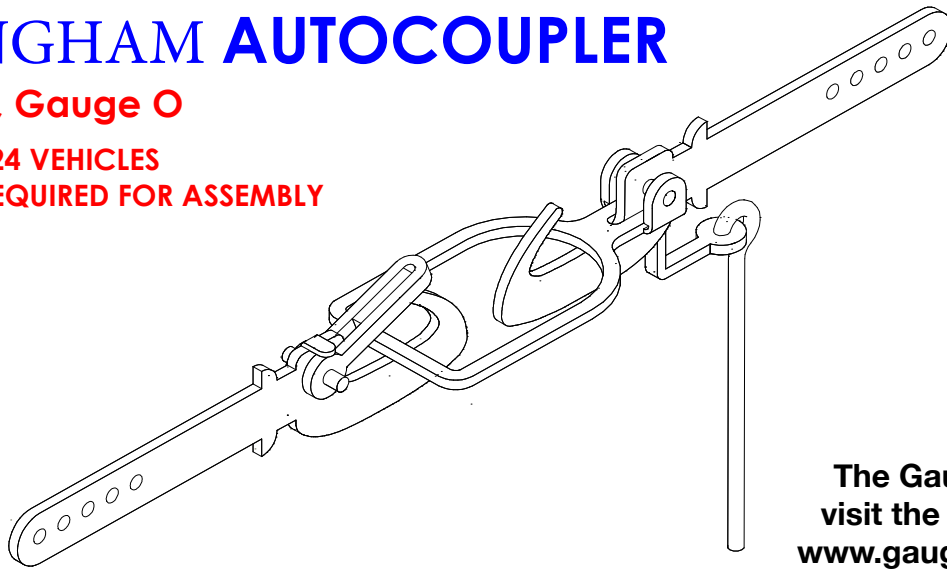


# THE DINGHAM AUTOCOUPLER

for 7mm : 1ft, Gauge O

PARTS FOR 20 - 24 VEHICLES

SOLDERING IS REQUIRED FOR ASSEMBLY



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## The DINGHAM Autocoupler

The DINGHAM Autocoupler was developed by Trevor Shaw for use on *Lofthouse-in-Nidderdale*, an O Gauge layout of the Skipton and District Railway Society.

Every train that runs on *Lofthouse* is shunted in public view for one reason or another. Goods trains have brake vans attached or detached, banking engines are attached to the rear of up trains and pilot locos are detached from double-headed down trains. There is also a daily pick-up goods in the timetable. Finally, passenger locos are run round trains and non-passenger vehicles, such as horseboxes and fitted cattle wagons are set down or picked up from the yard.

*Lofthouse* needed reliable and unobtrusive auto-couplers and we could find nothing on the market that satisfied all our requirements. So – no alternative but to develop a coupler that did. Now, these couplers are commercially available as the DINGHAM Autocoupler.

The coupler uses a latch and loop system and is intended primarily for single-ended use – i.e. the loop is always on the right-hand end of stock and the latch on the left, or *vice versa*. However, on layouts where locos are turned, it may be possible to fit locos with a latch *and* a loop at each end, so enabling automatic coupling and uncoupling whichever way locos are facing.

### The DINGHAM Autocoupler's unique combination of features –

- **Quick and easy to fit to new or existing stock** – the DINGHAM Autocoupler mounts through the existing coupler slot on the buffer beam, or a hole can be drilled in the beam and hidden behind one of the drawgear endplates supplied on the etch.
- **Reliable in operation** – the geometry of the DINGHAM Autocoupler has been carefully worked out to ensure that it is self-jigging in assembly and is virtually 100% reliable in operation.

**Easy to set up** – the vertical adjustment of the DINGHAM Autocoupler almost takes care of itself by virtue of its fitting in the existing coupler slot. In any case, the coupler is fairly tolerant of deviations from the ideal height. Longitudinally, the coupler is self-jigging for stock with buffer lengths of 1ft 6in (most unfitted wagons) or 1ft 8½in (fitted wagons, most locos and many coaches). The etch also contains parts for short hooks and loops intended for fitting to industrial locos with short or dumb buffers.

- **Robust** – when stock is put back in the box, the only vulnerable part of the coupler – the loop – flips upwards out of the way and is protected by the buffers.
- **Fully compatible with scale 3-link and screw couplings** – an essential feature for club layouts running members' stock or home layouts running visiting vehicles.
- **Electromagnetic operation with latching mechanism** – the hinged loop and latch mechanism of the DINGHAM Autocoupler means that, once uncoupled, it stays uncoupled until the operator wants to couple up again. This means that only one electromagnet is required for a fan of sidings and also provides –
- **Ability to uncouple vehicles at will in a moving train** – as a train is propelled over the electromagnet, wagons can be uncoupled at will whilst the train is on the move. No more having to stop over the magnet and then perform an unprototypical back and forth shuffle to uncouple and place a fixed loop on top of a fixed latch.

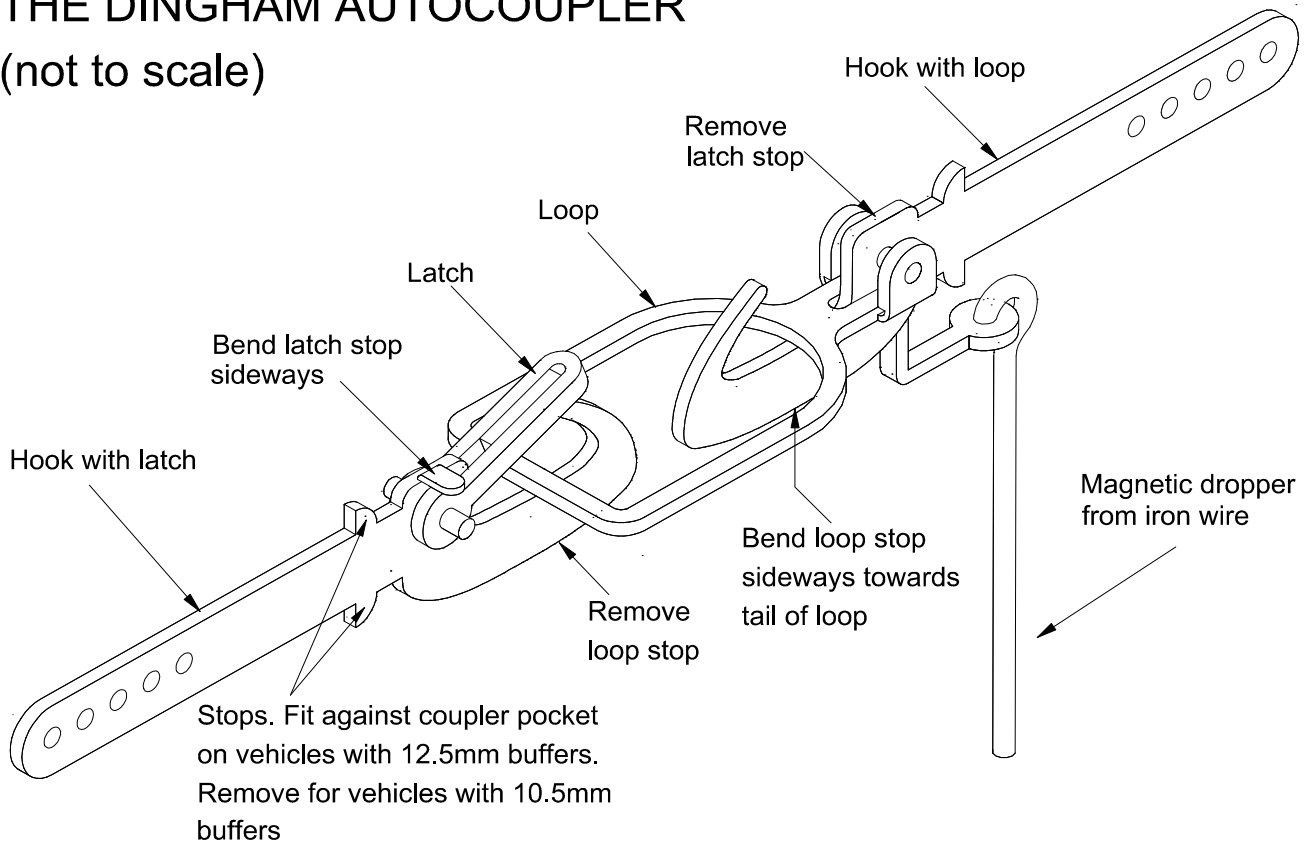


- **Unobtrusive** – the latched hook is only slightly larger than the prototype. The loop is etched as thinly as possible consistent with adequate strength.

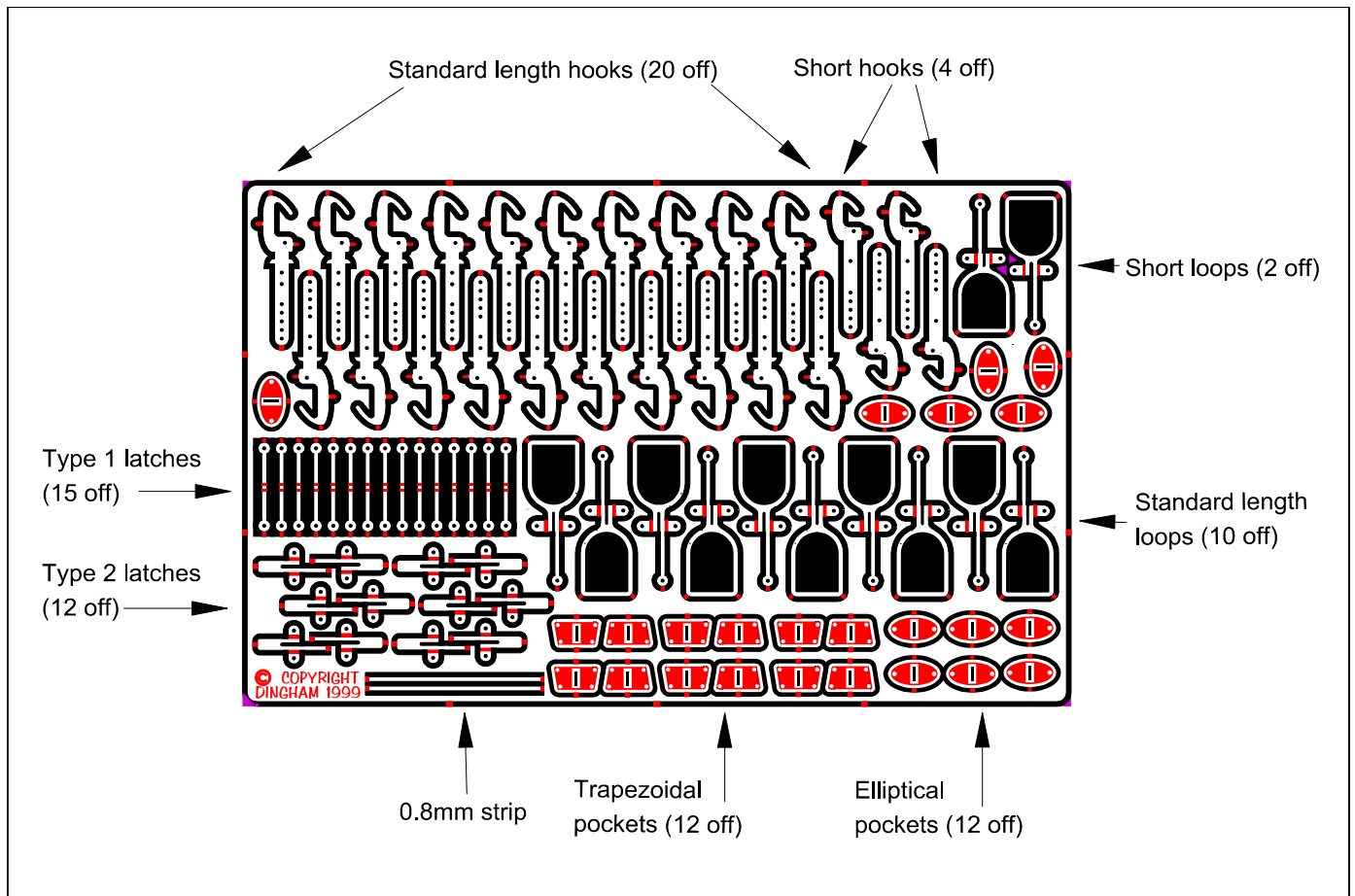
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# THE DINGHAM AUTOCOUPLER

(not to scale)



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# THE DINGHAM AUTOCOUPLER – ASSEMBLY AND FITTING INSTRUCTIONS – 7mm VERSION

The coupler is intended for single-ended use. This means vehicles must always face the same way on the layout. Each vehicle has a hook with loop at one end and a hook with latch at the other. Coupling takes place automatically as vehicles are pushed together. The loop slides up the hook on the next vehicle, passes under the tip of the latch and drops into the slot in the hook. Uncoupling can take place when vehicles are buffered-up by means of magnetic action on a dropper suspended from the tail of the loop under the buffer beam. The magnet pulls the dropper down and the loop is lifted, flipping the latch upwards, then dropping back on top of the latch and preventing re-coupling. Properly adjusted couplers on 4-wheel wagons will couple and uncouple readily on curves of 4ft 6in radius or less.

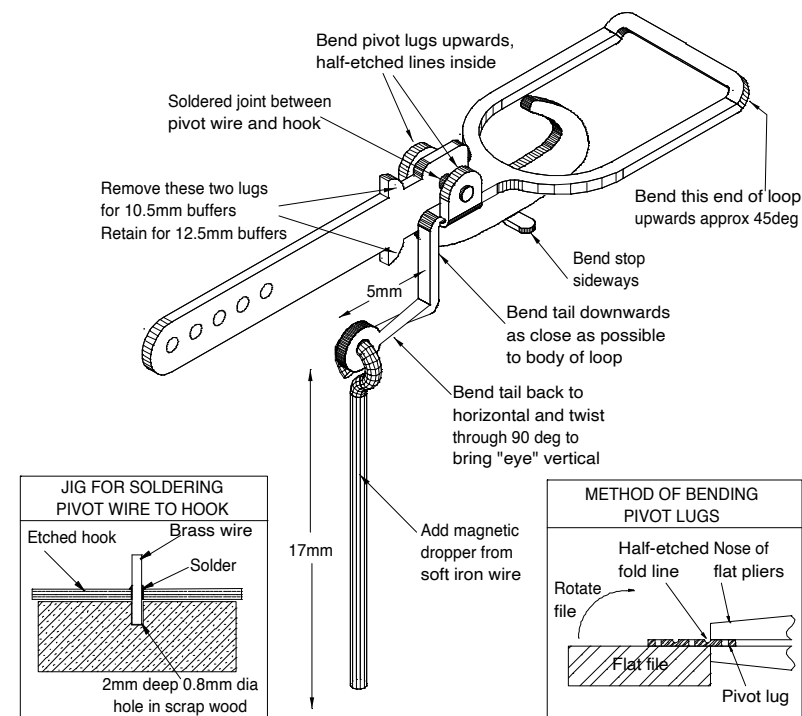
Two types of latch are provided on the fret. Try both and see which you prefer. Type 1 is less obtrusive and its operation is slightly more reliable, but type 2 is probably easier to assemble and fit.

**IMPORTANT:** For dependable working, the coupler relies on properly adjusted buffers on vehicles. If buffers are too long, it may be difficult to couple vehicles on curves. If buffers are too short, the coupler loop will be pushed against the back of the slot in the opposing hook when propelling, and the friction between loop and hook will prevent the loop lifting and uncoupling. For the same reason, uncoupling may be unreliable if buffer springs are soft enough to compress during normal shunting. *The short hooks and loops*, intended for some industrial locos (8.5mm buffer length), are a compromise, because 8.5mm is insufficient space to accommodate the DINGHAM geometry. The *short loop* will couple and uncouple with standard hooks, but the *short hook* will suffer loop-hook contact. This problem will be lessened if the type 1 latch is used with the short hooks.

**NOTE:** THE COUPLERS SHOULD BE CHEMICALLY BLACKENED ON COMPLETION. THEY WILL NOT WORK IF PAINTED. Carr's metal black for nickel silver or Birchwood Casey Super Blue are suggested. Clean and degrease the couplers before blackening.

## Hook with Loop (diagram below)

(a) *Prepare the hook.* Solder a short piece of 0.8mm brass wire into the pivot hole in the hook. (Make a simple jig by drilling a 0.8mm hole about 2mm deep in a piece of wood). Trim so that about 1.5mm of wire protrudes each side of the hook and remove burrs. (A jig made by drilling a 0.8mm hole through a piece of 1/16in brass strip is useful here). Remove the upper half-etched latch stop. If fitting to a vehicle with 10.5mm buffer projection, remove the lugs on the shank. Retain the lugs for 12.5mm buffers.



(b) *Prepare the loop.* Bend the pivot lugs upwards through 90deg (half-etched lines inside). To avoid distortion of the loop, do this by grasping each lug in turn with pliers and folding the rest of the loop upwards using a piece of flat wood or a flat file. Bend the front of the loop upwards at about 45deg. Bend the tail of the loop downwards through 90deg making the bend as close to the body of the loop as possible. Bend the last 5mm of the tail back to the horizontal and put a 90deg twist in it to bring the eye at the end vertical. With a cutting broach or 0.9mm drill, open up the holes in the pivot lugs to give a sloppy fit on the 0.8mm wire.

(c) *Fit loop to hook.* Holding the loop vertical in relation to the hook, place one pivot hole then the other over the pivot wire. If necessary, part the pivot lugs slightly to do this and squeeze them gently back into position after fitting. Swing the loop into its normal position as shown in the diagram and bend the half-etched stop on the bottom of the hook sideways towards the tail of the loop.

(d) *Fit a magnetic dropper.* Make a magnetic dropper from the 0.7mm soft iron wire supplied. Trim its total length to 17mm. It should clear the railhead by 1mm. (Note the iron wire is not rusty. Its brown coloration is a passive finish applied during manufacture.)

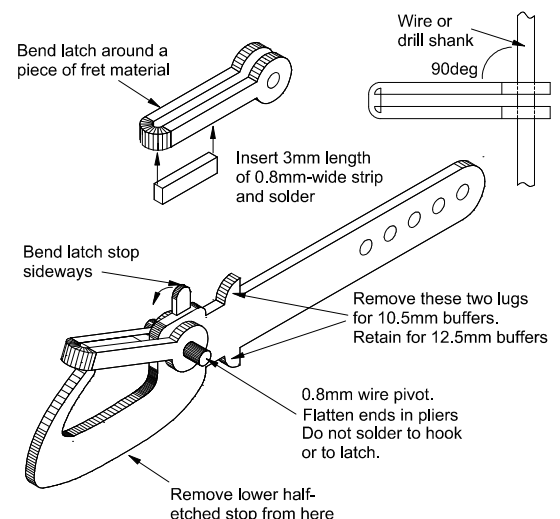
**Hook with Type 1 Latch (diagram right)**

## Hook with Type 1 Latch (diagram right)

(a) *Prepare the hook.* Remove the lower half-etched loop/latch stop. Depending on buffer length, remove or retain the lugs on the shank (see above).

(b) *Prepare the latch.* Fold the latch around the edge of a piece of fret material (half-etched lines inside) to ensure the correct distance between the legs. Pass a length of 0.8mm wire through the two holes in the latch. If the wire and latch are not at 90deg, push the latch gently sideways until they are. Take a 3mm length of the 0.8mm-wide strip, insert into the latch as shown and solder. Alternatively, fill the end of the latch with solder. Remove any projections carefully. They may impair the working of the coupler. With a cutting broach or 0.9mm drill, open up the pivot holes in the latch to give a sloppy fit on the 0.8mm wire.

(c) *Fit latch to hook.* Flatten about 0.5mm of one end of a piece of 0.8mm brass wire by squeezing in pliers. Position the latch over the hook and pass the wire through the pivot holes in latch and hook. Cut off the wire 0.5 – 1mm from the opposite side of the hook and flatten this end also in the pliers. Fold the upper latch stop sideways.

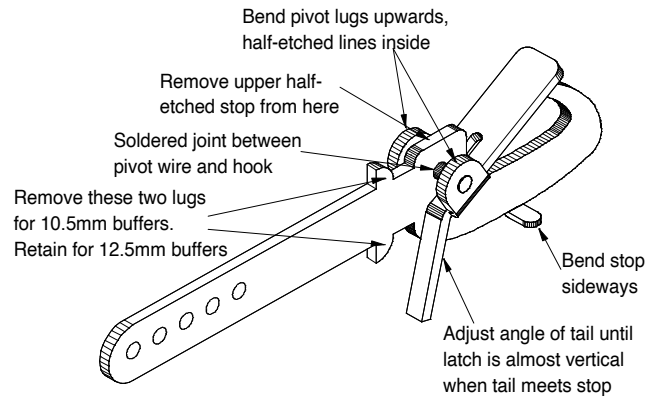


## Hook with Type 2 Latch (diagram right)

(a) *Prepare the hook.* Prepare the hook by soldering in a pivot wire in exactly the same way as for the hook with loop.

(b) *Prepare the latch.* Bend the pivot lugs upwards through 90deg (half-etched lines inside). Bend the tail of the loop downwards through approx 45deg. Open up the holes in the pivot lugs with a broach or 0.9mm drill to give a sloppy fit on the 0.8mm wire.

(c) *Fit latch to hook.* Use the same method as described for fitting the loop. Bend the half-etched stop at the bottom of the hook sideways, towards the latch tail then adjust the angle of the tail until the latch is almost vertical when the tail meets the stop.

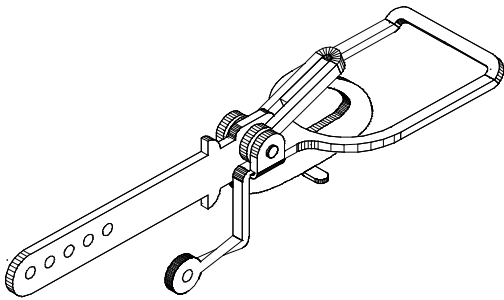
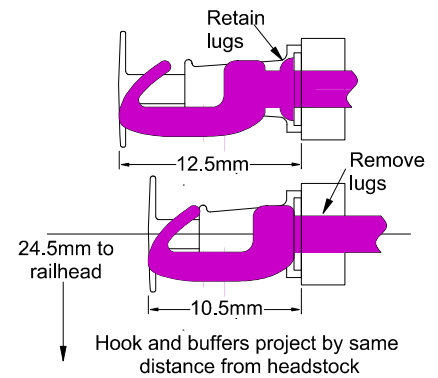


## Fitting Couplers to Vehicle

**IMPORTANT:** CHECK THE LENGTHS OF THE BUFFERS ON YOUR STOCK – SPRUNG BUFFERS SHOULD BE ADJUSTED TO EITHER 10.5 OR 12.5MM PROJECTION. For all buffer lengths, the couplers *must* be fitted so that the hook projects the same distance from the beam as the buffers, or up to 0.5mm less (see diagram right).

The couplers are fitted in the same way as the usual 3-link or screw couplings – through the coupler slots in the buffer beam. THE CENTRE HEIGHT OF THE COUPLER SLOT SHOULD BE 24.5mm ABOVE THE RAILHEAD. If it differs much (more than about 1mm) from this height, remove the existing drawgear endplate, drill a 2.5mm hole at the correct height, and use one of the etched endplates provided. The couplers should be secured by soldering or by adhesive (cyanoacrylate or epoxy). Holes are provided in the shank for fixing by spring and split-pin or by the spring-wire method used in Peco kits. However, rigid fixing is much to be preferred, because it gives positive positioning and more reliable operation.

If no coupler slot or drawgear endplate is provided, or if it will not fit the shank on the hook, drill a 2.5mm hole through the beam centred at 24.5mm above rail height. Cover it with one of the drawgear endplates provided on the etch, and fit the coupler through the slot in the etched component.



## Double-Ended Operation

On many layouts, rolling stock is never turned, so single-ended couplers are no problem. However, to allow locos to be turned, it *may* be possible to fit double-ended couplers. A loop *and* a type 1 latch (but not a type 2 latch) can be fitted at both ends of the loco as shown in the diagram left. In assembling double-ended couplers, first solder the pivot wire into the hook. Then bend the type 1 latch until the eyes on the ends are about 3mm apart and place over the pivot wire. Squeeze the latch together over a 3mm length of 0.8mm-wide strip and solder in place. Finally add the loop in the usual way. It is emphasised that the couplers will almost certainly not work as well in this set-up as in single-ended mode.

## Operating with DINGHAM Autocouplers

Electromagnets are recommended for actuating DINGHAM Autocouplers. Suitable magnets are available from the Gauge O Guild. Permanent magnets, with a lifting and lowering mechanism (lift the magnet to actuate the couplers), may also be used. If using permanent magnets, make sure that a pole of the magnet is facing upwards. (The magnetic field is strongest near the poles).

Examples of operation are given below.

**Example 1:** A passenger train enters a station where the service terminates and the loco runs round. The train is stopped with the coupling between loco and train over a suitably placed magnet. The loco now eases back on the train (a movement of about 3 – 4mm and quite prototypical, because the buffers have to be compressed to allow the screw coupling to be unhooked). If the magnet is now briefly energised, latched uncoupling will take place, and the loco can move away from the train at any time.

**Example 2:** For shunting a yard, magnets can be placed at the entrance to a fan of sidings. Only one electromagnet may be required, though it is often advantageous if several are provided. As a train is propelled into the yard, any coupler may be uncoupled by energising the magnet as that coupler passes over it. The vehicles will remain uncoupled so long as they are propelled steadily.

**Example 3:** The diagram below shows the arrangement of magnets on the layout for which the DINGHAM Autocoupler was developed. 'A more detailed account of positioning magnets for realistic operation is included in the instructions for the DINGHAM electromagnets which can be accessed as a pdf on the Gauge O Guild website.

## Lofthouse-in-Nidderdale Skipton and District Railway Society

