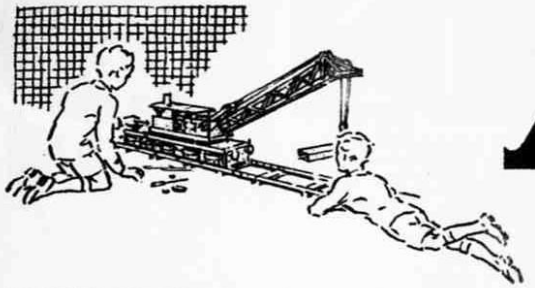
MECCANO

INSTRUCTIONS FOR

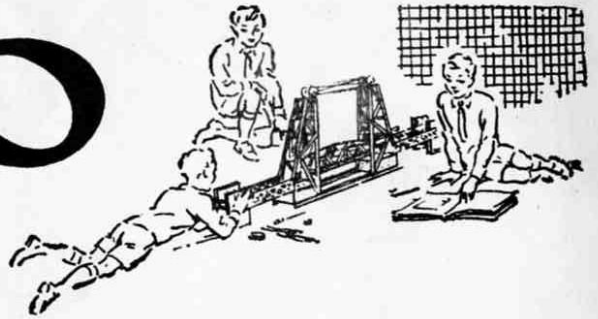
No. 5a ACCESSORY OUTFIT

No.
50.5a



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.

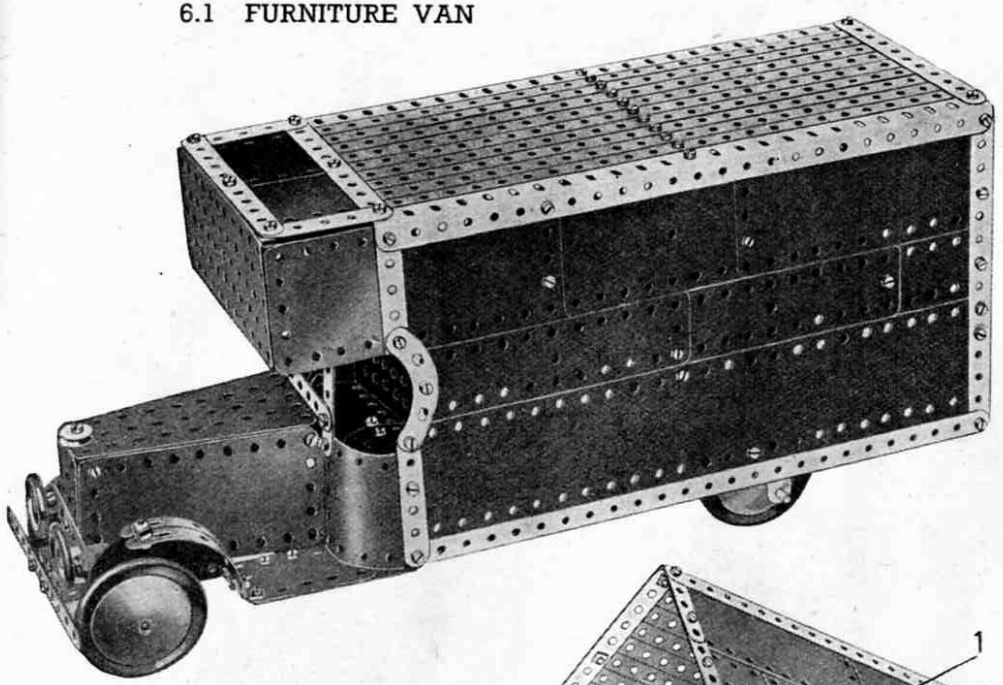
Clubs founded and established under the guidance of the Guild Secretary provide Meccano boys with opportunities of enjoying to the utmost the fun of model-building. Each has its Leader, Secretary, Treasurer and other officials. With the exception of the Leader, all the officials are boys, and as far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

6.1 FURNITURE VAN



The construction of the model is commenced by building the van body, the base of which consists of two 12½" Angle Girders joined at each end by a 5½" Strip. The lower part of each side consists of a 12½" Strip Plate and different sized Flexible Plates, and the two flat plates 1 form the upper part of the sides. The flat plates 1 are obtained by removing the centre pin from a Hinged Flat Plate and using the halves separately. Each side is bolted over a framework of 12½" Strips and 5½" Strips, which can be seen in Fig. 6.1a. The top is constructed from 12½" strips clamped at each end between 5½" Strips connected to the frame.

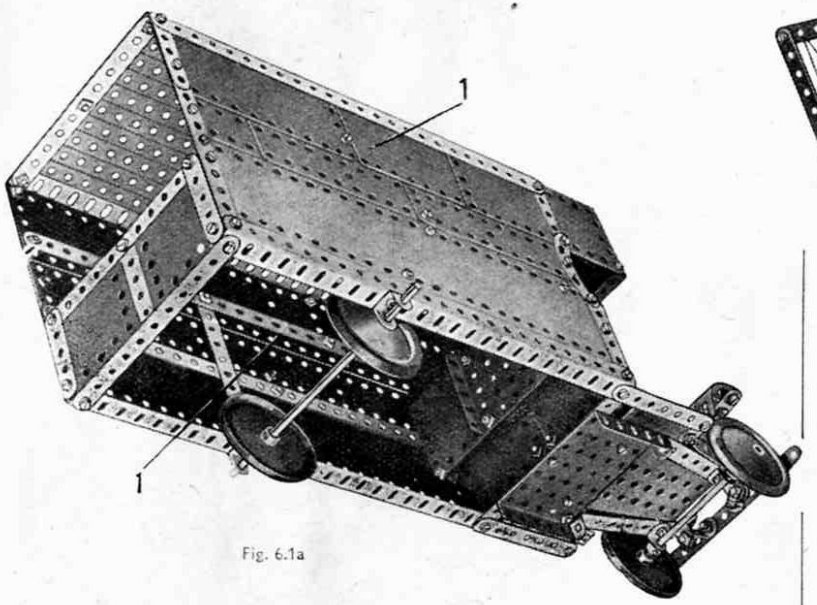


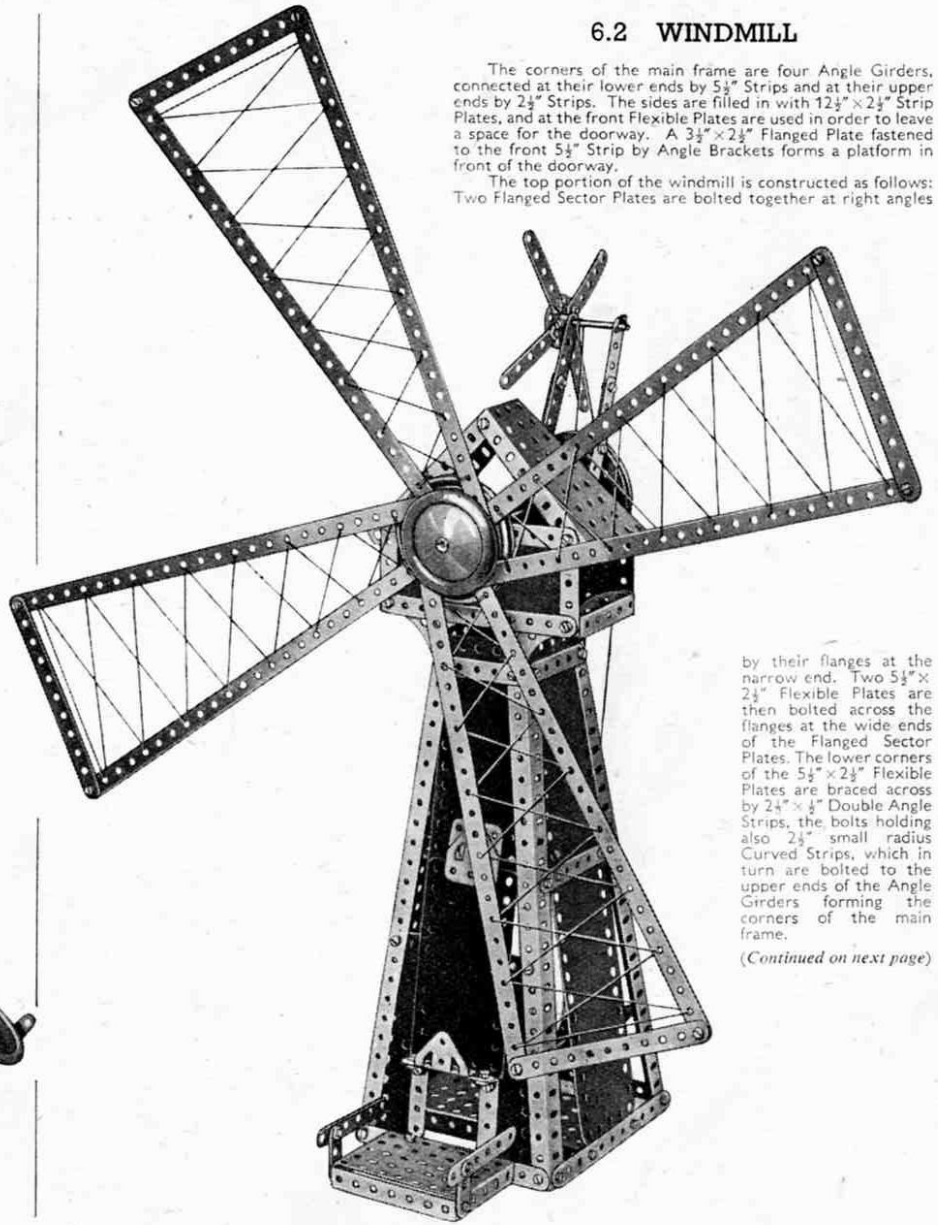
Fig. 6.1a

The bonnet unit consists of two Flanged Sector Plates, the flanges of which are joined by 4½"×2½" Flexible Plates. The radiator is bolted in position to the two Flanged Sector Plates, the upper Bolt being ¾" long and carrying a ½" loose Pulley to represent the radiator cap. The lower Flanged Sector Plate is bolted to a 3½"×2½" Flanged Plate, which is secured to the chassis.

The front bumper is fastened by two Reversed Angle Brackets to the ends of two 3½"×½" Double Angle Strips fixed under the bonnet. The headlights are represented by 1" fast Pulleys on the shanks of two ¾" Bolts, which are passed through a 2½"×½" Double Angle Strip bolted to the radiator. Running boards are represented by 2½"×1½" Flexible Plates bolted to the 3½"×2½" Flanged Plate, and they provide supports for the front mudguards. The latter each consists of two Formed Slotted Strips coupled together by Fishplates and they are secured to the running board by Angle Brackets.

The seat inside the cab is made from two U-Section Curved Plates connected by Fishplates and attached by an Angle Bracket to the back of the seat, which consists of a 3½"×2½" Flanged Plate extended by a 2½"×2½" Flexible Plate.

6.2 WINDMILL



The corners of the main frame are four Angle Girders, connected at their lower ends by 5½" Strips and at their upper ends by 2½" Strips. The sides are filled in with 12½"×2½" Strip Plates, and at the front Flexible Plates are used in order to leave a space for the doorway. A 3½"×2½" Flanged Plate fastened to the front 5½" Strip by Angle Brackets forms a platform in front of the doorway.

The top portion of the windmill is constructed as follows: Two Flanged Sector Plates are bolted together at right angles by their flanges at the narrow end. Two 5½"×2½" Flexible Plates are then bolted across the flanges at the wide ends of the Flanged Sector Plates. The lower corners of the 5½"×2½" Flexible Plates are braced across by 2½"×½" Double Angle Strips, the bolts holding also 2½" small radius Curved Strips, which in turn are bolted to the upper ends of the Angle Girders forming the corners of the main frame.

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6.2
WINDMILL
continued—

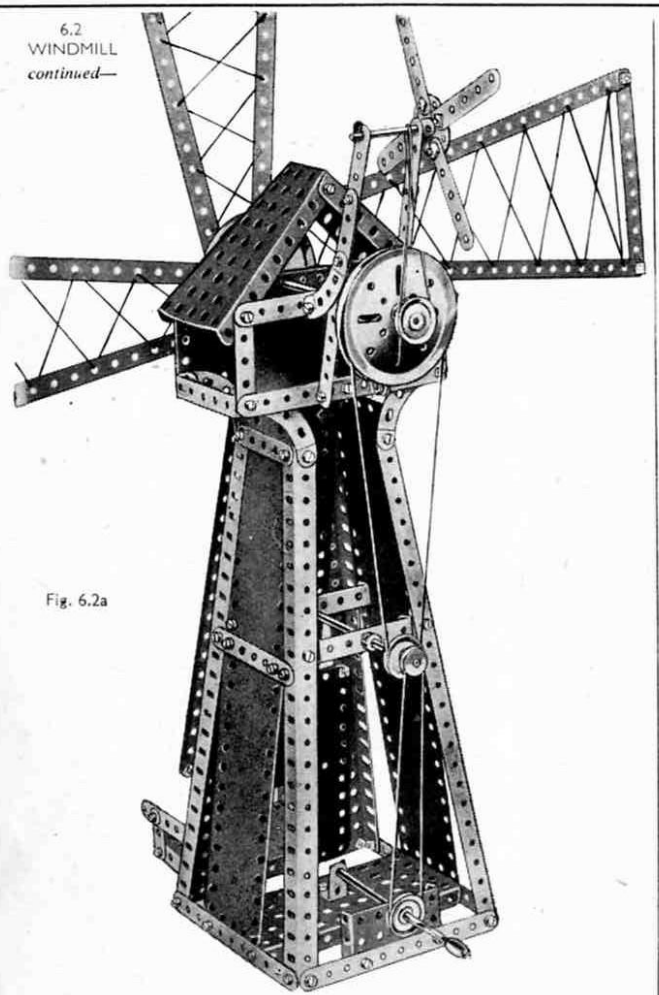

Fig. 6.2a

A superstructure (Fig. 6.2a) is erected at the rear to hold the directional vanes. It is constructed by fastening two compound strips, each consisting of a 5½" and a 2½" Strip, to the back 5½"×2½" Flexible Plate by a 1½"×½" Double Angle Strip. The compound strips are braced by two 2½" Curved Strips, also fastened to the 5½"×2½" Flexible Plate by a 1½"×½" Double Angle Strip. A 2" Rod, journalled in the end holes of the compound strips, carries at its end a Bush Wheel, to which are bolted 2½" Strips representing the vanes.

The construction of the sails, and the manner in which they are mounted are clear from the illustration.

A Crank Handle journalled as shown in Fig. 6.2a carries on its shaft a 1" Pulley that is connected by a Driving Band to a ½" Pulley on a 5" Rod midway up the frame. A 1" fast Pulley, also on the 5" Rod, is connected by Cord to the 3" Pulley on the shaft of the sails, and a 1" Pulley on this shaft is connected by a Driving Band with the 2" Rod carrying the directional vanes.

6.3 TOWER WAGON

Each side member of the chassis consists of two 12½" Strips secured together by Fishplates. The side members are joined at the rear by a 5½"×2½" Flanged Plate, and at the front by a Flanged Sector Plate. The bonnet is built up by bolting 4½"×2½" Flexible Plates to the flanges of the Flanged Sector Plate and then fastening another Flanged Sector Plate to their upper edges. The radiator, a 2½"×1½" Flanged Plate, is bolted in position between the ends of the Flanged Sector Plates, the upper Bolt being ¾" long and carrying a ½" loose Pulley to represent the radiator cap.

A 3½"×2½" Flanged Plate forms the base for the cab, and is secured to the chassis by a 2½"×½" Double Angle Strip (Fig. 6.3a). The back of the cab consists of two 2½"×1½" Flexible Plates, overlapped three holes and supported by Angle Brackets between two 2½" Strips joined together and bolted to the flanges of the 3½"×2½" Flanged Plate. Each of the doors is constructed by bolting a 2½"×1½" Flexible Plate to the lower end of one of the 2½" Strips fastened to the 3½"×2½" Flanged Plate. A 1 11/16" radius Curved Plate is then bolted to the 2½"×1½" Flexible Plate, overlapping it two holes, each bolt carrying two Washers between the Flexible and Curved Plates. A second 3½"×2½" Flanged Plate is fixed to the upper ends of the 2½" Strips, and is secured by Reversed Angle Brackets to two more compound strips each consisting of two 2½" Strips joined together and bolted to the chassis.

The front Road Wheels are fixed on a 3½" Rod journalled in the flanges of the lower Flanged Sector Plate, and the 5" Rod carrying the rear Road Wheels passes through the lower 12½" Strips.

The framework inside which the tower slides consists of four Angle Girders, which are bolted to the chassis as shown in the illustration and are joined at the top by the Strips 1. Each side of the tower is built up from 12½" Strips 5 connected at the bottom by a 3" Strip, and bolted at their upper ends to the stand. To prevent the 12½" Strips from sliding too freely, Flat Trunnions are fastened to the Angle Girders at 4. The Crank Handle for raising and lowering the tower is journalled in the upper 12½" Strips of the chassis. It carries at its end a 1" Pulley, which is connected by a Driving Band to one of the Pulleys 2 on the 3½" Rod mounted in two of the Flat Trunnions 4. Cord is fastened to a Cord Anchoring Spring on this Rod, and its other end is tied to the centre of the 3½" Rod 3.

The ladder is constructed by bolting 2½"×½" Double Angle Strips between two 12½" Strips. The latter are fastened at their lower ends to the 5½"×2½" Flanged Plate by Angle Brackets, and at their upper ends they are attached to two Fishplates bolted to Strips 1.

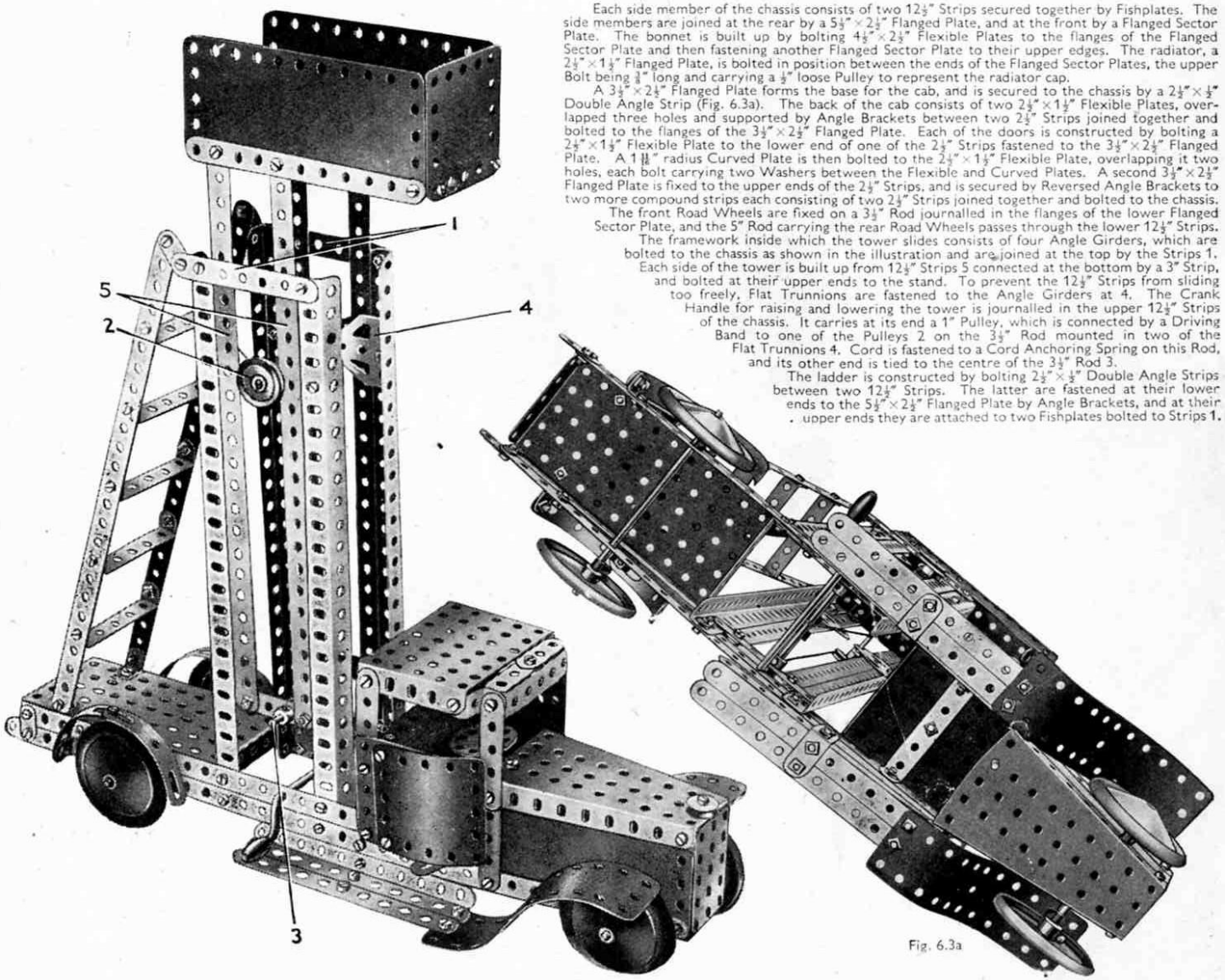

Fig. 6.3a

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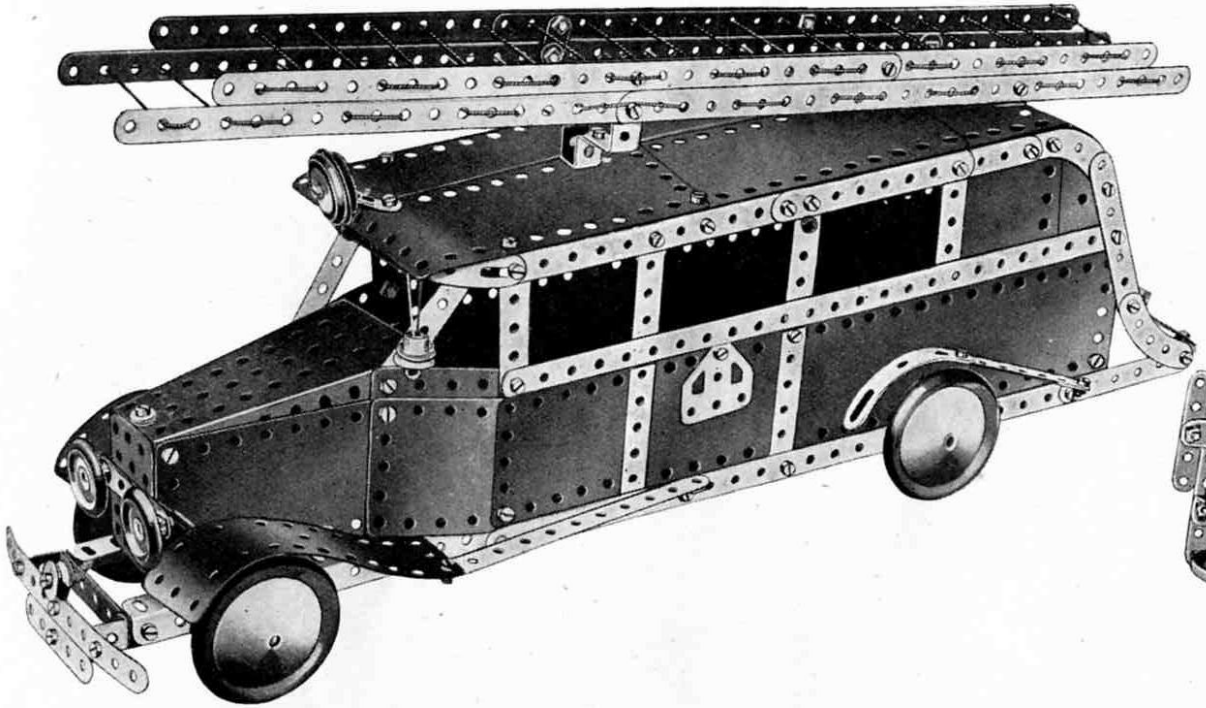
6.4 STREAMLINED FIRE ENGINE



Each side member of the chassis consists of a pair of Angle Girders connected by two ¾" Bolts, the nuts of which are left untightened. The side members are jointed together at the front by a 2½" × ½" Double Angle Strip and a 5½" Strip. The rear Angle Girders are not joined, but are pushed apart as far as the ¾" Bolts allow. Reference to Fig. 6.4a will make the arrangement clear.

The sides of the body consist of 12½" × 2½" Strip Plates, and are attached by Fishplates to the rear Angle Girders. The roof is formed by four 5½" × 2½" Flexible Plates, and is secured by Angle Brackets to the compound strips forming the tops of the windows. The curved back is obtained by bending Flexible Plates to the correct shape and fastening them to a framework of Strips

The sides of the bonnet are each represented by a 4½" × 2½" Flexible Plate, and are secured to the body of the fire-engine by 2½" × 2½" Flexible Plates and 2½" × 1½" Flexible Plates. The last named are bolted to the 12½" × 2½" Strip Plates forming the sides of the body. A Flanged Sector Plate forms the top of the bonnet, and is secured by the flanges of its narrow end to the two 4½" × 2½" Flexible Plates. At its wide end it is fastened to the 2½" × 1½" Flexible Plates secured to the body. The radiator is represented by a 2½" × 1½" Flanged Plate bolted to the front end of the Flanged Sector Plate. The Bolt carries two Washers above the Flanged Sector Plate to represent the radiator cap.

Two 1" fast Pulleys are used for the headlights, and they are secured by ¾" Bolts to a 2½" Strip fixed to the 2½" × 1½" Flanged Plate forming the radiator. The ¾" Bolts pass through the end holes of the 2½" Strip, and are locked in the bosses of the 1" Pulleys. The front bumper is represented by a 5½" Strip extended downward by a 2½" Strip. It is fastened in position to the 2½" × ½" Double Angle Strip at the front of the chassis by two Reversed Angle Brackets.

The Road Wheels are held on 5" Rods journalled in the sides of the chassis. The front mudguards are each formed by a 5½" × 1½" Flexible Plate bolted to the 5½" Strip joining the side members of the chassis. A 3½" Strip extended by a Formed Slotted Strip and secured by an Angle Bracket to the side of the body, is used for each of the rear mudguards.

The rear 5" Rod carries a Collar between the side members of the chassis. A Pivot Bolt, which carries a 1" fast Pulley 2 against its head, is screwed into the tapped hole of the Collar, thus holding it in position on the Rod. A Flanged Sector Plate 1 is loosely suspended from a 2½" × ½" Double Angle Strip 3 by a lock-nutted ⅜" Bolt. When the rear Road Wheels revolve, the Pulley 2 strikes the Flanged Sector Plate 1, and thus provides an automatic gong.

Two small radius Curved Strips each fitted with a Fishplate are bolted as shown in Fig. 6.4b to the back of the Fire Engine to represent the appliance tools. A 2" Rod is clamped between the Fishplates and the Flexible Plates.

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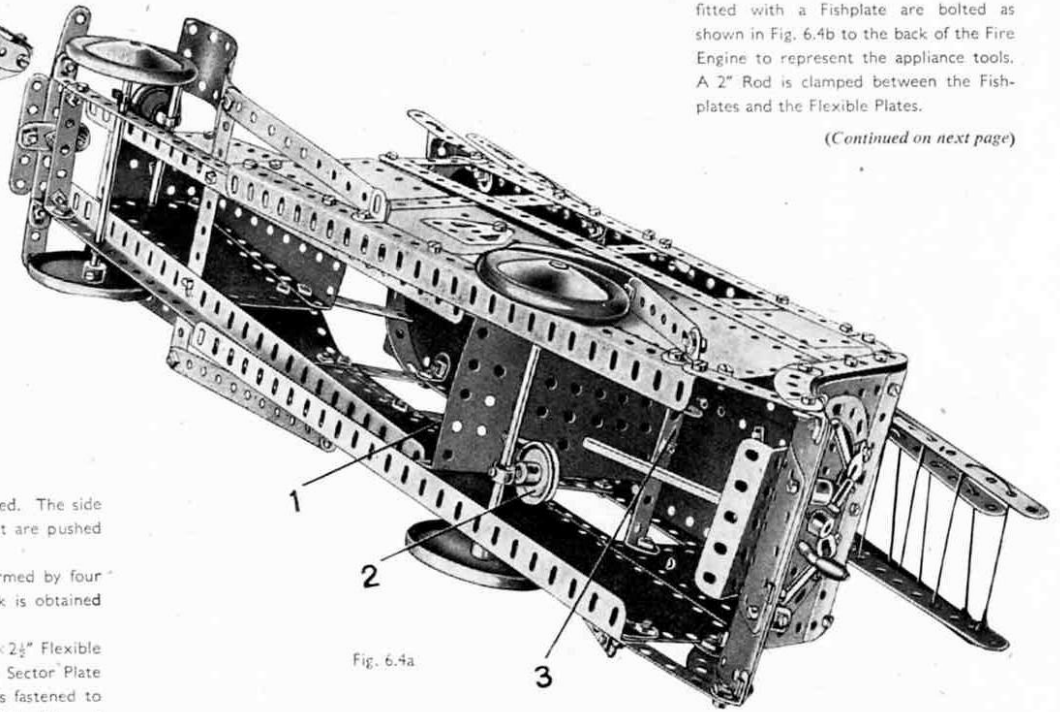


Fig. 6.4a

6.4 STREAMLINED FIRE ENGINE—
Continued

The fixed escape ladder consists of two pairs of compound strips, each built up from two 12½" Strips bolted together overlapping eight holes. The escape is attached to the roof of the car at the rear by a 2½ × ½" Double Angle Strip, and at the front by a compound bracket, which is built up by attaching 1" × 1" Angle Brackets to the ends of a Double Bent Strip. The extension escape is built up from two pairs of compound strips each consisting of two 12½" Strips overlapping 13 holes. The extension ladder is fastened to the fixed part of the escape by Fishplates. The rungs of the ladders are represented by Cord threaded through the holes in the Strips

The searchlight at the front of the fire-engine is made by placing a ¾" Washer, a 1" loose Pulley fitted with a Rubber Ring, a Wheel Disc, and a second 1" loose Pulley on the shank of a ½" Bolt. The complete unit is then fastened to the roof by a compound bracket consisting of two Obtuse Angle Brackets bolted together.

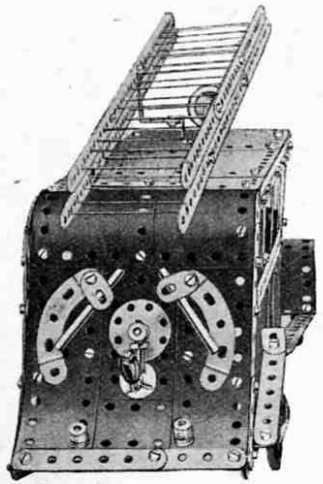
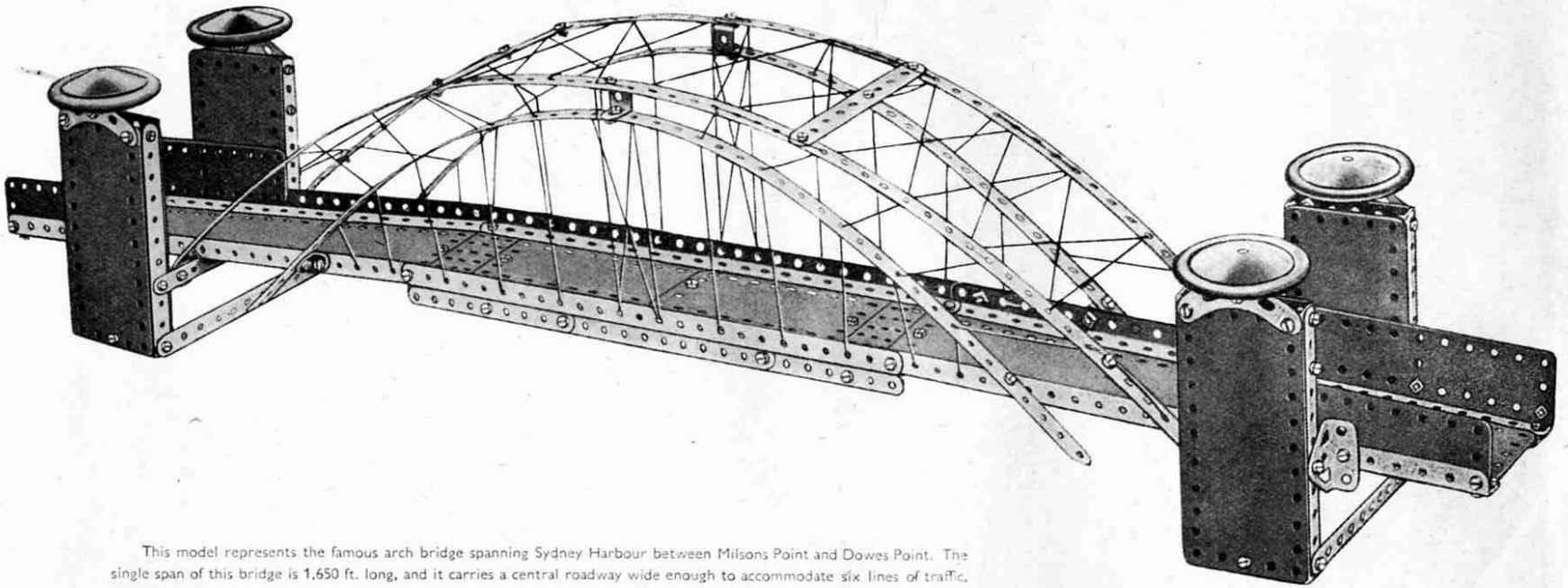


Fig. 6.4b

6.5 SYDNEY HARBOUR BRIDGE



This model represents the famous arch bridge spanning Sydney Harbour between Milsons Point and Dowes Point. The single span of this bridge is 1,650 ft. long, and it carries a central roadway wide enough to accommodate six lines of traffic, flanked on either side by two railway tracks and a footpath

Each of the towers consists of two 5½" Strips joined across by 2½" × ½" Double Angle Strips, between which 5½" × 2½" Flexible Plates are bolted on the outside face, and on the inside face 2½" × 2½" Flexible Plates are attached by Angle Brackets. A 2½" small radius Curved Strip bolted to the upper 2½" × ½" Double Angle Strip carries an Angle Bracket, to which a Road Wheel is attached by a ¾" Bolt. The pairs of towers at each end of the bridge are joined across by two 5½" Strips and a compound strip formed from two 3½" Strips.

Each side of the span consists of two Angle Girders joined together by two 12½" Strips arranged in the form of an angle girder. The two sides are connected by 3½" × 2½" Flanged Plates held by the same bolts as the 12½" Strips, and also by a 3½" × ½" Double Angle Strip at the centre. The roadway at the centre of the span is represented by two 4½" × 2½" Flexible Plates overlapped one hole and bolted between the 3½" × 2½" Flanged Plates. The remainder of the roadway consists of 12½" × 2½" Strip Plates, attached to the 3½" × 2½" Flanged Plates at one end and clamped between Fishplates and the Angle Girders at the other end. The sides of the approach roadways are 5½" × 1½" Flexible Plates bolted to the Angle Girders of the span. The completed span is attached to each pair of towers by a Trunnion bolted in the position shown in the illustration.

The top of the suspension arch on each side consists of two 12½" Strips, bolted together and extended at each end by a 2½" Strip. An Obtuse Angle Bracket and an Angle Bracket are bolted to the end of the 2½" Strip, the Angle Bracket being attached to the span and the Obtuse Angle Bracket to the upper 5½" Strip spacing the towers. The inside of the arch is made of two 12½" Strips fixed by Angle Brackets to the sides of the roadway and connected by a Double Bracket to the other arch at its centre.

The arches on each side are braced across by compound strips, each of which consists of a 3½" Strip and a 3" Strip overlapped three holes. The model is completed by adding the roadway suspension cables, which are represented by Cord and are arranged as shown in the illustration.

6.6 MECHANICAL HORSE AND TRAILER

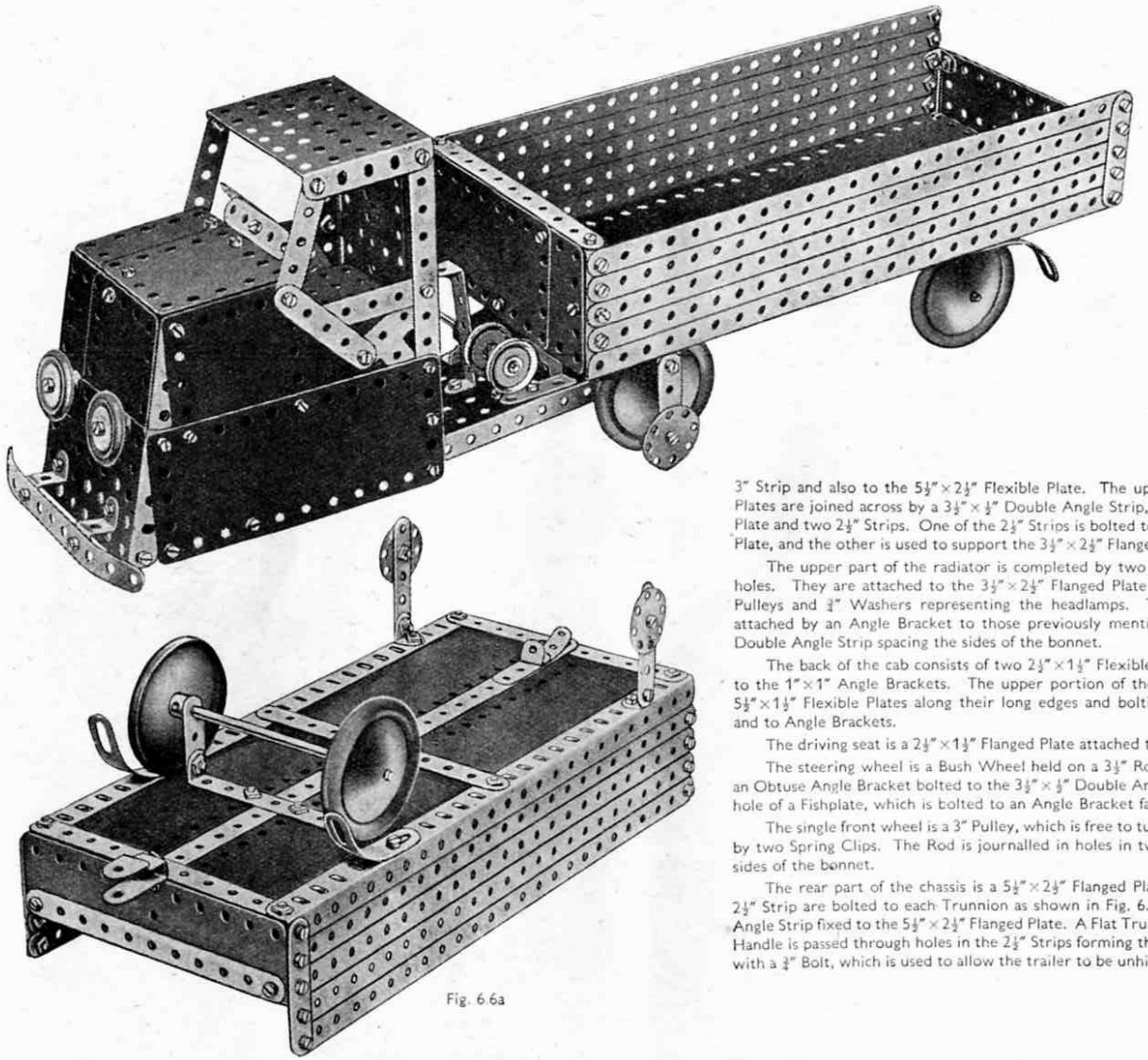


Fig. 6.6a

The cab and bonnet of the mechanical horse are first constructed, and are built up on a base consisting of two 5½" Strips bolted to the flanges of a 3½"×2½" Flanged Plate. Two 5½"×2½" Flexible Plates are bolted to the 5½" Strips so that the Strips are extended one hole beyond the edge of the Flexible Plates, thus allowing the 3½"×2½" Flanged Plate representing the radiator to be sloped backwards and bolted to the Flexible Plates. Two 3" Strips are bolted inside the flanges of the 3½"×2½" Flanged Plate and they overlap the flanges two holes. Two 5½" Strips overlap the rear ends of the 5½"×2½" Flexible Plates by three holes, and 1"×1" Angle Brackets are bolted to the lower rear corners of the two Flexible Plates for the purpose of holding the back in position.

Each side of the bonnet is completed by bolting a 2½"×2½" Flexible Plate to the 3" Strip and also to the 5½"×2½" Flexible Plate. The upper rear corners of the 2½"×2½" Flexible Plates are joined across by a 3½"×½" Double Angle Strip, each Bolt holding also a 2½"×1½" Flexible Plate and two 2½" Strips. One of the 2½" Strips is bolted to a Flat Trunnion and the 2½"×1½" Flexible Plate, and the other is used to support the 3½"×2½" Flanged Plate that represents the roof of the cab.

The upper part of the radiator is completed by two 2½"×2½" Flexible Plates overlapped three holes. They are attached to the 3½"×2½" Flanged Plate by the ½" Bolts that hold in place the 1" Pulleys and ¾" Washers representing the headlamps. Two further 2½"×2½" Flexible Plates are attached by an Angle Bracket to those previously mentioned, and are bolted also to the 3½"×½" Double Angle Strip spacing the sides of the bonnet.

The back of the cab consists of two 2½"×1½" Flexible Plates overlapped three holes and bolted to the 1"×1" Angle Brackets. The upper portion of the back is completed by overlapping three 5½"×1½" Flexible Plates along their long edges and bolting them at their top ends to a 3½" Strip and to Angle Brackets.

The driving seat is a 2½"×1½" Flanged Plate attached to the back of the cab by an Angle Bracket.

The steering wheel is a Bush Wheel held on a 3½" Rod. The Rod is passed through the hole of an Obtuse Angle Bracket bolted to the 3½"×½" Double Angle Strip. It is held by a Spring Clip in the hole of a Fishplate, which is bolted to an Angle Bracket fastened to the side of the bonnet.

The single front wheel is a 3" Pulley, which is free to turn on a 3½" Rod, and is retained in position by two Spring Clips. The Rod is journalled in holes in two Reversed Angle Brackets bolted to the sides of the bonnet.

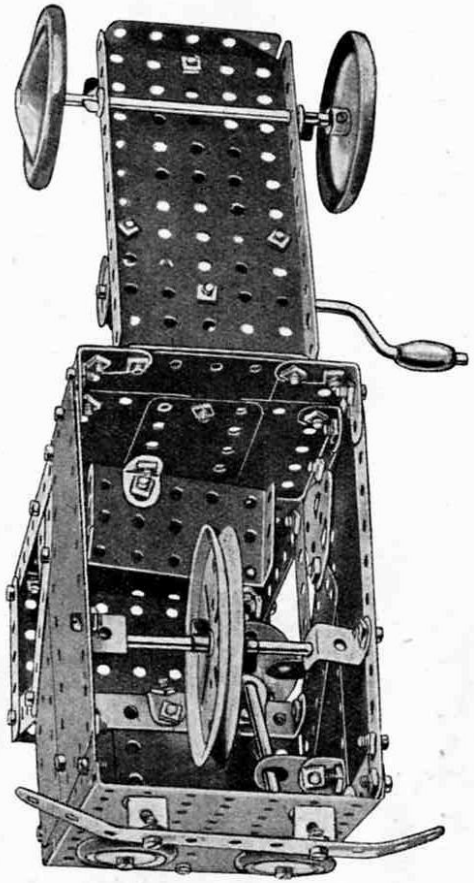


Fig. 6.6b

The rear part of the chassis is a 5½"×2½" Flanged Plate, and it carries a ramp built as follows. Two Trunnions are bolted to the Flanged Plate, and a 3½" Strip and a 2½" Strip are bolted to each Trunnion as shown in Fig. 6.6c. The 2½" Strips are extended by 2½" large radius Curved Strips, which are bolted also to a 1½"×½" Double Angle Strip fixed to the 5½"×2½" Flanged Plate. A Flat Trunnion is attached to an Obtuse Angle Bracket held by the same bolt as the 1½"×½" Double Angle Strip. The Crank Handle is passed through holes in the 2½" Strips forming the ramp, and two 1" Pulleys are secured to it, one on each side of the near 2½" Strip. The inner 1" Pulley is fitted with a ¾" Bolt, which is used to allow the trailer to be unhitched from the power unit. The 2½"×½" Double Angle Strip at the end of the ramp acts as a stop for the trailer.

(*Continued on next page*)

6.6 MECHANICAL HORSE & TRAILER—*Continued*

An underneath view of the trailer is shown in Fig. 6.6a, its main members are 12½" Angle Girders, joined across by a 5½" Strip at each end. At the centre a 12½" Strip is bolted across the 5½" Strips, and the floor is filled in with two 12½" Strip Plates. Each of the sides is built up from four 12½" Strips, bolted at the rear end to a 2½" Strip and at the front end to a 2½" × ½" Double Angle Strip. The front end of the trailer consists of two 4½" × 2½" Flexible Plates overlapped seven holes, and attached by Angle Brackets to the bottom and sides. The rear end is a 5½" × 1½" Flexible Plate fixed to a 5½" Strip and attached to the sides by Angle Brackets, and the rear coupling hook is a Stepped Bent Strip bolted to a Fishplate.

The rear Road Wheels are carried on a 4½" Rod journalled in 1½" Strips bolted to a 3½" × ½" Double Angle Strip. The front wheels are Wheel Discs bolted to 2½" Strips attached by Angle Brackets to the Angle Girders.

The 2½" Strip seen underneath the trailer in Fig. 6.6a, is fitted with an Angle Bracket, which engages with the Flat Trunnion forming part of the ramp on the mechanical horse.

When the Crank Handle is turned the ¾" Bolt in the boss of the inner Pulley lifts the front of the trailer and releases the Angle Bracket from behind the Flat Trunnion.

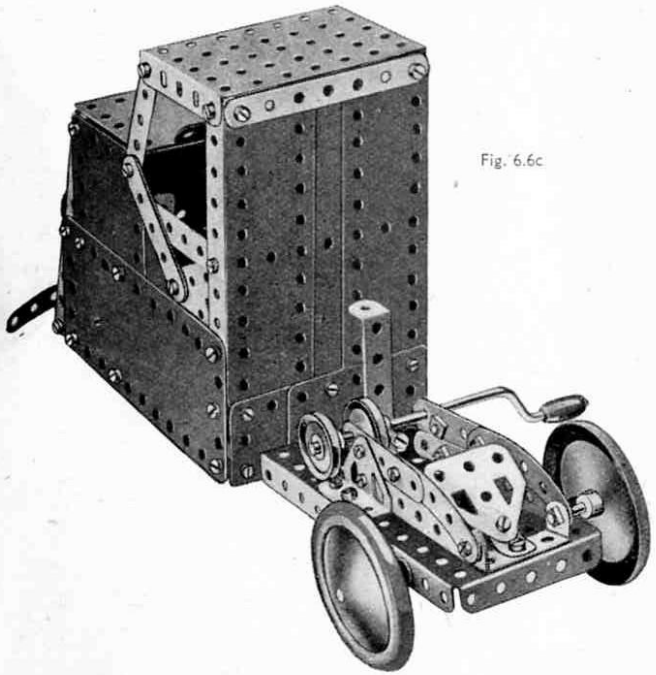
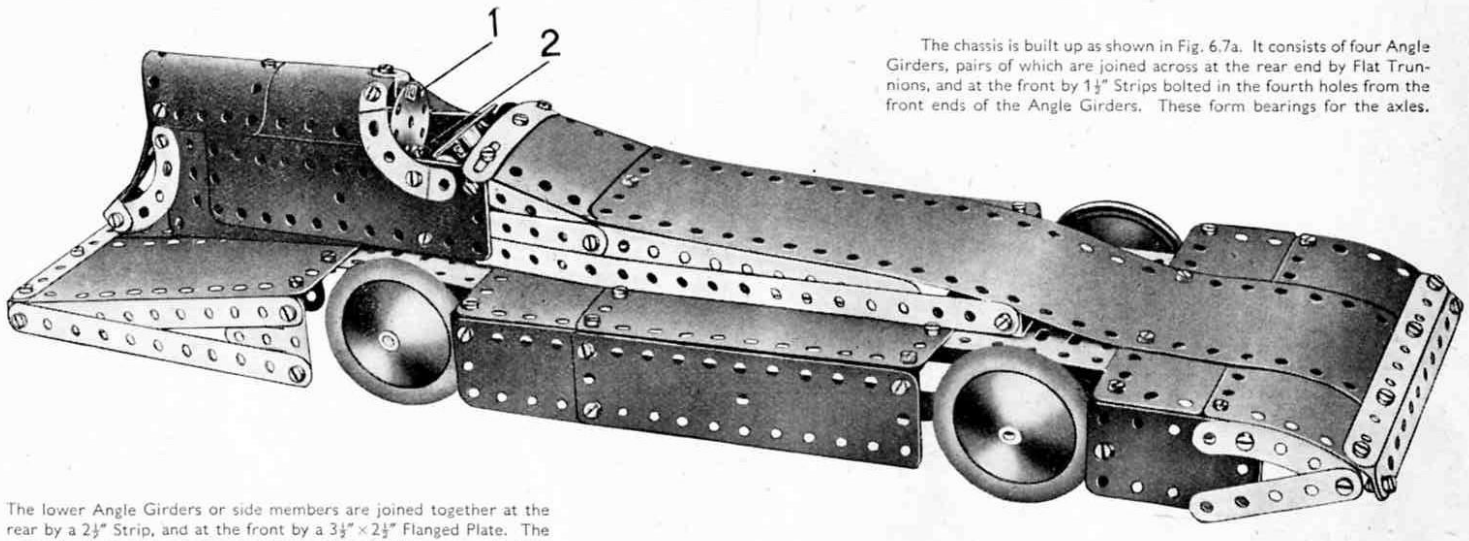


Fig. 6.6c

6.7 "BLUEBIRD" SPEED CAR



The chassis is built up as shown in Fig. 6.7a. It consists of four Angle Girders, pairs of which are joined across at the rear end by Flat Trunnions, and at the front by 1½" Strips bolted in the fourth holes from the front ends of the Angle Girders. These form bearings for the axles.

The lower Angle Girders or side members are joined together at the rear by a 2½" Strip, and at the front by a 3½" × 2½" Flanged Plate. The upper Angle Girders are joined across by three 5½" Strips, two of which are bolted five holes from the rear ends and seven holes from the front ends of the Angle Girders respectively, to form supports for the streamlined casing between the wheels.

Two 12½" Strips overlapping the chassis 13 holes extend the tail of the car, which consists of two Flanged Sector Plates bolted at their broad ends by their flanges to a 2½" × ½" Double Angle Strip on one edge, and to an Angle Bracket on the other edge. The narrow ends of the two Flanged Sector Plates are spaced one hole apart, and are bolted in the second hole in their flanges to a 5½" Strip. Two 2½" small radius Curved Strips and a 2½" Strip are bolted to a Double Bracket and fixed as shown. Two U-Section Curved Plates overlapped one hole also are bolted to the Flanged Sector Plates, and are joined to the 5½" × 1½" Flexible Plates by 2½" small radius Curved Strips.

Two 5½" × 2½" Flexible Plates are bolted between the two 5½" Strips to form the rear wheel fairings, and the 5½" Strips forming the sides are bolted to a Flat Trunnion and a Double Bracket. The engine and cockpit fairing consists of a 12½" × 2½" Strip Plate and a 2½" × 2½" Flexible Plate, bolted at the join to a 2½" × ½" Double Angle Strip. The last named is joined in turn to two 5½" Strips that fill in the side of the fairing. The method of building up the streamlined radiator will be clear from the general view of the model.

The front and rear axles are 5" Rods held in place by Collars. They carry a 1" Pulley, fitted with Rubber Ring, and a Road Wheel at each end.

The headrest is a Wheel Disc lock-nutted to Bolt 1. Bolt 2 holds in place a second Wheel Disc, which in turn is bolted at right angles to a third Disc 3 by means of a Reversed Angle Bracket.

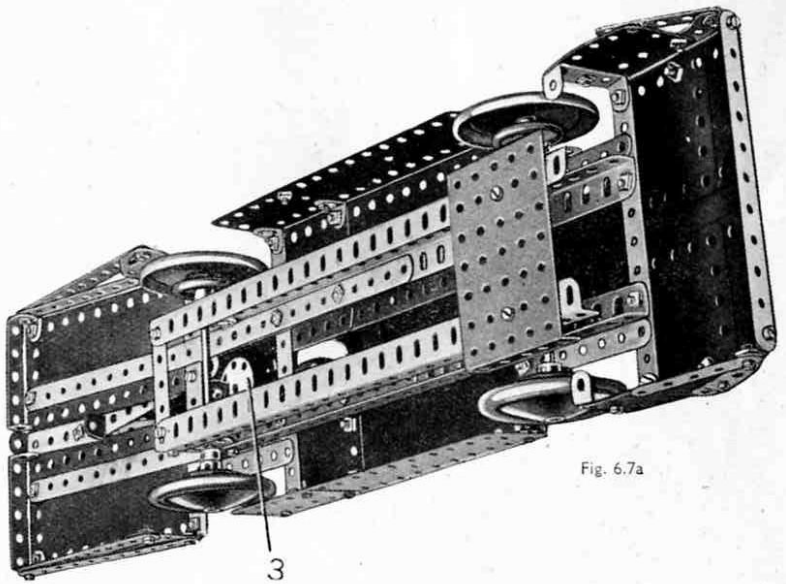


Fig. 6.7a

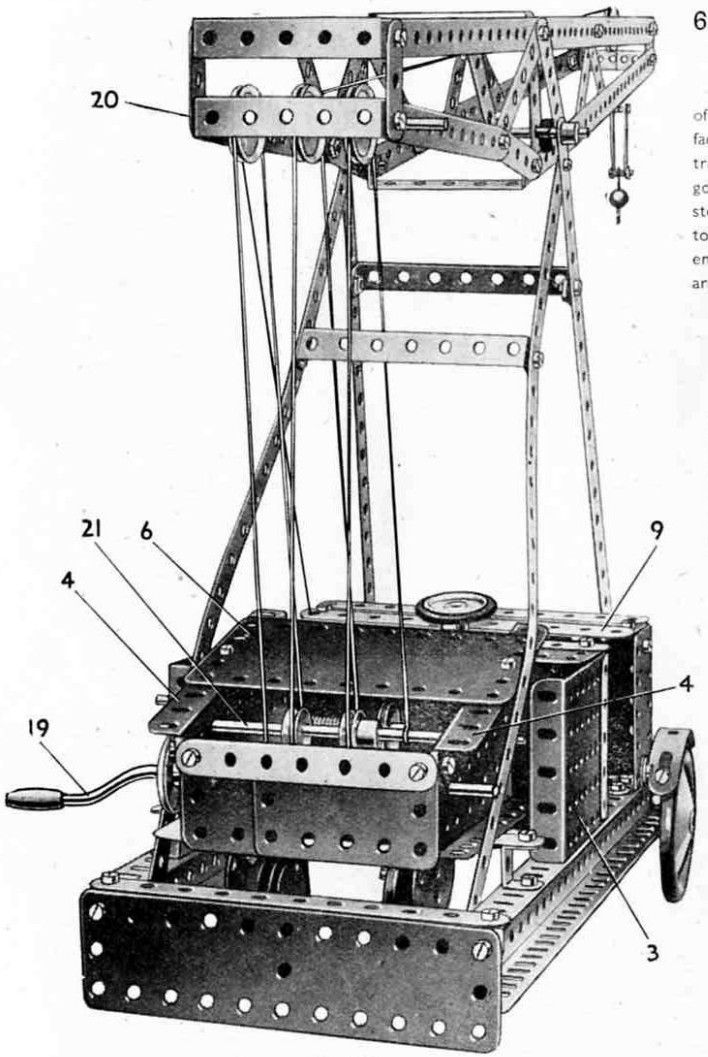
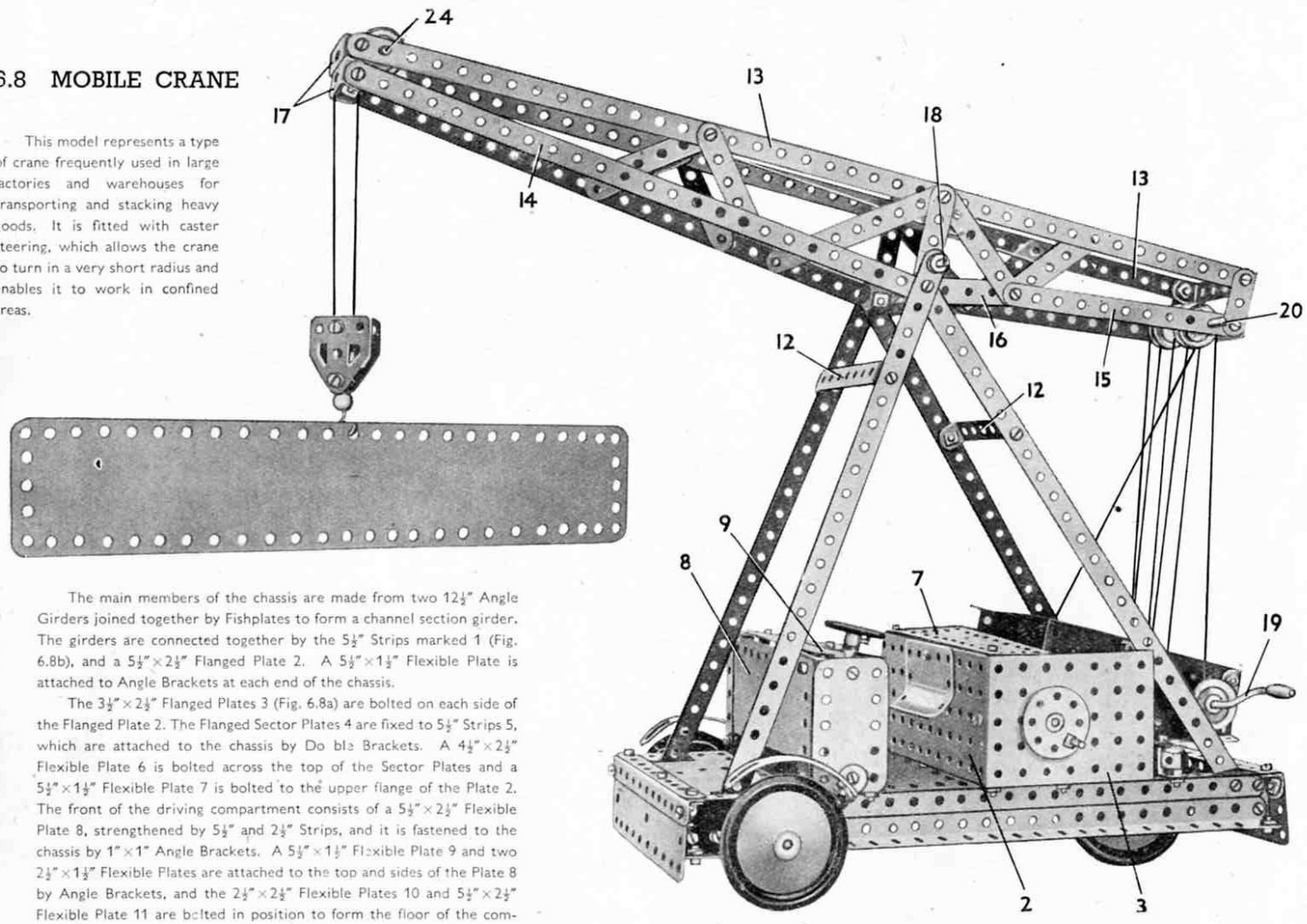


Fig. 6.8a

6.8 MOBILE CRANE

This model represents a type of crane frequently used in large factories and warehouses for transporting and stacking heavy goods. It is fitted with caster steering, which allows the crane to turn in a very short radius and enables it to work in confined areas.



The main members of the chassis are made from two 12½" Angle Girders joined together by Fishplates to form a channel section girder. The girders are connected together by the 5½" Strips marked 1 (Fig. 6.8b), and a 5½"×2½" Flanged Plate 2. A 5½"×1½" Flexible Plate is attached to Angle Brackets at each end of the chassis.

The 3½"×2½" Flanged Plates 3 (Fig. 6.8a) are bolted on each side of the Flanged Plate 2. The Flanged Sector Plates 4 are fixed to 5½" Strips 5, which are attached to the chassis by Double Brackets. A 4½"×2½" Flexible Plate 6 is bolted across the top of the Sector Plates and a 5½"×1½" Flexible Plate 7 is bolted to the upper flange of the Plate 2. The front of the driving compartment consists of a 5½"×2½" Flexible Plate 8, strengthened by 5½" and 2½" Strips, and it is fastened to the chassis by 1"×1" Angle Brackets. A 5½"×1½" Flexible Plate 9 and two 2½"×1½" Flexible Plates are attached to the top and sides of the Plate 8 by Angle Brackets, and the 2½"×2½" Flexible Plates 10 and 5½"×2½" Flexible Plate 11 are bolted in position to form the floor of the compartment.

The steering caster unit is made by bolting Semi-Circular Plates to the sides of a 2½"×1½" Flanged Plate. The Flanged Plate is pivotally attached to the Strip 5 by a lock-nutted Bolt. The Semi-Circular Plates form bearings for two Road Wheels locked on a 3½" Rod. Steering is controlled by a 4" Rod journalled in the Flexible Plate 11 and a Fishplate attached to the Plate 9. A length of Cord is lapped several times around the Rod and its ends are fastened to the sides of the caster unit. The front axle consists of a 5½" Rod journalled in the main chassis girders and held in place by Spring Clips.

(*Continued on next page*)

6.8 MOBILE CRANE—*Continued*

The jib is supported by four 12½" Strips. Two of these are bolted as shown to each side of the chassis, and connected to the pair on the opposite side by two 3½"×½" Double Angle Strips 12. Each side of the jib consists of a compound strip 13, made by overlapping two 12½" Strips 11 holes, a 12½" Strip 14, a 5½" Strip 15 and a 2½" Strip 16. These Strips are bolted together and braced as shown in the illustration. The two sides are joined together at the rear and centre by 2½"×½" Double Angle Strips, and at the front by the 1½"×½" Double Angle Strips 17. The jib pivots about a 4½" Rod 18.

The jib is luffed by means of a Cord extending from the Crank Handle 19. This Cord passes over a 1" loose Pulley on the 3½" Rod 20, around a ½" loose Pulley on the 4" Rod 21, and around a second 1" loose Pulley on Rod 20. It is then taken around a ½" Pulley on Rod 21 and a 1" Pulley on Rod 20, and finally is tied to Rod 21.

Raising and lowering of the load is controlled by a 5" Rod 22, fitted with a Bush Wheel and Threaded Pin. This Rod is journalled in the 3½"×2½" Flanged Plate and a Trunnion 23. A length of Cord from Rod 22 is passed over Rod 20, around a 1" Pulley fixed on the 2" Rod 24 and around a Pivot Bolt in the pulley block. It is then fastened to the jib head.

A simple foot brake is fitted to the Rod 22. It consists of a short length of Cord passed around a 1" Pulley 25, and tied to the 3½" Strip 26. This Strip is lock-nutted to an Angle Bracket bolted to the Flanged Plate 2, and is fitted with an Angle Bracket 27 to represent the foot pedal. Normally it is held in the 'on' position by the 2½" Driving Band 28.

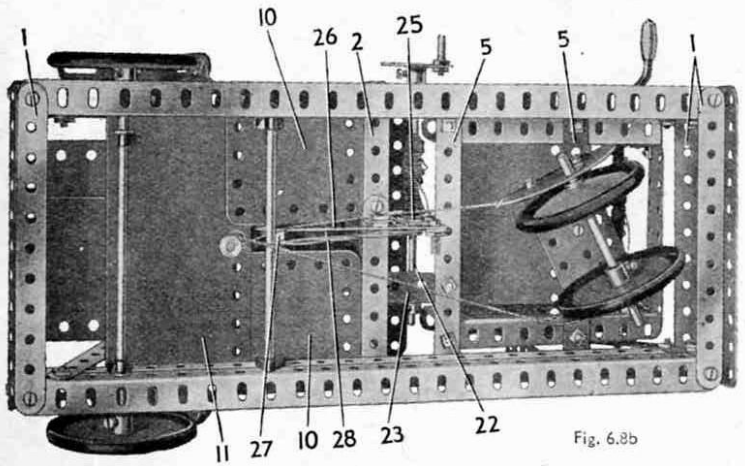
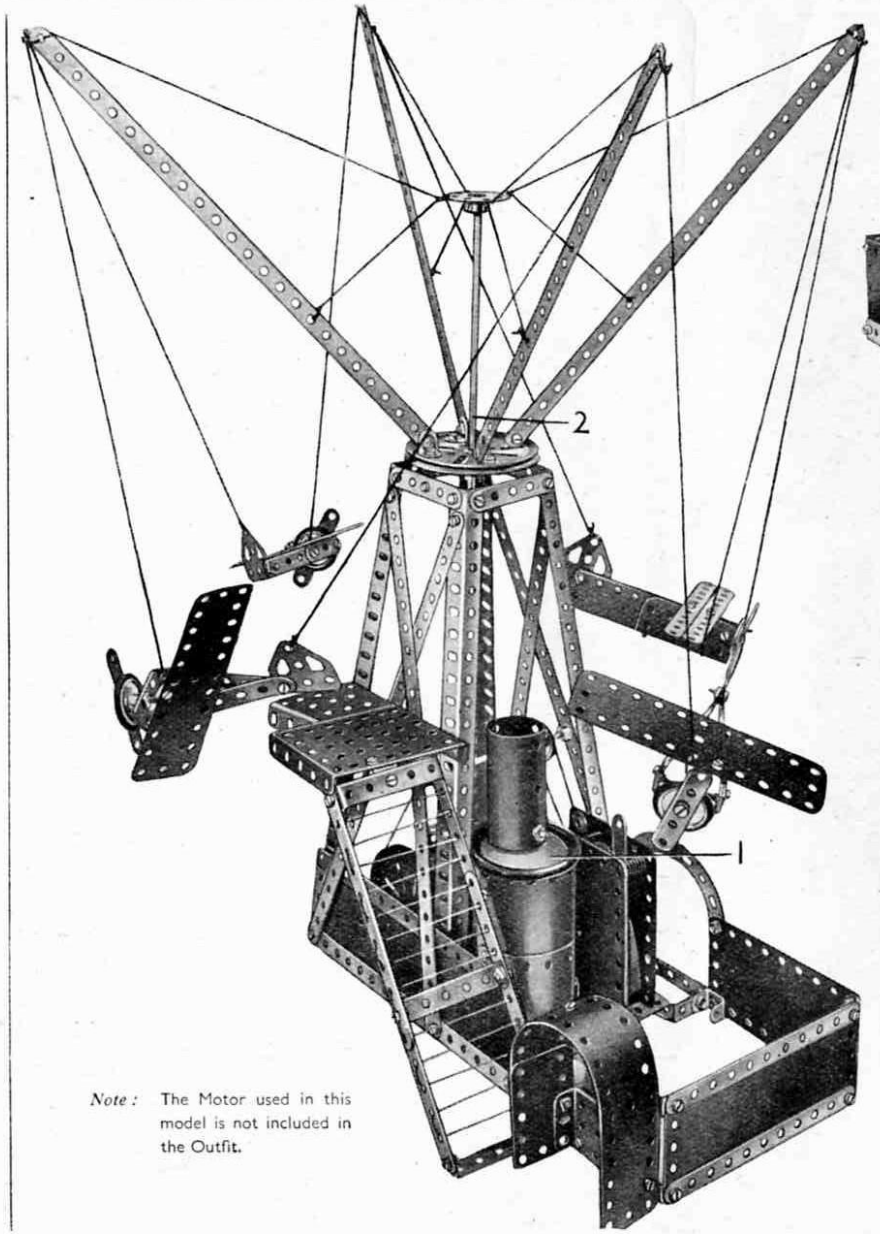


Fig. 6.8b



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

6.9 HIGH FLYERS

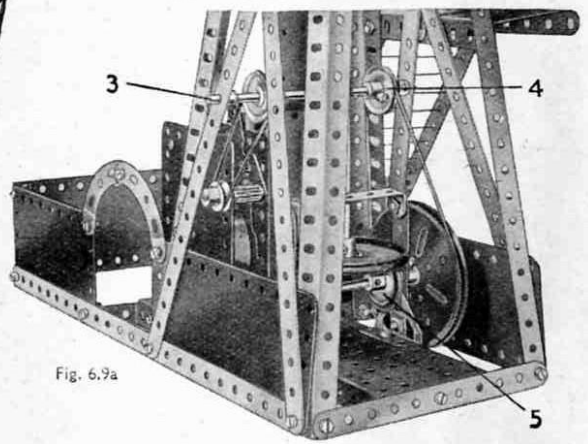


Fig. 6.9a

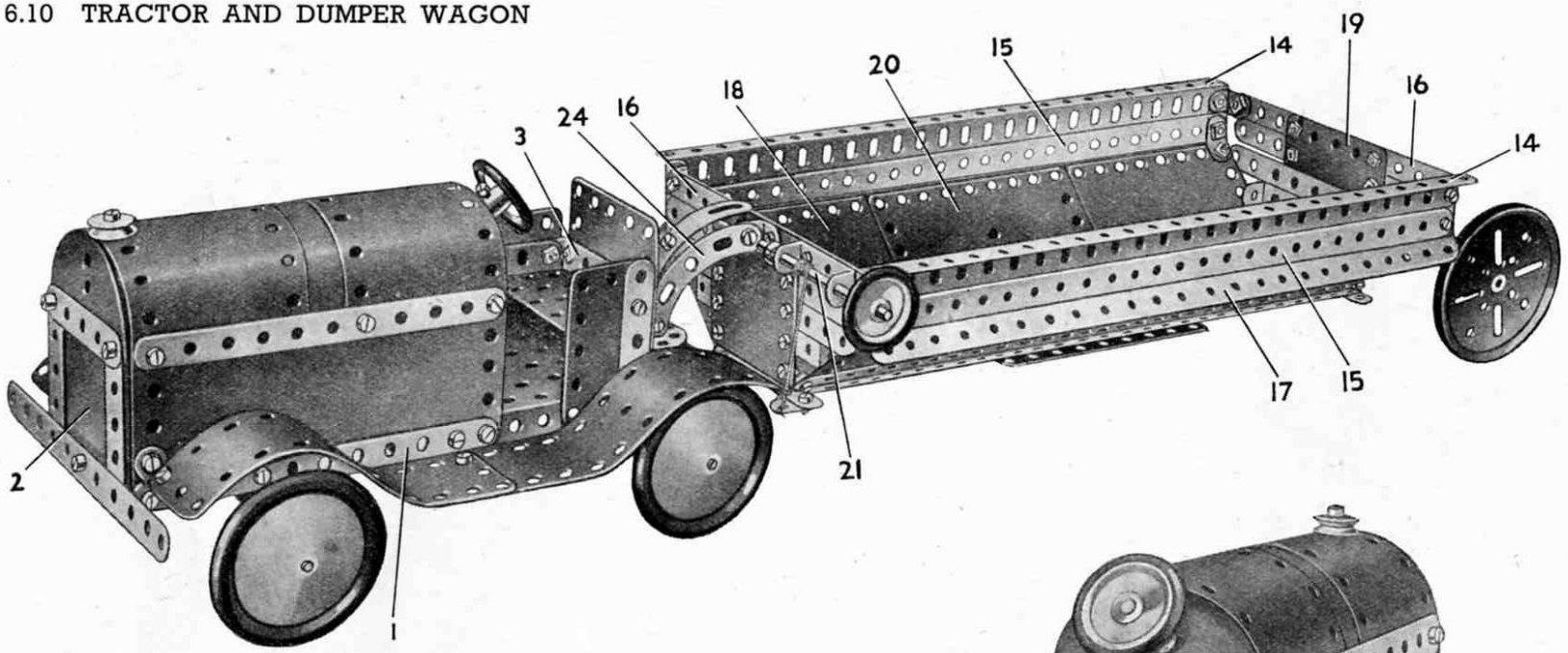
A base for the model is provided by bolting two 12½" Strips to the Angle Girders that form the tower. Two 5½" Strips are bolted to the Angle Girders across their lower ends, and between them is fixed a 5½"×2½" Flanged Plate. The Flanged Plate is extended on the inside by a 3½"×2½" Flanged Plate attached to it by a Fish-plate. The 3½"×2½" Flanged Plate is attached also to one of the 12½" Strips of the base by a 1"×1" Angle Bracket and a Double Bracket.

The boiler consists of two 5½"×2½" Flexible Plates bolted together and extended by two 1 11/16" radius Curved Plates. They are then curved to shape and their ends are bolted together. The boiler is fixed to the side of the model. The Road Wheel 1 is fastened on a 3" Screwed Rod, which is lock-nutted to a Fishplate bolted to a 1"×1" Angle Bracket inside the boiler. Inside the 2½" Cylinder is an Angle Bracket which is fitted on to the Screwed Rod, where it is held in place by a nut.

The No. 1 Clockwork Motor is fastened by Double Brackets to the 5½"×2½" Flanged Plate and the 3½"×2½" Flanged Plate. The drive is taken by a Driving Band from a ½" fast Pulley on the driving shaft of the Motor, to a 1" fast Pulley on a 5" Rod 3 journalled in the sides of the tower. This Rod carries also a second 1" Pulley 4, which is connected by a Driving Band to a 3" Pulley on the 3½" Rod carrying the Pulley 5 (Fig. 6.9a). Pulley 5 is fitted with a Rubber Ring, which is in contact with the rim of the Road Wheel at the bottom of the main shaft. The arms carrying the aeroplanes are fastened by Angle Brackets to a 3" Pulley on the main shaft and are supported by Cords. The main shaft consists of an 11½" Rod and a 6½" Rod joined by a Rod Connector 2.

The construction of three of the aeroplanes will be clear from the illustration. The fuselage of the aeroplane partly hidden by the tower consists of two U-section Curved Plates bolted together at the tail. A 1" loose Pulley is attached to the fuselage by a Double Bracket to form the engine. The wing is made of two 5½" Strips bolted to two Angle Brackets and fastened to the sides of the fuselage.

6.10 TRACTOR AND DUMPER WAGON



The chassis of the tractor unit is formed by bolting the 5½" Strips 1 to each side of a 5½"×2½" Flanged Plate. The Strips 1 are connected at the front by a 2½"×½" Double Angle Strip, and 5½"×2½" Flexible Plates attached to the 5½" Strips form the sides of the bonnet. The radiator is represented by a 2½"×2½" Flexible Plate 2 and a Semi-Circular Plate. The sides of the bonnet are joined by two 2½"×½" Double Angle Strips, and the top consists of two 5½"×2½" and a 4½"×2½" Flexible Plate curved to the same radius as the Semi-Circular Plate and attached to the sides.

The driver's seat is made by bolting 2½"×1½" Flexible Plates to the sides of the 5½"×2½" Flanged Plate. The back of the seat consists of a 2½"×2½" Flexible Plate attached to the Double Angle Strip 3, and the seat proper is represented by a 2½"×1½" Flanged Plate.

The rear wheels are locked on a 5" Rod journalled in the Flat Trunnions 4 (Fig. 6.10c). The Fishplate 5 is attached to a 3½" Strip lock-nutted to the chassis, so that it can be forced against a 1" Pulley fitted with a Rubber Ring on the rear axle, to act as a brake. The front axle 6 consists of a 3½" and a 2½" Strip overlapped three holes and secured to the chassis by a 2½"×½" Double Angle Strip. Two ⅜" Bolts passed through the 1½" Strips 7 and Double Brackets 8 are locked in the end holes of the strip 6 by two nuts. The Strips 7 are connected by lock-nuts to a compound strip 9 made from a 3½" and a 2½" Strip overlapped three holes. The front wheels are fixed on 1½" Rods mounted in the Double Brackets 8.

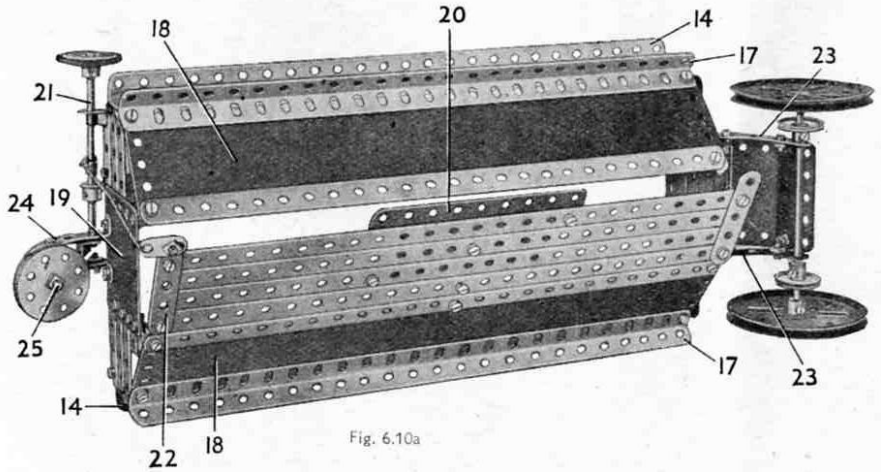


Fig. 6.10a

The steering column is a 6½" Rod journalled in the Semi-Circular Plate 10 (Fig. 6.10b) and an Angle Bracket 11. An Obtuse Angle Bracket 12, bolted to a Bush Wheel on the steering column, is fitted over a Threaded Pin 13. The Threaded Pin is fixed to an Angle Bracket attached to the strip 9.

The mudguards on each side are formed by two 5½"×1½" Flexible Plates joined together and attached to the chassis by Angle Brackets.

(Continued on next page)

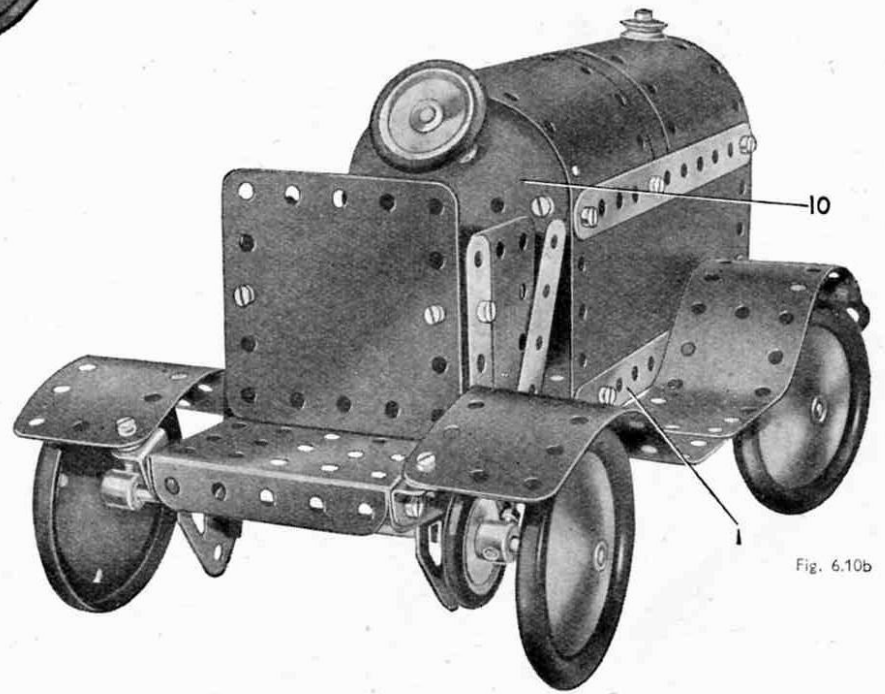


Fig. 6.10b

6.10 TRACTOR & DUMPER WAGON—*Continued*

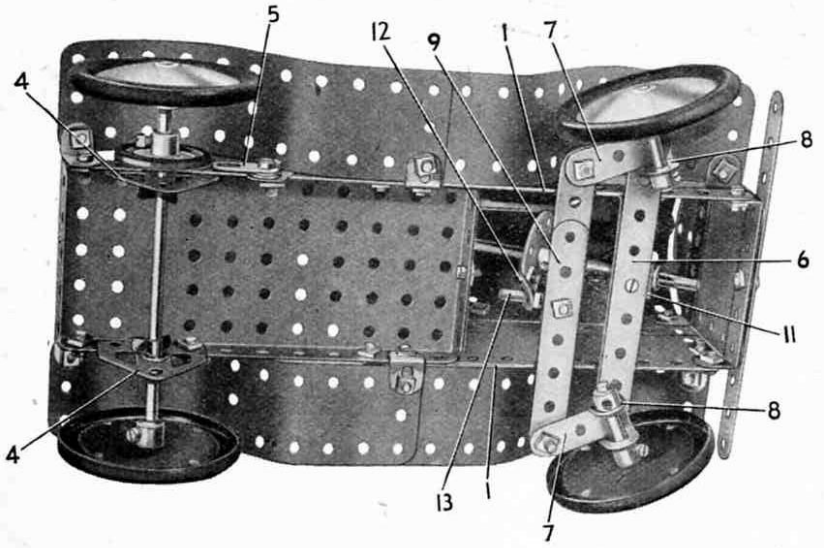


Fig. 6.10c

The loading hopper is made by joining the 12½" Angle Girders 14 to the 12½" Strips 15 by Fishplates, and to the 5½" Strips 16 by Angle Brackets. The Angle Girders 17 (Fig. 6.10a) and 12½" Strip Plates 18 are attached to the Strips 15 by Obtuse Angle Brackets. The Plates 18 are joined to the 2½"×2½" Flexible Plates 19 by Angle Brackets. Each end of the hopper is filled in by two 5½" Strips and a 3½"×½" Double Angle Strip bolted to the Flexible Plate 19.

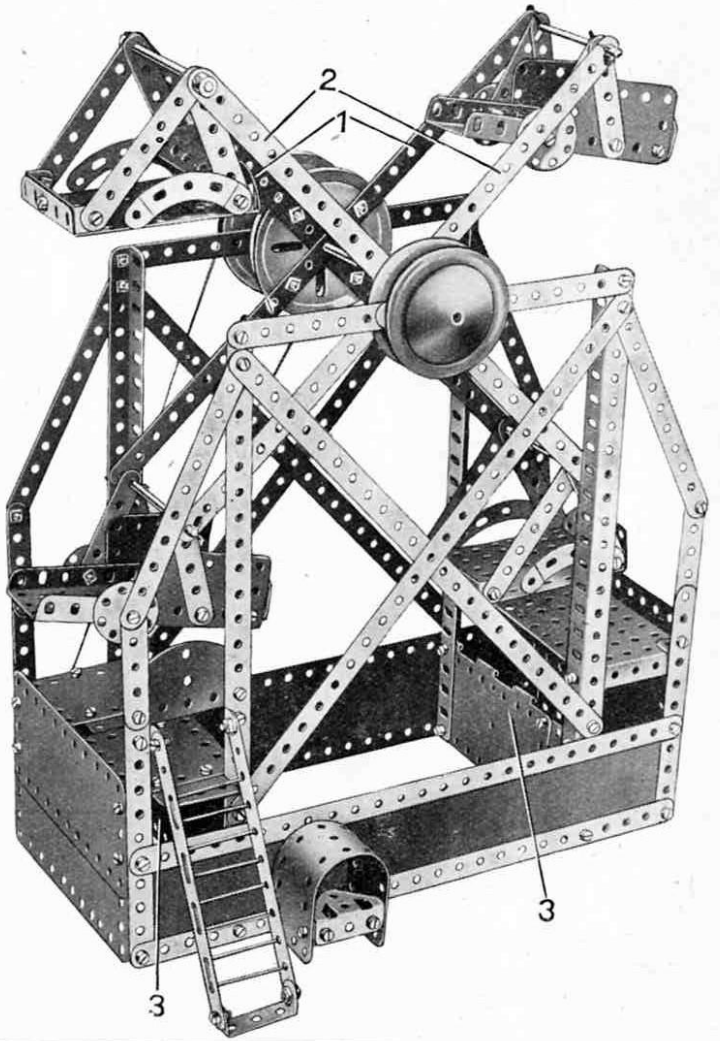
The bottom of the hopper is made by bolting four 12½" Strips to one half of a Hinged Flat Plate 20. The other half of this Plate is attached to the side of the hopper. The bottom can be opened or closed by operating the 3½" Rod 21. A length of Cord fastened to a Cord Anchoring Spring on this Rod is tied to a Fishplate bolted to the 2½" Strip 22.

The hopper runs on two 3" Pulleys locked on a 5" Rod. This Rod is journalled in the end holes of the Curved Strips 23. These Strips are fixed to Trunnions bolted to the rear end of the hopper, and a 1⅛" radius Curved Plate is attached to them by Angle Brackets and a 2½"×½" Double Angle Strip.

The hopper is pivotally connected to the tractor by the Curved Strips 24. These are attached to the hopper by two Angle Brackets, and to the tractor by a ½" Bolt 25 passed through a Double Bracket and lock-nutted to the rear of the tractor. Four Wheel Discs are used for spacing purposes.

6.11 FLY BOATS

The base consists of two 12½"×2½" Strip Plates, joined at each end by 5½"×2½" Flexible Plates and strengthened by 5½" Strips bolted to the ends of the base. Four Angle Girders are bolted to the base as shown in the illustration, and pairs of them are joined at the top by compound strips, each of which consists of two 5½" Strips overlapped five holes. The Angle Girders are braced across by 12½" Strips.



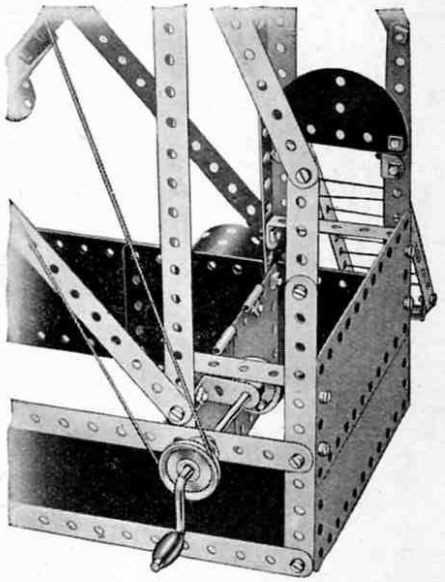


Fig. 6.11a

The centre pin is withdrawn from a Hinged Flat Plate and the halves are used as flat plates 3. The 12½" Strips 1 and 2 form the supports for the carriages. The Strips 2 are bolted across a Bush Wheel mounted on the 6½" Rod forming the main shaft. Strips 1 are bolted across a 3" Pulley also secured on the 6½" Rod.

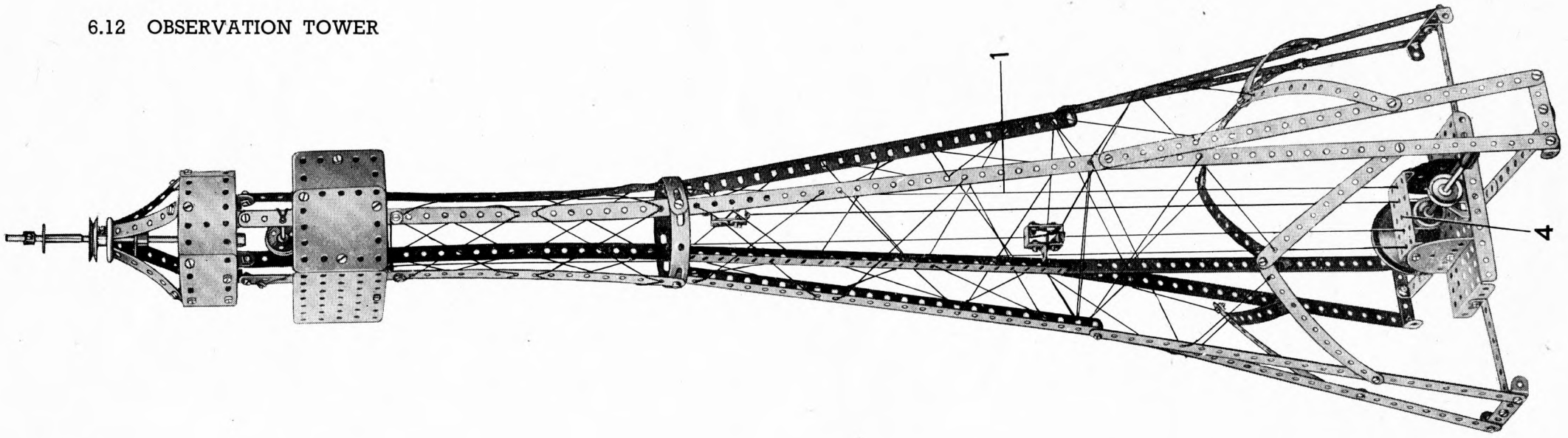
Two of the carriages are made by fastening 2½"×½" Double Angle Strips inside the flanges of a 3½"×2½" Flanged Plate. Pairs of Strips of various lengths are bolted to the ends of the Double Angle Strips. A 4" Rod passes through the holes in these Strips and through the end holes of the 12½" Strips 1 and 2. A back is provided by a U-Section Curved Plate bolted to the rear of the 3½"×2½" Flanged Plate, and the sides are formed by 2½" small radius Curved Strips.

The base of each of the other two carriages is a Flanged Sector Plate. The sides consist of 2½"×1½" Flexible Plates, and bearings for the 3½" Rods on which the carriages are supported are provided by the end holes of 2½" Strips, bolted to the flanges of the Flanged Sector Plate. The back is formed by two Flat Trunnions fixed to a 2½"×½" Double Angle Strip secured between the flanges of the Flanged Sector Plate.

The Crank Handle (Fig. 6.11a) by which the carriages are set in motion, is journalled in the 12½"×2½" Strip Plate forming the rear side of the base, and also in a 1"×1" Angle Bracket. The 1"×1" Angle Bracket is bolted to the half of a Hinged Flat Plate used in the construction of the left-hand platform. The drive is taken by Cord from a 1" Pulley on the shaft of the Crank Handle to a 3" Pulley on the main shaft.

The pay-box consists of a 5½"×1½" Flexible Plate bent to shape, and is secured to the base by a 1½"×½" Double Angle Strip. The counter is formed by a Trunnion, and is fastened in position by Angle Brackets.

6.12 OBSERVATION TOWER



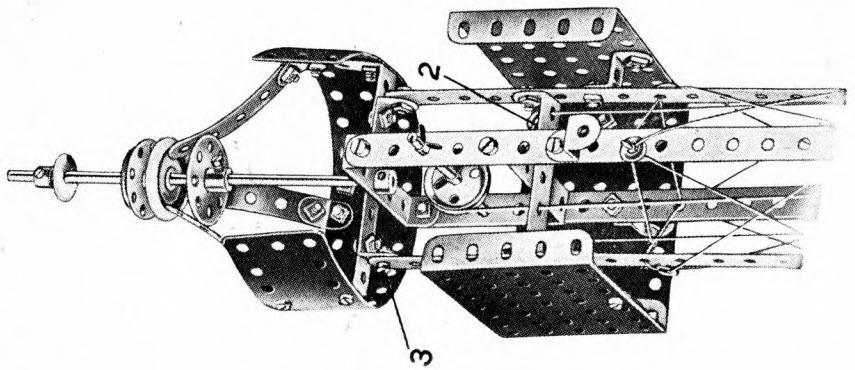


Fig. 6.12a

Two sides of the lower platform at the top of the tower are formed by 3½" × 2½" Flanged Plates fastened to the frame by Reversed Angle Brackets. The other two sides are each constructed from a 2½" × 2½" Flexible Plate and a 2½" × 1½" Flexible Plate bolted together overlapping one hole, and they also are secured to the frame by Reversed Angle Brackets. The top platform consists of three 5½" × 1½" Flexible Plates bolted together and attached by 1" × 1" Angle Brackets to the top of the frame. Four 2½" Strips are curved slightly and fastened by Obtuse Angle Brackets to the 5½" × 1½" Flexible Plates.

Several of the Flexible Plates have been removed in Fig. 6.12a to show the construction of the top of the frame and the arrangement of the Pulleys and Bush Wheel on the compound rod at the top of the tower.

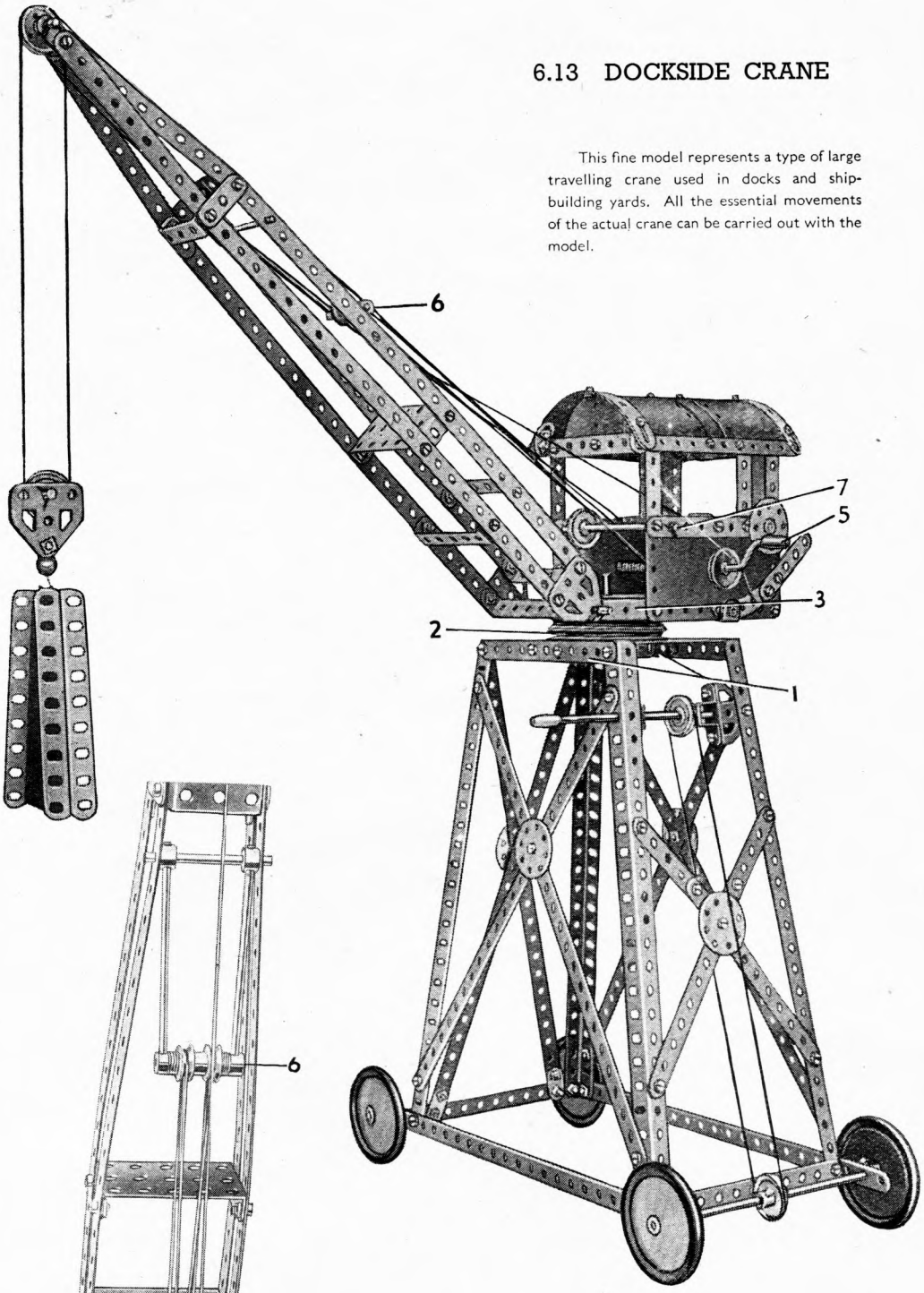
Each of the lifts consists of two Double Brackets joined by Fishplates, and an Angle Bracket is fastened to the side of each lift to receive the guide Cord 1. The operating cable consists of two Cords of equal length. The first of these is tied to the bottom of one lift, taken around the 1" Pulley on the Crank Handle and then tied to the bottom of the other lift. The second Cord is tied to the roof of the second lift, taken over the 1" loose Pulley at the top of the tower and then tied to the top of the first lift.

The guide Cord is anchored to a Washer 2, and is pushed through the Angle Bracket on the outside of one lift, then taken through the end hole of the 2½" × 1½" Flanged Plate 4, across the back of the Flanged Plate, to a similar hole on the other side. It then passes upwards through the Angle Bracket of the second lift to the top of the model, where it is secured to Bolt 3.

The lifts should be spaced on the Cord so that when one reaches the top of the tower the other is at the bottom.

6.13 DOCKSIDE CRANE

This fine model represents a type of large travelling crane used in docks and ship-building yards. All the essential movements of the actual crane can be carried out with the model.



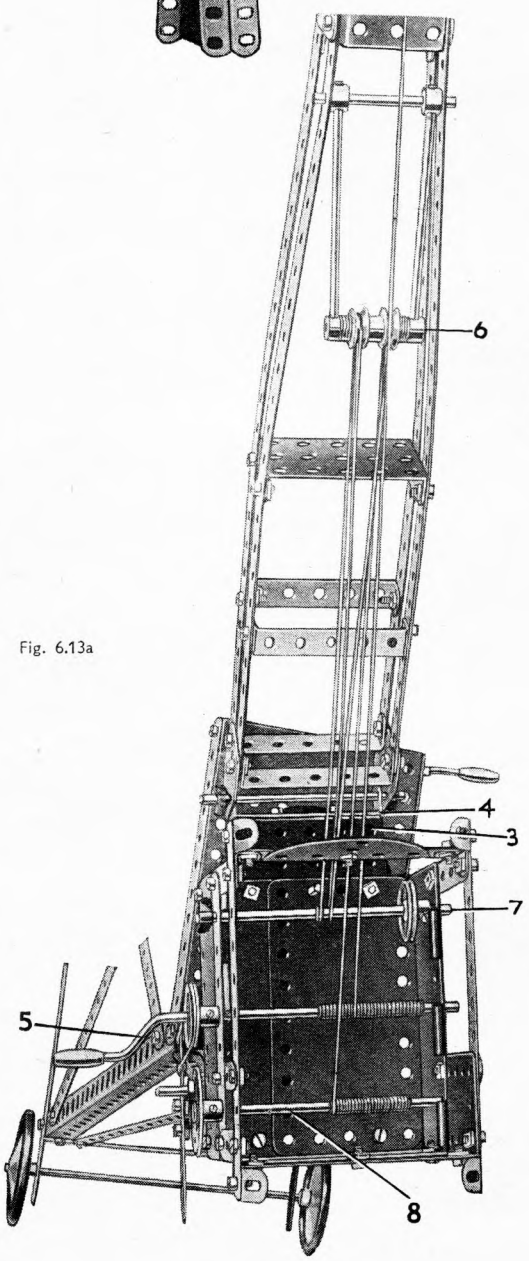


Fig. 6.13a

The top of the travelling tower consists of two $3\frac{1}{2}$" × $2\frac{1}{2}$" Flanged Plates bolted to a $5\frac{1}{2}$" Strip 1 on each side. The cab rotates about a 2" Rod locked in the 3" Pulley 2. The cab is built up on two $3\frac{1}{2}$" × $\frac{1}{2}$" Double Angle Strips secured to the $5\frac{1}{2}$" × $2\frac{1}{2}$" Flanged Plate 3. The sides are made by withdrawing the pin from a Hinged Flat Plate and bolting the separated halves to the Double Angle Strips. The jib is held in position by a $3\frac{1}{2}$" Rod passed through a $2\frac{1}{2}$" × $\frac{1}{2}$" Double Angle Strip 4 (Fig. 6.13a).

Raising and lowering of the load is controlled by a length of Cord fastened to a Cord Anchoring Spring on the Crank Handle 5. This Cord passes over a 1" loose Pulley in the jib head, around a similar Pulley in the pulley block, and is then secured to the jib head.

The jib is luffed by a length of Cord attached to the $4\frac{1}{2}$" Rod 8. From this Rod the Cord passes around a $\frac{1}{2}$" loose Pulley on the Rod 6, around the Rod 7, over a $\frac{1}{2}$" Pulley on Rod 6, and finally is secured to Rod 7. The Rod 6 is pivotally attached to the jib by means of two Screwed Rods screwed into the tapped holes of Collars locked on Rod 6, and also into two Collars on a 2" Rod journalled in the jib.

6.14 PITHEAD GEAR

Each side of the lower framework of the model is made by bolting the vertical 12½" Angle Girders 1 and 12½" Strips 2 to the compound strips 3. The compound strips consist of a 12½" and a 5½" Strip joined together. The sides are connected by the 5½" Strips 4 and a 5½"×2½" Flanged Plate 5.

The tower consists of four 12½" Strips bolted to the lower framework and joined at the top by the 5½" Strips 6 and 5½"×1½" Flexible Plates 7, which are attached to the 12½" Strips by Angle Brackets. The 3" Pulleys 8 are held between Spring Clips on a 6½" Rod mounted in 2½" Strips bolted to the top of the tower.

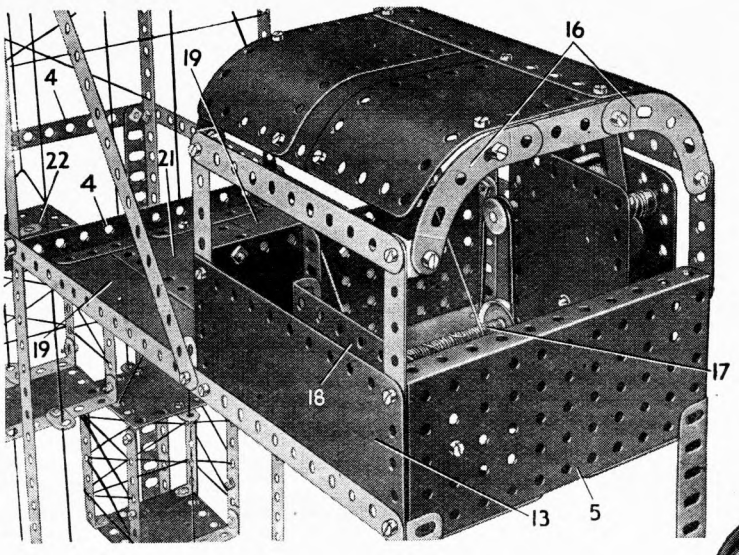


Fig. 6.14a

One of the cages is formed by connecting together two 2½"×2½" Flexible Plates by means of 3½" Strips 9 and Angle Brackets. The second cage is made in a similar way, except that two 3½"×½" Double Angle Strips and two compound strips, each consisting of a 2½" Strip and a 1½" Strip, are used in place of the Strips 9. Guides for the cages are provided by four lengths of Cord. These are fastened at the top to Flat Trunnions (Fig. 6.14b) attached to the Strips 6 by Double Brackets, and at their lower ends to the 2½"×½" Double Angle Strips 11 and 1½"×½" Double Angle Strips 12. The Cords pass through Fishplates attached to top and bottom of the cages.

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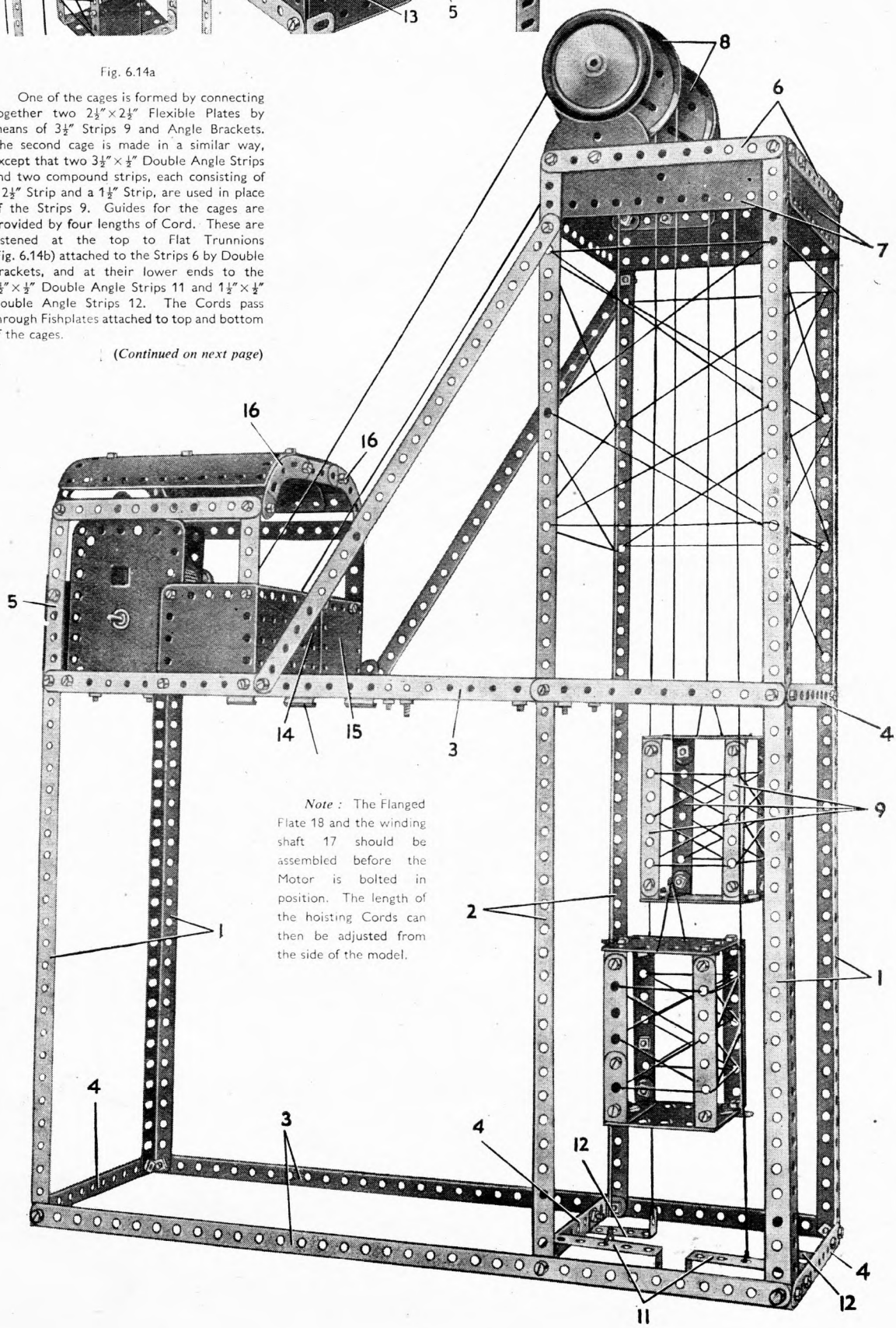
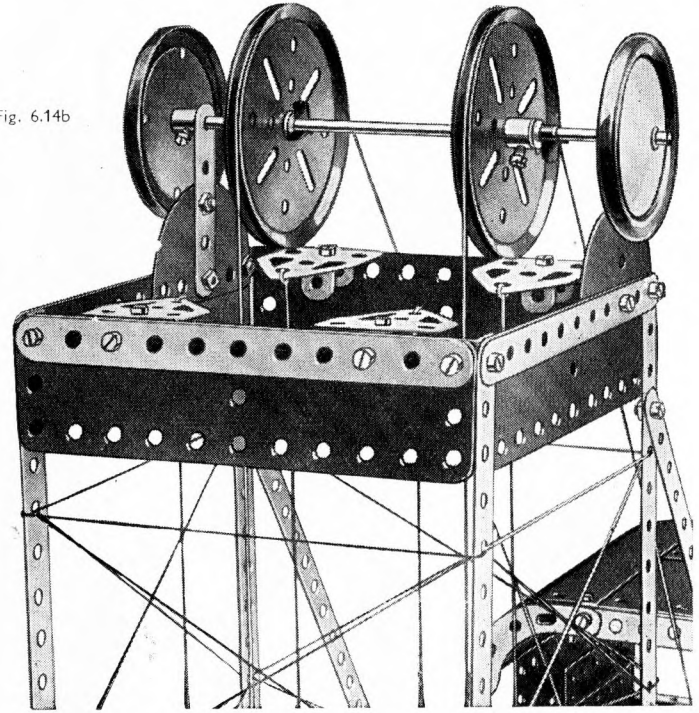


Note : The Flanged Plate 18 and the winding shaft 17 should be assembled before the Motor is bolted in position. The length of the hoisting Cords can then be adjusted from the side of the model.

6.14 PITHEAD GEAR—*Continued*

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

Fig. 6.14b

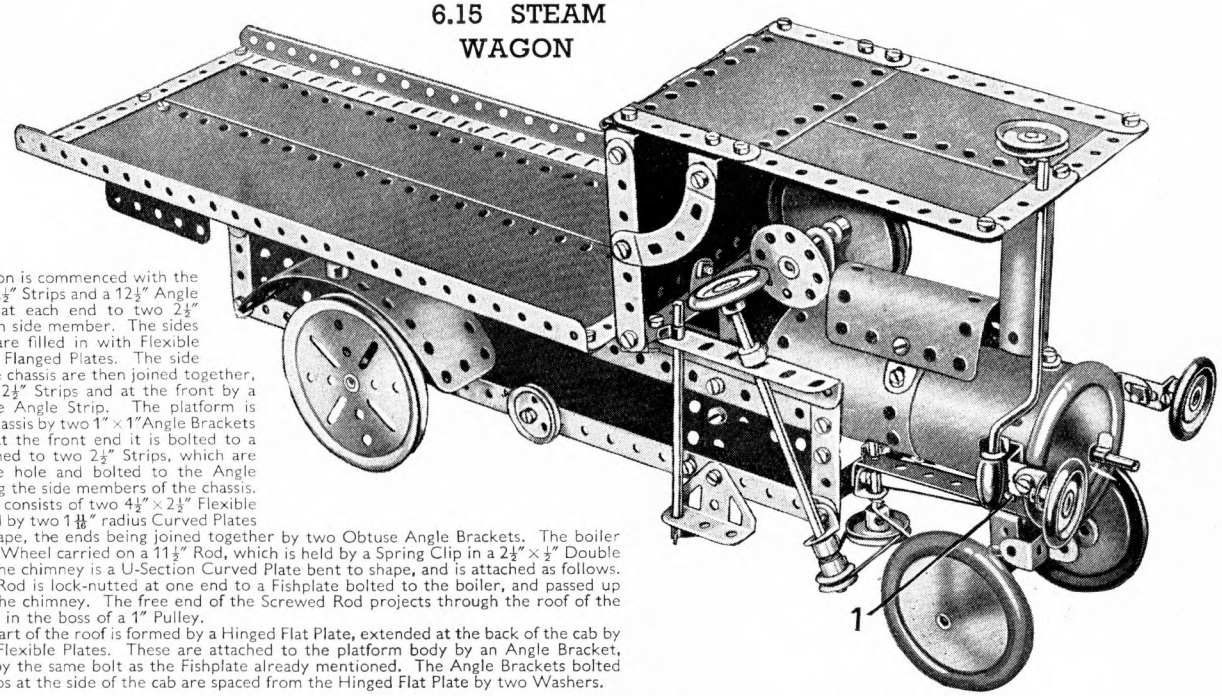


One side of the winding house consists of a 5½" × 2½" Flexible Plate 13, and the front is formed by the 3½" × 2½" Flanged Plate 14 and 2½" × 2½" Flexible Plate 15. The roof consists of a 4½" × 2½" and three 5½" × 2½" Flexible Plates fastened together as shown, and attached by Angle Brackets to the Curved Strips 16.

A No. 1 Clockwork Motor is bolted securely to the framework, and the drive taken from a ½" Pulley on the Motor output shaft to a 1" Pulley on Rod 17 (Fig. 6.14a). This Rod is journalled in the side-plate of the motor and a 3½" × 2½" Flanged Plate 18. Lengths of Cord extending from the cages are passed over the 3" Pulleys 8 and wound in opposite directions around the Rod 17, so that as one Cord is taken in the other is paid out.

"Ground level" is represented by two 12½" Strip Plates 19, one half of a Hinged Flat Plate 20, and a 4½" × 2½" Flexible Plate 21. These are attached to the Flanged Plate 5 and to two Reversed Angle Brackets, one of which is seen at 22.

6.15 STEAM WAGON



Construction is commenced with the chassis. Two 12½" Strips and a 12½" Angle Girder bolted at each end to two 2½" Strips form each side member. The sides of the chassis are filled in with Flexible Plates and two Flanged Plates. The side members of the chassis are then joined together, at the rear by 2½" Strips and at the front by a 2⅛" × ½" Double Angle Strip. The platform is bolted to the chassis by two 1" × 1" Angle Brackets at the rear. At the front end it is bolted to a Fishplate attached to two 2½" Strips, which are overlapped one hole and bolted to the Angle Girders forming the side members of the chassis.

The boiler consists of two 4½" × 2½" Flexible Plates extended by two 1 $\frac{11}{16}$" radius Curved Plates and bent to shape, the ends being joined together by two Obtuse Angle Brackets. The boiler front is a Road Wheel carried on a 11½" Rod, which is held by a Spring Clip in a 2½" × ½" Double Angle Strip. The chimney is a U-Section Curved Plate bent to shape, and is attached as follows. A 3" Screwed Rod is lock-nutted at one end to a Fishplate bolted to the boiler, and passed up the centre of the chimney. The free end of the Screwed Rod projects through the roof of the cab and is held in the boss of a 1" Pulley.

The rear part of the roof is formed by a Hinged Flat Plate, extended at the back of the cab by two 2½" × 2½" Flexible Plates. These are attached to the platform body by an Angle Bracket, which is held by the same bolt as the Fishplate already mentioned. The Angle Brackets bolted to the 3½" Strips at the side of the cab are spaced from the Hinged Flat Plate by two Washers.

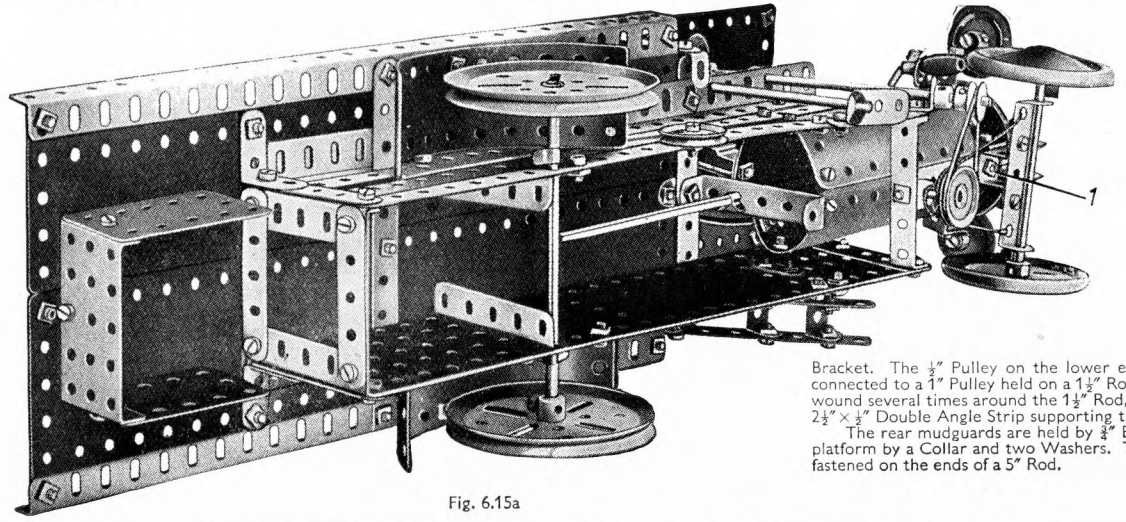


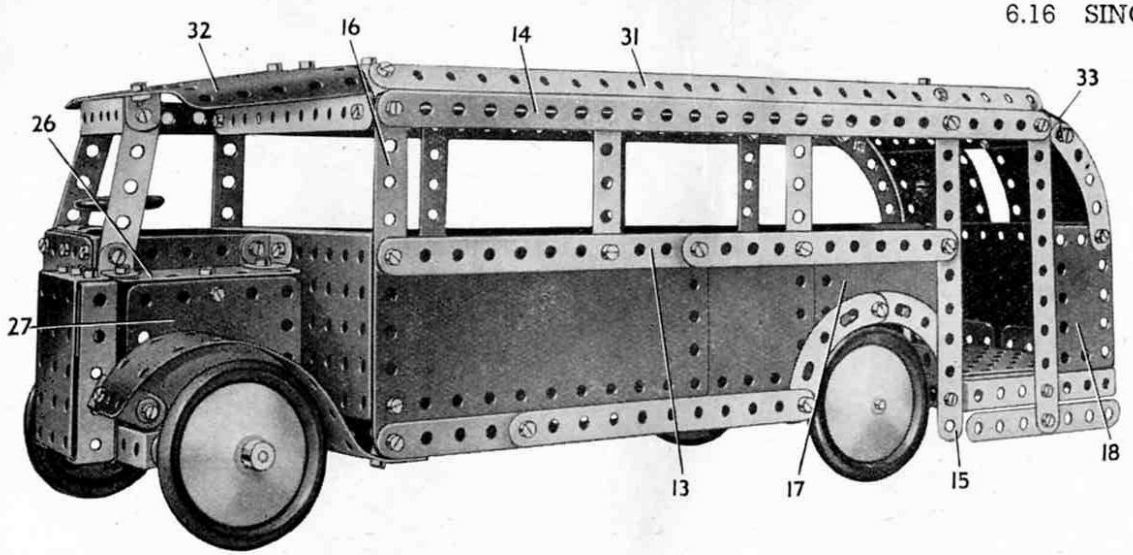
Fig. 6.15a

The front axle is mounted in the following manner. A Double Bracket is fastened by Obtuse Angle Brackets to the underside of the boiler, and a 3½" × ½" Double Angle Strip is bolted to it and to the Double Angle Strip spacing the front of the chassis. To the Double Angle Strip a Double Bent Strip carrying the front axle support is lock-nutted by Bolt 1.

The steering column is journalled in the Angle Girder at the side of the cab, and also in an Angle Bracket. The ½" Pulley on the lower end of the steering column is connected to a 1" Pulley held on a 1½" Rod, by a Driving Band. Cord is wound several times around the 1½" Rod, and is tied at each end to the 2½" × ½" Double Angle Strip supporting the front axle.

The rear mudguards are held by ¾" Bolts, and are spaced from the platform by a Collar and two Washers. The rear wheels are 3" Pulleys fastened on the ends of a 5" Rod.

6.16 SINGLE DECK BUS



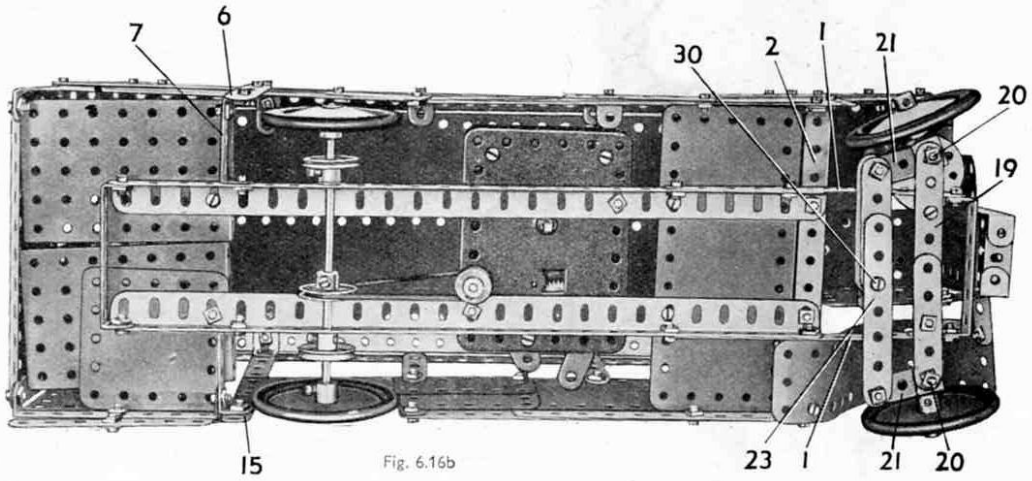


Fig. 6.16b

The chassis is formed by two 12½" Angle Girders extended by the 5½" Strips 1 (Fig. 6.16b). The Angle Girders are connected by a 2½" × ½" Double Angle Strip at the rear, and by a 5½" × 2½" Flanged Plate 2. The rear platform consists of two 3½" × 2½" Flanged Plates and a 2½" Flexible Plate bolted to the chassis members.

The off-side of the body, seen in Fig. 6.16c, is built up on a framework consisting of a compound strip 3, made by overlapping two 12½" Strips 17 holes, and a 12½" Strip 4 extended by a 2½" Strip 5. These are bolted to a 5½" Strip 6, which is attached to the chassis by a 1½" × ½" Double Angle Strip 7, and to a 2½" Strip 8. The side is filled in by a 2½" × 1½" Flexible Plate 9, two 4½" × 2½" Flexible Plates, a 5½" × 1½" Flexible Plate 10, and two 2½" × 2½" Flexible Plates 11. The 5½" Strips 12 are attached to the Flexible Plates by Fishplates.

The near side of the model, seen in the general view, consists of two 5½" Strips 13 and a 12½" Strip 14. These are bolted to the 5½" Strip 15 and 2½" Strip 16, and the side is filled in by a 5½" × 2½" Flexible Plate, a 2½" × 2½" Flexible Plate, a 5½" × 1½" Flexible Plate 17 and a 2½" × 1½" Flexible Plate 18. The rear of the bus is formed by a 5½" × 2½" Flexible Plate attached by Angle Brackets to the Plates 11 and 18.

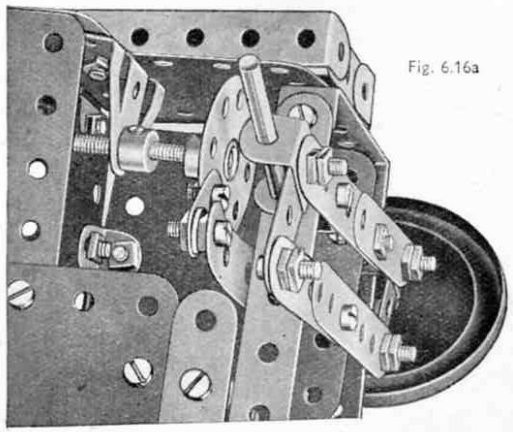


Fig. 6.16a

The front axle consists of a compound strip 19, made by overlapping a 3½" and a 2½" Strip three holes, and is attached to the Strips 1 by Double Brackets. The ⅜" Bolts 20 are passed through the 1½" Strips 21 and two Double Brackets, and are held by lock-nuts in the end holes of the strip 19. The Strips 21 are connected by lock-nutted bolts to a compound strip 23. This strip consists of a 3½" and a 2½" Strip over lapped three holes. The Road Wheels are free to turn on 1½" Rods held by Spring Clips in the Double Brackets.

The driver's cab is formed by a 2½" × 1½" Flexible Plate and a 2½" × 2½" Flexible Plate 25 bolted to a 2½" × ½" Double Angle Strip 24. The bonnet consists of a 2½" × 1½" Flexible Plate 26 and a 2½" × 2½" Flexible Plate 27. The radiator is represented by a 2½" × 1½" Flanged Plate. This is fitted with a 2½" × ½" Double Angle Strip on each side and is attached by a Fishplate to the Flexible Plate 26.

The steering column is a 3" Screwed Rod mounted in the Trunnions 28. A Bush Wheel fixed on the end of this Rod is fitted with a Fishplate and connected by a lock-nutted bolt to a 2½" Strip. The opposite end of this Strip is placed over a ⅜" Bolt 30.

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

The 12½" Strips 31 are attached by Obtuse Angle Brackets to the strips 4 and 14. The roof is formed by two 12½" Strip Plates fastened by Angle Brackets to the Strips 31. A 5½" × 2½" Flexible Plate 32 is attached to the Strip Plates by a 2½" Strip, and fastened by an Angle Bracket to the front of the driver's cab.

The curved panelling at the rear of the bus is formed by two 1 11/16" radius Curved Plates bolted to a 5½" × 1½" Flexible Plate 33. This Plate is attached to the 12½" Strip Plates.

The model is driven by a No. 1 Clockwork Motor bolted to the chassis as shown in Fig. 6.16b. A ½" Pulley on the driving shaft of the Motor is connected by a Driving Band to a 1" Pulley on the rear axle. The rear axle consists of a 3½" and a 2" Rod joined by a Rod Connector.

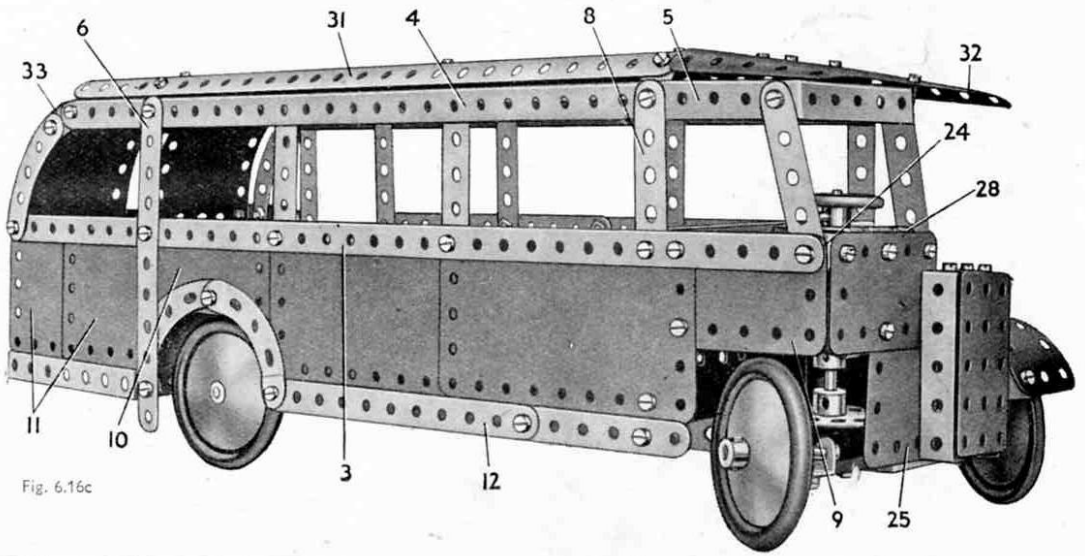


Fig. 6.16c

6.17 FARM TRACTOR AND HARVESTER

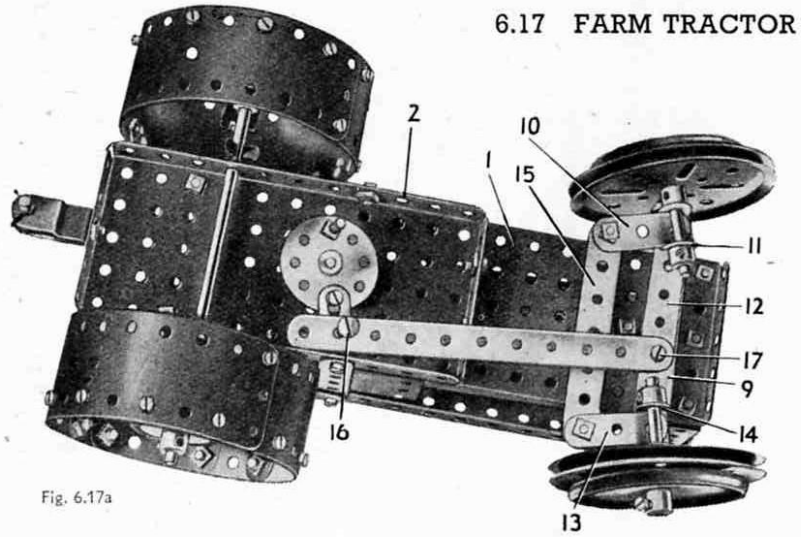


Fig. 6.17a

This is a model of a tractor and harvester of the type now in use on many farms. The tractor is generally driven by a diesel engine, and is capable of being used as a hauling unit for other types of farm equipment such as ploughs and harrows.

The tractor chassis consists of a 3½" × 2½" Flanged Plate 1 (Fig. 6.17a) bolted to a 5½" × 2½" Flanged Plate 2. Each side of the bonnet is formed by a 2½" × ½" Double Angle Strip 3 and a 3" Strip 4. The Strips 3 and 4 are connected by a 5½" Strip 5, and are joined to similar Strips on the opposite side by two 2½" × ½" Double Angle Strips (Fig. 6.17b).

The radiator consists of the 2½" Strips 6 and a 2½" × 1½" Flanged Plate 7, and the top of the bonnet is formed by a 5½" × 2½" Flexible Plate attached to the Curved Strips 8 by Angle Brackets. The engine is represented by a U-Section Curved Plate attached to a Cylinder by means of a Double Bracket, the Cylinder being bolted to the Flanged Plate 1. The seat consists of a U-Section Curved Plate attached to the Flanged Plate 2 by 1½" × ½" Double Angle Strips.

The rear wheels are made by joining together a 2½" × 1½" and two 5½" × 1½" Flexible Plates, and bolting these to spokes which on one wheel consist of two 3½" × ½" Double Angle Strips, and on the other of two 3½" Strips and Angle Brackets. The hubs are formed by Wheel Discs, and the wheels are clamped on a 6½" Rod between a Collar and a 1" Pulley fitted with a Rubber Ring.

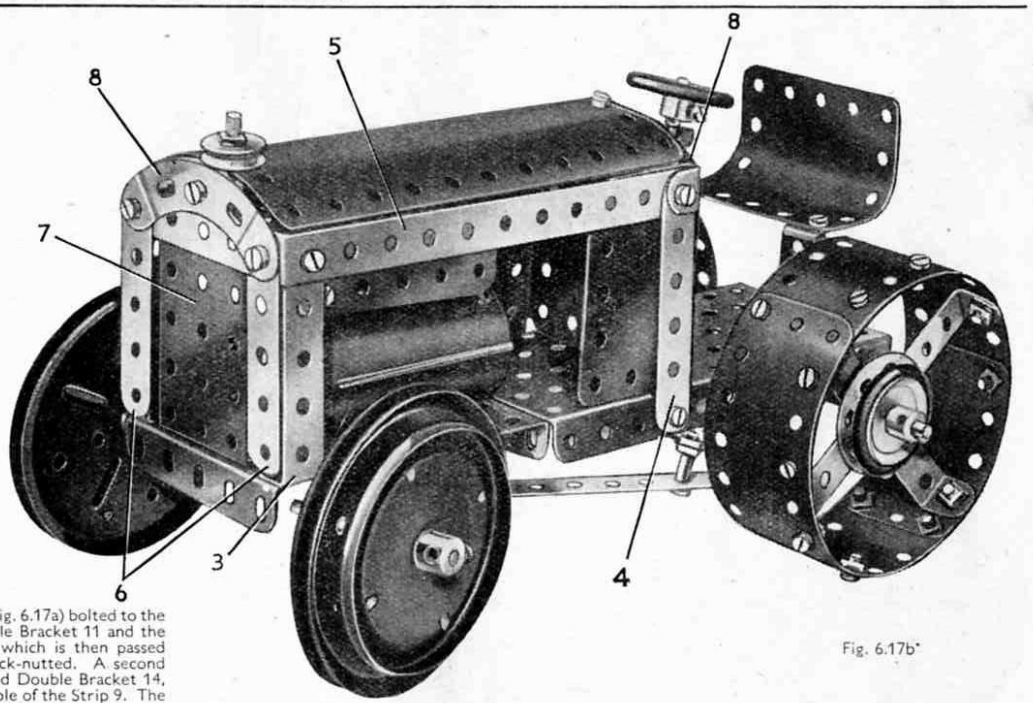
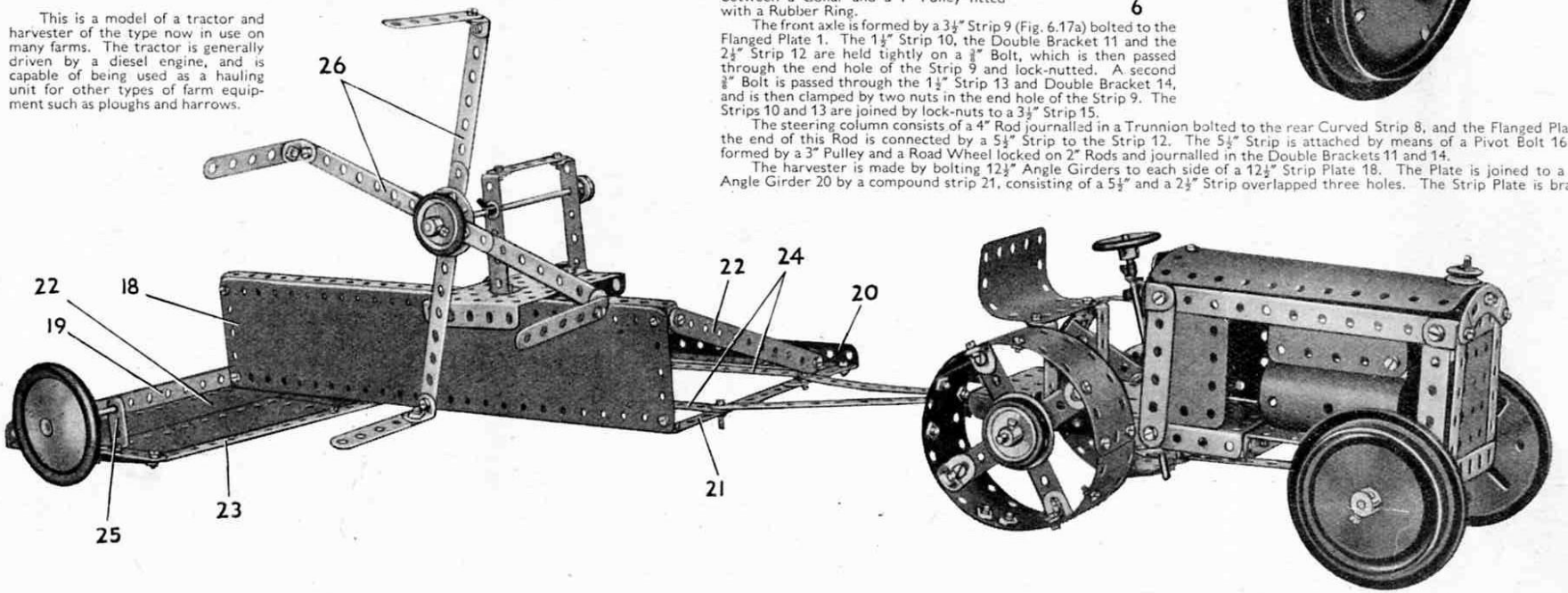


Fig. 6.17b

The front axle is formed by a 3½" Strip 9 (Fig. 6.17a) bolted to the Flanged Plate 1. The 1½" Strip 10, the Double Bracket 11 and the 2½" Strip 12 are held tightly on a ⅜" Bolt, which is then passed through the end hole of the Strip 9 and lock-nutted. A second ⅜" Bolt is passed through the 1½" Strip 13 and Double Bracket 14, and is then clamped by two nuts in the end hole of the Strip 9. The Strips 10 and 13 are joined by lock-nuts to a 3½" Strip 15.

The steering column consists of a 4" Rod journalled in a Trunnion bolted to the rear Curved Strip 8, and the Flanged Plate 2. A Fishplate bolted to a Bush Wheel fixed to the end of this Rod is connected by a 5½" Strip to the Strip 12. The 5½" Strip is attached by means of a Pivot Bolt 16 and a lock-nutted Bolt 17. The front wheels are formed by a 3" Pulley and a Road Wheel locked on 2" Rods and journalled in the Double Brackets 11 and 14.

The harvester is made by bolting 12½" Angle Girders to each side of a 12½" Strip Plate 18. The Plate is joined to a 12½" Angle Girder 19, and connected to a second Angle Girder 20 by a compound strip 21, consisting of a 5½" and a 2½" Strip overlapped three holes. The Strip Plate is braced by a 5½" Strip 27 attached to Angle Brackets. The binder platform consists of a 12½" Strip Plate 22 and a 2½" × 2½" and two 5½" × 2½" Flexible Plates joined together and bolted to the 12½" Strip 23. The 12½" Strips 24 are then added for bracing purposes.



The harvester runs on two Road Wheels. One of these is fixed on a 1½" Rod journalled in the 1" × 1" Angle Bracket 25 and a Trunnion. The other is locked on a 5" Rod, which is mounted in a Semi-Circular Plate bolted to the Angle Girder 20 and in a 1" × 1" Angle Bracket attached to the Strip 23.

The rotating blades are formed by 2½" Strips fastened by Angle Brackets to the compound strips 26. These strips consist of 5½" Strips overlapped five holes and bolted to a Wheel Disc. The Wheel Disc is held tightly on a 5" Rod between a Spring Clip and a 1" Pulley fitted with a Rubber Ring. A ½" Pulley on this Rod is connected by a Driving Band to a 1" Pulley fixed on the 5" Rod supporting the Road Wheel.

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Fig. 6.18a

6.18 GIANT DRAGLINE

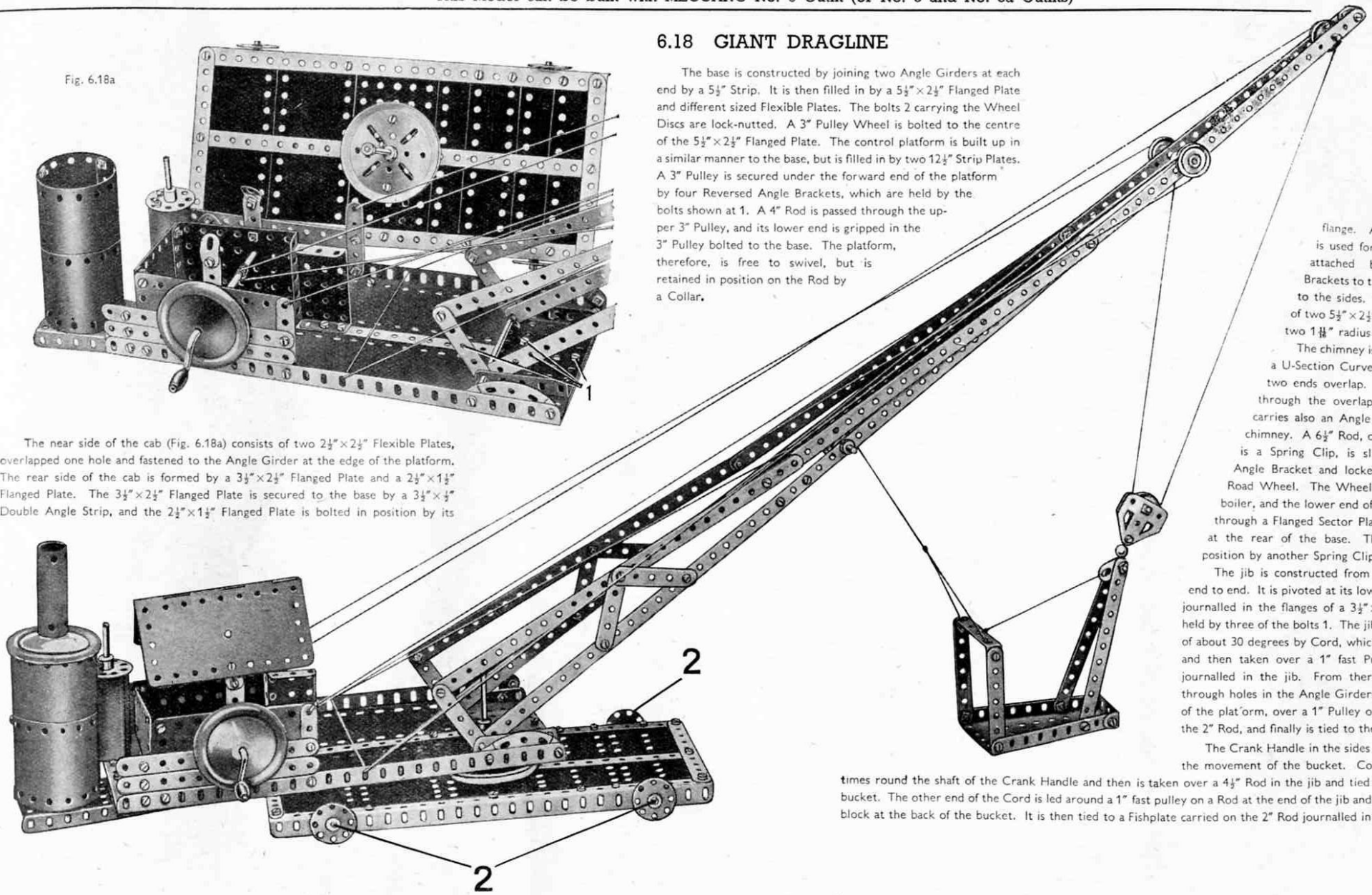
The base is constructed by joining two Angle Girders at each end by a 5½" Strip. It is then filled in by a 5½"×2½" Flanged Plate and different sized Flexible Plates. The bolts 2 carrying the Wheel Discs are lock-nutted. A 3" Pulley Wheel is bolted to the centre of the 5½"×2½" Flanged Plate. The control platform is built up in a similar manner to the base, but is filled in by two 12½" Strip Plates. A 3" Pulley is secured under the forward end of the platform by four Reversed Angle Brackets, which are held by the bolts shown at 1. A 4" Rod is passed through the upper 3" Pulley, and its lower end is gripped in the 3" Pulley bolted to the base. The platform, therefore, is free to swivel, but is retained in position on the Rod by a Collar.

The near side of the cab (Fig. 6.18a) consists of two 2½"×2½" Flexible Plates, overlapped one hole and fastened to the Angle Girder at the edge of the platform. The rear side of the cab is formed by a 3½"×2½" Flanged Plate and a 2½"×1½" Flanged Plate. The 3½"×2½" Flanged Plate is secured to the base by a 3½"×½" Double Angle Strip, and the 2½"×1½" Flanged Plate is bolted in position by its flange. A Hinged Flat Plate is used for the roof, and it is attached by Obtuse Angle Brackets to two 1½" Strips bolted to the sides. The boiler consists of two 5½"×2½" Flexible Plates and two 1 11/16" radius Curved Plates.

The chimney is formed by bending a U-Section Curved Plate so that the two ends overlap. A bolt is fastened through the overlapping portions, and carries also an Angle Bracket inside the chimney. A 6½" Rod, on the end of which is a Spring Clip, is slipped through the Angle Bracket and locked in the boss of a Road Wheel. The Wheel is placed over the boiler, and the lower end of the 6½" Rod passes through a Flanged Sector Plate, which is bolted at the rear of the base. The Rod is held in position by another Spring Clip.

The jib is constructed from 12½" Strips bolted end to end. It is pivoted at its lower end on a 4" Rod journalled in the flanges of a 3½"×2½" Flanged Plate held by three of the bolts 1. The jib is held at an angle of about 30 degrees by Cord, which is tied to the cab and then taken over a 1" fast Pulley on a 2" Rod journalled in the jib. From there the Cord is led through holes in the Angle Girders forming the sides of the platform, over a 1" Pulley on the other end of the 2" Rod, and finally is tied to the cab.

The Crank Handle in the sides of the cab controls the movement of the bucket. Cord is wound a few times round the shaft of the Crank Handle and then is taken over a 4½" Rod in the jib and tied to the front of the bucket. The other end of the Cord is led around a 1" fast pulley on a Rod at the end of the jib and through the pulley block at the back of the bucket. It is then tied to a Fishplate carried on the 2" Rod journalled in the jib.



6.19 LIFTING BRIDGE

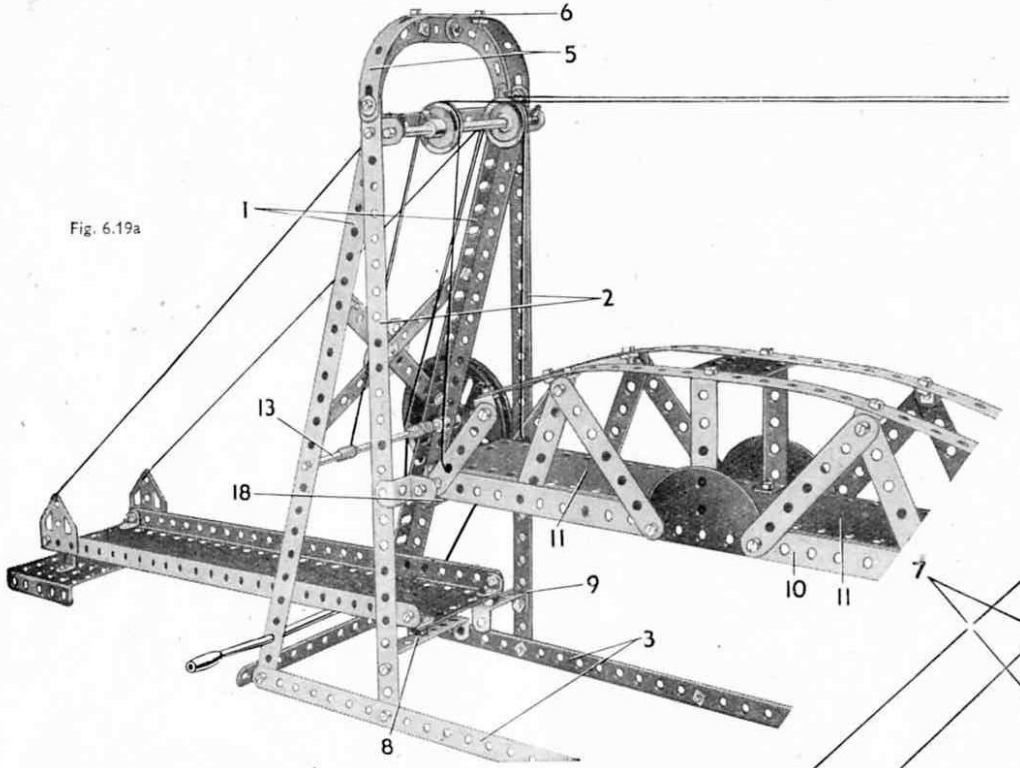
The towers are identical in construction and consist of two 12½" Angle Girders 1, and two 12½" Strips 2 (Fig. 6.19a). These are bolted to compound strips 3, made by joining two 12½" Strips overlapped nine holes. The upper ends of the Angle Girders are connected by two 2½" Strips joined together, and the lower ends by a 5½" Strip.

The Curved Strips 4 are bolted to Obtuse Angle Brackets attached to the Angle Girders, and are connected by a 1½" Strip. A Formed Slotted Strip 5 is then bolted to each side of the tower. The Slotted Strips are joined by a 2½" Strip 6. Cross bracing of each tower is provided by two 5½" Strips 7.

The approach roadways consist of two 12½" Strips fastened to a 12½" Strip Plate by Angle Brackets. They are attached to a 2½"×½" Double Angle Strip 8 and a 1½"×½" Double Angle Strip 9 by means of ⅜" Bolts. A Spring Clip is placed on each Bolt to raise the level of the roadway slightly.

The central span is made by bolting a 12½" Strip to each side of a 5½"×2½" Flanged Plate. One of these can be seen at 10. These Strips are joined at each end by a 2½"×½" Double Angle Strip, and the 5½"×2½" Flexible Plates 11 are bolted to the Double Angle Strips and the Flanged Plate.

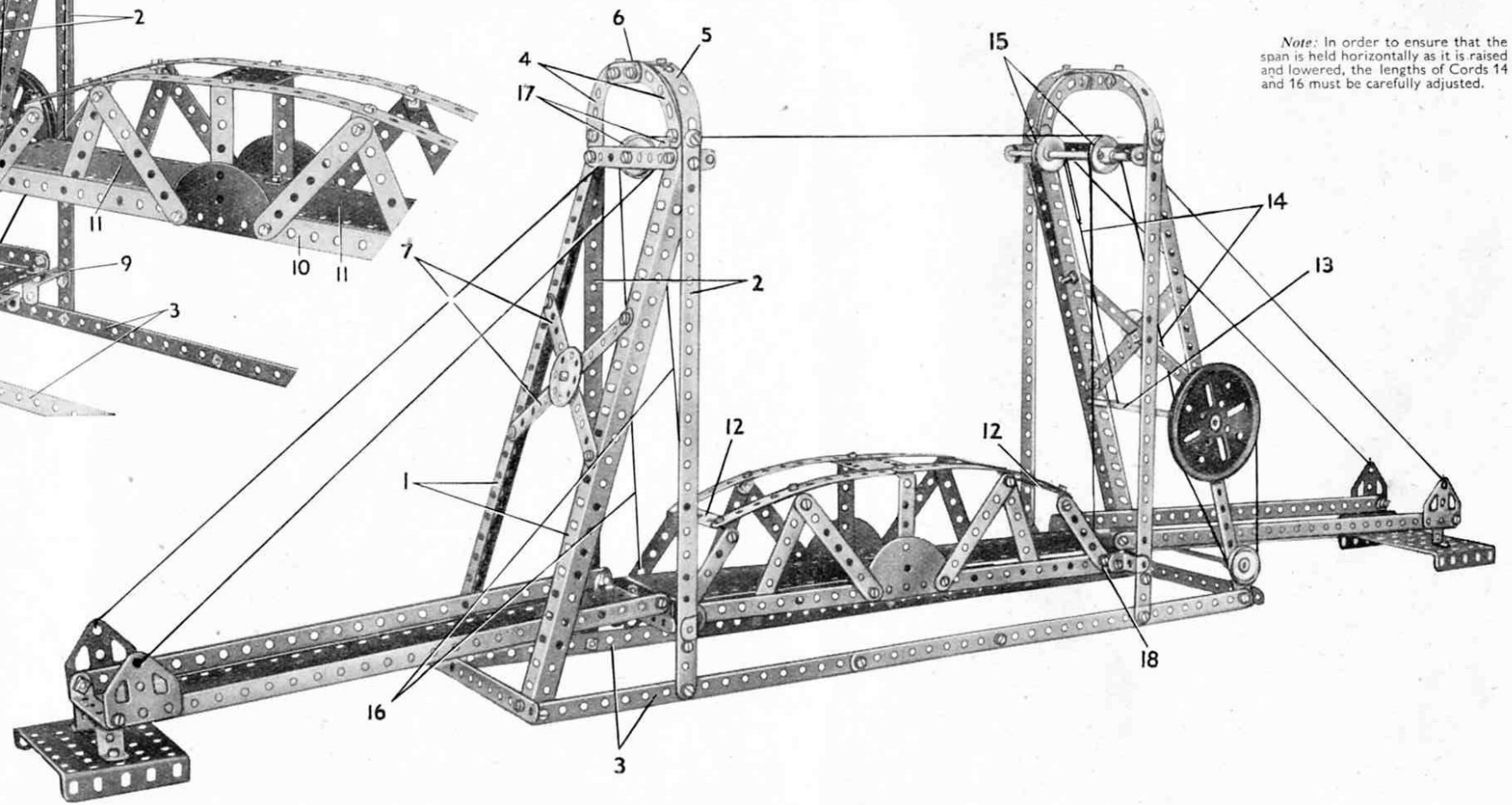
Fig. 6.19a



The arch girders on each side of the span are formed by two 5½" Strips bolted together. These are joined by 2½"×½" Double Angle Strips 12 at each end and by a 2½"×1½" Flexible Plate in the centre. The arch girders are attached to the roadway by means of a 2½"×½" Double Angle Strip in the centre and a 2½" Strip at each end.

A 3½"×½" Double Angle Strip 18 is fastened to each end of the moving span, at one end by a Double Bent Strip and at the other by a Stepped Bent Strip. Four Reversed Angle Brackets bolted to the ends of the Double Angle Strips are free to slide on the 12½" Strips 2 and provide guides for the lifting span.

The span is raised and lowered by means of a Crank Handle journalled in two of the Angle Girders 1. A 1" Pulley on the Crank Handle is connected by a Driving Band to a 3" Pulley on a 5" Rod 13. The Cords 14 extending from the Rod 13 are passed over the 1" Pulleys 15 and tied to the end of the span. The Cords 16 are fastened to the opposite end of the span, passed over the Pulleys 17 and 15, and finally tied to the Cords 14.



Note: In order to ensure that the span is held horizontally as it is raised and lowered, the lengths of Cords 14 and 16 must be carefully adjusted.

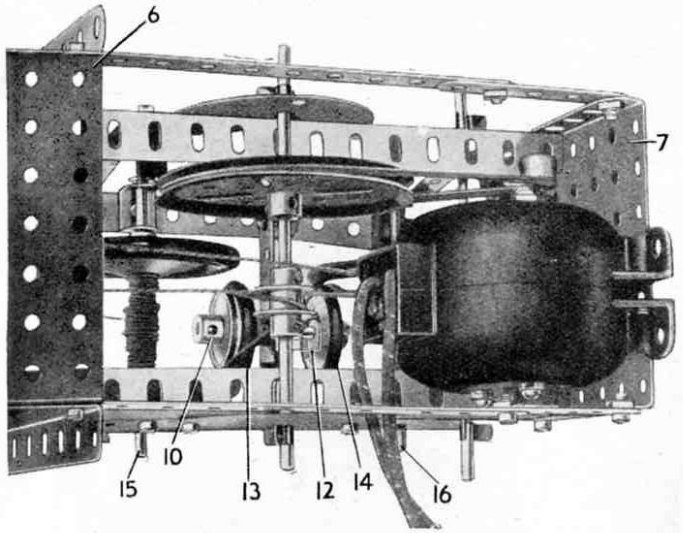
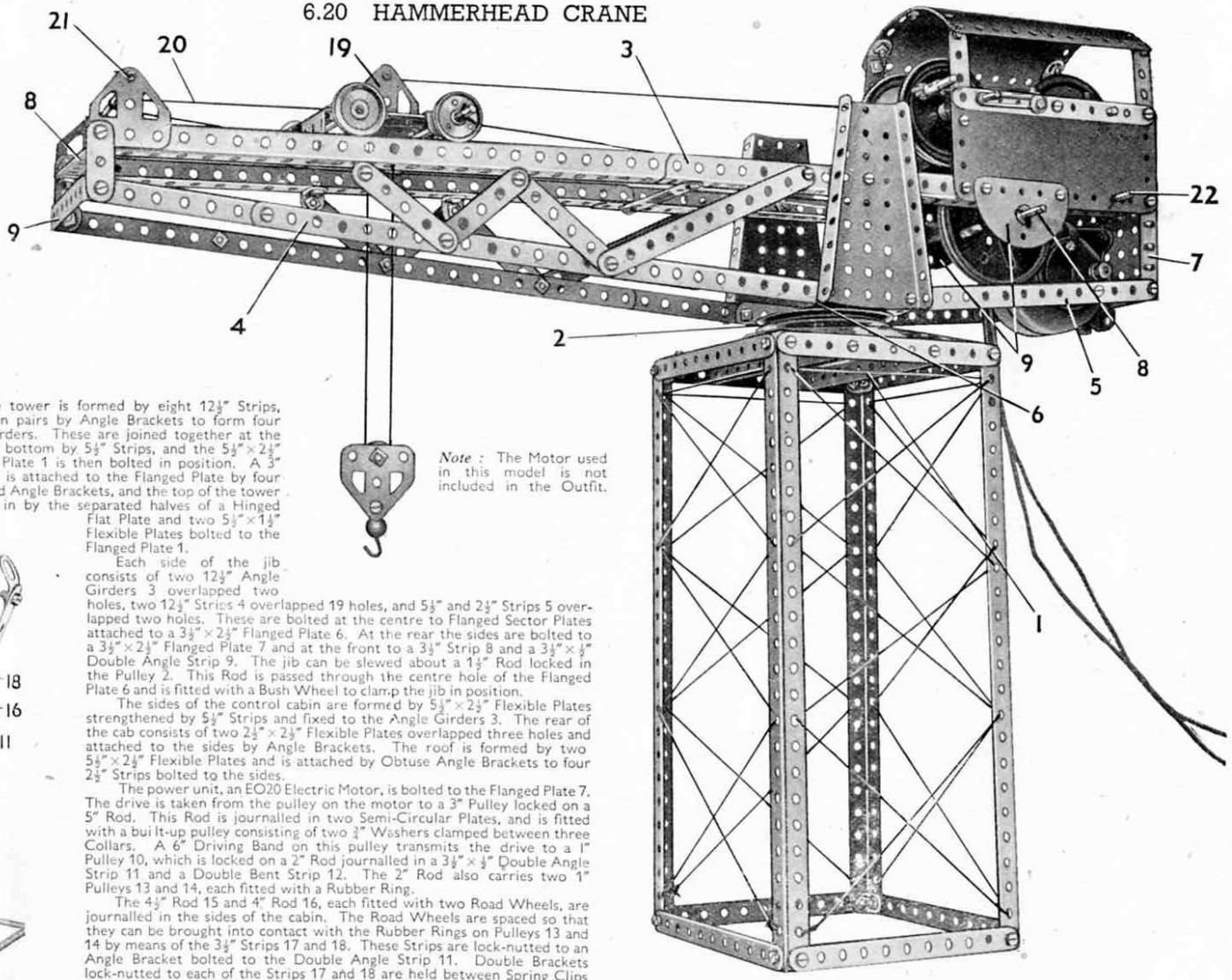


Fig. 6.20a

6.20 HAMMERHEAD CRANE



The tower is formed by eight 12½" Strips, bolted in pairs by Angle Brackets to form four angle girders. These are joined together at the top and bottom by 5½" Strips, and the 5½"×2½" Flanged Plate 1 is then bolted in position. A 3" Pulley 2 is attached to the Flanged Plate by four Reversed Angle Brackets, and the top of the tower is filled in by the separated halves of a Hinged Flat Plate and two 5½"×1½" Flexible Plates bolted to the Flanged Plate 1.

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

Each side of the jib consists of two 12½" Angle Girders 3 overlapped two holes, two 12½" Strips 4 overlapped 19 holes, and 5½" and 2½" Strips 5 overlapped two holes. These are bolted at the centre to Flanged Sector Plates attached to a 3½"×2½" Flanged Plate 6. At the rear the sides are bolted to a 3½"×2½" Flanged Plate 7 and at the front to a 3½" Strip 8 and a 3½"×½" Double Angle Strip 9. The jib can be slewed about a 1½" Rod locked in the Pulley 2. This Rod is passed through the centre hole of the Flanged Plate 6 and is fitted with a Bush Wheel to clamp the jib in position.

The sides of the control cabin are formed by 5½"×2½" Flexible Plates strengthened by 5½" Strips and fixed to the Angle Girders 3. The rear of the cab consists of two 2½"×2½" Flexible Plates overlapped three holes and attached to the sides by Angle Brackets. The roof is formed by two 5½"×2½" Flexible Plates and is attached by Obtuse Angle Brackets to four 2½" Strips bolted to the sides.

The power unit, an EO20 Electric Motor, is bolted to the Flanged Plate 7. The drive is taken from the pulley on the motor to a 3" Pulley locked on a 5" Rod. This Rod is journalled in two Semi-Circular Plates, and is fitted with a built-up pulley consisting of two ¾" Washers clamped between three Collars. A 6" Driving Band on this pulley transmits the drive to a 1" Pulley 10, which is locked on a 2" Rod journalled in a 3½"×½" Double Angle Strip 11 and a Double Bent Strip 12. The 2" Rod also carries two 1" Pulleys 13 and 14, each fitted with a Rubber Ring.

The 4½" Rod 15 and 4" Rod 16, each fitted with two Road Wheels, are journalled in the sides of the cabin. The Road Wheels are spaced so that they can be brought into contact with the Rubber Rings on Pulleys 13 and 14 by means of the 3½" Strips 17 and 18. These Strips are lock-nutted to an Angle Bracket bolted to the Double Angle Strip 11. Double Brackets lock-nutted to each of the Strips 17 and 18 are held between Spring Clips and Washers on Rods 15 and 16 respectively.

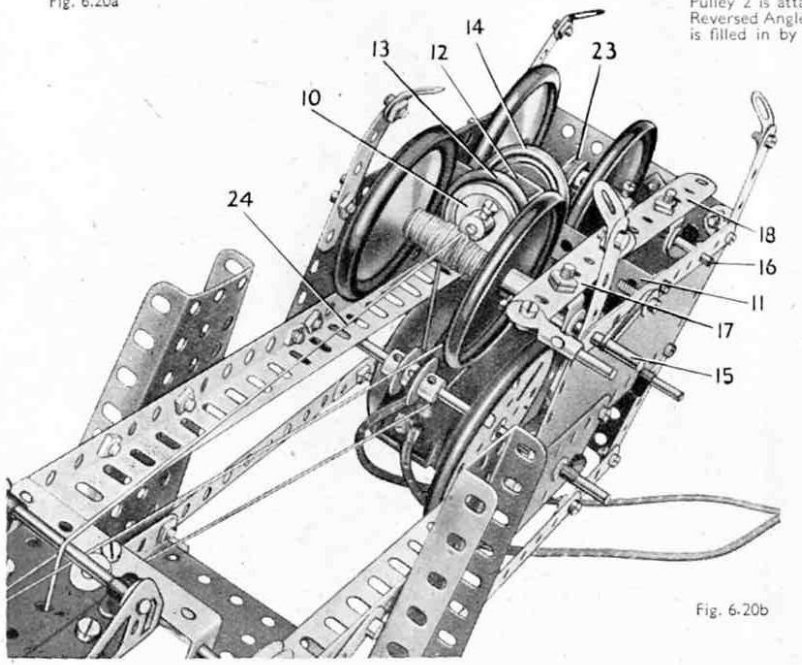
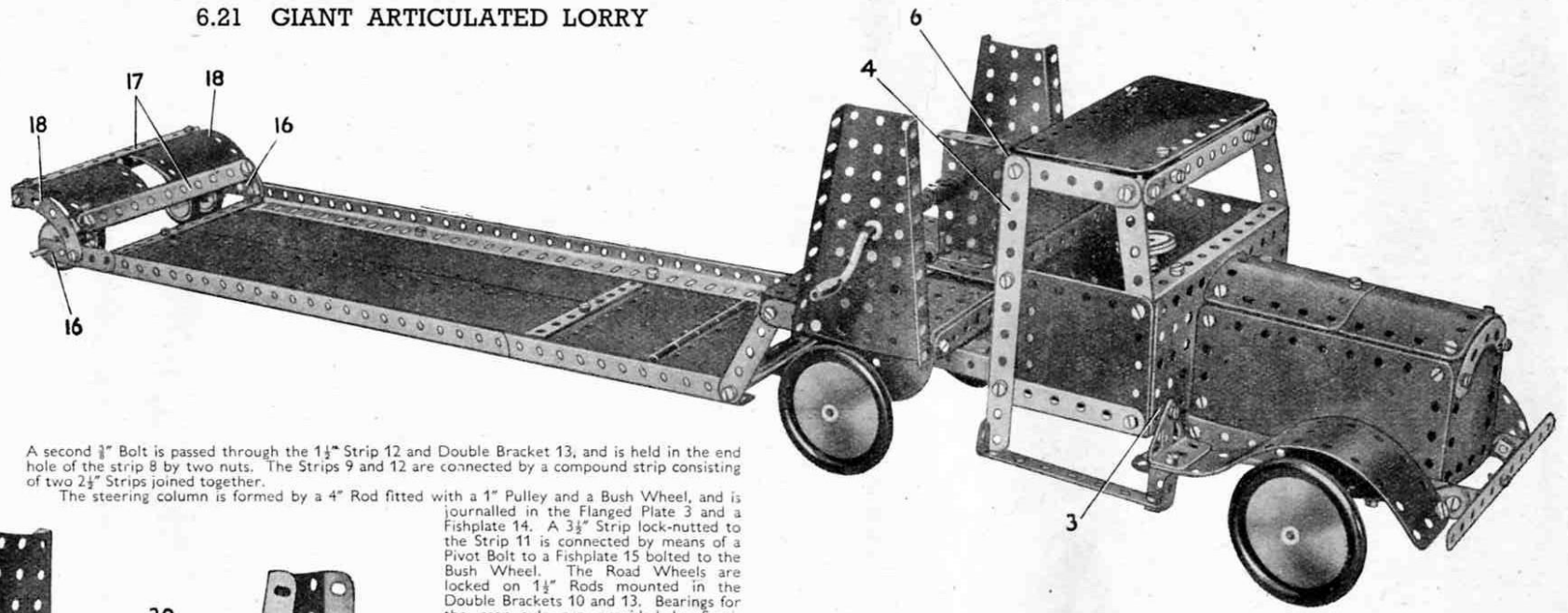


Fig. 6.20b

The travelling carriage consists of a 2½"×1½" Flanged Plate fitted with two Trunnions, one of which is seen at 19. Two 1" Pulleys are locked on a 3½" Rod journalled in a 2½"×½" Double Angle Strip bolted to the Flanged Plate, and two 1" loose Pulleys are held by Spring Clips on a 5" Rod mounted in a similar manner to the 3½" Rod.

The Cord 20 extending from the front of the carriage is taken around Rods 21 and 22, and passed twice around a ½" Pulley 23 on Rod 16. It is then passed again around Rod 22 and fastened to the rear of the carriage. The Cord 24 which is tied to Rod 15, is taken over a 1½" Rod mounted in the Trunnions 19, around a ½" loose Pulley in the pulley block, and finally fastened to the travelling carriage.

6.21 GIANT ARTICULATED LORRY



The chassis consists of two 12½" Strips joined at the front by 2½"×½" Double Angle Strip 1, and at the rear by two similar Double Angle Strips 2. The 5½"×2½" Flanged Plate 3 is attached to the chassis by Angle Brackets.

The sides of the bonnet are formed by 4½"×2½" Flexible Plates bolted to the chassis members, and the top consists of two 1 11/16" radius Curved Plates joined together and fastened to the sides by Obtuse Angle Brackets. The radiator is represented by a 2½"×2½" Flexible Plate, and is attached to Angle Brackets bolted to the sides.

The back of the cab consists of two 5½"×2½" Flexible Plates joined together. These are attached to the 5½" Strips 4 by Angle Brackets 5 and two 2½"×½" Double Angle Strips. One of the Double Angle Strips can be seen at 6. The sides of the cab are formed by a 2½"×2½" and a 2½"×1½" Flexible Plate overlapped two holes and attached to the Flanged Plate 3 and the Strips 4. A 5½"×2½" Flexible Plate represents the roof and is bolted to the 2½"×½" Double Angle Strips 7.

The front axle beam 8 (Fig. 6.21b) consists of a 3½" and a 2½" Strip overlapped three holes, and is attached to the chassis members by two Angle Brackets. A ⅜" Bolt is passed through the 1½" Strip 9 and the Double Bracket 10. The 2½" Strip 11 is locked in position by a nut, and the Bolt passed through the end hole of the strip 8 and held by lock-nuts, so that the assembly is free to pivot.

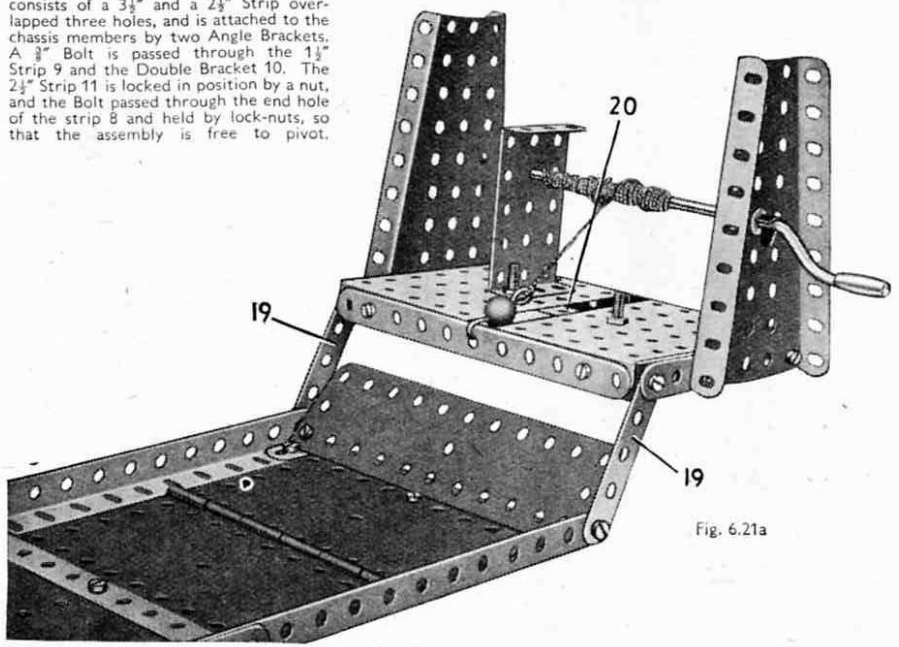


Fig. 6.21a

A second ⅜" Bolt is passed through the 1½" Strip 12 and Double Bracket 13, and is held in the end hole of the strip 8 by two nuts. The Strips 9 and 12 are connected by a compound strip consisting of two 2½" Strips joined together.

The steering column is formed by a 4" Rod fitted with a 1" Pulley and a Bush Wheel, and is journalled in the Flanged Plate 3 and a Fishplate 14. A 3½" Strip lock-nutted to the Strip 11 is connected by means of a Pivot Bolt to a Fishplate 15 bolted to the Bush Wheel. The Road Wheels are locked on 1½" Rods mounted in the Double Brackets 10 and 13. Bearings for the rear axle are provided by Semi-Circular Plates attached to the chassis members. The rear axle consists of a 5" Rod and is held in place by Collars.

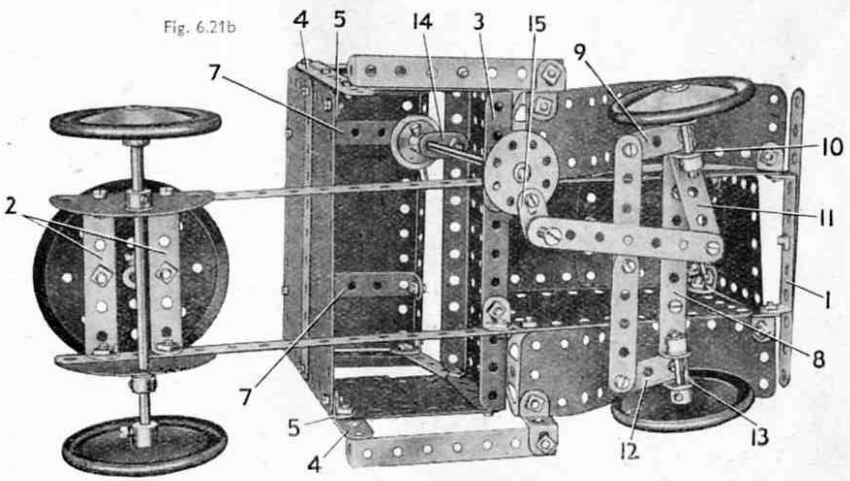
The main girders on each side of the semi-trailer are formed by two 12½" Angle Girders overlapped 14 holes. The girders are joined together by four 5½" Strips. The loading platform consists of two 12½" Strip Plates and a Hinged Plate. A compound strip made by overlapping two 12½" Strips is bolted in the centre of the trailer underneath the Plates forming the platform.

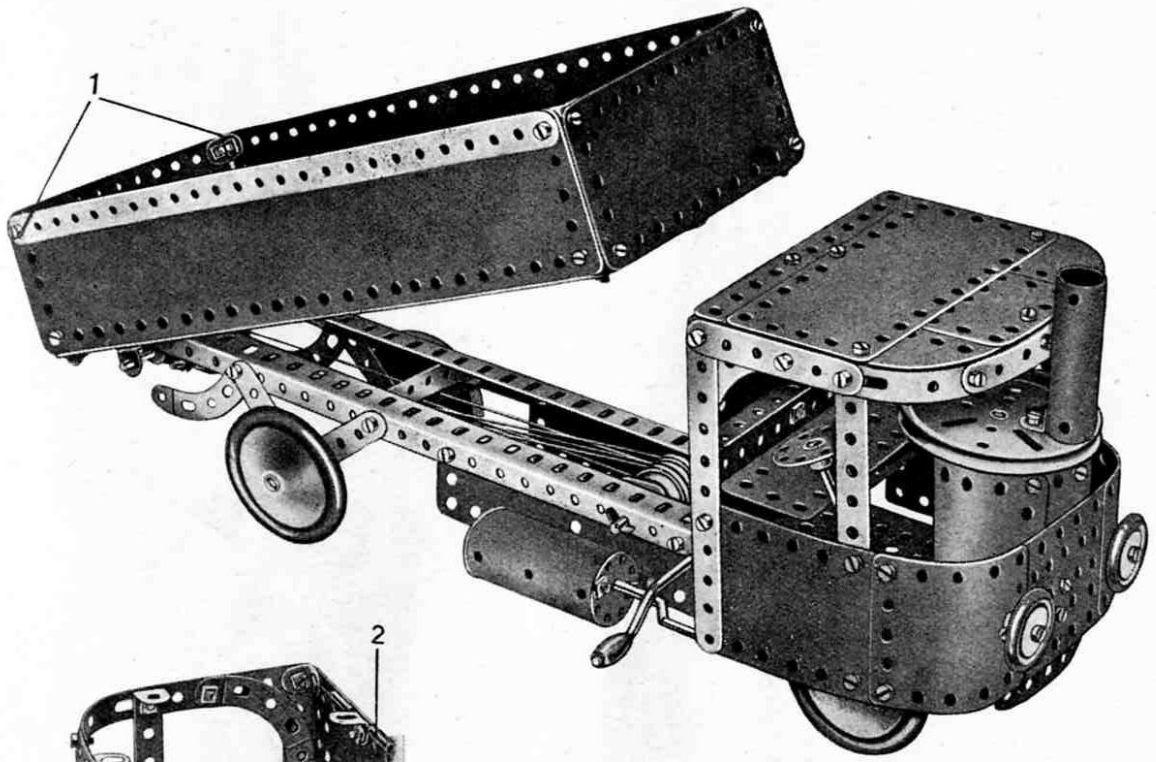
The trailer runs on four wheels, consisting of two 1" Pulleys and two 1" loose Pulleys. These are held on a 6½" Rod journalled in the 2½" Strips 16. A cover over the wheels is provided by two 2½"×2½" Flexible Plates. These are bolted to the 5½" Strips 17 and attached to the Curved Strips 18 by two 1½"×½" Double Angle Strips.

Construction of the swan-neck of the trailer can be seen in Fig. 6.21a. The 3½"×2½" Flanged Plates are connected together by 5½" Strips bolted to their flanges, and are joined to the 2½" Strips 19 by 1"×1" Angle Brackets.

The trailer is pivotally attached to the chassis by means of a 1½" Rod held in a 3" Pulley bolted to the Double Angle Strips 2. This Rod is passed through the centre hole of a 2½"×½" Double Angle Strip 20.

Fig. 6.21b





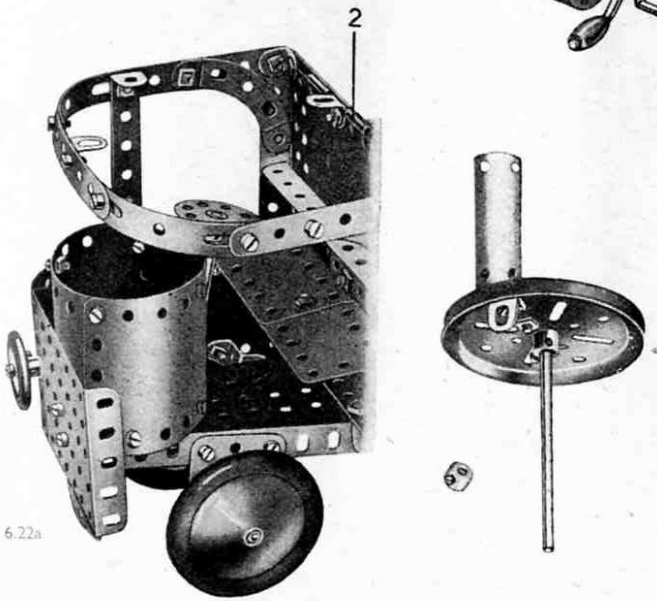


Fig. 6.22a

6.22 TIPPING STEAM WAGON

The chassis is built up by joining two 12½" Angle Girders by 2½"×½" Double Angle Strips. This structure is extended to the front by a Flanged Sector Plate. The rear wheels are fixed on a 4½" Rod, which is journalled at each side in the end holes of two 2½" Strips bolted to the chassis. A Flat Trunnion is secured at each side of the Flanged Sector Plate, and the 4" Rod carrying the front Road Wheels is journalled in holes in their narrow ends.

The body of the wagon is built up on a base consisting of two Angle Girders joined at each end by a 5½" Strip. The bottom is filled in with 12½" Strips bolted between the two 5½" Strips. Two 12½" Strip Plates bolted to the Angle Girders form the sides, and a 5½"×2½" Flexible Plate is secured by four Angle Brackets to the front end. The ⅜" Bolts 1, which hold two Angle Brackets supporting the rear 5½"×2½" Flexible Plate, are lock-nutted, and the end of the body is free to swing open when the body is tipped.

The body of the wagon is pivoted on a 5" Rod, which passes through holes in the Angle Girders forming the chassis and through two Double Brackets bolted beneath the body.

The tipping mechanism is shown in Fig. 6.22b. A 3½" Rod is passed through the Angle Girders forming the sides of the chassis, and it carries between the Angle Girders a Fishplate, a 1" fast Pulley, a 1" loose Pulley, and a ½" loose Pulley, all of which are held on the Rod by Spring Clips.

The Pulleys at the rear end of the body are carried on a 2" Rod passed through holes in 1"×1" Angle Brackets. The 2" Rod carries a Collar, a 1" fast Pulley, a 1" loose Pulley and a ½" fast Pulley.

The Cord is tied to a Cord Anchoring Spring on the Crank Handle. It is then taken over the Rods and Pulleys in the following order:—Over the front Rod, rear Rod, ½" loose Pulley (front), 1" fast Pulley (rear), 1" loose Pulley (front), 1" loose Pulley (rear), 1" fast Pulley (front), ½" fast Pulley (rear). Finally it is tied to the Fishplate on the front Rod.

Several of the Flexible Plates have been removed from the model in Fig. 6.22a to show the construction of the cab. The back consists of a 5½"×2½" Flanged Plate, which is bolted to the chassis by one of its flanges, and is extended upwards by a flat plate 2 obtained by removing the centre pin from a Hinged Flat Plate. The front of the cab is formed by a 3½"×2½" Flanged Plate and a 2½"×1½" Flexible Plate attached to the Flanged Sector Plate by an Angle Bracket, and each side consists of a 4½"×2½" Flexible Plate and a 2½"×2½" Flexible Plate, overlapped three holes and bolted together. The sides are secured at the forward end to the 3½"×2½" Flanged Plate, and at the rear to the shorter flanges of the 5½"×2½" Flanged Plate. The seat is represented by two 2½"×1½" Flexible Plates attached to the 5½"×2½" Flanged Plate by a Trunnion.

The steering wheel is formed by a Bush Wheel locked on the end of a 4" Rod, which passes through a Double Bracket and is fastened in position by two Spring Clips. The Double Bracket is bolted to one of the flanges of the Flanged Sector Plate.

The boiler is constructed from two U-Section Curved Plates and two 1½" radius Curved Plates, and is bolted to the 3½"×2½" Flanged Plate at the front of the cab. The top of the cab consists of a 5½"×1½" Flexible Plate and a 5½"×2½" Flexible Plate, bolted together overlapping two holes, and then secured to the flat plate 2 by an Angle Bracket. The two Flexible Plates are extended to the front by a 2½"×1½" Flexible Plate and two Semi-Circular Plates.

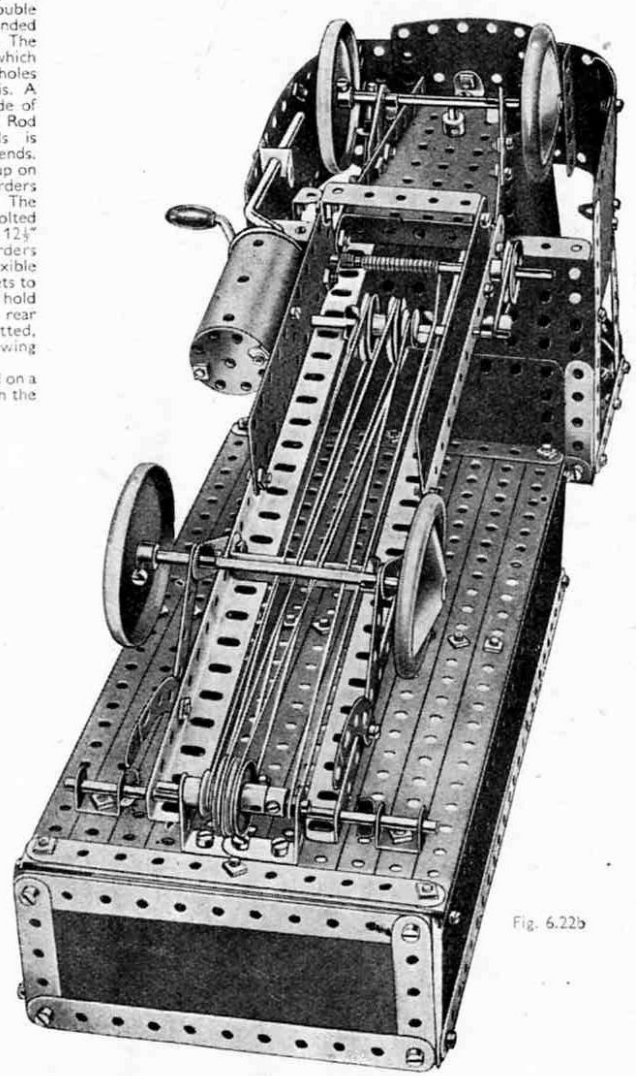


Fig. 6.22b

6.23 TRAMCAR

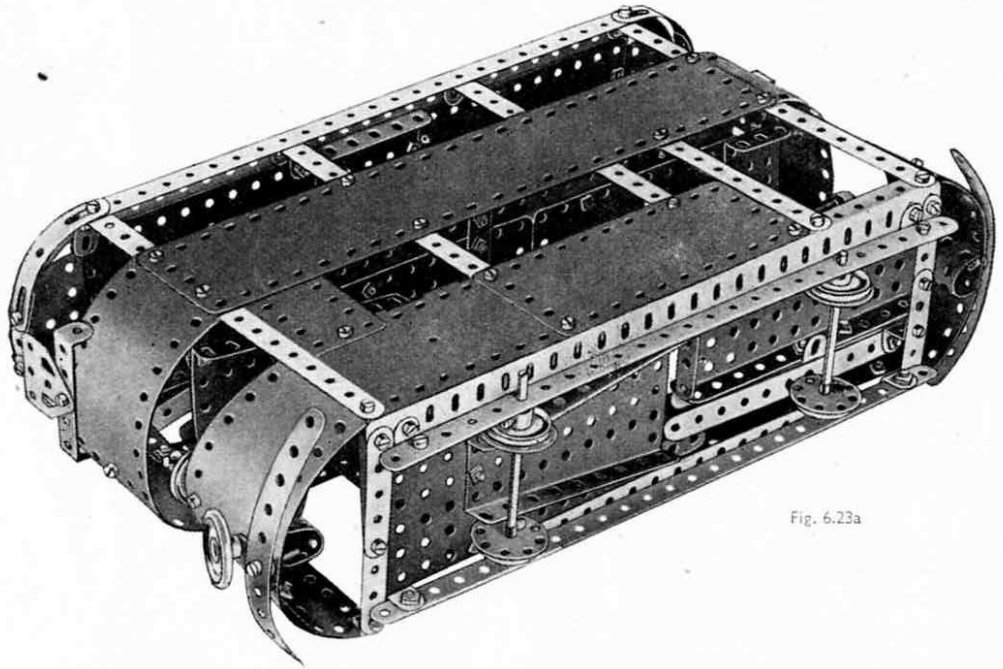


Fig. 6.23a

The upper deck consists of five 12½" Strips, three of which are bolted to one side of a 3½" × ½" Double Angle Strip, while the other two are fastened to a Fishplate that is attached to the Double Angle Strip. The floor is filled in with 2½" × 2½" Flexible Plates, with a Flanged Sector Plate at the front end and a 2½" × 1½" Flanged Plate at the rear end.

U-Section Curved Plates are attached by Obtuse Angle Brackets to each end of the tram to represent the speed control boxes, the securing bolts holding also an Angle Bracket. Two 3" Screwed Rods are each fitted with a 1" loose Pulley, and Collars with 1½" Rods locked in them are fixed on the upper end of each Screwed Rod to form the control switch.

A Reversed Angle Bracket is bolted to a 3½" × 2½" Flanged Plate in the roof of the tram and a Rod and Strip Connector is attached by a lock-nutted Bolt to its other lug. A second Rod and Strip Connector is carried at the end of the 11½" Rod forming the trolley, and a ½" loose Pulley is attached by a lock-nutted Bolt.

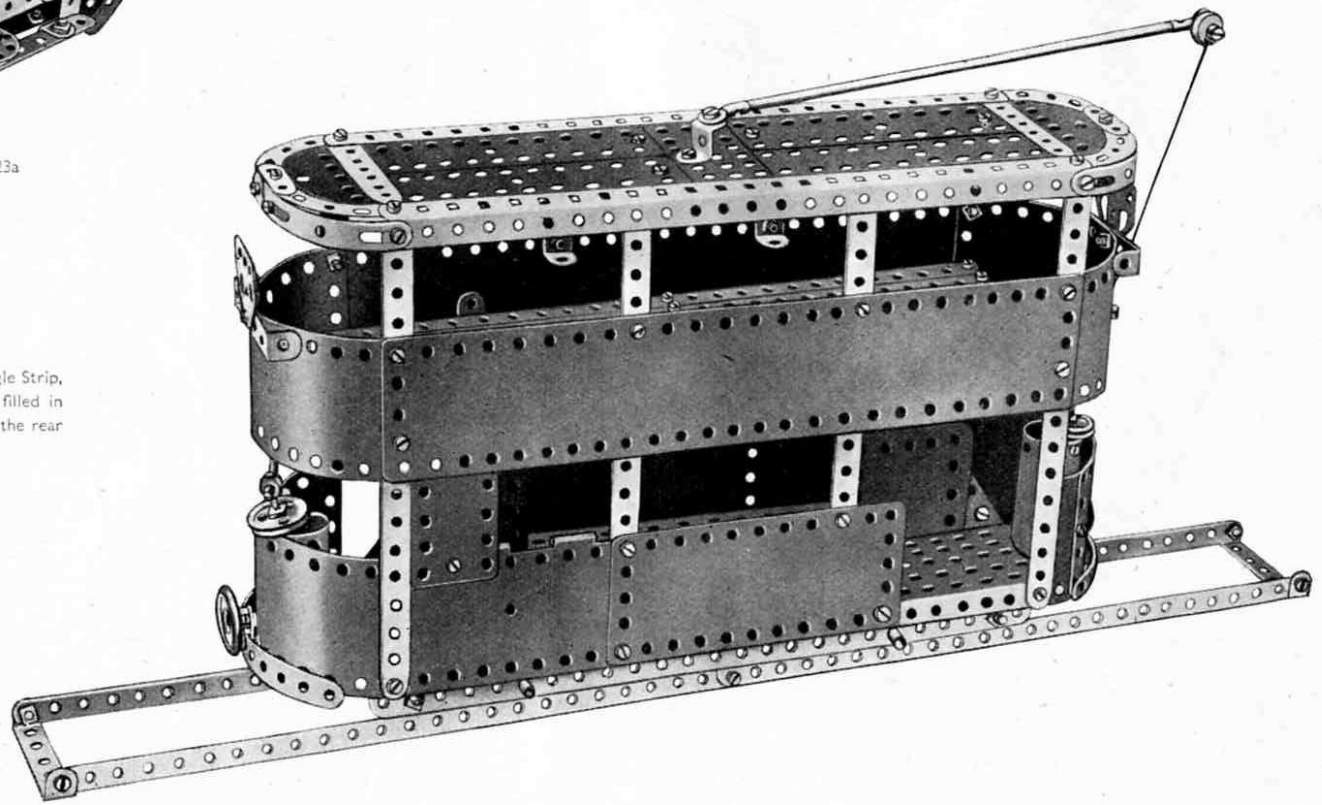
The roof on each side of the 3½" × 2½" Flanged Plate consists of two 5½" × 1½" Flexible Plates. These are bolted at their inner ends to the Flanged Plate, and they are extended at their outer ends by Semi-Circular Plates. The Semi-Circular Plates are edged with small radius Curved Strips as shown.

The destination indicators at each end of the tramcar are formed by Flat Trunnions bolted to 2½" × ½" Double Angle Strips. They are attached to the curved Flexible Plates of the upper saloon.

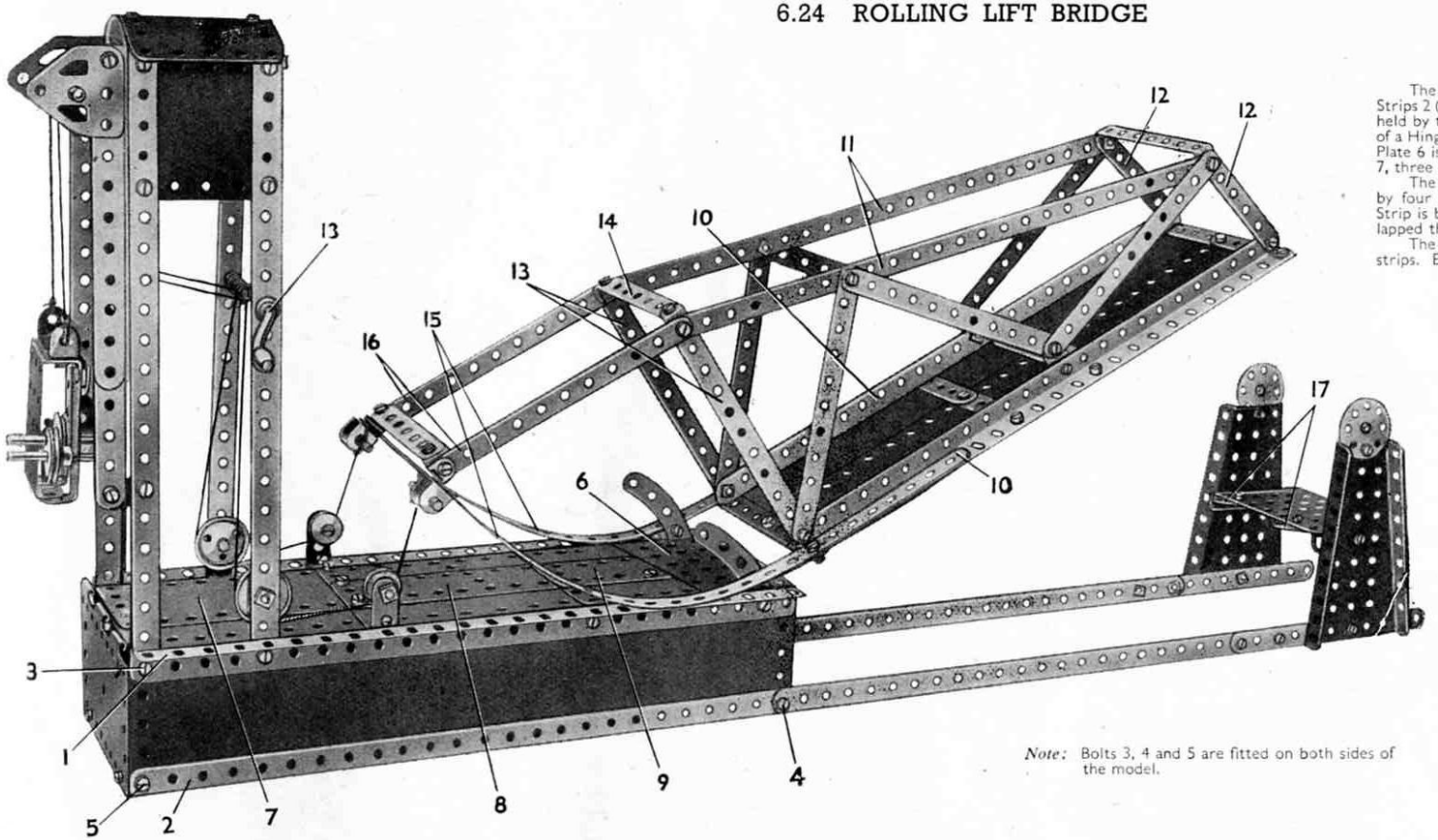
Construction is commenced with the chassis as shown in Fig. 6.23a. Two 12½" Strips are connected by Angle Brackets to two Angle Girders, and the last named are joined across at each end by compound strips consisting of two 2½" Strips overlapped two holes. The bottom is filled in by bolting a 3½" × 2½" Flanged Plate by its flange to the lower Angle Girder, and a 5½" × 2½" Flanged Plate to the other Angle Girder. A Flanged Sector Plate and a 5½" Strip are bolted to the 3½" × 2½" Flanged Plate, and two further 5½" Strips are attached by Reversed Angle Brackets, one to the 5½" × 2½" Flanged Plate, and the other to the compound strip that spaces the Angle Girders.

The sides of the car are next added. One half of a Hinged Flat Plate is bolted to a 5½" × 2½" Flexible Plate to form each side of the lower saloon. Five 5½" Strips carry the upper deck, and 2½" Strips and Double Angle Strips support the roof.

The wheels are fixed on 4" Rods mounted in the 12½" Strips forming part of the chassis members. Each wheel consists of a Wheel Disc held against the face of a 1" Pulley by a Spring Clip placed on the axle. Washers are placed between the 1" Pulleys and the 12" Strips so that the wheels can revolve freely.



6.24 ROLLING LIFT BRIDGE



Note: Bolts 3, 4 and 5 are fitted on both sides of the model.

The sides of the approach roadway are made by bolting the Angle Girders 1 and 12½" Strips 2 (Fig. 6.24a) to 12½" Strip Plates. The sides are joined by a 3½"×½" Double Angle Strip held by the Bolt 3, and a 3½" Strip fastened to Angle Brackets held by the Bolt 4. One half of a Hinged Flat Plate is attached to Angle Brackets held by the Bolt 5. A 3½"×2½" Flanged Plate 6 is then bolted in position. The roadway is filled in by two 4½"×2½" Flexible Plates 7, three 5½"×1½" Flexible Plates 8 and three 2½"×1½" Flexible Plates 9.

The tower consists of four vertical 12½" Strips connected together at their upper ends by four 2½"×½" Double Angle Strips and four 2½"×2½" Flexible Plates. A 2½" Curved Strip is bolted in position at the front and rear of the tower, and two Curved Plates overlapped three holes are attached to the Curved Strips by Angle Brackets.

The rolling span is formed from two 12½" Angle Girders 10, joined by four 4½" compound strips. Each of these strips consists of two 2½" Strips bolted together. The 12½" Strips 11 are fastened to the 3" Strips 12 and 5½" Strips 13. Three 5½" Strips are then bolted in position on each side for bracing purposes. The Strips 11 are connected by a 3½"×½" Double Angle Strip and a 3½" Strip 14 attached to Angle Brackets. The span rolls upon the 12½" Strips 15. These are bolted to the Angle Girders 10 and connected by Angle Brackets to the 5½" Strips 16. Guides for the rollers are provided by 2½" Curved Strips. The roadway of the lifting span is formed by four 5½"×2½" and two 2½"×2½" Flexible Plates.

When the bridge is in the closed position the span rests on two Flat Trunnions 17. These are attached to a 3½"×2½" Flanged Plate bolted between two Flanged Sector Plates.

The 1" loose Pulleys are free to turn on ½" Bolts locked by two nuts to the 12½" Strips forming part of the tower. The ½" Pulleys are loose on ¾" Bolts locked to 1"×1" Angle Brackets bolted to the Angle Girders 1.

Raising and lowering of the span is operated by a Crank Handle 18. Two lengths of Cord from this pass around the 1" and ½" Pulleys and are fastened to 1½" Rods mounted in Double Brackets. The Double Brackets are bolted to the upper ends of the Strips 15.

The counter-balance weight consists of a 2½"×1½" Flanged Plate. A 2½"×1½" Flexible Plate is bolted to 2½"×½" Double Angle Strips bolted to the Flanged Plate, and two 1" Pulleys are locked on 1½" Rods journalled in the Flanged Plate and the Double Angle Strips. Guides for the balance weight are provided by four 5½" Strips. Two of these are attached to each side of the tower by Fishplates. A 2½" Strip 19 fitted with two Reversed Angle Brackets is bolted to the balance weight. The Reversed Angle Brackets are free to slide between the 5½" Strips and the 12½" Strips forming the rear members of the tower.

Two lengths of Cord from the balance weight are passed over the Rod 20 and under Rod 21. They are then attached to the Crank Handle so that as the span is raised the balance weight is lowered.

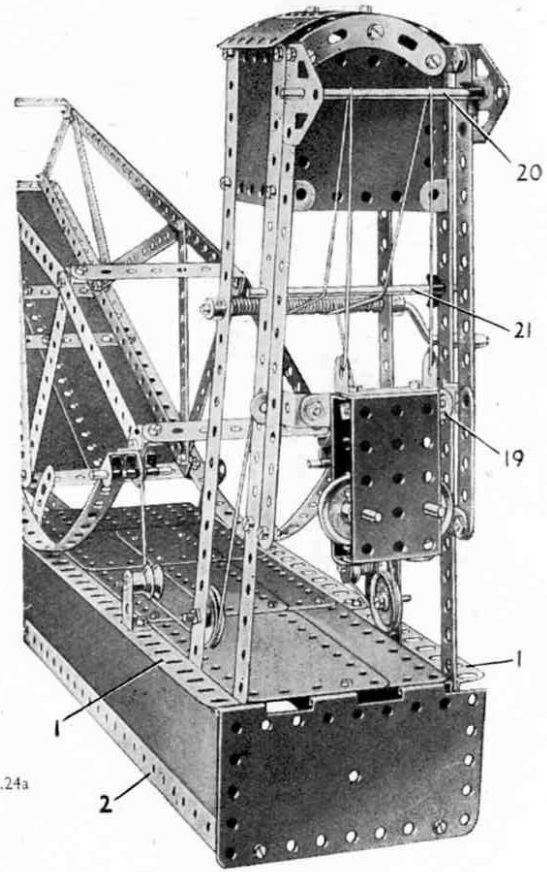
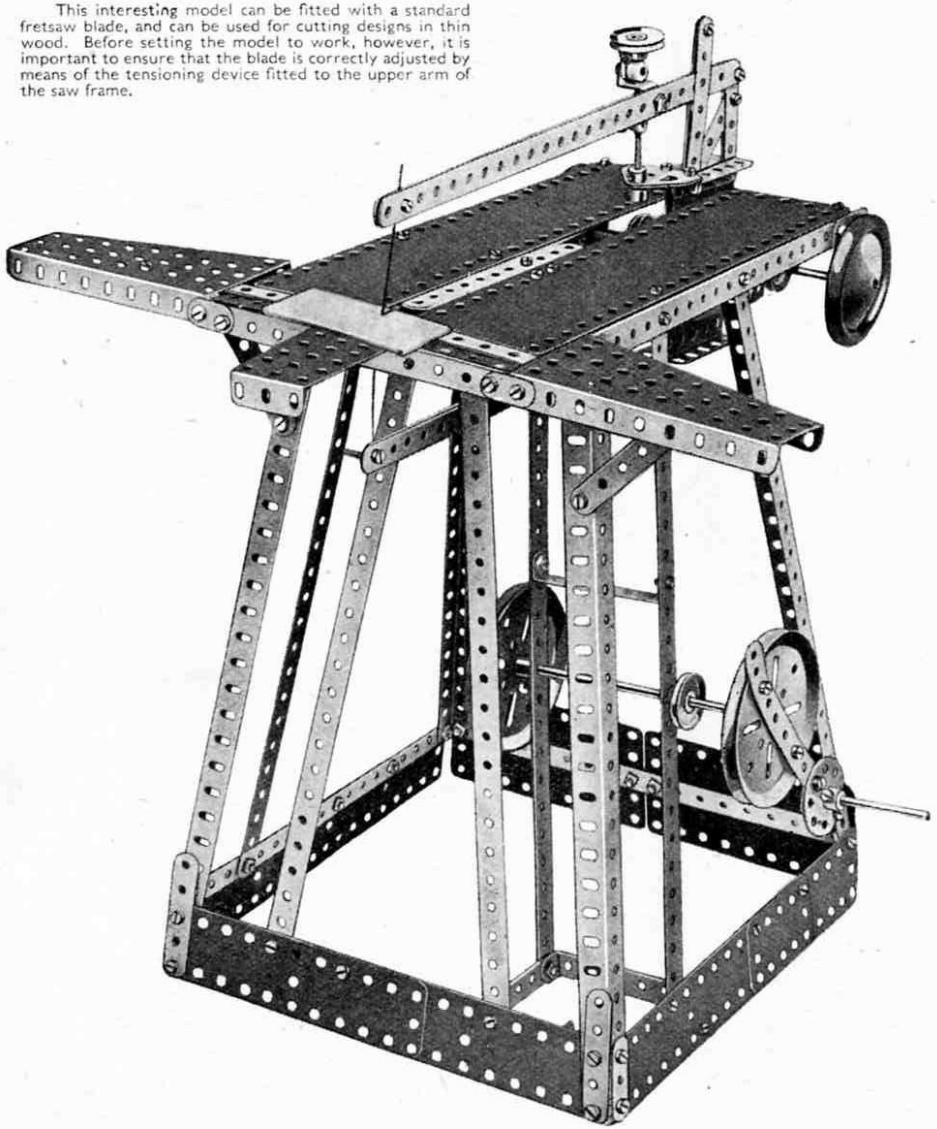


Fig. 6.24a

6.25 FRETWORK MACHINE

This interesting model can be fitted with a standard fretsaw blade, and can be used for cutting designs in thin wood. Before setting the model to work, however, it is important to ensure that the blade is correctly adjusted by means of the tensioning device fitted to the upper arm of the saw frame.



The main framework of the model consists of four 12½" Angle Girders joined across at their lower ends by compound strips consisting of two 5½" Strips. The Strips spacing the sides are overlapped two holes, and those spacing the front and rear are overlapped four holes.

The base is extended downwards by 5½"×1½" and 2½"×1½" Flexible Plates, which are joined at the corners by Angle Brackets bolted inside the Flexible Plate at the front of the model. At the top the Angle Girders are spaced at the front and rear by 5½" Strips, and at the sides by 12½" Strips, which are bolted so that they extend five holes to the front of the table. Four 12½" Strips are bolted to the frame of the base and to the upper 5½" and 12½" Strips, and a supplementary framework to support the operating handle is also added (see Fig. 6.25a).

The table is shown complete in the front view of the model, and in Fig. 6.25a one of the 12½"×2½" Strip Plates has been removed. A 5½"×2½" Flanged Plate is bolted across the 12½" Strips at the sides of the table. The two 12½"×2½" Strip Plates are bolted to the Flanged Plate and joined by Angle Brackets to the ends of the 12½" Strips, the bolts carrying also two Flat Trunnions. The table is extended to the front by a 2½"×1½" Flanged Plate, which is bolted to a 5½" Strip and to the ends of two 2½"×½" Double Angle Strips. The side extensions are Flanged Sector Plates, each of which is attached to the frame by a Fishplate, a 3½" Strip and a 12½" Strip. A 2½"×½" Double Angle Strip provides additional support underneath.

The saw frame consists of two long arms, each consisting of two 12½" Strips bolted together. One of the arms is bolted between two 3½"×2½" Flanged Plates, and the other is lock-nutted at its end to an N-shaped piece, consisting of two 2½" Strips and two 3½" Strips braced across by a 2½" Strip in the manner shown. A tensioning device for the sawblade consists of a Double Bent Strip lock-nutted to the upper arm. A 3" Screwed Rod is passed through holes in the Double Bent Strip and a Collar is screwed on each of its ends.

The shanks of two bolts in the end holes of the Double Bent Strip engage in the plain holes of the Collars. The Screwed Rod passes also through a hole in two Flat Trunnions bolted to the flanges of the 3½"×2½" Flanged Plates, and two Collars are held by their grub screws on the Screwed Rod on each side of the Flat Trunnions.

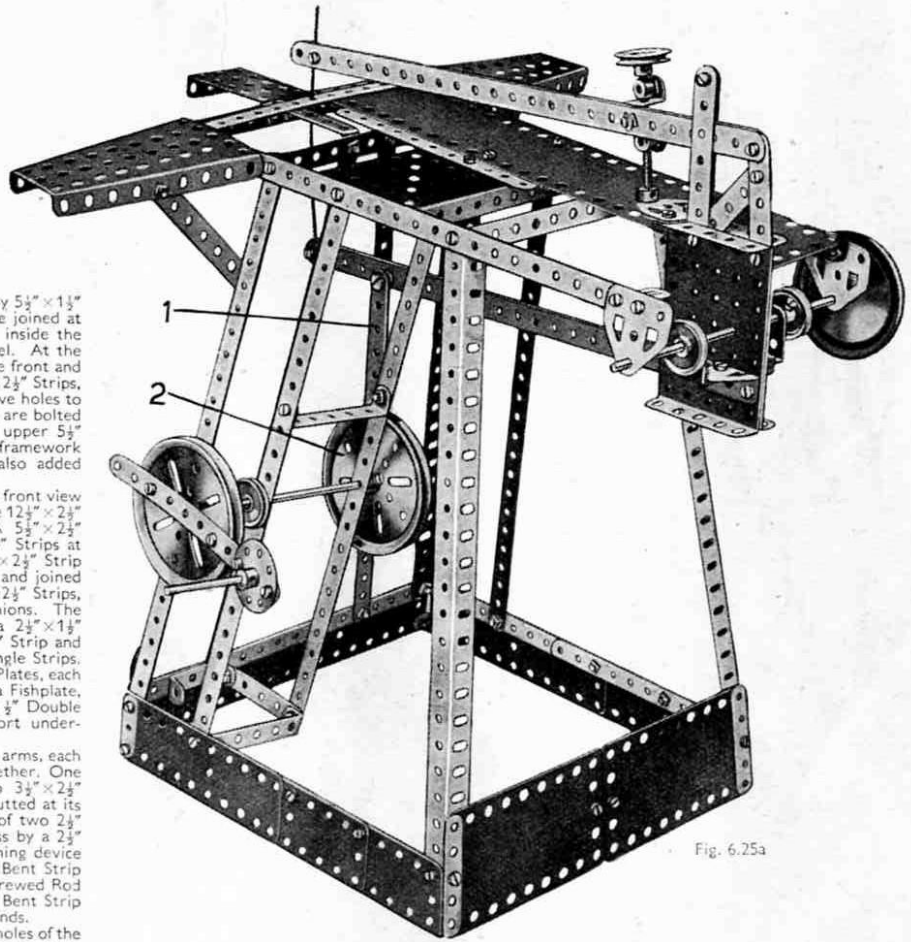


Fig. 6.25a

A 6½" Rod is passed through the end holes of 1"×1" Angle Brackets attached to Trunnions bolted to the 3½"×2½" Flanged Plates, and is journalled in the two Flat Trunnions as shown.

The handle for operating the machine is constructed by fastening a 2" Rod in the boss of a Bush Wheel that is attached to a 5½" Strip. The Strip in turn is bolted across a 3" Pulley held on the end of a 4½" Rod journalled in two 12½" Strips. On its other end the 4½" Rod carries another 3" Pulley 2, which is pivotally connected by a 5½" Strip 1 to the lower arm of the frame. The lower end of the 5½" Strip is pivoted on a Threaded Pin and is held in place by a Spring Clip; its upper end being pivoted on a Pivot Bolt lock-nutted to the lower arm of the saw frame. The Pivot Bolt carries six Washers on its shank.

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"

9a 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** **20a**

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

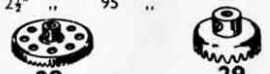
26

25. Pinion, ½" diam., ½" face, 25 teeth
25a. " ½" " ½" " 25 "
25b. " ½" " ½" " 25 "
26. " ½" " ½" " 19 "
26a. " ½" " ½" " 19 "
26b. " ½" " ½" " 19 "

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

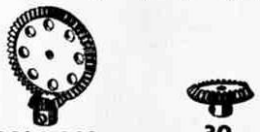
Gear Wheels

27. 1½" diam. 50 teeth,
27a. 1½" " 57 "
27b. 3½" " 133 "
27c. 2½" " 95 "



28 **29**

28. Contrate Wheel, 1½" diam., 50 teeth
29. " " ½" " 25 "



30A & 30C **30**

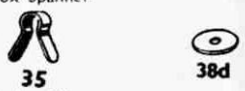
30. Bevel Gear, ½" diam., 26 teeth (for use in pairs)
30a. " " ½" " 16 " } Can only be
30c. " " 1½" " 48 " } used together

31 **32**

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

34B

34. Spanner
34b. Box Spanner

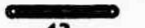


35 **38d**

35. Spring Clip
36. Screwdriver
36a. "
36c. Drift (for levering bolt holes into line)
37. Nut and Bolt, $\frac{7}{32}$"
37a. Nut
37b. Bolt, $\frac{7}{32}$"
38. Washer
38d. " ⅜"
40. Hank of Cord

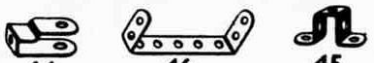
41

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 **58a**

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 **62a**

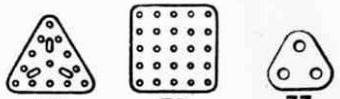
62. Crank
62a. Threaded Crank
62b. Double Arm Crank

63 **63a** **63c**

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

64 **65**

64. Threaded Boss
65. Centre Fork
69. Set Screw, $\frac{3}{16}$"
69a. Grub Screw, $\frac{3}{16}$"
69b. " " $\frac{3}{32}$"
69c. " " $\frac{3}{64}$"



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,

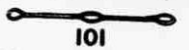
94

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

95a

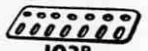
99 Braced Girders

No.		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



103a Flat Girders

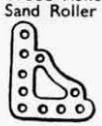
103.	5½" long	103e.	3" long
103a.	9½" "	103f.	2½" "
103b.	12½" "	103g.	2" "
103c.	4½" "	103h.	1½" "
103d.	3½" "	103k.	7½" "

104

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

106 **106A**

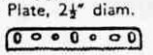
106. Wood Roller
106a. Sand Roller



108

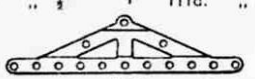
109

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



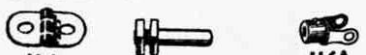
110

110. Rack Strip, 3½" long
110a. " " 6½" "
111. Bolt, ½" | 111c. Bolt, ⅜"
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, ⅝" long

122

122. Miniature Loaded Sack

123

125

123. Cone Pulley, 1¼", 1" and ¾" diam.
124. Reversed Angle Bracket, 1"
125. " " " ½"

126

126A

126. Trunnion 126a. Flat Trunnion

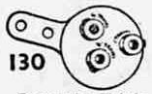
127

128

127. Bell Crank
128. Bell Crank, with Boss

129

129. Toothed Segment, 1½" radius



130

130A

130. Eccentric, Triple Throw, ¼", ⅜" and ½"
130a. Eccentric, Single Throw, ¼"

131

132

131. Dredger Bucket
132. Flywheel, 2½" diam.

133

133A

133. Corner Bracket, 1½"
133a. " " 1"

134

No.
134. Crank Shaft, 1" stroke

136

137

136A

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

138A

138a. Ship Funnel

139

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

140

140. Universal Coupling

142

142A

142. Rubber Ring (to fit 3" diam. rim)
142a. Motor Tyre (to fit 2" diam. rim)
142b. " " " 3" "
142c. " " " 1" "
142d. " " " 1½" "

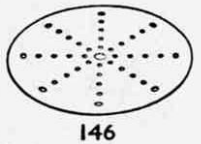
143

143. Circular Girder, 5½" diam.

144

No.
144. Dog Clutch

145



146

145. Circular Strip, 7½" diam. overall
146. " Plate 6" "
146a. " " 4" "

147 & 148

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

151

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

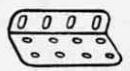
154A&154B

154a. Corner Angle Bracket, ½" (right-hand)
154b. Corner Angle Bracket, ½" (left-hand)
155. Rubber Ring (for 1" Pulleys)

157

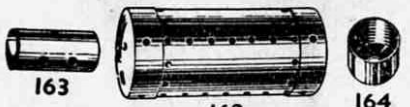
157. Fan, 2" diam.

160



161

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



163

162

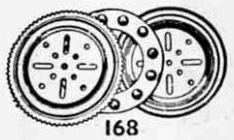
164

No.
162. Boiler, complete, 5" long × 2 1/16" diam.
162a. " Ends, 2 1/16" diam. × ⅛"
162b. " without ends, 4½" long × 2 1/16" diam.
163. Sleeve Piece, 1½" long × 11/16" diam.
164. Chimney Adaptor, ⅜" diam. × ½" high

165

166

165. Swivel Bearing
166. End "
167b. Flanged Ring, 9⅞" diam.



168

168. Ball Bearing, 4" diam.
168a. " Race, flanged disc, 3¾" diam.
168b. " " toothed " 4" diam.
168c. " Cage, 3⅛" diam., complete with balls.

171

171. Socket Coupling

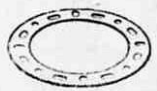
175

175. Flexible Coupling Unit

176

176. Anchoring Spring for Cord

179



180

179. Rod Socket
180. Gear Ring, 3½" diam. (133 ext. teeth, 95 int.)

185

187

No.
185. Steering Wheel, 1¾" diam.
186. Driving Band, 2½" (Light)
186a. " " 6" "
186b. " " 10" "
186c. " " 10" (Heavy)
186d. " " 15" "
186e. " " 20" "
187. Road Wheel, 2½" diam.
187a. Conical Disc, 1⅞" diam.

192

197

Flexible Plates.

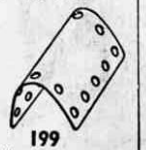
188. 2½" × 1½"
189. 5½" × 1½"
190. 2½" × 2½"
190a. 3½" × 2½"
191. 4½" × 2½"
192. 5½" × 2½"

Strip Plates.

196. 9½" × 2½"
197. 12½" × 2½"

200

198



199

198. Hinged Flat Plate, 4½" × 2½"
199. Curved Plate, U-Section
200. " " 2½" × 2½" × ⅜" radius
2½" × 2½" × 1 1/16" radius

211A&211B

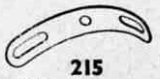
211a. Helical Gear, ½" } Can only be
211b. " " 1½" } used together

212

213

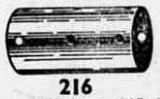
212. Rod and Strip Connector
213. Rod Connector

214



215

214. Semi-Circular Plate, 2½"
215. Formed Slotted Strip, 3"



216

216. Cylinder, 2½" long, 1¼" diam.

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