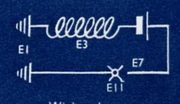
MODEL No. 31

SINGLE DROP HAMMER

Part No.		Part No.	
A1	2	E11	1
B1	14	F9	2
E1	1	F13	2
E3	1	N1	27
E4	1	P29	2
E6	4	S55	3
E7	1	U2	2
E8	2	W10	2
E9	1	W16	1
E10	1		



Wiring diagram

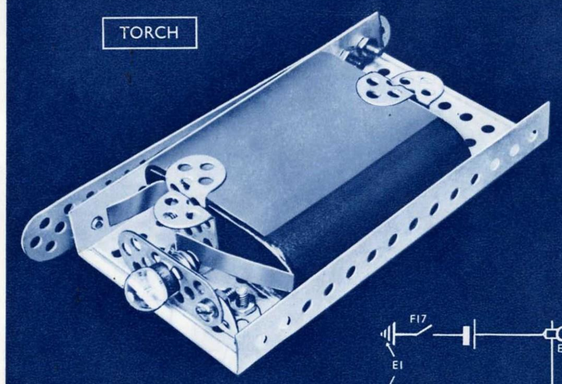
CONSTRUCTION

Main frame consists of two F13's cross-braced by U2's and fastened by A1's to base E1. The bobbin E3 is held in position by S55's and a P29 acting as a packing piece on the top U2 as shown. Between the P29 and E3 a piece of card is placed to prevent the E9 sticking in the bobbin. The lower U2 and centre of E3, act as guides for this E9 which carries a W16 as hammer. Two horizontal F9's carry an S55 to the centre of which an E11 is fixed. The S55 is turned by a crank made from P29 and E4. Two E8's are fixed to base and carry an E7. One battery lead goes to the E7 and the other to one lead of bobbin. Other bobbin lead is earthed.
When the crank is turned the E11 makes contact with the E7 thus completing the circuit and energising the bobbin causing the E9 to be drawn up. Further turning of the crank breaks contact and the hammer will fall.

MODEL No. 15

TORCH

Part No.		Part No.	
A1	3	F17	1
B1	9	N1	9
E1	1	U1	2
E12	1		



Wiring diagram

CONSTRUCTION

Lampholder, E12, is fixed to base E1 by an A1. The 4½ volt flat battery is held in the base with A1's and U1's. The long strip of battery should press firmly against the centre contact of bulb. Switch consists of an F17 fixed to E1 and bent out slightly. An N1/B1 is fitted in F17 and passes through E1. Bend up short strip of battery so that it is just clear of the N1/B1. Press switch and bulb will light up.

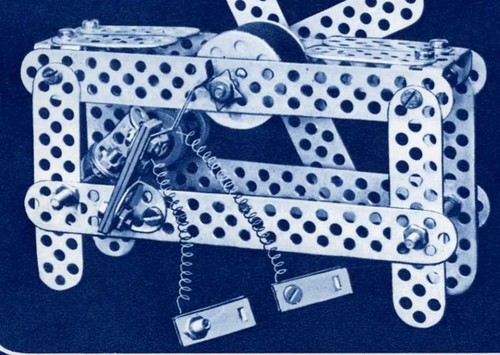
Be sure all electrical connections are clean and tight.

MODEL No. 26

PLANING BENCH

Part No.		Part No.	
A1	2	F9	4
B1	14	F13	2
E3	1	F17	4
E4	1	N1	34
E6	4	P29	2
E7	1	S55	3
E8	2	U1	1
E10	1	U2	2
E11	1	W10	2
F5	4		

Wiring diagram



CONSTRUCTION

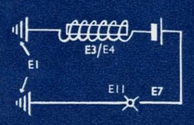
The frame is made up of four horizontal F17's with four vertical F9's as legs. U2's join the top and S55's the bottom. Four F5's make up the table. The planer is made of a cut down cotton reel fixed between two P29's on a shaft S55 which revolves in the centre holes of the top F17's. A cross of F13's is fixed at one end of this shaft, the other end carries a commutator E11. Bobbin E3 and core E4 are fixed to a U1 to which an A1 is bolted and attached to one of the lower S55's. The crossed F13's should clear the E4 when rotating. The commutator brush E7 is fixed to E8's which are attached to the lower F17 by an A1. One E3 lead is earthed to frame, the other goes to the battery. The commutator circuit is SEC 7. Adjust carefully and start by hand.

Use SEC 4 to increase the power of this model.

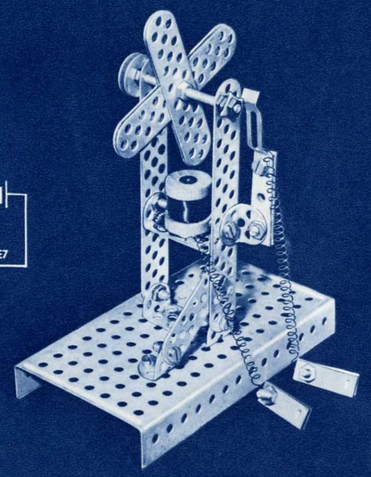
MODEL No. 29

MOTOR

Part No.		Part No.	
A1	2	E11	1
B1	12	F5	1
E1	1	F9	4
E3	1	F13	2
E4	1	N1	22
E6	4	S55	1
E7	1	U2	2
E8	2	W10	2
E10	1	W16	2



Wiring diagram



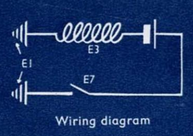
CONSTRUCTION

The framework consists of two vertical F13's attached to base E1 by a U2. Another U2 fixed to the F13's, six holes up from the base, carries an E3 and E4. Working in the top outside holes of the F13's is an S55 which carries in the centre a cross made from four F9's. Attached to one end of the S55 is a pulley made from a W10 and two W16's. At the other end of the spindle (S55) a commutator E11 is fixed. The commutator brush E7 is fixed to two E8's which in turn are attached to the F13 by an A1. The F9's, commutator E11 and brush E7 are adjusted and the model wired as described in SEC 7. Start by hand.

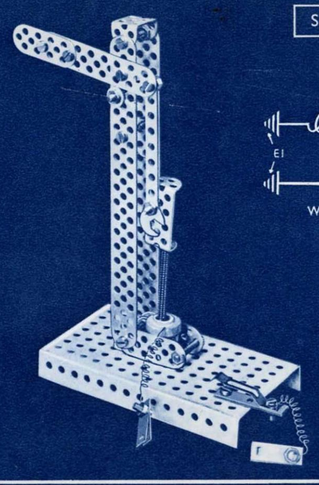
MODEL No. 25

SIGNAL

Part No.		Part No.	
B1	18	F17	2
E1	1	N1	24
E3	1	S25	1
E6	4	S55	1
E7	1	U1	2
E8	1	U2	1
E10	1	W10	3
F5	3	Sp	1
F9	3		



Wiring diagram



CONSTRUCTION

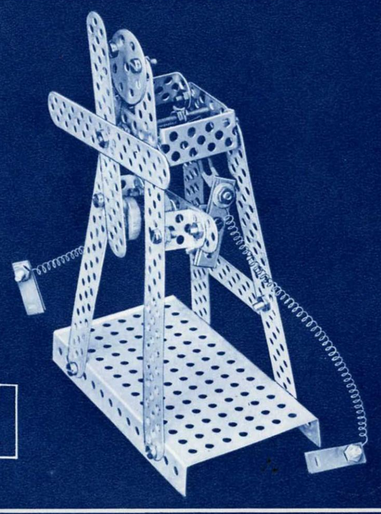
Signal post made of two F17's and two F9's is fixed to base by U1. Also attached to this U1 are two F5's which with an S25 hold bobbin E3. Signal quadrant F9 and F5 is pivoted to post, the operating rod consists of an Sp, U2 and S55, one end of which dips into the bobbin. Loose joints made from a B1 and two N1's are used as pivots for signal and operating arms. A switch made from E7 bolted to E8, is fixed to base. One battery lead is connected to this E7.
One side of E3 is earthed to frame, the other going to battery. When the E7 is pressed into contact with the base, current flows through the bobbin, which attracts the S55 and so causes the signal arm to move to the off position.

MODEL No. 27

WINDMILL

Part No.		Part No.	
A1	1	F5	4
B1	20	F9	2
E1	1	F13	2
E3	1	F17	4
E4	1	N1	29
E6	4	P29	1
E7	1	S55	1
E8	2	U1	2
E10	1	U2	2
E11	1	W10	2

Wiring diagram



CONSTRUCTION

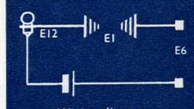
Framework consists of F17's joined at top by U2's and F5's. Sails are F13's attached to an S55 which also carries the commutator E11. The bobbin E3 and core E4 are fixed on an F9 which is attached to front F17's by U1's. The commutator brush E7 is attached to E8's which in turn is fixed to the F9 by an A1. Circuit and operation as in SEC 7.Start by hand.

Be sure all electrical connections are clean and tight. To increase the power of the motor driving the sails use two batteries connected up as in SEC 4.

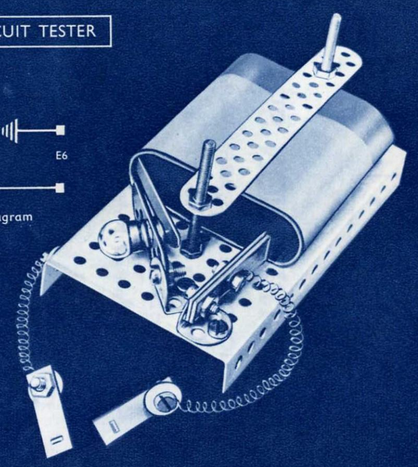
MODEL No. 18

CIRCUIT TESTER

Part No.		Part No.	
A1	2	E12	1
B1	8	F13	1
E1	1	N1	16
E6	3	S55	2
E8	2	W10	3



Wiring diagram



CONSTRUCTION

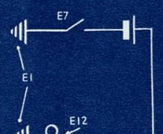
The battery is held to the base by two S55's and an F13. Bulb holder E12 is fixed to base E1 by an A1 so that the centre contact of the bulb presses against the long strip of battery. Short strip of battery makes contact with an E6 fixed to two E8's which in turn are fixed to an A1 bolted to base. One test lead is attached to the base, the other to the E6. To operate, fix one lead to each end of circuit to be tested. Bulb will light up if circuit is complete.

Be sure all electrical connections are clean and tight.

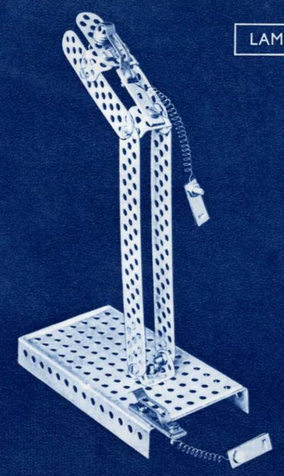
MODEL No. 17

LAMP STANDARD

Part No.		Part No.	
A1	2	E12	1
B1	15	F9	2
E1	1	F17	2
E6	4	N1	15
E7	2	U1	2
E8	2	W10	1
E10	2		



Wiring diagram



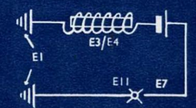
CONSTRUCTION

The standard consists of F17's and F9's joined together and to the base, E1, by U1's. Bulb holder, E12, is fixed by A1's to the F9's, the centre contact of bulb presses against an E7 fixed to an E8 which is attached to the top U1. Battery clip (E6's) is connected to the E7 by an E10.
Switch is made from an E7 attached to an E8 (note that this fixing bolt is clear of the base). Other battery lead is connected to this bolt. Contact is made by pressing the E7 on to the B1 which secures E8 to base.

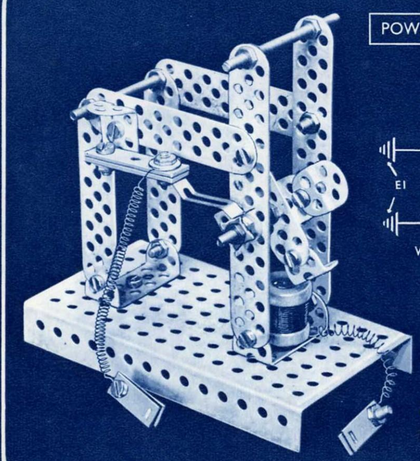
MODEL No. 28

POWER MOTOR

Part No.		Part No.	
A1	4	E11	1
B1	16	F5	2
E1	1	F9	4
E3	1	F13	2
E4	1	N1	32
E6	4	S55	3
E7	1	U1	1
E8	2	U2	2
E10	1	W10	3



Wiring diagram



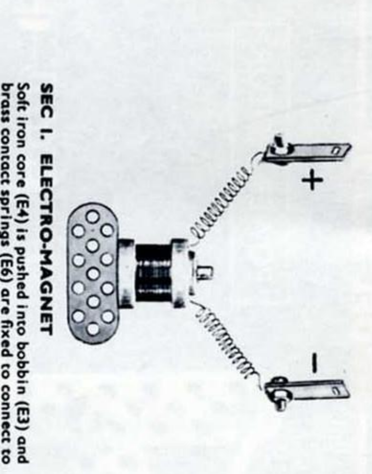
CONSTRUCTION

Framework consists of vertical F13's attached to base E1 by a U2 and braced with F9's as shown. The bobbin E3 and core E4 are fixed to base through the centre hole of the U2 which holds the F13's.
The revolving armature, carried on a spindle S55, is made from crossed F5's, which carry A1's at their ends. A commutator E11 is fixed to this spindle. An E7, fixed to E8's is held to frame by a U1. Circuit as in SEC 7. Adjust carefully and wire up to battery. Spin armature to start.

To increase the power of this motor use two batteries connected up as in SEC 4.

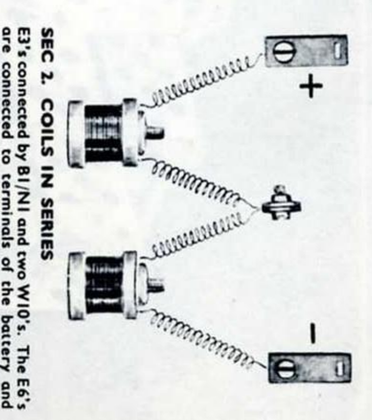
STANDARD ELECTRICAL CIRCUITS

As you work through the examples of Trix models given overleaf, you will find that certain types of electrical circuits will recur. Here we give seven examples of electrical circuits and when giving you hints on how to assemble models we shall merely refer to these circuits by their numbers (e.g. SEC 7). Study these SEC's carefully, as the proper working of your models is dependent upon accurate construction, clean contacts, etc. Always adjust very carefully. For clarity, framework and base plates have been omitted from the illustrations.



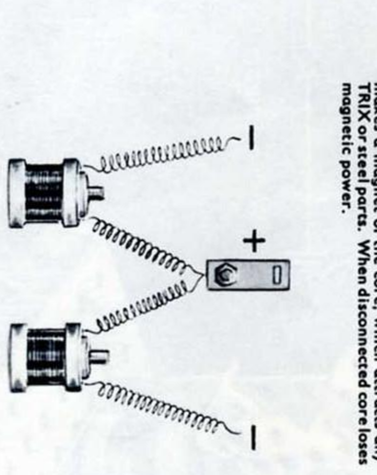
SEC 1. ELECTRO-MAGNET

Soft iron core (E4) is pushed into bobbin (E3) and brass contact springs (E6) are fixed to connect to battery. The current passing around the coil makes a magnet of the core, which attracts any TRIX or steel parts. When disconnected core loses magnetic power.



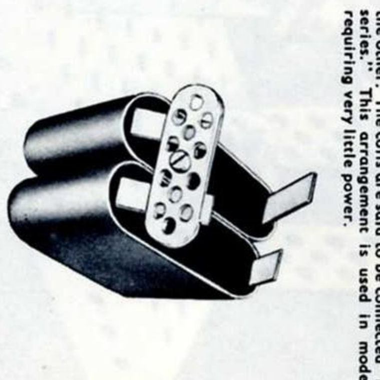
SEC 2. COILS IN SERIES

E3's connected by B1/N1 and two W10's. The E6's are connected to terminals of the battery and current passes through one coil and then through the other. The coils are said to be connected "in series." This arrangement is used in models requiring very little power.



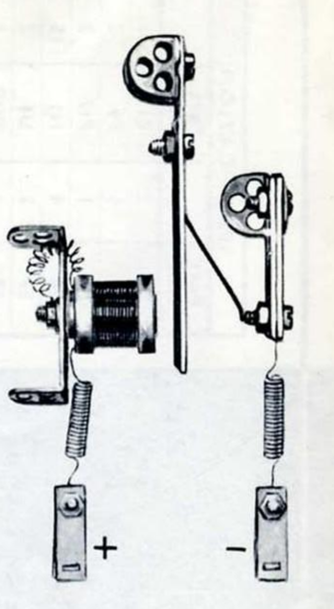
SEC 3. COILS IN PARALLEL

E3's connected by an E6. The E6 is connected to one side of the battery. The loose wires from the E3's can be joined up to framework of model, or joined together direct to the other side of battery. Coils are said to be connected "in parallel." This method of connection uses more current than when "in series," but gives more power necessary for larger models.



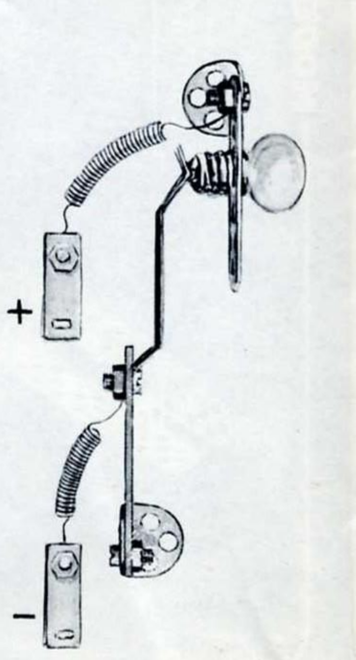
SEC 4. BATTERIES IN SERIES

Two pocket lamp batteries connected by two F5's and a B1/N1, joining the long and short ends (i.e. positive and negative). This increases the driving power for models. When using 3·5 volt pocket lamp bulbs the above method of connecting the batteries must *NOT* be used, as the voltage is too great and would burn out the lamps. In this case the batteries must be connected in parallel.



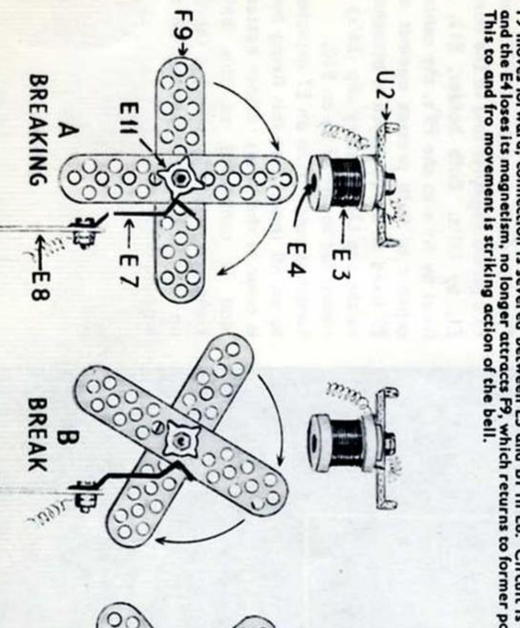
SEC 5. BELL or BUZZER CIRCUIT

Current passes from one side of the battery through E10 to B1 in E8, and along E5 (slightly bent, as shown, and bolted to an F9) to U1. The current then flows via the base through E3 to other side of battery. E4 is now a magnet and attracts F9. As the F9 moves forward, connection is severed between E5 and B1 in E8. Circuit is broken and the E4 loses its magnetism, no longer attracts F9, which returns to former position. This to and fro movement is striking action of the bell.



SEC 6. LAMP CIRCUIT

E6's connect the two E10's to the two terminals of the battery. Thus the current passes from one terminal of the battery to the E7 on the insulator E8. From here it passes to the centre contact of the lamp bulb and through the filament to E12, which is bolted to the framework, and so to the other terminal of the battery.



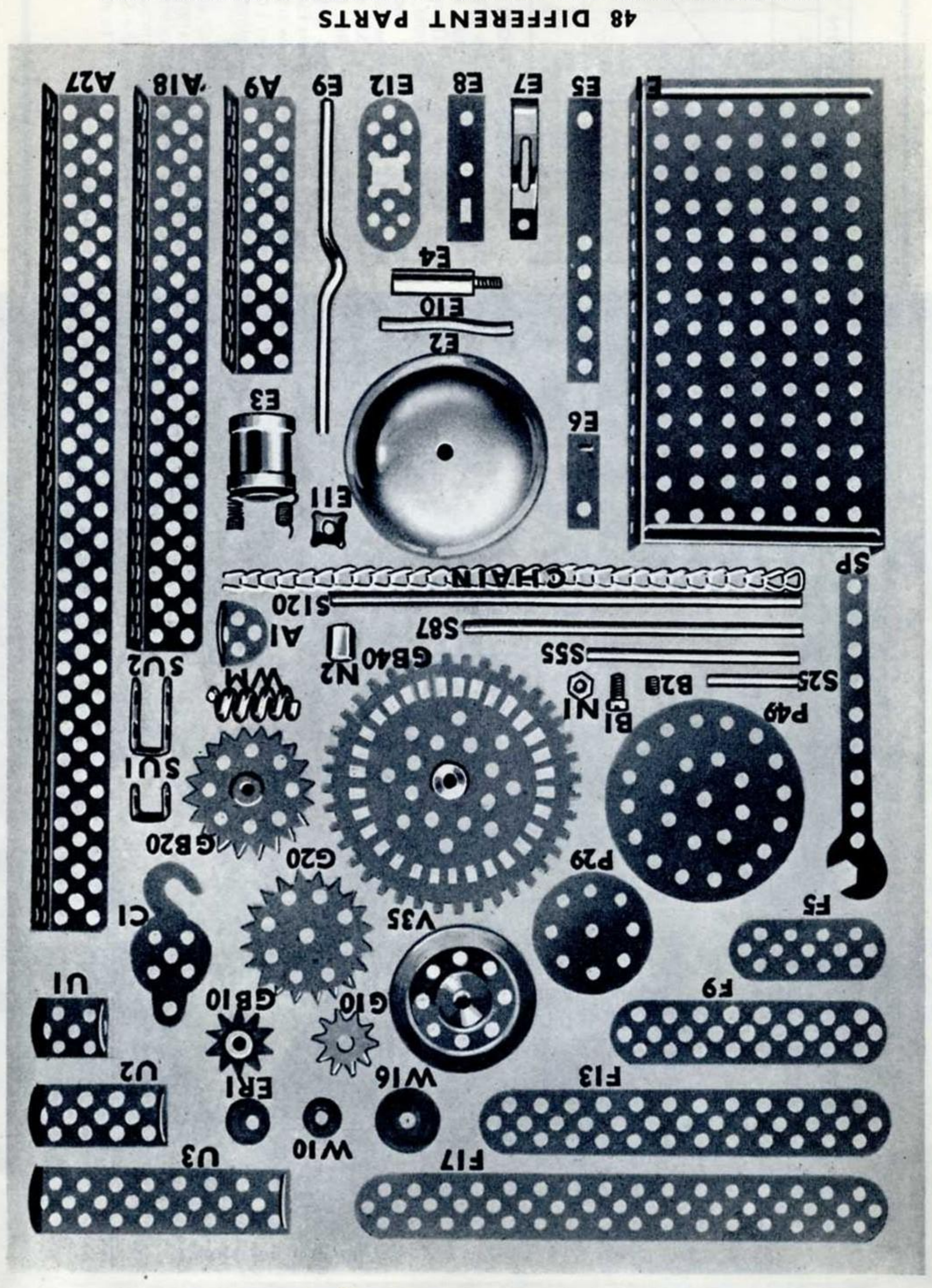
SEC 7. COMMUTATOR CIRCUIT

This shows how to set an E11, to make proper contact with an E7, to build and run a motor. One terminal of battery is connected to the E7 which is insulated from frame by an E8. Other terminal of battery is connected to one wire of E3 into which is inserted an E4; E4 is secured to a U2 bolted to frame. Other wire of E3 is fastened to U2. The cross of F9's on a spindle, to which is fixed the E11, revolves in a clockwise direction. Gap between F9 and E4 must be as small as possible. Insert W10's between E3 and U2 to adjust gap.

When the cross is EXACTLY in position "A" set E11 so that it just breaks contact with E7.

When the E11 and E7 are in contact (see "C") the circuit is complete and the current flows through E7 to E11, thence via the frame to U2 and through E3 back to battery. The E3/E4 is now an electro-magnet (see SEC 1) which attracts an arm of the cross. As this revolves, contact between E11 and E7 is broken (see "B"); thus the E3/E4 loses its magnetic power. However, momentum of the cross, acting as a flywheel, causes it to continue turning until position "C" is reached when the cycle of operations again takes place.

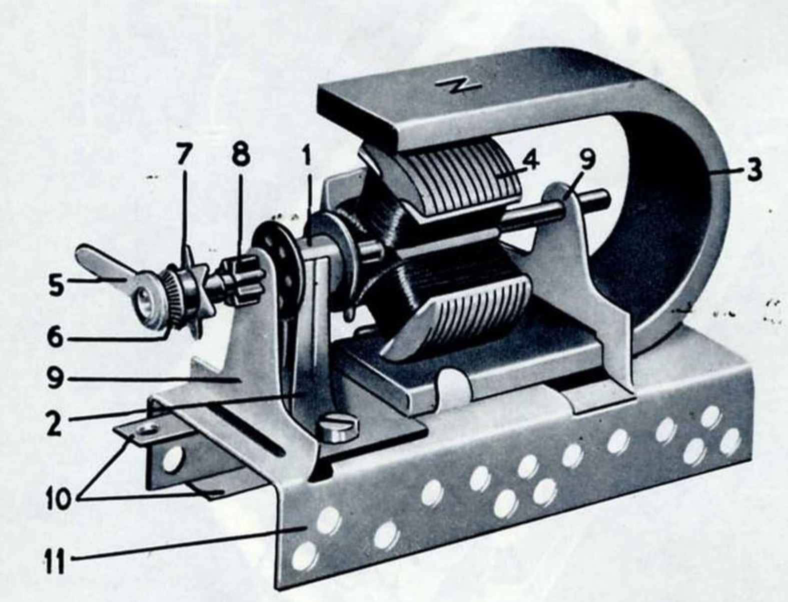
This construction and circuit clearly demonstrates the elementary principle underlying all forms of electro-magnetic motors.



48 DIFFERENT PARTS

ILLUSTRATION SHOWS THE VARIOUS CONSTRUCTOR COMPONENTS USED IN THE TRIX SYSTEM. WITH THEM YOU CAN ACTUALLY MAKE 48 EXCITING MODELS WHICH INCLUDE FUNICULAR RAILWAY, MOBILE DOCKYARD CRANE, WINDMILL PUMP, MORSE TELEGRAPH, ETC., ETC.

Permag ELECTRIC MOTOR 2051



KEY

1. Commutator.
2. Contact Brushes.
3. Magnet.
4. Armature.
5. Driver.
6. Pulley Wheel.
7. Chain Sprocket Wheel.
8. Small Gear Wheel.
9. Bearing.
10. Terminals.
11. Base.

HERE is the sturdy and surprisingly powerful Trix "Permag" motor which is used to drive and operate many models.

It is mounted on a girder-type base which enables it to be bolted in position within the framework of the model it is working. It can be used with Trix or with other types of Constructional Sets and it is quite literally the "little motor of a thousand and one uses".

The powerful permanent magnet gives a strong " field " and the tripolar laminated armature revolves in sturdy bearings, giving only minimum air gap between the pole-pieces and the magnet. This means that the motor is very economical in current.

For light model work it will run from a single pocket flash lamp battery ($4\frac{1}{2}$ volts), but for heavy work (such as driving cranes or lifting heavy loads) it is better to use batteries with a bigger capacity, e.g., bell batteries or accumulators. Any battery giving between 4 and 8 volts is suitable. The motor should *never*, of course, be connected up to the house lighting mains, whether A.C. or D.C.

One of the great features of this motor is that it can be used to drive by belt, by chain, by gear or by direct shaft drive. It is very light in proportion to the power it develops and every boy who runs models will want to have one. Instructions for the construction of a power pack to operate this motor will be found inside the motor carton.

DRIVES

Whichever type of drive you use make sure that the driven gear wheel or pulley is in the same plane as the driver and that the drive is free without being too slack.

BELT DRIVE

A good belt can be made by cutting off a very narrow strip of an old car inner tube. Better still is a piece of thin leather boot lace. Cut to desired length, pierce at each end with a needle and join ends with wire. Avoid clumsy knots.

CHAIN DRIVE

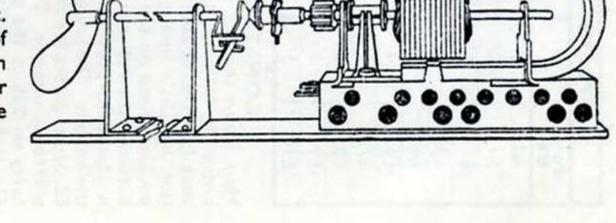
A length of suitable chain is available and with aid of small pliers any number of links can be detached to give desired length of drive. Chain drive is " positive "—it cannot slip like belt drive.

GEAR DRIVE

Many Constructor models can be driven by direct gearing. A train of gears (as in clock) can be used to step up or step down the speed.

BOAT DRIVE

The illustration shows how the Permag Motor can be used to drive a motor boat. The drive on the end of motor spindle engages in the fork on the propeller shaft and transmits the rotary motion.



TRIX

CONSTRUCTION SETS

THREE COMPLETE SETS ARE AVAILABLE

No. 1 Set contains 48 parts with which 13 models can be made.

No. 2 Set contains 112 parts with which 33 models can be made.

No. 3 Set contains 231 parts with which 48 models can be made.

EXTRA-PAKS

These consist of plastic bags which contain extra components. 24 of these Extra-Paks are available and they enable every Construction Set user to enlarge and develop his hobby at a very economical cost.

TRIX

CONSTRUCTION SETS

Build a Tractor, a Swivel Crane, a Roundabout, a Morse Telegraph or a Funicular Railway, etc., with the scientifically designed TRIX components which are illustrated and described in the four series of blueprints.

Set No. 1/13/H — 13 simple models
Set No. 2/11/H — 11 more advanced models
Set No. 3/15/H — 15 very advanced models
Set No. 4/9/S — 9 electric battery-operated models

Leaflet SCD illustrates 50 Standard Construction Details, including Double Disc Wheels; Crank and Pulleys, Piston and Cylinder; Hoist Mechanisms, etc. In addition to illustrating and describing the famous Trix Permag Electric Motor No. 2051.

Any two of the above will be sent post free on receipt of 1s. stamps, or the whole set of five will be sent for 2s. 6d.

The Ref. No. of this sheet is

Set No. 4/9/S — 9 electric battery-operated models.

TRIX 310 SUMMER LANE,
BIRMINGHAM 19.