Elektron Parts Used With Meccano

Ideas for Electrical Models

ELECTRICAL devices of one kind or another are often required in building Meccano models and while some of the more simple of these can be assembled quite easily with the aid of the parts included in the Meccano range, there are occasions when the special solenoids, contact breakers and other parts from an Elektron Electrical Outfit are of great assistance. By using these in conjunction with Meccano parts almost any kind of electrical mechanism likely to be required in a model can readily be put together. All the Elektron parts are obtainable separately, and in this article we are describing a few of their many different applications in connection with Meccano model-building.

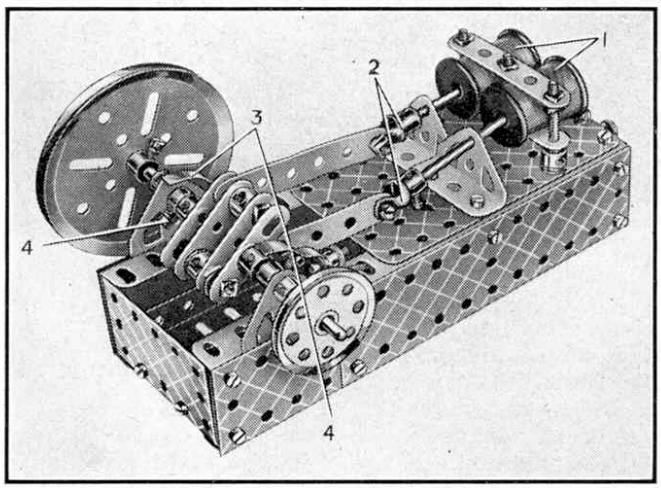

Fig. 1. A model horizontal engine operated by two Elektron Magnet Coils.

One of the first essentials in building up any electrical mechanism in Meccano is a means of insulating one metal part from another to which it is bolted. Fortunately a means of doing this is provided by the special 6 B.A. Nuts and Bolts included in the Elektron range and the Meccano Insulating Bushes and Washers (Parts Nos. 182 and 182a respectively).

The Insulating Bushes and Washers are somewhat similar in appearance to the Meccano Washers, but are made of fibre instead of metal. The Insulating Bush has a small ridge around the hole through its centre, which fits exactly into a standard Meccano hole thus preventing the shank of a 6 B.A. Bolt passed through the Bush from touching the Plate or other part to which it is attached. For example, when it is required to insulate a Strip from a Flanged Plate, a 6 B.A. Bolt is first pushed through one of the holes in the Strip and an Insulated Bush is placed on its shank. The Bolt is then passed through the desired hole in the Flanged Plate and its shank is fitted with an Insulated Washer and a 6 B.A. Nut, the latter being screwed up tightly.

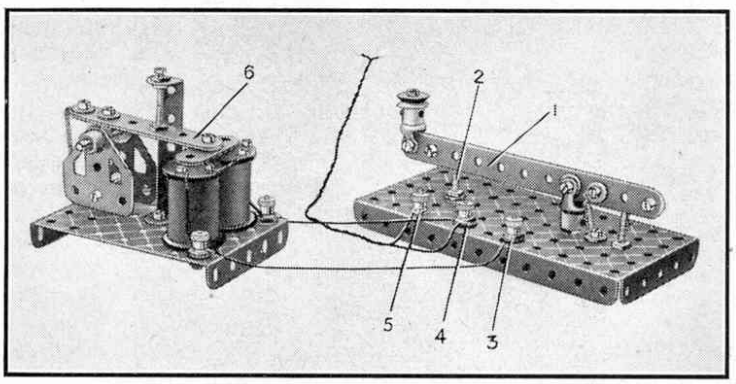

Fig. 2. It is easy to learn the Morse code with this tapper key and buzzer.

A good example of the use of 6 B.A. Bolts in building up an electrical model is illustrated in Fig. 4. This shows part of a model in which it is necessary to fit several bulbs on a rotating beam, a method of construction that is sometimes required in illuminating models such as roundabouts. As the beam has to be free to rotate it is impossible to carry wires direct to the bulbs, and the best plan is to use a rotary current collector. This consists of a Wheel Flange 2, which is fixed on to the shaft of the model by a Bush Wheel. The Wheel Flange is insulated from the Bush Wheel by means of 6 B.A. Bolts, Insulating Bushes and Washers as described above, and it picks up the current from a Pendulum Connection 1 (Part No. 172). The Pendulum Connection is insulated from the main frame of the model, and one wire from the Transformer or battery is fitted to the shank of the 6 B.A. Bolt by which the Pendulum Connection is attached. The wire is gripped by an Elektron Terminal 3 screwed on to the Bolt. The other wire from the Transformer is connected to the frame of the model.

A Lamp Holder 4 (Elektron Part No. 1534) is secured to the beam by an insulated 6 B.A. Bolt. The Lampholder is not insulated from the beam, however, but makes electrical contact with it. A Terminal is screwed on to the end of the 6 B.A. Bolt and connected by a wire to the Wheel Flange 2. The best wire to use for connecting purposes is Elektron No. 23 Gauge S.C.C. Copper Wire (Elektron Part No. 1587).

Rotary current collectors of this type also can be used to good effect in model big wheels, and there are many other instances in which they are useful.

By this time readers will have realised that the Elektron 6 B.A. Bolts and Insulating Bushes and Washers open up a tremendously wide field of subjects for models. Switches, flashing electric signs and electric locomotives fitted with proper current collecting gear are all easy to build when it is possible to insulate one part from another. A useful example is the overhead current collector or pantograph for an electric locomotive shown in Fig. 3. The construction of this is simple and when completed it is mounted on the roof of the locomotive by insulated 6 B.A. Bolts. The current is picked up from an overhead conductor wire by a curved collector 8 and is conveyed to the Motor inside the model by the wire 12. For the collector No. 26 Gauge Copper Wire (Elektron Part No. 1584) is used.

Many model-builders no doubt will be familiar with the Elektron Magnet Coils (Elektron Part No. 1538). These can be used in a great number of really fascinating

working Meccano models. The Coil is approximately 1″ in length and ¾″ in diameter, and it is supplied with a special removable metal Core (Elektron Part No. 1539), a portion of which carries a 6 B.A. thread so that the Core can be attached to a model in any desired position.

The Magnet Coils are intended to be operated from the 3.5-volt circuit of a T6A or T20A Transformer, but if four or more of them are wired together, they may be connected up in the 9-volt circuit of a T6, T6A or T6M Transformer.

One use of the Coils is in forming a hoisting magnet for an electric crane. For this purpose two Coils can be mounted on a Magnet Yoke (Elektron Part No. 1541), or alternatively the yoke can be built up from Meccano parts as shown in Fig. 5. In this case four Coils are attached to a Face Plate and are wired together in series, that is, the inner terminal of one Coil is joined to the outer terminal of the next Coil, and so on. A 1″ Rod is locked in the boss of the Face Plate and it carries an End Bearing that provides a means of attaching the magnet to the crane hook.

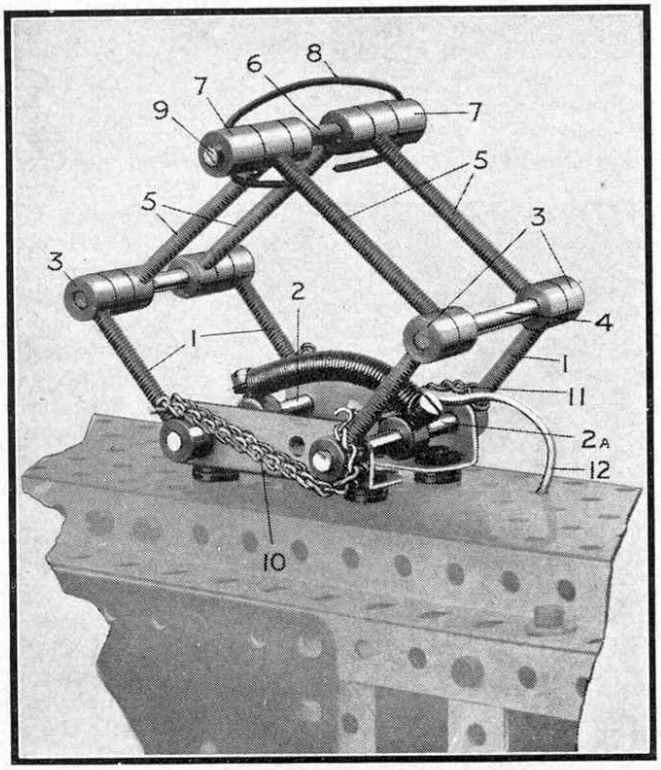

Fig. 3. A pantograph current collector for use on model electric locomotives.

Another good use for Elektron Magnet Coils is in building up electric engines such as that shown in Fig. 1. In the small horizontal engine illustrated the motive power is supplied by two Coils, the cores of which are connected to the crankshaft through connecting rods.

The engine is operated by first passing a current through one of the Magnet Coils. The core of this Coil is then sucked inward and as it is connected to the crankshaft the latter is pulled round half a turn. The current is then switched off, but the impetus of the flywheel maintains the crankshaft in motion until it has passed "dead centre." Current is then passed through the second Coil, and the core of the latter pulls the crankshaft through the remaining half turn. The process of switching the current to the Magnet Coils on and off, is carried out automatically by two commutators. Each of these consists of a Pendulum Connection 3 fixed by a 6 B.A. Bolt to an Angle Bracket, which is bolted to the base but insulated from it by Insulating Bushes. The end of the 6 B.A. Bolt is provided with a Terminal. The Pendulum Connection is curved so that the bolt 4 which is screwed into the tapped holes of a Collar on the crankshaft, makes contact with its surface when the crankshaft rotates.

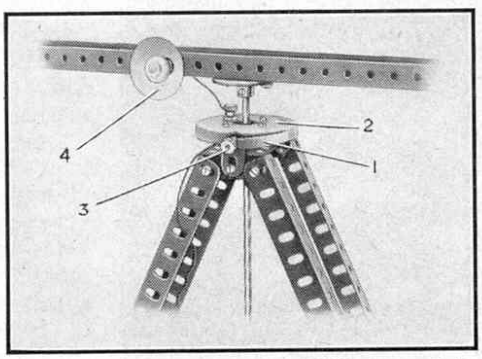

Fig. 4. A rotary current collector suitable for supplying current to rotating structures such as roundabouts.

The Pendulum Connections are each connected by wire to the outer terminals of the two Magnet Coils 1. The inner terminals of the Coils are each connected to an insulated 6 B.A. Bolt fixed at the rear of the base to serve as a terminal for one of the Transformer leads. The second Transformer lead is "earthed" to any convenient point of the frame of the model.

Readers who are interested in telegraphy and wish to learn the Morse Code used in signalling by this means, should build up the simple Morse tapper and buzzer shown in Fig. 2. Both make use of Elektron parts in conjunction with Meccano parts and they are quite simple to assemble.

The tapper consists of an arm 1, built up from three 5½″ Strips and pivotally mounted as shown in the arms of an End Bearing attached to a 5½″×2½″ Flanged Plate. The rear end of the arm is held by a length of Spring Cord against a stop formed by a ¾″ Bolt. An insulated 6 B.A. Bolt 2 is fixed to the Plate under the forward part of the arm, and is connected by a short length of wire to a second insulated Bolt 3. The latter is also joined by wire to one of the terminals of the buzzer. The two wires from the Transformer are fixed to 6 B.A. Bolts 4 and 5 on the 5½″×2½″ Flanged Plate. Bolt 4 is insulated from the Plate with an Insulating Bush and Washer and is connected to the second terminal of the buzzer, but Bolt 5 is in electrical contact with the Plate. The terminals of the buzzer are joined up to the Magnet Coils so that when the tapper arm is depressed and touches the contact 2 the circuit is completed and the Coils energized.

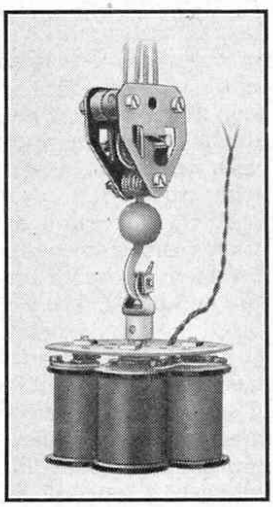
Fig. 5. Elektron Magnet Coils can be used in conjunction with Meccano parts to build up powerful magnets for cranes.

The buzzer consists of two Coils complete with Cores mounted on a 3½″×2½″ Flanged Plate. Above the Coils is a vibrating arm formed by two 3″ Strips 6 and two 1½″ Strips. A Double Bracket attached to the Strips 6 is pivoted on a 2″ Rod supported by two Flat Trunnions from the 3½″×2½″ Flanged Plate. The 1½″ Strips normally are raised from the ends of the Cores by a length of Spring Cord fixed between the rear of Strip 6 and the baseplate. A 6 B.A. Bolt fitted through a hole in the arm contacts with a second 6 B.A. Bolt attached to a 2½″×½″ Double Angle Strip as shown.

Magnet Coils can also be used in building up synchronous motors, relays and other similar mechanisms.