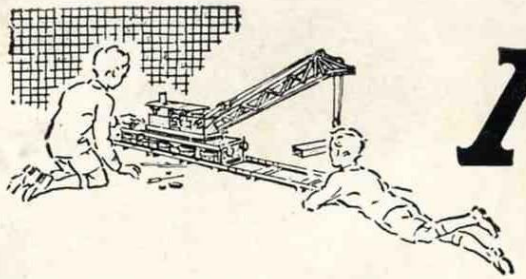
MECCANO

INSTRUCTIONS

FOR

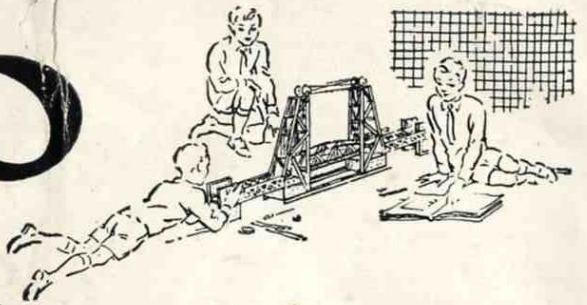
No. 3 OUTFIT

No.
41.3



MECCANO

Real Engineering in Miniature



MODEL-BUILDING WITH MECCANO

There is no limit to the number of models that can be built with Meccano—Cranes, Clocks, Motor Cars, Ship Coalers, Machine Tools, Locomotives—in fact everything that interests boys. A screwdriver and a spanner, both of which are provided in each Outfit, are the only tools necessary.

When you have built all the models illustrated in the Manuals of Instruction the fun is not over, but is just beginning. Now comes the chance to make use of your own ideas. First of all, re-build some of the models with small changes in construction that may occur to you ; then try building models entirely of your own design. In doing this you will feel the real thrill of the engineer and the inventor.

HOW TO BUILD UP YOUR OUTFIT

Meccano is sold in eleven different Outfits, ranging from No. O to No. 10. Each Outfit from No. 1 upwards can be converted into the next one larger by the purchase of an Accessory Outfit. Thus, Meccano No. 1 Outfit can be converted into No. 2 Outfit by adding to it a No. 1a Accessory Outfit. No. 2a Outfit would then convert it into a No. 3 and so on. In this way, no matter with which Outfit you commence, you can build it up by degrees until you possess a No. 10 Outfit.

All Meccano parts are of the same high quality and finish, but the larger Outfits contain a greater quantity and variety, making possible the construction of more elaborate models.

As shown in the illustrations, the realism of many models can be increased by the inclusion of the figures, motor vehicles and other items from the Dinky Toys Series ; pilots and drivers from the Aeroplane and Motor Car Constructor Outfits ; trees and hedges from the Hornby Railway Series ; Meccano sacks, cable drums, etc. These items are not included in any of the Outfits. A Clockwork Motor is included in Outfits 7a, 8, 9 and 10 only, and an Electric Motor in Outfits 9a and 10 only.

ELECTRIC LIGHTING OF MECCANO MODELS

It is great fun to illuminate your Meccano models by electric light, and a special Meccano Lighting Set can be obtained from your dealer for this purpose. This consists of two spot lights with plain and coloured imitation glass discs, one stand lamp, two special brackets, and two pea lamps, operated from a 4-volt flash-lamp battery (not included in the Set). The stand lamp is used for decorative purposes, and the spot lights can be used as headlamps, floodlights on cranes, and in countless other ways.

THE "MECCANO MAGAZINE"

The "Meccano Magazine" is published specially for Meccano boys. Every month it describes and illustrates new Meccano models for Outfits of all sizes, and deals with suggestions from readers for new Meccano parts and for new methods of using the existing parts. There are model-building competitions specially planned to give an equal chance to the owners of small and large Outfits. In addition, there are splendid articles on such subjects as Railways, Famous Engineers and Inventors, Electricity, Chemistry, Bridges, Cranes and Aeroplanes, and special sections dealing with the latest Engineering, Aviation, Shipping and Road and Track News. Other pages deal with Stamp Collecting, and Books of interest to boys ; and a feature of outstanding interest is the section devoted to short articles from readers.

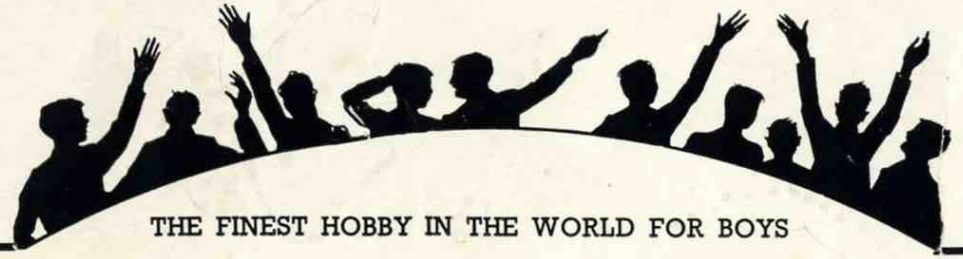
The " Meccano Magazine " is the finest of all papers for boys who are interested in the wonderful things going on in the world around them. It is published on the first of each month. If you are not already a reader write to the Editor for full particulars, or order a copy from your Meccano dealer, or from any newsagent.

THE MECCANO GUILD

Every owner of a Meccano Outfit should join the Meccano Guild. This is a world-wide organisation, started at the request of Meccano boys. Its primary object is to bring boys together and to make them feel that they are all members of a great brotherhood, each trying to help others to get the very best out of life. Its members are in constant touch with Headquarters, giving news of their activities and being guided in their hobbies and interests. Write for full particulars and an application form to the Secretary, Meccano Guild, Binns Road, Liverpool 13.

Clubs founded and established under the guidance of the Guild Secretary provide Meccano boys with opportunities of enjoying to the utmost the fun of model-building. There are nearly 200 active clubs in Great Britain, and nearly 100 in countries overseas, each with its Leader, Secretary, Treasurer and other officials. With the exception of the Leader, all the officials are boys, and as far as possible the proceedings of the clubs are conducted by boys.

Recruiting Medallions are awarded to members who are successful in securing recruits for the Guild, and good work on behalf of Meccano clubs, or of the Guild generally, is recognised by the presentation of special Merit Medallions. Full particulars of both these awards will be sent post free on request.



THE FINEST HOBBY IN THE WORLD FOR BOYS

MECCANO SERVICE

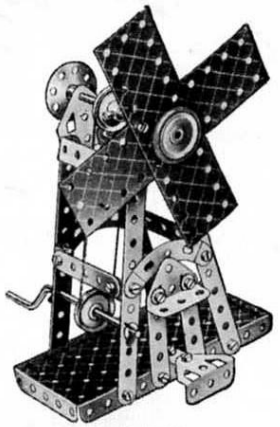
The service of Meccano does not end with selling an Outfit and an Instruction Manual. If ever you are in any difficulty with your models, or if you want advice on anything connected with this great hobby, write to us. We receive every day hundreds of letters from boys in all parts of the world, and each of these is answered personally by one of our staff of experts. Whatever your problem may be, write to us about it.

HOW TO COMMENCE THE FUN

THE MOST FASCINATING OF ALL HOBBIES

Meccano model-building is the most fascinating of all hobbies, because it never becomes dull. There is always something new to be done. First of all there is the fun of building a new model, and watching it take shape as part after part is added. Then, when the model is complete, comes the thrill of setting it to work just like the real structure it represents, by means of a Meccano Motor. This wonderful process can be repeated indefinitely, for there is no end to the number of Meccano models that can be built. Another point is that models built with Meccano are real engineering structures in miniature, and the keen model-builder has wonderful opportunities for learning the working of machines and mechanisms of all kinds. So he acquires practical engineering knowledge without special study.

It is so simple to build Meccano models that operations can be started as soon as the first Outfit is opened. Different boys build in different ways, but in the end they all reach the same splendid results. The following hints are given with the object of showing boys who are just commencing the wonderful Meccano hobby how to obtain the greatest possible fun.



Windmill

THE IMPORTANCE OF "LOCK-NUTTING"

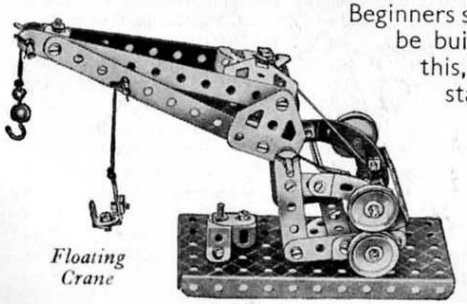
In building models in which Rods revolve in the holes of other parts it is important to make sure that such holes are exactly in line with one another. This can be done very easily by pushing through the holes a long Rod before the Bolts holding the various parts are tightened up.

In some models it is necessary to join certain parts together, so that, although they cannot come apart, they are free to pivot or move in relation to one another. To do this the parts are bolted together as usual, but the Nut is not screwed up tightly, so that the parts are not gripped. Then, to prevent the Nut from unscrewing, a second Nut is screwed up tightly against it, the first, meanwhile, being held with a spanner. This method of using a second Nut is known as lock-nutting, and it is employed in a large number of Meccano models.

During the construction of a model it is best to screw up the Nuts with the fingers, followed by just a light turn with the screwdriver, leaving the final tightening with spanner and screwdriver until all the parts are connected up.

A FEW USEFUL HINTS

It will be noticed that with each model shown in this Manual of Instructions is given a list of the parts required to build it. For the first few models it is a good plan to lay out on the table all the parts required for the one it is proposed to build, and put the remainder of the Outfit on one side. To help you to pick out the correct parts for your model a complete list of Meccano parts is given at the back of this Manual, and all the principal parts are illustrated. In the list the parts are all numbered, and in most cases their measurements are given. There is no need, however, to measure the parts to find out which is which, as the size is easily found from the number of holes. All Meccano holes are spaced $\frac{1}{2}$" apart, so that by counting two holes to the inch the size of a part can be found at once. For instance, Part No. 2 is listed as a $5\frac{1}{2}$" Perforated Strip, so you look in your Outfit for a Strip with eleven holes. Similarly No. 192 is a $5\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plate, so you look for a Flexible Plate eleven holes in length and five holes in width. By the time a few models have been built the names of the parts will have become familiar.



Floating Crane

Beginners sometimes wonder which section of a model should be built first. There cannot be any definite rule for this, as it depends on the design of the model. In stationary models the base usually should be built first. In most of the smaller models a $5\frac{1}{2}$"×$2\frac{1}{2}$" Flanged Plate forms an important part of the structure, and often the best plan is to start building by bolting parts to this Plate. For other models a good general rule is that the sections that form supports for a number of other parts should be built first.

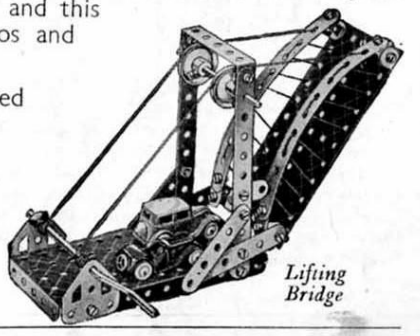
MOTORS AND GEARING

Models can be operated by means of either Meccano Clockwork or Electric Motors.

The Clockwork Motors have the advantage of being self-contained and extremely simple. If only a small amount of power is needed, the model may be driven direct from the driving spindle of the Motor or through a belt running over two pulleys of the same size, giving what is described as a 1:1 (one-to-one) ratio. Greater power can be obtained by a reduction in the speed of the drive, which can be produced in a simple manner by connecting a small pulley on the Motor to a larger pulley by means of a belt. Thus if a 1" Pulley is made to drive a 3" Pulley, a reduction ratio of approximately 1:3 is obtained. This means that the driven shaft will take about three times the load that the driving shaft would handle, but will rotate at only one-third of the speed. Rubber bands are better than Cord for driving belts for most purposes.

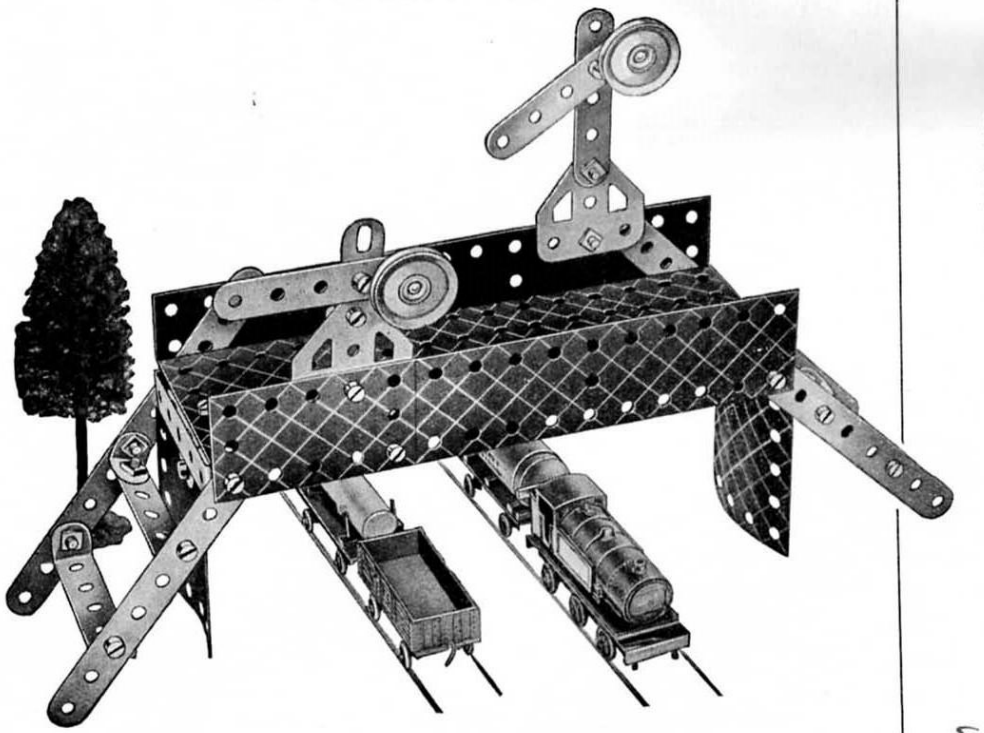
The Electric Motors have the advantage of giving long continuous runs. Their speed is much higher than that of the Clockwork Motors, and this makes it possible to employ higher reduction ratios and thus obtain greater power.

With the larger Outfits, belt drive can be replaced with advantage by gearing. To operate a slow-moving model demanding great power, such as a traction engine, gears that will provide a considerable reduction must be used. For example, a Worm meshed with a $\frac{1}{2}$" Pinion will give a 1:19 reduction; while a Worm meshed with a 57-teeth Gear will give a 1:57 reduction.



Lifting Bridge

2.1 RAILWAY FOOTBRIDGE



Parts required

4 of No. 2	2 of No. 22	1 of No. 52	2 of No. 188
6 „ „ 5	32 „ „ 37	2 „ „ 111c	2 „ „ 189
2 „ „ 10	2 „ „ 37a	2 „ „ 126	1 „ „ 190
6 „ „ 12	2 „ „ 48a	2 „ „ 126a	2 „ „ 200

The span of the bridge is a 5½" × 2½" Flanged Plate, extended by a 2½" × 2½" Flexible Plate. Trunnions are bolted to each end of the span, and have 1 ⅛" radius Curved Plates fastened to them. The sides of the approach stairways are 5½" Strips. They are joined across by 2½" × ½" Double Angle Strips and 2½" Strips fitted with Angle Brackets at each end.

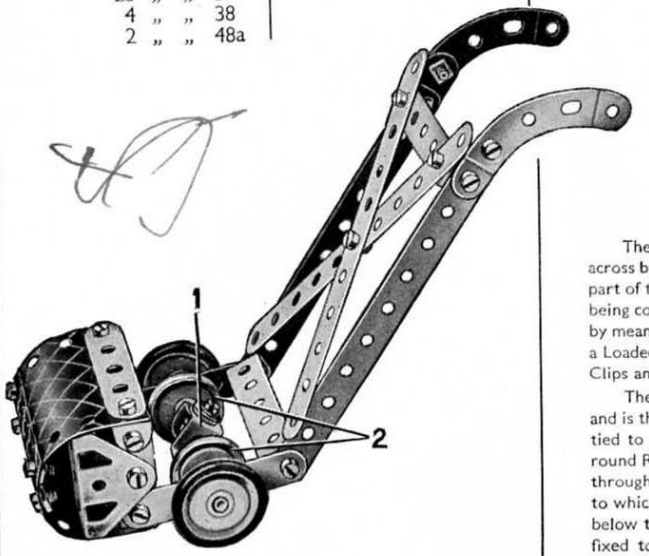
The signals are supported on Flat Trunnions bolted to the sides of the bridge. The smaller of the two signal posts is formed by two Flat Brackets, and the larger one is a 2½" Strip. The signal arms are 2½" Strips bolted to the posts in the second holes from one end. They are fitted at their shorter ends with 1" Pulleys, representing the spectacles, which are held in place by ⅜" Bolts passed through the Strips and inserted in their bosses.

2.2 LAWN MOWER

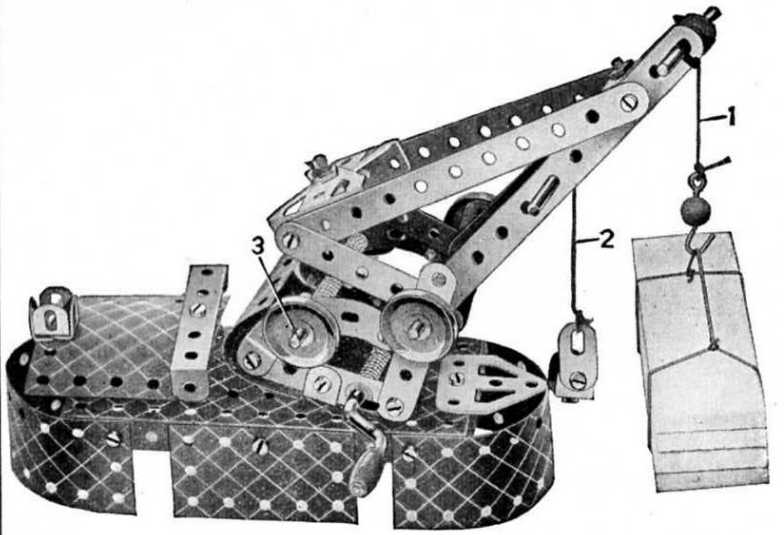
The "cutter" is made by bolting an Angle Bracket at each end of a Reversed Angle Bracket 1 and then sliding an Axle Rod through the free holes of the Brackets. The two Pulleys 2 are fixed to the Rod and pushed tightly against the "cutter" to make it rotate with the Rod as the wheels revolve. The wheels are 1" Pulleys fitted with Rubber Rings.

Parts required

4 of No. 2	2 of No. 90a
4 „ „ 5	1 „ „ 125
4 „ „ 10	2 „ „ 126
6 „ „ 12	2 „ „ 155a
1 „ „ 16	2 „ „ 200
4 „ „ 22	
25 „ „ 37	
4 „ „ 38	
2 „ „ 48a	



2.3 FLOATING CRANE



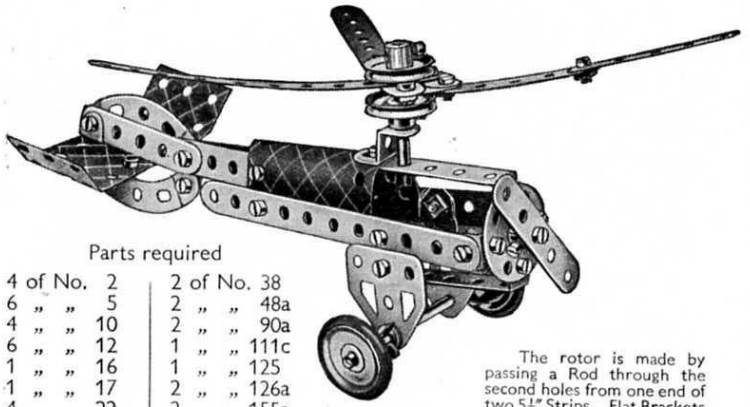
Parts required

4 of No. 2	4 of No. 22	2 of No. 48a	1 of No. 126a
6 „ „ 5	1 „ „ 24	1 „ „ 52	1 „ „ 176
3 „ „ 10	4 „ „ 35	1 „ „ 57c	2 „ „ 188
8 „ „ 12	29 „ „ 37	2 „ „ 90a	2 „ „ 189
2 „ „ 16	3 „ „ 37a	4 „ „ 111c	1 „ „ 199
2 „ „ 17	4 „ „ 38	1 „ „ 125	1 „ „ 200
1 „ „ 19g	1 „ „ 40	2 „ „ 126	

The jib consists of 5½" Strips and 2½" Strips. At its upper end these are joined across by Angle Brackets, and at its lower end by Trunnions. Each side of the lower part of the crane consists of 2½" Strips and small radius Curved Strips, the two sides being connected by 2½" × ½" Double Angle Strips. The jib is pivoted to this structure by means of a 3½" Rod, which carries at each end a 1" Pulley. The Cord 1 fitted with a Loaded Hook, is passed over a 2" Rod held in place in the jib by means of Spring Clips and is then wound around the Crank Handle.

The Cord 2 passes over a Rod held in place in the jib by an Anchoring Spring, and is then wound around the Rod that forms the pivot for the jib. A third Cord is tied to a Bolt fastened in the two Trunnions at the base of the jib, and is wound round Rod 3. This Cord controls the luffing motion of the crane. A ⅜" Bolt passes through the Flanged Plate and is held by a set screw in the boss of the Bush Wheel to which the jib is fastened. The Bush Wheel is bolted to the Double Angle Strip below the Rod 3. The roof of the cabin is bolted to a ½" Reversed Angle Bracket fixed to the Flanged Plate.

2.4 AUTOGIRO



Parts required

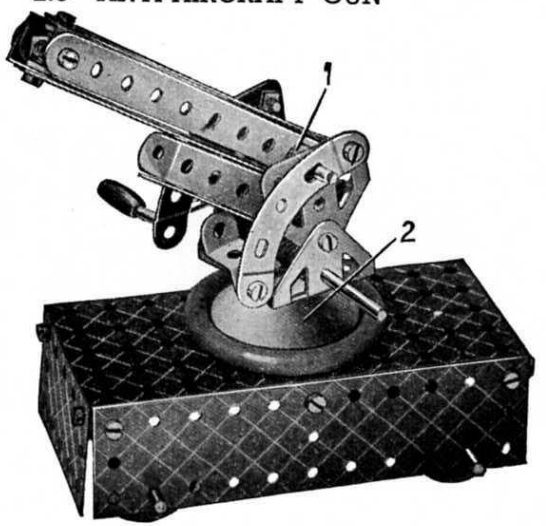
4 of No.	2	2 of No.	38
6 „ „	5	2 „ „	48a
4 „ „	10	2 „ „	90a
6 „ „	12	1 „ „	111c
1 „ „	16	1 „ „	125
1 „ „	17	2 „ „	126a
4 „ „	22	2 „ „	155a
1 „ „	24	2 „ „	188
3 „ „	35	1 „ „	199
25 „ „	37		

The rotor is made by passing a Rod through the second holes from one end of two 5½" Strips. Flat Brackets are bolted to the short ends of the Strips and the third blade of the rotor is fixed to them as shown.

2.5 ANTI-AIRCRAFT GUN

Parts required

4 of No.	2
1 „ „	5
6 „ „	12
2 „ „	16
2 „ „	17
1 „ „	19g
4 „ „	22
1 „ „	24
3 „ „	35
26 „ „	37
4 „ „	38
2 „ „	48a
1 „ „	52
2 „ „	90a
1 „ „	125
2 „ „	126
2 „ „	126a
4 „ „	155a
1 „ „	176
1 „ „	187
2 „ „	188
2 „ „	189

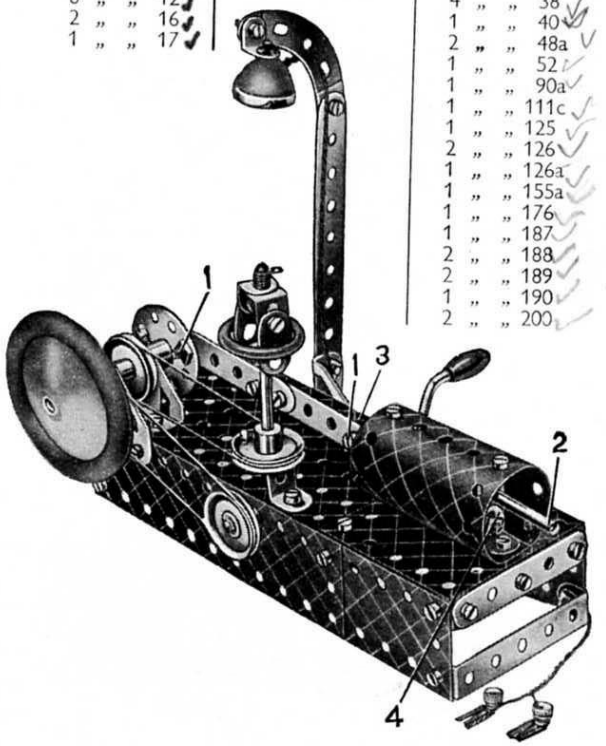


One end of a piece of Cord is fastened to the Crank Handle. It is wound round the Handle a few times and its other end is then fastened to the end of the gun. The two Trunnions are bolted to a Bush Wheel fixed on a 2" Rod that passes through the Road Wheel 2 and the Flanged Plate and is held in place by an Anchoring Spring. The Spring Clips at 1 space the gun barrel from the Flat Trunnions.

2.6 GAS ENGINE

Parts required

1 of No.	2	1 of No.	19g	4 of No.	35
3 „ „	5	4 „ „	22	39 „ „	37
4 „ „	10	1 „ „	24	3 „ „	37a
8 „ „	12			4 „ „	38
2 „ „	16			1 „ „	40
1 „ „	17			2 „ „	48a
				1 „ „	52
				1 „ „	90a
				1 „ „	111c
				1 „ „	125
				2 „ „	126
				1 „ „	126a
				1 „ „	155a
				1 „ „	176
				1 „ „	187
				2 „ „	188
				2 „ „	189
				1 „ „	190
				2 „ „	200



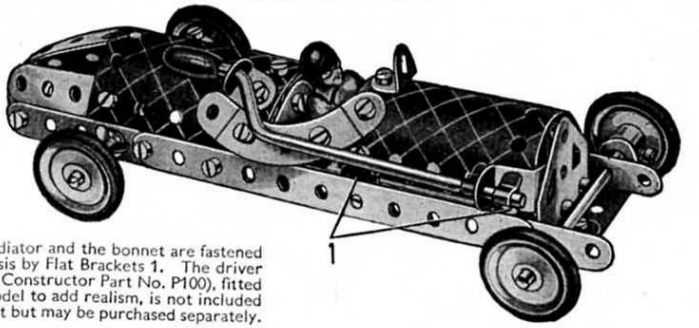
The bearings for the Rod representing the crankshaft are a Flat Trunnion and a Trunnion. The crankshaft carries a Road Wheel and a 1" Pulley at one end, a second 1" Pulley between the bearings, and a Bush Wheel at its other end.

The connecting rod is fastened to the Bush Wheel and to an Angle Bracket 3 by lock-nutted Bolts 1. The Rod 2 is held in the Angle Bracket 3 by means of Spring Clips, one on each side. An Angle Bracket 4, carrying a Flat Bracket, is bolted inside the cylinder, and a similar arrangement is fitted at the other end. These form bearings for the Rod 2.

The model is operated by the Crank Handle, which carries also a 1" Pulley connected to one of the 1" Pulleys on the crankshaft by a belt of Cord. A second Cord drives the governor, which is mounted on a 3½" Rod journalled in the 5½" × 2½" Flanged Plate and a Reversed Angle Bracket.

The model is fitted with a Spotlight from the Meccano Lighting Set, current being supplied by a 4.5-volt pocket-lamp battery housed in the base of the model.

2.7 RACING CAR



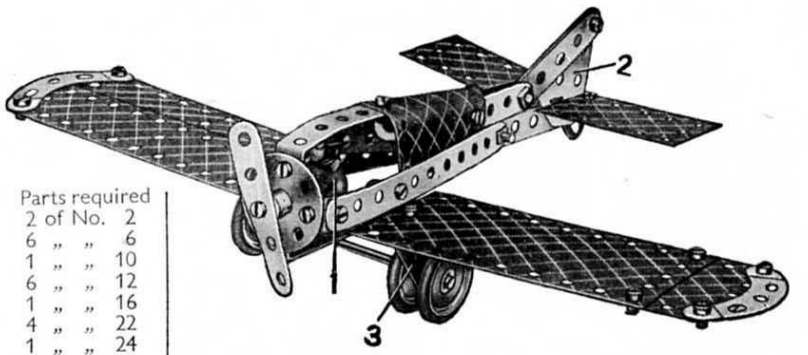
The radiator and the bonnet are fastened to the chassis by Flat Brackets 1. The driver (Aeroplane Constructor Part No. P100), fitted into the model to add realism, is not included in the Outfit but may be purchased separately.

Parts required

4 of No.	2	1 of No.	19g	2 of No.	38
5 „ „	5	4 „ „	22	1 „ „	48a
4 „ „	10	4 „ „	35	2 „ „	90a
8 „ „	12	30 „ „	37	1 „ „	125
2 „ „	16	1 „ „	37a	1 „ „	126

1 of No.	126a
4 „ „	155a
1 „ „	199
1 „ „	200

2.8 LOW WING MONOPLANE

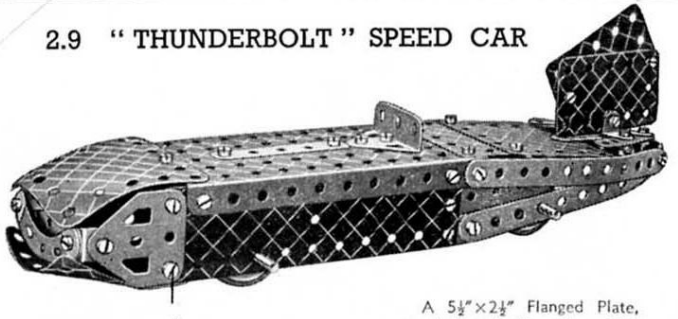


Parts required

2 of No.	2	2 of No.	126	2 of No.	189
6 „ „	6	1 „ „	126a	1 „ „	190
1 „ „	10	4 „ „	155a	1 „ „	191
6 „ „	12	2 „ „	188	1 „ „	199
1 „ „	16				
4 „ „	22				
1 „ „	24				
23 „ „	37				
2 „ „	37a				
2 „ „	38				
2 „ „	48a				
2 „ „	90a				
3 „ „	111c				

The pilot 1 (Aeroplane Constructor Part No. P100) is not included in the Outfit, but may be bought separately. The fin 2 is a Flat Trunnion, and it is clamped between the two 2½" Strips. The bearings 3 for the axle of the landing wheels are Trunnions, bolted to the wings. The wings are attached to the fuselage by Angle Brackets.

2.9 "THUNDERBOLT" SPEED CAR

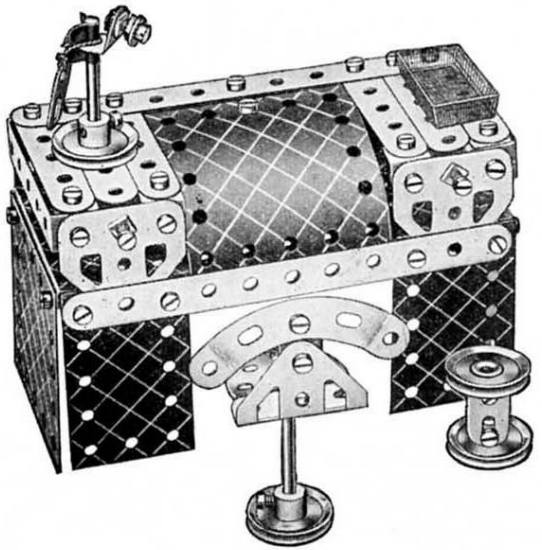


Parts required

4 of No.	2	1 of No.	52
6 „ „	5	2 „ „	90a
2 „ „	10	1 „ „	126
4 „ „	12	2 „ „	126a
2 „ „	16	4 „ „	155a
4 „ „	22	2 „ „	188
39 „ „	37a	2 „ „	189
38 „ „	37b	2 „ „	190
4 „ „	38	2 „ „	200
2 „ „	48a		

A 5½"×2½" Flanged Plate, extended at the front by a 1 11/16" radius Curved Plate and at the rear by two 2½"×2½" Flexible Plates, forms the top of the car. The rear part of each side is formed by two 5½" Strips and a 2½" Strip, the former being connected together at the tail by Angle Brackets. Bolts 1 hold a 2½"×½" Double Angle Strip that carries the 1 11/16" radius Curved Plate forming the underside of the front cowling.

2.10 ROLL TOP DESK



Parts required

2 of No.	2
6 „ „	5
4 „ „	10
7 „ „	12
2 „ „	17
4 „ „	22
1 „ „	24
3 „ „	35
38 „ „	37
5 „ „	37a
1 „ „	38
2 „ „	48a
1 „ „	52
1 „ „	90a
3 „ „	111c
1 „ „	126
2 „ „	126a
2 „ „	188
1 „ „	189
2 „ „	190
1 „ „	200

2.11 TRAVELLING CRANE

Parts required

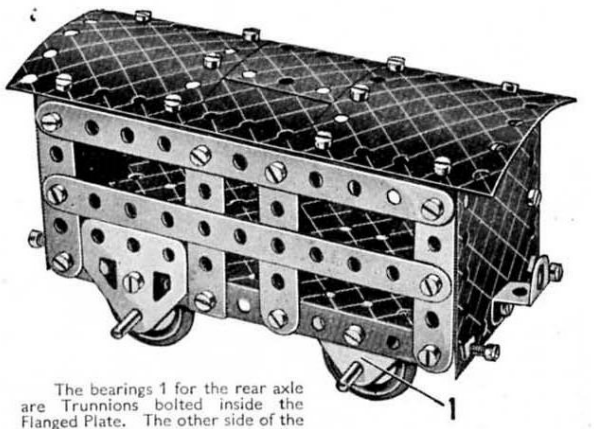
4 of No.	2	1 of No.	19g	3 of No.	38	2 of No.	111c
6 „ „	5	4 „ „	22	1 „ „	40	2 „ „	126
4 „ „	10	1 „ „	24	2 „ „	48a	2 „ „	126a
6 „ „	12	4 „ „	35	1 „ „	52	1 „ „	176
2 „ „	16	38 „ „	37	1 „ „	57c	1 „ „	187
2 „ „	17	2 „ „	37a	2 „ „	90a	2 „ „	188
2 of No. 189				1 of No. 200			

A 2" Rod is secured in the boss of the Bush Wheel 3. It then passes through the Road Wheel and through the centre of a 2½"×½" Double Angle Strip bolted between the two Trunnions 1. A Washer and a Cord Anchoring Spring are pushed on to the Rod to hold it in position. The crane jib is attached to the Bush Wheel by the Angle Brackets 2.

2.12 CATTLE TRUCK

Parts required

4 of No.	2
6 „ „	5
4 „ „	10
5 „ „	12
2 „ „	16
4 „ „	22
38 „ „	37
8 „ „	37a
4 „ „	38
2 „ „	48a
1 „ „	52
4 „ „	111c
1 „ „	125
2 „ „	126
2 „ „	126a
4 „ „	155a
2 „ „	188
2 „ „	190
2 „ „	200



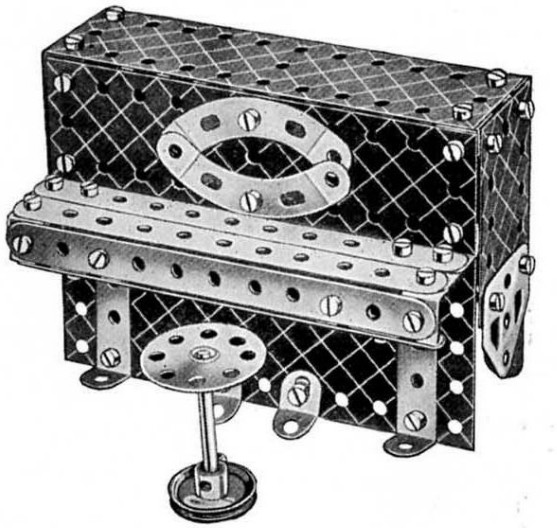
The bearings 1 for the rear axle are Trunnions bolted inside the Flanged Plate. The other side of the truck is constructed in a similar manner to the side shown in the illustration.

2.13 PIANO

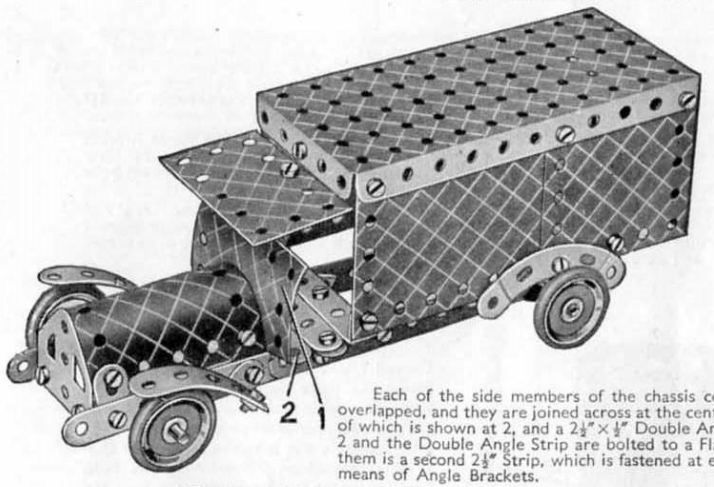
A 5½"×2½" Flanged Plate is used for the upper part of the back and to each end of this a 2½" Strip is bolted to form the rear legs.

Parts required

4 of No.	2
4 „ „	5
4 „ „	10
8 „ „	12
1 „ „	17
1 „ „	22
1 „ „	24
38 „ „	37
4 „ „	38
2 „ „	48a
1 „ „	52
2 „ „	90a
2 „ „	126
2 „ „	126a
2 „ „	188
2 „ „	189
1 „ „	190
1 „ „	191



2.14 MOTOR VAN



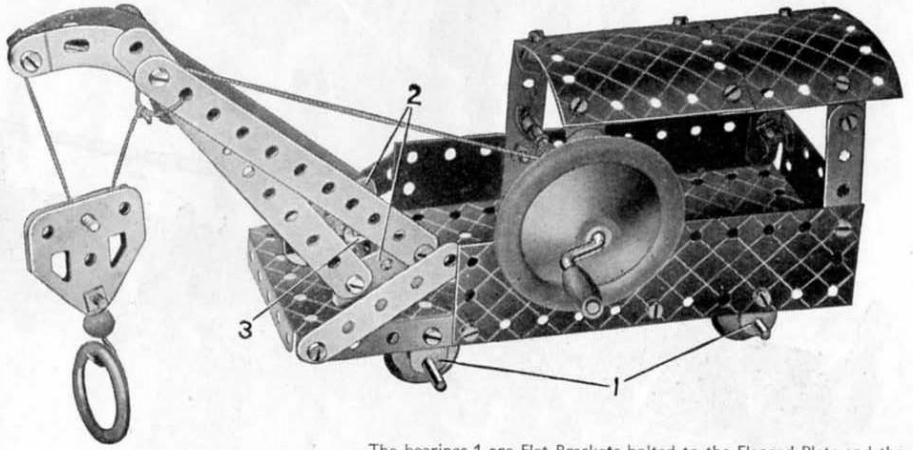
Each of the side members of the chassis consists of two 5½" Strips overlapped, and they are joined across at the centre by two 2½" Strips, one of which is shown at 2, and a 2½"×½" Double Angle Strip. The 2½" Strip 2 and the Double Angle Strip are bolted to a Flat Trunnion and between them is a second 2½" Strip, which is fastened at each end to the chassis by means of Angle Brackets.

The Plate 1 is fastened to an Angle Bracket that is bolted to Strip 2. The body is fixed to the chassis by a Double Angle Strip and an Angle Bracket.

Parts required

4	of No.	2
4	„ „	5
4	„ „	10
8	„ „	12
2	„ „	16
4	„ „	22
4	„ „	35
40	„ „	37
4	„ „	38
2	„ „	48a
1	„ „	52
2	„ „	90a
1	„ „	126
2	„ „	126a
4	„ „	155a
2	„ „	188
2	„ „	189
2	„ „	190
1	„ „	191
1	„ „	199

2.15 RAILWAY BREAKDOWN CRANE

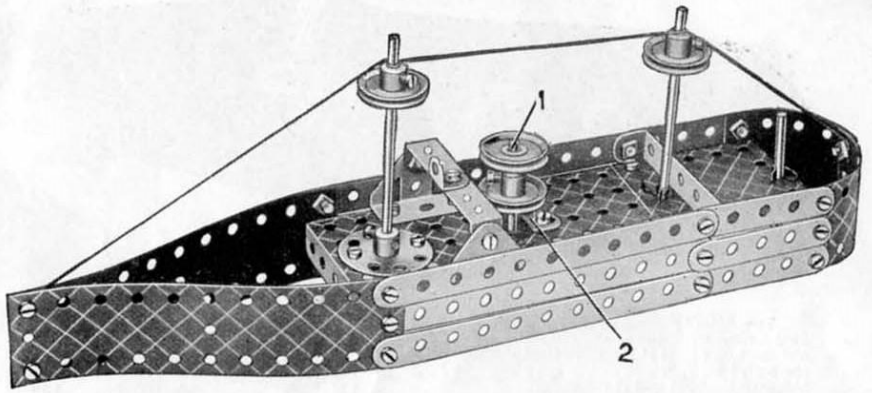


The bearings 1 are Flat Brackets bolted to the Flanged Plate and the Flexible Plates respectively. The jib is fastened to two Trunnions 2, which are bolted to the Bush Wheel 3. A 2" Rod is secured in the boss of the Bush Wheel 3. It then passes through a hole in the Flanged Plate, and is held in position by a Spring Clip underneath the Plate.

Parts required

4	of No.	2
6	„ „	5
4	„ „	10
3	„ „	12
2	„ „	16
1	„ „	17
1	„ „	19g
4	„ „	22
1	„ „	24
2	„ „	35
39	„ „	37
3	„ „	37a
3	„ „	38
1	„ „	40
2	„ „	48a
1	„ „	52
1	„ „	57c
2	„ „	90a
3	„ „	111c
2	„ „	126
2	„ „	126a
1	„ „	155a
1	„ „	176
1	„ „	187
1	of No.	188
2	„ „	189
1	„ „	190
2	„ „	200

2.16 STEAMSHIP

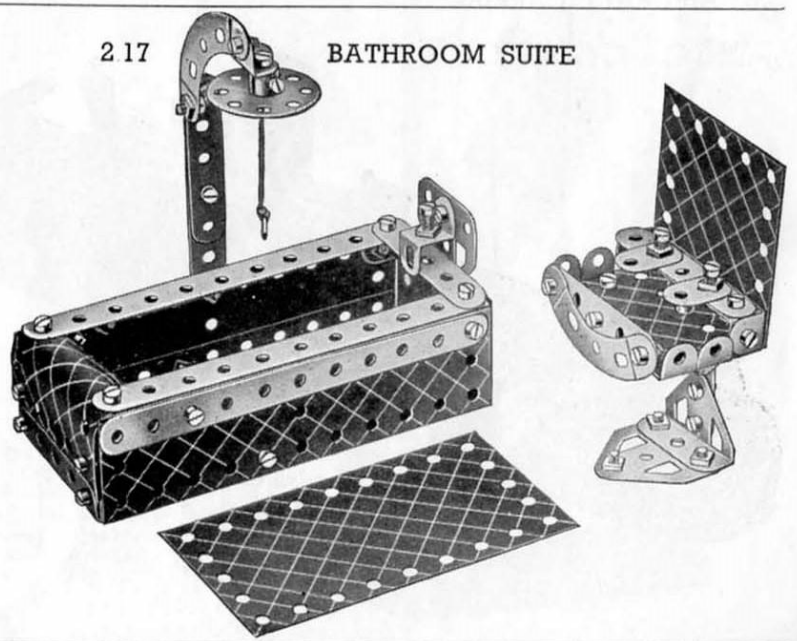


The deck of the model is a 5½"×2½" Flanged Plate extended by a 2½"×2½" Flexible Plate. A 2½"×½" Double Angle Strip fitted with an Angle Bracket represents the bridge, and it is supported by two Trunnions bolted to the deck. The funnel consists of a Rod 1 fitted with two 1" fast Pulleys. The Rod passes through the hole in a Reversed Angle Bracket 2 and then through the Flanged Plate.

Parts required

4	of No.	2
6	„ „	5
1	„ „	12
2	„ „	16
2	„ „	17
4	„ „	22
1	„ „	24
4	„ „	35
34	„ „	37
1	„ „	40
2	„ „	48a
1	„ „	52
1	„ „	125
2	„ „	126
2	„ „	188
2	„ „	189
1	„ „	190

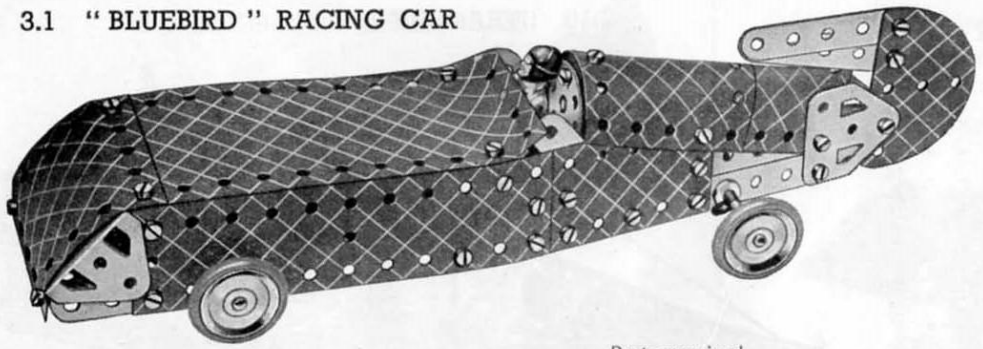
2 17 BATHROOM SUITE



Parts required

4	of No.	2
6	„ „	5
4	„ „	10
8	„ „	12
1	„ „	24
40	„ „	37
6	„ „	37a
2	„ „	38
2	„ „	48a
1	„ „	52
2	„ „	90a
4	„ „	111c
1	„ „	125
2	„ „	126
2	„ „	126a
2	„ „	188
2	„ „	189
1	„ „	190
1	„ „	191
1	„ „	199
1	„ „	200

3.1 " BLUEBIRD " RACING CAR



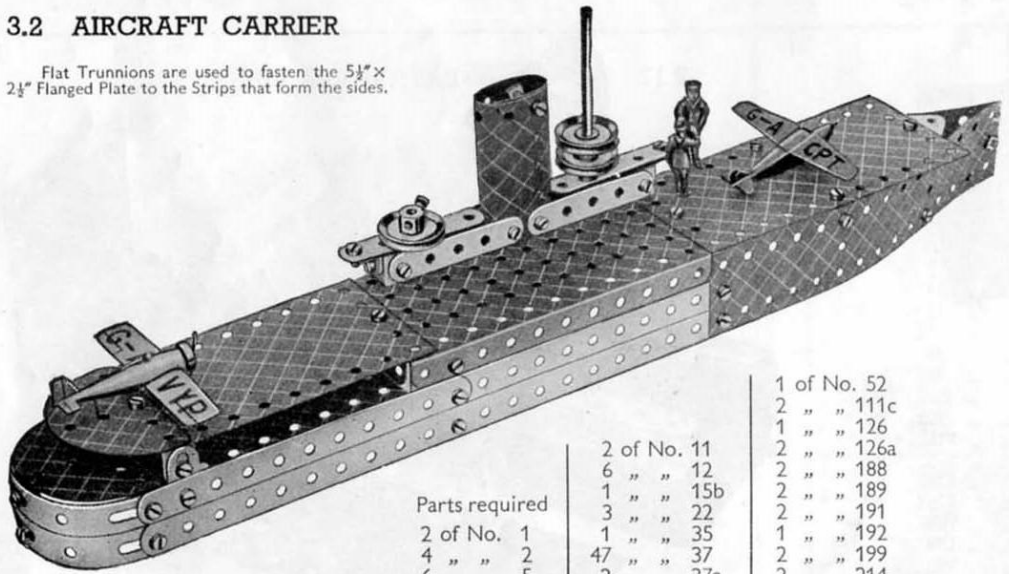
The 5½"×2½" Flanged Plate is used for the front end of the chassis, and the two 5½"×1½" Flexible Plates are bolted on each side in the third hole from the front end of the chassis. The two 5½" Strips forming the rear end of the chassis overlap the 5½"×1½" Flexible Plates one hole.

Parts required

2 of No.	2	2 of No.	35	2 of No.	126	1 of No.	192
6 „ „	5	39 „ „	37	2 „ „	126a	2 „ „	199
2 „ „	10	4 „ „	38	4 „ „	155a	1 „ „	200
3 „ „	12	1 „ „	48a	2 „ „	188	2 „ „	214
2 „ „	16	1 „ „	52	2 „ „	189	1 „ „	217a
4 „ „	22						

3.2 AIRCRAFT CARRIER

Flat Trunnions are used to fasten the 5½"×2½" Flanged Plate to the Strips that form the sides.



Parts required

2 of No.	1	2 of No.	11	1 of No.	52		
4 „ „	2	6 „ „	12	2 „ „	111c		
6 „ „	5	1 „ „	15b	1 „ „	126		
4 „ „	10	3 „ „	22	2 „ „	126a		
		1 „ „	35	2 „ „	188		
		47 „ „	37	2 „ „	189		
		2 „ „	37a	2 „ „	191		
		1 „ „	48a	1 „ „	192		
				2 „ „	199		
				2 „ „	214		
				4 „ „	215		

3.3. MARINE ENGINE

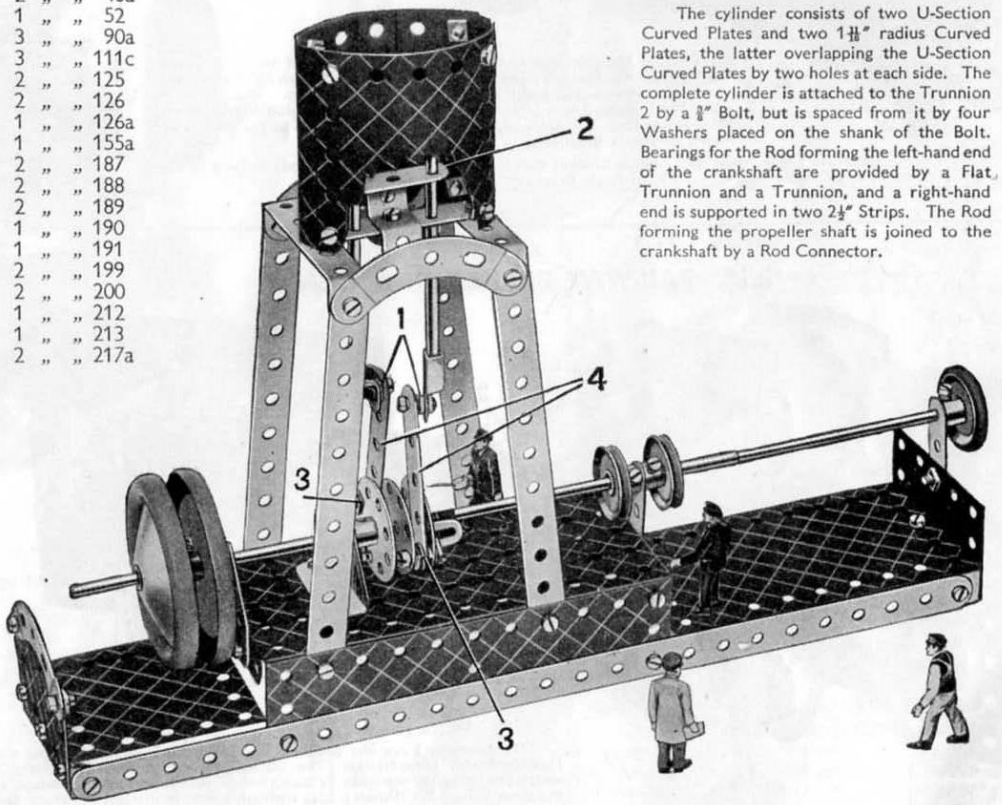
Parts required

2 of No.	1	1 „ „	155a
4 „ „	2	2 „ „	187
5 „ „	5	2 „ „	188
8 „ „	12	2 „ „	189
2 „ „	15b	1 „ „	190
3 „ „	16	1 „ „	191
3 „ „	22	2 „ „	199
1 „ „	24	2 „ „	200
4 „ „	35	1 „ „	212
47 „ „	37	1 „ „	213
9 „ „	37a	2 „ „	217a
6 „ „	38		
2 „ „	48a		
1 „ „	52		
3 „ „	90a		
3 „ „	111c		
2 „ „	125		
2 „ „	126		
1 „ „	126a		

Bolts 1 are lock-nutted. The Bolts 3 are ⅜" long and are lock-nutted twice as shown. The 2½" Strips 4 must be quite free to move when the crankshaft is rotated.

The left-hand piston rod is held by two Spring Clips, one at each side of the Angle Bracket pivotally fastened by the Bolts 1. Inside the cylinder the Rods slide through holes in a 2½" Strip and a Trunnion 2. In order to show the construction clearly part of the cylinder has been cut away in the illustration.

The Rod carrying two 1" Pulleys passes through the centre hole in the outer 1¼" Disc. A ½"×½" Angle Bracket is bolted to the Disc in such a position that when the Disc is turned the Angle Bracket engages with a Spring Clip on the Rod. It is important that all nuts and bolts are made quite secure with the Spanner and Screwdriver.



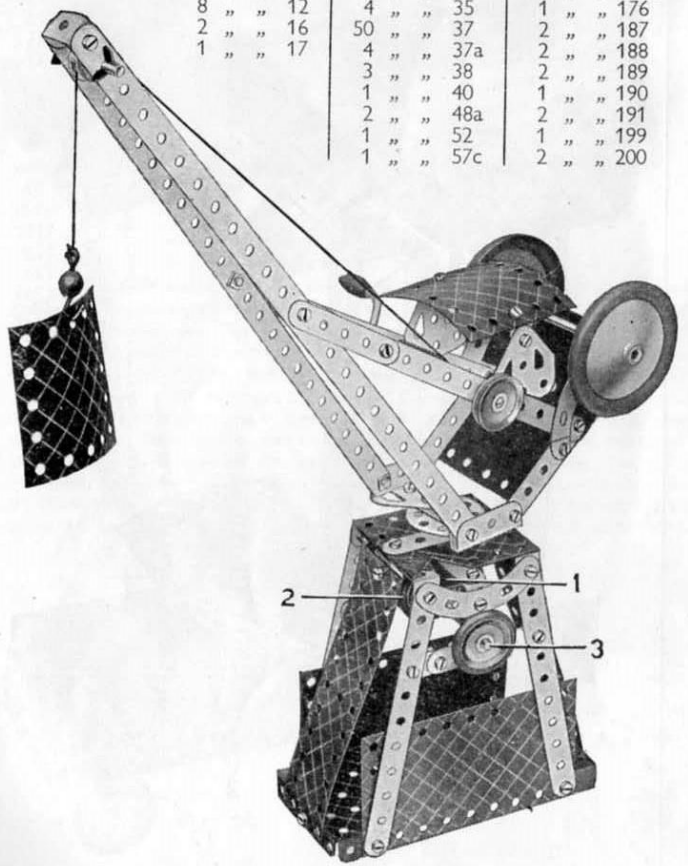
The cylinder consists of two U-Section Curved Plates and two 1⅜" radius Curved Plates, the latter overlapping the U-Section Curved Plates by two holes at each side. The complete cylinder is attached to the Trunnion 2 by a ⅜" Bolt, but is spaced from it by four Washers placed on the shank of the Bolt. Bearings for the Rod forming the left-hand end of the crankshaft are provided by a Flat Trunnion and a Trunnion, and a right-hand end is supported in two 2½" Strips. The Rod forming the propeller shaft is joined to the crankshaft by a Rod Connector.

3.4 SWIVELLING JIB CRANE

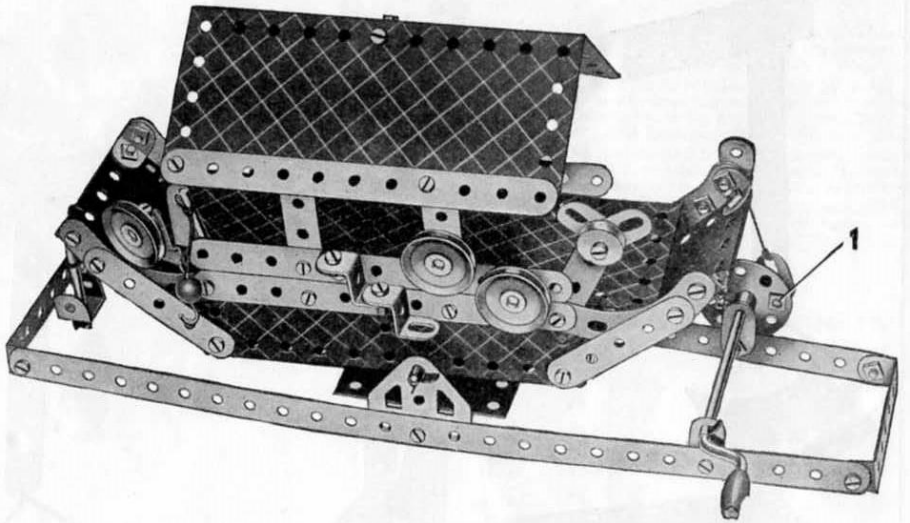
A 1" fast Pulley 1 is fastened to the lower end of a 2" Rod, which passes into and is held in the boss of the Bush Wheel. The Pulley rests on the tyre of Pulley Wheel 2, which is fastened on Rod 3. When the Rod 3 is rotated the jib is caused to swivel. Bearings for Rod 3 are formed by Flat Brackets, which are bolted through their elongated holes to the 2½" Strips shown in the illustration. The roof of the cab is fastened by means of Angle Brackets to two Flat Trunnions, and these in turn are bolted to the compound Strips bracing the jib.

Parts required

2 of No. 1	1 of No. 18a	4 of No. 90a
6 „ „ 2	1 „ „ 19g	4 „ „ 111c
9 „ „ 5	4 „ „ 22	2 „ „ 126
4 „ „ 10	1 „ „ 23	2 „ „ 126a
1 „ „ 11	1 „ „ 24	2 „ „ 155a
8 „ „ 12	4 „ „ 35	1 „ „ 176
2 „ „ 16	50 „ „ 37	2 „ „ 187
1 „ „ 17	4 „ „ 37a	2 „ „ 188
	3 „ „ 38	2 „ „ 189
	1 „ „ 40	1 „ „ 190
	2 „ „ 48a	2 „ „ 191
	1 „ „ 52	1 „ „ 199
	1 „ „ 57c	2 „ „ 200



3.5 NOAH'S ARK



Parts required

2 of No. 1	1 of No. 18a	1 of No. 40	2 of No. 126
6 „ „ 2	1 „ „ 19g	1 „ „ 44	2 „ „ 126a
9 „ „ 5	3 „ „ 22	2 „ „ 48a	1 „ „ 176
5 „ „ 10	1 „ „ 23	1 „ „ 52	2 „ „ 188
2 „ „ 11	1 „ „ 24	1 „ „ 57c	2 „ „ 189
8 „ „ 12	6 „ „ 35	4 „ „ 90a	2 „ „ 190
1 „ „ 16	50 „ „ 37	5 „ „ 111c	2 „ „ 191
1 „ „ 17	3 „ „ 37a	2 „ „ 125	2 „ „ 192

A 5½"×2½" Flanged Plate is used for the bottom of the ark and 5½"×2½" Flexible Plates and 5½" Strips form the sides. The deck is fastened to the sides by ½"×½" Angle Brackets.

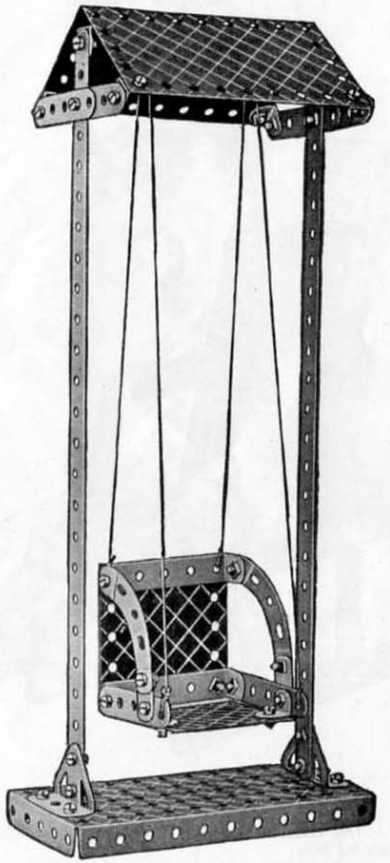
The ark is pivoted on a 3½" Rod journalled in Flat Trunnions, the Rod passing through the flanges of the baseplate at the fifth holes from the end near the Crank Handle. The Crank Handle carries a Bush Wheel, and to this a Flat Bracket is lock-nutted at 1. A length of Cord is attached to the free hole of the Flat Bracket and is then tied to a Double Bracket bolted to the side of the ark. When the Crank Handle is rotated, the downward motion of the Flat Bracket causes one end of the ark to be pulled down, but as the Flat Bracket rises again, the ark returns to its original position.

3.6 SWING

Two 2½" Strips overlapped one hole are attached to the tops of the 12½" Strips by ½"×½" Angle Brackets.

Parts required

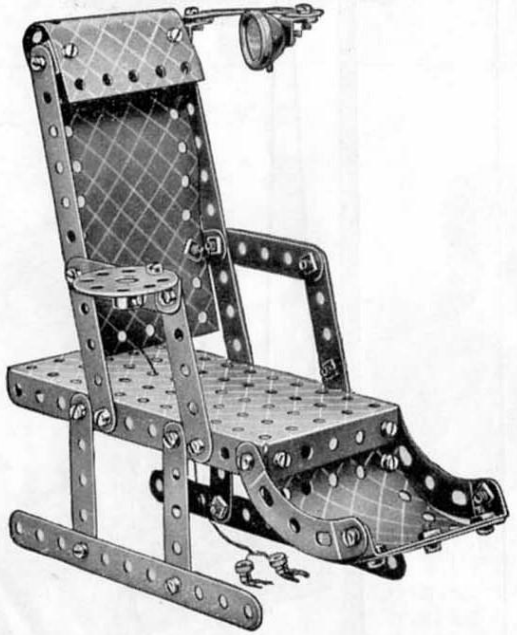
2 of No. 1	2 of No. 48a
6 „ „ 5	1 „ „ 52
2 „ „ 10	2 „ „ 90a
8 „ „ 12	2 „ „ 126
34 „ „ 37	2 „ „ 190
1 „ „ 40	2 „ „ 191



3.7 DENTIST'S CHAIR

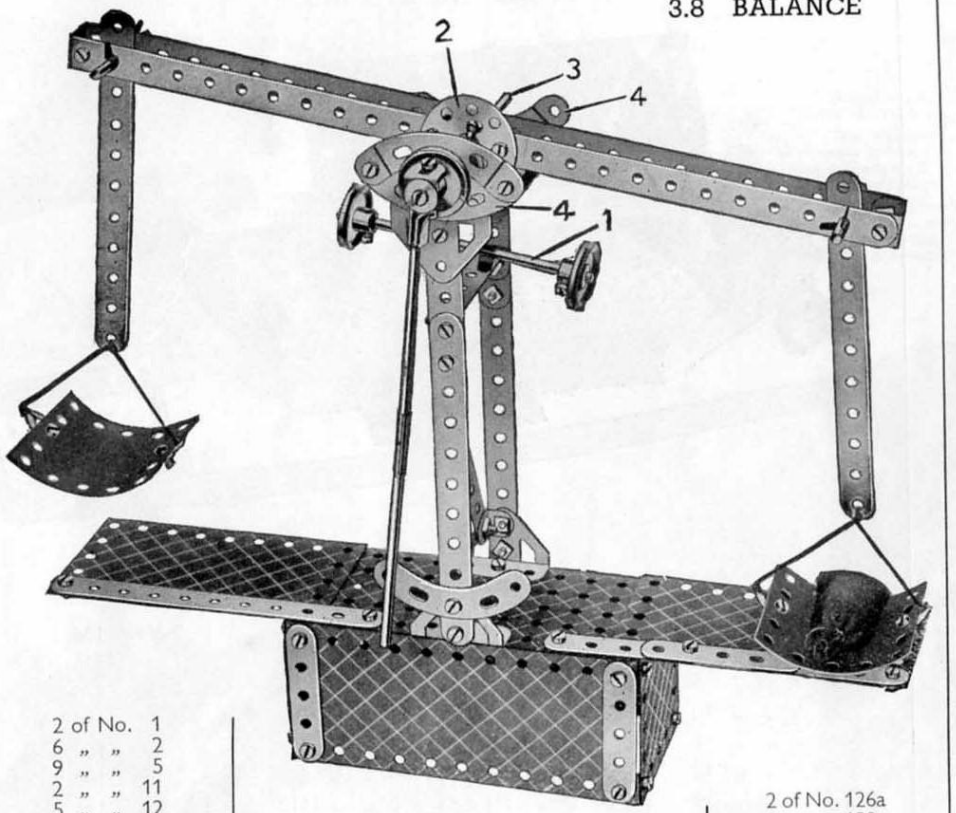
Parts required

4 of No.	2	1 of No.	52
8 „ „	5	3 „ „	90a
2 „ „	10	1 „ „	190
4 „ „	12	1 „ „	191
1 „ „	24	1 „ „	200
38 „ „	37	Lighting Set	
1 „ „	37a	(Not Included in Outfit)	
1 „ „	48a		



This model is fitted with a Spotlight from the Meccano Lighting Set.

3.8 BALANCE



Parts required

2 of No.	1	4 of No.	37a	1 of No.	52
6 „ „	2	5 „ „	38	4 „ „	90a
9 „ „	5	1 „ „	40	4 „ „	111c
2 „ „	11	1 „ „	44	1 „ „	125
5 „ „	12	2 „ „	48a	2 „ „	126
2 „ „	15b				
2 „ „	16				
2 „ „	17				
4 „ „	22				
1 „ „	24				
6 „ „	35				
50 „ „	37				

2 of No.	126a	
2 „ „	190	
2 „ „	191	
2 „ „	192	
2 „ „	200	
1 „ „	212	
1 „ „	213	
2 „ „	215	

One of the 12½" Strips that form the beam of the balance is bolted across a Bush Wheel 2. The 3½" Rod 3 that is locked in the boss of the Bush Wheel rests on the two Curved Strips 4.

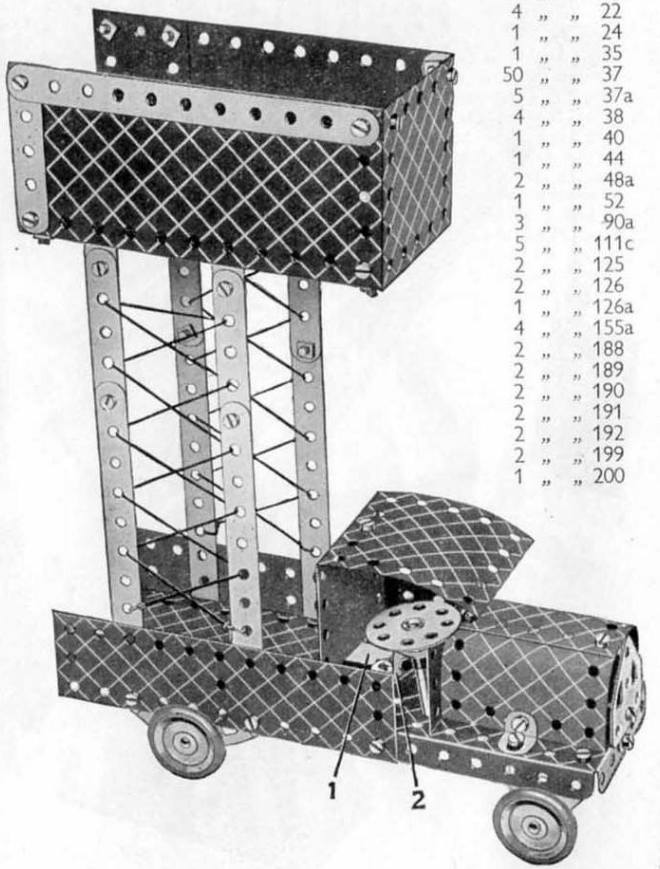
The Rod **1**, by which the balance is adjusted, is pushed through the two holes of a Cranked Bent Strip fastened to the Bush Wheel 2 by a Reversed Angle Bracket. The 5½" Strips from which the scale pans are suspended are pivoted at their upper ends on 2" Rods, which are passed through holes in the 12½" Strips of the beam.

3.9 TOWER WAGON

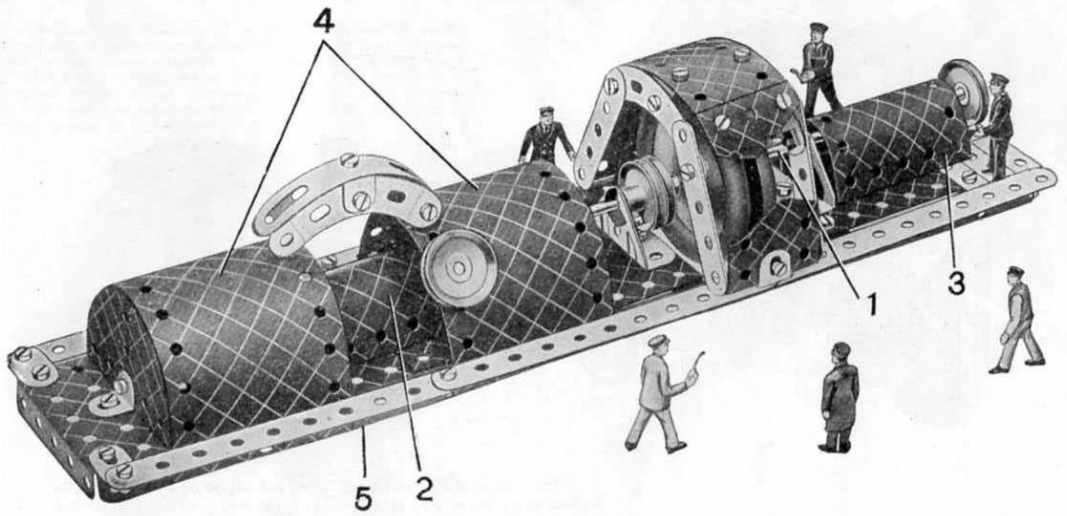
A Cranked Bent Strip 1 is bolted in a horizontal position in the centre of the Flanged Plate, and a 2½" Curved Strip is bolted on top of it by the centre hole to form a seat. A Reversed Angle Bracket 2 is then bolted in one of the elongated holes of the Curved Strip to form a bearing for the Rod carrying the Bush Wheel.

Parts required

6 of No.	2
6 „ „	5
1 „ „	10
2 „ „	11
8 „ „	12
2 „ „	16
1 „ „	18a
4 „ „	22
1 „ „	24
1 „ „	35
50 „ „	37
5 „ „	37a
4 „ „	38
1 „ „	40
1 „ „	44
2 „ „	48a
1 „ „	52
3 „ „	90a
5 „ „	111c
2 „ „	125
2 „ „	126
1 „ „	126a
4 „ „	155a
2 „ „	188
2 „ „	189
2 „ „	190
2 „ „	191
2 „ „	192
2 „ „	199
1 „ „	200



3.10 ELECTRIC GENERATING SET



The base is constructed by bolting two 12½" Strips to the flanges o a 5½" × 2½" Flanged Plate 5, and joining them at their free ends by a 2½" × ½" Double Angle Strip. The space between the 12½" Strips is then filled in by Flexible Plates and 2½" Strips. The Rods that form the shaft of the machine are joined together at 1 by a Rod Connector. The bearings for the shaft are formed by two Trunnions. In the illustration part of the Flexible Plate has been cut away to show the structure of the armature and the commutator. The commutator consists of two 1" Pulleys and the armature of two Road Wheels, the bosses of which are placed in contact with each other.

The connecting pipe is formed from two 2½" Curved Strips and one 3" Formed Slotted Strip joined together at their centre holes by a Double Bracket, and is fastened to the turbine by means of an Angle Bracket. The U-Section Curved Plate 2 is held by a Spring Clip slipped on the upper end of a 2" Rod. One end of the Rod is passed through the middle hole in the top of the Plate, and its other end is then pushed through the Flexible Plate forming the base. The Rod is held by a Spring Clip underneath the Plate. The U-Section Curved Plate 3 is fixed to the base by an Angle Bracket on the rear side of the model. The two Flexible Plates 4 are bolted to the flanges of the 5½" × 2½" Flanged Plate 5. The 1" Pulley representing the steam control is held by a ⅜" Bolt, which passes through a hole in one of the Flexible Plates 4, and is locked in the boss of the Pulley.

Parts required

2 of No. 1	1 of No. 16	1 of No. 52	1 of No. 189
6 „ „ 2	1 „ „ 18a	4 „ „ 90a	1 „ „ 190
8 „ „ 5	4 „ „ 22	1 „ „ 111c	1 „ „ 191
3 „ „ 10	4 „ „ 35	2 „ „ 125	2 „ „ 192
2 „ „ 11	50 „ „ 37	2 „ „ 126	2 „ „ 199
8 „ „ 12	1 „ „ 38	2 „ „ 187	1 „ „ 213
1 „ „ 15b	2 „ „ 48a	1 „ „ 188	2 „ „ 214

1 of No. 215

3.11 TROTTING CAR

The seat of the car consists of two 2½" × 1½" Flexible Plates, overlapped two holes, and it carries at each end a Trunnion. The 3" Formed Slotted Strips that form the mudguards are supported by Reversed Angle Brackets 2, which are spaced from the Flexible Plate by three Washers. The axle consists of two 2" Rods joined by a Rod Connector, and is journalled in the Trunnions.

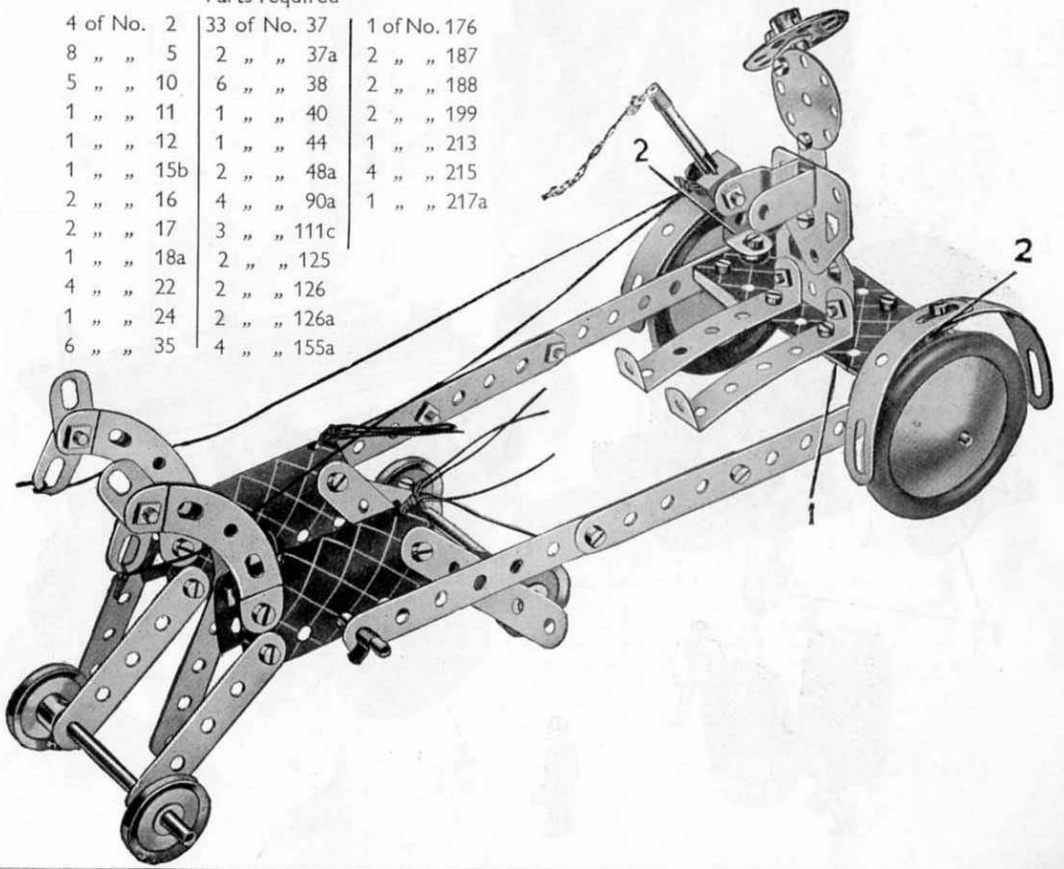
Each of the horses is built up as follows. Four 2½" Strips are bolted to a U-Section Curved Plate in the positions shown to form the legs, and two 2½" small radius Curved Strips represent the neck. A Rod is pushed through the centre holes of the U-Section Curved Plates and is supported in the end holes of the shafts. Two 3½" Rods carrying 1" Pulleys at each of their ends are journalled in the end holes of two of the forelegs, and two of the hind-legs of the horses, as shown.

The driver's body is made with two Flat Trunnions, which are bolted together and then fitted with 2½" × ½" Double Angle Strips to represent legs. The Bolt that fixes the Cranked Bent Strip to the body holds also a Flat Bracket that supports a 1¼" Disc representing the head. An Angle Bracket bolted to the Disc secures a Bush Wheel that has a ⅜" Bolt fixed in its boss by the set-screw.

The whip is a 2" Rod held by Spring Clips in a Double Bracket, and the lash is attached to it by a Cord Anchoring Spring. The reins are fastened to the Flat Brackets that form the horses' heads, and also to the Double Bracket to which the whip is fixed. Short lengths of Cord fastened to the U-Section Curved Plates represent the horses' tails.

Parts required

4 of No. 2	33 of No. 37	1 of No. 176
8 „ „ 5	2 „ „ 37a	2 „ „ 187
5 „ „ 10	6 „ „ 38	2 „ „ 188
1 „ „ 11	1 „ „ 40	2 „ „ 199
1 „ „ 12	1 „ „ 44	1 „ „ 213
1 „ „ 15b	2 „ „ 48a	4 „ „ 215
2 „ „ 16	4 „ „ 90a	1 „ „ 217a
2 „ „ 17	3 „ „ 111c	
1 „ „ 18a	2 „ „ 125	
4 „ „ 22	2 „ „ 126	
1 „ „ 24	2 „ „ 126a	
6 „ „ 35	4 „ „ 155a	



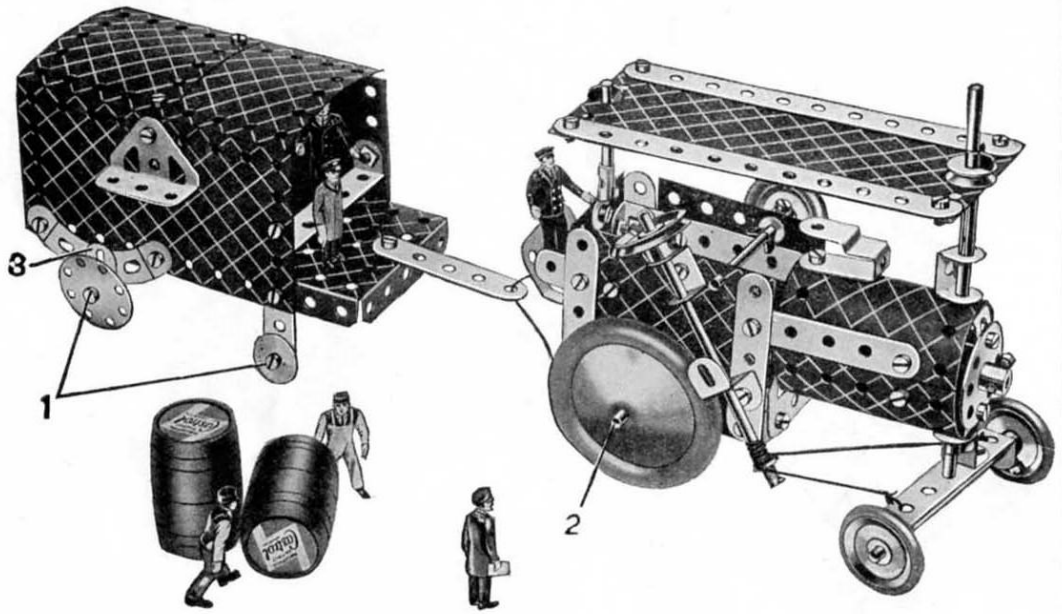
3.12 STEAM TRACTOR AND TRAILER

The steering column, a 3½" Rod, is supported in the holes of a Double Bracket and a Reversed Angle Bracket bolted to the side of the cab. Cord is wound round the lower part of the Rod and its ends are tied to the 2½" × ½" Double Angle Strip that carries the front axle. Care must be taken that the Cord is wound tightly round the Rod, or it will slip when the steering wheel is rotated. The Rod 2 is supported in holes in the Flexible Plates that form the sides of the cab.

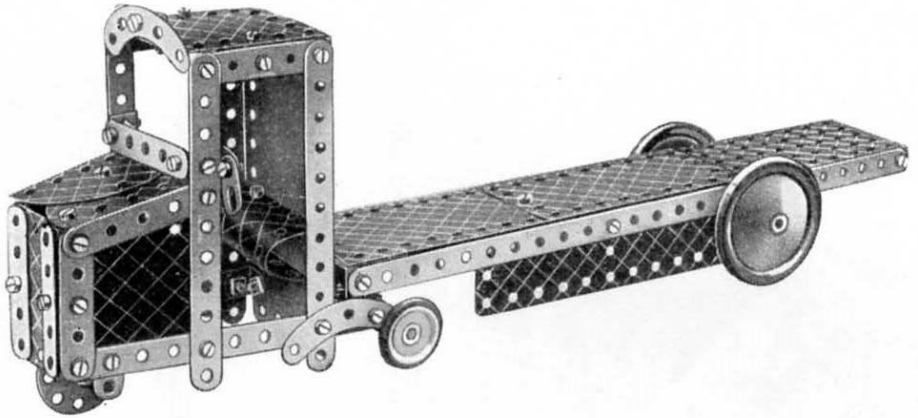
The Bush Wheel that forms the front of the boiler has two Angle Brackets bolted to it and a Rod passes through the free holes of these Brackets to hold the Bush Wheel in position. This Rod is joined by a Rod Connector to a 2" Rod that forms the chimney. The roof of the cab consists of a 5½" × 2½" Flexible Plate, and is held in position by Spring Clips placed on the two Rods that pass through it. The Flat Brackets 3 are bolted in the centre holes of the 2½" Curved Strips. The Bolts 1 are lock-nutted in position and the Discs turn freely on them.

Parts required

4 of No. 2	1 of No. 23	2 of No. 90a	2 of No. 191
9 „ „ 5	1 „ „ 24	4 „ „ 111c	1 „ „ 192
5 „ „ 10	4 „ „ 35	2 „ „ 125	2 „ „ 199
2 „ „ 11	43 „ „ 37	2 „ „ 126	2 „ „ 200
8 „ „ 12	8 „ „ 37a	2 „ „ 126a	1 „ „ 212
2 „ „ 15b	6 „ „ 38	3 „ „ 155a	1 „ „ 213
2 „ „ 16	1 „ „ 40	1 „ „ 176	1 „ „ 214
2 „ „ 17	1 „ „ 44	2 „ „ 187	2 „ „ 217a
1 „ „ 18a	2 „ „ 48a	2 „ „ 188	2 „ „ 217b
4 „ „ 22	1 „ „ 52	2 „ „ 190	



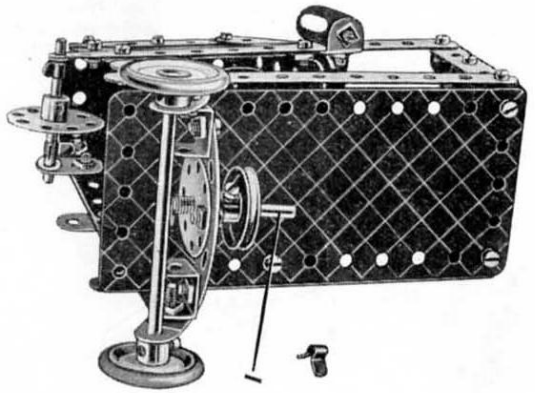
3.13 MECHANICAL HORSE AND TRAILER



Parts required

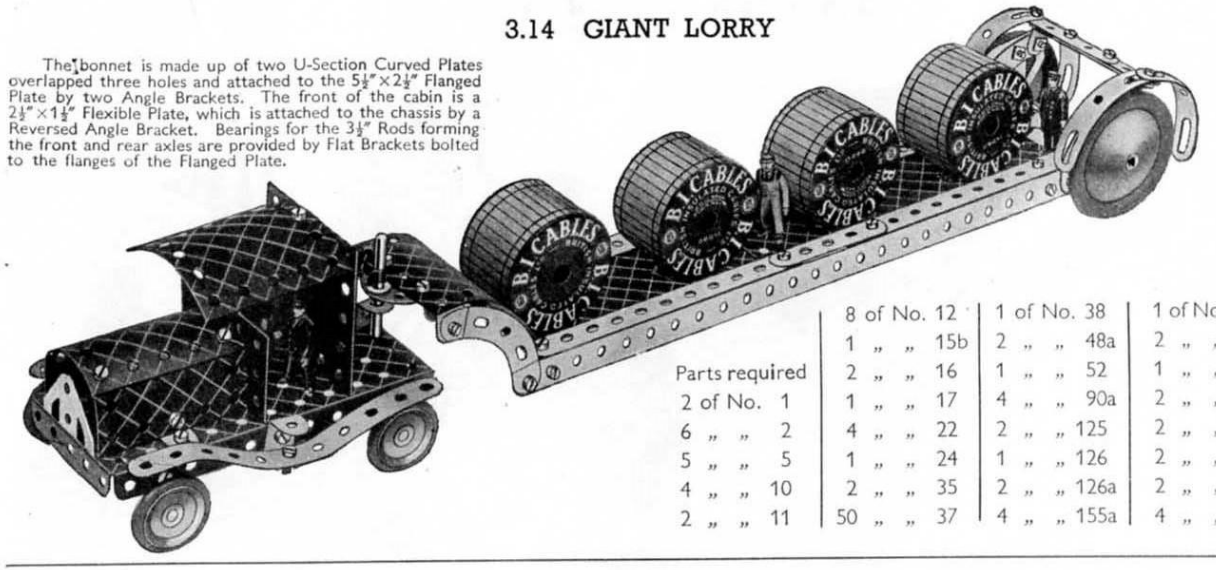
2 of No. 1	4 of No. 90a
6 „ „ 2	6 „ „ 111c
9 „ „ 5	2 „ „ 125
4 „ „ 10	2 „ „ 126
2 „ „ 11	2 „ „ 126a
8 „ „ 12	2 „ „ 155a
2 „ „ 16	1 „ „ 176
1 „ „ 17	2 „ „ 187
1 „ „ 18a	1 „ „ 188
3 „ „ 22	2 „ „ 189
1 „ „ 24	2 „ „ 190
4 „ „ 35	2 „ „ 191
56 „ „ 37a	1 „ „ 192
50 „ „ 37b	1 „ „ 199
2 „ „ 38	1 „ „ 200
2 „ „ 48a	2 „ „ 214
1 „ „ 52	1 „ „ 127a

The chassis of the mechanical horse is built up on two 5½" Strips, extended at the rear by 2½" Curved Strips that provide bearings for the rear axle. The method of building up the bonnet and cab is clear from the illustration. The rear ends of the 5½" Strips are joined by a Curved Strip and two Double Brackets. At the centre of the Curved Strip is bolted a 1¼" Disc through which passes a 1½" Rod 1. This Rod engages in the centre hole of the Plate at the front of the trailer, and is retained in place by a Spring Clip and a Cord Anchoring Spring. A 1" Pulley and two Washers space the end of the trailer from the 1¼" Disc. Bearings for the rear axle are provided by Flat Trunnions.



3.14 GIANT LORRY

The bonnet is made up of two U-Section Curved Plates overlapped three holes and attached to the 5½" × 2½" Flanged Plate by two Angle Brackets. The front of the cabin is a 2½" × 1½" Flexible Plate, which is attached to the chassis by a Reversed Angle Bracket. Bearings for the 3½" Rods forming the front and rear axles are provided by Flat Brackets bolted to the flanges of the Flanged Plate.



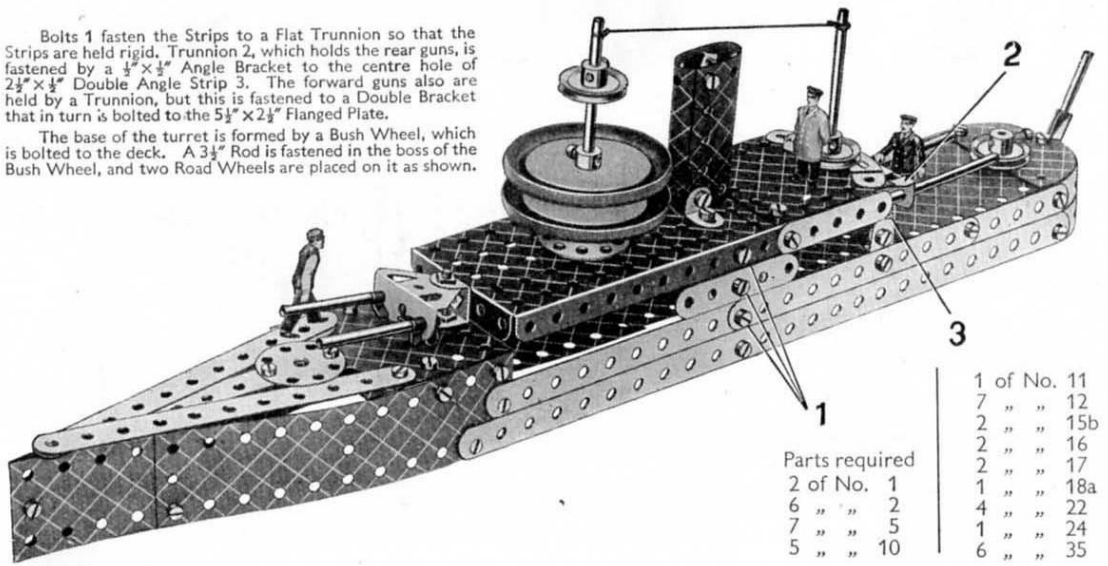
Parts required

2 of No.	1	8 of No.	12	1 of No.	38	1 of No.	176
6 „ „	2	1 „ „	15b	2 „ „	48a	2 „ „	187
5 „ „	5	2 „ „	16	1 „ „	52	1 „ „	188
4 „ „	10	1 „ „	17	4 „ „	90a	2 „ „	190
2 „ „	11	4 „ „	22	2 „ „	125	2 „ „	192
		1 „ „	24	1 „ „	126	2 „ „	199
		2 „ „	35	2 „ „	126a	2 „ „	200
		50 „ „	37	4 „ „	155a	4 „ „	215

3.15 BATTLE CRUISER

Bolts 1 fasten the Strips to a Flat Trunnion so that the Strips are held rigid. Trunnion 2, which holds the rear guns, is fastened by a ½" × ½" Angle Bracket to the centre hole of 2½" × ½" Double Angle Strip 3. The forward guns also are held by a Trunnion, but this is fastened to a Double Bracket that in turn is bolted to the 5½" × 2½" Flanged Plate.

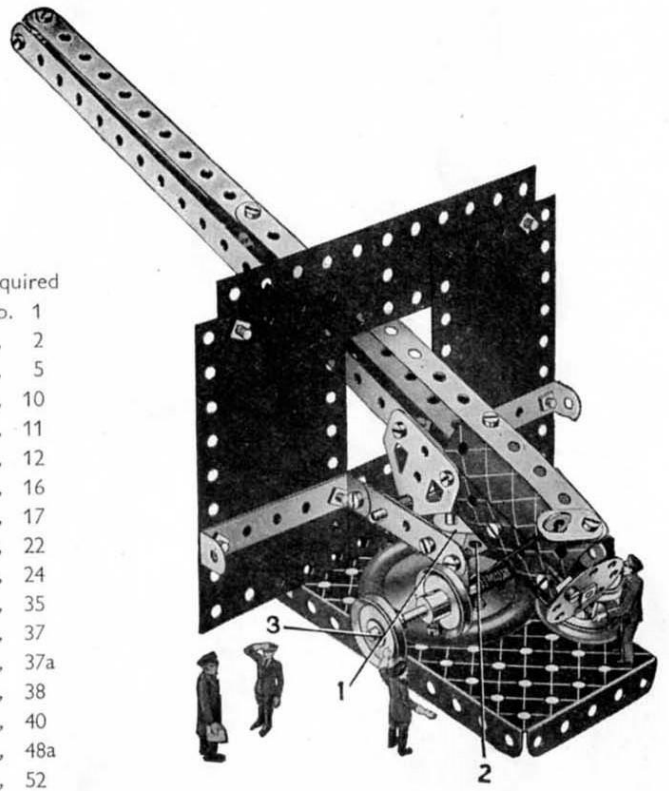
The base of the turret is formed by a Bush Wheel, which is bolted to the deck. A 3½" Rod is fastened in the boss of the Bush Wheel, and two Road Wheels are placed on it as shown.



Parts required

2 of No.	1	1 of No.	11	50 of No.	37		
6 „ „	2	7 „ „	12	6 „ „	37a		
7 „ „	5	2 „ „	15b	1 „ „	40		
5 „ „	10	2 „ „	16	2 „ „	48a		
		2 „ „	17	1 „ „	52		
		1 „ „	18a	1 „ „	90a		
		4 „ „	22	6 „ „	111c		
		1 „ „	24	2 „ „	126		
		6 „ „	35	2 „ „	126a		
				1 „ „	176		
				2 „ „	187		
				2 „ „	188		
				2 „ „	189		
				2 „ „	190		
				1 „ „	191		
				1 „ „	192		
				1 „ „	199		
				2 „ „	200		
				1 „ „	212		
				1 „ „	214		
				4 „ „	215		
				1 „ „	217a		
				1 „ „	217b		

3.16 NAVAL GUN



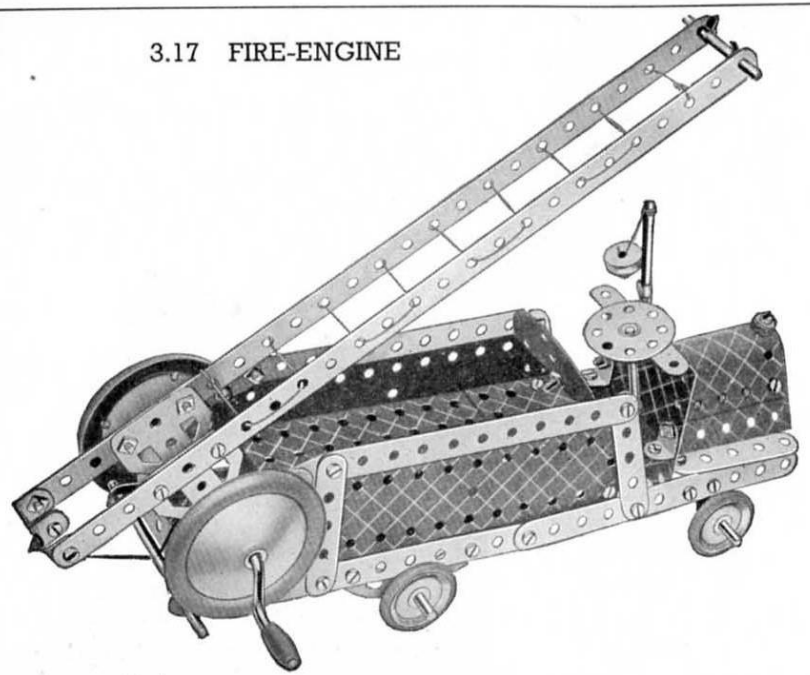
Parts required

2 of No.	1
5 „ „	2
3 „ „	5
3 „ „	10
2 „ „	11
2 „ „	12
1 „ „	16
2 „ „	17
4 „ „	22
1 „ „	24
4 „ „	35
28 „ „	37
2 „ „	37a
5 „ „	38
1 „ „	40
2 „ „	48a
1 „ „	52
2 „ „	111c
2 „ „	126
2 „ „	126a
1 „ „	155a
1 „ „	176
1 „ „	187
1 „ „	188
1 „ „	189
2 „ „	191
2 „ „	199
1 „ „	217a

The Flexible Plates forming the gun shield are fastened by means of Double Angle Strips and 2½" Strips to two Trunnions 1. The Trunnions are bolted to Bush Wheel 2. A 2" Rod held in the boss of the Bush Wheel passes through a Road Wheel and the centre hole of the 5½" × 2½" Flanged Plates. The Rod is fastened underneath the Flanged Plate by a Cord Anchoring Spring so that the gun is free to swivel.

The elevation of the gun is controlled by Rod 3. Cord is wound round the Rod, then passed through the hole of a Flat Bracket fastened at the rear end of the gun, and knotted to a Washer as shown. The 1¼" Disc at the end of the gun is fastened by an Angle Bracket to the U-Section Curved Plates representing the breech.

3.17 FIRE-ENGINE



Parts required

2 of No.	1	2 of No.	125
6 „ „	2	2 „ „	126
8 „ „	5	2 „ „	126a
5 „ „	10	4 „ „	155a
2 „ „	11	1 „ „	176
7 „ „	12	2 „ „	187
2 „ „	15b	2 „ „	188
2 „ „	16	2 „ „	189
1 „ „	17	2 „ „	190
1 „ „	19g	1 „ „	192
4 „ „	22	1 „ „	199
1 „ „	23	1 „ „	212
1 „ „	24	1 „ „	214
6 „ „	35		
50 „ „	37		
6 „ „	37a		
5 „ „	38		
1 „ „	40		
2 „ „	48a		
1 „ „	52		
4 „ „	90a		
6 „ „	111c		

Two Flat Trunnions are bolted to the bottom of the ladder, and the shaft of the Crank Handle shown in Fig. 3.17a passes through the holes at their narrow ends. The bonnet, which is formed from a U-Section Curved Plate and two 2½" × 1½" Flexible Plates, is fastened to the frame by Reversed Angle Brackets. These latter also support the 2½" Strips at the side of the bonnet.

The 3½" Rod representing the steering column passes through the free hole of a Flat Bracket bolted to the dashboard, then through a hole in the Flexible Plate at the bottom of the cab. It is fastened in position by a Cord Anchoring Spring.

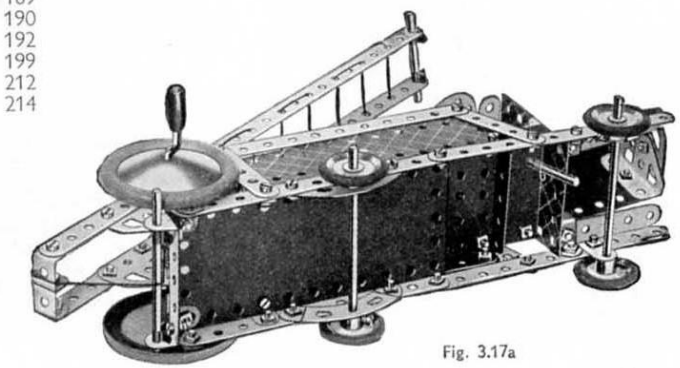
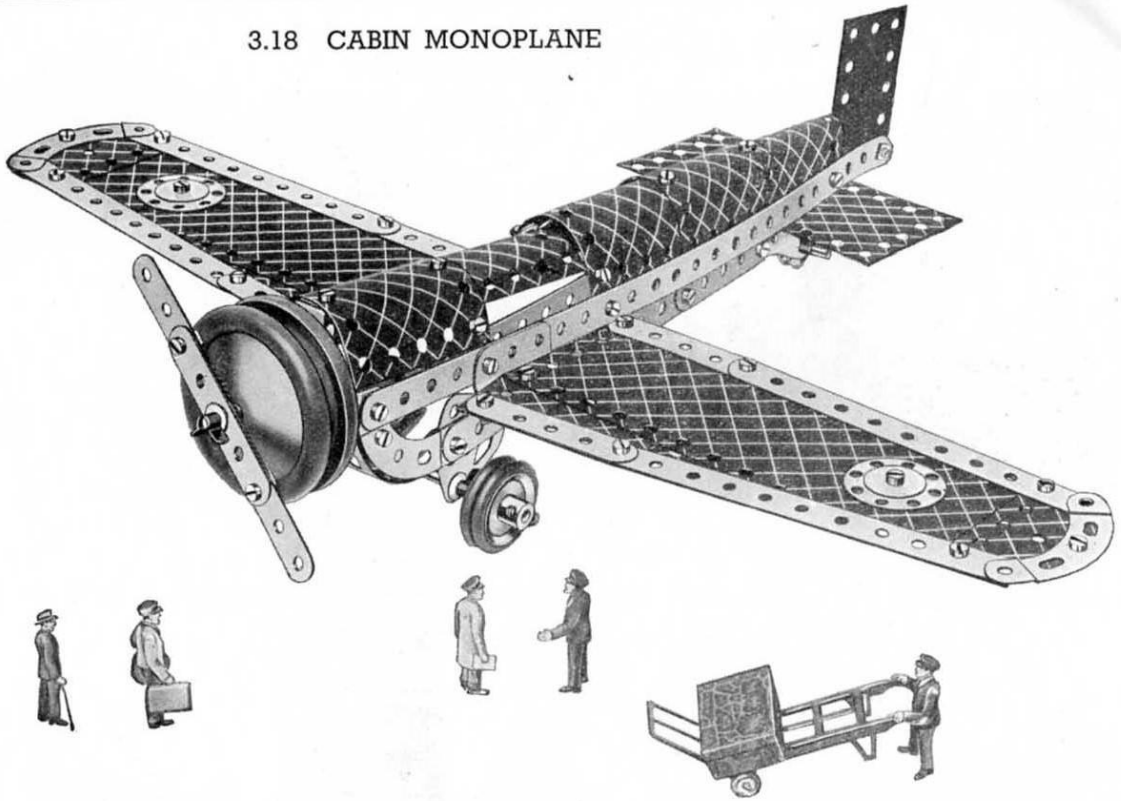


Fig. 3.17a

3.18 CABIN MONOPLANE



Parts required

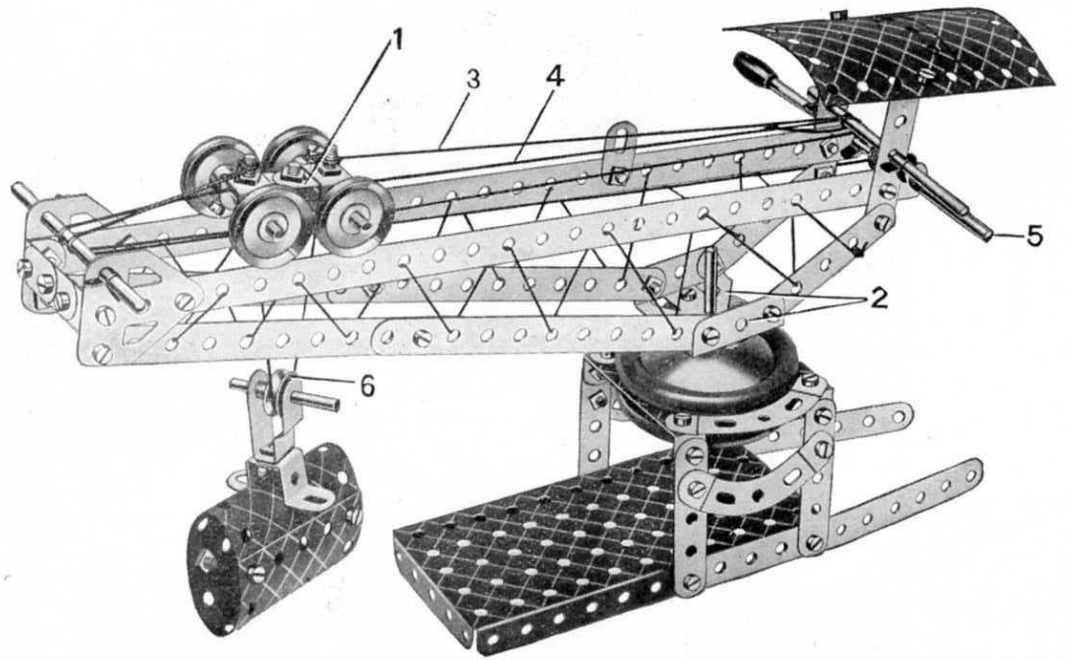
1 of No.	1	4 of No.	22	4 of No.	90a	2 of No.	190
6 „ „	2	1 „ „	23	6 „ „	111c	1 „ „	191
9 „ „	5	1 „ „	24	2 „ „	125	2 „ „	192
5 „ „	10	5 „ „	35	2 „ „	126	2 „ „	199
1 „ „	11	50 „ „	37	2 „ „	126a	2 „ „	200
8 „ „	12	6 „ „	37a	4 „ „	155a	2 „ „	214
1 „ „	16	5 „ „	38	2 „ „	187	2 „ „	215
1 „ „	17	1 „ „	44	2 „ „	188	2 „ „	217a
1 „ „	18a	2 „ „	48a	2 „ „	189	2 „ „	217b

The engine and propeller are attached by fastening a Bush Wheel to the nose of the fuselage by two Angle Brackets. A 2" Rod is locked in the boss of the Bush Wheel and forms the support for the Road Wheels and the compound strip representing the propeller.

The wings are attached to the fuselage by ½" × ½" Angle Brackets and Trunnions. The tail wheel is supported on a 1½" Rod journalled in the holes of a Cranked Bent Strip fastened to the fuselage by a Double Bracket.

The Rod on which the double landing wheels are mounted passes through the holes in the narrow ends of two Flat Trunnions bolted to the fuselage.

3.19 BLOCK-SETTING CRANE



Parts required

2 of No.	1	4 of No.	37a
6 „ „	2	6 „ „	38
8 „ „	5	1 „ „	40
5 „ „	10	1 „ „	44
2 „ „	11	2 „ „	48a
4 „ „	12	1 „ „	52
1 „ „	15b	4 „ „	90a
2 „ „	16	4 „ „	111c
2 „ „	17	2 „ „	125
1 „ „	18a	2 „ „	126
1 „ „	19g	2 „ „	126a
4 „ „	22	1 „ „	176
1 „ „	23	2 „ „	187
1 „ „	24	2 „ „	188
6 „ „	35	2 „ „	199
50 „ „	37	2 „ „	200

The travelling bogie 1 consists of two Flat Brackets bolted together by their elongated holes, and at each end of it Double Brackets are fastened by ⅜" Bolts. Two 2" Rods are pushed through the Double Brackets and carry 1" fast Pulleys spaced so that their grooves fit on the two 12½" Strips that form the top of the jib. The Trunnions 2 at the base of the jib, are secured to a Bush Wheel mounted on a Rod held in the bosses of two Road Wheels. The Road Wheels are placed one above and one below the 2½"×1½" Flexible Plates that form the top of the tower.

Cord 3 is first fastened to the ⅜" Bolt at the rear end of the travelling bogie, and then wound three times around the Crank Handle. It is then led around the Rod journalled in the Flat Trunnion at the front end of the jib, and brought back and tied to another ⅜" Bolt at the front of the bogie.

Cord 4 is first fastened to Rod 5, which is passed through the end holes of the 12½" Strips, and then over the rear axle of the bogie. It is then passed around the ½" Pulley 6, led over the front axle of the bogie, around the Rod at the front end of the jib, and finally tied to the bogie. The ½" loose Pulley 6 and its Rod are held in the Cranked Bent Strip by a Cord Anchoring Spring.

Parts required

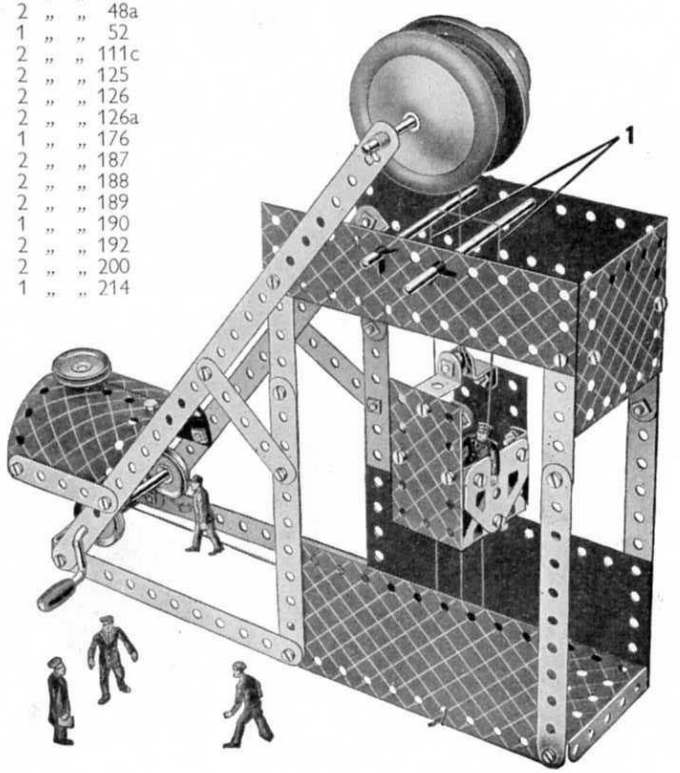
2 of No.	1
6 „ „	2
8 „ „	5
1 „ „	10
1 „ „	11
7 „ „	12
1 „ „	15b
2 „ „	16
1 „ „	18a
1 „ „	19g
4 „ „	22
1 „ „	24
6 „ „	35
41 „ „	37
1 „ „	37a
6 „ „	38
1 „ „	40
2 „ „	48a
1 „ „	52
2 „ „	111c
2 „ „	125
2 „ „	126
2 „ „	126a
1 „ „	176
2 „ „	187
2 „ „	188
2 „ „	189
1 „ „	190
2 „ „	192
2 „ „	200
1 „ „	214

3.20 PITHEAD GEAR

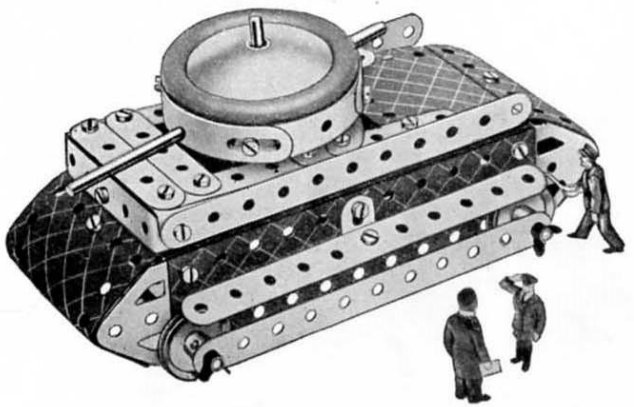
A 3½" Rod is journalled in the top holes of the 12½" Strips. Between the two Road Wheels on this Rod is a 1" fast Pulley, over which the cord controlling the cage passes. A Cord Anchoring Spring is pushed on one end of the Rod, and a Bush Wheel is fixed to the other end. The cage is built up from Trunnions and Flat Trunnions, and the 2½"×1½" Flexible Plates that form its sides are fastened to the Flat Trunnions by Angle Brackets.

A ⅜" Bolt is passed through the holes of Reversed Angle Brackets bolted to the top of the cage, and Washers are placed on its shank for spacing purposes.

The guides 1 for the cage consist of a piece of Cord which is passed over two Rods as shown and then led downward and through two holes in the Flanged Plate that forms the base. Washers are tied to each end of the Cord underneath the Plate, to maintain it in tension.



3.21 TANK



Parts required

6	of No.	2
7	„ „	5
2	„ „	10
8	„ „	12
2	„ „	15b
2	„ „	16
1	„ „	17
4	„ „	22
1	„ „	24
6	„ „	35
40	„ „	37
1	„ „	38
1	„ „	48a
1	„ „	52
1	„ „	90a
1	„ „	125
2	„ „	126
2	„ „	126a
1	„ „	176
1	„ „	187
2	„ „	189
1	„ „	190
2	„ „	199
4	„ „	215
1	*Magic*	Motor

Construction of the gun turret is commenced by bolting a 2½" Strip across a Bush Wheel. Four 3" Formed Slotted Strips are bolted together to form a circle and fastened to the 2½" Strip by means of Angle Brackets. Next two Angle Brackets are bolted to the Bush Wheel in the positions shown in Fig. 3.21a. Two Rods are pushed through holes in the Formed Slotted Strips and through the free holes of the Angle Brackets, and are fastened in position by means of Spring Clips. The turret is held in place by a 3½" Rod that is locked in the boss of the Bush Wheel and then passed through the 5½"×2½" Flanged Plate and through a hole in a Reversed Angle Bracket. A Cord Anchoring Spring is then screwed on to it to hold it in position. To complete the turret a Road Wheel is fastened on the upper end of the 3½" Rod. The Reversed Angle Bracket is bolted to the 5½"×2½" Flanged Plate.

The *Magic* Motor is bolted to the Flanged Plate, and the drive is taken to the back axle by means of a Driving Band.

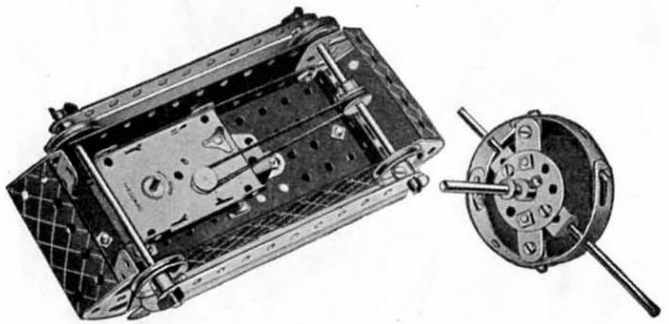
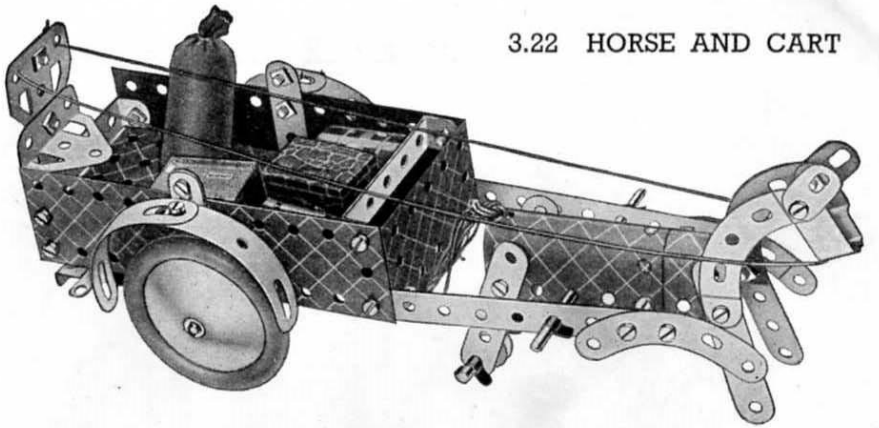


Fig. 3.21a

3.22 HORSE AND CART

Parts required

2	of No.	2
7	„ „	5
2	„ „	10
2	„ „	12
2	„ „	16
1	„ „	17
1	„ „	23
4	„ „	35
35	„ „	37
2	„ „	38
1	„ „	40
1	„ „	44
2	of No.	48a
1	„ „	52
4	„ „	90a
1	„ „	125
1	„ „	126
1	„ „	126a
2	„ „	187
1	„ „	188
2	„ „	189
2	„ „	199
4	„ „	215
1	*Magic*	Motor



The model is driven by a *Magic* Motor fastened underneath the 5½"×2½" Flanged Plate that forms the bottom of the cart. The drive is taken by a Driving Band from the pulley of the Motor to a ½" fast Pulley on the back axle. A ½" loose Pulley is fitted on a 2" Rod journalled in the bottom holes of the Strips forming the hind-legs of the horse, so that the model will travel smoothly along the ground.

3.23 ROUNDABOUT

Parts required

2	of No.	1
6	„ „	2
8	„ „	5
4	„ „	10
2	„ „	11
8	„ „	12
1	„ „	16
1	„ „	17
1	„ „	18a
1	„ „	19g
4	„ „	22
1	„ „	24
6	„ „	35
50	„ „	37
4	of No.	37a
4	„ „	38
1	„ „	40
2	„ „	48a
1	„ „	52
4	„ „	90a
4	„ „	111c
2	„ „	125
2	„ „	126
2	„ „	126a
1	„ „	187
2	„ „	188
2	„ „	191
2	„ „	199

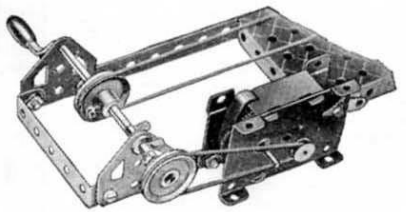


Fig. 3.23a

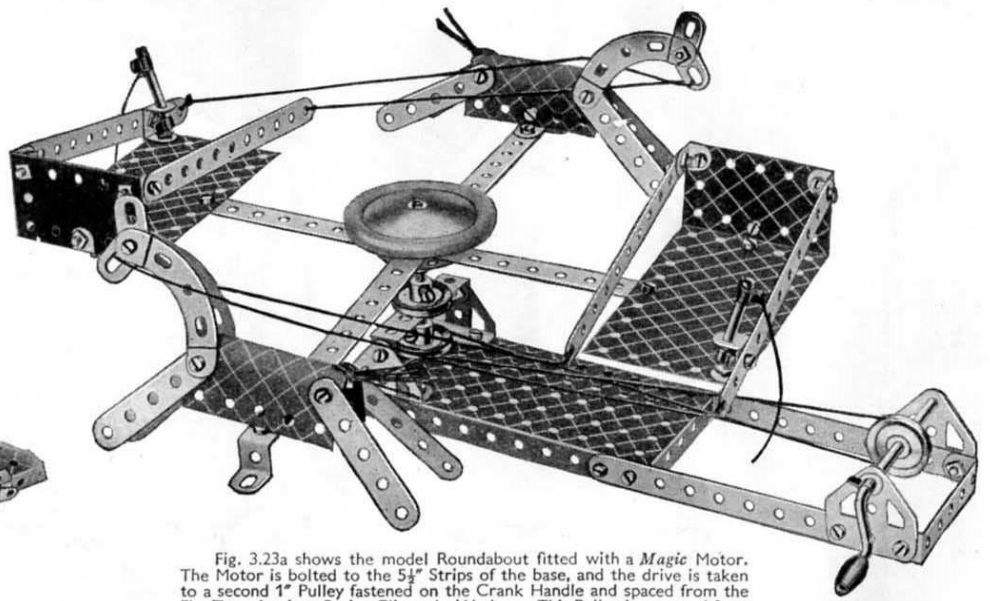


Fig. 3.23a shows the model Roundabout fitted with a *Magic* Motor. The Motor is bolted to the 5½" Strips of the base, and the drive is taken to a second 1" Pulley fastened on the Crank Handle and spaced from the Flat Trunnion by a Spring Clip and a Washer. This Pulley is removed from the end of the pivot rod of the roundabout underneath the 5½"×2½" Flanged Plate.

3.24 WINDMILL PUMP

Up and down motion of the pumping shaft is obtained from a crank fastened to the end of the Crank Handle. The crank is formed by securing an Angle Bracket to the boss of a 1" Pulley, two Washers being used between the Bracket and the boss. A 2½" Strip is pivoted to the crank and to the pumping beam, the other end of which is pivotally attached to a Double Bracket on the pump rod. The Bolts 1 are lock-nutted. The 1" Pulley on the Crank Handle is connected by a belt of Cord to the shaft carrying the sails. The *Magic* Motor is bolted by its flanges to the baseplate, and the drive is taken from the pulley of the Motor to a ½" Pulley fixed on the shaft of the Crank Handle, if desired the Motor may be dispensed with and the model operated by hand.

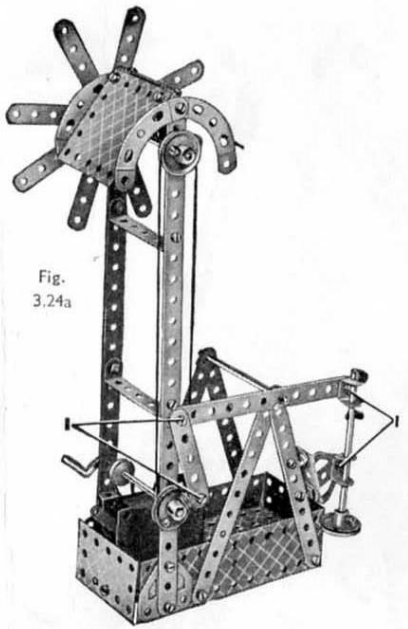
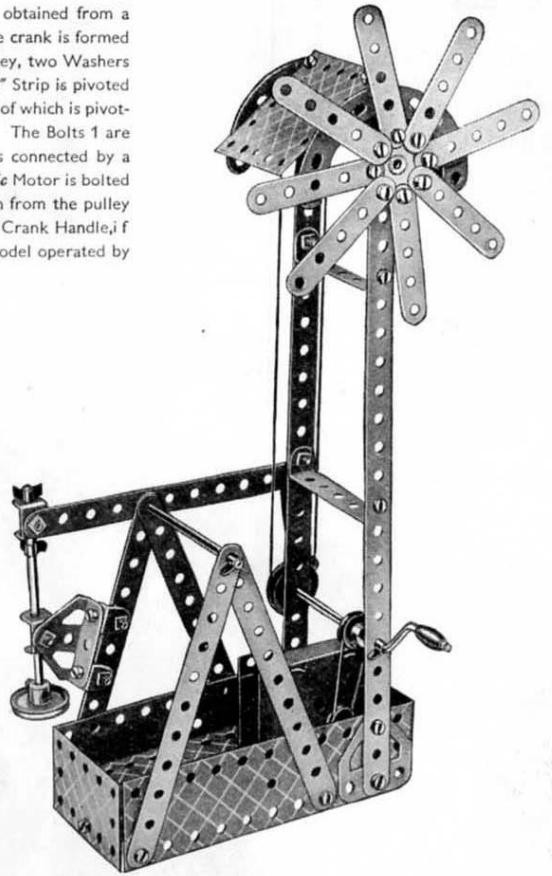


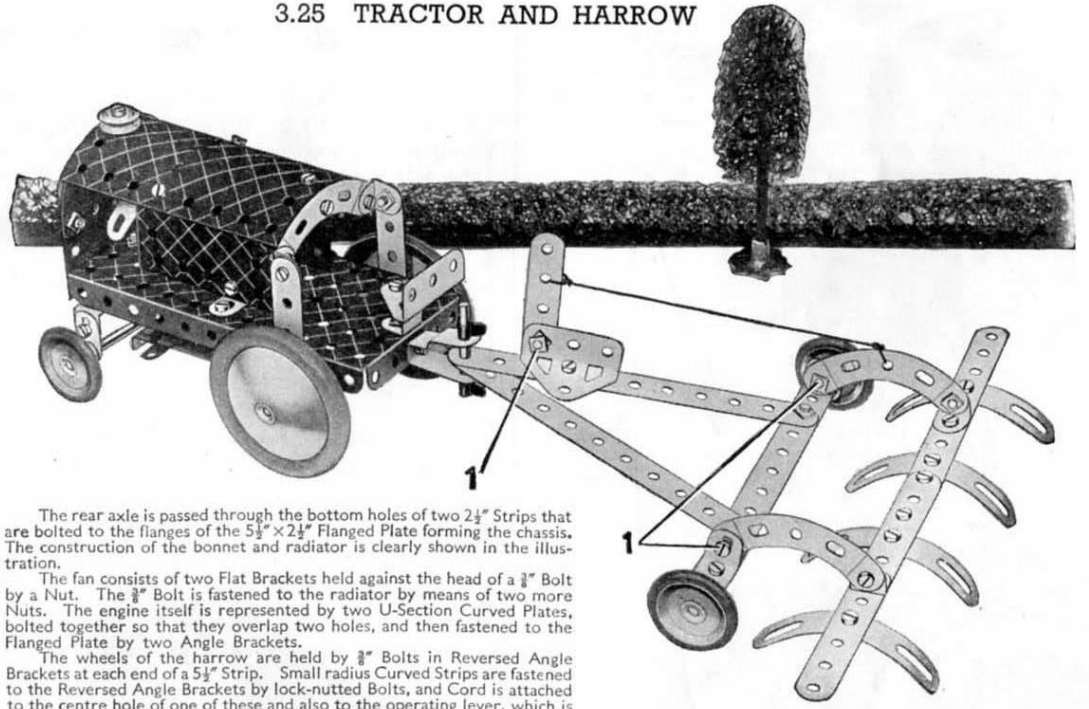
Fig. 3.24a



Parts required

2 of No. 1	2 of No. 11	2 of No. 16	2 of No. 48a
5 „ „ 2	7 „ „ 12	1 „ „ 19g	1 „ „ 52
9 „ „ 5	1 „ „ 15b	3 „ „ 22	4 „ „ 90a
		1 „ „ 24	1 „ „ 126
		4 „ „ 35	2 „ „ 126a
		39 „ „ 37	2 „ „ 188
		3 „ „ 37a	2 „ „ 189
		2 „ „ 38	2 „ „ 190
		1 „ „ 40	1 *Magic* Motor

3.25 TRACTOR AND HARROW



The rear axle is passed through the bottom holes of two 2½" Strips that are bolted to the flanges of the 5½"×2½" Flanged Plate forming the chassis. The construction of the bonnet and radiator is clearly shown in the illustration.

The fan consists of two Flat Brackets held against the head of a ⅜" Bolt by a Nut. The ⅜" Bolt is fastened to the radiator by means of two more Nuts. The engine itself is represented by two U-Section Curved Plates, bolted together so that they overlap two holes, and then fastened to the Flanged Plate by two Angle Brackets.

The wheels of the harrow are held by ⅜" Bolts in Reversed Angle Brackets at each end of a 5½" Strip. Small radius Curved Strips are fastened to the Reversed Angle Brackets by lock-nutted Bolts, and Cord is attached to the centre hole of one of these and also to the operating lever, which is held by lock-nuts to a Trunnion. By moving the lever forward the harrow may be raised from the ground when not in use.

The Bolts 1 shown in both illustrations are lock-nutted.

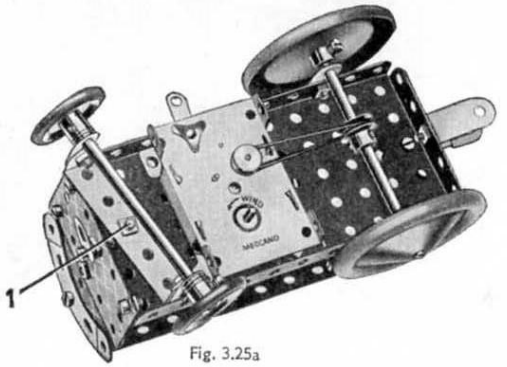
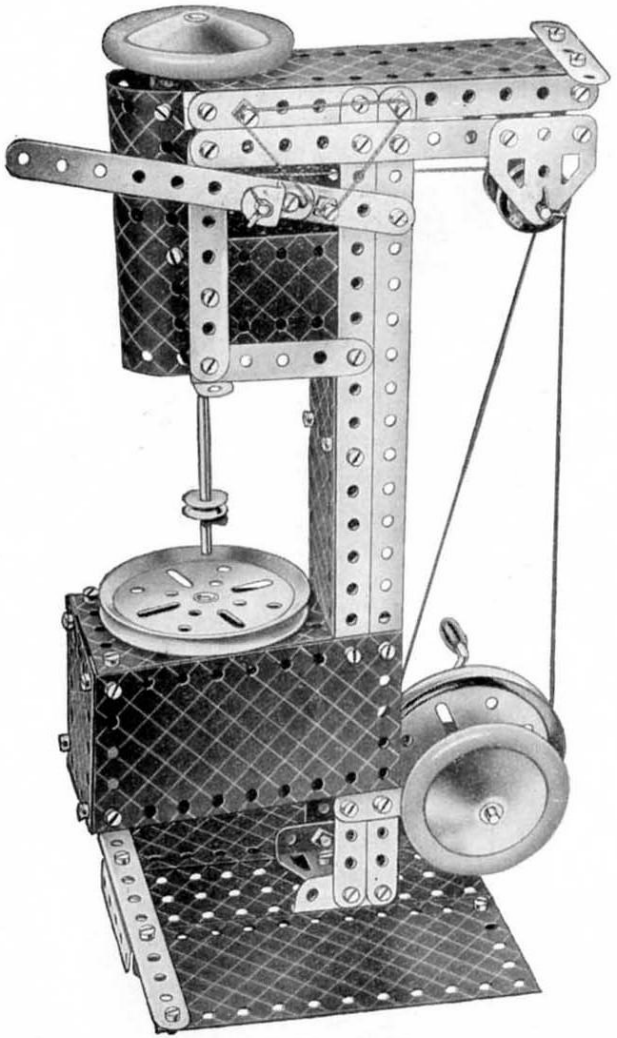


Fig. 3.25a

Parts required

5 of No. 2	4 of No. 22	2 of No. 125	
3 „ „ 5	1 „ „ 23	2 „ „ 126	
5 „ „ 10	2 „ „ 35	4 „ „ 155a	
2 „ „ 11	46 „ „ 37	2 „ „ 187	
8 „ „ 12	10 „ „ 37a	1 „ „ 188	
2 „ „ 16	6 „ „ 38	2 „ „ 199	
1 „ „ 18a	1 „ „ 44	2 „ „ 200	
	1 „ „ 48a	1 „ „ 214	
	1 „ „ 52	4 „ „ 215	
	4 „ „ 90a	1 *Magic* Motor	
	5 „ „ 111c		



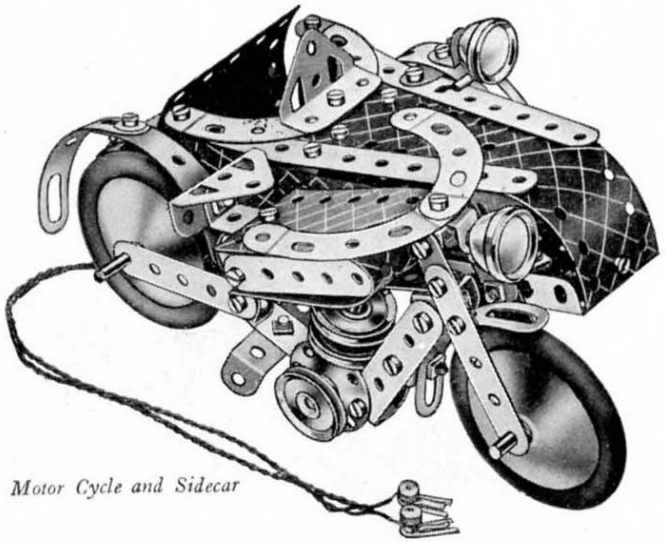
Drilling Machine

BUILD BIGGER AND BETTER MODELS

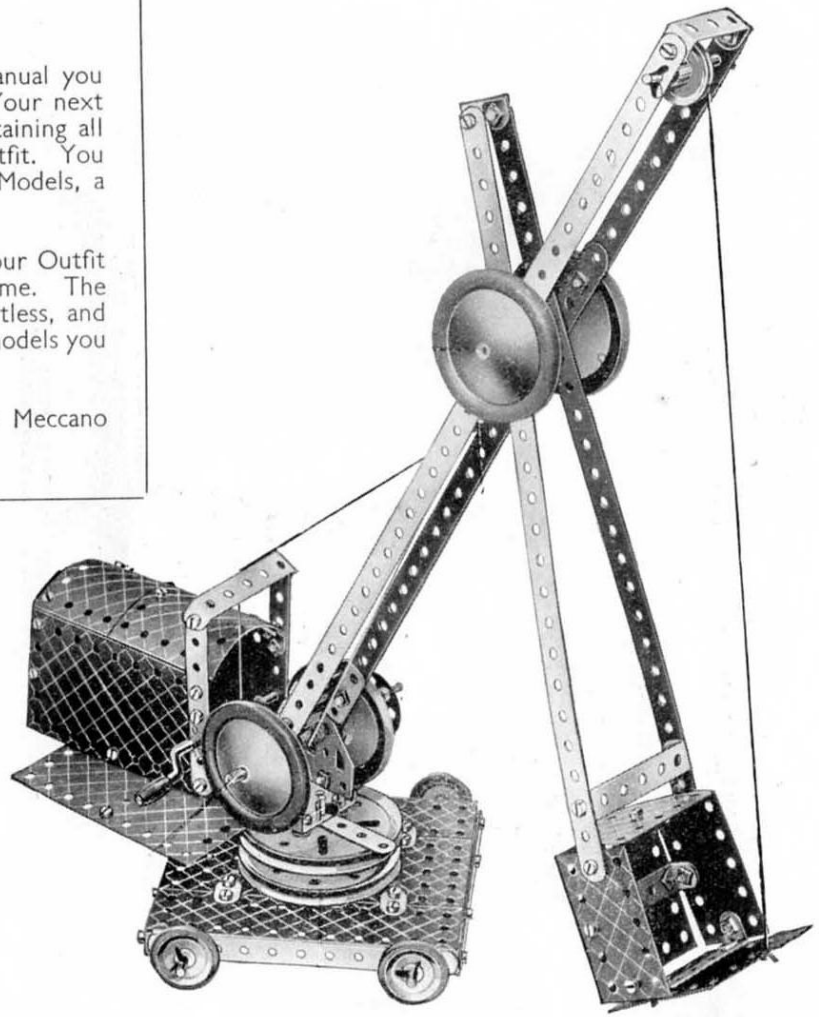
When you have built all the models shown in this Manual you will be keen to build bigger and more elaborate models. Your next step is to purchase a Meccano No. 3a Accessory Outfit containing all the parts required to convert your No. 3 into a No. 4 Outfit. You will thus be able to build the full range of No. 4 Outfit Models, a selection of which is illustrated on this page.

If you prefer to do so, you can build up and develop your Outfit quite easily by adding various parts to it from time to time. The model-building possibilities of the Meccano System are limitless, and the more Meccano parts you have the bigger and better the models you will be able to build.

Ask your dealer to post to you regularly the latest Meccano parts lists and other Meccano literature.



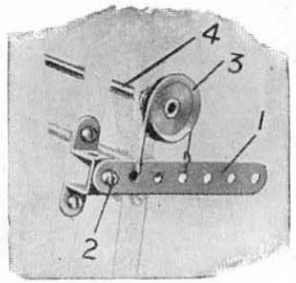
Motor Cycle and Sidecar



Giant Excavator

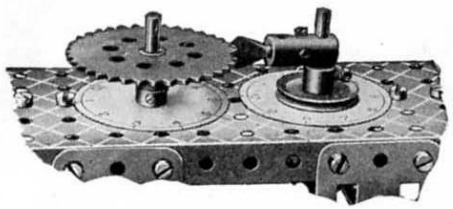
Here are a few simple and interesting movements showing how easily real mechanisms can be reproduced with Meccano.

STRAP AND LEVER BRAKE



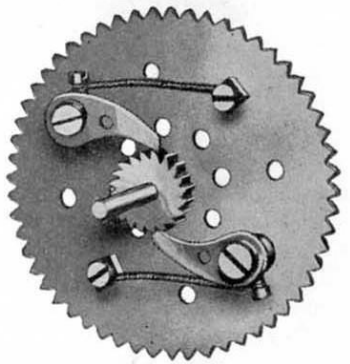
This device will be found very useful as a quick emergency hand-brake. Although it is the simplest of such devices, it is also one of the most valuable and can be used in a great variety of models.

INTERMITTENT ROTARY MOTION



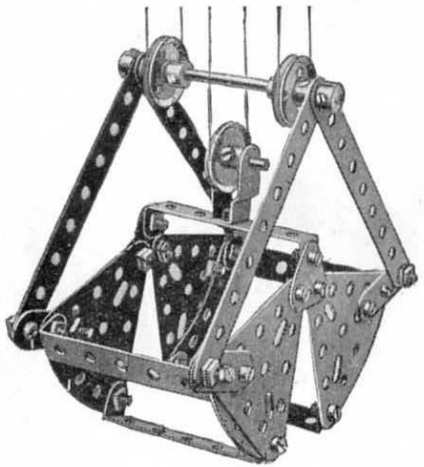
Intermittent rotary motion can be obtained by means of the above device. Such an arrangement is useful in revolution counters, measuring machines, etc. In addition to mechanisms that give true intermittent motion, different types of cams that convert a regular rotary motion into a constant or intermittent reciprocating motion can be constructed.

PAWL AND RATCHET MOVEMENT



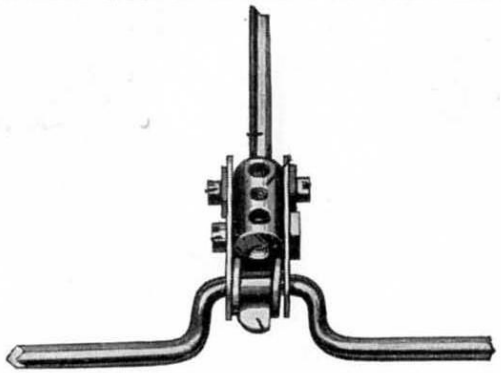
By means of this device it is possible to construct certain types of automatic brakes and free wheels.
The illustration shows the method of building up a free-wheel unit.

GRABS



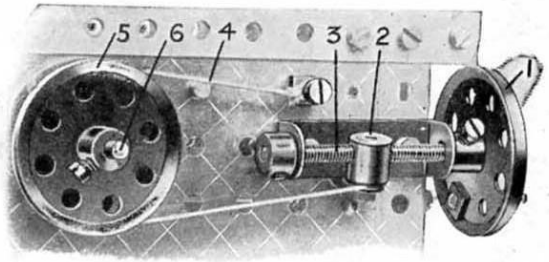
Here is a typical example of the many kinds of grab that can be constructed from Meccano. If the grab is fitted to a model crane or ship-coaler, all its movements can be controlled from an operating box built into the frame of the model. The outer sides of the jaws may be filled in with cardboard and the grab can then be used to pick up loads of sand, grain, marbles, etc.

BIG END FOR MECCANO CRANKSHAFT



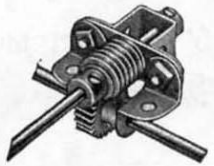
A Spring Clip is first clipped on to the centre of the cranked portion of the Crankshaft, and on each side of this is carried a Washer. On the outside of each of the Washers is placed a 1½" Strip, and these are connected together by means of a Coupling. A ½" Bolt passes completely through the two 1½" Strips at their centre holes and also through the inner transverse tapped hole of the Coupling. The outer tapped holes are fitted with Set-Screws, under the heads of which a Washer is placed.

STRAP AND SCREW BRAKE



The type of brake shown above is used to apply a constant retarding effect to a rotating shaft. It can thus be utilised in a crane to prevent the load from falling back when the winding spindle is released. An advantage of the brake is that the speed of the shaft to which it is applied can be varied as required ; the retarding action of the brake cannot vary once set unless the hand wheel is turned.

WORM AND PINION BEARING

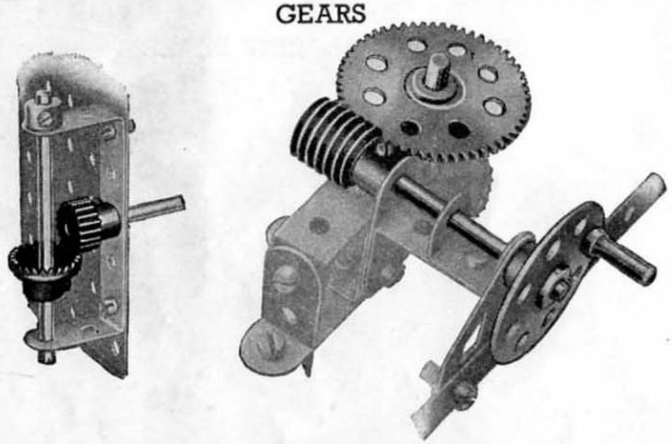


The compact rear axle drive unit illustrated above is intended chiefly for use in small models of motor cars. Two Corner Angle Brackets are secured by Bolts passing through their elongated holes to a 1½" Strip, to which a Double Bent Strip also is secured. The Rod carrying the Worm is passed through the centre hole of the Strips and held in position by a Collar.

The driven Rod is journalled in the Corner Angle Brackets and carries a Pinion that engages with the Worm.

A feature of this bearing that should not be overlooked is that the useful gear ratio of 25:1 is provided by employing a ¾" Pinion.

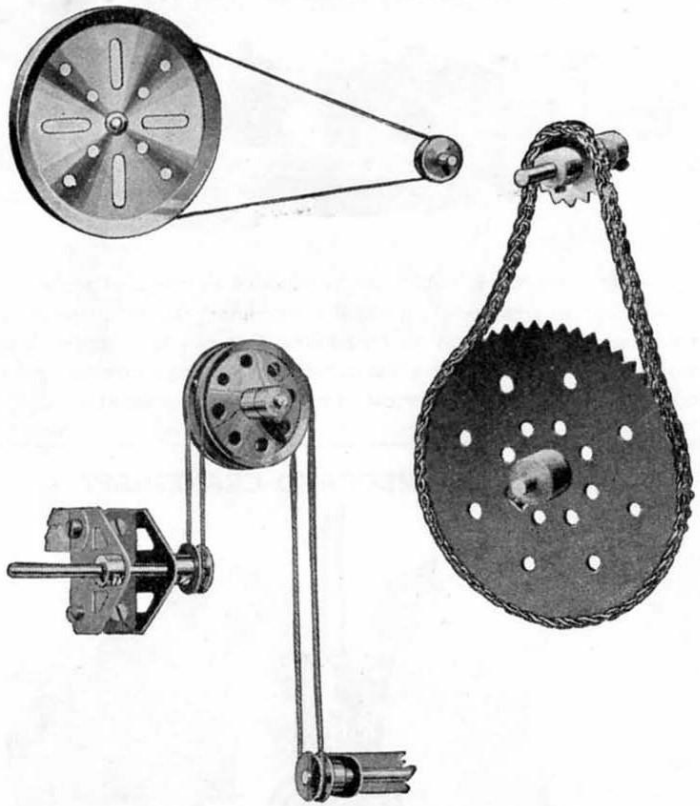
GEARS



The Meccano system includes a wide range of Gear Wheels, Bevel Gears, Pinion Wheels, Contrate Wheels and Worms in various sizes. All manner of interesting movements can be obtained by the use of these gears.

How a drive can be transmitted from a vertical to a horizontal shaft or vice versa, is shown on the left. On the right the Worm engaged with a Gear Wheel, gives a very great reduction in shaft speed.

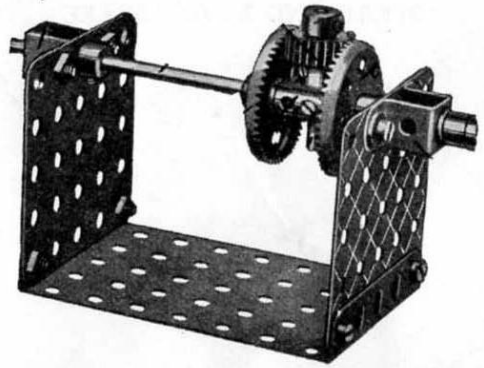
BELT AND CHAIN DRIVES



Above we show examples of belt and chain drive. The movements illustrated require no explanation excepting, perhaps, the lower belt drive, which shows a simple method for transmitting the drive from one shaft to another when the shafts are not in line.

Cords usually take the place of belts in Meccano models but miniature belting can be made from strips of canvas, indiarubber, etc., in which case Flanged Wheels should be used instead of grooved Pulleys.

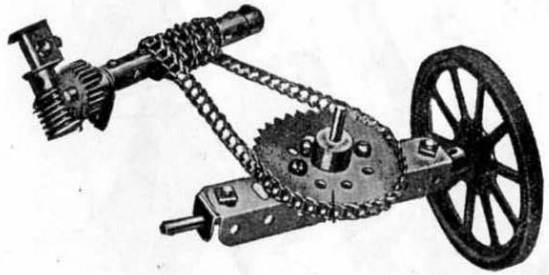
EPICYCLIC TRANSMISSION GEAR



Practically every type of mechanical power transmission gear can be reproduced with Meccano.

The device illustrated is designed to provide a gear ratio between two shafts mounted in direct line with one another. Its chief merit lies in the compactness of its construction and lack of external bearings.

STEERING GEARS



The various types of steering mechanism commonly in use on vehicles of all descriptions can readily be reproduced with Meccano.

In the example illustrated, the road wheels are controlled by an endless Sprocket Chain operated by a Worm and Pinion mechanism.

CONTENTS OF MECCANO OUTFITS

No.	Description	0	1	1a	2	2a	3	3a	4	4a	5	5a	6	6a	7	7a	8	8a	9	9a	10
1	Perforated Strips 12½"	—	—	—	—	2	2	2	4	6	10	2	12	—	12	2	14	—	14	10	24
1a	" " 9½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	6
1b	" " 7½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	4	6
2	" " 5½"	4	4	—	4	2	6	2	8	6	14	—	14	4	18	3	21	3	24	12	36
2a	" " 4½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	6	—	6	2	8
3	" " 3½"	—	—	—	—	—	—	2	2	—	2	2	4	2	6	—	6	—	6	12	18
4	" " 3"	—	—	—	—	—	—	—	—	—	—	2	2	—	2	4	6	2	8	4	12
5	" " 2½"	2	4	2	6	3	9	—	9	3	12	—	12	—	12	6	18	18	36	36	72
6	" " 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4	8	12
6a	" " 1½"	—	—	—	—	—	—	—	—	2	2	—	2	2	4	2	6	—	6	4	10
7	Angle Girders, 24½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8
7a	" " 18½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	4	6
8	" " 12½"	—	—	—	—	—	—	—	—	4	4	—	4	4	8	2	10	—	10	6	16
8a	" " 9½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	4	6
8b	" " 7½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
9	" " 5½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4	8	12
9a	" " 4½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8
9b	" " 3½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	6
9c	" " 3"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
9d	" " 2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	6	8
9e	" " 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
9f	" " 1½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
10	Flat Brackets	4	4	—	4	1	5	—	5	3	8	—	8	4	12	8	20	3	23	1	24
11	Double Brackets	—	—	—	—	2	2	—	2	2	4	—	4	—	4	1	5	3	8	4	12
12	Angle Brackets, ½"×½"	4	8	—	8	—	8	—	8	4	12	4	16	2	18	16	34	2	36	14	50
12a	" " 1"×1"	—	—	—	—	—	—	—	—	2	2	—	2	2	4	2	6	—	6	2	8
12b	" " 1"×½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	6	8
12c	Obtuse Angle Brackets, ½"×½"	—	—	—	—	—	—	4	4	—	4	2	6	—	6	2	8	—	8	4	12
13	Axle Rods, 11½"	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2	—	2	—	2
13a	" " 8"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	4
14	" " 6½"	—	—	—	—	—	—	—	—	—	—	1	1	—	1	2	3	—	3	1	4
15	" " 5½"	—	—	—	—	—	—	—	—	2	2	—	2	—	2	2	4	—	4	2	6
15a	" " 4½"	—	—	—	—	—	—	—	—	1	1	—	1	2	3	2	5	—	5	1	6
15b	" " 4"	—	—	—	—	2	2	—	2	—	2	—	2	—	2	—	2	—	2	—	2
16	" " 3½"	1	2	—	2	1	3	1	4	—	4	—	4	—	4	1	5	—	5	3	8
16a	" " 2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	3	3	6
16b	" " 3"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
17	" " 2"	1	2	—	2	—	2	—	2	—	2	—	2	—	2	3	5	—	5	4	8
18a	" " 1½"	—	—	—	—	1	1	1	2	2	4	—	4	—	4	—	4	—	4	2	6
18b	" " 1"	—	—	—	—	—	—	1	1	—	1	—	1	—	1	1	2	—	2	2	4
19b	Pulley Wheels, 3" with set screws	—	—	—	—	—	—	2	2	—	2	—	2	—	2	—	2	—	2	4	6
19g	Crank Handles, 3½" shaft with Erinoid grip	—	—	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	1	2
19h	" " 5" " " "	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1	—	1	1	1
19s	" " 3½" shaft without Erinoid grip	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20	Flanged Wheels, 1¼" diameter	—	—	—	—	—	—	—	—	—	—	—	—	—	2	4	4	—	4	—	4
20a	Pulley Wheels, 2" with set screws	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4	2	6	—	4
20b	Flanged Wheels, ¾" diameter	—	—	—	—	—	—	—	—	—	—	—	—	4	4	—	4	—	4	—	4
21	Pulley Wheels, 1½" with set screws	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2
22	" " 1" " "	2	4	—	4	—	4	1	5	—	5	—	5	—	5	—	5	—	5	3	8
22a	" " 1" without " "	—	—	—	—	1	1	—	1	2	2	—	2	—	2	2	4	—	4	2	6
23	" " ¾" " " "	—	—	—	—	—	—	—	—	—	1	—	1	—	1	2	3	—	3	1	4
23a	" " ¾" with " "	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1	—	1	1	2
24	Bush Wheels	1	1	—	1	—	1	—	1	—	1	—	1	—	1	1	2	—	2	2	4
25	Pinion Wheels, ¾" diam., ½" wide	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	3	4
25a	" " ¾" " ⅜" "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
26	" " ½" " ⅜" "	—	—	—	—	—	—	—	—	—	—	—	—	2	2	1	3	1	4	2	6
26a	" " ½" " ½" "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
26b	" " ½" " ⅜" "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
27	Gear Wheels, 50 teeth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
27a	" " 57 "	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2	—	2	2	4
27b	" " 133 " 3½" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
27c	" " 95 " 2½" "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
28	Contrate Wheels, 1½" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2
29	" " ¾" "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2	—	2
30	Bevel Gears, ¾", 26 teeth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
30a	" " ¾", 16 "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
30c	" " 1½", 48 "	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
31	Gear Wheels, 1", 38 teeth	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
32	Worms	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2	—	2	—	2
34	Spanners	1	2	—	2	—	2	—	2	—	2	—	2	—	2	—	2	—	2	—	2
34b	Box Spanners	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
35	Spring Clips	4	4	—	4	2	6	2	8	6	14	—	14	4	18	1	19	12	31	5	36
36	Screwdrivers	1	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1
36b	" (Special)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1
37a	Nuts	22	30	16	46	10	56	25	81	10	91	20	111	51	162	76	238	60	298	352	650
37b	Bolts, ⅜"	18	24	16	40	10	50	25	75	10	85	20	105	45	150	70	220	60	280	320	600
38	Washers	2	4	—	4	2	6	2	8	6	14	6	20	6	26	—	26	—	26	49	75
40	Hanks of Cords	—	1	—	1	—	1	—	1	—	1	1	2	1	3	—	3	3	6	—	6
41	Propeller Blades	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
43	Springs	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1	3	4
44	Cranks Bent Strips	—	—	—	—	1	1	—	1	—	1	—	1	—	1	—	1	—	1	1	2
45	Double Bent Strips	—	—	—	—	—	—	—	—	1	1	—	1	1	2	1	3	—	3	1	4
46	" Angle Strips, 2½"×1"	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2	2	4	—	4
47	" " " 2½"×1½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
47a	" " " 3"×1½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
48	" " " 1½"×½"	—	—	—	—	—	—	1	1	—	1	1	2	—	2	—	2	—	2	2	4
48a	" " " 2½"×½"	2	2	—	2	—	2	4	6	2	8	—	8	2	10	—	10	—	10	2	12
48b	" " " 3½"×½"	—	—	—	—	—	—	—	—	—	—	2	2	—	2	4	6	—	6	2	8
48c	" " " 4½"×½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4
48d	" " " 5½"×½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4	—	4
50a	Eye Pieces with Boss	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
51	Perforated Flanged Plates, 2½"×1½"	—	—	—	—	—	—	1	1	—	1	—	1	—	1	1	2	—	2	—	2
52	" " " 5½"×2½"	1	1	—	1	—	1	—	1	—	1	—	1	1	2	—	2	—	2	2	4
52a	" Flat Plates, 5½"×3½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	2	6
53	" Flanged Plates, 3½"×2½"	—	—	—	—	—	—	—	—	—	—	2	2	1	3	2	5	—	5	1	6
53a	" Flat Plates, 4½"×2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
54a	" Flanged Sector Plates, 4½"	—	—	—	—	—	—	2	2	—	2	—	2	—	2	—	2	—	2	—	2
55a	Perforated Strips, Slotted, 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
57b	Hooks, Loaded	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1
57c	" " (Small)	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	1	2
59	Collars with Set Screws	—	—	—	—	—	—	—	—	—	—	4	4	2	6	4	10	2	12	12	24
62	Cranks	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2	2	4
62a	" Threaded	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
62b	Double Arm Cranks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
63	Couplings	—	—	—	—	—	—	—	—	—	—	—	—	1	1	5	6	—	6	2	8
64	Threaded Bosses	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
65	Centre Forks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1
69c	Grub Screws, ⅝"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12	12
70	Perforated Flat Plates, 5½"×2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
72	" " " 2½"×2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
76	" Triangular Plates, 2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
77	" " " 1"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4
78	Screwed Rods, 11½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
80a	" " 3½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1
80c	" " 3"	—	—	—	—	—	—	—	—	2	2	—	2	—	2	—	2	—	2	—	2
81	" " 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
82	" " 1"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
89	Curved Strips, 5½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	8	12
89a	" " 3" Cranked	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	6
89b	" " 4"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	6	8
90	" " 2½"	—	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4	—	4	8	12
90a	Curved Strips, 2½" Cranked	2	2	—	2	2	4	—	4	—	4	—	4	—	4	—	4	—	4	4	8
94	Sprocket Chain, 40" lengths	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2

(*Continued on following page*)

No.	Description	0	1	1a	2	2a	3	3a	4	4a	5	5a	6	6a	7	7a	8	8a	9	9a	10
95	Sprocket Wheels, 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2
95a	" " 1½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
95b	" " 3"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
96	" " 1"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4
96a	" " ¾"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2
100	Braced Girders 5½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
102	Single Bent Strips	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	3	4
103	Flat Girders, 5½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
103a	" " 9½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
103b	" " 12½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
103c	" " 4½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
103d	" " 3½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
103e	" " 3"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
103f	" " 2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
103g	" " 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
103h	" " 1½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
103k	" " 7½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
108	Architraves	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4
109	Face Plates, 2½" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	2	4
110	Rack Strips, 3½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
111	Bolts, ¾"	—	—	—	—	—	—	—	—	—	—	2	2	—	2	1	3	—	3	15	18
111a	" ½"	—	—	—	—	—	—	—	—	2	2	—	2	—	2	4	6	—	6	12	18
111c	" ⅜"	½ 2	4	—	4	2	6	—	6	—	6	—	6	—	6	—	6	6	12	12	24
114	Hinges	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
115	Threaded Pins	—	—	—	—	—	—	—	—	1	1	—	1	1	2	—	2	—	2	2	4
116	Fork Pieces, Large	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1	1	2
116a	" " Small	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2
117	Steel Balls, ⅜" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	24	24	—	24
118	Hub Discs, 5½" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
120b	Commpression Springs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	3	4
124	Reversed Angle Brackets, 1"	—	1	—	1	1	2	—	2	2	4	—	4	—	4	—	—	2	2	2	4
125	" " " ½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	—	4	2	6
126	Trunnions	½ 2	2	—	2	—	2	—	2	—	2	—	2	—	2	2	4	—	4	4	8
126a	Flat Trunnions	½ 2	2	—	2	—	2	—	2	—	2	2	4	—	4	—	4	2	6	6	12
128	Boss Bell Cranks	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
129	Rack Segments, 3" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
130	Triple Throw Eccentrics	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
132	Flywheels, 2¾" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
133	Corner Brackets, 1½" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
133a	" 1"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
134	Crank Shafts, 1" stroke	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
136	Handrail Supports	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	2	4
136a	" Couplings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
137	Wheel Flanges	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	3	4
140	Universal Couplings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
142a	Motor Tyres, 2"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	2	6	—	6
142b	" " 3"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
143	Circular Girders, 5½" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
144	Dog Clutches	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
145	Circular Strips, 7½" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
146	" Plates, 6" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
146a	" " 4" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2
147a	Pawls	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
147b	Pivot Bolt with 2 Nuts	—	—	—	—	—	—	—	—	1	1	—	1	—	1	1	2	1	3	3	6
147c	Pawls without Boss	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2
154a	Corner Angle Brackets, ½" R.H.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
154b	" " " ½" L.H.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
155a	Rubber Rings, for 1" pulley	2	4	—	4	—	4	—	4	—	4	—	4	—	4	—	4	—	4	4	8
157	Fans, 2" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	—	1	1
160	Channel Bearings, 1½"×1"×½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2
161	Girder Brackets, 2"×1"×½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
162	Boiler with Ends, complete	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1	1	2
162a	Boiler Ends	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
162b	Boilers without Ends	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1
163	Sleeve Pieces	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2	—	2
164	Chimney Adaptors	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2	—	2	2	4
165	Swivel Bearings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2	—	2
166	End Bearings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	1	2
167b	Ring Frames for Rollers	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
168	Ball Bearings, 4" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
169	Digger Buckets	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
170	Eccentrics, ½" Throw	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2
171	Socket Couplings	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
175	Flexible Coupling Units	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
176	Anchoring Springs for Cord	—	—	1	1	—	1	—	1	—	1	—	1	—	1	—	1	—	1	3	4
179	Rod Socket	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
185	Steering Wheel, 1¾" diam.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1
186	Driving Bands, 2½" Light	—	—	1	1	—	1	—	1	—	1	—	1	2	3	—	3	—	3	—	3
186a	" " 6"	—	—	—	—	—	—	—	—	1	1	—	1	1	2	—	2	—	2	—	2
186b	" " 10"	—	—	—	—	—	—	—	—	—	—	1	1	1	2	—	2	—	2	—	2
186c	" " 10" Heavy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
186d	" " 15"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	1	2
186e	" " 20"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	2	—	2
187	Road Wheels	—	—	1	1	1	2	2	4	—	4	—	4	—	4	—	4	—	4	—	4
188	Flexible Plates, 2½"×1½"	—	—	2	2	—	2	—	2	2	4	—	4	2	6	2	8	2	10	2	12
189	" " 5½"×1½"	—	2	—	2	—	2	—	2	2	4	—	4	2	6	2	8	2	10	2	12
190	" " 2½"×2½"	—	—	2	2	—	2	2	4	—	4	2	6	2	8	2	10	4	14	2	16
190a	" " 3½"×2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
191	" " 4½"×2½"	—	—	1	1	1	2	—	2	—	2	—	2	—	2	4	6	—	6	10	16
192	" " 5½"×2½"	—	—	—	2	2	—	2	2	4	—	4	2	6	6	12	6	18	12	30
196	Strip Plates, 9½"×2½"	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4
197	" " 12½"×2½"	—	—	—	—	—	—	—	—	—	—	2	2	—	2	4	6	—	6	14	20
198	Hinged Flat Plates, 4½"×2½"	—	—	—	—	—	—	1	1	—	1	—	1	—	1	—	1	—	1	—	1
199	Curved Plates, U Section, 2½"×2½"×$\frac{9}{32}$" radius	—	—	1	1	1	2	—	2	—	2	—	2	—	2	—	2	—	2	10	12
200	Curved Plates, 2½"×2½"×1$\frac{11}{16}$" radius	—	—	2	2	—	2	—	2	—	2	—	2	—	2	6	8	—	8	4	12
212	Rod and Strip Connectors	—	—	—	—	1	1	—	1	—	1	1	2	—	2	—	2	—	2	2	4
213	Rod Connectors	—	—	—	—	1	1	—	1	—	1	1	2	—	2	—	2	—	2	—	2
214	Semi-Circular Plates, 2½"	—	—	—	—	2	2	—	2	—	2	—	2	—	2	—	2	2	4	—	4
215	Formed Slotted Strips, 3"	—	—	—	—	4	4	—	4	—	4	—	4	4	8	—	8	—	8	4	12
216	Cylinder, 2½"	—	—	—	—	—	—	—	—	—	1	—	1	—	1	1	2	—	2	—	2
217a	Discs, 1½"	—	—	—	—	2	2	—	2	2	4	—	4	—	4	—	4	—	4	—	4
217b	" ¾"	—	—	—	—	2	2	—	2	—	2	—	2	—	2	—	2	—	2	2	4
219	Wheel Discs	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4	4	2	6	—	6
A1083	Drifts	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1	—	1
P52	Aeroplane Collars	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
	Clockwork Motor No. 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	1	—	1
	Electric Motor No. E120, 20-volts	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1

Full instructions for building a fine range of models are included with each Outfit.

REAL ENGINEERING PARTS IN MINIATURE

Meccano parts, an illustrated list of which is given in the following pages, combine to form a complete miniature engineering system with which practically any movement known in mechanics can be correctly reproduced. New parts are always being introduced in order to keep Meccano model-building in line with the most modern engineering requirements. The greatest care is taken in the designing of these parts to ensure that they function exactly as their counterparts in actual engineering practice. Ask your dealer for the latest complete illustrated price list and ask him also to keep you advised of all new parts that are added to the system.

MECCANO PARTS

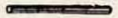
3 Perforated Strips

No.		No.	
1.	12½"	3.	3½"
1a.	9½"	4.	3"
1b.	7½"	5.	2½"
2.	5½"	6.	2"
2a.	4½"	6a.	1½"

9B Angle Girders

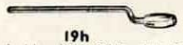
7.	24½"	9a.	4½"
7a.	18½"	9b.	3½"
8.	12½"	9c.	3"
8a.	9½"	9d.	2½"
8b.	7½"	9e.	2"
9.	5½"	9f.	1½"

10. Flat Brackets
11. Double Brackets
12. Angle Brackets, ½" × ½"
12a. " " 1" × 1"
12b. " " 1" × ½"
12c. Obtuse Angle Brackets, ½" × ½"



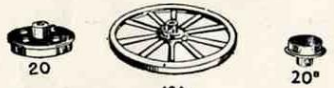
Axle Rods

13.	11½"	16	3½"
13a.	8"	16a.	2½"
14.	6½"	16b.	3"
15.	5"	17.	2"
15a.	4½"	18a.	1½"
15b.	4"	18b.	1"



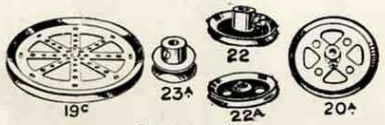
19h

19g. Crank Handles, 3½" with Erinoid grip
19h. " " 5" " "
19s. " " 3½" without "



20 19A 20B

19a. Wheels, 3" diam., with set-screws
20. Flanged Wheels, 1¼" diam.
20b. " " ¾" "



19C 23A 22 22A 20A

Pulley Wheels

19b. 3" diam. with centre boss & set-screw
19c. 6" " " " "
20a. 2" " " " "
21. 1½" " " " "
22. 1" " " " "
23a. ½" " " " and grub-screw
22a. 1" " without " " "
23. ½" " " " " "

24. Bush Wheels

26B

No.
25. Pinion Wheels, ½" diam., ¼" face
25a. " " " "
25b. " " " "
26. " " " "
26a. " " " "
26b. " " " "

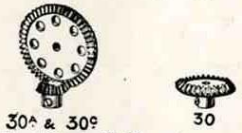
27 27A 27B

Gear Wheels

27. 50 teeth, to gear with ¾" pinion
27a. 57 " " " "
27b. 133 " " " " (3½" diam.)
27c. 95 " " " " (2½" diam.)

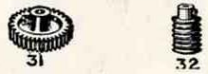
28 29

28. Contrate Wheels, 1½" diam.
29. " " ¾" "



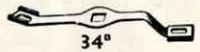
30A & 30C 30

30. Bevel Gears, ½", 26 teeth
30a. " " ½", 16 " } Can only be
30c. " " 1½", 48 " } used together



31 32

31. Gear Wheels, 1", 38 teeth
32. Worms



34B

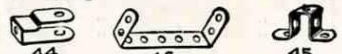
34. Spanners
34b. Box Spanners

35

35. Spring Clips ... ... box of 20
35s. " " ... ... box of 60
36. Screwdrivers
36a. " Extra Long
36b. " Special
37. Nuts and Bolts, 3/32" ... box of 12
37af. Nuts ... ... box of 50
37bf. Bolts, 3/8" ... box of 50
37f. Nuts and Bolts, 7/32" ... box of 50
37g. " " 3/32" ... box of 144
38d. Washers ... ... pkt. of 20
38s. " ... ... box of 60
40. Hanks of Cord

41. Propeller Blades

No.
43. Springs



44 46 45

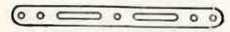
44. Cranked Bent Strips
45. Double " "
46. Double Angle Strips, 2½" × 1"
47. " " " 2½" × 1½"
47a. " " " 3" × 1½"
48. " " " 1½" × ½"
48a. " " " 2½" × ½"
48b. " " " 3½" × ½"
48c. " " " 4½" × ½"
48d. " " " 5½" × ½"

50a. Eye Pieces, with boss

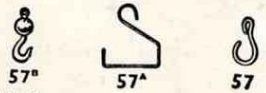
52 53

51. Flanged Plates, 2½" × 1½"
52. " " 5½" × 2½"
52a. Flat Plates, 5½" × 3½"
53. Flanged Plates, 3½" × 2½"
53a. Flat Plates, 4½" × 2½"

54a. Flanged Sector Plates, 4½" long

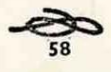


55. Perforated Strips, slotted, 5½" long
55a. " " " 2" long



57B 57A 57

57. Hooks
57a. " Scientific
57b. " Loaded, Large
57c. " Loaded, Small

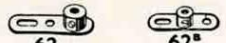


58 58B

58. Spring Cord, 40" Length
58a. Coupling Screws for Spring Cord
58b. Hooks for Spring Cord

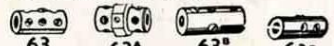
59. Collars, with grub-screws

61. Windmill Sails



62 62A

No.
62. Cranks
62a. Threaded Cranks
62b. Double Arm Cranks



63 63A 63B 63C

63. Couplings
63a. Octagonal Couplings
63b. Strip Couplings
63c. Threaded Couplings

64 65

64. Threaded Bosses
65. Centre Forks

66 & 67

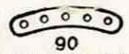
66. Weights, 50 grammes
67. " 25 "
68. Woodscrews, ½"
69. Set Screws
69a. Grub Screws, ¼"
69b. " " 3/32"
69c. " "

76 72 77

70. Flat Plates, 5½" × 2½"
72. " " 2½" × 2½"
73. " " 3" × 1½"
76. Triangular Plates, 2½"
77. " " 1"

80A Screwed Rods

78.	11½"	80b.	4½"
79.	8"	80c.	3"
79a.	6"	81.	2"
80.	5"	82.	1"
80a.	3½"		



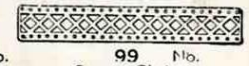
90

89. 5¼" Curved Strips, 10" radius
89a. 3" " " cranked, 1¾" radius 4 to circle
89b. 4" Curved Strips, cranked, 4½" radius, 8 to circle
90. 2½" Curved Strips, 2⅜" radius
90a. 2½" " " cranked, 1⅛" radius, 4 to circle

94

95B

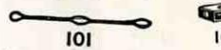
94. Sprocket Chain, per 40" length
95. " Wheels, 36 teeth, 2" diam.
95a. " " 28 " 1½" "
95b. " " 56 " 3" "
96. " " 18 " 1" "
96a. " " 14 " ¾" "



99

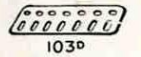
No. Braced Girders

97.	3½" long	99a.	9½" long
97a.	3" "	99b.	7½" "
98.	2½" "	100.	5½" "
99.	12½" "	100a.	4½" "



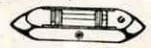
101 102

101. Healds, for looms
102. Single Bent Strips

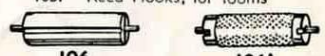


103D Flat Girders

103.	5½" long	103e.	3" long
103a.	9½" "	103f.	2½" "
103b.	12½" "	103g.	2" "
103c.	4½" "	103h.	1½" "
103d.	3½" "	103k.	7½" "

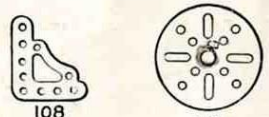


104. Shuttles, for looms
105. Reed Hooks, for looms



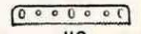
106 106A

106. Wood Rollers
106a. Sand Rollers
107. Tables for designing machines



108 109

108. Architraves
109. Face Plates, 2½" diam.

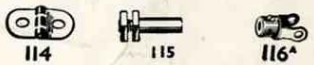


110

110. Rack Strips, 3½" long
110a. " " 6½" "
111. Bolts, ¾" | 111c. Bolts, ¾"
111a. " ½" | 111d. " 1⅛"

113

113 Girder Frames



114 115 116A

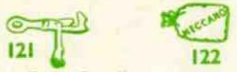
114. Hinges
115. Threaded Pins
116. Fork Pieces, Large
116a. " " Small
117. Steel Balls, ⅜" diam.

118. Hub Discs, 5½" diam.

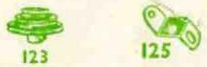
Ask your dealer for a copy of the latest Meccano Parts price list.

MECCANO PARTS

No.
120. Buffers 120a. Spring Buffers
120b. Compression Springs



121. Train Couplings
122. Miniature Loaded Sacks

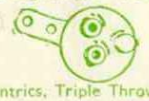


123. Cone Pulleys
124. Reversed Angle Brackets, 1"
125. " " " 1½"

126. Trunnions 126a. Flat Trunnions

127. Simple Bell Cranks
128. Boss Bell Cranks

129. Rack Segments, 3" diam.



130. Eccentrics, Triple Throw

131. Dredger Buckets
132. Flywheels, 2½" diam.

133. Corner Brackets, 1½"
133a. " " 1"

134. Crank Shafts, 1" stroke
135. Theodolite Protractors

136. Handrail Supports
136a. Handrail Couplings
137. Wheel Flanges

No.
138. Ships' Funnels
138a-z. " " Raked

139. Flanged Brackets (right)
139a. " " (left)

140. Universal Couplings
141. Wire Lines (for clock weights)

142. Rubber Rings (to fit 3" diam. rims)
142a. Motor Tyres (to fit 2" diam. rims)
142b. " " " 3" "
142c. " " " 1" "
142d. " " " 1½" "

143. Circular Girders, 5½" diam.

144. Dog Clutches

145. Circular Strips, 7½" diam. overall
146. " Plates, 6" "
146a. " " 4" "

147 & 148. Pawls, with Pivot Bolt and Nuts
147a. Pawls
147b. Pivot Bolts with 2 Nuts
147c. Pawls without boss
148. Ratchet Wheels

149. Collecting Shoes for Electric Locos

150. Crane Grabs

151

No.
151. Pulley Blocks, Single Sheave
152. " " Two "
153. " " Three "

154A & 154B

154a. Corner Angle Brackets, ½" (right-hand)
154b. Corner Angle Brackets, ½" (left-hand)
155. Rubber Rings (for 1" Pulleys) Black
155a. " " " White

156. Pointers (with boss), 2½" overall

157

158A

157. Fans, 2" diam.
158a. Signal Arms, Home
158b. " " Distant

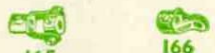
160

161

160. Channel Bearings, 1½"×1"×½"
161. Girder Bracket, 2"×1"×½"

163 162 164

162. Boilers, complete, with ends
162a. " Ends
162b " without ends
163. Sleeve Pieces
164. Chimney Adaptors

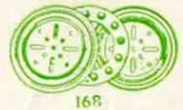


165 166

165. Swivel Bearings
166. End "

167a, b, c

167. Geared Roller Bearings
167a. Roller Races, geared, 192 teeth
167b. Ring Frames for Rollers
167c. Pinions for Roller Bearings (16 teeth)



168

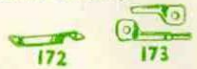
No.
168. Ball Bearings, 4" diam.
168a. " Races, flanged discs
168b. " " toothed "
168c. " Casings, complete with balls

169. Digger Buckets

170

171

170. Eccentrics, ½" throw
171. Socket Couplings



172 173

172. Pendulum Connections
173. Rail Adaptors

174. Grease Cups

175

175. Flexible Coupling Units

176. Anchoring Springs for Cord

177

179

180

181

182

177. Shafting Standards, Large
178. " Small
179. Rod Sockets
180. Toothed Gear Rings, 3½" diam.
181. Bobbins
182. Insulating Bushes
182a. Insulating Washers

183

183 Lamp Holders 184c 6-volt Lamps
184a. 2½-volt Lamps 184d. 10 " "
184b. 3½ " " 184e. 20 " "

185

187

No.
185. Steering Wheels, 1¾" diam.
186. Driving Bands, 2½" (Light)
186a. " " 6" "
186b. " " 10" "
186c. " " 10" (Heavy)
186d. " " 15" "
186e. " " 20" "
187. Road Wheels

192

197

Flexible Plates.
188. 2½"×1½"
189. 5½"×1½"
190. 2½"×2½"
190a. 3½"×2½"
191. 4½"×2½"
192. 5½"×2½"
Strip Plates.
196. 9½"×2½"
197. 12½"×2½"

200

198

199

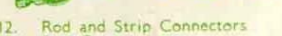
198. Hinged Flat Plates, 4½"×2½"
199. Curved Plates U-Section 2½"×2½"×½"
200. " " 2½"×2½" 1 11/16" radius

207A

206

201. Lamps with Flex (3½ volts)
202. Angle Brackets (for Headlamps)
203. Headlamps
203a. Headlamp Rims
203b. " Bodies
204. " Nuts
205. " Glasses
206. Lampshades
207. Lamp Bases
207a. Lamp with Standard and Flex
208. Battery Tags and Studs
208a. Washers for Battery Studs
210. Nuts for Battery Studs

211a. Helical Gear ½" } Can only be
211b. " " 1½" } used together



212 213

212. Rod and Strip Connectors
213. Rod Connectors

215 214

214. Semi-Circular Plates 2½"
215. Formed Slotted Strips 3"

216. Cylinders 2½"

217A

217B

217a. Discs 1¼" 217b. Discs ¾"
219. Wheel Discs

Printed in England