SR 'SCHOOLS' 4-4-0

These locos were designed by Maunsell, and the first ten, nos. 900-9, were built in 1930. They had many standard parts, such as the 'Lord Nelson' type bogie and cylinders, and a shortened version of the 'Kings Arthur' boiler, and proved very successful. A further 20 were ordered in 1931 and built between 1932 and 1934, nos. 910-29, a final ten being added in 1934/5, nos. 930-39.

The first ten were built without smoke deflectors, these being added in 1931/32, and also their cabs had lower side windows than on subsequent locos. Smokebox snifting valves were originally fitted to all the class, but these were removed in the late I 940's. The class became BR nos. 30900-39, and all were withdrawn in 1961-2. Further information can be found in the RCTS Locos of the S.R., part 1.

To complete the loco, the following will be needed:

- 2 pairs 26mm driving wheels, axles and crankpins
- 2 pairs 12mm bogie wheels
- 3 pairs 16mm tender wheels, spoked or disc, depending on which loco is being modelled.
- Portescap motor, or can motor and gearbox.

ASSEMBLY INSTRUCTIONS

Chassis Assembly

Take the frames (1) and solder in the axle bushes (2). Select the '00' or 'EM' frame spacers (3) as required, and solder an 8BA nut (4) over the hole in the centre of the front spacer, and over the hole towards the front of the main, central spacer. Assemble the frames and spacers, making sure everything is square and flat before finally soldering together. The rectangular holes in the central spacer should be directly under the rear axle, for oiling the finished chassis. Solder pieces of 22g wire through the small holes in the frames to form the brake gear supports, and lifting arm supports (5). (The lifting arm supports need to extend 10mm from the frames). Bend the cylinder block (6) along the etched fold lines, and solder it into the slots in the front end of the chassis. Fold the slide bar bracket (7) in half to make it double thickness, then solder it into the slot in the frame tops.

Next fit the driving wheels, axles, motor and/or gears, and crankpins to the chassis. Clearance has been provided to allow the fitting of either a Portescap motor, or a can motor and gearbox. Solder the pairs of coupling rod halves (8) together, place the rods on the crankpins, check that the wheels revolve freely, then fit to the rear crankpins with crankpin washers. Put paper between the coupling rods and washers when fixing to avoid soldering the rods to the crankpins, then remove the paper afterwards. Screw the collector tag (9) to the main spacer using one of the 8BA screws (10) and the two fibre washers (11). Check that the tag is not electrically live to the chassis, then form the current pickups from some of the 26g wire soldered to the tag, and bearing on the backs of the insulated wheel rims. Now take the brake hangers (12) and solder the brake blocks (13) to them, making LH & RH pairs, then solder the assembled brakes to the support wires in the chassis, making sure that the brakes do not touch the wheels. Use 22g wire to form the tie bars (14), fitting the pull rods (15) at the same time. The rear ends of the pull rods should be soldered to the inside faces of the frames.

Turn now to the cylinders, and solder the piston rod guides (16), cylinder end covers (17), front valve end covers (18) and rear valve end covers (19) into their holes in the cylinder block. Curve the top and bottom ends of the cylinder sides (20), and then fit the sides in place. Bend the ends of the slide bar backing plates (21) at right angles, and then solder the plates to the slide bar bracket, noting that the forward part of the backing plate is longer than the rear part. Next take the crossheads (22), bend up the body of each, and solder them to the top plates. Bend the front piece on the crossheads round a piece of the piston rod bar and solder in place (see assembly diagram). Fix a connecting rod (23) to its corresponding crosshead with a I4BA screw and nut, trimming the screw to length after fixing. Slide a crosshead into its piston rod guide, put the connecting rod onto the leading crankpin, and revolve the wheels to check that the piston rod is not too long, then take the slidebars (24) and solder the ends to the ends of the bracket.

Next assemble the valve gear using the rivets provided. Start by riveting an anchor link (25) to a combination lever (26), the link going in front of the lever. Then rivet the other end of the combination lever to the front end of a valve rod (27), with the valve rod behind the lever. Next rivet an expansion link (28) to the rear end of the valve rod, with the expansion link in front of the valve rod. Rivet the smaller end of an eccentric rod (29) to the lower end of the expansion link, the rod going in front of the link. Finally, rivet the larger end of the eccentric rod to the smaller end of the return crank (30), with the rod in front of the crank. To attach the valve gear to the chassis, pin the end of the anchor link to the hole in the bottom of the crosshead, solder the valve rod onto the wire support in the chassis, and solder the return crank to the crankpin of the leading driving wheel. The valve rod should go through the rectangular hole in the slide bar bracket. Check that all runs freely, then repeat the process on the other side. Take the valve guides (31), bend the ends at right angles, and solder the guides to the rear valve end covers.

Next fit the front sandboxes (32) to the frames, behind, and up against the lifting arm supports, then fit the rear sandboxes (33) to the frames, between the coupled wheels. Turn now to the bogie (34), and bend down the sides and centre pieces at right angles to the stretcher. Solder the front plate (35) into the grooves on the inside face of the sides, then solder the axle bushes (36) into their holes. Take the riveted side overlays (37) and fit them to the bogie. The bogies on the ‘Schools’ were strengthened in later years by having deeper side frames. The main bogie etching has the shape of the original side frames, and if modelling a loco in early condition the lower edges of the side overlays should be shaped after fitting to match the bogie sides. If modelling a loco in later years the side overlays should be left as they are, i.e. with straight lower edges. Fit the wheels, using the axle washers (38) to take up any side play if necessary. Fit the compensation gear ends (39) into the holes in the centre of the sides, then take the bogie link (40), solder the washer over its smaller end, and tap the hole 8BA. Screw the bogie to the link, leaving a small amount of play, and then shorten the screw so that it is flush with the top surface of the link. The bogie can now be screwed to the chassis using an 8BA screw and the cast pivot (41).

Glue the balance weights (42) to the wheels, the larger ones going on the front pair of wheels. The drawbar (43) and drawbar pivot (44) are attached to the chassis with the same screw used to fix the chassis to the body. Cylinder drain cock pipes (45) are provided and these should be fixed to the bottom of the cylinders. Care must be taken with these, as the front ends go against the front face of the steps on the body, after completing the loco Finally, cut a 27mm long piece of the 20g wire, pass it through the two small brackets behind the rear bogie wheel cut-outs so that it protrudes equally either side, and solder in

place. Fix the two small angle pieces (46) to the brackets and to the 20g wire, then fix the rear end of the operating levers (47) to the ends of the 20g wire, and the front end of the levers to the cylinder drain cock pipes.

Superstructure Assembly

Remove the footplate (1) and valances (2) from the fret and, using the half-etched lines, bend down and curve the footplate ends to match the valances. At the same time, crank the front end of the valances inwards where the small half-etched lines are and press out the rivets where the half-etched holes are. When this is done, solder the valances into the half-etched grooves in the underside of the footplate, then solder the buffer beam (3), and drag beam (4) in place. Slot the frame pieces *(5)* into the front end of the footplate and solder in place. Take the front step plates (6), bend up the bottom steps, and bend the step so that they slope inwards. Those with small radius curves will find it better to leave these step plates straight, to give the front bogie wheels more clearance. Solder them behind the front end of the valances, up against the buffer beam, then bend and fit the steps (7). Bend and fit the three front lamp brackets (8) into the slots in the front edge of the footplate, then fit the buffers (9) into the holes in the buffer beam. Bend and fit the rear step plates (10), and the rear steps (11), then solder an 8BA nut (12) over the two chassis fixing holes in the footplate under the smokebox and cab. Bend the ends of the two large plates under the rear section of the footplate (13) and fit these plates into their grooves. Curve the front splasher tops (14) to match the splasher sides, and solder them in place, with the half-etched recesses in the edges over the edges of the splasher sides.

Take the cab sides/front (15), bend the sides at right angles to the front, then bend the upper, half-etched section of the sides inwards at 10~ to match the front, and solder up the joint. Slot the cab into the footplate and solder in place. Curve the rear splasher tops (16) and solder in position. Bend the ends of the cab floor support (17) at right angles, and solder it to the footplate, slightly in from the rear edge of the footplate. Curve the fall plate (18) along its length, solder a piece of handrail wire along its front edge, protruding either end, and place a split pin over each end. Take the cab floor (19) and push the split pins into the holes in its rear edge, and fix in place, forming a hinge for the fall plate, then solder the cab floor into the cab, on top of the floor support.

Turn now to the boiler/firebox (20), and flare out the base of the smokebox and firebox along the half-etched lines, so that the edges are 17mm apart, then solder up the seam of the boiler. The smokeboxes were originally flush riveted, but later acquired raised rivets round the front edge, and these should be pressed out if required. Those modelling a loco in earlier condition with snifting valves should drill out the half-etched holes in the smokebox to take these. Solder the smokebox front (21) in place, then fit the small front step (22) into its slot, and make and fit the four short handrails in the lower section. Fit the four boiler bands (23). The distance from the front edge of the smokebox to their centres should be 20.5, 42.5, 65.5 and 70.5mm. The boiler/firebox can now be fitted to the footplate/cab, checking everything for squareness and correct alignment before soldering in place. The boiler handrails can then be made and fitted from the handrail wire and handrail knobs provided (24). Make the ejector pipe (25) from the 20g wire, and fit to the LH side of the boiler. Fold up the two firebox stay covers (26), slot them into the footplate between the splashers, and fix in place.

Turn back to the cab, form the cab window shields (27) to fit round the cab front windows, and solder them on. Take the cab splashers parts (28), curve the top pieces to match the sides, fit the separate side pieces to each top piece, and then fit the splashers over the cut-outs in the cab floor. Take the backhead (29), fit the regulator handle (30) to it, and then fix the backhead into the cab. Take the reverser stand (31), fit the etched hand wheel (32) to it, and then fit the assembly into the LH side of the cab. Next curve the cab roof (33) to match the curve of the cab front, and solder to the front and the top edge of the sides. Bend the rain strip (34), so that it fits into the groove in the cab roof (on its edge, not laying flat), and solder in place. Two pairs of upper cab sides (35) are provided, one set for nos. 900-9, and the other for 910-39. Choose which pair you require, bend over the top 3mm so that the angle matches the angle between the sides and the roof, then solder the sides in place. Fit the cab handrails, then fit the roof support (36) to the underside of the cab roof just behind the rear edge of the cab sides. Fold up the reverser linkage cover (37) and fix to the front of the cab on the LH side of the loco.

Now take the long pipes and their cover strips (38) that run down the length of each side of the boiler, and fix them to the boiler and firebox. The LH one slots into the edge of the reverser linkage cover. Fit the reverser shaft bearings (39) into their holes in the footplate, and then fit the reversing lever (40) to the LH side of the loco. Its rear end slots into the reverser linkage cover, and its front end attaches to the reverser shaft bracket. Fit the sandbox filler caps (41) into the holes in the footplate behind the leading splashers, and then fix the expansion link covers (42) into the holes in the footplate in front of the leading splashers. The small fiat on the covers should face forwards.

Turn back to the boiler, and fit the whistle (43), the etched safety valve base (44), the safety valves (45), dome (46) and chimney (47). Fit the snifting valves (48) if required (These were removed in the late 1940’s). Fit the clacks (49) to the front section of the boiler, with the lower end of their pipe fitted into the hole in the footplate. Now take the smokebox door (50), and fit the handrail and upper lamp bracket to it. The side lamp brackets (51) should also be fitted to the smokebox door if modelling a loco with smoke deflectors. The first ten were built without smoke deflectors, and with the side lamp brackets fitted to the smokebox, smoke deflectors being fitted in 1931/32. Fit the steam pipes (52) either side of the smokebox, using the smoke deflectors (53) to position them, then fit the beading (54) to the smoke deflectors, slot them into the small slots in the footplate (these small slots will need to be filled if not fitting deflectors), and secure with solder. Bend and fit the upper injector pipes and valves (55) with their upper ends in the holes either side of the whistle, and their lower ends through the holes in the footplate. Note that the pipe on the LH side goes outside the ejector pipe, but behind the handrail. Fit the vacuum pipe (56) into the hole in the front of the footplate, and fit the LH injector (57) and RH injector (58) to the back of the steps under the cab.

In the last few years of their life half of the class were fitted with AWS equipment. If modelling one of these locos the AWS timing reservoir (59) and battery box (60) should be fitted onto the footplate on the LH side of the loco, in front of the cab.

Schools Parts List

Chassis

1. Frames, LH & RH
2. Driving axle bushes -4
3. Frame spacers - 3
4. 8BA nuts-2
5. Brake gear & lifting arm supports
6. Cylinder block
7. Slide bar bracket
8. Coupling rods
9. Collector tag
10. 8BA screws - 5
11. Fibre washers – Not supplied
12. Brake hangers - 4
13. Brake blocks- 4
14. Tie bars, 22g wire
15. Brake pull rods - 2
16. Piston rod guides - 2
17. Cylinder end covers - 2
18. Front valve end covers - 2
19. Rear valve end covers- 2
20. Cylinder sides - 2
21. Slide bar backing plates, LH & RH
22. Crossheads, LH & RH
23. Connecting rods, LH & RH
24. Slide bars, LH & RH
25. Anchor links - 2
26. Combination levers - 2
27. Valve rods - 2
28. Expansion links - 2
29. Eccentric rods, LH & RH
30. Return cranks - 2
31. Valve guides-2
32. Front sandboxes, LH & RH
33. Rear sandboxes, LH & RH
34. Bogie
35. Bogie front plate
36. Bogie axle bushes - 4
37. Bogie side overlays, LH & RH
38. Bogie axle washers - 4
39. Compensation gear ends - 2
40. Bogie link and washer
41. Bogie pivot
42. Balance weights, 2 large, 2 small
43. Drawbar
44. Drawbar pivot
45. Cylinder drain cocks, LH&RH
46. Operating lever bracket
47. Operating levers - 2

Superstructure

1. Footplate
2. Valances, LH & RH
3. Buffer beam
4. Drag beam
5. Front frame pieces - 2
6. Front step plates, LH & RH
7. Front steps - 2
8. Lamp brackets - 4
9. Buffers-2
10. Rear step plates, LH & RH
11. Rear steps
12. 8BA nuts-2
13. Plates under footplate, LH & RH
14. Front splasher tops - 2
15. Cab
16. Rear splasher tops - 2
17. Cab floor support
18. Fall plate
19. Cab floor
20. Boiler/firebox
21. Smokebox front
22. Front step
23. Boiler bands - 4
24. Handrail wire & knobs - 16
25. Ejector pipe, 20g wire
26. Firebox stay covers - 2
27. Cab window shields - 2
28. Cab splashers, 2 parts, LH & RH
29. Backhead
30. Regulator handle
31. Reverser stand
32. Reverser wheel
33. Cab roof
34. Rain strip
35. Upper cab sides, LH&RH, 2 types
36. Interior roof support
37. Reverser linkage cover
38. Pipes & cover strips, LH & RH
39. Reverser shaft bearings, LH & RH
40. Reverser lever
41. Sandbox fillers -2
42. Expansion link covers -2
43. Whistle
44. Safety valve base
45. Ross pop safety valves - 2
46. Dome
47. Chimney
48. Snifting valves - 2
49. Clacks - 2
50. Smokebox door
51. Side lamp brackets, LH & RH
52. Steam pipes - 2
53. Smoke deflectors, LH & RH
54. Smoke deflector beadings
55. Upper injector pipes, LH&RH
56. Vacuum and steam heating pipe
57. Injector, LH
58. Injector, RH
59. AWS timing reservoir
60. AWS battery box

SR MAUNSELL 4000 GALLON TENDER

This kit is primarily designed for the tenders for the 'Schools' class. However, they were similar to other Ashford-built 4000 gallon tenders, and this kit can also be used to build the five flat-sided tenders constructed for King Arthur's numbers 763-767. These tenders were transferred to Maunsell S15's numbers 833-837 in 1936. The kit requires 16mm diameter wheels to complete, either disc or spoked, depending on which loco is being modelled.

Parts List

1. Chassis
2. Axle bearings - 6
3. Brake gear supports, 22g wire
4. Brakes-6
5. Brake pull rods - 2
6. Tie bars, 22g wire
7. Footplate
8. Valances - 2
9. Buffer beam
10. Drag beam
11. Frames, LH & RH
12. Triangular brackets - 4
13. Step plates, 2 LH & 2 RH
14. Steps-4
15. 8BAnuts-2
16. Drawbar pin, 1/16" dia. brass
17. Guard irons - 2
18. Buffers-2
19. Tender sides and back
20. Lamp brackets - 6
21. Small rear steps - 2
22. Handrail wire
23. Internal support
24. Tender top
25. Coal plate
26. Coal chute
27. Rear bulkhead
28. Tank filler
29. Floor support
30. Floor
31. Vertical cover plate
32. Vacuum pipe
33. Axleboxes-6
34. Toolboxes - 2
35. Brake column
36. 8BA screws -2

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Assembly

Take the chassis (1), clean out the axle holes with a 3.0mm drill, and then bend down the sides at right angles. Fit the axle bearings (2) into their holes, and then pass pieces of the 22g wire through the small holes in the sides to form the brake gear supports (3). Next fit the wheels to the chassis. Solder the brakes (4) to the support wires, making sure they do not touch the wheels, and then take the two pull rods (5), and thread 22g wire through the lower ends of the brakes and through the pull rods to form the tie bars (6).

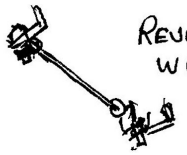
Turn now to the footplate (7) and solder the valances (8) into the etched grooves in either edge, then solder the buffer beam (9) and drag beam (10) in place. Slot the side frames (11) into the footplate with the half-etched grooves for the angle pieces facing outwards, and then solder them in place. Solder each tag and the frame ends, rather than along the whole frame, to avoid heat build-up and possible distortion of the footplate due to expansion. Now fix the four triangular brackets (12) into the grooves in the frames and the underside of the footplate. Bend up the steps on the bottom of the step plates (13) and fit them into the slots in the footplate, then bend up the ends of the four steps (14) and fix them into the slots in the step plates. Solder an 8BA nut (15) over the two fixing holes in the footplate, and then solder the piece of 1/16” dia. brass behind the centre of the drag beam to form the drawbar pin (16). Solder the two guard irons (17) to the inside faces of the frames, behind the buffer beam, and bend to shape after fixing, then solder the buffers (18) to the buffer beam.

Before removing the body sides and back (19) from the fret, the positions of the corners should be marked lightly on the inside face. The position of the corners is marked on the etching fret. After doing this, remove the sides/back from the fret, and curve the corners to 2mm radius. If using the tender for a ‘Schools’, the top 5 1/2mm of each side should be gripped in a vice, and bent inwards at an angle of 100. Slot the tender body into the footplate and solder in place. Bend five of the lamp brackets (20) and fix them into the slots in the back of the tender, then fix the two small steps (21) into their slots in the tender back. Make and fit the corner handrails from the handrail wire (22) provided. Slot the internal support (23) into the footplate and solder in place. Bend down the front of the tender top (24), then bend the coal plate (25) to shape and solder it to the underside of the tender top. Fit this assembly into the tender and solder in place, then bend up the ends of the coal chute (26) and fix it into the slot at the bottom of the coal hole. Take the rear bulkhead (27) next. If modelling a ‘Schools’ the ends will need to be cut off at 10 degrees along the half-etched lines. Solder it into the slots in the top of the tender, and then fix the tank filler (28) into its hole.

Take the floor support (29), bend the ends at right angles, and then fit it to the front of the tender. Fit the floor (30) to it, ensuring that the hole for the brake column is in the correct position. Fit the thin vertical cover plate (31) to the left-hand side of the tender, 4mm in from the front edge of the side. Fit the vacuum pipe (32) to the buffer beam, fit the axleboxes (33) to the frames, fit the toolboxes (34) in place, and, finally, fit the brake column (35) into its hole in the floor. Two 8BA screws (36) are provided to screw the chassis to the body.

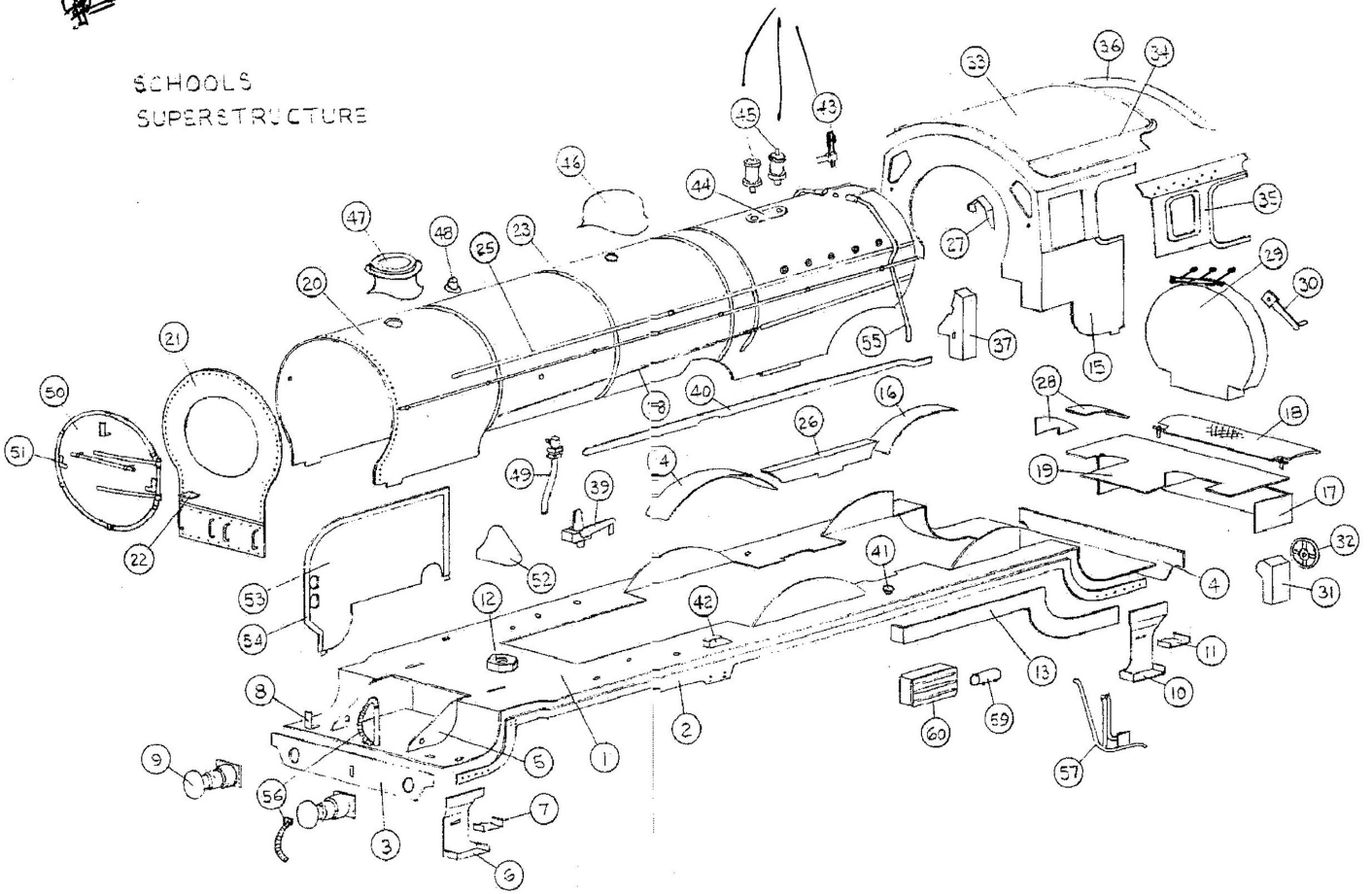
EXTRA'S

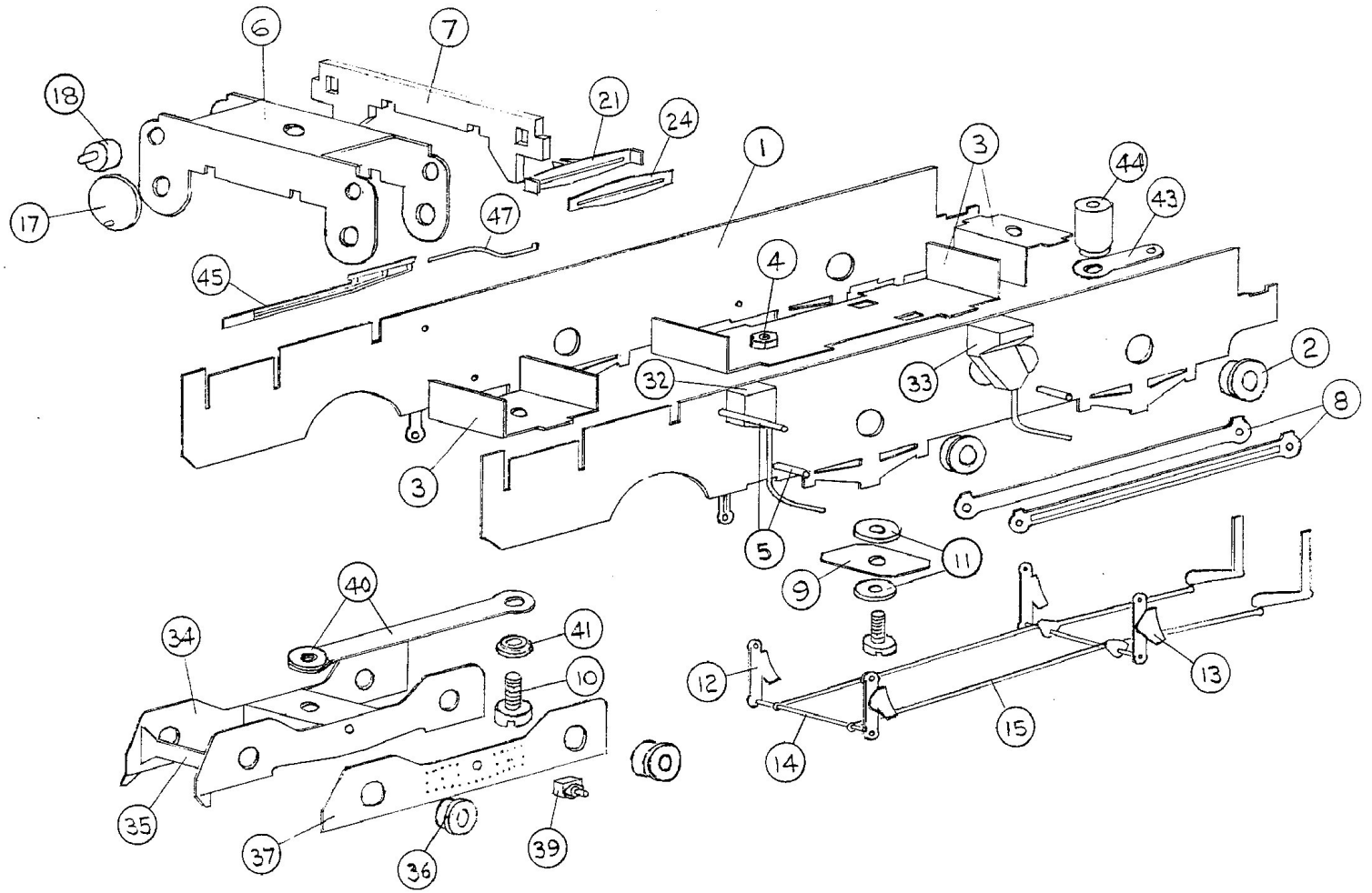
1)  CAB BACKHEAD MANIFOLD (SEE N°29)

2)  REVERSING SHAFT - COMPLETE WITH LINK ENDS. (SEE N°39.

TURNED BRASS

SCHOOLS
SUPERSTRUCTURE





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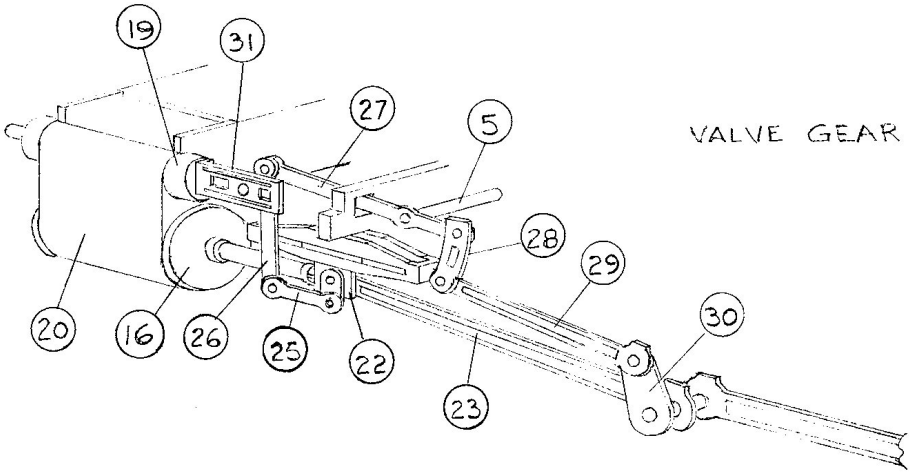
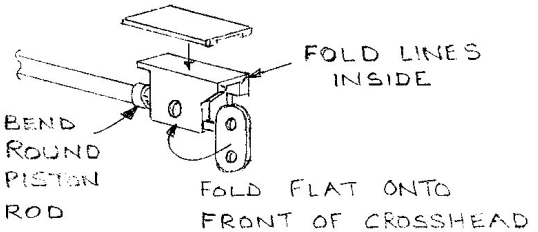
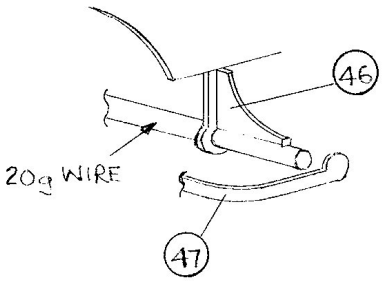


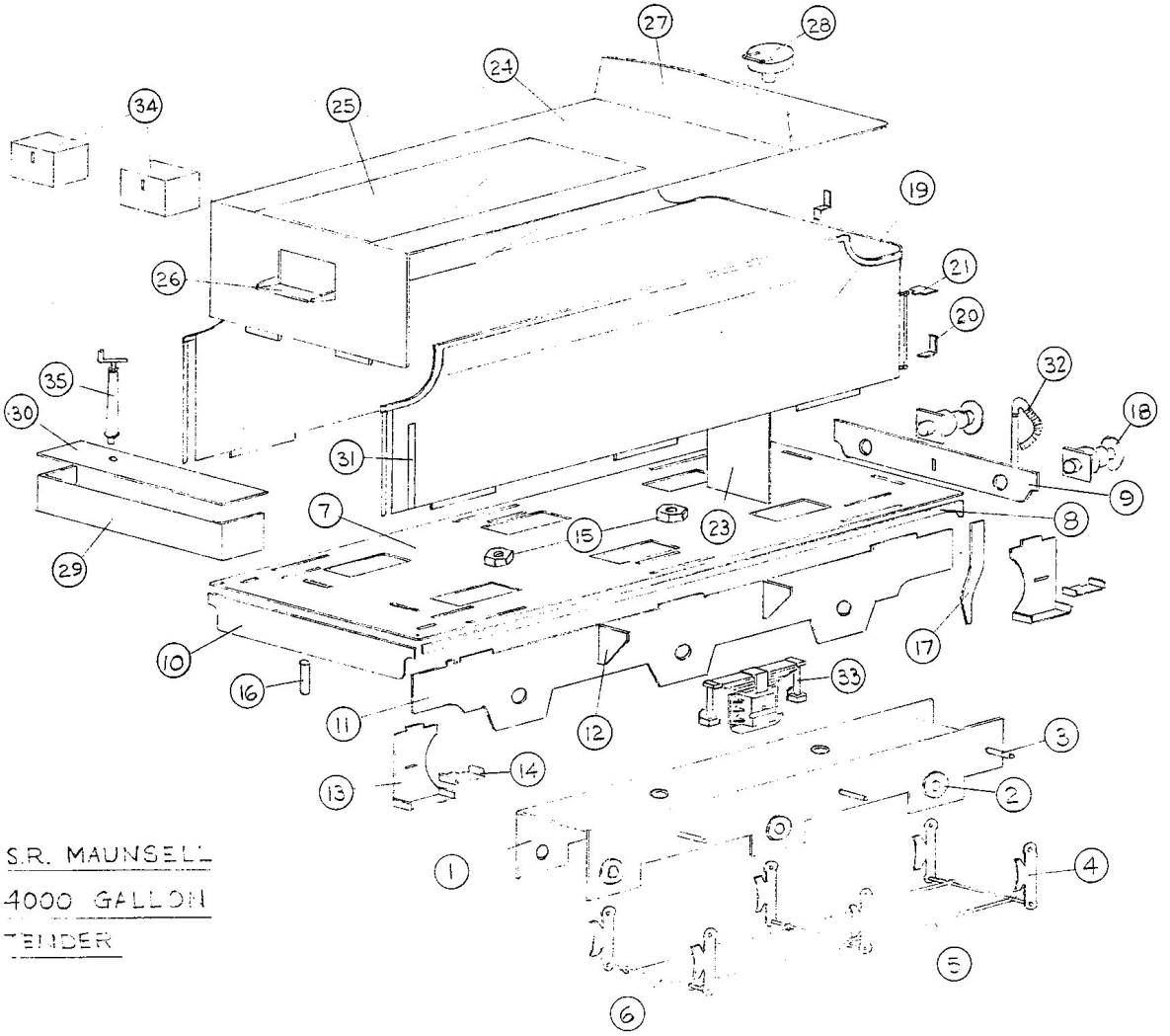
VALVE GEAR ASSEMBLY



CROSSHEAD ASSEMBLY



DRAIN COCK OPERATING LEVER AND BRACKET


S.R. MAUNSELL
4000 GALLON
TENDER