Single and Double Flyboats

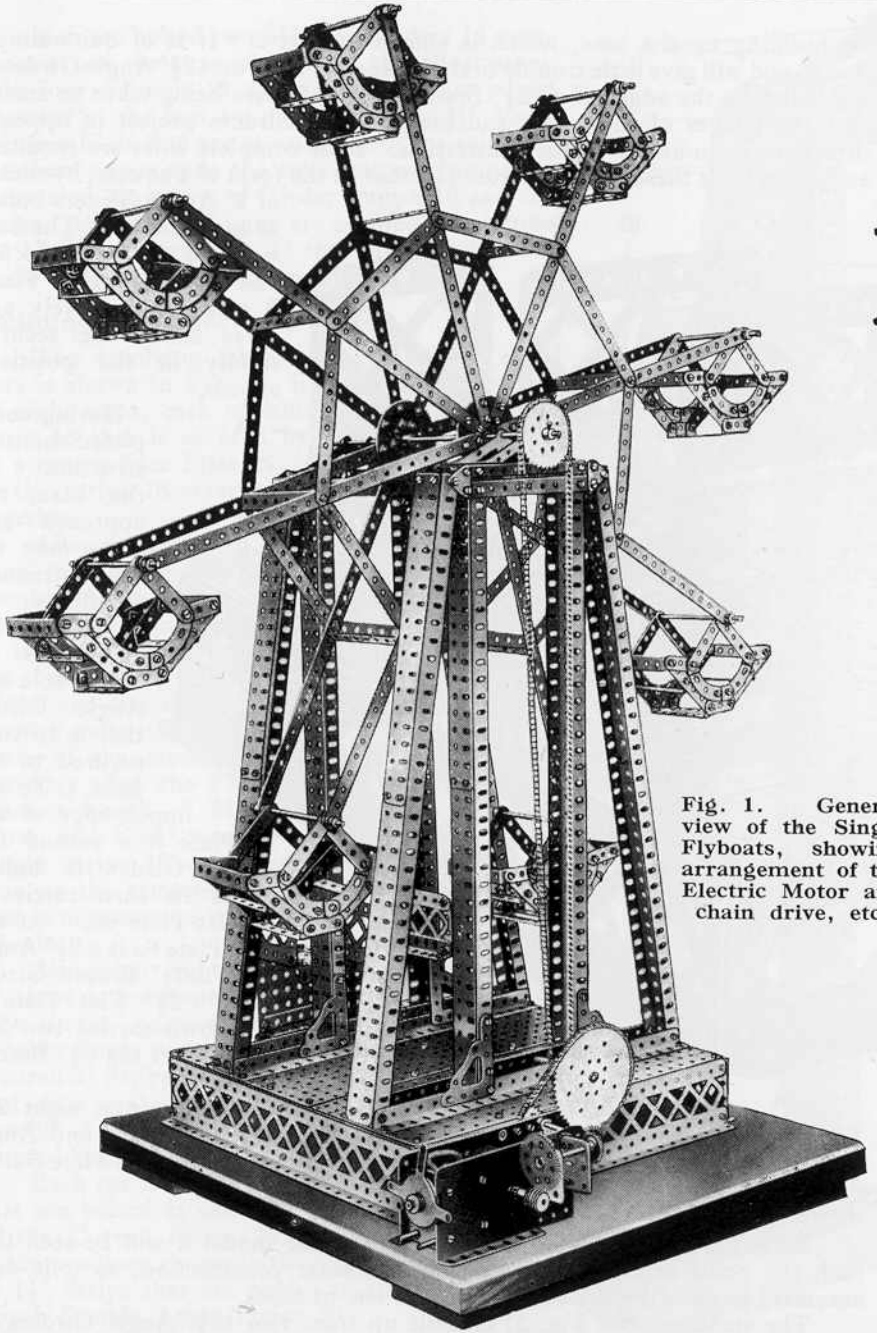


Fig. 1. General view of the Single Flyboats, showing arrangement of the Electric Motor and chain drive, etc.

The two Meccano models described in this leaflet represent popular pleasure fair attractions. When set in motion by means of the Meccano Electric Motor they present a very realistic appearance, and are entirely automatic in operation.

EVERY boy will be familiar with the huge roundabouts, scenic railways and oscillating swing boats which form such prominent features at most seaside resorts and country fairs, and he will no doubt have many pleasant memories of happy hours spent riding first on one and then on another of these jolly machines. It is doubtful, however, if he will be equally familiar with the very enjoyable ride that may be had in a car of such a machine as the Revolving Flyboats, a model of which is shown on this page. This device, although not so much in evidence as various other mechanical amusements, is nevertheless a warm favourite with thousands of boys and girls in some parts of the country. It is perhaps principally on account of its necessarily huge size that it is not met with more frequently.

It is indeed an exhilarating experience to step into one of the little cars and to be carried high into the air and then as the car descends to the ground, to see the earth apparently rushing out to meet it! A typical structure of this nature stood for many years at Blackpool, in Lancashire, but unfortunately it has recently been condemned as unsafe and has had to be dismantled. It was known as the "Big Wheel" and during its long life it has been a source of pleasure to countless thousands of holiday makers. It formed a very conspicuous landmark that could be seen from many miles around.

The construction of the Blackpool Big Wheel was commenced

Published by MECCANO LIMITED, OLD SWAN, LIVERPOOL Printed in England.

in February, 1896, and the following August saw the giant structure thrown open to the public. The erection was carried out by Lieutenant W. B. Bassett, R.N. and a staff of 250 men. Most of the metal used in the various ties and struts was Scotch Steel, while the spokes and driving cables were manufactured from Lancashire steel cable. From the ground to the topmost girder the height of the structure was 220 feet—the tip of the wheel being 260 feet above sea level! The total weight of the wheel with its 30 cars attached was 1,000 tons, while its superficial area for painting purposes was estimated at 2,000 square yards!

The vast size of this great wheel may perhaps be better realised when it is learned that 2½ tons of paint were necessary in order to apply two coatings to the steelwork! Each of the carriages weighed 3 tons 3 cwt., and was capable of carrying 30 passengers—giving a grand total of 900 passengers that could be carried at one time.

The rim of the wheel itself was built of steel girders bolted together and was suspended from the axle by 120 wind ties and spokes of steel cable. For rotating the wheel giant steel cables were used, the total length of which was 3,132 feet, or ¾ of a mile! The splicing on these two cables was recognised as the longest spliced joints in the world. The huge wheel was mounted on a massive steel axle, the circumference of which measured 6 feet 10 inches, the axle having a weight of 30 tons!

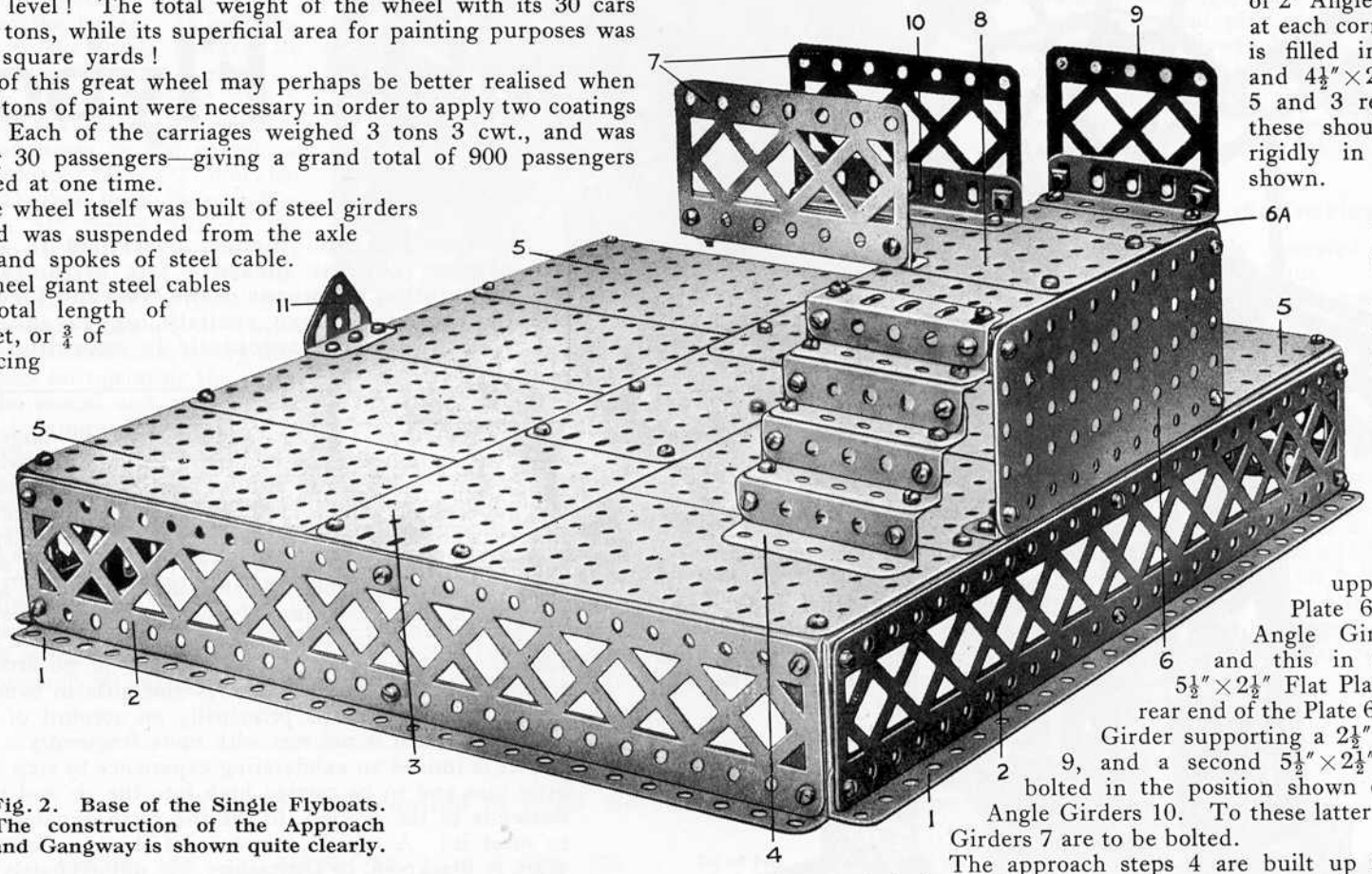


Fig. 2. Base of the Single Flyboats. The construction of the Approach and Gangway is shown quite clearly.

Although the Meccano model Flyboats differ in some respects from the structural design of the Blackpool Wheel the underlying principle is the same as that on which most Big Wheels and Flyboats are designed. We would refer those boys who wish to build a more accurate model of the Blackpool Wheel to the Meccano Instructions Manual, which contains illustrations and constructional details for building a model that is fashioned to a great extent on this famous pleasure wheel (see Model No. 6.6).

Construction of the Single Flyboats

It is convenient when constructing a model of this description to commence by building up the base, which is shown in Fig. 2. It is of quite simple design and will give little trouble to the builder. The two 12½" Angle Girders 1 are bolted to the edges of a 12½" Braced Girder 2, care being taken to ensure that the flanges of the upper and lower Angle Girders project in opposite directions as indicated in the illustration. Four complete sides are required, and when built these may be bolted together in the form of a square, by means of 2" Angle Girders bolted at each corner. The base is filled in by 3½"×5½" and 4½"×2½" Flat Plates 5 and 3 respectively and these should be secured rigidly in the positions shown.

Having completed the construction of the base, the approach and steps may receive attention as follows. A 5½" × 3½" Flat Plate 6 is bolted to a 5½" Angle Girder that is in turn secured to the base. To the upper edge of the Plate 6 a second 5½" Angle Girder is bolted and this in turn carries a 5½"×2½" Flat Plate 6a. At the rear end of the Plate 6a is a 2½" Angle Girder supporting a 2½" Braced Girder 9, and a second 5½"×2½" Flat Plate 8 bolted in the position shown carries two 3½" Angle Girders 10. To these latter the 3½" Braced Girders 7 are to be bolted.

The approach steps 4 are built up from eight 2½" Angle Girders bolted together in the manner shown, the upper end Angle Girders of the stairway when complete being bolted to the Flat Plate 6a.

Details of the Main Standards

Referring to the general view (Fig. 1) of the model it will be seen that both the main vertical standards are of similar construction, so it is only necessary to describe the construction of one of them.

The standard (see Fig. 3) is built up from two 18½" Angle Girders 13

to which are bolted two 9½" Flat Girders 14 overlapped one hole as shown in the illustration. The four columns 13 when completed are joined together at the foot by means of two 12½" Angle Girders 12, bolted one at each side of the columns. At their upper ends the two centre columns are connected by means of Girder frames 16 and the outer "inclined" columns are secured in position by 1" Triangular Plates 17 that are bolted to the ends of the Girder Frames.

Building the Wheel and Cars

The revolving wheel that carries the eight cars is shown in Fig. 5. Each side is composed of eight arms, each of which consists of a 12½" Strip 18 that is secured by means of two Bolts to a centre Face Plate 21. 5½" Strips 20 bolted to the Strips 18 serve to hold the whole rigidly together.

After building two similar sides as described they may be joined together by means of 3½" Double Angle Strips 19, which are secured in position between each opposite pair of Strips 18. It is important that care is taken to ensure that the bosses and central bores of the two Face Plates are directly in line so that the wheel will revolve quite true about its axis when the various parts of the model are finally assembled. To correctly align the Face Plates it is advisable to place a length of Meccano Rod through their bores and then carefully re-adjust the Double Angle Strips 19 until the wheel runs free and true on the temporary axle. A little care is all that is necessary to construct a perfectly balanced wheel.

Altogether eight cars are required and each of these is constructed as follows (see Fig. 4). The lower portion is composed of 2½" × ½" Double Angle Strips 23 to the ends of which are secured 3" Strips 24 and 2" Strips 22. The backs and seats are constructed from further 2½" × ½" Double Angle Strips 23 while 2½" small radius Curved Strips 25 complete the sides of the cars.

Each car is provided with four 2½" Strips 26 that are bolted at one of their ends to the ends of the Curved Strips 25. The latter are held in the positions shown in the illustration by means of 1½" Strips that are bolted to the ends of the upper Double Angle Strips 23.

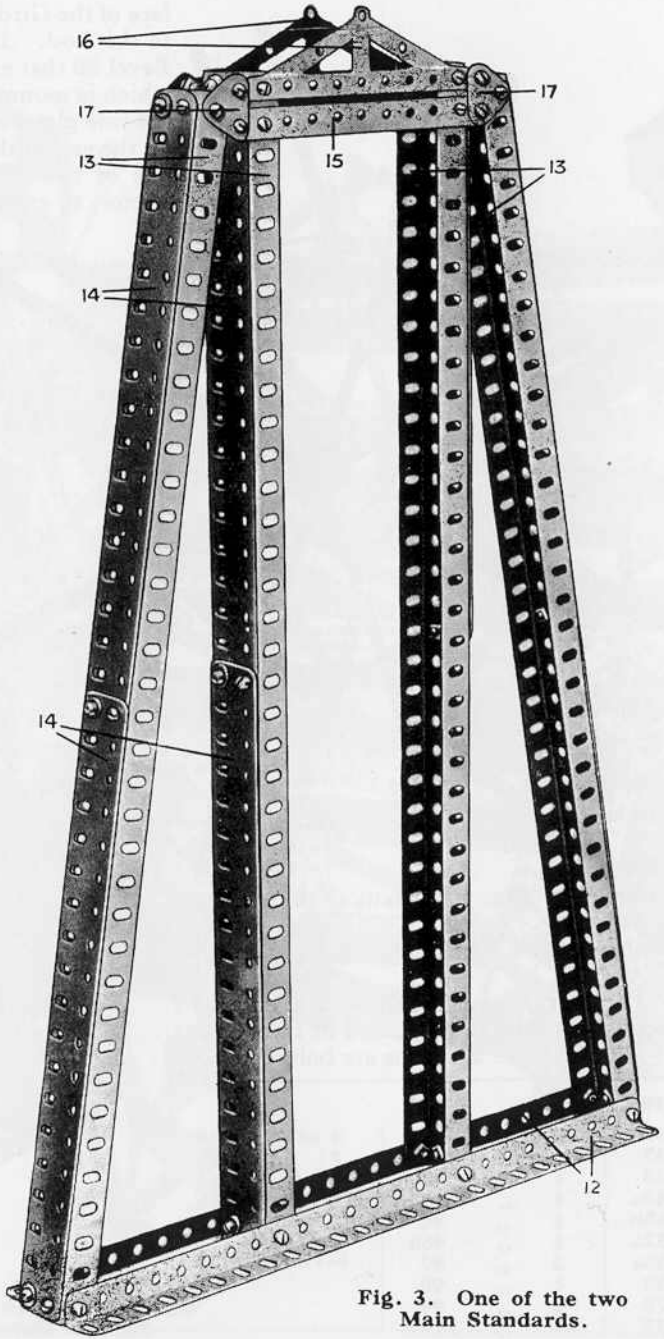


Fig. 3. One of the two Main Standards.

Assembly of the Single Flyboats

Having completed the various portions of the model it remains now to assemble them in their respective positions. The first step is to attach to the base the two vertical standards (Fig. 3) that support the wheel. As will be seen from the general view the standards are bolted one at either side of the base. The bolts securing each standard pass through the Angle Girders 12 (Fig. 3) and through the fourth and seventh holes of the Flat Plates 5, counting the holes from the sides of the base (see general view).

To ensure perfect rigidity it is advisable to further secure each standard to the base by means of bolts and nuts passed through the Girders 12 about midway along their length. Having made sure that the main standards are perfectly secure, attention may be given to the moving parts of the model.

The wheel (Fig. 5) revolves on an 11½" Rod and to place it in position between the standards, the Rod should first of all be passed through the apex holes of the Girder Frame 16 (Fig. 3) of the outer standard. The Wheel may now be placed between the standards and the 11½" Rod passed through the Face Plates 21 (Fig. 5) then through the apex holes of the Girder Frames capping the opposite standard. It is held in position by means of two Collars secured to the Rod one at each end and placed against the faces of the Girder Frames 16.

The wheel should be secured centrally on the Rod by tightening the set-screws of the Face Plates 21.

The next step is to attach the cars to the arms of the wheel. The method of doing this is illustrated in the general view (Fig. 1).

Each car is suspended pivotally on a 3½" Rod that is journalled in the end holes of the Strips 18 (Fig. 5) that form the arms of the wheel. This Rod passes through the upper end holes of the Strips 26 (Fig. 4) and is held in position in the arms of the wheel by means of two Collars. As all the cars are suspended freely on their respective pivot Rods it will be found that as the wheel is rotated the cars maintain a horizontal position.

The Chain Drive Mechanism

The mechanism for rotating the wheel is very

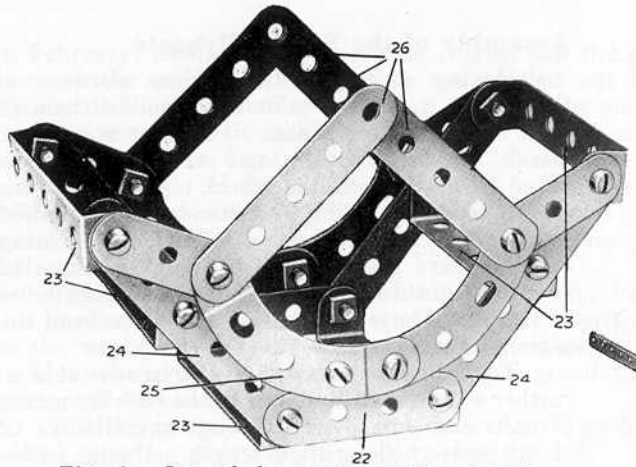


Fig. 4. One of the cars, showing details of construction.

simple. A study of Fig. 1 in conjunction with the following description should make its arrangement quite clear.

The drive is taken from a 6-volt Meccano Electric Motor screwed down in the position shown to the wooden baseboard on which the model itself is mounted. On one end of the 11½" Rod on which the wheel revolves is a 2" Sprocket Wheel that is connected by a length of Sprocket Chain to a 1" Sprocket that is secured to a short Rod carrying a 3" Sprocket, the Rod of the latter Sprocket is journalled in the centre holes of the Angle Girder 12 of the vertical standard and held in position by means of Collars.

It will be seen from the illustration that the model has been mounted together with the Motor on a wooden baseboard, but this is not absolutely essential, and if it is not possible to obtain a suitable board the Motor could be secured to a Flat Plate bolted in a suitable position to the base of the model.

The armature spindle of the Electric Motor 35 (Fig. 6) carries a Worm 36 that engages a 57-teeth Gear Wheel 37 that is secured on a Rod 38. This Rod is journalled in two Girder Brackets 38a, which are bolted to the Motor casing. Two or three 2" Strips are bolted to each face of the Girder Brackets in order to give additional bearing surface to the Rod. In addition to the Gear 37 the Rod 38 carries also a Bevel 39 that engages with a second Bevel secured on a Rod 40, on which is mounted also a ½" Pinion 41. The Rod 40 is journalled in the side plates of the Motor and is held in position by a Collar placed on the end of the Rod opposite to the Bevel. It is advisable to place one or two Washers on the Rod 40 between the Bevel and the Motor, to ensure the proper engagement of its teeth.

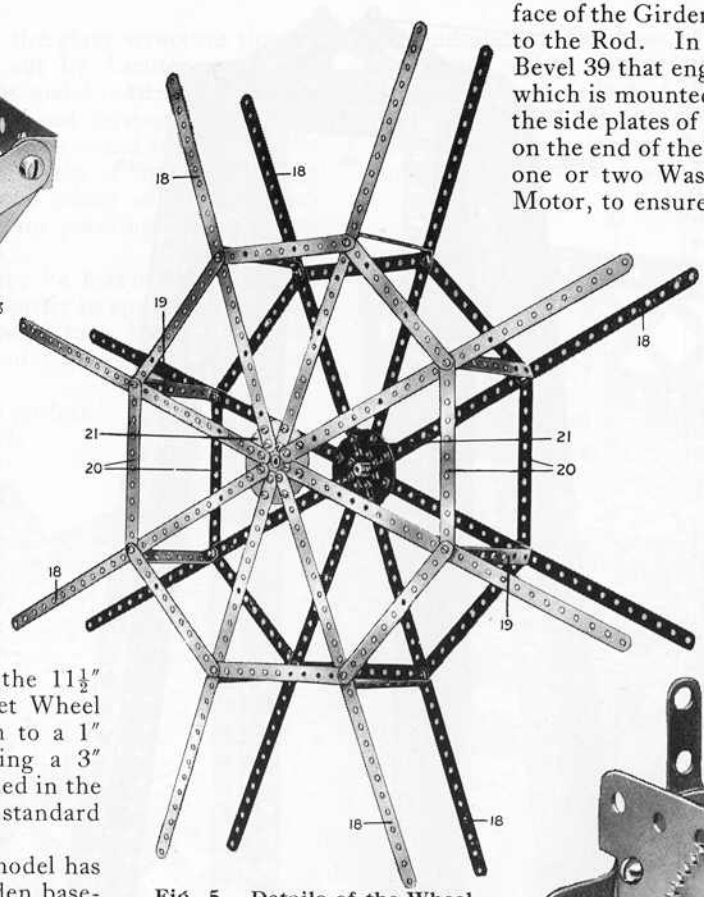


Fig. 5. Details of the Wheel.

The ½" Pinion 41 engages a 57-teeth Gear 42 carried on a Rod that is journalled in a manner similar to the Rod 40. On this Rod, and placed outside the Motor casing, is a ¾" Sprocket 43, which is connected by a length of Sprocket Chain to the 3" Sprocket of the model driving mechanism (see Fig. 1).

In motion, this model presents a most pleasing sight and it is quite easy to believe that one is actually enjoying all the excitement and fun of a real fair ground. If it is possible to place a Meccano Roundabout, Joy Wheel, or Revolving Aeroplane alongside the Flyboats a miniature fairground may readily be constructed and heaps of good fun and hours of pleasure will be obtained. The No. 4-7 Meccano Instruction Manual contains full details for building the Revolving Aeroplanes, Joy Wheel, Big Wheel, and a Cake Walk, besides hundreds of other equally fascinating models.

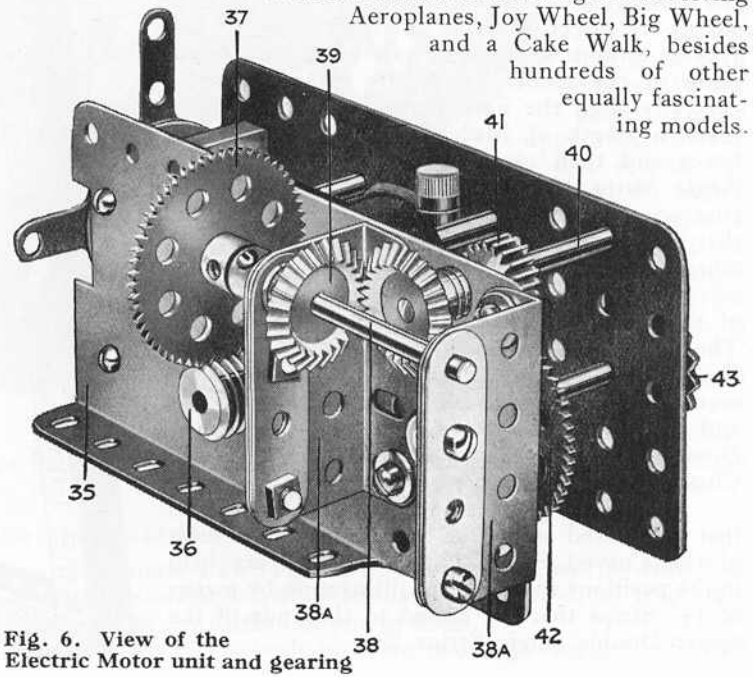


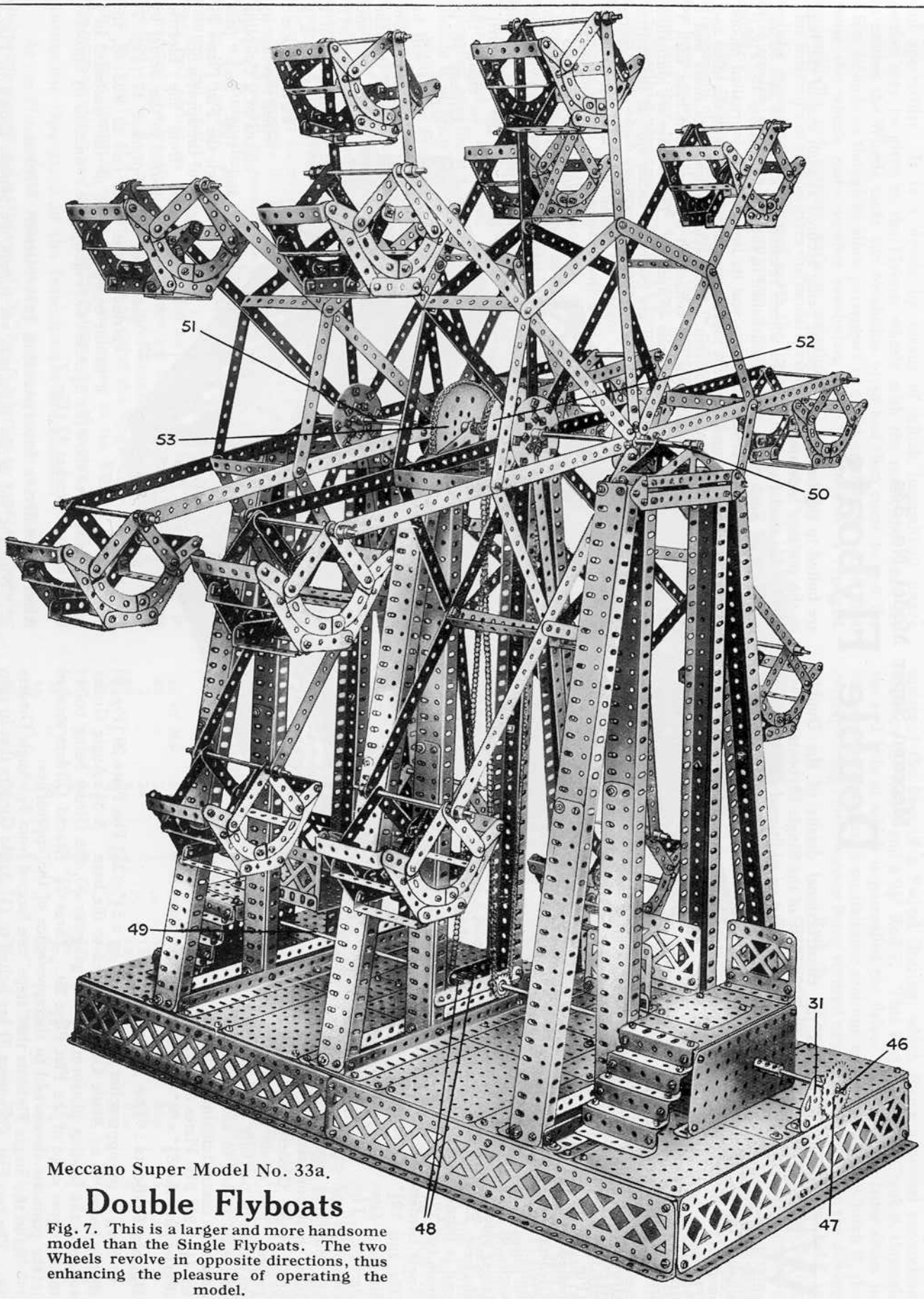
Fig. 6. View of the Electric Motor unit and gearing

Parts Required :

16	of No.	1	2	of No.	9b	1	of No.	32	32	of No.	90a
20	,,	2	9	,,	9d	428	,,	37	4ft.2in.	,,	94
1	,,	2a	4	,,	9e	41	,,	38	1	,,	95
32	,,	4	1	,,	13	48	,,	48a	1	,,	95b
32	,,	5	8	,,	15a	8	,,	48b	1	,,	96
20	,,	6	2	,,	16a	8	,,	52a	1	,,	96a
32	,,	6a	2	,,	17	3	,,	53a	2	,,	97
16	,,	7a	1	,,	26	37	,,	59	1	,,	98
15	,,	8	2	,,	27a	3	,,	70	4	,,	99
3	,,	9	2	,,	30	8	,,	77	16	,,	103a

4	of No.	108
2	,,	109
4	,,	113
1	,,	126
2	,,	161

6-Volt Motor.



Meccano Super Model No. 33a.

Double Flyboats

Fig. 7. This is a larger and more handsome model than the Single Flyboats. The two Wheels revolve in opposite directions, thus enhancing the pleasure of operating the model.

Double Flyboats

WITH certain exceptions the constructional details of the Double Flyboats (Fig. 7) are the same as those of the Single Flyboats. Two wheels (Fig. 5) are of course required and an additional main standard (Fig. 3). The design and construction of the cars is identical with that of the smaller model, as also is the arrangement of the Electric Motor unit (Fig. 6). The base, however, is larger and the driving mechanism differs considerably from that of the Single Flyboats.

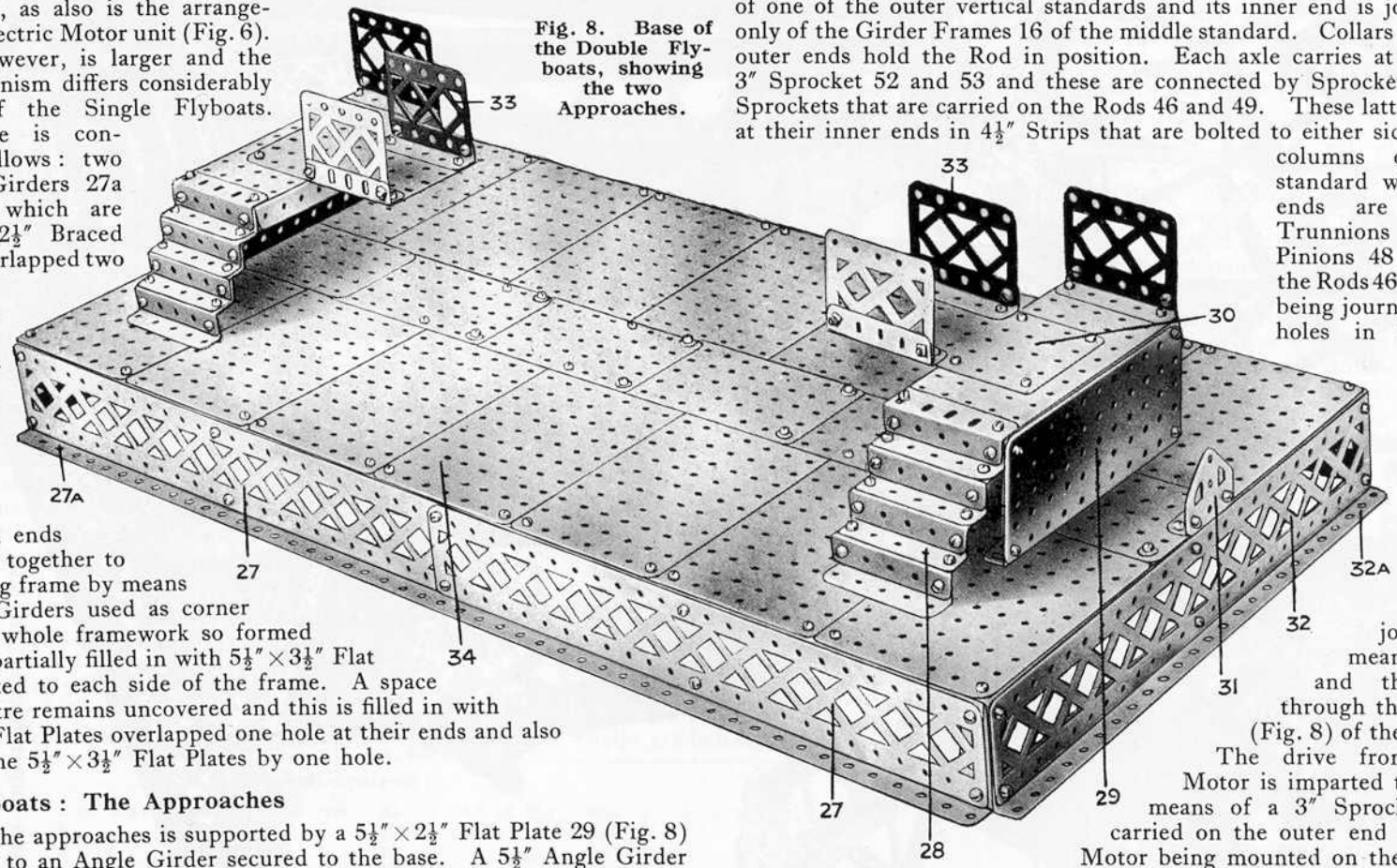


Fig. 8. Base of the Double Flyboats, showing the two Approaches.

The base is constructed as follows: two 24½″ Angle Girders 27a (Fig. 8) to which are bolted two 12½″ Braced Girders 27 overlapped two holes, form each of the larger sides of the base. Each end is formed from two 12½″ Angle Girders 32a and 12½″ Braced Girders 32. The two sides and ends are connected together to form an oblong frame by means of 2″ Angle Girders used as corner pieces. The whole framework so formed may then be partially filled in with 5½″×3½″ Flat Plates 34 bolted to each side of the frame. A space down the centre remains uncovered and this is filled in with six 4½″×2½″ Flat Plates overlapped one hole at their ends and also overlapping the 5½″×3½″ Flat Plates by one hole.

Double Flyboats: The Approaches

Each of the approaches is supported by a 5½″×2½″ Flat Plate 29 (Fig. 8) that is bolted to an Angle Girder secured to the base. A 5½″ Angle Girder supports the landing platform and the gangway 30, the Girder being bolted to the upper edge of the Flat Plate 29. Three 2½″ Braced Girders secured in the positions shown add to the appearance of the approaches.

As in the Single Flyboats the "steps" are formed from 2½″ Angle Girders 28. The two Flat Trunnions 31 are bolted to 1½″ Angle Girders that in turn are bolted to the base, one Trunnion being secured at each end of the base in the position indicated.

In this model each of the two wheels revolves on a separate axle 50 and 51 (Fig. 7). Each of the axles is journalled in the Girder Frames 15 (Fig. 3) of one of the outer vertical standards and its inner end is journalled in one only of the Girder Frames 16 of the middle standard. Collars on the inner and outer ends hold the Rod in position. Each axle carries at its inner end a 3″ Sprocket 52 and 53 and these are connected by Sprocket Chain with 1″ Sprockets that are carried on the Rods 46 and 49. These latter are journalled at their inner ends in 4½″ Strips that are bolted to either side of the central columns of the centre standard while their outer ends are journalled in Trunnions 31. Two ½″ Pinions 48 are carried on the Rods 46 and 49, the Rods being journalled in suitable holes in the 4½″ Strips to enable the Pinions 48 to engage.

It will be observed from Fig. 7 that the Rods 46 and 49 are both composed of a long and a short Rod joined together by means of a Coupling and that they pass through the Flat Plates 29 (Fig. 8) of the approaches.

The drive from the Electric Motor is imparted to the model by means of a 3″ Sprocket 47 (Fig. 7) carried on the outer end of Rod 46, the Motor being mounted on the baseboard in a suitable position to allow the Sprocket 43 (Fig. 6) to be connected by Sprocket Chain to the Sprocket 47 (Fig. 7).

Alternative Drive Incorporating Intermittent Motion

With the aid of the ingenious yet simple mechanism shown in Fig. 9

it is possible to make the operation of the Flyboats much more interesting and spectacular. It is a device by means of which intermittent rotary motion may be given to the Flyboat wheels, with the result that when set in motion the Wheels make one revolution or so and then come to rest for a few seconds as though to allow passengers to alight or embark. After this pause the wheels make another revolution, when the process is repeated automatically and entirely without attention. This intermittent motion gives the model a very realistic appearance and is well worth the little extra trouble required to incorporate it in the model.

The photograph shows a convenient arrangement of the gearing, although of course the layout and general assembly of the necessary apparatus may be altered as desired to suit individual requirements. The Rod 1 forms the driven shaft, which conveys intermittent motion to the model. The drive from the Motor is led to a Worm Wheel 2 that meshes with a 57-teeth Gear Wheel 3, in the face of which two Threaded Pins 4 are secured as shown. For driving the Flyboats it is advisable to use one pin only and the other shown in the photograph should be removed. In the illustration the Gear Wheel 3 is secured to a short Rod journalled in a footstep bearing consisting of a Double Bent Strip bolted to a base plate.

Either the Single or the Double Flyboats may be fitted with the device and this will entail several minor alterations in the constructional details of the driving mechanism previously described. The necessary alterations are the same for both the Single and the Double Flyboats, and are of such simple character that no difficulty should be experienced.

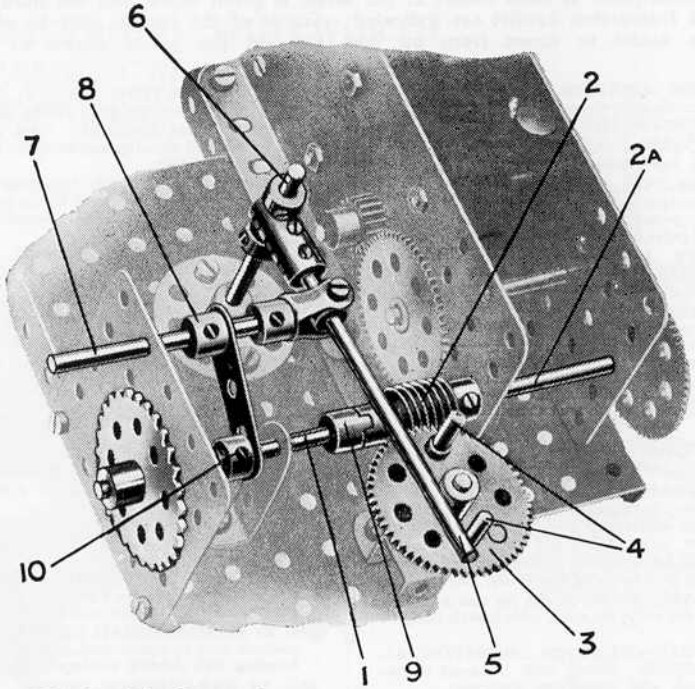


Fig. 9. The Intermittent mechanism. One of the Pins 4 should be removed when using this mechanism in connection with the Single or Double Flyboats.

To incorporate the intermittent mechanism into the Double Flyboats it will be necessary to remove the large Sprocket 47 (Fig. 7) and to replace it with a $\frac{1}{2}$" Pinion that is driven by a Worm secured on a long Rod at right angles to Rod 46. The Rod of the Worm may be journalled in any suitable manner and must be long enough to project beyond the side of the model. This Rod carries on the opposite end to the Worm a 3" Sprocket that is connected by a length of Meccano Sprocket Chain with the $1\frac{1}{2}$" Sprocket on the Rod 1 (Fig. 9) of the intermittent mechanism. These are the only alterations required to the standard layout of either the Single or Double Flyboats. This arrangement will result in the transferring of the Electric Motor from the position shown in Fig. 1 to the left (as seen in that view) of the base.

Automatic Operation of the Intermittent Mechanism

As the 57-teeth Gear Wheel 3 (Fig. 9) slowly rotates the Threaded Pin 4 alternately presses against the end of a $3\frac{1}{2}$" Rod 5, which is secured in a Coupling mounted on a suitable pivot 6. On this Rod 5, about $\frac{1}{4}$" from the Coupling, is mounted the boss of a Swivel Bearing, which forms a pivotal connection between the Rod 5 and a $2\frac{1}{2}$" Rod 7. This Rod 7 carries a Crank 8, through the end hole of which is journalled the driven shaft 1. The latter slides in its bearings and carries on its inner end one section of a Dog Clutch 9, the corresponding clutch section being secured next to the Worm 2 on the driving Rod 2a. The Clutch is normally held in engagement by means of a Compression Spring mounted on the driven shaft and pressing against a Collar 10. This Spring, while retaining the Clutch in engagement, also tends to hold the lever 5 against the boss of the 57-teeth Gear Wheel 3.

When the Pin 4 strikes the lever 5, the Rod 7 is pushed back in its bearings. This movement is conveyed by means of the Crank 8 to the Rod 1, the Spring thereon is compressed and the clutch members 8 disengaged. The model is thus thrown out of gear and the Motor is free to rotate independently. It continues to do so until the movement of the Gear Wheel 3 has carried the Threaded Pin far enough to allow the Rod 5, through the action of the Spring on the Rod 1, to slip back into its normal position, when the Clutch is re-engaged. The Motor is now connected to the model and the latter is operated until the Threaded Pin again presses against the Rod 5. The cycle of operations is then repeated.

Adjusting the Frequency of Operation

The speed ratio between the Motor and the Gear Wheel carrying the Threaded Pin has a direct bearing on the rapidity with which the cycles of operations take place. An increase in the ratio will result in a corresponding increase in the time taken to complete each cycle, and vice versa. Hence, by altering the gear train attached to the Motor, it is a simple matter to vary the length of the periods during which the Model is at rest or in motion.

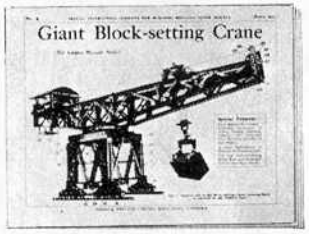
Parts Required :

32	of No.	1	4	of No.	9e	72	of No.	38	2	of No.	95b
38	,,	2	1	,,	9f	96	,,	48a	1	,,	96
2	,,	2a	2	,,	13	16	,,	48b	2	,,	96a
64	,,	4	2	,,	13a	14	,,	52a	6	,,	98
64	,,	5	16	,,	15a	8	,,	53a	6	,,	99
48	,,	6	2	,,	16a	74	,,	59	24	,,	103a
64	,,	6a	2	,,	17	1	,,	63	4	,,	109
4	,,	7	3	,,	26	4	,,	70	6	,,	113
24	,,	7a	2	,,	27a	12	,,	77	1	,,	126a
16	,,	8	2	,,	30	64	,,	90a	2	,,	161
6	,,	9	1	,,	32	8ft.	,,	94	1	6-Volt	Motor
22	,,	9d	735	,,	37	1	,,	95a			

MECCANO SUPER MODELS

No. 6 Leaflet.

No. 3 Leaflet.



No. 4 Leaflet.

No. 8 Leaflet.

Our expert designers have produced for us 34 super models that reach the highest pinnacle ever attained in Meccano construction. Each model in this series is a masterpiece and there is not a boy who will not be eager to build them all.

These models are so important that we have engaged expert engineers to describe them and a special leaflet with beautiful half-tone illustrations has been written for each of them. A selection of the leaflets is illustrated on this page.

A brief description of each model in the series is given below and the number and price of the special Instruction Leaflet are indicated. Copies of the leaflets may be obtained from any Meccano dealer or direct from us, post free, at the prices shown at foot.

No. 1 MOTOR CHASSIS. This model runs perfectly under its own power. It has Ackermann Steering, Differential, Gear Box and Clutch, etc.

No. 2 SHIP COALER. All the movements of a real ship-coaler are reproduced in this model.

No. 3 MOTOR-CYCLE AND SIDECAR. The sidecar is of stream-line design and is mounted on springs. The motor-cycle is complete with lamps, horn, exhaust pipes, etc.

No. 4 GIANT BLOCK-SETTING CRANE. This realistic model is fitted with an accurate reproduction of Fidler's block-setting gear.

No. 5 TRAVELLING BUCKET DREDGER. In this model trucks and wagons can run underneath the chute through which falls the material raised by the dredger buckets.

No. 6 STIFF-LEG DERRICK. This model has many interesting movements, including hoisting, luffing and swivelling, which are controlled by suitable levers.

No. 7 PLATFORM SCALES. This model will weigh articles up to 4½ lbs. with remarkable accuracy.

No. 8 ROUNDABOUT. This model is most attractive when in motion. As the roundabout rotates the cars spin round and the horses rise and fall.

No. 9 BAGATELLE TABLE. This is an interesting model that will give hours of fun to the players.

No. 10 LOG SAW. In this model the saw is driven rapidly to and fro while the work table travels beneath it.

No. 11 SINGLE-CYLINDER HORIZONTAL STEAM ENGINE. Fitted with balanced crankshaft, crosshead, and centrifugal governor.

No. 12 STONE SAWING MACHINE. The model is equipped with adjustable work table and overhead trolley with self-sustaining chain hoist.

No. 13 MECCANOGRAPH. This wonderful model will draw hundreds of beautiful designs.

No. 14 GRANDFATHER CLOCK. A practical example of Meccano model-building. The model keeps accurate time.

No. 15 BALTIC TANK LOCOMOTIVE. The driving wheels are operated by an Electric Motor. An accurate reproduction of Walschaerts' Valve Gear is fitted.

No. 16 LOOM. This is perhaps the greatest Meccano success. The model weaves beautiful material.

No. 17 PLANING MACHINE. Fitted with quick-return motion.

No. 18 REVOLVING CRANE. This model is fitted with screw-operated luffing gear.

No. 19 STEAM SHOVEL. This model embodies travelling and rotating mechanisms and jib hoisting and lowering gear.

No. 21 TRANSPORTER BRIDGE. The carriage automatically travels to and fro as long as the motor is driven, pausing for a few seconds at each end of its travel.

No. 22 TRACTION ENGINE. A remarkably realistic model that will pull a boy of average weight. Fitted with two speeds.

No. 23 VERTICAL LOG SAW. While the saws are in motion, the logs are fed slowly to them.

No. 24 TRAVELLING GANTRY CRANE. The movements of this model comprise the traversing of the entire gantry, hoisting and lowering, and the traversing of the crane trolley.

No. 25 HYDRAULIC CRANE. The hydraulic ram is represented realistically by a powerful screw mechanism.

No. 26 TWIN ELLIPTIC HARMONOGRAPH. Some beautiful designs may be produced with this model.

No. 27 DRAGLINE. This imposing model of a giant excavator is fitted with travelling, luffing, slewing and dragging movements.

No. 28 PONTOON CRANE. The movements of this model include the operation of the two hoisting blocks, slewing of the entire crane, and luffing.

No. 29 HAMMERHEAD CRANE. This is a very realistic and powerful model, comprising traversing, hoisting and slewing motions.

No. 30 BREAKDOWN CRANE. This model is equipped with travelling, slewing, luffing, and hoisting motions, and also is fitted with laminated springs, brakes, out-riggers, etc.

No. 31 WAREHOUSE WITH ELEVATORS. The two cages are driven automatically and work alternately, pausing at top and bottom positions.

No. 32 TWO-CYLINDER STEAM ENGINE AND BOILER. This is a realistic working model of a complete steam plant, equipped with valve gear, governor, balanced cranks, etc.

No. 33 SINGLE AND DOUBLE FLYBOATS. These two models represent popular pleasure-fair attractions.

No. 34 THREE-ENGINE BIPLANE. This is a realistic model of an "Argosy" machine, and is fitted with ailerons, elevators and rudders.

INSTRUCTION LEAFLET PRICES.

Leaflet Nos. 3 5 6 7 8 9 10 11 12 17 18 19 21 22 23 24 25 26 28 29—United Kingdom 2d., Overseas 3d., Canada 5 cents.

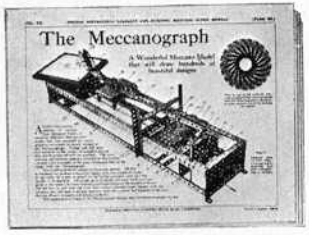
Leaflet Nos. 1 2 13 14 15 16 27 30 31 32 33 34—United Kingdom 3d., Overseas 4d., Canada 8 cents.

Leaflet No. 4—United Kingdom 6d., Overseas 8d., Canada 15 cents.

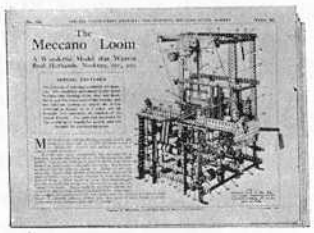
MECCANO LIMITED - Old Swan - LIVERPOOL

No. 19 Leaflet.

No. 1 Leaflet.



No. 13 Leaflet.



No. 16 Leaflet.