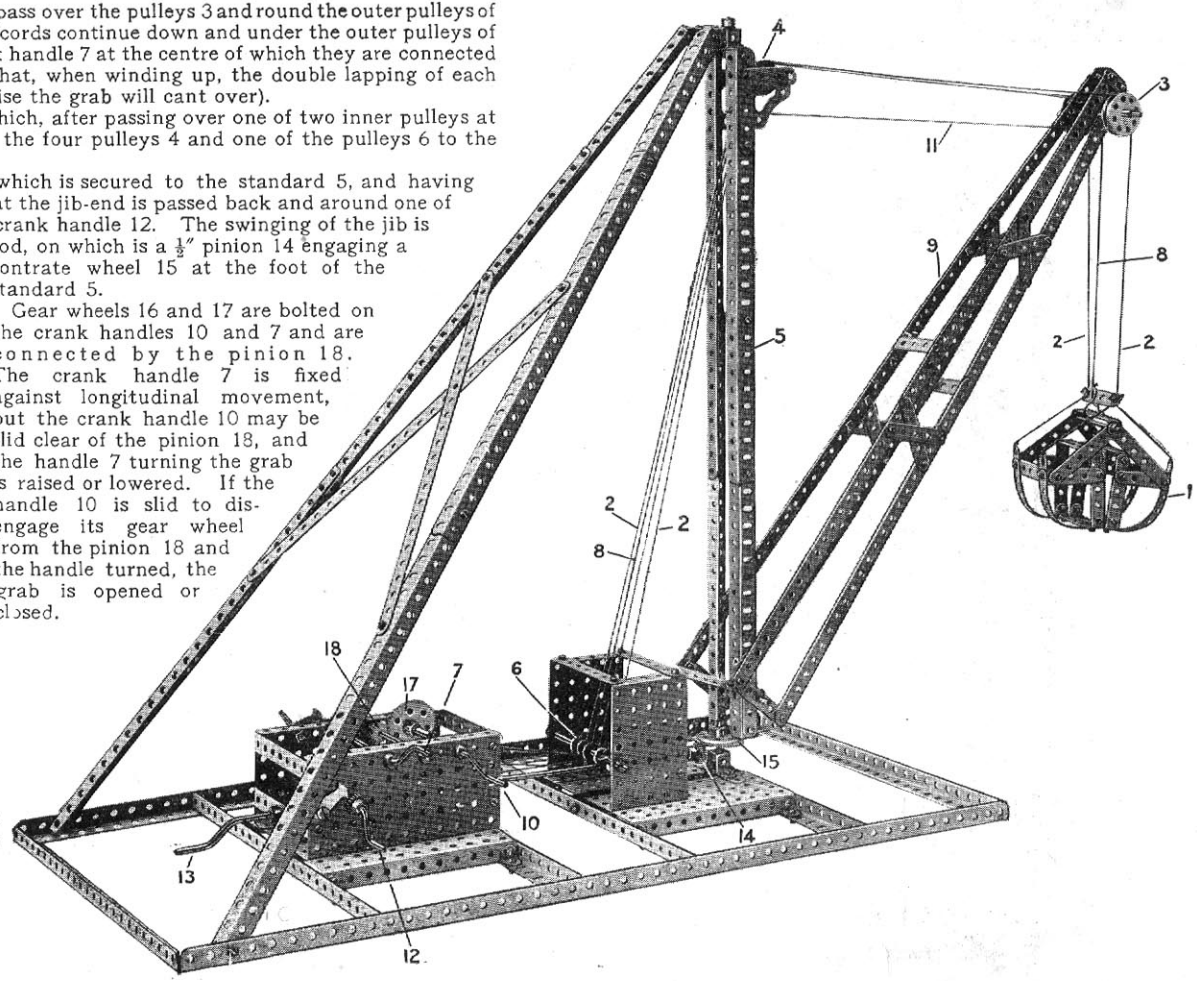


FIG. A

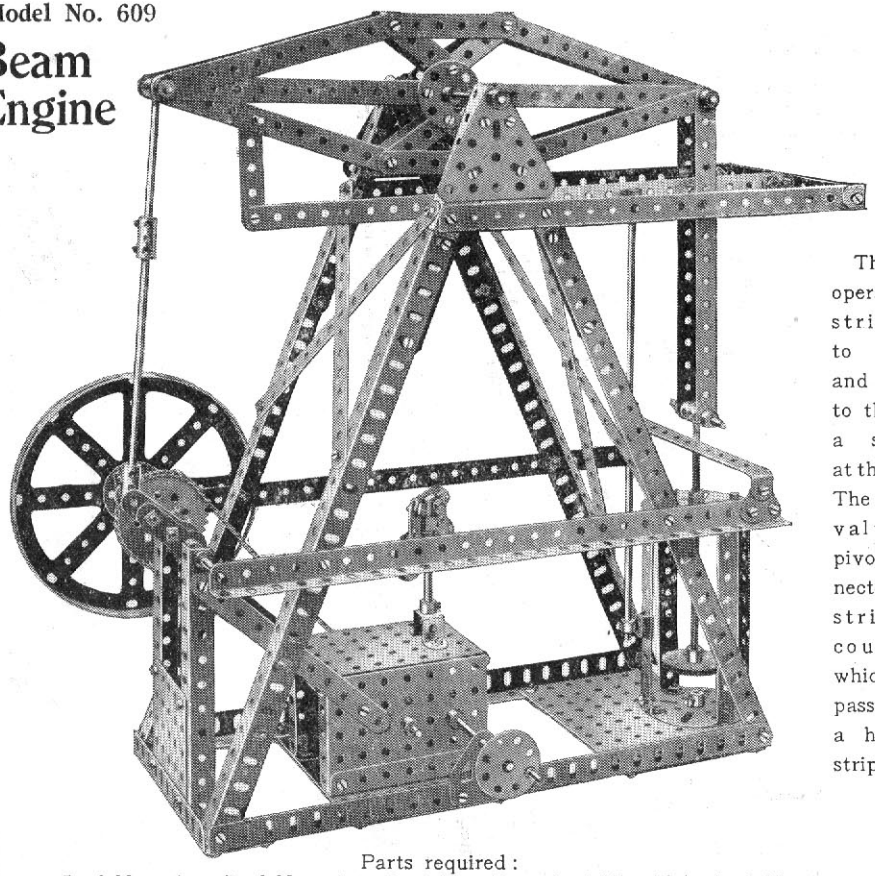


Parts required :

10	of	No.	1	3	of	No.	16	6	of	No.	35
6	„	„	3	2	„	„	17	161	„	„	37
4	„	„	4	1	„	„	18A	2	„	„	44
18	„	„	5	4	„	„	19	4	„	„	48
4	„	„	6	2	„	„	20	9	„	„	48A
2	„	„	7	2	„	„	22	5	„	„	48B
14	„	„	8	3	„	„	22A	6	„	„	52
2	„	„	9	4	„	„	23	2	„	„	53
6	„	„	10	2	„	„	24	1	„	„	57
6	„	„	11	4	„	„	26	16	„	„	59
10	„	„	12	2	„	„	27A	1	„	„	63
1	„	„	13	1	„	„	28	2	„	„	108
2	„	„	15A	2	„	„	33	2	„	„	115
				1	„	„	126				

Model No. 609

Beam Engine



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

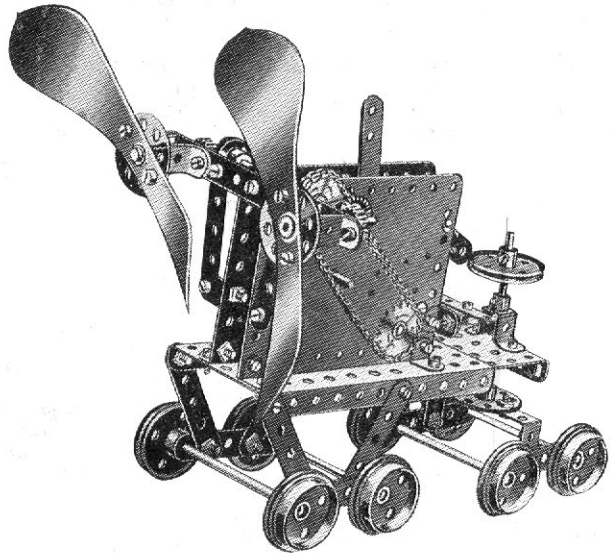
Parts required:

5	of No.	1	7	of No.	9	2	of No.	18A	1	of No.	45	1	of No.	72
4	„ „	1B	2	„ „	9B	1	„ „	18B	3	„ „	48C	2	„ „	76
10	„ „	2	4	„ „	11	1	„ „	21	2	„ „	48D	2	„ „	77
1	„ „	2A	3	„ „	12	2	„ „	22A	1	„ „	50	1	„ „	95
4	„ „	4	3	„ „	14	4	„ „	24	2	„ „	52A	1	„ „	96A
1	„ „	5	3	„ „	15	2	„ „	26	3	„ „	53	2	„ „	109
8	„ „	6	2	„ „	15A	1	„ „	27A	17	„ „	59	1	„ „	115
5	„ „	6A	2	„ „	16	1	„ „	29	2	„ „	62	1	„ „	118
8	„ „	8	1	„ „	16A	120	„ „	37	6	„ „	63	1	„ „	126A
2	„ „	8A	2	„ „	17	6	„ „	38	1	„ „	63B	2	„ „	133

Clockwork Motor (not included in Outfit).

Model No. 610

Velocipede



Parts required:

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

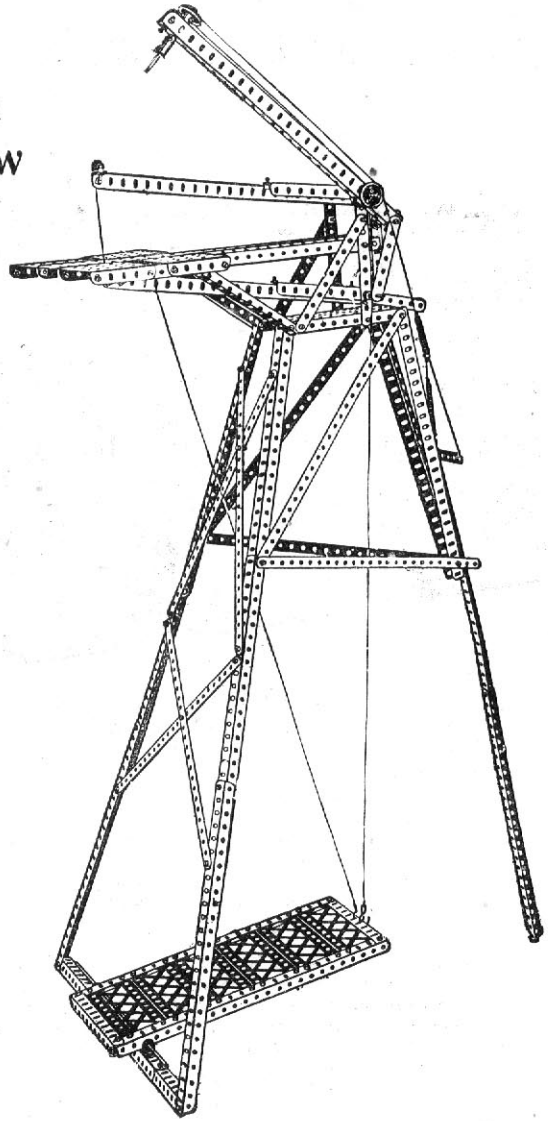
Clockwork Motor
(not included in Outfit).

Model No. 611

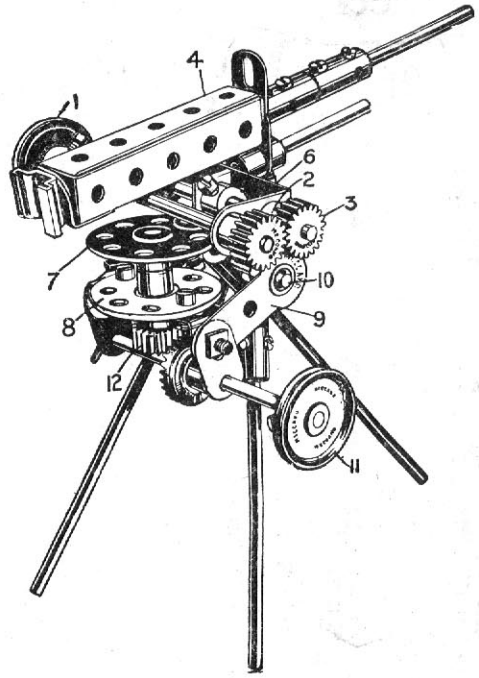
Fret Saw

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. 612 # Maxim Gun

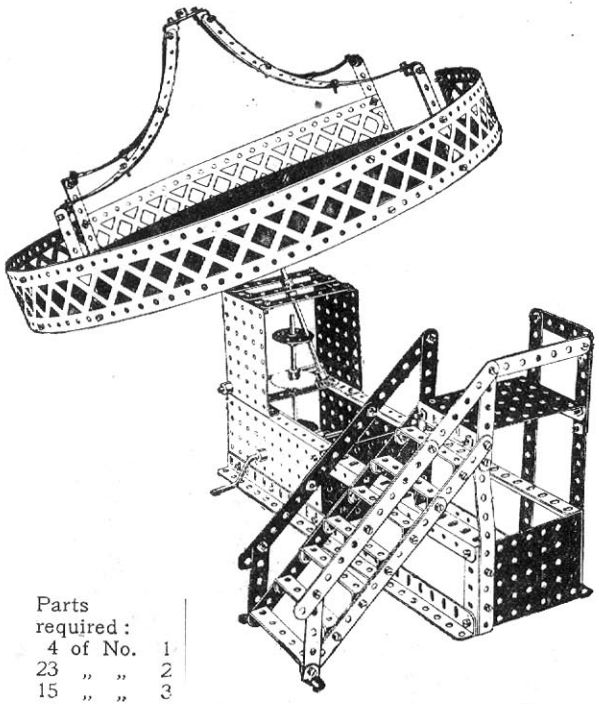


Parts required :

4	of	No.	10
1	„	„	11
5	„	„	12
2	„	„	15
2	„	„	15A
3	„	„	16
1	„	„	17
1	„	„	18A
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, the movement of the wheel 1 elevating the gun. The double angle 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.

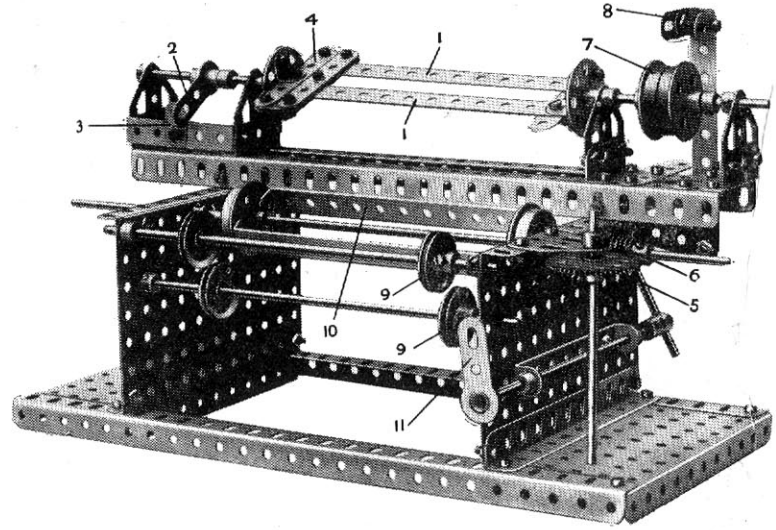
Model No. 613 Joy Wheel



Parts required:

4	of	No.	1	1	of	No.	15A	121	of	No.	37
23	„	„	2	1	„	„	19	7	„	„	48A
15	„	„	3	3	„	„	24	2	„	„	52
4	„	„	4	1	„	„	26	6	„	„	53
3	„	„	5	2	„	„	27	8	„	„	59
1	„	„	6	1	„	„	32	4	„	„	99
4	„	„	8								
10	„	„	12								
1	„	„	14								
1	„	„	15								

Model No. 614 Linen Winder



Parts required:

2	of	No.	2	1	of	No.	13	1	of	No.	27A
1	„	„	2A	2	„	„	13A	1	„	„	32
8	„	„	5	1	„	„	14	66	„	„	37
4	„	„	8	1	„	„	15A	2	„	„	37A
4	„	„	9	2	„	„	16	1	„	„	37B
4	„	„	9F	1	„	„	16A	6	„	„	38
6	„	„	10	4	„	„	20	1	„	„	44
1	„	„	11	4	„	„	22	1	„	„	48A
7	„	„	12	2	„	„	24	1	„	„	48B

2	of	No.	48D				
2	„	„	52				
2	„	„	52A				
16	„	„	59				
2	„	„	62				
2	„	„	63				
5	„	„	126A				

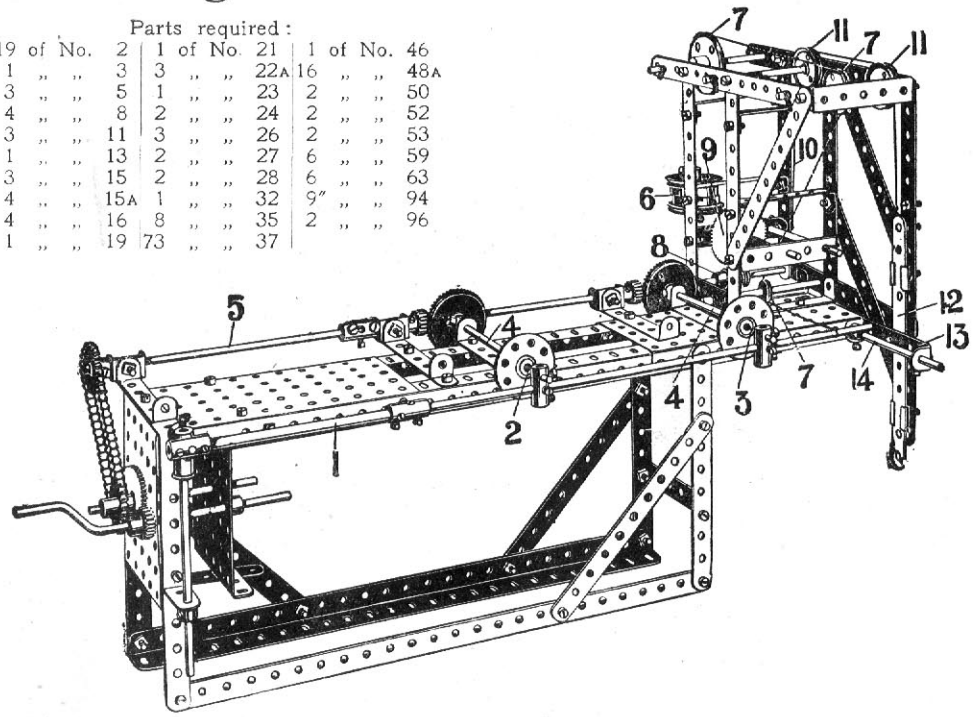
In order to disengage the winding frame bars 1 the crank 2 is lifted clear of the stop 3 and drawn back, this action disengaging the end cross strips 4 from the tips of the frame bars 1 and permitting the wound linen to be removed. The gear wheel 5 engaging the worm 6 forms a counter. 7 are the belt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

Model No. 615

Profiling Machine

Parts required :

19	of No.	2	1	of No.	21	1	of No.	46
1	„ „	3	3	„ „	22A	16	„ „	48A
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	6	„ „	63
4	„ „	15A	1	„ „	32	9″	„ „	94
4	„ „	16	8	„ „	35	2	„ „	96
1	„ „	19	73	„ „	37			



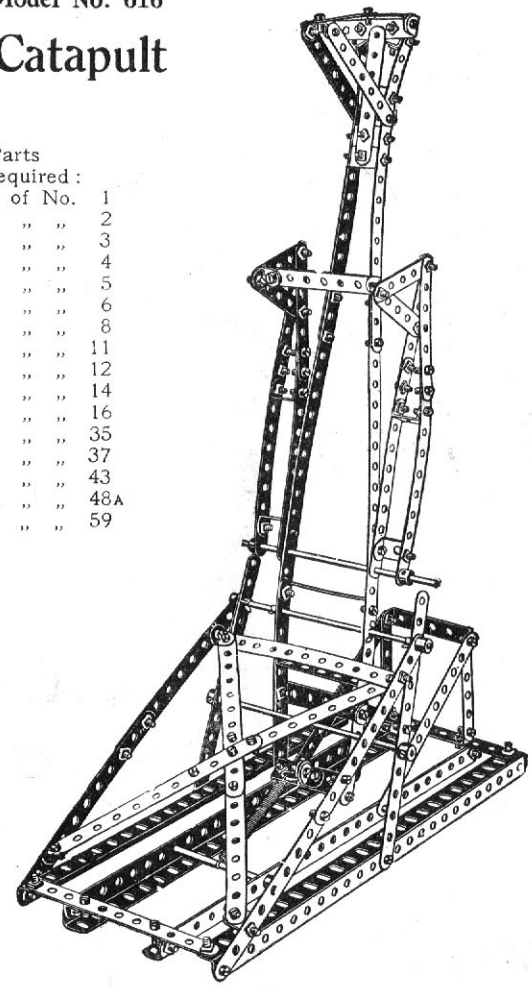
The side shaft 1 carries the follower tool 2 of the medal to be copied, and the cutting tool 3 for the work. The copy and work are rotated by the shafts 4 from the driving shaft 5, and resilient pressure is imparted to the cutting tool 3 by means of a weight 6, the cord of which passes over pulley 7 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 5½″ 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. 616

Catapult

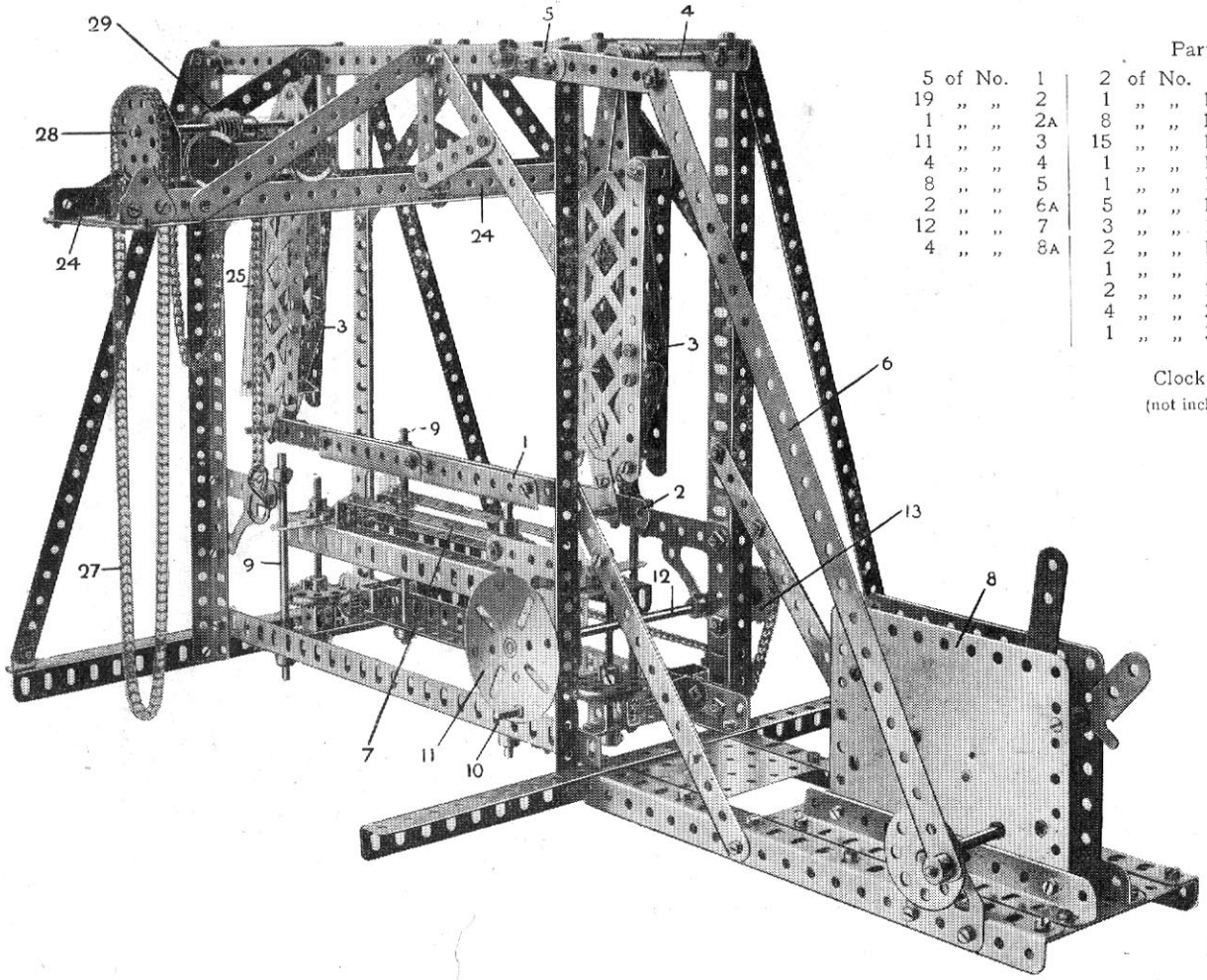
Parts required :

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	
4	„ „	48A	
8	„ „	59	



This Model can be made with MECCANO Outfit No. 6, or No. 5 and No. 5A.

Model No. 617 Stone-Sawing Machine



Parts required :

5	of	No.	1	2	of	No.	9	3	of	No.	26	2	of	No.	62A
19	„	„	2	1	„	„	10	2	„	„	28	2	„	„	77
1	„	„	2A	8	„	„	11	1	„	„	32	2	„	„	80A
11	„	„	3	15	„	„	12	12	„	„	35	40″	„	„	94
4	„	„	4	1	„	„	14	185	„	„	37	1	„	„	95A
8	„	„	5	1	„	„	15	32	„	„	38	1	„	„	96A
2	„	„	6A	5	„	„	15A	6	„	„	45	4	„	„	100
12	„	„	7	3	„	„	16	1	„	„	47	4	„	„	108
4	„	„	8A	2	„	„	16A	5	„	„	48A	1	„	„	109
				1	„	„	17	3	„	„	53	2	„	„	110
				2	„	„	18A	2	„	„	57	2	„	„	115
				4	„	„	22	15	„	„	59	4	„	„	125
				1	„	„	24	2	„	„	62	3	„	„	126A

Clockwork Motor
(not included in Outfit)

The sawing strip 1 consists of two rack strips bolted to a 12½″ strip 2 connected by 1″ rods to the ends of the swinging frames 3, one loosely pivoted on one of the rods carried in the frame and the other secured by a crank to the rod 4. The swinging frames 3 are oscillated from the crank 5 and connecting rod 6 driven by the clockwork motor 8.

Model No. 617 Stone-Sawing Machine *(continued)*

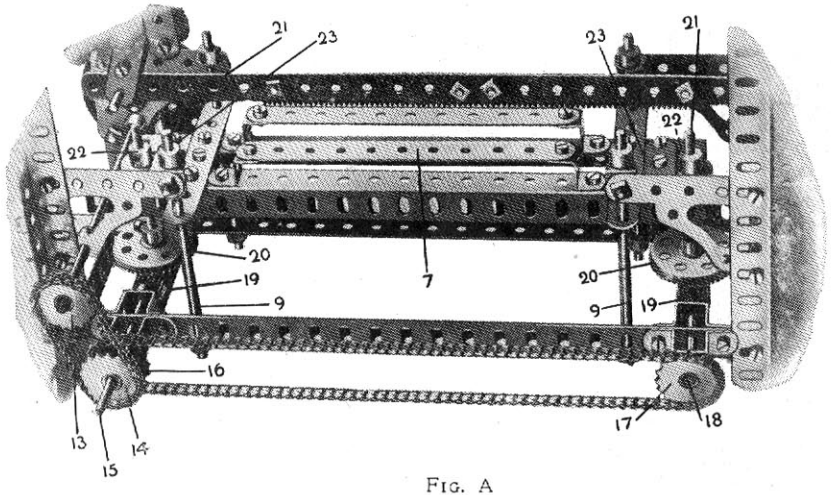


FIG. A

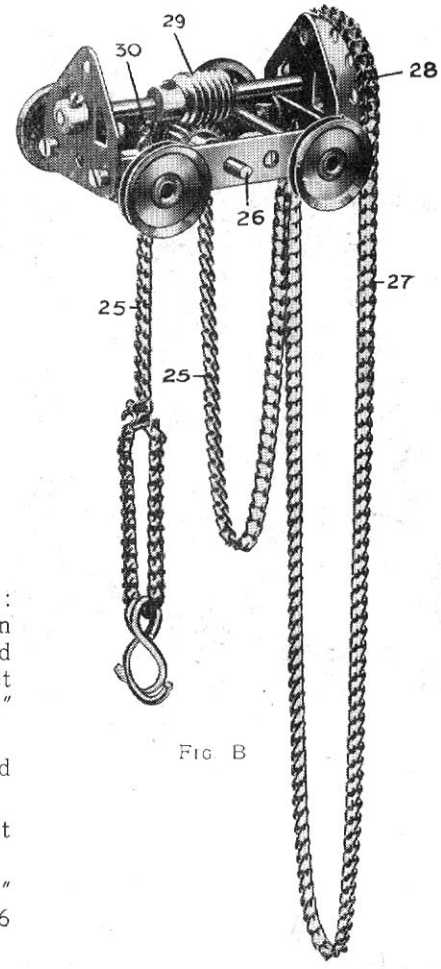


FIG B

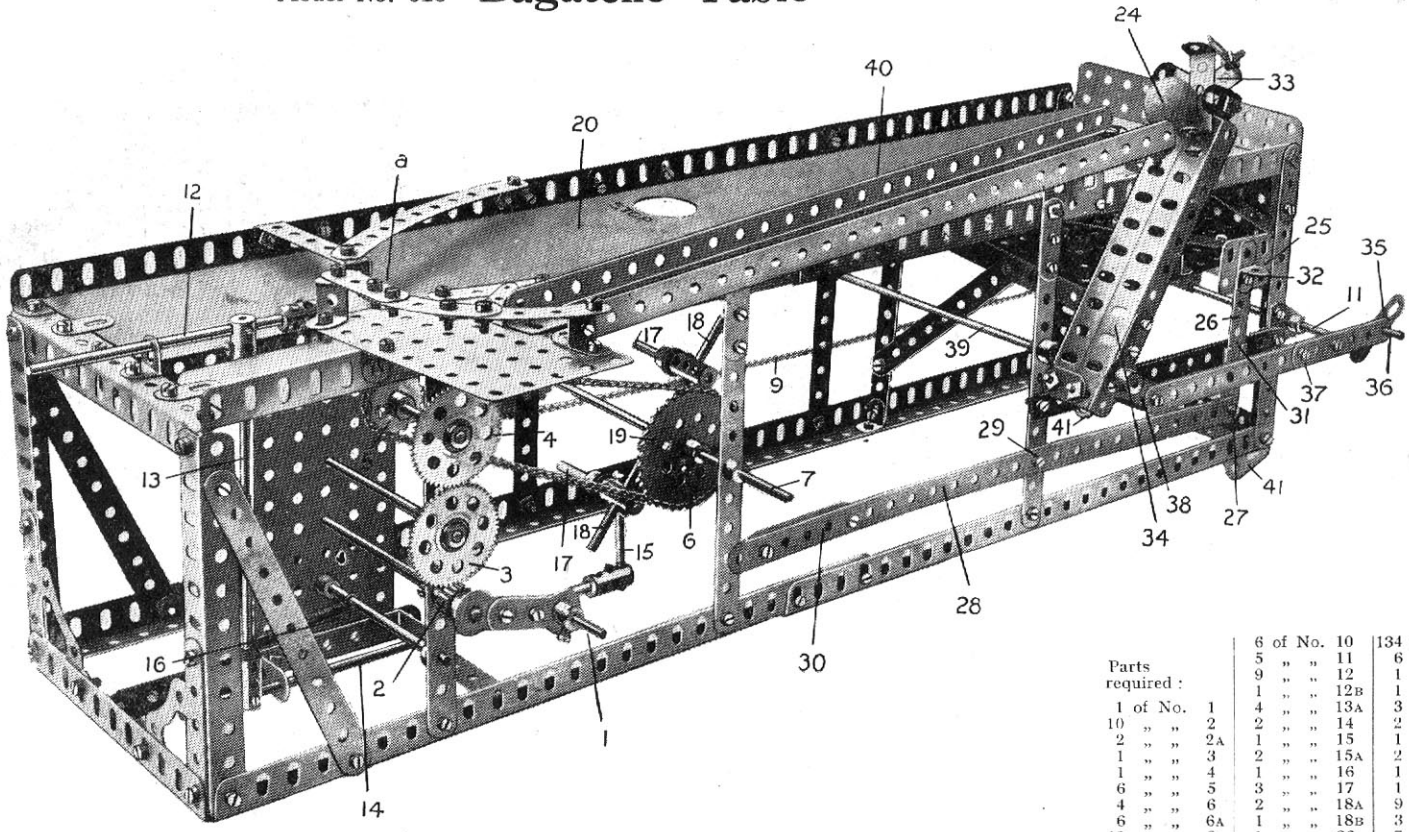
The support frame 7 (Fig. A) for the stone to be sawn is raised and lowered as follows: The frame 7 is guided on the vertical rods 9 and raised and lowered by the operation of the threaded pin 10 forming a handle on the face plate 11. This face plate is mounted on a rod 12 carrying a 1" sprocket wheel 13 connected by a chain to another 1" sprocket wheel 14 on a rod 15. A third 1" sprocket 16 on the same rod is coupled to another 1" sprocket wheel 17 at the other end of the machine.

The rods 15 and 18 carry $\frac{1}{2}$" pinions 19 driving contrate wheels 20 secured on screwed rods 21 and engaging threaded cranks 22 secured to the frame 7 by $1\frac{1}{2}$" strips 23.

The trolley (Fig. B) runs on gantry rails 24 and the load chain 25 passes over a $\frac{3}{4}$" sprocket wheel on the rod 26, to be secured at one end to the trolley frame.

The chain 25 is raised or lowered by the operation of a sprocket chain 27 passing over a $1\frac{1}{2}$" sprocket wheel 28, the rod of which carries a worm 29. This engages a $\frac{1}{2}$" pinion on the rod 26 carrying a sprocket wheel 30 over which the load chain 25 passes.

Model No. 618 Bagatelle Table



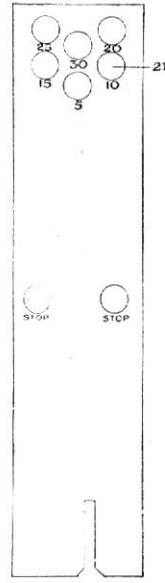


FIG. A

Parts required :

1	of No.	1	6	of No.	10	134	of No.	37	3	of No.	77
10	" "	2	5	" "	11	6	" "	38	4	" "	89
2	" "	2A	9	" "	12	1	" "	43	2	" "	90
1	" "	3	1	" "	12B	1	" "	46	3	" "	95
1	" "	4	4	" "	13A	3	" "	48	1	" "	96
6	" "	5	2	" "	14	2	" "	48A	1	" "	103H
4	" "	6	1	" "	15	1	" "	50	2	" "	108
6	" "	6A	2	" "	15A	2	" "	52	1	" "	111A
10	" "	8	1	" "	16	1	" "	52A	1	" "	115
11	" "	9	3	" "	17	1	" "	53A	1	" "	125
			2	" "	18A	9	" "	59	3	" "	126A
			1	" "	18B	3	" "	62	1	" "	128
			1	" "	26	7	" "	63			
			2	" "	27A	1	" "	70			

Model No. 618 Bagatelle Table *(continued)*

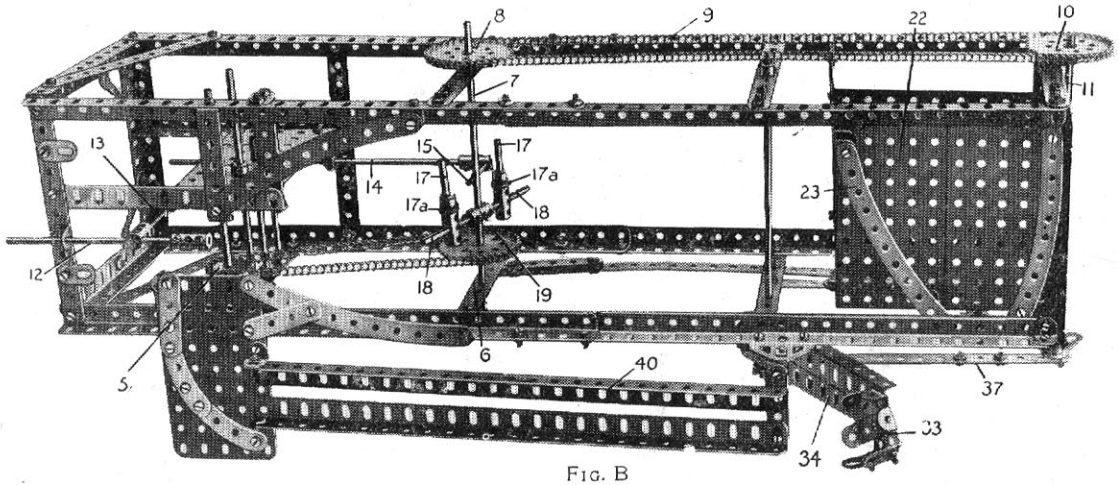


FIG. B

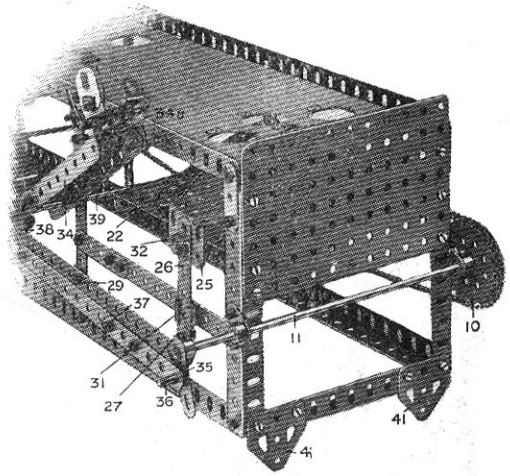


FIG. C

The operating handle 1 drives a ½″ pinion 2 engaging a 1½″ gear wheel 3. This engages another 1½″ gear wheel 4 on the axle rod of which is a 1″ sprocket wheel 5 coupled by a chain to a 2″ sprocket wheel 6 on the axle rod 7. On the further end of this rod 7 is another 2″ gear wheel 8 connected by a chain 9 to a 2″ gear wheel 10 on a rear axle rod 11.

The pusher-rod 12 (by means of which the marble is driven from the point a), is carried from a 5½″ vertical rod 13 which is connected to an 8″ rod 14. At the front end of the latter is a 2″ rod 15 arranged vertically and a spring 16 tends to pull the pusher-rod forward to strike the marble. The pusher-rod is depressed against the spring by the action of two 1″ rods 17 upon which are mounted ½″ pulley wheels 17a carried from two couplings secured on two 2″ rods 18 which enter the central coupling 19. The axle rod 7 passes completely through the coupling 19.

As the rods 17 rotate, the pulleys 17a bear against the rod 15 and depress the pusher-rod rearwardly until released, when the spring pulls the pusher-rod sharply forward to drive the marble from the point a along the table 20 towards the holes 21 (Fig. A). When the marble falls into any one of the holes 21 it drops on to the Plate 22 (Figs. B and C) formed of two 5½″ flanged plates bolted together. The plate 22 is inclined one hole down, and guides consisting of 5½″ curved strips 23 (Fig. B) connected to the plate by double angle brackets, lead the marble 24 (Fig. 618) to the end of the plate, where it is retained by a 1½″ flat girder 25 (Fig. C) carried on a 3½″ strip 26 pivotally connected at 27 (Fig. 618) by locked nuts to a 12½″ strip pivoted at 29 and weighted at 30 with 2½″ strips.

The strip 26 (Fig. C) is guided in an eye piece 31 and an angle bracket 32 is bolted near the top of the strip. The pocket 33 consists of three 1½″ × ½″ double angle strips at the end of an arm 34 formed by two 5½″ angle girders. The pocket is carried from the arm 34 by a 1″ triangular plate 34a the two base holes of which are bolted in the end holes of the angle girders. The pocket is bolted to the apex hole of the triangular plate, with three washers beneath the pocket to set it up.

The arm 34 is rocked from the rod 11 (Fig. 618) by a crank 35, a threaded pin 36 on which engages the end hole of a 5½″ and a 3″ strip 37 overlapped three holes. The other end of the strip is connected to a boss bell crank 38 bolted to the arm 34 and secured to the rod 39.

As the axle rod 11 rotates, the arm 34 is permitted to fall, and in so doing makes contact with the angle bracket 32 and depresses the stop plate 25, permitting the marble to drop from the plate 22 into the pocket 33. Further rotary movement of the rod 11 again raises the arm 34 with the marble in the pocket, until the marble is deposited into the chute 40 and is returned to the point a.

Meanwhile, on the rising of the arm 34 the plate 25 is again raised to close the outlet from the inclined plate 22. The bearings for the axle rod 11 are formed by two 1″ triangular plates secured to the rear vertical angle girders.

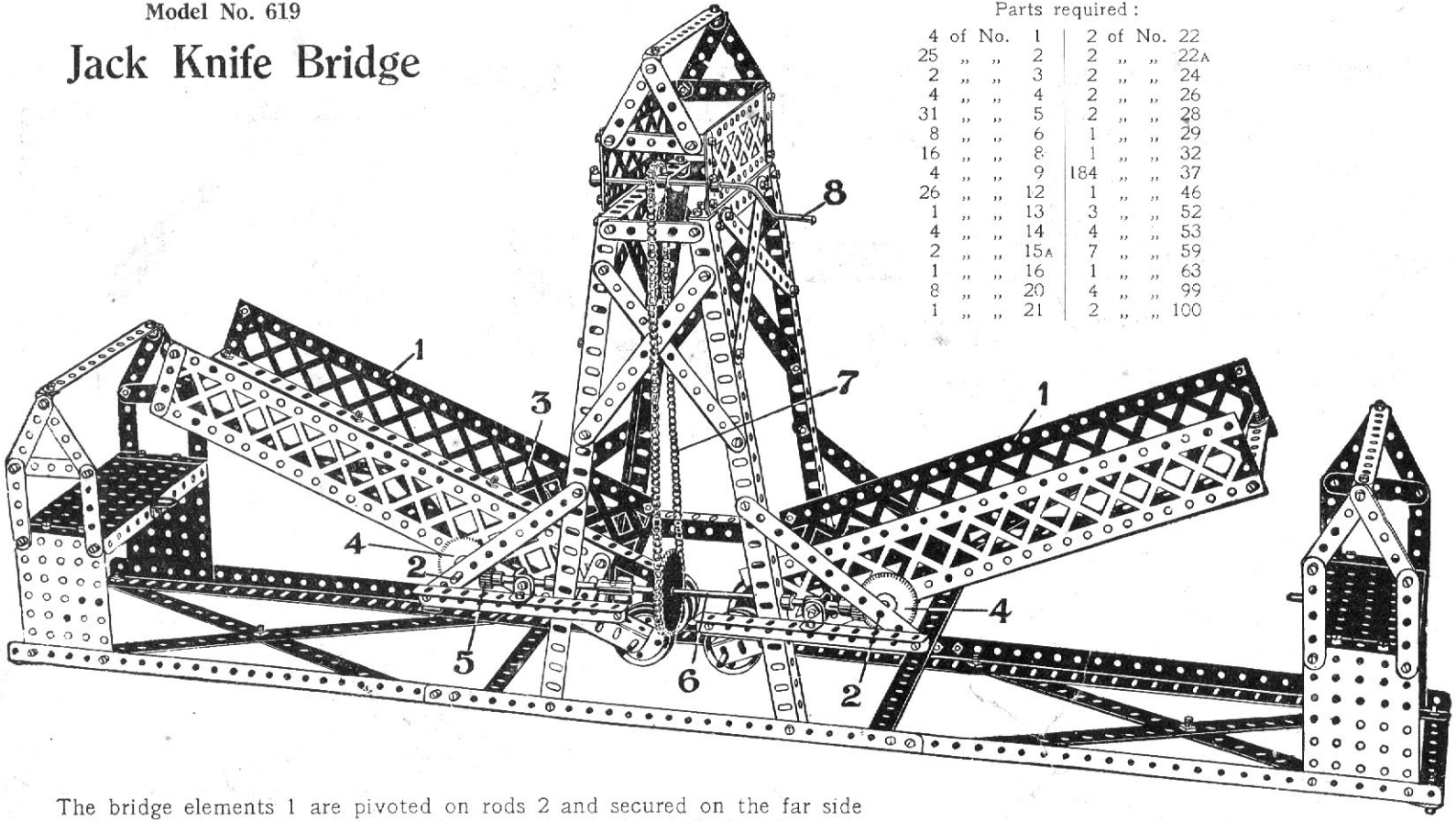
Figure A shows the shape and size of the cardboard table. The holes 21 should be made only slightly larger than the marble used. (The marble is not supplied in Meccano Outfits, but may be purchased separately). The table is given a slight incline towards the pusher-rod end by forming at the other end two feet with two flat trunnions 41 bolted to the lower 5½″ angle girders.

Model No. 619

Jack Knife Bridge

Parts required :

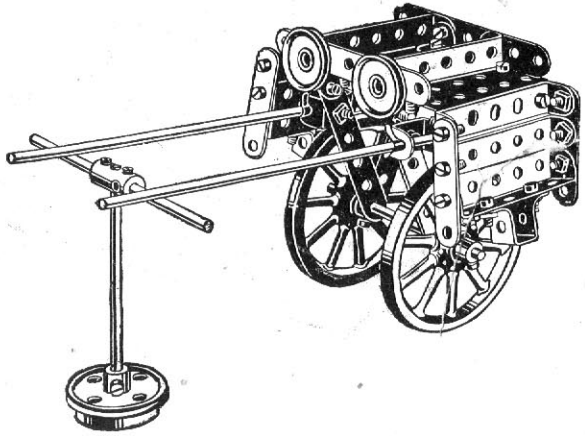
4	of	No.	1	2	of	No.	22
25	„	„	2	2	„	„	22A
2	„	„	3	2	„	„	24
4	„	„	4	2	„	„	26
31	„	„	5	2	„	„	28
8	„	„	6	1	„	„	29
16	„	„	8	1	„	„	32
4	„	„	9	184	„	„	37
26	„	„	12	1	„	„	46
1	„	„	13	3	„	„	52
4	„	„	14	4	„	„	53
2	„	„	15A	7	„	„	59
1	„	„	16	1	„	„	63
8	„	„	20	4	„	„	99
1	„	„	21	2	„	„	100



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.

Model No. 620

Jaunting Car

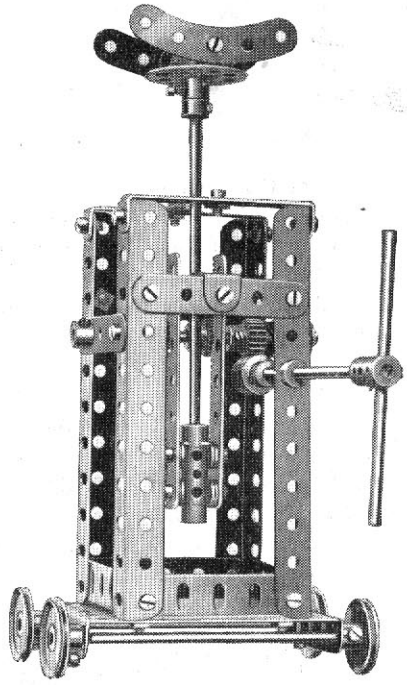


Parts required :

2	of	No.	3	1	of	No.	16	40	of	No.	37
4	„	„	4	2	„	„	17	2	„	„	45
4	„	„	6	2	„	„	19A	8	„	„	48A
14	„	„	12	1	„	„	20	1	„	„	53
2	„	„	13A	2	„	„	22	4	„	„	59
1	„	„	15	4	„	„	35	1	„	„	63

Model No. 621

Jack

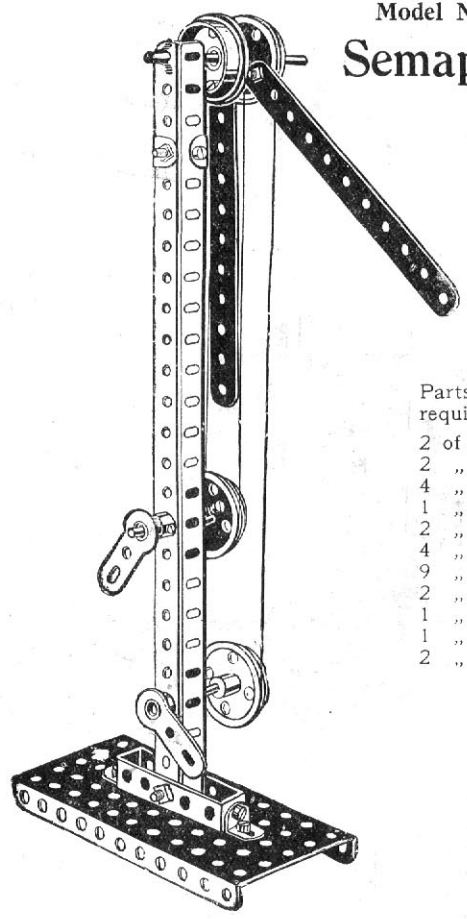


Parts required :

5	of	No.	5	4	of	No.	9	3	of	No.	26
4	„	„	9	1	„	„	32	32	„	„	37
4	„	„	9D	2	„	„	12	8	„	„	38
2	„	„	14	3	„	„	48A	2	„	„	15A
1	„	„	16	7	„	„	53	1	„	„	16B
4	„	„	22	2	„	„	63	1	„	„	24
2	„	„	90	2	„	„	110				

Model No. 622

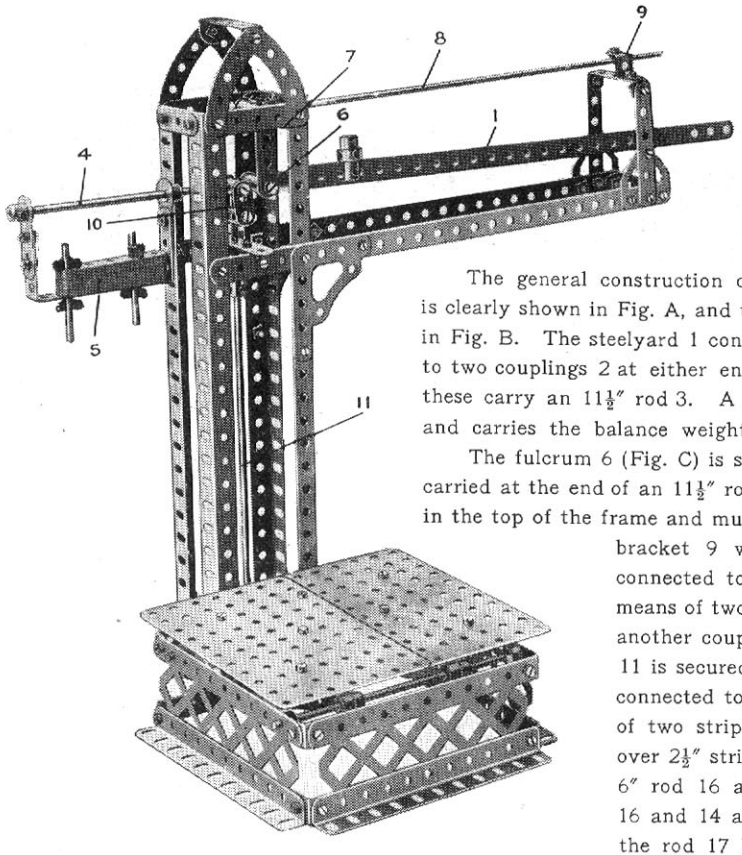
Semaphore



Parts required :

2	of	No.	2
2	„	„	8
4	„	„	12
1	„	„	16
2	„	„	17
4	„	„	20
9	„	„	37
2	„	„	48A
1	„	„	52
1	„	„	59
2	„	„	62

Model No. 623 Platform Scales



The general construction of the framework of the scales is clearly shown in Fig. A, and the construction of the platform in Fig. B. The steelyard 1 consisting of a 12½" strip, is bolted to two couplings 2 at either end of the strip at the rear and these carry an 11½" rod 3. A 6" rod 4 also enters the coupling and carries the balance weights 5 made of 2½" strips.

The fulcrum 6 (Fig. C) is suspended from two 2" strips 7 carried at the end of an 11½" rod 8 which passes through a hole in the top of the frame and must be engaged beneath the angle bracket 9 when weighing. The rod 4 is connected to couplings, and from these, by means of two ½" flat brackets 10 is supported another coupling into which the vertical rod 11 is secured. The lower end of this rod is connected to a 4½" rod 12 in the outer ends of two strips 13 connected to a 6" rod 14 over 2½" strips 15 and connected to another 6" rod 16 and to a 5" rod 17. The rods 16 and 14 are journalled in the framework, the rod 17 bearing on the strips 13.

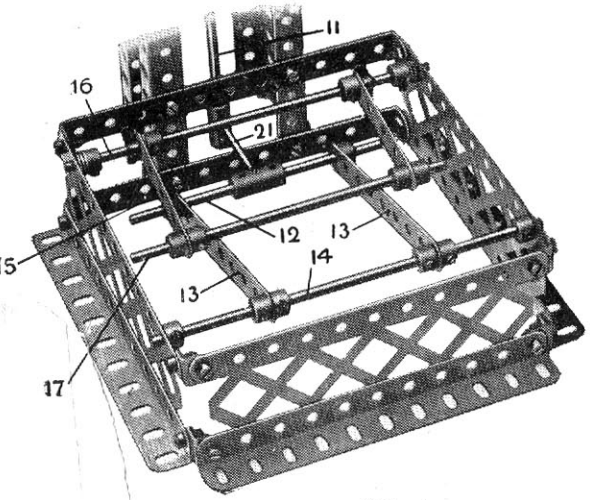


FIG. A

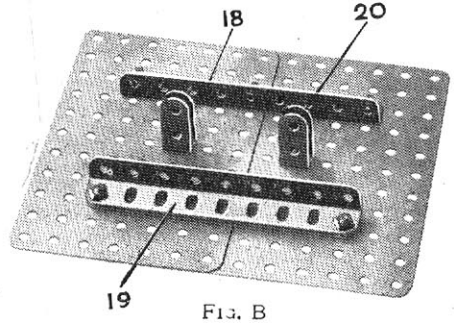


FIG. B

Parts required:

3 of No. 1	3 of No. 9	1 of No. 15	1 of No. 47A	2 of No. 70
2 „ „ 2A	2 „ „ 9A	1 „ „ 15A	3 „ „ 48	4 „ „ 90
2 „ „ 4	2 „ „ 10	3 „ „ 17	2 „ „ 48D	3 „ „ 100
21 „ „ 5	6 „ „ 12	1 „ „ 18A	18 „ „ 59	2 „ „ 102
2 „ „ 6	2 „ „ 13	6 „ „ 35	2 „ „ 62	2 „ „ 108
4 „ „ 6A	1 „ „ 13A	74 „ „ 37	9 „ „ 63	1 „ „ 125
4 „ „ 8	3 „ „ 14	10 „ „ 38	2 „ „ 63B	2 „ „ 126A

Model No. 623 Platform Scales
(continued)

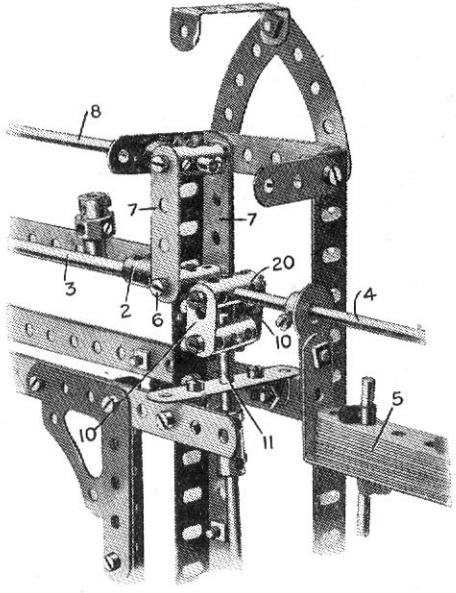
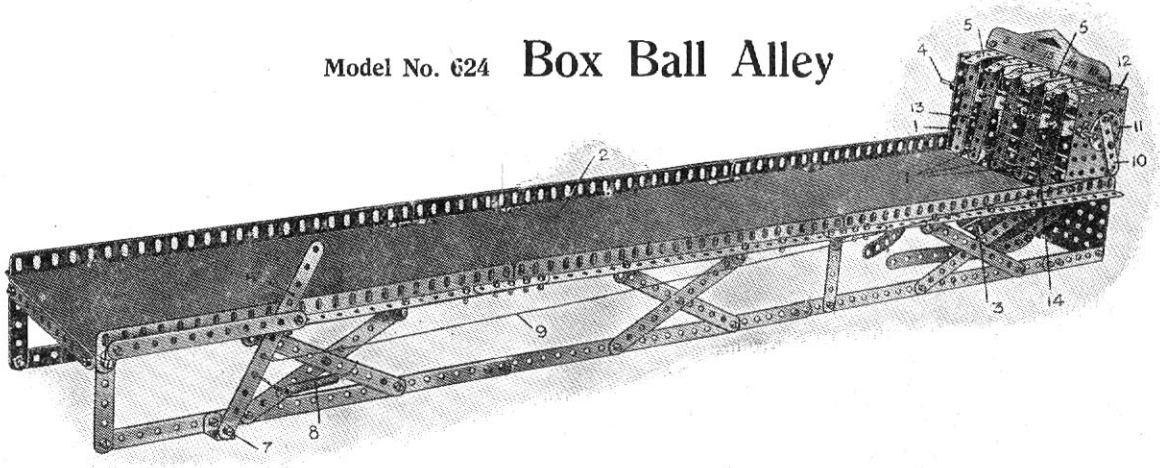


FIG. C

The platform is composed of two plates, $5\frac{1}{2}'' \times 3\frac{1}{2}''$, overlapped one hole and secured together by $4\frac{1}{2}''$ angle girders 18 and 19 (Fig. B). The angle girder 19 is provided with two washers underneath to ensure that this lower girder shall make contact properly with the strips. Two single bent strips 20 are bolted to the plates and form guide lines to the centre rod 17. The platform is suspended in order to weigh when the rod 8 is passed beneath the angle bracket 19.

Model No. 624 Box Ball Alley



Parts required:

6	of No.	1	6	of No.	8	2	of No.	16	2	of No.	52
19	„ „	2	5	„ „	11	1	„ „	24	2	„ „	53
5	„ „	3	27	„ „	12	8	„ „	35	2	„ „	54
2	„ „	4	1	„ „	14	32	„ „	37	2	„ „	59
15	„ „	5	1	„ „	15	1	„ „	43	2	„ „	62

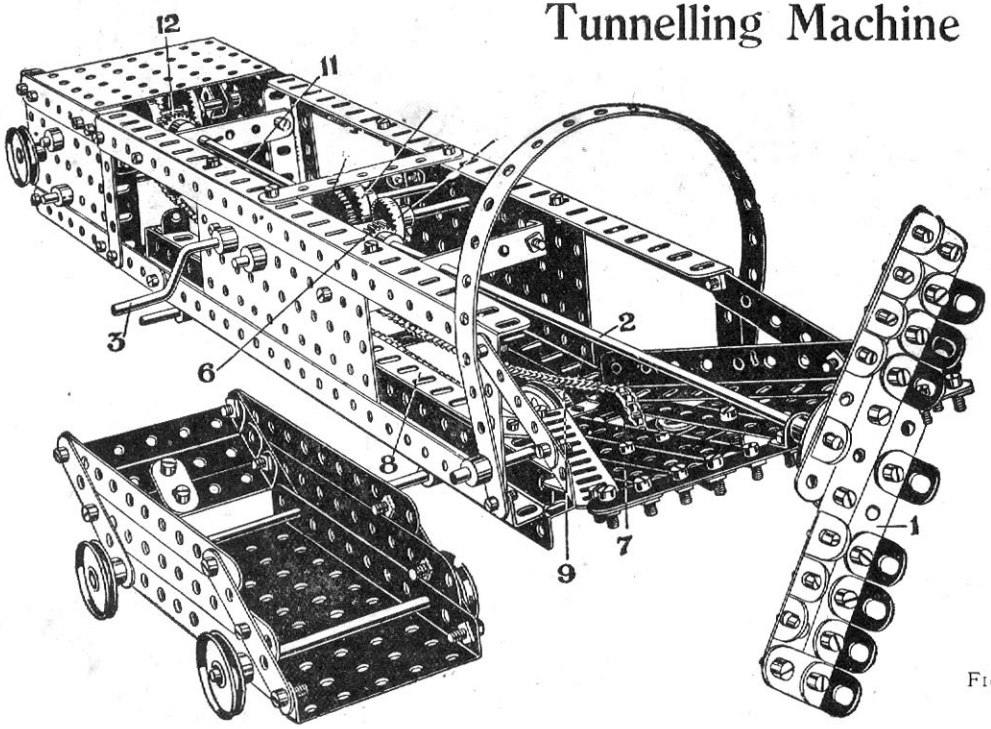
1 of No. 63

This model of a Box Ball Alley gives endless amusement, apart from the actual construction.

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.

Model No. 625

Tunnelling Machine



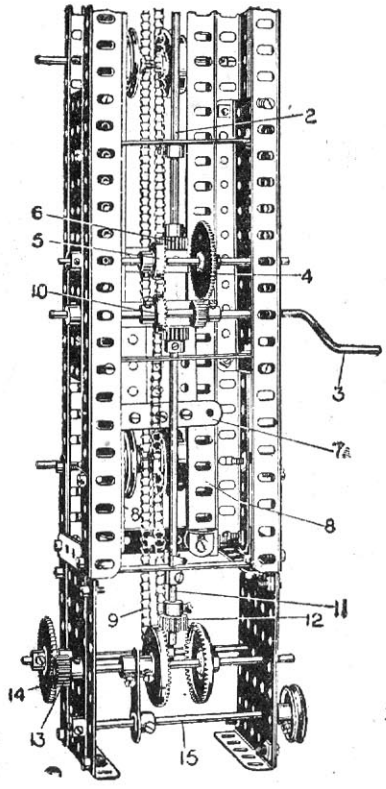


FIG. 625A

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
3	„	„	48A
1	„	„	52
3	„	„	53
12	„	„	59
1	„	„	62
2′ 6″	„	„	94
2	„	„	96

The main boring head 1 is driven by the shaft 2 from the crank 3, on the spindle of which a 19 tooth pinion engages a 57 tooth gear wheel 4 which is fixed on the same spindle as the 25 tooth 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 small contrate wheel 10 engaging a 19 tooth 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 19 tooth pinion 13 which engages a 57 tooth gear wheel 14 on the spindle of the rear sprocket wheel carrying the chain. The reversing mechanism is operated by sliding the rod 15.

This Model can be made with MECCANO Outfit No. 6, or No. 5 and No. 5A.

Model No. 626 Crane

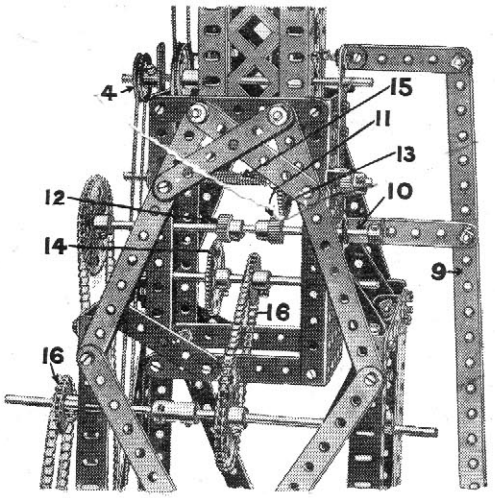


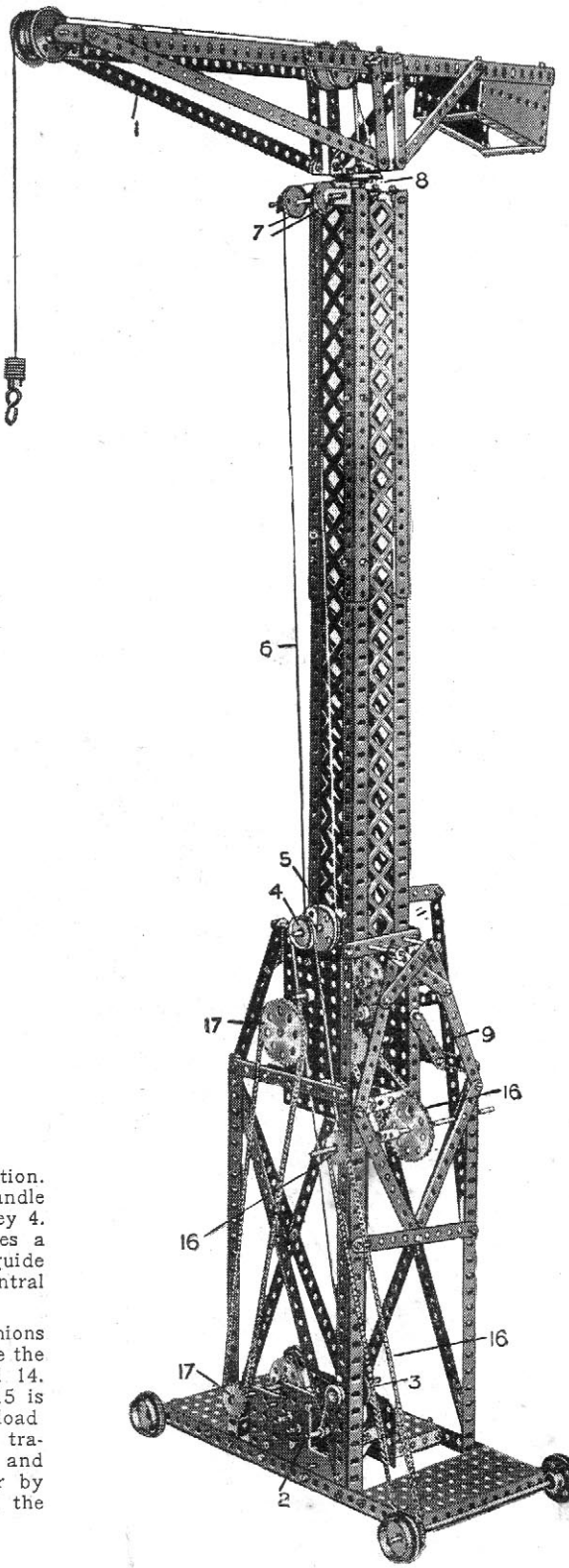
FIG. 626A

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	1	„	„	45
9	„	„	12	1	„	„	46
2	„	„	13A	2	„	„	48A
4	„	„	14	5	„	„	52
2	„	„	15	2	„	„	54
2	„	„	15A	1	„	„	57
3	„	„	16	14	„	„	59
2	„	„	17	1	„	„	62
1	„	„	18A	1	„	„	63
8	„	„	20	6″	„	„	94
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.



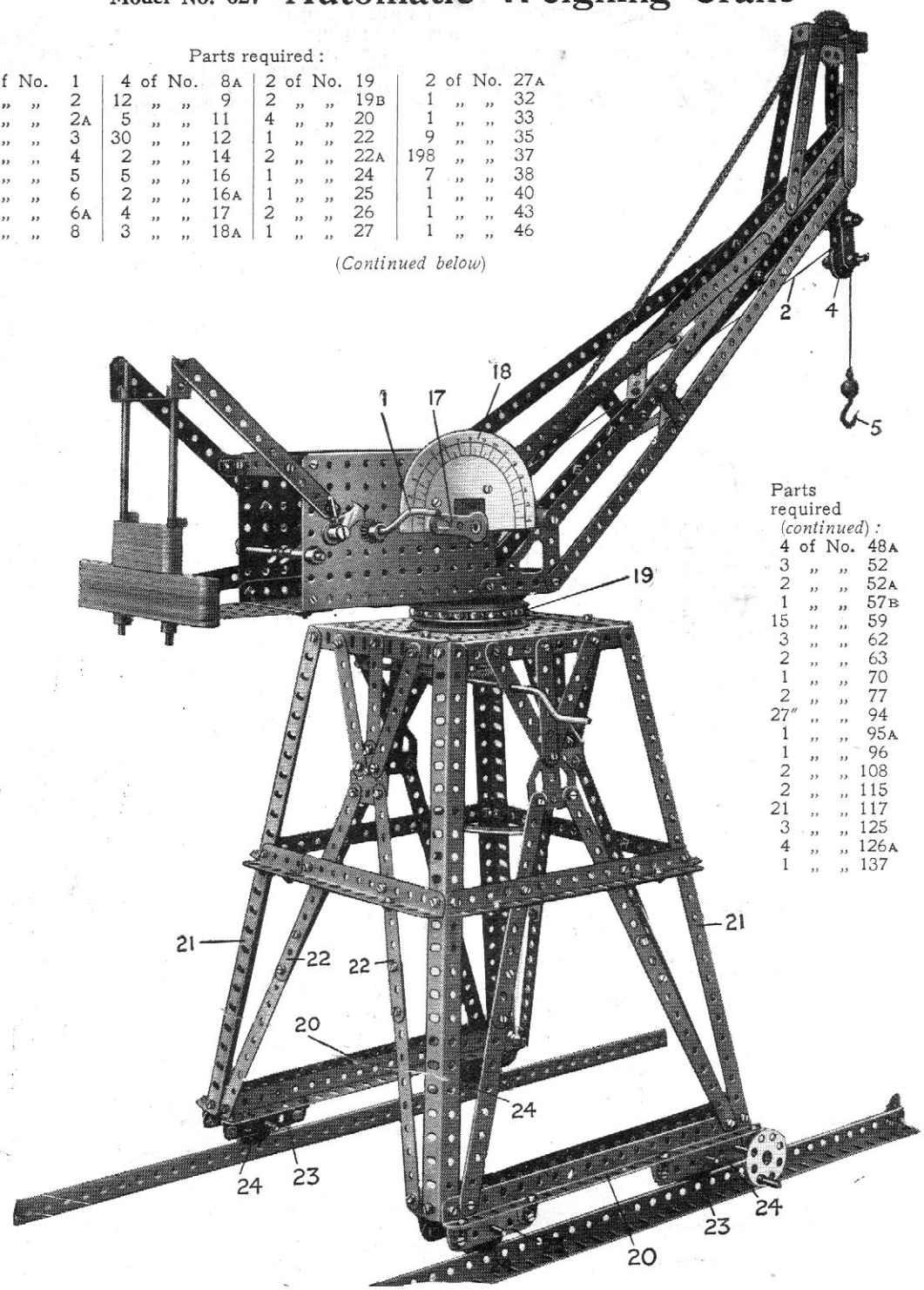
Model No. 627 Automatic Weighing Crane

Parts required :

8	of	No.	1	4	of	No.	8A	2	of	No.	19
50	„	„	2	12	„	„	9	2	„	„	19B
2	„	„	2A	5	„	„	11	4	„	„	20
10	„	„	3	30	„	„	12	1	„	„	22
12	„	„	4	2	„	„	14	2	„	„	22A
36	„	„	5	5	„	„	16	1	„	„	24
2	„	„	6	2	„	„	16A	1	„	„	25
2	„	„	6A	4	„	„	17	2	„	„	26
8	„	„	8	3	„	„	18A	1	„	„	27

2	of	No.	27A
1	„	„	32
1	„	„	33
9	„	„	35
198	„	„	37
7	„	„	38
1	„	„	40
1	„	„	43
1	„	„	46

(Continued below)



Parts required *(continued)* :

4	of	No.	48A
3	„	„	52
2	„	„	52A
1	„	„	57B
15	„	„	59
3	„	„	62
2	„	„	63
1	„	„	70
2	„	„	77
27″	„	„	94
1	„	„	95A
1	„	„	96
2	„	„	108
2	„	„	115
21	„	„	117
3	„	„	125
4	„	„	126A
1	„	„	137

Model No. 627 Automatic Weighing Crane *(continued)*

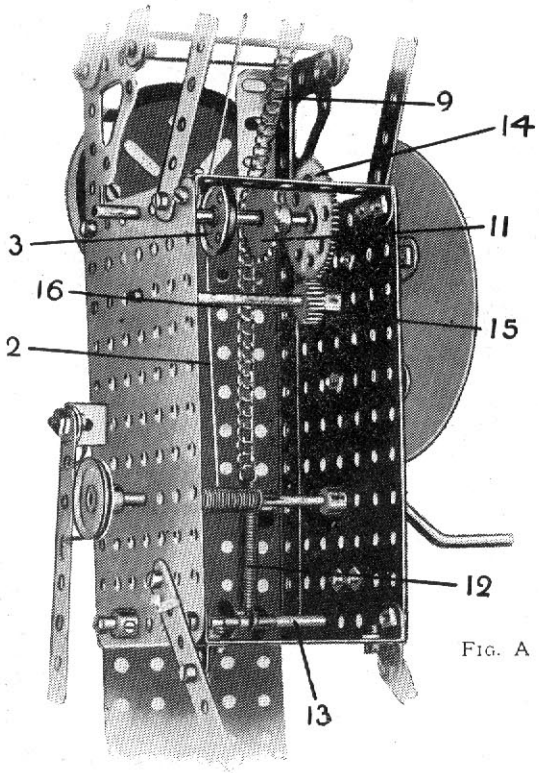


FIG. A

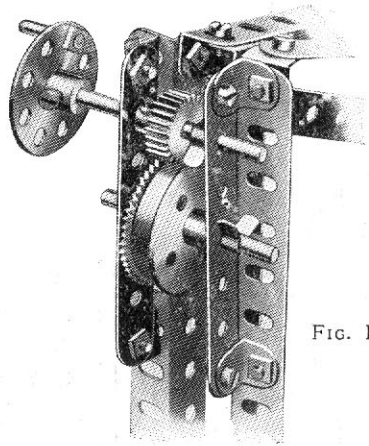


FIG. B

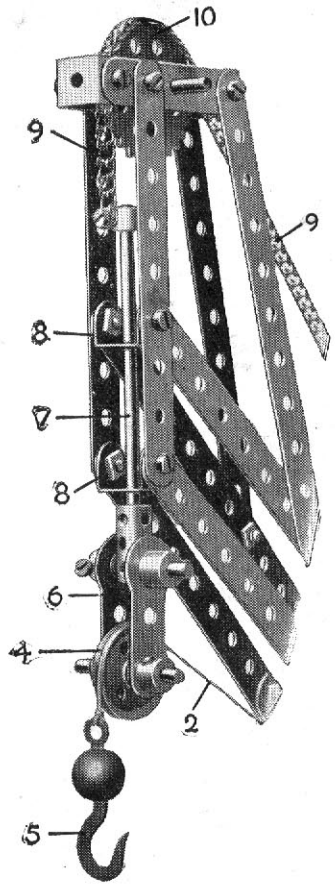


FIG. C

This is a model of a crane that, when raising a load, automatically indicates the weight carried. The load is raised or lowered by the operation of the crank handle 1 upon which is wound a lifting cord 2 passing round a 1" pulley 3 and over another 1" pulley 4 (Fig. C) to the loaded hook 5. The 1" pulley 4, which bears the weight of the load, is carried by two cranks 6 connected to a 3½" rod 7, slidable in two double brackets 8.

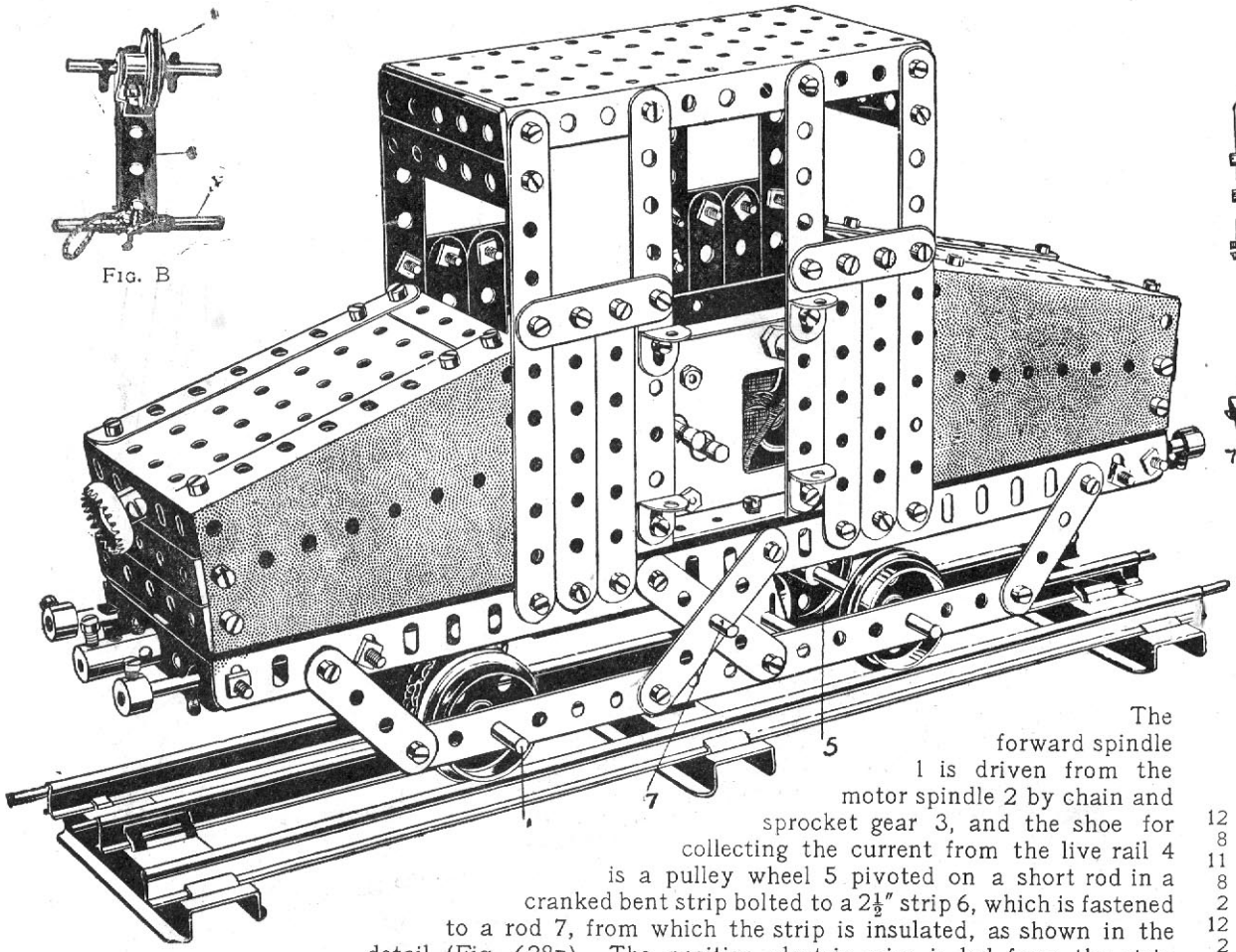
To the top of the rod is connected a sprocket chain 9 which passes over a 1½" sprocket wheel 10 and under a 1" sprocket wheel 11 (Fig. A), the other end of the chain being connected to a spring 12, secured to a 3½" rod 13. Thus, when a load is being raised the weight is carried by the rod 7 which pulls down in its bearings, the rod 13 pulling against the spring 12. In this movement, the chain 9 rotates the sprocket wheel 11 and a 1½" gear wheel 14 on the rod of the sprocket 11 engages a ½" pinion 15 on a rod 16. On the outer end of this rod 16 is a crank 17 that sweeps around the graduated dial 18 to indicate the weight of the load that is being lifted.

The construction of the remainder of the model will be clearly seen from the illustration. The bearings 23 carrying the flanged wheels 24 are formed of 2½" strips connected to the girders 20 by angle brackets.

It will be noted that the crane jib is carried upon ball bearings 19, the balls (Part No. 117) for which are not supplied in the No. 6 Outfit but may be obtained separately. The crane will work well without the ball bearing, but the operation is easier when such a bearing is fitted.

Model No. 628 Electric Loco

FIG. B



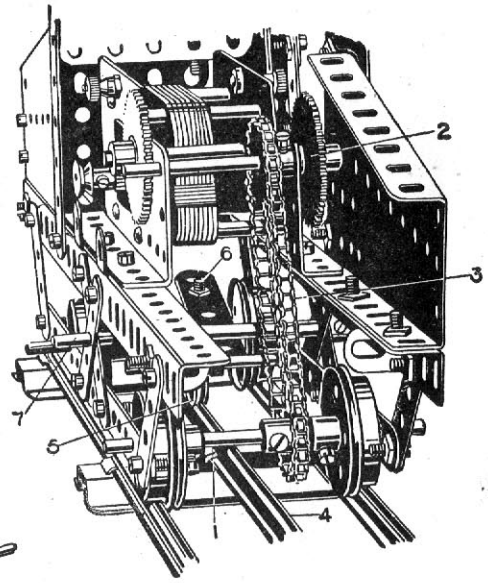


FIG. A

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. 628B). 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	10	of	No. 48A
8	„	„ 3	1	„	„ 18A	1	„	„ 52
11	„	„ 5	4	„	„ 20	2	„	„ 53
8	„	„ 6	1	„	„ 22	4	„	„ 54
2	„	„ 8	1	„	„ 29	5	„	„ 59
12	„	„ 12	2	„	„ 35	1	„	„ 63
2	„	„ 15A	97	„	„ 37	9″	„	„ 94
4	„	„ 16	1	„	„ 44	2	„	„ 96

Electric Motor
(not included in Outfit)

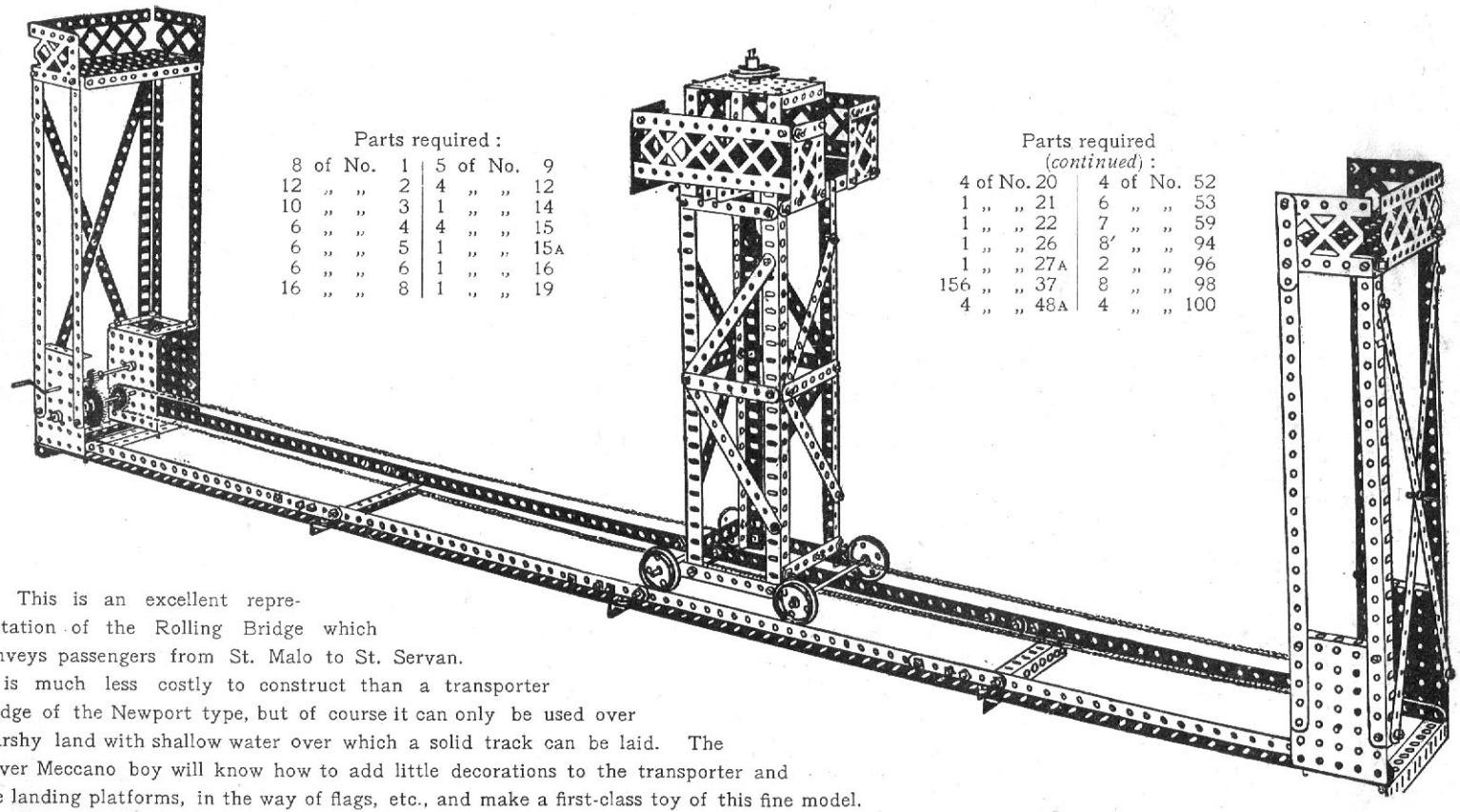
Model No. 629 St. Malo Transporter Bridge

Parts required :

8	of No.	1	5	of No.	9
12	„ „	2	4	„ „	12
10	„ „	3	1	„ „	14
6	„ „	4	4	„ „	15
6	„ „	5	1	„ „	15A
6	„ „	6	1	„ „	16
16	„ „	8	1	„ „	19

Parts required (*continued*) :

4	of No.	20	4	of No.	52
1	„ „	21	6	„ „	53
1	„ „	22	7	„ „	59
1	„ „	26	8	„ „	94
1	„ „	27A	2	„ „	96
156	„ „	37	8	„ „	98
4	„ „	48A	4	„ „	100

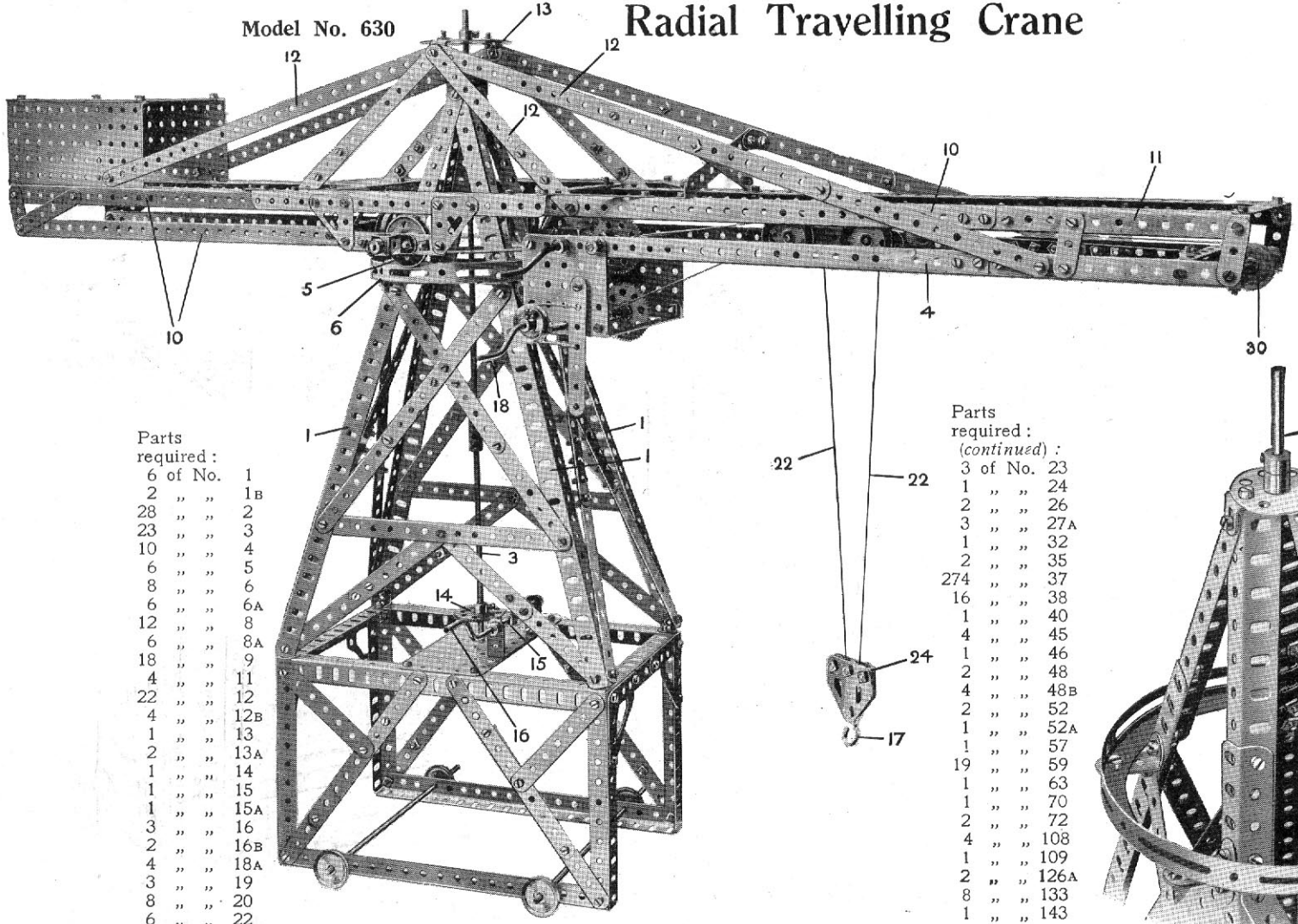


This is an excellent representation of the Rolling Bridge which conveys passengers from St. Malo to St. Servan. It is much less costly to construct than a transporter bridge of the Newport type, but of course it can only be used over marshy land with shallow water over which a solid track can be laid. The clever Meccano boy will know how to add little decorations to the transporter and the landing platforms, in the way of flags, etc., and make a first-class toy of this fine model.

This Model can be made with MECCANO Outfit No. 6, or No. 5 and No. 5A.

Model No. 630

Radial Travelling Crane



Parts required :

6	of	No.	1
2	„	„	1B
28	„	„	2
23	„	„	3
10	„	„	4
6	„	„	5
8	„	„	6
6	„	„	6A
12	„	„	8
6	„	„	8A
18	„	„	9
4	„	„	11
22	„	„	12
4	„	„	12B
1	„	„	13
2	„	„	13A
1	„	„	14
1	„	„	15
1	„	„	15A
3	„	„	16
2	„	„	16B
4	„	„	18A
3	„	„	19
8	„	„	20
6	„	„	22

Parts required : *(continued)* :

3	of	No.	23
1	„	„	24
2	„	„	26
3	„	„	27A
1	„	„	32
2	„	„	35
274	„	„	37
16	„	„	38
1	„	„	40
4	„	„	45
1	„	„	46
2	„	„	48
4	„	„	48B
2	„	„	52
1	„	„	52A
1	„	„	57
19	„	„	59
1	„	„	63
1	„	„	70
2	„	„	72
4	„	„	108
1	„	„	109
2	„	„	126A
8	„	„	133
1	„	„	143

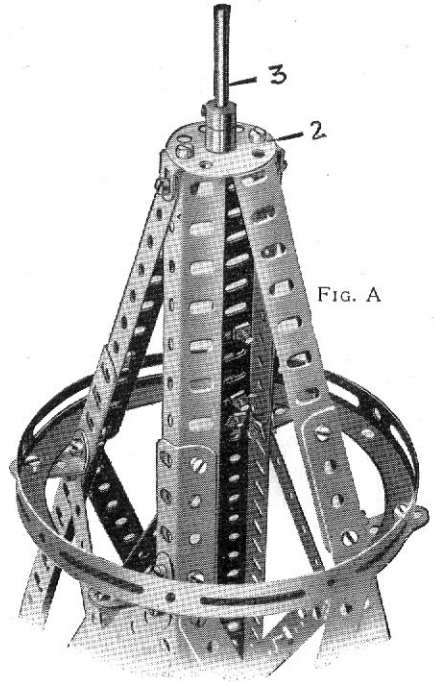


FIG. A

Model No. 630 Radial Travelling Crane *(continued)*

Begin to build this model by constructing the main tower, the details of which are clearly brought out in the illustrations on the previous page. Notice that the inclined corner angle girders 1 are connected at the top (as shown in Fig. A) by a bush wheel 2 secured by angle brackets. This bush wheel forms a bearing for the vertical rod 3 by which the cantilever arm 4 is turned.

The cantilever arm 4 turns on a wheel-race formed of flanged wheels 5, which run on a circular girder 6 supported by four 1″ × ½″ angle brackets bolted to the corner girders 1. The cantilever is built up (as shown in Fig. B) from two 9½″ angle girders 8 braced by two 5½″ angle girders 9 overlapped nine holes. From these, 12½″ angle girders 10 extend at one side, and to similar girders 10 at the other side are connected 5½″ girders 11.

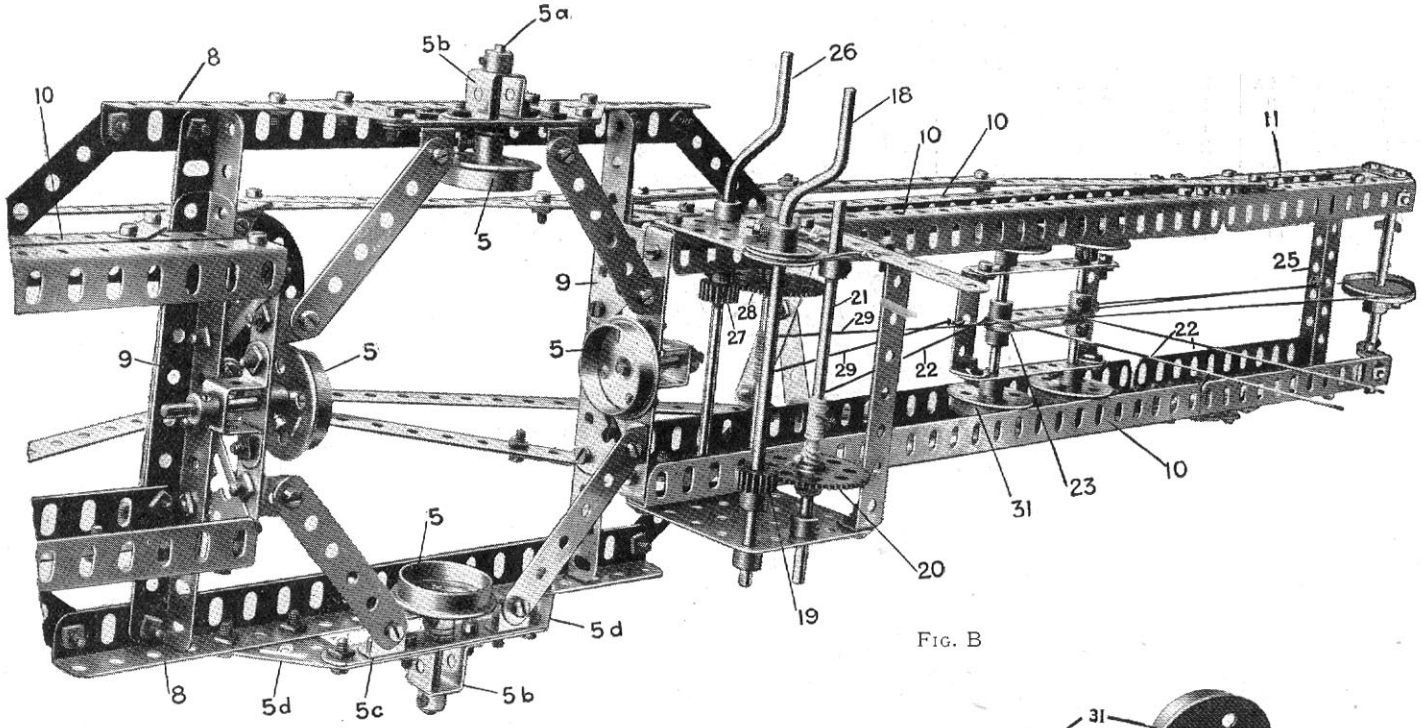


FIG. B

The inclined strips 12 are connected at the top, by means of angle brackets, to a face plate 13 secured to the vertical rod 3. At the foot of the rod 3 is a 1½″ gear wheel 14 engaged by a worm wheel 15 operated by the crank handle 16 and in this way the cantilever arm is swung round, the wheels 5 riding on the circular girder 6.

The load carried from the hook 17 is raised or lowered by the crank handle 18, a ½″ pinion 19 on which engages a 1½″ gear wheel 20 on a rod 21 on which is wound a cord 22. This cord passes over a ½″ pulley 23 to the block 24 and back over another ½″ pulley on the trolley, and is secured to the 3½″ × ½″ double angle strip 25 at the outer end of the cantilever arm. Consequently, when the trolley is caused to travel along the cantilever arm the load remains suspended at a constant height—an important point and an interesting detail.

The trolley is caused to move to and fro along the cantilever arm by the action of the crank handle 26. On this a ½″ pinion 27 engages a 1½″ gear wheel 28 on a rod on which is wound the cord 29, the opposite ends of which are connected to the opposite ends of the trolley. The cord 29 passes round a pulley 30 at the outer end of the jib. By turning the crank handle 26, therefore, the cord 29 winds on and off its rod, and moves the trolley to and fro, its wheels 31, as shown in Fig. C, running on the angle girders 10.

The wheels 5 are connected to 1½″ rods 5a which are journalled in double bent strips 5b bolted to 3½″ strips 5c carried from the angle girders 8 by corner brackets 5d.

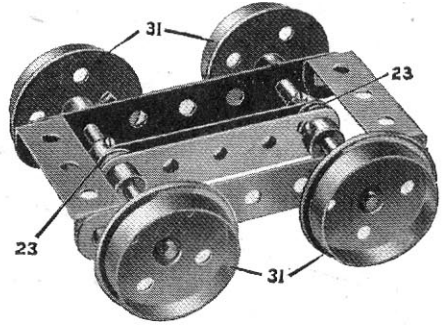


FIG. C

This Model can be made with MECCANO Outfit No. 6, or No. 5 and No. 5A.

Model No. 631 Horizontal Engine

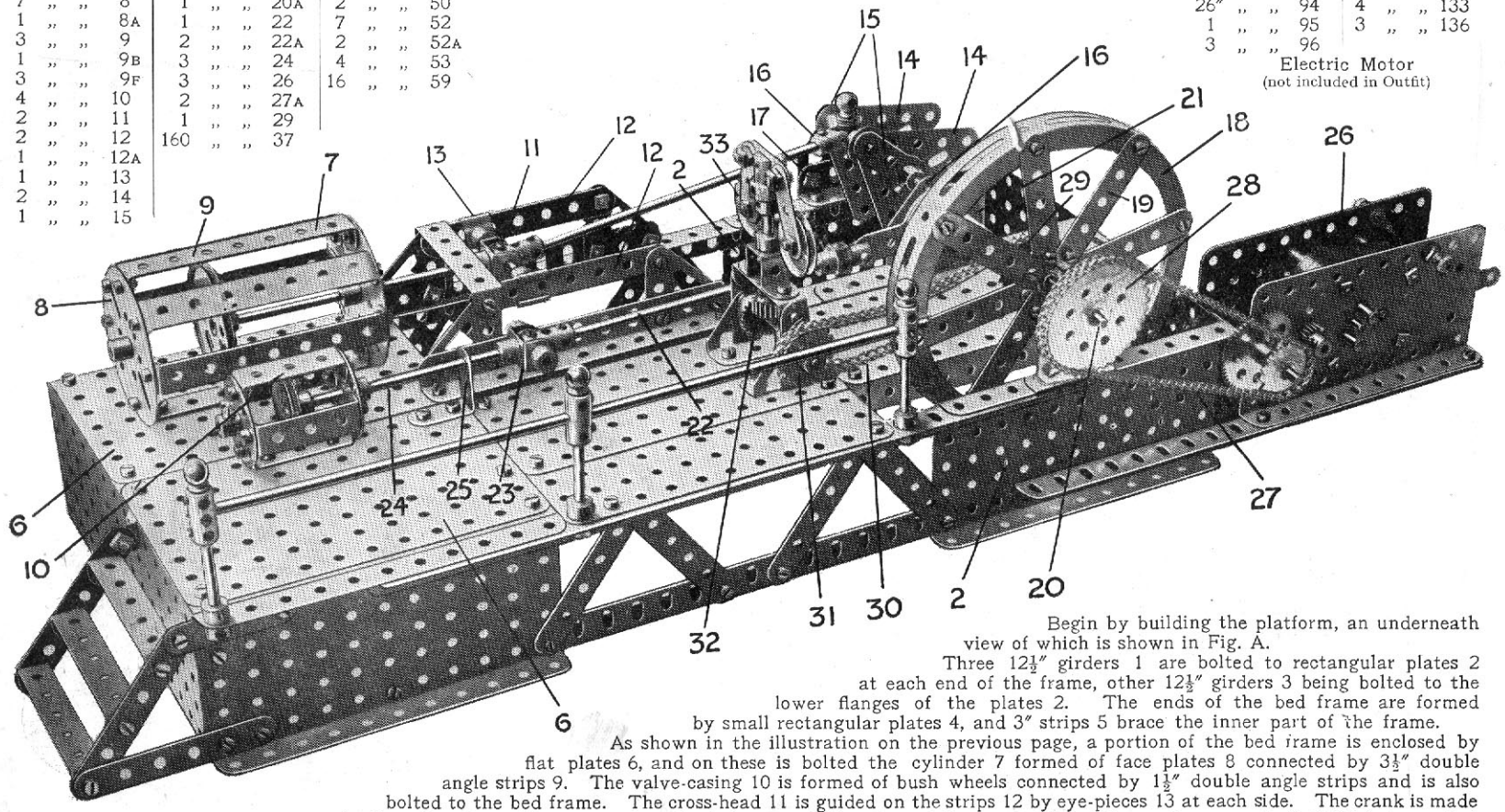
Parts required :

2	of	No.	3	1	of	No.	15A	20	of No. 38
11	„	„	4	2	„	„	16	1	„ „ 45
8	„	„	5	2	„	„	16A	4	„ „ 48
1	„	„	6	5	„	„	17	4	„ „ 48A
5	„	„	6A	2	„	„	18A	6	„ „ 48B
7	„	„	8	1	„	„	20A	2	„ „ 50
1	„	„	8A	1	„	„	22	7	„ „ 52
3	„	„	9	2	„	„	22A	2	„ „ 52A
1	„	„	9B	3	„	„	24	4	„ „ 53
3	„	„	9F	3	„	„	26	16	„ „ 59
4	„	„	10	2	„	„	27A		
2	„	„	11	1	„	„	29		
2	„	„	12	160	„	„	37		
1	„	„	12A						
1	„	„	13						
2	„	„	14						
1	„	„	15						

Parts required *(continued)* :

4	of	No.	62	2	of	No.	109
6	„	„	63	2	„	„	116
2	„	„	63B	1	„	„	118
3	„	„	70	2	„	„	126
2	„	„	76	3	„	„	126A
26″	„	„	94	4	„	„	133
1	„	„	95	3	„	„	136
3	„	„	96				

Electric Motor
(not included in Outfit)



Begin by building the platform, an underneath view of which is shown in Fig. A.

Three 12½″ girders 1 are bolted to rectangular plates 2 at each end of the frame, other 12½″ girders 3 being bolted to the lower flanges of the plates 2. The ends of the bed frame are formed by small rectangular plates 4, and 3″ strips 5 brace the inner part of the frame.

As shown in the illustration on the previous page, a portion of the bed frame is enclosed by flat plates 6, and on these is bolted the cylinder 7 formed of face plates 8 connected by 3½″ double angle strips 9. The valve-casing 10 is formed of bush wheels connected by 1½″ double angle strips and is also bolted to the bed frame. The cross-head 11 is guided on the strips 12 by eye-pieces 13 at each side. The crank is made up of triangular plates 14 representing the balance weights, secured to cranks 15. The main or crank shaft 20 is journalled in flat trunnions 16 secured to 1½″ girders 17, which are in turn bolted to the flanges of the rectangular plates 2.

Model No. 631 Horizontal Engine *(continued)*

The fly-wheel is made of a circular girder 18 connected by strips 19 to a bush wheel secured to the shaft 20. The eccentric 21 is pivotally connected by a rod 22 to the fork piece 23 on the valve rod 24, which slides in the 1″ angle bracket 25. The electric motor 26 drives by sprocket chain 27 a 2″ gear wheel 28 on the shaft 20. A 1″ sprocket wheel 29 drives by sprocket chain 30 another 1″ sprocket wheel 31 in the governor.

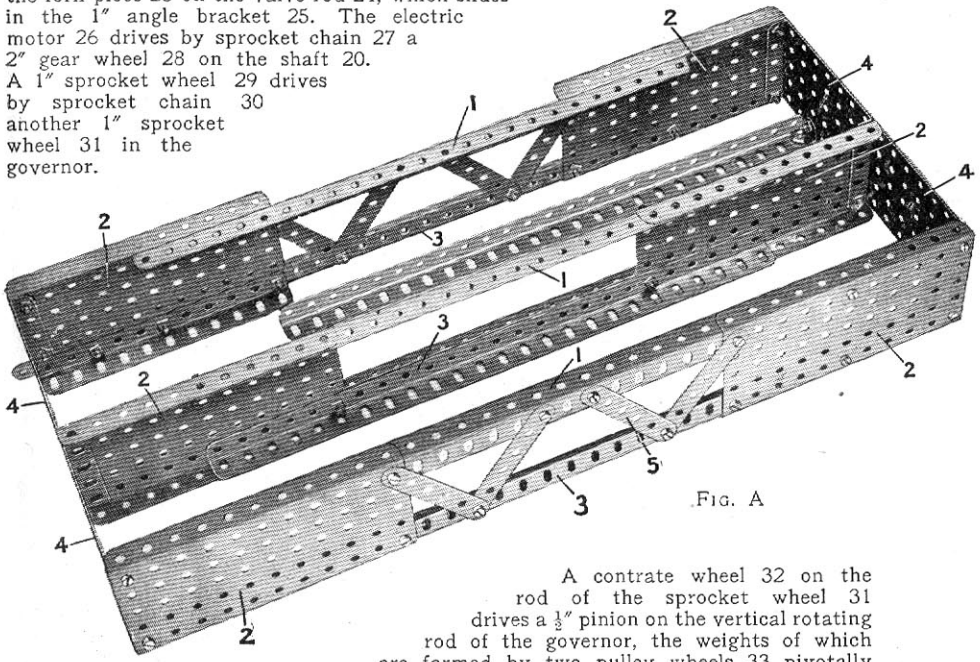
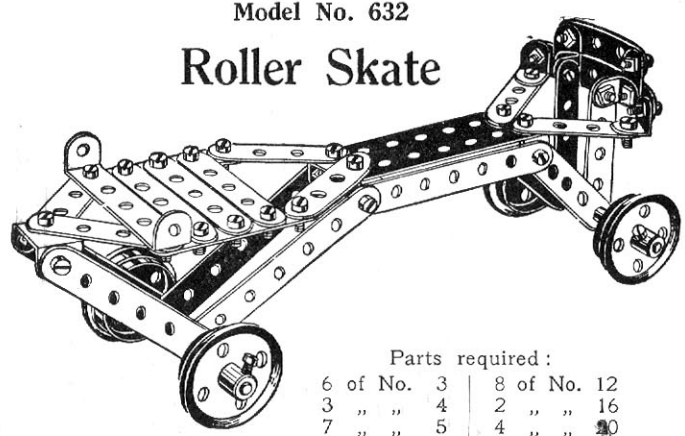


FIG. A

A contrate wheel 32 on the rod of the sprocket wheel 31 drives a ½″ pinion on the vertical rotating rod of the governor, the weights of which are formed by two pulley wheels 33 pivotally hung by 1½″ strips, lock-nutted in the outer holes of a horizontal 1½″ strip. This strip is bolted in the slot of an octagonal coupling, secured to the top of the vertical rod of the governor.

In the operation of an engine such as the model represents, the valve 10 controls the admission of steam to each end of the cylinders 7, thus causing the crank shaft 20 to be driven. When the engine speed increases too much, the weights 33 of the governor fly out and shut off steam, causing the engine to slow down again. The governor thus keeps the engine speed constant.

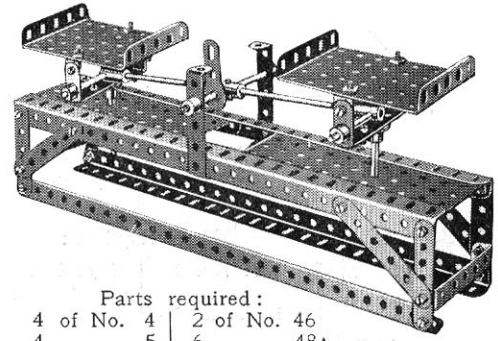
Model No. 632
Roller Skate



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	,, ,,	48A	

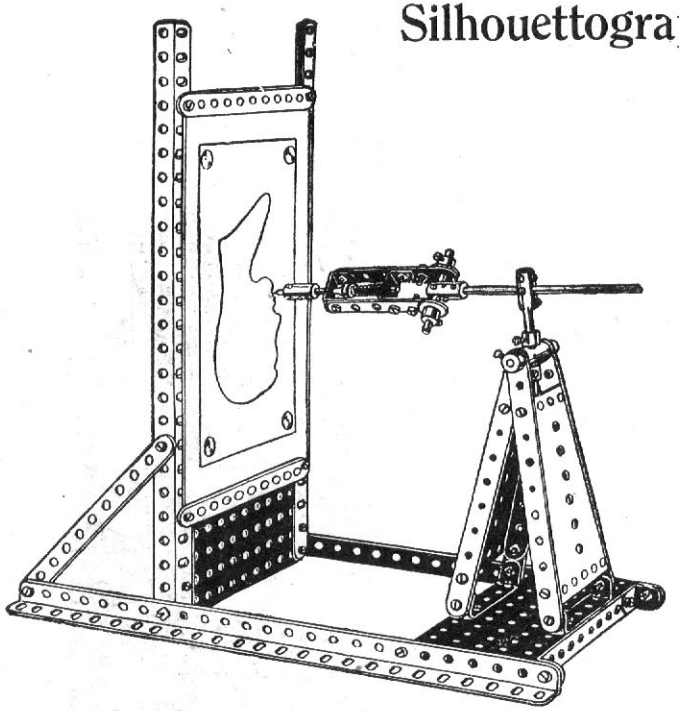
Model No. 633 Scales



Parts required:

4	of No.	4		2	of No.	46	
4	,, ,,	5		6	,, ,,	48A	
4	,, ,,	8		2	,, ,,	52	
5	,, ,,	16		2	,, ,,	53	
2	,, ,,	17		6	,, ,,	59	
30	,, ,,	37		3	,, ,,	62	
				3	of No.	63	

Model No. 634
Silhouettograph

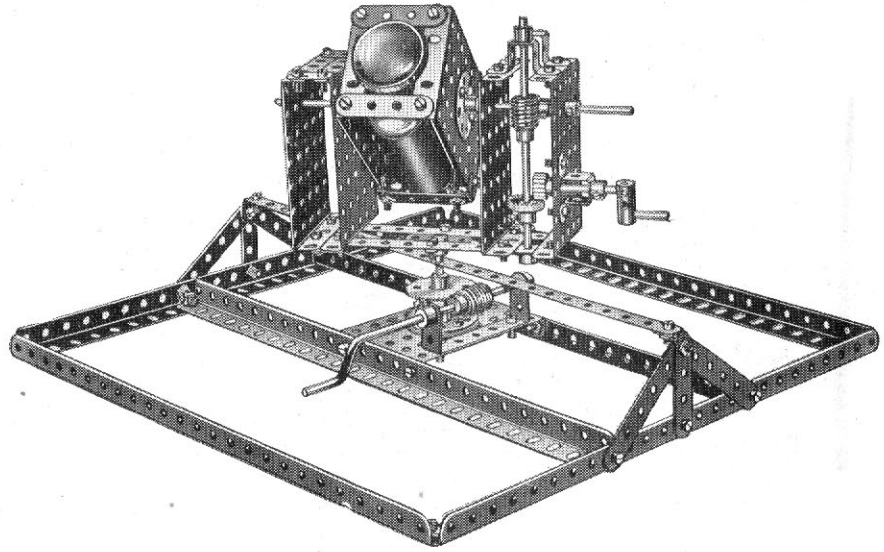


Parts required:

8	of No.	2	4	of No.	12	2	of No.	18A	2	of No.	54
2	„ „	4	3	„ „	13	42	„ „	37	5	„ „	59
4	„ „	8	1	„ „	16	1	„ „	43	2	„ „	62
2	„ „	11	2	„ „	17	2	„ „	52	6	„ „	63

The writing arm should be about 3′ long. The person to be silhouetted should sit with his profile exactly opposite the centre of the writing board, upon which a sheet of plain paper has been fixed. The writing arm is then passed smoothly round the profile

Model No. 635 Searchlight



Parts required:

1	of No.	1	2	of No.	10	1	of No.	18A	1	of No.	27A	1	of No.	46
2	„ „	2	6	„ „	12	1	„ „	19	1	„ „	29	7	„ „	53
4	„ „	4	1	„ „	15	1	„ „	21	2	„ „	32	8	„ „	59
6	„ „	6	1	„ „	16	3	„ „	24	62	„ „	37	1	„ „	63
6	„ „	8	2	„ „	17	2	„ „	26	3	„ „	45			

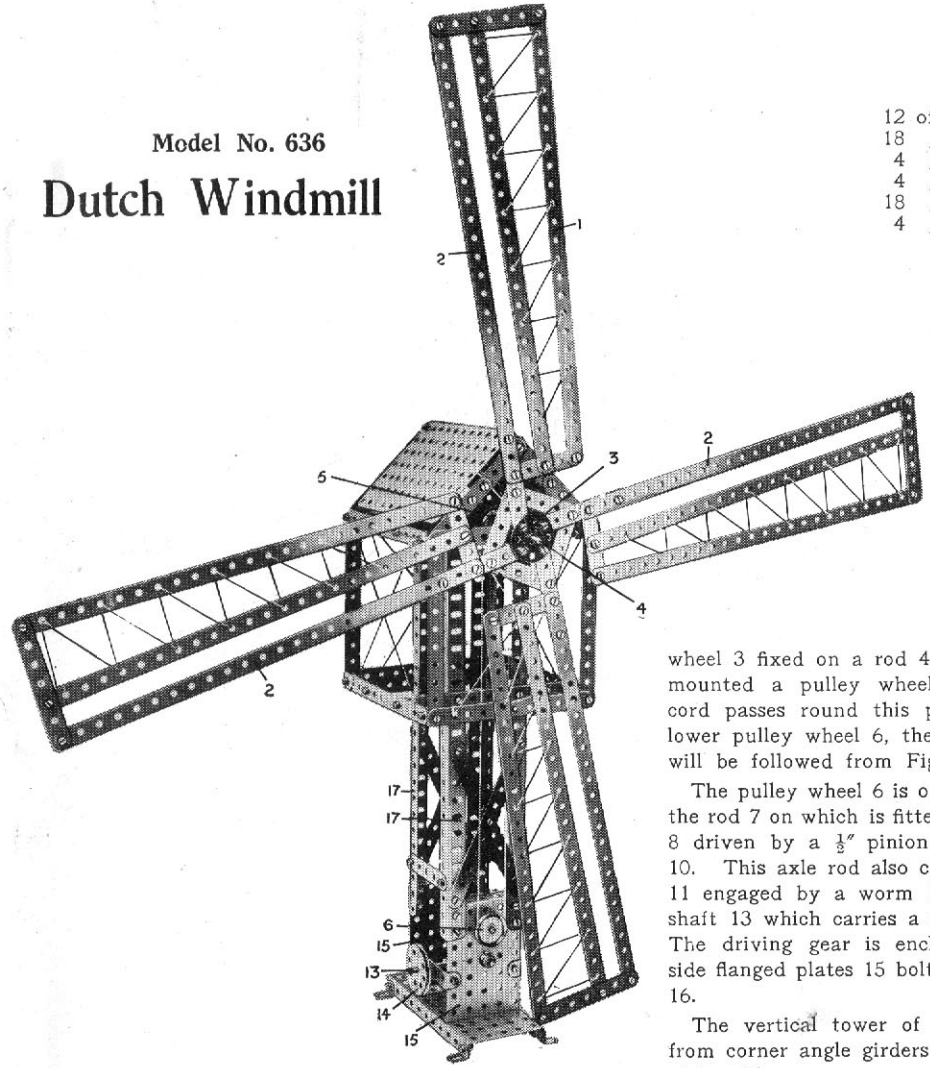
A splendid model with which great fun may be obtained by fitting an electric flash lamp. The light may be quickly manœuvred in any direction and enemy aircraft spotted at once.

Model No. 636

Dutch Windmill

Parts required :

12 of No. 1	24 of No. 12	2 of No. 26	2 of No. 52
18 „ „ 2	1 „ „ 14	1 „ „ 27A	2 „ „ 52A
4 „ „ 3	3 „ „ 16	1 „ „ 32	2 „ „ 53
4 „ „ 4	1 „ „ 21	124 „ „ 37	5 „ „ 59
18 „ „ 5	2 „ „ 22	1 „ „ 40	
4 „ „ 8	1 „ „ 24	2 „ „ 48A	



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 3 fixed on a rod 4, on which is also mounted a pulley wheel 5. The driving cord passes round this pulley wheel to a lower pulley wheel 6, the driving of which will be followed from Fig. A.

The pulley wheel 6 is on the outer end of the rod 7 on which is fitted a $1\frac{1}{2}$" gear wheel 8 driven by a $\frac{1}{2}$" pinion 9 on the axle rod 10. This axle rod also carries a $\frac{1}{2}$" pinion 11 engaged by a worm 12 on the driving shaft 13 which carries a driving pulley 14. The driving gear is enclosed in two small side flanged plates 15 bolted to a base plate 16.

The vertical tower of the mill is made from corner angle girders 17 bolted to side plates 15.

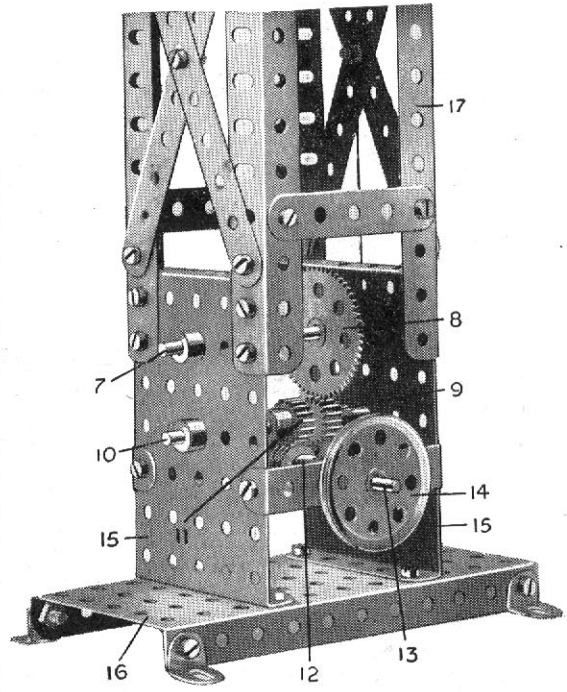
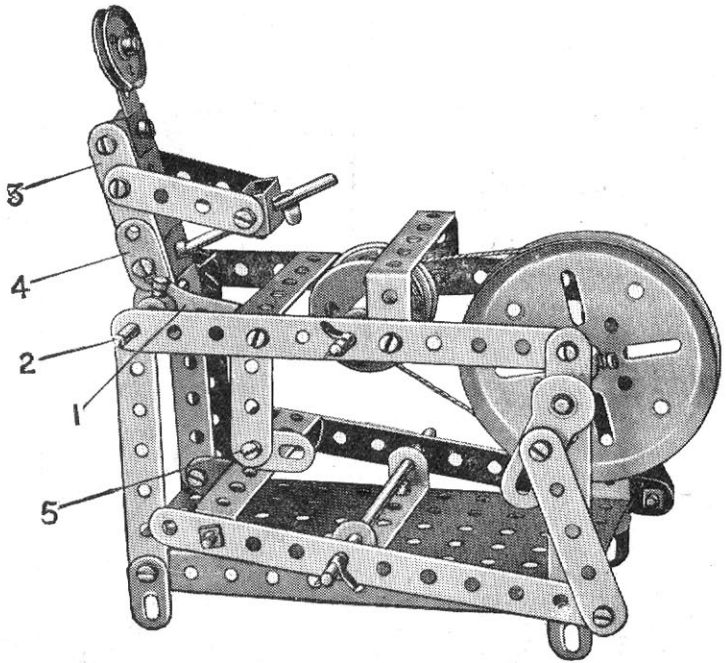


FIG. A

Model No. 637

Knife Grinder



Parts required :

4	of	No.	2
4	„	„	3
2	„	„	4
4	„	„	5
3	„	„	6
4	„	„	10
3	„	„	11
2	„	„	12
1	„	„	15
3	„	„	16
1	„	„	17
1	„	„	19A
2	„	„	20
1	„	„	22
1	„	„	22A
2	„	„	35
32	„	„	37
6	„	„	37A
1	„	„	46
2	„	„	48A
1	„	„	48B
1	„	„	52
3	„	„	62

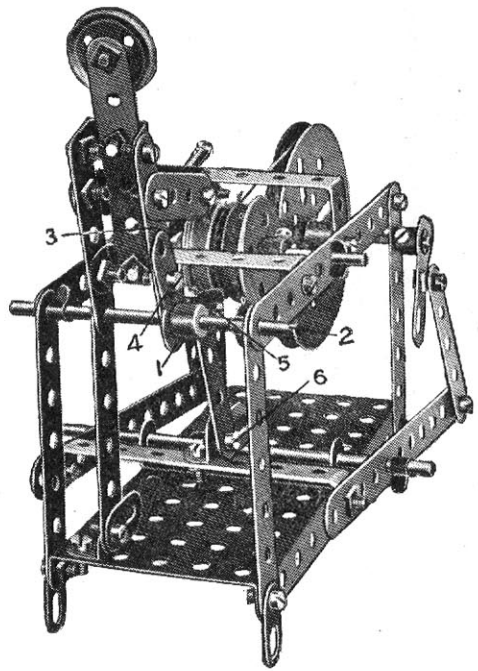
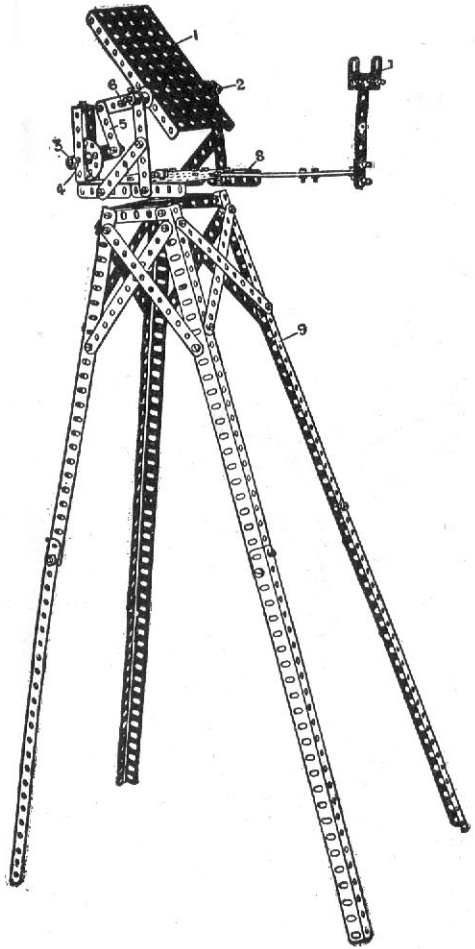


FIG. A

The crank 1 is secured to the rod 2, and the 7½" side-strip 3 is clamped to the crank 1 by the flat bracket 4. The bolt at the end of the crank forming the knee and the bolt 5 are lock-nutted to allow free movement. When the treadle is operated the body works backwards and forwards.



Model No. 638

Heliograph

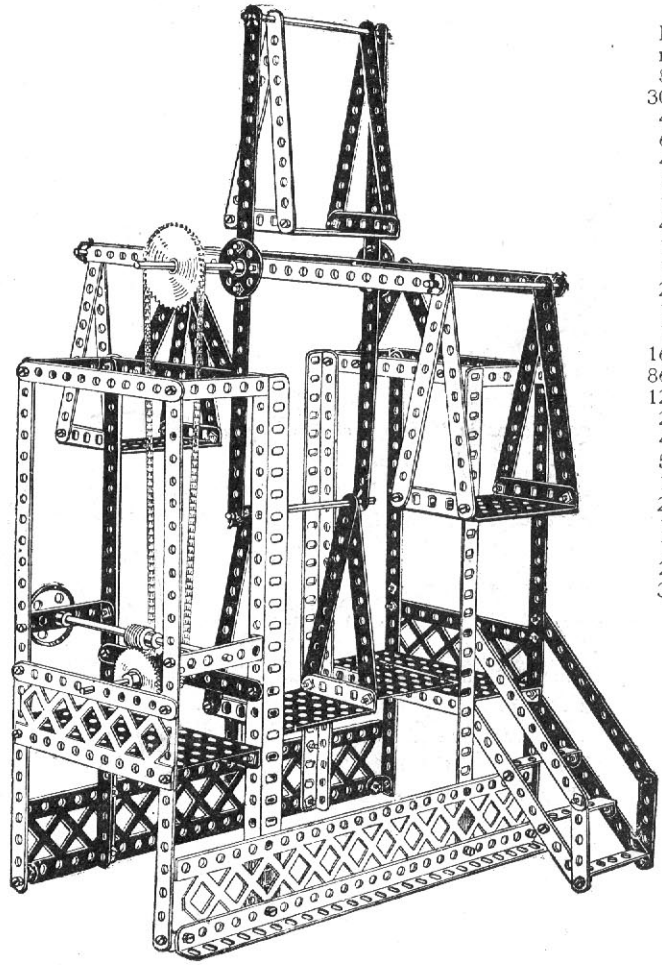
Parts required:

9	of	No.	2
3	„	„	3
5	„	„	4
1	„	„	5
2	„	„	6
8	„	„	8
4	„	„	10
3	„	„	12
1	„	„	15A
1	„	„	17
1	„	„	18A
2	„	„	24
64	„	„	37
2	„	„	48A
1	„	„	52
3	„	„	53
3	„	„	59
3	„	„	62

A large rectangular plate 1 is rocked about its pivots 2 by a lever 3, pivoted at 4 and connected by a 2″ strip 5 to the outer end of a crank 6, to which is connected a 2″ strip. The rectangular plate 1 should be fitted with a mirror, and a sighting aperture 7 is mounted in front, the operator bringing one of the perforations in the plate 1 in line with the aperture 7 while signalling, so that he can see the opposite instrument in the distance. The platform 8 is pivotally mounted on the standard 9 so that it may be swung round to any position, a bush wheel being bolted to the top of the standard in which the pivot works. The platform is made of two small rectangular plates butted together and connected on each side by strips.

Model No. 639

Fly Boats

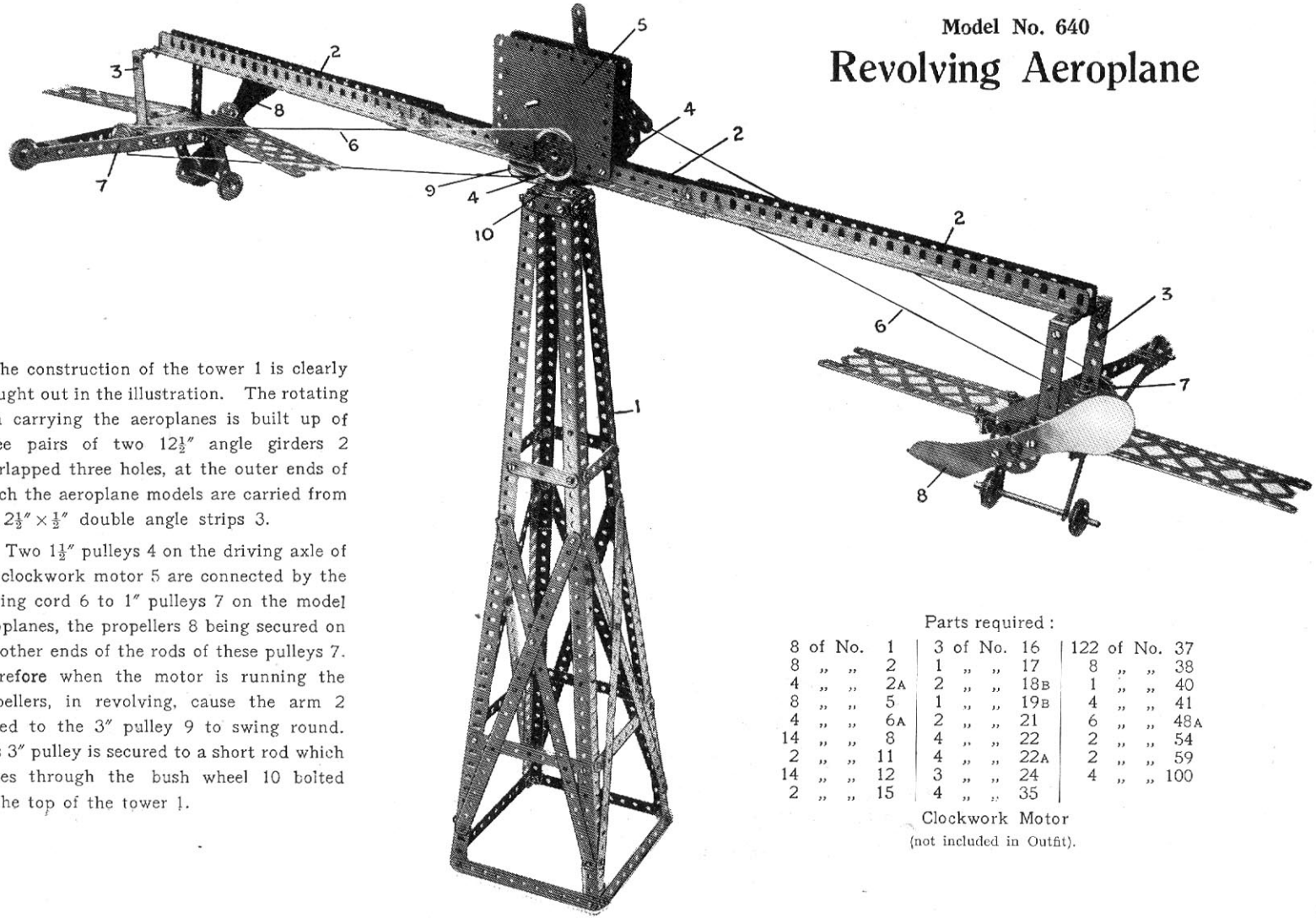


Parts required:

8	of	No.	1
30	„	„	2
4	„	„	3
6	„	„	8
4	„	„	11
1	„	„	13
1	„	„	14
4	„	„	15
1	„	„	15A
1	„	„	21
2	„	„	24
1	„	„	27A
1	„	„	32
16	„	„	35
86	„	„	37
12	„	„	48A
2	„	„	52
4	„	„	53
5	„	„	59
1	„	„	70
2′	„	„	94
1	„	„	95
1	„	„	96
2	„	„	99
3	„	„	100

Model No. 640

Revolving Aeroplane



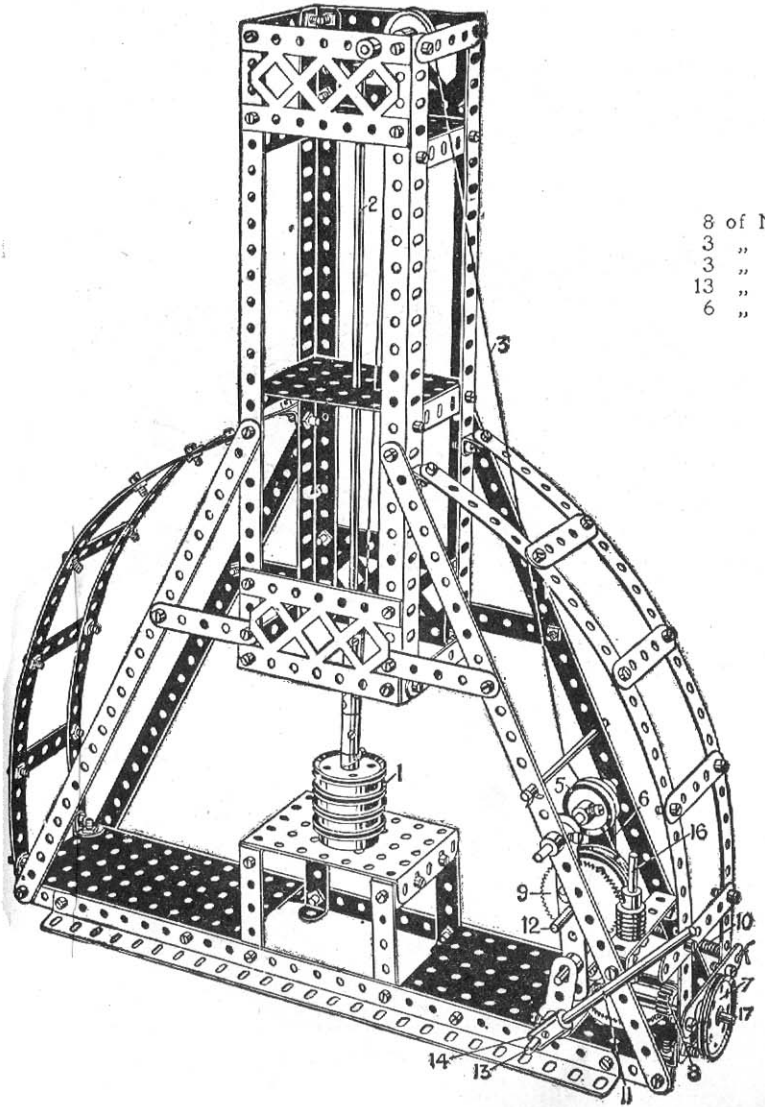
The construction of the tower 1 is clearly brought out in the illustration. The rotating arm carrying the aeroplanes is built up of three pairs of two 12½″ angle girders 2 overlapped three holes, at the outer ends of which the aeroplane models are carried from the 2½″ × ½″ double angle strips 3.

Two 1½″ pulleys 4 on the driving axle of the clockwork motor 5 are connected by the driving cord 6 to 1″ pulleys 7 on the model aeroplanes, the propellers 8 being secured on the other ends of the rods of these pulleys 7. Therefore when the motor is running the propellers, in revolving, cause the arm 2 bolted to the 3″ pulley 9 to swing round. This 3″ pulley is secured to a short rod which passes through the bush wheel 10 bolted on the top of the tower 1.

Parts required :

8 of No. 1	3 of No. 16	122 of No. 37
8 „ „ 2	1 „ „ 17	8 „ „ 38
4 „ „ 2A	2 „ „ 18B	1 „ „ 40
8 „ „ 5	1 „ „ 19B	4 „ „ 41
4 „ „ 6A	2 „ „ 21	6 „ „ 48A
14 „ „ 8	4 „ „ 22	2 „ „ 54
2 „ „ 11	4 „ „ 22A	2 „ „ 59
14 „ „ 12	3 „ „ 24	4 „ „ 100
2 „ „ 15	4 „ „ 35	

Clockwork Motor
(not included in Outfit).



Model No. 641 Drop Hammer

Parts required:

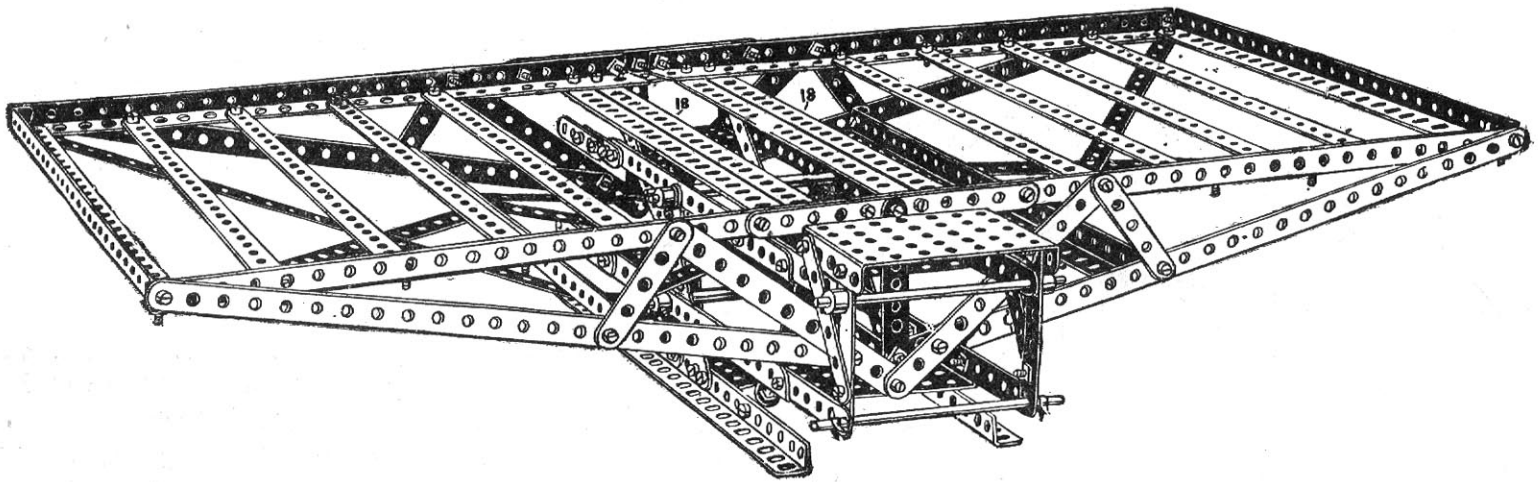
8	of	No.	1	2	of	No.	11	4	of	No.	16	1	of	No.	24	2	of	No.	35	3	of	No.	53
3	„	„	3	8	„	„	12	3	„	„	17	1	„	„	26	112	„	„	37	8	„	„	59
3	„	„	4	1	„	„	13	5	„	„	20	1	„	„	27A	1	„	„	43	3	„	„	62
13	„	„	5	1	„	„	15	1	„	„	21	1	„	„	28	8	„	„	48A	6	„	„	63
6	„	„	8	2	„	„	15A	3	„	„	22	1	„	„	32	2	„	„	52	4	„	„	97

The weighted hammer head 1 is fixed at the end of the slideable rod 2 and lifted by a cord 3 connected to the head and passing over a pulley and between guide pulleys 5 on to a winding drum of two flanged wheels 6. The driving pulley 7 is geared by a pinion 8 to a contrate wheel, on the spindle of which is a worm gearing with a 57-toothed gear wheel 9 by which the cord is operated. The coupling 15 is threaded on the upright spindle 16 and forms a bearing for the axle 17. The gear wheel 9 and flanged wheels 6 are held in engagement with the worm by the pull of a spring 10 when raising the hammer, but may be disengaged, in order to drop the hammer, by the handle-rod 11 secured to the rod 12 about which the geared wheel 9 pivots. To the rod 13 a crank is secured on each side of the winding-drum mechanism, to which also is secured the coupling 14 and a corresponding coupling at the other end of the rod to which the spring 10 is attached. This rod is pivotally attached to a $2\frac{1}{2}$" bent strip bolted to the base plate.

Model No. 642 Weighbridge

Parts required :

22	of No.	1	14	of No.	8	130	of No.	37
12	„ „	2	12	„ „	12	1	„ „	48A
6	„ „	3	4	„ „	15	6	„ „	53
6	„ „	4	2	„ „	15A	10	„ „	59
8	„ „	5	2	„ „	35			



Begin the construction of this model by making the weigh beam, Fig. 642A. The side strips 1 are bolted to the base angle girders, 2, and in the strips 1 are journalled the rods 3 which form the fixed pivots of the weigh beam. The upper and lower rods 4 are journalled in the strips 5 and form the moving pivots of the beam. All the rods 3 and 4 pass through perforations in the upper and lower strips 6 of the beam. Next construct the platform, Fig. 642B, leaving the strips at one side unconnected, as shown. The platform is then passed between the upper and lower parts of the weigh beam, and the unconnected strips then bolted, as follows. The ends 7 are bolted to the lowest hole 8, and the ends 9 to the angle bracket 10, and the end of the angle girder 11 is overlapped five holes of the strip 12 and bolted in the hole 13. The outer holes 14 of the 12½" crossed strips, Fig. 642A, are then bolted to the same holes 15 in the angle girders 16 as the strips 17. The double angle girders 18 are then bolted in position, and the outer holes 19, Fig. 642A, are

Model No. 642 Weighbridge *(continued)*

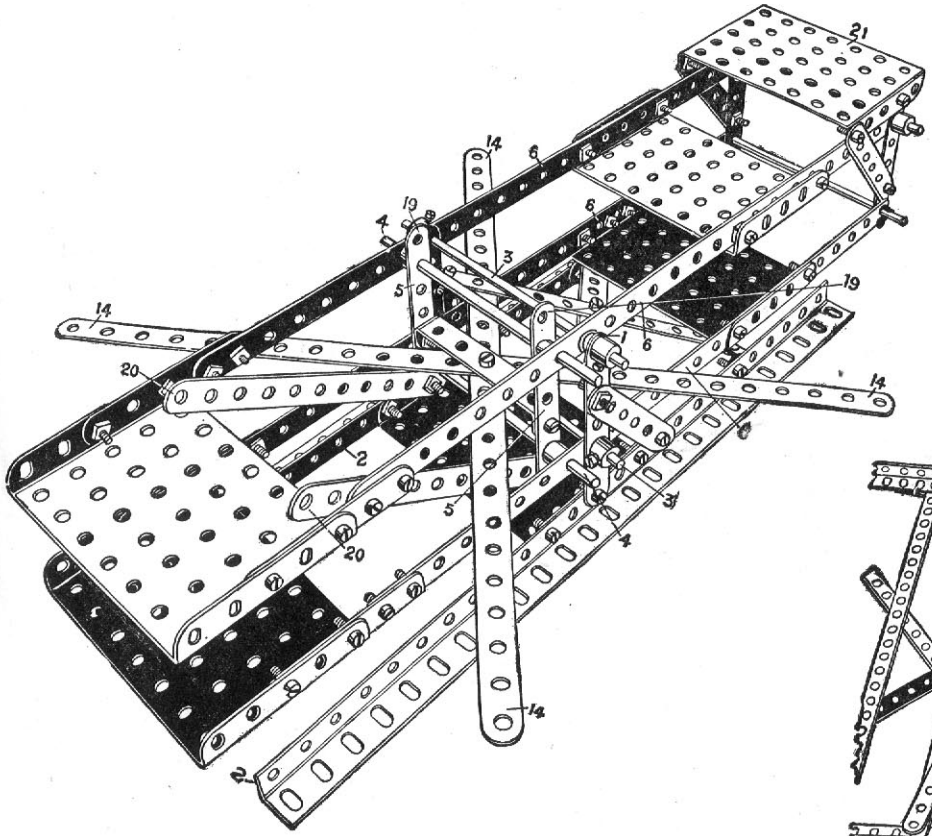


FIG. 642A

bolted to the angle girders 18 in the centre holes and the holes 20, Fig. 642A, to the angle girders 18 at the fifth hole from the girder ends. The load to be weighed rests on the main platform, and the weights are placed on the small rectangular plate 21 at the end of the weigh beam.

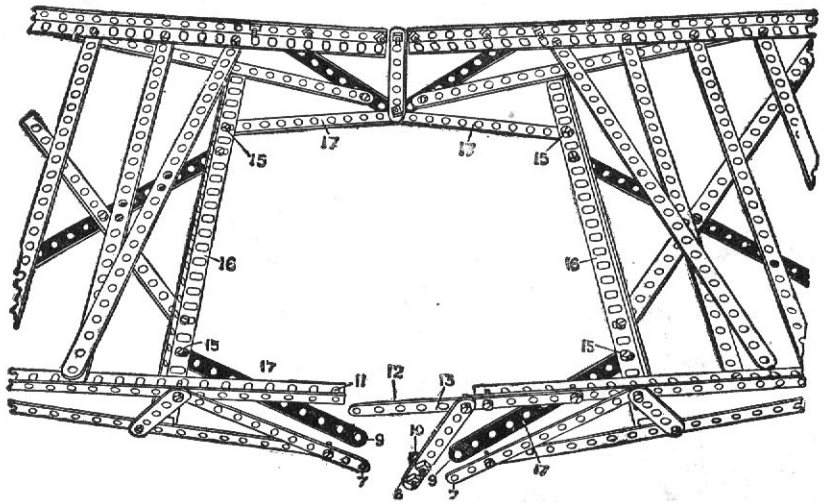
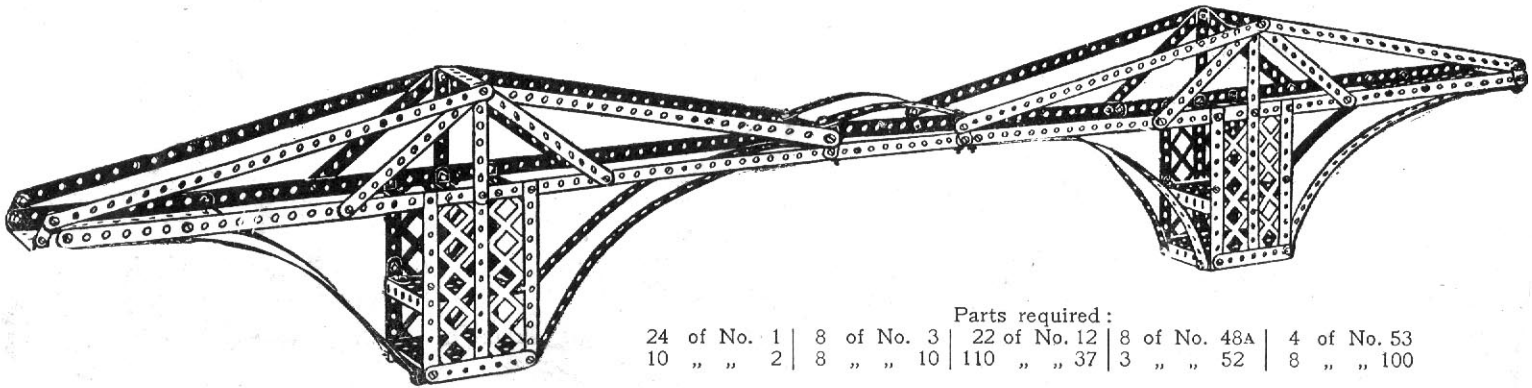


FIG. 642B

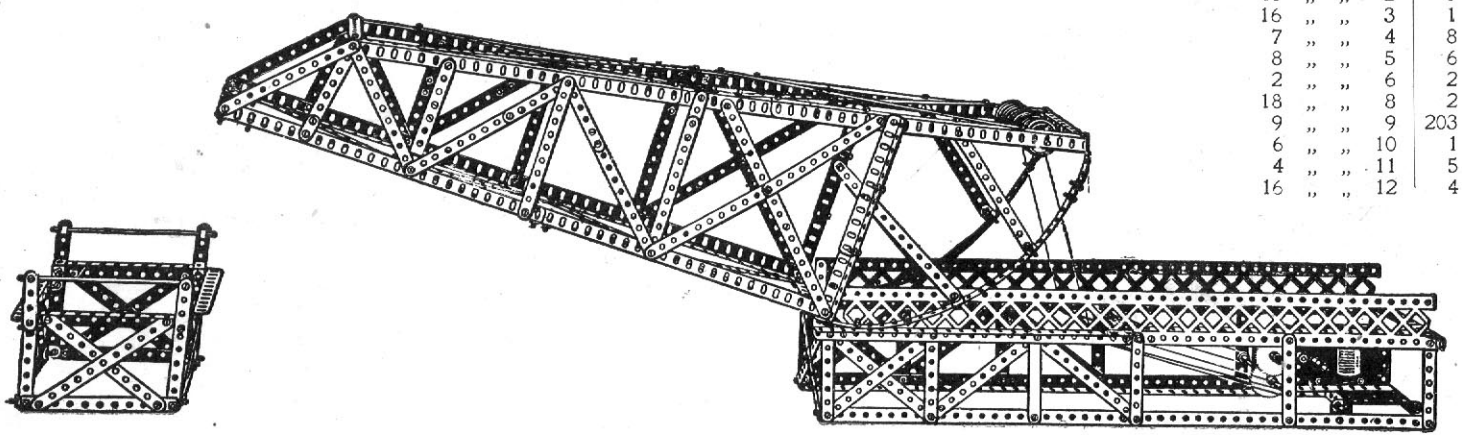
Model No. 643 Cantilever Bridge



Parts required:

24 of No. 1	8 of No. 3	22 of No. 12	8 of No. 48A
10 „ „ 2	8 „ „ 10	110 „ „ 37	3 „ „ 52
			4 of No. 53
			8 „ „ 100

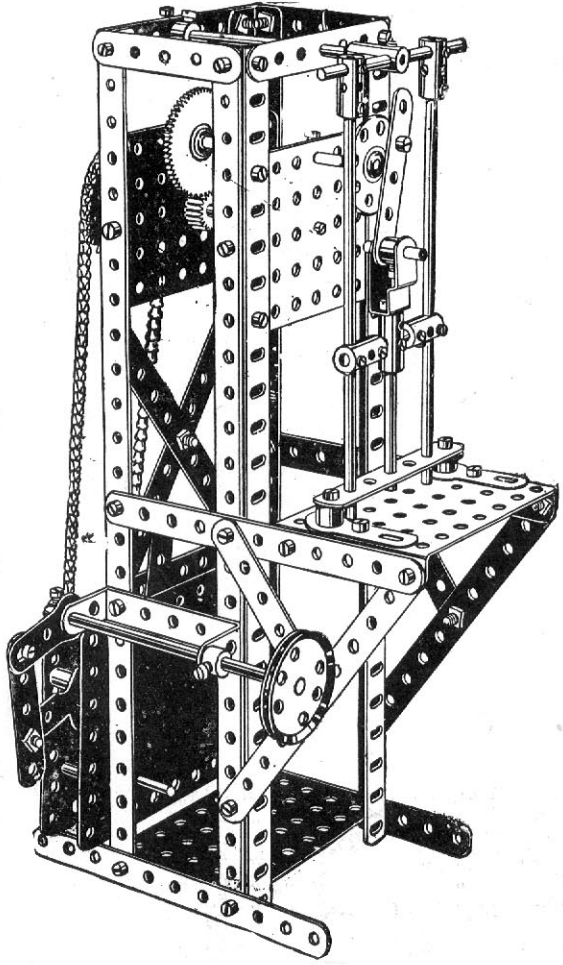
Model No. 644 Rolling Lift Bridge



Parts required:

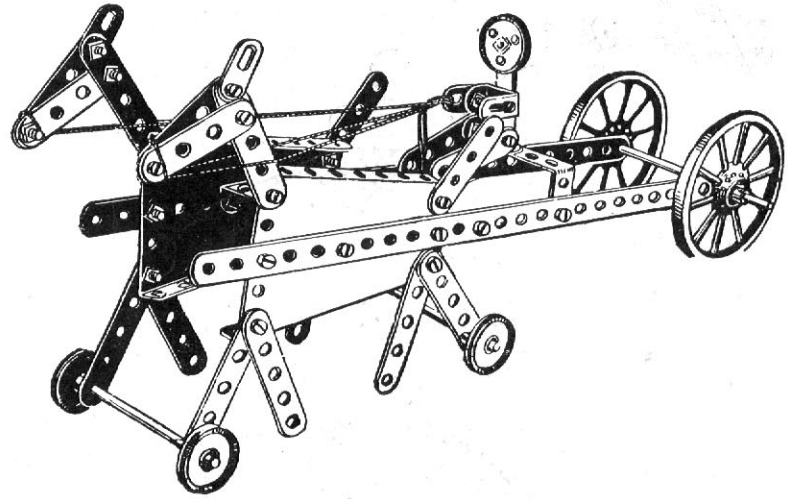
10 of No. 1	2 of No. 13
46 „ „ 2	3 „ „ 14
16 „ „ 3	1 „ „ 17
7 „ „ 4	8 „ „ 20
8 „ „ 5	6 „ „ 23
2 „ „ 6	2 „ „ 26
18 „ „ 8	2 „ „ 27
9 „ „ 9	203 „ „ 37
6 „ „ 10	1 „ „ 52
4 „ „ 11	5 „ „ 59
16 „ „ 12	4 „ „ 99

Model No. 645 Punching Machine



Parts required :

8	of	No.	2
3	„	„	3
2	„	„	4
4	„	„	5
4	„	„	8
2	„	„	14
2	„	„	15A
2	„	„	16
2	„	„	17
1	„	„	18A
1	„	„	21
1	„	„	24
1	„	„	26
1	„	„	27A
50	„	„	37
2	„	„	38
1	„	„	44
1	„	„	46
4	„	„	53
6	„	„	59
3	„	„	62
6	„	„	63
2	„	„	94
1	„	„	95
1	„	„	96



Model No. 646

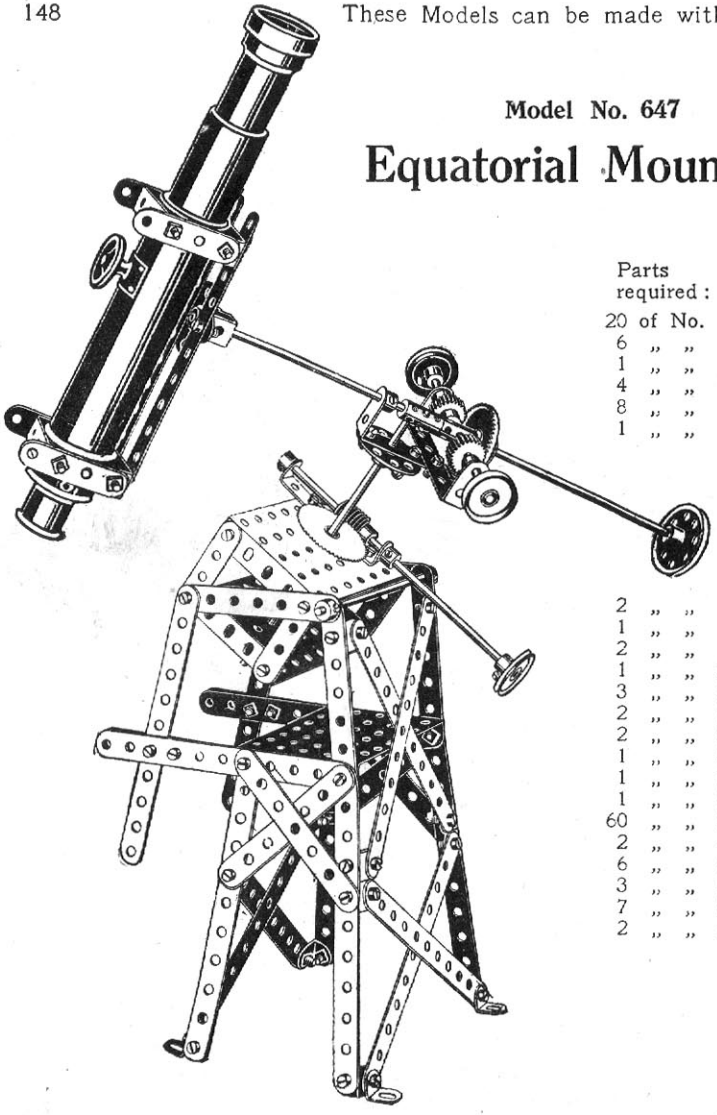
Sulky and Driver

Parts required :

2	of	No.	1	1	of	No.	12	32	of	No.	37
10	„	„	5	3	„	„	15A	1	„	„	46
9	„	„	6	2	„	„	19A	2	„	„	48A
4	„	„	10	4	„	„	22	2	„	„	54
2	„	„	11	1	„	„	22A				

Model No. 647

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	„	„	28
1	„	„	32
60	„	„	37
2	„	„	46
6	„	„	48A
3	„	„	53
7	„	„	59
2	„	„	63

Model No. 648

Field Gun

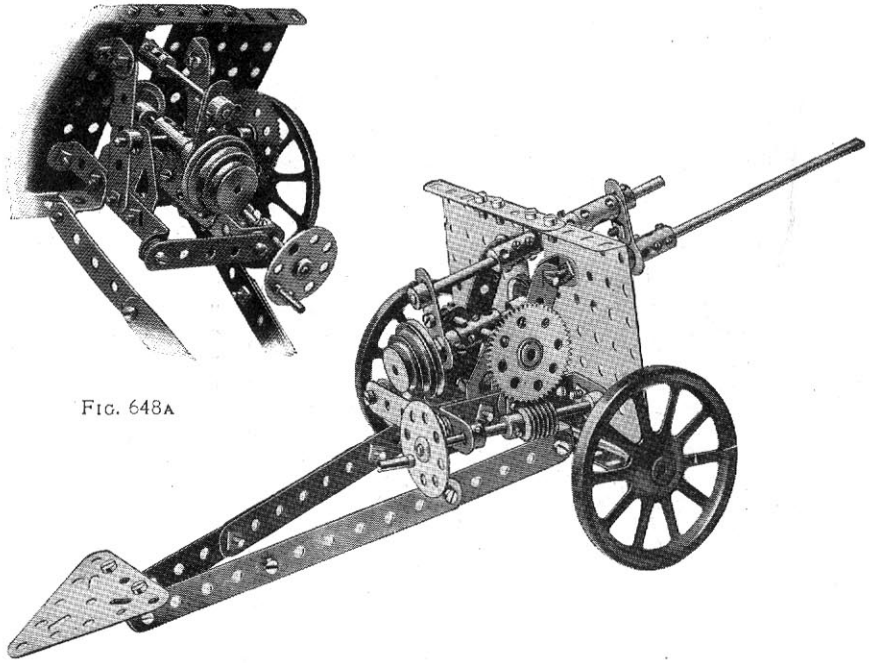
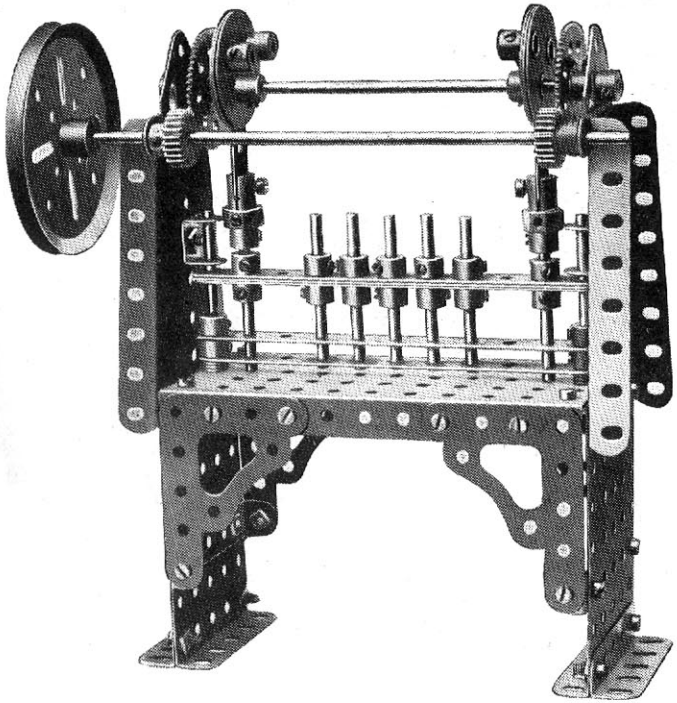


FIG. 648A

Parts required :

4	of	No.	2	1	of	No.	16	1	of	No.	32	4	of	No.	63
5	„	„	5	1	„	„	16A	34	„	„	37	1	„	„	76
2	„	„	10	1	„	„	18B	6	„	„	38	1	„	„	115
1	„	„	11	2	„	„	19B	1	„	„	46	1	„	„	123
6	„	„	12	3	„	„	22	1	„	„	47	2	„	„	124
1	„	„	13A	1	„	„	24	2	„	„	53	2	„	„	126A
1	„	„	14	1	„	„	26	5	„	„	59				
1	„	„	15	1	„	„	27A	2	„	„	62				

Model No. 649 Punching Press



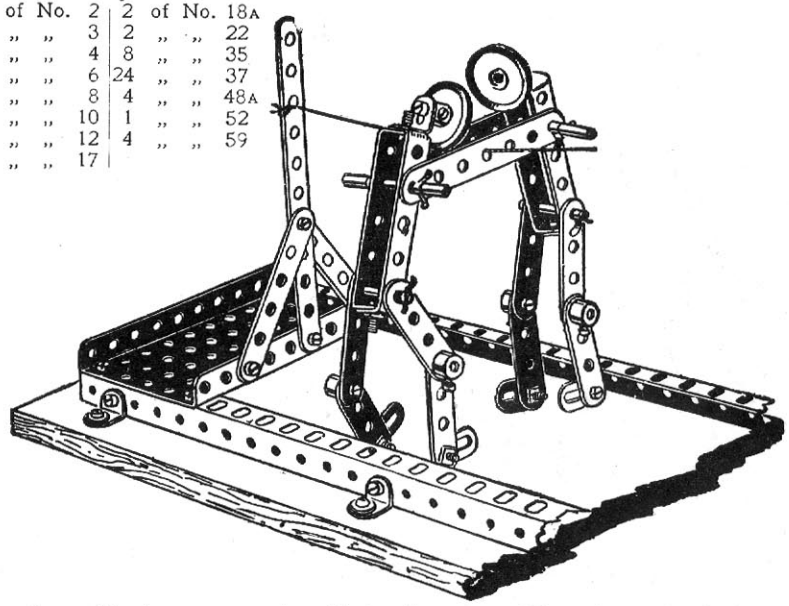
Parts required :

5	of No.	2	1	of No.	19B	2	of No.	53
2	„ „	6	2	„ „	25	2	„ „	54
2	„ „	9D	2	„ „	27A	21	„ „	59
2	„ „	11	34	„ „	37	2	„ „	63B
1	„ „	13A	6	„ „	38	4	„ „	108
1	„ „	14	2	„ „	48A	2	„ „	126A
9	„ „	17	1	„ „	52	2	„ „	130

Model No. 650 The Wrestlers

Parts required :

1	of No.	2	2	of No.	18A
2	„ „	3	2	„ „	22
2	„ „	4	8	„ „	35
8	„ „	6	24	„ „	37
2	„ „	8	4	„ „	48A
4	„ „	10	1	„ „	52
8	„ „	12	4	„ „	59
2	„ „	17			



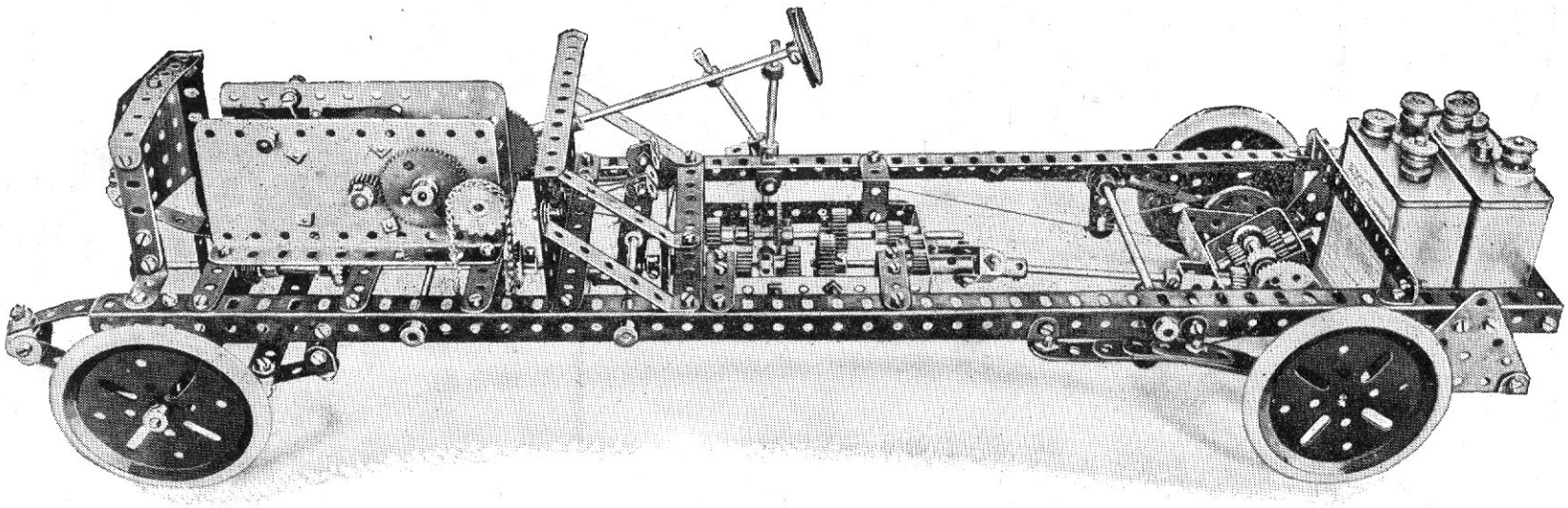
Boys will at once recognise this familiar toy. When the cord, which should be about 4′ long, is kept fairly tight and manipulated, the figures will wrestle in a most realistic manner. The model should be mounted on a board, to keep it steady.

HOW TO CONTINUE

This completes the Models which may be made with MECCANO Outfit No. 6. 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. 6A Accessory Outfit, the price of which will be found in the List at the end of the Manual.

Model No. 701

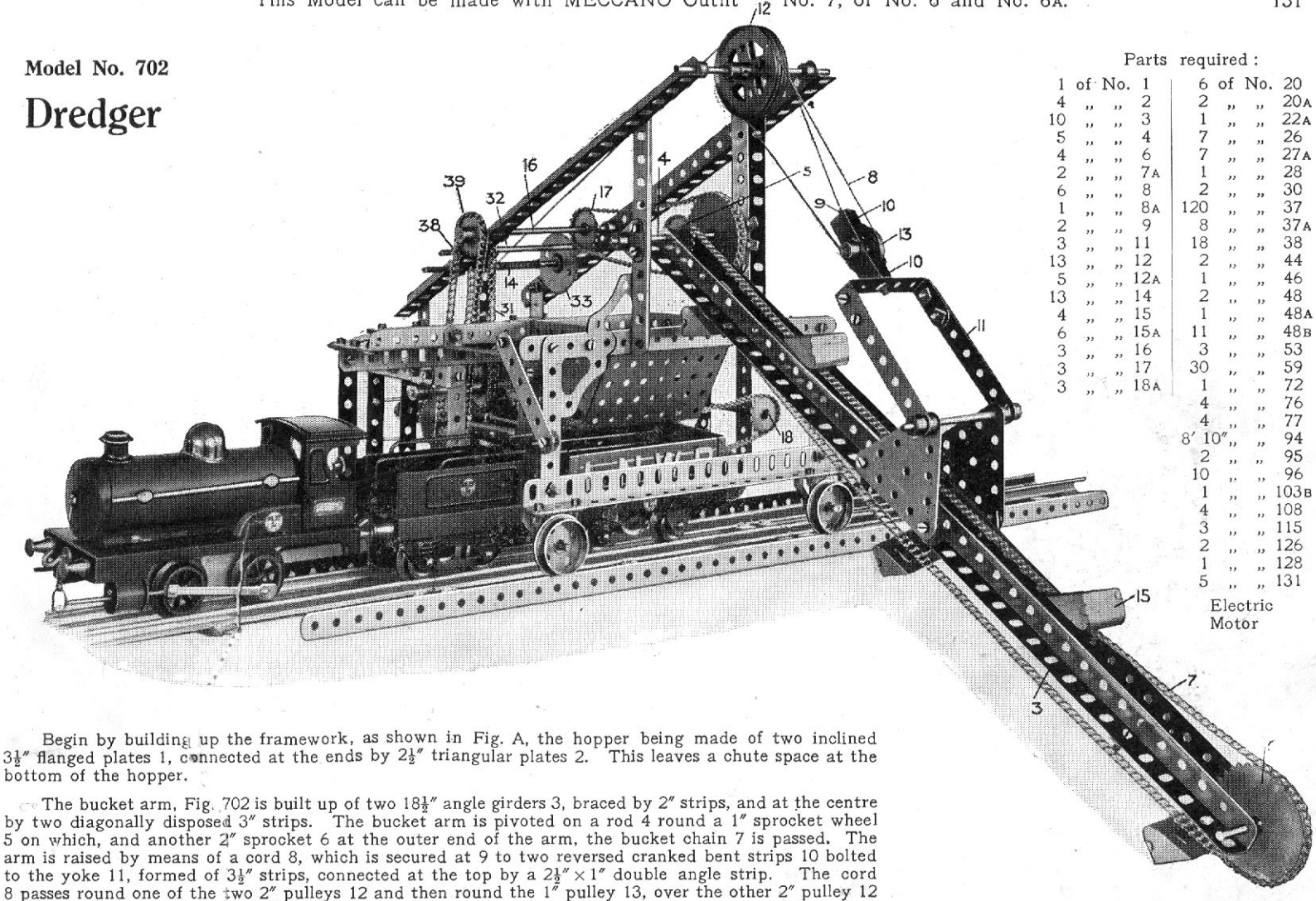
Meccano Motor Chassis



The Meccano Motor Chassis is a model of exceptional interest as it provides a complete demonstration of a real Motor Chassis. It is equipped with differential, steering gear and gear box, giving two forward speeds and a reverse. It is underslung and is provided with elliptical leaf-springs. In order to make its construction quite clear a number of sectional photographs and drawings are necessary, and it is impossible to find space for these and the necessary instructions which go with them, in this Manual. We have, therefore, compiled a separate sheet, printed on art paper, containing full instructions and clear illustrations. This may be purchased either from your dealer or from Meccano Limited, Liverpool. Price 3d. (post free 4d.).

Model No. 702

Dredger



Parts required :

1	of	No.	1	6	of	No.	20
4	„	„	2	2	„	„	20A
10	„	„	3	1	„	„	22A
5	„	„	4	7	„	„	26
4	„	„	6	7	„	„	27A
2	„	„	7A	1	„	„	28
6	„	„	8	2	„	„	30
1	„	„	8A	120	„	„	37
2	„	„	9	8	„	„	37A
3	„	„	11	18	„	„	38
13	„	„	12	2	„	„	44
5	„	„	12A	1	„	„	46
13	„	„	14	2	„	„	48
4	„	„	15	1	„	„	48A
6	„	„	15A	11	„	„	48B
3	„	„	16	3	„	„	53
3	„	„	17	30	„	„	59
3	„	„	18A	1	„	„	72
				4	„	„	76
				4	„	„	77
				8′ 10″	„	„	94
				2	„	„	95
				10	„	„	96
				1	„	„	103B
				4	„	„	108
				3	„	„	115
				2	„	„	126
				1	„	„	128
				5	„	„	131

Electric Motor

Begin by building up the framework, as shown in Fig. A, the hopper being made of two inclined 3½″ flanged plates 1, connected at the ends by 2½″ triangular plates 2. This leaves a chute space at the bottom of the hopper.

The bucket arm, Fig. 702 is built up of two 18½″ angle girders 3, braced by 2″ strips, and at the centre by two diagonally disposed 3″ strips. The bucket arm is pivoted on a rod 4 round a 1″ sprocket wheel 5 on which, and another 2″ sprocket 6 at the outer end of the arm, the bucket chain 7 is passed. The arm is raised by means of a cord 8, which is secured at 9 to two reversed cranked bent strips 10 bolted to the yoke 11, formed of 3½″ strips, connected at the top by a 2½″ × 1″ double angle strip. The cord 8 passes round one of the two 2″ pulleys 12 and then round the 1″ pulley 13, over the other 2″ pulley 12 on to the winding rod 14. The buckets 15 are caused to move round the arm by rotation of the rod 4, which is effected from the rod 16 by chain and sprocket gear 17.

Model No. 702 Dredger

(continued)

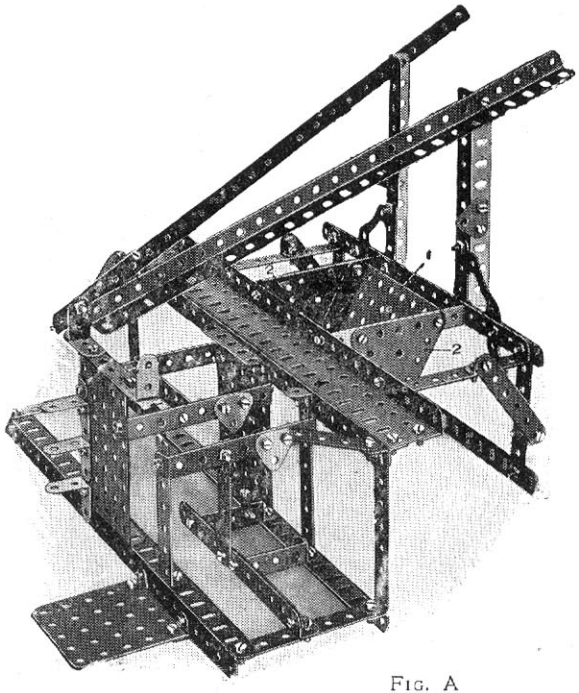


FIG. A

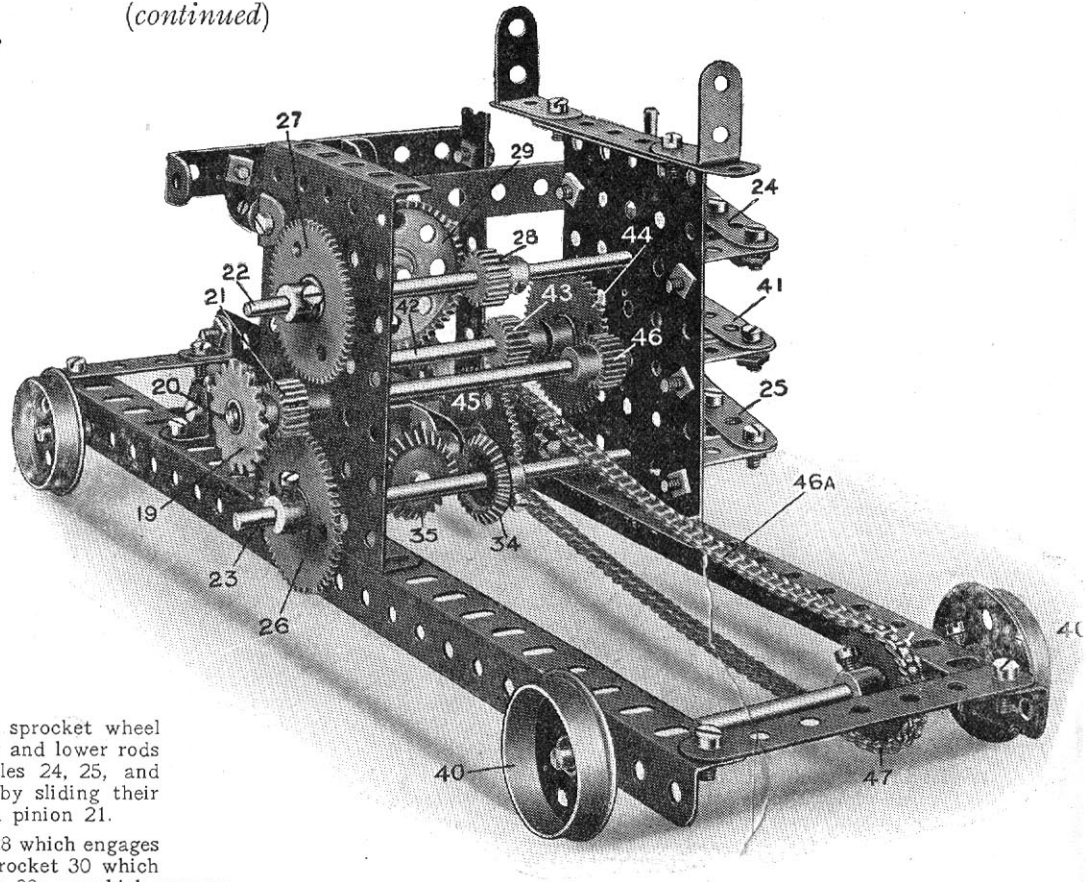


FIG. B

The motor spindle 18, Fig. 702, drives on to the sprocket wheel 19 on a rod 20 on which is a ½" pinion 21. The upper and lower rods 22, 23, Fig. 702B, are controlled by their clutch handles 24, 25, and carry 57-toothed gear wheels 26, 27, either of which by sliding their rods may be brought into engagement with the driven pinion 21.

The rod 22, Fig. 702B and 702C, carries a ½" pinion 28 which engages a contrate wheel 29, on the rod carrying which is a sprocket 30 which drives by a chain 31 a sprocket on the rod 32, a ½" pinion 33A on which engages and drives the gear wheel 33 on the winding rod 14 controlling the cord 8, which raises and lowers the arm. Consequently by operating the clutch handle 24 the bucket arm may be raised or lowered.

Model No. 702 Dredger *(continued)*

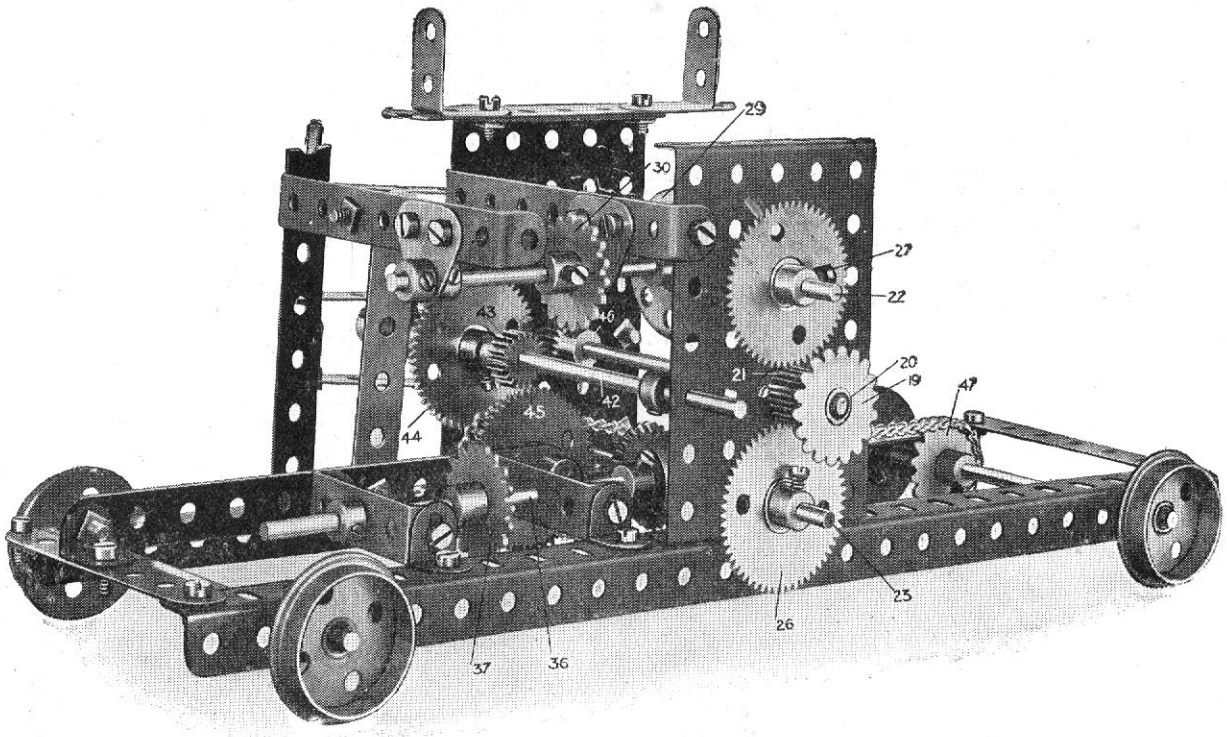


FIG. C

The rod 23, Fig. 702B, similarly may be moved by its clutch arm 25 and the gear wheel 26 brought into engagement with the pinion 21. On the rod 23 is a bevel 34 engaging another bevel wheel 35, on a rod 36, Fig. 702C, on which is a sprocket wheel 37. This sprocket drives by a chain 38, Fig. 702D, a sprocket wheel 39, on the rod 16, which as previously described, operates the movement of the buckets, which are thus under the control of the clutch handle 25.

The travelling of the apparatus on the wheels 40 is controlled by a middle clutch handle 41, which moves the rod 42, Fig. 702C, this rod carrying a ½" pinion 43 and a 57-toothed gear wheel 44, which are operated by the sliding movement of the rod 42 to engage or disengage respectively with a gear wheel 45 and a ½" pinion 46, the latter being on the same rod as the pinion 21, whilst the gear wheel 45 is on a short rod, carrying a sprocket 45A, Fig. 702D, which drives through a chain 46A another sprocket 47, Fig. 702B, on the rod of the travelling wheels 40. Consequently, the drive from the motor is taken from the sprocket 19, Fig. 702B, through the pinion 46 and rod 42 to the chain 46A, and so to the sprocket 47 driving the travelling wheels 40. In order to reverse any of the movements, the switch handle of the motor is connected to the bell crank 48 pivoted on the rod 49, Fig. 702D, and provided with a handle strip 50.

Model No. 702

Dredger

(continued)

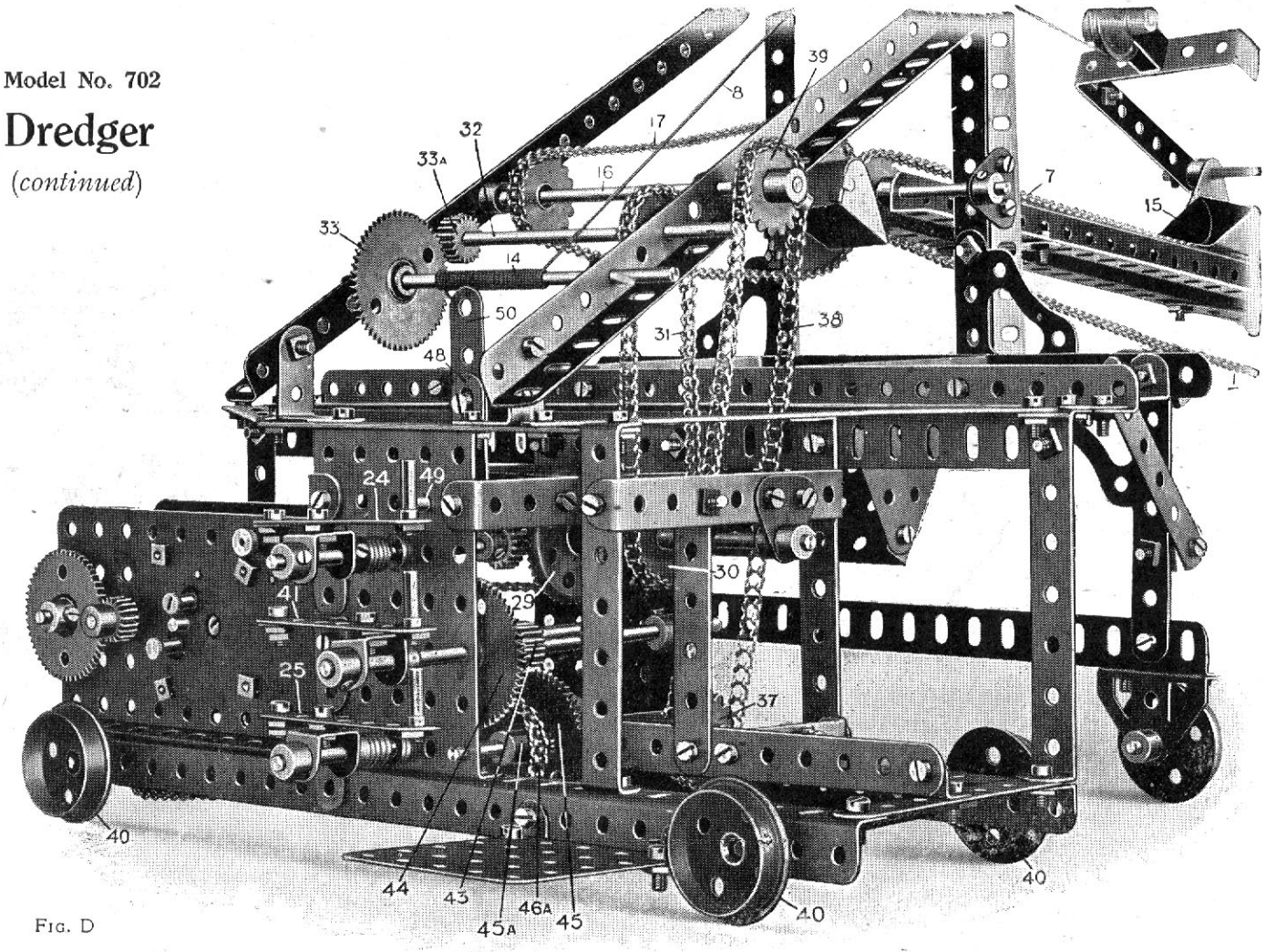
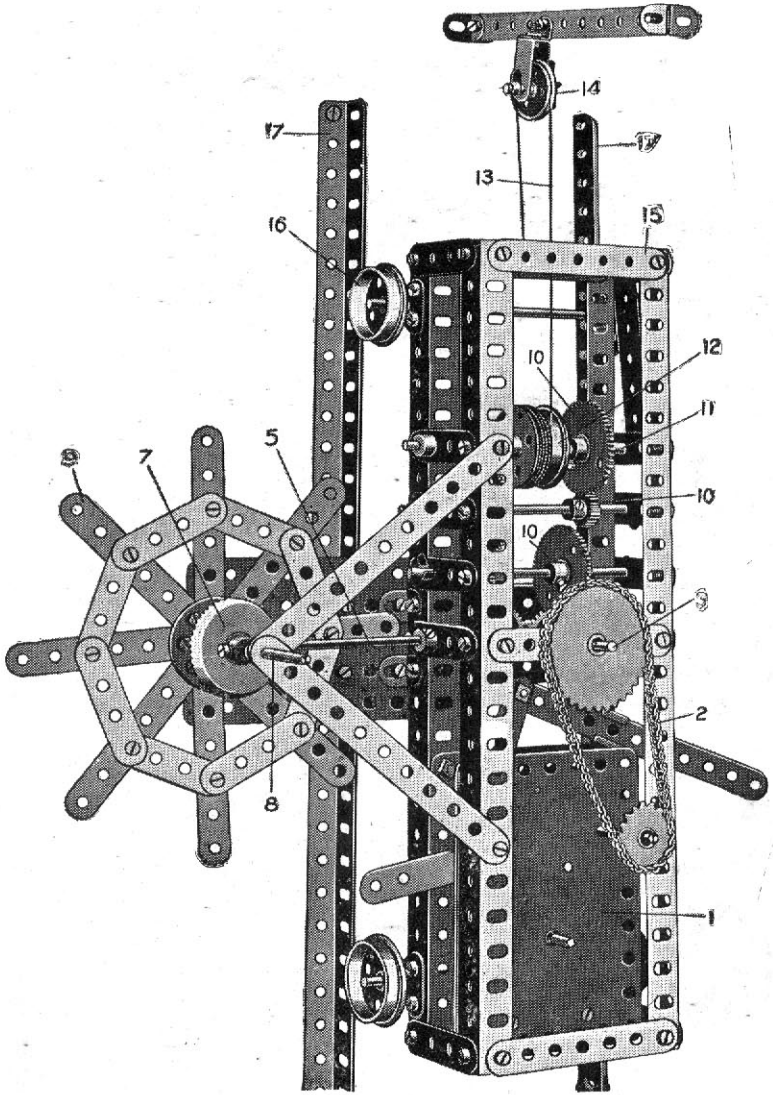


FIG. D



Model No. 703 Coal-Cutting Machine

Parts required :

4	of	No.	2	4	of	No.	26
6	„	„	3	3	„	„	27A
8	„	„	4	1	„	„	28
20	„	„	6	2	„	„	30
2	„	„	7	6	„	„	35
4	„	„	8	75	„	„	37
2	„	„	9	1	„	„	44
9	„	„	12	1	„	„	50
1	„	„	13A	1	„	„	52A
5	„	„	15	6	„	„	59
1	„	„	16	1	„	„	63
1	„	„	17	4	„	„	77
1	„	„	18A	12″	„	„	94
6	„	„	20	1	„	„	95
1	„	„	22A	1	„	„	96
1	„	„	24				

Clockwork Motor

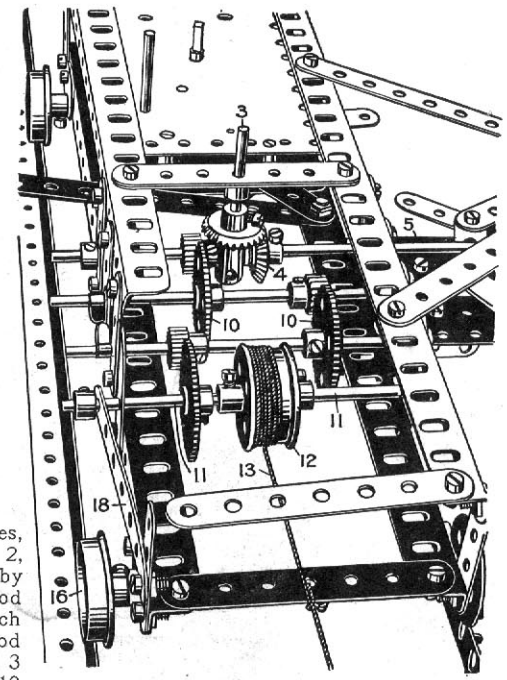


FIG. A

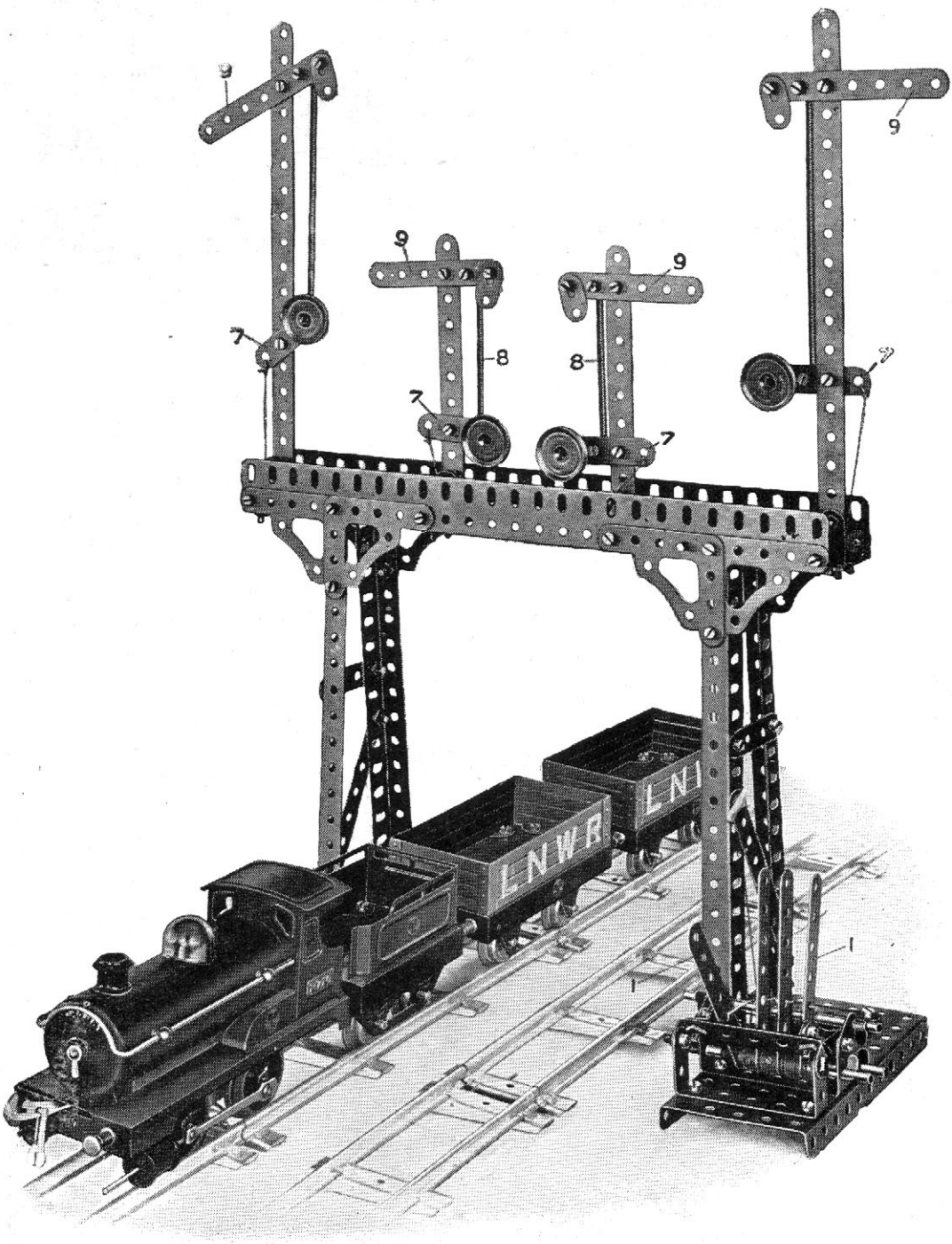
The clockwork motor 1 drives, by the chain and sprocket gear 2, the rod 3, which is connected by bevel wheels 4 to the horizontal rod 5, a ½″ pinion on the end of which drives a contrate wheel 7 on the rod 8 of the cutting wheel 9. The rod 3 also drives through a gear train 10 a rod 11 on which is a drum composed of two flanged wheels 12. A cord 13 winding from the drum round a pulley 14, is connected to the trolley 15. The pulley 14 is fixed to the trolley 15 which runs on flanged wheels 16 on the rails 17. Consequently, as the cutting wheel 9 is rotated from the motor, the cord 13 is also slowly wound on the drum 12, and the whole carriage moving along, the cutting wheel also travels along the coal face.

The mechanism may be thrown out of gear by pressing the rod 11 which slides in its bearings. The strip 18 forms a spring to hold it in gear.

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 704

Signal Gantry



Model No. 704

Signal Gantry *(continued)*

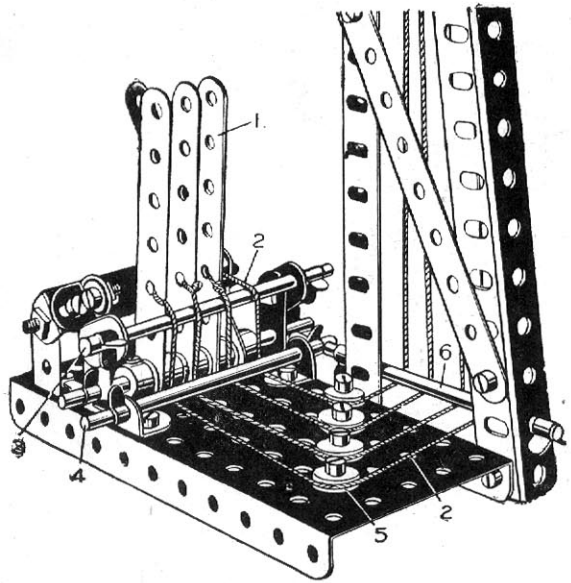


FIG. A

Parts required:

2	of	No.	1A
2	„	„	2
2	„	„	2A
6	„	„	3
2	„	„	4
1	„	„	5
6	„	„	6
4	„	„	8A
6	„	„	10
4	„	„	12A
4	„	„	16
1	„	„	17
4	„	„	22
8	„	„	23
4	„	„	33A
10	„	„	35
77	„	„	37
4	„	„	37B
10	„	„	38
2	„	„	46
1	„	„	48A
1	„	„	52
5	„	„	59

The detail views, Figs. 704A and 704B, bring out the construction of the various parts. In Fig. 704A the levers 1 operate the cords 2 which are passed round the upper and lower rods 3 and 4, and round the ½" pulleys 5, giving the cords a quarter turn before they pass round the rods 6, thence to the various weighted levers 7, which are connected as shown in Fig. 704B to threaded bosses 8 on the signal arms 9 by threaded rods 10.

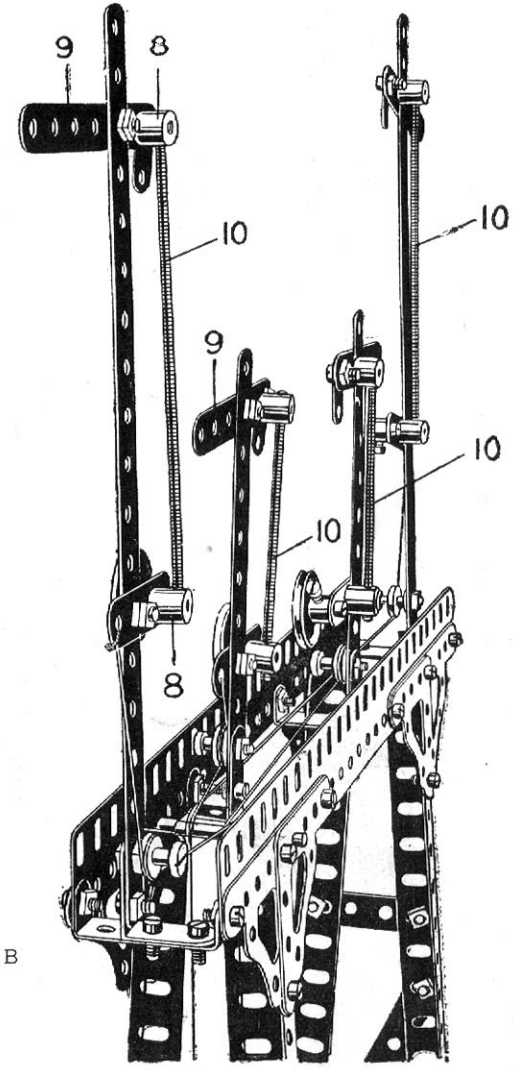


FIG. B

Model No. 705 Planing Machine

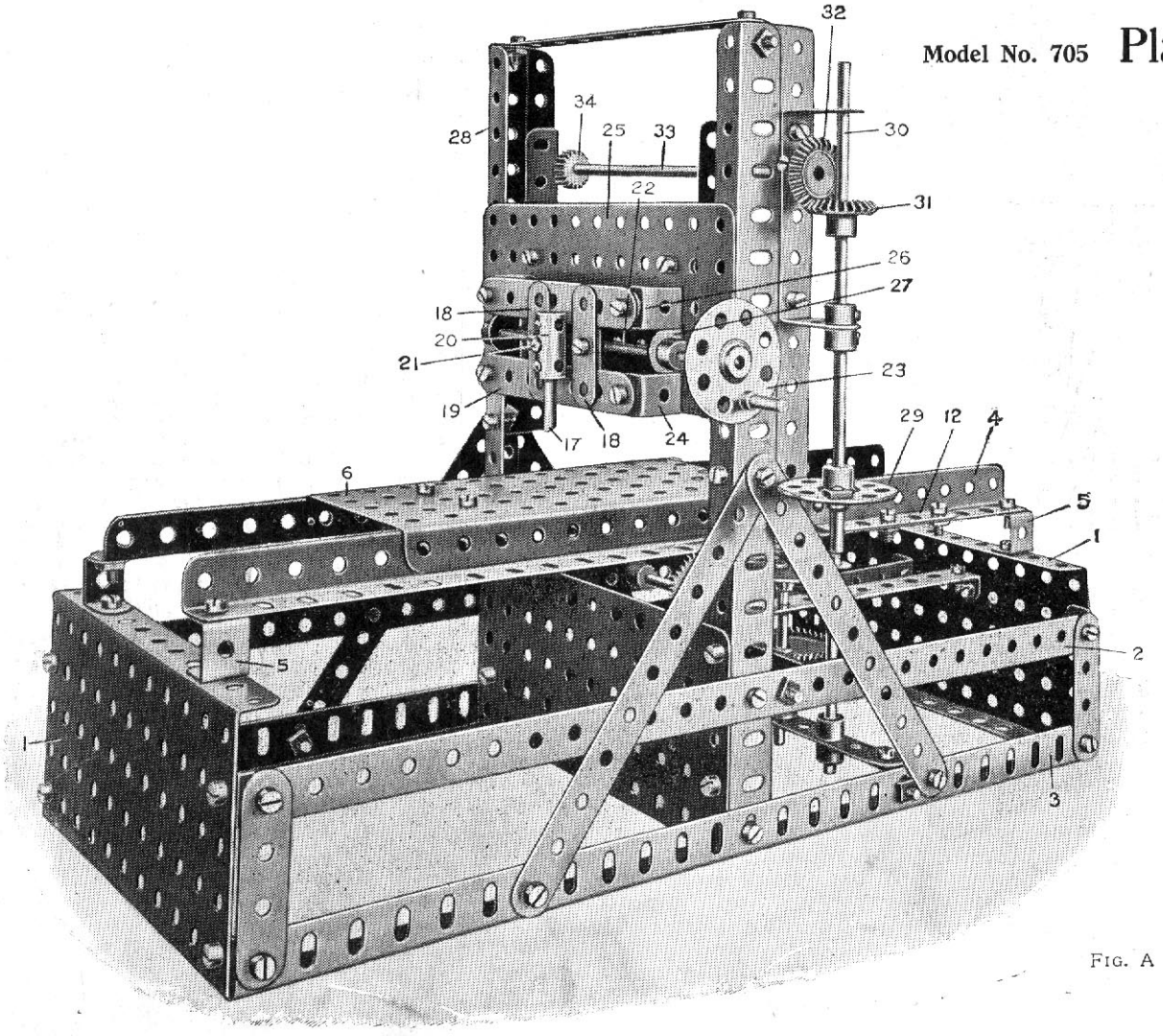


FIG. A

Parts required:

2	of	No. 1	1	of	No. 28
7	„	„ 2	2	„	„ 30
3	„	„ 3	74	„	„ 37
1	„	„ 5	3	„	„ 37A
4	„	„ 6	9	„	„ 38
3	„	„ 6A	2	„	„ 46
4	„	„ 8	1	„	„ 48B
2	„	„ 8A	5	„	„ 48D
8	„	„ 11	1	„	„ 50
12	„	„ 12	2	„	„ 52
1	„	„ 14	12	„	„ 59
1	„	„ 15	1	„	„ 63
5	„	„ 16	1	„	„ 64
1	„	„ 18A	2	„	„ 70
2	„	„ 20	1	„	„ 80
3	„	„ 24	2	„	„ 103
5	„	„ 26	2	„	„ 110
2	„	„ 27A	2	„	„ 115

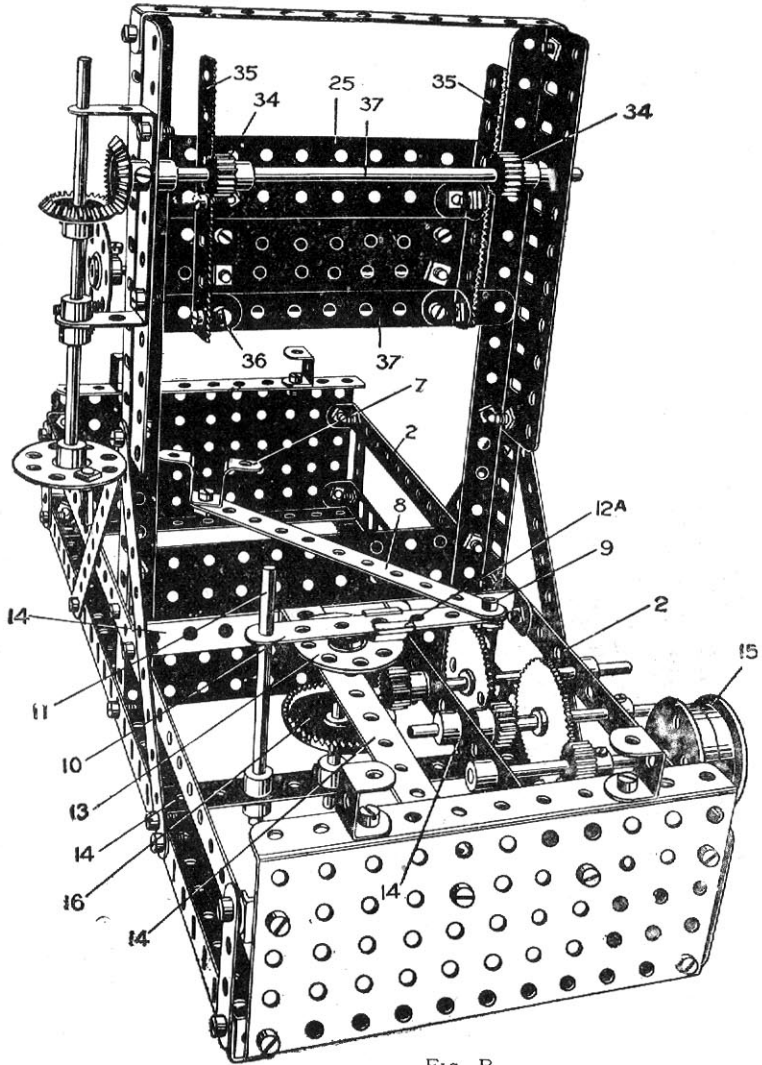


FIG. B

Model No. 705

Planing Machine *(continued)*

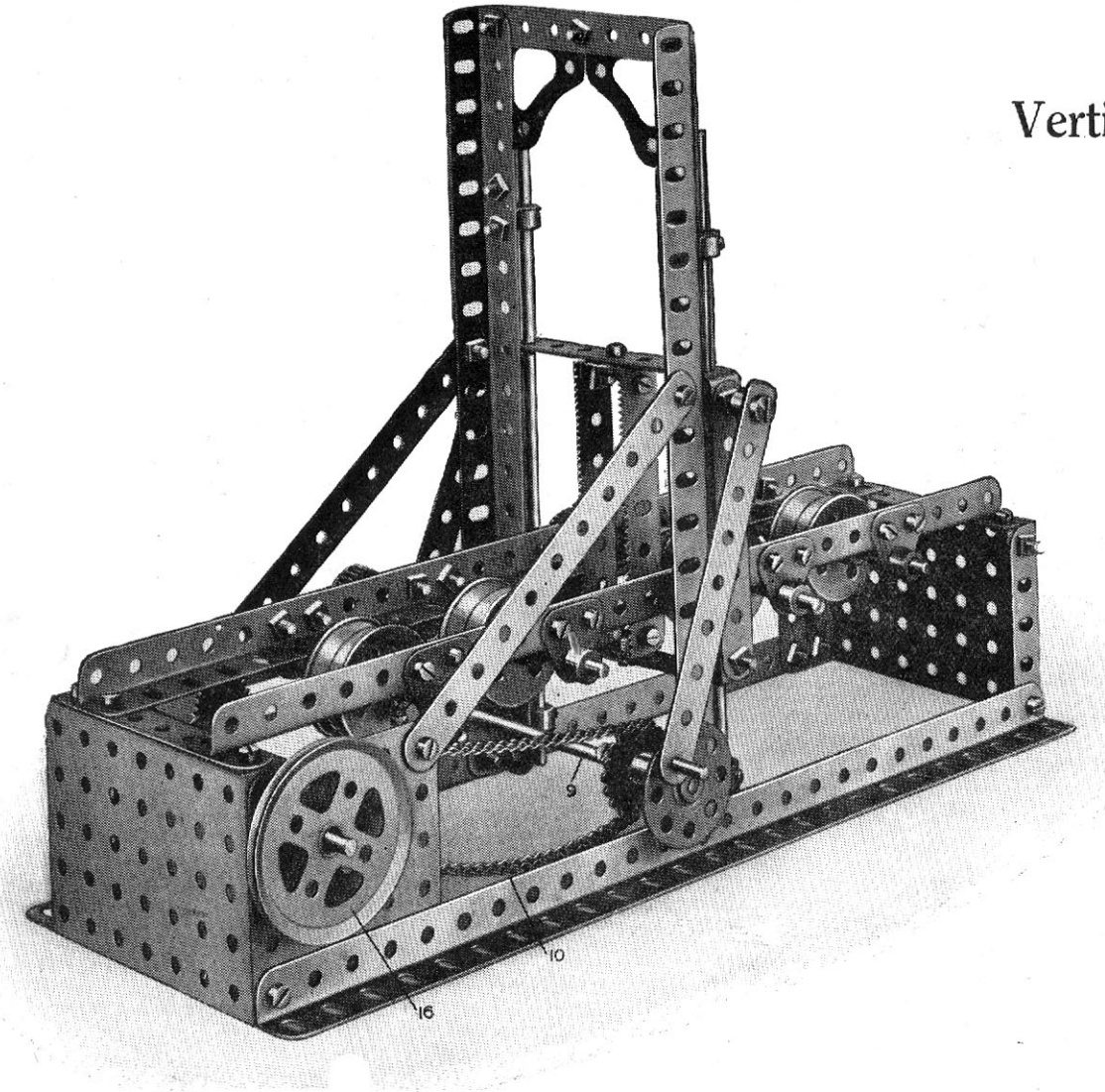
Fig. 705A is a perspective view from the front.

Fig. 705B is a rear view.

The main frame is built up from 5½" flanged plates 1, connected by angle brackets to 12½" strips 2 and lower angle girders 3. Angle girders 4 are bolted to the flanged plate 1 by double brackets 5. These angle girders 4 form the rails upon which the table 6 of the planer slides. The table consists of a 5½" flanged plate. The table is moved to and fro, being bolted by the double bent strip 7, Fig. 705B, to a 5½" strip 8 the end of which is attached at 9 to a 3½" strip 10, pivoted on a rod 11. The strips should be lock-nutted to allow free movement. The rod 11 passes through one of the elongated holes in the angle girder 4, and to prevent play of the rod a 2½" strip 12 is bolted on the flange of the angle girder 4, and in the end hole of this strip the top of the rod 11 is pivoted. The strip 10 engages an eye piece 12A bolted to a bush wheel 13. The eye piece is lock-nutted on the bush wheel, so that while held to the bush wheel it may rotate freely about the bolt as a pivot. Consequently, as the wheel 13 rotates, the table 6 will be moved in one direction, while cutting, more slowly than on the return movement when the work is being brought back. A gear framing by which the bush wheel 13 is driven is made by 5½" by ½" double angle strips 14, Fig. 705B. The gear is driven from the belt pulley 15, formed of two flanged wheels reversed. The gear train may be clearly followed from the illustration, terminating in a pinion driving the contrate wheel 16, secured on the bush wheel rod.

The traversing movement of the cutting tool 17 is effected by means of a guide, formed of two 1½" strips 18, bolted to two corresponding strips at the rear of the horizontal 3½" strips 19, a middle spacing 1½" strip being horizontally arranged between the strips 18. The cutting tool 17 is carried in a coupling 20, which is connected by a threaded pin 21, to a threaded boss on a feed screw 22, which is operated from the bush wheel 23, Fig. 705A. The horizontal strips 19 are supported by double angle brackets 24 from the flat plate 25, and washers 26 are placed beneath the nuts on the strips 19, in order to give the necessary distance at the rear for clearance for the threaded boss on the threaded rod 22. The threaded rod 22 is journalled in the ends of a 3½" by ½" double angle strip 27, bolted to the plate 25. The vertical movement of the plate 25 on the upright angle girders 28 is effected from the bush wheel 29 mounted on a rod 30, a bevel wheel 31 engaging a corresponding bevel 32 on a rod 33, carrying 2 pinions 34, which engage the racks 35, secured by angle brackets 36 to 5½" strips 37, bolted to the plate 25, with spacing washers between, so that a clearance is provided between the ends of the strips 37 and the plate 25, to engage in a sliding movement round the flanges of the angle girders 28.

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.



Model No. 706

Vertical Log Saw

Parts required :

2	of	No.	2
2	„	„	2A
5	„	„	3
1	„	„	6
4	„	„	8
2	„	„	8A
12	„	„	12
2	„	„	12A
1	„	„	13
2	„	„	13A
1	„	„	15
4	„	„	15A
2	„	„	16
8	„	„	20
1	„	„	20A
2	„	„	24
2	„	„	25
1	„	„	26
1	„	„	27A
2	„	„	30
2	„	„	32
2	„	„	33A
59	„	„	37
6	„	„	37A
2	„	„	48B
2	„	„	53
17	„	„	59
2	„	„	72
10	„	„	77
12"	„	„	94
2	„	„	96
2	„	„	108
2	„	„	110
2	„	„	115

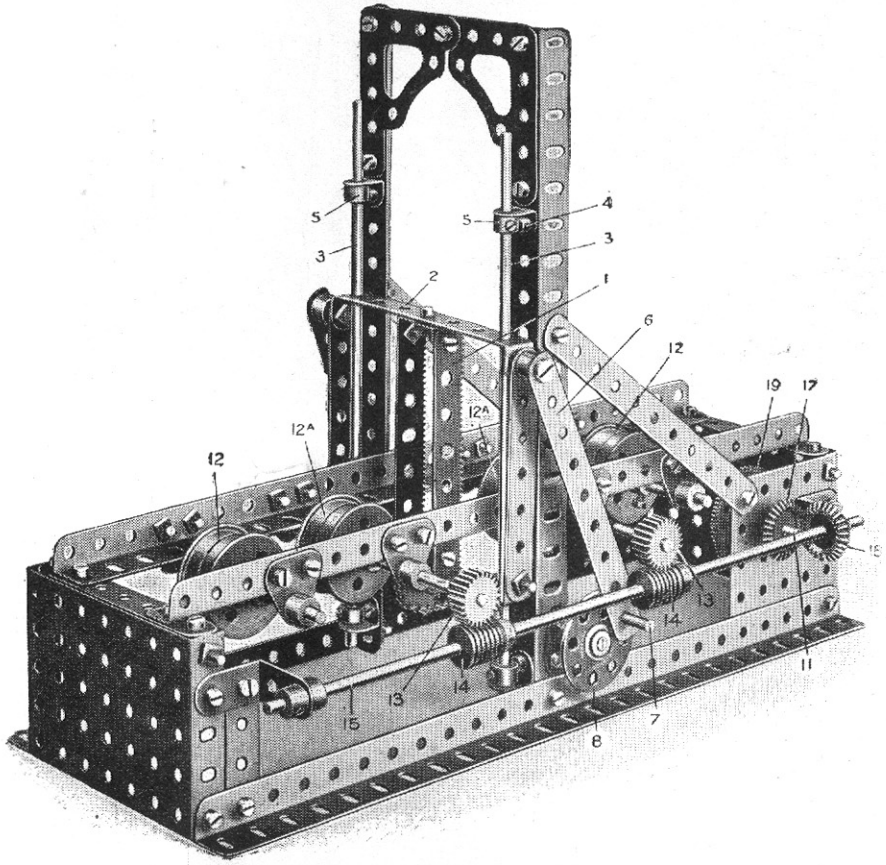


FIG. 706A

Model No. 706

Vertical Log Saw

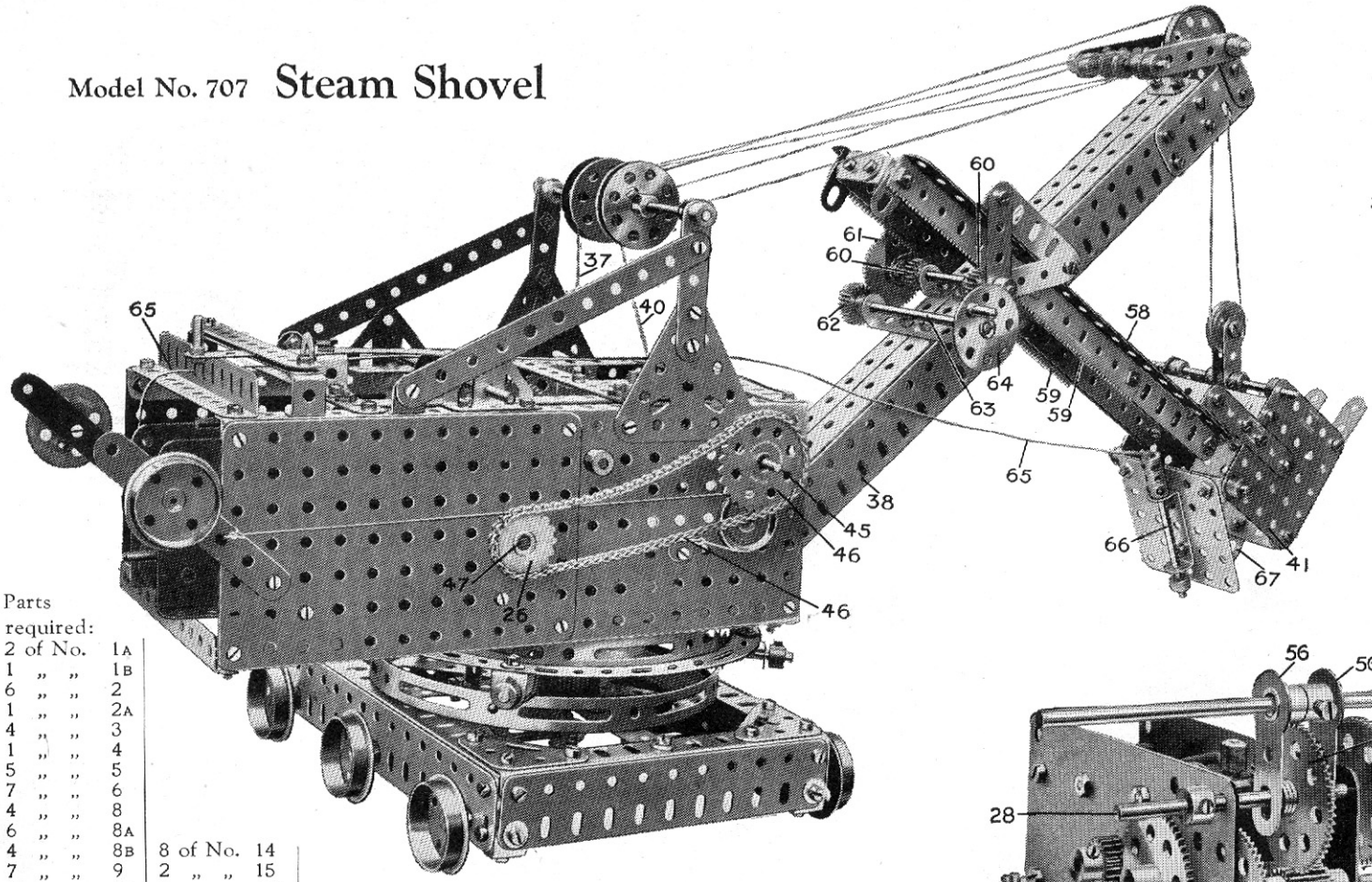
(continued)

This is a model of a machine used for sawing logs into planks.

Fig. 706 is a front perspective view of the log saw, and Fig. 706A a rear perspective view.

The saws represented by the rack strips 1 are carried in a vertical moveable frame 2 which slides on the rods 3 as guides. These rods 3 are rigidly held in the angle brackets 4 by the collars 5. The saw frame is reciprocated on the guide rods 3 by the link strips 6, connected to the frame 2 by pivot bolts lock-nutted to the frame and spaced with collars and the lower holes engage the threaded pins 7 on the bush wheels 8, the rod 9 of which is connected by a sprocket chain 10 to a sprocket wheel on the spindle 11. The log is caused to move past the saws by being supported on the pairs of reversed flanged wheels 12 and 12A, the centre pairs of which are positively driven from the $\frac{3}{4}$" pinions 13, which are engaged by the worm 14 on the rod 15. The movement of the flanged pulleys 12A and of the saws 1 are both effected from the 2" pulley wheel 16, the rod of which carries a $\frac{1}{2}$" pinion engaging a 56-toothed wheel 19 on the rod 11. At the outer end of this rod 11 is a bevel wheel 17 engaging a corresponding bevel 18 on the rod 15. Consequently, if the pulley wheel 16 be driven, the saw frame is reciprocated vertically, and the centre pairs of the flange wheels rotated, causing the log to be fed towards the saws. The opposite end of the rod carrying the pulley wheel 16 passes through one of the holes of the 1" angle bracket forming the bearing for the rod 15.

Model No. 707 Steam Shovel



Parts required:

2 of No.	1A	8 of No.	14												
1 „ „	1B	2 „ „	15												
6 „ „	2	1 „ „	15A												
1 „ „	2A	7 „ „	16												
4 „ „	3	4 „ „	16A	4 of No.	22A	1 of No.	27	1 of No.	32	1 of No.	45				
1 „ „	4	1 „ „	18A	2 „ „	23	7 „ „	27A	1 „ „	33A	1 „ „	48				
5 „ „	5	5 „ „	18B	4 „ „	23A	1 „ „	27B	5 „ „	35	3 „ „	48A				
7 „ „	6	8 „ „	20	5 „ „	24	1 „ „	28	195 „ „	37	1 „ „	48D				
4 „ „	8	1 „ „	21	1 „ „	25	2 „ „	30	24 „ „	38	5 „ „	52A				
6 „ „	8A	2 „ „	22	9 „ „	26	2 „ „	31	1 „ „	40	36 „ „	59				
4 „ „	8B														
7 „ „	9														
2 „ „	9B														
4 „ „	9D														
4 „ „	9F														
7 „ „	10														
6 „ „	11														
11 „ „	12														
4 „ „	12B														
2 „ „	13A														

Parts required (*continued*):

3 of No.	62		
2 „ „	63		
4 „ „	72		
2 „ „	76		
2 „ „	77		
36″ „ „	94		
1 „ „	95		
1 „ „	95A		
3 „ „	96		
1 „ „	96A		
2 „ „	103		
2 „ „	103B		
2 „ „	103F		
1 „ „	103H		
2 „ „	103K		
4 „ „	110		
4 „ „	111		
2 „ „	115		
1 „ „	118		
4 „ „	125		
3 „ „	126		
4 „ „	133		
1 „ „	143		
1 „ „	145		

Electric Motor

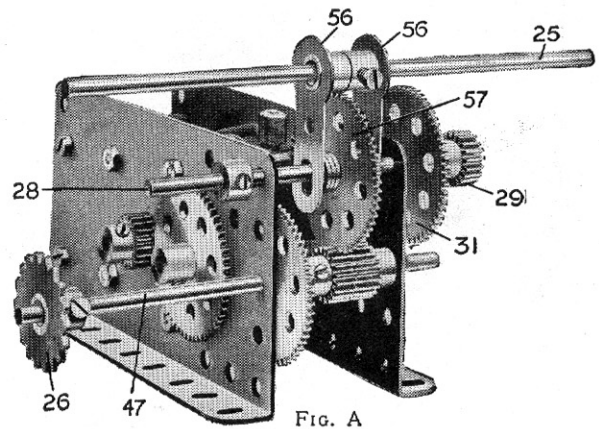


FIG. A

Model No. 707 Steam Shovel

(continued)

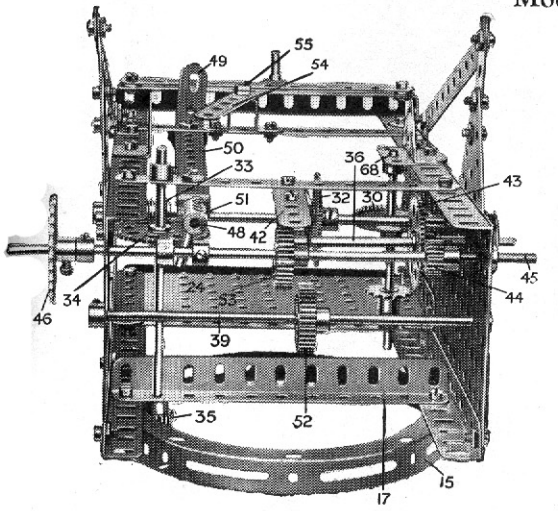


FIG. B.

Begin by building up the base frame (Fig. D) from 7½" flat girders 1 at the sides, and 5½" flat girders 2 at the front. These are joined to 7½" and 5½" angle girders 3 and 4, respectively braced with corner brackets 5 at the top and angle brackets at the bottom. A hub disc 6 is bolted to a 7½" strip 8, which is secured across the angle girders, and also bolted to two side angle girders 3. The vertical 4½" rod 9 is then passed through the centre hole of the strip 8, and beneath is secured a bevel wheel. This engages another bevel wheel on the axle, which carries the central travelling wheels 10 and is connected by sprocket wheels and chain to the rear axle. The large 3½" gear wheel 11 is then secured to the hub disc by four ½" reversed angle brackets by bolts 12.

The body (Fig. C) consists of two 5½" × 3½" flat plates, overlapped three holes to form each side. These are secured to 9½" angle girders 13 along the upper and lower edges, and these are connected across by 5½" angle girders 14. Beneath the body is bolted a circular girder 15 by bolts 16, across which, held by the same bolts, is a 5½" angle girder 17. Through this angle girder passes the rod 9 carrying a 2" sprocket wheel 18. A collar 19 engages above the angle girder 17.

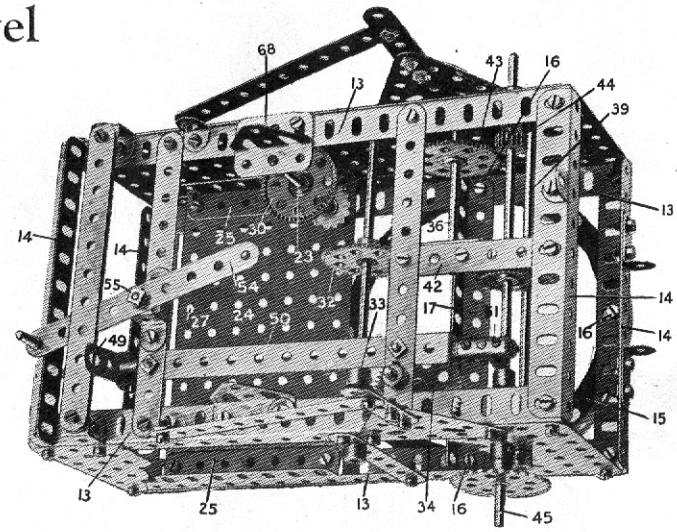


FIG. C.

Next build up the roller race (Fig. D) formed of four double brackets 20, bolted to a flat ring 21. ½" fast pulleys are secured on 1½" rods 22, which are also secured with collars on the outside. The whole is then placed on the top edge of the hub disc and the body is threaded on to the rod 9 in the centre hole of the angle girder 17. After the collar 19 is secured in position, the sprocket wheel 18 is bolted to the rod 9.

The top bearing for the 3½" rod 23 is formed by a 1½" flat girder, over which is secured a trunnion. A 3½" × 5½" flat plate 24 is secured to each side of the body by 3½" angle girders 25 in the second hole up. This provides a bed to which the electric motor is secured. On the lower part of rod 23 is secured a ¾" sprocket wheel from which a chain drives the sprocket wheel 18 which operates the lower bevels to drive the travelling wheels.

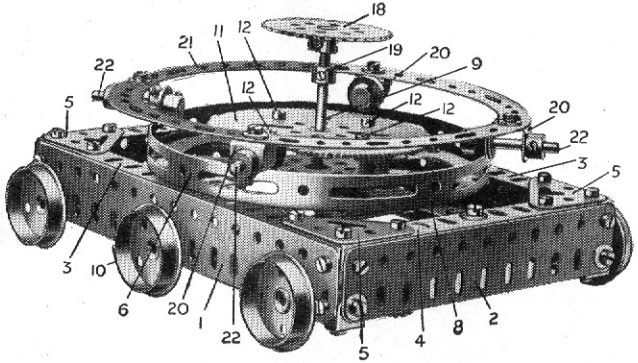


FIG. D.

Now build up the motor unit, leaving off the rod 25 and sprocket 26. (The gear wheels and rods are clearly seen in Fig. A). The motor is then secured to the plate 24, the correct position being found when the fourth hole from the back of the motor registers with hole 27 in the plate.

When the motor is in position, owing to the rod 28 being slideable the pinion 29 may be engaged with the contrate wheel 30 or the gear wheel 31 with the gear wheel 32. The spindle of the other gear wheel 32 carries a worm 33 (Fig. B) which engages a gear wheel 34. On the spindle of 34 is a pinion 35, which engages and drives the 3½" gear wheel 11, thus rotating the Shovel.

On the 3½" rod 36 is wound the cord 37 for raising and lowering the jib 38, and on the 6" rod 39 is wound the cord 40 for raising and lowering the shovel 41. The rod 36 is journalled in a trunnion bolted underneath the strip 42 and carries a 1½" gear wheel 43, which is engaged by a pinion 44 on an 8" rod, 45. This is driven by a 1½" sprocket wheel 46 from the 1" sprocket wheel 26 on the motor spindle 47.

The spindle 45 is slideable by the rotation of an 8" rod 48 operated by the crank 49, the rod being journalled in the ends of a 5½" × ½" double angle strip 50, a coupling 51 carrying a 1" rod which engages between two collars on the rod 45. In this way the pinion 44 may be meshed with the gear wheel 43 in order to raise or lower the jib, or a 1" gear wheel 52 on the rod 39 may be engaged with a 1" gear wheel 53 to raise or lower the shovel arm 38.

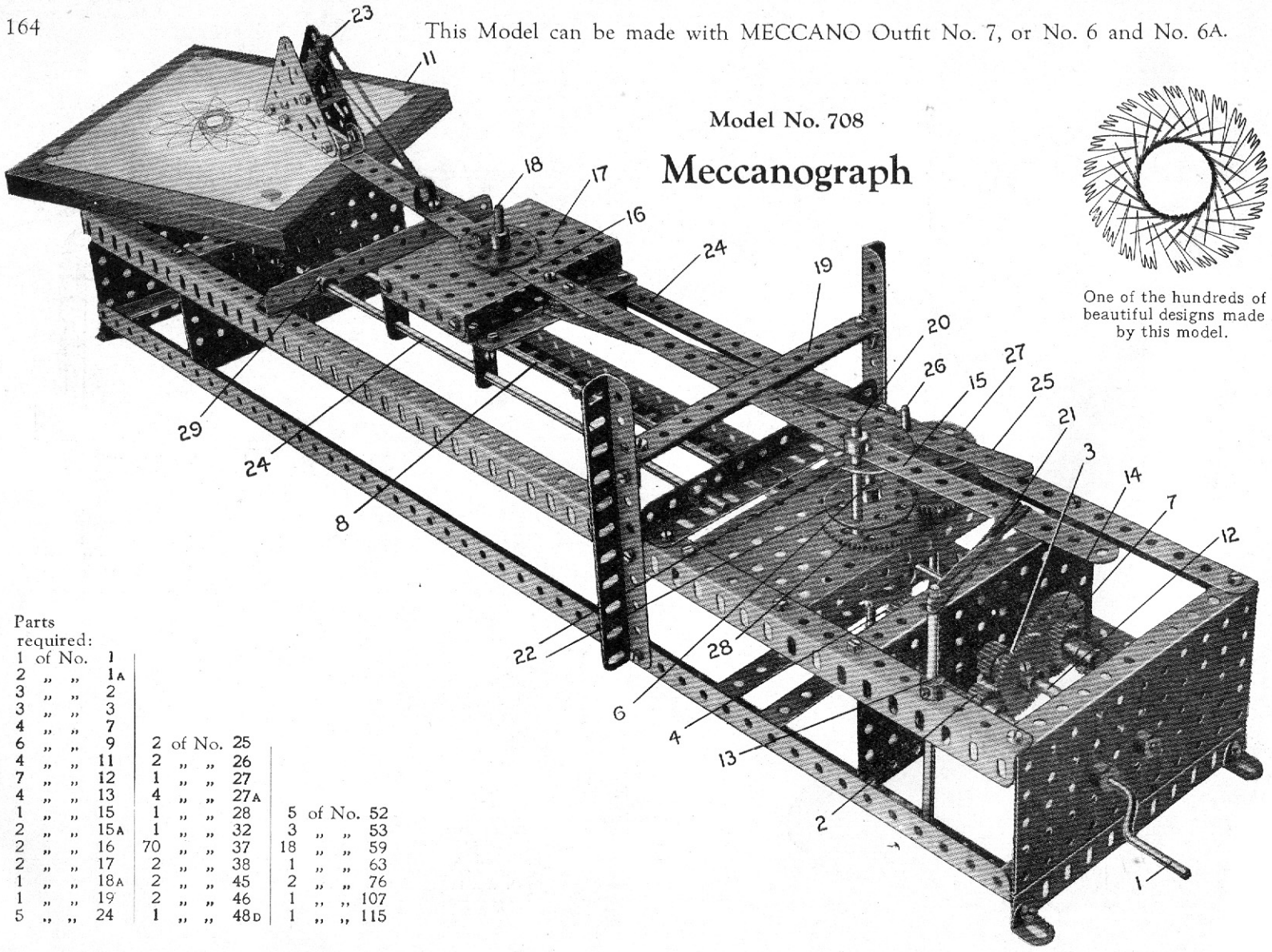
The rod 28 is slideable by a 4½" strip 54 pivoted at 55, the outer end of which engages between two cranks 56. These grip on either side of a 1½" gear wheel 57, several washers being placed between the cranks to take up the slack. The shovel 41 is carried on a sliding frame consisting of angle girders 58 to which are bolted racks 59. These are engaged by ½" pinions 60 on a 3½" rod. A 50-toothed gear wheel 61, which is driven by a ¾" pinion 62 on a 3½" rod 63 operated by the hand wheel 64. The bottom of the shovel is released by a cord 65 connected to a sliding rod 66, the end of which enters the aperture of a flat bracket 67.

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 708

Meccanograph

One of the hundreds of beautiful designs made by this model.



Parts required:

1	of No.	1	2	of No.	25	5	of No.	52
2	„ „	1A	2	„ „	26	3	„ „	53
3	„ „	2	1	„ „	27	18	„ „	59
3	„ „	3	4	„ „	27A	1	„ „	63
4	„ „	7	1	„ „	28	2	„ „	76
6	„ „	9	1	„ „	32	1	„ „	107
4	„ „	11	70	„ „	37	1	„ „	115
7	„ „	12	2	„ „	38			
4	„ „	13	2	„ „	45			
1	„ „	15	2	„ „	46			
2	„ „	15A	1	„ „	48D			
2	„ „	16						
2	„ „	17						
1	„ „	18A						
1	„ „	19						
5	„ „	24						

Model No. 708

Meccanograph *(continued)*

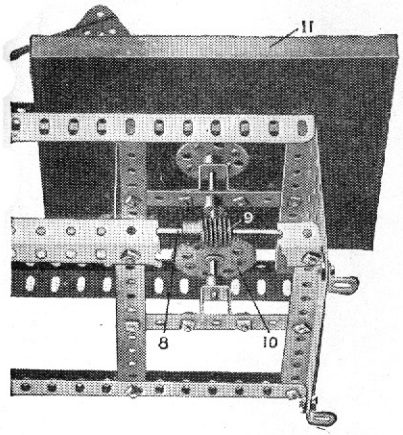


FIG. A

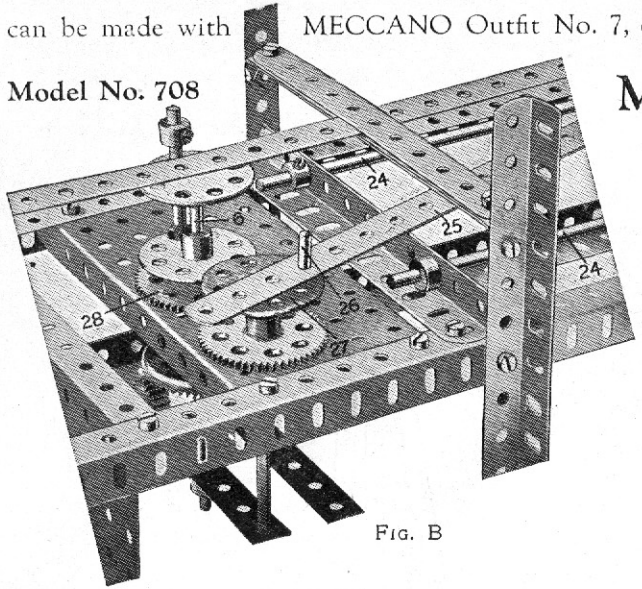


FIG. B

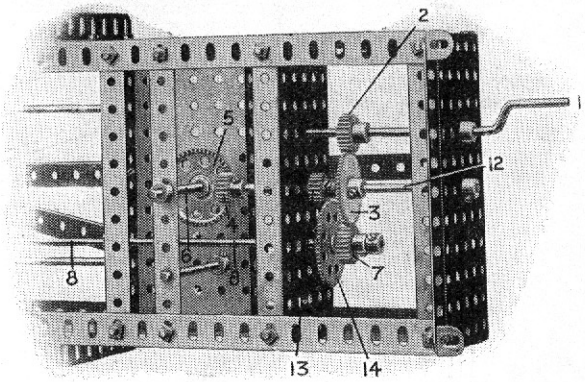


FIG. C

This is a model of extraordinary interest, and we hope that all Meccano boys will build it. With it any boy can make an amazing variety of exquisite designs by fixing a sheet of paper and pen in position and turning the handle. We have reproduced a neat design that has been made with the Meccanograph, and this could be supplemented by thousands of others if we had the space. We must content ourselves by saying that there is no limit whatever to the variety and beauty of the designs to be made by simply varying the adjustments. When tastefully filled-in with different tints of water colours, the effect is most pleasing.

The Meccanograph is driven from the handle 1 on which is a 25-toothed pinion 2 engaging a 50-toothed gear wheel 3 on the axle of which is a 19-toothed pinion 4 engaging a 1½" contrate wheel 5 on the spindle 6. The gear wheel 3 drives a 25-toothed pinion 7 on an axle rod 8 extending along to the table and by means of a worm 9 (Fig. A) drives a 57-toothed gear wheel 10 on the upright spindle to which the rotating table 11 is secured by a bush wheel. In order to vary the speed of rotation of the table 11 for a constant turning of the handle 1 an alternative drive is arranged. For this purpose there is loosely mounted on the rod 12 a 19-toothed pinion 13 adapted to engage a 57-toothed gear wheel 14. Consequently, the rod 8, when the wheels 13 and 14 are loose, is driven by the toothed wheels 3 and 7, and if the pinion 7 be disconnected from its rod and the pinion 13 and gear wheel 14 be fixed to their respective rods, the table will be driven at a much lower speed.

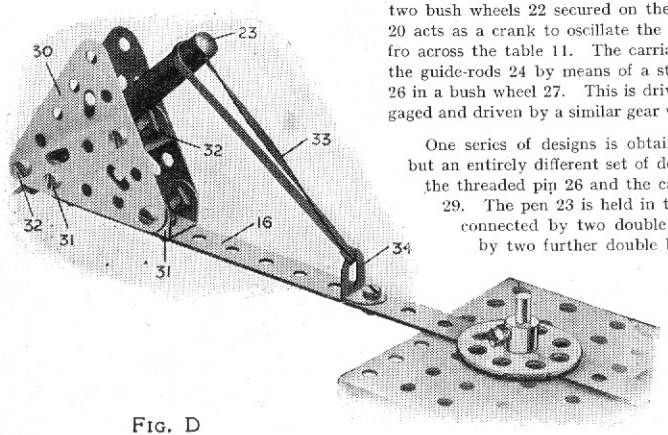


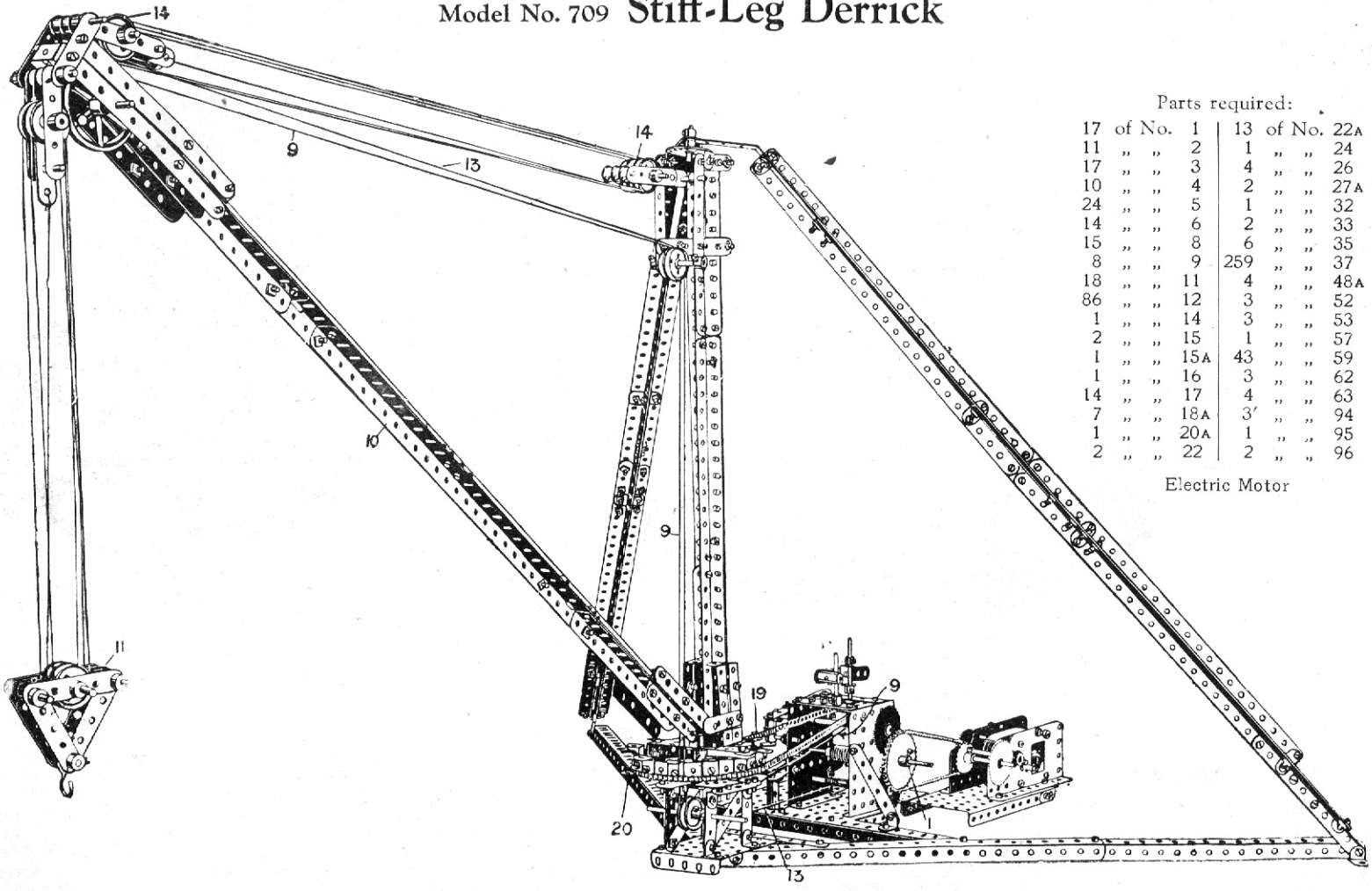
FIG. D

The arm is built up of a 12½" strip 15 and a 9½" strip 16 overlapped three holes and adjustably connected to the carriage 17 by a 1" rod 18. It passes through one of the perforations in the strip 16 so that, in order to vary the design produced, the rod 18 may be inserted in any suitable hole in the strip 16 or in any suitable hole in the carriage 17. The strip 15 is guided between the 5½" strips 19 spaced by washers at each end. The strip 15 of the arm continually bears against the rod 20 by the pulling action of an elastic band 21, the rod 20 passing through two bush wheels 22 secured on the rod 6. Consequently, as the bush wheels rotate, the rod 20 acts as a crank to oscillate the arm about the pivot rod 18 and moves the pen 23 to and fro across the table 11. The carriage 17 is simultaneously caused to travel to and fro along the guide-rods 24 by means of a strip 25 (Fig. B), one hole of which engages a threaded pin 26 in a bush wheel 27. This is driven by means of a 1½" gear wheel on its axle rod, being engaged and driven by a similar gear wheel 28 secured on the vertical rod 6.

One series of designs is obtained from the Meccanograph as shown in the illustration, but an entirely different set of designs may be obtained if the strip 25 is disconnected from the threaded pin 26 and the carriage 17 locked on the guide rods 24 by means of collars 29. The pen 23 is held in the holder (Fig. D) formed by two 2½" triangular plates 30 connected by two double brackets 31 to the arm 16, and connected together also by two further double brackets 32. The pen 23 is retained in this holder by an elastic band 33 connected to an angle bracket 34 on the arm.

Care should be taken to see that all parts of the model work smoothly and that no jolting takes place, otherwise the lines of the design will be uneven.

Model No. 709 Stiff-Leg Derrick



Parts required:

17	of No.	1		13	of No.	22A
11	„	„	2	1	„	„	24
17	„	„	3	4	„	„	26
10	„	„	4	2	„	„	27A
24	„	„	5	1	„	„	32
14	„	„	6	2	„	„	33
15	„	„	8	6	„	„	35
8	„	„	9	259	„	„	37
18	„	„	11	4	„	„	48A
86	„	„	12	3	„	„	52
1	„	„	14	3	„	„	53
2	„	„	15	1	„	„	57
1	„	„	15A	43	„	„	59
1	„	„	16	3	„	„	62
14	„	„	17	4	„	„	63
7	„	„	18A	3	„	„	94
1	„	„	20A	1	„	„	95
2	„	„	22	2	„	„	96

Electric Motor

Model No. 709 Stiff-Leg Derrick *(continued)*

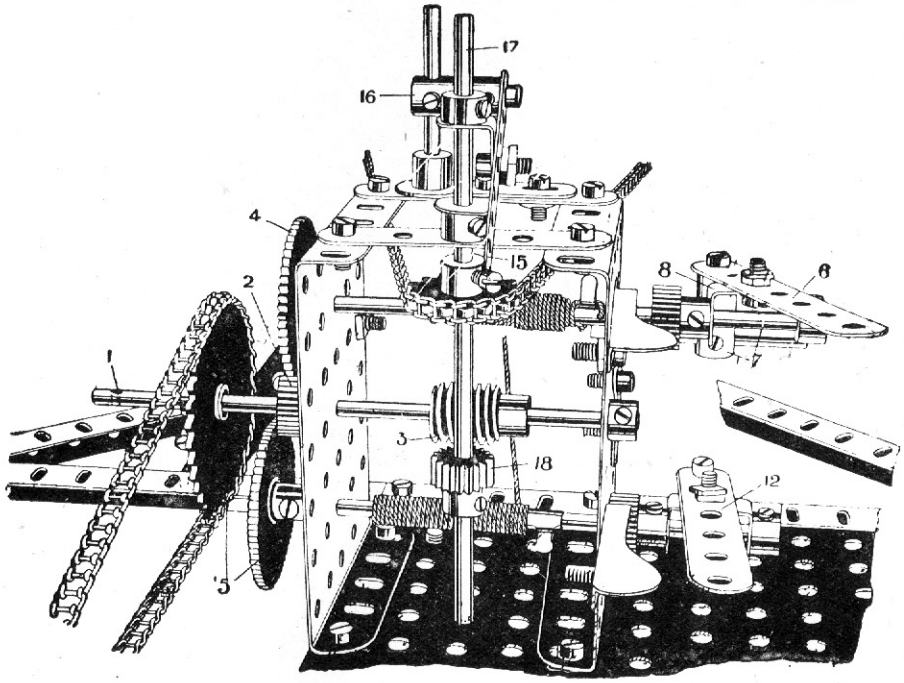


FIG. 709A

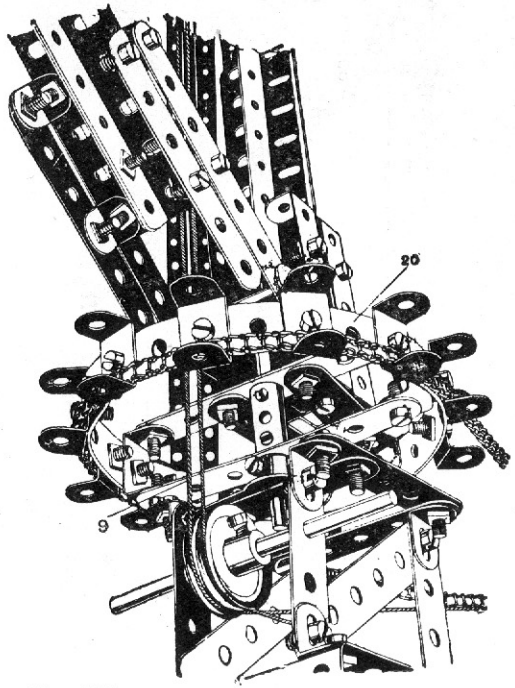


FIG. 709B

There are three motions in this Crane, hoisting, swinging and luffing the jib.

The main driving spindle 1 geared by chain and sprocket to the motor carries a pinion 2 and a worm 3. With the pinion 2 one or other of the gear wheels 4, 5 are engaged according as to whether the load is to be raised or the jib luffed. The spindles of the gear wheels are slideable in their bearings, and a lever 6, pivoted to a coupling 7 and pivotally bolted to a double bracket 8 on the hoisting spindle, is adapted to move the gear 4 into or out of engagement with the pinion 2, the cord 9 winding on or off the spindle. This cord passes round the purchase block 11. To luff the jib 10 the lower strip 12, pivoted like the upper one to a coupling and connected to a double bracket on the spindle of the gear wheel 5, is moved bringing the gear 5 into engagement with the pinion 2, the luffing cord 13 passing round the pulleys 14. To swing the jib a third lever 15, pivoted to a coupling 16, is connected by a double bracket to a vertically slideable rod 17, which carries a pinion 18. By moving the handle 15 the pinion is engaged or disengaged with the worm 3 on the main shaft and the jib swung round by reason of a chain and sprocket gear 19 passing round a wheel 20 formed by a bent 12½" strip having double brackets bolted on its circumference.

Model No. 710

Aeroscope

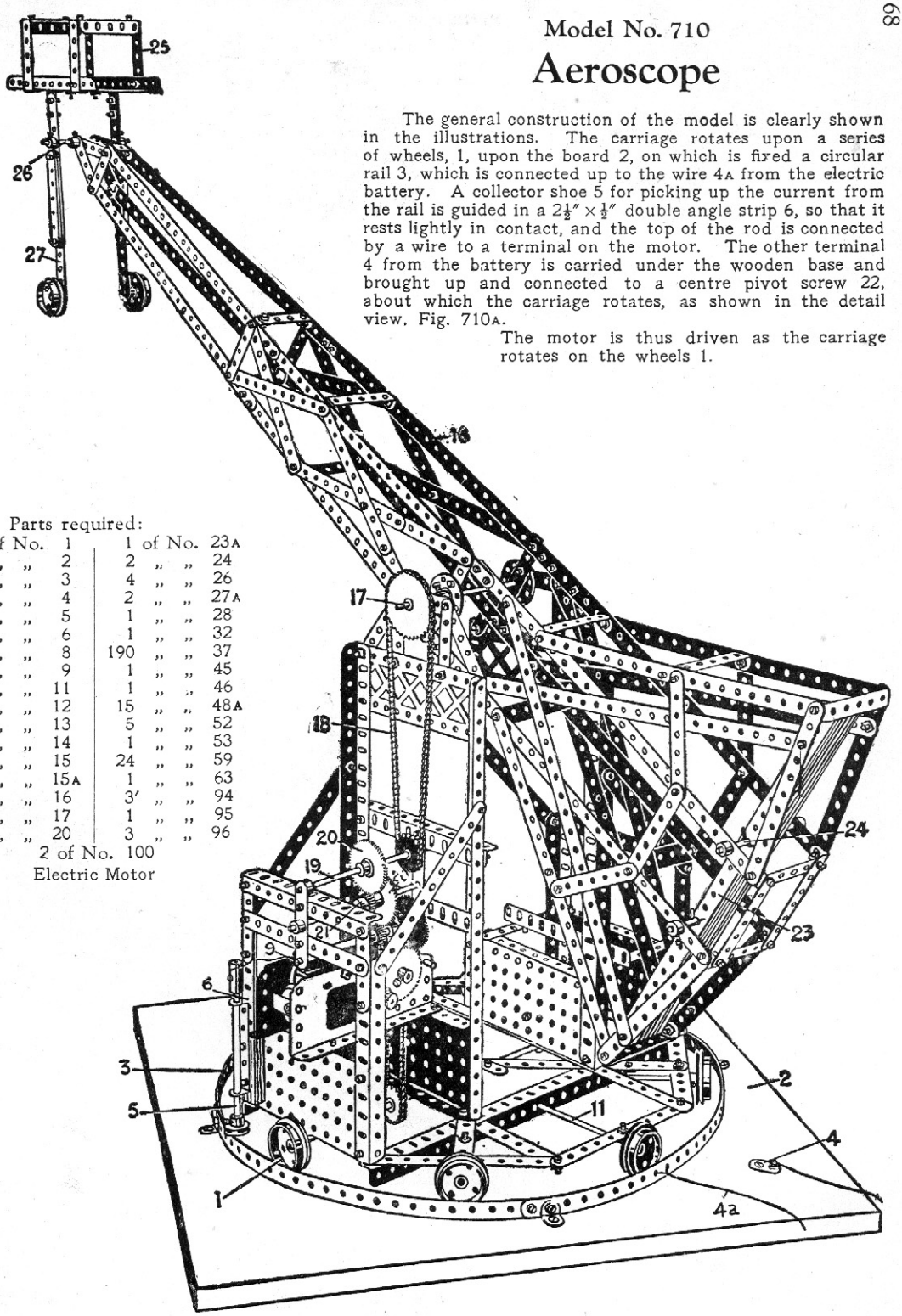
The general construction of the model is clearly shown in the illustrations. The carriage rotates upon a series of wheels, 1, upon the board 2, on which is fixed a circular rail 3, which is connected up to the wire 4A from the electric battery. A collector shoe 5 for picking up the current from the rail is guided in a $2\frac{1}{2}'' \times \frac{1}{2}''$ double angle strip 6, so that it rests lightly in contact, and the top of the rod is connected by a wire to a terminal on the motor. The other terminal 4 from the battery is carried under the wooden base and brought up and connected to a centre pivot screw 22, about which the carriage rotates, as shown in the detail view, Fig. 710A.

The motor is thus driven as the carriage rotates on the wheels 1.

Parts required:

50	of No.	1		1	of No.	23A
40	„ „	2		2	„ „	24
20	„ „	3		4	„ „	26
6	„ „	4		2	„ „	27A
21	„ „	5		1	„ „	28
4	„ „	6		1	„ „	32
6	„ „	8		190	„ „	37
8	„ „	9		1	„ „	45
2	„ „	11		1	„ „	46
19	„ „	12		15	„ „	48A
1	„ „	13		5	„ „	52
1	„ „	14		1	„ „	53
5	„ „	15		24	„ „	59
1	„ „	15A		1	„ „	63
2	„ „	16		3'	„ „	94
5	„ „	17		1	„ „	95
10	„ „	20		3	„ „	96

2 of No. 100
Electric Motor



Model No. 710 Aeroscope *(continued)*

The rotation of the carriage is effected from the pinion 7, which gears with and drives a gear wheel on the spindle 8 on which latter is a worm gearing with a gear wheel 9, the spindle of which latter drives through the sprocket chain 10 and rod 11 on the outer ends of which are fixed flanged wheels 12.

The wheels 12 at each end of the rod 11 are caused to rotate in opposite directions by means of the gear shown in Fig. 710A, the rod 11 being divided and two pinions 13 and 14, secured on the separate parts of the rod, gearing with a contrate wheel 15, so that the flanged wheels at each end rotate in opposite directions. The end of one part of rod 11 is entered into the bore of the pinion 14, which is secured on the other part of the rod, the pinion 14 thus supporting the end of the other part of the rod 11.

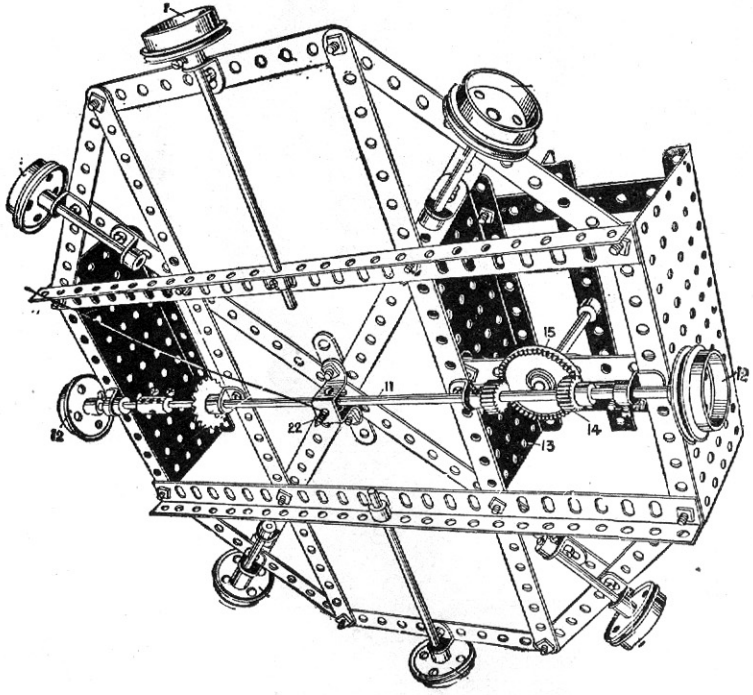


FIG. 710A

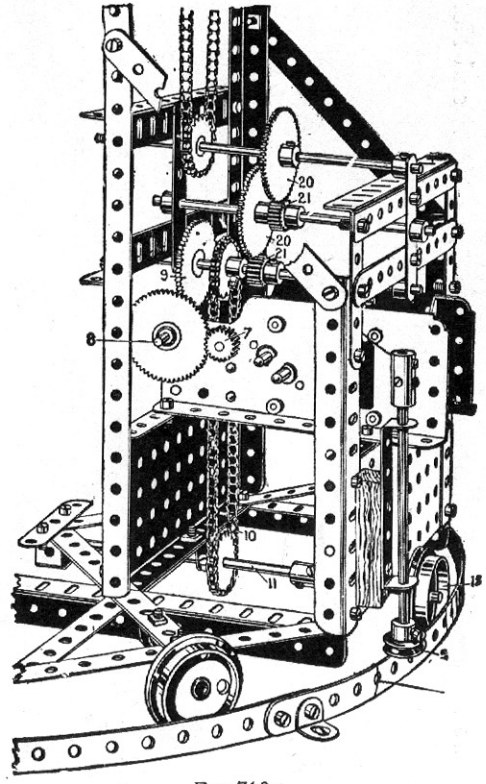
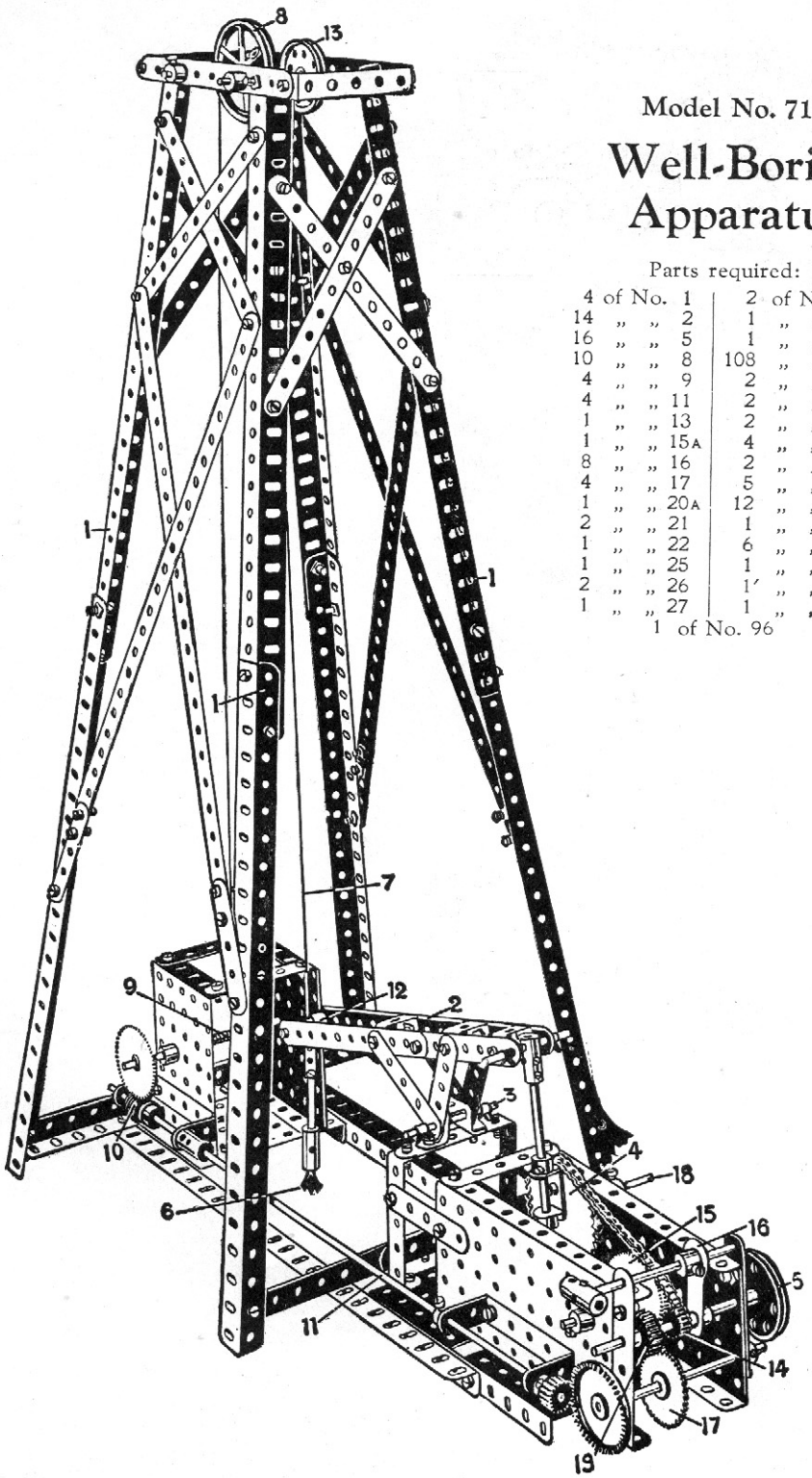


FIG. 710B

The weighted arm 16 is caused to swing about its pivot rod 17 by means of chain and sprocket gear 18 driven from a spindle 19 through a train of gears 20 and pinions 21 from the spindle 9. The arm 16 is balanced by a number of 12½" strips 23, threaded on rods 24, secured to the framework. At the opposite end of the arm the carriage 25 is pivoted on a rod 26, which passes through strips 27, these being suitably weighted by a number of strips and flanged wheels, so that the carriage always remains vertical while the arm swings over

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.



Model No. 711

Well-Boring Apparatus

Parts required:

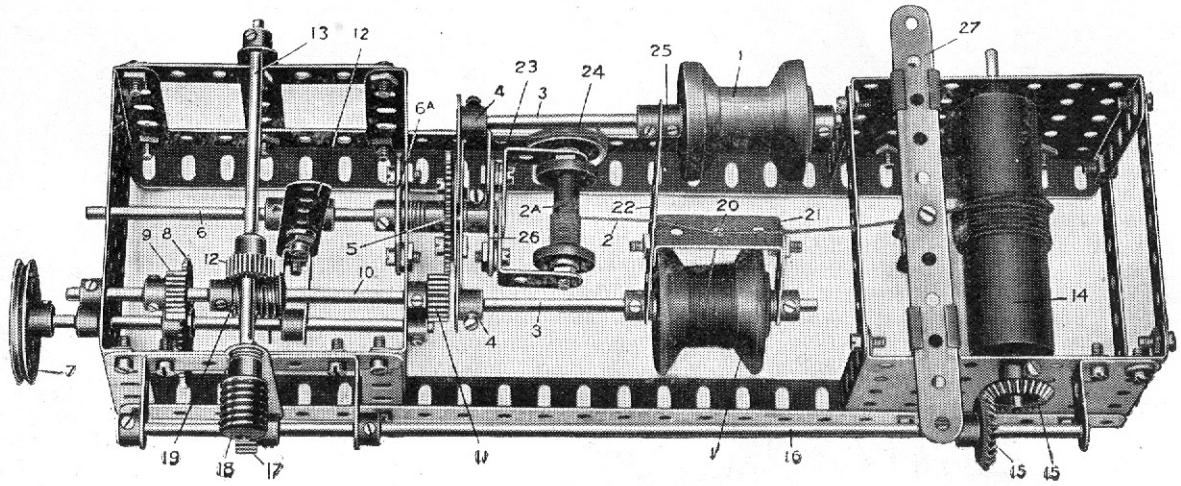
4	of No.	1		2	of No.	27A
14	„	„	2	1	„	„	28
16	„	„	5	1	„	„	32
10	„	„	8	108	„	„	37
4	„	„	9	2	„	„	38
4	„	„	11	2	„	„	45
1	„	„	13	2	„	„	46
1	„	„	15A	4	„	„	48A
8	„	„	16	2	„	„	52
4	„	„	17	5	„	„	53
1	„	„	20A	12	„	„	59
2	„	„	21	1	„	„	62
1	„	„	22	6	„	„	63
1	„	„	25	1	„	„	65
2	„	„	26	1	„	„	94
1	„	„	27	1	„	„	95

1 of No. 96

Model No. 712 Wire Covering Machine

Parts required:

1	of No.	2	2	of No.	27A
7	„ „	3	2	„ „	30
2	„ „	4	2	„ „	32
1	„ „	5	41	„ „	37
2	„ „	6A	17	„ „	38
2	„ „	8	2	„ „	44
1	„ „	10	1	„ „	46
2	„ „	12	1	„ „	48
3	„ „	12A	2	„ „	50
1	„ „	13	4	„ „	53
3	„ „	15	12	„ „	59
4	„ „	15A	2	„ „	62
1	„ „	21	1	„ „	63
1	„ „	22	1	„ „	81
2	„ „	24	1	„ „	106
4	„ „	26	1	„ „	301



The bobbins 1, carrying the thread by means of which the wire 2 is covered, are carried in a yoke consisting of two rods 3, secured in cranks 4, between a 2½″ and 1½″ strip, and bolted to a 57-toothed gear wheel 5, rotatable loosely on a fixed 5″ rod 6. On the rod 6, is a bush wheel 6A, bolted thereto and to the frame. This holds the rod against rotation. The bobbin 2A is carried in the two 1″ angle brackets, forming a frame which is bolted to the bush wheel 26, the latter being held by its screw fixedly on the rod 6. The yoke is rotated from the pulley wheel 7, a 57-toothed gear wheel 8, on the spindle of which drives a ½″ pinion 9, on an upper 4″ rod 10, another ½″ pinion 11, on the end of which engages and drives the gear wheel 5 ; this rotates the yoke. The gear 8 is caused to engage or disengage with the pinion 9 by a clutch mechanism operated by the handle 12. As the yoke rotates, the thread from the bobbins is wound closely round the wire 2, and in order to ensure an even wrapping of the thread on the wire, the take-up roller 14, is provided, on to which the wire as it is covered is wound. The take-up roller is driven with a very slow movement by bevel pinions 15, from a side rod 16, a ½″ pinion 17 on which is driven by a worm 18, on the rod 13. Consequently, the same rotary movement of the rod 10, to drive the bobbin yoke, also operates the worm 19, engaging the pinion 12 and worm 18, engaging the pinion 17, which drives the take-up roller 14, bringing the uncovered wire 2 slowly past a perforation 20, in the guide strip 21, formed of 1½″ by ½″ double angle strip and carried from the yoke arm 22.

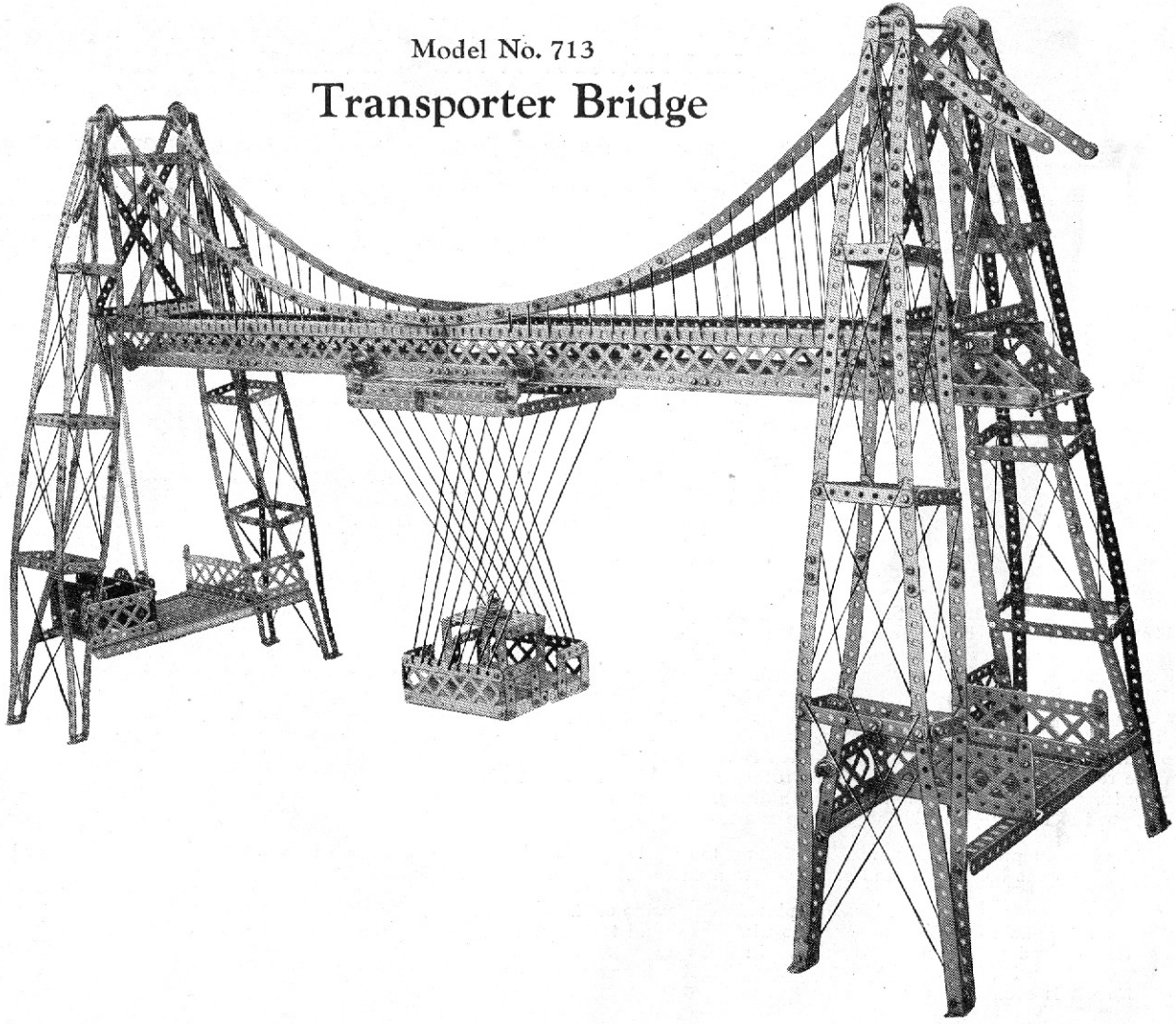
In order to prevent the wire 2 unwinding too freely from its bobbin 2A, a brake is provided, consisting of a cord 23, passing round a pulley 24, on the spindle of the bobbin 2A, and connected to a flat bracket bolted on the bush wheel 26.

It will be noticed that a collar 25 is placed on one side of the yoke strip 22, which has the effect of setting one of the bobbins slightly to the rear of the other, and the effect of this is to give two windings round the wire, one over the other. The thread on the bobbins may be of different colours, which would give a variegated effect to the covering. In order to cause the covered wire to be wound evenly on the take-up roller 14, a distributor is provided, consisting of a strip 27, beneath which is bolted a double bracket through which the covered wire passes. By moving the strip 27 from one side to the other, the wire winds evenly on the roller 14.

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 713

Transporter Bridge



Parts required:

32	of No.		1
52	„	„	2
8	„	„	3
32	„	„	4
120	„	„	5
32	„	„	6
4	„	„	7
20	„	„	8
8	„	„	9
4	„	„	10
10	„	„	11
89	„	„	12
3	„	„	14
2	„	„	15A
1	„	„	17
4	„	„	18A
4	„	„	20
1	„	„	21
5	„	„	22
1	„	„	26
1	„	„	27A
507	„	„	37
10	„	„	48A
6	„	„	52
7	„	„	53
15	„	„	59
10	„	„	94
4	„	„	96
3	„	„	97
8	„	„	99
6	„	„	100

Electric Motor

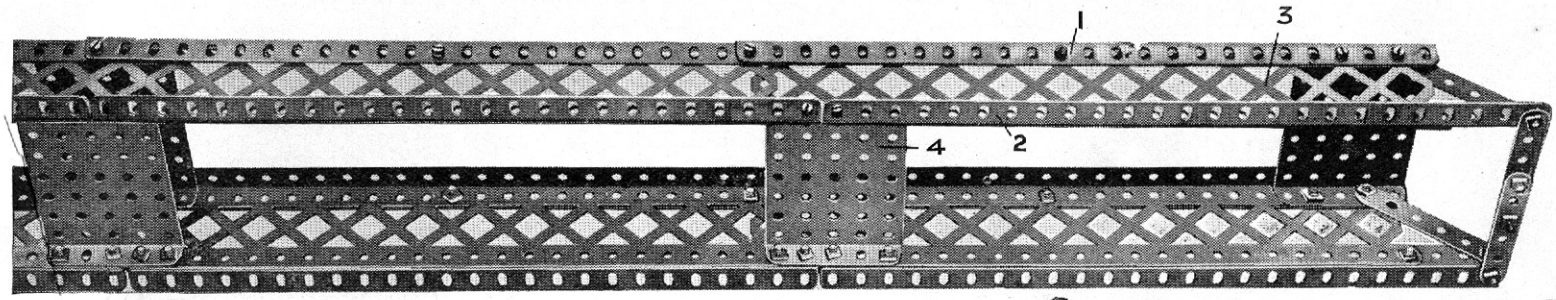
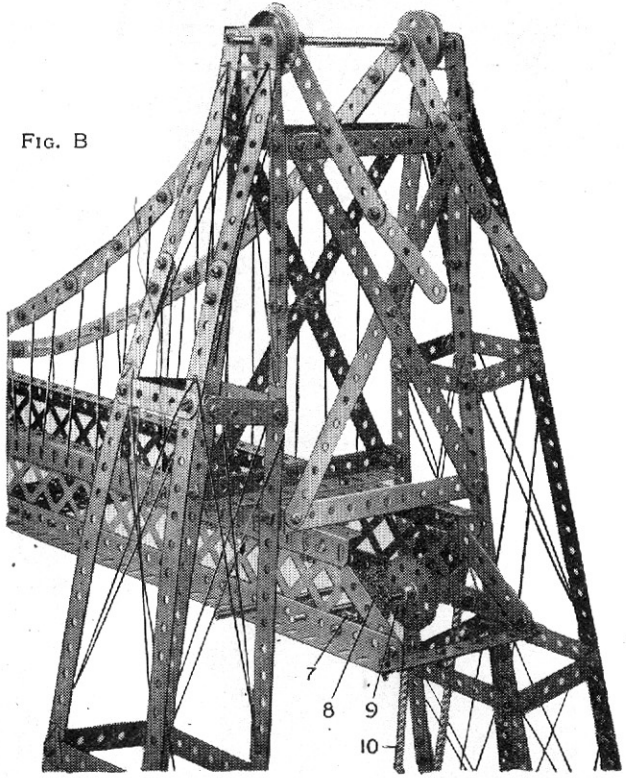


FIG. A

FIG. B



Model No. 713

Transporter

(continued)

The main girder is built up of side pieces, consisting of top and bottom angle girders 1 and 2 (Fig. A) reversed, and connected together by the braced girder 3. The sides are connected across by small rectangular plates 4. The ends of the main girder are supported from the end towers, as shown in Fig. B. The travelling platform 5 (Fig. C), supported from the carriage 6, runs on 1" pulleys, which travel along the outer edges of the lower angle girders 2. The carriage 6 is moved by a sprocket chain 7 passing round wheels 8 supported in the main girder and operated from the pinion and 57-toothed gear wheel 9 by the sprocket chain 10 driven by the motor.

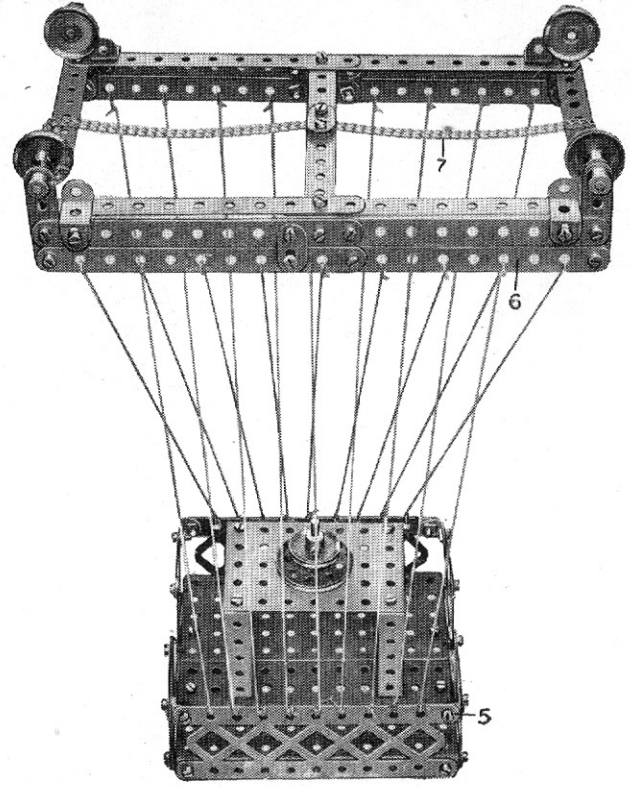


FIG. C.

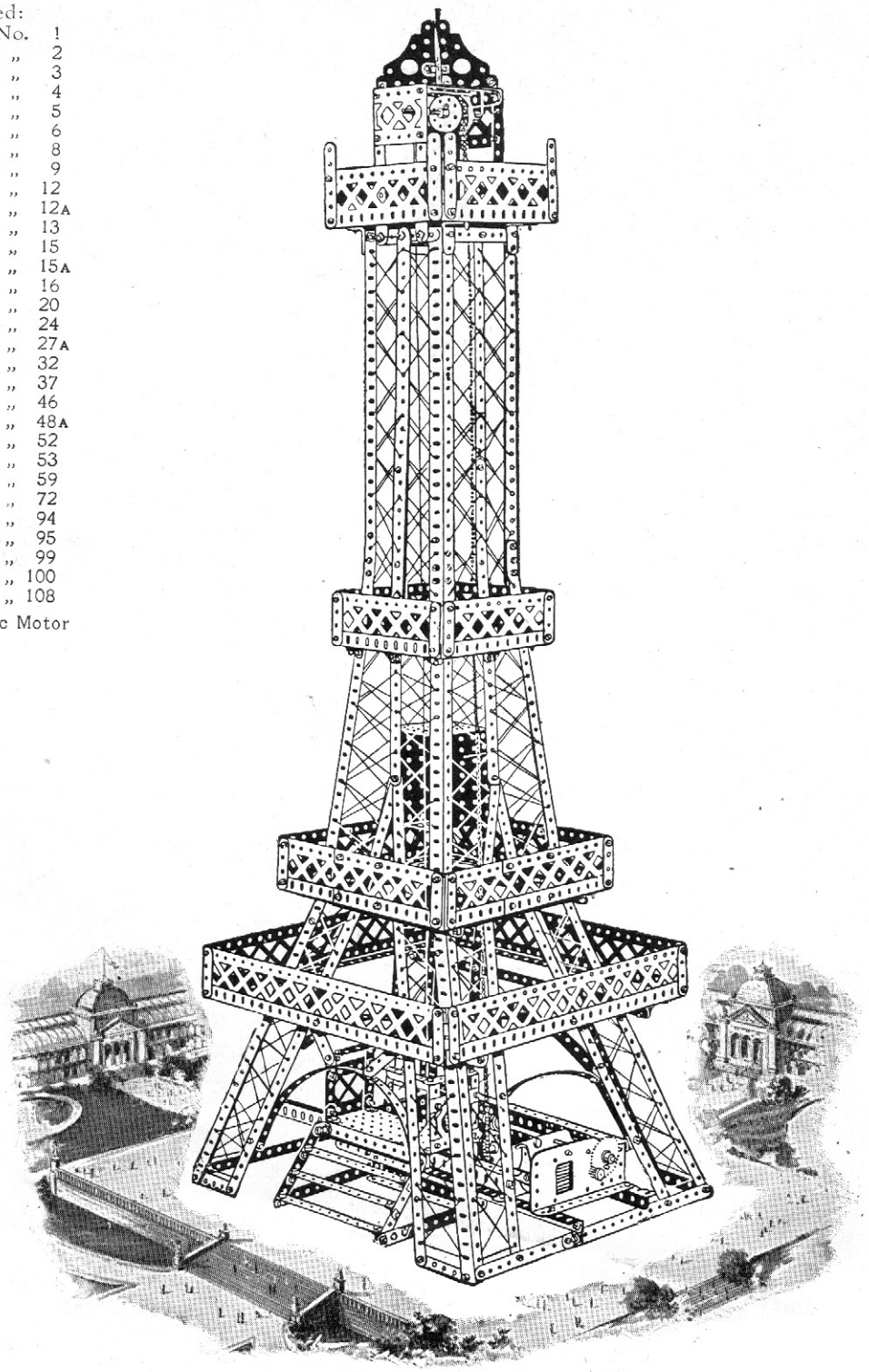
This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 714 Eiffel Tower

Parts required:

22	of No.	1
27	„ „	2
6	„ „	3
12	„ „	4
14	„ „	5
24	„ „	6
20	„ „	8
16	„ „	9
72	„ „	12
4	„ „	12A
1	„ „	13
1	„ „	15
2	„ „	15A
1	„ „	16
1	„ „	20
1	„ „	24
1	„ „	27A
1	„ „	32
337	„ „	37
1	„ „	46
4	„ „	48A
3	„ „	52
3	„ „	53
6	„ „	59
2	„ „	72
8	„ „	94
1	„ „	95
4	„ „	99
16	„ „	100
4	„ „	108

Electric Motor



Model No. 714 Eiffel Tower (*continued*)

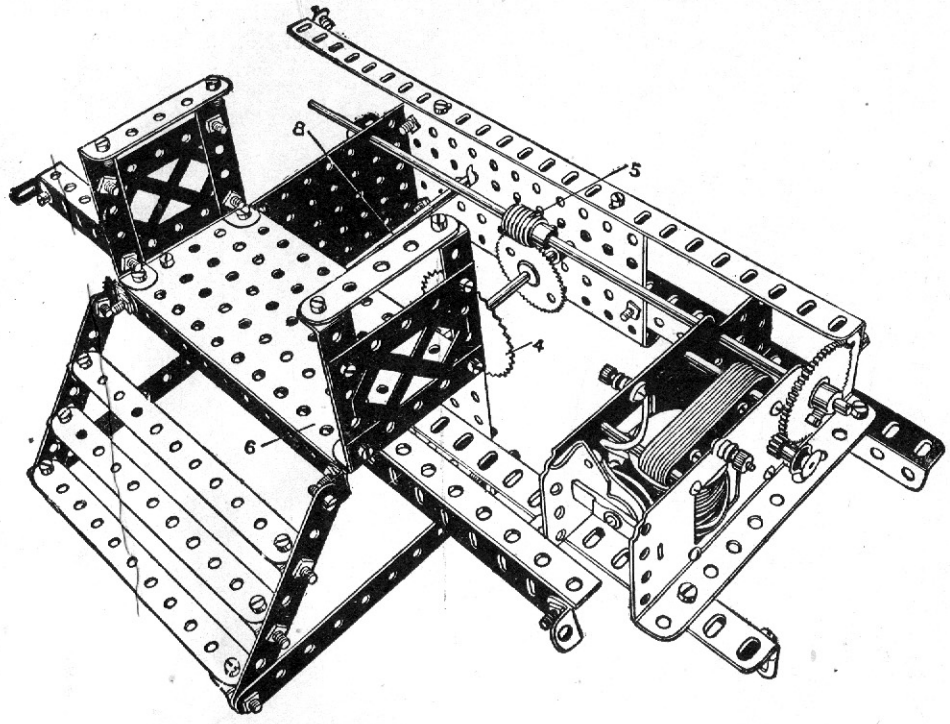


FIG. 714A

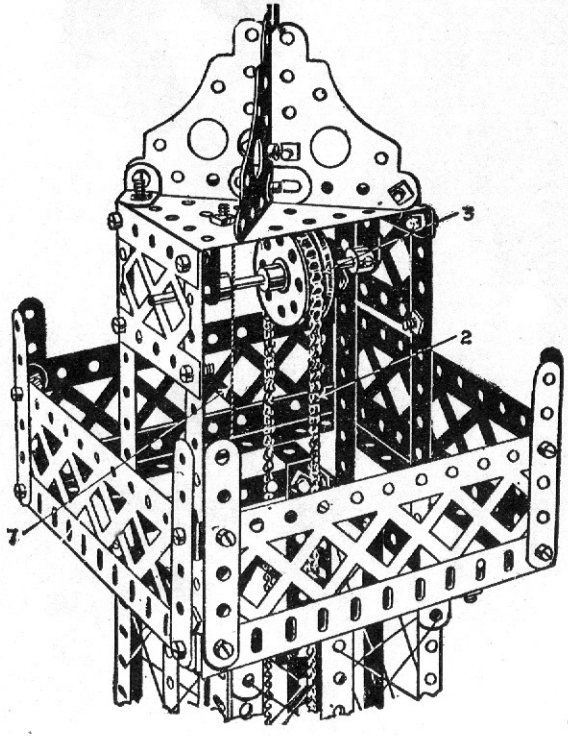
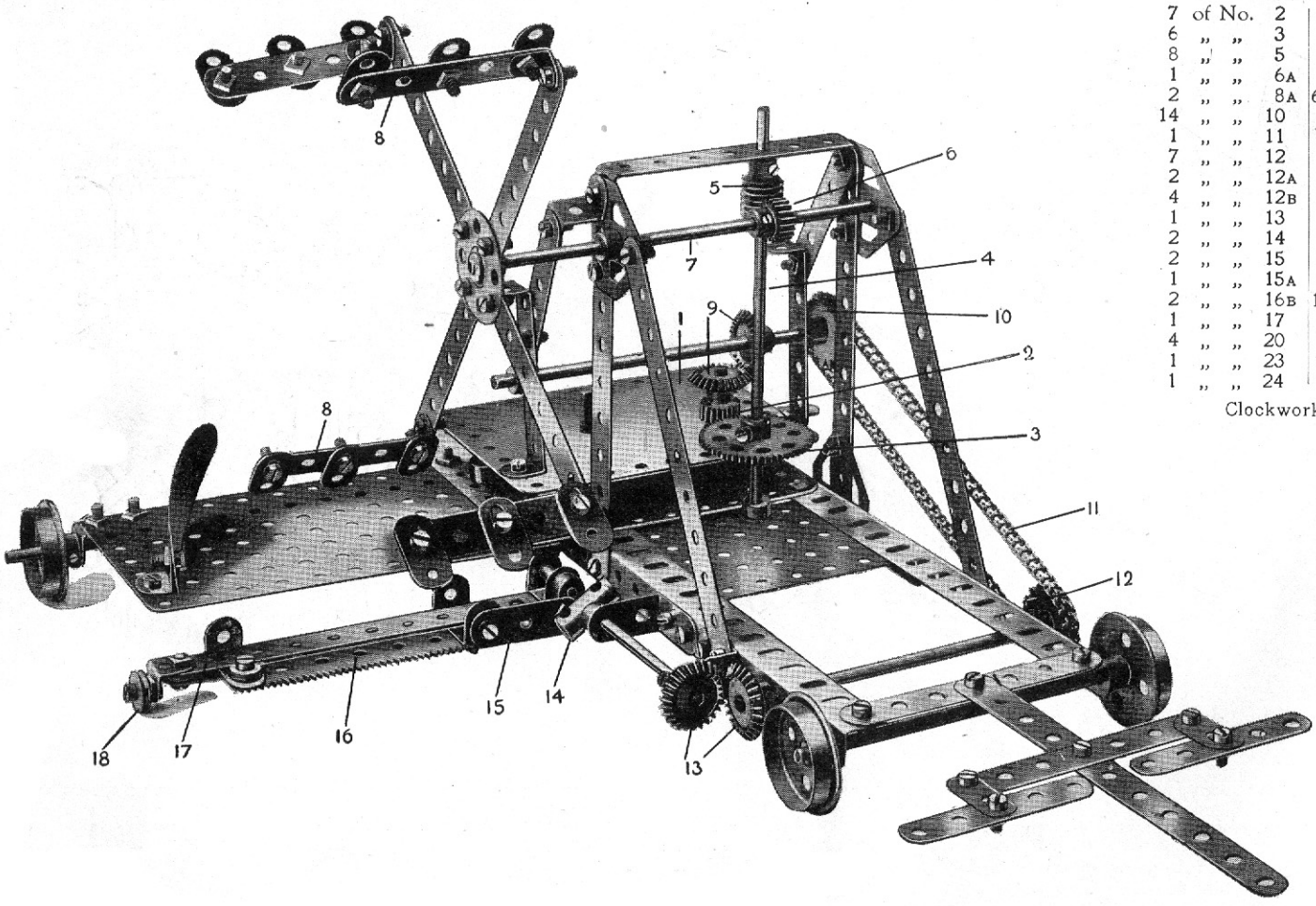


FIG. 714B

No description is necessary of the tower itself. The lift carriage 1 is raised and lowered by the chain 2 which passes over a pulley wheel 3 formed by butting a flanged wheel and a bush wheel together in the top, and a 2" sprocket wheel 4 in the bottom, driven by the worm gearing 5 from the motor. The lift carriage is brought to rest at the platform 6, and is guided by the cord 7 passing through the holes in the perforated plates of the lift carriages, the cord being secured to the top of the tower and to the rod 8 at the bottom.

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 715 Reaping Machine



Parts required:

7	of No.	2	2	of No.	26	
6	„	„ 3	1	„	„	27A
8	„	„ 5	4	„	„	30
1	„	„ 6A	1	„	„	32
2	„	„ 8A	66	„	„	37
14	„	„ 10	6	„	„	38
1	„	„ 11	1	„	„	41
7	„	„ 12	1	„	„	48
2	„	„ 12A	2	„	„	48A
4	„	„ 12B	1	„	„	48B
1	„	„ 13	1	„	„	52A
2	„	„ 14	1	„	„	53
2	„	„ 15	7	„	„	59
1	„	„ 15A	1	„	„	63
2	„	„ 16B	16″	„	„	94
1	„	„ 17	1	„	„	110
4	„	„ 20	1	„	„	125
1	„	„ 23	3	„	„	126A
1	„	„ 24				

Clockwork Motor

Model No. 715 Reaping Machine

(continued)

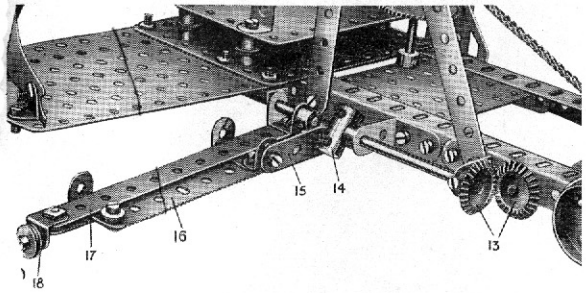
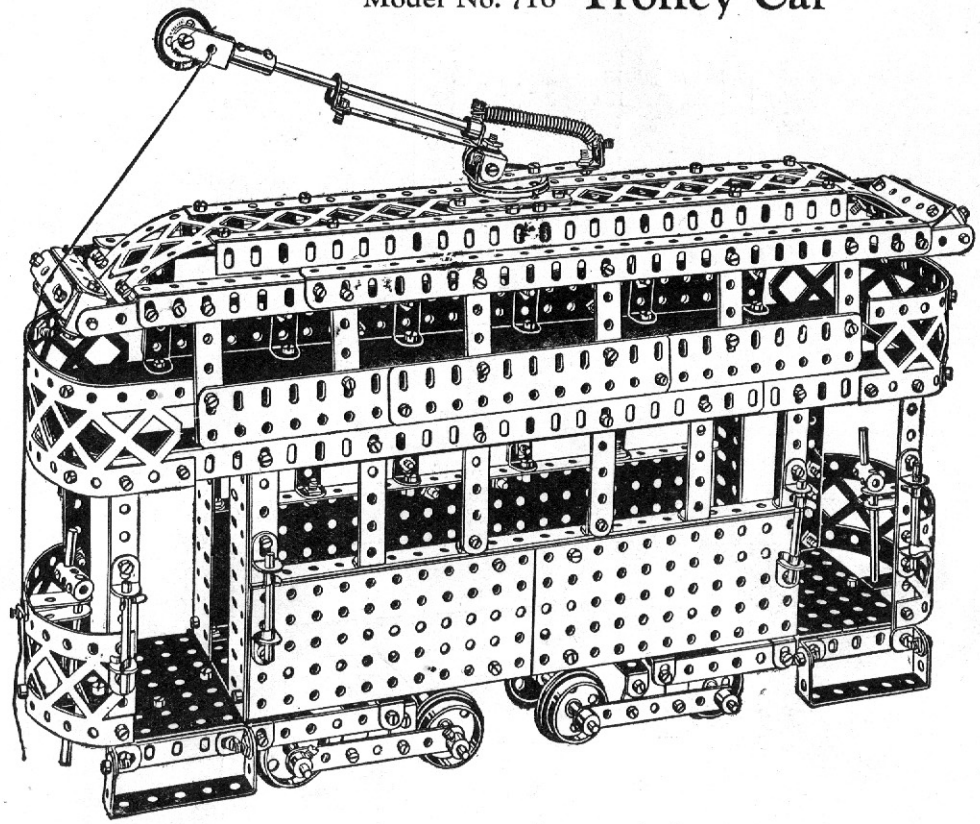


FIG. A

This model is constructed with the assistance of the following details. The spindle of the Meccano clockwork motor 1 carries a pinion 2 engaging a gear wheel 3 on the rod 4. At the top of this rod 4 is a worm 5 driving a ½" pinion 6 on a rod 7 which carries the arms 8 that sweep towards the knife.

The driving spindle of the motor also drives through bevel pinions 9 a 1" sprocket wheel 10 coupled by a sprocket chain 11 to another 1" sprocket wheel 12, which in turn drives through bevel wheels 13 a coupling 14. This coupling acts as a crank and is connected by 1½" strip 15 lock-nutted to the cutter 16. The cutter is formed by a rack strip guided to and fro by two 1" × ½" angle brackets between two 5½" strips 17 spaced apart by washers at each end. The outer end of these strips is fitted with a ½" pulley 18 on which the cutter knife travels. The remainder of the detail of the model will be made quite clear from our illustration. When completed the model works in a very realistic manner.

Model No. 716 Trolley Car



Parts required:

8	of No.	2	49	of No.	12	1	of No.	22A	4	of No.	52
11	„ „	3	1	„ „	15	21	„ „	35	2	„ „	53
2	„ „	4	8	„ „	16	225	„ „	37	12	„ „	59
17	„ „	5	8	„ „	17	1	„ „	43	1	„ „	63
8	„ „	8	5	„ „	18A	3	„ „	44	2	„ „	99
2	„ „	9	10	„ „	20	4	„ „	46	6	„ „	100
10	„ „	11	1	„ „	21	24	„ „	48A	6	„ „	103

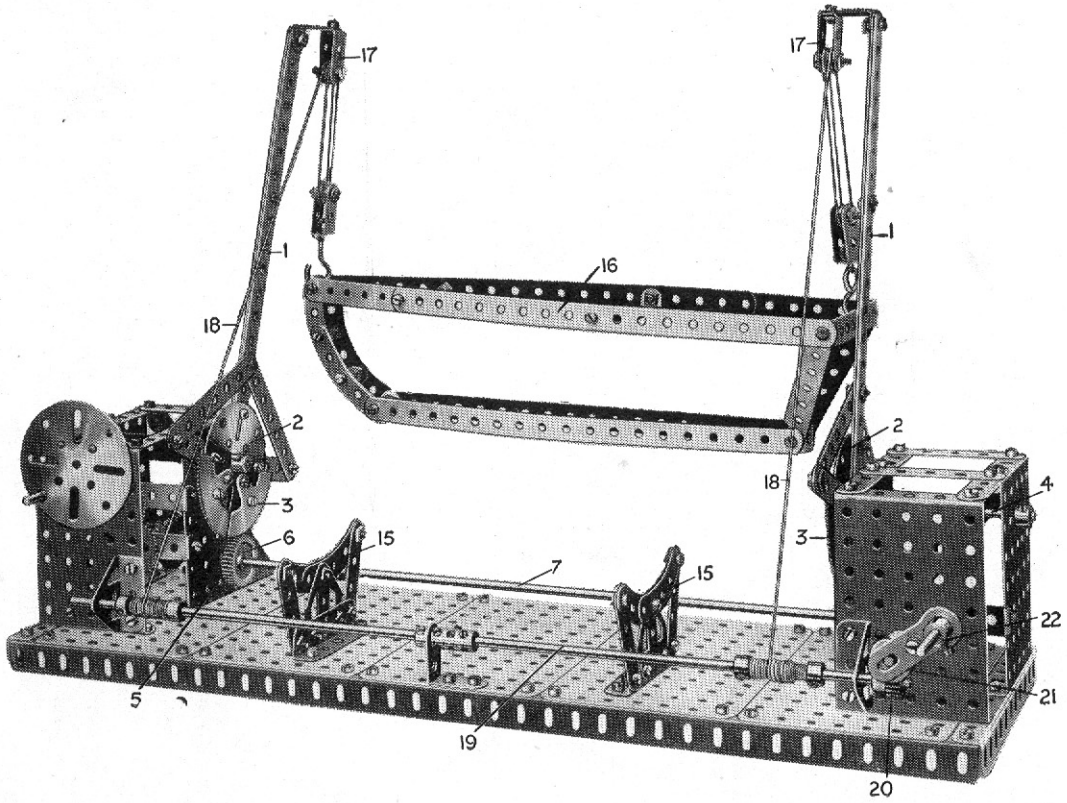
This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 717 Boat-Lowering Gear

Parts required:

10	of No.	1A	2	of No.	12	6	of No.	23	5	of No.	48A
2	„ „	2A	1	„ „	12A	4	„ „	26	2	„ „	48B
6	„ „	3	2	„ „	12B	2	„ „	27A	5	„ „	52A
7	„ „	5	1	„ „	13	2	„ „	31	6	„ „	53
8	„ „	6	2	„ „	13A	2	„ „	32	2	„ „	57
2	„ „	7A	1	„ „	15	4	„ „	33A	13	„ „	59
2	„ „	9	3	„ „	16	142	„ „	37	2	„ „	62
2	„ „	9D	2	„ „	16A	14	„ „	38	2	„ „	63
3	„ „	11	1	„ „	18A	1	„ „	40	8	„ „	90

4	of No.	102	
3	„ „	109	
1	„ „	115	
2	„ „	126	
2	„ „	126A	
4	„ „	129	



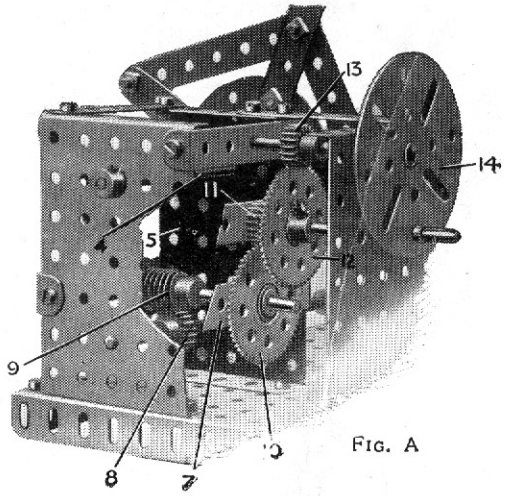


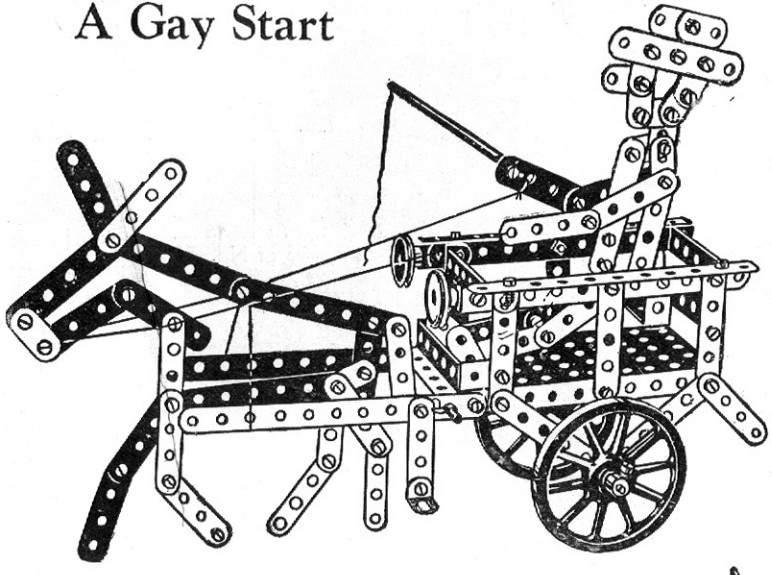
FIG. A

The davit arms 1 are connected to face plates 2 to which are bolted two rack segments 3 forming the usual geared quadrants. The davit arms are secured to rods 4 journalled in the face plates 5, the rack segments 3 being engaged and driven by 1″ gear wheels 6 on an axle rod 7. This rod 7 carries a pinion 8 (Fig. A) driven by a worm 9 and a rod, to which is secured a 1½″ gear wheel 10. This is driven by a ½″ pinion 11 on a rod to which is also secured a 1½″ gear wheel 12 driven by a ½″ pinion 13 rotated by a hand wheel formed by a face plate 14. As the hand wheel is rotated, the davit arms are raised outward when launching the boat 16 or inward when it is desired to deposit the boat on the chocks 15.

The boat 16 is raised or lowered from the blocks 17 by the ropes 18 which wind on to a rod 19. On this rod is secured a ½″ pinion 20 engaged by a worm 21 which is rotated by the crank handle 22 formed of two cranks bolted together, and in this way the boat may be lowered over the ship's side.

Model No. 718

A Gay Start

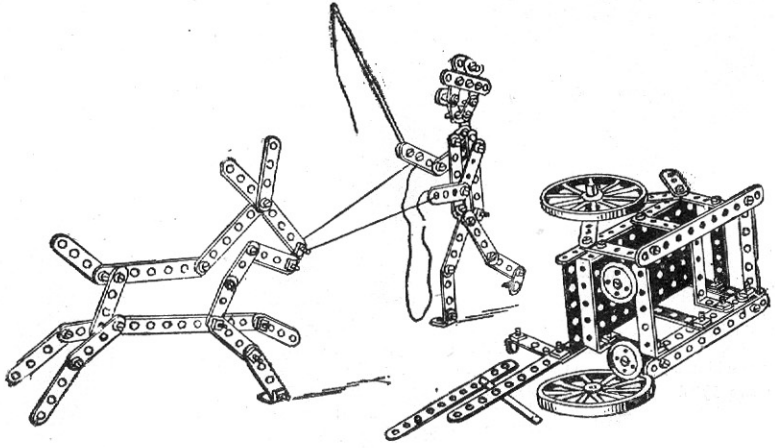


Parts required:

6	of No.		2
2	„	„	3
5	„	„	4
10	„	„	5
24	„	„	6
23	„	„	10
8	„	„	12
1	„	„	15
1	„	„	15A
1	„	„	16
2	„	„	19B
2	„	„	22
2	„	„	35
71	„	„	37
2	„	„	46
3	„	„	48A
1	„	„	52

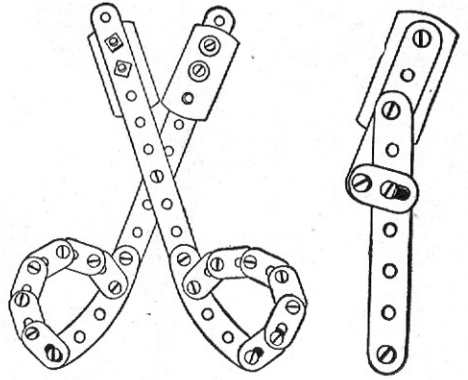
Model No. 719

The End of a Perfect Day



Model Nos. 720 and 721

Scissors Knife



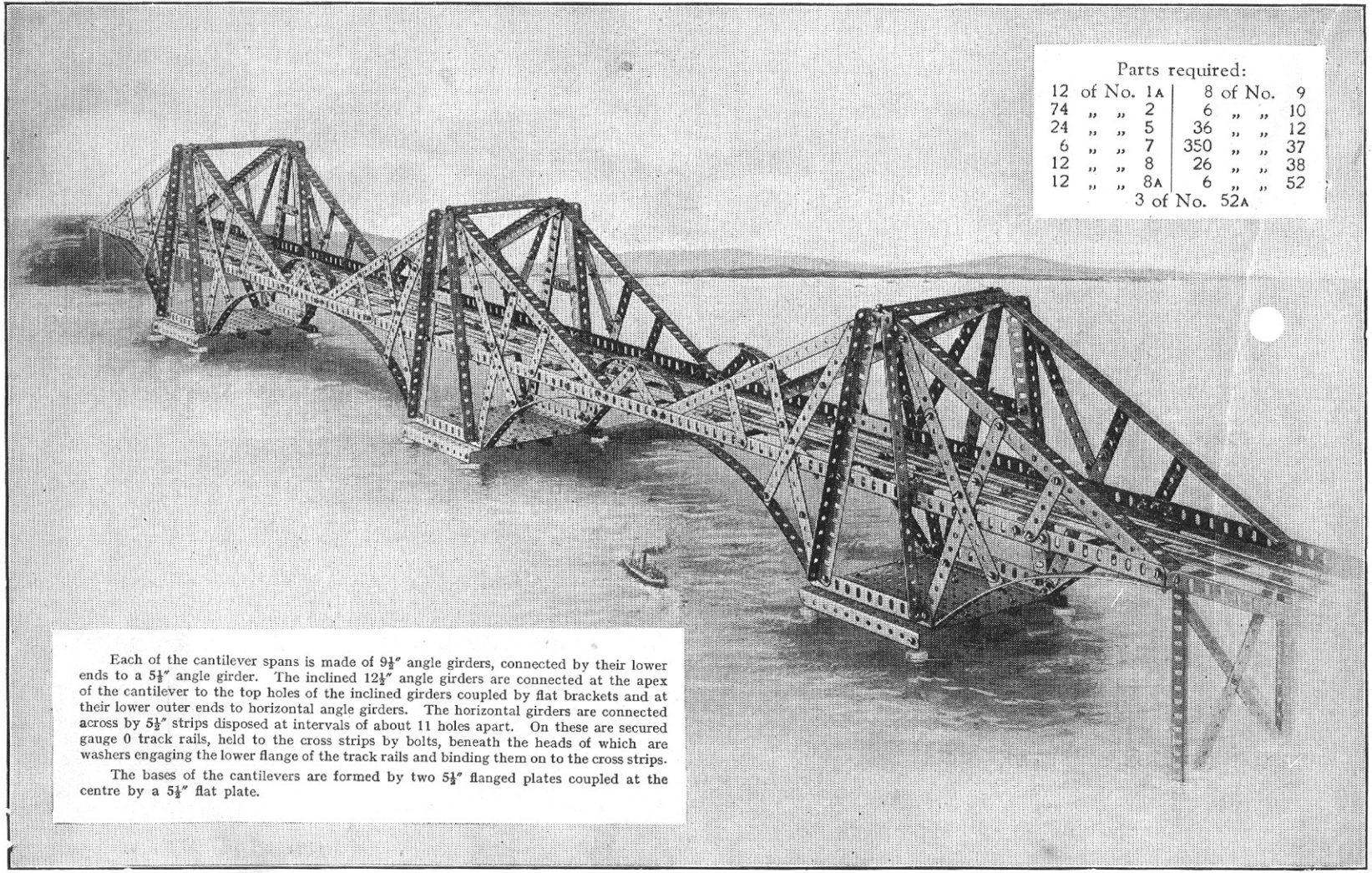
Suggestions for using old safety razor blades to make a pair of scissors and photographer's trimming knife.

Parts required:

Model No. 720				Model No. 721			
2	of No.		2	2	of No.		3
12	„	„	10	1	„	„	5
21	„	„	37	1	„	„	10
2	„	„	90	5	„	„	37
2 razor blades				1 razor blade			

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 722 Forth Bridge



Parts required:

12	of No.	1A		8	of No.	9	
74	„	„	2	6	„	„	10
24	„	„	5	36	„	„	12
6	„	„	7	350	„	„	37
12	„	„	8	26	„	„	38
12	„	„	8A	6	„	„	52
				3	of No.	52A	

Each of the cantilever spans is made of 9½″ angle girders, connected by their lower ends to a 5½″ angle girder. The inclined 12½″ angle girders are connected at the apex of the cantilever to the top holes of the inclined girders coupled by flat brackets and at their lower outer ends to horizontal angle girders. The horizontal girders are connected across by 5½″ strips disposed at intervals of about 11 holes apart. On these are secured gauge 0 track rails, held to the cross strips by bolts, beneath the heads of which are washers engaging the lower flange of the track rails and binding them on to the cross strips.

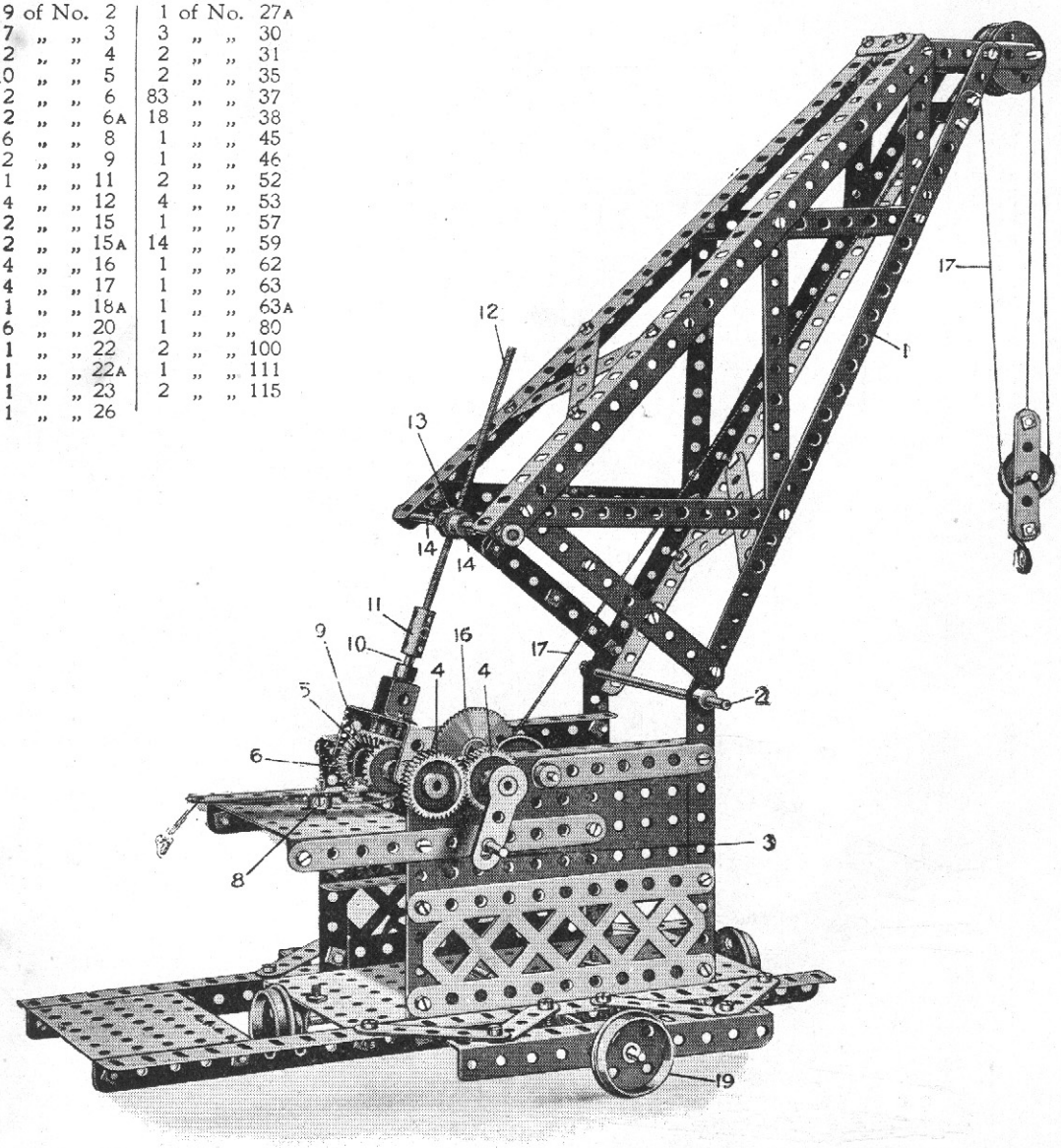
The bases of the cantilevers are formed by two 5½″ flanged plates coupled at the centre by a 5½″ flat plate.

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 723 Revolving Crane

Parts required:

9	of No.	2	1	of No.	27A
17	„ „	3	3	„ „	30
2	„ „	4	2	„ „	31
10	„ „	5	2	„ „	35
2	„ „	6	83	„ „	37
2	„ „	6A	18	„ „	38
6	„ „	8	1	„ „	45
2	„ „	9	1	„ „	46
1	„ „	11	2	„ „	52
4	„ „	12	4	„ „	53
2	„ „	15	1	„ „	57
2	„ „	15A	14	„ „	59
4	„ „	16	1	„ „	62
4	„ „	17	1	„ „	63
1	„ „	18A	1	„ „	63A
6	„ „	20	1	„ „	80
1	„ „	22	2	„ „	100
1	„ „	22A	1	„ „	111
1	„ „	23	2	„ „	115
1	„ „	26			



Model No. 723 Revolving Crane *(continued)*

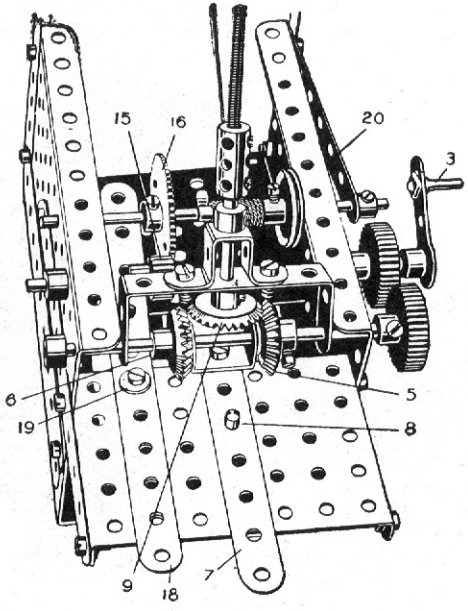


FIG. 723A

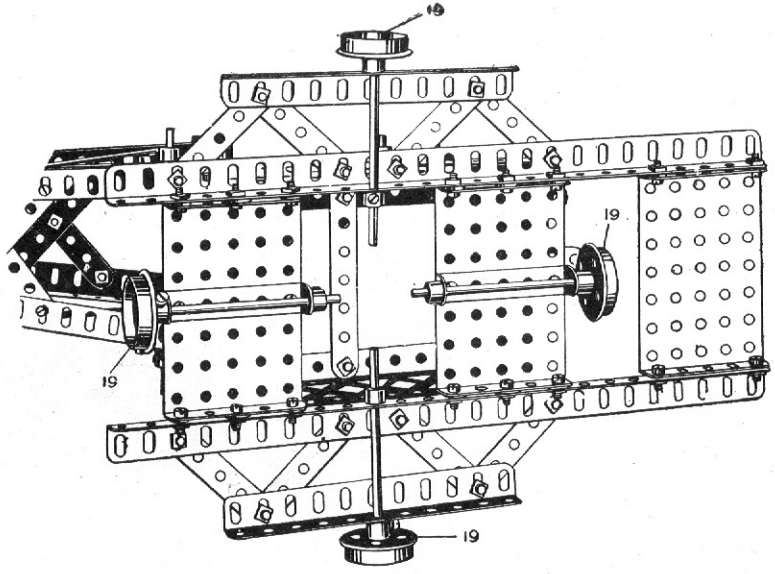


FIG. 723B

The jib 1, the construction of which is clear from the drawing, is pivoted at its lower end on a 5″ axle rod 2, the movement of the jib about this pivot being obtained from the handle 3, which drives a rod carrying bevel wheels 5, 6 (from the 1″ gear wheels 4). The bevel wheel rod is arranged to slide in its bearings by the strip 7, at the end of which is a double bracket, pivoted at 8, on the frame of the crane, on a threaded pin under which is a collar, and thus bring either the bevel 5, or the bevel 6, into engagement with a third bevel 9, Fig. 723A, on the end of a 2″ rod 10, connected by the coupling 11, to a 5″ screwed rod 12. This screwed rod engages the transverse threaded hole in an octagonal coupling 13, which is pivotally carried on two 2″ rods 14, so as to give a clear way for the screwed rod 12. According to the direction in which the clutch handle 7 is thrown over, and the handle 3 turned, the jib will be raised or lowered. The rod of the handle 3, also carries a ½″ pinion 15, which is adapted to engage and drive a 57-toothed gear wheel 16, round the spindle of which is wound the cord 17, by means of which the load is raised or lowered. The spindle of the wheel 16, is caused to slide in its bearings to engage the pinion 15, by means of the 5½″ strip 18, Fig. 723A, pivoted at 19, by a bolt lock-nutted to the plate, the other end of which is bent up to engage between the boss of the gear wheel 16, and a collar (not shown).

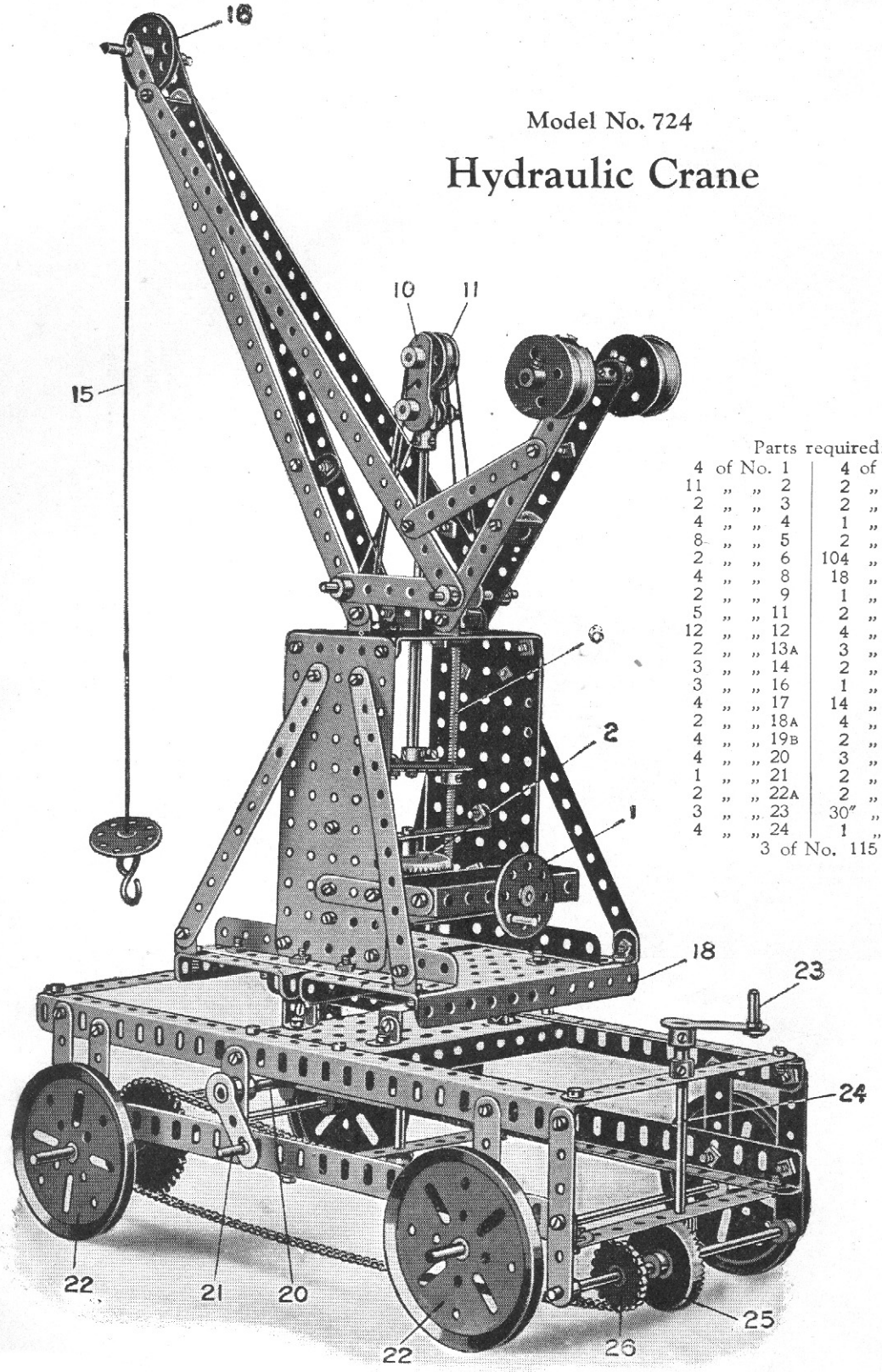
A spring formed by slightly bending a 3½″ strip 20, bolted to the side of the frame, automatically releases the winding spindle from engagement with the pinion 15 when the handle 18 is released.

The crane rotates on the wheels 19, which are carried on rods at right angles, as shown in Fig. 723B.

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Model No. 724

Hydraulic Crane



Parts required:

4	of No.	1	4	of No.	26
11	„	„ 2	2	„	„ 27A
2	„	„ 3	2	„	„ 28
4	„	„ 4	1	„	„ 32
8	„	„ 5	2	„	„ 35
2	„	„ 6	104	„	„ 37
4	„	„ 8	18	„	„ 38
2	„	„ 9	1	„	„ 45
5	„	„ 11	2	„	„ 48A
12	„	„ 12	4	„	„ 48B
2	„	„ 13A	3	„	„ 52
3	„	„ 14	2	„	„ 53
3	„	„ 16	1	„	„ 57
4	„	„ 17	14	„	„ 59
2	„	„ 18A	4	„	„ 62
4	„	„ 19B	2	„	„ 62A
4	„	„ 20	3	„	„ 63
1	„	„ 21	2	„	„ 70
2	„	„ 22A	2	„	„ 80
3	„	„ 23	30″	„	„ 94
4	„	„ 24	1	„	„ 95

3 of No. 115

Model No. 724

Hydraulic Crane *(continued)*

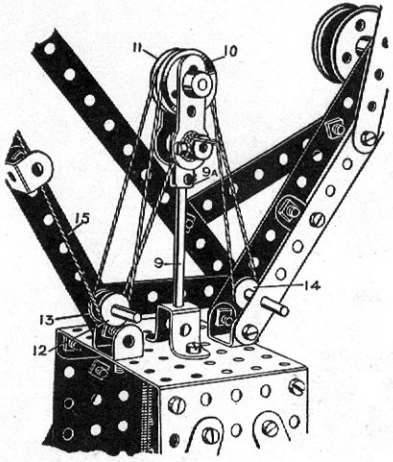


FIG. 724B

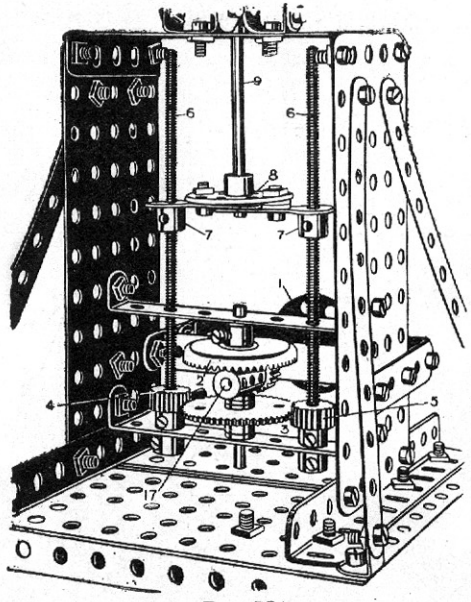


FIG. 724C

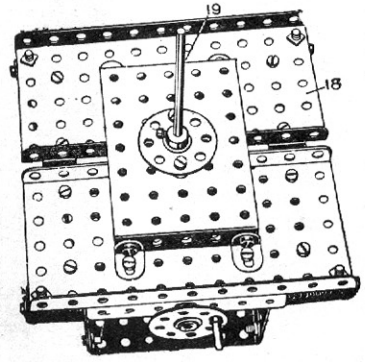


FIG. 724D

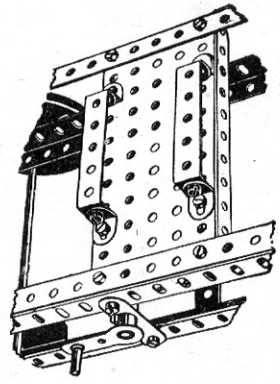


FIG. 724E

This model is designed to illustrate the operating of a Hydraulic Crane, in which great power is utilised to force two or more sets of pulley wheels apart, chains passing round the pulley wheels so that by a small movement of the operating power a great movement of the load is effected. In the model, instead of water-power, screws are used to move the chain or cord pulleys.

The weight is raised or lowered by operating the hand-wheel 1. The rod of this wheel carries a pinion which gears with a 1½″ contrate wheel 2. On the rod of the contrate wheel is a lower 57-toothed gear wheel 3, which engages two ½″ pinions 4 and 5, secured on vertical screwed rods 6, so that these rods are rotated in the same direction on the turning of the handle 1. The rods engage the bosses of threaded cranks 7, secured on a bush wheel 8, in the boss of which is fixed a 6″ rod 9. This rod at the top is secured in a coupling 9A, to which are connected on a 1″ transverse rod two cranks which support another 1″ rod, forming a bearing for two 1″ loose pulleys 10 and 11. Two ½″ pulleys 12 and 13 are loosely mounted on a 2″ rod at the base of the jib on one side, and a single ½″ pulley 14 on another 2″ rod at the other side.

The cord 15 passes over the pulley 16 at the top of the jib, round the pulley 12, up round the pulley 10, round the lower pulley 14, back round the other pulley 11, round the small pulley 13, and is made fast to the coupling 9A.

By turning the handle 1 the contrate wheel 2 is rotated, thus driving the pinions 4 and 5 and rotating the screwed rods, which causes the threaded cranks to be raised or lowered, and the rod 9, carrying the pulleys 10 and 11, also to be raised or lowered. As the pulleys 10 and 11 are forced up, the cord 15 travels round all the pulleys, and, due to the number of loops of the cord, the small movement of the top pulleys 10 and 11 results in a larger movement of the crane hook.

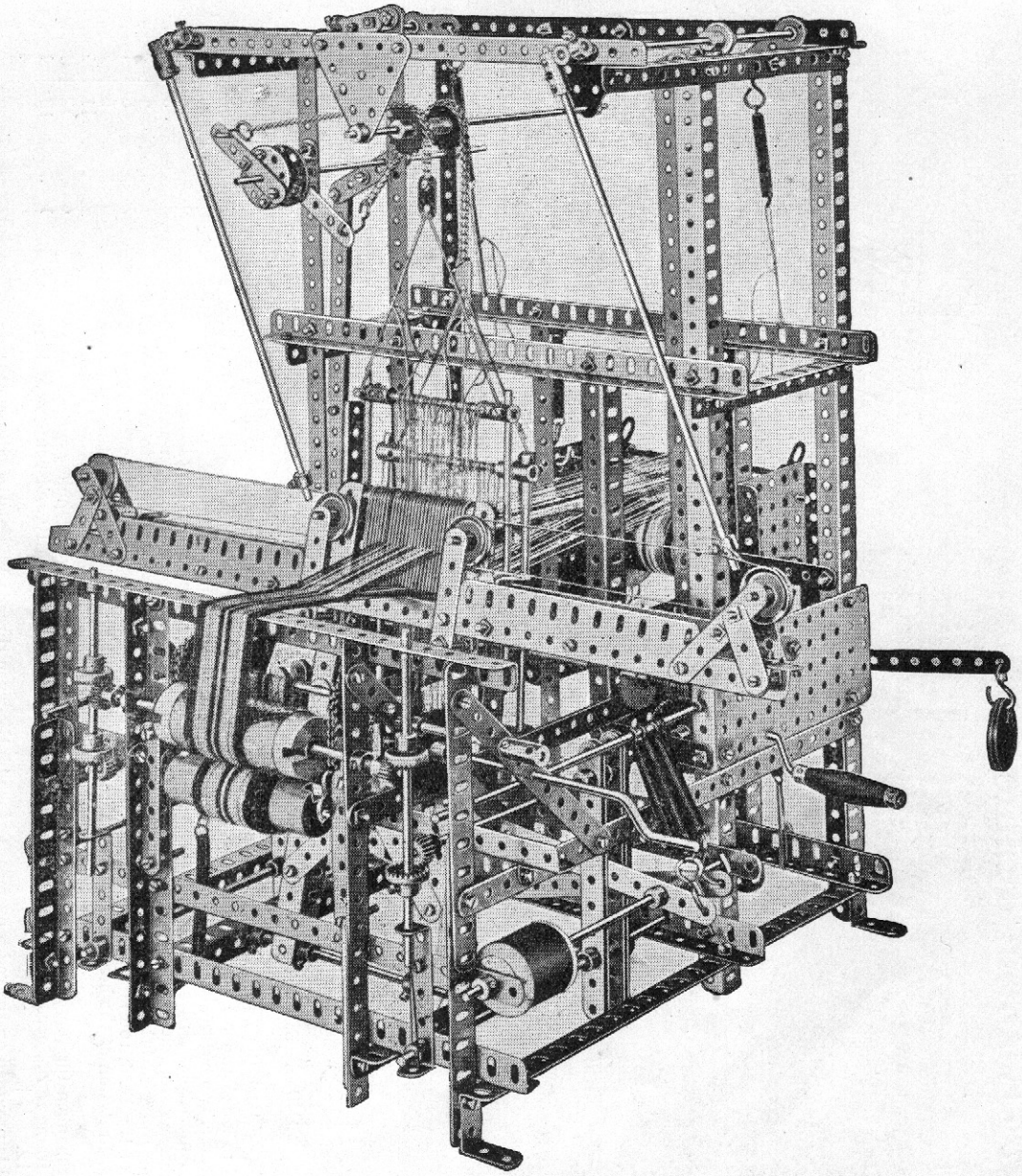
The rod of the bush wheel 1, which carries a ½″ pinion, is journalled in a coupling 17, above and beneath which are placed two washers. The rod is held in position by the wheel 1 on one side of the cross strip, and by a collar on the other side.

The crane is carried on a platform 18, pivoting about a vertical rod 19, on which is a 57-toothed gear wheel engaged and driven by a worm on a rod 20, on the end of which is the operating handle 21.

The crane is caused to travel on the wheels 22 by the handle 23, a ½″ pinion at the foot of its rod 24 driving a 1½″ contrate wheel 25 on the rod 26, coupled by chain and sprocket wheels to the front wheels 22.

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

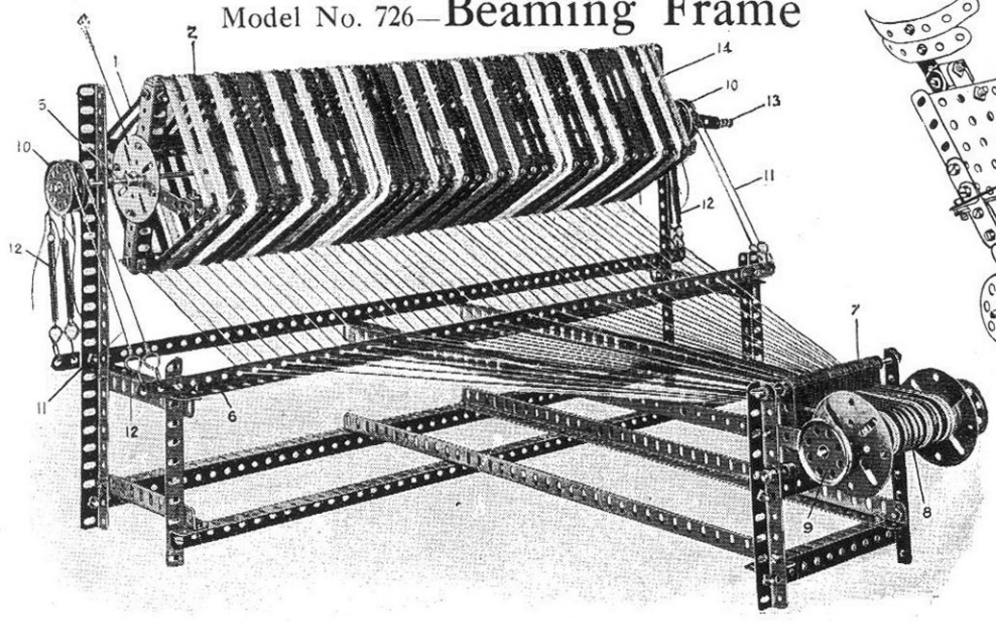
Model No. 725 Loom



The Meccano Loom is one of the most remarkable and interesting models that can be made with Meccano. It is absolutely automatic and beautiful material may be woven by simply turning the handle. It is a somewhat complicated model, requiring careful construction and accurate adjustment and as it is impossible to do justice to it in this book, we have compiled a special sheet of instructions in which it is illustrated and described in detail. This may be purchased either from your local Meccano dealer or from Meccano Limited, Liverpool. Price 3d. (post free, 4d.).

These Models can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A

Model No. 726—Beaming Frame



Parts required :

2 of No. 1	4 of No. 7	8 of No. 12	1 of No. 26	4 of No. 43	1 of No. 103
4 ,, ,, 2	2 ,, ,, 7A	2 ,, ,, 13	1 ,, ,, 33	8 ,, ,, 57	4 ,, ,, 109
44 ,, ,, 5	12 ,, ,, 8	3 ,, ,, 14	253 ,, ,, 37	10 ,, ,, 59	
4 ,, ,, 6	10 ,, ,, 9	6 ,, ,, 21	88 ,, ,, 38	1 ,, ,, 63	

The frame upon which the warp threads are wound is built up of 12½" angle girders, 2, overlapped seven holes and bolted to a 5½" girder 1 and 5½" strip crossed and connected to face plates 4 on the 11½" rod 5.

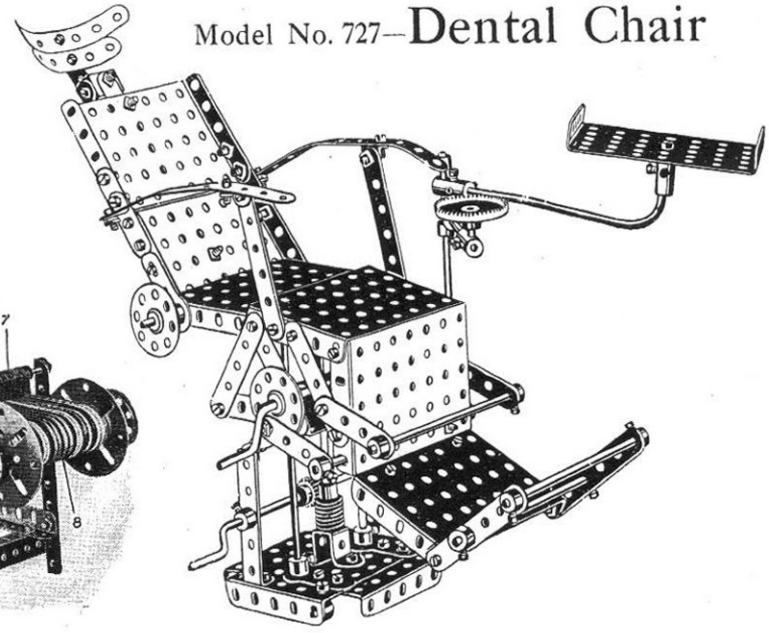
Inside the frame, two 5½" angle girders are bolted nine holes from each end to form the inner bearings for the rods 5. Another 5½" girder is bolted crosswise to these in the centre to form a stay.

The warp threads are first wound upon the warp-frame, and pass through the holes in a 24½" angle girder 6, and, converging together, pass between the 2½" strips 7 forming the reed, and so on to the beam 8. On the far side of the beam rod is a ½" pinion engaged by a pawl (not shown on the photograph) which prevents backward rotation of the beam as the warp threads are wound thereon by turning the 1½" pulley wheels 9.

A brake mechanism for tensioning the frame 2 is provided by securing two 1" pulley wheels 10 at each end of the frame rod 5, cords 11, secured by hooks passing over the pulleys 10 and being kept taut by the springs 12.

A handle 13 is provided on the rod 5 by means of which the warp threads 14 are originally wound on the frame.

Model No. 727—Dental Chair

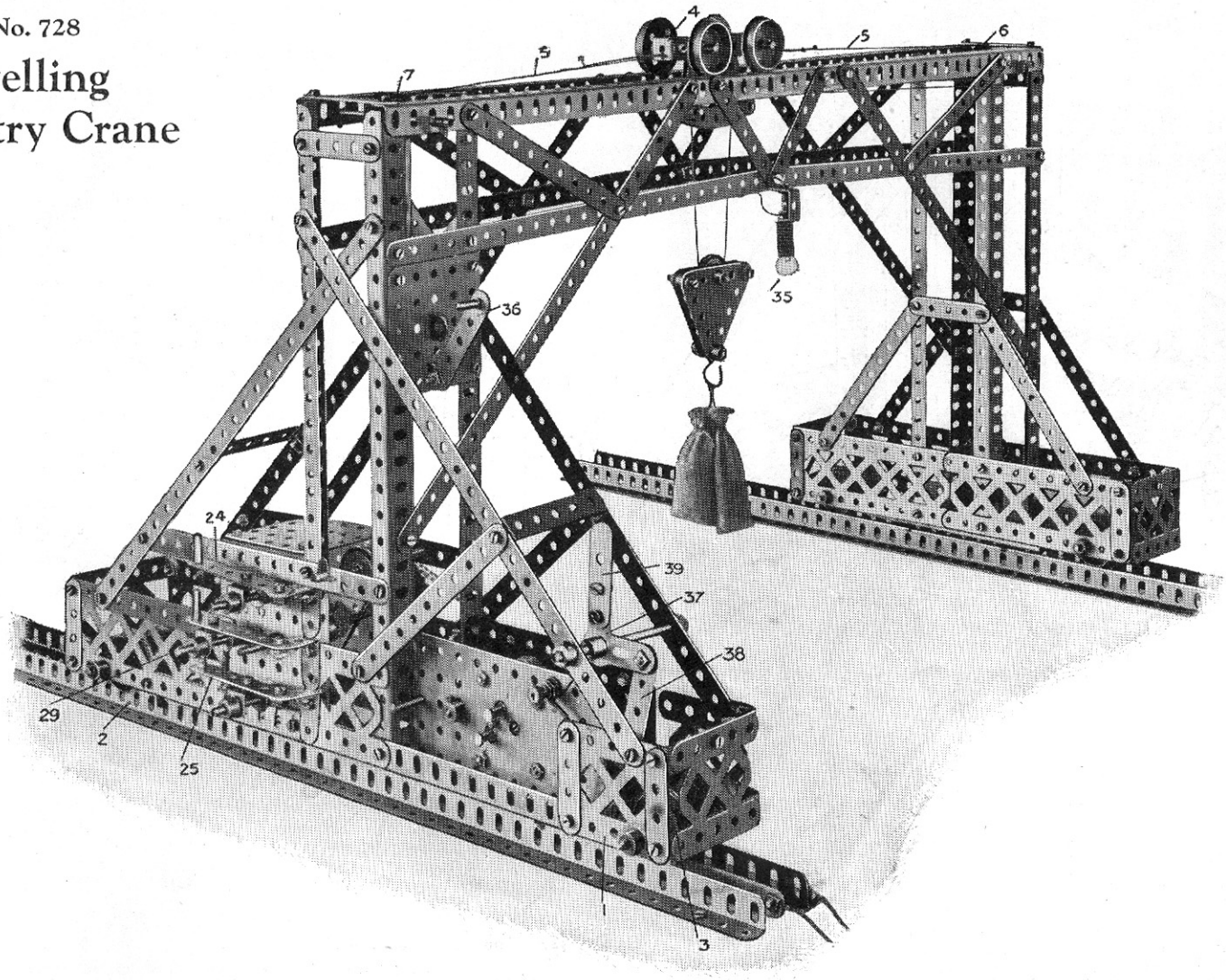


Parts required :

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	

Model No. 728

Travelling Gantry Crane



Model No. 728 Travelling Gantry Crane *(continued)*

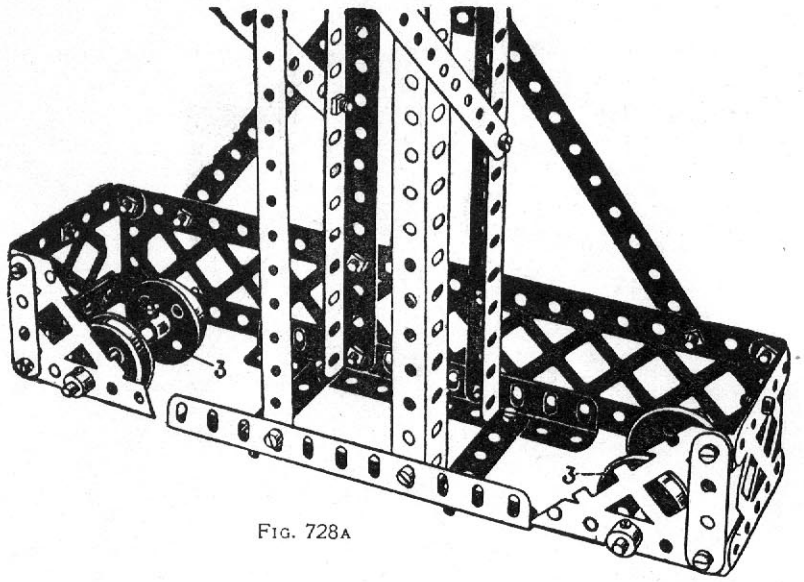


FIG. 728A

Parts required:

12	of No.	1	3	of No.	26
12	" "	2	3	" "	27
6	" "	3	3	" "	27A
3	" "	4	11	" "	35
17	" "	5	149	" "	37
14	" "	6	10	" "	37A
1	" "	6A	38	" "	38
6	" "	7	3	" "	44
10	" "	8	9	" "	48A
2	" "	9	2	" "	53
6	" "	11	1	" "	57
4	" "	12A	30	" "	59
2	" "	15	1	" "	72
2	" "	15A	2	" "	76
11	" "	16	2	" "	90
1	" "	16A	26"	" "	94
2	" "	17	1	" "	95
4	" "	18A	3	" "	96
12	" "	20	8	" "	98
8	" "	22A	6	" "	100
2	" "	23	2	" "	111
2	" "	25	1	" "	128

1 Electric Motor

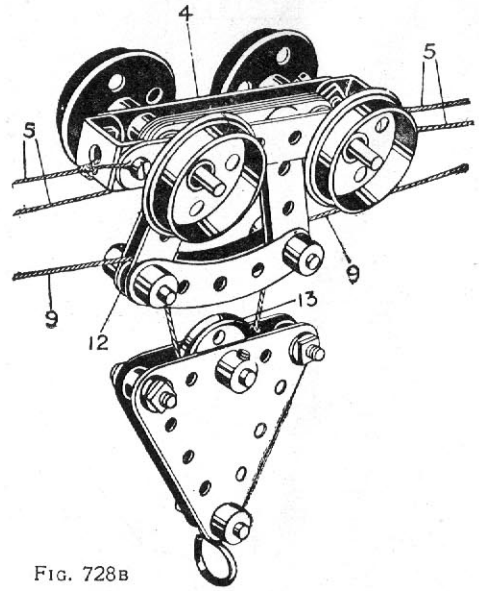


FIG. 728B

The upper part of the framework is well brought out in the illustration. It is to be noted that as regards the feet carrying the motor and the travelling wheels, the centre portion is composed of 12½" angle girders at the lower edge, extended on one side by 2½" braced girders 1, overhanging 4 holes, and on the other side by 5½" braced girders 2 overhanging five holes. The other shorter foot on the gantry is shown in Fig. 728A, and is built up of 5½" braced girders overlapped and overhanging the lower angle girders five holes on each side. The travelling wheels 3 are carried in the lower holes of the braced girders.

The traversing of the trolley 4, is effected by a cord 5 which passes from the far end of trolley 4, round a pulley 6, and is returned and passed over one of the 1" pulleys 7, down to, and has three turns round the rod 8, then passing up and round another of the pulleys 7, and is connected to the near end of the trolley, Fig. 728B. Consequently, rotation of the rod 8 will wind up one end of the traversing cord 5 and pay out the other end, thus causing the trolley 4 to travel to or fro along the gantry rails.

The load is raised or lowered by another cord 9 which is wound round the upper rod 10, thence round the guide pulley 11, round the third of the pulleys 7, Fig. 728, and over the ½" pulley 12, Fig. 728B, beneath the 1" pulley 13, on the load block round another ½" pulley, and is made fast on the far end of the gantry frame. If the rod 10 is not being rotated, therefore, the trolley 4 travels to and fro without the load being raised or lowered. Rotation of the rod 10, however, in one or other direction, will result in the load being raised or lowered.

The travelling of the whole gantry crane upon the wheels 3 is effected from the rod 14, a sprocket wheel 15 on which is connected by a chain 16 to another sprocket wheel 17 on the rod 18 of the travelling wheels, 728C. The rods 8, 10 and 14 are operated as follows: The motor spindle 19, Fig. 728D, drives by the chain 20 a 2" sprocket wheel 21 on a rod 22, on which is a ½" pinion 23, Fig. 728C. The rods 10 and 8 are slideably controlled by the clutch operating handles 24,

Model No. 728 Travelling Gantry Crane *(continued)*

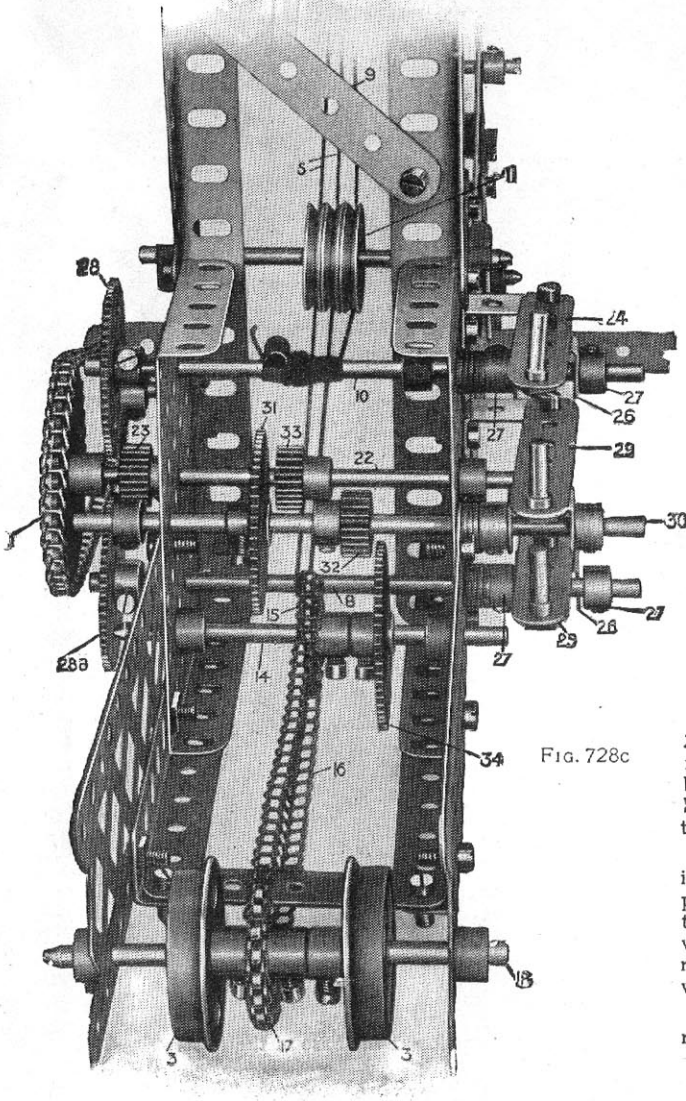


FIG. 728C

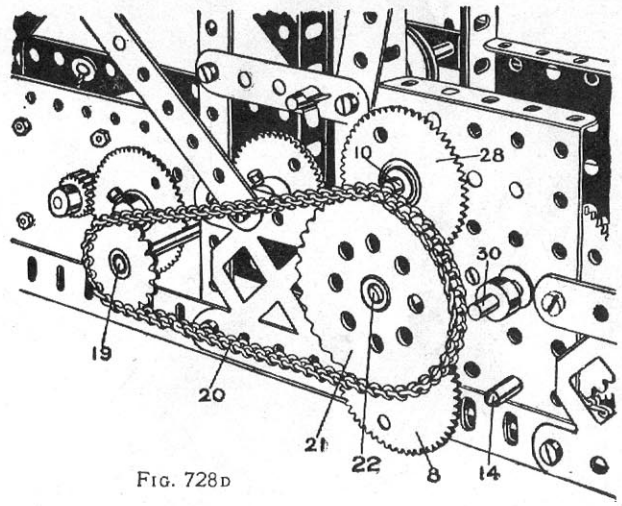


FIG. 728D

25, which are bolted and lock-nutted to double bent strips 26, engaging between collars 27 nipped on the rods. On the outer end of the rod 10 is a 57-toothed wheel 28, a similar wheel being secured on the outer end of the rod 8. By operating the clutch handles 24, 25, either or both of the gear wheels 28 or 28A may be brought into engagement with the ½" pinion 23 and thus cause the load to be raised or lowered, or the trolley 4 to be traversed.

The third clutch handle 29 similarly controls the sliding movement of a rod 30, on which is secured a 57-toothed gear wheel 31 and ½" pinion 32, and on the rod 22 is secured another ½" pinion 33, while on the rod 14 is a further 57-toothed gear wheel 34. By moving the handle 29, therefore, the gear wheel 31 and the pinion 32 may be brought into engagement respectively with the pinion 33 and the gear wheel 34, thus providing a reduced gear train from the driven rod 22 to the rod 14, and as the latter is coupled by the chain 16 to the rod 18 of the travelling wheels 3 the whole gantry is caused to move to and fro.

The reversal of the motor is controlled by a bell crank 37, coupled by a 2½" strip 38 to the reversing lever of the motor, a strip 39 being bolted to the bell crank as an extension handle.

A small electric globe 35 may be mounted on the crane, and controlled by switch 36, Fig. 728.

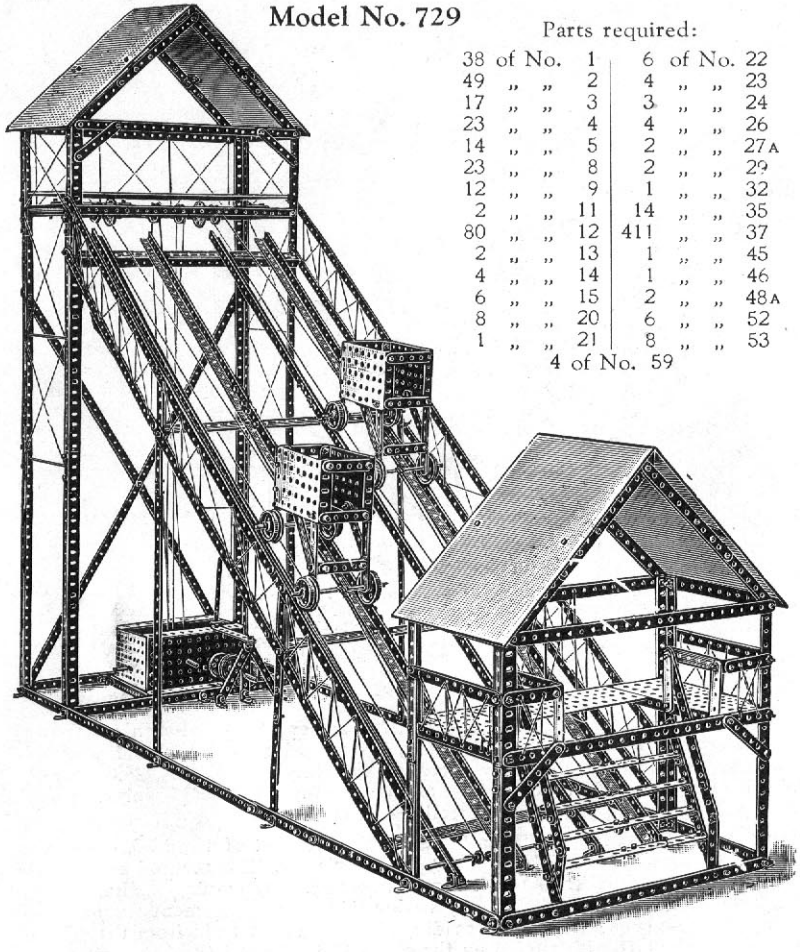
This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.

Funicular Railway

Model No. 729

Parts required:

38	of No.	1		6	of No.	22	
49	„	„	2	4	„	„	23
17	„	„	3	3	„	„	24
23	„	„	4	4	„	„	26
14	„	„	5	2	„	„	27A
23	„	„	8	2	„	„	29
12	„	„	9	1	„	„	32
2	„	„	11	14	„	„	35
80	„	„	12	411	„	„	37
2	„	„	13	1	„	„	45
4	„	„	14	1	„	„	46
6	„	„	15	2	„	„	48A
8	„	„	20	6	„	„	52
1	„	„	21	8	„	„	53
4 of No. 59							



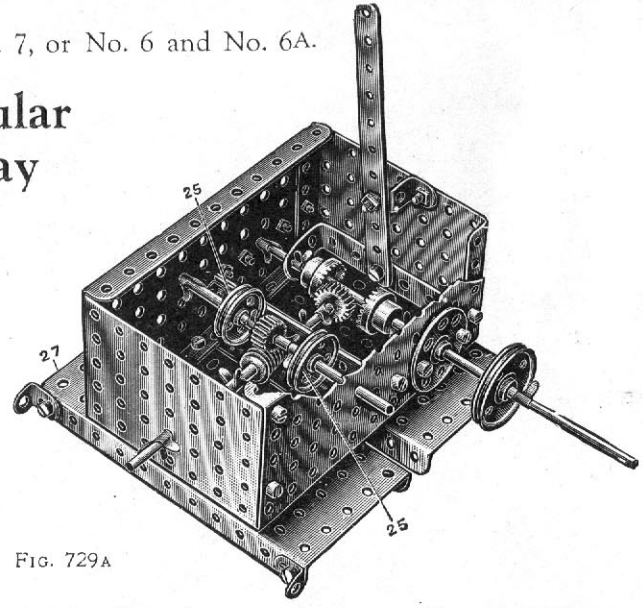


FIG. 729A

Begin by constructing the main tower, the corner pillars of which are made from two 12½" angle girders and a 5½" angle girder; the 12½" girders overlapped three holes and the 5½" girders two holes. The rear diagonal ties are made from 12½" strips overlapped. The roof rafters consist of 5½" strips overlapped five holes.

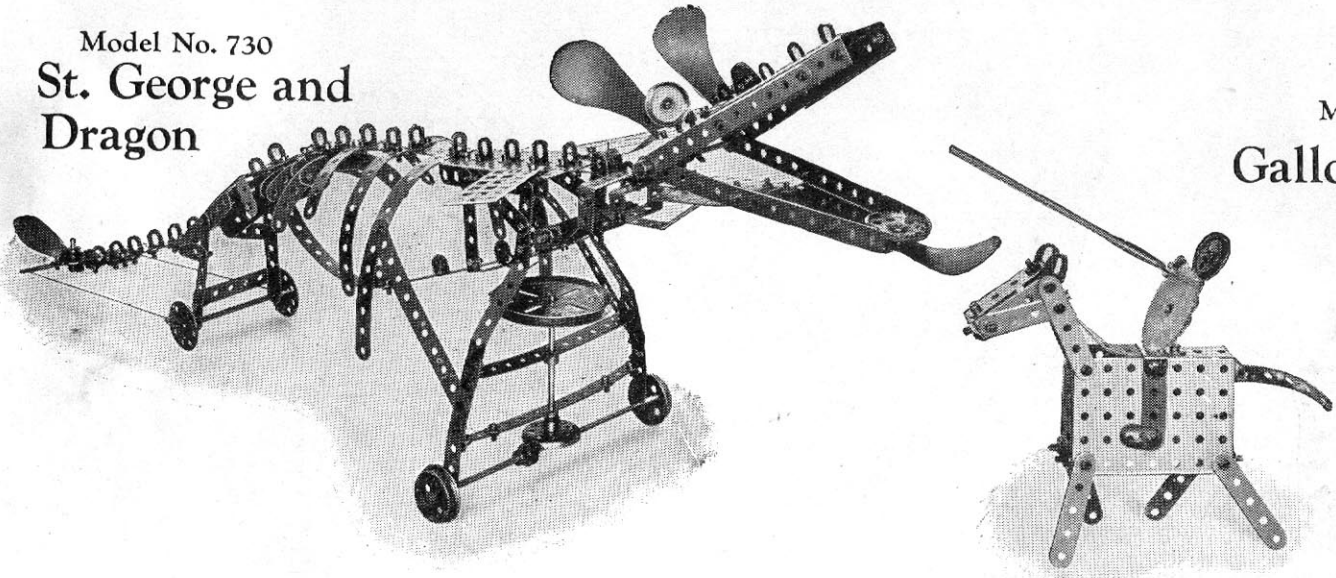
The inclined rails are made from 4 sets of 12½" angle girders, butted together and connected by 3" strips. The rails rest on three upper crossing 12½" angle girders, and a lower 12½" strip to the ends of which are bolted the latticed side rails supported by the vertical members. The loading platform is built up from 5½" 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 12½" strips overlapped as shown.

The wagons are made as follows: Two small flanged plates are connected top and bottom by 2½" strips. The journals for the front axle are made by two 3½" 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 3½" 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. 729A, the operting 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.

Model No. 730
St. George and Dragon



Parts required, Dragon:

2	of No.	1	4	of No.	16	2	of No.	35	6	of No.	59
17	„ „	2	1	„ „	18A	126	„ „	37	2	„ „	61
7	„ „	3	1	„ „	19B	7	„ „	38	1	„ „	69
5	„ „	5	2	„ „	20	4	„ „	41	2	„ „	72
3	„ „	6	2	„ „	22	1	„ „	43	6	„ „	90
3	„ „	11	3	„ „	24	3	„ „	46	2	„ „	110
34	„ „	12	1	„ „	26	9	„ „	48A	2	„ „	114
1	„ „	13A	2	„ „	28	4	„ „	54			

This model requires little description. The jaws of the dragon work by means of a cord fastened to a 3½" strip which is attached to the 2½" × 2½" flat plate forming the head. The cord is passed through a hole in the 12½" strip, which forms the back-bone. It is attached at its other end to the periphery of a 3" pulley wheel, which is caused to rotate as the dragon moves along the ground. To make the tail wag, cords are fastened to each end of the pivoted 3½" strip which carries the bush wheel and propeller blade forming the tail, and attached at the other ends to angle brackets bolted to the back wheels. As the model moves along the ground the tail wags in quite a realistic way.

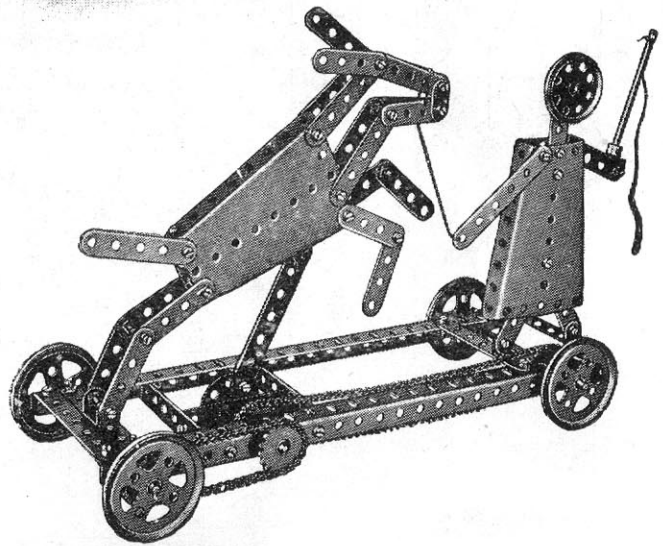
Model No. 731
Galloping Donkey

Parts required:

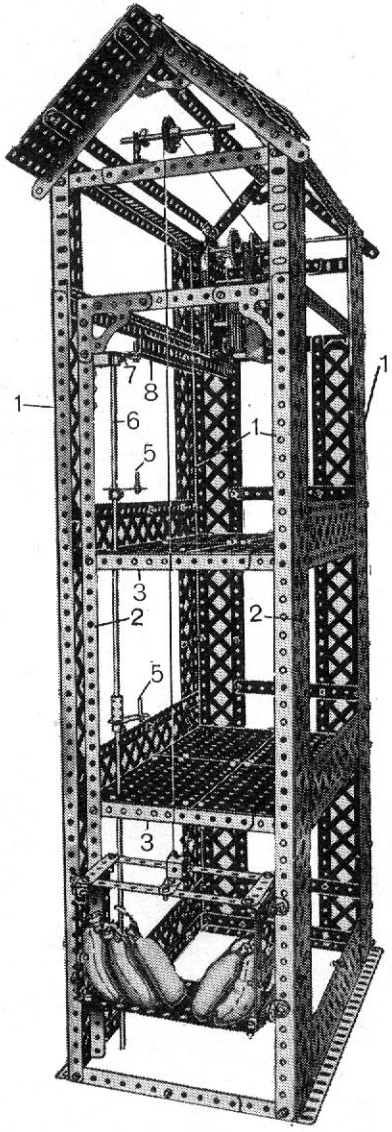
5	of No.	3	1	of No.	21			
1	„ „	4	1	„ „	24			
9	„ „	5	1	„ „	35			
10	„ „	6	52	„ „	37			
2	„ „	8	5	„ „	37A			
2	„ „	10	1	„ „	38			
1	„ „	11	1	„ „	48A			
2	„ „	12	2	„ „	48B			
2	„ „	15	4	„ „	54			
1	„ „	16	1	„ „	59			
1	„ „	16A	18"	„ „	94			
4	„ „	20A	4	„ „	96			

Parts required, St. George:

1	of No.	3
7	„ „	5
7	„ „	6
7	„ „	10
3	„ „	11
2	„ „	12
1	„ „	14
1	„ „	22A
31	„ „	37
1	„ „	37B
2	„ „	48A
2	„ „	53
1	„ „	62
1	„ „	95



Model No. 732 Warehouse



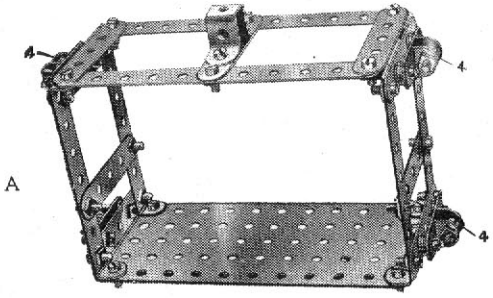


FIG. A

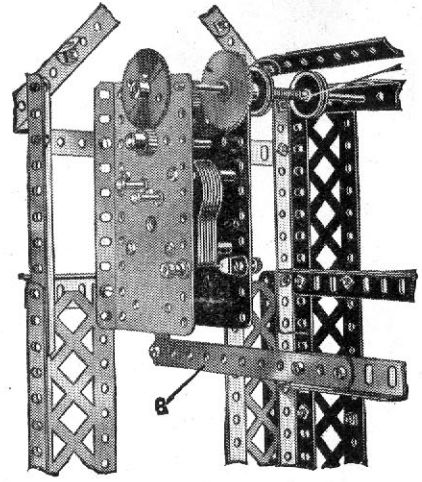


FIG. B

Commence this model by building the framework. 24½" angle girders are used to form the corner uprights 1 with 5½" angle girders overlapped eight holes at the top. Two 24½" angle girders 2 are also used to carry the front portion of the warehouse floors, the latter being bolted to two 5½" angle girders 3 overlapped eight holes and connected across to the two inner angle girders 2. Two similar 5½" angle girders are bolted to the back of the framework, to carry the other end of each of the floors. The floor is formed of four 5½" × 3½" flat plates butted together and bolted in the centre to a 5½" flat girder on the underside—the two outer ends being bolted to the angle girders 3. The horizontal side-strips are formed of 12½" strips to which are bolted the braced girder strips.

Fig. A shows the construction of the cage. This is guided by bolt heads 4, at each side riding along the inwardly turned flanges of the angle girders 2. The bolts are attached to angle brackets, which are secured to a 1½" strip, this latter being secured to the side-strips of the cage, spaced with three washers to take up the play between the cage and the upright girders 2.

Fig. B shows the position of the motor, and this may be started and stopped from the control crank handles 5, one on each floor of the warehouse. These crank handles are fixed on a vertical rod 6 composed of two 11½" rods connected by a coupling. A crank 7 is secured to the upper end of this rod and is connected by a 5½" angle girder and strip 8 to the operating lever of the motor.

1" brackets secured to the sides of the warehouse by strips form the bearings for the upper and lower ends of the vertical rod.

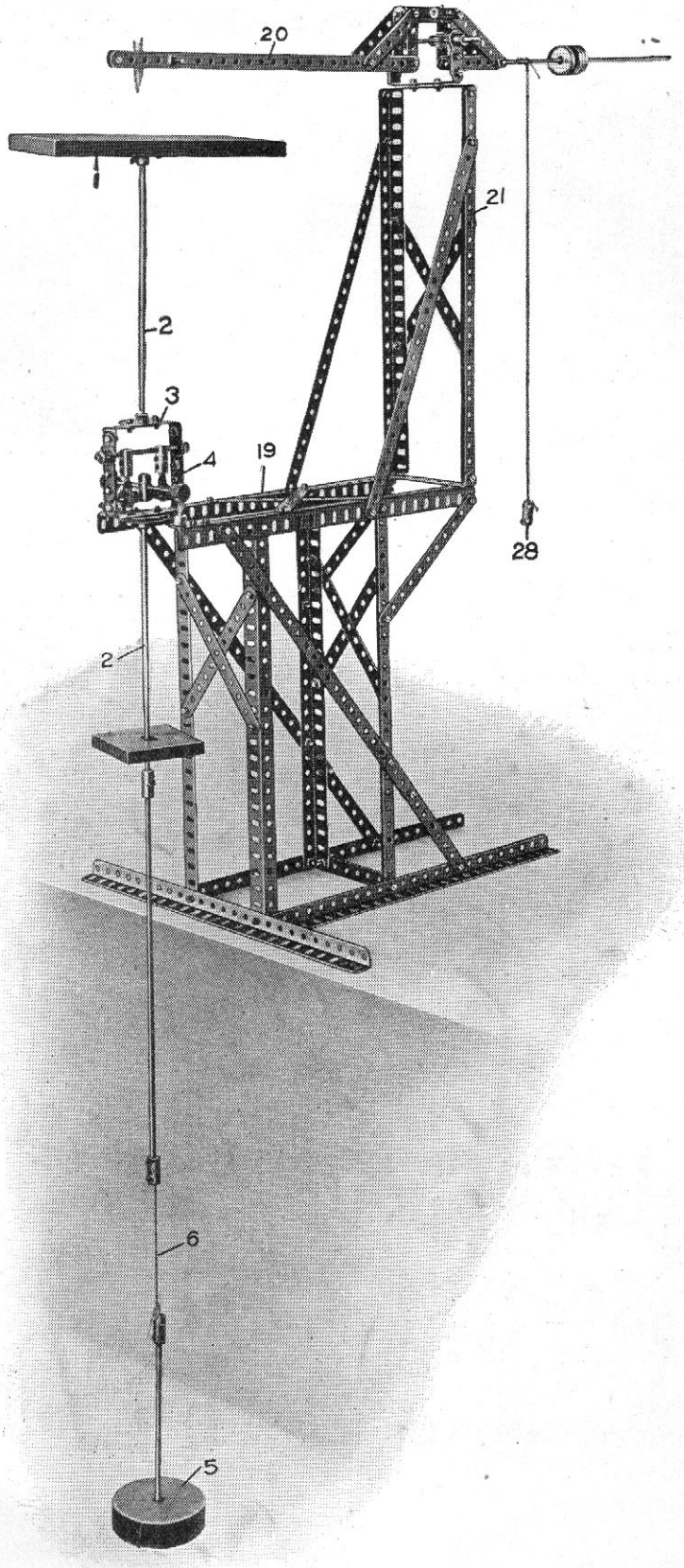
When the motor is wired up to the accumulator, the elevator is ready to be operated.

Parts required:

18	of No.	1	2	of No.	13	1	of No.	59
21	„ „	2	1	„ „	14	4	„ „	62
9	„ „	5	1	„ „	16	1	„ „	63
1	„ „	6	3	„ „	22	3	„ „	70
4	„ „	6A	2	„ „	35	18	„ „	99
6	„ „	7	240	„ „	37	4	„ „	100
6	„ „	8	30	„ „	38	2	„ „	103
23	„ „	9	1	„ „	45	4	„ „	108
16	„ „	12	1	„ „	46	4	„ „	115
2	„ „	12A	8	„ „	52A			

Electric Motor

This Model can be made with MECCANO Outfit No. 7, or No. 6 and No. 6A.



Model No. 733

Twin-Elliptic Harmonograph

Parts required:

8	of	No.	1
10	„	„	2
3	„	„	3
4	„	„	4
6	„	„	5
4	„	„	6
11	„	„	7
5	„	„	11
2	„	„	12
2	„	„	13
2	„	„	13A
1	„	„	14
3	„	„	16
2	„	„	16A
1	„	„	17
1	„	„	21
3	„	„	22
2	„	„	22A
2	„	„	24
6	„	„	26
86	„	„	37
2	„	„	37A
2	„	„	38
3	„	„	46
1	„	„	48B
4	„	„	59
6	„	„	62
9	„	„	63
6	„	„	65
1	„	„	107
2	„	„	111

Model No. 733 Twin-Elliptic Harmonograph *(continued)*

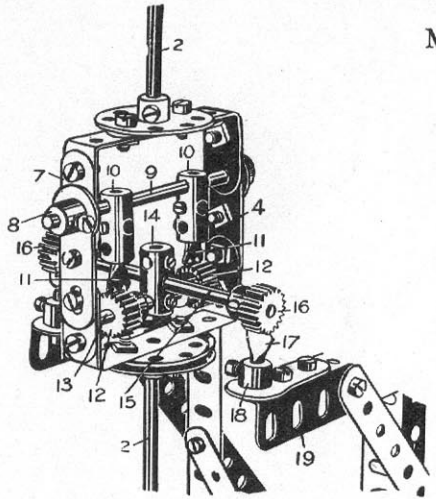


FIG. 733A

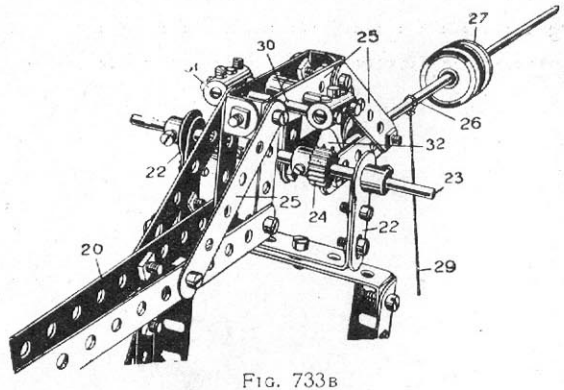


FIG. 733B

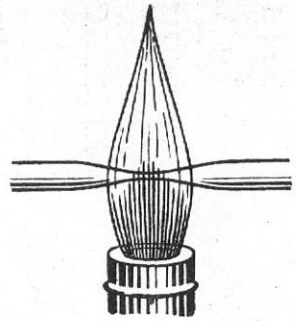


FIG. 733C

The table 1, upon which the paper for the design rests, is carried on a rod 2, the lower end of which is bolted to a bush wheel 3, which in turn is bolted to a frame 4, Fig. 733A, the lower rod 2 being similarly bolted to the frame 4 and carrying a somewhat heavy weight 5.

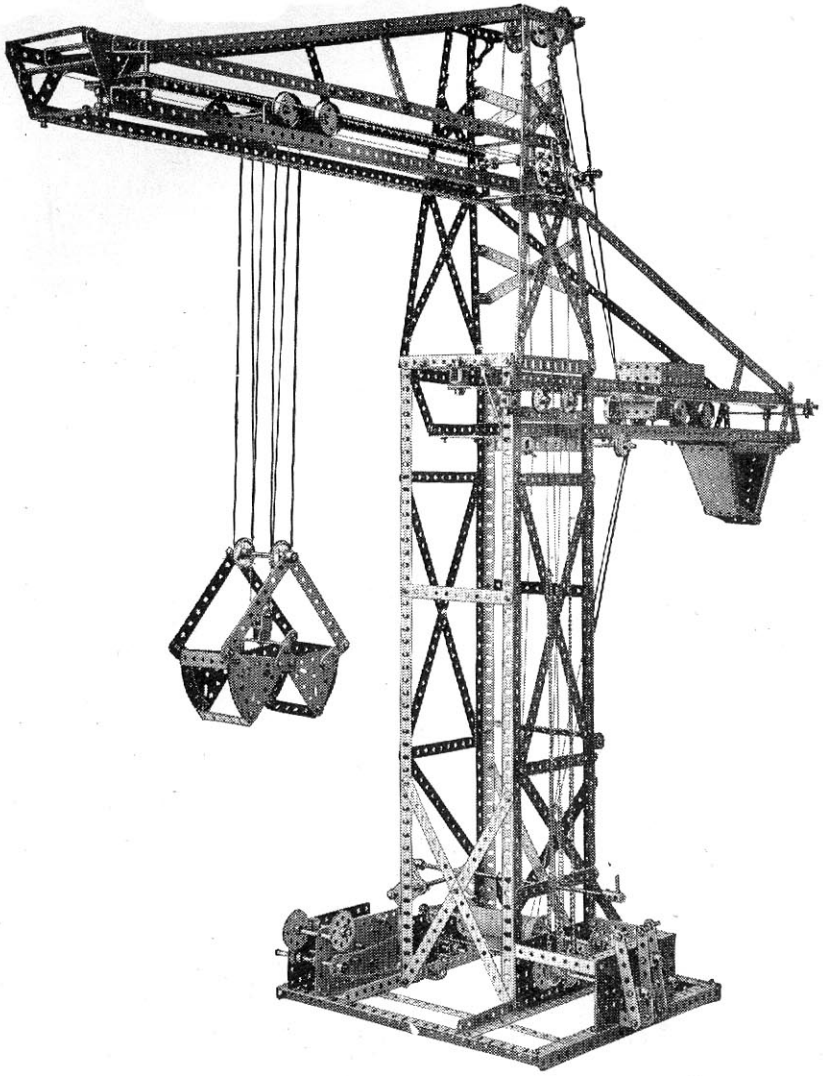
In order to obtain a flexible movement of the weight 5, the lower parts of the rod are coupled by a short length of string 6.

The frame 4 is built up as shown in Fig. 733A. of double angle strips 2½″ by 1″, connected by 2½″ side strips 7, outside which are bolted cranks 8 to provide bearings for a rod 9 secured in the crank bosses. On the rod 9 are secured couplings 10 in the lower ends of which are mounted centre forks 11 forming knife edges engaging between the teeth of two ½″ pinions 12 fixed on a 2″ rod 13, which is secured in a centre coupling 14 across which, in the centre hole of each, is bolted a 3½″ rod 15. On the outer ends of this rod 15 are two ½″ pinions 16 which rest upon centre forks 17 forming lower knife edges, secured in the bosses of cranks 18 carried on angle girders 19. Consequently, the frame 4 is balanced so as to swivel in two directions about the knife edges 17 and the knife edges 11! The ink pencil is gripped between the ends of two 12½″ strips 20, forming an arm which is pivotally supported as shown in Fig. 733. At the top of the arm 21, Fig. 733B, are bolted two cranks 22, in the bosses of which is secured a rod 23 carrying two pinions 24. The strips 20 are coupled by 3″ and 2″ strips 25 to form a yoke, in the rear of which is fixed a rod 26 on which is a balance weight 27, formed by a number of pulleys, and a further weight 28 is suspended from the rod 26 by cord 29. The balance weight is adjusted along the rod so that the pencil will just rest lightly on the paper on the table 1, and the extra weight 28, when hanging free, as in Fig. 733, just lifts the pencil clear of the paper. By lifting the weight 28 and resting it somewhere on the frame, the pencil is brought into light contact with the table 1.

In the yoke 25 are inserted two rods 30, each carrying couplings 31 in the centre holes of which are secured centre forks 32 forming knife-edges, which engage the ½″ pinions 24 about which the pencil arm swivels.

The pencil is made by drawing out a short length of ⅛″ glass tubing in a bunsen or methylated spirit lamp, about ½″ taper, Fig. 733C, and the end ground smoothly on a clean wet hone laid on the table; the tube is then filled with ink, which flows freely through the fine perforation in the point.

To operate the apparatus, if the weight 5 be given a swinging movement, the table 1 is oscillated, and the stationary pencil describes a diagram on the paper, which is varied according to the direction in which the weight swings.



Model No. 734

High-Speed Ship Coaler

This Model will appeal to most boys interested in shipping, as showing the manner in which ships can be coaled quickly. The apparatus is centrally controlled and is a good example of the adaptability of Meccano to the construction of such complicated mechanical models.

This is a model to which it is not possible to do justice in this Manual. Instructions for making it are contained in a special leaflet, which may be purchased from your Meccano dealer, price 3d., or from Meccano Ltd., Liverpool, post free 4d.

Interesting Experiments in Applied Mechanics with Meccano

Few boys know what an important part the science of "Applied Mechanics" plays in everything which they see around them. It is this science which enables engineers to design machines, so that they will withstand all kinds of strains. It enables bridge builders to make their constructions so that they are able to guarantee them to bear certain weights When an engineer builds a crane and guarantees it to lift a load of so many tons, "Applied Mechanics" tells him where the strain will come, exactly what strength of materials he must use, and how his crane ought to be designed.

Of course "Applied Mechanics" is a big subject, and you can only grasp its principles thoroughly after a lot of study; but it is a very fascinating subject, and some of the elementary principles are most interesting and novel and not at all difficult to understand. To simplify the working out of the examples which will be found on the following pages, we have introduced a standard frame work, so that the various examples may be easily and quickly set up. Any boy can get lots of fun and learn a lot of useful points in mechanics, by making these experiments.

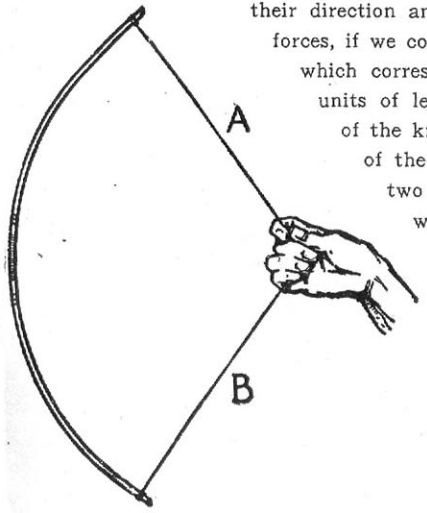
The following is a list of the parts required to build all the Scientific Examples illustrated here :—

No. 1.	2	Perforated strips,	12½″
,, 2.	12	,, ,,	5½″
,, 3.	6	,, ,,	3½″
,, 4.	6	,, ,,	3″
,, 5.	6	,, ,,	2½″
,, 7.	4	Angle girders,	24½″
,, 7A.	4	,, ,,	18½″
,, 8.	6	,, ,,	12½″
,, 9.	1	,, ,,	5½″
,, 10.	24	Flat brackets	
,, 11.	2	Double ,,	
,, 12.	12	Angle ,,	
,, 12A.	4	,, ,,	1″
,, 13.	1	Rod,	11½″
No. 13A.	1	Rod,	8″
,, 15.	6	,,	5″
,, 16.	1	,,	3½″
,, 17.	6	,,	2″
,, 19.	1	Crank handle	
,, 19B.	6	Pulley wheels,	3″
,, 20.	4	Flanged and grooved wheels	
,, 21.	2	Pulley wheels,	1½″
,, 22.	1	,, ,,	1″
,, 24.	1	Bush wheel	
,, 37.	48	Nuts and bolts	
,, 38.	12	Washers	
,, 43.	1	Spring	
,, 48A.	6	Double angle strips,	2½″ × ½″
No. 52.	3	Perforated flanged plates,	5½″ × 2½″
,, 57A.	6	Scientific hooks	
,, 59.	12	Collars and set screws	
,, 62.	2	Cranks	
,, 63.	4	Couplings	
,, 66.	12	50-gramme weights	
,, 67.	2	25 ,, ,,	
,, 68.	12	½″ wood screws	
,, 81.	3	Screwed rods,	2″
,, 82.	1	,, ,,	1″
,, 94.	5′	Sprocket chain	
,, 95.	1	,, wheel	2″
,, 96.	1	,, ,,	1″
	1	Board,	12½″ × 11½″ × ½″

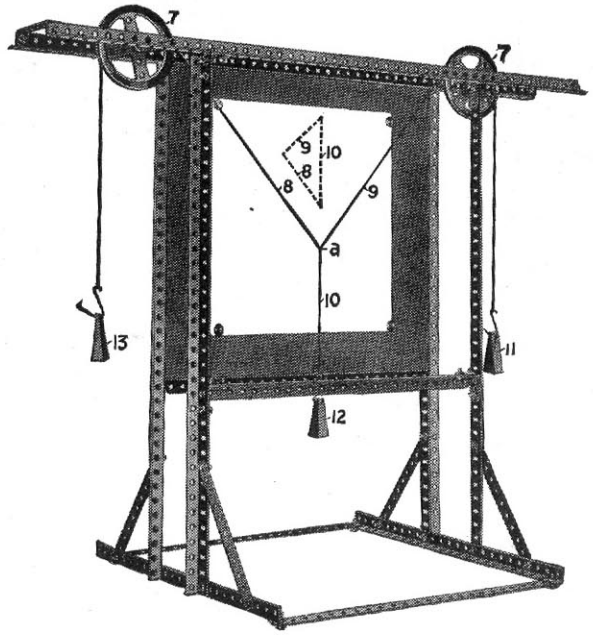
The board is not provided in this Outfit on account of its size. This, however, can be provided at little expense.

Model No. 735 Triangle of Forces

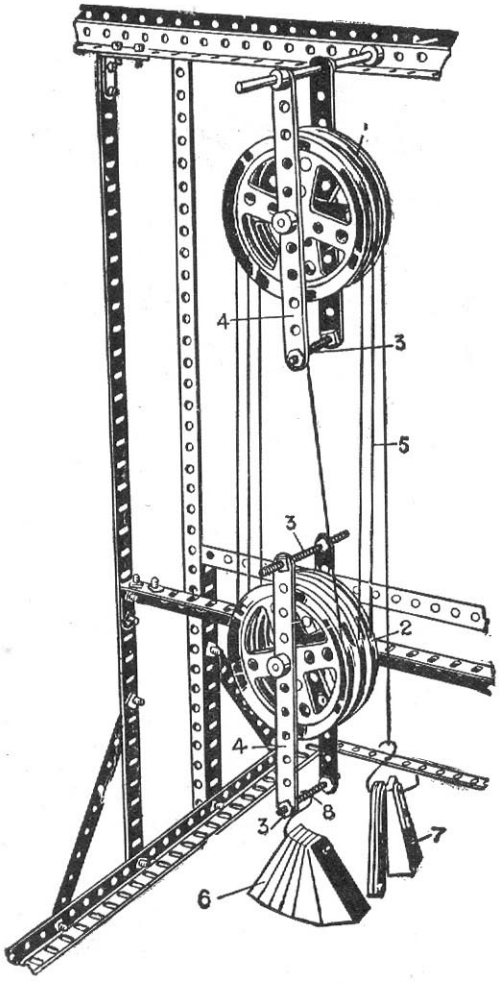
The first example is called the "Triangle of Forces." Briefly, if three forces meet at a point and balance each other, and we know one of the forces, we can find out the other two by drawing a triangle, making each side parallel to the direction of one of the forces. To demonstrate this, two large pulleys 7 are carried on rods in the top rails, and cords 8, 9, passed over these pulleys and their ends joined to another cord 10. Weights 11, 12, and 13 are then hung on the ends of the cords 8, 9, and 10, and when the point of junction (a) of the three cords has come to rest, lines in the direction of the cords are drawn on the sheet of paper, which is afterwards removed and a triangle drawn, as shown in the illustration, with its sides 8, 9, and 10 parallel to the directions of the three cords. This triangle is shown in dotted lines. If the sides of the triangle are measured it will be found that they are in the same proportion as the weights 11, 12, and 13. For instance, if the weight 12 were 15 units and the weight 13 were 9 units, and the weight 11 were 7 units, the lengths of the sides of the triangle would be 15, 9, and 7 units. By this experiment, therefore, we demonstrate that when three forces meet at a point, and we know their direction and the value in grammes or pounds of one of the forces, if we construct a triangle, making that side of the triangle which corresponds to the known force equal to a number of units of length, each unit representing a gramme or pound of the known force, then by scaling off the other two sides of the triangle we can determine the value of the other two forces in grammes or pounds. Several experiments with different weights should be tried and triangles drawn, and the accuracy of the apparatus for different weights tested.



As an example of the triangle of forces, when a boy pulls a bow to shoot an arrow, if we know the force he pulls with, we can find the pull along each part A and B of the string by measuring the angle which the string forms.



Little difficulty will be experienced in constructing the Meccano Demonstration Frame from this illustration. It may be well to mention, however, that the rear uprights, which consist of 18½" angle girders, are secured to the sides of the board shown in the illustration by ordinary wood screws. The 24½" girder at the top is secured in the same manner, as is also the 12½" girder at the bottom. The board is used for pinning on sheets of paper, upon which the diagrams are drawn.



Model No. 736

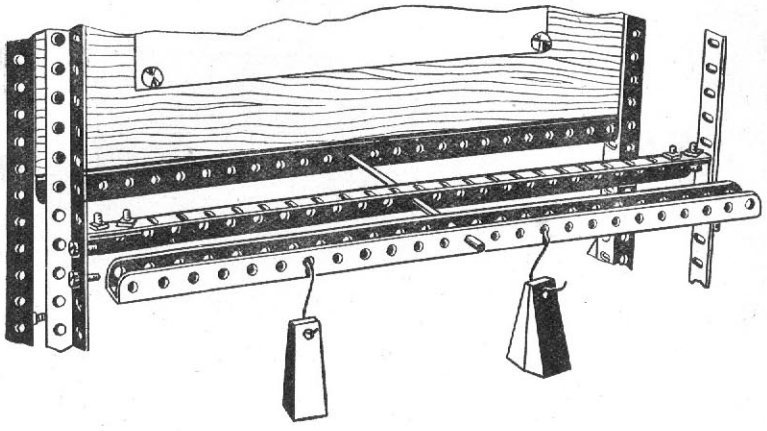
Pulleys

In this model the principle of a purchase pulley block is demonstrated. In engineering shops and other places where heavy weights are required to be lifted by hand, it is necessary to provide some means so that the ordinary power that a man can exert is multiplied to such an extent as to enable him to lift much heavier weights than would otherwise be possible without a pulley block. Whenever an apparatus for this purpose is used, what is gained in power is lost in speed. The pulley block shown consists of three 3" pulley wheels 1 in the upper block and a similar number of wheels 2 in the lower block. The construction of these blocks may be seen from the illustration, the rods 3 being screwed throughout their length, and the side strips 4 held thereon by nuts on the rods 3 inside and outside of the strips. The upper block 1 is fixed from the top girders of the frame, but the lower pulley block 2 is supported on the loops of the cord 5 and rises and falls carrying with it the weights 6 suspended from the lower block. The weights 6 represent the load to be lifted and the smaller weight 7 represents the power applied such as the pull of a man. If there were no such thing as friction in the bearings of the pulleys, then the proportion of the weight 7 necessary to balance or just raise the weights 6 would be as 1 is to 6. Of course the weight 7 moves six times the distance that the load 6 is lifted or lowered, so that although the heavy load 6 is overcome by a light power 7 the distance the power weight 7 has to move is considerably greater, in fact it is six times as great. In order to ascertain the amount of friction to be overcome, it is necessary in the first place to attach small weights to a hook 7, sufficient to counterbalance the weight of the lower block to the point when it commences to move. After the weights have been added as indicated above, that is, in the proportion of 1 to 6, the amount of friction can be ascertained by again adding small weights to the point when it commences to move, the weights added representing the amount of friction.

Different load weights 6 should be hung on the lower pulley, and it should be noted what are the corresponding power weights 7 required just to overcome the load weights. These results should be tabulated like the following which were obtained by experiment:

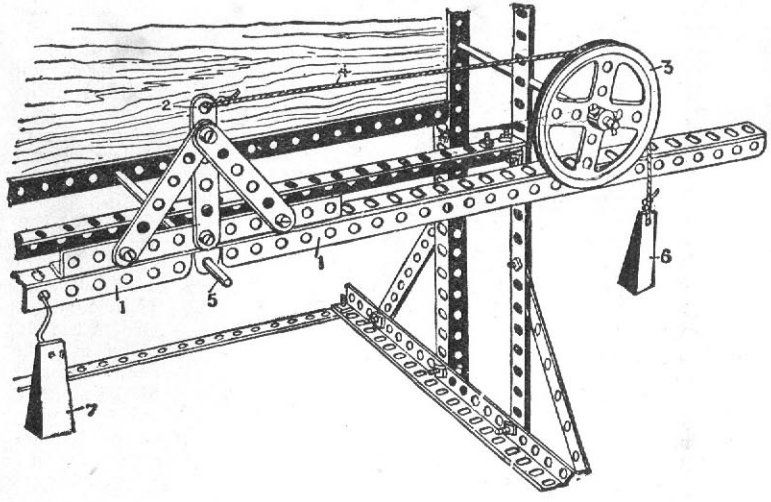
Power.	Load.	Friction.
25 + 3.3 = 28.3 grammes	150 grammes	2.2 per cent.
50 + 6.6 = 56.6 ,,	300 ,,	2.2 ,,
75 + 8.8 = 83.8 ,,	450 ,,	1.9 ,,

Model No. 737 Levers



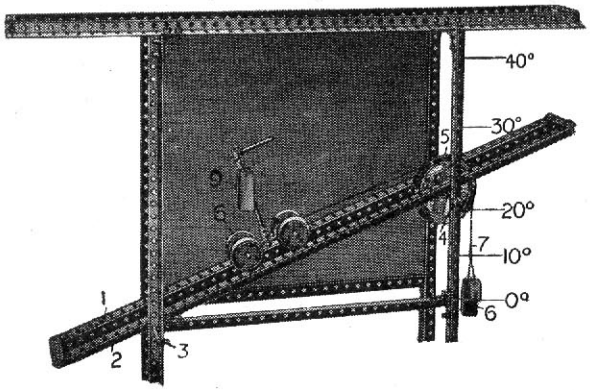
If we have a lever 6″ long and pivoted 4″ from one end, the arms of the lever will be 4″ and 2″, and if we hang a 2-lb. weight at the end of the 2″ arm, we say that the moment of the force of the 2-lb. weight about the pivot is equal to the weight in pounds multiplied by the length of the arm in inches. In this case the moment, therefore, would be $2 \times 2 = 4$, and this would be called a moment of 4 inch-lbs. Similarly if a weight of 1-lb. were hung at the end of the 4″ arm of the lever we would say that the moment of that weight would be 1-lb. multiplied by the length of the arm, $1 \times 4 = 4$, and we would call this 4 inch-lbs. Now when the moments of a lever obtained in this way are equal, the lever is balanced. Levers are of various kinds ; they may be straight levers or bell-crank levers, that is to say, where one of the arms is at right angles to the other. A straight lever is shown in this Model and a bell-crank lever in Model No. 737A. Now we will demonstrate the principle of moments in the case of the straight lever. This is made up of two $12\frac{1}{2}$″ angle girders bolted together as shown, and pivoted on a short rod. The holes in the Meccano strips are all at a standard distance of $\frac{1}{2}$″ apart, so that we can easily fix the lengths of the lever arms in inches by counting the holes. If we hang two weights of 50 grammes (that is 100 grammes) from the third hole, or $1\frac{1}{2}$″ from the pivot at one side, the moment of that weight will be $100 \times 1\frac{1}{2} = 150$ inch-grammes. Now if we hang a single weight of 50 grammes on the other side at six holes or 3″ from the pivot the moment will be $50 \times 3 = 150$ inch-grammes, and as the moments are equal the lever will balance, though the weights themselves are unequal.

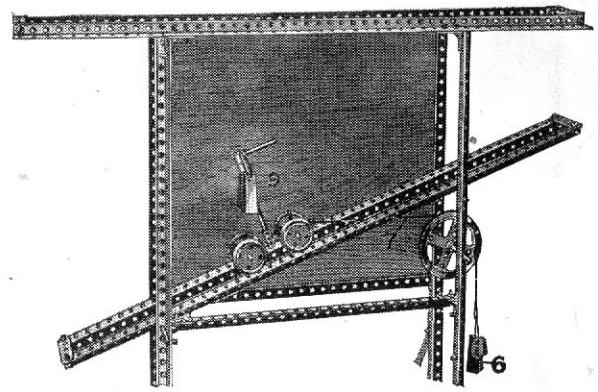
Model No. 737a Bell Crank



This Model is made up of two $12\frac{1}{2}$″ angle girders 1 braced to a vertical strip 2, pivoted through a double bracket. A large wheel 3 is mounted on a rod in the side girders, care being taken that the cord 4 coming over the top of the pulley is parallel to the angle girders 1 of the lever. The arms of this lever are the left angle girder 1 and the vertical strip 2, and in order that this lever may balance about its pivot 5, the moment of the forces about the pivot must be equal, as we have previously described. Supposing, therefore, we hang a weight 6 of 50 grammes on the end of the cord 4 round the pulley 3, and connect the cord 4 to the strip 2 at 6 holes or 3″ distance from the pivot 5 then the moment of the force will be the weight 50 multiplied by $3 = 150$. The lever will be kept balanced if we hang an equal weight 7 of 50 grammes on the angle girder 1 at 6 holes or 3″ distance from the pivot 5, because the moments $50 \times 3 = 150$ inch-grammes, are then equal. If, on the other hand, we hang two weights 6 of 50 grammes each on the end of the cord 4, the lever will be balanced by one 50 gramme weight 7 at 12 holes or 6″ distance from the pivot.

Model No. 738 Inclined Plane





Another interesting principle which may be demonstrated on this apparatus is that known as the Inclined Plane. The force required to raise a body up an inclined plane varies according to the angle of the plane, that is to say, the slope. The plane is made of two angle girders 1, 2, connected together at each end by $2\frac{1}{2}$″ strips and fixed on a rod 3 passed through holes in the vertical girders of the frame and the girders of the plane, and the other end of the plane rests on a rod 4 which carries a 3″ pulley wheel 5. By placing the rod 4 through different holes in the side girders the slope or angle of the inclined plane may be varied. To obviate the need of a protractor to ascertain the slope of the plane, it may be stated that if the rod 4 be placed in the fourth hole with the plane pivotally mounted on rod 3 (as shown in the illustration) the surface of the plane will represent an incline of 10°. If placed in the 9th hole, 20°. If in the 15th hole 30°, and if in the 21st hole 40°. The force or weight 6 on the cord 7 is arranged to act parallel to the plane. and the cord is connected to the carriage 8 so that the latter may roll up the plane. The bearings for the axles of the wheels are formed of couplings and connected by a 2″ rod.

Before commencing the experiment, weights should be hung on the cord 7, which are just sufficient to balance the carriage 8. If a weight 9 be then hung on the carriage it should be noted what additional weight is required to be hung on the end of the cord 7 just to make the carriage slowly ascend the plane. The weight 9 should then be varied and the alteration in the weight 6 on the cord 7 to make the carriage ascend the plane noted, and these results should be tabulated.

When the student has finished this experiment he should try the second example illustrated above, where the force along the cord 7 is not parallel to the slope of the plane, but is horizontal, first hanging on weights 6 until the carriage is just balanced on the plane, and then hanging different weights 9 on the carriage and noting what additional weights at 6 are necessary just to cause the carriage to begin to move up the plane. These results should also be tabulated.

Experiments made with the apparatus have yielded the following results:

When forces are parallel to the plane:

At	Force 6 Grammes.	Weight 9 Grammes.
10°	22·2	100
20°	40·54	100
30°	58·8	100
40°	70	100

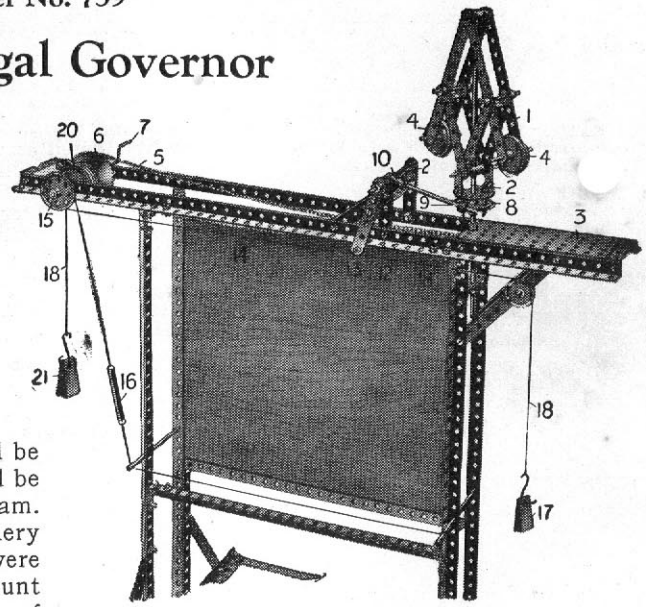
When forces are horizontal:

At	Force 6 Grammes.	Weight 9 Grammes.
10°	23·31	100
20°	43·87	100
30°	63·2	100
40°	89·43	100

A good example of an inclined plane is a horse pulling a cart up a slope, the horse being the force and the cart the weight.

Model No. 739

Centrifugal Governor



In this model an apparatus is shown for demonstrating the controlling effect of a governor. A governor is a device which is fitted on an engine in order to make its speed constant. In the case of an engine driving a works, for instance, if all the machinery in the shop were running, the engine would be driving a heavy load and would be using a certain amount of steam. If a great portion of the machinery were stopped and the engine were allowed to take the same amount of steam, owing to the lightness of the load then on the engine it would race at great speed and probably be damaged. To prevent this engineers fit a governor device which, as the load on the engine is lightened, automatically shuts off the steam, or throttles it, and which, as the load comes again on the engine, permits it to take more steam. The governor thus arranges the steam supply to the engine to be suitable for the load which the engine bears and to drive it at a constant speed. Most governors are of the centrifugal ball type, that is to say, they have a pair of ball weights which are spun round by the engine. As the engine's speed increases, the ball weights fly out, and this flying out or centrifugal action is arranged to shut off the steam.

The governor 1, the construction of which is quite clear from the illustration, is mounted on a spindle 2 in a rectangular plate 3 fitted in the top girders. The flanged pulley wheels 4 represent the ball weights of the governor. Below the rectangular plate 3 and on the spindle 2 is a sprocket wheel 22 connected by the sprocket chain 5 to another sprocket wheel 6 on the cranked axle 7.

A bush wheel and a $1\frac{1}{2}$" pulley wheel 8 are fixed on the spindle of the governor a slight distance apart, and the head of a bolt in the collar 9 engages between the wheels 8. The collar 9 is connected by a coupling 10 to a rod 11 pivoted in the strips 12. The near end of the rod carries a strip 13, clamped between two cranks, to which is connected a cord 14 passed once round the $1\frac{1}{2}$" pulley 15 and connected to the spring 16. The cord 14 acts as a brake on the pulley 15, another cord 18 connected to the strip 13 carries a weight 17, and another cord 19, which is wound on the flanges of two reversed flanged and grooved wheels, is loaded with different weights 21 in order to conduct the experiments. The weights 21 correspond to the driving force of the engine, and the governor controls this varying driving force by applying the brake which is the cord 14. Different weights 21 should be hung on the cord 19, and the cord then wound up to the top by the crank axle 7. The time taken for different weights 21 to fall should be noted, and if the apparatus has been properly adjusted the different weights 21 should take nearly the same time to fall to the floor. If heavy weights are hung on, the governor ball weights 4 fly out and raise the discs 8 which swing the strip 13 and apply the brake thus retarding the fall of the weights. The student should tabulate his results, using different weights and noting the variation in seconds taken for the weights to fall. The following are examples :—

Weight.	Time in falling.	Weight.	Time in falling.	Weight.	Time in falling.
75 grammes	12 Secs.	100 grammes	11 Secs.	200 grammes	10 Secs.

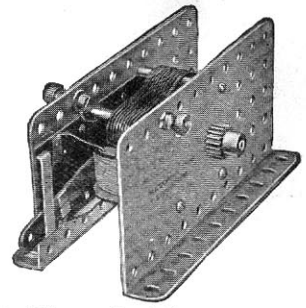
MECCANO ACCESSORY OUTFITS AND MOTORS

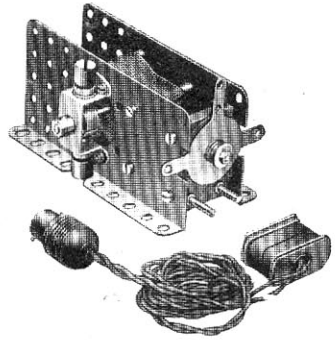
Meccano Accessory Outfits

Our illustration shows one of the Meccano Accessory Outfits. As has already been explained, these Outfits connect the main Outfits from No. 00 to No. 7, making it possible for a boy who commences with one of the earlier Outfits to build up his equipment by easy stages, until he is the possessor of parts that cover the entire system. For prices see page 206.

4-Volt Electric Motor

The 4-volt motor is also specially designed to build into Meccano models. It is a most reliable and powerful model and when properly geared will lift over 30 lbs. dead weight. It may be run by a 4-volt accumulator, or by employing a suitable transformer, direct from the main, fitted with reversing motion, provided with stopping and starting controls, and the gearing is interchangeable. For price see page 206.





No. 2 Electric Motor

(100-250 Volt)

This Electric Motor may be employed for any purpose for which a small motor is suitable, but it is specially adapted for driving Meccano models. The side plates are perforated with standard equidistant holes, thus allowing the motor to be built into any Meccano model. The motor is specially designed for connection with the electric-light main. It is supplied for 100-120 volts or 200-250 volts (alternating or direct), and is fitted with 6 ft. length of flex, an insulated plug for connection with the motor terminals, and an adapter for connection with an ordinary lamp socket.

A suitable resistance is required when the motor is run with a 200-250 volt current, and this is supplied by connecting a 20-watt lamp in series with the motor. A board on which are mounted a suitable lamp-holder (lamp not included) and a switch is provided separately. For prices see page 206.

Electrical Outfit

All Meccano boys are fascinated by electricity and never become tired of learning more about this wonderful subject. The application of electricity to the Meccano system adds a further and wonderful charm, and the joys of model-building are now increased by the fascinating pastime of carrying out delightful electrical experiments.

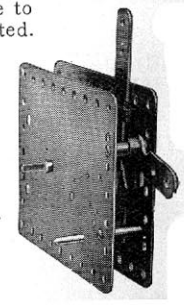
The Meccano Electrical Outfit contains a number of specially designed electrical parts which may be used in conjunction with any of the regular Outfits. For price see page 206.

4-Volt Accumulator

This new and excellent type of accumulator has been adapted to drive the 4-volt Electric Motor. It has been subjected to the severest tests and has proved itself to be the most suitable accumulator for use with any type of electric motor. It is non-spillable, has remarkable recuperative powers, and will continue to supply current when nominally exhausted. For price see page 206.

Clockwork Motor

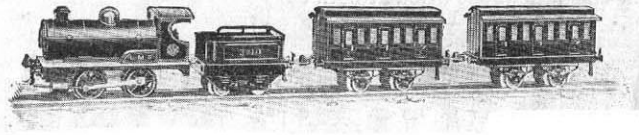
How splendid it is, after spending hours in building a model, to be able to set it in motion with a motor, just as do real engineers! The Meccano Clockwork Motor is specially made for this purpose and is a fine piece of mechanism—simple, powerful, and reliable. It is fitted with starting and stopping levers, and has a reversing movement. For price see page 206.



HORNBY CLOCK WORK TRAINS

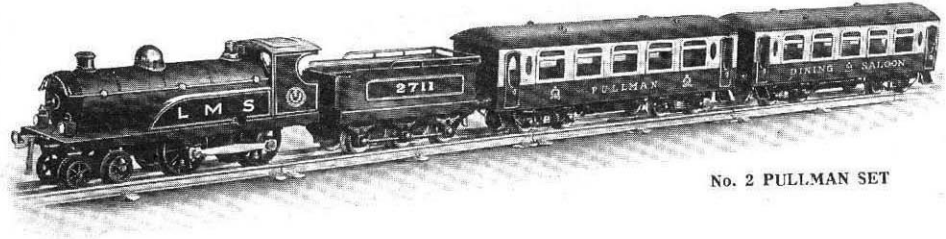
THE HORNBY TRAINS are manufactured by Meccano Ltd., and they are built on the Meccano principle. All the parts are standardised and any lost or damaged part may be replaced with a new one. *A Hornby Train lasts for ever!* The Hornby Train is a beautiful piece of workmanship, with perfect clockwork mechanism, ensuring smooth running. Each Train is guaranteed by Meccano Ltd.

No. 1 PASSENGER SET.—Gauge 0. Each Set contains Loco, Tender and two Coaches, with Rails for a 2ft. diameter circle and two straights. The Loco is fitted with reversing gear, brake, and governor. In colours to represent the L.M.S. or L.N.E.R. Companies' rolling stock. Complete in brown leather-finished gold-embossed box. *For price see page* 206.



No. 1 GOODS SET.—Gauge 0. This Set is similar in every way to No. 1 Passenger Set, except that it contains Loco, Tender and one Wagon. Complete in strong attractive gold-embossed box. *For price see page* 206.

No. 2 PULLMAN SET.—This Set includes Loco and Tender of a larger type, measuring 17" in length. A superior mechanism has been adopted, making this the most attractive and satisfactory clockwork train yet produced. The Coaches are beautiful, both in colour and finish. Each Set includes Loco, Tender, one Pullman and one Dining Coach, as illustrated, with set of Rails making a 4ft. diameter circle. Gauge 0. In colours to represent the L.M.S. or L.N.E.R. Companies' rolling stock. The Loco is fitted with reversing gear, brake and governor Complete in gold-em ossed box. *For price see page* 206.

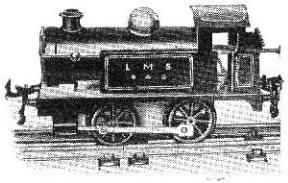


No. 2 PULLMAN SET

No. 2 GOODS SET.—Similar to No. 2 Pullman Set but two Wagons in place of Coaches. Complete in gold-embossed box.

SEND FOR SPECIAL LIST OF RAILS, POINTS AND CROSSINGS (*See page* 204).

HORNBY TANK LOCOS



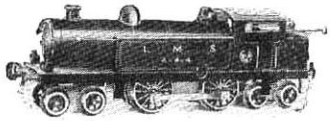
No. 1 LOCO

A strong and durable Loco capable of any amount of hard work; richly enamelled and highly finished; fitted with reversing gear, brake and governor.

Gauge 0, in colours to represent the principal British Railway Companies' locos.

For price see page 206.

No. 2 LOCO



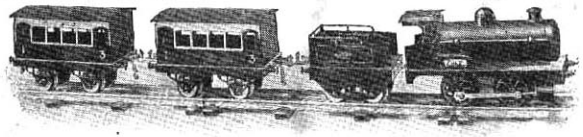
The Hornby No. 2 Tank Loco is a powerful model embodying all the characteristics of the Hornby Train. It is 11½in. in length and is fitted at both ends with a four-wheeled bogie.

Beautifully finished in colours to represent the principal British Railway Companies' locos. Fitted with reversing gear, brake and governor.

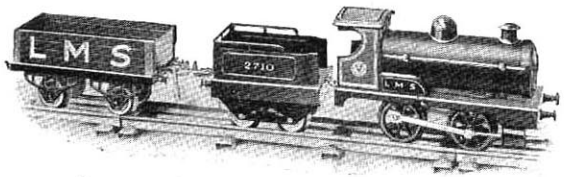
For price see page 206.

ZULU CLOCK WORK TRAINS

Fine and durable mechanism and strength of construction of all parts are the main characteristics of this new type of clockwork train. The Zulu is a well-designed and efficient train and will give excellent and long service. Richly enamelled and highly finished; fitted with brake and governor; non-reversing.



Each Set contains Loco, Tender, two Passenger Coaches and Set of Rails, including a 2ft. diameter circle and two straights. Gauge 0, in colours to represent the principal British Railway Companies' rolling stock. Packed in strong cardboard box. For price see page 206.

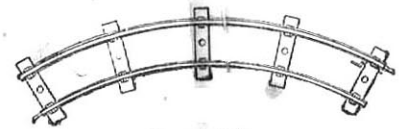


Goods Set is the same as the Passenger Set but contains one Brake Van in place of Passenger Coaches. Gauge 0, in colours to represent the principal British Railway Companies' rolling stock. Packed in strong cardboard box. For price see page 206.

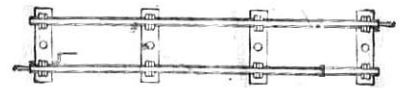
RAILS, POINTS AND CROSSINGS

(HORNBY SERIES)

The range of Rails, Points and Crossings is now very comprehensive and a special leaflet is published (price 4d. post free) showing some of the combinations of rail designs to which the Rails lend themselves. The curved rails are made in both 1ft. and 2ft. radius (to form circles of 2ft. and 4ft. diameter respectively). For those interested in electric railways these rails are also made with third rail specially fitted for the purpose. Send for the latest illustrated price list.

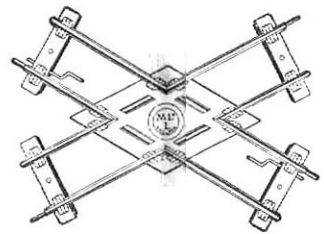


Curved Rail.

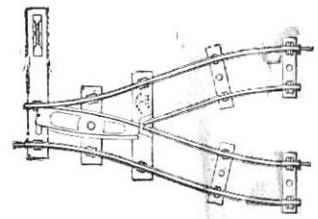


Straight Rail.

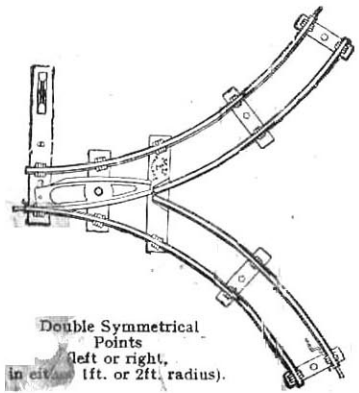
(Also made in half and quarter lengths).



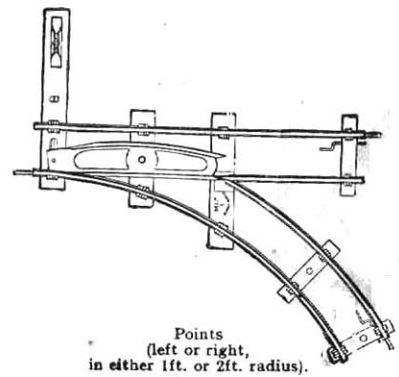
Acute Angle Crossing.



Parallel Points (left or right).



Double Symmetrical Points (left or right, in either 1ft. or 2ft. radius).

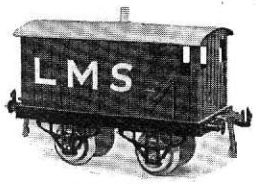


Points (left or right, in either 1ft. or 2ft. radius).

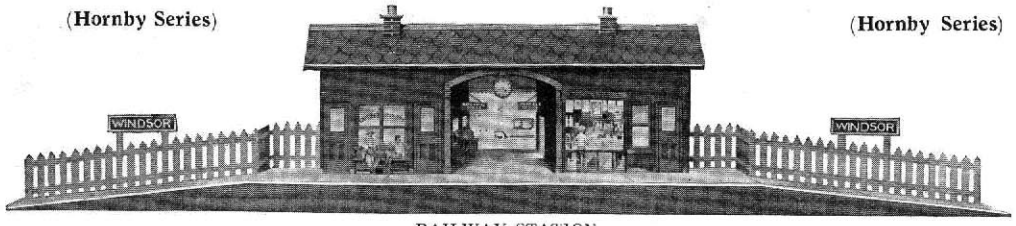
Rolling Stock and Accessories for Trains

(Hornby Series)

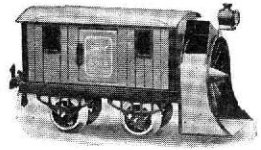
(Hornby Series)



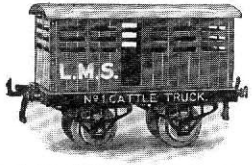
* BRAKE VAN
Finished in grey and black.
Price **6/-**



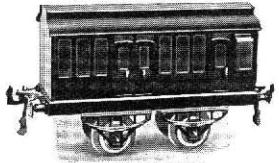
RAILWAY STATION
Excellent model, beautifully designed and finished. Dimensions : Length 2ft. 9in., breadth 6in., height 7in. Price **18/6**



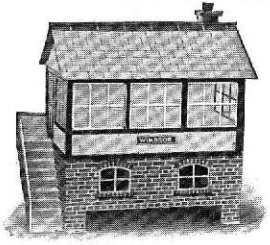
*SNOW PLOUGH
With revolving plough driven from front axle ... Price **8/6**



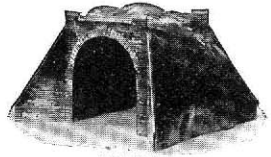
* No. 1 CATTLE TRUCK
Fitted with sliding door.
Very realistic design. Price **6/-**



* GUARD'S VAN
Realistic design, fitted each side with doors as shown. Price **5/6**

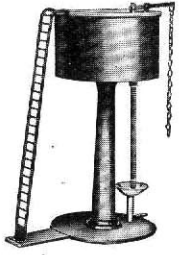


SIGNAL CABIN
Dimensions : Height 6¾in., Width 3½in., Length 6½in. Finished in colour and lettered "Windsor." Roof and back open to allow signal levers to be fitted inside cabin if desired. Price **10/-**

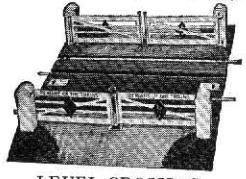


TUNNEL
Realistic and finished in colours.
Price **12/-**

PETROL TANK WAGON
"SHELL"
Finished in red. Price **4/6**

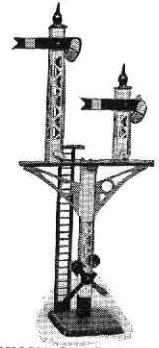


WATER TANK
Brightly coloured. Stands 8¼in. high. Fitted with flexible tube and valve lever ... Price **10/6**



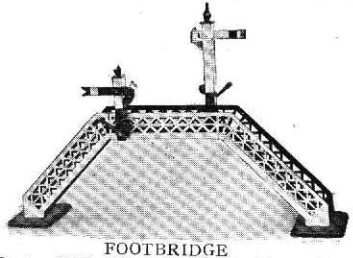
LEVEL CROSSING
Beautifully designed in colour. Measures 11½×7¼in. with Gauge 0 rails in position. Price **10/-**

SECCOTINE WAGON
Beautifully finished in blue.
Lettered white ... Price **6/-**

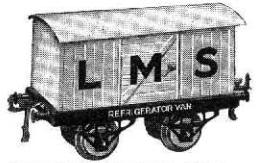


JUNCTION SIGNAL
Signal arms operated by levers at base. Very realistic model standing 14in. in height.
Price **8/6**

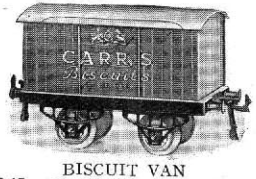
ROTARY TIPPING WAGON
Finished in grey and green.
Price **6/-**



FOOTBRIDGE
No. 1. With detachable Signals Price **9/6**
No. 2. Without Signals ... ,, **6/-**
Signals only ... per pair **3/9**



* REFRIGERATOR VAN
Enamelled in white.
Lettered black. Price **6/-**

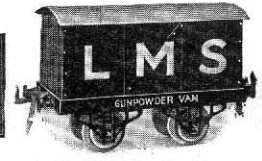


BISCUIT VAN
(Jacob's, Crawford's, Carr's).
Finished in colour. Price **6/-**

PLATFORM ACCESSORIES
No. 1. Miniature Luggage.
Price per set **3/-**

PLATFORM ACCESSORIES
No. 3. Platform Machines, etc.
Price per set **3/-**

PLATFORM ACCESSORIES
No. 2. Milk Cans and Truck.
Price per set **3/-**



* GUNPOWDER VAN
Finished in red. Price **6/-**

There are now over 50 items of Rolling Stock and Accessories in the Hornby Series, some of which are illustrated and described above. Send for a complete illustrated price list.

* *Lettered L.M.S. or L.N.E.R.*

Meccano Price List

MECCANO OUTFITS

No. 00 Meccano Outfit	5/–
„ 0 „ „	7/6
„ 1 „ „	12/6
„ 2 „ „	23/–
„ 3 „ „	35/–
„ 4 „ „	60/–
„ 5* „ „ (Carton)	80/–
„ 5* „ Presentation Outfit	125/–
„ 6* „ Outfit (Carton)	155/–
„ 6* „ Presentation Outfit	210/–
„ 7 „ „ „	540/–

ACCESSORY OUTFITS

No. 00A Meccano Outfit	2/6
„ 0A „ „	6/–
„ 1A „ „	11/6
„ 2A „ „	13/–
„ 3A „ „	26/–
„ 4A „ „	20/–
„ 5A* „ „ (Carton)	75/–
„ 5A* „ „ (Wood)	120/–
„ 6A „ „ „	300/–
Meccano Clockwork Motor	10/6
„ No. 1 Electric Motor (4 Volt)	18/6
„ „ 2 „ „ (100-120 or 200-250 Volt)	57/6
Lamp Board (with lamp-holder and switch)	7/6
Meccano Electrical Outfit X2	65/–
Meccano Accumulator	30/–

* Outfits Nos. 5, 5A and 6 are supplied in neat and well-made cardboard boxes (cartons) or in superior oak cabinets, with lock and key.

Hornby Train Price List

Complete Sets

Hornby No. 0 Goods Set	27/6
„ „ 0 Passenger Set	35/–
„ „ 1 Goods Set	32/6
„ „ 1 Passenger Set	40/–
„ „ 2 Goods Set	58/6
„ „ 2 Pullman Set	90/–
„ „ 1 Tank Goods Set	37/6
„ „ 2 Tank Goods Set	67/6
„ „ 2 Tank Passenger Set	67/6
„ Electric Train	160/–

Components

Hornby No. 0 Locomotive	15/6
„ „ 1 Locomotive	20/–
„ „ 2 Locomotive	35/–
„ Electric Locomotive	75/–
„ No. 1 Tank Locomotive	18/–
„ „ 2 Tank Locomotive	40/–
„ Tender (For No. 0 and No. 1 Sets)	3/6
„ Tender (For No. 2 Set)	5/6
„ Passenger Coach (For No. 0 and No. 1 Sets and No. 2 Tank Passenger Sets)	5/6
„ Pullman Coach (For No. 2 Train Set)	21/–
„ Wagon (For all Sets)	3/9

Note.—The additional rolling stock included in the Hornby Tank Sets is listed on page 205.

Contents of Outfits

No.	Description of Part.	00	00A	0	0A	1	1A	2	2A	3	3A	4	4A	5	5A	6	6A	7
1	Perforated Strips, 12½″	—	—	—	4	4	6	10	—	10	2	12	4	16	32	48	2	50
1A	,, ,, 9½″	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	10	12
1B	,, ,, 7½″	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4
2	,, ,, 5½″	4	—	4	3	7	7	14	4	18	3	21	5	26	24	50	25	75
2A	,, ,, 4½″	—	—	—	—	—	—	—	—	—	2	2	2	4	—	4	—	4
3	,, ,, 3½″	—	—	—	1	1	1	2	4	6	—	6	6	12	12	24	—	24
4	,, ,, 3″	—	—	—	—	—	—	—	2	2	4	6	2	8	2	10	26	36
5	,, ,, 2½″	9	—	9	—	9	3	12	—	12	6	18	18	36	—	36	84	120
6	,, ,, 2″	—	—	—	—	—	—	—	—	—	—	—	4	4	20	24	12	36
6A	,, ,, 1½″	—	—	—	—	—	2	2	—	2	—	2	4	6	8	14	—	14
7	Angle Girders, 24½″	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	12
7A	,, ,, 18½″	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	6
8	,, ,, 12½″	—	—	—	—	—	4	4	4	8	—	8	6	14	12	26	—	26
8A	,, ,, 9½″	—	—	—	—	—	—	—	—	—	—	—	4	4	2	6	6	12
8B	,, ,, 7½″	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
9	,, ,, 5½″	—	—	—	—	—	—	—	—	—	4	4	—	4	14	18	6	24
9A	,, ,, 4½″	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
9B	,, ,, 3½″	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
9D	,, ,, 2½″	—	—	—	—	—	—	—	—	—	—	—	1	1	3	4	—	4
9F	,, ,, 1½″	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4
10	Flat Brackets	4	1	5	—	5	3	8	—	8	—	8	4	12	4	16	8	24
11	Double Brackets	—	2	2	—	2	2	4	—	4	1	5	3	8	—	8	10	18
12	Angle Brackets, ½″×½″	6	2	8	—	8	4	12	2	14	8	22	14	36	12	48	48	96
12A	,, ,, 1″×1″	—	—	—	—	—	2	2	1	3	1	4	—	4	—	4	8	12
12B	,, ,, 1″×½″	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4
13	Axle Rods, 11⅞″	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4	—	4
13A	,, ,, 8″	—	—	—	—	—	—	—	—	—	1	1	—	1	3	4	9	13
14	,, ,, 6½″	—	—	—	—	—	—	—	—	—	3	3	—	3	1	4	9	13
15	,, ,, 5″	—	—	—	—	—	2	2	—	2	2	4	—	4	—	4	3	7
15A	,, ,, 4½″	—	—	—	—	—	1	1	2	3	2	5	—	5	—	5	1	6
16	,, ,, 3½″	2	—	2	1	3	1	4	—	4	1	5	—	5	—	5	7	12
16A	,, ,, 2½″	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
16B	,, ,, 3″	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
17	,, ,, 2″	2	—	2	—	2	—	2	—	2	3	5	—	5	—	5	9	14
18A	,, ,, 1½″	—	—	—	1	1	1	2	—	2	2	4	—	4	—	4	4	8
18B	,, ,, 1″	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	5	7
19	Crank Handles	1	—	1	—	1	—	1	1	2	—	2	—	2	2	4	—	4
19A	Wheels, 3″	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4	—	4
19B	Pulley Wheels, 3″	—	—	—	—	—	—	1	1	—	1	1	2	—	2	2	—	4
20	Flanged Wheels	—	—	—	—	—	4	4	—	4	4	8	—	8	—	8	11	19
20A	Pulley Wheels, 2″	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	5	6
21	,, ,, 1½″	—	—	—	—	—	—	—	1	1	—	1	1	2	—	2	2	4
22	,, ,, 1″ (Fast)	4	—	4	—	4	—	4	—	4	—	4	—	4	2	6	—	6
22A	,, ,, 1″ (Loose)	—	—	—	2	2	—	2	—	2	1	3	—	3	1	4	9	13
23	,, ,, ⅝″ (Loose)	1	—	1	—	1	—	1	—	1	2	3	—	3	3	6	2	8
23A	,, ,, ½″ (Fast)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
24	Bush Wheels	1	—	1	—	1	—	1	—	1	1	2	—	2	2	4	1	5
25	Pinion Wheels, ¾″	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	3	5
26	,, ,, ½″	—	—	—	—	—	—	—	2	2	—	2	1	3	3	6	3	9
27	Gear Wheels, 50 Teeth	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	3	5
27A	,, ,, 57 ,,	—	—	—	—	—	—	—	1	1	—	1	1	2	1	3	4	7
27B	,, ,, 133 ,, (3½″ diam.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
28	Contrate Wheels, 1½″	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2	—	2
29	,, ,, ¾″	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2	2	4
30	Bevel Gears	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
31	Gear Wheels, 1″, 38 Teeth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3
32	Worm Wheels	—	—	—	—	—	—	—	1	1	—	1	—	1	1	2	—	2
34	Spanners	—	—	1	1	1	—	1	—	1	1	2	—	2	—	2	—	2
35	Spring Clips	4	2	6	2	8	4	12	—	12	6	18	—	18	6	24	12	36
36	Screw Drivers	1	1	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1
36A	,, ,, (extra long)	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1
37	Nuts and Bolts	20	5	25	5	30	25	55	35	90	40	130	45	175	145	320	280	600
38	Washers	—	6	6	—	6	6	12	—	12	12	24	—	24	12	36	164	200
40	Hanks of Cord	1	—	1	—	1	1	2	1	3	1	4	2	6	—	6	—	6
41	Propeller Blades	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4	—	4
43	Springs	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2	13	15
44	Cranked Bent Strips	1	—	1	—	1	—	1	—	1	—	1	—	1	1	2	1	3
45	Double Bent Strips	—	—	—	—	—	1	1	—	1	2	3	—	3	3	6	—	6
46	Double Angle Strips, 2½″×1″	—	—	—	—	—	—	—	1	1	1	2	2	4	—	4	—	4
47	,, ,, ,, 2½″×1½″	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2	—	2
47A	,, ,, ,, 3″×1½″	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2
48	,, ,, ,, 1½″×½″	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4	—	4
48A	,, ,, ,, 2½″×½″	2	2	4	2	6	2	8	2	10	—	10	—	10	6	16	8	24
48B	,, ,, ,, 3½″×½″	—	—	—	—	—	—	—	2	2	4	6	—	6	—	6	6	12
48C	,, ,, ,, 4½″×½″	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	—	3
48D	,, ,, ,, 5½″×½″	—	—	—	—	—	—	—	—	—	2	2	2	4	—	4	1	5
50	Eye Pieces	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2	—	2
52	Perforated Flanged Plates, 5½″×2½″	1	—	1	—	1	—	1	1	2	—	2	2	4	3	7	—	7
52A	Flat Plates, 5½″×3½″	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	6	8
53	Perforated Flanged Plates, 3½″×2½″	—	—	—	—	—	—	—	3	3	2	5	—	5	3	8	2	10
53A	Flat Plates, 4½″× 2½″	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
54	Perforated Flanged Plates (Sector)	—	1	1	1	2	—	2	—	2	1	3	—	3	1	4	—	4
56	Instruction Manuals	1	1	1	1	1	—	1	—	1	1	1	—	1	1	2	—	2
57	Hooks	1	—	1	—	1	—	1	—	1	—	1	1	2	—	2	15	17
57A	,, (Scientific)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	6
57B	,, (Loaded)	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
58	Spring Cord, 40″ length	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
59	Collars with Set Screws	—	—	—	—	—	—	—	4	4	6	10	3	13	8	21	34	55
61	Windmill Sails	—	—	—	—	—	—	—	—	—	4	4	—	4	—	4	—	4
62	Cranks	—	—	—	—	—	2	2	—	2	—	2	—	2	2	4	11	15
62A	Threaded Cranks	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
63	Couplings	—	—	—	—	—	—	—	1	1	5	6	—	6	3	9	4	13

[Continued Overleaf

Contents of Outfits—*continued*

No.	Description of Part.	00	00A	0	0A	1	1A	2	2A	3	3A	4	4A	5	5A	6	6A	7
63A	Octagonal Couplings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
63B	Strip Couplings	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
64	Threaded Bosses	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	5	8
65	Centre Forks	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1	5	6
66	Weights, 50 Gramme	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	5
67	" 25 "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	5
70	Flat Plates, 5½"×2½"	—	—	—	—	—	—	—	—	—	—	—	1	1	2	3	1	4
72	" " 2½"×2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
76	Triangular Plates, 2⅜"	—	—	—	—	—	—	—	—	—	2	2	—	2	1	3	7	10
77	" 1"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
78	Screwed Rods, 11½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
80	" " 5"	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2	—	2
80A	" " 3½"	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	2	3
81	" " 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
82	" " 1"	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4	2	6
89	Curved Strips, 5½"	—	—	—	—	—	—	—	4	4	—	4	2	6	10	16	—	16
90	" " 2½"	—	—	—	—	—	—	—	—	—	3′	3′	—	3′	5′	8′	17′	25′
94	Sprocket Chain	—	—	—	—	—	—	—	—	—	1	1	1	2	1	3	—	3
95	Sprocket Wheels, 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
95A	" " 1½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
95B	" " 3"	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4	13	17
96	" " 1"	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
96A	" " ¾"	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4
97	Braced Girders, 3½"	—	—	—	—	—	—	—	1	1	—	1	—	1	7	8	—	8
98	" " 2½"	—	—	—	—	—	—	—	—	—	4	4	—	4	4	8	10	18
99	" " 12½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
100	" " 5½"	—	—	—	—	2	2	—	2	4	6	1	7	1	8	8	16	16
101	Healds for Looms	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	48	48
102	Single Bent Strips	—	—	—	—	—	—	—	—	—	—	2	2	—	2	2	2	4
103	Flat Girders, 5½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	6
103B	" " 12½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
103F	" " 2½"	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2	—	2
103H	" " 1½"	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
103K	" " 7½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
104	Shuttles for Looms	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
105	Reed Hooks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
106	Wood Rollers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
106A	Sand Rollers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
107	Designing Tables	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
108	Architraves	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4	4	8
109	Face Plates, 2½"	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2	2	4
110	Rack Strips, 3½"	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
111	Bolts, ⅜"	—	—	—	—	—	—	—	2	2	1	3	—	3	—	3	4	7
111A	" ¼"	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
113	Girder Frames	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
114	Hinges	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
115	Threaded Pins	—	—	—	—	—	1	1	—	1	1	2	—	2	—	2	6	8
116	Fork Pieces	—	—	—	—	—	—	—	1	1	—	1	—	1	1	2	—	2
118	Hub Discs (½" diam.)	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
122	Miniature Loaded Sacks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	12
123	Cone Pulleys	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
124	Reversed Angle Brackets, 1"	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
125	" " " ½"	2	—	2	—	2	2	4	—	4	—	4	—	4	—	4	—	4
126	Trunnions	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	—	3
126A	Flat Trunnions	2	—	2	—	2	—	2	2	4	—	4	1	5	—	5	1	6
128	Boss Bell Cranks	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2	—	2
129	Rack Segments (3" diam.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
130	Triple Throw Eccentrics	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2	—	2
131	Dredger Buckets	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	5
132	Flywheels, 2¾"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
133	Corner Brackets	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8	—	8
134	Crank Shafts, 1" stroke	—	—	—	—	—	—	—	1	1	—	1	—	1	—	1	—	1
135	Theodolite Protractors	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
136	Handrail Supports	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4
137	Wheel Flanges	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
138	Ship's Funnels	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
143	Circular Girders (5½" diam.)	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
145	Circular Strips (7" diam. over all)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
147	Pawl	—	—	—	—	—	—	—	1	1	—	1	—	1	1	2	—	2
148	Ratchet Wheels	—	—	—	—	—	—	—	1	1	—	1	—	1	1	2	—	2
301	Bobbins	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
302	Bushes, Insulating	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	12
303	Washers "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	12
304	6 B.A. Screws	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	14	14
305	6 B.A. Nuts	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	30	30
306	Terminals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
307	Contact Screws	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
308	Pole Pieces	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
309	Coil Cheeks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
310	Lamp Holder	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
311	Lamps	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
312	27 Gauge B.I. Wire, 30" Coil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
313	26 " S.C.C. Wire Reel, 50 yds.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
314	23 " " " 25 "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
315	Bare Copper Wire, 4 yd. Coil	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Electrical Manual of Instructions	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Loom Leaflets	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Chassis "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Charging Board Leaflets	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Clockwork Motors	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Electric Motors (4-volt)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Accumulators	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1

MECCANO

Hornby's Original System, First Patented 1901

PATENTS AND DESIGNS

GREAT BRITAIN :				AUSTRALIA :
3,869/14	139,125	671,485	682,934	13,460/19
4,183/14	177,430	671,534	683,011	14,388/14
4,564/15	577,207	671,790	686,112	15,136/14
20,535/13	577,272	680,416	698,054	
21,117/12	648,958	682,208	699,653	
22,962/13	671,484	682,209	699,654	

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, and his mind, as regards proper mechanical construction and methods, is distorted instead of instructed. He thus learns wrong principles, and when his ambition tempts him to invent or construct more elaborate models, he will find that he cannot do so because of the deficiencies of his non-mechanical system.

No Outfit is genuine unless it bears the Trade Mark MECCANO

PRINTED IN ENGLAND