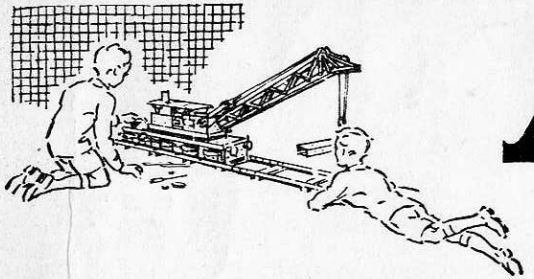
MECCANO

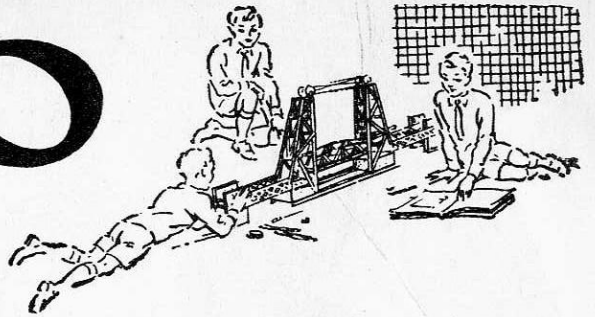
INSTRUCTIONS for OUTFIT No. 4

49.4



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, Aeroplanes, 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 Books of Instructions the fun is not over, it 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 11 different Outfits, ranging from No. O to No. 10. Each Outfit can be converted into the next larger by the purchase of an Accessory Outfit. Thus Meccano No. O Outfit can be converted into No. 1 Outfit by adding to it a No. Oa Accessory Outfit. No. 1a Outfit would then convert it into a No. 2 and so on. In this way, no matter with which Outfit you begin, you can build it up by degrees until you have 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.

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, Bridges, Cranes and Aeroplanes, and special sections dealing with the latest Engineering, Aviation, Motoring and Shipping News. Other pages deal with Stamp Collecting, and Books of interest to boys ; and a feature of outstanding popularity is the section devoted to short articles from readers.

If you are not already a reader write to the Editor for particulars. Supplies of the Magazine are very limited owing to the paper shortage.

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.

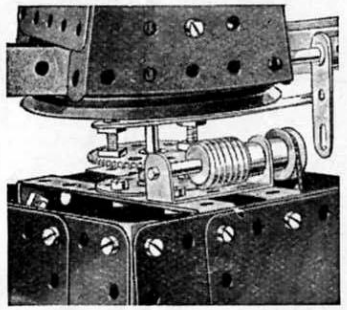
Clubs founded and established under the guidance of the Guild Secretary provide Meccano boys with opportunities of enjoying to the utmost the fun of model-building. Each has its Leader, Secretary, Treasurer and other officials. With the exception of the Leader, all the officials are boys, and as far as possible the proceedings of the clubs are conducted by boys.

MECCANO SERVICE

The service of Meccano does not end with selling an Outfit and a Book of Instructions. 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 hundreds of interesting letters from boys in all parts of the world, and each of these is answered personally by one of our staff of experienced experts.

Whatever your problem may be, write to us about it. Do not hesitate. We shall be delighted to help you in any way possible.

HOW TO BEGIN THE FUN



A Worm and a 57-teeth Gear give a useful drive ratio for many models.

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.

A FEW USEFUL HINTS

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 $5\frac{1}{2}'' \times 2\frac{1}{2}''$ 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.

Flexible Plates are sometimes used for forming curved surfaces in models, but they are not intended to be bent at right angles. With careful handling a Plate can be bent to the required curve and after use straightened again.

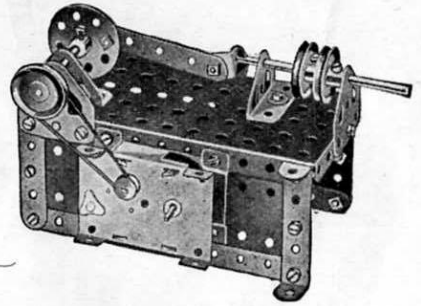
All Outfits from No. 2 upward include a Cord Anchoring Spring, Part No. 176. This part provides a neat and positive method of fastening a length of Cord to a Rod. When pushing the Spring on to a Rod or Crank Handle, turn left so that its coils tend to unwind ; turn it in the same direction when pulling it off the Rod.

THE IMPORTANCE OF "LOCK-NUTTING"

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 nut being held with a spanner. This method of using a second nut is known as **Lock-nutting.**

A Rod is usually mounted in a support or bearing, such as a hole in a strip, so that it is free to revolve. The Rod is then said to be **journalled** in the Strip.

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.

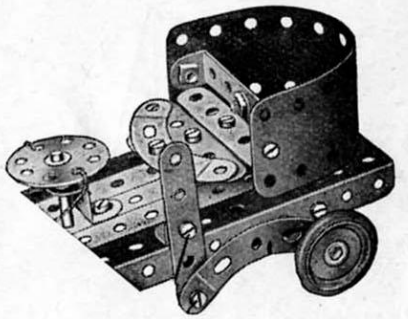


A Magic Motor fitted to drive a Steam Engine.

DRIVING YOUR MODELS

Models can be driven by means of either clockwork or electric motors.

Small and light models may be driven direct from the driving pulley of the motor or through a belt running over two pulleys of the same size, giving what is known as a 1 : 1 (one-to-one) ratio. For large models it is necessary to take the drive from a small pulley on the motor shaft to a larger pulley on the driving shaft of the model. In most cases a 1" Pulley on the motor shaft and a 3" Pulley on the model shaft will be found satisfactory. This provides a reduction ratio of approximately 3 : 1.



A Flexible Plate used to form a curved surface.

Rubber bands are very convenient for driving belts. Sometimes, however, a rubber band of the right length is not available, and then Meccano Cord or thin string is used. To tie the Cord to form an endless belt, use the familiar reef knot.

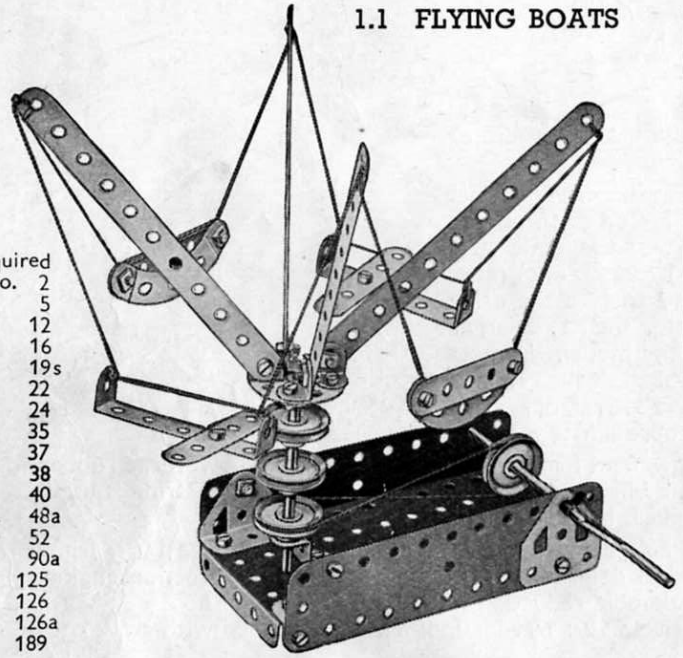
With the larger Outfits, belt drive can be replaced with advantage by gearing. To operate a slow-moving model demanding great power, such as a traction engine, gears that will provide a considerable reduction must be used. For example, a Worm meshed with a $\frac{1}{2}''$ Pinion will give a 19 : 1 reduction;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

All the models in this Book were built up and tested in our model-building department. Some of them are shown fitted with a motor, and provided that they are properly constructed the motor will drive them satisfactorily.

If the motor is to operate successfully however, there must be no excessive friction in the mechanism of the model. This can be caused by shafts and their bearings being slightly out of line, or by a belt or Cord drive being too tight. Before condemning the motor therefore, first make sure that every revolving shaft moves quite freely in its bearings, and that the bearings are in line with one another. The bearings can be brought into line by pushing through them a Drift (Part No. 36c) or a Rod, before the bolts holding the various parts are tightened up. To make the running perfectly smooth, apply a little light machine oil to every bearing or pivot on which moving parts are mounted.

The models included in this Book give a good idea of the various parts of Meccano construction, and provide a guide to the building of a large number of other models with this outfit. If any difficulty should arise in planning a new model, write to Meccano Limited, Binns Road, Liverpool 13, and every possible assistance will be given.

1.1 FLYING BOATS



Parts required

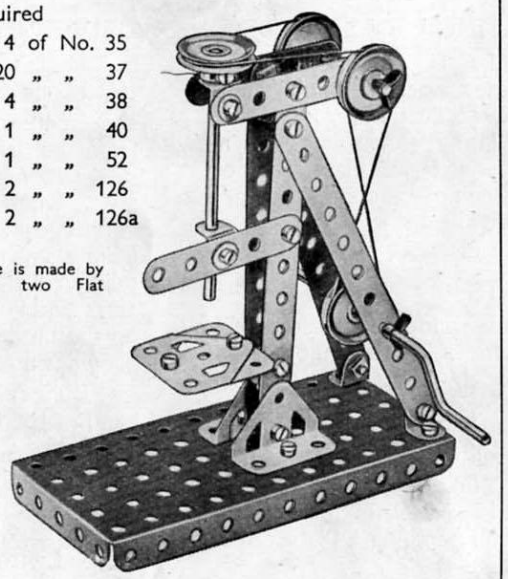
4	of No.	2
4	„ „	5
4	„ „	12
1	„ „	16
1	„ „	19s
4	„ „	22
1	„ „	24
3	„ „	35
24	„ „	37
1	„ „	38
1	„ „	40
2	„ „	48a
1	„ „	52
2	„ „	90a
1	„ „	125
2	„ „	126
2	„ „	126a
2	„ „	189

1.2 DRILL

Parts required

4	of No.	2	4	of No.	35
3	„ „	5	20	„ „	37
8	„ „	12	4	„ „	38
1	„ „	16	1	„ „	40
1	„ „	17	1	„ „	52
1	„ „	19s	2	„ „	126
4	„ „	22	2	„ „	126a

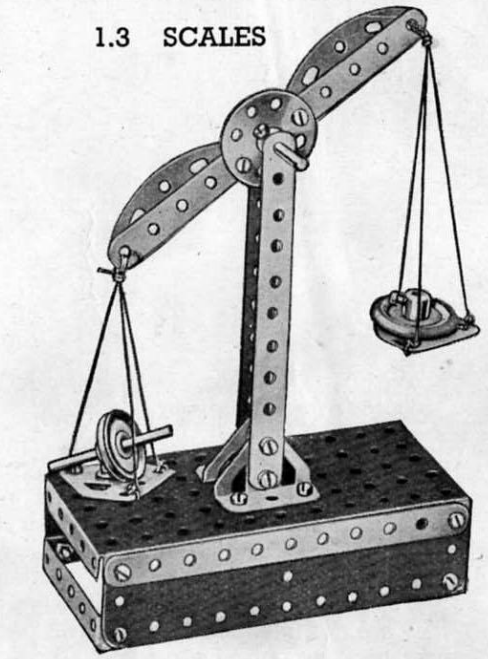
The drill table is made by bolting together two Flat Trunnions.



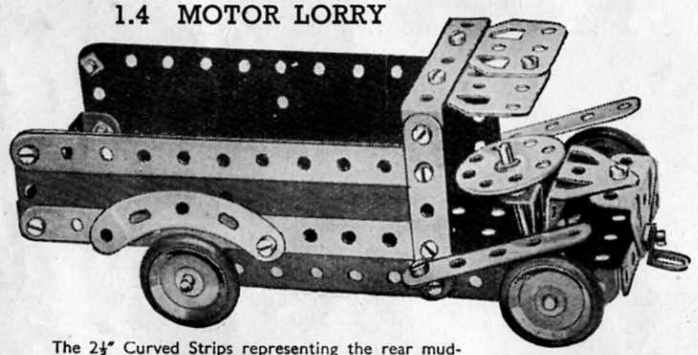
1.3 SCALES

Parts required

4	of No.	2
2	„ „	5
2	„ „	17
2	„ „	22
1	„ „	24
19	„ „	37
1	„ „	38
1	„ „	40
2	„ „	48a
1	„ „	52
2	„ „	90a
1	„ „	111c
2	„ „	126
2	„ „	126a
1	„ „	155
2	„ „	189



1.4 MOTOR LORRY

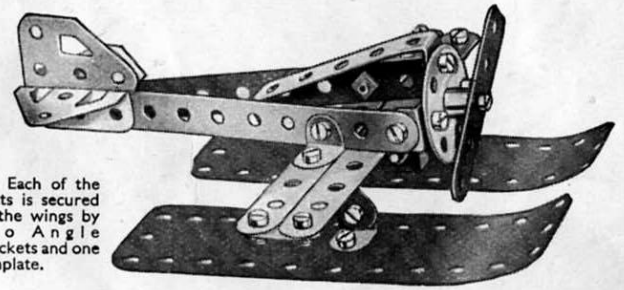


The 2½" Curved Strips representing the rear mudguards are each fastened to the sides by a ⅜" Bolt and nut, with a Spring Clip between the mudguards and the 5½" Strip to form a distance piece.

Parts required

4	of No.	2	1	of No.	17	19	of No.	37	2	of No.	90a	2	of No.	126a
4	„ „	5	4	„ „	22	4	„ „	37a	3	„ „	111c	4	„ „	155
3	„ „	12	1	„ „	24	2	„ „	48a	1	„ „	125	2	„ „	189
2	„ „	16	2	„ „	35	1	„ „	52	2	„ „	126			

1.5 RACING SEAPLANE



Each of the floats is secured to the wings by two Angle Brackets and one Fishplate.

Parts required

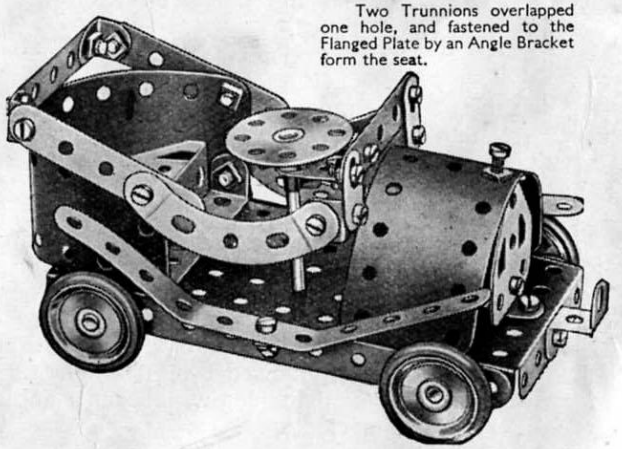
3	of No.	2	1	of No.	24	2	of No.	111c
3	„ „	5	19	„ „	37	2	„ „	126
4	„ „	10	1	„ „	37a	1	„ „	126a
8	„ „	12	1	„	48a	2	„ „	189

1.6 KIDDIE CAR

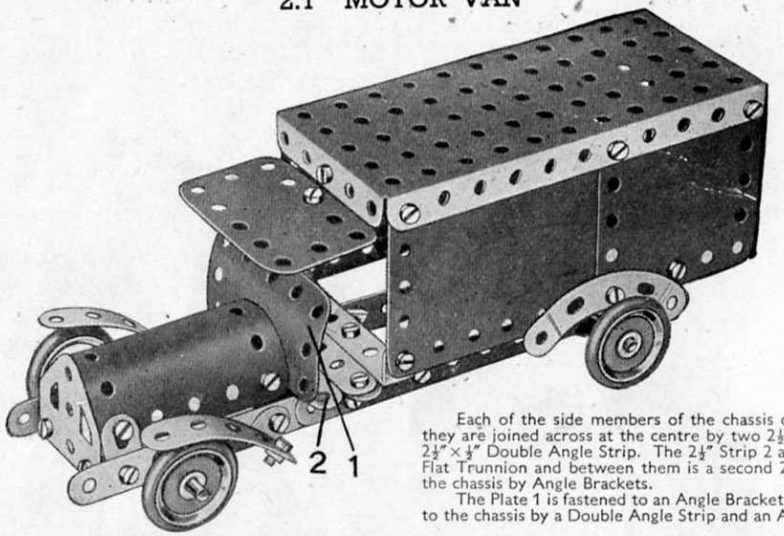
Parts required

4	of No.	2
4	„ „	5
3	„ „	10
7	„ „	12
2	„ „	16
1	„ „	17
4	„ „	22
1	„ „	24
1	„ „	35
24	„ „	37
3	„ „	37a
2	„ „	48a
1	„ „	52
2	„ „	90a
2	„ „	111c
1	„ „	125
2	„ „	126
1	„ „	126a
4	„ „	155
2	„ „	189

Two Trunnions overlapped one hole, and fastened to the Flanged Plate by an Angle Bracket form the seat.



2.1 MOTOR VAN



Parts required

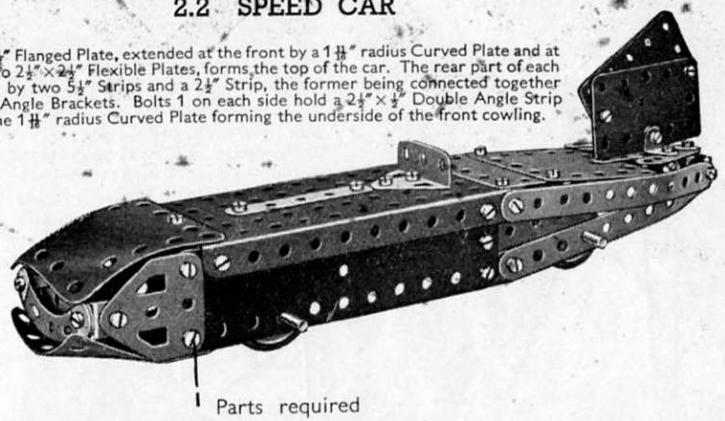
4 of No.	2	1 of No.	52
4 „ „	5	2 „ „	90a
4 „ „	10	1 „ „	126
8 „ „	12	2 „ „	126a
2 „ „	16	4 „ „	155
4 „ „	22	2 „ „	188
4 „ „	35	2 „ „	189
40 „ „	37	2 „ „	190
4 „ „	38	1 „ „	191
2 „ „	48a	1 „ „	199

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 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.

2.2 SPEED CAR

A 5½"×2½" Flanged Plate, extended at the front by a 1¾" 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 on each side hold a 2½"×½" Double Angle Strip that carries the 1¾" radius Curved Plate forming the underside of the front cowling.



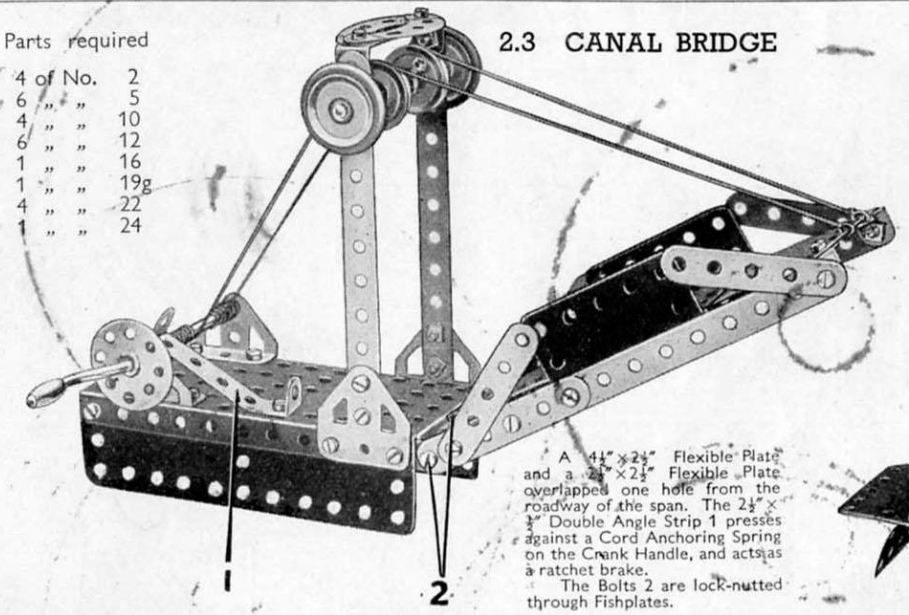
Parts required

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

2.3 CANAL BRIDGE

Parts required

4 of No.	2
6 „ „	5
4 „ „	10
6 „ „	12
1 „ „	16
1 „ „	19g
4 „ „	22
1 „ „	24



Parts required (continued)

39 of No.	37
2 „ „	37a
2 „ „	38
2 „ „	48a
1 „ „	52
2 „ „	90a
2 „ „	126
2 „ „	126a
2 „ „	155
1 „ „	176
2 „ „	188
2 „ „	189
2 „ „	190
1 „ „	191
1 „ „	199
1 „ „	200

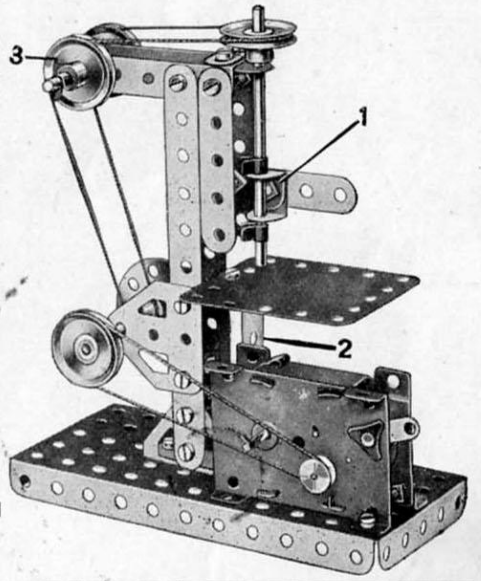
A 4½"×2½" Flexible Plate and a 2½"×2½" Flexible Plate overlapped one hole from the roadway of the span. The 2½"×½" Double Angle Strip 1 presses against a Cord Anchoring Spring on the Crank Handle, and acts as a ratchet brake.

The Bolts 2 are lock-nutted through Fishplates.

2.4 DRILLING MACHINE

The horizontal 2½" Strips at the top of the drill are joined together, and also to the vertical 2½" Strips, by means of Angle Brackets. The lower bearings 1 are two Angle Brackets bolted to a 2½" Strip, and the Rod forming the drill is journalled in these, and in a Fishplate at its upper end. A 2½"×2½" Flexible Plate is supported by a Double Angle Strip 2, and represents the table.

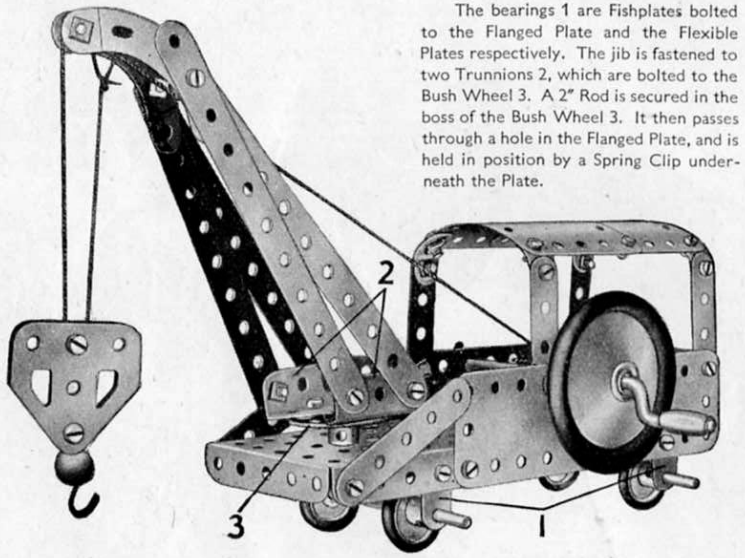
The drive is taken from the Motor to the 1" Pulley on the lower shaft. A second Driving Band passes round the ½in. fixed Pulley supplied with the Motor, which is also fixed on the lower shaft, round the two Pulleys at 3, and finally round the 1" Pulley fastened on the vertical drill shaft.



Parts required

2 of No.	2	1 of No.	24	1 of No.	111c
5 „ „	5	4 „ „	35	2 „ „	126
1 „ „	10	22 „ „	37	2 „ „	126a
5 „ „	12	2 „ „	37a	1 „ „	190
1 „ „	16	1 „ „	40	1 *Magic* Motor	
2 „ „	17	1 „ „	48a	(Not included in Outfit)	
4 „ „	22	1 „ „	52		

2.5 RAILWAY BREAKDOWN CRANE



The bearings 1 are Fishplates 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.

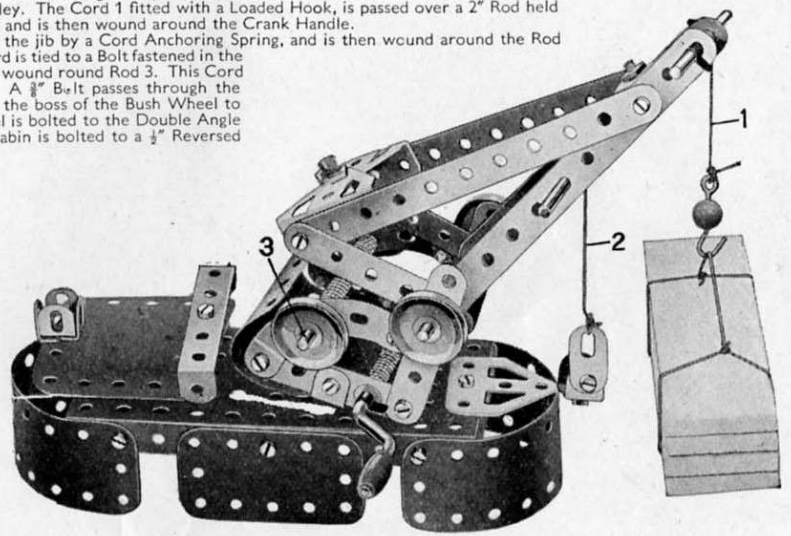
Parts required

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	„ „	155
1	„ „	176
1	„ „	187
1	„ „	188
2	„ „	189
1	„ „	190
2	„ „	200

2.6 FLOATING CRANE

The jib consists of 5½" Strips and 2½" Strips. At its upper end these are joined by Angle Brackets, and at its lower end by Trunnions. Each side of the lower part of the crane consists of 2½" Strips and a small radius Curved Strip, the two sides being connected by a 2½"×½" Double Angle Strip. 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.

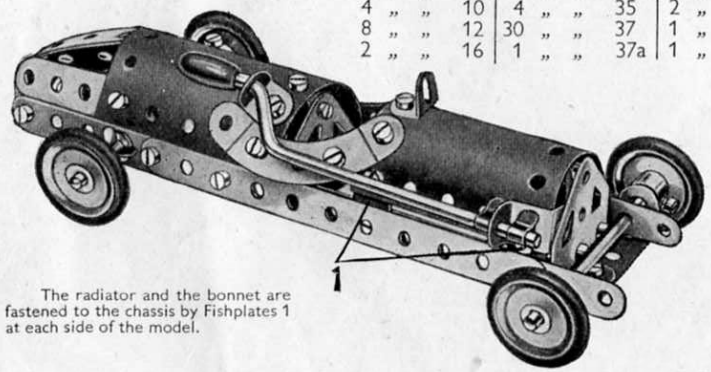
The Cord 2 passes over a Rod held in the jib by a Cord Anchoring Spring, and is then wound around the Rod that forms the pivot for the jib. A third Cord is tied to a Bolt fastened in the two Trunnions at the base of the jib, and is wound round Rod 3. This Cord controls the luffing motion of the crane. 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.



Parts required

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

2.7 RACING CAR



The radiator and the bonnet are fastened to the chassis by Fishplates 1 at each side of the model.

Parts required

4	of No.	2	1	of No.	19g	2	of No.	38	1	of No.	126a
5	„ „	5	4	„ „	22	1	„ „	48a	4	„ „	155
4	„ „	10	4	„ „	35	2	„ „	90a	1	„ „	199
8	„ „	12	30	„ „	37	1	„ „	125	1	„ „	200
2	„ „	16	1	„ „	37a	1	„ „	126			

2.8 BACON SLICER

Parts required

3	of No.	2
6	„ „	5
1	„ „	10
8	„ „	12
1	„ „	16
1	„ „	17
1	„ „	19g
4	„ „	22
1	„ „	24
2	„ „	35
36	„ „	37
4	„ „	37a
3	„ „	38
1	„ „	40
2	„ „	48a
1	„ „	52
2	„ „	90a
1	„ „	125
2	„ „	126a
1	„ „	187
2	„ „	188
2	„ „	189
2	„ „	190

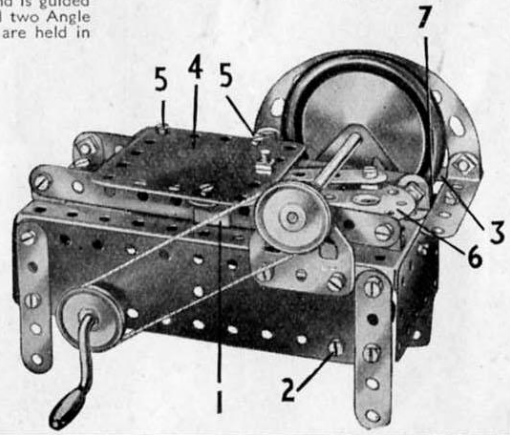
The base of the model consists of a Flanged Plate fitted with four 2½" Strips or legs. Two 5½"×1½" and two 2½"×1½" Flexible Plates are bolted to the flanges of the Plate.

The guides for the sliding carriage 4 are formed by two 5½" Strips attached to the Flanged Plate by Angle Brackets. The carriage consists of a 2½"×2½" Flexible Plate 4 and is guided along the Strips by the Reversed Angle Bracket 1 and two Angle Brackets on the opposite side. The Angle Brackets are held in place by Bolts 5.

The cutting blade is represented by a Road Wheel fixed on a 3½" Rod journalled in two Flat Trunnions. A Pulley on this Rod is connected by a belt of Cord to a second Pulley on the Crank Handle.

The carriage is moved backwards and forwards by a crank consisting of a Bush Wheel 6 fixed on a 2" Rod. This Rod is journalled in the Flanged Plate and in the centre hole of a Double Angle Strip fixed across the interior of the base by the Bolt 2 and another in a similar position on the opposite side. A 1" Pulley on the 2" Rod is connected by a crossed belt of Cord to a further 1" Pulley secured to the Crank Handle between the 5½" Flexible Plates.

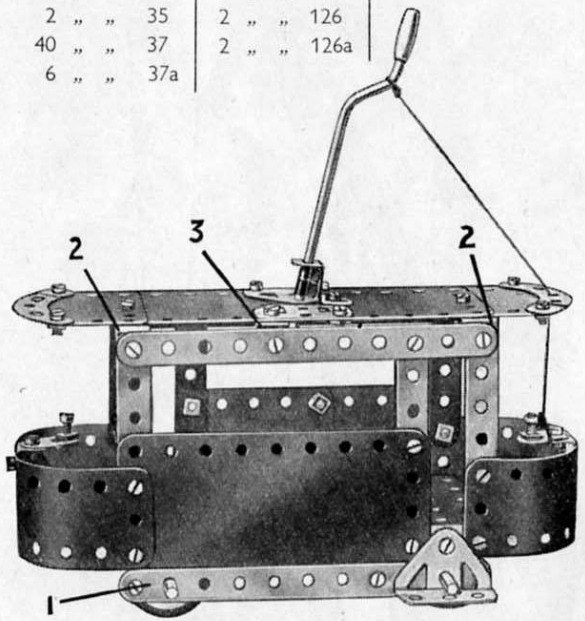
A guard for the rotating blade is provided by two Curved Strips attached to a 5½" Strip 3. This Strip is fastened at one end to the Flanged Plate by a 2½" Strip and a Fishplate 7, and at its other end it is attached to a 2½"×2½" Flexible Plate bolted horizontally to the Flanged Plate.



2.9 TRAMCAR

Parts required

4 of No.	2	4 of No.	38	4 of No.	155
6 „ „	5	1 „ „	40	2 „ „	188
2 „ „	10	2 „ „	48a	2 „ „	189
4 „ „	12	1 „ „	52	2 „ „	190
2 „ „	16	2 „ „	90a	1 „ „	191
1 „ „	19g	4 „ „	111c	2 „ „	200
4 „ „	22	1 „ „	125		
2 „ „	35	2 „ „	126		
40 „ „	37	2 „ „	126a		
6 „ „	37a				

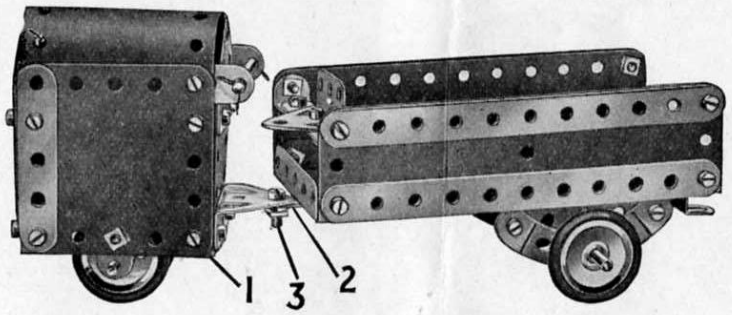


Two 5½" × 1½" Flexible Plates are curved and bolted across the ends of a Flanged Plate to form the driving compartments at each end, and a 4½" × 2½" Flexible Plate is used for one side of the model. This also is bolted to the Flanged Plate. The other side consists of two 1 11/16" radius Curved Plates, flattened and bolted in position. Both sides are strengthened by a 5½" Strip, one of which is seen at 1.

The roof is supported on each side by three 2½" Strips, connected at their upper ends by a 5½" Strip. The roof is in halves, each half consisting of a 2½" × 1½" and a 2½" × 2½" Flexible Plate. The halves are joined at the centre by two Flat Trunnions, and the roof is secured to the Double Angle Strips 2 and Angle Brackets 3 on each side. A Crank Handle is used to represent the trolley pole and it is held in the Flat Trunnions and a Reversed Angle Bracket by Spring Clips.

The wheels are 1" Pulleys fixed on 3½" Rods that run in holes in the sides of the model.

2.10 PETROL-ENGINED STATION TRACTOR



Parts required

4 of No.	2	1 „ „	52
6 „ „	5	2 „ „	90a
4 „ „	10	3 „ „	111c
8 „ „	12	1 „ „	125
1 „ „	16	2 „ „	126
2 „ „	17	2 „ „	126a
4 „ „	22	4 „ „	155
2 „ „	35	2 „ „	188
40 „ „	37	2 „ „	189
4 „ „	37a	2 „ „	190
4 „ „	38	1 „ „	191
2 „ „	48a		

Each side of the tractor unit consists of a 2½" × 2½" Flexible Plate bolted to a Double Angle Strip 1. A 4½" × 2½" Flexible Plate is curved and attached to each side to form the top. The front and rear of the unit are each fitted by a 2½" × 1½" Flexible Plate and a Flat Trunnion. The front axle is mounted in two Fishplates.

The load carrier is made by bolting 5½" × 1½" Flexible Plates to the sides of a Flanged Plate. The rear axle is carried in two Curved Strips, which are attached to 2½" Strips and secured to the Flanged Plate by Angle Brackets.

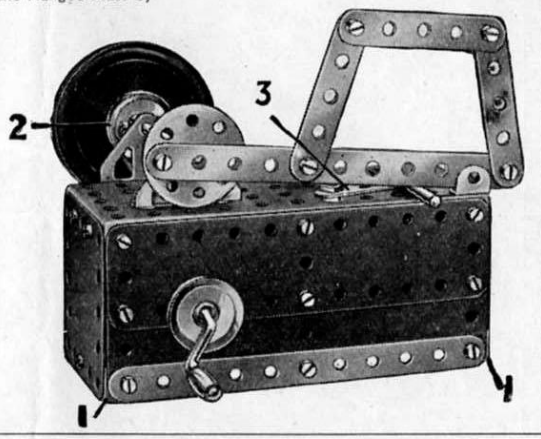
The tractor unit and the load carrier are connected by a Trunnion bolted to the tractor and a 2½" Strip 2 secured to the base of the load carrier. The ⅜" Bolt 3 is passed through holes in these parts and is fitted with lock-nuts.

2.11 MECHANICAL HACKSAW

The base consists of Flexible Plates bolted to a Flanged Plate. One side is formed by a 4½" × 2½" and a 2½" × 1½" Flexible Plate, and the other by two 5½" × 1½" Plates. A 2½" × 2½" Flexible Plate is bolted to each end. The base is strengthened at each end by Double Angle Strips 1 and a 5½" Strip on each side.

The saw is actuated by a crank formed from a Bush Wheel fixed to a 3½" Rod. The Rod rotates in a Trunnion and a Flat Trunnion. The Trunnion is raised from the Flanged Plate by two Washers. The Rod carries a 1" Pulley 2 and a Road Wheel. The Pulley 2 is connected by a belt of Cord to a similar Pulley fixed on the Crank Handle.

The material to be sawn is clamped to the base by means of two 2½" Strips, one of which is shown at 3.



Parts required

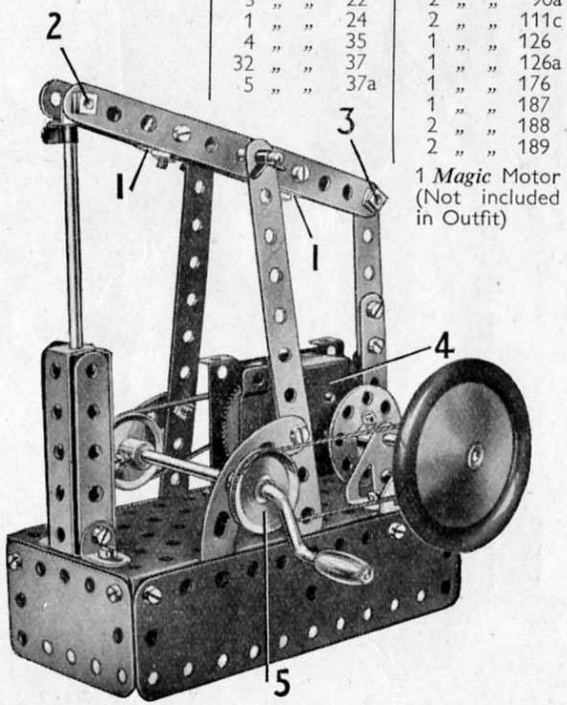
3 of No.	2	1 of No.	40
6 „ „	5	2 „ „	48a
2 „ „	12	1 „ „	52
2 „ „	16	4 „ „	111c
1 „ „	19g	1 „ „	126
3 „ „	22	1 „ „	126a
1 „ „	24	1 „ „	187
30 „ „	37	1 „ „	188
8 „ „	37a	2 „ „	189
4 „ „	38	2 „ „	190
1 of No. 191			

2.12 BEAM ENGINE

Parts required

4 of No.	2	1 of No.	16	3 of No.	38
4 „ „	5	2 „ „	17	1 „ „	40
7 „ „	12	1 „ „	19g	1 „ „	52
		3 „ „	22	2 „ „	90a
		1 „ „	24	2 „ „	111c
		4 „ „	35	1 „ „	126
		32 „ „	37	1 „ „	126a
		5 „ „	37a	1 „ „	176
				1 „ „	187
				2 „ „	188
				2 „ „	189

1 *Magic* Motor (Not included in Outfit)



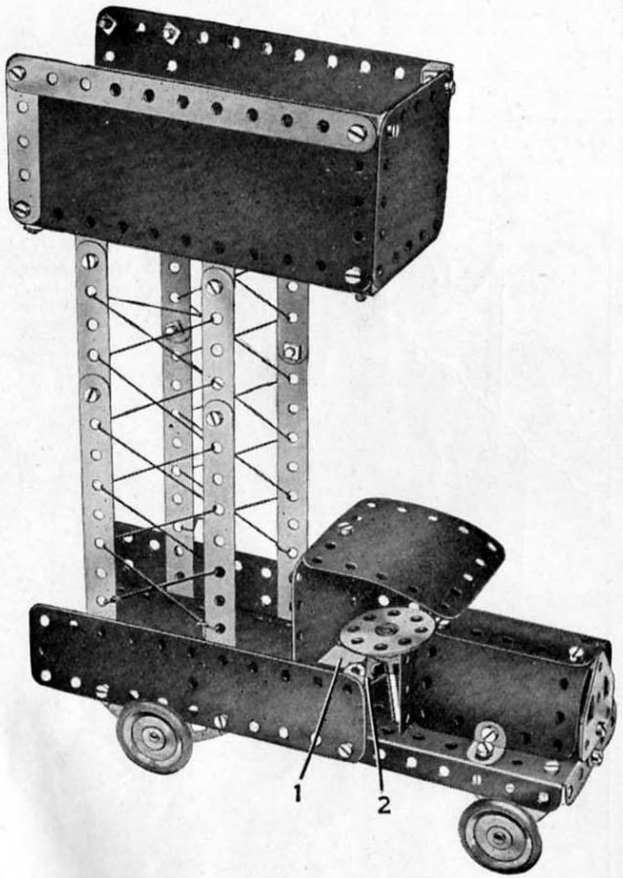
The engine bed or base consists of two 5½" × 1½" and two 2½" × 1½" Flexible Plates bolted to the sides of a Flanged Plate. Two 5½" Strips form the supports for the beam, which pivots on a 2" Rod held in position by Spring Clips.

The beam is made from two 5½" Strips held together by four Angle Brackets 1, which are bolted in pairs to form two U-shaped pieces.

The cylinder consists of two 2½" × ½" Double Angle Strips and two 2½" Strips. The piston rod is a 3½" Rod attached to the beam by an Angle Bracket, the Bolt 2 that holds the Bracket being lock-nutted. The Rod is held in the Angle Bracket by Spring Clips. The connecting rod is pivoted on a bolt lock-nutted to a Bush Wheel held on a 2" Rod journalled in a Trunnion and a Flat Trunnion. This Rod also carries a 1" Pulley and a Road Wheel. At its upper end the connecting rod is attached to the beam by the lock-nutted bolt 3.

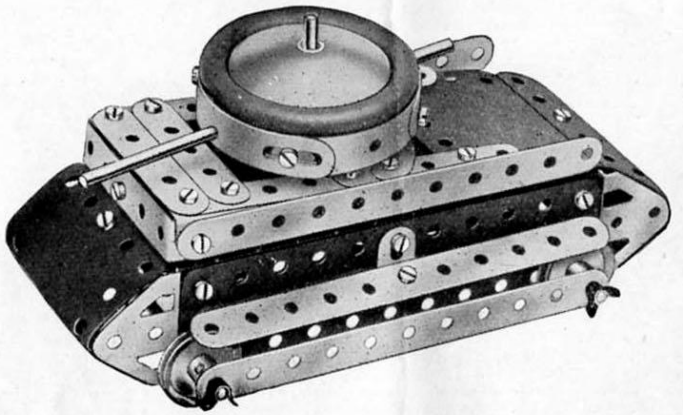
The *Magic* Motor 4 is bolted to the base by its flanges, and its pulley is connected by a Driving Band to a 1" Pulley on the Crank Handle. A further 1" Pulley 5 on the Crank Handle is connected by a belt of Cord to the Pulley on the 2" Rod.

3.1 TOWER WAGON



A Stepped 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.

3.2 TANK



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. 3.2a. 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.

Note : The Motor used in this model is not included in the Outfit.

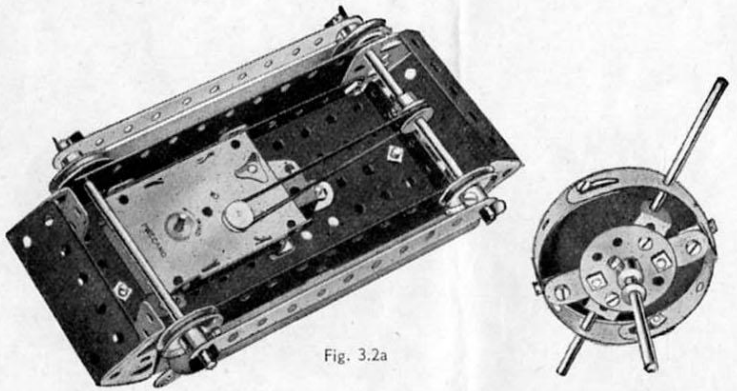


Fig. 3.2a

3.3 PORTABLE GARAGE CRANE

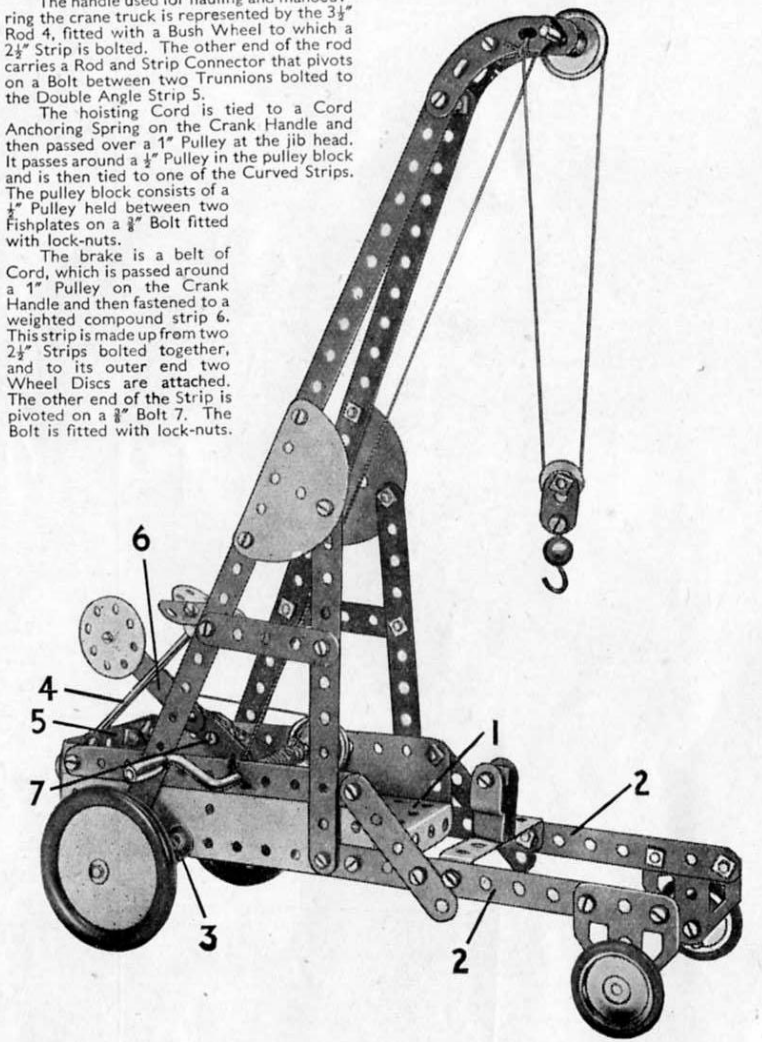
A Flanged Plate 1 is extended on each side by 5½" Strips 2. The Road Wheels are locked on a 3½" Rod supported in 2½" Curved Strips 3 on each side of the model. The 1" Pulleys rotate on ⅜" Bolts passed through Flat Trunnions.

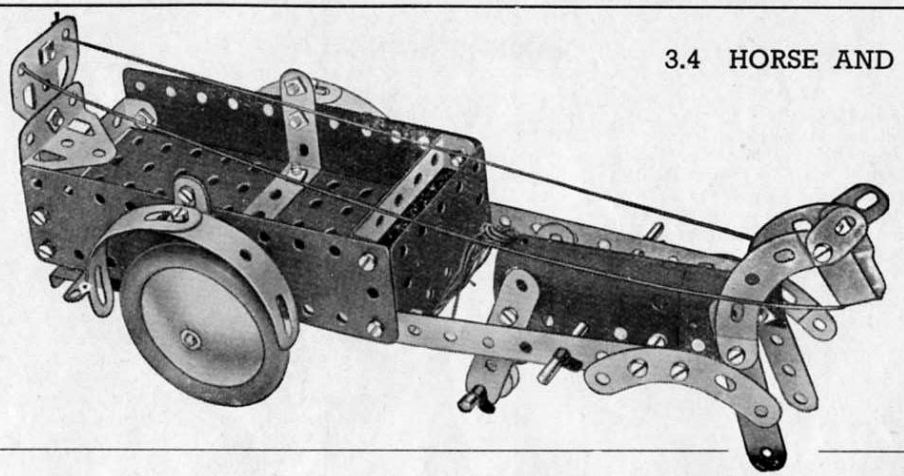
The jib is built up from two 12½" Strips bolted to the sides of the Flanged Plate and extended at their upper ends by Curved Strips. It is held rigid by 5½" Strips fixed to the Flanged Plate and also to Semi-Circular Plates fastened to the 12½" Strips.

The handle used for hauling and manoeuvring the crane truck is represented by the 3½" Rod 4, fitted with a Bush Wheel to which a 2½" Strip is bolted. The other end of the rod carries a Rod and Strip Connector that pivots on a Bolt between two Trunnions bolted to the Double Angle Strip 5.

The hoisting Cord is tied to a Cord Anchoring Spring on the Crank Handle and then passed over a 1" Pulley at the jib head. It passes around a ½" Pulley in the pulley block and is then tied to one of the Curved Strips. The pulley block consists of a ½" Pulley held between two Fishplates on a ⅜" Bolt fitted with lock-nuts.

The brake is a belt of Cord, which is passed around a 1" Pulley on the Crank Handle and then fastened to a weighted compound strip 6. This strip is made up from two 2½" Strips bolted together, and to its outer end two Wheel Discs are attached. The other end of the Strip is pivoted on a ⅜" Bolt 7. The Bolt is fitted with lock-nuts.





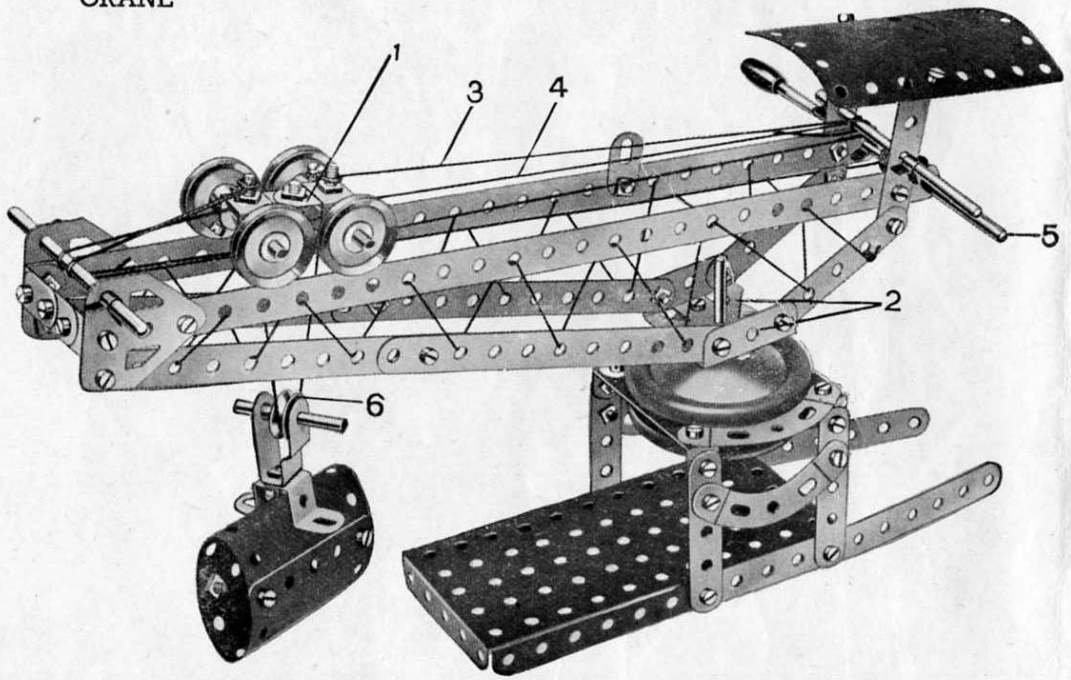
3.4 HORSE AND CART

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.

Note : The Motor used in this model is not included in the Outfit.

3.5 BLOCK-SETTING CRANE

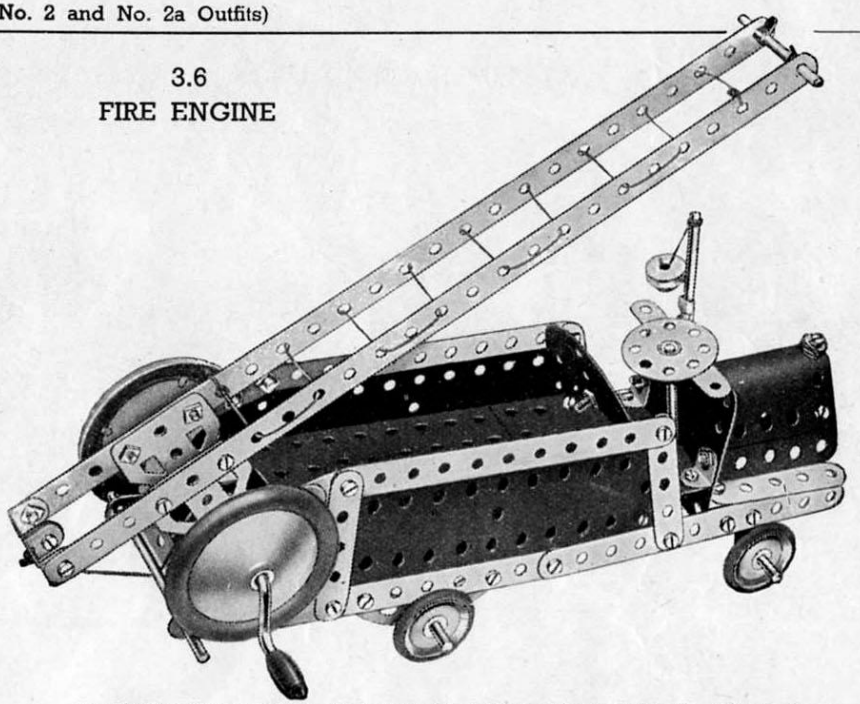
The travelling bogie 1 consists of two Fishplates bolted together by their elongated holes, and at each end of it Double Brackets are fastened by ⅜" Bolts. Two 2" Rods are pushed through the Double Brackets and carry 1" fast Pulleys spaced so that their grooves fit on the two 12½" Strips that form the 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 Trunnions 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 Stepped Bent Strip by a Cord Anchoring Spring.

3.6 FIRE ENGINE



Two Flat Trunnions are bolted to the bottom of the ladder, and the shaft of the Crank Handle shown in Fig. 3.6a 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 sides of the bonnet.

The 3½" Rod representing the steering column passes through the free hole of a Fishplate 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.

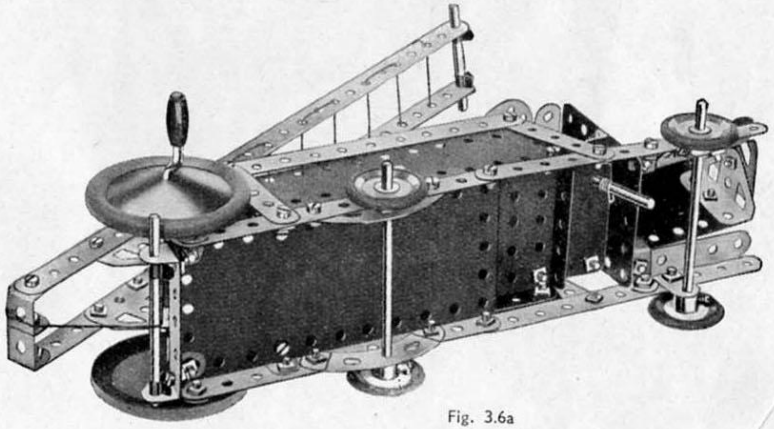
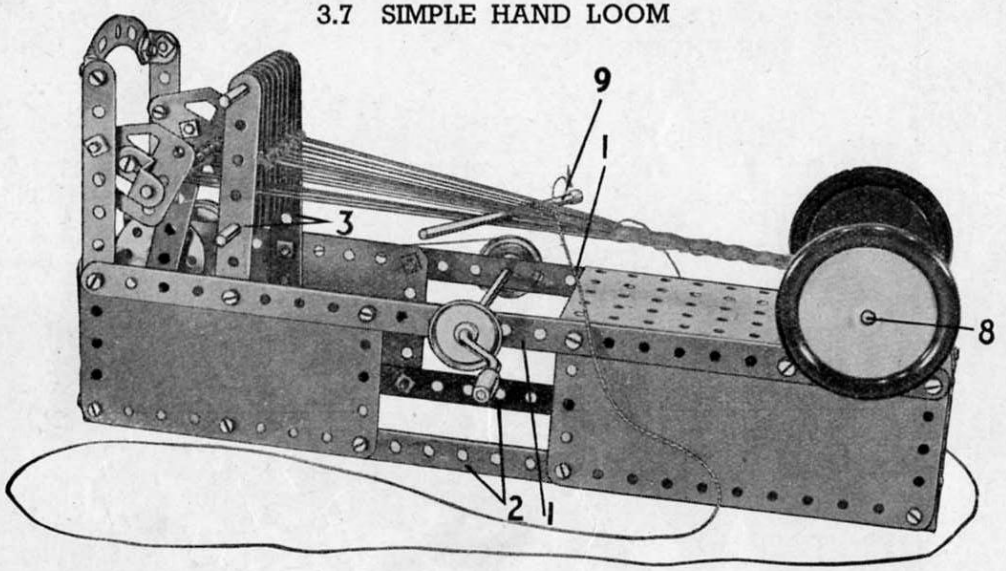


Fig. 3.6a

3.7 SIMPLE HAND LOOM



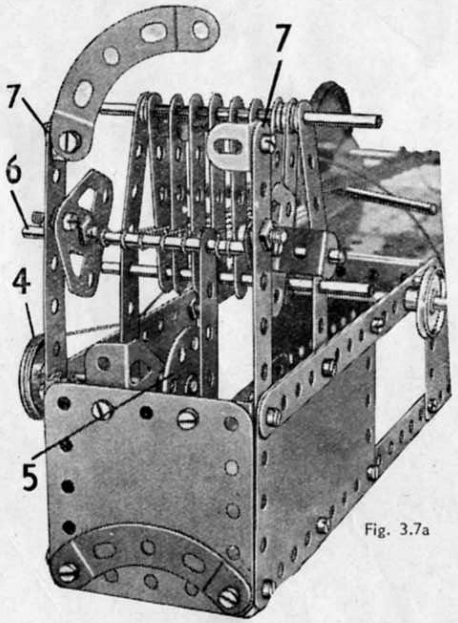


Fig. 3.7a

This interesting model is designed to demonstrate the principles of hand weaving. The base is formed by two 12½" Strips 1 bolted to a Flanged Plate at one end and joined by a 2½"×½" Double Angle Strip at the other. Two 5½"×2½" and two 4½"×2½" Flexible Plates are bolted to the Strips and joined at their lower edges by the 5½" Strips 2.

The 5½" Strips 3 form a support for the heald frame, which consists of eight 2½" Strips held by two 3½" rods. The Strips are separated by Spring Clips and Washers as shown, these parts being placed between the Strips on the upper Rod.

The warp separating movement is operated from a Crank Handle. A 1" Pulley on this is connected by a belt of Cord to a similar Pulley 4, which is locked on a 2" Rod that carries also the Bush Wheel 5. A 2½" Strip lock-nutted to the Bush Wheel links it with the Rod 6. This Rod is mounted in two Flat Trunnions, each fitted with a Reversed Angle Bracket. The Trunnions are free to turn on the shanks of ⅜" Bolts fastened in the Strips 7.

A 4" Rod 8 fitted with two Road Wheels passes through two Semi-Circular Plates bolted to the sides of the Flanged Plates.

A length of Cord taken from each of the 2½" Strips forming the healds is tied to the Rod 8. A second set of similar Cords is taken from the Rod 8. Each of these Cords passes between the healds and is fastened to Rod 6.

To operate the model the two sets of warp threads are separated by turning the Crank Handle slightly. A length of Cord is then passed between the layers by means of the 3½" Rod 9. The Crank Handle is then again turned slightly, thus changing the positions of the warp layers, and the Rod 9 is again passed through.

Cord is used in the illustrations to show the positions of the threads more clearly, but in actual operation it is better to use wool as this will give a closer and finer texture to the woven material.

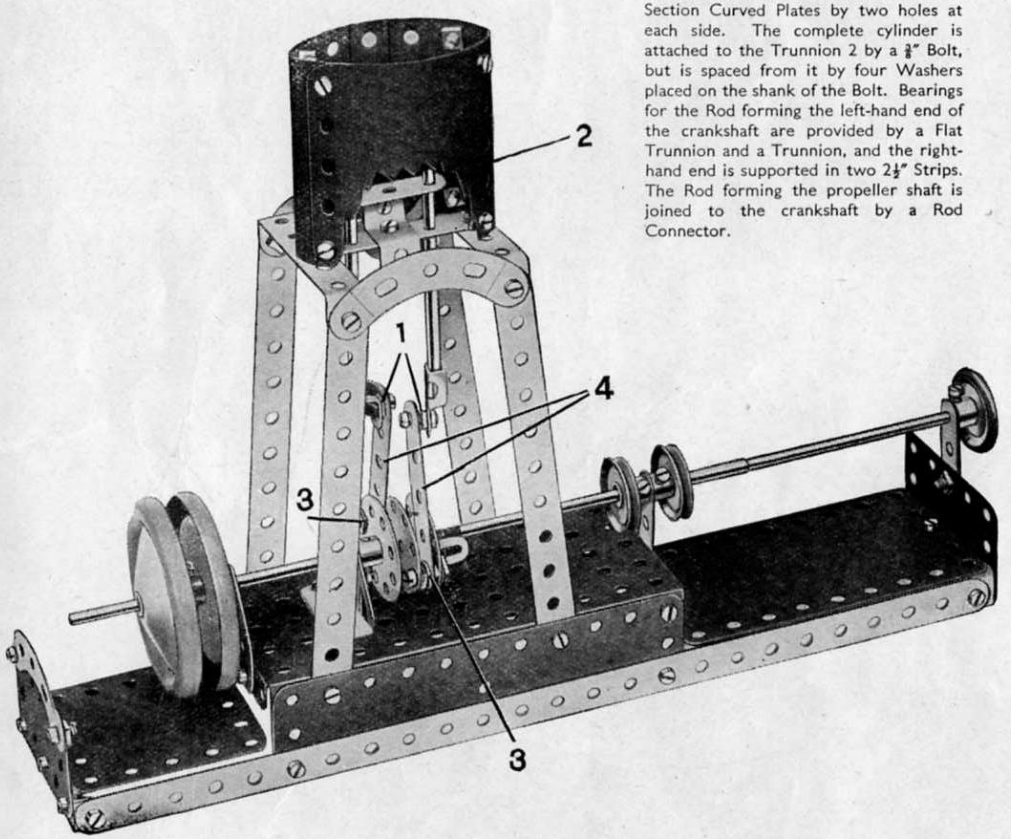
3.8 MARINE ENGINE

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 piston rod is held by two Spring Clips, one at each side of the Angle Bracket pivotally fastened by one of 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.

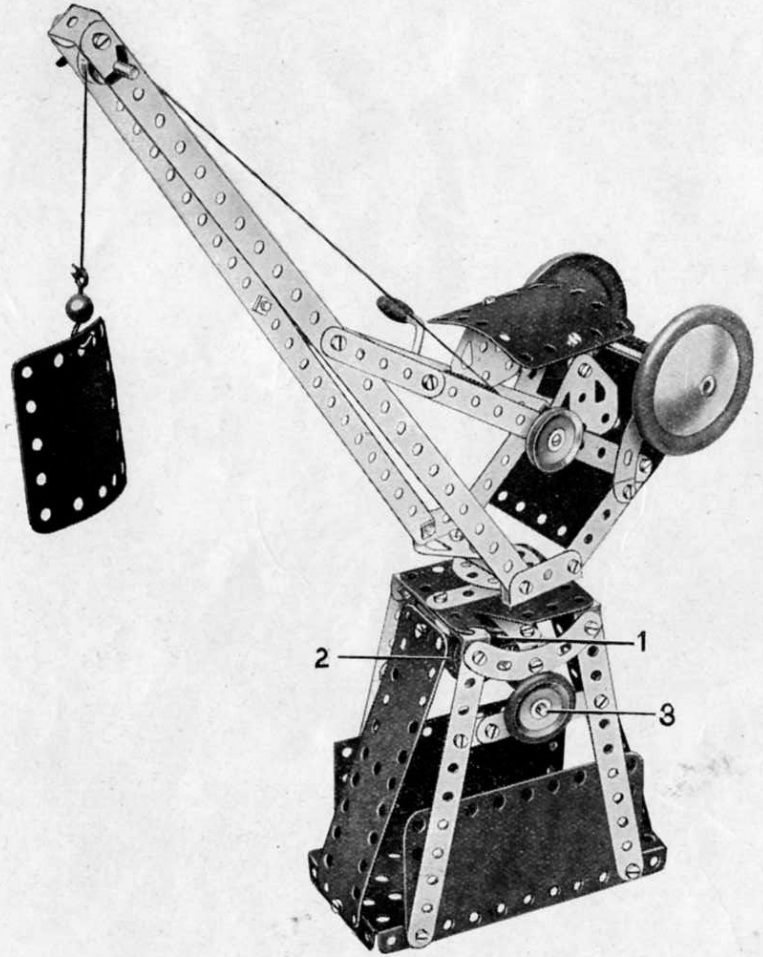
The Rod carrying two 1" Pulleys passes through the centre hole in the outer Wheel Disc. A ½"×½" Angle Bracket is bolted to the Disc in such a position that when the Disc is turned the Angle Bracket engages with a Spring Clip on the Rod. It is important that all nuts and bolts are made quite secure with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

The cylinder consists of two U-Section Curved Plates, and two 1 11/16" 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 the right-hand end is supported in two 2½" Strips. The Rod forming the propeller shaft is joined to the crankshaft by a Rod Connector.

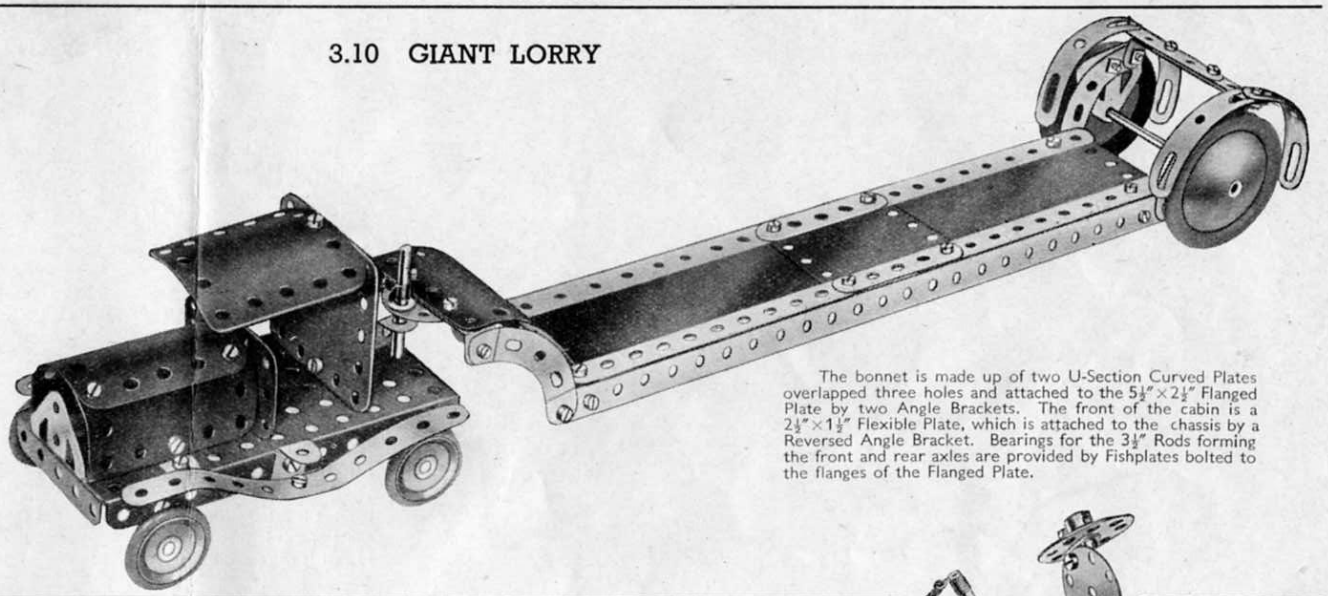


3.9 SWIVELLING JIB CRANE

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 2, which is fastened on Rod 3. When the Rod 3 is rotated the jib is caused to swivel. Supports for Rod 3 are formed by Fishplates, 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.



3.10 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 Fishplates bolted to the flanges of the Flanged Plate.

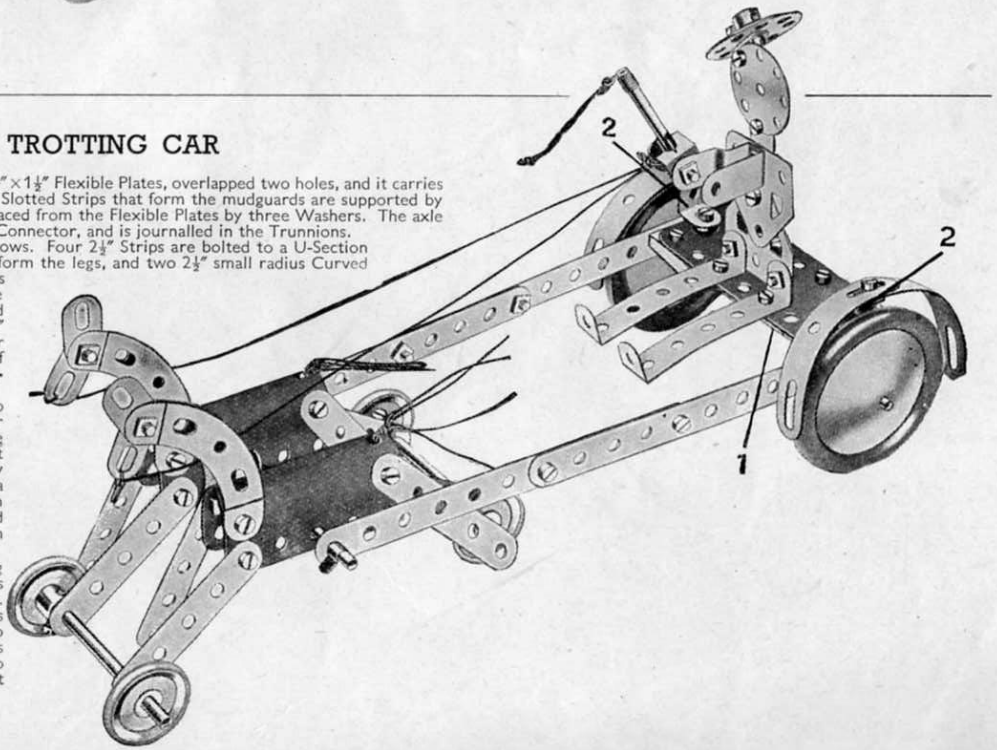
3.11 TROTTING CAR

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 Plates by three Washers. The axle consists of two 2" Rods joined by a Rod Connector, and is journalled in the Trunnions.

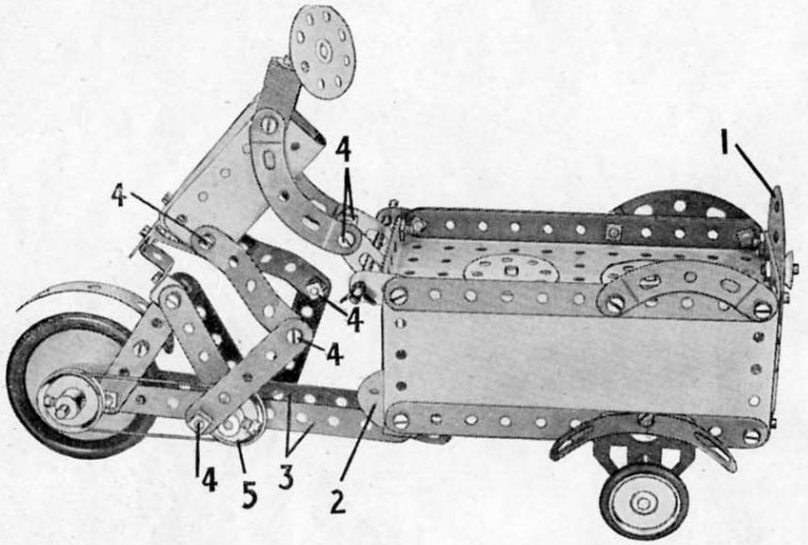
Each of the horses is built up as follows. Four 2½" Strips are bolted to a U-Section Curved Plate in the positions shown to form the legs, and two 2½" small radius Curved Strips represent the neck. A rod is pushed through the centre holes of the U-Section Curved Plates and is supported in the end holes 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 hindlegs of the horses, as shown.

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

The whip is a 1½" 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 Fishplates 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 Plares represent the horses' tails.



3.12 ICE CREAM VENDOR AND VAN



The carrier box of the tricycle is made by bolting two 5½" × 2½" and two 2½" × 2½" Flexible Plates to a Flanged Plate. The wheels are made fast to a 3½" Rod that rotates in Flat Trunnions. A Semi-Circular Plate 1 is attached to the front of the carrier, and a similar part 2 is bolted to a Double Angle Strip that spans the sides of the carrier.

The 5½" Strips 3 are secured to a Double Bracket pivotally attached to the Semi-Circular Plate 2. The supports for the saddle consist of four 2½" Strips, and a Trunnion is attached to these by a Reversed Angle Bracket and an Angle Bracket.

The body of the rider is formed by two U-Section Curved Plates, and is attached to the Trunnion by an Angle Bracket. His legs are made from four 2½" Strips. It is important to note that all the Bolts numbered 4 are lock-nutted so that the parts they hold are free to pivot.

The rear wheel is fixed on a 2" Rod fitted with a 1" Pulley. This Pulley is connected by a belt of Cord to a second Pulley 5 on a 1½" Rod. An Angle Bracket is bolted to the boss of Pulley 5 and attached to one of the rider's legs, see Fig. 3.12a The other leg is attached to a Reversed Angle Bracket. The slotted hole of the Bracket is fitted with a nut and bolt, and is then pushed on to the 1½" Rod. The effect of this is that the nut presses against the Rod and locks the Bracket firmly so that it rotates with the Rod.

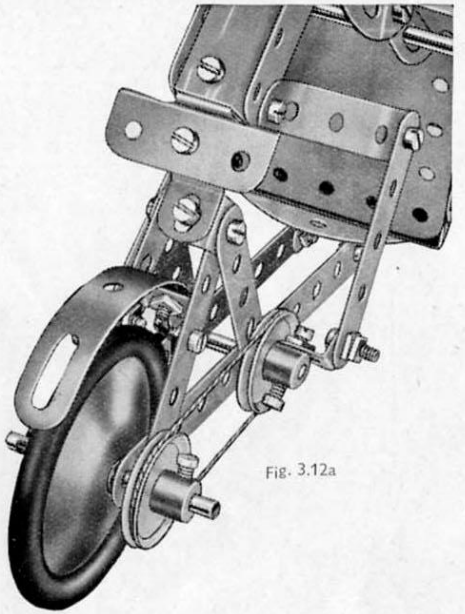
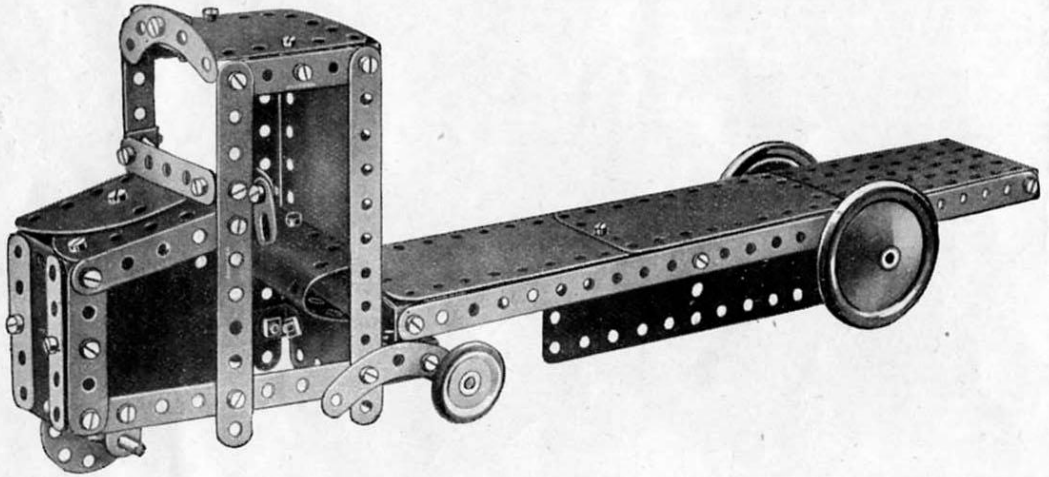


Fig. 3.12a

3.13 MECHANICAL HORSE AND TRAILER



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 fo the 5½" Strips are joined by a Curved Strip and two Double Brackets. At the centre of the Curved Strip is bolted a Wheel 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 Wheel Disc. Bearings for the rear axle are provided by Flat Trunnions.

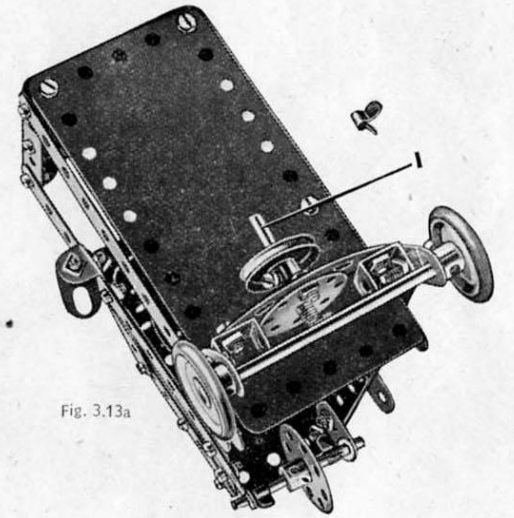
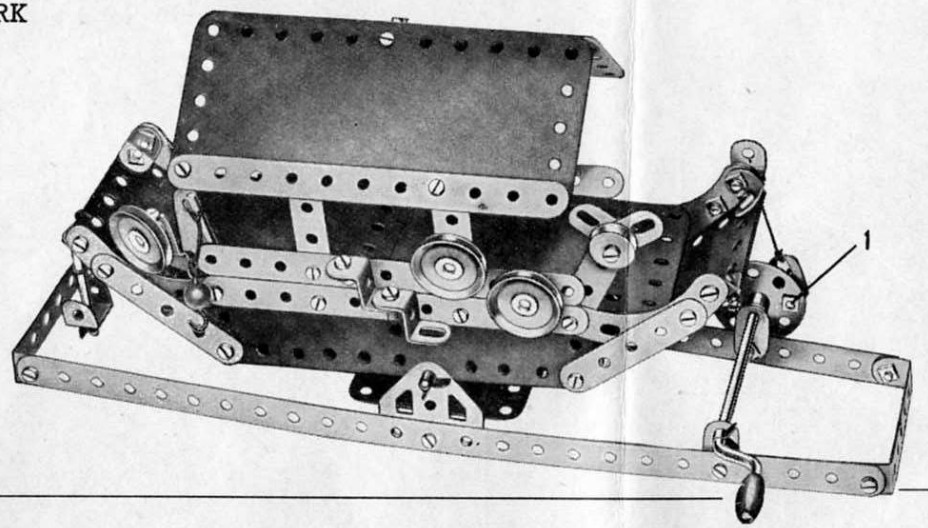


Fig. 3.13a

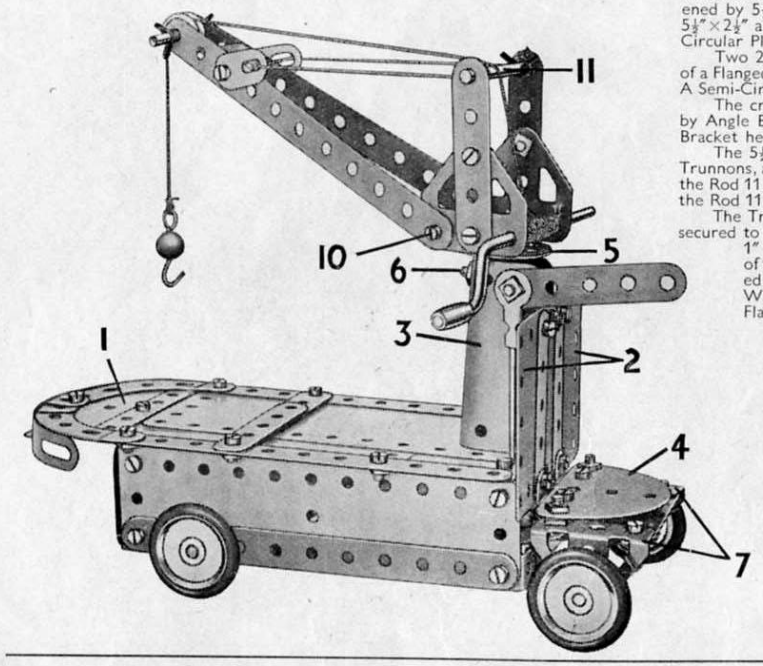
3.14 NOAH'S ARK

A 5½"×2½" Flanged Plate is used for the bottom of the ark and 5½"×1½" 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 hole from the end near the Crank Handle. The Crank Handle carries a Bush Wheel, and to this a Fishplate is lock-nutted at 1. A length of Cord is attached to the free hole of the Fishplate 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 Fishplate causes one end of the ark to be pulled down, but as the Fishplate rises again, the ark returns to its original position.



3.15 ELECTRIC CRANE TRUCK



The electric truck is built up first by bolting a 2½"×1½" and two 5½"×1½" Flexible Plates to the flanges of a Flanged Plate At their lower edges the Flexible Plates are strengthened by 5½" strips and two 2½"×½" Double Angle Strips. The platform consists of two 5½"×2½" and two 4½"×2½" Flexible Plates overlapped, and these are extended by a Semi-Circular Plate 1.

Two 2½"×2½" Flexible Plates 2, overlapped three holes, are bolted to the front end of a Flanged Plate, and a U-Section Curved Plate 3 is attached to these by a Double Bracket. A Semi-Circular Plate 4 is attached to the Flanged Plate by Angle Brackets.

The crane jib is supported by Flat Trunnions, which are attached to a Wheel Disc 5 by Angle Brackets. The Wheel Disc is lock-nutted through its centre hole to an Angle Bracket held by the Bolt 6.

The 5½" Strips forming the jib pivot on a 2" Rod 10 passed through holes in the flat Trunnons, and the jib is held at the required angle by a length of Cord. This Cord is tied to the Rod 11 and then passed through the Fishplates at the jib head, finally being tied again to the Rod 11.

The Trunnions 7, which form part of the steering device, are free to turn on ⅜" Bolts secured to the Semi-Circular Plate 4, and they carry ⅜" Bolts that form stub axles for the 1" Pulleys. The 2½" Strip 8, seen in the underneath view of the model, is bolted to a Bush Wheel, and is connected to each Trunnion by Cord as shown. The Bush Wheel is fixed on a 3½" Rod passed through the Flanged Plate and an Angle Bracket 9.

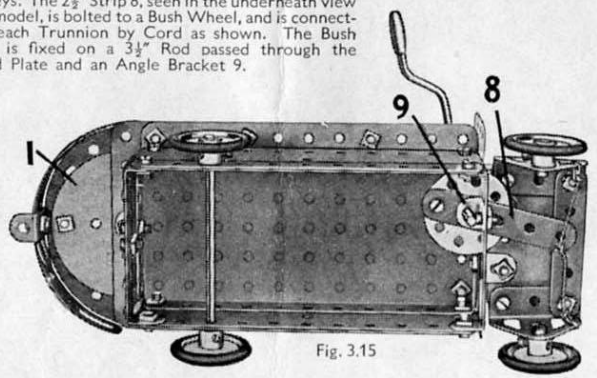


Fig. 3.15

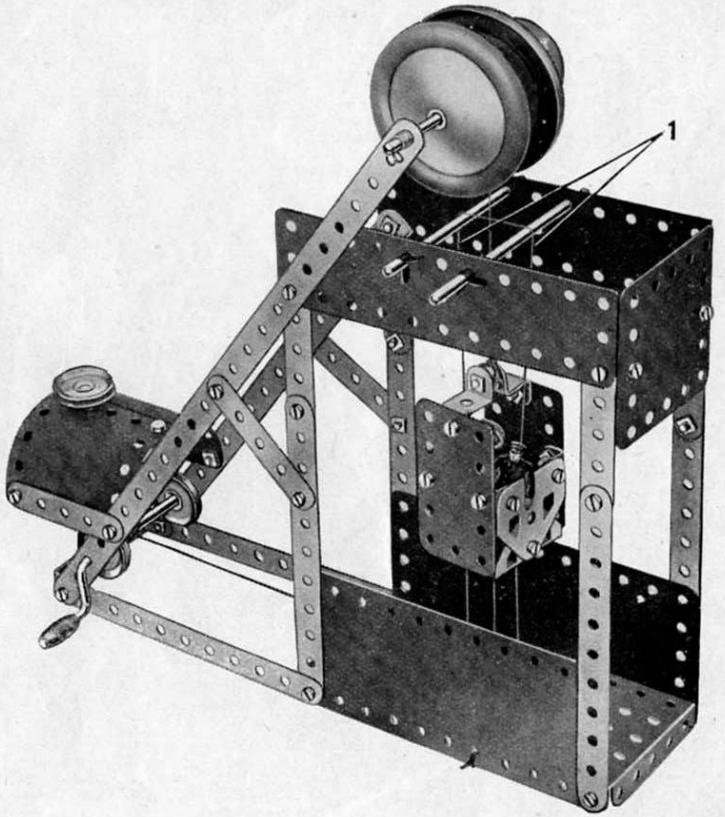
3.16 PITHEAD GEAR

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.

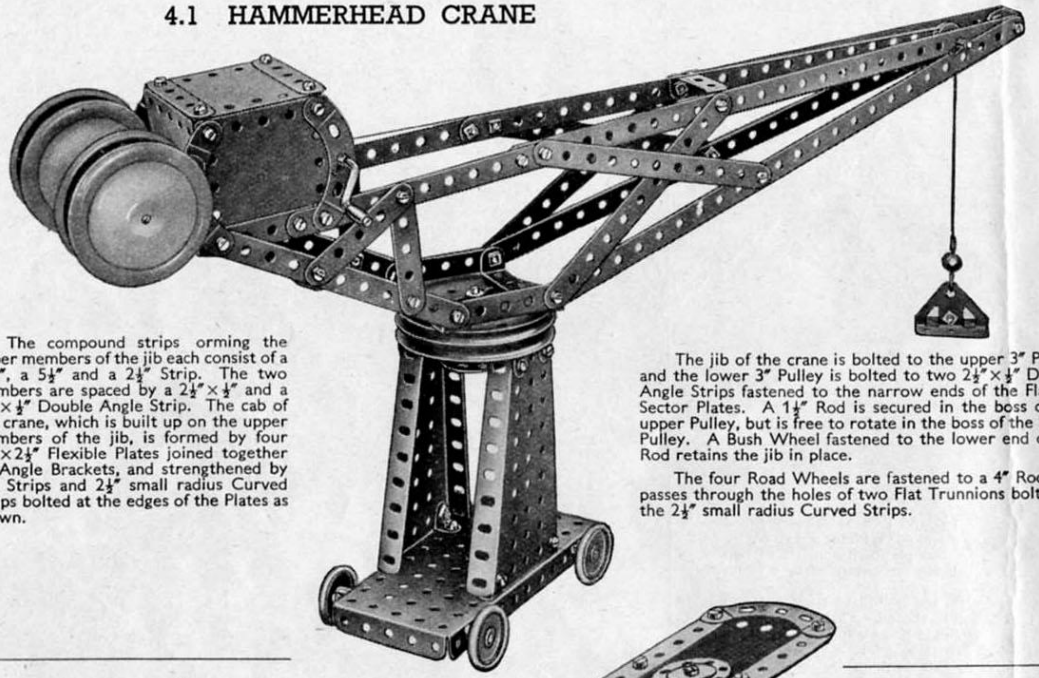
A ⅜" Bolt is passed through the holes of Reversed Angle Brackets bolted to the top of the cage, and Washers are placed on its shank for spacing purposes.

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.

The Cord used for elevating the cage is wound round the Crank Handle, and one end is passed over the 3½" Rod and tied to the top of the cage. The other end of the Cord is passed through a hole in the Flanged Plate and tied to the underneath of the cage.



4.1 HAMMERHEAD CRANE

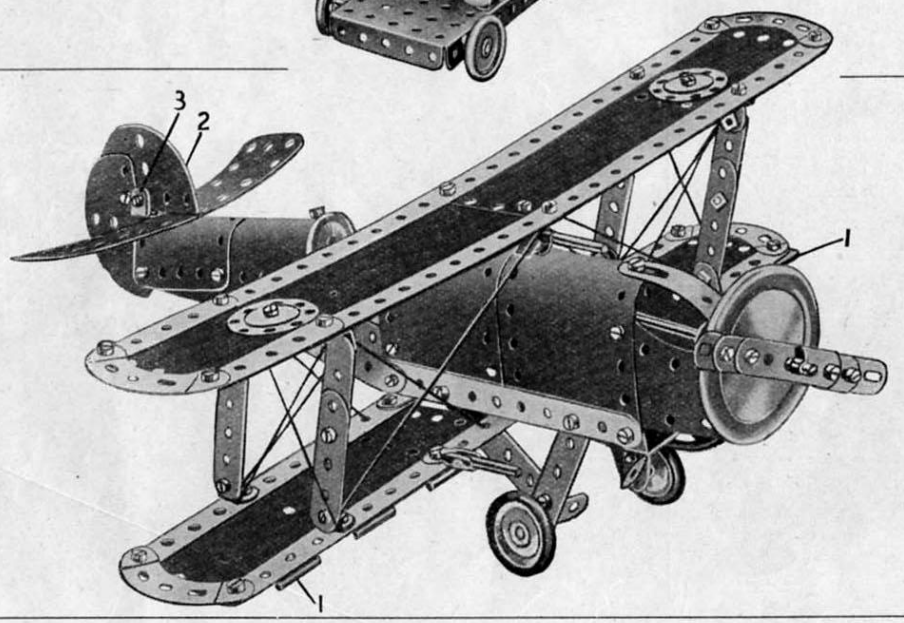


The compound strips orming the upper members of the jib each consist of a 12½", a 5½" and a 2½" Strip. The two members are spaced by a 2½"×½" and a 1½"×½" Double Angle Strip. The cab of the crane, which is built up on the upper members of the jib, is formed by four 2½"×2½" Flexible Plates joined together by Angle Brackets, and strengthened by 2½" Strips and 2½" small radius Curved Strips bolted at the edges of the Plates as shown.

The jib of the crane is bolted to the upper 3" Pulley, and the lower 3" Pulley is bolted to two 2½"×½" Double Angle Strips fastened to the narrow ends of the Flanged Sector Plates. A 1½" Rod is secured in the boss of the upper Pulley, but is free to rotate in the boss of the lower Pulley. A Bush Wheel fastened to the lower end of the Rod retains the jib in place.

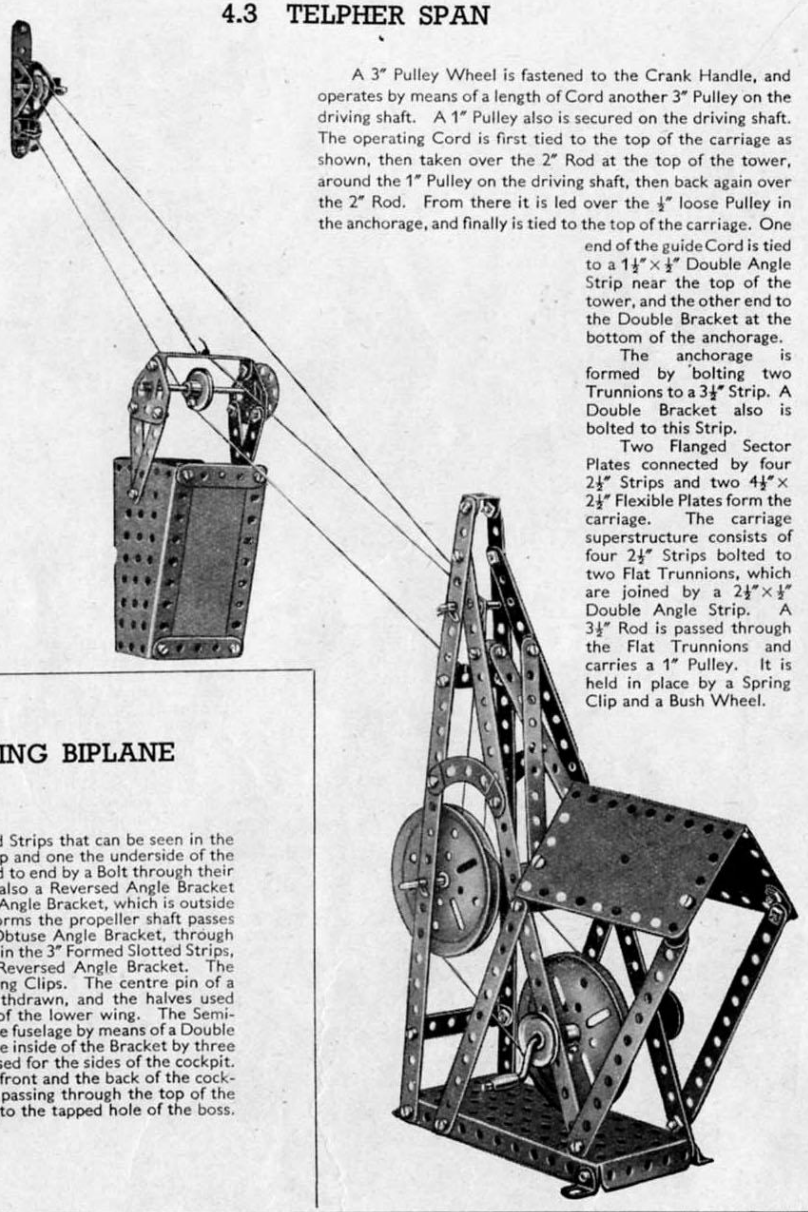
The four Road Wheels are fastened to a 4" Rod that passes through the holes of two Flat Trunnions bolted to the 2½" small radius Curved Strips.

4.2 FIGHTING BIPLANE



The two 3" Formed Slotted Strips that can be seen in the illustration, one forming the top and one the underside of the nose of the plane, are joined end to end by a Bolt through their slotted holes. The Bolt holds also a Reversed Angle Bracket inside the nose, and an Obtuse Angle Bracket, which is outside the nose. The 3½" Rod that forms the propeller shaft passes through the free hole of the Obtuse Angle Bracket, through the unoccupied part of the slots in the 3" Formed Slotted Strips, and through the hole of the Reversed Angle Bracket. The Rod is held in position by Spring Clips. The centre pin of a Hinged Flat Plate has been withdrawn, and the halves used as flat plates 1, for form part of the lower wing. The Semi-Circular Plate 2 is fastened to the fuselage by means of a Double Bracket 3, and is spaced from the inside of the Bracket by three Washers. Flat Trunnions are used for the sides of the cockpit. The 1" fast Pulleys forming the front and the back of the cockpit are each fastened by a Bolt passing through the top of the U-Section Curved Plates and into the tapped hole of the boss.

4.3 TELPHER SPAN

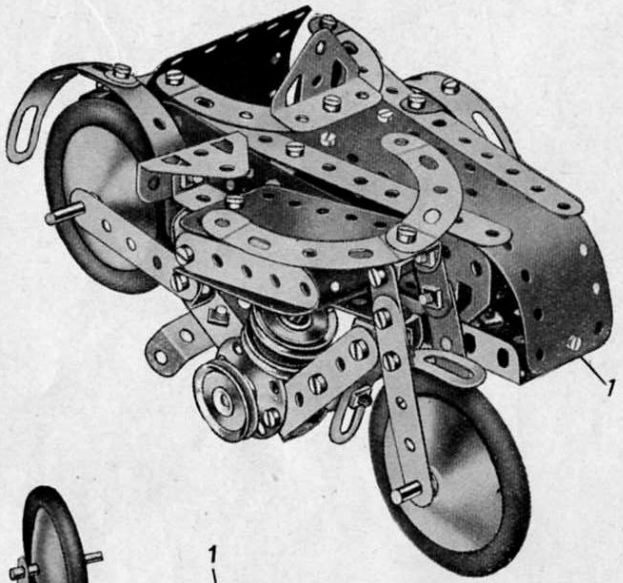


A 3" Pulley Wheel is fastened to the Crank Handle, and operates by means of a length of Cord another 3" Pulley on the driving shaft. A 1" Pulley also is secured on the driving shaft. The operating Cord is first tied to the top of the carriage as shown, then taken over the 2" Rod at the top of the tower, around the 1" Pulley on the driving shaft, then back again over the 2" Rod. From there it is led over the ½" loose Pulley in the anchorage, and finally is tied to the top of the carriage. One end of the guide Cord is tied to a 1½"×½" Double Angle Strip near the top of the tower, and the other end to the Double Bracket at the bottom of the anchorage.

The anchorage is formed by bolting two Trunnions to a 3½" Strip. A Double Bracket also is bolted to this Strip.

Two Flanged Sector Plates connected by four 2½" Strips and two 4½"×2½" Flexible Plates form the carriage. The carriage superstructure consists of four 2½" Strips bolted to two Flat Trunnions, which are joined by a 2½"×½" Double Angle Strip. A 3½" Rod is passed through the Flat Trunnions and carries a 1" Pulley. It is held in place by a Spring Clip and a Bush Wheel.

4.4 MOTOR CYCLE AND SIDECAR



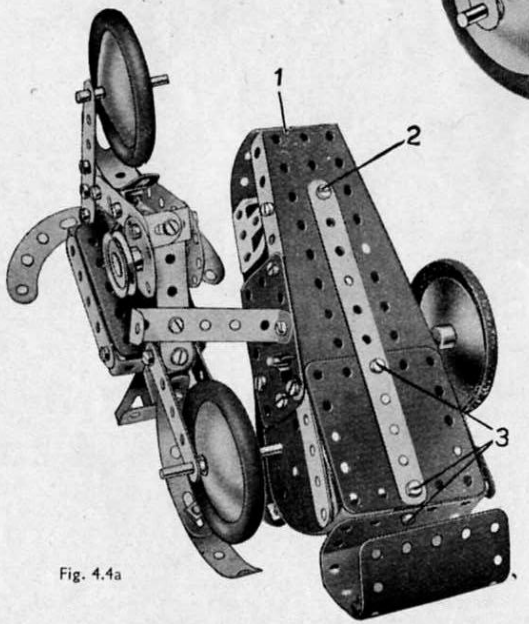


Fig. 4.4a

The $5\frac{1}{2}$"×$1\frac{1}{2}$" Flexible Plate that forms the front of the sidecar is bolted at 1 to a $2\frac{1}{2}$"×$\frac{1}{2}$" Double Angle Strip, which is fastened by Bolt 2 (Fig. 4.4a) to the $4\frac{1}{2}$" Flanged Sector Plate forming the bottom of the sidecar. The Bolts 3 pass through the Flexible Plates and also through a $2\frac{1}{2}$"×$\frac{1}{2}$" Double Angle Strip.

The engine cylinder consists of two 1" Pulleys mounted on a 2" Rod, one end of which is supported in the Strip 4 (Fig. 4.4b) that forms the top of the frame. The other end of the Rod is held between the two Bolts that fasten the Wheel Discs to the frame.

The petrol tank is represented by a $5\frac{1}{2}$"×$1\frac{1}{2}$" Flexible Plate bent to U-shape and attached to a $1\frac{1}{2}$"×$\frac{1}{2}$" Double Angle Strip by Angle Brackets. A $2\frac{1}{2}$" Strip is attached to the Double Angle Strip and the unit is then bolted to the Strip 4 (Fig. 4.4b). The saddle, which is a Trunnion, is also attached to this Strip by a $\frac{1}{2}$" Reversed Angle Bracket.

The Strip 4 carries a Double Bracket at its front end, and to this are bolted two $2\frac{1}{2}$" Strips. To these Strips are attached two Wheel Discs, and these are joined by a double bracket built up from two Angle Brackets (see Fig. 4.4a).

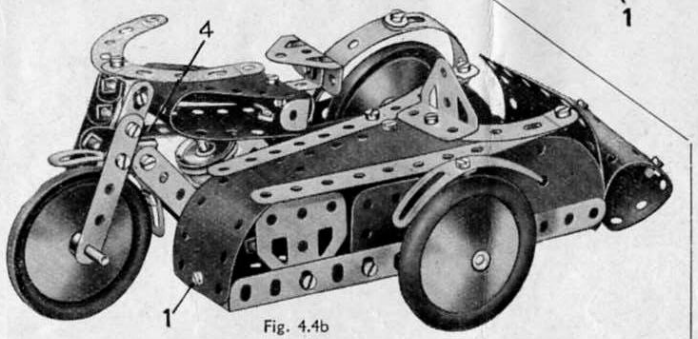
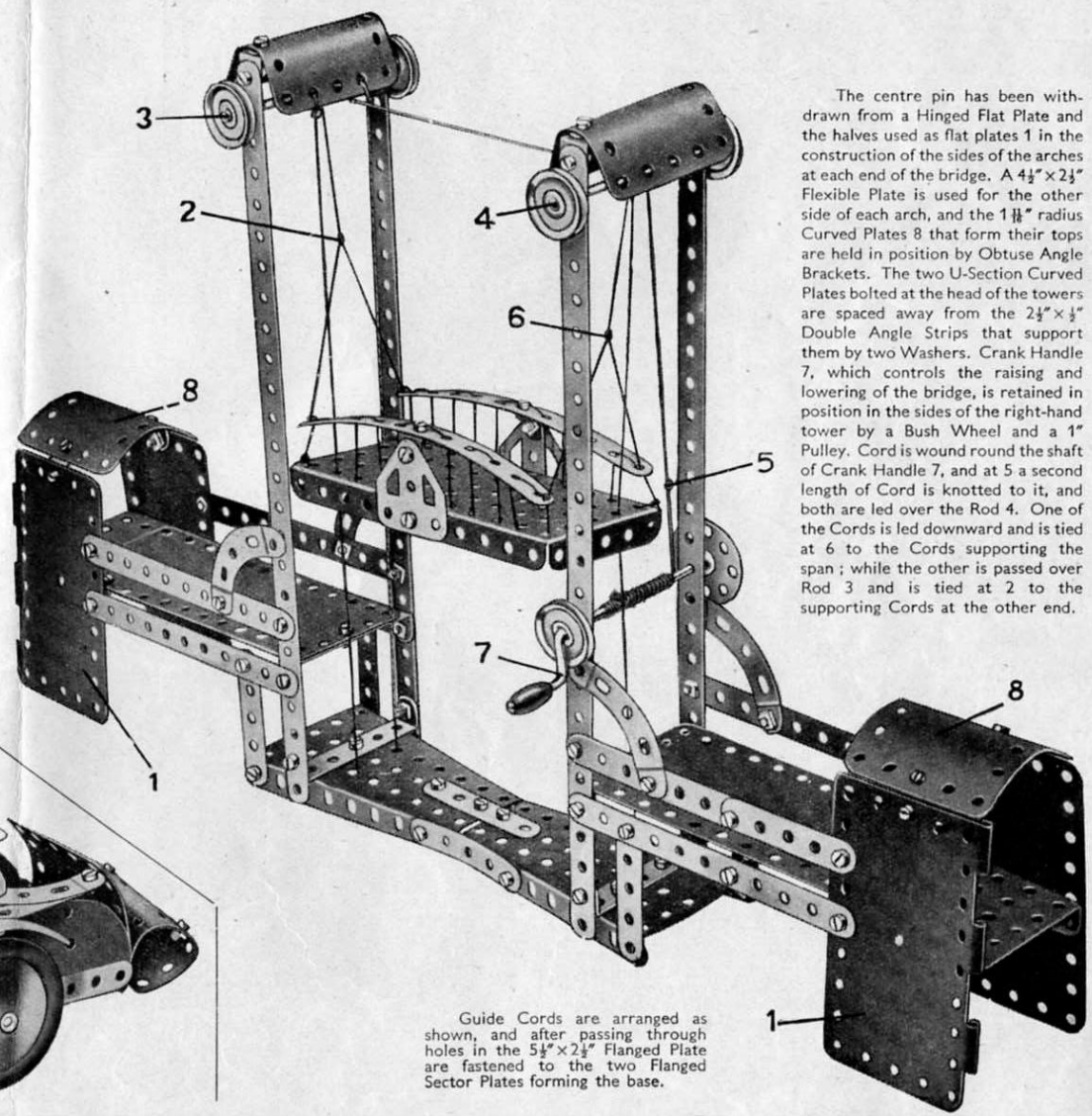


Fig. 4.4b

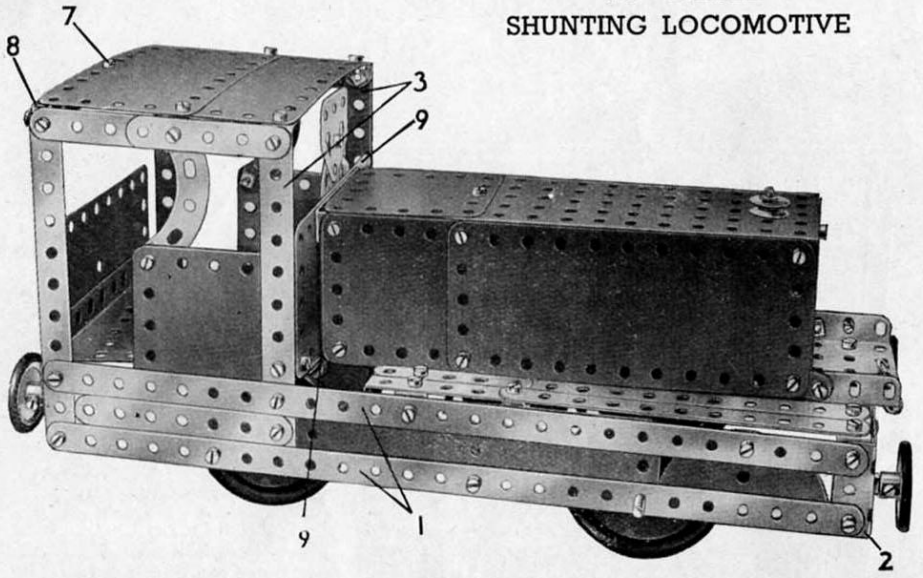
4.5 LIFTING BRIDGE



The centre pin has been withdrawn from a Hinged Flat Plate and the halves used as flat plates 1 in the construction of the sides of the arches at each end of the bridge. A $4\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plate is used for the other side of each arch, and the $1\frac{11}{16}$" radius Curved Plates 8 that form their tops are held in position by Obtuse Angle Brackets. The two U-Section Curved Plates bolted at the head of the towers are spaced away from the $2\frac{1}{2}$"×$\frac{1}{2}$" Double Angle Strips that support them by two Washers. Crank Handle 7, which controls the raising and lowering of the bridge, is retained in position in the sides of the right-hand tower by a Bush Wheel and a 1" Pulley. Cord is wound round the shaft of Crank Handle 7, and at 5 a second length of Cord is knotted to it, and both are led over the Rod 4. One of the Cords is led downward and is tied at 6 to the Cords supporting the span ; while the other is passed over Rod 3 and is tied at 2 to the supporting Cords at the other end.

Guide Cords are arranged as shown, and after passing through holes in the $5\frac{1}{2}$"×$2\frac{1}{2}$" Flanged Plate are fastened to the two Flanged Sector Plates forming the base.

4.6 DIESEL SHUNTING LOCOMOTIVE



The main frames of the locomotive consist of 12½" Strips 1, bolted to a 5½"×1½" Flexible Plate, a Semi-Circular Plate and the Trunnions 2. The back of the cab is formed by half a Hinged Flat Plate attached to the frames by Angle Brackets. The other half of the Hinged Flat Plate is used for the front of the cab, and is fixed to the 5½" Strips 3 by Angle Brackets.

The main frames are connected at the front by a 2½"×½" Double Angle Strip 4 (Fig. 4.6a), a 1½"×½" Double Angle Strip 5 and a 2½"×1½" Flanged Plate 6. Two 2½"×1½" Flexible Plates bolted together are attached to the Trunnions 2 by ⅜" Bolts. A 1" Pulley is locked on the shank of each of these Bolts to represent the buffers.

The sides of the cab are formed by 2½"×2½" Flexible Plates attached to the Strips 3 and the main frames.

The roof is made by overlapping two 4½"×2½" Flexible Plates two holes. It is bolted to Angle Brackets attached to the Strips 3. A second Angle Bracket held by the Bolt 7 is bolted to a compound strip 8, consisting of two 2½" Strips fastened to the sides by Angle Brackets.

Each side of the engine housing consists of a 5½"×2½" and a 2½"×2½" Flexible Plate. These are attached to the Flanged Plate 6 by Fishplates and to the front of the cab by Double Angle Strips 9. The top is filled in by a 5½"×2½" Flanged Plate and a 1 11/16" radius Curved Plate. The radiator is formed by a second 1 11/16" radius Curved Plate.

The running plate above the wheels consists of 5½" Strips bolted to the Double Angle Strips 4 and 5. The 5½" Strips are extended on one side by two 2½" Strips, and on the other by a 2½" Strip and a 2½"×½" Double Angle Strip. These Strips are supported by the Double Angle Strips 10.

The leading axle consists of a 3½" and a 2" Rod joined by a Rod Connector and supported in the main frames. The rear axle is a 4" Rod free to turn in two Reversed Angle Brackets. The *Magic* Motor is bolted to one of the main frames and drives a 1" Pulley on the leading axle.

Note: The Motor used in this model is not included in the Outfit

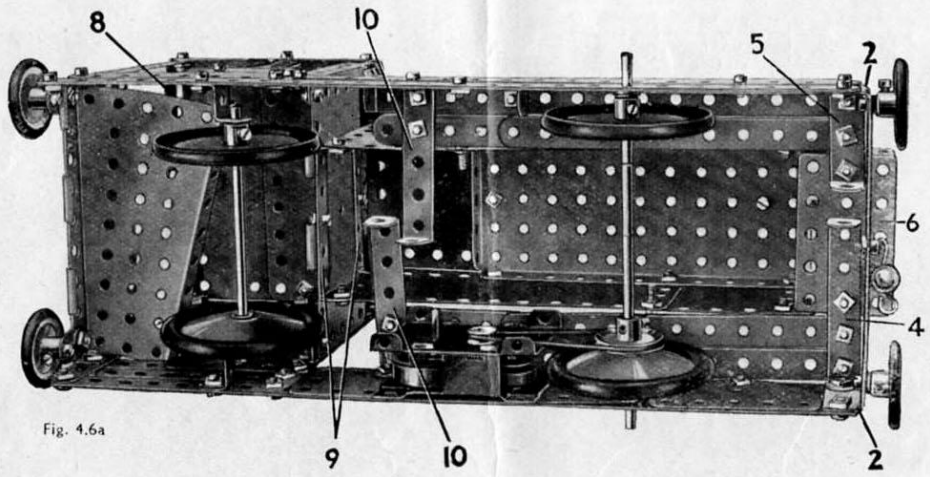
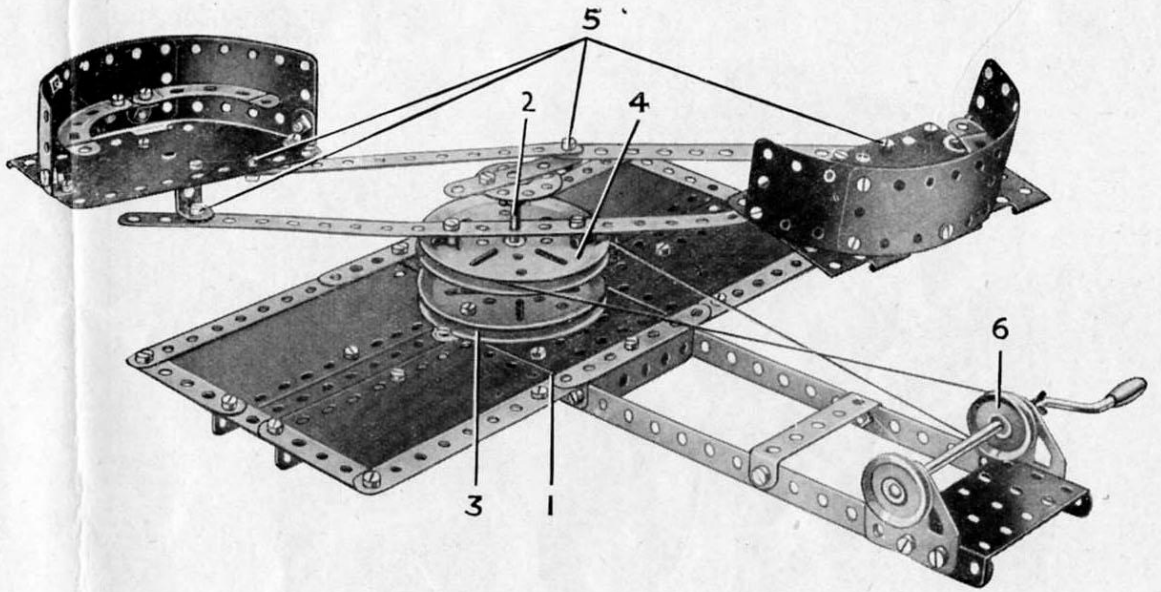


Fig. 4.6a

4.7 "WHIP" ROUNDABOUT



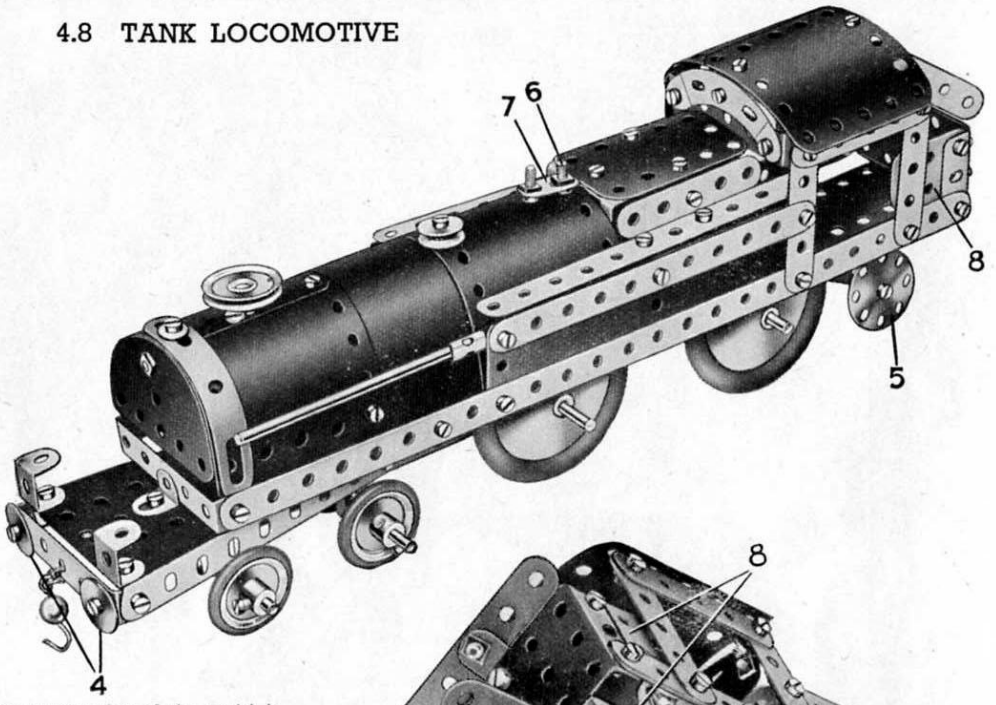
The base of the model is formed by a 5½"×2½" Flanged Plate 1 extended on each side by a Flanged Sector Plate, a 5½"×2½" and a 4½"×2½" Flexible Plate. The edges of the base are strengthened with Strips. Two 12½" Strips are bolted to the flanges of Plate 1 and their ends are connected by a 2½"×1½" Flanged Plate. Two Flat Trunnions provide bearings for a small Crank Handle.

A 3" Pulley 3 is bolted to Flanged Plate 1 and in its boss is fixed a 2" Rod 2. A second 3" Pulley 4 is spaced from Pulley 3 by a Spring Clip and is free to turn on Rod 2. Across its face is bolted a 12½" Strip, the Strip being spaced from the Pulley by a Spring Clip placed on the shank of each securing Bolt.

A Bush Wheel fitted with a 2½" Strip is secured on Rod 2 in the position shown, the end of the Strip being connected to the cars by 5½" Strips. All the Bolts 5 are lock-nutted.

The 1" Pulley 6 mounted on the Crank Handle, drives Pulley 4 through a belt of Cord.

4.8 TANK LOCOMOTIVE



The construction of the model is commenced by building the chassis as shown in Fig. 4.8a. The Fishplates 1 must be bolted to the 12½" Strips 2 before the Flanged Sector Plate 3 is fitted. The Wheel Discs 5 rotate on ⅜" Bolts lock-nutted in the end holes of two 2½" small radius Curved Strips, which are bolted to the 12½" Strips forming the side members of the frame.

The top of the cab consists of two 1 11/16" radius Curved Plates, overlapped three holes and fastened by an Angle Bracket to a small radius Curved Strip. The Curved Strip in turn is fastened by Angle Brackets to two 2½" Strips bolted to the frame. A 2½"×1½" Flanged Plate is used for the back of the cab, and Flat Trunnions 8 fill in the sides.

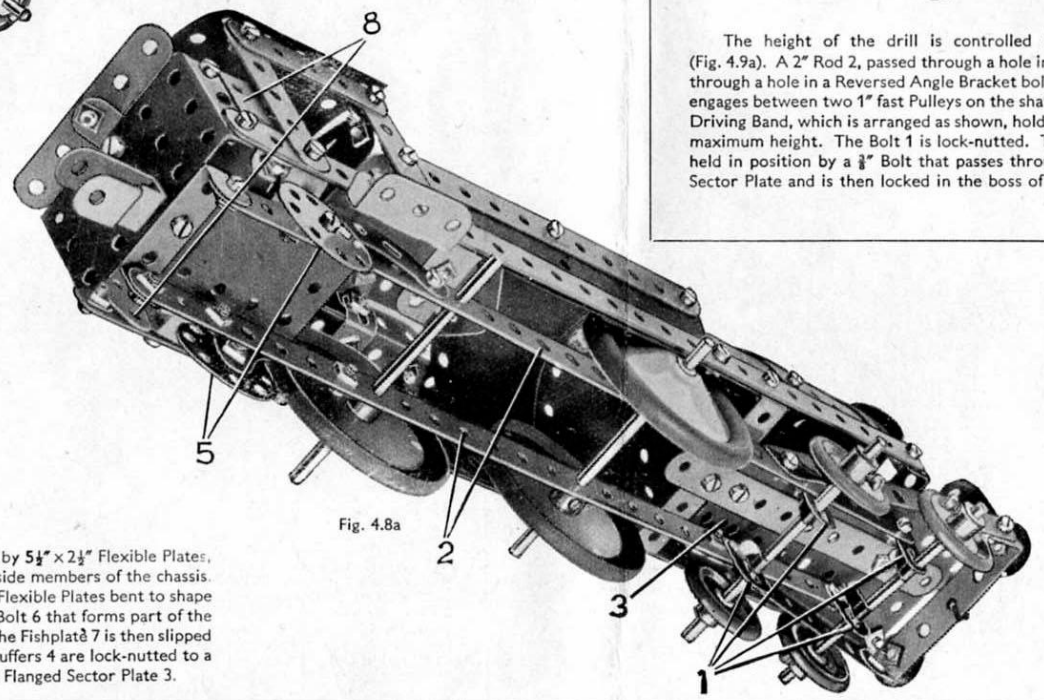


Fig. 4.8a

The centre and rear parts of the boiler are formed by 5½"×2½" Flexible Plates, which are bolted direct to the 12½" Strips forming the side members of the chassis. The forward part of the boiler consists of two 2½"×2½" Flexible Plates bent to shape and bolted to the centre portion of the boiler. The ⅜" Bolt 6 that forms part of the safety valve is held in the top of the boiler by a nut, and the Fishplate 7 is then slipped over it and fastened in position by a further nut. The buffers 4 are lock-nutted to a 2½"×½" Double Angle Strip bolted to the flanges of the Flanged Sector Plate 3.

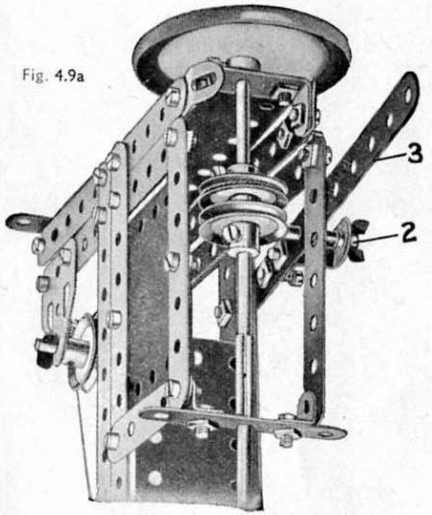
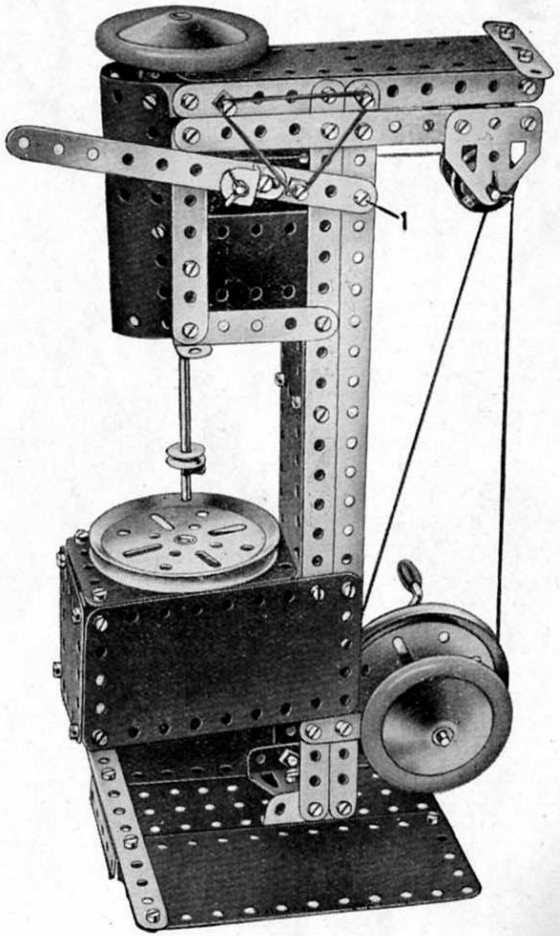


Fig. 4.9a

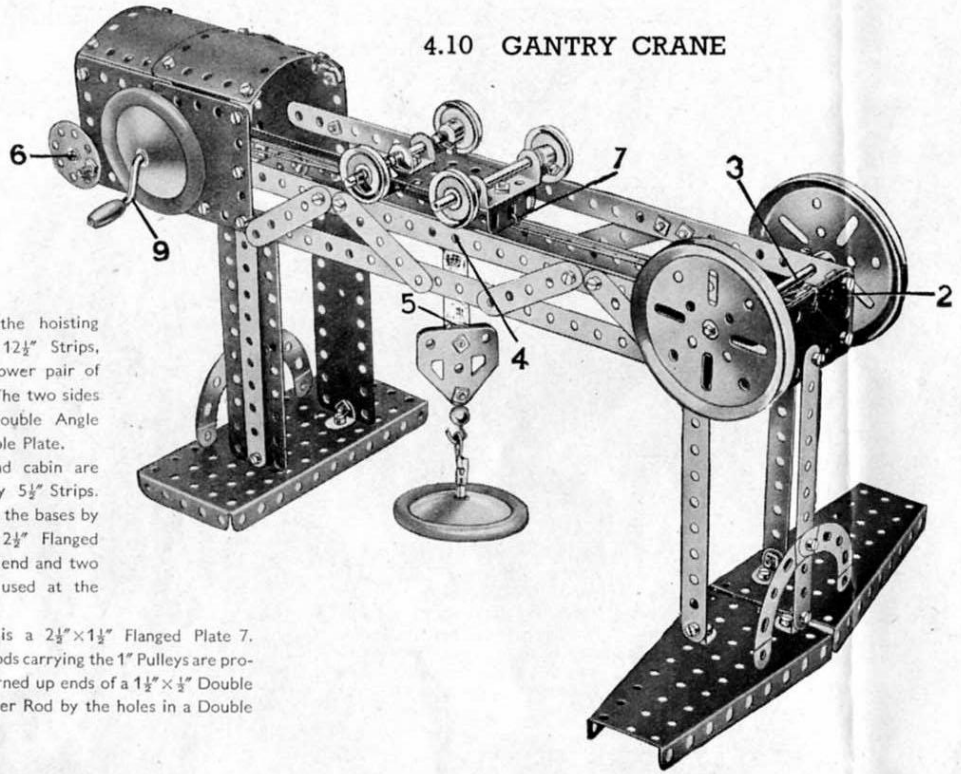
The height of the drill is controlled by the lever 3 (Fig. 4.9a). A 2" Rod 2, passed through a hole in the Strip 3 and through a hole in a Reversed Angle Bracket bolted to the Strip, engages between two 1" fast Pulleys on the shaft of the drill. A Driving Band, which is arranged as shown, holds the lever at its maximum height. The Bolt 1 is lock-nutted. The drill table is held in position by a ⅜" Bolt that passes through the Flanged Sector Plate and is then locked in the boss of the Pulley.

4.9 DRILLING MACHINE

A Flanged Sector Plate that supports the drilling table is bolted to the 12½" Strips that form the main column of the machine. The sides of the table are filled in by two 4½"×2½" and one 2½"×2½" Flexible Plate joined by Angle Brackets. Two 2½" Strips bolted to the main column provide the bearings for the Crank Handle.



4.10 GANTRY CRANE



The sides of the cabin each consist of two 2½" × 2½" Flexible Plates overlapped one hole. The top of the cabin, which consists of two 1 11/16" radius Curved Plates, is attached to the sides by means of Obtuse Angle Brackets at each corner as shown.

The rails on which the hoisting carriage travels are two 12½" Strips, which are braced to the lower pair of 12½" Strips by 2½" Strips. The two sides are spaced by 2½"×½" Double Angle Strips and a 2½"×1½" Flexible Plate.

The complete span and cabin are supported at each end by 5½" Strips. These Strips are attached to the bases by Angle Brackets. A 5½"×2½" Flanged Plate forms the base at one end and two Flanged Sector Plates are used at the other end.

The hoisting carriage is a 2½"×1½" Flanged Plate 7. Bearings for one of the 3½" Rods carrying the 1" Pulleys are provided by the holes in the turned up ends of a 1½"×½" Double Angle Strip, and for the other Rod by the holes in a Double Bracket. The Bolt 1 (Fig. 4.10a) secures a Stepped Bent Strip 4 vertically to the underside of the Flanged Plate 7. A 1" Rod passes through the lower holes of the Stepped Bent Strip and is held in position by Spring Clips.

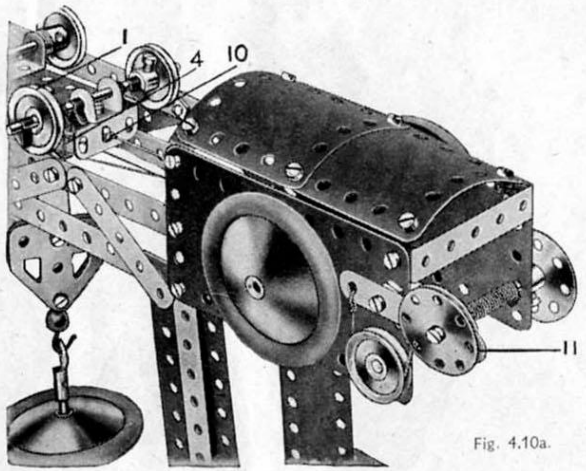
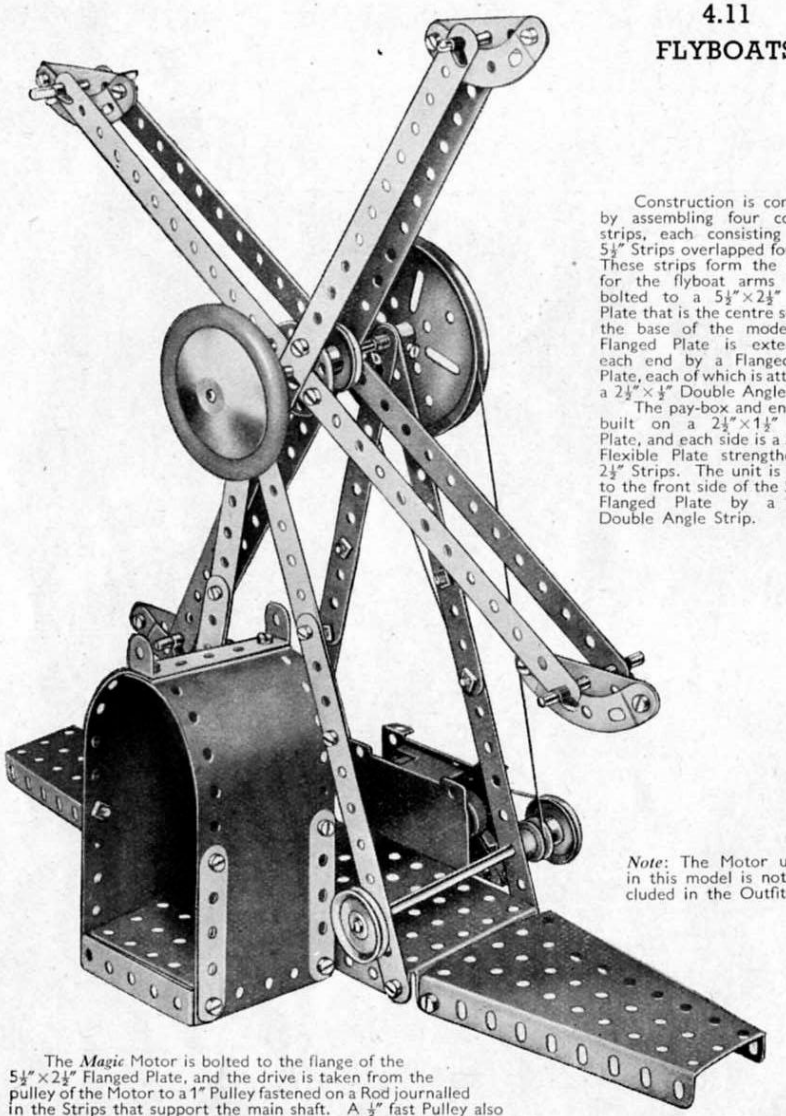


Fig. 4.10a.

Two Flat Trunnions form the pulley block. They are fastened together at their wide ends by a ⅜" Bolt, which carries a ½" loose Pulley 5 on its shank between the two Flat Trunnions.

The Cord that operates the hoisting carriage 7 is tied at 10 (Fig. 4.10a). It is then passed round Rod 3, which carries the two 3" Pulleys, and is taken to the Crank Handle 9. The Cord is wound round the Crank Handle several times to enable it to grip the shaft, and finally is tied to the rear end of the carriage. The hoisting Cord is tied to Rod 6 fitted with a Bush Wheel, and wound round it several times. It is then taken over the 1" Rod held in the Stepped Bent Strip 4, round Pulley 5, back over the 1" Rod, and tied at 2. Strip 11 (Fig. 4.10a) is the lever of a band brake, the Cord of which passes around a 1" Pulley on Rod 6.

4.11 FLYBOATS



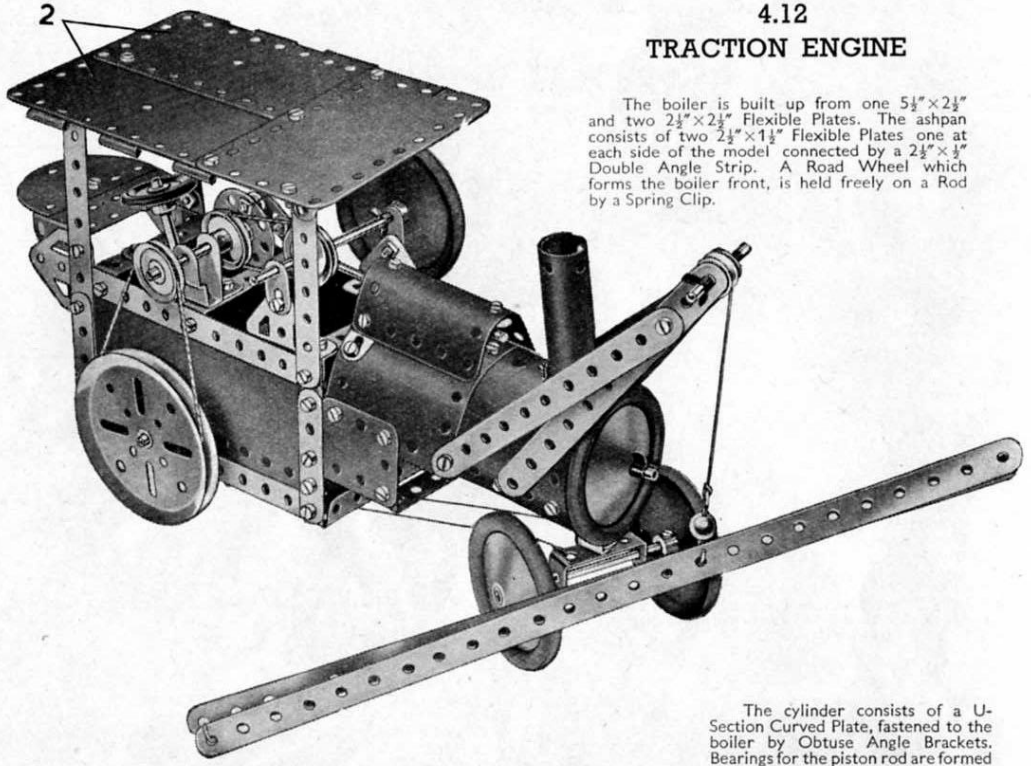
Construction is commenced by assembling four compound strips, each consisting of two 5½" Strips overlapped four holes. These strips form the supports for the flyboat arms and are bolted to a 5½"×2½" Flanged Plate that is the centre section of the base of the model. This Flanged Plate is extended at each end by a Flanged Sector Plate, each of which is attached by a 2½"×½" Double Angle Strip.

The pay-box and entrance is built on a 2½"×1½" Flanged Plate, and each side is a 5½"×2½" Flexible Plate strengthened by 2½" Strips. The unit is attached to the front side of the 5½"×2½" Flanged Plate by a 2½"×½" Double Angle Strip.

Note: The Motor used in this model is not included in the Outfit.

The *Magic* Motor is bolted to the flange of the 5½"×2½" Flanged Plate, and the drive is taken from the pulley of the Motor to a 1" Pulley fastened on a Rod journalled in the Strips that support the main shaft. A ½" fast Pulley also is secured on this Rod, and drives through a belt of Cord a 3" Pulley on the main shaft. The arms that support the boats are bolted to a Bush Wheel fastened on the main shaft. Each of the boats consists of a 2½" Strip and a 2½" small radius Curved Strip bolted together.

4.12
TRACTION ENGINE



The boiler is built up from one 5½"×2½" and two 2½"×2½" Flexible Plates. The ashpan consists of two 2½"×1½" Flexible Plates one at each side of the model connected by a 2½"×½" Double Angle Strip. A Road Wheel which forms the boiler front, is held freely on a Rod by a Spring Clip.

The cylinder consists of a U-Section Curved Plate, fastened to the boiler by Obtuse Angle Brackets. Bearings for the piston rod are formed by the holes of two Angle Brackets, which are held in place by the Bolts that can be seen at the top of the cylinder. The Bolts 1 (Fig. 4.12a) which pass through a connecting rod consisting of two Fishplates, are lock-nutted. A U-Section Curved Plate, bent so that its ends overlap one hole, is used for the chimney. The centre pin of a Hinged Flat Plate has been removed and the two parts used as flat plates 2 in the construction of the roof of the cab.

The 1½"×½" Double Angle Strip that supports the front axle is pivotally attached by a lock-nutted Bolt, to the centre hole of a double bent strip, which consists of two Reversed Angle Brackets. The Cord controlling the steering is wound twice around the lower end of the steering column.

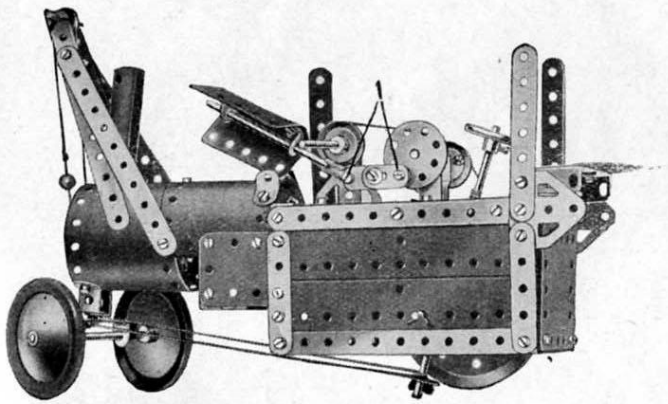


Fig. 4.12a

4.13 GIANT EXCAVATOR

The Cord 1 is fastened to a Crank Handle journalled in holes in the sides of the cab, and after passing round the 2½"×½" Double Angle Strip above the cabin is tied to the jib at 2. This Cord controls the luffing movement of the jib. The Cord 3 is tied to the bucket and is passed over the 1" Pulley 5 and then wound round Rod 6. By turning the handle on the Bush Wheel 7 the bucket is raised or lowered.

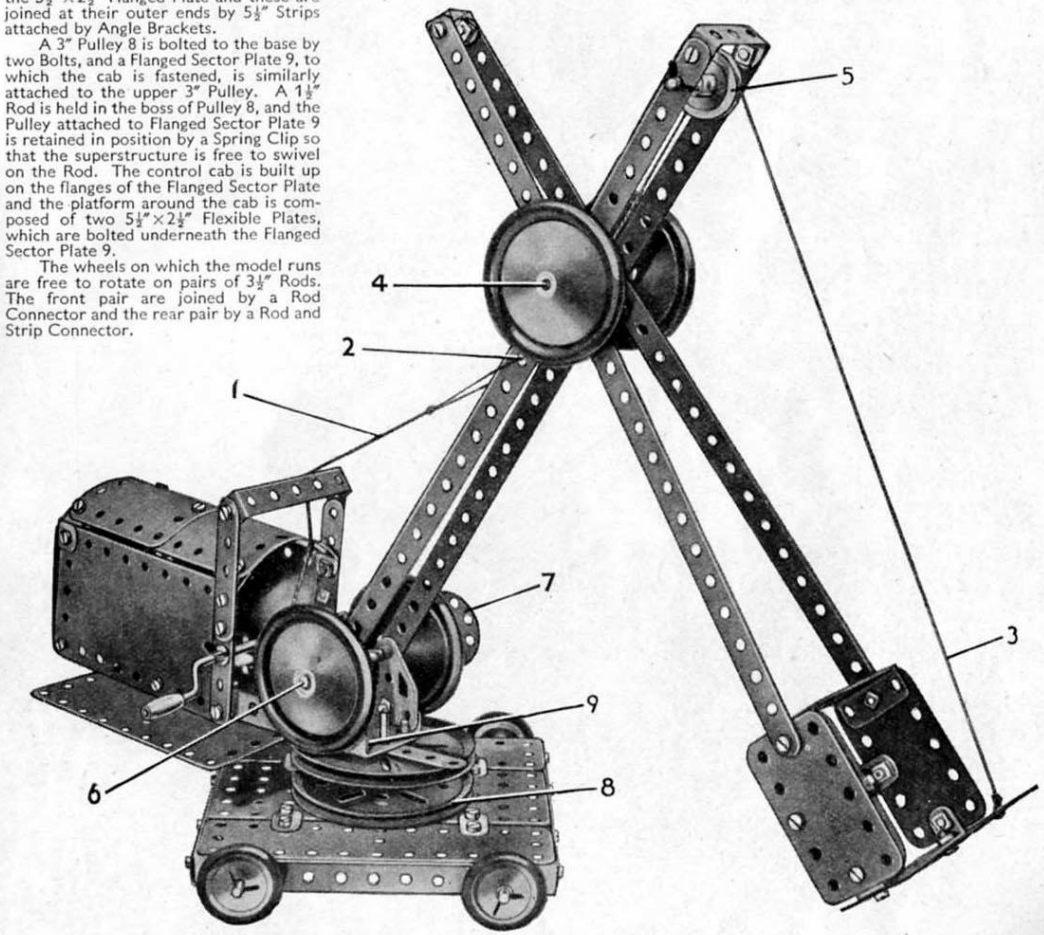
The bucket arm is pivoted on Rod 4, which passes through holes in the 12½" Strips forming the jib and the bucket arm Road Wheels fastened at each end of Rod 4 retain it in position.

The bucket is assembled from two 2½"×1½" and two 2½"×2½" Flexible Plates and one 2½"×1½" Flanged Plate The 2½"×2½" Flexible Plate forming the bottom of the bucket is bolted to a 2½"×½" Double Angle Strip.

The base is a 5½"×2½" Flanged Plate extended at each side by a 5½"×1½" Flexible Plate attached by two Fishplates. A 5½" Strip is bolted across each end of the 5½"×2½" Flanged Plate and these are joined at their outer ends by 5½" Strips attached by Angle Brackets.

A 3" Pulley 8 is bolted to the base by two Bolts, and a Flanged Sector Plate 9, to which the cab is fastened, is similarly attached to the upper 3" Pulley. A 1½" Rod is held in the boss of Pulley 8, and the Pulley attached to Flanged Sector Plate 9 is retained in position by a Spring Clip so that the superstructure is free to swivel on the Rod. The control cab is built up on the flanges of the Flanged Sector Plate and the platform around the cab is composed of two 5½"×2½" Flexible Plates, which are bolted underneath the Flanged Sector Plate 9.

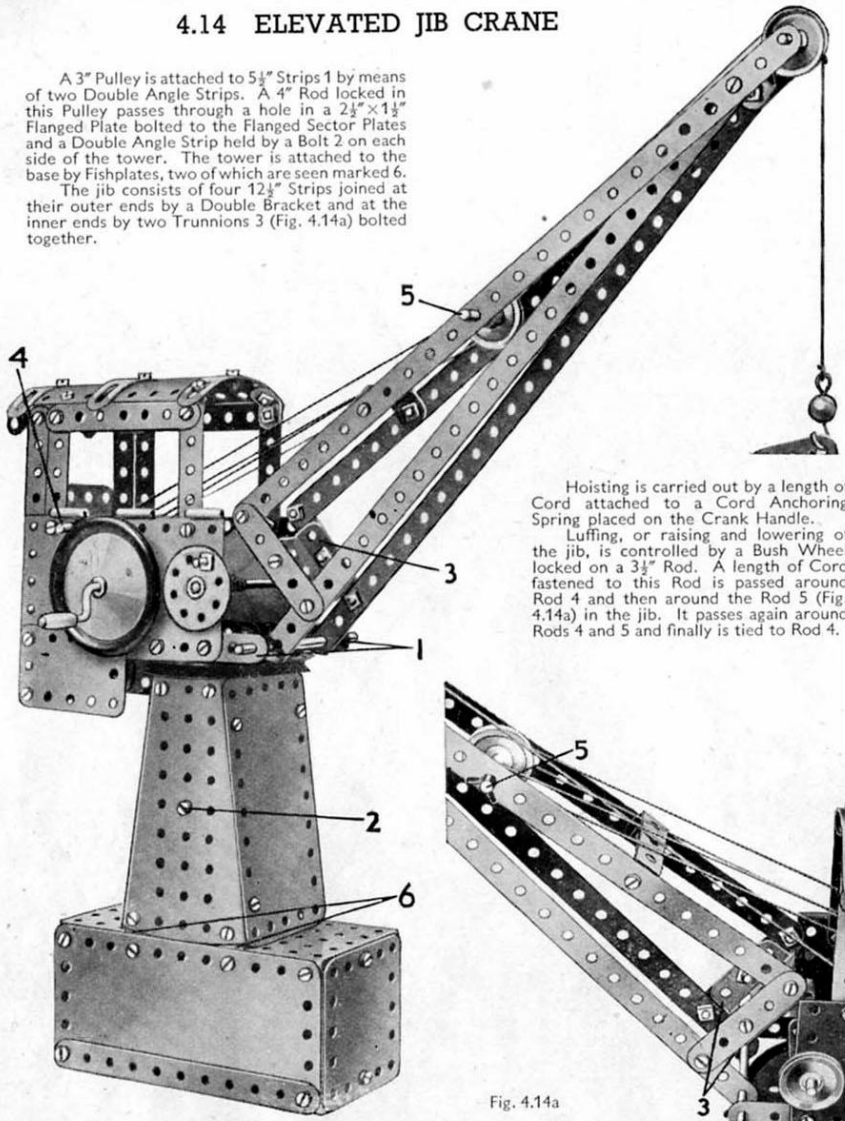
The wheels on which the model runs are free to rotate on pairs of 3½" Rods. The front pair are joined by a Rod Connector and the rear pair by a Rod and Strip Connector.



4.14 ELEVATED JIB CRANE

A 3" Pulley is attached to 5½" Strips 1 by means of two Double Angle Strips. A 4" Rod locked in this Pulley passes through a hole in a 2½"×1½" Flanged Plate bolted to the Flanged Sector Plates and a Double Angle Strip held by a Bolt 2 on each side of the tower. The tower is attached to the base by Fishplates, two of which are seen marked 6.

The jib consists of four 12½" Strips joined at their outer ends by a Double Bracket and at the inner ends by two Trunnions 3 (Fig. 4.14a) bolted together.



Hoisting is carried out by a length of Cord attached to a Cord Anchoring Spring placed on the Crank Handle.

Luffing, or raising and lowering of the jib, is controlled by a Bush Wheel locked on a 3½" Rod. A length of Cord fastened to this Rod is passed around Rod 4 and then around the Rod 5 (Fig. 4.14a) in the jib. It passes again around Rods 4 and 5 and finally is tied to Rod 4.

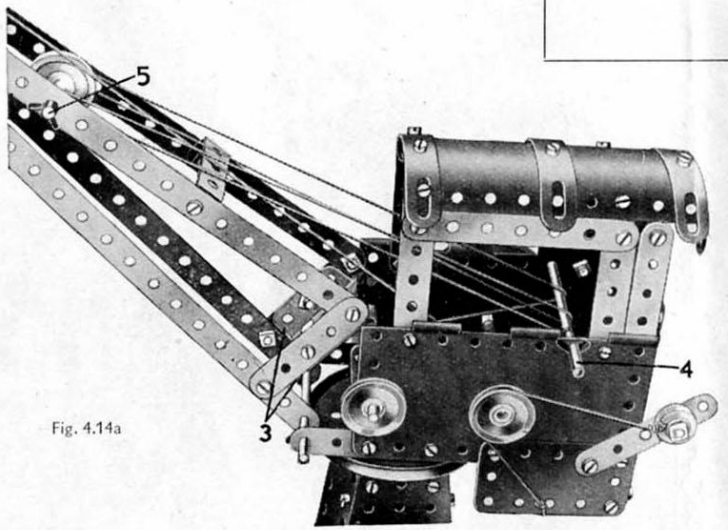
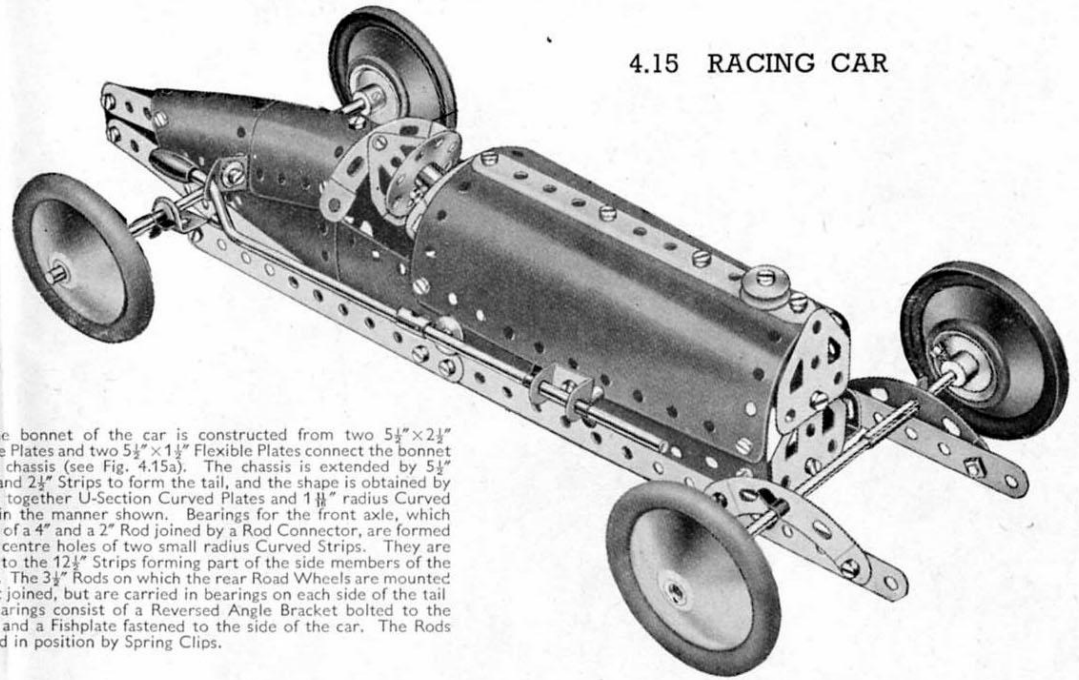


Fig. 4.14a

4.15 RACING CAR



The bonnet of the car is constructed from two 5½"×2½" Flexible Plates and two 5½"×1½" Flexible Plates connect the bonnet to the chassis (see Fig. 4.15a). The chassis is extended by 5½" Strips and 2½" Strips to form the tail, and the shape is obtained by bolting together U-Section Curved Plates and 1 11/16" radius Curved Plates in the manner shown. Bearings for the front axle, which consist of a 4" and a 2" Rod joined by a Rod Connector, are formed by the centre holes of two small radius Curved Strips. They are bolted to the 12½" Strips forming part of the side members of the chassis. The 3½" Rods on which the rear Road Wheels are mounted are not joined, but are carried in bearings on each side of the tail The bearings consist of a Reversed Angle Bracket bolted to the chassis and a Fishplate fastened to the side of the car. The Rods are held in position by Spring Clips.

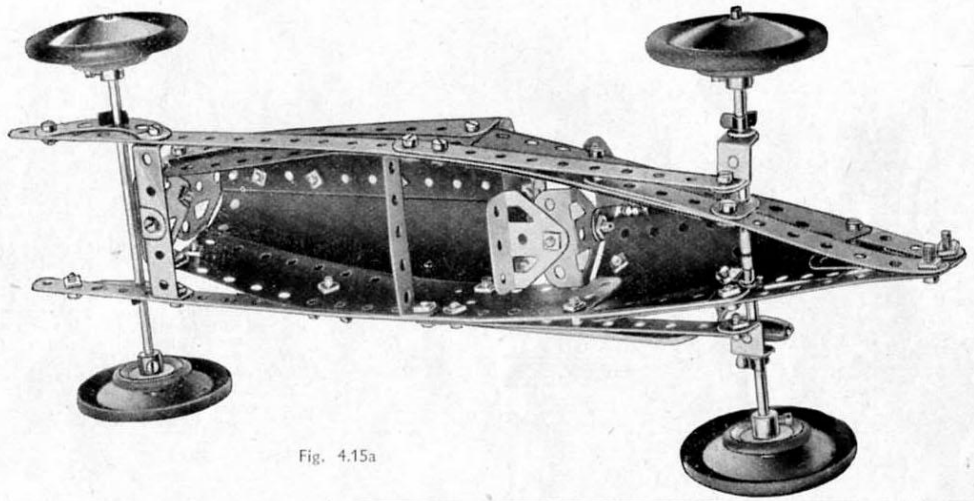
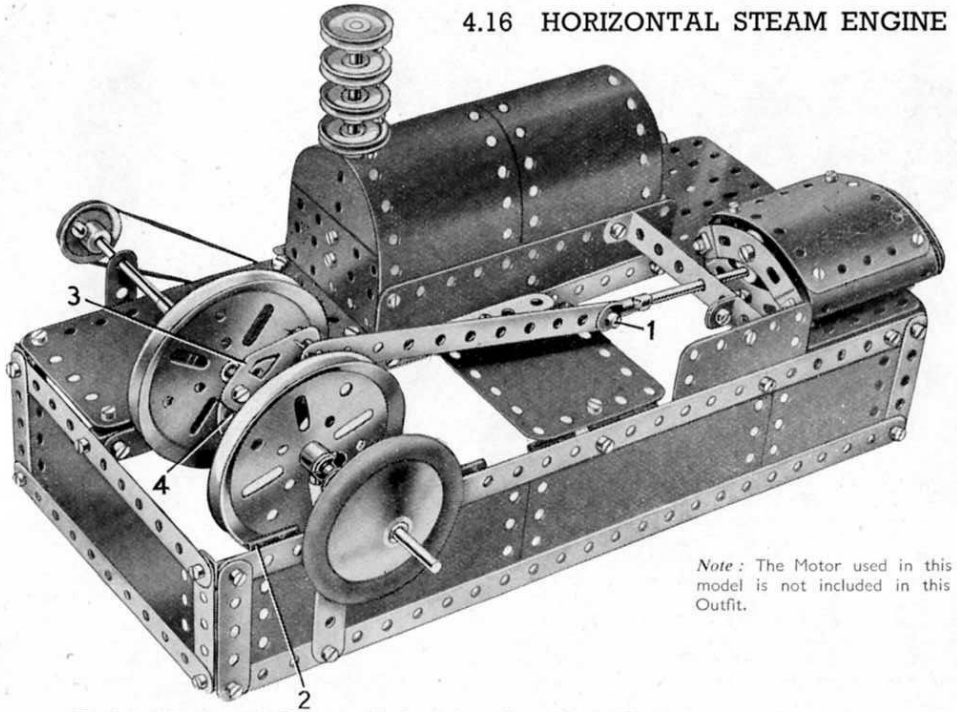


Fig. 4.15a

4.16 HORIZONTAL STEAM ENGINE



Note : The Motor used in this model is not included in this Outfit.

The Bolt 1 is lock-nutted. The centre pin is withdrawn from a Hinged Flat Plate and the halves used as flat plates at 2. The Flat Trunnion 3 is bolted to Bush Wheel 4 and forms one web of the crank. The Bush Wheel is fastened to a 2" Rod, which carries also a 3" Pulley, and a Rod Connector joins this Rod to a 3½" Rod that transmits the drive from the *Magic* Motor. The other web of the crank is made by bolting a Wheel Disc 5 (Fig. 4.16a) to a Flat Trunnion 6, one of the Bolts holding also a Reversed Angle Bracket 7. A Spring Clip 8 is fixed in position so that when the crankshaft is rotated the Rod on which the 3" Pulley and the Road Wheel are fastened is rotated by the Reversed Angle Bracket 7. The cylinder is composed of two 1 11/16" radius Curved Plates and two U-Section Curved Plates bolted together as shown, and the complate unit is fastened in position to the 5½" × 2½" Flanged Plate that forms the base.

The boiler consists of two 5½" × 2½" Flexible Plates, bolted to 5½" × 1½" Flexible Plates, and its ends are closed by Semi-Circular Plates and a 2½" × 1½" Flexible Plate and a 2½" × 1½" Flanged Plate.

The chimney is a 4" Rod fitted with 1" Pulleys, and is held in place by a Cord Anchoring Spring. Fig. 4.16a shows the arrangement for driving the model with a *Magic* Motor.

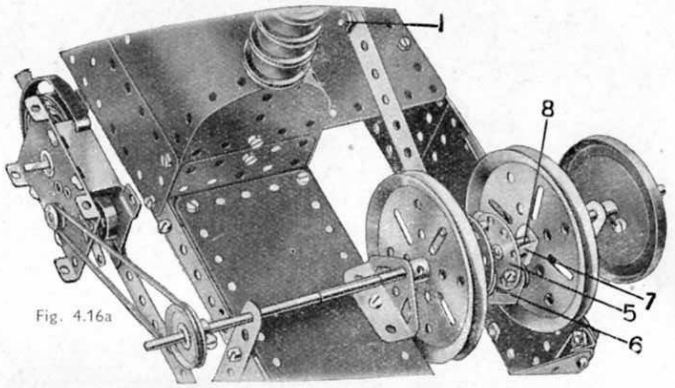
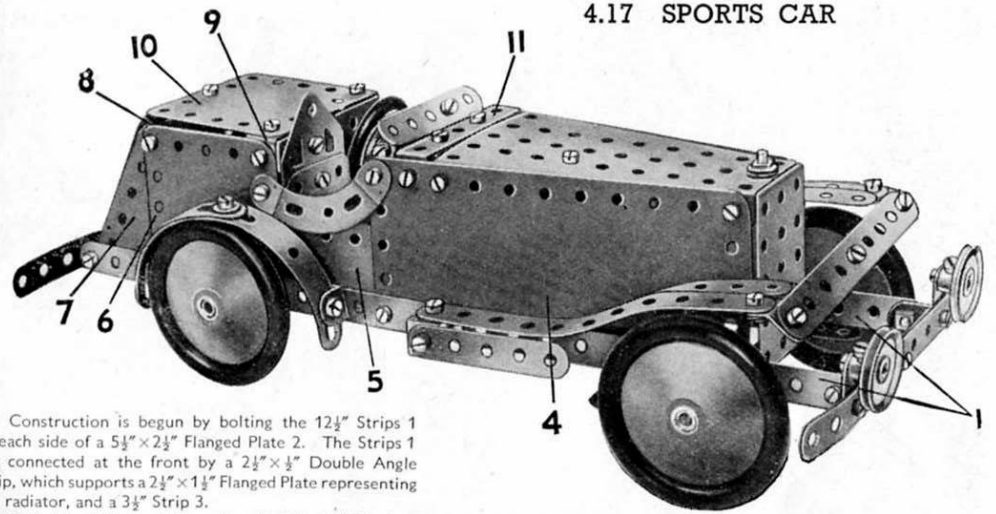


Fig. 4.16a

4.17 SPORTS CAR



Construction is begun by bolting the 12½" Strips 1 to each side of a 5½" × 2½" Flanged Plate 2. The Strips 1 are connected at the front by a 2½" × ½" Double Angle Strip, which supports a 2½" × 1½" Flanged Plate representing the radiator, and a 3½" Strip 3.

Each side of the model consists of a 5½" × 2½" Flexible Plate 4, a 5½" × 1½" Flexible Plate 5 and a 2½" × 2½" Flexible Plate 6. A Semi-Circular Plate 7 is bolted in position at a slight angle. The sides are joined at the rear by two 2½" × ½" Double Angle Strips 8 and 9. A 2½" × 2½" Flexible Plate is bolted to the Double Angle Strip 8 and a similar Plate 10 is attached by two Angle Brackets and an Obtuse Angle Bracket.

The top of the bonnet is represented by a Flanged Sector Plate extended by a 2½" × ½" Double Angle Strip 11. The windshield consists of a 2½" Strip, and is attached to an Obtuse Angle Bracket bolted to the Double Angle Strip 11.

The steering mechanism is built up by passing the ⅜" Bolts 12 (Fig. 4.17a) through the end hole of the Strip 3. The Angle Brackets 13 and 2½" Strips 14 are then held tightly on the Bolts by two nuts, leaving the Bolts free to turn in the Strip 3. The Strips 14 are connected by a lock-nutted 3½" Strip 15. This Strip is fitted with an Angle Bracket held by the Bolt 16, and a ⅜" Bolt 17.

The steering column consists of a 4" Rod journalled in an Angle Bracket 18 and the end hole of a 1½" × ½" Double Angle Strip bolted to the top of the bonnet. The steering column is fitted with a Rod and Strip Connector and a 2½" Strip 19.

The end of this Strip engages between the Angle Bracket and the Bolt 17 on the Strip 15. The Road Wheels are locked on ⅜" Bolts passed through the Angle Brackets 13.

Each of the front mudguards is formed by two 5½" Strips. These are bent slightly and attached to Double Brackets bolted to the chassis. The rear mudguards consist of Formed Slotted Strips, and are fastened to the chassis by Angle Brackets. The 5½" Strips representing the front and rear bumpers are bolted to 2½" × ½" Double Angle Strips.

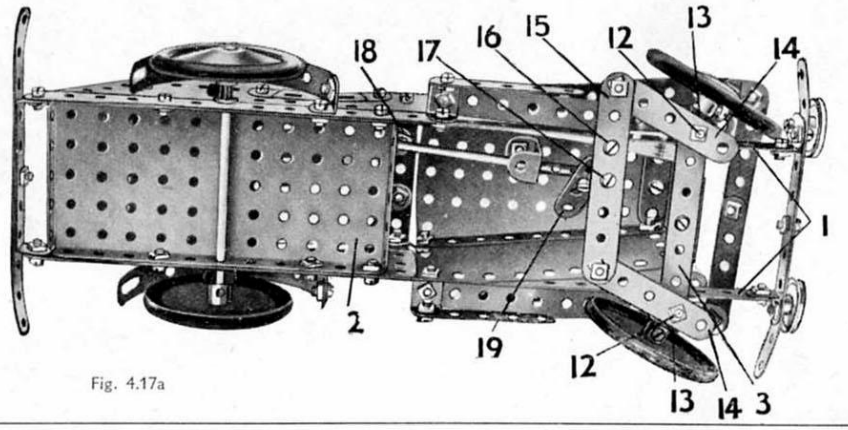


Fig. 4.17a

4.18 MECHANICAL DIGGER

The chassis is constructed from two Flanged Sector Plates, the flanges of which are connected by two 2½" Strips. A gap of ½" is left between the ends of the Plates. A 3" Pulley 1 is then bolted boss downwards to the Flanged Sector Plates by two ⅜" Bolts.

A 2" Rod is locked in the boss of Pulley 1, and on it is placed Pulley 2, boss upward. The base of the cab (Fig. 4.18a) is a 5½"×2½" Flanged Plate, which rests on Pulley 2 and is retained on the 2" Rod by a Road Wheel 3.

The construction of the cab is clear from the illustrations. The boiler comprises a cylinder built up from two 1 11/16" radius Curved Plates, a 4½"×2½" Flexible Plate, and two 5½"×1½" Flexible Plates. The edges of the cylinder are strengthened with Formed Slotted Strips. Semi-Circular Plates are attached to the top of the boiler by a 2½"×½" Double Angle Strip. The boiler is fastened to the back of the cab by a 1½"×½" Double Angle Strip 7 at the top, and by a ⅜" Bolt at the bottom, where it is spaced from the cab by three Washers.

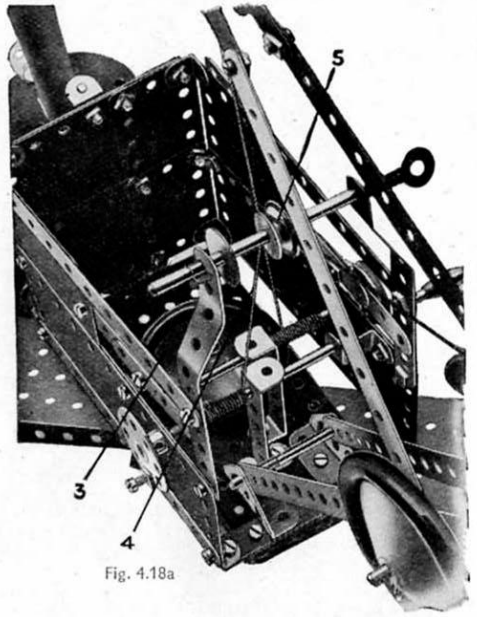
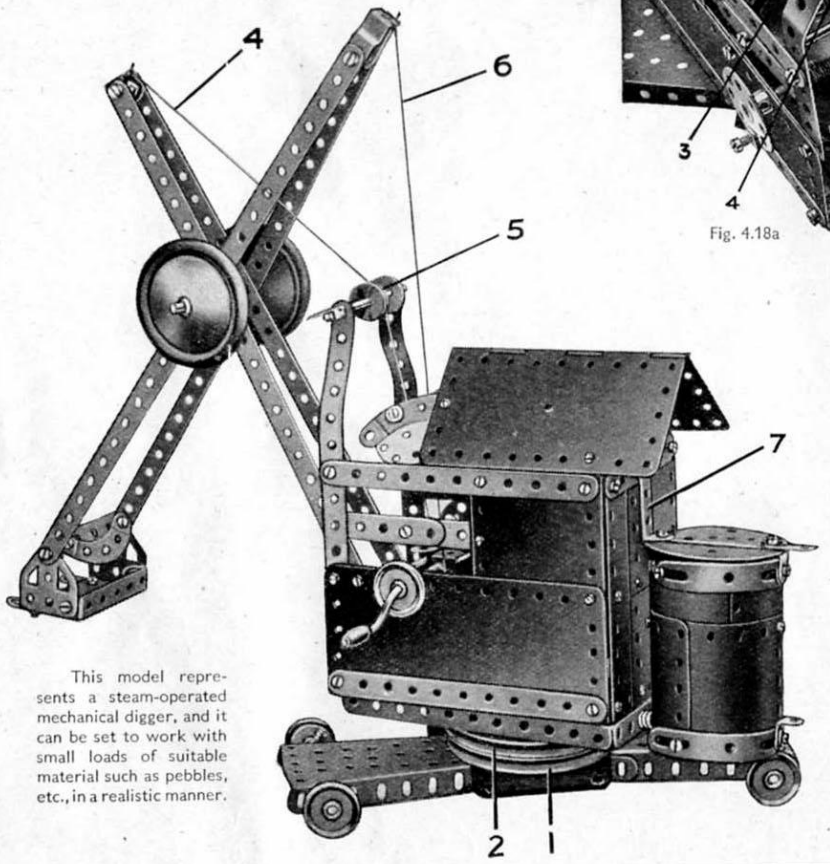


Fig. 4.18a

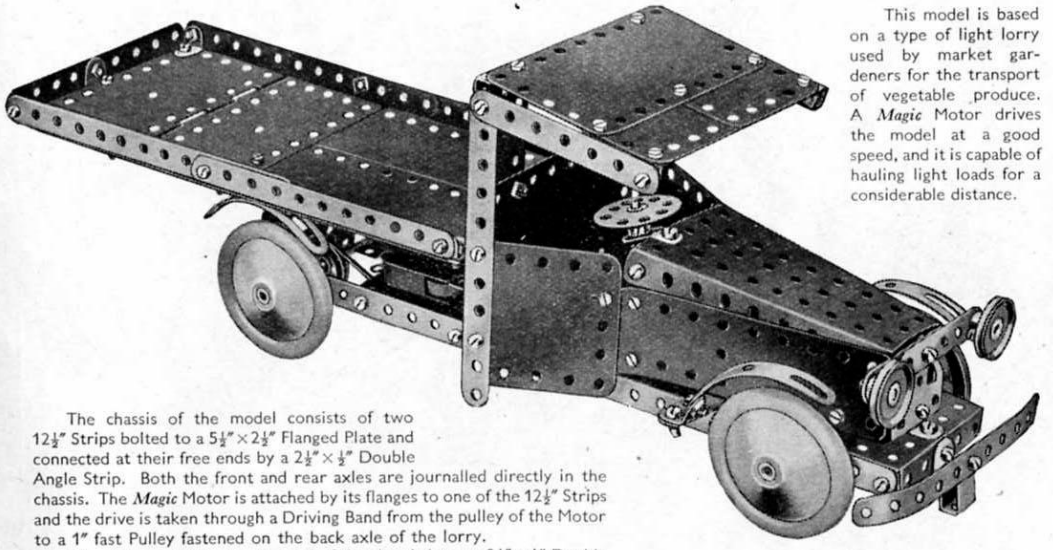
The Cord 4 is tied to a 3½" Rod carrying a Bush Wheel fitted with a ⅜" Bolt. It is then passed over the ½" Pulley 5, and tied to the Double Bracket at the top of the jib. This ½" Pulley 5 is clamped loosely between two ⅜" Washers by two Spring Clips to form a deep-grooved pulley.

The Cord 6 is wound around the Crank Handle and is tied to the Stepped Bent Strip at the top of the dipper stick.



This model represents a steam-operated mechanical digger, and it can be set to work with small loads of suitable material such as pebbles, etc., in a realistic manner.

4.19 MOTOR LORRY



This model is based on a type of light lorry used by market gardeners for the transport of vegetable produce. A *Magic* Motor drives the model at a good speed, and it is capable of hauling light loads for a considerable distance.

The chassis of the model consists of two 12½" Strips bolted to a 5½"×2½" Flanged Plate and connected at their free ends by a 2½"×½" Double Angle Strip. Both the front and rear axles are journalled directly in the chassis. The *Magic* Motor is attached by its flanges to one of the 12½" Strips and the drive is taken through a Driving Band from the pulley of the Motor to a 1" fast Pulley fastened on the back axle of the lorry.

The platform is fixed to the end of the chassis by two 2½"×½" Double Angle Strips, the ends of which can be seen in Fig. 4.19a, and also to the back of the cab by a 1½"×½" Double Angle Strip. The front bumper consists of a 5½" Strip curved to shape and fastened by a Stepped Bent Strip to the 5½"×2½" Flanged Plate forming the front of the chassis. The head-lamps, which are 1" Pulleys, are fixed in place by ⅜" Bolts pushed through the 2½" Strips into the bosses of the Pulleys and held by the set-screws.

Note : The Motor used in this model is not included in the Outfit.

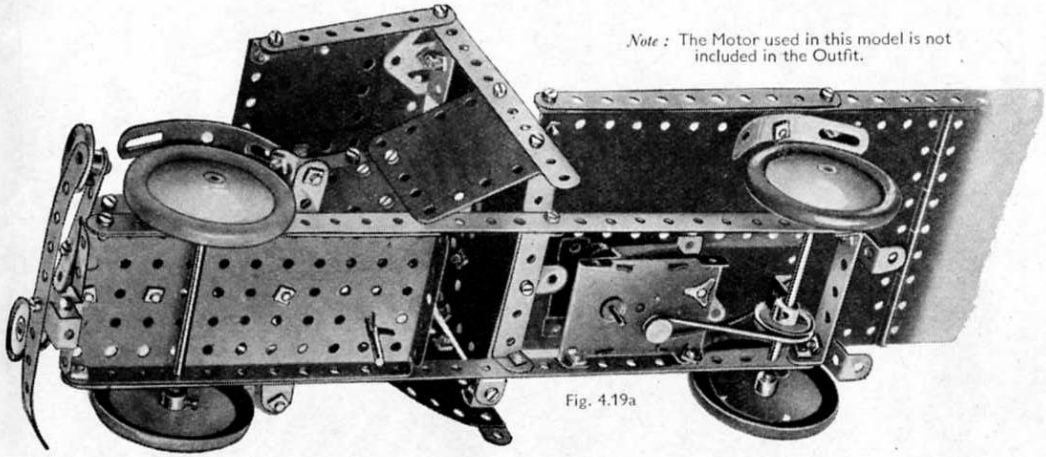
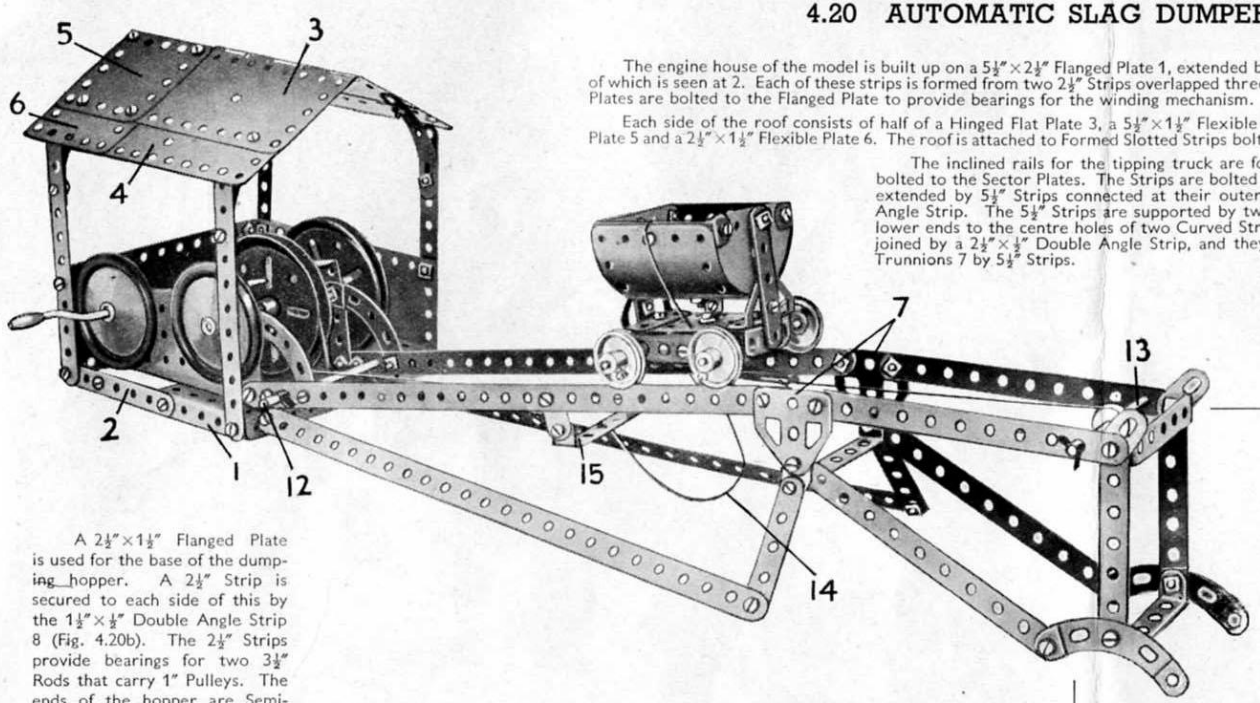


Fig. 4.19a

4.20 AUTOMATIC SLAG DUMPER



The engine house of the model is built up on a 5½" × 2½" Flanged Plate 1, extended by two compound strips, one of which is seen at 2. Each of these strips is formed from two 2½" Strips overlapped three holes. Two Flanged Sector Plates are bolted to the Flanged Plate to provide bearings for the winding mechanism.

Each side of the roof consists of half of a Hinged Flat Plate 3, a 5½" × 1½" Flexible Plate 4, a 2½" × 2½" Flexible Plate 5 and a 2½" × 1½" Flexible Plate 6. The roof is attached to Formed Slotted Strips bolted to the upright 5½" Strips.

The inclined rails for the tipping truck are formed from two 12½" Strips bolted to the Sector Plates. The Strips are bolted to Flat Trunnions 7, and are extended by 5½" Strips connected at their outer ends by a 2½" × ½" Double Angle Strip. The 5½" Strips are supported by two 3½" Strips bolted at their lower ends to the centre holes of two Curved Strips. The Curved Strips are joined by a 2½" × ½" Double Angle Strip, and they are connected to the Flat Trunnions 7 by 5½" Strips.

A 2½" × 1½" Flanged Plate is used for the base of the dumping hopper. A 2½" Strip is secured to each side of this by the 1½" × ½" Double Angle Strip 8 (Fig. 4.20b). The 2½" Strips provide bearings for two 3½" Rods that carry 1" Pulleys. The ends of the hopper are Semi-Circular Plates joined by two 2½" × ½" Double Angle Strips. The two 1 11/16" radius Curved Plates that form the bottom and sides of the hopper are bolted to the Double Angle Strips.

The hopper is pivoted on ⅜" Bolts attached to 2½" Strips, which are fixed to Trunnions bolted to the 2½" × 1½" Flanged Plate.

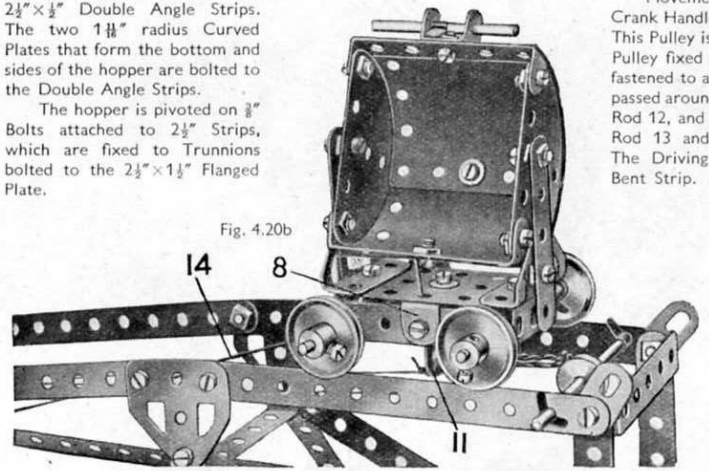


Fig. 4.20b

Movement of the hopper is controlled by a Crank Handle fitted with a 1" Pulley 9 (Fig. 4.20a). This Pulley is connected by a belt of Cord to a 3" Pulley fixed on a 4" Rod 10. A length of Cord fastened to a Stepped Bent Strip 11 (Fig. 4.20b) is passed around a second 3" Pulley on Rod 10, under Rod 12, and then is taken around a ½" Pulley on Rod 13 and fastened to a 2½" Driving Band. The Driving Band is secured to the Stepped Bent Strip.

The hopper is tilted so as to discharge its contents by Cord 14 (Fig. 4.20b). This Cord is tied to a Double Angle Strip 15 and passes through a hole in the base of the hopper truck. It is then fastened to the side of the hopper. The length of this Cord is arranged so that the hopper is tipped when it reaches the limit of its travel.

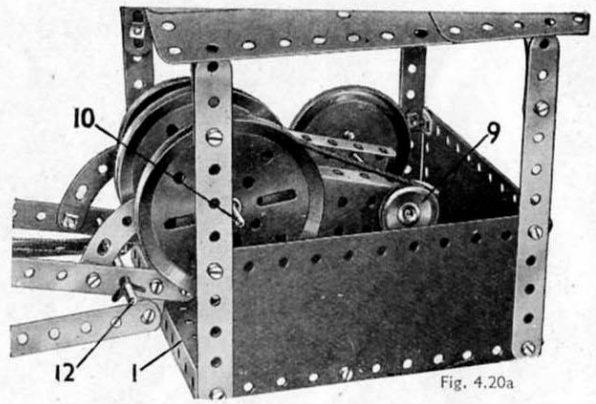
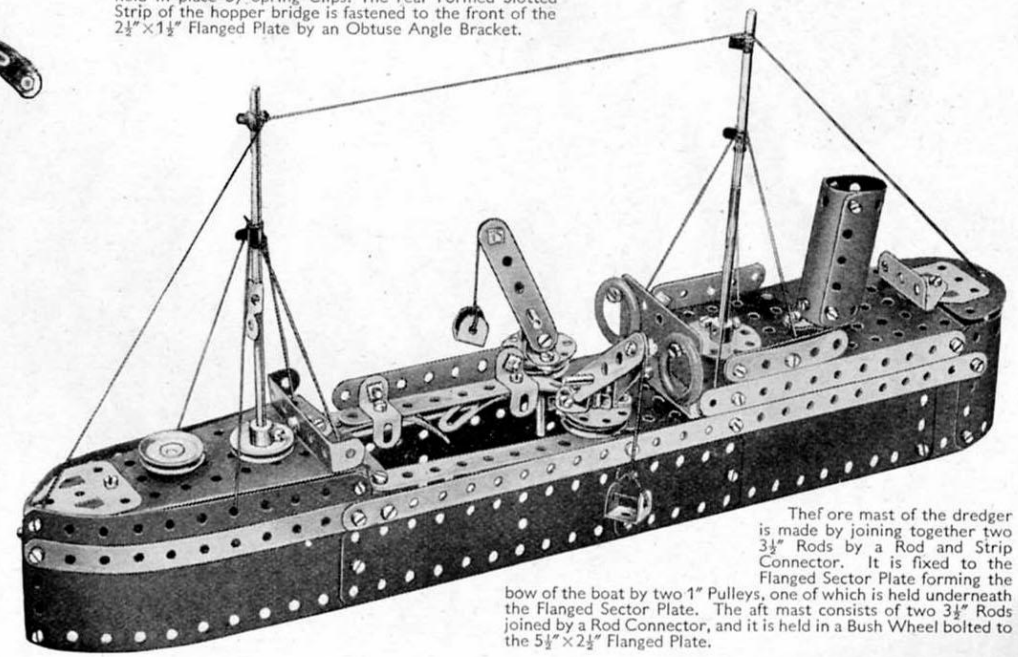


Fig. 4.20a

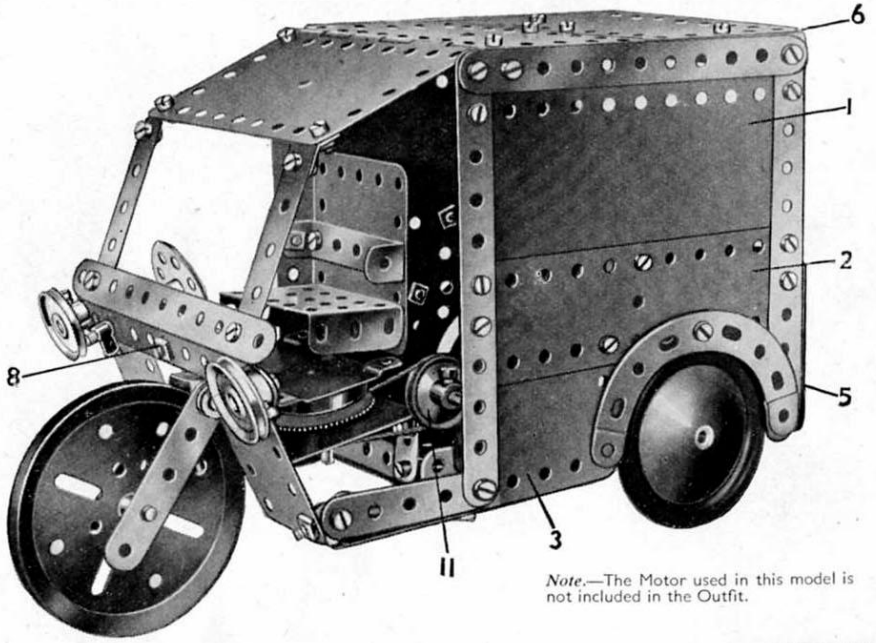
4.21 DREDGER

A 2½" × ½" Double Angle Strip is bolted to the front flange of the 5½" × 2½" Flanged Plate, and a Semi-Circular Plate is held between the flange and the Double Angle Strip by the same Bolt. The deck-cranes each consist of a 1" Pulley fastened to a 2" Rod, above which is placed a Wheel Disc fitted with Angle Brackets. Bolted securely to these are the 2½" Strips forming the jib. The complete units are held in place by Spring Clips. The rear Formed Slotted Strip of the hopper bridge is fastened to the front of the 2½" × 1½" Flanged Plate by an Obtuse Angle Bracket.



The fore mast of the dredger is made by joining together two 3½" Rods by a Rod and Strip Connector. It is fixed to the Flanged Sector Plate forming the bow of the boat by two 1" Pulleys, one of which is held underneath the Flanged Sector Plate. The aft mast consists of two 3½" Rods joined by a Rod Connector, and it is held in a Bush Wheel bolted to the 5½" × 2½" Flanged Plate.

4.22 MOTOR TRICYCLE DELIVERY VAN



Note.—The Motor used in this model is not included in the Outfit.

Each side of the van body consists of a 5½"×2½" Flexible Plate 1, a 5½"×1½" Plate 2 and a 2½"×2½" Plate 3. The sides are attached to the 2½" Strips 4 (Fig. 4.22a) by Angle Brackets, and to a 4½"×2½" Flexible Plate 5 by a 2½"×½" and a 1½"×½" Double Angle Strip. The Flexible Plate 5 is bolted to the Flanged Plate forming the chassis of the model.

The roof consists of a Hinged Flat Plate bolted to Angle Brackets, and a 4½"×2½" Flexible Plate attached to 2½" Double Angle Strips, one of which is shown at 6. The 2½" Strips used for the side pillars of the windscreen are attached to the roof and to the Strip 8 by Obtuse Angle Brackets.

The front wheel is locked on a 1" Rod passed through two 2½" Strips. These Strips are bolted to a Double Bracket.

A ⅜" Bolt is secured to the Double Bracket by the Nut 7 (Fig. 4.22b). The Bolt is then passed through an Angle Bracket fixed to the 5½" Strip 8, and a Fishplate 9 is locked the to Bolt by two nuts.

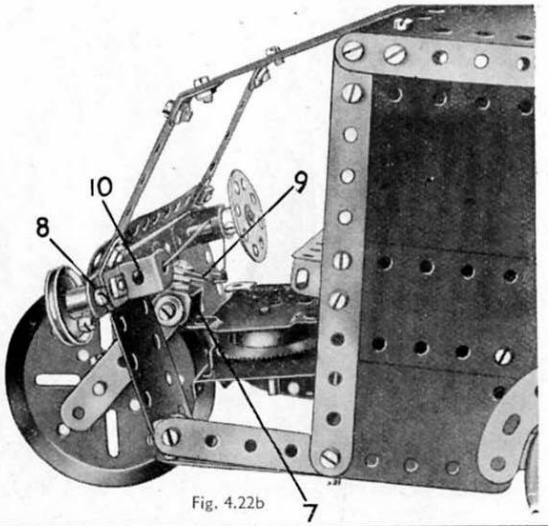


Fig. 4.22b

A Bush Wheel fixed on a 1½" Rod represents the steering wheel, and the Rod is passed through a Reversed Angle Bracket and the Strip 8. One end of a length of Cord is fastened to the Fishplate 9, and given several turns around the 1½" Rod. It is then passed through the Reversed Angle Bracket 10 and securely tied to the Fishplate.

The rear wheels are locked on a 4" Rod passed through holes in the sides of the 5½"×2½" Flanged Plate.

The *Magic* Motor is fastened to the Flanged Plate by two Fishplates, and the drive is taken from it to a 1" Pulley 11. This Pulley is locked on a 3½" Rod that rotates in Flat Trunnions secured to the Flanged Plate. A ½" Pulley on the same Rod is connected by a Driving Band to a 1" Pulley on the back axle.

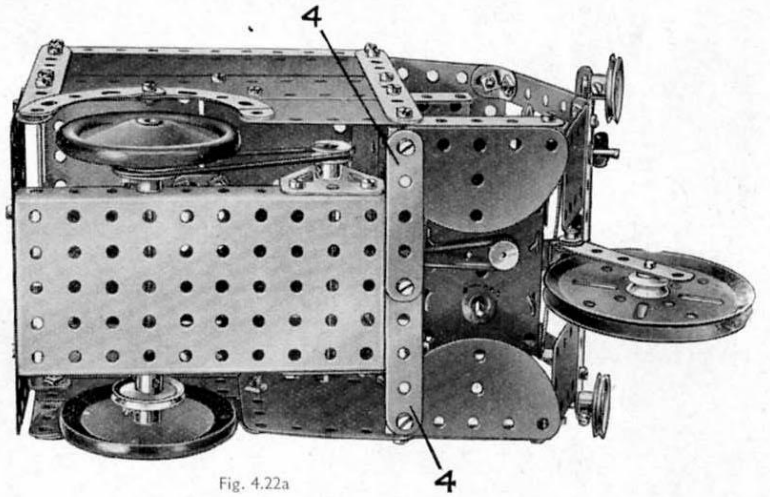
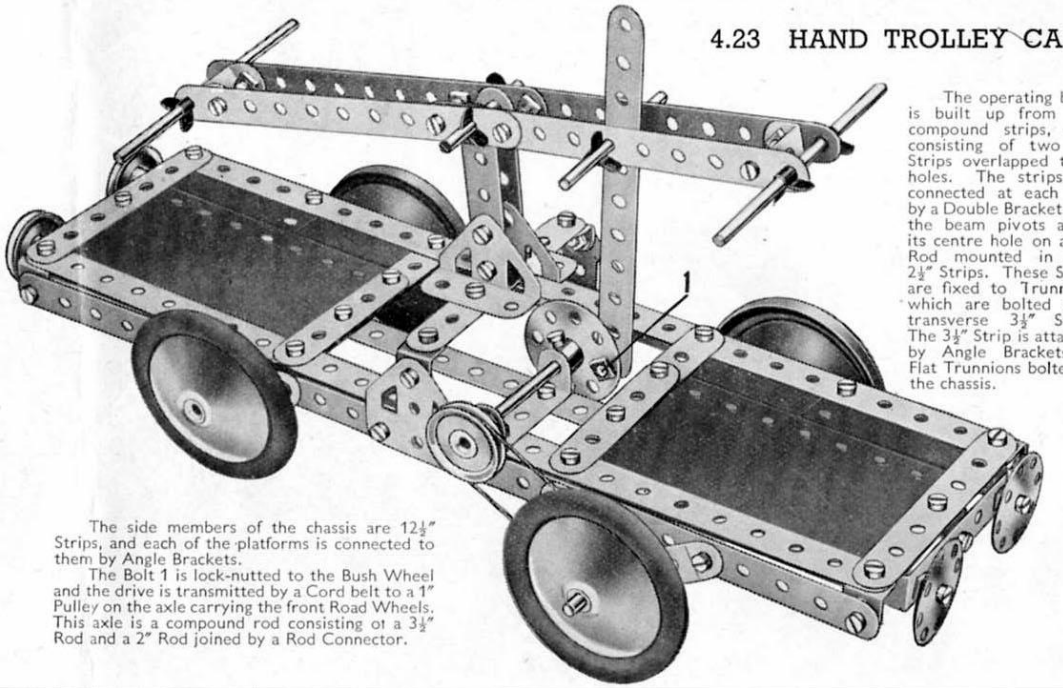


Fig. 4.22a

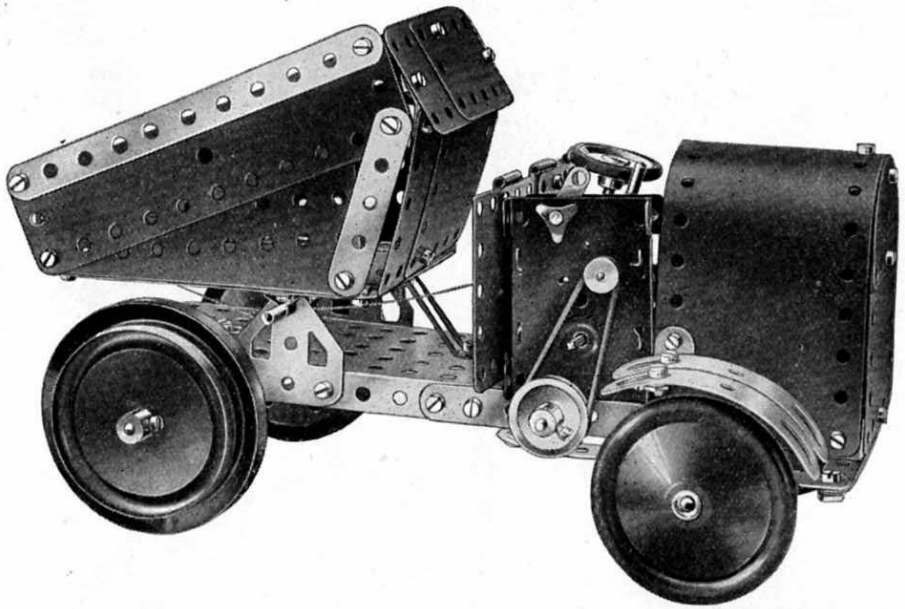
4.23 HAND TROLLEY CAR



The operating beam is built up from two compound strips, each consisting of two 5½" Strips overlapped three holes. The strips are connected at each end by a Double Bracket, and the beam pivots about its centre hole on a 1½" Rod mounted in two 2½" Strips. These Strips are fixed to Trunnions which are bolted to a transverse 3½" Strip. The 3½" Strip is attached by Angle Brackets to Flat Trunnions bolted to the chassis.

The side members of the chassis are 12½" Strips, and each of the platforms is connected to them by Angle Brackets.

The Bolt 1 is lock-nutted to the Bush Wheel and the drive is transmitted by a Cord belt to a 1" Pulley on the axle carrying the front Road Wheels. This axle is a compound rod consisting of a 3½" Rod and a 2" Rod joined by a Rod Connector.



4.24 DUMPER TRUCK

The chassis consists of a 5½"×2½" Flanged Plate extended by the 5½" Strips 1. These Strips are connected together by a 2½"×½" Double Angle Strip 2 (Fig. 4.24b). The front of the driver's compartment is formed by half of a Hinged Flat Plate, which is attached to the end of the Flanged Plate by a Fishplate.

The engine housing is formed by two 5½"×2½" Flexible Plates bolted to the Strips 1 and bent over and joined together at the top. The front and rear of the housing each consists of a Semi-Circular Plate and a 2½"×2½" Flexible Plate. A 2½"×1½" Flanged Plate forms the floor of the driver's compartment, and the seat is represented by a Trunnion bolted to a 1½"×½" Double Angle Strip.

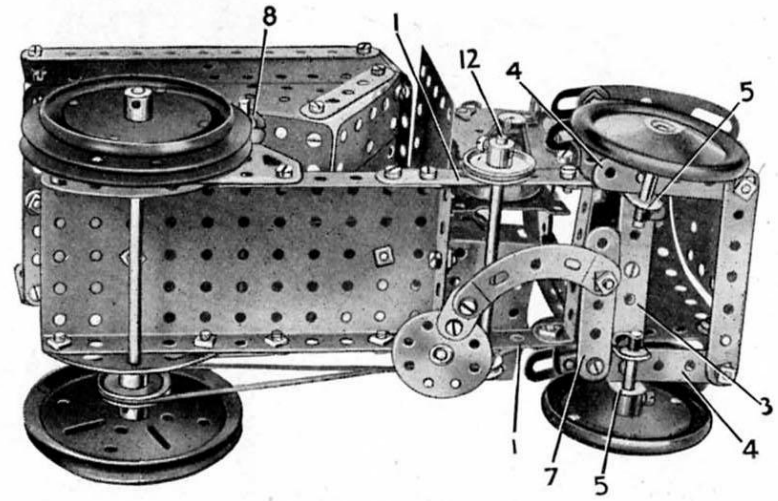


Fig. 4.24a

A 3½" Strip 3 (Fig. 4.24a) is bolted to a Double Angle Strip secured to the Strips 1. The 2½" Strips 4 and the Double Brackets 5 are free to turn on ⅜" Bolts fixed to the Strip 3 by two nuts. The Strips 4 are connected together by a 3½" Strip held by lock-nuts. Two Road Wheels are locked on 1½" Rods passed through the Double Brackets

The steering column is a 4" Rod, which is passed through the Trunnion 6 and the 2½"×1½" Flanged Plate. A Fishplate bolted to a Bush Wheel on this Rod is connected by a Curved Strip and lock-nuts to a 2½" Strip 7.

The driving axle is supported in Curved Strips bolted to the Flanged Plate, and consists of a 3½" and a 2" Rod joined by a Rod Connector.

Each side of the load carrier is formed by a Flanged Sector Plate and a 5½"×1½" Flexible Plate. Its bottom consists of two 4½"×2½" Flexible Plates overlapped three holes and bolted together. The back is made from two 1 11/16" radius Curved Plates and two 2½"×1½" Flexible Plates attached to the sides and bottom by Angle Brackets and Obtuse Angle Brackets. The load carrier pivots about a 3½" Rod, which is passed through Flat Trunnions bolted to the chassis and through an Angle Bracket fixed on each side of the carrier. One of the Angle Brackets is shown at 8.

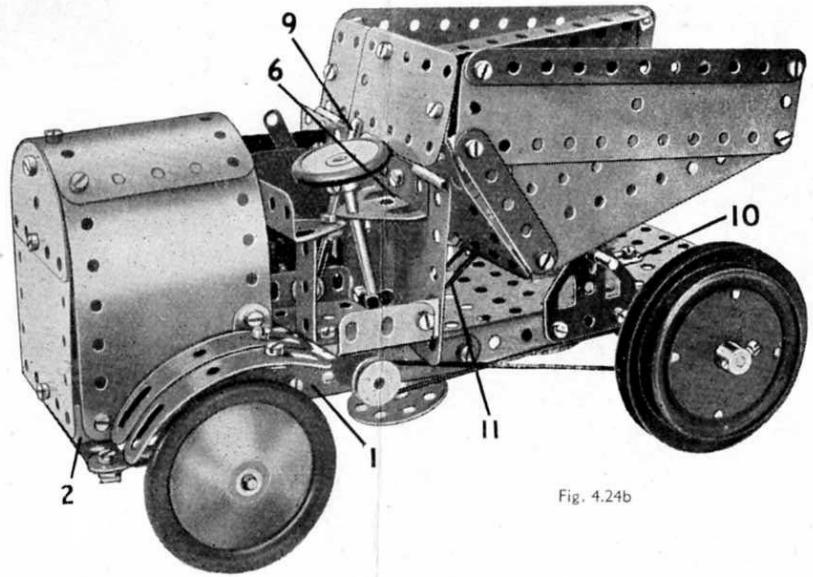


Fig. 4.24b

The mudguard over each of the rear wheels is represented by two Formed Slotted Strips. These are joined together by a Fishplate, and attached to the side of the engine housing by an Angle Bracket.

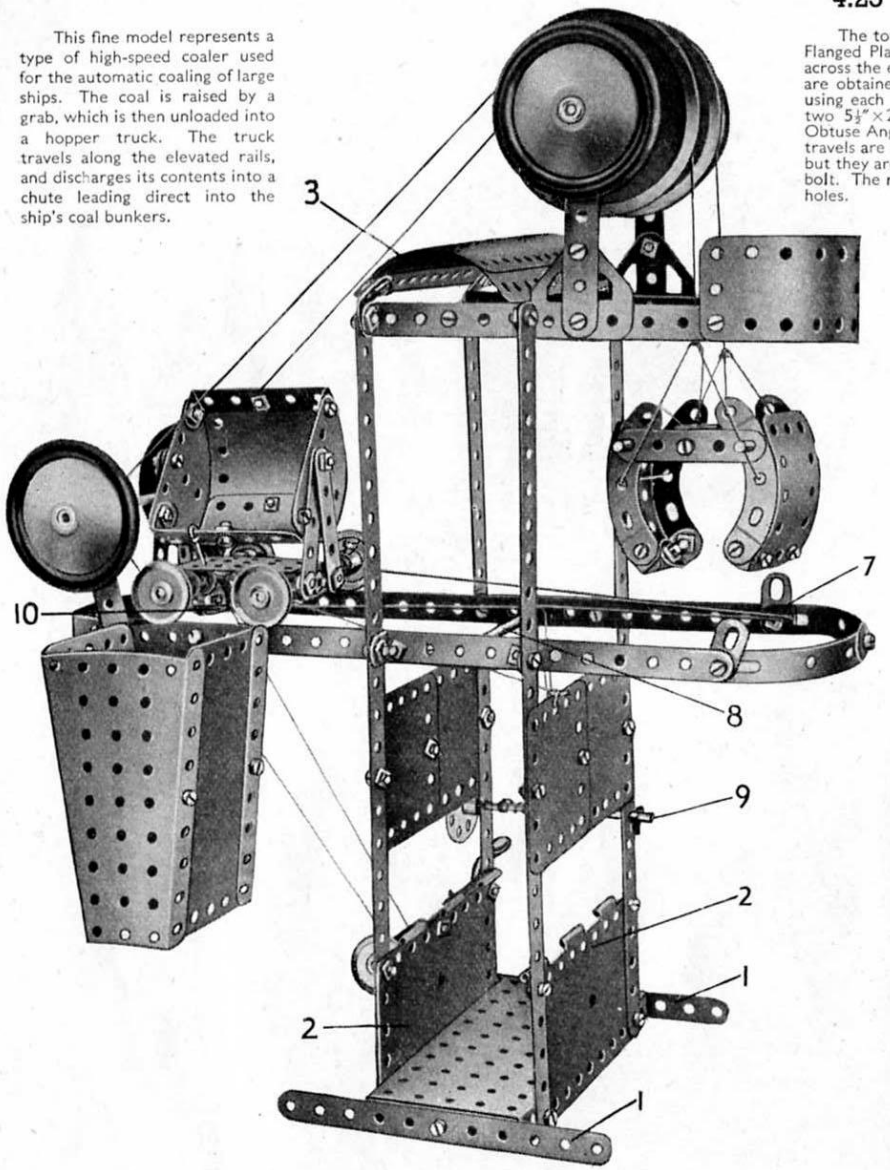
The carrier is tipped for unloading by a 2" Rod 9, held in a Rod and Strip Connector that is lock-nutted to the side of the 2½"×1½" Flanged Plate. A length of Cord from this Rod passes through the Obtuse Angle Bracket 10, and fastened to the front of the carrier. The carrier is returned to its normal position by the 2½" Driving Band 11.

The *Magic* Motor is bolted to a Fishplate attached to the chassis. The drive from the Motor is taken to a 1" Pulley on Rod 12, and a ½" Pulley on the same Rod drives a 1" Pulley on the driving axle through a crossed Driving Band.

Note : The Motor used in this model is not included in the Outfit.

4.25 AUTOMATIC SHIP COALER

This fine model represents a type of high-speed coaler used for the automatic coaling of large ships. The coal is raised by a grab, which is then unloaded into a hopper truck. The truck travels along the elevated rails, and discharges its contents into a chute leading direct into the ship's coal bunkers.



The tower is built from four 12½" Strips bolted to a 5½"×2½" Flanged Plate that forms the base. Two 5½" Strips 1 are bolted across the ends of the Flanged Plate to give stability. The plates 2 are obtained by removing the pin from a Hinged Flat Plate and using each half separately. The top of the tower is formed from two 5½"×2½" Flexible Plates 3 attached to the 12½" Strips by Obtuse Angle Brackets. The rails on which the dumper truck travels are attached to the tower by 2½"×½" Double Angle Strips, but they are spaced from the Double Angle Strips by a nut on each bolt. The rails are each made from two 5½" Strips overlapped five holes.

The Rod carrying the 3" Pulleys 4 is passed through the ends of 3½" Strips 5.

The dumper truck is made up from two 2½"×2½" Curved Plates and two Semi-Circular Plates joined together by 2½"×½" Double Angle Strips and pivoted by ⅜" Bolts on 2½" Strips 6 (Fig. 4.25a). The truck base is a 2½"×1½" Flanged Plate, and a Double Bracket is bolted to the centre of each flange to provide bearings for 3½" Rods fitted with 1" Pulleys. Cord is tied to one axle, and is passed through the Angle Bracket 7, over Rod 8, and then wound around Rod 9, which carries a Bush Wheel. The other end of the Cord is passed over the Rod 8, threaded through the Angle Bracket 10, and then attached to the other axle of the truck.

A piece of Cord 11 is attached to one side of the body of the truck and then is passed through the Flanged Plate and tied to the side of the tower, as shown in Fig. 4.25b. The Cord is adjusted so that the body of the truck is tipped sideways when it reaches the chute.

The Cords that operate the grab are passed over the 3" Pulleys 4, then over the Rod 12, and finally are wound around the Crank Handle.

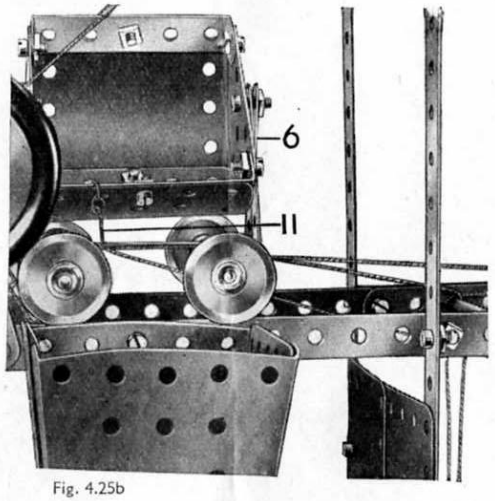


Fig. 4.25b

With this model is it possible to carry out most of the essential movements of a real coaling plant. The hopper truck is automatically unloaded as it reaches the limit of its travel by an ingenious system of cords.

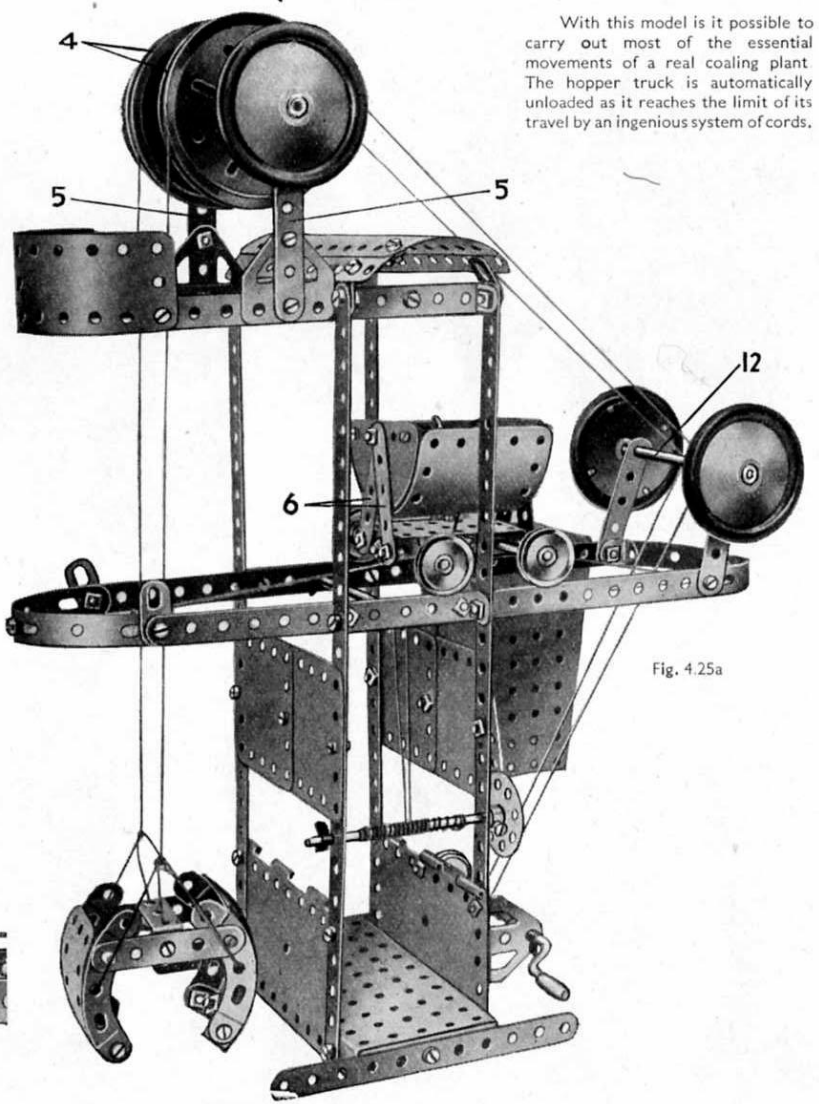
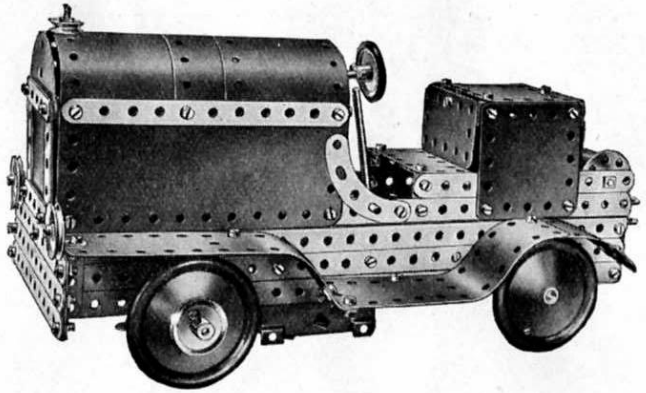


Fig. 4.25a

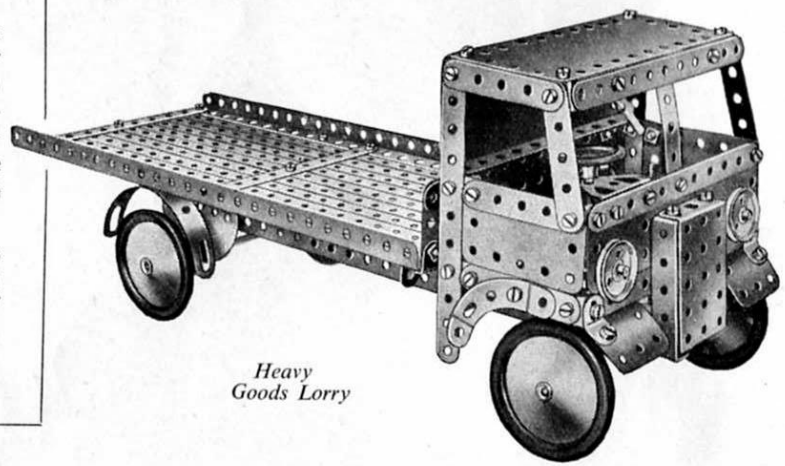


Industrial Tractor

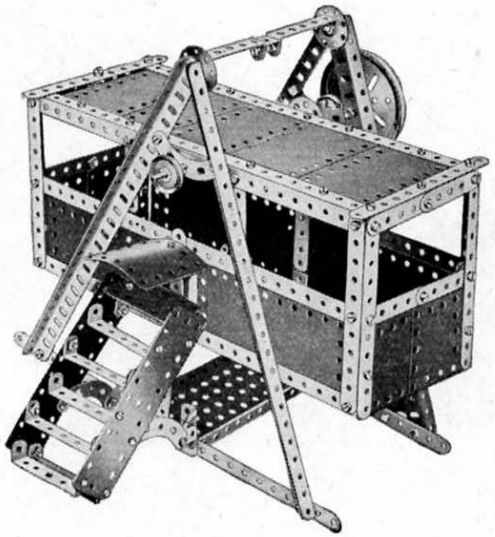
BUILD BIGGER AND BETTER MODELS

When you have built all the models shown in this Book of Instructions, you will be keen to build bigger and more elaborate models. Your next step is to purchase a Meccano No. 4a Accessory Outfit containing all the parts required to convert your No. 4 into a No. 5 Outfit. You will then be able to build the full range of No. 5 Outfit models, a selection of which is illustrated on this page.

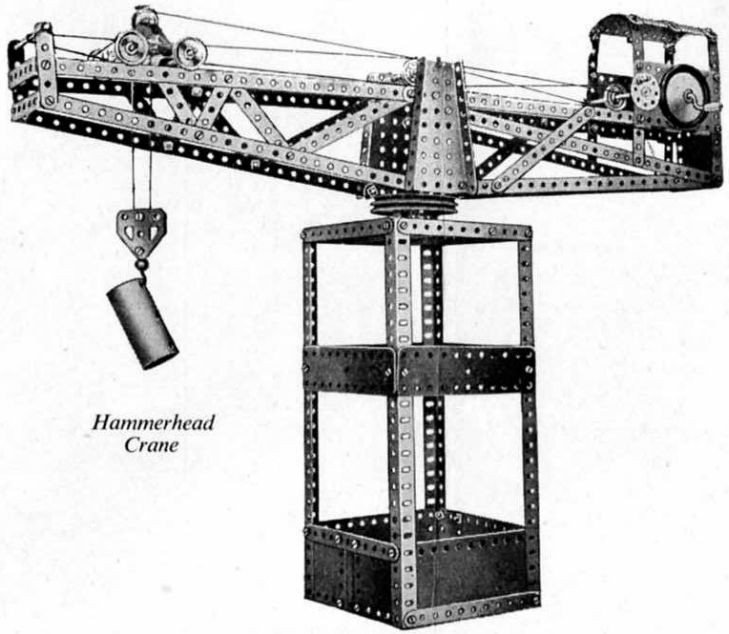
If you prefer to do so, you can build up and develop your Outfit quite easily by adding various parts to it from time to time. The model-building possibilities of the Meccano System are unlimited, and the more Meccano parts you have the bigger and better the models you will be able to build.



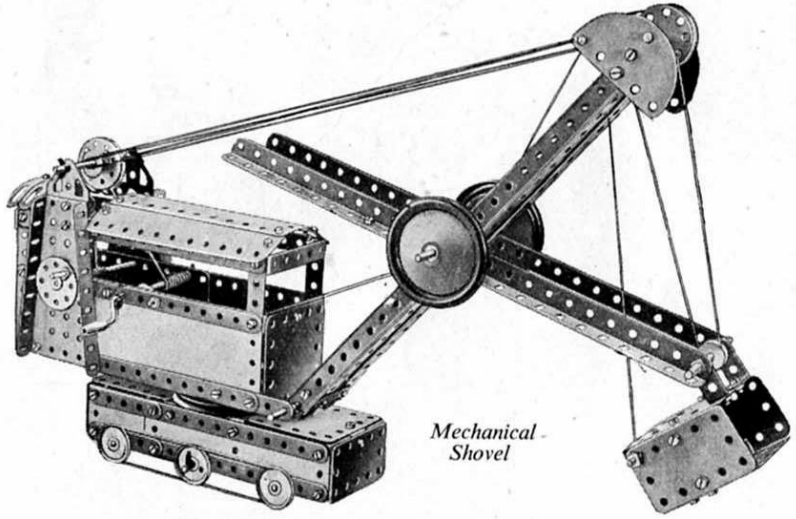
Heavy Goods Lorry



Giant Swing Boat



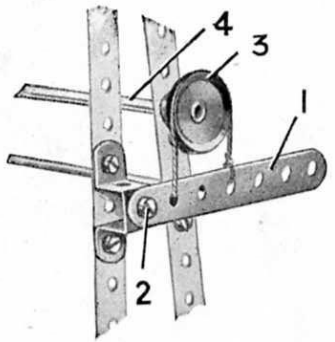
Hammerhead Crane



Mechanical Shovel

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

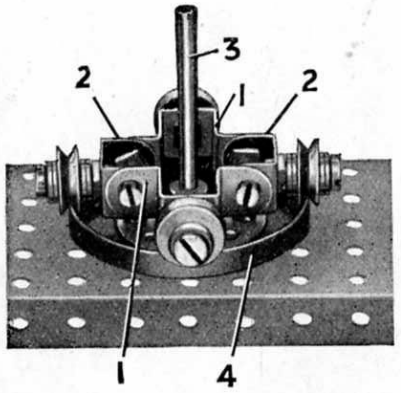
USEFUL BAND BRAKE



S.M.111. The brake lever consists of a 3½" Strip 1, pivotally attached at a suitable point on the frame of the model, to be fitted, by means of a lock-nutted ⅜" Bolt 2. The driven shaft 4 is fitted at one end with a 1" fast Pulley 3 round which a short length of Cord is passed. The two ends of this Cord are secured to the brake lever at the points shown in the illustration.

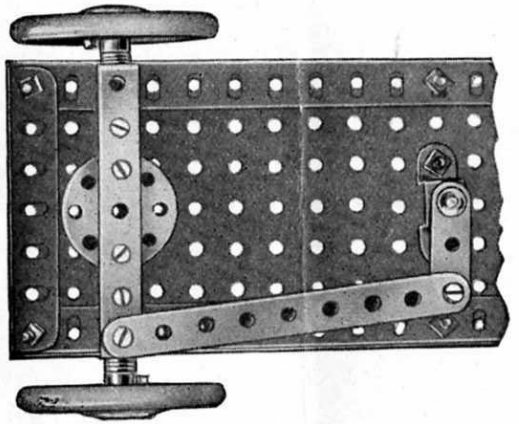
If increased braking effect is desired a larger Pulley may be used in place of the 1" fast Pulley 3, the brake lever 1 being attached in a lower position if necessary. Alternatively a weight can be hung from the end of the brake lever.

BUILT-UP ROLLER BEARING



S.M.136. The spider frame is built up from Double Bent Strips 1 connected together by two Double Brackets 2. The four wheels used are represented by ½" loose Pulleys journalled on Pivot Bolts secured to the outer ends of the four arms of the frame. Four Washers, two on each side of the Pulleys are passed on to the shank of each of the Pivot Bolts that are attached to the Double Brackets 2. In the case of the other two Pivot Bolts, two Washers are placed against the external side only of the Pulley.

SIMPLE STEERING GEAR



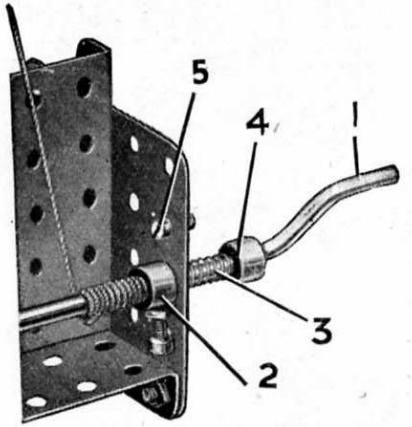
S.M.162 The simple steering above will be found suitable for most small model vehicles.

In this example the two front wheels are mounted on separate stub axles that are secured to each end of a rigid front axle. The base of the chassis consists of two long Angle Girders connected together at the front end by a 3½" Angle Girder and filled in along their length by means of 5½" × 3½" Flat Plates.

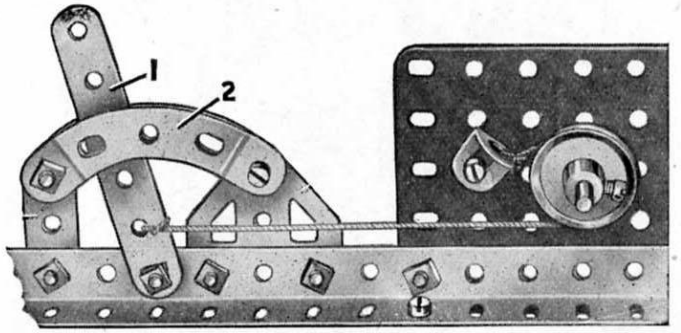
The front axle, a 3½" × ½" Double Angle Strip, is pivotally mounted at its centre on a Bush Wheel and short Rod. It is fitted, ½" from each end, with a ½" × ½" Angle Bracket, this forming the inner bearing for its respective stub axle. The outer bearing for the axle consists of the upturned lug of the Double Angle Strip. One end of this latter part is fitted with a pivotally attached 4½" Strip, by means of which the front axle is linked up to a Crank fixed to the steering column.

SAFETY CATCH FOR CRANE WINDING GEAR

S.M.125. The Compression Spring 3 is mounted on the Crank Handle 1 between the Collar 4 and a Washer, and normally holds the Collar 2 against the inner side of the plate. The Collar 2 is fitted with a ⅜" Bolt, and if the Crank Handle commences to rotate, the head of this Bolt strikes against the stop 5 and prevents further movement.



BRAKE LEVER and QUADRANT



S.M.112. This mechanism is a form of band brake in which the lever 1 can be held in any position by means of the quadrant 2. In this way varying pressures can be applied to the Pulley forming the brake drum.

One end of the brake Cord is attached to a ½" × ½" Angle Bracket bolted in a suitable position on the model. After passing round the 1" fast Pulley forming the brake drum the cord is secured at the next to bottom hole of a 3" Strip 1. This Strip forms the brake lever, and it is secured to the frame of the model by a lock-nutted Bolt.

CONTENTS OF MECCANO OUTFITS

O	Oa	1	1a	2	2a	3	3a	4	4a	No.	Description of Parts	5	5a	6	6a	7	7a	8	8a	9	9a	10
—	—	—	—	—	2	2	2	4	6	1	Perforated Strips, 12½"	10	2	12	—	12	2	14	—	14	10	24
—	—	—	—	—	—	—	—	—	—	1a	,, ,, 9½"	—	—	—	—	—	—	—	—	—	6	6
—	—	—	—	—	—	—	—	—	—	1b	,, ,, 7½"	—	—	—	—	—	—	2	2	4	4	6
4	—	4	—	4	2	6	2	8	6	2	,, ,, 5½"	14	—	14	4	18	3	21	3	24	12	36
—	—	—	—	—	—	—	—	—	—	2a	,, ,, 4½"	—	—	—	—	—	6	6	—	6	2	8
—	—	—	—	—	—	—	2	2	—	3	,, ,, 3½"	2	2	4	2	6	—	6	—	6	12	18
—	—	—	—	—	—	—	—	—	—	4	,, ,, 3"	—	2	2	—	2	4	6	2	8	4	12
2	2	4	2	6	3	9	—	9	3	5	,, ,, 2½"	12	—	12	—	12	6	18	18	36	36	72
—	—	—	—	—	—	—	—	—	—	6	,, ,, 2"	—	—	—	—	—	2	2	2	4	8	12
—	—	—	—	—	—	—	—	—	2	6a	,, ,, 1½"	2	—	2	2	4	2	6	—	6	4	10
—	—	—	—	—	—	—	—	—	—	7	Angle Girders, 24½"	—	—	—	—	—	—	—	—	—	8	8
—	—	—	—	—	—	—	—	—	—	7a	,, ,, 18½"	—	—	—	—	—	—	—	2	2	6	8
—	—	—	—	—	—	—	—	—	4	8	,, ,, 12½"	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"	—	—	—	—	—	—	—	—	—	8	8
—	—	—	—	—	—	—	—	—	—	9c	,, ,, 3"	—	—	—	—	—	—	—	—	—	4	4
—	—	—	—	—	—	—	—	—	—	9d	,, ,, 2½"	—	—	—	—	—	—	—	2	2	6	8
—	—	—	—	—	—	—	—	—	—	9e	,, ,, 2"	—	—	—	—	—	—	—	—	—	4	4
—	—	—	—	—	—	—	—	—	—	9f	,, ,, 1½"	—	—	—	—	—	—	—	2	2	6	8
4	—	4	—	4	1	5	—	5	3	10	Fishplates	8	—	8	4	12	8	20	3	23	1	24
—	—	—	—	—	2	2	—	2	2	11	Double Brackets	4	—	4	—	4	1	5	3	8	4	12
4	4	8	—	8	—	8	—	8	4	12	Angle Brackets, ½"×½"	12	4	16	2	18	16	34	2	36	14	50
—	—	—	—	—	—	—	—	—	2	12a	,, ,, 1"×1"	2	—	2	2	4	2	6	—	6	2	8
—	—	—	—	—	—	—	—	—	—	12b	,, ,, 1"×½"	—	—	—	—	—	2	2	—	2	6	8
—	—	—	—	—	—	—	4	4	—	12c	Obtuse Angle Brackets, ½"×½"	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	3	4
—	—	—	—	—	—	—	—	—	—	14	,, ,, 6½"	—	1	1	—	1	2	3	—	3	1	4
—	—	—	—	—	—	—	—	—	2	15	,, ,, 5"	2	—	2	2	2	4	4	—	4	2	6
—	—	—	—	—	—	—	—	—	1	15a	,, ,, 4½"	1	—	1	2	3	2	5	—	5	1	6
—	—	—	—	—	2	2	—	2	—	15b	,, ,, 4"	2	—	2	—	2	—	2	—	2	—	2
1	1	2	—	2	1	3	1	4	—	16	,, ,, 3½"	4	—	4	—	4	1	5	—	5	3	8
—	—	—	—	—	—	—	—	—	—	16a	,, ,, 2½"	—	—	—	—	—	—	—	3	3	3	6
—	—	—	—	—	—	—	—	—	—	16b	,, ,, 3"	—	—	—	—	—	—	—	—	—	4	4
1	1	2	—	2	—	2	—	2	—	17	,, ,, 2"	2	—	2	—	2	3	5	—	5	3	8
—	—	—	—	—	1	1	1	2	2	18a	,, ,, 1½"	4	—	4	—	4	—	4	—	4	2	6
—	—	—	—	—	—	—	1	1	—	18b	,, ,, 1"	1	—	1	—	1	1	2	—	2	2	4
—	—	—	—	—	—	—	2	2	—	19b	Pulleys, 3" diam. with boss and screw	2	—	2	—	2	—	2	—	2	4	6
—	—	—	—	—	—	—	—	—	—	19c	Pulley, 6" diam. with boss and screw	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	1	—	1	—	1	—	19g	Crank Handles, 3½" shaft with grip	1	—	1	—	1	—	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	19h	,, ,, 5" ,, ,, ...	—	1	1	—	1	—	1	—	1	—	1
1	—	1	—	—	—	—	—	—	—	19s	,, ,, 3½" shaft without grip	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	20	Flanged Wheels, 1⅛" diameter	—	—	—	—	—	4	4	—	4	—	4
—	—	—	—	—	—	—	—	—	—	20a	Pulleys, 2" diam. with boss and screw ...	—	—	—	2	2	2	4	2	6	—	6
—	—	—	—	—	—	—	—	—	—	20b	Flanged Wheels, ¾" diameter	—	—	—	4	4	—	4	—	4	4	8
—	—	—	—	—	—	—	—	—	—	21	Pulleys, 1½" diam. with boss and screw ...	—	—	—	—	—	2	2	—	2	—	2
2	2	4	—	4	—	4	1	5	—	22	,, 1" ,, ,, ,, ,, ,,	5	—	5	—	5	—	5	—	5	3	8
—	—	—	—	—	—	—	—	—	2	22a	,, 1" ,, without boss ...	2	—	2	—	2	2	4	—	4	2	6
—	—	—	—	—	1	1	—	1	—	23	,, ½" ,, ,, ,, ,, ...	1	—	1	—	1	2	3	—	3	1	4
—	—	—	—	—	—	—	—	—	—	23a	,, ½" ,, with boss and screw ...	—	1	1	—	1	—	1	—	1	1	2
1	—	1	—	1	—	1	—	1	—	24	Bush Wheels, 1⅜" diam.	1	—	1	—	1	1	2	—	2	4	6
—	—	—	—	—	2	2	—	2	2	24a	Wheel Discs, 1⅜" diam. without bush ...	4	—	4	—	4	—	4	—	4	—	4
—	—	—	—	—	—	—	—	—	—	25	Pinions, ⅜" diam., ½" face, 25 teeth ...	—	—	—	—	—	—	—	1	1	3	4
—	—	—	—	—	—	—	—	—	—	25a	,, ⅜" ,, ½" ,, 25 ,, ...	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	26	,, ⅜" ,, ½" ,, 19 ,, ...	—	—	—	2	2	1	3	1	4	4	8
—	—	—	—	—	—	—	—	—	—	26a	,, ½" ,, ½" ,, 19 ,, ...	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	26b	,, ½" ,, ⅜" ,, 19 ,, ...	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	27	Gear Wheels, 1½" diam., 50 teeth ...	—	—	—	—	—	—	—	1	1	3	4
—	—	—	—	—	—	—	—	—	—	27a	,, ,, 1½" ,, 57 ,, ...	—	—	—	1	1	1	2	—	2	4	6
—	—	—	—	—	—	—	—	—	—	27b	,, ,, 3½" ,, 133 ,, ...	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	27c	,, ,, 2½" ,, 95 ,, ...	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	28	Contrate Wheels, 1½" diam., 50 teeth ...	—	—	—	—	—	1	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	29	,, ,, ⅝" ,, 25 ,, ...	—	—	—	—	—	1	1	1	2	—	2
—	—	—	—	—	—	—	—	—	—	30	Bevel Gears, ½" diam., 26 teeth ...	—	—	—	—	—	—	—	—	—	8	8
—	—	—	—	—	—	—	—	—	—	30a	,, ,, ⅜" ,, 16 ,, ...	—	—	—	—	—	—	—	1	1	—	1
—	—	—	—	—	—	—	—	—	—	30c	,, ,, 1½" ,, 48 ,, ...	—	—	—	—	—	—	—	1	1	—	1
—	—	—	—	—	—	—	—	—	—	31	Gear Wheels, 1" diam., ½" face, 38 teeth ...	—	—	—	—	—	—	—	—	—	2	2
1	1	2	—	2	—	2	—	2	—	32	Worms, ½" diam.	—	—	—	1	1	1	2	—	2	—	2
—	—	—	—	—	—	—	—	—	—	34	Spanners	2	—	2	—	2	—	2	—	2	—	2
—	—	—	—	—	—	—	—	—	—	34b	Box Spanners	—	—	—	—	—	—	—	1	1	—	1
4	—	4	—	4	2	6	2	8	6	35	Spring Clips	14	—	14	4	18	1	19	12	31	5	36
1	—	1	—	1	—	1	—	1	—	36	Screwdrivers	1	—	1	—	1	—	1	—	1	—	1
—	—	—	—	—	—	—	—	—	—	36a	,, longer	—	—	—	—	—	1	1	—	1	—	1
—	—	—	—	—	—	—	—	—	—	36c	Drifts	—	—	—	1	1	—	1	—	1	—	1
22	8	30	16	46	10	56	31	87	21	37a	Nuts	108	22	130	52	182	85	267	67	334	366	700
18	6	24	16	40	10	50	31	81	19	37b	Bolts, 7/32"	100	20	120	46	166	74	240	64	304	346	650
2	2	4	—	4	2	6	2	8	6	38	Washers	14	6	20	6	26	—	26	—	26	49	75
—	—	—	—	—	2	2	—	2	—	38d	,, ⅜" diam.	2	—	2	—	2	—	2	—	2	2	4
—	1	1	—	1	—	1	—	1	—	40	Hanks of Cord	1	1	2	1	3	—	3	3	6	—	6
—	—	—	—	—	—	—	—	—	—	41	Propeller Blades	—	—	—	—	—	—	—	2	2	2	4
—	—	—	—	—	—	—	—	—	—	43	Tension Springs, 2" long	—	—	—	1	1	—	1	—	1	3	4
—	—	—	—	—	1	1	—	1	—	44	Bent Strips, Stepped	1	—	1	—	1	—	1	—	1	1	2
—	—	—	—	—	—	—	—	—	1	45	Double Bent Strips	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
—	—	—	—	—	—	—	1	1	—	48	,, ,, ,, 1½"×½"	1	1	2	—	2	—	2	—	2	2	4
2	—	2	—	2	—	2	4	6	2	48a	,, ,, ,, 2½"×½"	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
—	—	—	—	—	—	—	—	—	—	50	Slide Pieces	—	—	—	—	—	—	—	1	1	1	2
—	—	—	—	—	—	—	1	1	—	51	Flanged Plates, 2½"×1½"	1	—	1	—	1	1	2	—	2	—	2
1	—	1	—	1	—	1	—	1	—	52	,, ,, 5½"×2½"	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	2	4
—	—	—	—	—	—	—	2	2	—	54	Flanged Sector Plates, 4½"	2	—	2	—	2	—	2	—	2	—	2
—	—	—	—	—	—	—	—	—	—	55a	Perforated Strips, Slotted, 2"	—	—	—	—	—	—	—	1	1	1	2
—	—	—	—	—	—	—	—	—	—	57b	Hooks, Loaded (Large)	—	—	—	—	—	1	1	—	1	—	1
—	1	1	—	1	—	1	—	1	—	57c	,, ,, (Small)	1	—	1	—	1	—	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	58	Spring Cord, 40" lengths	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	59	Collars with 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
—	—	—	—	—	—	—	—	—	—	63b	Strip Couplings	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	63c	Threaded Couplings	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	64	Threaded Bosses	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	65	Centre Forks	—	—	—	—	—	1	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	69c	Grub Screws, 7/64"	—	—	—	—	—	—	—	—	—	12	12
—	—	—	—	—	—	—	—	—	—	70	Flat Plates, 5½"×2½"	—	—	—	—	—	—	—	2	2	2	4
—	—	—	—	—	—	—	—	—	—	72	,, ,, 2½"×2½"	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	73	,, ,, 3"×1½"	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	76	Triangular Plates, 2½"	—	—	—	—	—	—	—	2	2	2	4
—	—	—	—	—	—	—	—	—	—	77	,, ,, 1"	—	—	—	—	—	2	2	—	2	2	4
—	—	—	—	—	—	—	—	—	—	78	Screwed Rods, 11½"	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	79a	,, ,, 6"	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	80a	,, ,, 3½"	—	—	—	—	—	1	1	—	1	—	1
—	—	—	—	—	—	—	—	—	2	80c	,, ,, 3"	2	—	2	—	2	—	2	—	2	—	2
—	—	—	—	—	—	—	—	—	—	81	,, ,, 2"	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	82	,, ,, 1"	—	—	—	—	—	—	—	—	—	2	2

Continued on following page

O	Oa	1	1a	2	2a	3	3a	4	4a	No.	Description of Parts	5	5a	6	6a	7	7a	8	8a	9	9a	10
—	—	—	—	—	—	—	—	—	—	89	Curved Strips, 5½" 10" radius ..	—	—	—	—	—	—	—	4	4	8	12
—	—	—	—	—	—	—	—	—	—	89a	" " Stepped, 3" 1¾" " ..	—	—	—	—	—	—	—	—	—	6	6
—	—	—	—	—	—	—	—	—	—	89b	" " " 4" 4½" " ..	—	—	—	—	—	—	—	2	2	6	8
—	—	—	—	—	—	—	—	—	—	90	" " 2½" 2⅝" " ...	—	2	2	—	2	2	4	—	4	8	12
2	—	2	—	2	2	4	—	4	—	90a	" " Stepped, 2½" 1⅜" " ...	4	—	4	—	4	—	4	—	4	4	8
—	—	—	—	—	—	—	—	—	—	94	Sprocket Chain, 40" lengths	—	—	—	—	—	1	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	95	Sprocket Wheels, 2" diam., 36 teeth	—	—	—	—	—	2	2	—	2	—	2
—	—	—	—	—	—	—	—	—	—	95a	" " 1½" " 28 "	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	95b	" " 3" " 56 "	—	—	—	—	—	—	—	1	1	1	2
—	—	—	—	—	—	—	—	—	—	96	" " 1" " 18 "	—	—	—	—	—	2	2	—	2	2	4
—	—	—	—	—	—	—	—	—	—	96a	" " ¾" " 14 "	—	—	—	—	—	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	Corner Gussets	—	—	—	—	—	2	2	—	2	2	4
—	—	—	—	—	—	—	—	—	—	109	Face Plates, 2½" diam.	—	—	—	—	—	2	2	—	2	2	4
—	—	—	—	—	—	—	—	—	—	110a	Rack Strips, 6½"	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	111	Bolts, ⅜"	—	2	2	—	2	1	3	—	3	15	18
—	—	—	—	—	—	—	—	—	2	111a	" ½"	2	—	2	—	2	4	6	—	6	12	18
2	2	4	—	4	2	6	—	6	—	111c	" ⅝"	6	—	6	—	6	—	6	6	12	12	24
—	—	—	—	—	—	—	—	—	—	111d	" 1½"	—	—	—	—	—	—	—	—	—	6	6
—	—	—	—	—	—	—	—	—	—	114	Hinges	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	1	115	Threaded Pins	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	Metal Balls, ⅜" diam.	—	—	—	—	—	—	—	24	24	—	24
—	—	—	—	—	—	—	—	—	—	118	Hub Discs, 5½" diam.	—	—	—	—	—	—	—	—	—	4	4
—	—	—	—	—	—	—	—	—	—	120b	Compression Springs, ½" long	—	—	—	—	—	1	1	—	1	3	4
—	—	—	—	—	—	—	—	—	—	124	Reversed Angle Brackets, 1"	—	—	—	—	—	—	—	2	2	2	4
—	1	1	—	1	1	2	—	2	2	125	" " " ½"	4	—	4	—	4	—	4	—	4	2	6
2	—	2	—	2	—	2	—	2	—	126	Trunnions	2	—	2	—	2	2	4	—	4	4	8
2	—	2	—	2	—	2	—	2	—	126a	Flat Trunnions	2	2	4	—	4	—	4	2	6	6	12
—	—	—	—	—	—	—	—	—	—	128	Bell Cranks, with boss	—	—	—	—	—	—	—	1	1	1	2
—	—	—	—	—	—	—	—	—	—	130	Eccentrics, Triple Throw, ¼", ⅜", ½" ...	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	130a	Eccentrics, Single Throw, ½"	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	133	Corner Brackets, 1½"	—	—	—	—	—	—	—	—	—	4	4
—	—	—	—	—	—	—	—	—	—	133a	" " 1"	—	—	—	—	—	—	—	2	2	—	2
—	—	—	—	—	—	—	—	—	—	134	Crank Shafts, 1" stroke	—	—	—	—	—	—	—	1	1	—	1
—	—	—	—	—	—	—	—	—	—	136	Handrail Supports	—	—	—	—	—	—	—	2	2	2	4
—	—	—	—	—	—	—	—	—	—	136a	" Couplings	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	137	Wheel Flanges	—	—	—	—	—	—	—	1	1	3	4
—	—	—	—	—	—	—	—	—	—	140	Universal Couplings	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	142a	Motor Tyres to fit 2" diam. rim	—	—	—	—	—	4	4	2	6	—	6
—	—	—	—	—	—	—	—	—	—	142b	" " " " 3" " "	—	—	—	—	—	—	—	—	—	6	6
—	—	—	—	—	—	—	—	—	—	143	Circular Girders, 5½" diam. ...	—	—	—	—	—	—	—	1	1	1	2
—	—	—	—	—	—	—	—	—	—	144	Dog Clutches	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	145	Circular Strips, 7½" diam. overall ...	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	146	" Plates, 6" diam.	—	—	—	—	—	—	—	—	—	4	4
—	—	—	—	—	—	—	—	—	—	146a	" " 4" "	—	—	—	—	—	—	—	1	1	1	2
—	—	—	—	—	—	—	—	—	—	147a	Pawls	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	1	147b	Pivot Bolt with 2 Nuts	1	—	1	—	1	1	2	1	3	3	6
—	—	—	—	—	—	—	—	—	—	147c	Pawls without Boss	—	—	—	—	—	1	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	148	Ratchet Wheels	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	154a	Corner Angle Brackets, ½" R.H.	—	—	—	—	—	—	—	1	1	—	1
—	—	—	—	—	—	—	—	—	—	154b	" " ½" L.H.	—	—	—	—	—	—	—	1	1	—	1
2	2	4	—	4	—	4	—	4	—	155	Rubber Rings, for 1" pulley	4	—	4	—	4	—	4	—	4	4	8
—	—	—	—	—	—	—	—	—	—	157	Fans, 2" diam.	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	160	Channel Bearings, 1½"×1"×½"	—	—	—	—	—	1	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	161	Girder Brackets, 2"×1"×½"	—	—	—	—	—	—	—	2	2	—	2
—	—	—	—	—	—	—	—	—	—	162	Boilers, Complete, 5" long by 2½" diam. ...	—	—	—	1	1	—	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	162a	Boiler Ends, 2½" diam. by ⅜"	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	162b	Boilers without Ends, 4½" long by 2½" diam. ...	—	—	—	—	—	—	—	1	1	—	1
—	—	—	—	—	—	—	—	—	—	163	Sleeve Pieces, 1½" long by 11/16" diam. ...	—	—	—	2	2	—	2	—	2	—	2
—	—	—	—	—	—	—	—	—	—	164	Chimney Adaptors, ⅝" diam. by ½" high ...	—	—	—	1	1	1	2	—	2	2	4
—	—	—	—	—	—	—	—	—	—	165	Swivel Bearings	—	—	—	—	—	2	2	—	2	—	2
—	—	—	—	—	—	—	—	—	—	166	End Bearings	—	—	—	—	—	1	1	—	1	1	2
—	—	—	—	—	—	—	—	—	—	167b	Flanged Ring, 9⅞" diam.	—	—	—	—	—	—	—	—	—	2	2
—	—	—	—	—	—	—	—	—	—	168	Ball Bearings, 4" diam.	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	171	Socket Couplings	—	—	—	—	—	—	—	—	—	1	1
—	—	—	—	—	—	—	—	—	—	175	Flexible Coupling Units	—	—	—	—	—	—	—	—	—	1	1
—	—	—	1	1	—	1	—	1	—	176	Anchoring Springs for Cord	1	—	1	—	1	—	1	—	1	3	4
—	—	—	—	—	—	—	—	—	—	179	Rod Sockets	—	—	—	—	—	—	—	2	2	—	2
—	—	—	—	—	—	—	—	—	—	185	Steering Wheels, 1¾" diam....	—	—	—	—	—	1	1	—	1	—	1
—	—	—	1	1	—	1	—	1	—	186	Driving Bands, 2½" Light	1	—	1	2	3	—	3	—	3	—	3
—	—	—	—	—	—	—	—	—	1	186a	" " 6" "	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
—	—	—	1	1	1	2	2	4	—	187	Road Wheels, 2½" diam.	4	—	4	—	4	—	4	—	4	—	4
—	—	—	—	—	—	—	—	—	—	187a	Conical Disc, 1⅞" diam.	—	—	—	—	—	4	4	2	6	—	6
—	—	—	2	2	—	2	—	2	2	188	Flexible Plates, 2½"×1½"	4	—	4	2	6	2	8	2	10	2	12
—	2	2	—	2	—	2	—	2	2	189	" " 5½"×1½"	4	—	4	2	6	2	8	2	10	2	12
—	—	—	2	2	—	2	2	4	—	190	" " 2½"×2½"	4	2	6	2	8	2	10	4	14	2	16
—	—	—	—	—	—	—	—	—	—	190a	" " 3½"×2½"	—	—	—	—	—	—	—	—	—	4	4
—	—	—	1	1	1	2	—	2	—	191	" " 4½"×2½"	2	—	2	—	2	4	6	—	6	10	16
—	—	—	—	—	2	2	—	2	2	192	" " 5½"×2½"	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
—	—	—	—	—	—	—	1	1	—	198	Hinged Flat Plates, 4½"×2½"	1	—	1	—	1	—	1	—	1	—	1
—	—	—	1	1	1	2	—	2	—	199	Curved Plates, U Section, 2½"×2½"×⅝" radius ...	2	—	2	—	2	—	2	—	2	10	12
—	—	—	2	2	—	2	—	2	—	200	Curved Plates, 2½"×2½"×1 11/16" radius	2	—	2	—	2	6	8	—	8	4	12
—	—	—	—	—	1	1	—	1	—	212	Rod and Strip Connectors	1	1	2	—	2	—	2	—	2	2	4
—	—	—	—	—	1	1	—	1	—	213	Rod Connectors	1	1	2	—	2	—	2	—	2	—	2
—	—	—	—	—	2	2	—	2	—	214	Semi-Circular Plates, 2½"	2	—	2	—	2	—	2	2	4	—	4
—	—	—	—	—	4	4	—	4	—	215	Formed Slotted Strips, 3"	4	—	4	4	8	—	8	—	8	4	12
—	—	—	—	—	—	—	—	—	1	216	Cylinders, 2½" long, 1¼" diam.	1	—	1	—	1	1	2	—	2	—	2

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

THE MECCANO SYSTEM

The foregoing list contains all the Meccano parts that are included in Outfits. It shows which parts are required to build up any Outfit into the one next larger. Thus it is helpful to boys who wish to add a few parts from time to time instead of buying an Accessory Outfit. It also enables a boy to check the contents of his Outfit at intervals, so that he can note and replace any missing parts.

There are in addition many Meccano parts that are not included in Outfits. These parts will be found in the illustrated list in the following pages, which includes every part in the Meccano System.

MECCANO PARTS

3

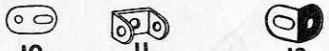
Perforated Strips

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″



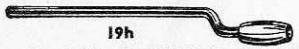
10 **11** **12**

10. Fishplate
11. Double Bracket
12. Angle Bracket, ½″×½″
12a. ,, ,, 1″×1″
12b. ,, ,, 1″×½″
12c. Obtuse Angle Bracket, ½″×½″

17

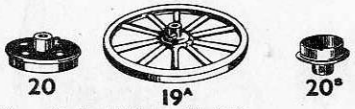
Axle Rods

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 Handle, 3½″ Shaft with grip
19h. ,, ,, 5″ ,, ,,
19s. ,, ,, 3½″ ,, without grip



20 **19A** **20B**

19a. Spoked Wheel, 3″ diam.
20. Flanged Wheel, 1½″ diam.
20b. ,, ,, ¾″ ,,

22

19C **23A** **22A** **20A**

Pulleys

19b. 3″ diam. with boss and screw
19c. 6″ ,, ,, ,,
20a. 2″ ,, ,, ,,
21. 1½″ ,, ,, ,,
22. 1″ ,, ,, ,,
22a. 1″ ,, without ,, ,,
23. ½″ ,, ,, ,,
23a. ½″ ,, with ,, ,,

24 **24A**

No.
24. Bush Wheel, 1⅜″ diam.
24a. Wheel Disc, 1⅜″ diam., without bush

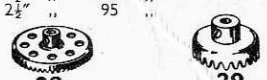
26

25. Pinion, ¾″ diam., ¼″ face, 25 teeth
25a. ,, ¾″ ,, ⅜″ ,, 25 ,,
25b. ,, ¾″ ,, ½″ ,, 25 ,,
26. ,, ¼″ ,, ¼″ ,, 19 ,,
26a. ,, ⅜″ ,, ⅜″ ,, 19 ,,
26b. ,, ½″ ,, ¾″ ,, 19 ,,

27 **27A** **27B**

Gear Wheels

27. 1¼″ diam. 50 teeth,
27a. 1″ ,, 57 ,,
27b. ¾″ ,, 133 ,,
27c. ½″ ,, 95 ,,



28 **29**

28. Contrate Wheel, 1½″ diam., 50 teeth
29. ,, ,, ¾″ ,, 25 ,,

30A & 30C **30**

30. Bevel Gear, ⅝″ diam., 26 teeth (for use in pairs)
30a. ,, ,, ½″ ,, 16 ,, } Can only be
30c. ,, ,, 1½″ ,, 48 ,, } used together

31 **32**

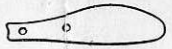
31. Gear Wheel, 1″ diam., ¼″ face, 38 teeth
32. Worm, ½″ diam.

34B

34. Spanner
34b. Box Spanner

35 **38D**

35. Spring Clip
36. Screwdriver
36a. ,,
36c. Drift (for levering bolt holes into line)
37. Nut and Bolt, ⅞″
37a. Nut
37b. Bolt, ⅞″
38. Washer
38d. ,, ¾″
40. Hank of Cord

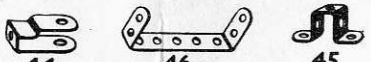


41

No.
41. Propeller Blade

43

43. Tension Spring, 2″ long

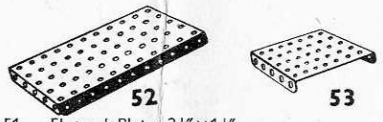


44 **46** **45**

44. Bent Strip, stepped
45. Double Bent Strip
46. Double Angle Strip, 2½″×1″
47. ,, ,, ,, 2½″×1½″
47a. ,, ,, ,, 3″×1½″
48. ,, ,, ,, 1½″×½″
48a. ,, ,, ,, 2½″×½″
48b. ,, ,, ,, 3½″×½″
48c. ,, ,, ,, 4½″×½″
48d. ,, ,, ,, 5½″×½″

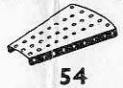
50

50. Slide Piece



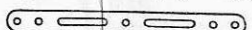
52 **53**

51. Flanged Plate, 2½″×1½″
52. ,, ,, 5½″×2½″
52a. Flat Plate, 5½″×3½″
53. Flanged Plate, 3½″×2½″
53a. Flat Plate, 4½″×2½″



54

54. Flanged Sector Plate, 4½″ long



55

55. Perforated Strip, slotted, 5½″ long
55a. ,, ,, ,, 2″ ,,

57B

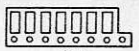
57b. Hook, Loaded, Large
57c. ,, ,, Small

58 **58B**

58. Spring Cord, 40″ Length
58a. Coupling Screw for Spring Cord
58b. Hook for Spring Cord

59

59. Collar, with screw



61

No.
61. Windmill Sail

62 **62B**

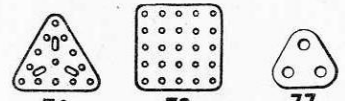
62. Crank
62a. Threaded Crank
62b. Double Arm Crank

63 **63B** **63C**

63. Coupling
63b. Strip Coupling
63c. Threaded Coupling

64 **65**

64. Threaded Boss
65. Centre Fork
69. Set Screw, 3/32″
69a. Grub Screw, 3/32″
69b. ,, ,, 3/16″
69c. ,, ,, 7/64″



76 **72** **77**

70. Flat Plate, 5½″×2½″
72. ,, ,, 2½″×2½″
73. ,, ,, 3″×1½″
76. Triangular Plate, 2½″
77. ,, ,, 1″

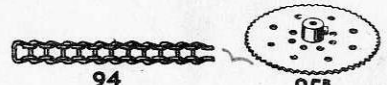
80A

Screwed Rods

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

90

89. Curved Strip, 5½″, 10″ radius
89a. ,, ,, stepped, 3″, 1½″ radius,
89b. Curved Strip, stepped, 4″, 4½″ radius,
90. Curved Strip, 2½″, 2⅜″ radius
90a. ,, ,, stepped, 2½″, 1⅜″ radius,

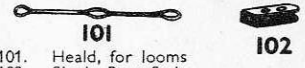


94 **95B**

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

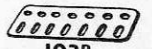
99

No.	Braced Girders	No.	
97.	3½″ long	99a.	9½″ long
97a.	3″ ,,	99b.	7½″ ,,
98.	2½″ ,,	100.	5½″ ,,
99.	12½″ ,,	100a.	4½″ ,,



101 **102**

101. Heald, for looms
102. Single Bent Strip



103D

Flat Girders

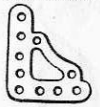
103.	5½″ long	103e.	3″ long
103a.	9½″ ,,	103f.	2½″ ,,
103b.	12½″ ,,	103g.	2″ ,,
103c.	4½″ ,,	103h.	1½″ ,,
103d.	3½″ ,,	103k.	7½″ ,,

104

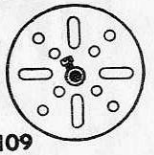
104. Shuttle, for looms
105. Reed Hook, for looms

106 **106A**

106. Wood Roller
106a. Sand Roller

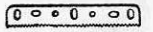


108



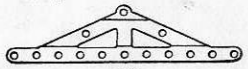
109

108. Corner Gusset
109. Face Plate, 2½″ diam.



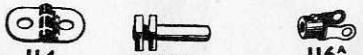
110

110. Rack Strip, 3½″ long
110a. ,, ,, 6½″ ,,
111. Bolt, ¾″ | 111c. Bolt, ¾″
111a. ,, ½″ | 111d. ,, 1⅛″



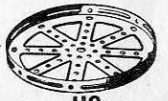
113

113. Girder Frame



114 **115** **116A**

114. Hinge
115. Threaded Pin
116. Fork Piece, Large
116a. ,, ,, Small
117. Steel Ball, ⅜″ diam.



118

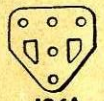
118. Hub Disc, 5½″ diam.

MECCANO PARTS

No.
120b. Compression Spring, $\frac{3}{16}$" long

122. Miniature Loaded Sack

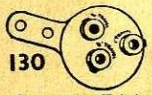
123. Cone Pulley, $1\frac{1}{4}$", 1" and $\frac{3}{4}$" diam.
124. Reversed Angle Bracket, 1"
125. " " " $\frac{1}{2}$"

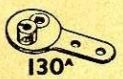


126. Trunnion 126a. Flat Trunnion

127. Bell Crank
128. Bell Crank, with Boss

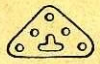
129. Toothed Segment, $1\frac{1}{2}$" radius





130. Eccentric, Triple Throw, $\frac{1}{4}$", $\frac{3}{8}$" and $\frac{1}{2}$"
130a. Eccentric, Single Throw, $\frac{1}{4}$"

131. Dredger Bucket
132. Flywheel, $2\frac{3}{4}$" diam.



133. Corner Bracket, $1\frac{1}{2}$"
133a. " " 1"

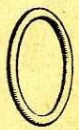
No.
134. Crank Shaft, 1" stroke

136. Handrail Support
136a. Handrail Coupling
137. Wheel Flange

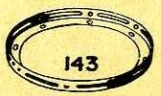
138a. Ship Funnel

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

140. Universal Coupling

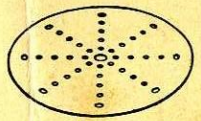


142. Rubber Ring (to fit 3" diam. rim)
142a. Motor Tyre (to fit 2" diam. rim)
142b. " " " 3" "
142c. " " " 1" "
142d. " " " $1\frac{1}{2}$" "



143. Circular Girder, $5\frac{1}{2}$" diam.

No.
144. Dog Clutch



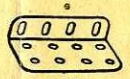
145. Circular Strip, $7\frac{1}{2}$" diam. overall
146. " Plate 6" "
146a. " " 4" "

147. Pawl, with Pivot Bolt and Nuts
147a. Pawl
147b. Pivot Bolts with 2 Nuts
147c. Pawl without boss
148. Ratchet Wheel

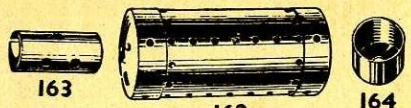
151. Pulley Block, Single Sheave
152. " " Two "
153. " " Three "

154a. Corner Angle Bracket, $\frac{1}{2}$" (right-hand)
154b. Corner Angle Bracket, $\frac{1}{2}$" (left-hand)
155. Rubber Ring (for 1" Pulleys)

157. Fan, 2" diam.

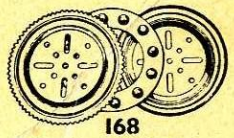


160. Channel Bearing, $1\frac{1}{2}$"×1"×$\frac{1}{2}$"
161. Girder Bracket, 2"×1"×$\frac{1}{2}$"



No.
162. Boiler, complete, 5" long×$2\frac{1}{16}$" diam.
162a. " Ends, $2\frac{1}{16}$" diam.×$\frac{3}{4}$"
162b. " without ends, $4\frac{1}{2}$" long×$2\frac{1}{16}$"diam.
163. Sleeve Piece, $1\frac{1}{2}$" long×$\frac{11}{16}$" diam.
164. Chimney Adaptor, $\frac{5}{8}$" diam.×$\frac{1}{2}$" high

165. Swivel Bearing
166. End "
167b. Flanged Ring, $9\frac{7}{8}$" diam.

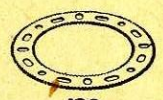


168. Ball Bearing, 4" diam.
168a. " Race, flanged disc, $3\frac{3}{4}$" diam.
168b. " " toothed " 4" diam.
168c. " Cage, $3\frac{3}{8}$" diam., complete with balls.

171. Socket Coupling

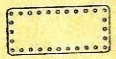
175. Flexible Coupling Unit

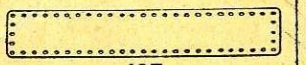
176. Anchoring Spring for Cord



179. Rod Socket
180. Gear Ring, $3\frac{1}{2}$" diam. (133 ext. teeth, 95 int.)

No.
185. Steering Wheel, $1\frac{3}{4}$" diam.
186. Driving Band, $2\frac{1}{2}$" (Light)
186a. " " 6" "
186b. " " 10" "
186c. " " 10" (Heavy)
186d. " " 15" "
186e. " " 20" "
187. Road Wheel, $2\frac{1}{2}$" diam.
187a. Conical Disc, $1\frac{7}{8}$" diam.



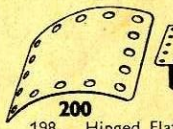


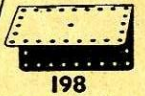
Flexible Plates.

188.	$2\frac{1}{2}$"×$1\frac{1}{2}$"	190a.	$3\frac{1}{2}$"×$2\frac{1}{2}$"
189.	$5\frac{1}{2}$"×$1\frac{1}{2}$"	191.	$4\frac{1}{2}$"×$2\frac{1}{2}$"
190.	$2\frac{1}{2}$"×$2\frac{1}{2}$"	192.	$5\frac{1}{2}$"×$2\frac{1}{2}$"

Strip Plates.

196.	$9\frac{1}{2}$"×$2\frac{1}{2}$"	197.	$12\frac{1}{2}$"×$2\frac{1}{2}$"

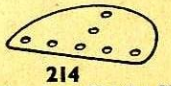


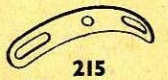


198. Hinged Flat Plate, $4\frac{1}{2}$"×$2\frac{1}{2}$"
199. Curved Plate, U-Section
$2\frac{1}{2}$"×$2\frac{1}{2}$"×$\frac{5}{16}$" radius
200. " " $2\frac{1}{2}$"×$2\frac{1}{2}$"×$1\frac{11}{16}$" radius

211a. Helical Gear, $\frac{1}{2}$" } *Can only be*
211b. " " $1\frac{1}{2}$" } *used together*

212. Rod and Strip Connector
213. Rod Connector





214. Semi-Circular Plate, $2\frac{1}{2}$"
215. Formed Slotted Strip, 3"

216. Cylinder, $2\frac{1}{2}$" long, $1\frac{1}{4}$" diam.

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