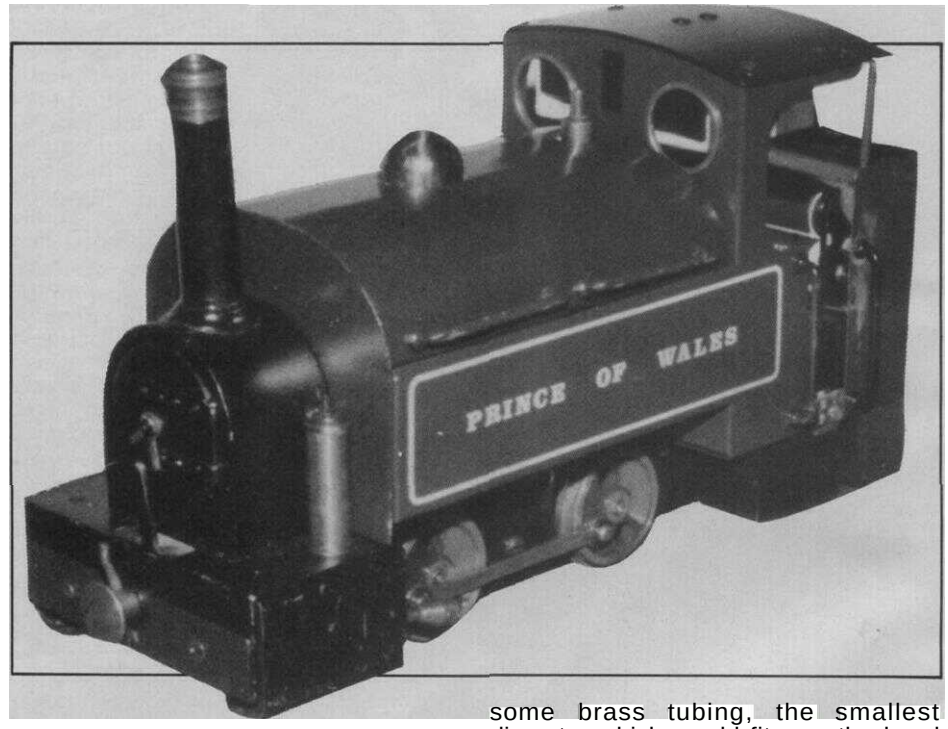
TAMING THE MAMOD

The Mamod is a good base to start out of doors steaming. Keith Bucklitch adds radio control and a bit of individualism

During 1983 Fred Game described in Model Trains a method of fitting radio-control into a Mamod locomotive which entailed the construction of a tender. As I had already done something similar, for my second 'mamodification' I decided to attempt something different. What I wanted to do was to fit the radio gear into the locomotive. The following account details how I achieved this.

You will note that there are a few changes in the outline of the model. Some of these such as the bunker were necessary to fit the radio equipment, but several are purely cosmetic and could be omitted if so wished. I feel, however, that the result is a fine "chunky" little engine.



General arrangement

Picture No. 3 shows a view of the cab and rear bunker. The radio receiver is situated beneath the roof, the servo is on the floor and the batteries are mounted in the bunker. The aerial can be seen coiled against the receiver. The switch protrudes through the rear bunker wall.

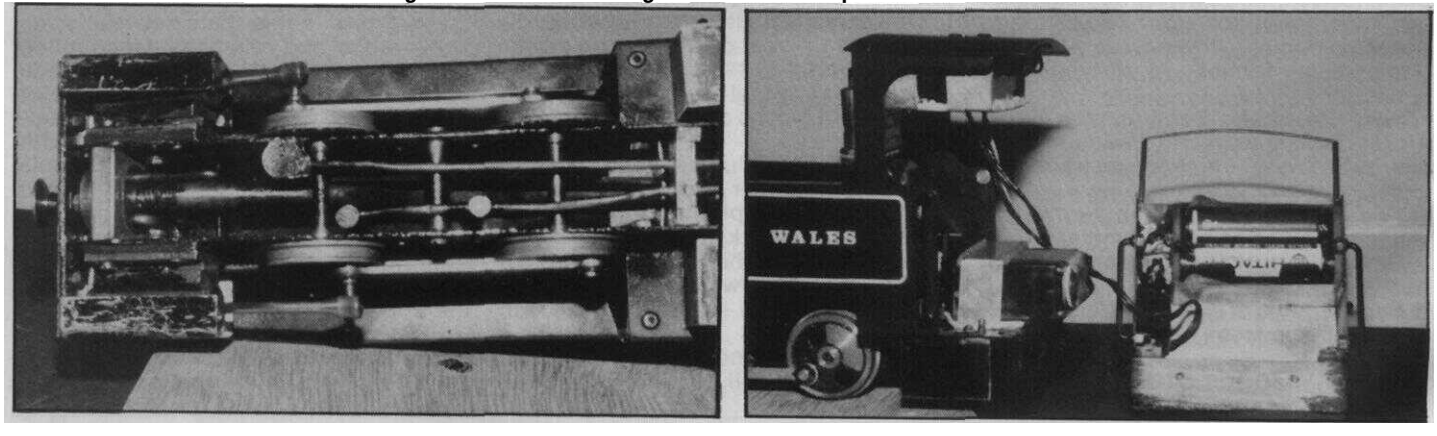
The servo drives a torsion bar running the length of the firebox and linking with the spindle of the steam valve. This can be seen in the photograph.

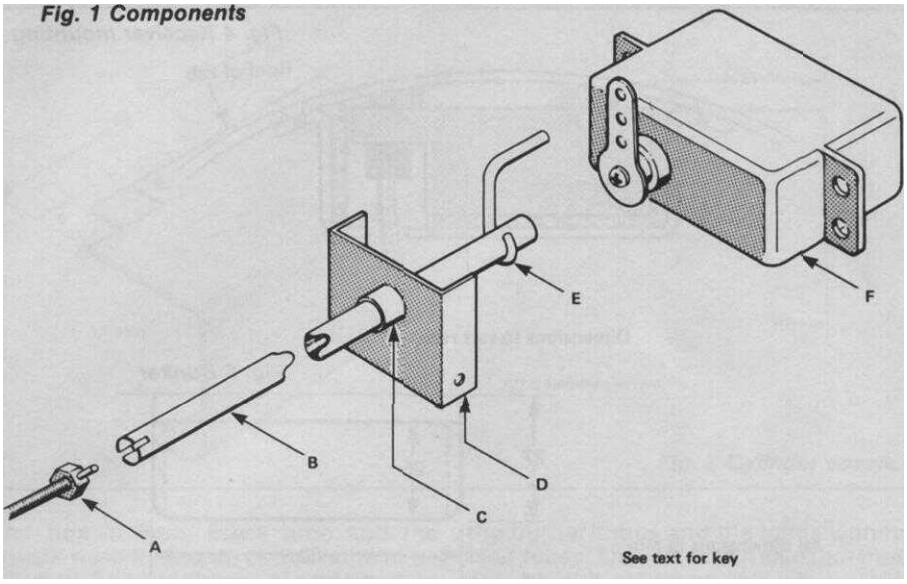
Control Linkage

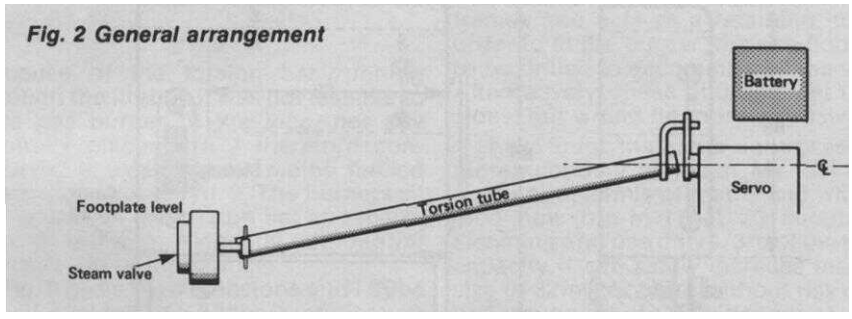
See Figs. 1 and 2. The first task was to drill a hole through the hexagon head of the retaining screw inserted into the rear face of the Mamod steam valve. This was drilled to a size to be an interference fit for a piece of piano wire. I used some wire of 1mm diameter, but this is not critical. A short length of wire inserted into the hole made a Tommy'-bar (A). Rotating the tommy-bar rotated the steam valve.

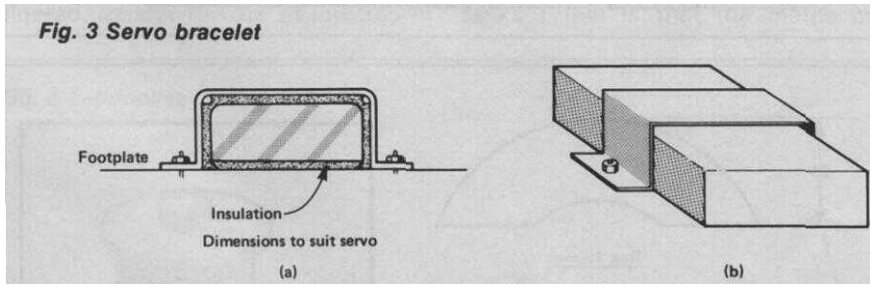
The torsion bar (B) was made from some brass tubing, the smallest diameter which would fit over the head of the tommy-bar. A slot was cut in the end of this to produce a fork to engage with the arms of the tommy-bar in a crude universal coupling. Before cutting to length, the excess tube emerged through the firebox hole into the cab. The tube was easily rotated by hand and the motion was transferred to the steam valve.

Left: the burner and control arm. Right: the radio control gear Installed. **All photos: the author.**









It was necessary to support the rear end of the tube and close off the firebox opening to keep the fire away from the electronics. A bearing plate (D) was folded from some 0.020 in. sheet and drilled -to accept the torsion bar. The plate is a close fit between the frames and is held in place by two convenient nuts and bolts which hold the cabsides to the frames.

In order to retain the torsion bar in contact with the tommy-bar, a collar (C) was made from some larger diameter tube. This is a tight fit and so prevents the torsion bar sliding backwards. The tubing was then marked and cut to length with torsion bar sliding backwards. The tubing was then marked and cut to length with *%\n.* protruding into the cab.

With the steam valve in neutral (closed) position, the rear end of the torsion tube was marked and drilled to take the crank (E). This, also made of piano wire was shaped to grip the tube to prevent rotation and soldered into place. In practice, the solder has occasionally melted, but the crank has remained firm. The length of the vertical arm of the crank will depend upon the height of the servo horn you use. It is therefore necessary to line up the servo before shaping the bend of the crank and cutting to final length.

Servo Mounting

Initially during the trial runs, the servo was stuck down with "servo tape'. This is a spongy plastic tape, self-adhesive on both sides. The battery box was stuck on top and the receiver similarly fastened under the roof. However, it soon became obvious that for ease of dismantling and servicing something more technical had to be made.

This consists of a small bracket (Fig. 3) which is bolted to the floor of the cab. Dimensions will depend upon your servo. I lined this with some foam plastic which clamps the servo in place. I also placed a small square cut from an asbestos oven pad underneath the servo to insulate it form the heat of the cab floor.

Theoretically, the drive shaft of the servo should be in line with the axis of the torsion bar (see Fig. 2). Although mine is slightly off-centre, vertically it seems to function satisfactorily. To guard against the plastic servo coming into contact with the hot metal torsion bar, a small piece of asbestos mat is glued to the servo horn as insulation.

The receiver and batteries were briefly connected to the servo and the assembly was tested.

Receiver Mounting

Originally the receiver was simply stuck in place, beneath the cab roof with servo tape. However, during one steam-up session, some meths which had been split on the cab floor caught fire and started to cook the servo and especially the receiver which began to melt. Peter Dowd (who is a former fireman) rapidly extinguished the flames with a squirt from his boiler water filling bottle. (N.B. immersion in water is not normally recommended by the manufacturers of radio gear) and to our surprise, despite the inferno, the radio still responded to the transmitter. The servo required a new horn and final gear which cost 60p and we were back in action. However, for future protection I encased the receiver in a tinplate cover, lined with more cooking mat. Since then a further fire in the cab has caused little damage, and it is obvious that the radio gear will withstand considerable heat without **ill**-effects.

The protective cover has cutouts to enable the servo and battery leads to be plugged in or removed and is held by four 12BA countersunk screws through the cab roof. At the moment the cover still requires a coat of matt black paint which will make it less conspicuous.

Incidentally, the fire in the cab is the reason for the absence of a driver from the photographs. The heat of the fire became too much for the plastic figure I was using, causing his legs to buckle and he 'bailed out'. He was later found by the lineside with burned hands and minus a leg and has taken early retirement from driving steam locomotives.

The aerial was simply coiled up and **stuck** to the cab roof with adhesive tape.

Bunker

The servo extends beyond the original rear buffer beam by some *1/2* in. It was therefore necessary to make a new cab back and buffer beam. This was folded

from 0.020" tinplate. Fig. 5 gives the dimensions. A shelf inside the bunker carries the battery holder and the rear face of the bunker was slotted and drilled to fit the switch.

The original handrails were fitted **to** the bunker sides and a wire arch made which clips to the cab roof. The bunker is retained in place by two screws which pass through the holes in the buffer beam and a wooden buffer beam which fills in the gap between the original buffer beam and the extended bunker.

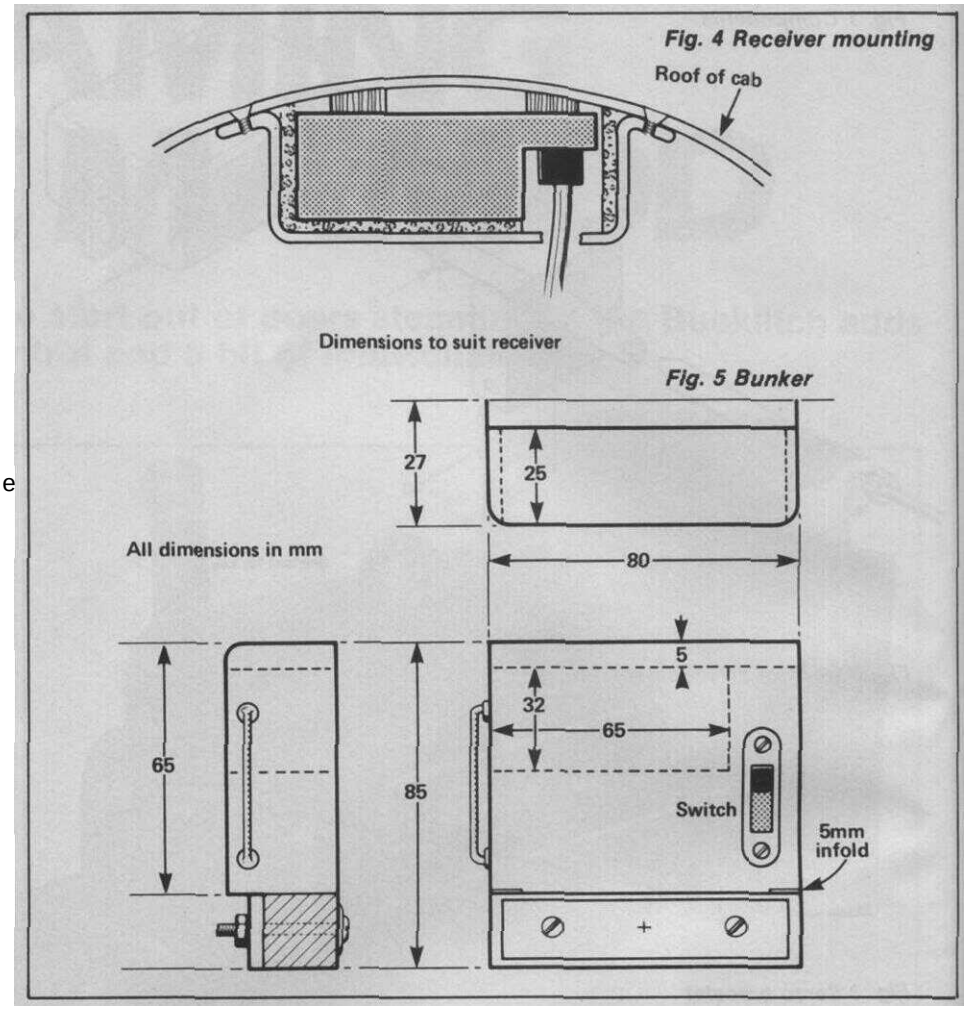
Saddle Tank

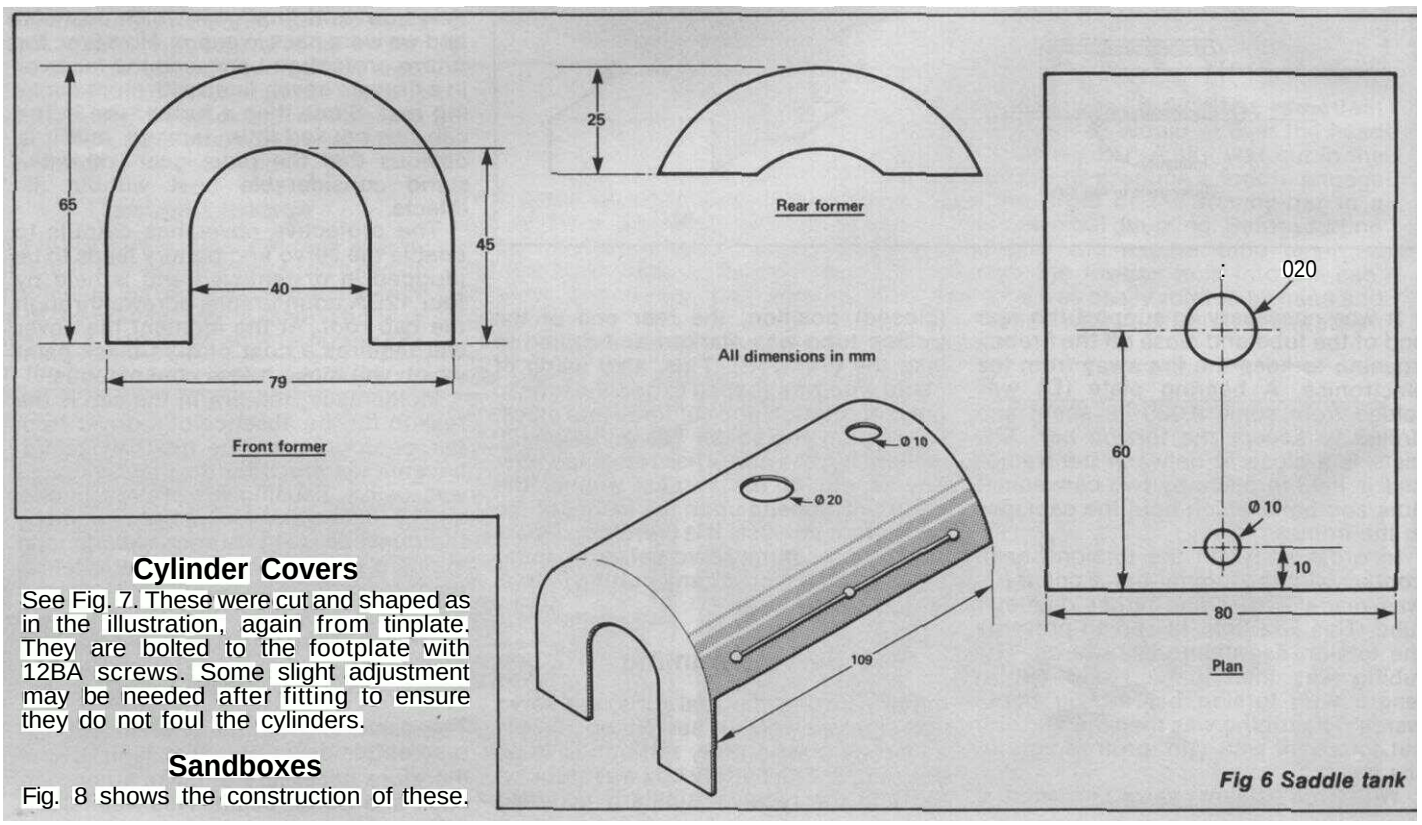
See Fig 6. This was shaped from the tinplate and slides into place, the front former fitting snugly between the smokebox and the side tanks. Small clips on the rear former locate the saddle at the rear. The operating lever for the whistle was removed. I personally find it obtrusive and feel the steam loss in its use can not be afforded in such a low pressure boiler. Anyway, the saddle tank won't fit with it in place.

Suitable handrails complete the fittings.

Chimney

The original chimney was removed by sawing it just above the smokebox-chimney collar and a replacement chimney available from the 16mm Association fitted in place, glued with epoxy. Whilst the chimney is removed, the steam exhaust pipe in the smokebox is adjusted to blow up the chimney. This improves the steam exhaust plume from the chimney and reduces water condensate in the smokebox.





Cylinder Covers

See Fig. 7. These were cut and shaped as in the illustration, again from tinplate. They are bolted to the footplate with 12BA screws. Some slight adjustment may be needed after fitting to ensure they do not foul the cylinders.

Sandboxes

Fig. 8 shows the construction of these.

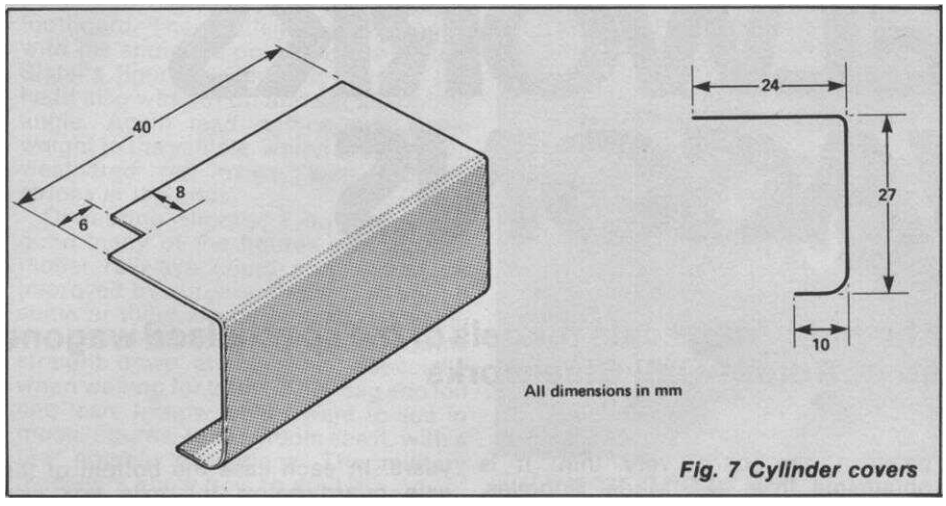
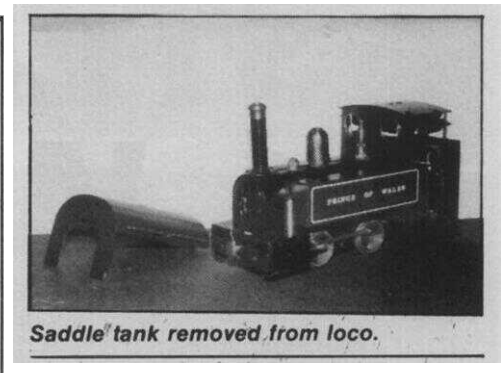


Fig. 7 Cylinder covers


Saddle tank removed from loco.

The box is 9mm brass tube and the covers were turned up on the lathe to be a firm fit. The sandboxes are retained on the footplate by one of the bolts securing the cylinder covers.

Fire

Because of the torsion bar running through the firebox it was not feasible to fit a gas burner to the loco, nor any centrally placed fire. I therefore constructed a three burner meths fuelled system as seen in Fig. 9. The burners sit either side of the torsion bar and therefore do not heat it directly, although it can still get fairly warm.

Fig. 9 gives the dimensions and I hope is self-explanatory. All the joints are soft soldered, except for the baseplates of the burner tubes and the joints with the feed tubes. I have heard it said that these can be soft-soldered, but when I tried this they fell off when the joints melted. The baffle is a friction fit between the frames and acts as a retaining clip. In order to fit the burner, the cab floor had to be drilled to accommodate the vents. Alternatively, these could be set in the sides, but would be more obtrusive.

I have found that radio-control permits more economy of steam. My fuel tanks hold about 24mls of meths and with the loco now run-in I get 20 minutes of steaming and use only 1/3rd of the boiler capacity. I can safely increase the tank size to 32mls or more without risk of the boiler running dry. The danger of larger tanks I feel is that the meths could become too warm, vapourise, and a major conflagration ensue, unless tank cooling was employed. This is more likely to occur when the loco is stationary or slow shunting.

Painting

The original *Prince of Wales* livery was retained. To match the paint I took the original cab back along to the car accessory shop and found an aerosol paint which matched exactly — in this case Ford 'Royal Blue'. Although a cellulose base paint, this has withstood the heat well.

Cost

Basic Mamod locos can be obtained for £35 or less if you look around. Radio control sets are usually sold with two servos, but friendly model shops will often remove a servo. The metal can be obtained for under £2 in total, so for around £60 one has a useful little engine with surprising haulage capacity, i

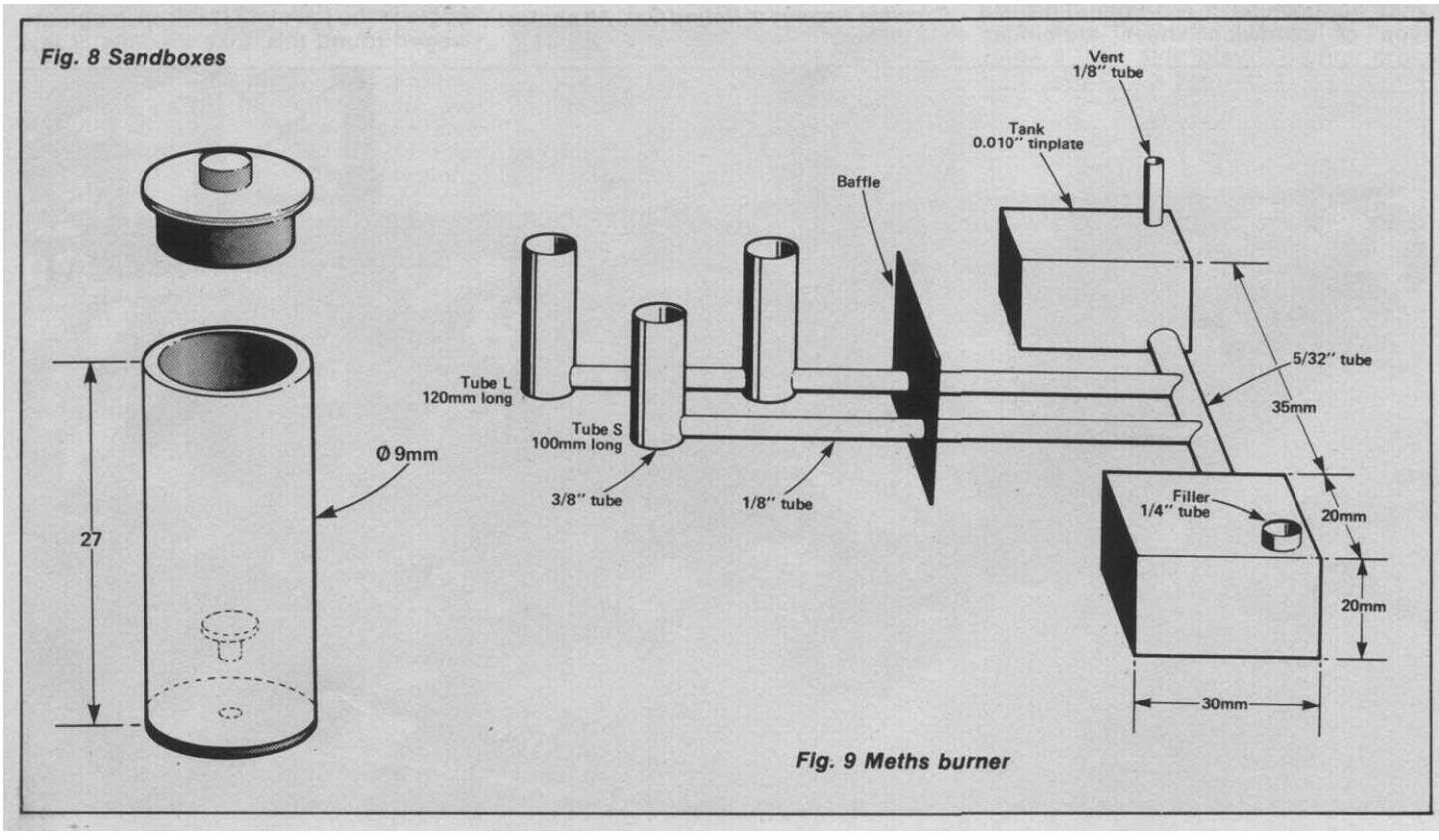


Fig. 8 Sandboxes

Fig. 9 Meths burner