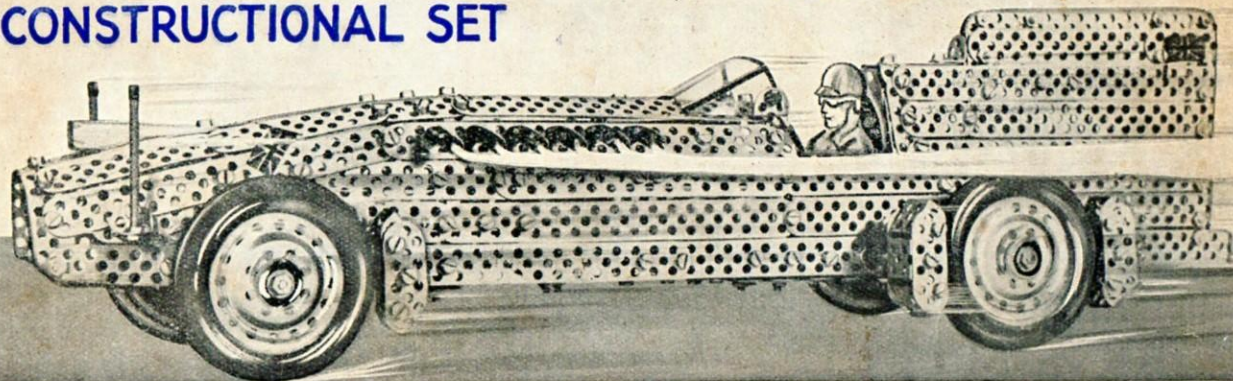




*Book 2*

INCLUDING  
**TRIX**  
ELECTRIC MOTOR  
AND ITS USES

BRITISH PATENTS  
383087 363547 383240  
AND VARIOUS  
FOREIGN PATENTS

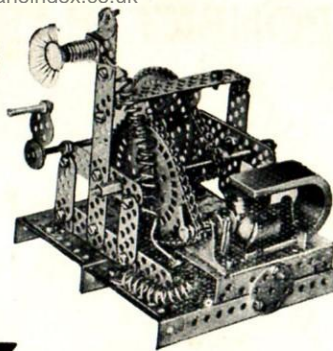


**THE BOOK OF TRIX MODELS**

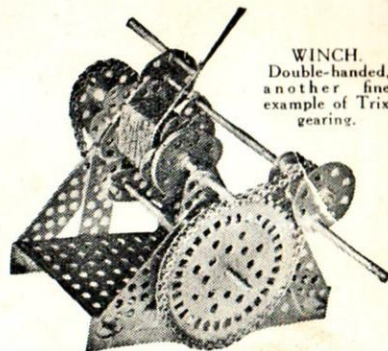
PRICE.  
**3D.**



Now put Models  
*in gear* with  
the  
**TRIX**



**DYNAMO**  
showing the clever use of  
Trix Gears.



**WINCH.**  
Double-handed,  
another fine  
example of Trix  
gearing.

**GET THIS FINE  
"GEAR BOOK,"**

***Trix Book No. 3.***

You will find Book No. 3 invaluable. It contains many grand models fitted with TRIX Gears, the finest models in the books! Everything is made easy for you. Book No. 3—remember the number. Be sure to get it. Price, 3d.

**Gear Set**



Add gears to your models! Models so equipped are far more realistic, far more like the real thing. With the TRIX Universal Gear Set, which only costs one shilling, you can make a fine start. The Set contains large and small gear wheels in three sizes, and all the necessary parts for making "drives" of many kinds—worm drive, sprocket chain drive, direct gear drive for different speeds, right-angle drive, and many others. Endless gear ratios are possible. The Gear Wheels have a polished brass finish. Full instructions are sent with the outfit. A tractor, a clock, trolley, windmill, fire escape, and even a travelling gantry crane may be made with the aid of TRIX Gears. Be sure to introduce gears into your model's.

**BUILD WITH TRIX • DRIVE WITH TRICY-TRIX • FIT TRIX GEARS**



# ALL TRIX COMPONENT PARTS. ACTUAL SIZES.



A 1  
Angle Piece



N 1  
Nut



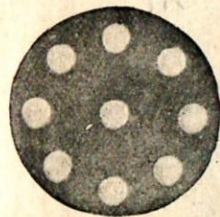
B 1  
Bolt



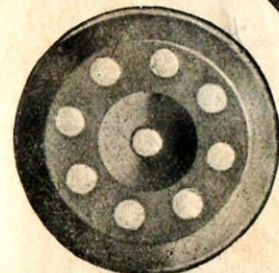
C 1  
Crane Hook



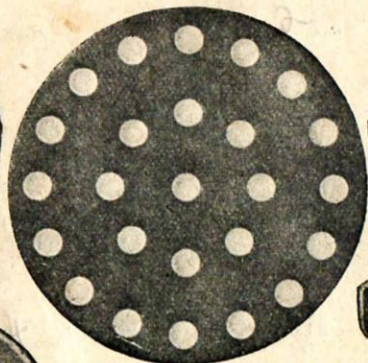
ER 1  
Eccentric Washer



P 29  
Pierced Disc, 29 mm.



V 35  
Half of grooved (V) Pulley



P 49  
Pierced Disc, 49 mm.



W 10  
Washer  
10 mm.



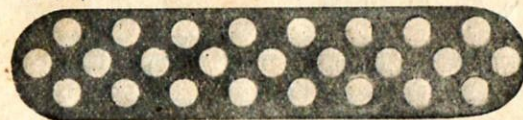
W 16  
Washer  
16 mm.



SU 1  
Small  
U piece

FLAT  
STRIPS  
F 5 —

F 9 ↓

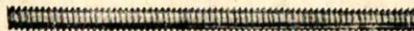


S 25

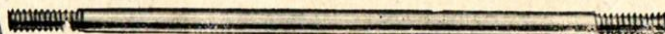


Screwed Spindle, 25 mm. long

S 55



Screwed Spindle, 55 mm. long



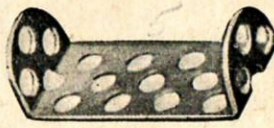
S 87 Plain shaft with screwed ends, 87 mm. long



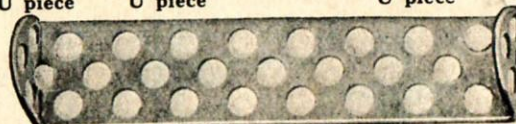
SU 2  
U piece



U 1  
U piece



U 2  
U piece



U 3 Long U piece



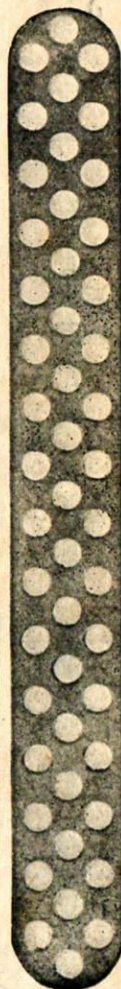
Spanner

FLAT STRIPS

F 17 →

F 13 ↓

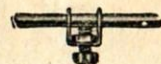
No. denotes  
number of  
middle holes





**TRIX**

# **ELEMENTARY CONSTRUCTIONS** (Scale half actual size). **FOR ELEMENTARY CONSTRUCTIONS Nos. EC 1 to EC 23—SEE BOOK 1.**



EC 24  
Adjustable U piece



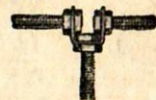
EC 25  
Joint Coupling



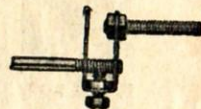
EC 26  
Shaft Coupling



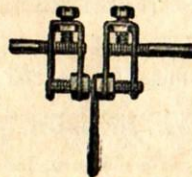
EC 27  
Double Shaft  
Coupling



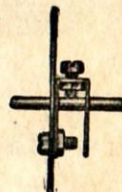
EC 28  
T Coupling



EC 29  
Crank



EC 30  
Double Crank



EC 31  
Disc Fastening



EC 32  
Large Crown Wheel



EC 33  
Small Crown Wheel



EC 34  
Toothed Bar



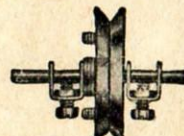
EC 35  
Friction Wheel  
Distance Washers are fixed between the discs



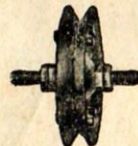
EC 36  
Rope Pulley



EC 37  
Fixed V Pulley  
An ER 1 is fixed between the two V 35's



EC 38  
Loose V Pulley.  
Secured by adjustable U pieces



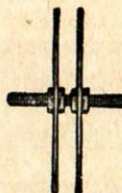
EC 39  
Loose V Pulley.  
Secured by lock nuts



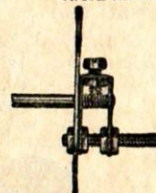
EC 40  
Fixed V Pulley.  
Held by two nuts



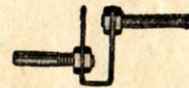
EC 41  
Flanged Wheel



EC 42  
Double Disc Wheel.  
for Rubber Tyres



EC 43  
Disc Fastening with  
Crank



EC 44  
Crank



EC 45  
Crank with joint  
fastenings



# TRIX PERMAG MOTOR (4-8 volt) AND DYNAMO. **TRIX**

This wonderfully effective motor has many uses for TRIX enthusiasts. It is built with a very powerful permanent magnet and a tripolar armature wound to give the most efficient running with the minimum of current consumption.

It will run on a  $3\frac{1}{2}$ -volt pocket battery or give more power with two pocket batteries in series or in parallel. It will run off a larger 4 or 8 volt battery or accumulator, anything between the range of four to eight volts.

This motor can be used for many purposes. There are illustrations in this book showing it driving TRIX models. Every TRIX worker should have this motor.

The Permagan also be used to drive a boat. TRIX Ltd., have designed a boat hull which is ideal to house this motor as a power unit. The hull can be purchased separately or as a motor boat complete. The motor for the boat is exactly as above illustrated and can be easily removed from the hull when not required. (See page 4).

One of the special features of this motor is its quadruple drive. It is fitted with a pinion for gear drive which can be used to drive constructional sets, a sprocket wheel for chain drive, a V-pulley for the usual driving of TRIX models and also a special driver for propeller shaft, etc.

A unique feature of its base is that the holes will not only pick up and bolt to TRIX parts, but also to other constructional Sets.

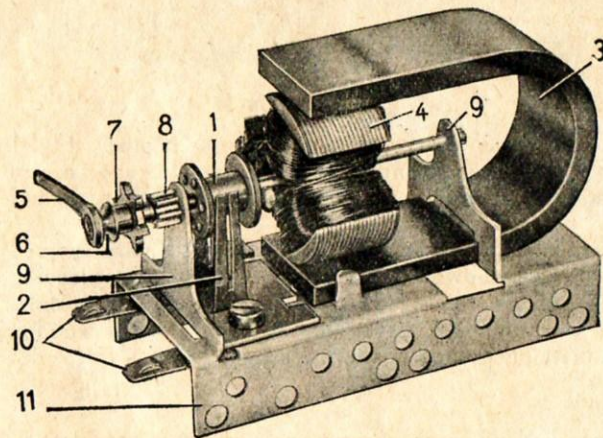
## THE PERMAG USED AS A DIRECT CURRENT DYNAMO.

This marvellous little machine can also be used for electric lighting. To do this the battery is detached from the motor and the machine is driven by a band from a small steam engine or a clockwork motor. When sufficient speed is attained, a small supply of current enough to light an electric pocket lamp bulb is given off at the two terminals. This makes the Permagan very interesting and instructive in every way.

The price of the motor complete with full instructions is **2/6**.

## COMPONENT PARTS OF PERMAG MOTOR.

- |                     |   |   |
|---------------------|---|---|
| 1. Commutator.      | 7. Chain Sprocket Wheel.  | 9. Bearings.  |
| 2. Contact Brushes. | (This Chain Sprocket Wheel is used for driving Constructional Sets, where chain drive is used). | 10. Terminals.  |
| 3. Magnet.          | 8. Small Gear Wheel, suitable for gear driving Constructional Sets.                             | 11. Base with holes suitable for connecting up to TRIX and other Constructional Sets. |
| 4. Armature.        |   |   |
| 5. Driver.          |   |   |
| 6. Pulley Wheel.    |   |   |





# TRIX

## PERMAG MOTOR.

### Boat Drive and Reversing Switch.

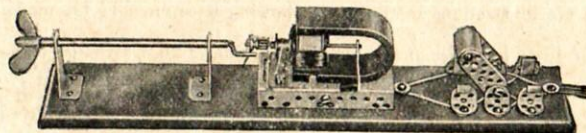


Fig. 1.



Fig. 2.

Many boys like to build their own motor boat and would like to drive it with a Permag Motor. Fig. 1 shows the arrangement necessary to do this. First the propeller shaft and stern tube, then the special arm drive from the Permag Motor and, lastly, the reversing switch, which can be made up of TRIX parts and fitted to the boat.

The wiring of the reversing switch is very simple and is shown clearly in Fig. 2. Six A 1's are screwed on to a piece of wood or other insulating material and wired up as shown. The two centre connections leaving the board run to the terminals of the batteries used. Two F 5's are hinged to the two centre A 1's by bolts and locknuts so that the switch is held securely but can move in either direction. A small piece of wood is cut to size and fixed by two wood screws between the unattached ends of the F 5's.

#### Use of the Switch.

When the F 5's are in a vertical position the motor is switched off as no current can pass from the battery. When the switch is pushed forward and makes contact with the A 1's the motor will run. Pulled right over to the other side, the current will be reversed and the motor will run in the opposite direction. To make a good switch contact it is best to bend a piece of tin or brass strip over each A 1 as shown on Fig. 2, but this is not absolutely necessary.

SEE PAGES 62-69 FOR ILLUSTRATIONS AND DESCRIPTIONS OF TRIX MODELS BEING DRIVEN BY THE PERMAG MOTOR.



# TRIX

No. 117.

## HORIZONTAL ENGINE.

Built with one each of Sets  
No. 1, 1a and 2a.

### Instructions :

The crank shaft consists of an S 55 and two S 25's, which have been connected by two P 29's. The connecting rod, F 5, is fixed between locknuts on the S 25. Two B 1's represent the governor weights, and are tied with thread to the SU 2.

### Parts Required:

4	of	A 1	4	of	S 55
32	„	B 1	1	„	S 87
4	„	F 5	2	„	SU1
4	„	F 9	2	„	SU2
2	„	F 13	2	„	U 1
4	„	F 17	2	„	U 2
5½	„	N 1	2	„	U 3
4	„	P 29	4	„	V 35
2	„	P 49	2	„	W16
2	„	S 25			

Fig. 1.

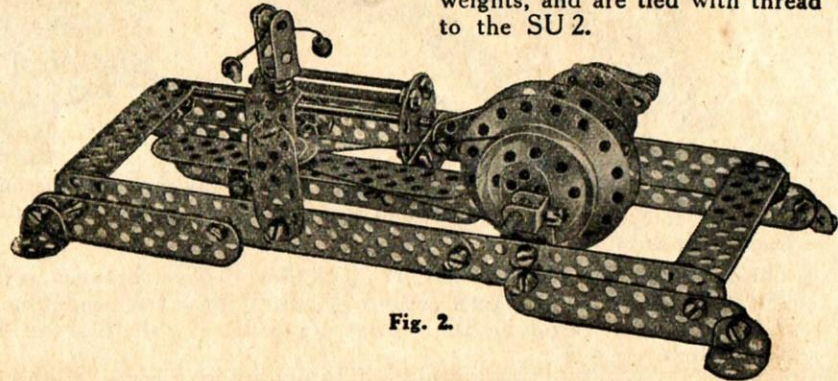


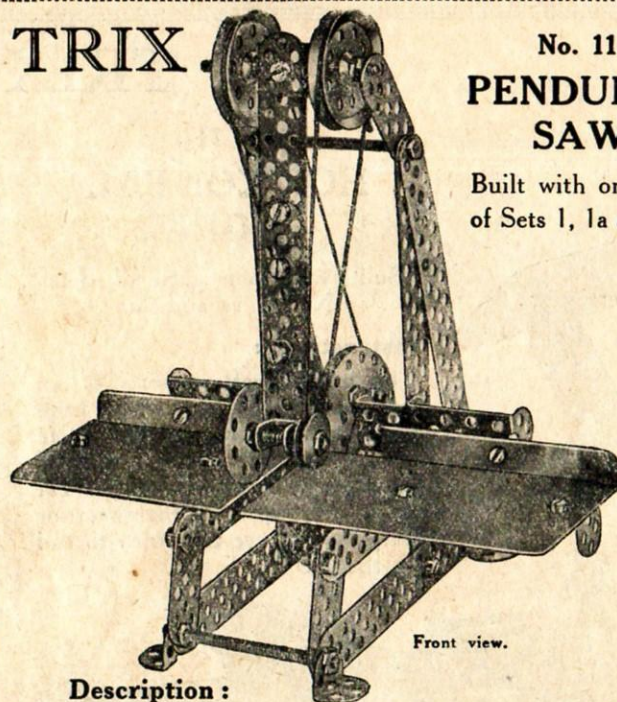
Fig. 2.



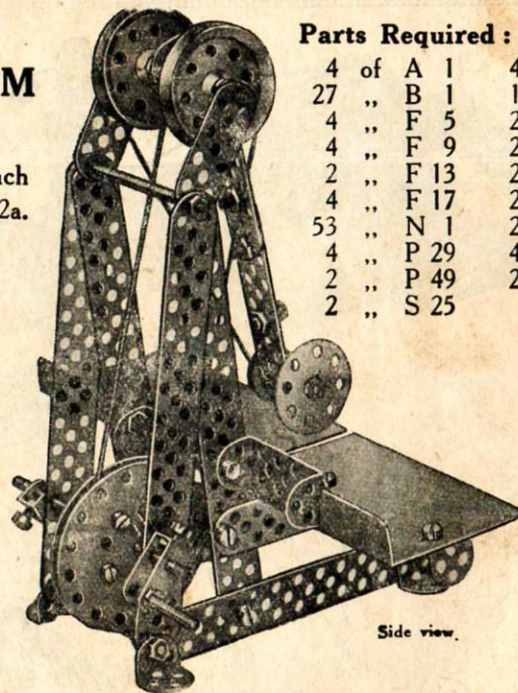
# TRIX

## No. 118. PENDULUM SAW.

Built with one each  
of Sets 1, 1a and 2a.



Front view.



Side view.

### Parts Required :

4	of	A	1	4	of	S	55
27	„	B	1	1	„	S	87
4	„	F	5	2	„	SU	1
4	„	F	9	2	„	SU	2
2	„	F	13	2	„	U	1
4	„	F	17	2	„	U	2
53	„	N	1	2	„	U	3
4	„	P	29	4	„	V	35
2	„	P	49	2	„	W	16
2	„	S	25				

### Description :

Pendulum saws are used to cut an accurate, angular division in prepared woods. The work is held by clamps at the back of the table, and the high speed circular saw blade is controlled by hand.

### Instructions :

The driving pulley, made of two P 49's with three P 29's in between, is fastened to the crank shaft as in EC 31. The two upper pulleys are fixed to an S 55 and EC 40. The pendulum arm is guided at the top end by means of a U 1, while it carries an SU 1 as bearing for the saw shaft, at the lower end. The table is of cardboard. See pattern, page 70.



# TRIX

## No. 119. LETTER SCALES.

Built with one each of Sets No. 1, 1a and 2a.

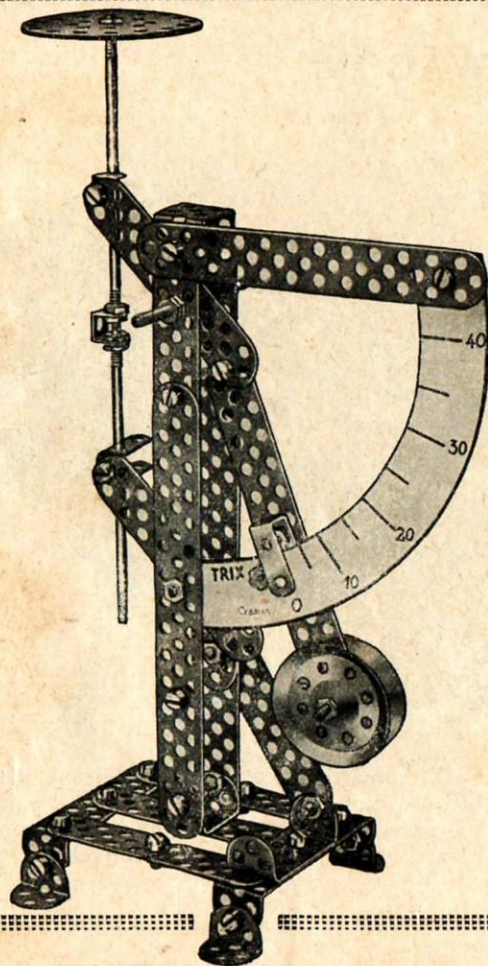
**This Scale can be of real use.**

### Parts Required :

4	of	A	1	1	of	S	25
27	"	B	1	1	"	S	55
4	"	F	5	2	"	S	87
4	"	F	9	2	"	SU	1
2	"	F	13	2	"	SU	2
4	"	F	17	2	"	U	1
49	"	N	1	1	"	U	2
3	"	P	29	2	"	U	3
2	"	P	49	2	"	V	35

### Instructions :

The balance weight arm, made of an F 9 and an F 13, is fixed securely by means of a couple of locknuts on an S 55, which is fixed loosely on both sides. An SU 2 serves as pointer, fastened over the scale bow. It lies in the rest position on a B 1, acting as a stop. When the F 9 swings to the halfway position it works the parallel guide of the bearing rod. Two V 35's with three P 29's fixed together between them, build the balance weight. For the graduated scale, see page 70.





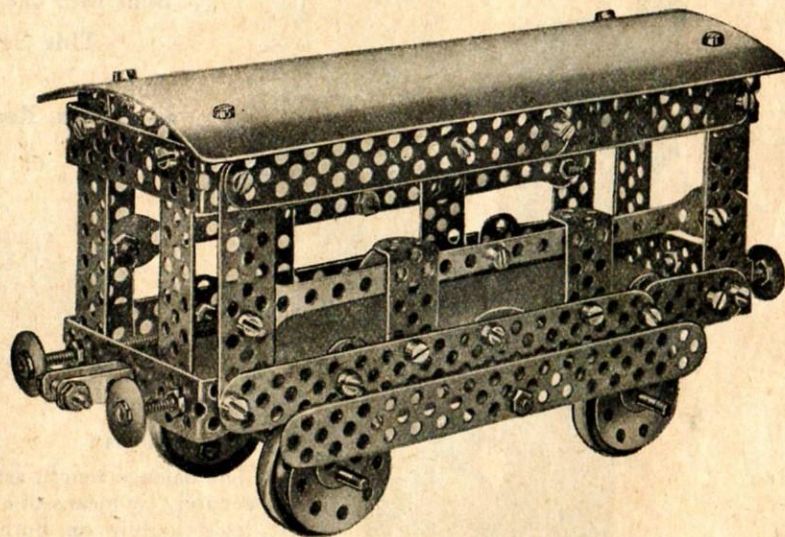
# TRIX

## No. 122. CATTLE WAGON.

Built with two Sets 1, one Set 1a, and two Sets 2a.

### Parts Required :

4	of	A 1	2	of	S 25
48	"	B 1	6	"	S 55
1	"	C 1	2	"	S 87
4	"	ER 1	2	"	SU 2
8	"	F 5	4	"	U 2
8	"	F 9	4	"	U 3
4	"	F 13	8	"	V 35
4	"	F 17	4	"	W 16
82	"	N 1	4	"	spanners.
6	"	P 29			



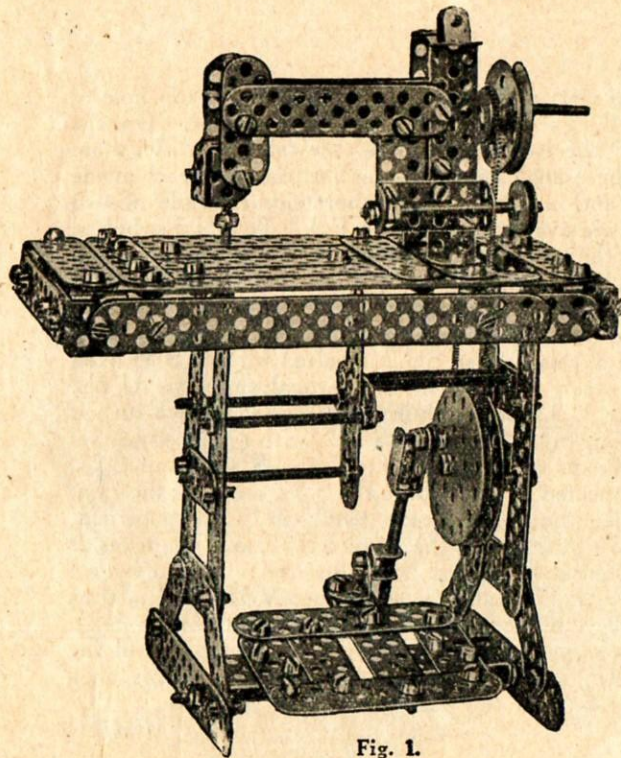
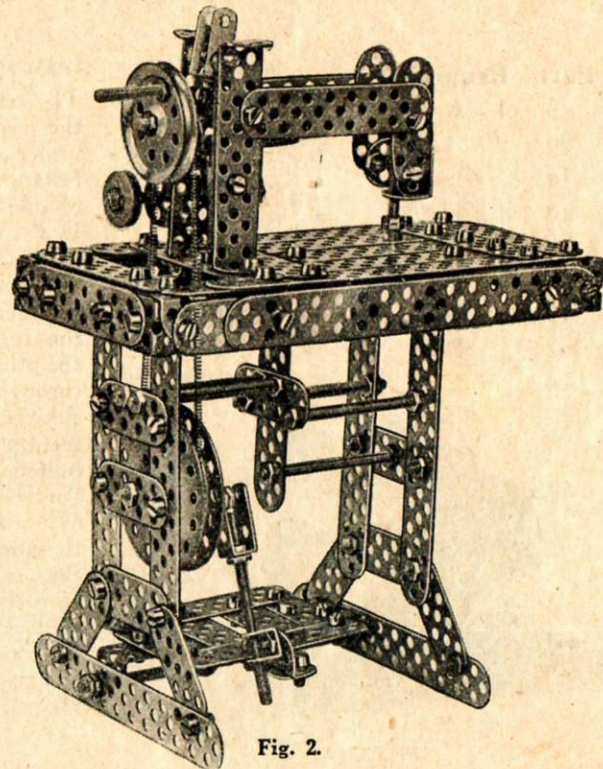
### Instructions :

The wheels are constructed as in EC 37 with their axles fixed in vertically mounted F 5's. A P 29 on each side serves as a spacing washer. P 29's are fixed in the centre on the inside of the lower horizontal framework, and on these P 29's the F 17's acting as wheel guards are attached, by means of an S 55 and three N 1's. These S 55's, fixed parallel to one another, are supported with one or two F 5's and two sets of locknuts to make the model more rigid. Two A 1's placed at the front and the back support the roof. The roof and floor are made of cardboard  $7\frac{1}{2} \times 3\frac{1}{2}$ -ins. and  $6\frac{1}{2} \times 2\frac{3}{8}$ -ins. respectively.



**No. 125. SEWING MACHINE****TRIX**

Built with four Sets No. 1, two Sets No. 1a, one Set No. 2a, and  
one Packet of Bolts and Nuts.

**Fig. 1.****Fig. 2.**



# TRIX

## No. 125. SEWING MACHINE—Continued.

### Parts Required :

8 of A 1	11 of S 55
90 „ B 1	2 „ SU2
16 „ F 5	2 „ SU1
16 „ F 9	4 „ U 1
8 „ F 13	8 „ U 2
8 „ F 17	2 „ U 3
155 „ N 1	4 „ V 35
2 „ P 49	4 „ W10
4 „ S 25	8 „ W16

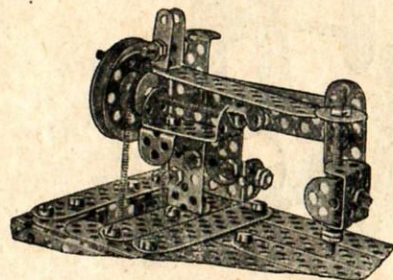


Fig. 3.

### Instructions :

The table top rests on four A 1's, fastened in the top hole of the vertical F 13's which make the lower frame. On the under side of the two long sides of the table four A 1's are fastened. These angles support the vertical sides each made of one F 17 and one F 5. Each short side is made of two U 2's, which are overlapped with an F 9. Two U 3's, bolted vertically on the table top, are supports for the mechanism. The finished head, made of two crossed U 1's (with a W 16 between) acts as the bearing for an S 55. This has a W 16 on the upper end (see Fig. 3) under which an F 9 is placed. On the other end of this F 9, an SU 2 is bolted with an S 55 fixed through the feet, moving in the vertical supports, U 3's. Between these U 3's, lower down, a U 1, with down-turned feet, is fixed (see Fig. 3), to which a U 2, with upturned feet, is bolted. This acts as a bearing for the cam shaft, an S 55. An SU 1, connected by one foot to the S 55, serves as the cam. When the pulley, built on the cam shaft as in EC 40, is turned, the horizontal F 9, and with the vertical S 55, are, by means of the cam, alternately raised and lowered. The flywheel consists of two P 49's between which two V 35's are fixed as pulleys. The whole is driven between locknuts on an S 25. Another S 25 serves as crank pin. On the under side of the treadle, two U 2's are bolted and each of these hinges on a securely fixed S 55 at the base of the side supports.



## No. 140. WEAVING LOOM.

# TRIX

Built with three Sets No. 1, two Sets No. 1a, one Set No. 2a, and one Packet of Bolts and Nuts.

### Description :

This model shows the simplest form of weaving. The long threads or warp are tied on the S 55 of the movable spool. The top threads (alternating with the lower ones) are passed between the F 9's through the upper holes of the U 3 and over the S 87. The lower ones are run between the F 9's and over the spaced P 29's, which are fixed together on a spindle. By moving the side lever, the loose working frame with one half of the warp is alternately raised and lowered so that it is first above, then below the other half of the threads on the P 29's. With each stroke the transverse thread, which meanwhile has been wound on a piece of cardboard acting as a shuttle, is drawn between the two halves of the warp, first from left to right, and then from right to left. The transverse threads are pushed tightly against each other by a comb.

### Parts Required :

5	of	A 1
51	"	B 1
12	"	F 5
12	"	F 9
6	"	F 13
8	"	F 17
134	"	N 1
12	"	P 29
2	"	P 49
4	"	S 25
10	"	S 55
2	"	S 87
2	"	SU1
2	"	SU2
4	"	U 1
6	"	U 2
2	"	U 3
3 Spanners.		

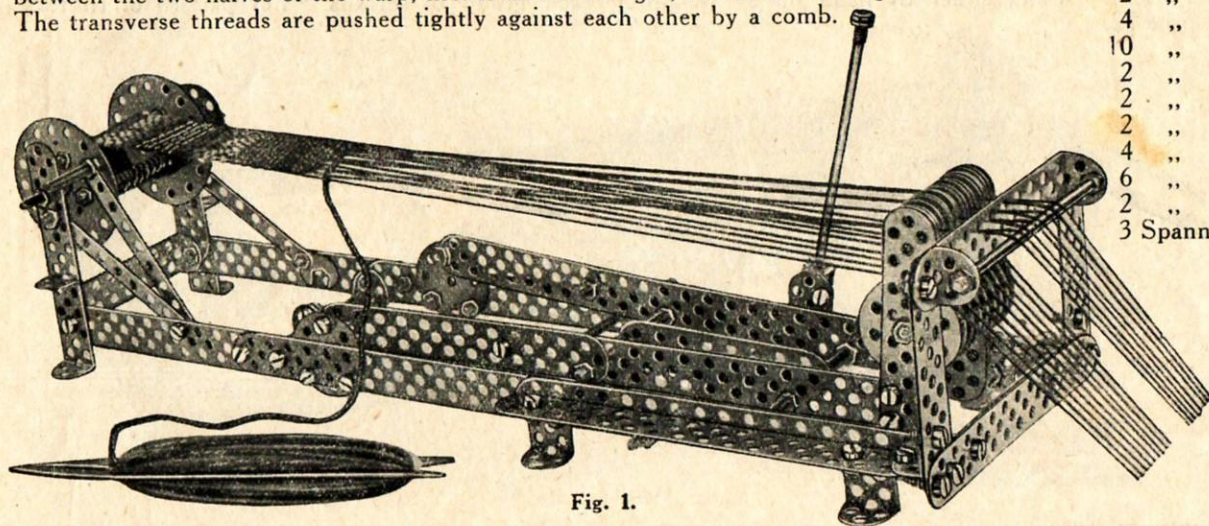


Fig. 1.



# TRIX

## No. 140. WEAVING LOOM—*Continued.*

### Instructions :

Two sets of two F 17's and one F 13, each overlapped three holes form the base strips. The ends consist of U 3's and the framework is strengthened by two struts each made of two U 2's. The working frame, fastened loosely to P 29's, is composed of flat strips, each made of an F 17 and an F 13 overlapped five holes and fastened together. These flat strips have a strengthening band of two F 9's fastened close to each other on the transverse S 55's (Fig. 1). The lever shaft underneath, which consists of two S 55's coupled as in EC 27, is pushed through and fastened tightly to an SU 2. This SU 2, by means of the side lever, presses against the working frame of F 9's and lifts it. At the top of this working frame is a fixed frame, consisting of two F 9's, eight F 5's and nine P 29's, spaced on a shaft by nuts. A spanner acting as a pawl prevents the spool turning, by means of an S 25, which drops into the outer holes of the P 49. The warp is always kept tight while working either by hand or by weighting each group of threads. For pattern of shuttle see page 72.

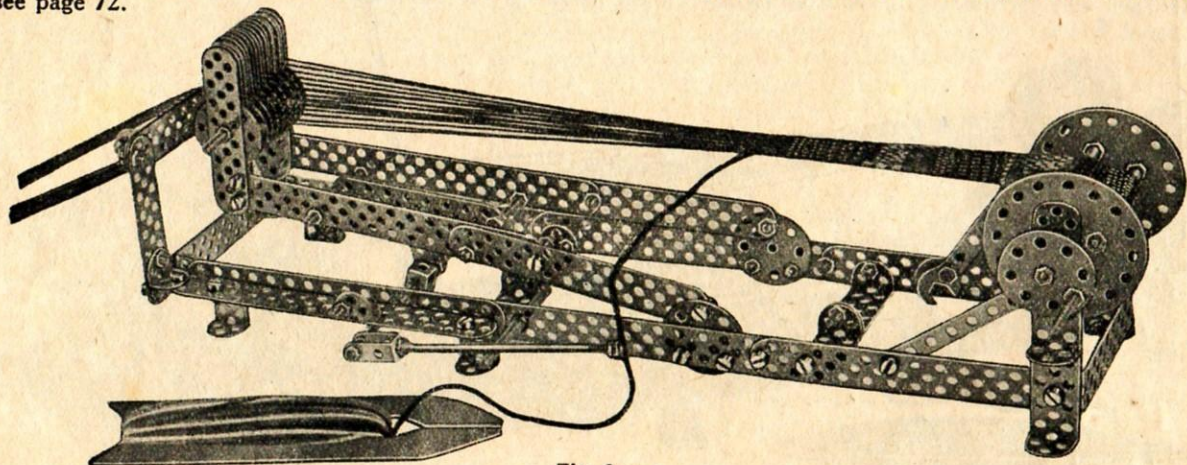


Fig. 2.



# TRIX

## No. 126. WORKSHOP WITH TRANSMISSION.

Built with three Sets No. 1, three Sets No. 1a, three Sets No. 2a, and one Packet of Bolts and Nuts.

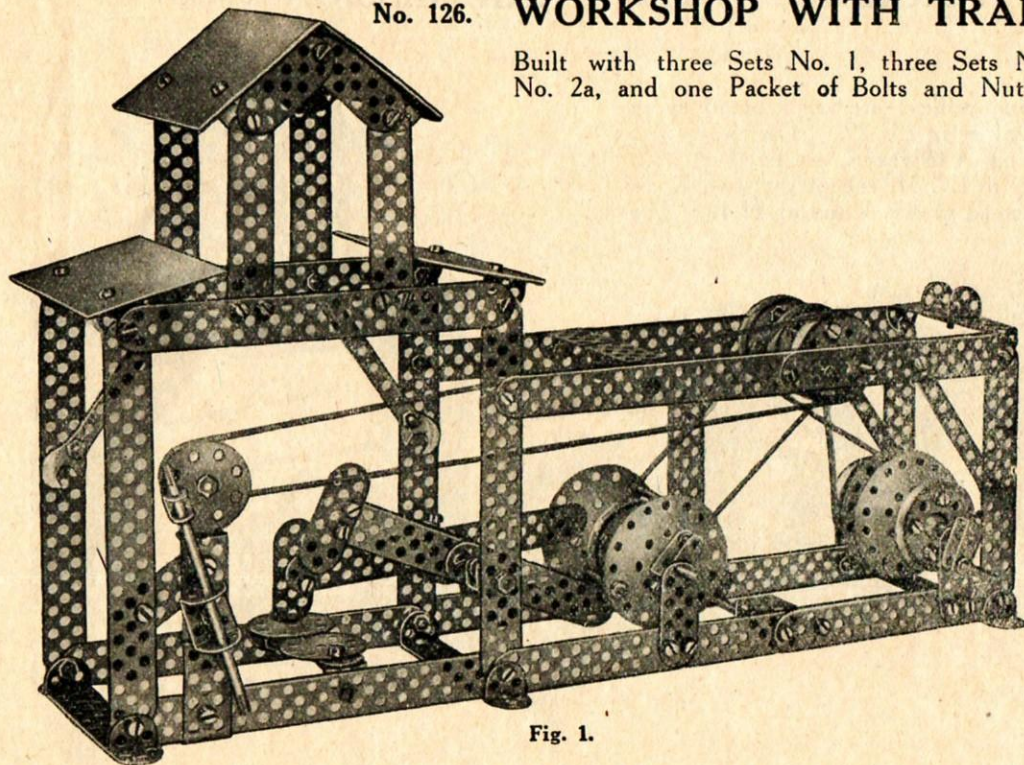


Fig. 1.

### Parts Required:

12	of	A	1
115	"	B	1
6	"	ER	1
11	"	F	5
11	"	F	9
6	"	F	13
12	"	F	17
150	"	N	1
3	"	P	29
4	"	P	49
5	"	S	25
1	"	S	55
5	"	S	87
6	"	SU	1
6	"	SU	2
4	"	U	1
6	"	U	2
6	"	U	3
12	"	V	35
3	"	W	10
2	"	W	16



# TRIX

## No. 126. WORKSHOP WITH TRANSMISSION—*Continued.*

### Instructions :

The entire set of driving pulleys are constructed as in EC 37, and the hand crank as in EC 29. The two P 49's on the driving shaft, acting as flywheels, are fixed on both sides to an SU 2, similar to EC 31, except that two N 1's and an S 25 are used instead of a B 1 and an N 1. The second pair of P 49's are as in EC 31, and have on each disc an S 25, which as it rotates, presses on the hammer shaft and causes the hammers to rise and fall. Two SU 1's, as in EC 24, serve to keep the hammer in the correct position. The connecting rod of the pump is coupled and held together as in EC 25, and is pushed through the feet of a U 1, which is loosely fixed on a U 2 by means of a B 1 and locknuts. Cardboard is used to finish the roof.

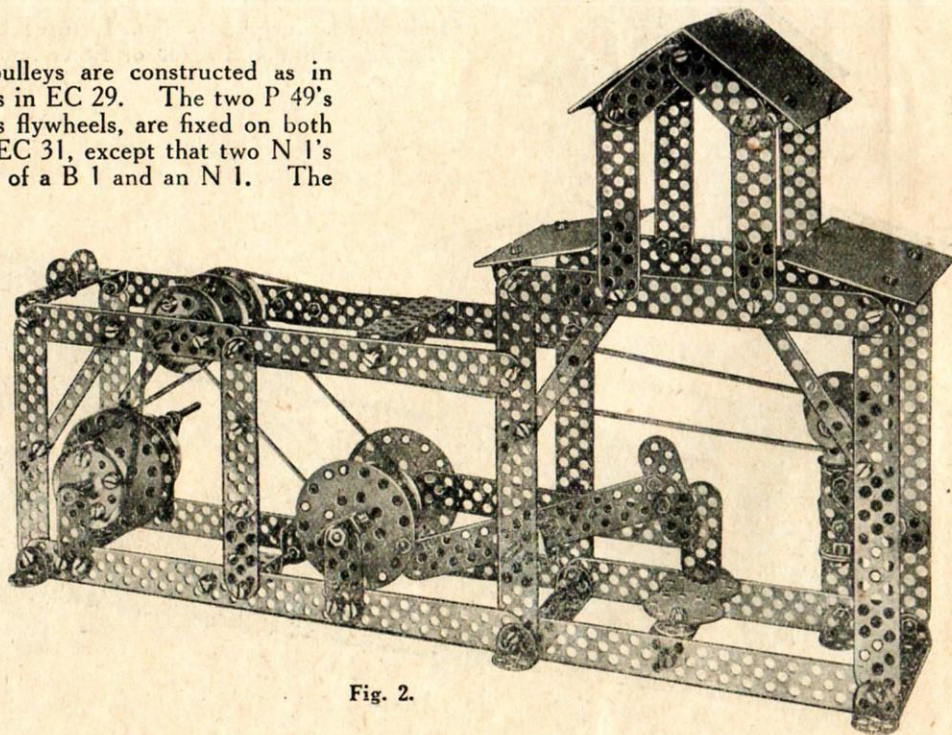


Fig. 2.



# TRIX

## No. 127. MOTOR CYCLE.

Built with four Sets No. 1, four Sets No. 1a, two Sets No. 2a,  
and two model rubber tyres.

### Instructions :

First, both the wheels are built as in EC 42 with an S 25 as axle for the front wheel and an S 55 for the back wheel. In addition to this two nuts are fixed on both sides of the axles to space the framework. Then the tyres are put on. Continuing, the frame is built and fixed to the back wheel by means of a U 1, which carries the saddle and a second U 1, to which the cylinder is fastened.

### Parts Required :

2	of	A	1
28	"	B	1
10	"	F	5
7	"	F	9
2	"	F	13
115	"	N	1
2	"	P	29
4	"	P	49
8	"	S	25
4	"	S	55
1	"	SU	2
4	"	SU	1
6	"	U	1
8	"	W	16

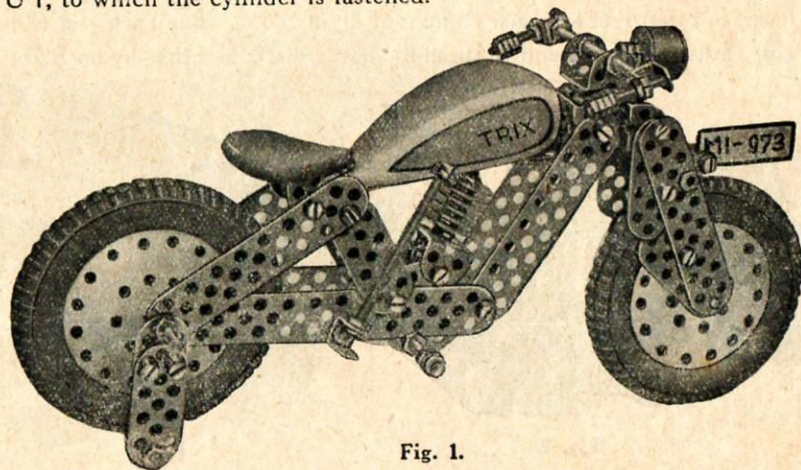


Fig. 1.



# TRIX

## No. 127. MOTOR CYCLE—*Continued.*

This cylinder consists of an S 25, with N 1's and W 10's alternately fixed on it. The frame is connected with a U 1, at the top of the handle bars, the two feet of which are pointed horizontally forwards, and fastened to the frame in the middle holes (Fig. 2). In the same way the forks (Fig. 3) are joined by a U 1, after an SU 2 as number plate holder has been fixed, by means of an S 25. An SU 1 is secured to the back of the U 1 in the middle hole of the fork, so that its feet lie horizontal, and an S 25 is fastened vertically in the upper foot of the SU 1 and bears the U 1 of the handle bars. A suitable cork, fixed between W 16's represents the lamp with an A 1 as lamp bracket. This is placed with the foot under the U 1 of the handle bars. The gear lever and foot rest are each composed of an S 55. The back rest consists of two overlapped F 5's on each side, fastened at one end to the hub shaft and at the other by an S 25. The saddle and tank are made

of plasticine, but can also be cut out of wood, and fastened to the model with small wood screws. Suitable model rubber tyres are obtainable from all toy shops or toy departments.

See page 70 for the shape of the saddle and tank.

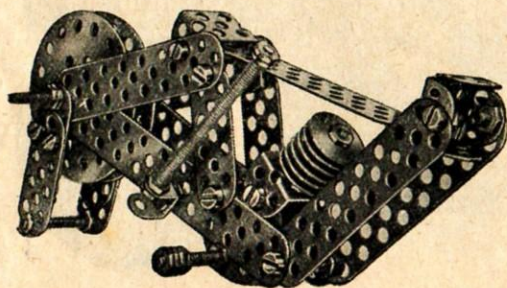


Fig. 2.



Fig. 3.



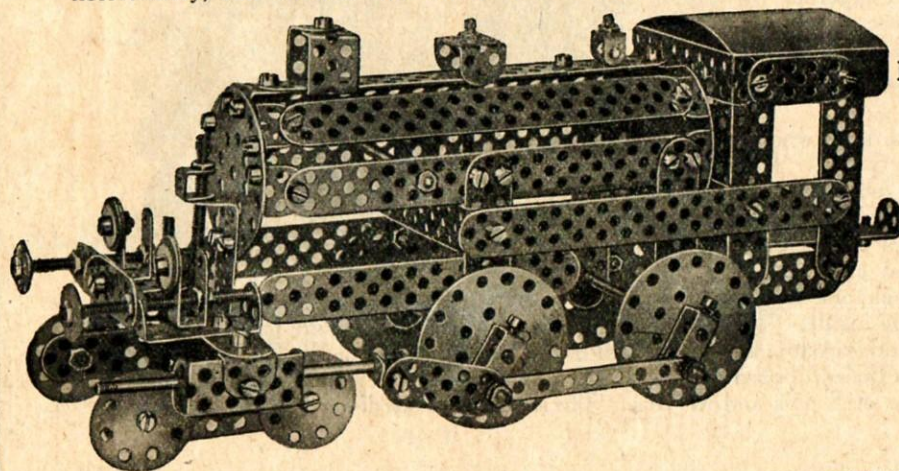
# Nos. 128 and 129. PASSENGER LOCOMOTIVE 4-4-0 TYPE AND TENDER.

# TRIX

Built with four Sets No. 1, three Sets No. 1a, and three Sets No. 2a.

## Instructions :

The front and back ends of the boiler consist of P 49's, with five A 1's fastened to each, in the upper circumference. The two pairs of F 17's fastened to these A 1's connect the back and front and form the sides of the boiler. The top strip is composed of an F 13 and an F 9, and fixed to it are the chimney, made of two U 1's, the steam dome, of one U 1, and the steam valve, made of an SU 1. The two last named are each held by an S 55. A vertical U 2 is placed on the front end of the boiler, and its lower foot is fastened to a transverse F 13 with an S 55 in the middle hole. This F 13 has horizontal U 2's on each side with spindles through them bearing head lamps and buffer plates. Two F 5's overlapped connect the front feet of these U 2's. Parallel to the F 13 underneath (at a distance of 12 m.m.) a U 3 with downturned feet is fixed in by two S 55's to each side of the middle vertical S 55. On the inside of the feet of this U 3, two F 9's are fastened horizontally, and on these the wheels, P 29's, run.



## Parts Required :

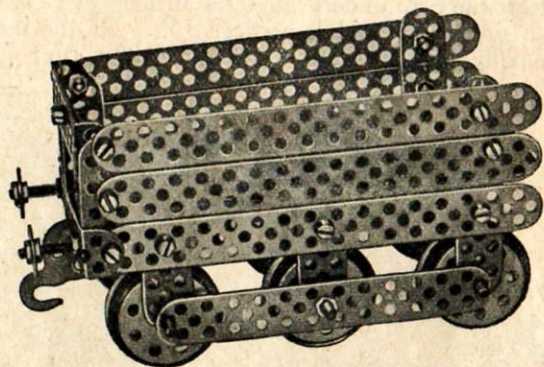
12 of	A 1	6 of	S 25
104 ..	B 1	11 ..	S 55
3 ..	C 1	6 ..	S 87
6 ..	ER1	6 ..	SU1
16 ..	F 5	6 ..	SU2
16 ..	F 9	6 ..	U 1
8 ..	F 13	7 ..	U 2
12 ..	F 17	6 ..	U 3
192 ..	N 1	4 ..	W10
11 ..	P 29	8 ..	W16
6 ..	P 49	12 ..	V 35
			2 Spanners.



# TRIX

## Nos. 128 and 129. PASSENGER LOCOMOTIVE and TENDER.

The F 9's fixed upright on the boiler sides are the bearings for the driving wheels. A horizontal F 13 is secured to each of the front F 9's, with one bolt only. The front ends of these F 13's come against the buffer bearings U 2's. Above the F 13's a U 3 is fixed across the boiler, with horizontal F 17's fixed to each of its back turned feet. At the same height as this, a U 3 is horizontally secured on the firebox end of the boiler, and holds the two rear ends of the F 17's by means of its feet, and, at the same time vertical F 9's acting as the front framework of the cab are fastened to each side. Two more vertical F 9's complete the ends of the cab. U 3, which bears the floor ( $2\frac{1}{2} \times 2\frac{1}{4}$ -ins.) connects these F 9's and another F 9 is fastened in the middle of it, with a U 1 at the end as coupling. The driving wheels are made as in EC 31, but instead of a B 1, an S 25 acts as crank pin. It is important that the cranks of the opposite sides should be arranged to displace at an angle of  $90^\circ$ . Each pair of driving wheels is coupled together by a spanner, and the front ones are connected to the piston rod S 87, as in EC 25. Cardboard pattern of roof, see page 70.



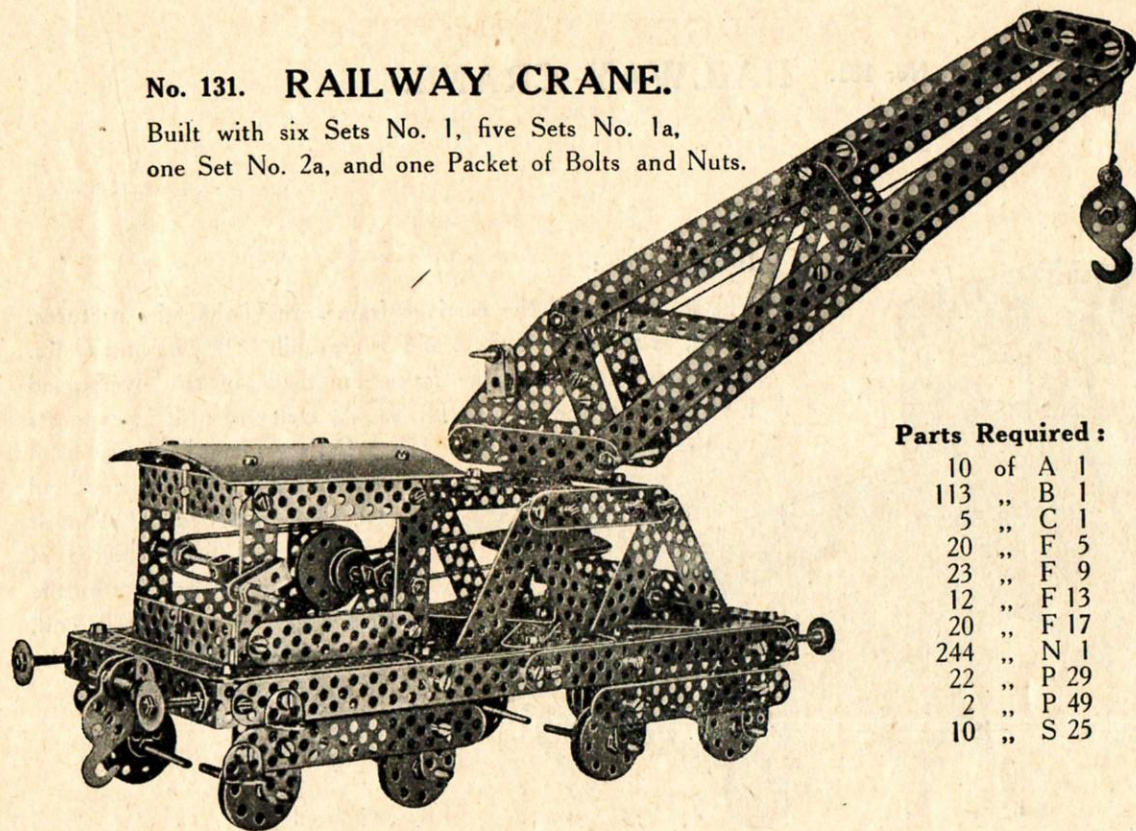
**Tender.** The front and back pairs of wheels (built as in EC 37) are fixed to S 87's. The middle pair of wheels are built as loose pulleys, each on an S 25, and P 29's are placed on the outer sides of the wheels. Both of the vertical F 9's, left and right, on the open end of the tender, bear the lowest F 17's, each one being fastened to the foot of a U 1 on the inside. The two unattached feet of these U 1's are joined by an S 55, to which the coupling to the locomotive is attached. On each of the backs of these U 1's, F 13's are attached in line with the tender, and support the cardboard floor. The C 1 on the back end is held between two U 2's, which also carry the buffers made of S 55's and W 16's. The floor is of cardboard  $6\frac{1}{4} \times 2\frac{5}{8}$ -ins.



# TRIX

## No. 131. RAILWAY CRANE.

Built with six Sets No. 1, five Sets No. 1a,  
one Set No. 2a, and one Packet of Bolts and Nuts.



### Parts Required :

10	of	A	1	19	of	S	55
113	"	B	1	2	"	SU	1
5	"	C	1	2	"	SU	2
20	"	F	5	9	"	U	1
23	"	F	9	12	"	U	2
12	"	F	13	2	"	U	3
20	"	F	17	4	"	V	35
244	"	N	1	6	"	W	10
22	"	P	29	10	"	W	16
2	"	P	49	4 Spanners.			
10	"	S	25				

Fig. 1.



# TRIX

## No. 131. RAILWAY CRANE.

### Instructions :

The long sides of the carriage frame are U-shaped structures, which, as shown in Figs. 2 and 3, are built of F 17's and U 1's. The ends of the carriage frame are made of two overlapped F 9's joined to the sides by U 1's. At each end an F 13 connects up the free ends of the F 17's. C 1's as couplings are fixed

between two A 1's at the front and back. Inside the long U-shaped sides F 5's are firmly bolted in pairs and form the bearings for the wheel axles. At the cab end, however, the F 5's are replaced by four corner posts, F 13's.

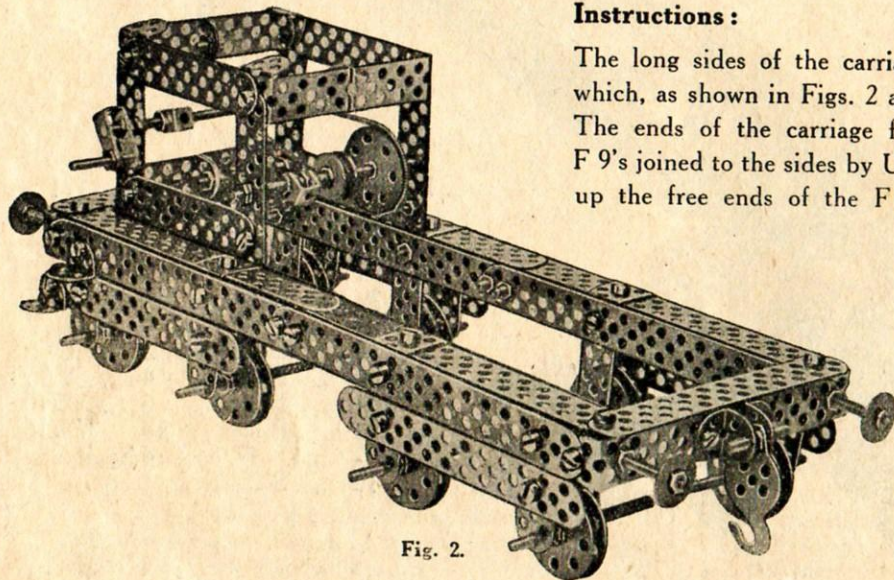


Fig. 2.



## No. 131. RAILWAY CRANE.

**Instructions—Continued.**

In constructing the jib the two side pieces are made first. (Fig. 4). These are connected by four S 55's at the base, U 2's and U 1's at the upper end.

An S 55 serves as crank axle to raise the load, with a crank handle as in EC 29. On each side two diagonally arranged spanners stiffen the framework, secured with only one bolt and nut. (See Fig. 4).

Fig. 5 shows the details of the turn-table. The two sides are bolted to the F 17's on the inside of the U-shaped frames and are fastened above by two U 3's. An F 9 is fastened diagonally under the latter, with a spacing nut in between. The middle hole of the F 9 is a bearing for the pivot shaft.

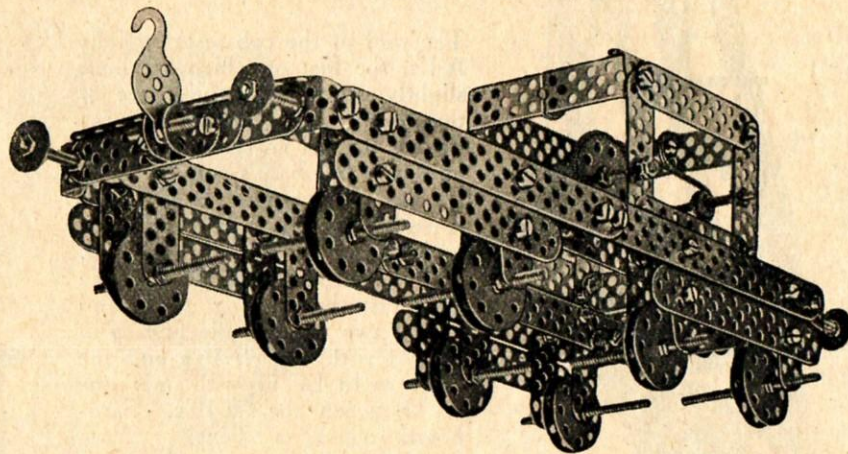


Fig. 3.



# TRIX

## No. 131. RAILWAY CRANE.

### Instructions—Continued.

The pivot shaft is driven by a pulley made of two P 49's and two P 29's. The baseplate of the jib is formed of four V 35's as shown in Fig. 5, which rest on a nut on the vertical S 55. Over this, the lower end of the jib, consisting of two S 55's, is mounted and held fast by two P 29's and N 1's on the other side. The rope pulley at the top of the jib is as in EC 11.

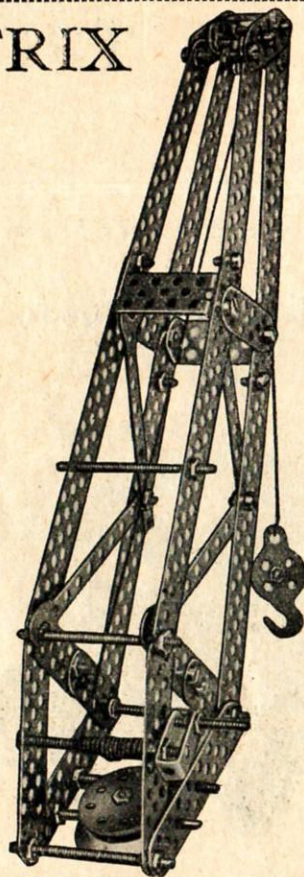


Fig. 4.

The roof of the cab rests on four A 1's, the feet of which are bent slightly upwards to the curve of the roof. The crank shaft producing the jib movement consists of S 55's and S 25's coupled as in EC 26. Driving pulley as in EC 11 is made with two W 10's and a nut in between. Crank as in EC 29. The intermediate shaft is built the same as the driving shaft and carries two pulleys, the first as in EC 10 with two W 16's and the other as in EC 11 with only one nut between the W 10's. Card-board roof  $3\frac{3}{4} \times 3\frac{3}{8}$ -ins.

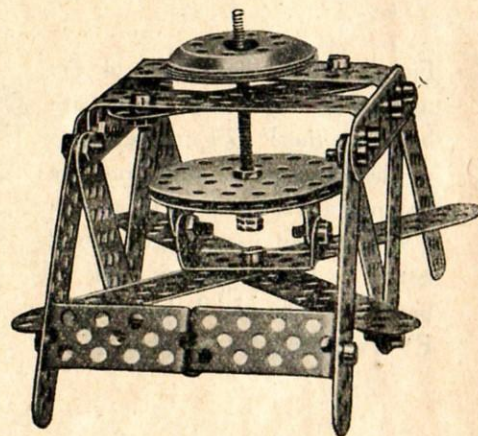


Fig. 5.



# No. 161. HORIZONTAL ENGINE—Tractor Type.

# TRIX

Built with seven Sets No. 1, eight Sets No. 1a and one Set No. 2a.

## Parts Required :

29 of A 1	22 of F 17	2 of SU2
163 „ B 1	281 „ N 1	16 „ U 1
1 „ C 1	9 „ P 29	7 „ U 2
2 „ ER1	2 „ P 49	2 „ U 3
27 „ F 5	16 „ S 25	2 „ V 35
28 „ F 9	18 „ S 55	7 „ W10
14 „ F 13	2 „ SU1	14 „ W16

## Instructions :

The boiler is open on the under side over the firebox. Beyond this, towards the chimney, F 13's are fastened to the feet of the three A 1's of the smoke-box end. The middle F 13 bears a U 1, to which two U 2's are bolted (acting as boiler supports). The ends of the F 13's are held by a star, built of four crossed F 9's. The eight ends of these bear alternately U 1's and A 1's, with which the star is fixed fast to the inner side of the boiler wall, strengthening the structure. The steam cylinder consists of two P 29's and eight S 55's. On one of these S 55's two A 1's are fixed and these serve to fasten it to the top of the boiler. At the same time also two F 5's are fastened to these, running horizontally towards the left side. These bear an F 17 parallel to the long strips of the boiler, and the U 1 for the base of the governor. An A 1

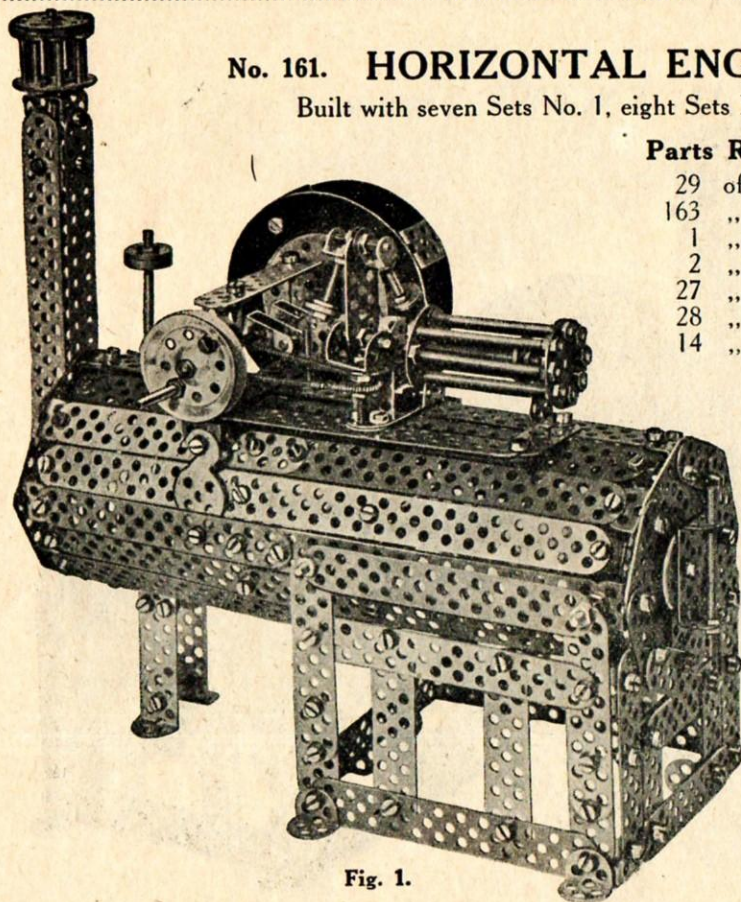


Fig. 1.



# TRIX

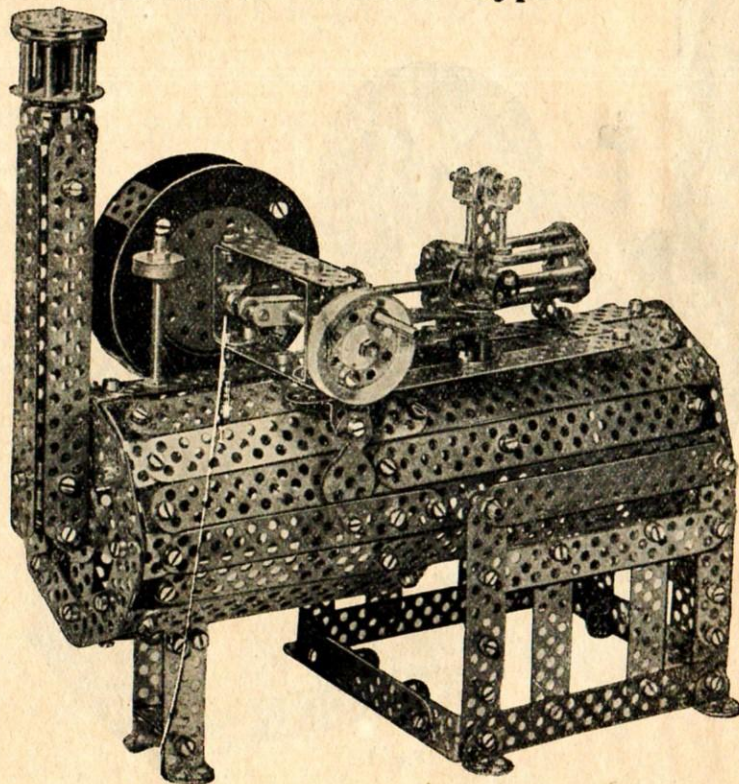
## No. 161. HORIZONTAL ENGINE—Tractor Type.

### Instructions—Continued.

works as cross-head, to which the connecting rod, F 5, is joined. An F 5 fastened horizontally with an upright S 25 serves as cross head guide, on which the A 1 slides in and out. The crank shaft consists of two S 55's as in EC 30. Pulley with hand crank as in EC 40. Driving pulley for governor as in EC 11.

The front and back ends of the boiler consist of circles of eight F 5's with two crossed F 9's inside. In the centre of the cross two P 29's are fastened, and on the edge of each circle nine A 1's are secured.

Five long strips, each made of an F 13 and an F 17, three holes overlapped, are fastened in the upper semi-circles of the boiler ends to the A 1's already mentioned, and a punched cardboard strip is inserted at the same time (pattern page 72). In the gaps between these strips struts are fastened, each composed of two F 17's (7 holes overlapped), to the cardboard—three on the right and three on the left sides of the upper circumference.





# TRIX

No. 132.

## AEROPLANE ROUNDAABOUT.

Built with six Sets No. 1, six Sets No. 1a,  
and two Sets No. 2a.

### Parts Required:

24	of	A	1
185	..	B	1
4	..	ER1	
18	..	F	5
23	..	F	9
12	..	F	13
24	..	F	17
240	..	N	1
2	..	P	29
4	..	P	49
5	..	S	25
1	..	S	55
4	..	S	87
4	..	SU1	
4	..	SU2	
11	..	U	1
12	..	U	2
4	..	U	3
2	..	V	35
10	..	W10	
8 Spanners.			

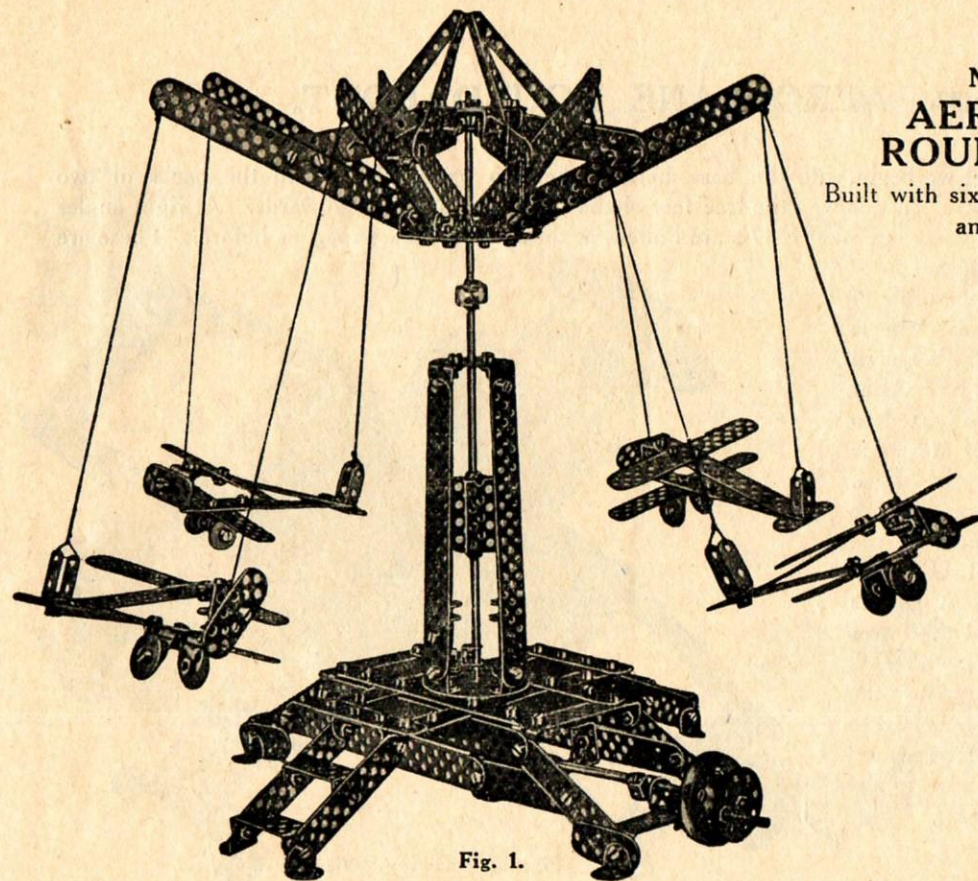


Fig. 1.



# TRIX

## No. 132. AEROPLANE ROUNDABOUT.

### Instructions :

In constructing this model we begin with the base, bolting the two parallel F 17's to the backs of two U 3's, using the outer holes. In this way the free feet of the U 3's are turned downwards. At right angles underneath the F 17's, two more parallel F 17's are bolted, at the same distance apart as before. These are connected by F 9's, whose outer holes remain free. In the middle of the cross now formed a P 49 is fixed, with four vertical U 2's bolted to it by two bolts and nuts. After this four vertical F 17's are fixed to these U 2's. The sides of the base are finished as shown in Figs. 1 and 2. At the foot these sides are strutted by U 3's and fixed to the downward turned feet of U 3's on both sides of the cross. A U 1 is fixed within each side and the lower feet of these are joined by an F 9. Another U 1, as bearing for the horizontal driving shaft, is bolted to this F 9. At the same point a second bearing, U 1, is placed close to the V-pulley on the U 3. (Fig. 1).

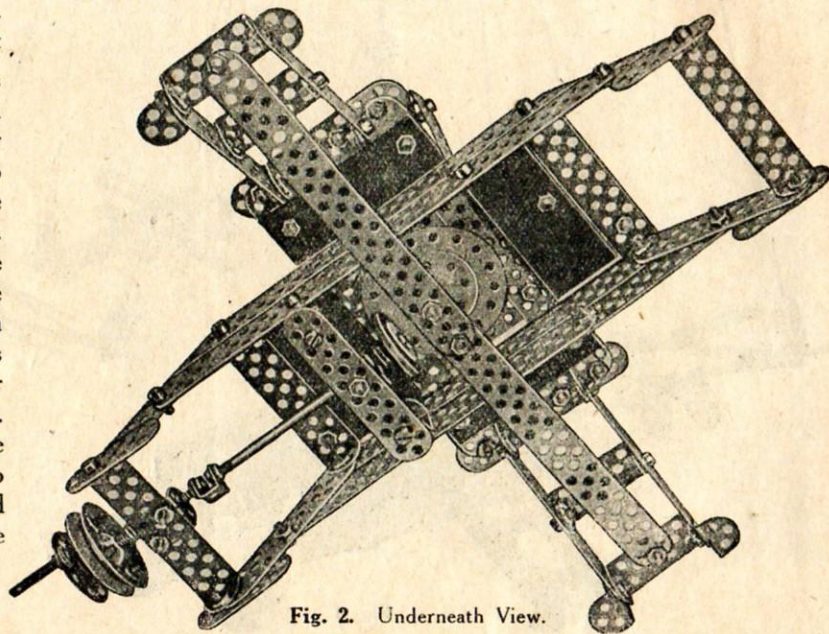


Fig. 2. Underneath View.



# TRIX

## No. 132. AEROPLANE ROUNDABOUT.

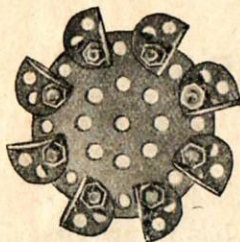


Fig. 3. Underneath.

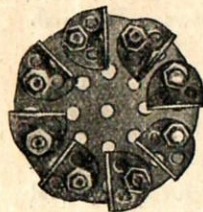


Fig. 4. Above.

### Instructions—Continued.

Each set of steps consists of two F 9's, two U 2's and two A 1's. These steps are fixed to the feet of the U 2's bolted underneath the F 9's. A transverse strut composed of two F 17's (Fig. 2) prevents the steps from spreading. The driving shaft bears on its outer end a hand crank as in EC 15 and a V pulley next to it as in EC 37. On the other end a friction drive pulley as in EC 35 with two W 16's, is used. The vertical shaft as in Fig. 1 consists of three S 87's coupled together and has on its lower end beneath the base a P 49 and a P 29. The P 49 rests on the friction pulley and is driven by means of the contact resulting from the turning of the horizontal shaft. The adjustable U piece above the base is not absolutely necessary. Before coupling the middle vertical S 87, a P 29 must be placed loosely over it. Four A 1's in the form of a cross are fastened to this, and the four vertical F 17's are fixed to the down-turned feet of these.

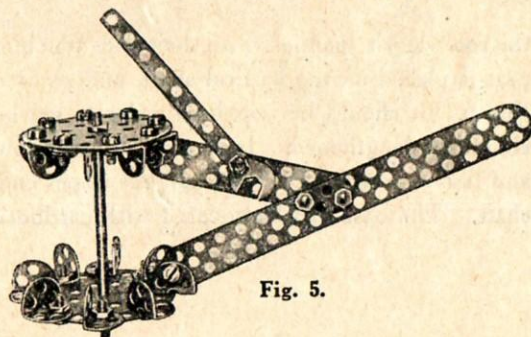


Fig. 5.



# TRIX

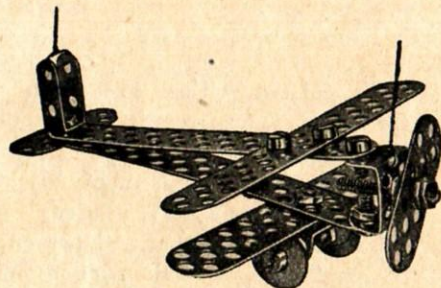


Fig. 6.

No. 132.

## AEROPLANE ROUNDABOUT.

### Instructions—Continued.

These vertical F 17's are now connected to the U 2's bolted on previously. The lower hub of the roundabout top is made as in Fig. 3 and F 17's are fixed to the eight A 1's (Fig. 5). Now the upper hub is made as in Fig. 4 with F 9's fixed to the A 1's. The two hubs are now connected as Figure 5 shows. To finish the roof we use spanners with their ends touching, fixed to every F 9 of the upper wheel hub. This complete part is placed on the vertical shaft, and secured by nuts. The construction of the aeroplanes is shown in Fig. 6. It should be noted, in order to get better results and strength, the vertical column of the model should be lengthened. Instead of utilising four B 1's to hold the four A 1's and P 29, we use four S 55's and fasten a second P 29 to their free upper ends, its middle hole serving as a further bearing for the vertical shaft. The base can be covered with cardboard. See pattern, page 70.



# TRIX

## No. 133. RACING CAR.

Built with seven Sets No. 1, six Sets No. 1a, four Sets No. 2a, and four model rubber tyres obtainable from all toy shops and toy departments.

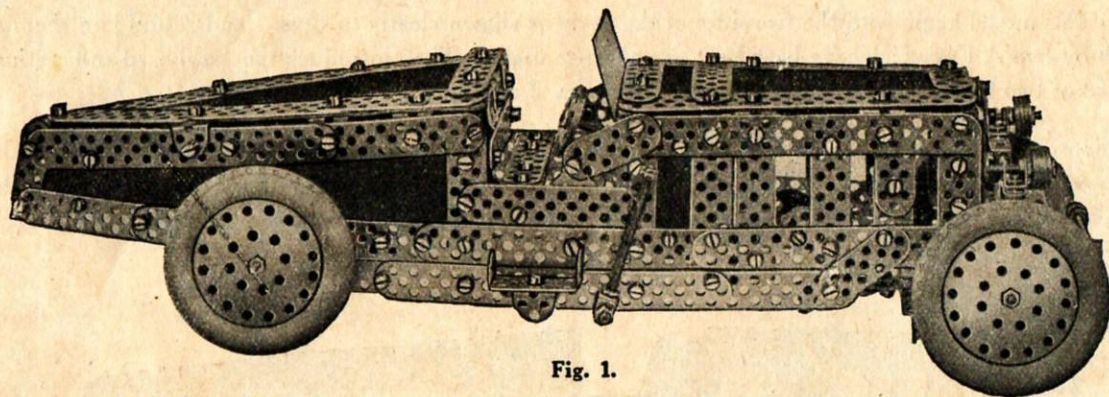


Fig. 1.

### Parts Required:

24	of	A	1	260	of	N	1	5	of	U	1
160	"	B	1	13	"	P	29	8	"	U	2
4	"	C	1	8	"	P	49	3	"	U	3
24	"	F	5	12	"	S	25	7	"	W	10
28	"	F	9	7	"	S	55	14	"	W	16
5	"	F	13	7	"	SU	1				
16	"	F	17	7	"	SU	2				



# TRIX

## No. 133. RACING CAR.

*Continued.*

### Instructions :

To build this model begin with the two sides of the body as shown clearly in Figs. 1 and 2, and join them at the back by two A 1's, which have been bent to a sharper angle. Then introduce the dashboard and seating, composed of two U 2's with F 9's overlapped. See Figs. 2 and 3.

The radiator (Fig. 4) consists of six F 5's and a U 3 with backward turned feet. Between this U 3 and the F 5's above, A 1's are fastened. The forward pointing feet of these A 1's bear the F 5's, which build the upper part of the front wheel springs. Underneath F 9's are fixed, as under springs, bolted to the F 5's

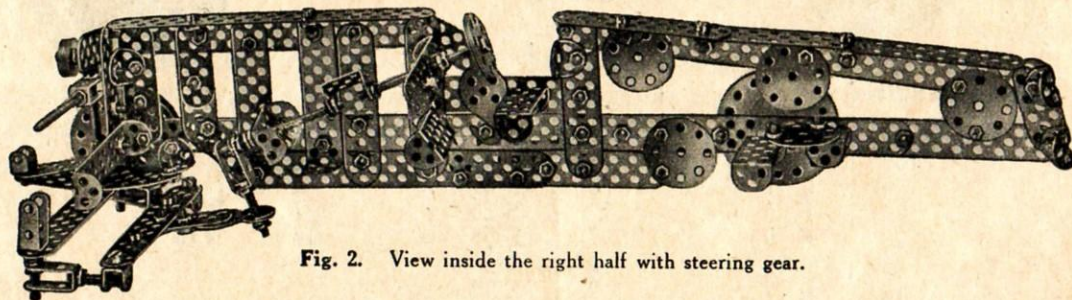


Fig. 2. View inside the right half with steering gear.



# TRIX

## No. 133. RACING CAR.

### Instructions—Continued.

at the top and fastened at the other end to the sides by A 1's. SU 1's are fastened in the front of the springs as buffers. An F 13, on which the two wheel bearings are fastened, is fixed to the springs with S 25's. (Fig. 3).

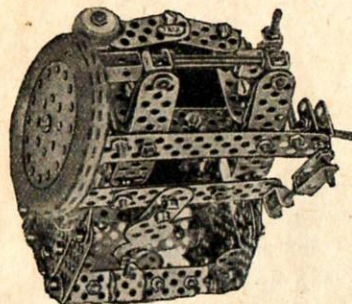


Fig. 3.

Underneath front view. The off-side front wheel and lamp are left out.

Between the F 9 and F 5 of each spring, which are curved, nuts are placed on the S 25's to keep the springs apart. Two SU 2's in which the stub axles run, are mounted on S 25's and held loosely in the end holes of the F 13. SU 2's are fixed by the feet to these vertical S 25's under the F 13, and another S 25 is attached to the end of each of the SU 2's. (Fig. 3).

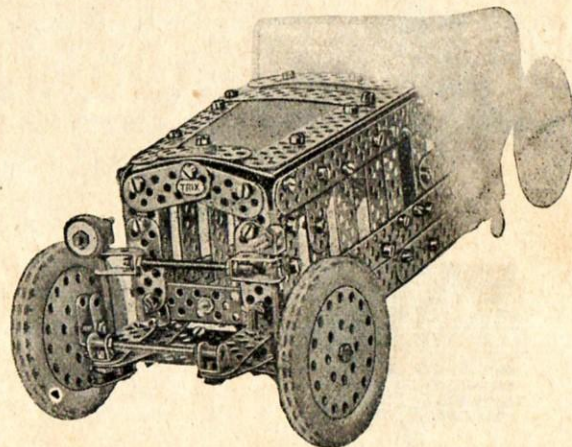


Fig. 4.



# TRIX

## No. 133. RACING CAR.

### Instructions—Continued.

The joints are made as in EC 25 and are placed over these S 25's and bolted to a cross strut made of two F 9's overlapped. Two C 1's are fastened to an F 5, which is fixed to the track rod, and hold the lever of the steering wheel shaft. This shaft consists of two S 55's with a U 1 as in EC 12, and an SU 2 fixed by one foot at the lower end. Three P 29's are used as steering wheel. An F 9 serves as bearing for the steering wheel shaft and represents at the same time the dash board. This F 9 is fastened to the sides by A 1's. The top of the radiator consists of two F 17's, which are bolted to the A 1's of the sides with the cardboard pattern in between. In front the cardboard bears a slightly curved F 5, and at the windscreen end a curved F 9 is also fixed. The wind screen is made of celluloid (pattern page 71). Under this F 9 are two A 1's used to fasten the screen. In addition, the two F 17's of the top are strutted by a second F 9 (see Fig. 1). The body at the back of the seat is built of seven F 9's. Here also cardboard is used to cover it. Two

F 9's form the back of the seat and the lower one is fixed to the sides by A 1's. Two steps each made of a U 1 and U 2, are fixed to the sides. A brake lever, made of an S 55 fastened in the middle hole of an SU 1, is connected to one of the S 25's at the side wheels as in EC 42. If you have eleven more F 5's, a spindle and twelve N 1's, you can make a radiator as in Fig. 5, and fasten it through the hole of the radiator cap. Cardboard patterns, page 71.

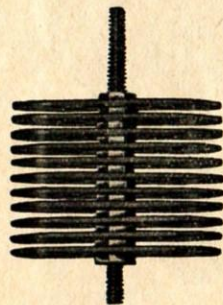


Fig. 5.



# TRIX

## Nos. 134 and 135. EXPRESS LOCOMOTIVE 4-6-0 TYPE AND TENDER.

Built with six Sets No. 1, seven Sets No. 1a, six Sets No. 2a, and three packets of bolts and nuts.

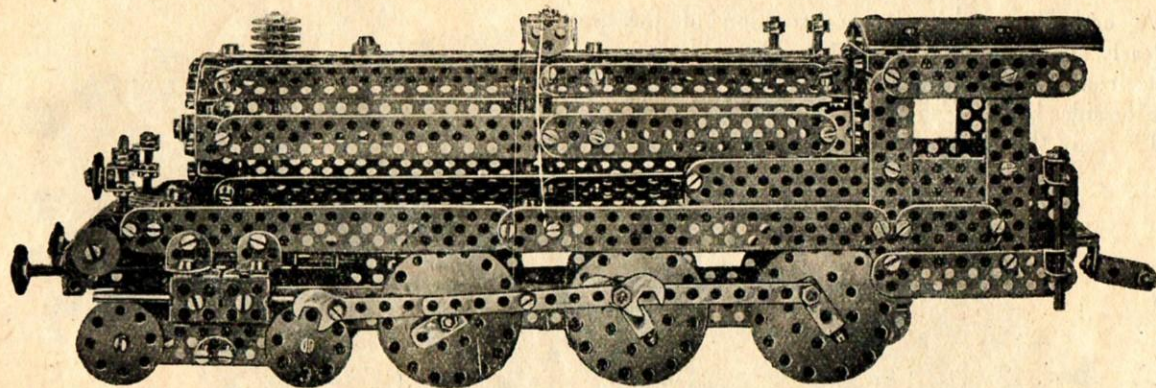


Fig. 1.

### Parts Required (for the Locomotive):

28 of A 1	21 of F 17	6 of S 55	12 of U 2
191 „ B 1	293 „ N 1	5 „ S 87	9 „ U 3
6 „ F 5	8 „ P 29	8 „ SU1	6 „ W10
8 „ F 9	9 „ P 49	7 „ SU2	10 „ W16
7 „ F 13	12 „ S 25	8 „ U 1	6 Spanners.



# TRIX

## Nos. 134 and 135. EXPRESS LOCOMOTIVE AND TENDER.

### Instructions :

We commence with the construction of the frame, clearly shown in Figs. 1 and 2. Three U 3's represent the front buffer bearings, which are each fixed together at the sides by W 16's and nuts and bolts. The foremost U 3 bears the buffer heads made of S 25's and W 16's.

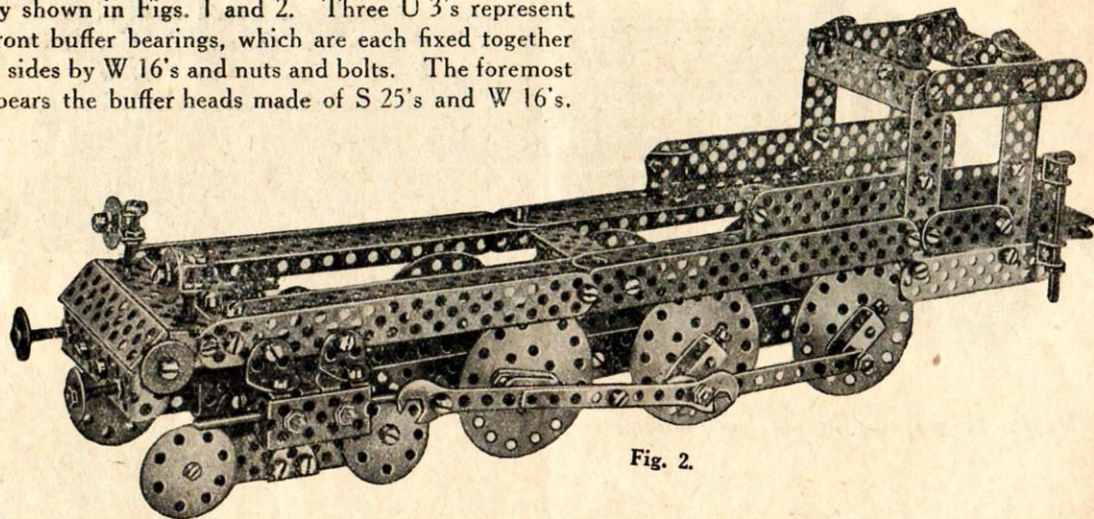


Fig. 2.



# TRIX

## Nos. 134 and 135. EXPRESS LOCOMOTIVE AND TENDER.

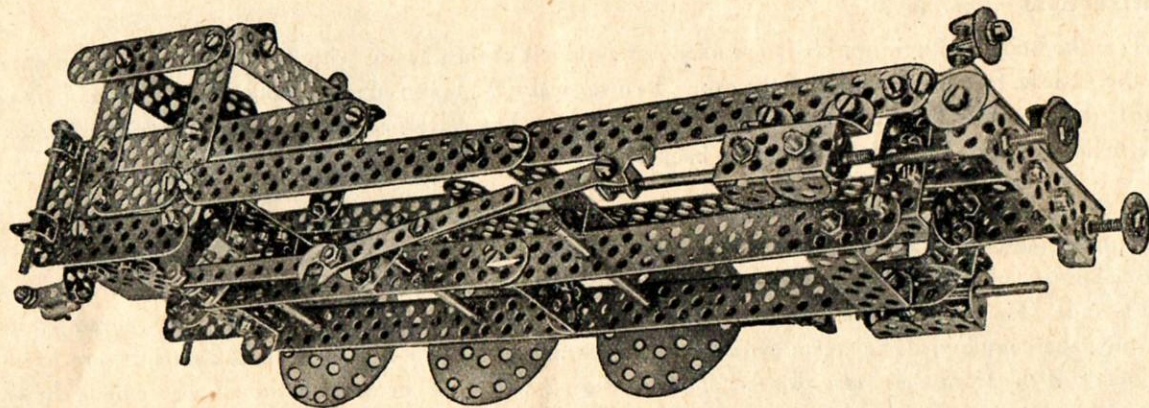


Fig. 3.

### Instructions—Continued.

The under frame bearing the axles consists of two pairs of F 17's, which are connected parallel at the front and in the middle by U 2's. At the cab end the F 17's are secured by U 2's to the under side of the chassis. Three P 49's are used to build the boiler, on each of which eight A 1's are bolted in the form of a star. However, it should be noted that an A 1 is fixed on the front and back ends of the boiler, so that this can be attached to the chassis, but an A 1 is not needed on the middle P 49. Seven F 17's overlapped three holes with F 13's are fastened to the P 49's and make the boiler covering. The upper strip is fitted with chimney, steam dome and safety valve. (See Fig. 1).



# TRIX

## Nos. 134 and 135. EXPRESS LOCOMOTIVE AND TENDER.

### Instructions—Continued.

Before the boiler is fitted up, U 1's are fixed right and left of the chassis, with F 17's fastened on the outside to their backs, forming the sides of the cab. Two vertical F 9's are fixed to each of these F 17's, and are each strutted by another F 9 underneath the roof. (Fig. 1). The cab sides are connected above the firebox of the boiler by a U 3 in front, and at the back by two U 2's bolted together.

Two A 1's are bolted to these and carry the roof. To finish, a vertical F 5 is fixed to each side of the cab (bearing a hand rail S 55 by means of a pair of SU 1's) and a horizontal F 5 and F 9 fixed underneath. The cab floor made of cardboard is held in by a U 3, fixed across the base, and to this is attached an F 5 with an A 1 at the end. The foot of the A 1 bears an SU 2 with an S 25 pushed through the feet and secured by nuts, forming the coupling. The steam cylinders, each composed of two U 1's with a U 2 outside, are fixed on each side of the front chassis by two A 1's. (See Figs. 2 and 3). The construction of the bogie is shown in Fig. 4. It is suspended by the two S 25's on the front U 2 of the chassis. Locknuts prevent loosening.

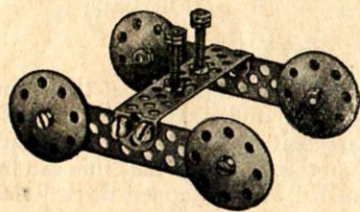


Fig. 4.

The front pair of driving wheels are made of P 49's as in EC 31 and the two back pairs of driving wheels of P 49's as in EC 43. The front cranks on one side must be set at an angle of  $90^\circ$  to the other side. The last pairs of driving wheels are coupled with two overlapped spanners each side (acting as connecting rods) to the piston rods, S 87's, as in EC 25. The cardboard roof and floor of the cab are 3 by 3-ins. and  $2\frac{1}{4}$  by  $2\frac{1}{4}$ -ins. respectively.



# TRIX

## Nos. 134 and 135. EXPRESS LOCOMOTIVE AND TENDER.

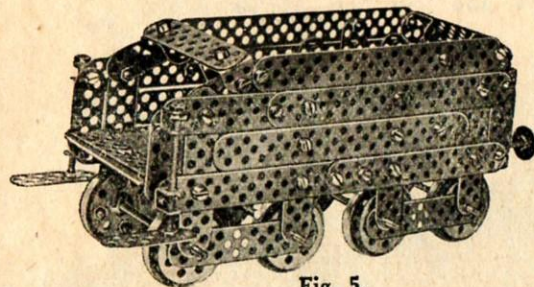


Fig. 5.

### Parts Required (for the Tender) :

85 of B 1	105 of N 1	1 of SU2
8 „ ER1	8 „ P 29	4 „ U 1
14 „ F 5	2 „ S 25	3 „ U 3
16 „ F 9	4 „ S 55	16 „ V 35
4 „ F 13	4 „ S 87	2 „ W16
6 „ F 17	4 „ SU1	

### Instructions—Continued.

In the tender are fixed the four vertical pairs of F 9's, which serve as axle bearings and at the same time hold the horizontal flat strips, composing the sides. The wheels are fixed on the S 87's as in EC 37 and one P 29 is placed outside each of the wheels. The F 9's on the outside connecting the two sets of axles each side, improve the appearance of the bogies. The cardboard floor (8 by 2½-ins.) is turned up at the top and secured to the back end of the tender, together with the two buffers.

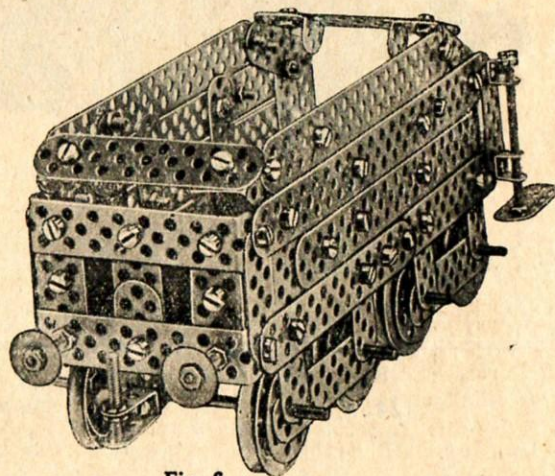


Fig. 6.



# TRIX

## No. 136. EXPRESS PASSENGER COACH.

Built with six Sets No. 1, five Sets No. 1a, and four Sets No. 2a.

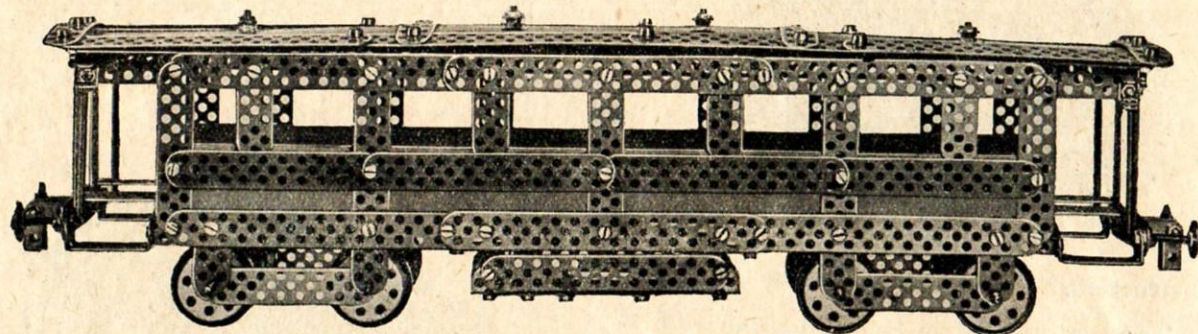


Fig. 1.

### Parts Required :

6 of A 1	12 of F 13	4 of S 55	12 of U 2
155 „ B 1	20 „ F 17	4 „ S 87	8 „ U 3
8 „ ER1	219 „ N 1	4 „ SU1	16 „ V 35
24 „ F 5	8 „ P 29	4 „ SU2	4 „ W10
24 „ F 9	10 „ S 25	6 „ U 1	8 „ W16



# No. 136. EXPRESS PASSENGER COACH

# TRIX

(Continued).



Fig. 4.

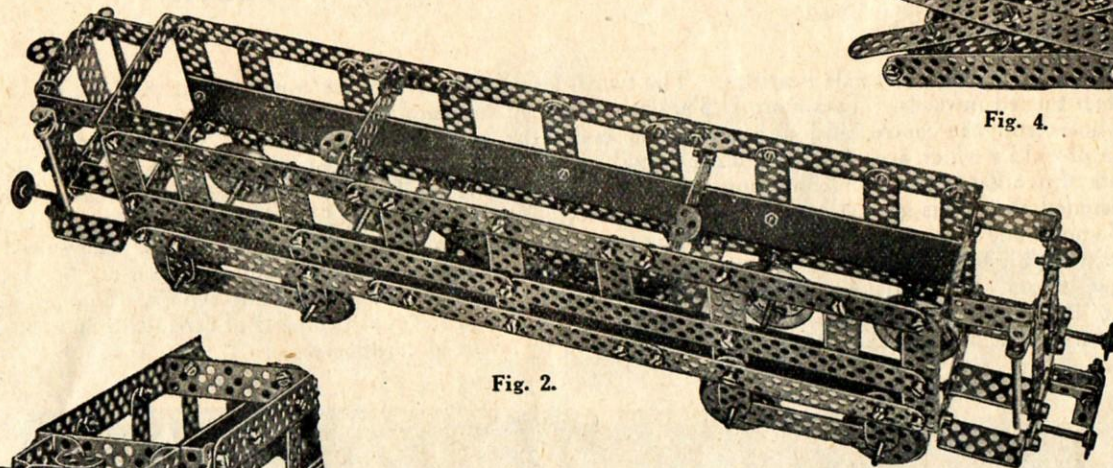


Fig. 2.

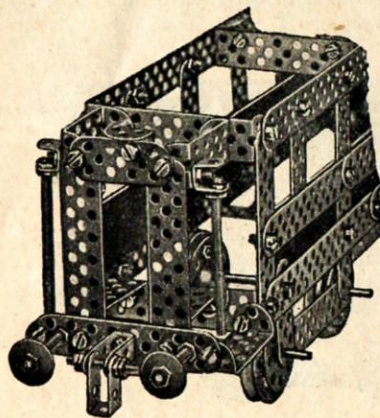


Fig. 3.

## Instructions :

We begin the construction of this coach by making the upper frame of the sides, each of three F 17's, three holes overlapped at the joints. A vertical F 9 is fixed in the middle and at each end. In the eleventh hole from each end an F 9 with an F 5 two holes overlapped is fastened, as axle bearing. F 5's are bolted in the spaces between the vertical struts. Parallel to the upper frame run four F 13's to form the windows, each one hole overlapped, and a small distance below another strut is fixed composed of three F 17's. On this strut, parallel to the lengthened wheel bearing strips, F 5's are fastened, as additional axle bearings.



# TRIX

## No. 136. EXPRESS PASSENGER COACH.

### Instructions—Continued.

An F 9 bridges each set of axle bearings. The two sides of the carriage are connected at the base by U 3's with feet turned inwards. Two more U 3's, with upturned feet, are also fastened to the bottom struts, each seven holes from the centre, and underneath these lies the gas cylinder (Fig. 4). The long sides of this consist of F 13's which are connected at each end by two U 1's, with their feet bolted together. The bottom is made of two flat strips, each consisting of three F 5's, one hole overlapped. Two diagonally crossed F 17's are fastened above this gas cylinder framework by two U 1's (see Fig. 4) and the hole is bolted to the U 3's. Fig. 3 shows one end of the coach. The buffers and the coupling, consisting of two SU 2's, are secured to an F 9, which is fastened to the U 2's, with nuts in between, and, in this way, the vertical F 9's can be placed between them. The carriage hand rails are fixed vertically from the roof by means of SU 1's. The arrangement of the wheels is similar to those of the tender. The roof of the coach consists of cardboard and is fixed as shown in Fig. 5, and the sides also can be improved by strips of cardboard.

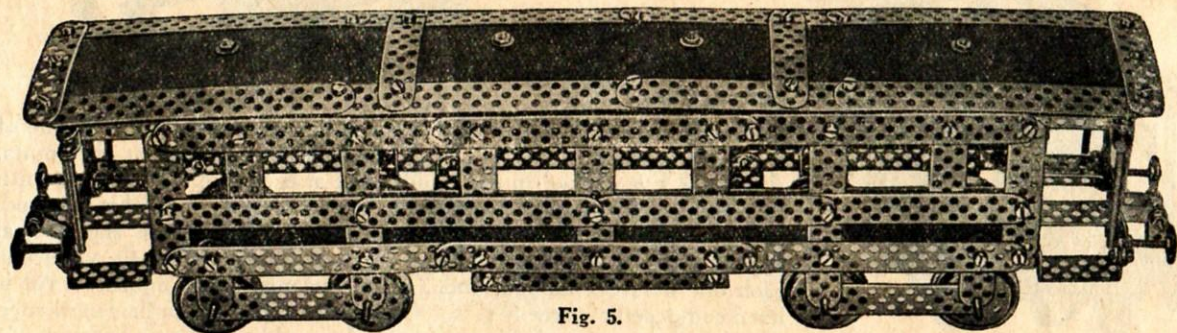


Fig. 5.



## No. 137. TIP LORRY.

TRIX

Built with ten Sets No. 1, six Sets No. 1a, six Sets No. 2A, two packets of bolts and nuts, and six model rubber tyres, obtainable from all toy shops or toy departments.

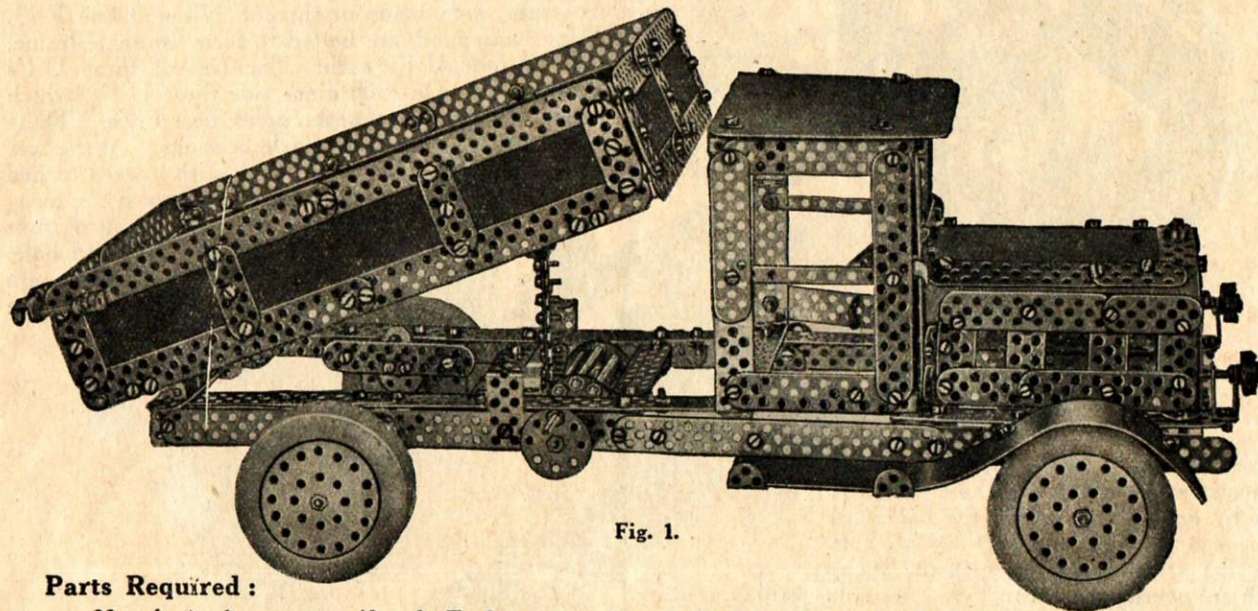


Fig. 1.

## Parts Required :

23 of A 1  
265 „ B 1  
4 „ C 1  
1 „ ER1  
40 „ F 5

40 of F 9  
20 „ F 13  
24 „ F 17  
400 „ N 1  
3 „ P 29

12 of P 49  
9 „ S 25  
19 „ S 55  
1 „ S 87  
10 „ SU1

4 of SU2  
12 „ U 1  
20 „ U 2  
10 „ U 3  
2 „ V 35

4 of W10  
12 „ W16  
3 Spanners.



# TRIX

## No. 137. TIP LORRY.

### Instructions :

Figures 2 and 3 show the construction of the chassis. Two pairs of struts, each made of three F 17's and one F 13, three holes overlapped, are bolted to form an angle frame, by means of four U 1's each. The feet of these U 1's point downwards. On each inner side these U 1's, which are fastened at a distance of seven holes, bear F 9's. These F 9's support the C 1's acting as axle bearings. At the rear end of the angle frame U 1's are fixed, with inward turned feet. An F 13 built of two F 9's overlapped five holes connects the two front ends of the angle frame in the third hole. The rear ends of the angle frame are joined by two U 2's and one F 9. The

chassis frame, finished in this way is further strutted in the 25th hole from the front by an F 17 on which the back end of the cab is fixed, and in the 15th hole by a flat strip consisting of two U 2's, which are overlapped by an F 9. A similar strip is used in the 31st hole. In the 17th and 24th holes from the front, U 2's are fastened as mud-guard and running board supports. Two F 5's fixed at an angle are bolted on the outer sides of the angle frame and serve together with the C 1's as wheel axle bearings.

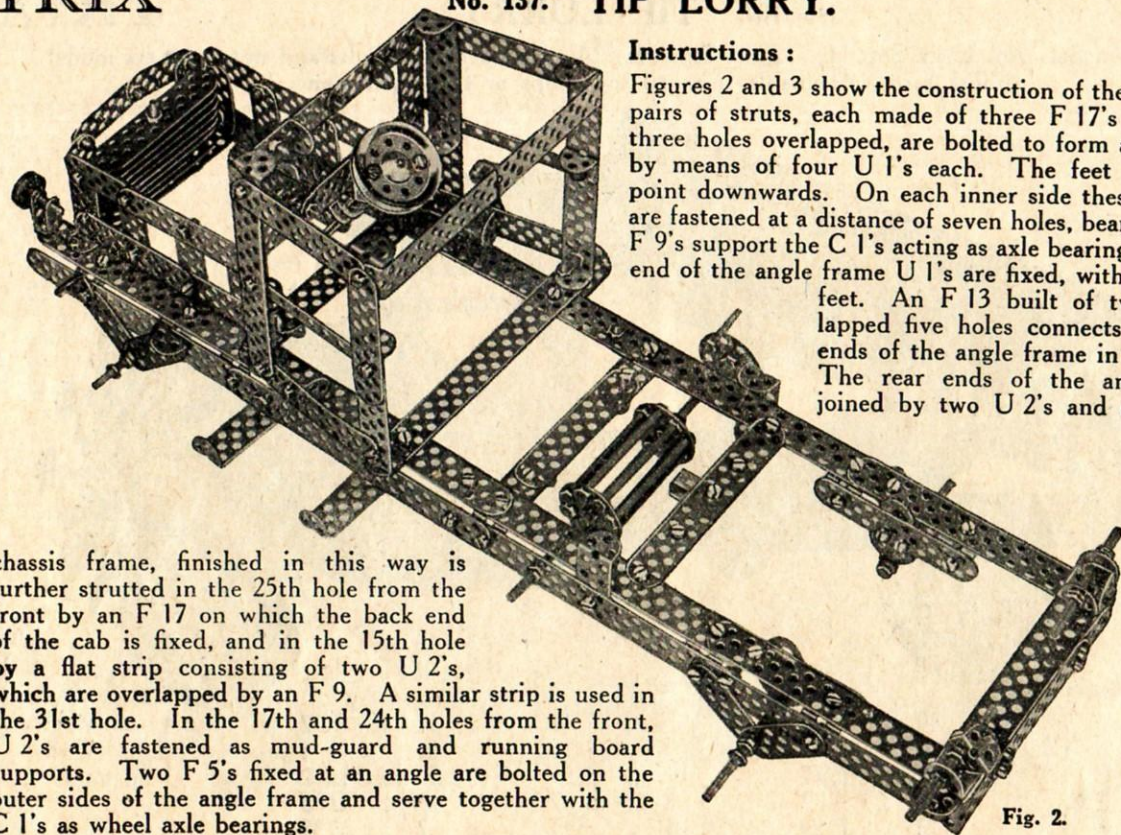


Fig. 2.



## No. 137. TIP LORRY.

TRIX

*Instructions—Continued.*

In the 34th hole from the front, the pinion drum, of two P 29's and ten S 55's, is fastened and secured to the outside of the frame by locknuts. The crank handle is as in EC 15. Two U 1's, as hinges for the tip truck, are fastened to the back end of the chassis. Behind the pinion drum, also on each side of the chassis, U 2's are provided as supports for the truck. The construction of the cab and bonnet is shown in Fig. 5. The radiator frame is fixed to the bonnet by two A 1's at the sides and fastened to the chassis by an A 1.

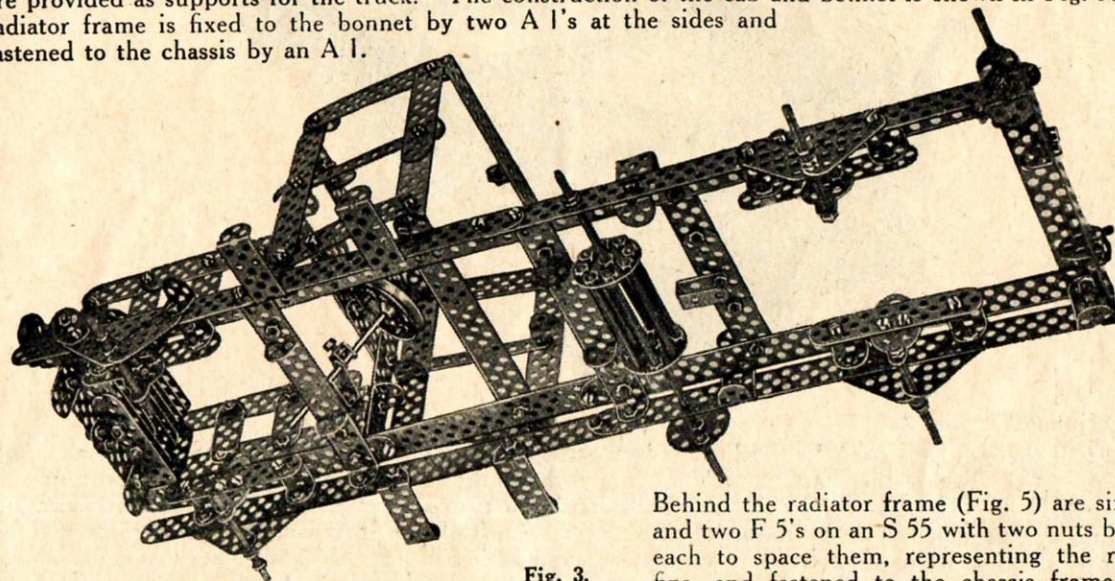


Fig. 3.

Behind the radiator frame (Fig. 5) are six F 9's and two F 5's on an S 55 with two nuts between each to space them, representing the radiator fins, and fastened to the chassis frame. The bonnet and the front of the cab are connected

right and left by a pair of A 1's. The corner posts at the front of the cab consist of F 13's and U 2's fixed to the chassis. At the front sides are F 13's and U 3's, whose inward feet fasten the roof.



# TRIX

## No. 137. TIP LORRY.

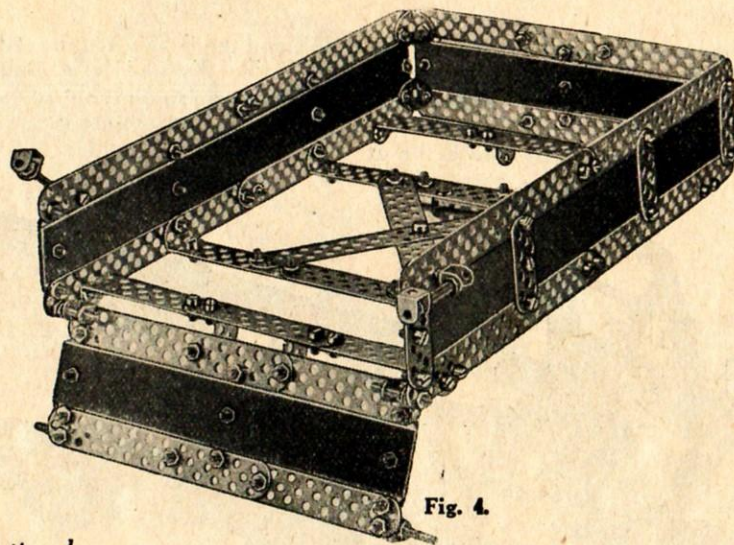


Fig. 4.

### Instructions—Continued.

The back of the roof rests on A 1's fixed to the back supports of the cab. The corner supports each consist of an F 9 and are fixed to the chassis by a U 3. Fig. 4 shows the construction of the tip truck with its sides and hinged back. The front and back ends each consist of two pairs of F 13's overlapped six holes, and made into a rectangular frame by means of three F 5's. Each of the sides consists of two pairs of F 17's (2 holes overlapped) which are bolted in a rectangular frame by four F 5's. Two A 1's at each corner connect these sides to the front end. Two SU 1's, as hinges, are fixed to the back end, and these move on the S 25's fastened to the sides. A second pair of SU 1's is fastened to the upper edges of the back end, and these hold S 25's, by which the slip bolts, made out of two SU 1's and an S 25 and fixed to the sides, hold up the back end. The front and back cross struts of the floor each consist of two U 3's with F 9's overlapped, and



## No. 137. TIP LORRY

TRIX

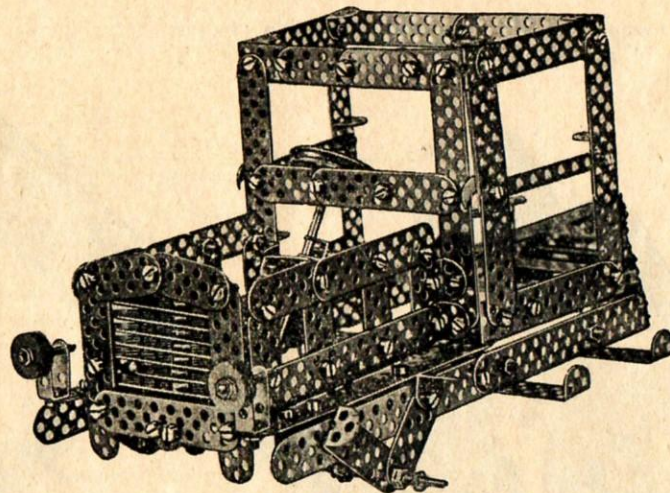


Fig. 5.

**Instructions—Continued.**

the two middle struts, each of two F 13's. These are fastened by A 1's to the sides. The foremost of these girders bears a U 2 on the centre of the underside, through the feet of which an S 55 is pushed and another U 2 is also connected with it. This bears a toothed bar or rack made with an F 9 as in EC 34, which gears into the pinion drum, so that the rack, and with it the truck, is raised and lowered by turning the crank handle. To prevent the rack from slipping backwards, an SU 2 is fixed behind to the transverse beam, running across the chassis. The front wheels are made of two P 49's on an S 55 as in EC 42. The back wheels, in pairs, are fixed similarly. The steering wheel shaft, made of an S 87 with a V 35 mounted as in EC 37, as steering wheel, rests in a SU 2, fastened to one side of the motor bonnet by means of two SU 1's as in EC 24. Card-board pattern. see page 71. Size of cardboard for truck bottom,  $9\frac{1}{2}$ -ins. by  $6\frac{1}{2}$ -ins.



# TRIX

## No. 138. MECHANICAL NAVVY.

Built with seventeen Sets No. 1, twenty Sets No. 1a, six Sets No. 2a, and one packet of nuts and bolts.

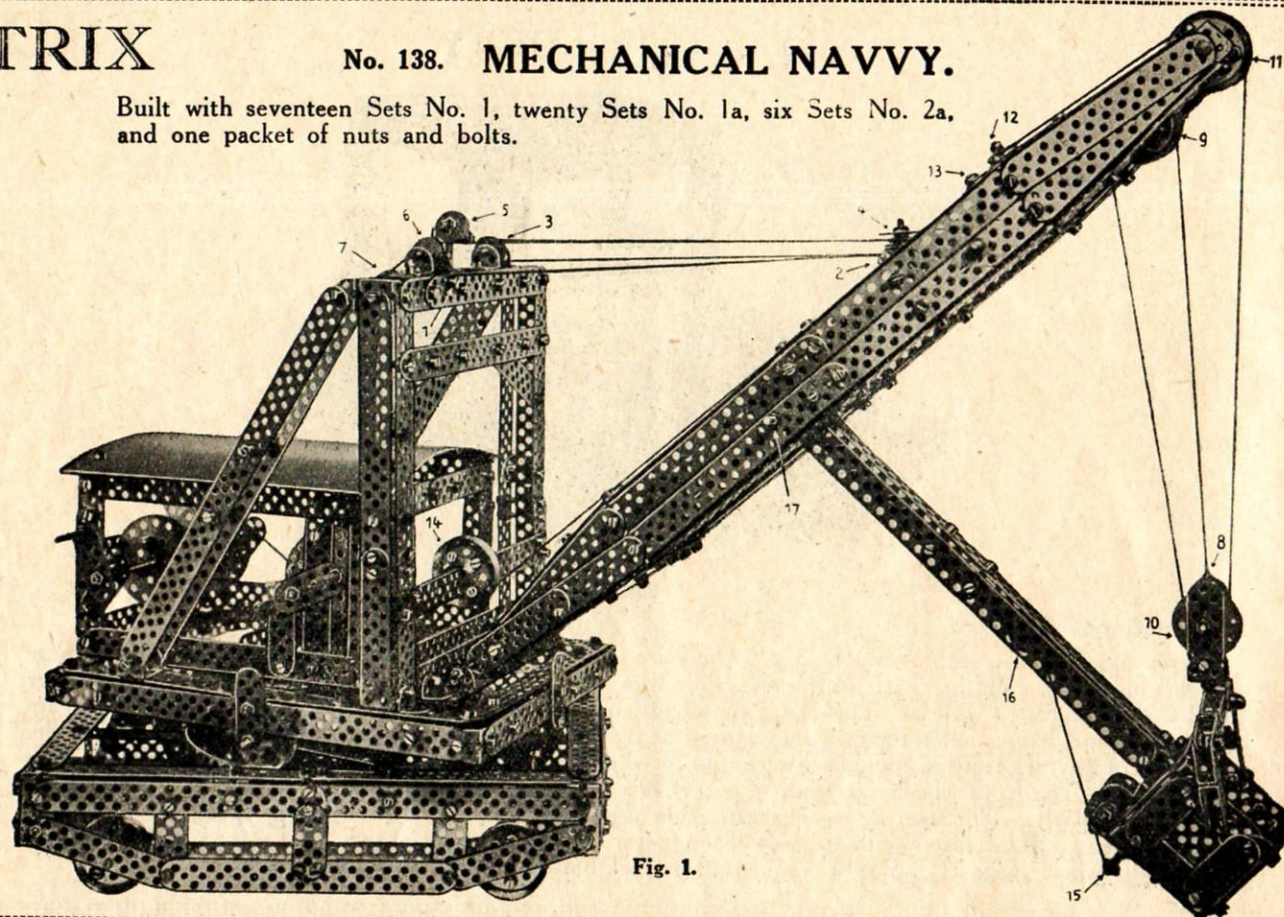


Fig. 1.



# TRIX

## No. 138. MECHANICAL NAVVY.

### Description.

#### Parts Required :

78	of	A	1
530	"	B	1
68	"	F	5
61	"	F	9
34	"	F	13
80	"	F	17
750	"	N	1
2	"	P	29
2	"	P	49
32	"	S	25
12	"	S	55
8	"	S	87
7	"	SU	1
9	"	SU	2
40	"	U	1
20	"	U	2
4	"	U	3
22	"	V	35
17	"	W	10
21	"	W	16

Mechanical Navvies or Steam Shovels, so-called because of the shovel-like operation of the grab situated on a swivelling jib, serve chiefly for the digging out of canal beds, etc. The machine is brought along on rails to the place required. By lowering the jib and sinking the grab-arm at the same time, the shovel or grab is brought into contact with the material to be removed. By a continuous action through the drawing upwards of the grab, worked by steel ropes guided over winding drums, the grab fills itself with the material to be excavated.

By the swivelling of the movable crane erection and afterwards by the opening of the grab door the material is deposited in transport wagons. All movements are carried out by means of motor or steam power. The model described here carries out all these functions. The front right crank allows the main jib, by pulleys, to stand either straight or slanting. The rear right-hand crank works in the same way for raising and lowering the grab-arm. The grab door is opened by pressing the lever at the left of the back. Finally the whole erection turns on rails, with a swivelling gudgeon in the centre. The chassis runs on wheels.

### Instructions :

The two sides of the chassis, made as in Fig. 2, of three F 17's, three F 5's, two F 9's, and in each corner, two U 2's, are bolted to a right-angled frame, with the two short sides made of two F 17's, two F 5's, three F 9's and two U 2's. To the upper feet of the four pairs of U 2's forming the corners, four flat strips, each consisting of two F 17's, are fastened. On the two long sides these flat strips are each angled at the sides, by two A 1's.



# TRIX

## No. 138. MECHANICAL NAVVY.

### Instructions—Continued.

Flat strips, each made of an F 17 and two F 9's, run parallel to the lower frame of the sides, at a spacing distance made by two U 1's on each side. These struts are strengthened at each end by S 25's, fixed inside the lower frame. This space serves to house the wheels made as in EC 39. Inside the chassis frame two angled struts of equal length, each built of four F 17's and six A 1's are bolted to the F 5's at the ends by means of U 2's. By this the upturned feet of the U 2's are the same height as the upper ends of the F 5's. The middle of this angled construction is strutted to the side by an F 9 and an A 1 on each side. Also the crossed F 9's bearing the king-gudgeon in the middle hole are bolted over two of the F 9's joining the angled struts. On both angled struts a ring made of four F 17's, overlapped two holes, is held fast by four A 1's, and serves as an iron rail for the cab, which turns around the centre or king-gudgeon on wheels. The cab floor framework (Figs. 4 and 5) whose wheels run on the rail of the chassis, consist of two long sides, each made of two pairs of F 17's, which are bolted to form an angle framework by U 1's. The ends of the angled frame are built with two pairs of F 13's and one pair of A 1's on each side. In the middle of the four sides, F 5's are bolted and are bearings for the axles, S 87's, on which the wheels run, EC 39. The inside ends of the S 87's run in three U 1's, which, as shown in Fig. 5, are mounted under an F 17.

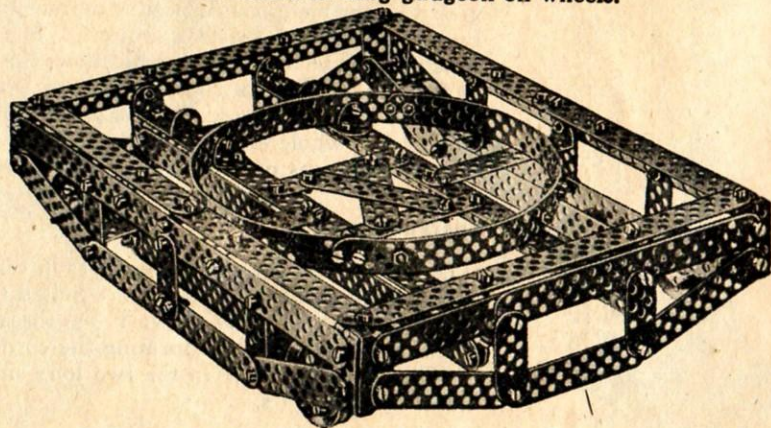


Fig. 2.



## No. 138. MECHANICAL NAVVY.

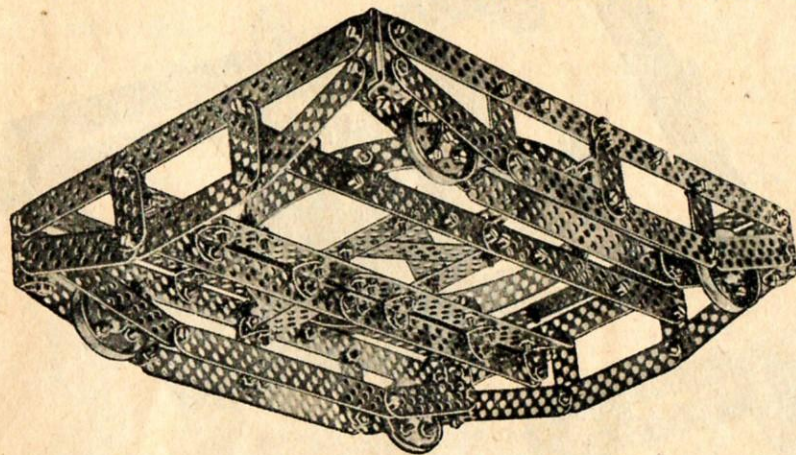


Fig. 3.

and 6 are fixed by means of four A 1's. Besides this an SU 2 is added and to this an SU 1 is fastened obliquely bearing an S 25 with pulley 5. A further pulley, 7, is placed on the back of the transverse girder by means of two A 1's. Two A 1's bolted on the lower cross strut fix it to the cab floor framework. Two more A 1's are fastened on the lower cross beam of the cab at this point and two on the inside of the cross strut. The front rope drum for moving the jib is built of two P 49's which are fixed together by four S 25's and 16 N 1's. A fifth S 25 is fixed to the middle hole of the first P 49 as shaft. An S 55 as shaft is placed through the other P 49 and held fast by two N 1's. On this S 55, another P 49 is placed (whose larger circle of holes is studded with bolts and nuts as in EC 32), and pressed against the second P 49 by an N 1.

**Instructions—Continued.**

This F 17 is supported by two S 25's from the flat strips placed above so that the S 87's lie horizontally in the same plane. Two F 13's are fastened on the upper side by A 1's (Fig. 4) and stiffen the middle girders.

On the cab floor framework is situated the braced framework, supporting the jib, so that it is self-contained and unattached to the cab itself. The pulley at the front is built as in EC 39 and runs on an S 55 fixed in the U 3's. The vertical girders, made in U-shaped form, are each fixed with three U 1's. The upper transverse girder is made of four U 1's, to which the pulleys 3



# TRIX

## No. 138. MECHANICAL NAVVY.

### Instructions—Continued.

The whole is mounted on a flat strip of two overlapped F 9's which is fixed to the sides of the cab. A second pair of overlapped F 9's act as the other bearing. This is spaced correctly by two S 55's (see Fig. 7). The drum axle is held in position

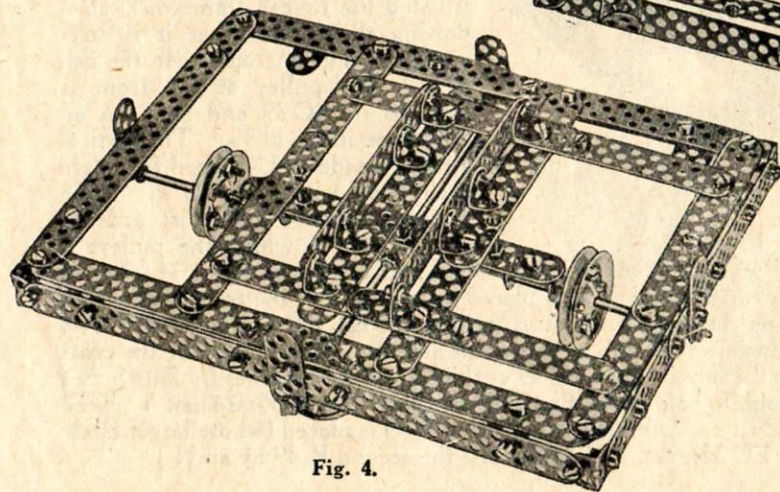


Fig. 4.

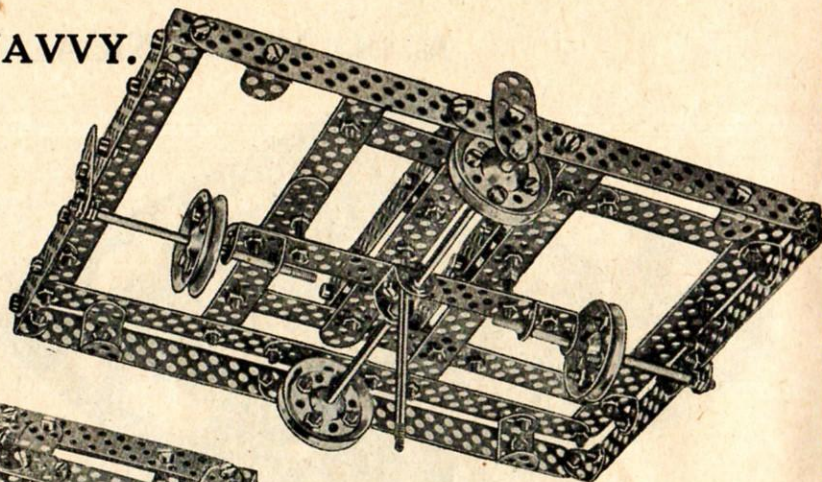


Fig. 5.

by locknuts. An F 5, as a pawl, is connected to the lower side struts (which has at its free end an A 1 fastened to an S 25). By placing this pawl between the teeth of the P 49 the ropes are prevented from unwinding.

At the back of the cab is a second rope drum by which the grab is



## No. 138. MECHANICAL NAVVY.

**Instructions—Continued.**

raised and lowered. The drum axle consists of two P 49's and four S 55's as well as 16 N 1's. The shaft ends, S 55's, run in the diagonally bolted F 5's at the right and left of the cab (Fig. 7). The drum is braked by an F 5 pressed against the rim of the P 49.

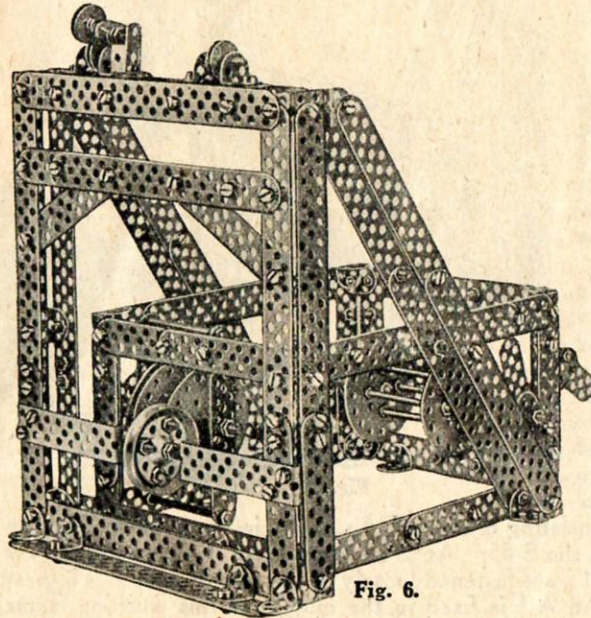


Fig. 6.

Outside these rope drums is a lever, provided for opening the grab floor. This is fixed in the left corner of the back of the cab and works between locknuts on an S 25 which is held to the corner by an A 1 bolted on the inside.

Figs. 1 and 8 show the construction of the jib. Both halves are completed in the same way. The two V 35 pulleys are made as in EC 39. The upper pulley runs on an S 55 which, at the same time, strengthens the jib end, while the under pulley turns on an S 25 which is supported by two A 1's fixed inside the under side of the jib.

Two overlapped F 5's fixed on the under side of the jib just where the tapering of the end begins, serve as further struts and bear an S 25 on which a guide pulley of two W 16's and one W 10 runs between locknuts. Further left, a similar pulley is fixed in a lower position. Below this pulley an S 87 is pushed through the sides of the jib and at the same time, through the feet of a U 3. This U 3 serves as hinge axle. A U 1 is fastened in the middle of this U 3,



# TRIX

## No. 138. MECHANICAL NAVVY.

### Instructions—Continued.

whose feet are lengthened by F 5's and bear between them, on an S 25, two pulleys running next to each other. The two pulleys each consist of two W 16's and two W 10's and are separated from each other by a further W 10. The small washers can be pressed together by means of locknuts so that the string cannot slip between. The jib is fastened to the lower frame by two U 1's at the foot.

The arm bearing the grab is U-shaped and is made of three struts, each of a pair of F 17's overlapped four holes. These are fastened at the ends and in the middle by three U 1's. At the front end of this arm a U 1 bearing the grab itself is fixed (Fig. 9). The other end of the arm bears a U 3 fastened across by two bolts. An S 87 as hinge pin is pushed through the feet of this U 3 and thus is held to the jib.

The grab is a box consisting of four equal sides, each made of two horizontal and two vertical F 5's joined together in the end holes by eight A 1's. However, the bolt is allowed to pass through on both sides in the case of the under side nearest the arm. Note that unlike the sides of the grab, in the front the horizontal F 5's lie outside the vertical ones. The back end of the grab is made of three vertical and three horizontal F 5's. Parallel to the lower F 5, a U 1 is fastened whose foot (in the lower hole) serves as bearing for an S 55. The grab door, consisting of seven F 5's, bears in two of its corners an SU 1 with upward pointing feet which move hinged on the S 55. An S 25 fastened to the door also serves as opening lever. On the upper edges of the grab, SU 1's are fastened loosely in the middle hole. To these the hinged frame made of eight SU 2's is fastened. An A 1 is fixed in the middle of this working frame

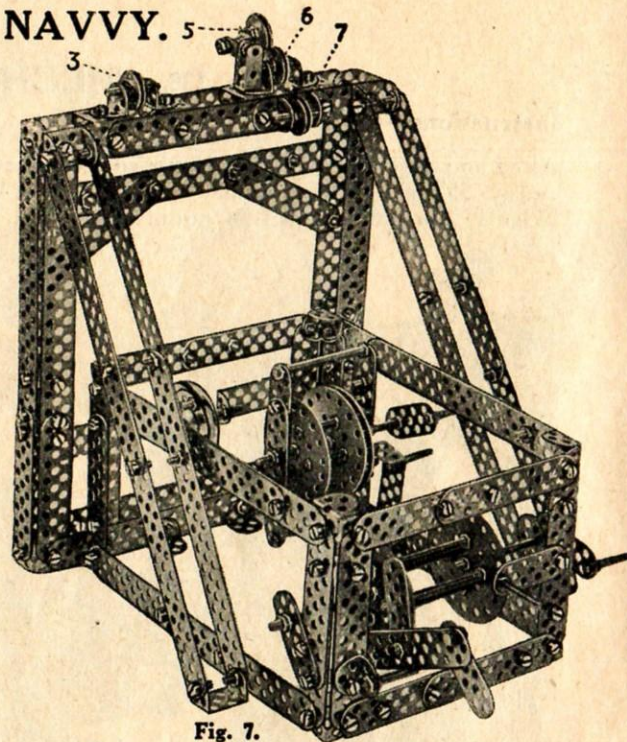


Fig. 7.



## No. 138. MECHANICAL NAVVY.

TRIX

**Instructions—Continued.**

with a U1 bolted to its free foot. These feet of the U1 are each lengthened by an F5 and have between them a pulley consisting of two P29's and three W16's as in EC11.

The first rope for moving the jib is fastened by a bolt to the upper beam of the braced framework and runs over pulley 2 and pulley 3. From the upper side it passes over pulley 4, between pulleys 5 and 6, over pulley 7 to the rope drum, to which it is securely tied. The second rope for raising and lowering the grab is fastened to the F5's over pulley 10 at the point 8, and runs from there over pulley 9 to pulley 10. From here the rope runs over pulleys 11, 12 and 13 and underneath pulley 14 to the rear rope drum.

To open the door (which is kept closed by a tight rubber band) a string is fixed to spindle 15 and runs over pulley 16 and shaft 17 to the transverse girder of the braced framework. Through one of the holes of this the cord to the lever is guided to the rear, and fastened there to the lever. The roof of the cab is as pattern, page 72.

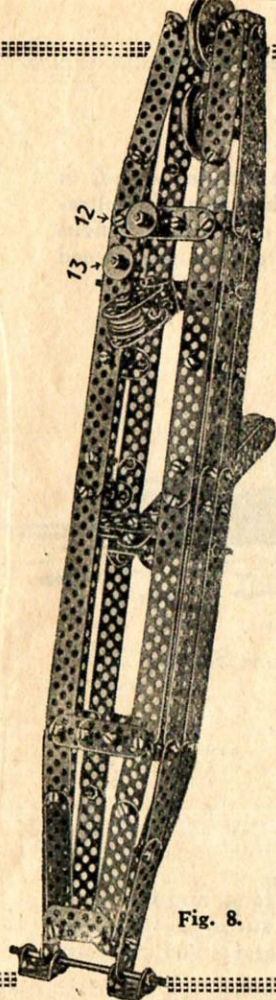


Fig. 8.

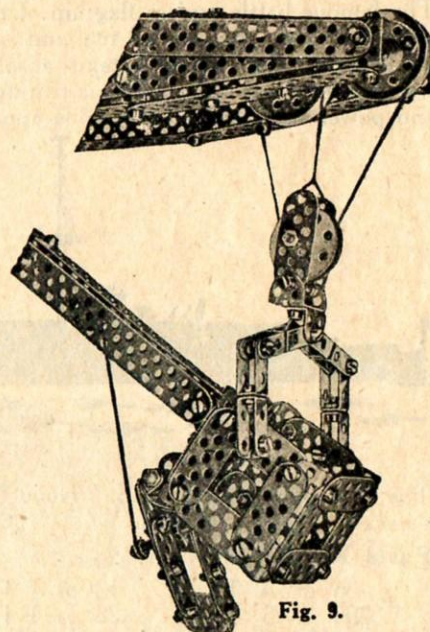


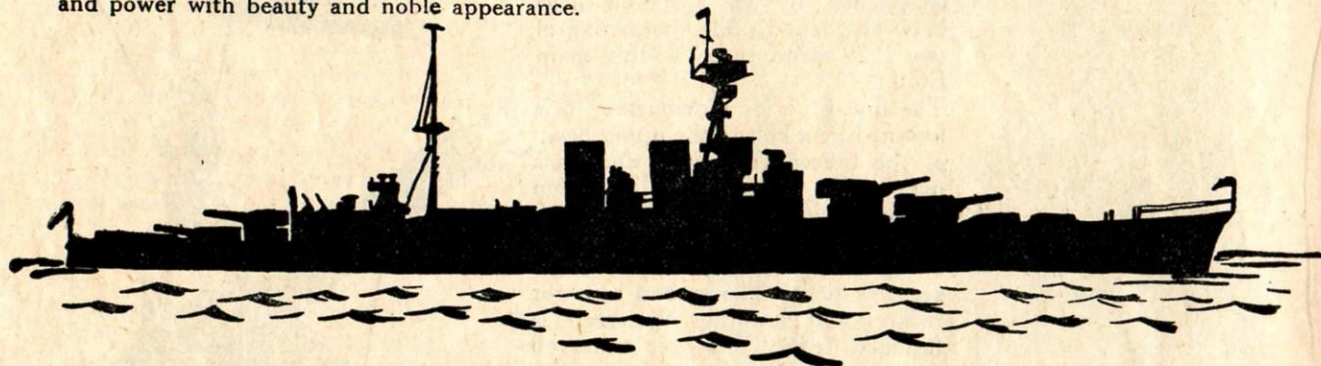
Fig. 9.



# TRIX

## Model No. 101B. H.M.S. "HOOD."

The famous battle-cruiser flagship of the Atlantic fleet is a ship of 44,600 tons, and has attained speeds of over 32 knots; she uses oil fuel and is fitted with turbine engines of 144,000 h.p. Although not an ultra-modern ship, the "Hood" stands absolutely alone in her class of engineering, and is one of the most famous warships in the world. She is a triumph of a great designer who managed to combine great strength, speed and power with beauty and noble appearance.



The Trix Model of H.M.S. "Hood" is made with seven Sets each of No. 1 and 1a, one Set No. 2a, and a packet of nuts and bolts.

### Parts Required:

26 of A 1	12 of F 13	5 of S 25	13 of U 1	8 of W10
200 „ B 1	28 „ F 17	12 „ S 55	14 „ U 2	7 „ W16
28 „ F 5	245 „ N 1	2 „ SU1	2 „ U 3	
26 „ F 9	20 „ P 29	2 „ SU2	1 „ V 35	

### Instructions:

Build the hull first, making two strips fifty-nine holes long, two strips eighty-seven holes long, and two strips eighty-eight holes long, of overlapped F 17's and F 9's. (See Fig. 1). Fix each set of strips together with P 29's and F 5's on the inner sides, as illustrated in Fig. 2. When the two sides are assembled correctly,



## Model No. 101B. H.M.S. "HOOD."

TRIX

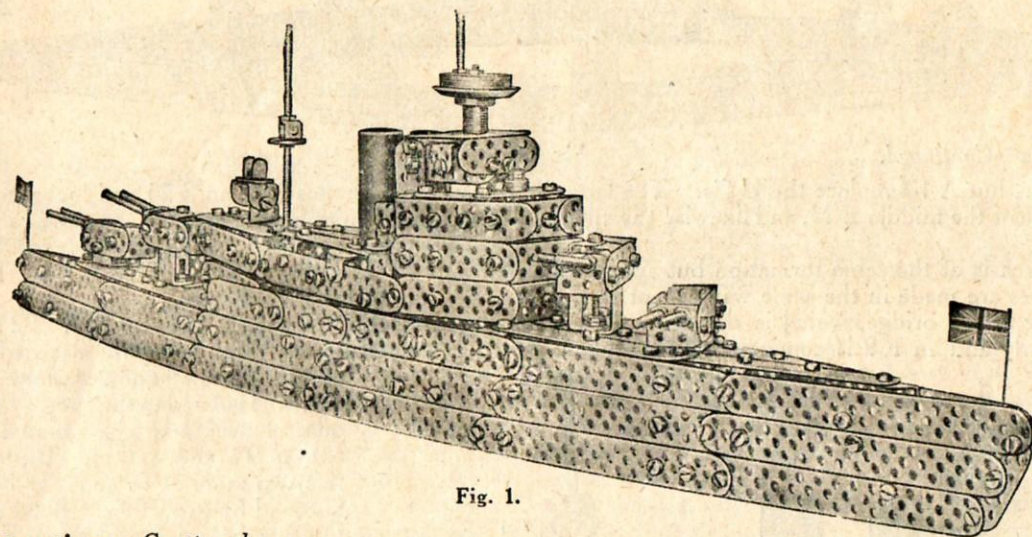


Fig. 1.

**Instructions—Continued.**

they are joined in the forty-seventh hole (from the bow) of the bottom strip by U 2's. The sides are now connected at the bow and stern and an F 5 is inserted between the strips when joining them at the bow. The decks are now fitted at each end. An A 1, with two F 13's connected to it in their end holes, is fixed at the bow in the ninth hole. These F 13's are also connected in the fifth inner hole thus forming a triangle, and a U 2 as support is fastened in the tenth hole of the F 13's. Two more F 13's are attached to the ends, and in the seventh hole of these an F 5, with an F 13 bolted in the middle hole, is fixed. The larger of the forward barbettes is made up of U 2's, U 1's, F 5's, S 55's, B 1's, and N 1's, and the smaller



# TRIX

## Model No. 101B. H.M.S. "HOOD."

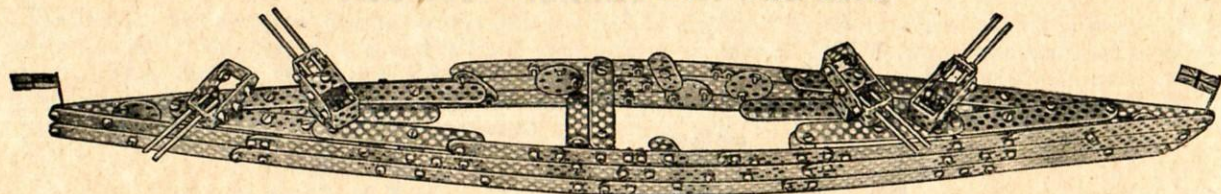


Fig. 2.

### Instructions—Continued.

one is similar, but A 1's replace the U 2's. The larger barbette turns by means of an S 25 and locknuts in the sixth hole of the middle F 13, and likewise the small one turns in the middle hole of the F 5 bolted to the F 13's.

The stern deck is of the same formation but smaller with only two F 13's, one F 5 and three A 1's. The after-barbettes are made in the same way except that the smaller one is one hole shorter.

Commencing at the bridge, which is shown in the course of construction in Fig. 3, the feet of a U 2 are opened slightly and an F 9 is connected on each side. Two F 9's overlapped three holes are attached to

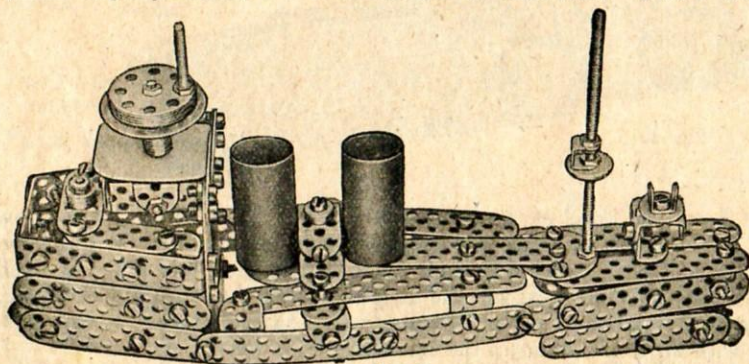


Fig. 3

each of these and angles, flattened out, are fastened to the ends. The quarter deck end is completed by two F 9's and a U 1. Beneath this two more F 9's and a U 1 are fastened by two P 29's. Bend two U 2's as before and bolt two F 9's to one and two U 3's to the other and fix them above the base of the bridge by means of an F 5 at each side.

The forward conning tower of W 10's and nuts is fixed to an F 5 by an S 25, and this is bolted by



## Model No. 101B. H.M.S. "HOOD."

TRIX

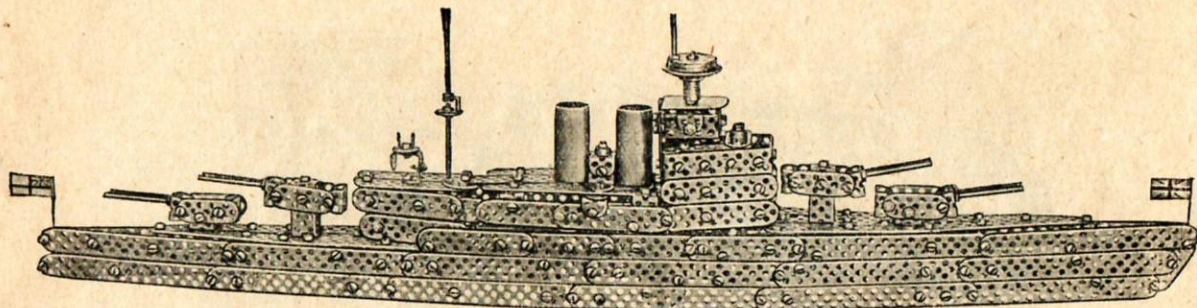


Fig. 4.

**Instructions—Continued.**

angles to the slanting U 3's of the bridge. F 5's and A 1's are fixed along the sides. A 1's are bolted to the back of the F 9's of the bridge and vertical F 9's are fixed to the feet of these A 1's and the U 3's. Two F 5's overlapped four holes connect the top of the vertical F 9's. To this the upper structure is fixed. This is composed of a U 2 on each side held together in the front by an F 5 and bolted to the back framework at the other end. The cardboard is fixed to another U 2 bolted to the U 2's with a nut in between. Pattern Page 72. The foremast is made of S 55's and W 10's with a control top of a V 35 and P 29's.

A strut consisting of an F 9 and A 1's is fixed across the ship between the funnels and supports a P 29. A U 1, two A 1's, W 10's bolts and nuts are fixed between the funnels on the F 9. A second cross strut, made of an F 5 and A 1's, is fixed at a distance of seven holes from the first and an F 9 is fixed to it in the fifth hole. A P 29 to which two F 9's, as quarter deck, have been bolted, is fixed to the end hole. On these F 9's, which are fastened in position by an A 1, the after-conning tower is built, made of three A 1's, one W 16 and an SU 1 bolted together as shown in Fig. 3.

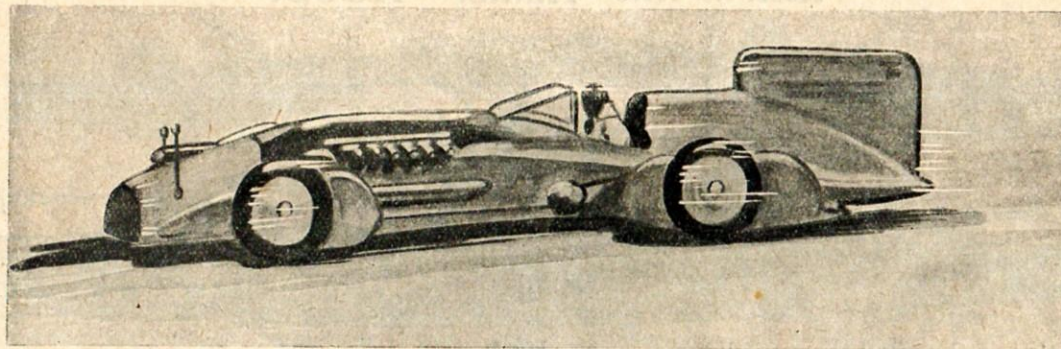
The main mast, made of two S 55's, two W 16's, one SU 1 and nuts, should be fastened to the side hole of the P 29 on the quarter deck.

The funnels are made of either wood fastened to the F 9 and P 29 by small wood screws or thin grey cardboard bent to an oval shape and fastened to the deck by A 1's.

To complete the ship a small White Ensign is fixed at the stern and a Union Jack at the bow.



# TRIX **Model No. 102B. SIR MALCOLM CAMPBELL'S "BLUEBIRD."**



On February 22nd, 1933, Sir Malcolm Campbell driving his all British "Bluebird" broke the World Land Speed Record on Daytona Beach with an average speed of 272.108 miles an hour. His previous record established a year before was 253.968 miles an hour.

This marvellous racing car—a triumph of British engineering—is fitted with an enormous Rolls-Royce twelve-cylinder engine of 2,500 h.p. We are all very proud of the "Bluebird," and all Trix enthusiasts should make this Master Model, which is made with nine Sets No. 1, eight Sets No. 1a, four Sets No. 2a, and four model rubber tyres, obtainable from all toy shops and toy departments.

## Parts Required :

18 of A 1	18 of F 13	273 of N 1	2 of SU1	9 of V 35
242 „ B 1	32 „ F 17	13 „ S 25	16 „ U 1	9 „ W10
36 „ F 5	2 „ P 29	16 „ S 55	7 „ U 2	18 „ W16
36 „ F 9	8 „ P 49	2 „ S 87	2 „ U 3	4 model rubber tyres.

## Instructions :

Build the two lower chassis strips, 67 middle holes, each of four F 17's and one F 9; these are joined by a bolt and nut at the back and by an S 55 at the front. Four semi-circles are erected from these struts consisting of an F 13 in the first hole, an F 17 in the ninth hole, and an F 13 and F 9 in the nineteenth and



# Model No. 102B. SIR MALCOLM CAMPBELL'S "BLUEBIRD" TRIX

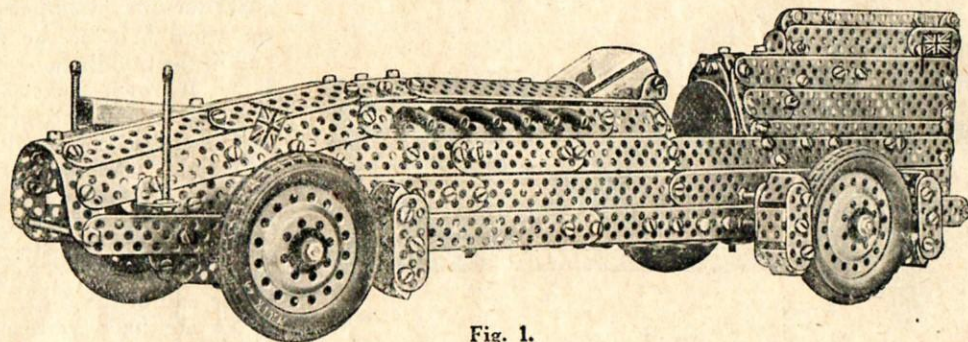


Fig. 1.

## Instructions—Continued.

thirty-seventh holes. A 1's are connected at the same time in the ninth hole and an F 13 is fixed to these on the side hole. In the 19th, 35th, 37th, 39th and 41st holes, the strips are spaced by F 9's with A 1's fixed each end in the second middle holes. Nuts are fixed on the bolts between the struts and the A 1's to make the exact distance.

The steering gear is made as follows. (See Fig. 2). A U 1 is fixed with bolt and locknuts to each end of the cross strut, F 13, and F 5's are fastened securely to the inner feet of these U 1's. A 1's pointing inwards are fastened to the free ends of the F 5's and an F 9 is fixed by bolts and locknuts to the A 1's. The steering rod consists of an S 87, A 1 and F 5, and is attached to the foot of an SU 1, which swivels on a bolt fixed to a second SU 1. An S 25 is fastened securely to this SU 1 at one end and at the other to the right hand F 5 already mentioned. The F 5 of the steering rod moves freely on a bolt which is fixed to a P 29 by two nuts. B 1's and N 1's are fixed in the P 29 (as crown-wheel gearing) and it is fastened on an S 55 by nuts. This shaft runs in the middle holes of two F 5's secured to the two feet of a U 2. Locknuts keep it in position. The U 2 is bolted to an F 17 which is fixed to the F 9's at the bottom of the chassis. This F 17 also supports a U 3 in the fifth hole from the U 2. A U 3 is also fixed to an F 9 in the 37th hole with a nut at each end to space the correct distance. These U 3's are bearings for the steering wheel shaft, S 87, which runs in



# TRIX Model No. 102B. SIR MALCOLM CAMPBELL'S "BLUEBIRD."

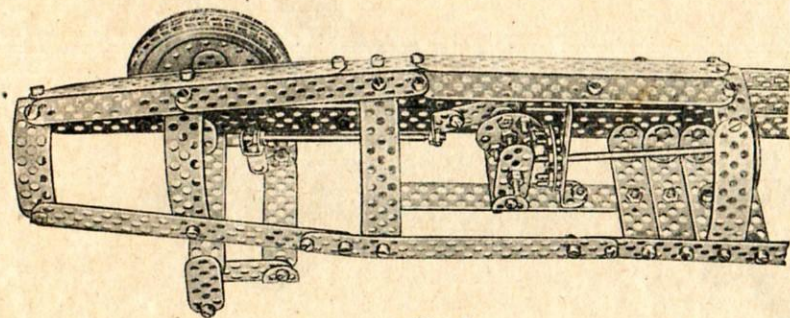


Fig. 2.

The wheels are made up of model rubber tyres, P 49's, V 35's, W 16's, W 10's and spindles. The back axle is made of an F 13 and the wheel bearings are U 1's fixed to the upper side in the end holes of the F 13.

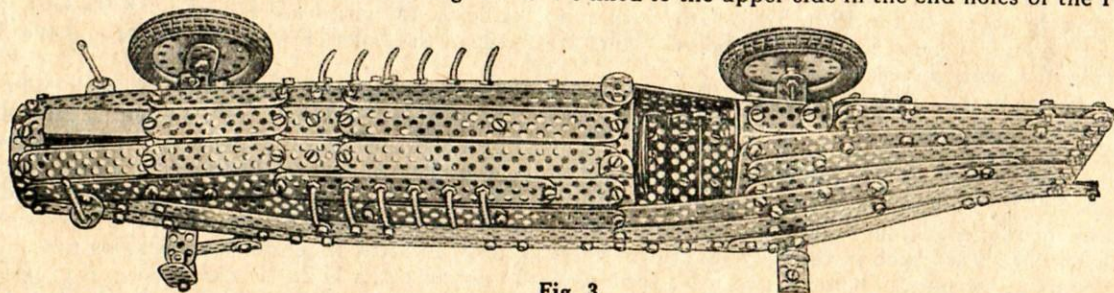


Fig. 3.

Now build the sides of the body as shown in Fig. 3, fastening the strips to the semi-circles already erected from the bottom strips.

The back of the seat shown in Fig. 4 is built of two F 9's joined by a P 29 at the top and spaced by F 5's.

## Instructions—Continued.

the third hole of the front U 3 and in the middle hole of the back U 3. A crown-wheel as in EC 33 is fixed at one end of the shaft and operates the steering to left and right. Adjustments can be made by altering the length of the steering rod and S 25 on the right of the model. The steering wheel is made of four V 35's and is fixed to the end of the S 87.

F 5's are fixed vertically to the U 1's as front wheel bearings.



## Model No. 102B. SIR MALCOLM CAMPBELL'S "BLUEBIRD." TRIX

### Instructions—Continued.

It is joined to the main body by a U 2 connected to the F 5's at the bottom and by an A 1 connected to the P 29 at the top. This angle is fastened to an F 5 and two A 1's. The feet of these A 1's are bent outwards and F 9's are attached to them. Struts fastened to these vertical F 9's lead to the fin, which is finished off by two vertical F 13's at the back end.

The wheel guards are constructed as shown in Fig. 1. The two front pairs are made of F 5's and U 1's and the back pair of F 5's and U 2's, and they are joined to the body of the car by spindles.

The wind screen is made of celluloid and the driver's seat is made of thin cardboard. Patterns, page 72.

The scoop to super charger can be made of wood or plasticine and fitted to the slope of the bonnet. Two S 55's with sealing wax heads are fastened by A 1's to the front of the car. These represent steering guides. Small Union Jacks pasted to the sides of the car and fin give a realistic touch to the model.

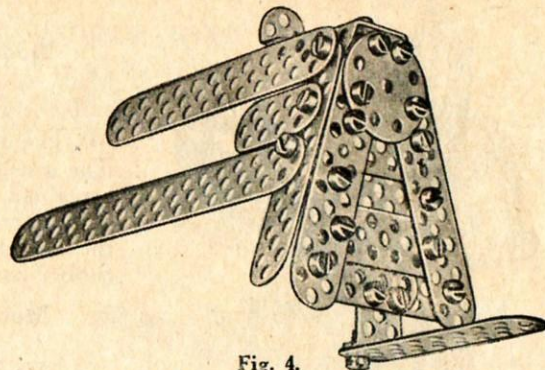


Fig. 4.

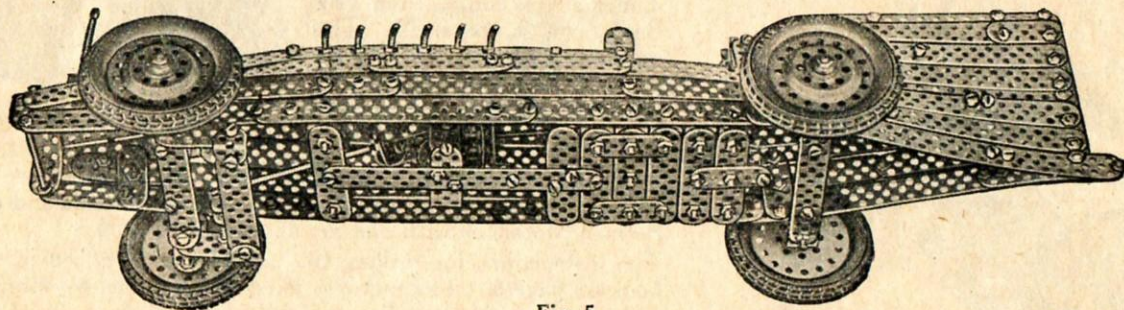
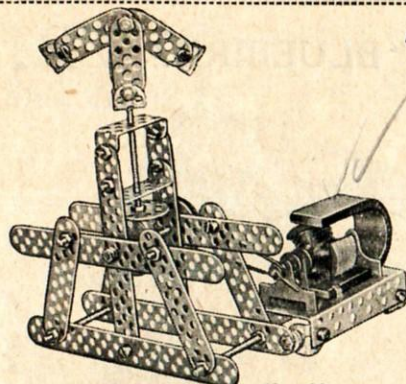


Fig. 5.



# TRIX PERMAG MOTOR DRIVING TRIX MODELS.

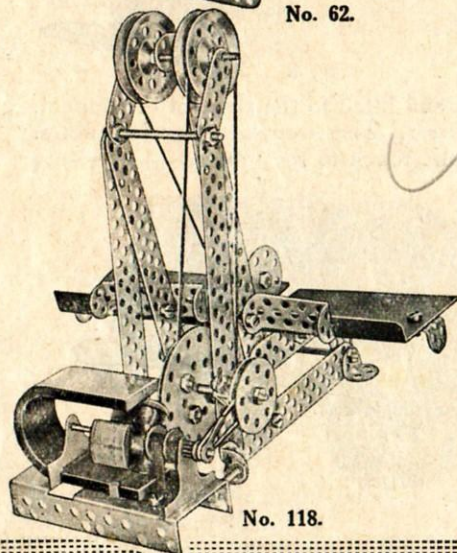


No. 62.

## Model No. 62. GOVERNOR.

Made with one Set No. 1, one set No. 1a and one Permang Motor, or with one Set of MOTO TRIX.

The instructions for making this model are contained in Trix Book No. 1, page 21. The Permang Motor is fixed to the side of the model and drives it by means of a small rubber band.

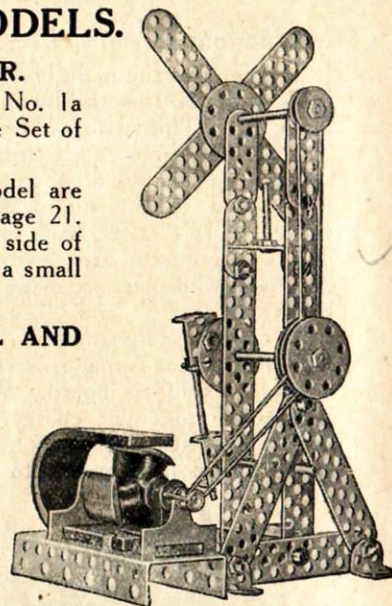


No. 118.

## Model No. 64. WINDMILL AND PUMP.

Made with one Set No. 1, one Set No. 1a and 1 Permang Motor, or with one Set of MOTO TRIX.

This model is contained in Trix Book No. 1, page 23. The motor is fixed to the model by an A1. The crank handle is removed and the model is driven by a small rubber band.



No. 64.

## Model No. 118. PENDULUM SAW.

Made with one each of Sets No. 1, No. 1a and No. 2a and one Permang Motor, or with one Set of MOTO TRIX.

The instructions for making this model are contained in this book on page 6. The motor is fixed to the model by spindles and a pulley is fastened to the end of the shaft.

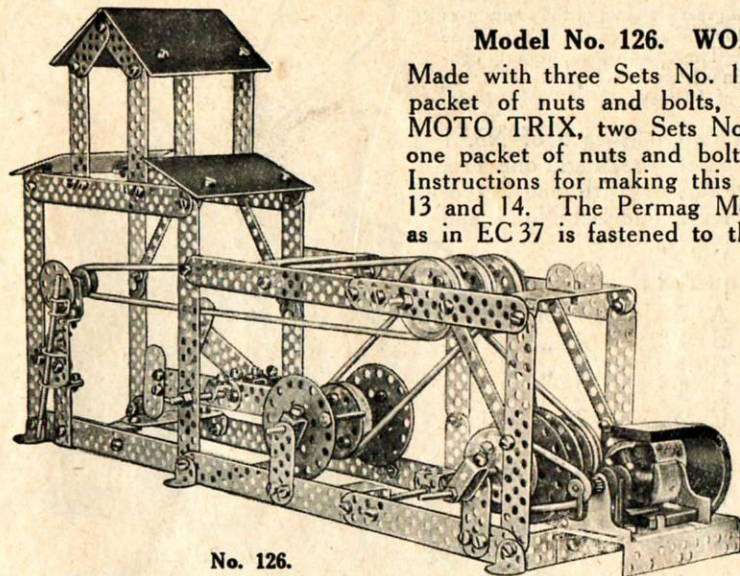


# PERMAG MOTOR DRIVING TRIX MODELS. TRIX

## Model No. 126. WORKSHOP WITH TRANSMISSION.

Made with three Sets No. 1, three Sets No. 1a, three Sets No. 2a, one packet of nuts and bolts, and one Permag Motor, or with one Set of MOTO TRIX, two Sets No. 1, two Sets No. 1a, two Sets No. 2a, and one packet of nuts and bolts.

Instructions for making this model are contained in this book on pages 13 and 14. The Permag Motor is bolted to U 3 at the side, and a pulley as in EC 37 is fastened to the shaft.

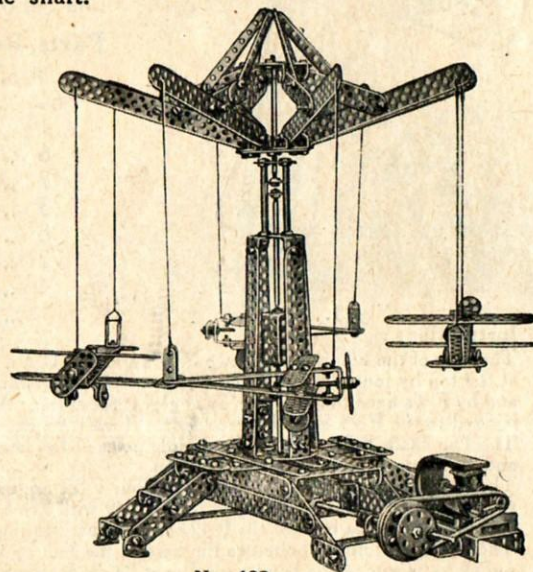


No. 126.

## Model No. 132. AEROPLANE ROUNDABOUT.

Made with six Sets each of No. 1 and 1a, two Sets No. 2a, and one Permag Motor, or with one Set of MOTO TRIX and five Sets each of No. 1, 1a and one Set No. 2a.

Two U 1's fix the Permag Motor to the base of the Aeroplane Roundabout described on pages 25-28. The horizontal shaft is driven by means of a rubber band, as illustrated.



No. 132.



# TRIX

## Model No. 103B. ELECTRIC FAN.

THIS ELECTRIC FAN is a great example of the many uses of TRIX. It is more than a toy and can be used in the house for real ventilating purposes. The Fan, when properly constructed, is almost noiseless in action and projects a strong current of air over a distance of 10 feet.

Built with two Sets each of No. 1 and 1a, one Set No. 2a and one Trix Permag Motor, or with one Set of MOTO TRIX, one Set No. 1 and one Set of No. 1a.

### Parts Required :

8 of A 1	1 of S 87
64 „ B 1	4 „ U 1
1 „ ER 1	2 „ U 2
6 „ F 5	2 „ U 3
7 „ F 9	2 „ V 35
3 „ F 13	2 „ W 10
8 „ F 17	4 „ W 16
72 „ N 1	1 Permag
4 „ P 29	Motor.
1 „ P 49	

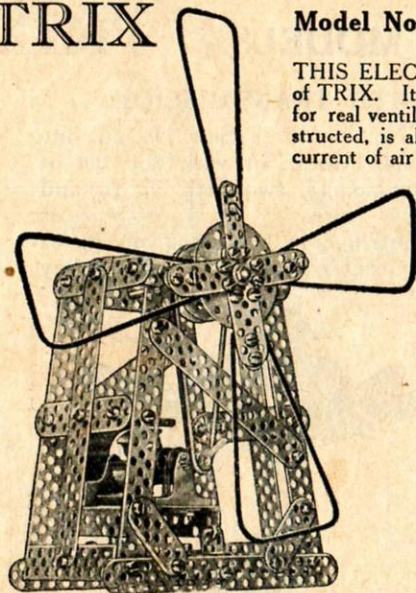


Fig. 1.

### Instructions :

The base of the Fan is built of two F 17's and two U 3's, and four F 17's are bolted upwards at the corners. These F 17's are joined at the top by four F 9's and four A 1's. This framework is strengthened by two F 13's bolted diagonally across the front and back and by F 9's fixed to the F 17's by angles at the sides. Another F 9 is fixed across the top of the frame by U 1's and an upright F 17 is fixed to the F 9's and U 3 each side. Two F 5's are bolted at the front bottom corners.

The Fan shaft, S 87, runs in the middle holes of the horizontal F 9's. A V-pulley of two V 35's and an ER 1 is bolted on the shaft and a driving band is placed in position.

The Fan blades are made as follows :—Four F 5's are fixed at an angle to the disc, P 49, to give the blades the necessary set. This set is obtained by fitting the F 5's to the P 49 with two bolts, one of which has a second nut in between the disc and the F 5. Discs and washers at the back of the P 49 act as thrust bearing for the Fan. The Fan shaft is held in position at the back by locknuts.

The Permag Motor is bolted to the base of the Fan by two U 2's, two U 1's and an F 13 as shown in Figs. 1 and 2. It drives the pulley by means of the band passed over its small driving pulley. The Fan blades, pattern page 72, are bolted to the F 5's.



Fig. 2.



# No. 115. JOINER'S DRILLING MACHINE.

# TRIX

Built with one each of Sets 1, 1a and 2a and 1 Permag Motor, or with one Set of MOTO TRIX.

## Parts Required :

4 of A 1	2 of F 13
30 „ B 1	2 or 4 „ F 17
2 „ ER1	56 „ N 1
1 „ E 1	4 „ P 29
4 „ F 5	2 „ P 49
4 „ F 9	2 „ S 25
	4 „ S 55
	1 „ S 87
	2 „ SU1
	1 „ SU2
	2 „ U 1
	2 „ U 2
	2 „ U 3
	4 „ V 35
	2 „ W16
	1 Spanner.
	1 Permag Motor.

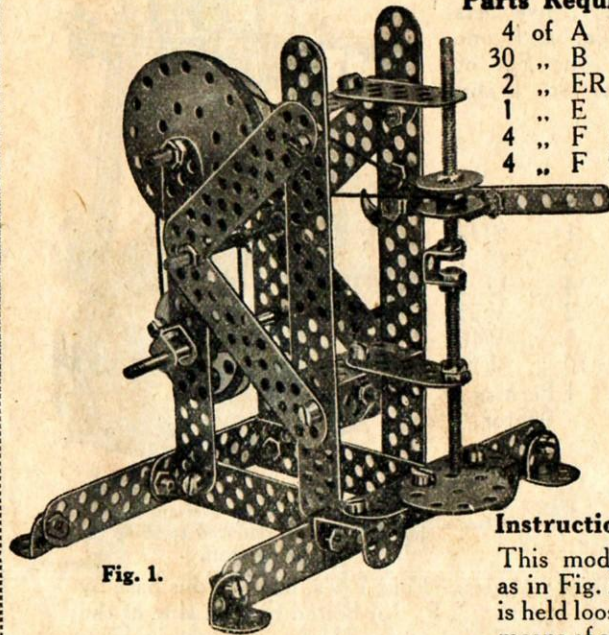


Fig. 1.

## Instructions :

This model can be built on an E 1 contained in a Set of Moto Trix as in Fig. 2, or with two F 17's as in Fig. 1. The vertical drilling head is held loosely in the two horizontal F 5's and is raised and lowered by means of a spanner, acting as a lever. Driving pulley on the crankshaft as in EC 37. Two P 49's with a P 29 in between, form the driving pulley on the top shaft. The V-pulley driving the drill is fixed on the S 55 as in EC 40. A pulley made of P 29's and nuts replaces the crank handle when the model is motor-driven. The Permag Motor is fastened to the side of the base by two A 1's and drives the shaft by means of a small rubber band or string.

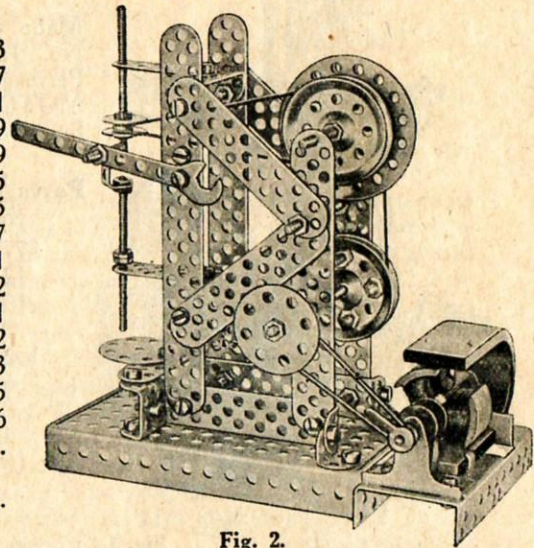


Fig. 2.



# TRIX Model No. 104B. SINGLE CYLINDER VERTICAL ENGINE WITH CENTRIFUGAL GOVERNOR.

Made with five Sets No. 1, five Sets No. 1a, one Set No. 2a, and one Permag Motor, or with one Set of MOTO TRIX, four Sets No. 1 and four Sets No. 1a.

## Parts Required :

20	of	A	1
77	"	B	1
12	"	F	5
19	"	F	9
10	"	F	13
156	"	N	1
6	"	P	29
2	"	P	49
4	"	S	25
16	"	S	55

1	of	SUI
1	"	SU2
9	"	U 1
4	"	U 2
2	"	V 35
5	"	W10
10	"	W16
1		Permag Motor.

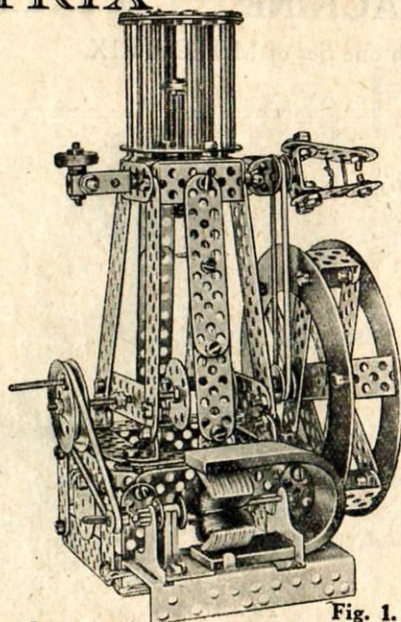


Fig. 1.

## Instructions :

Build the base first of eight F 9's and eight F 5's joined together by angles. Four F 9's, fixed to this base by angles, form the top and the crank-case, which is supported by angles. A P 29 is bolted to each side of the base. The crank-case is made of four F 13's, joined at the top by two F 5's and four U 2's as shown in Figs. 1 and 2. F 9's overlapped five holes are fixed to these U 2's at the back and front and are fastened to the base by A 1's. Two F 9's are bolted across in the second holes of the F 13's and act as bearings for the crankshaft. The cylinder is composed of two P 49's and four S 55's and a piston of one S 55 and three W 16's is inserted.

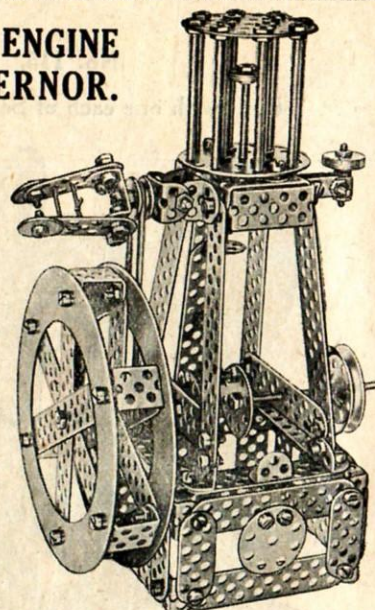
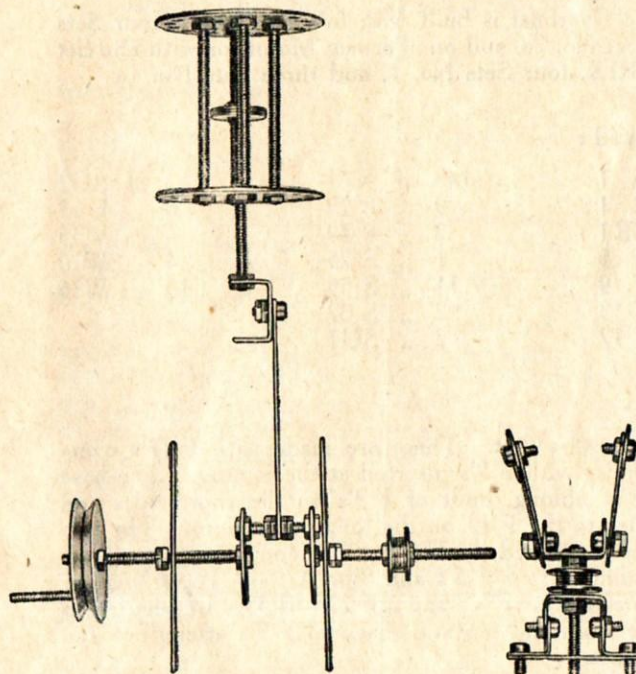


Fig. 2.

The strip of F 9's overlapped five holes has been removed to show the crank-shaft.



# Model No. 104B. SINGLE CYLINDER VERTICAL ENGINE WITH **TRIX** CENTRIFUGAL GOVERNOR.



**Fig. 3.**

Fig. 3 shows the cylinder, piston, connecting rod, crank-shaft, pulleys and bearings, F 9's. The centrifugal governor with pulley is also shown.

## **Instructions—Continued.**

Eight S 55's are fixed in the outer holes of the P 49's, and represent insulated lagging.

The Steam Valve is made as follows: An SU 1 and SU 2, joined by an S 25, are bolted to the F 5, at the side of the crank-case, and an S 25 and washers are fixed by nuts at the end.

The crank-shaft, shown clearly in Fig. 3, is made of two S 55's, two P 29's and one S 25, and the connecting rod of one F 9. The "big end" is placed loosely between locknuts on the S 25 and the "little end" is fixed to a U 1 by a bolt and locknuts. See Fig. 3. The crank-shaft is held in position by locknuts, and two V 35's and one S 25 are fixed at one end as pulley and hand crank. On the other side a small pulley of W 16's and W 10's, and the fly-wheel, are fixed.

The centrifugal governor is made as in Fig. 3. The F 5's are locked loosely on the U 1, allowing them to expand outwards, and this expanding action of the governor is controlled by a small elastic band. The governor is driven by a band passed over the two small pulleys.

The flywheel is made of six F 13's and six U 1's. The pattern for the cardboard discs is shown on page 72.

A Permag Motor is fixed to the side of the case by two bolts and nuts, and drives the crankshaft by means of a small band placed in position over the two pulleys.



# TRIX

## Model No. 105B. OVERBOAT.

This fine little Overboat is built with five Sets No. 1, four Sets No. 1a, one Set No. 2a, and one Permag Motor, or with one Set of MOTO TRIX, four Sets No. 1, and three Sets No. 1a.

### Parts Required :

16 of A 1	148 of N 1	2 of SU2
75 „ B 1	9 „ P 29	6 „ U 2
1 „ ER1	2 „ P 49	4 „ V 35
16 „ F 5	1 „ S 25	4 „ W10
20 „ F 9	11 „ S 55	10 „ W16
10 „ F 13	2 „ S 87	
16 „ F 17	2 „ SU1	

### Instructions :

Construct the towers first. These are made with F 17's overlapped three holes with F 9's inserted at the joining. The base of each tower is oblong, built of F 9's on the short sides and joined by angles to the F 13 on the long outer sides. The two inner sides are connected by U 2's. The top of each tower is square, composed of four F 5's and four A 1's. The triangular shaft bearing needs four F 5's and a P 29. S 55's are secured in the ninth hole from the top and diagonal F 9's strengthen the tower at the base.

Four F 13's are bolted to each of the central hubs, P 49's, two on one side and two on the other. Next make up the boats, each of one U 2, two P 29's and two F 9's. Fix the F 9's on

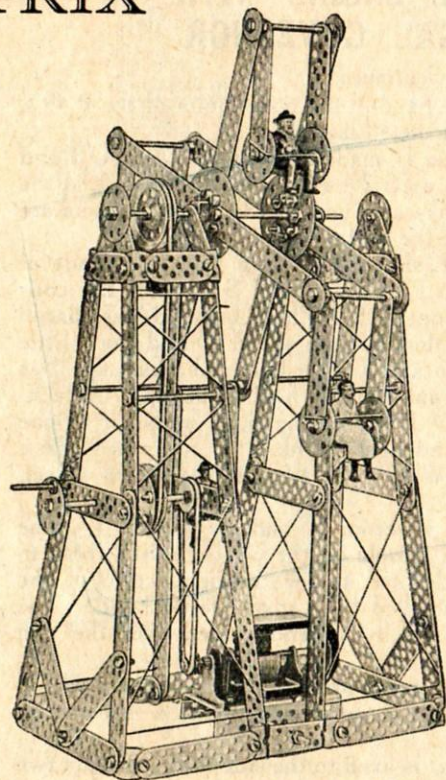


Fig. 1.



# TRIX

## Model No. 105B. OVERBOAT.

### Instructions—Continued.

S 55's between locknuts and on the outside attach the F 13's, making them fast by nuts.

SU 2's are fixed to each of the P 49's similar to EC 31 and to one of these an S 55 is attached. This shaft runs in the top hole of the F 5's and a pulley as in EC 40 is fixed to the S 55. A rubber driving band is inserted over this pulley. An SU 1 at the other end of the shaft keeps it in position. An intermediate shaft, S 87, runs in the horizontal F 9's of the tower. The rubber driving band is placed over a second pulley fixed to the shaft as in EC 37. On the inner end of the shaft a pulley, made of two W 16's and nuts, is fixed. An SU 1 and crank handle are secured to the other end.

The Permag Motor is fastened in the base by S 55's as illustrated and drives the intermediate shaft by means of another rubber driving band passed over the small pulley.

Figures and coloured string complete this model.

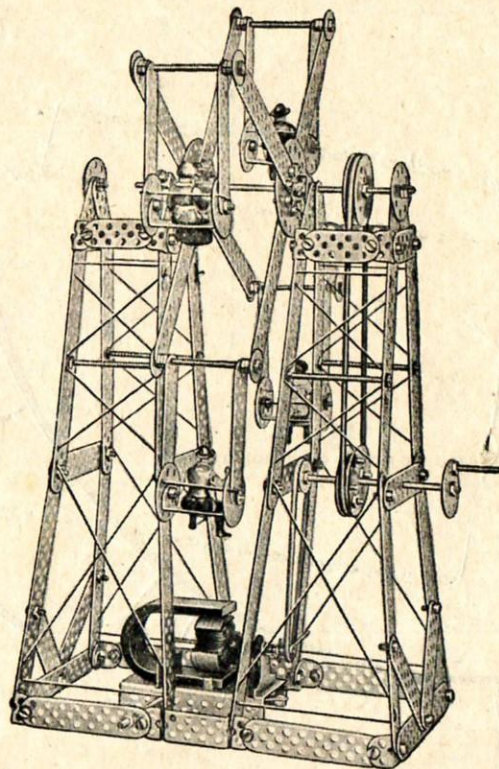
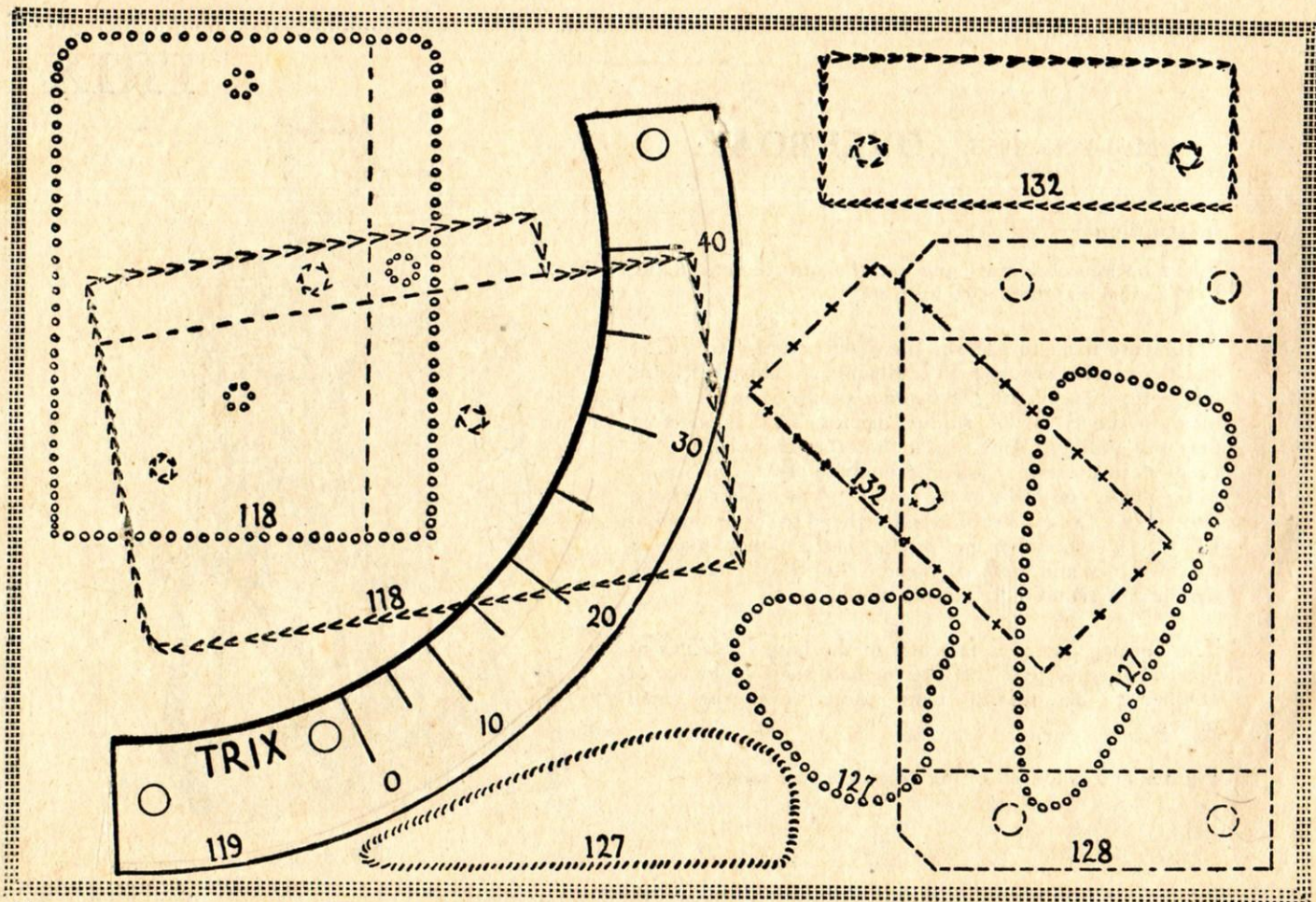
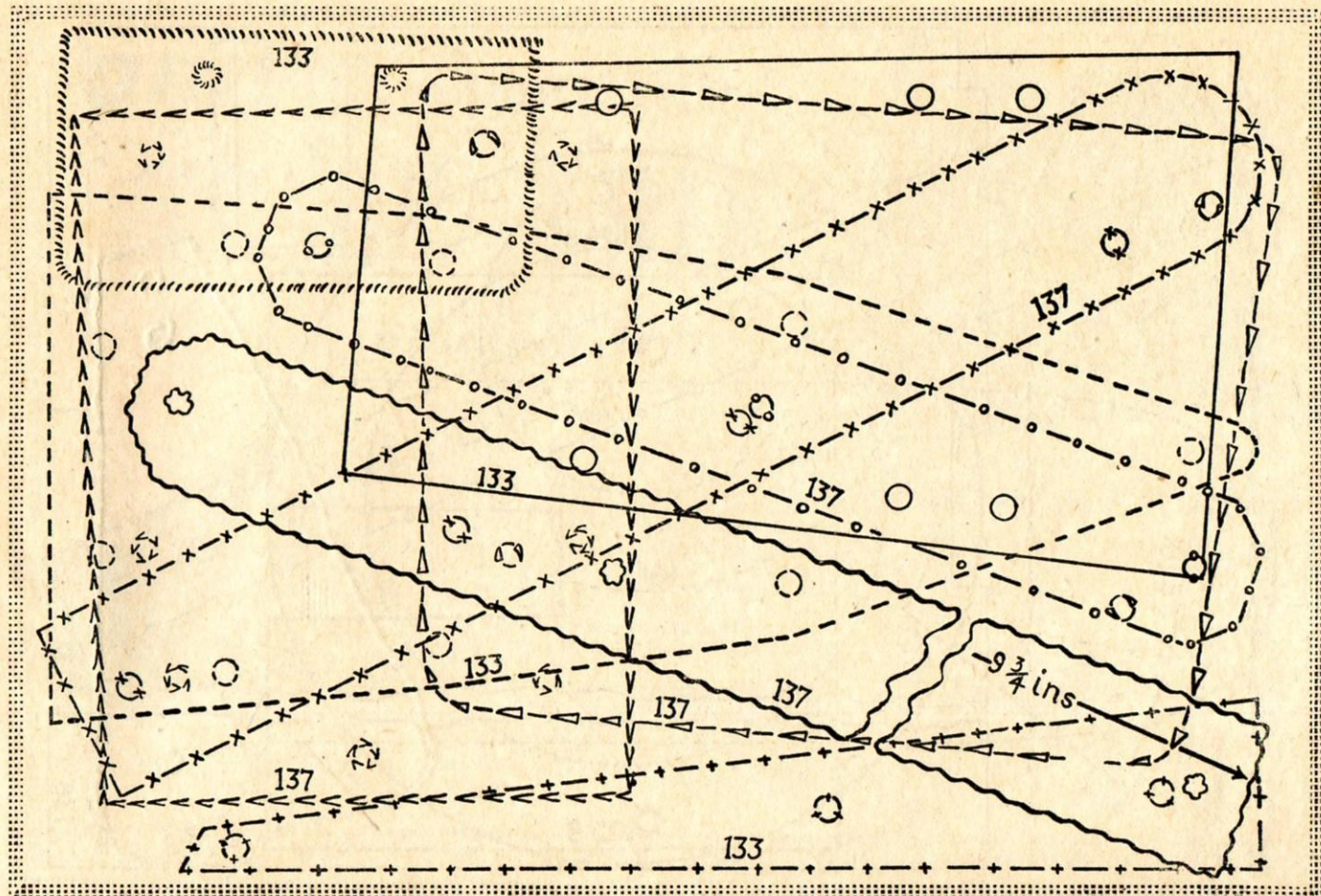


Fig. 2.

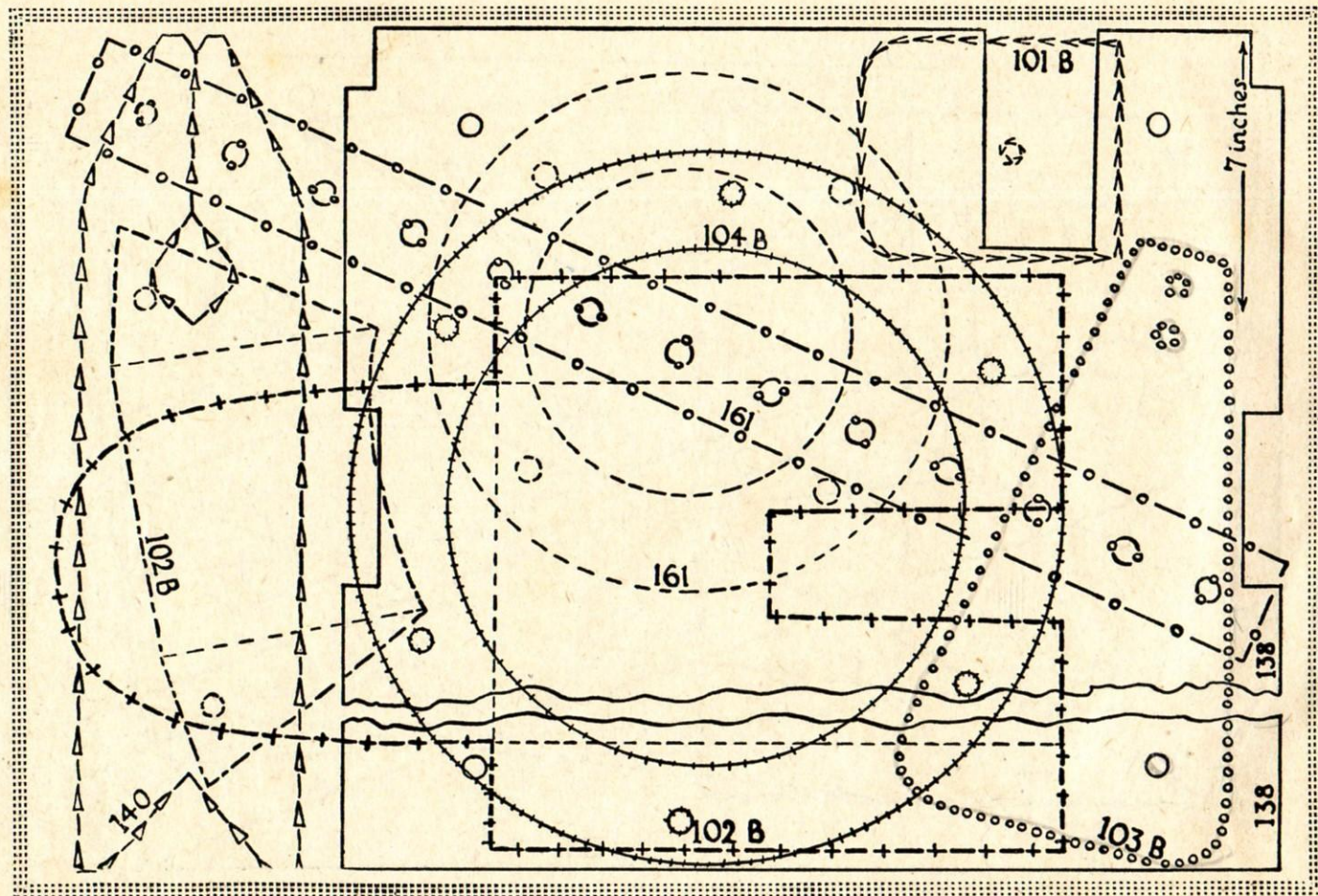








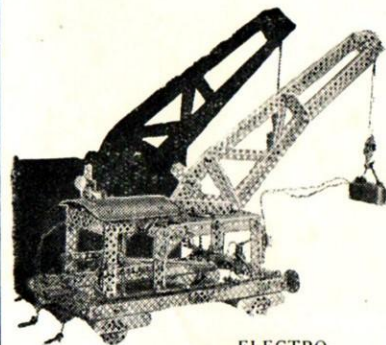






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# 2/6



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# 3/11

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Address all enquiries to:

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