2

TOYS WITH WHEELS

RAILWAY ENGINE

Railway engines are, if anything, even more popular with children (and adults) since the departure of steam. This model of a small tank engine can be made easily and cheaply, and when painted in attractive colours, will become a perennial favourite.

DIAGRAM 1

Locomotive body. Make the body of the locomotive from the timber base (1), the side pieces (2), the top (3) and front (4). Glue the pieces to the base, ensuring that the sides are vertical. Glue the top and front to the sides.

DIAGRAM 2

Locomotive cab. The cab consists of the front (5) two sides (6), the rear piece (7) and the roof (8). In the front of the cab, mark and drill two ½in (12mm) holes at a position of ¾in (18mm) from the top, and ½in (12mm) from each edge. Drill these holes to a depth of ½in (12mm).

DIAGRAM 3

On the cab sides 1in (25mm) from the top and 2in (50mm) from the bottom, mark and cut out a 1¾in (32mm) deep piece to represent the side lookouts. To ensure that these lookouts are identical, clamp the two pieces of wood together in the bench vice and cut them both out together. Use a coping saw to round the inside corners.

DIAGRAM 4 (see page 32)

The tank front and sides can now be glued to the main base of the locomotive. Glue the rear piece and the roof to the cab rear and top.

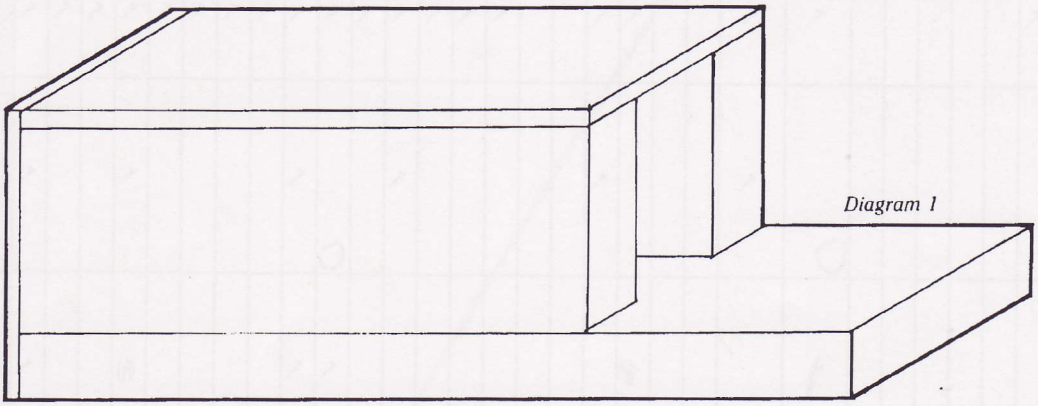


Diagram 1

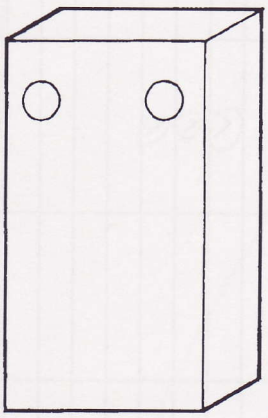


Diagram 2

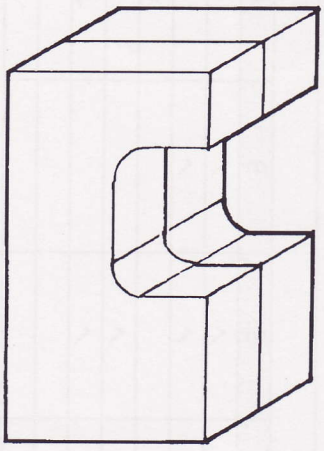


Diagram 3

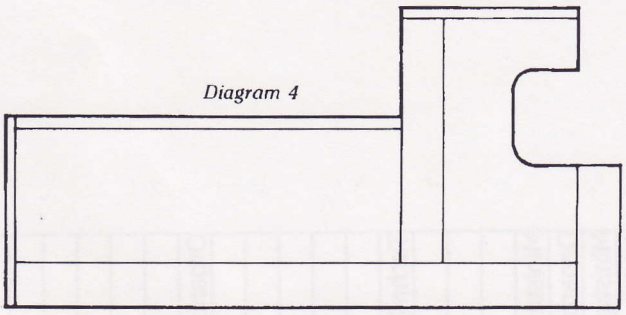
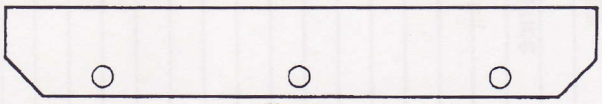


Diagram 4

DIAGRAM 5

Locomotive chassis. On the chassis piece of timber (9), 1in (25mm) from the top at each end, mark a 45-degree angle and, with a tenon saw, cut off these corner pieces. Mark the centres of the holes for the axles ⅜in (10mm) from the bottom of the chassis piece, one in the centre and the other two 4in (100mm) either side. On these marks, drill ⅜in (10mm) holes vertically through the chassis piece.

Diagram 5



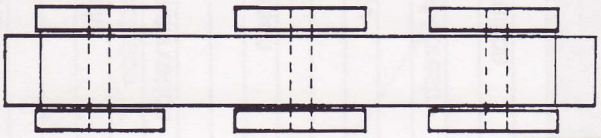
Chassis

DIAGRAM 6

Cut the three axles (10) to length and, with the hole saw, cut six 2in (50mm) diameter wheels (11). Glue the axles into the wheels on one side, ensuring that the axle is flush with the outside of the wheel.

Place each axle through the hole in the chassis and fit the other wheels on to the axles, again ensuring that the axle is flush with the outside of the wheel. The wheels should not be glued in position permanently at this stage, as it is easier to paint the whole locomotive first. Check that the chassis assembly runs smoothly.

Diagram 6

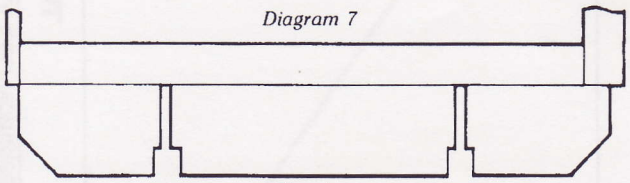


Chassis

DIAGRAM 7

3in (75mm) in from the end of the chassis piece on the bottom, drill two ⅜in (10mm) holes to a depth of ½in (12mm). Replace the ⅜in (10mm) drill with a ¼in (6mm) drill, and in the same holes, drill completely through the chassis. The chassis pieces can now be screwed to the underside of the base of the locomotive, using 1½in (37mm) gauge 8 screws. The chassis should be ¼in (6mm) in from each end of the locomotive body.

Diagram 7



Chassis

DIAGRAM 8

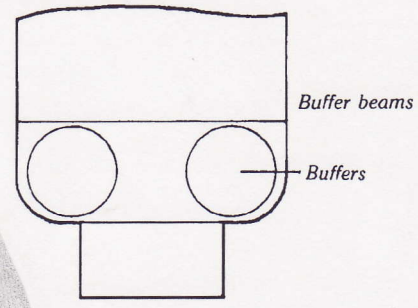
Take the two buffer beams (12) and, on the two bottom corners, mark a ½in (12mm) radius circle and cut the corners of the buffer beam to shape with a coping saw. Glue the buffer beams to the ends of the chassis pieces, ensuring that they are flush with the sides of the locomotive. Glue the buffers (13) in the centre of the buffer beam, ⅝in (15mm) in from each edge.

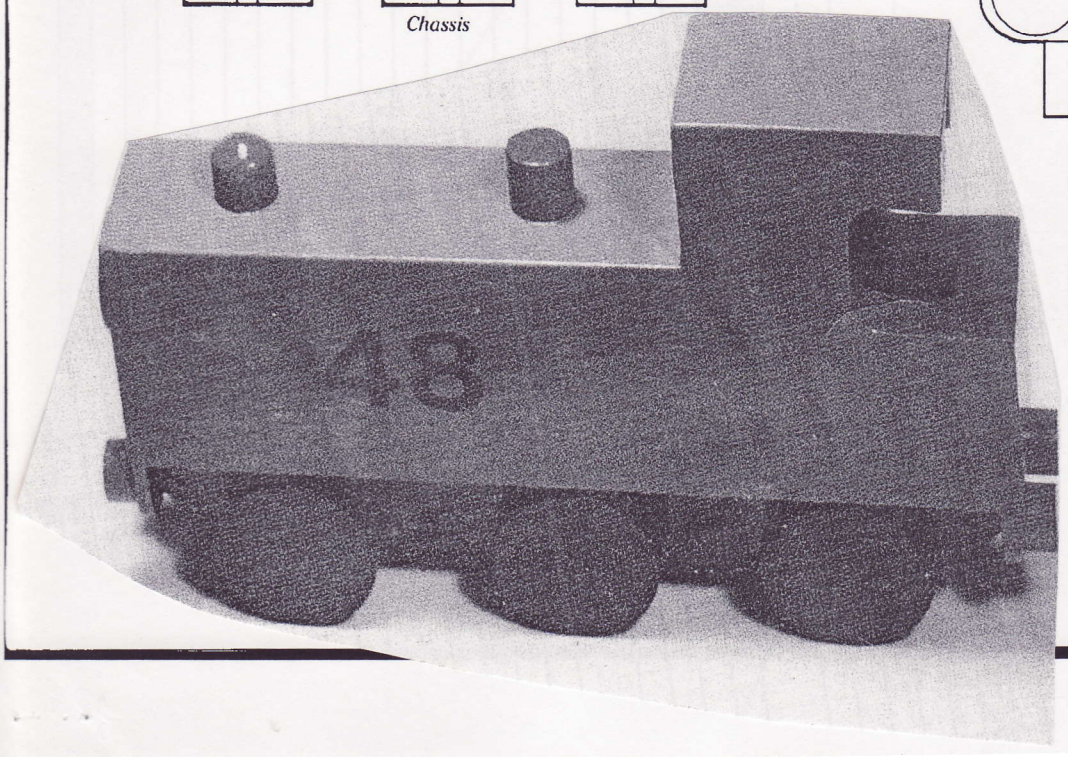
Glue the circular piece of timber (14) in the centre on the front of the locomotive to represent the smoke box door. Glue the two pieces of dowel (15 and 16) on the top of the locomotive body to represent a chimney and a safety valve.

The whole assembly should now be sanded with fine graded sandpaper and painted. Take special care not to allow paint to run into the axle holes.

Finally, the axles can be inserted in each hole and the second wheels glued in position with the axle flush with the outside edge. It may be necessary to add a dab of paint on to the end of the axle to complete the painting.

Diagram 8





MATERIALS FOR RAILWAY ENGINE

Locomotive Body

1. Base, timber: ⅞ × 11¼ × 2¾in (22 × 287 × 70mm)
2. Side pieces (2), timber: ⅞ × 8 × 2¾in (22 × 203 × 70mm)
3. Top, plywood: 8 × 2¾ × ¼in (203 × 70 × 6mm)
4. Front, plywood: 2¾ × 3⅞ × ¼in (70 × 98 × 6mm)

Locomotive cab

5. Front, timber: ⅞ × 2¾ × 5in (22 × 70 × 125mm)
6. Sides (2), timber: ⅞ × 2¾ × 5in (22 × 70 × 125mm)
7. Rear, timber: ⅞ × 2⅞ × 2¾in (22 × 72 × 70mm)
8. Roof, plywood: 2¾ × 3½ × ¼in (70 × 90 × 6mm)

Locomotive Chassis

9. Chassis, timber: 12 × 1¼ × 1¾in (305 × 33 × 45mm)
10. Axles (3), dowel: 2⅝ × ⅜in diameter (68 × 10mm)
11. Wheels (6), timber: ⅝ × 2⅜in diameter (15 × 60mm)
12. Buffer beams (2), plywood: 2¾ × 1 × ¼in (70 × 25 × 6mm)
13. Buffers (4), dowel: ½ × ⅞in diameter (12 × 22mm)
14. Smoke box, dowel: ¼ × 1¾in diameter (6 × 45mm)
15. Chimney, dowel: 1 × ⅞in diameter (25 × 22mm)
16. Safety valve, dowel: 1 × ⅞in diameter (25 × 22mm)