

Hornby Railways**OPERATING
INSTRUCTIONS****Please read before use.****SCALE MODELS****1. INTRODUCTION**

Your Hornby Model Railway has been carefully manufactured and tested at the factory. Before you start to build your layout, you should read these instructions which will help you to understand the workings of your model railway equipment and also help to avoid mistakes that may lead to damage or breakage, and consequent disappointment. Should you have any difficulty, check through the instructions first. If you are unable to see what is wrong consult either the Dealer from whom the model was purchased or your nearest Service Dealer, whose name and address appears in the Servicing Scheme Booklet supplied with all Train Sets, or write to the factory. A copy of this booklet can be supplied on receipt of a stamped addressed envelope. Our products are designed to last for years and we want you to have years of satisfaction.

2. TRACK

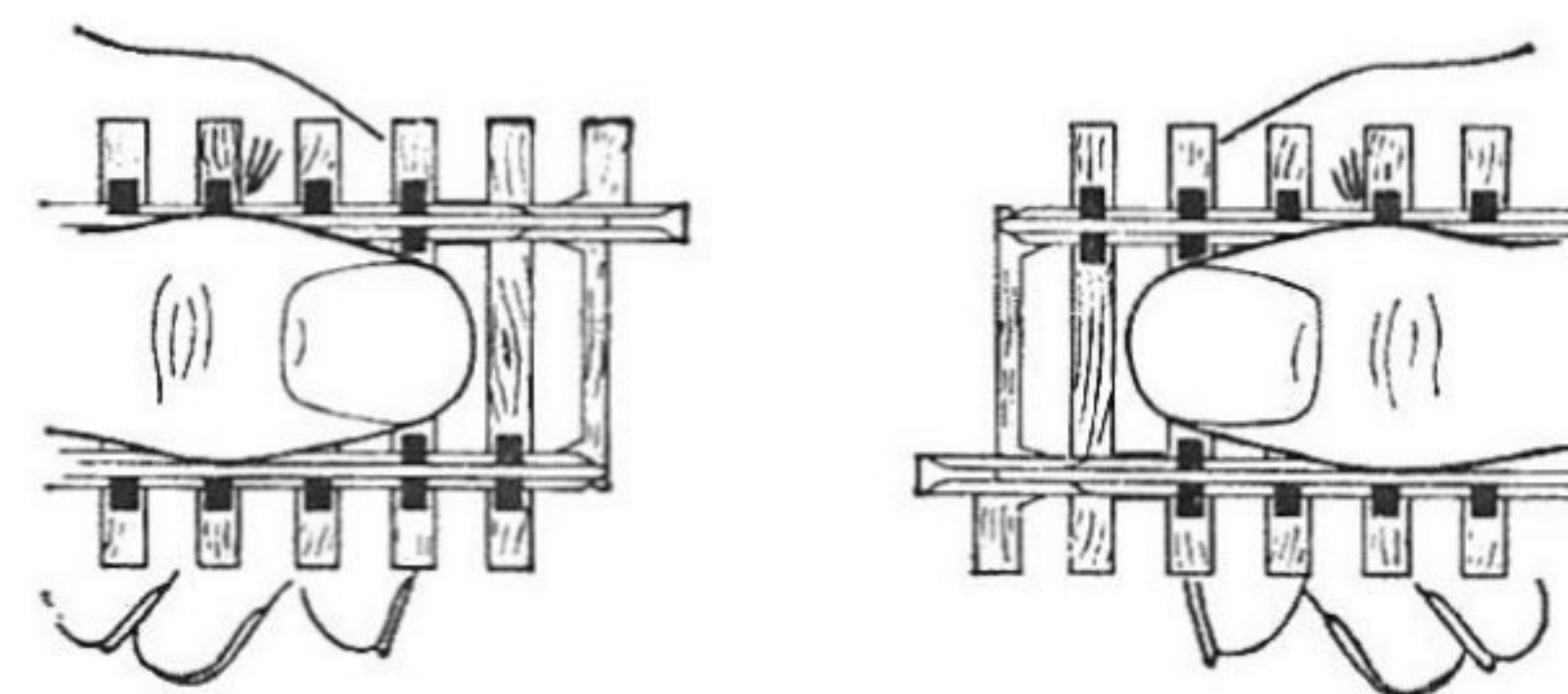
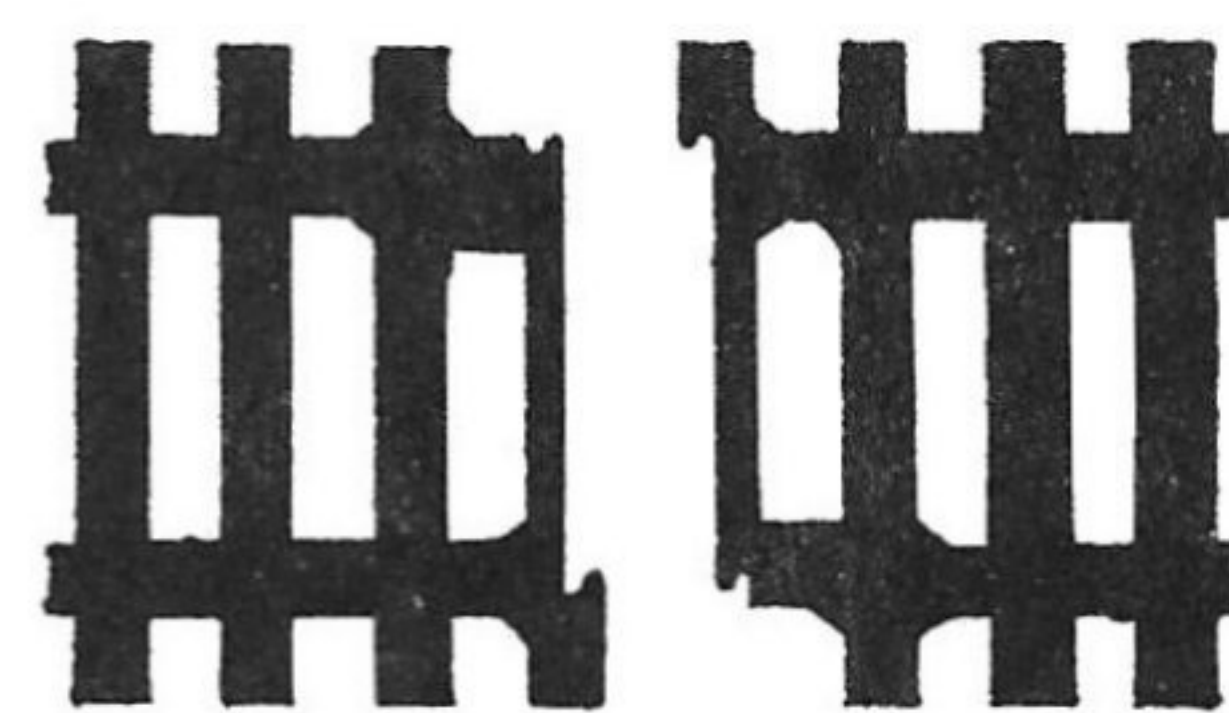
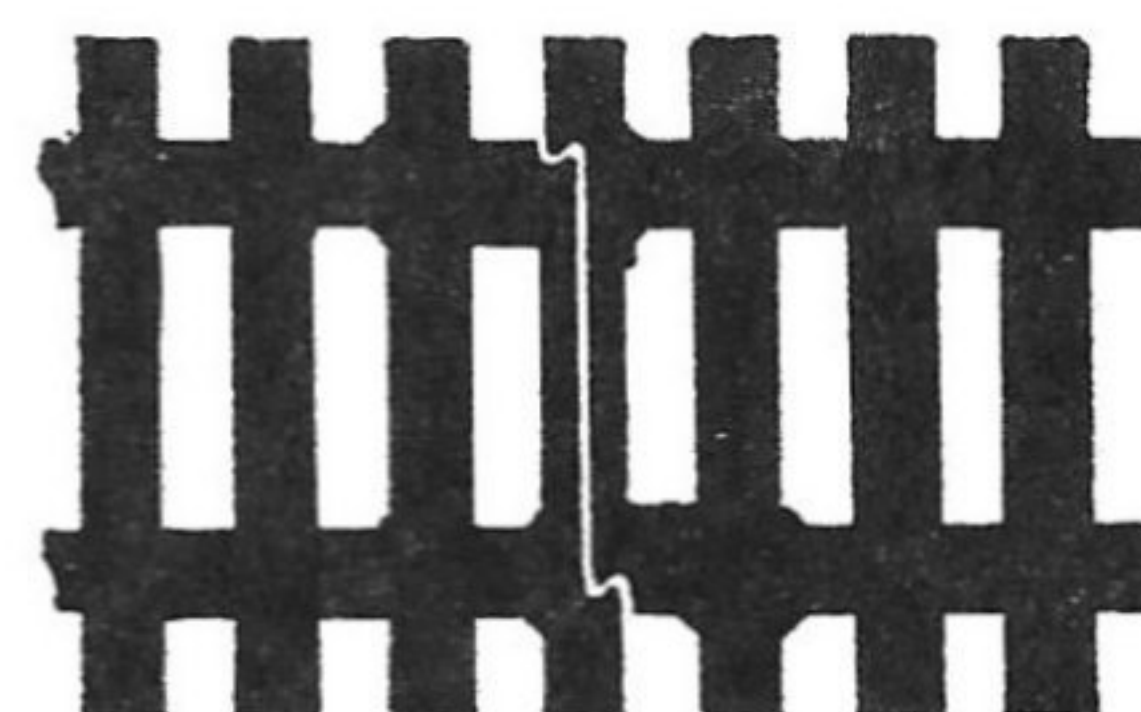
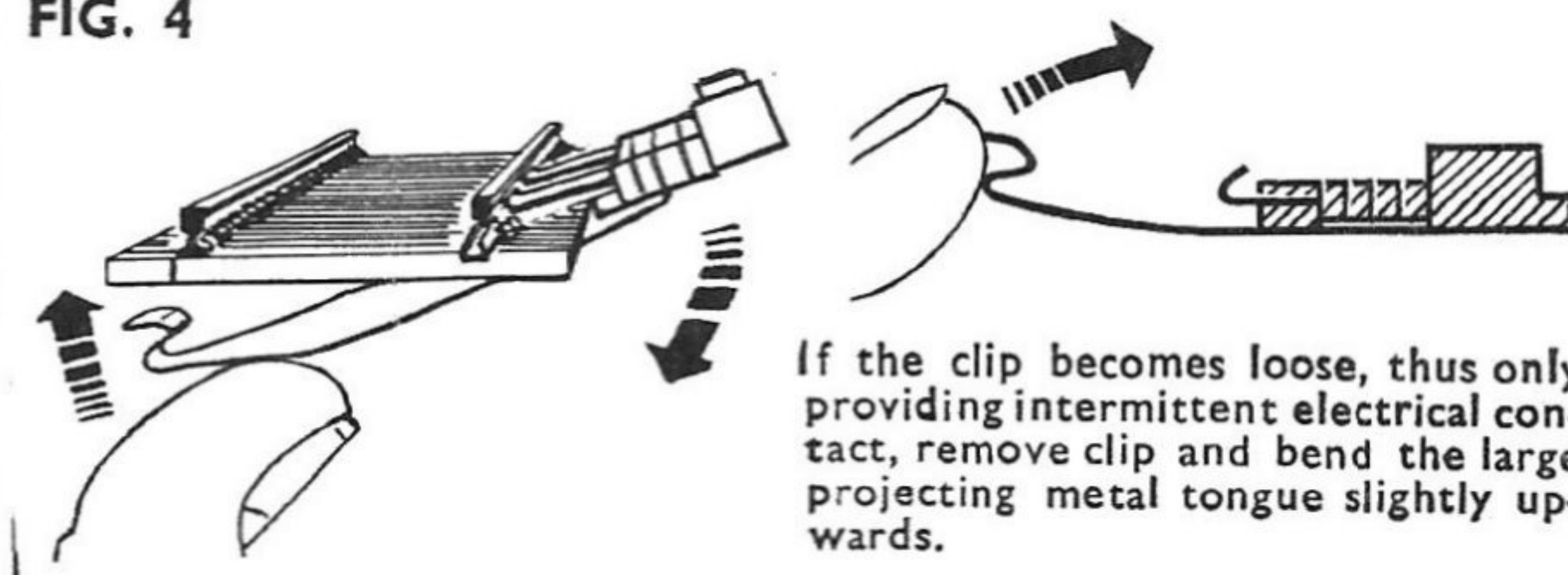
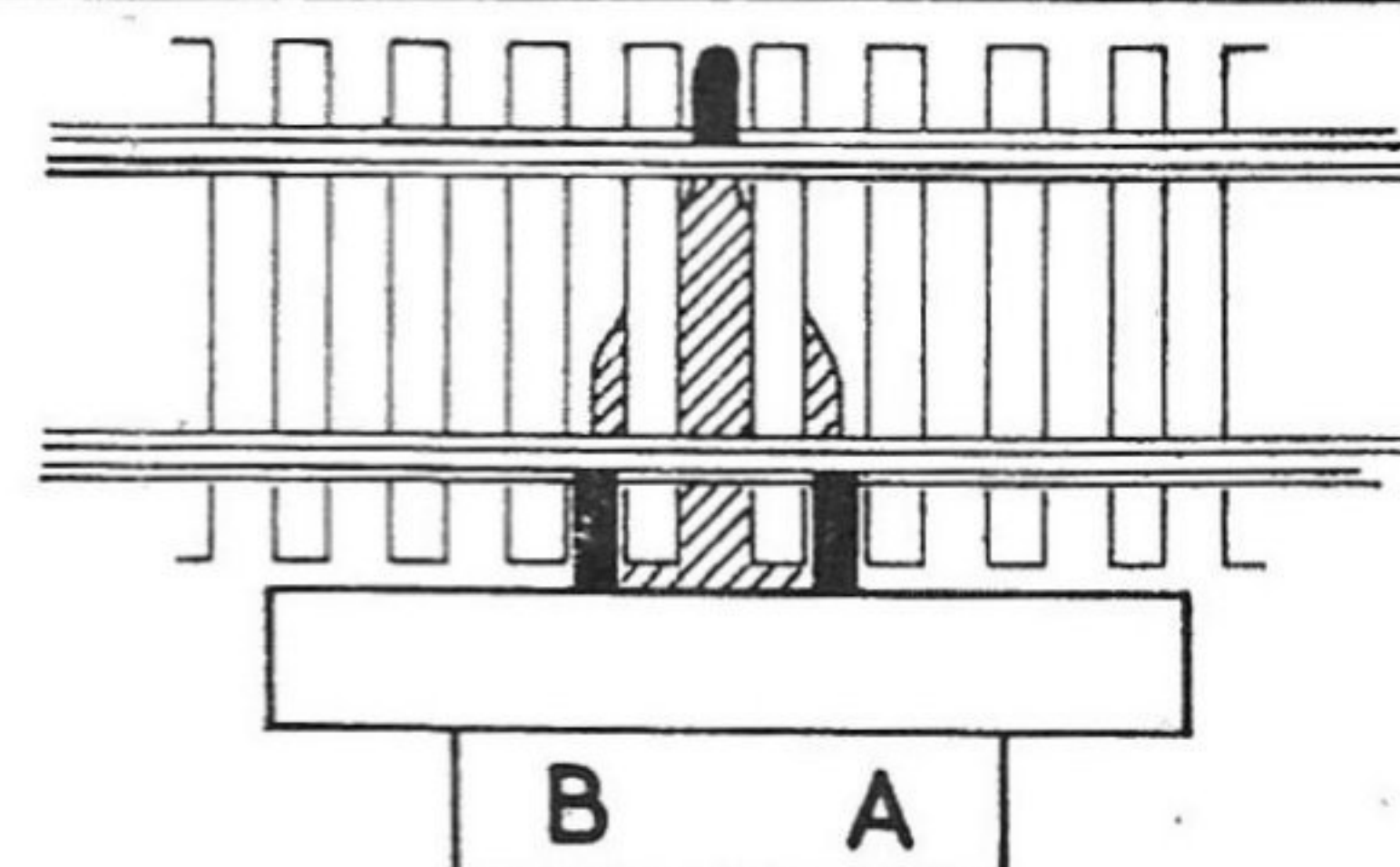
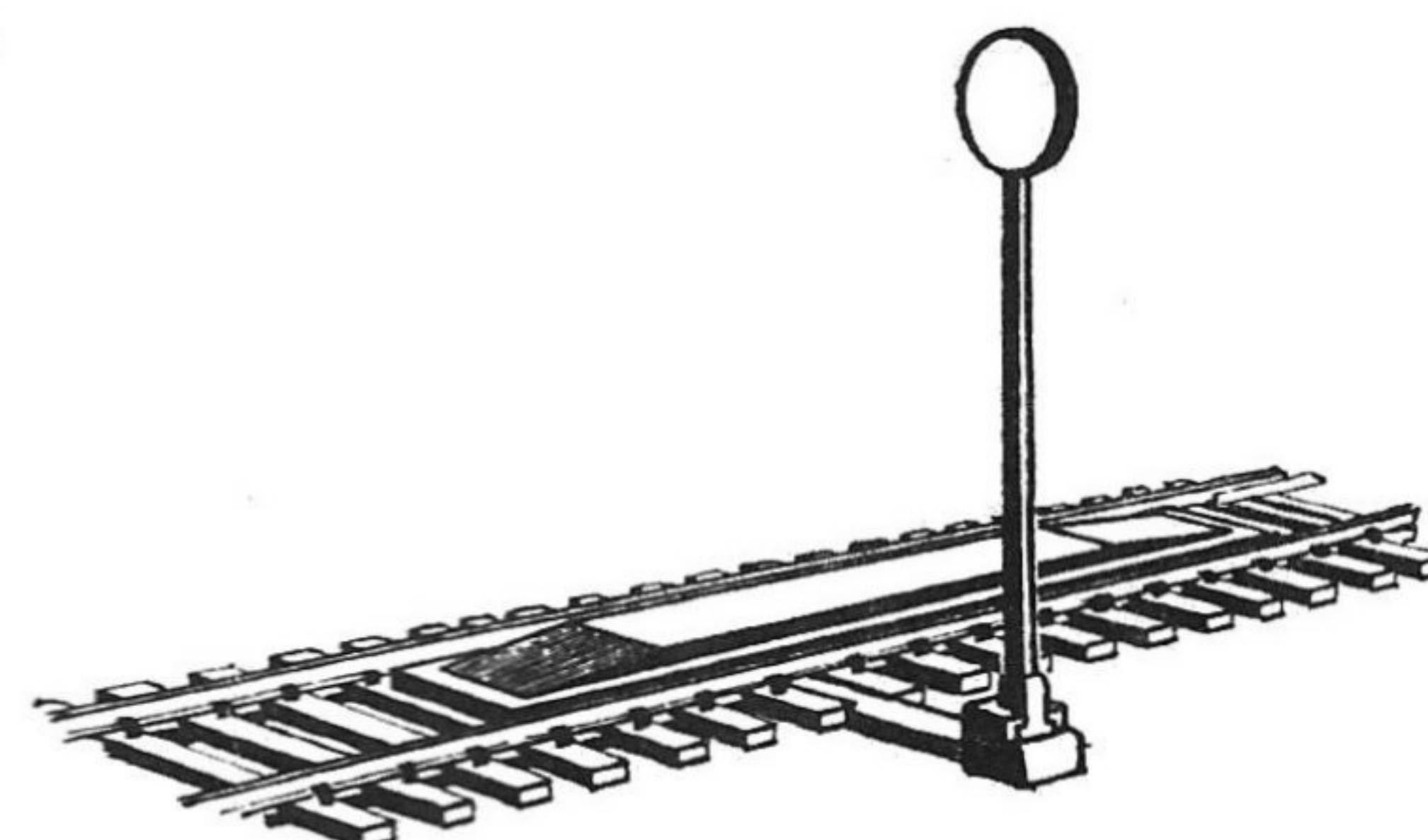
The sections of track are joined together by inserting each plain metal rail into the corresponding "fishplate" (Rail Joiner) on the other rail (Fig. 1), then push home firmly so that the plastic clips on the sleeper base (Fig. 2), snap together (Fig. 3). For clarity the fishplates and rail have been omitted from Fig. 2. Do not twist when assembling—a straight push is sufficient. Ensure that the track is flat and is not likely to be distorted, otherwise derailments may occur. Holes are provided in sleepers to take Hornby Track Pins R.207 (Packet contains approximately 144 pins) if the layout is to be a permanent fixture on a baseboard. The Track must not be fastened down too tightly or it will become distorted.

3. POWER CONNECTING CLIP

The 12 volts D.C. electric current to power a train is fed to the track through a Power Connecting Clip R.618, from a suitable Power Unit. This clip may be used on either straight or curved System 6 tracks and should be fitted to the required section (Figs. 4 and 5), before laying the track. A separate Power Connecting Clip will be required for each circuit of track.

4. UNCOUPLING RAMP

All Hornby rolling stock items are fitted with tension-lock couplings which will engage automatically when brought together on any part of the layout except above an uncoupling ramp. Remote control uncoupling can be carried out by means of a clip-fit Uncoupling Ramp R.617 which is fitted to straight System 6 track sections by pushing the ends down firmly so that they clip between the lower edge of the rail and the plastic sleeper (Fig. 6). The couplings on a train travelling over an uncoupling ramp are kept locked by the pull of the locomotive and depress the ramp. If a locomotive is brought to a halt with the couplings over a ramp and the train reversed momentarily, the couplings will be released. A train being pushed over a ramp will not be affected. As the uncoupling ramp cannot be seen with a train over it, a convenient marker sign is supplied (Fig. 6). For efficient operation of the couplings they should be kept at the correct height and not be bent or damaged.

FIG. 1**FIG. 2****FIG. 3****FIG. 4****FIG. 5****FIG. 6**

5. POWER SUPPLY

Your Hornby electric locomotive is designed to operate from a supply of 12 volts D.C. (Direct Current) which can be obtained from one of the following sources :

- (i) A.C. (ALTERNATING CURRENT) MAINS ELECTRICITY USING A TRANSFORMER RECTIFIER.
- (ii) DRY BATTERIES.
- (iii) ACCUMULATOR.

LOCOMOTIVES MUST NEVER BE CONNECTED TO THE MAINS.

The use of D.C. (Direct Current) Mains Electricity Supply is not recommended.

6. (i) MAINS OPERATION

When using Alternating Current the voltage must be reduced by means of a transformer and the supply converted to Direct Current through a rectifier. A speed and direction control is also required. All these items may be obtained built into one casing and referred to as a Power Controller (Fig. 7). Some Power Controllers have an auxiliary uncontrolled low voltage Direct Current output, which enables a second train to be controlled by adding a Circuit Controller (Fig. 8). This output may also be used for accessories suitable for 12 volts D.C. Some units have in addition a low voltage Alternating Current output for operating accessories designed for A.C. operation.

The Thermal Cut-Out device fitted inside the unit protects the outputs in the event of overloading by cutting off the supply to the output leads. Upon this occurring the Mains Supply must be switched off immediately, and the cause of the overload traced and remedied. The Thermal Cut-Out will reset itself automatically, after a period, and normal operation may be resumed. If the unit continually cuts out check (a) that there are no short circuit conditions, and (b) that the maximum total output of the unit is not being exceeded.

7. (ii) DRY BATTERIES

A battery control unit for use with three $4\frac{1}{2}$ volt dry batteries (EVER-READY 126, DRYDEX H.30, VIDOR V.0008) may be used to provide a 12 volt D.C. supply. The batteries must be arranged with their positive and negative terminals positioned so that they correspond with the + and - signs on the battery connecting unit. Remove the knurled heads of the terminals and place the battery connecting unit over the studs. Replace the terminal heads tightly. A train may be worked directly from a battery control unit or through a Circuit Controller (Fig. 9).

One set of batteries connected in this way is capable of operating only one train at a time. Always set the control knob to the off "O" position when the train is not in use, failure to do this can waste the power of the batteries. It is advisable to interchange the batteries from time to time so that one is not exhausted before the others.

8. (iii) ACCUMULATORS

A 12 volt accumulator having a minimum capacity of 20 amp hours may be used. Two leads from the accumulator should be connected to a Circuit Controller in the same way as those from the battery connecting unit shown in Fig. 9. As a precautionary measure, a 12 volt 3 amp fuse should be inserted in the negative lead from the accumulator.

9. TRACK WIRING — POWER CONTROLLER

Please read very carefully the Instruction Leaflet supplied with your Power Controller. Providing the plug is wired correctly and the right fuse is used, as stated in the leaflet, the Power Controller is perfectly safe even for the smallest child.

As already mentioned Figs. 7 and 8 illustrate the most commonly used wiring arrangement for one and two trains.

If more than one train is being run, an extra Power Connecting Clip, R.618, will be required for each circuit.

In order that two or more trains may be operated on the layout independently, it is important that :—

1. The Circuits upon which the trains are running are either separate or isolated electrically by pairs of Hornby points.
2. A separate power supply is used for each train.
3. Before changing points to transfer a train from one track to another one of the two units is set to the "Off" position to avoid a short circuit between the units.

Once the train has been moved from one circuit to another, it is very important to return both points to their original position before using the controller which was switched off as current can still be passed through one of the rails and this will cause a short circuit.

FIG. 7

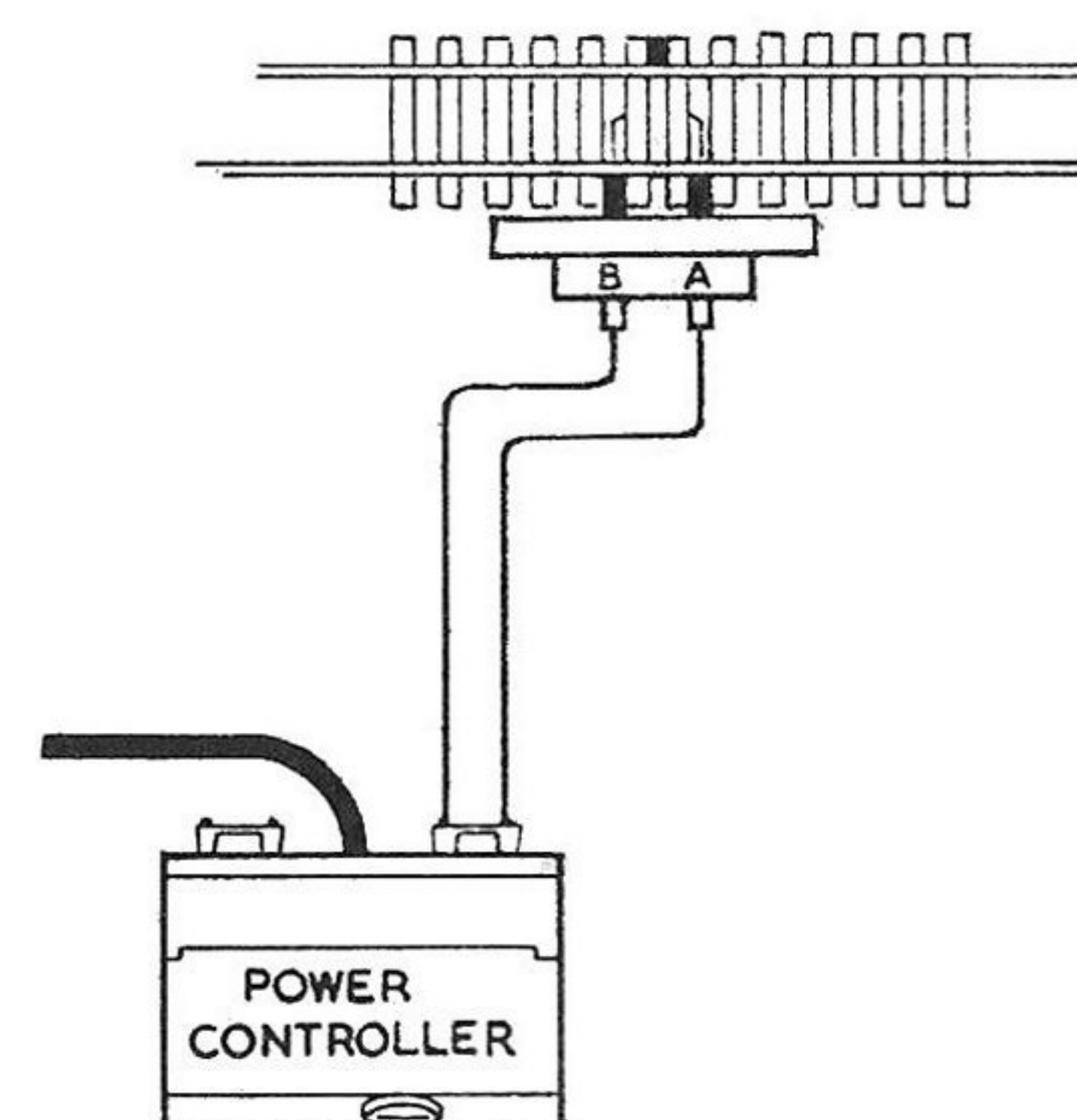


FIG. 8

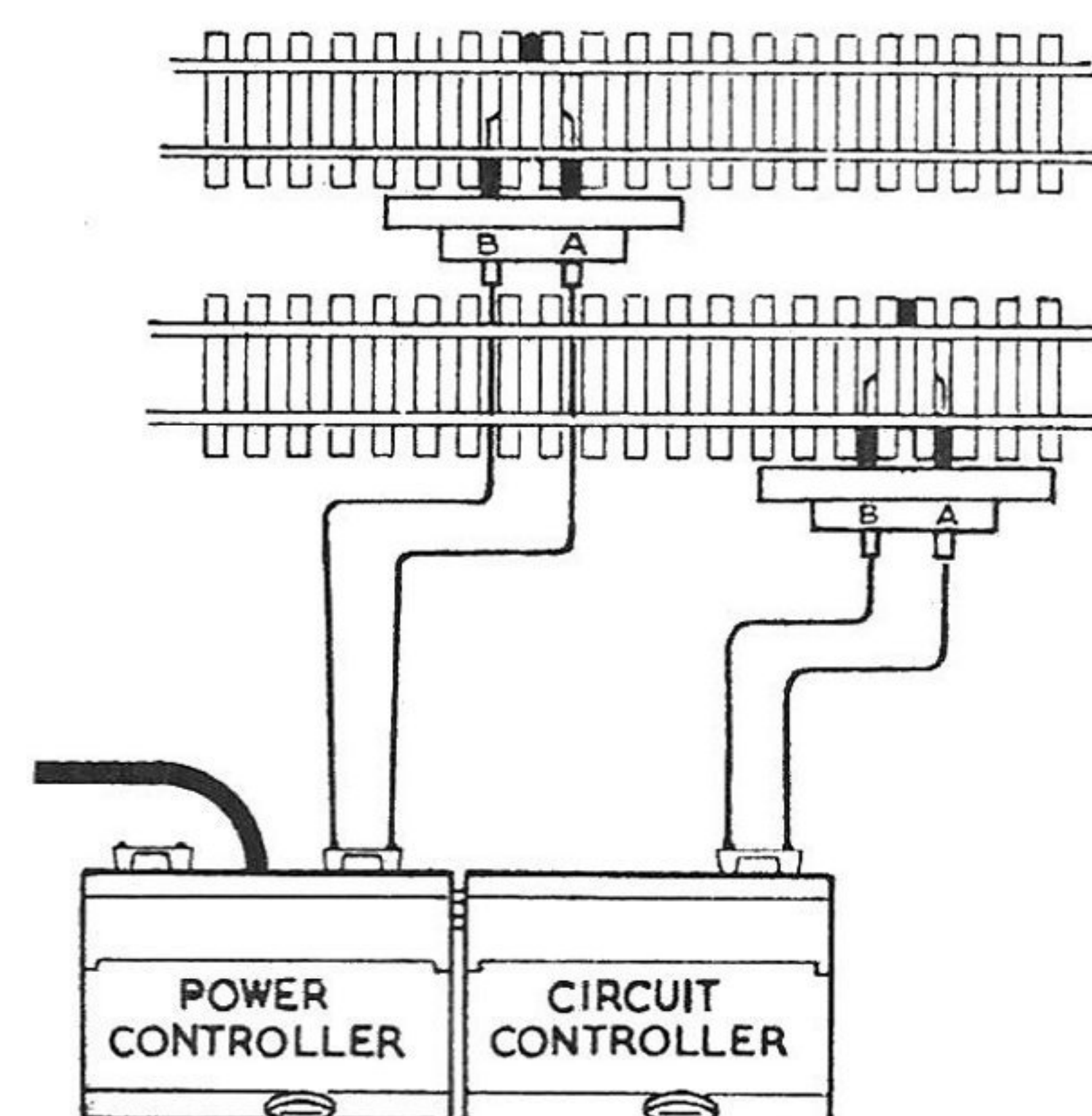
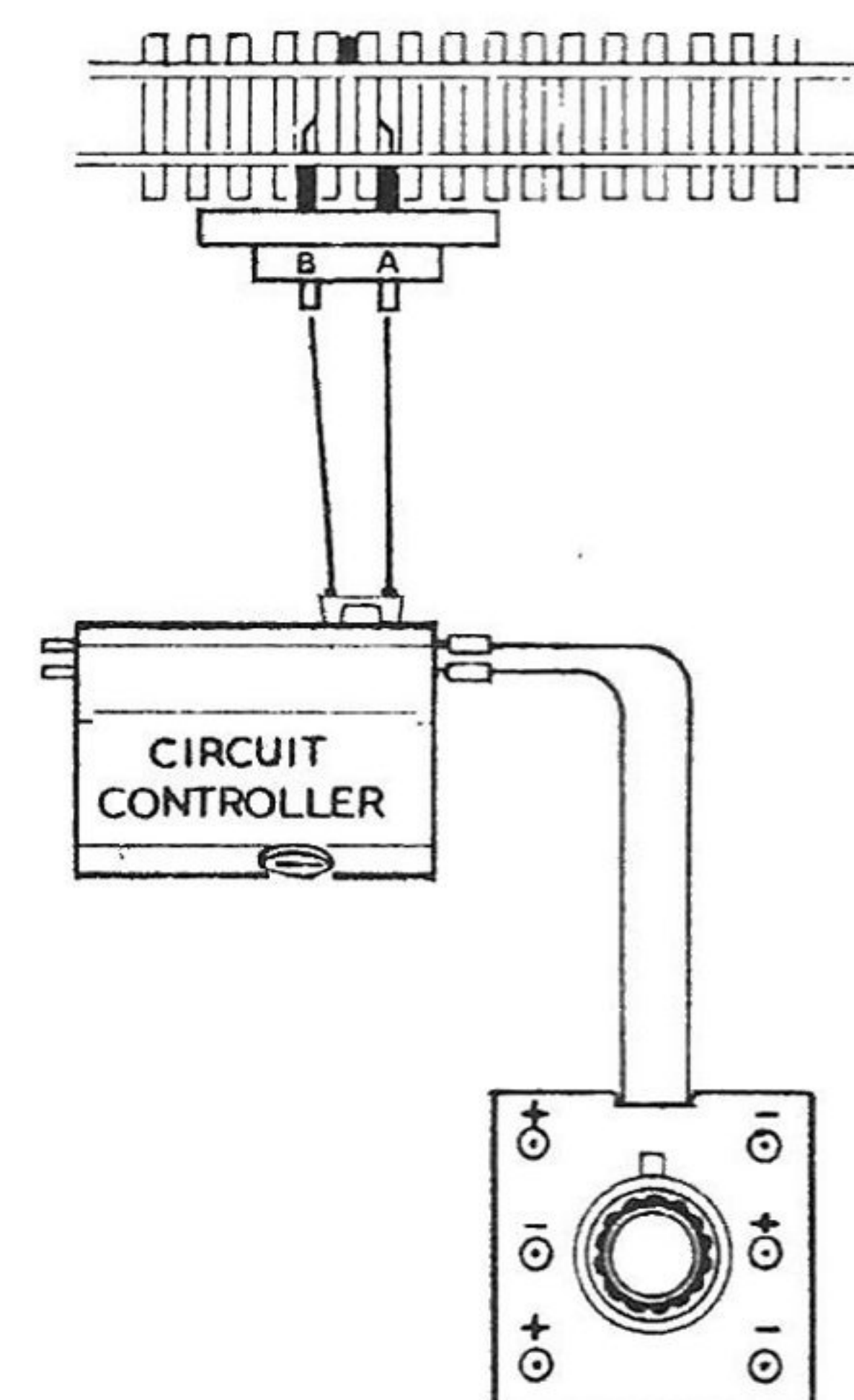


FIG. 9



10. TRACK CLEANING

It is very important that track surfaces are kept clean and methylated spirit is recommended as a track cleaning agent. This may be applied by means of the Hornby Track Cleaning Car R.344 (Fig. 10) or a cloth, before each operating session to ensure good electrical contact between locomotive driving wheels and track. **Emery cloth or any other abrasive must not be used as they will destroy the protective coating on the rails and rusting will follow.**

11. LOCOMOTIVE STEAM EXHAUST SOUND (Brit. Pat. Appl. No. 31923/70)

Some Hornby locomotives have tenders which are fitted with an "Exhaust Steam Sound" Generator. If you have one of these locomotives it will reproduce a most realistic "Chuff Chuff" noise when it is moving in either direction.

If after a period the tender fails to make a chuff sound when moving, check to ensure that both contacts are in their correct position and are not in need of adjustment. Fig. 11 shows the contacts in place and their shape.

When the contact with the abrasive section (S.3771) is worn out and requires replacing, the tender body must be removed and the Sound Box lifted off the chassis. With the exception of the "Britannia" tender body, which is a clip fit to the chassis, the body securing screw is situated underneath the Tender.

The worn contact can then be removed by lifting the top section clear of the locating slot with the point of a pin. The other contact, (S.3773) clips over the wheel spindle and can be pulled off if this requires replacing.

NOTE: The numbers shown in Fig. 11 are the spare part references for the contacts. The Sound Box and Contacts cannot be fitted to earlier pattern tenders.

12. LOCOMOTIVES

The electric motor fitted to your locomotive is a precision built item and is the most important part of it. Treated with care it should last for a number of years. Due to the meshing principle of the worm gear, fitted to the motor shaft and the worm wheel, which turns the driving wheels, the locomotive cannot be pushed by hand but, as the current passes through the motor and the gears rotate, the model can be moved either forward or in reverse at variable speeds depending on the setting of the power unit control knob.

To gain access to the motor the chart below Fig. 11 should be checked for the position of the body securing screw(s) so that the locomotive body may be removed, when necessary, for lubrication and cleaning. This is explained in more detail under a separate heading overleaf.

13. MAGNADHESION

Many Hornby locomotives are fitted with the "magnadhesion" feature which consists of small permanent magnets mounted in the chassis block between the steel tyred driving wheels. The magnets set up a magnetic attraction between the wheels and the Hornby Rails (which are made of tinned steel) and improves the grip on the track and this in turn increases the hauling power of the locomotive. This magnetic attraction can also cause particles of metal to be picked up by the wheels of locomotives, and care should be taken that no such loose items are left near the track.

14. SMOKE UNITS (British Patent No. 961630)

Pierce the corner of the capsule of smoke oil with a pin, place the filling funnel in the locomotive chimney and squeeze seven or eight drops of oil into the funnel. Do not overfill. In the case of models R.258 and R.869 the smoke unit is longer and four or five additional drops may be added. Blow gently into the funnel to remove surplus oil and withdraw it from the chimney. Replace pin in oil capsule.

Start the train and after a few seconds smoke should appear from the chimney whilst the model is moving, and continue until the oil in the unit is exhausted. If, after a period, the smoke unit fails to operate when filled with smoke oil, the element may need replacing. Spare elements are available under reference X.549 from your stockist. Remove the body from the locomotive and lift off the lid of the smoke unit. In the case of models R.258 and R.896, the screw in the centre must be withdrawn to release the lid. This screw retains the complete smoke unit on the chassis and care must be taken not to dislodge the unit once the screw is removed.

The element may be lifted out and the replacement inserted. Any filling material which is removed with the old element should be replaced below element level. Press the element well down into position to make good contact at both ends before refitting the lid. The screw and brass tag eyelet, where fitted, must be replaced correctly before refitting the body.

FIG. 10

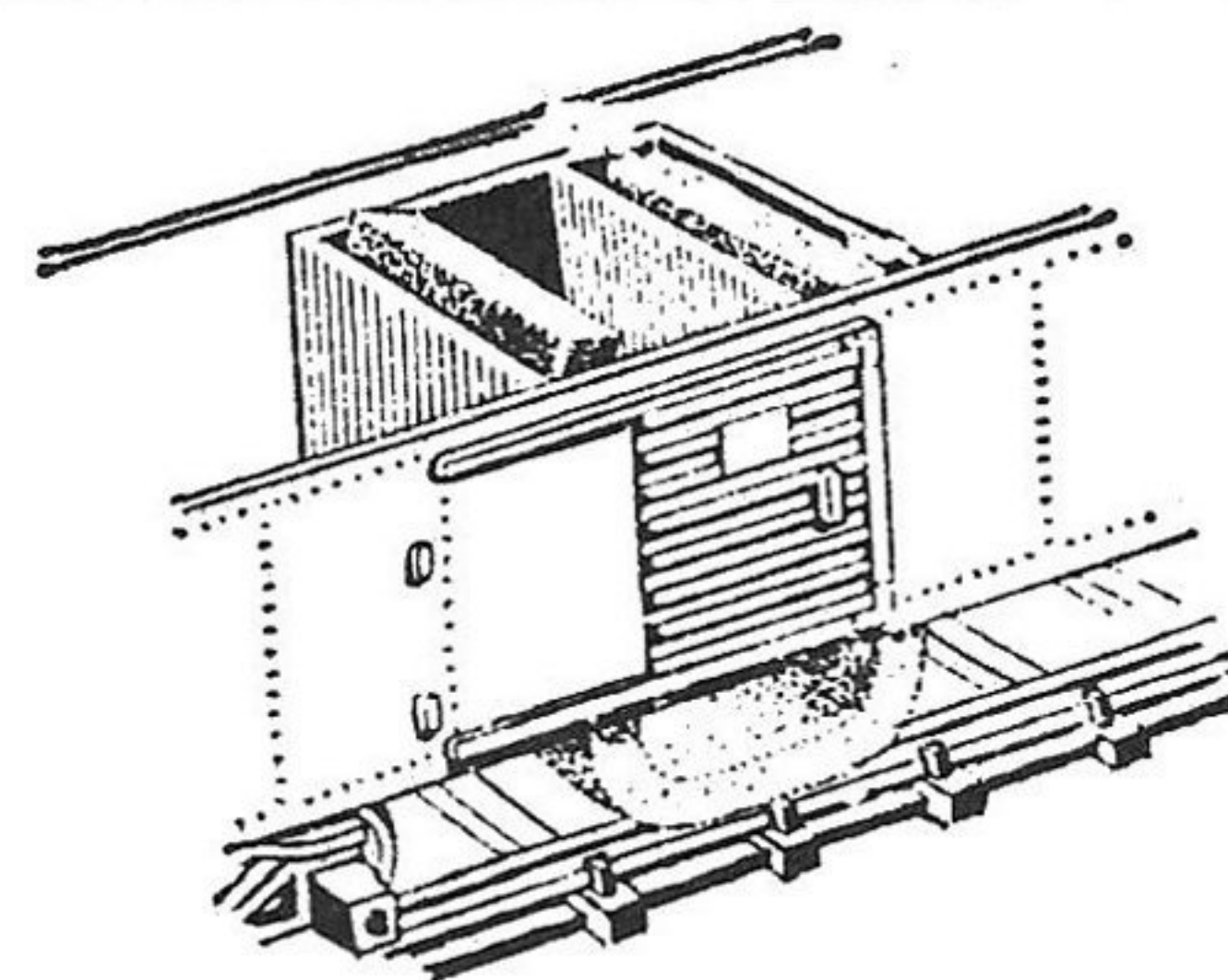
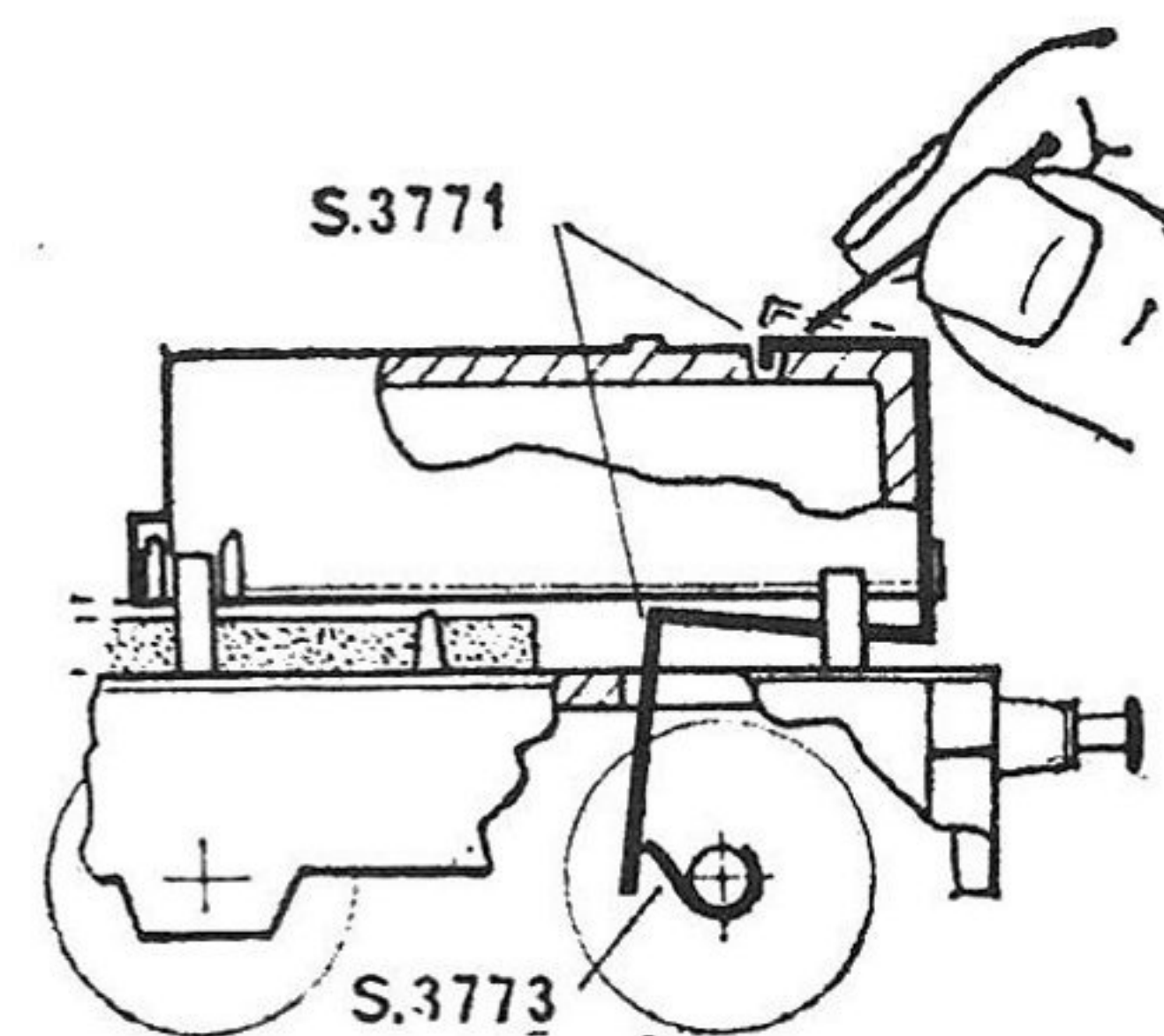


FIG. 11



MODEL NUMBER	POSITION OF BODY OR ROOF SCREW(S)
R.159	2 Screws in Roof. Remove Roof. 1 Screw over Motor Bogie.
R.857	1 Screw at rear end of Locomotive below Cab.
R.050, R.054, R.258, R.450, R.869	1 Screw at Front end of Footplate above bogie.
R.051, R.052, R.452	1 Screw on left hand side of body.
R.152, R.455, R.759, R.765, R.866	1 Screw at cab end.
R.307, R.357, R.751, R.758	1 Screw below.
R.253	1 Screw in Roof.
R.855, R.868	1 Screw below cab.
R.871	2 Screws below. 1 below Footplate at front. 1 below cab.
R.055, R.155, R.308, R.352	2 Screws in Roof.

TRACK PLANS BOOK

Further fully comprehensive details of extra track, underlay, operation of points and track layout diagrams are contained in the Hornby Railway Track Plans Booklet R.166 which is available from your local dealer.

SPARE PARTS

Fishplates (rail joiners), Leads (in various lengths) and similar spare parts may be purchased from Hornby Railway stockists or direct from the factory.

Service Sheets illustrating Hornby Locomotives in exploded view form are available from the factory. An index of these sheets can be sent on receipt of a stamped addressed envelope.

Complete models and accessories are not supplied from the factory and can only be purchased from a stockist.

15. LUBRICATION

Your locomotive was lubricated before it was packed at the factory. The lubricant may have dried out in storage and you should examine the locomotive before use to ensure that it is still adequately lubricated. The model should then be lubricated from time to time as required. This is very important if you wish to prolong the life of your model as wear will take place very quickly on unoled moving parts.

Place a drop of light machine oil on each of the points indicated in the appropriate diagram, Figs. 12 to 17. Some models may differ slightly in wheel arrangements, etc., from the illustrations but all the necessary lubricating points are referred to on the diagrams.

Over-oiling must be avoided. Do not use thick oil or grease.

The felt oil retaining pads on the armature shaft bearings must be kept moistened with oil and should not be permitted to dry out. **Axle bearings on locomotive bogies, pony trucks, tenders and ALL items of rolling stock should also be lightly oiled periodically for smooth running.**

Take care not to allow oil to come into contact with the commutator or carbon brushes.

16. COMMUTATOR AND BRUSHES

It is necessary for the slots between the segments of the commutator to be kept clean. This is the part upon which the carbon brushes make contact (Fig. 18), as these accumulate carbon from the brushes and this will interfere with the efficient running of the locomotive.

To clean these slots the brush pressure should be relieved from the commutator, or the brush removed completely, and a fine pointed pin or sharpened matchstick used to remove the deposit from the slots (Figs. 18, 19 and 20). Please take care not to scratch the surface of the commutator or damage the windings of the armature.

After this operation ensure that the insulating sleeve on the brush spring and the slip on the wire lead to the brush arm are in their correct positions (Figs. 12 and 15). If oil is present on the surface of the commutator it should be wiped off with a clean non-fluffy rag and if the carbon brushes are worn or have become softened by oil they should be replaced.

17. GENERAL CLEANING

The biggest enemy of smooth performance is hair and fluff which collects in the driving mechanism particularly if the train is being operated on the floor. Any fibres of this type should be removed with a pair of tweezers carefully checking that no hairs are wrapped around the commutator as, small as they are, these can stop the carbon brushes from making contact and therefore stop the locomotive from operating.

The driving wheels of the locomotive must also be kept clean to ensure good electrical continuity.

If at any time the driving wheels are removed from a power bogie or locomotive they must be replaced the right way round or a short circuit will occur. The insulated wheels must be on the same side as the metal collector arms.

18. TELEVISION INTERFERENCE

Hornby Railway locomotives and Power Connecting Clips are fitted with Television Interference Suppressors. Despite these measures interference with television reception may be encountered when operating trains on extended layouts. This is largely caused by sparking as the locomotive driving wheel (through which the current is collected) pass over the joints between sections of track. Sometimes interference is caused by running trains at more than scale speed and it may be found that by operating at slightly lower speeds the interference will be reduced. However, when such interference is evident, additional suppression may be obtained by inserting Power Connecting Clips R.618 at intervals along the track on either straight or curved sections. When used as a suppressor only, it is not connected to the power supply. The spacing at which suppressors need to be fitted vary, but one at each sixth or seventh section is recommended.

To obtain maximum freedom from interference it is essential that the track (see Paras. 2 and 10) and locomotive wheels and commutator (see Paras. 16 and 17) are kept clean. Also that all electrical connections in the circuit are securely made and are not corroded.

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