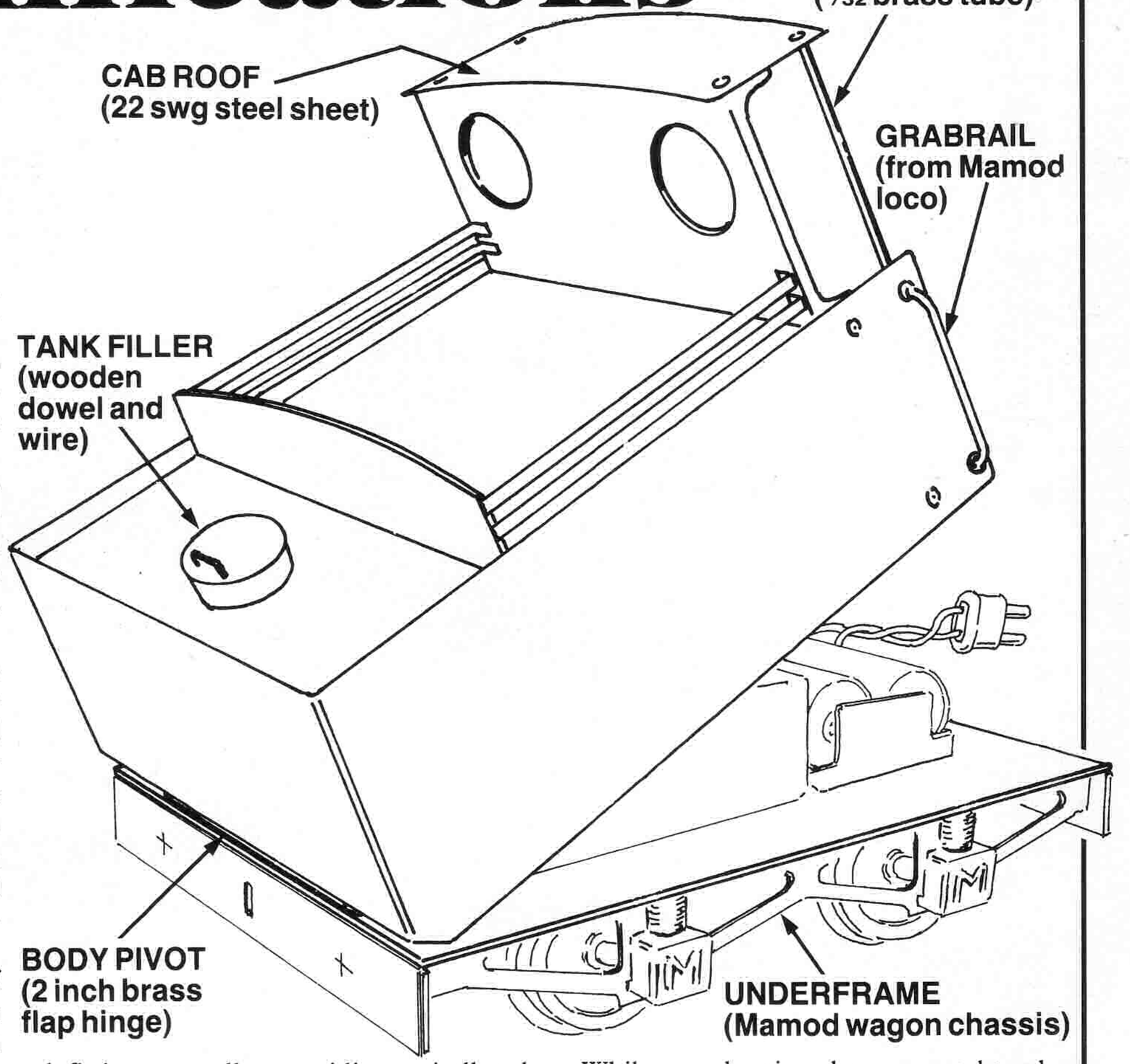
Mamodifications part 1

by FRED GAME



DESPITE the simple principles adopted for the Mamod loco's construction, the forward/reverse and speed lever, which projects through the footplate in front of the smokebox, is quite sensitive and gives very positive control over the model's performance. However, the prospect of walking alongside the engine as it meanders along, having to lean over to adjust if for the odd gradient here and there, didn't really appeal to me — some form of remote command seemed a far more attractive proposition.

An extended control leaver with gantries over the track to knock it one way or the other as the loco passed beneath is one method which I know has been used with success by some, but it would never be my choice as the system is more of a 'programme' than anything else — once set up, the driver just pushes the loco in the right direction and then becomes a mere spectator to its continued progress.

For a time I considered the possibility of using the rails to pass electrical impulses to a servo linked to the regulator, then I realised that I would have to insulate the wheels on the loco and any other Mamod underframes I intended to use, as well as becoming a slave to the task of track cleaning — a chore already detested on my indoor layout.

There appeared to be but one solution that would meet all my self-imposed criteria. Radio control.

Having made the decision, the main requirements for the conversion had to be considered. Firstly, whatever form of radio gear I used (at this point I had yet to make a final choice) one thing was certain; neither the receiver nor the ni-cad batteries needed to power it would give of their best if sited in close proximity to a steaming boiler. Secondly, the Mamod isn't endowed with a great deal of spare space anyway, so only the servo — out of necessity — could be mounted on its footplate and that would have to be shielded carefully from the heat.

I have heard of other modellers permanently attaching a wagon or van to the back of the loco to house all the electronic wizardry, but I decided against such an appendage and the unprototypical shortcomings it would involve in operation.

Although the Mamod represents a self-contained tank locomotive of freelance design, it seemed in order to bestow upon it the honour of a tender, much in the way the Festiniog Railway did when they purchased their two Hunslet 0-4-0ST's from the Penrhyn Quarry line. In fact, I based the design on the one fitted to *Blanche*, feeling that the half cab design suited the character of the loco and also served to hide the unauthentic cab fittings, as well as providing a windbreak for the 'fire hole'.

To keep it in the family, a Mamod wagon underframe was used for the tender chassis, this being available from most stockists at a cost of a few pounds. The clip-off rear spectacle panel from the loco, complete with its handrails, is also required.

It is important to provide access to the burner tray, servo and other radio gear, so rather than have to uncouple the loco and tender each time the need arose, I incorporated a hinge at the rear allowing the body to pivot up out of the way.

The drawing shows how simple the construction of the tender is, 0.025in brass was used in this instance, but tinplate would be equally acceptable — and cheaper. If, like us, you are retaining the character of the loco, riveted joints can be used where shown. More prototypical workers may prefer to solder, but remember the Mamod cab rear is made from mild steel and will not solder easily.

The two sides and rear were made from a single sheet, the back panel not being quite as deep, and the rear corners chamfered to allow for the action of the hinge. A two inch brass flap hinge has been used, riveted to the body but bolted to the underframe permitting total removal if required. In our case riveting was also employed to locate the Mamod rear spectacle plate — passing through the rearmost holes shown on the plan and those intended for the grabrail fixings. The location tabs at the base were bent up level with the bottom edge of the sides.

Whilst our drawing shows a metal tender top, bent over at the sides and ends for securing purposes, we eventually opted for a piece of 1/8in plywood, 'Araldited' into position. Mild steel sheet was used for the bunker section, of 22swg, as it was for the cab roof, so that it matched the Mamod original. After a coat of primer, to prevent rusting, the latter was fixed in place with two rivets.

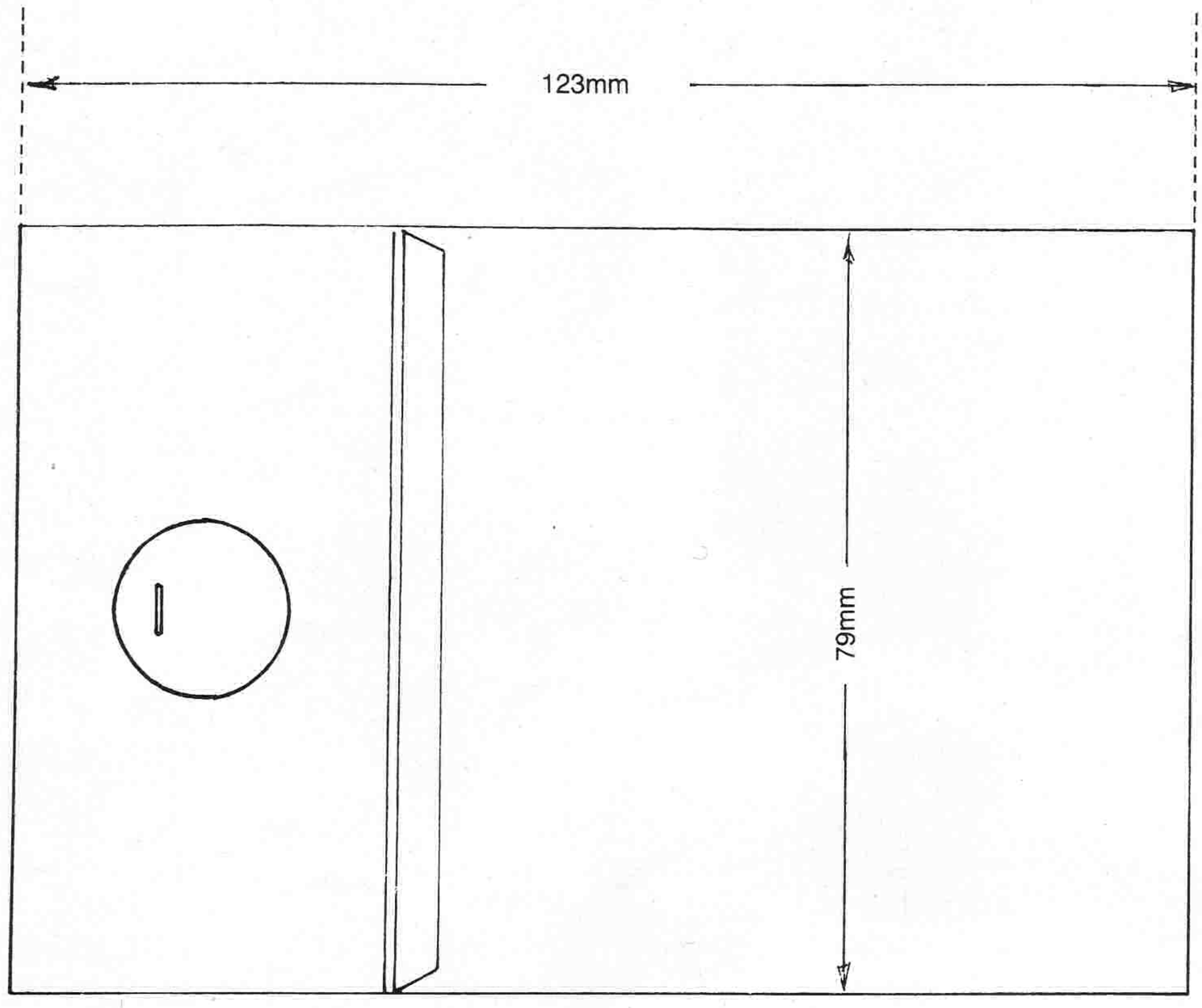
Four handrails/supporting stanchions were soldered up using 3/32in brass tube and 1/8in washers, as shown on the plan, with the top flattened and bent over to match the roof profile. Two of these can then be fixed into position using the retaining nuts for the original grabrails and pop-rivets at roof level.

The tank filler was made from a short section of dowel with a handle from steel wire. Bunker rails were fabricated from brass strip; a central support for each side — not shown in the drawing — also being included to prevent the rails distorting.

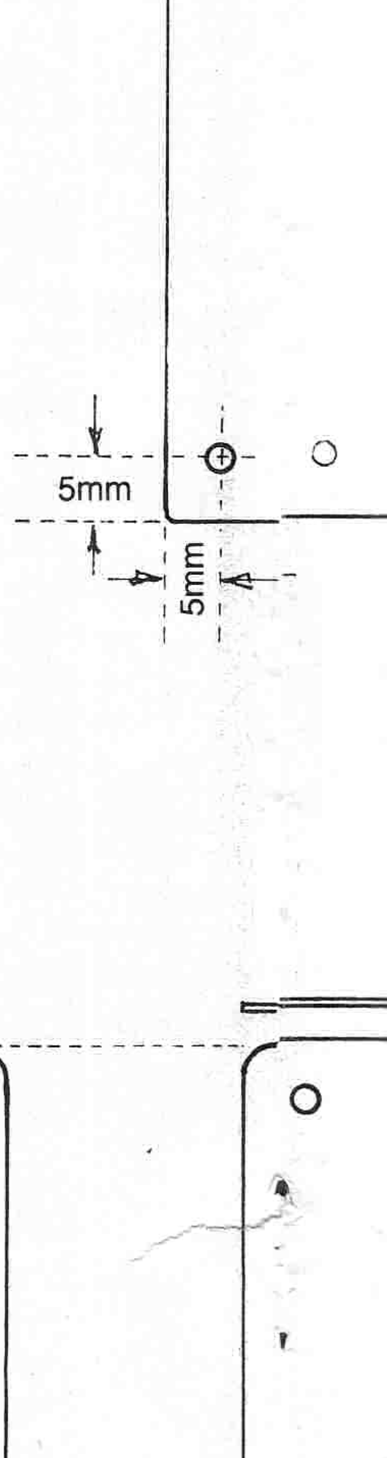
To match up the locomotive — and help conceal the servo which will be mounted on the footplate — the cab side sheets were extended using brass plates. Note that the kink, to allow the sheets to sit flush with the existing sides, must be handed (ie one as per the drawing and one mirror image). Once again, pop-rivets were used to hold them in place and the handrails fitted, after drilling holes in the cab roof as shown, as per the tender.

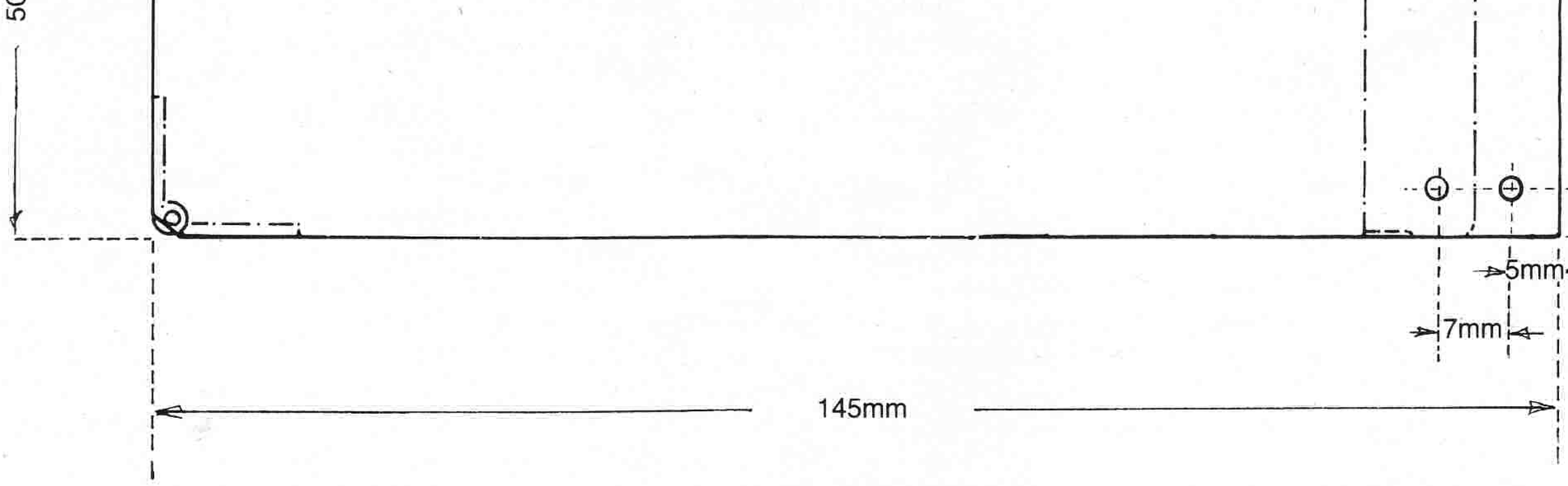
Now that we have a means of accommodating the radio control gear, our continuation of this feature next month will describe how it was installed.

MAMODIFICATIONS — drawings repro



TENDER TOP — from brass or 3mm ply.





TENDER SIDE — shape main section in one 370mm × 50mm piece with back and opposite side.

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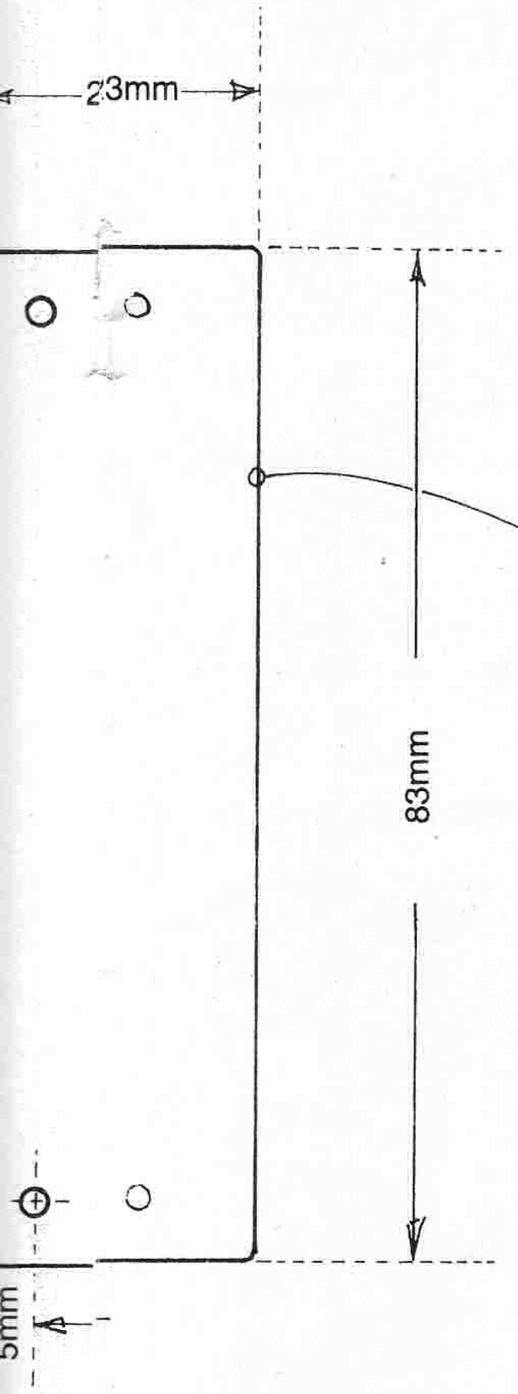
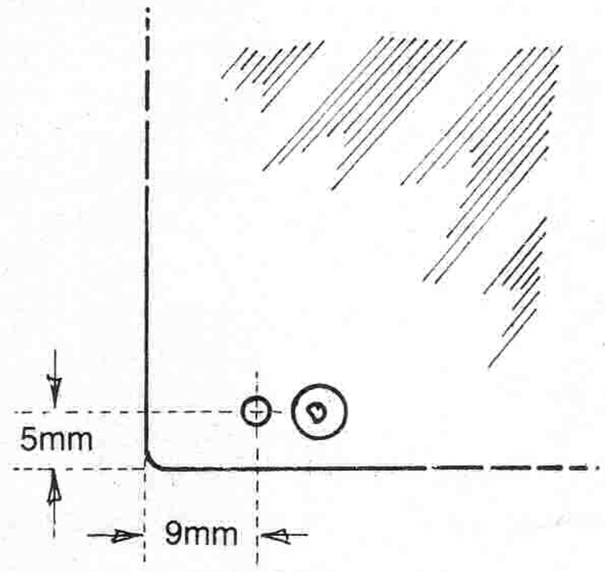
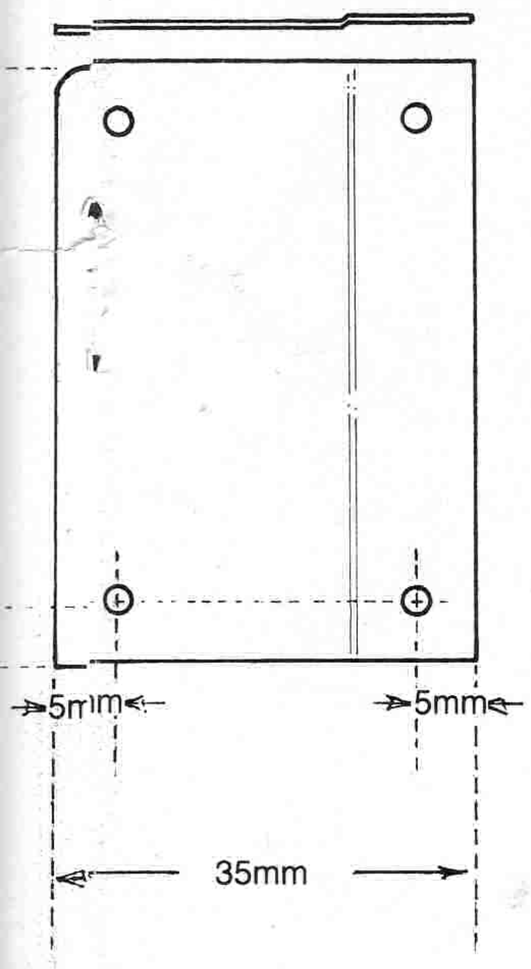


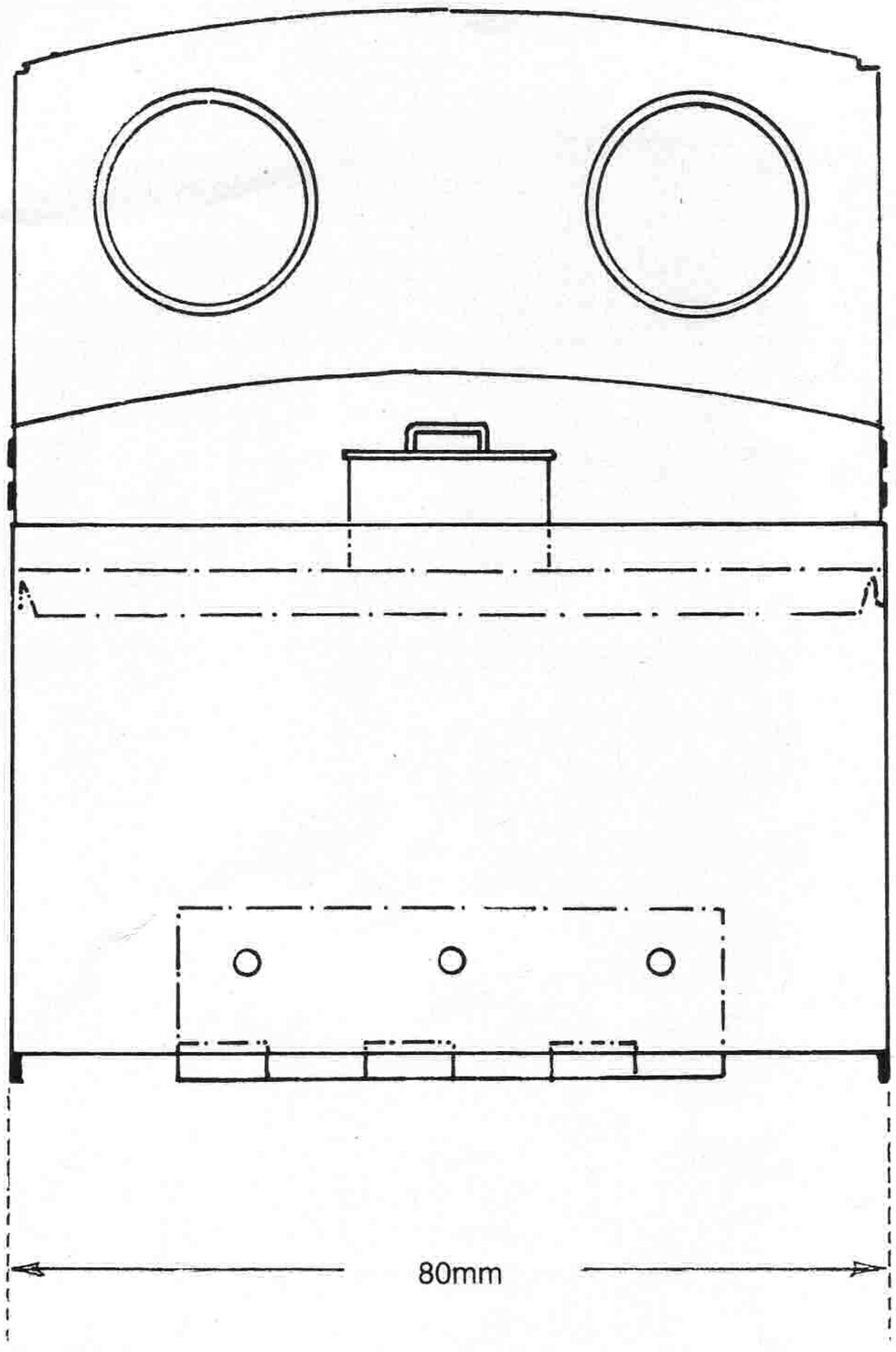
TENDER CAB ROOF — from 22swg steel, shaped to profile of spectacle plate.



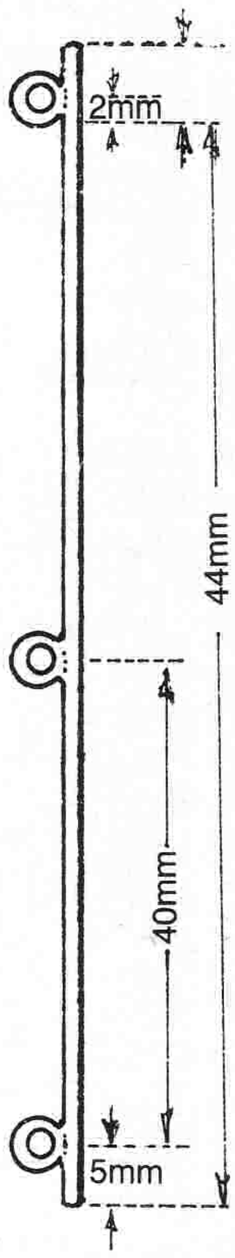
LOCO CAB ROOF — drill as shown for securing support stanchion.



LOCO CAB SIDE SHEETS — kink so it sits flush with existing loco sides.



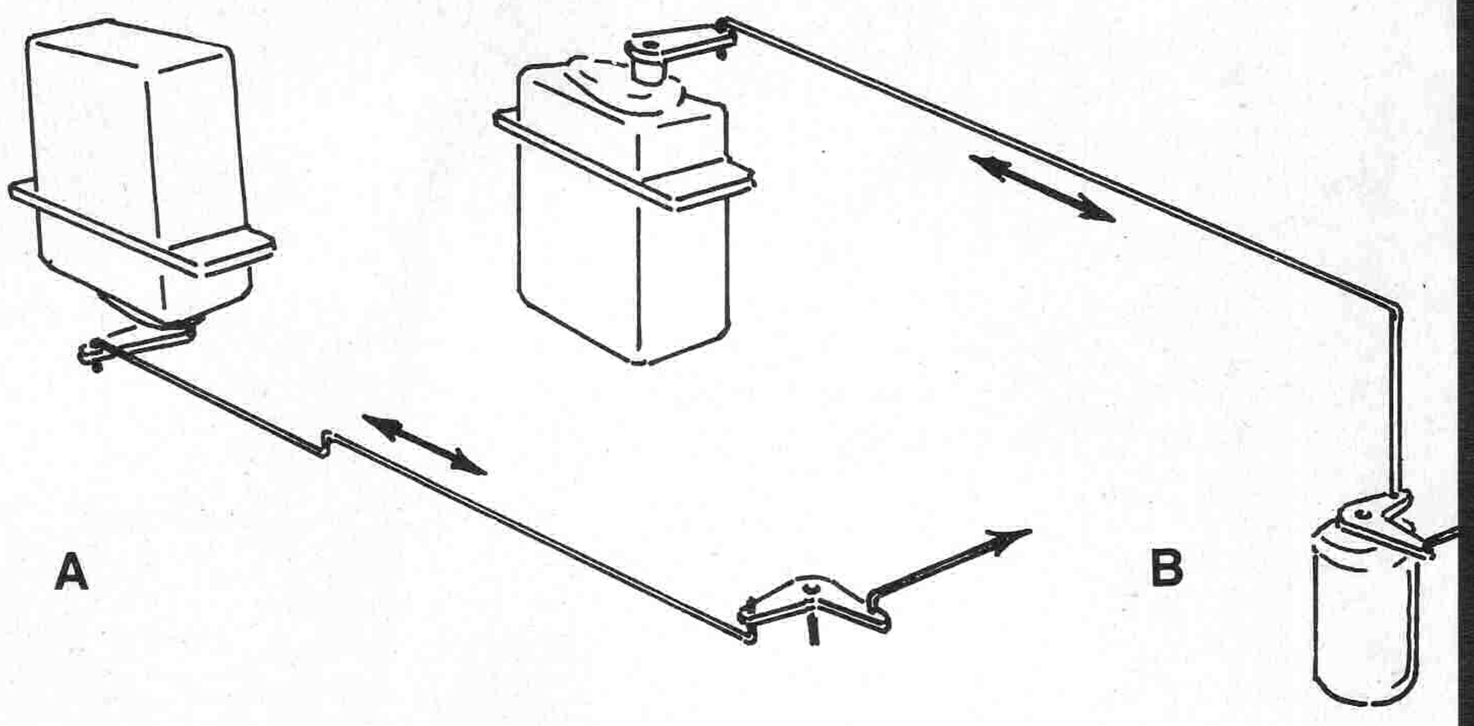
TENDER REAR — showing hinge position.



HANDRAIL/ SUPPORT STANCHIONS — make up 4 as shown.

Mamodifications part 2

by FRED GAME



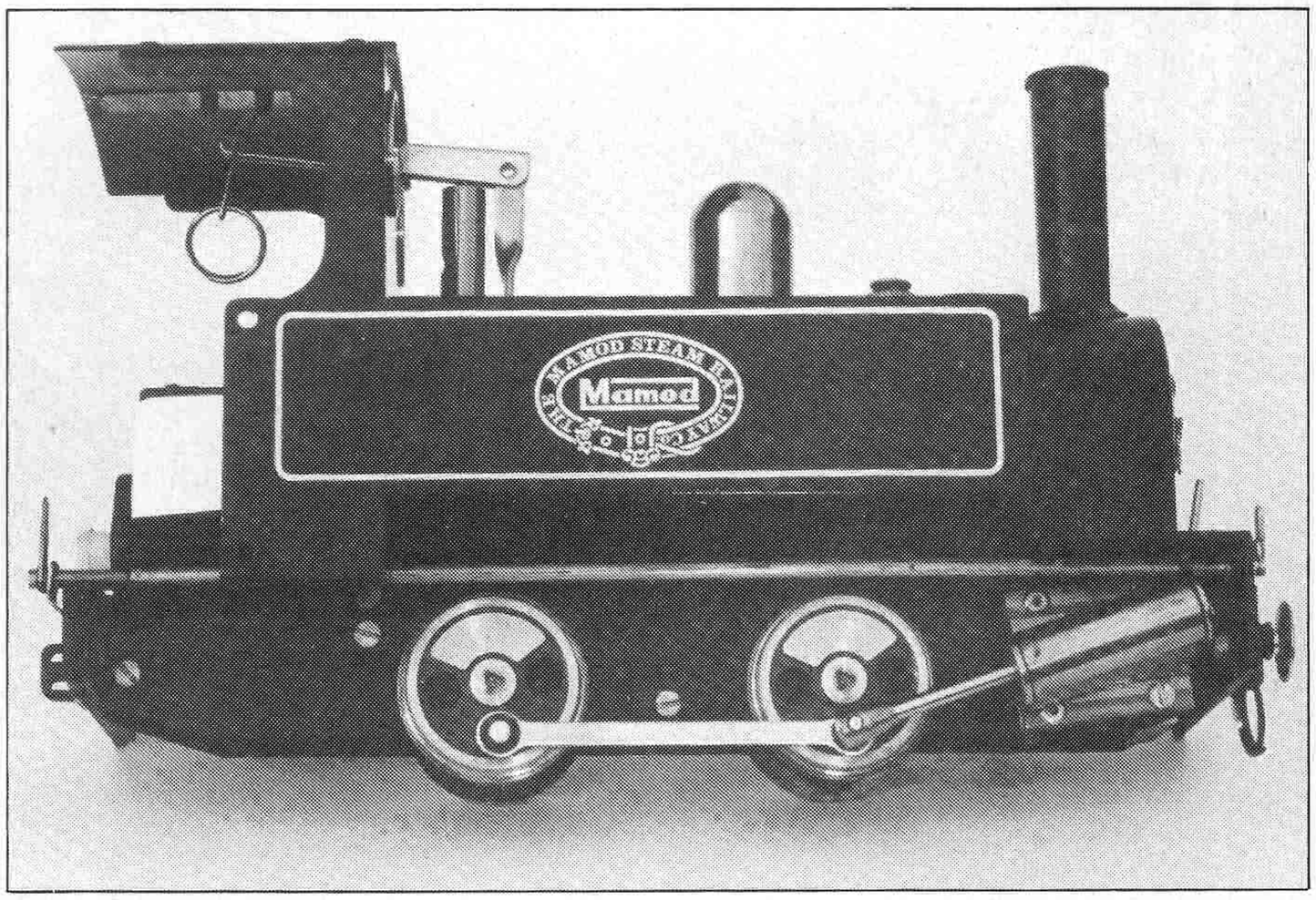
LAST month we described the building of a tender to go with the Mamod loco and house the radio-control receiver and battery pack. In the end we decided to use the *Accoms* AP227 two-channel equipment, which is readily available through any branch of Beatties at very reasonable cost. Although this conversion only makes use of one servo, it is possible that another receiver and battery pack could be obtained as spares — one could then control two locos from the same transmitter, providing the servos were plugged into different channels!

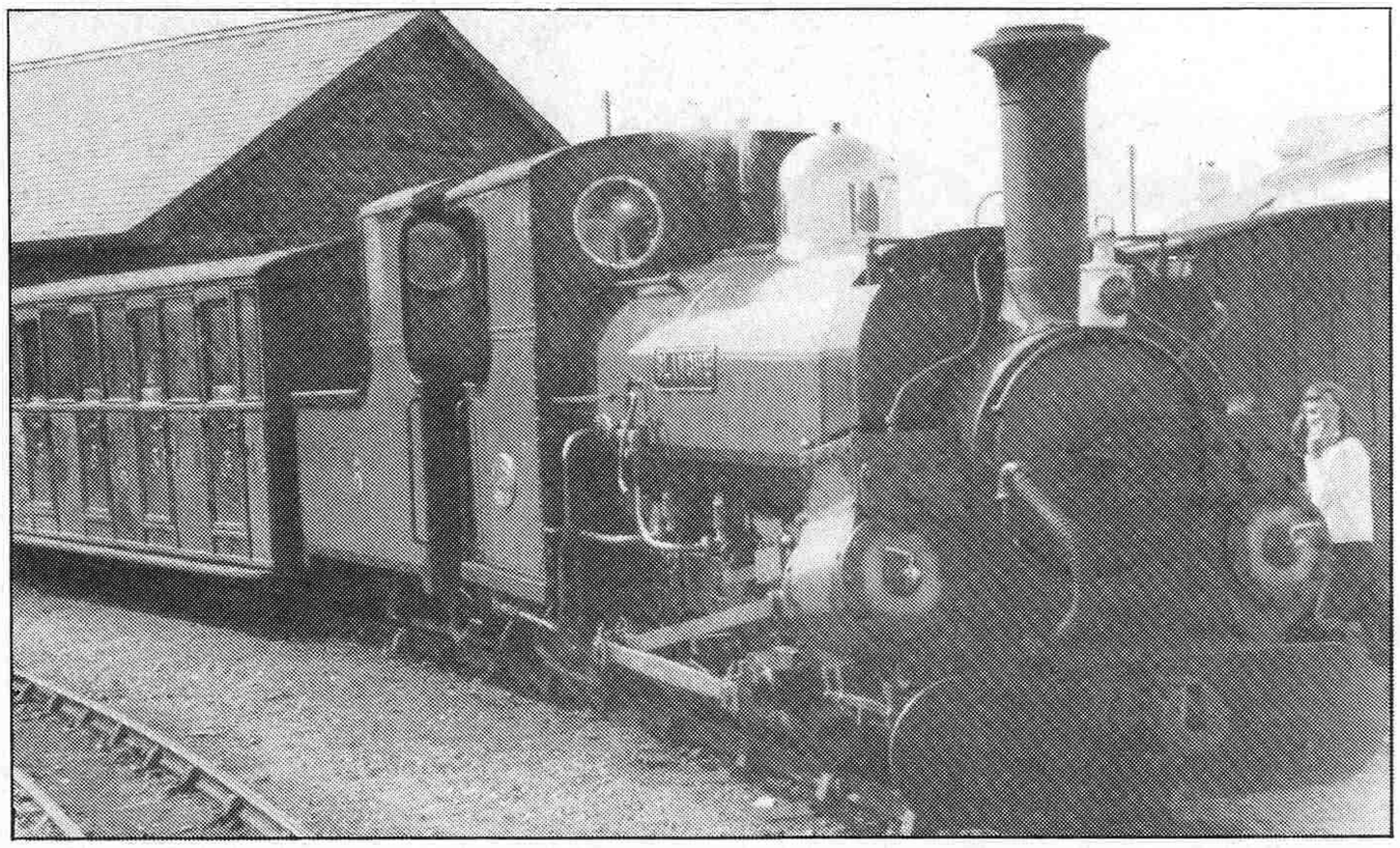
The first job is to install the linkage and servo on the loco itself, and here several alternatives presented themselves. Sketch A shows the method we thought of initially, one which has found favour with several enthusiasts already if photographs we have seen are anything to go by. The servo is mounted so that the drive arm extends through the cab floor, with a connecting link to a bellcrank on the front footplate and another link to the control lever in front of the smokebox.

In sketch B we have tried to disguise the linkage as sanding equipment, with the servo mounted up the other way and the connecting rod passing through the spectacle plate and along the boiler to the sandboxes on the footplate. A loop dropped down from the cross-link between the boxes engages a bolt mounted through the control lever.

More through having to make use of materials we had to hand, we eventually went for the method shown in C, which is not too obvious to the casual observer but seems to work perfectly. A length of ⅛in OD brass tube is passed through a hole in the front buffer beam, an aperture in the cab front just above floor level and finally to a support bearing at the rear. With a lever arm mounted at each end, the assembly acts as a torsion tube and, if painted black, almost disappears.

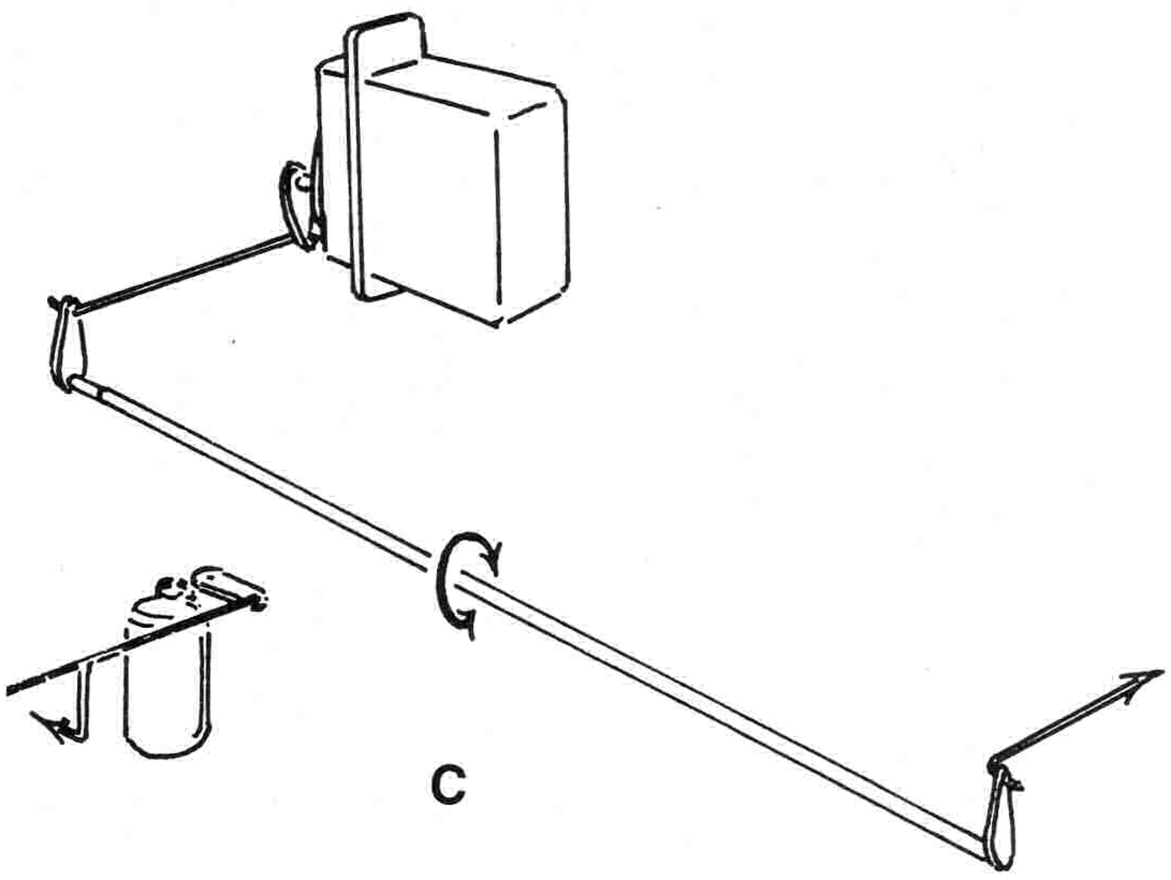
The servo is mounted with the drive towards the rear of the loco which makes any adjustments required, or removal of the unit, simple and straightforward. To protect it from the heat generated by the boiler a shield was bent up from thin aluminium lined with

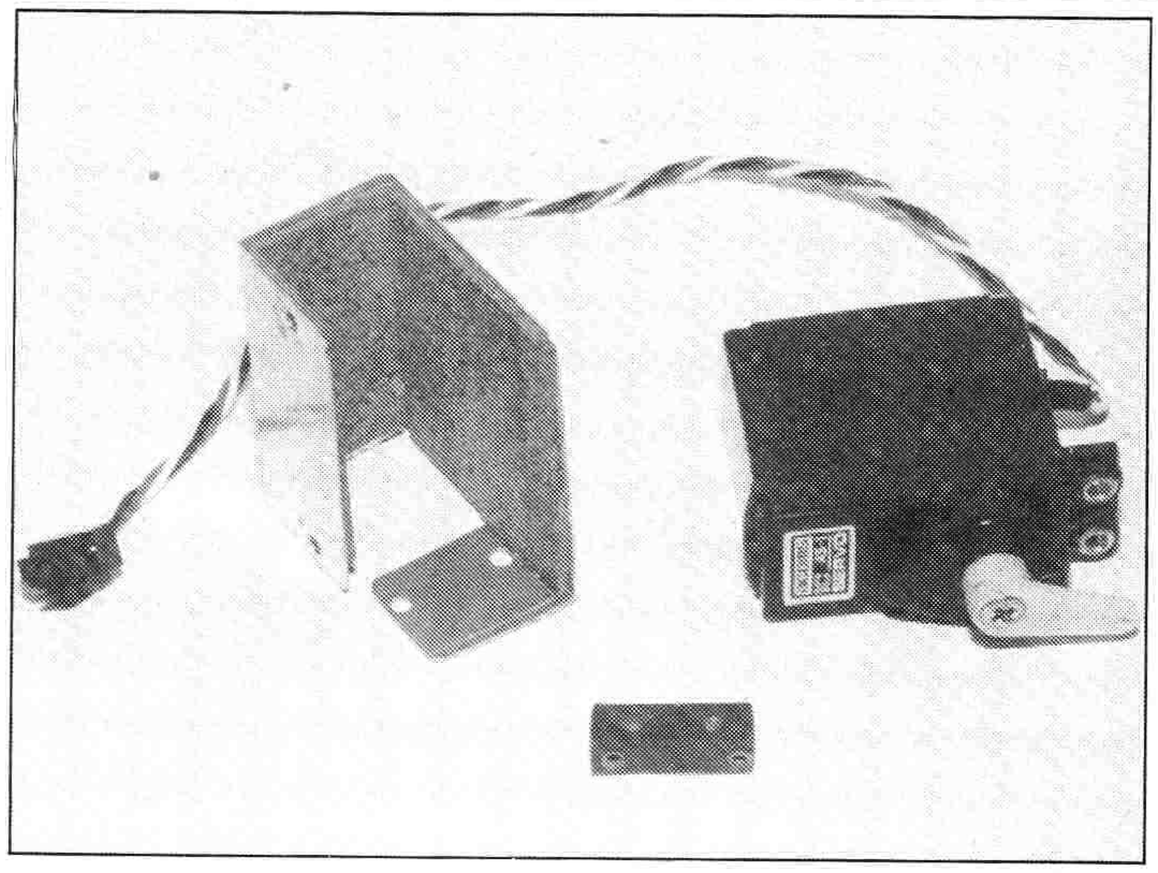




Left: Blanche, seen here at Portmadoc with her tender upon which our conversion was based. Above: This side view of the locomotive clearly shows positioning of the torsion tube. When painted black, it would be far less conspicuous.

Right: Although not yet linked together, the position of the servo arm and control arm for the torsion tube can be clearly seen in this photograph. Note how the support bracket for the latter bends under the buffer beam. Far right: This front end shot shows how simple the linkage to the control lever is.



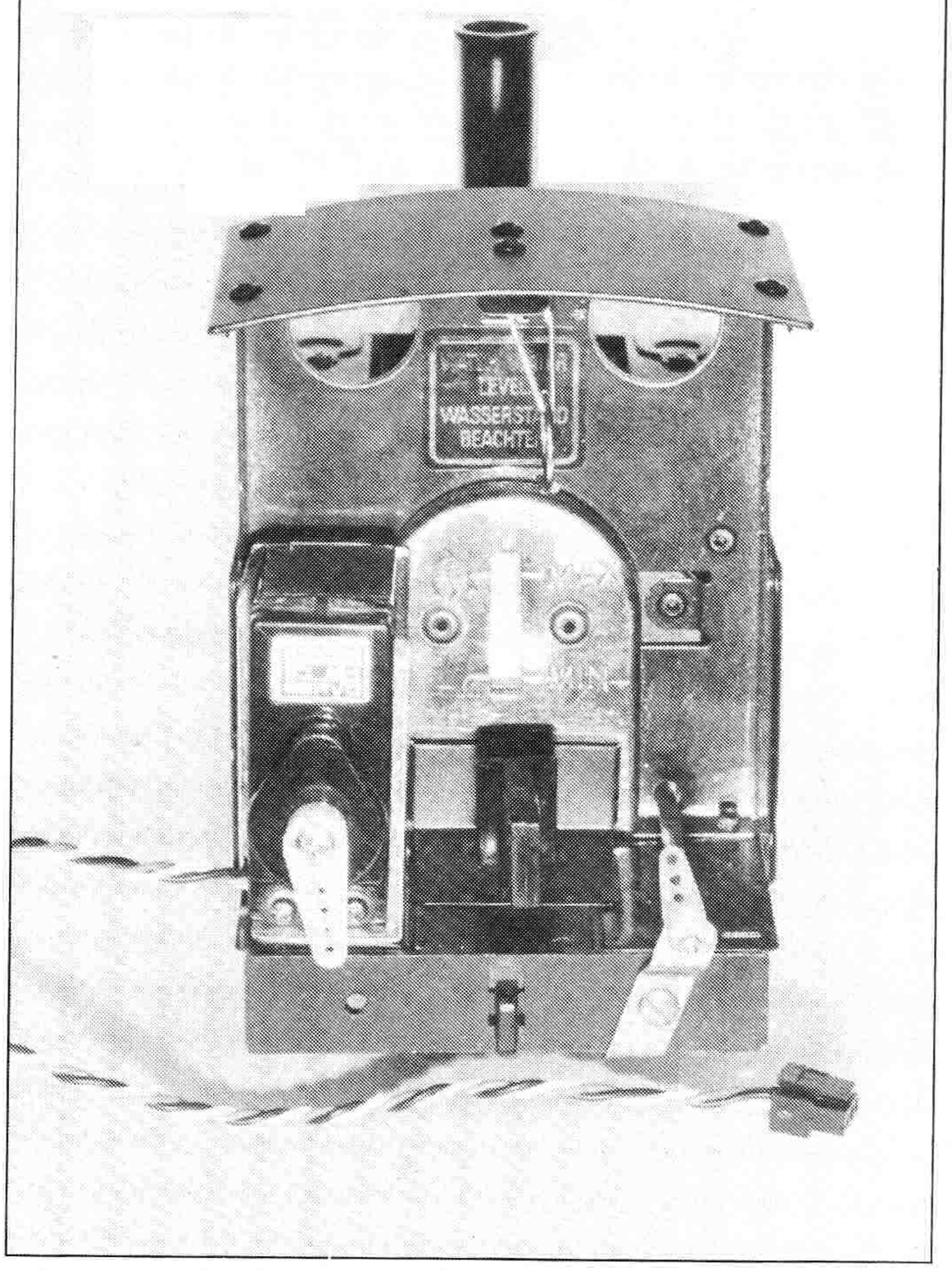


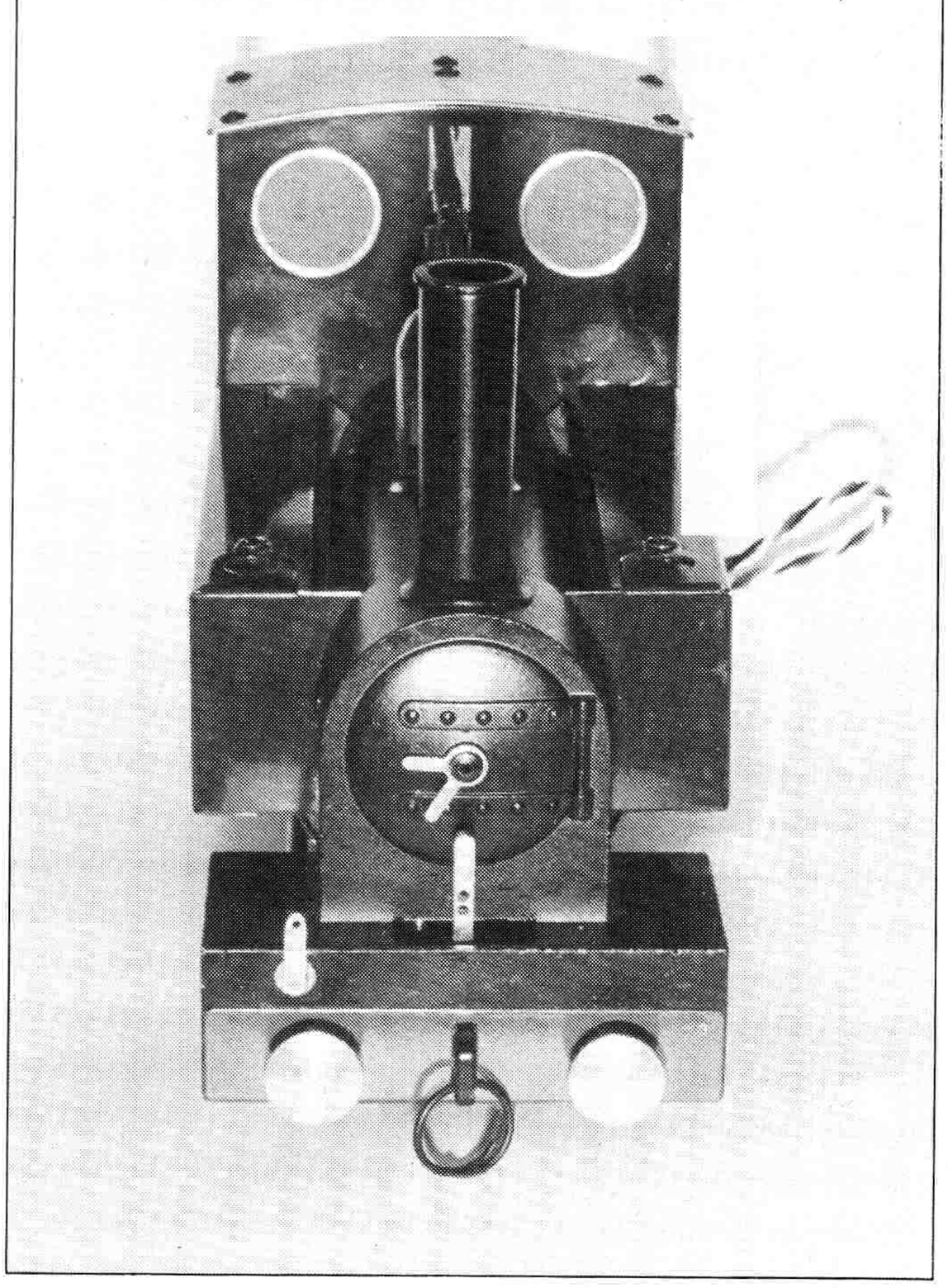
The heat shield is bent up from aluminium and lined with cork, as shown, whilst the small block of Paxolin secures the servo to the footplate.

cork. Drawing D (reproduced full size) shows this and the small Paxolin mounting block which screws to the cab floor. So that it doesn't project above the cab side sheets, the top lug has been cut off the servo as shown.

At the front, a hole is drilled through the control lever as shown in E; initially we drilled a couple whilst experimenting to find the optimum length of throw. The pivot arm and link wire should also be shaped as per the illustration, then the former can be soldered to the brass tube and, once this has been slid into place, the linkage can be assembled. At the servo end, the pivot arm can be soldered straight to the end of the tube (see drawing F) after being shaped up from scrap sheet, or retained by a bolt tapped into the tube to allow subsequent removal of the assembly should it be needed. Having an old Romford axle lying around, we shortened the tube and soldered this to the end of it — with a square hole in the arm, it can slide over the axle shoulder and be held in place by a 10BA nut.

We also had a spare ⅛in phosphor-bronze bearing and decided to use this at the front rather than let the tube bear straight onto the footplate casting. The rear support bearing, as shown in G, is retained by the Mamod buffer, although, in the photograph, we have temporarily secured it with a normal nut and bolt. It is our intention to keep the standard buffing gear between the loco and tender and fit the new *Tenmille* short chopper couplings

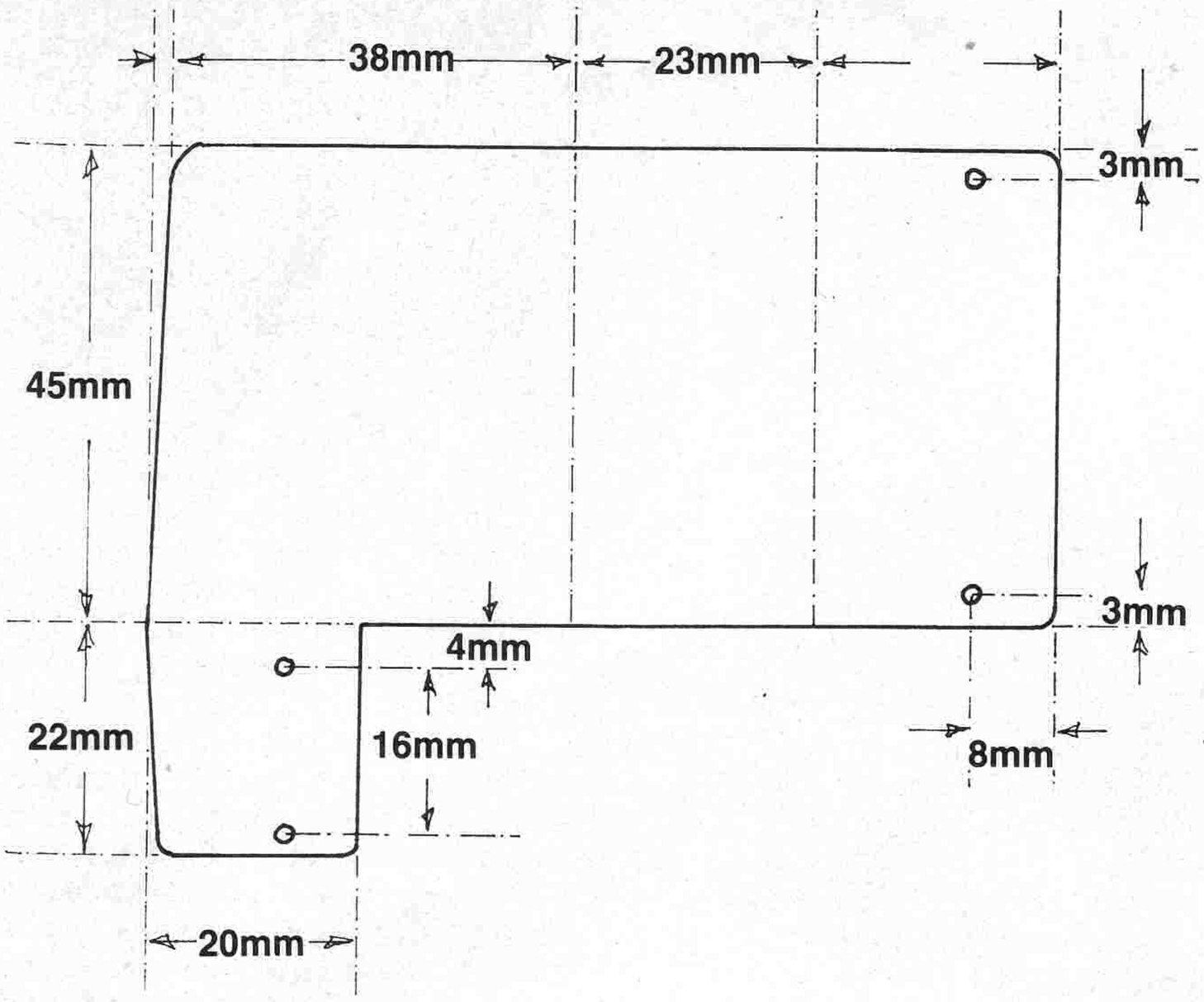


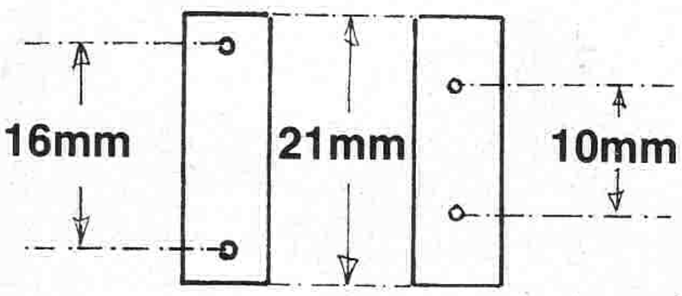


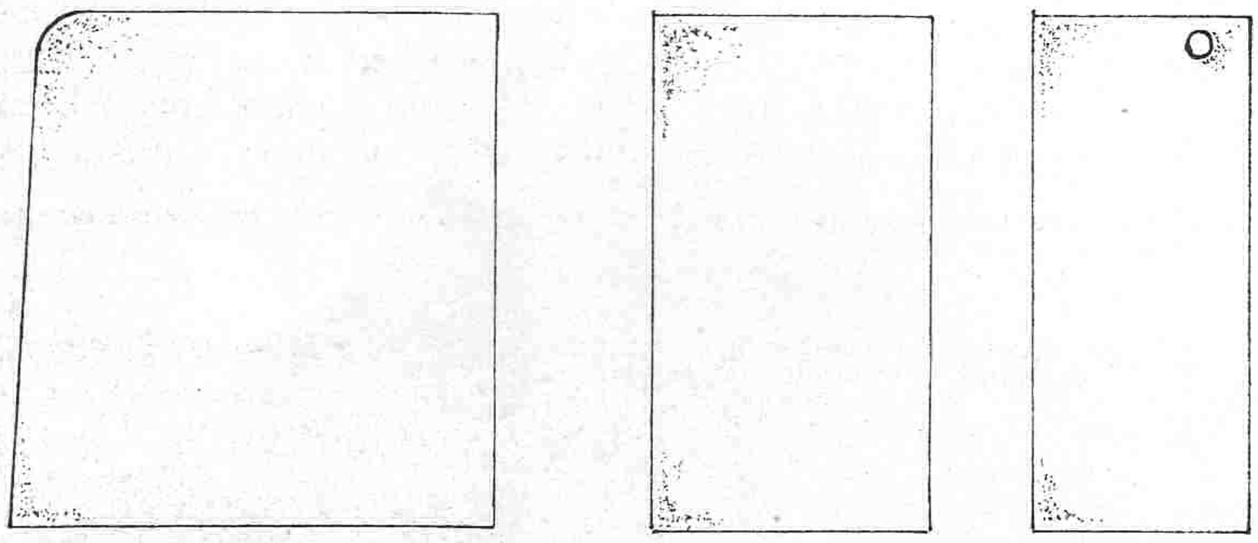
Right: Easy access to the tender contents is provided by the hinged body, as this photograph shows.

Far right: Although there is plenty of room, it pays to take care when laying out the radio gear in the tender. Note that the aerial is still furled up and is yet to be positioned beneath the tender top.

D







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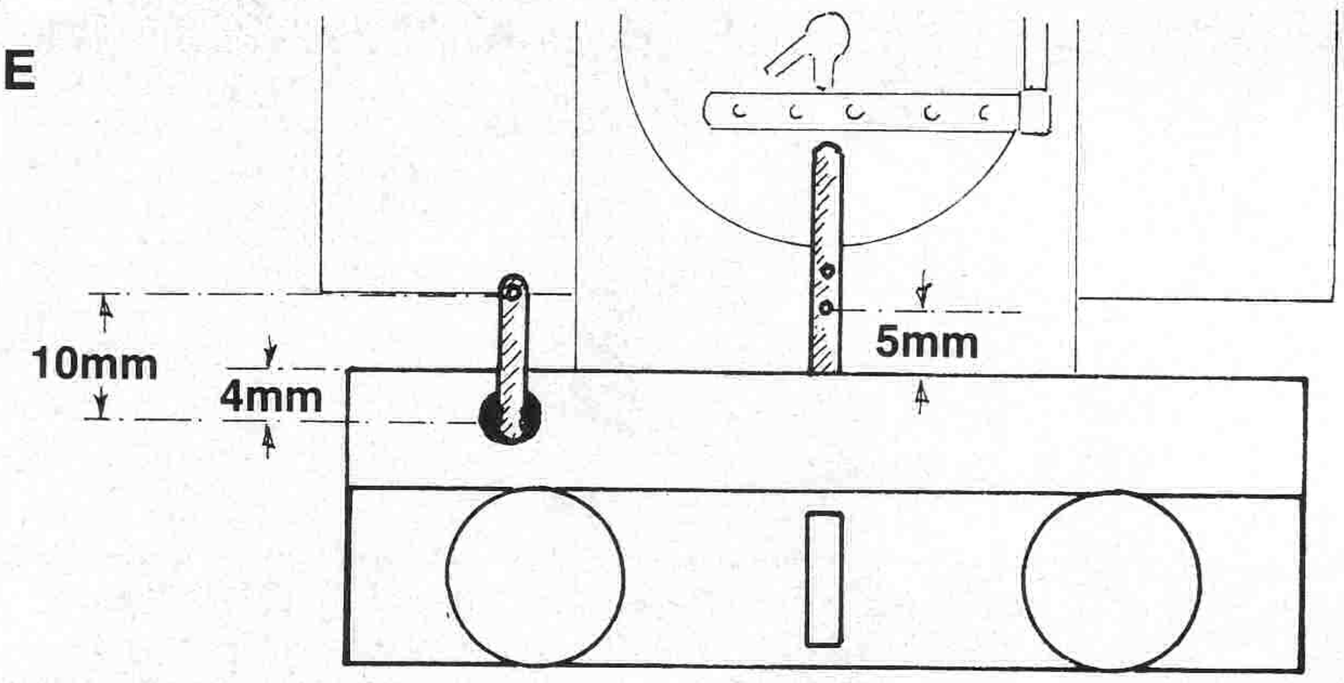

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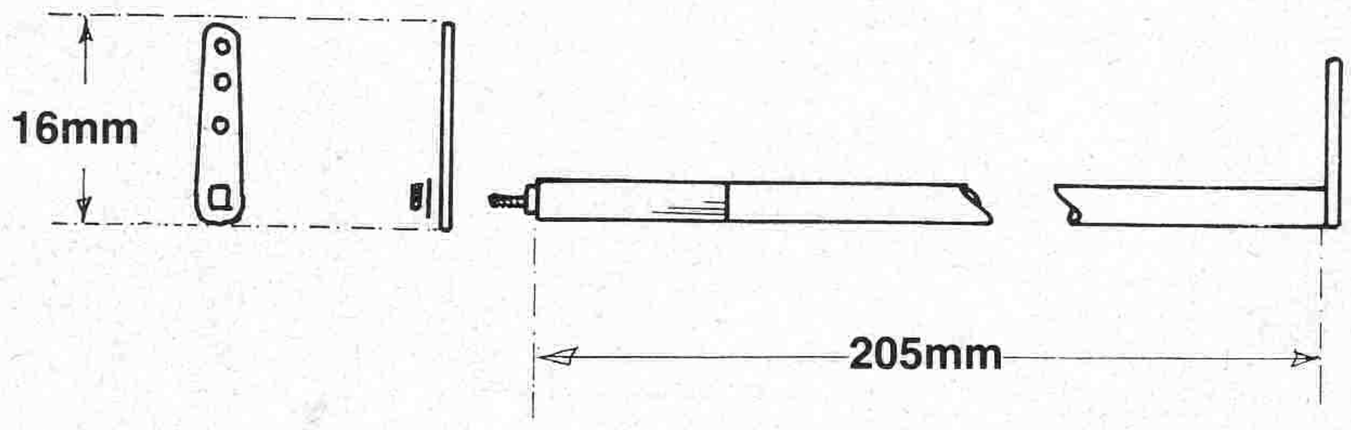
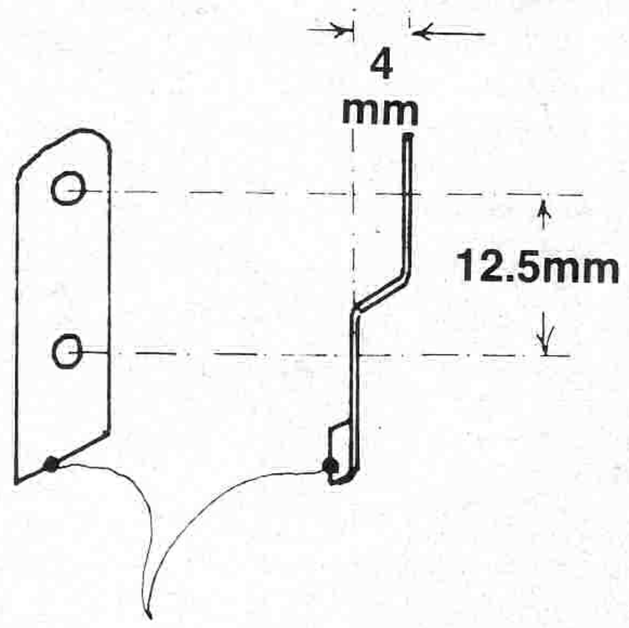
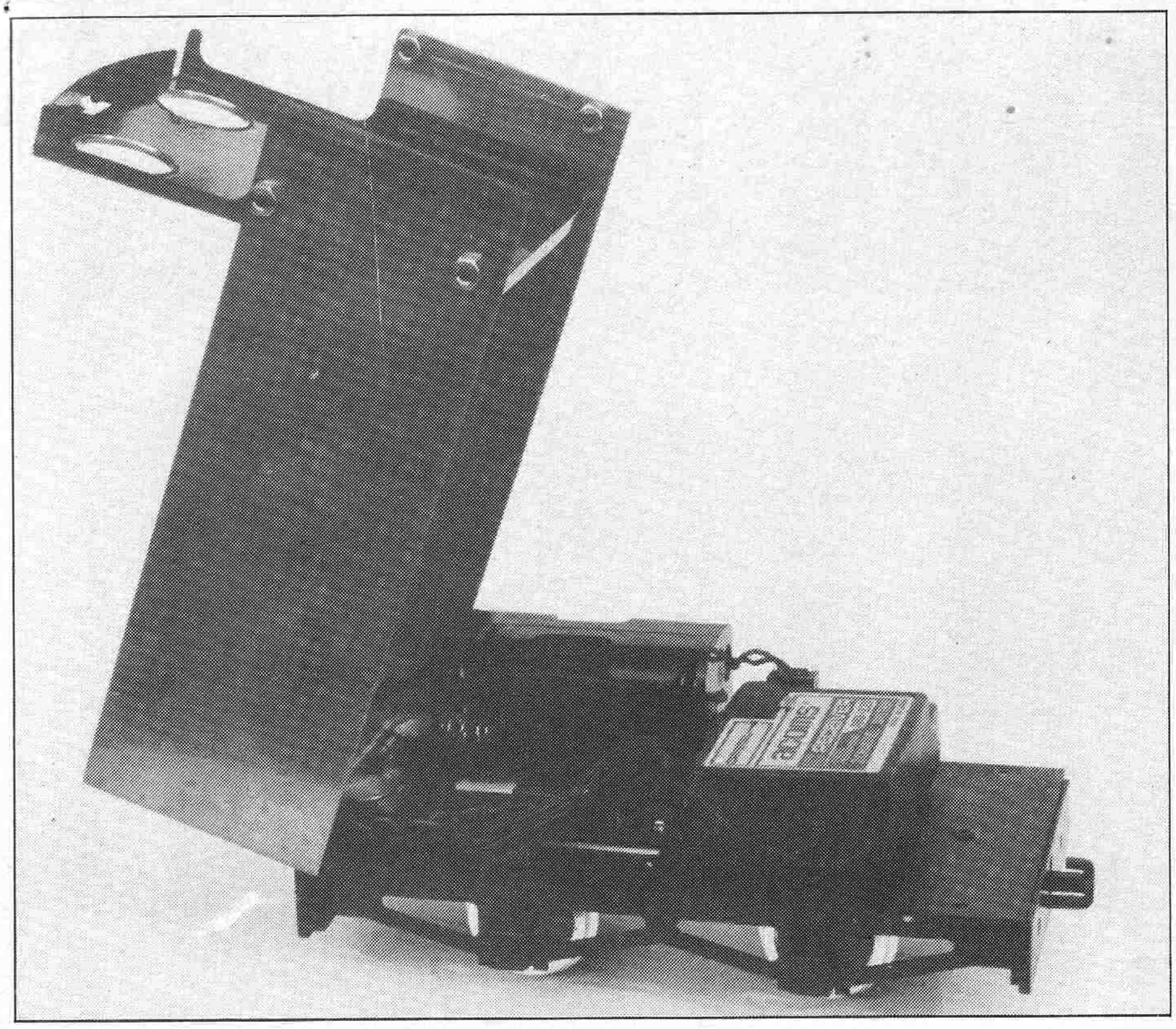


All drawings 16mm scale (Full size)

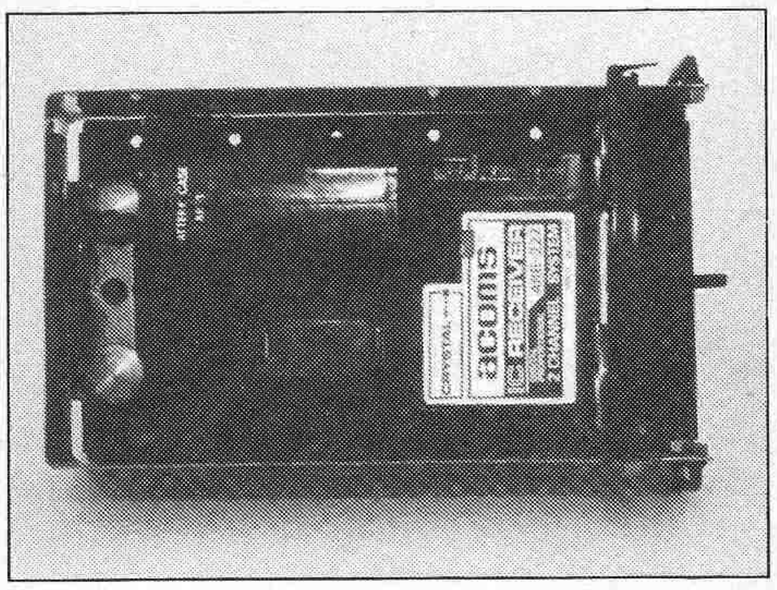
G





to the outer ends, so that the engine will couple to our existing stock.

Using a temporary link between the servo control and the pivot arm — and with the radio gear hooked up — we tested our endeavours to ensure that everything worked properly and that the throw was correct. Luckily, all proved to be OK and all that



remained was to arrange and secure the receiver and battery box into the tender, and sort out the cable runs.

The receiver, battery box and power switch were secured to the tender chassis by double-sided self-adhesive pads. We chose the positions shown in the photograph so that the batteries could be changed without removing the box and the receiver was as near as possible to the servo, avoiding the need to extend the lead between them. The aerial will be attached to the underside of the tender top, when it is finally fixed in position.

Next month we'll let you know how the loco performed and give you exact dimensions for the links between the cranks and control arms — there did not seem any point in passing this information on until we were sure it all worked in practice. We'll also be adding a few other refinements to the Mamod which might be of interest to existing owners.

Mamodifications part 3

by FRED GAME

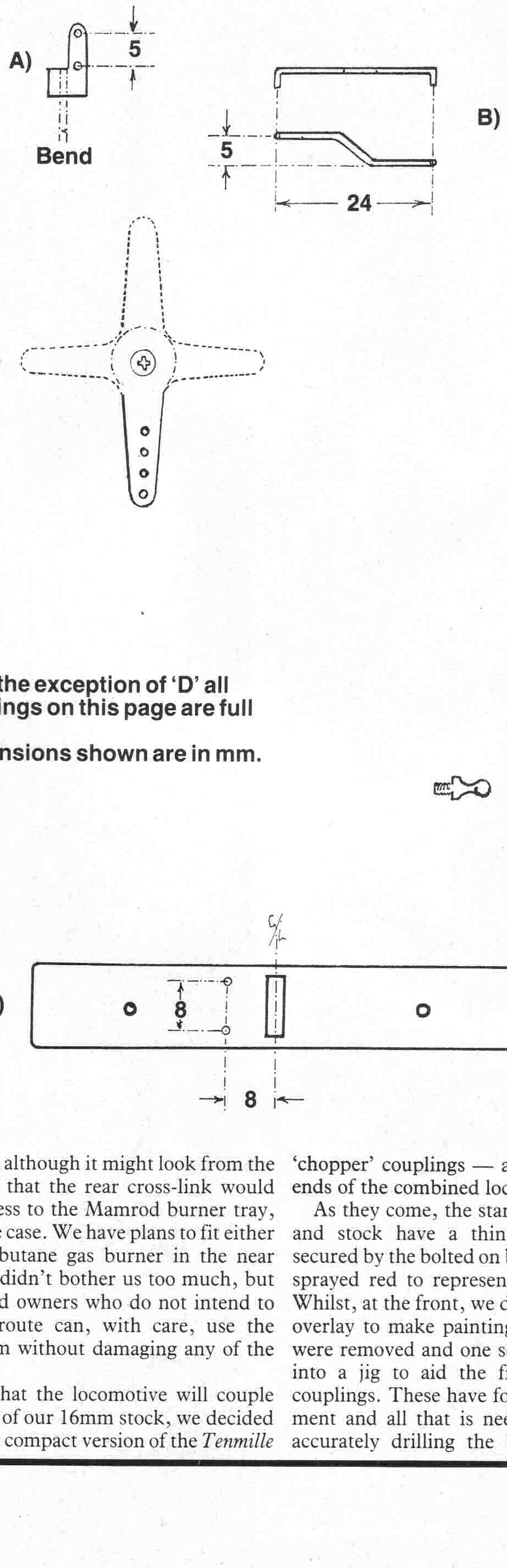
FIRSTLY, the bad news. If you copy the dimensions of the front pivot arm (which links to the Mamrod control lever) there is a chance that it can go over-centre at the extreme limit of its throw in either direction. To ensure that this doesn't happen, we made up a short extension — as shown in diagram A — which increased the length of the arm by a few millimetres.

The link itself was bent up from a length of 1mm diameter hard nickel silver wire, as in diagram B, with the ends bent round at 90°. A kink was incorporated so that, after installation, a degree of adjustment would be available by twisting it with the aid of a small pair of pliers.

To secure the link, each end was passed through their respective holes in the arm and lever, then thin pieces of paper were pushed on to the protruding wire stubs followed by small (12 BA) brass washers. After soldering the latter in place, the paper can be torn away and a neatening-up job performed with a flat Swiss file. Unless some of the solder has been allowed to flow past the temporary paper washers, the linkage should now move smoothly in each direction.

At the cab end of the locomotive an adjustable link, available as an accessory under the *Acoms* banner, was used. Sold in a pack, with sufficient parts to make three linkages, it consists of a brass ball on a threaded spigot which screws into the servo horn (we used the four arm version, modified as in C), a plastic pivot which clips on to the ball and has a sleeve to accept the length of steel rod — threaded at one end — which is also supplied, plus a metal spring-clip that retains the other end once it has been trimmed to length and given a right-angled bend, as shown in D. The spring-clip allows for speedy removal should the servo need attention or an adjustment be necessary — effected by screwing the rod in or out of the sleeve. A brass nut is provided to lock the rod in position once the correct setting has been selected. Care should be taken to choose the most suitable mounting holes in both the servo horn and the pivot arm, otherwise one will either get insufficient throw and a subsequent lack of power or too much, which would result in the mountings being strained — these *Acoms* servos are surprisingly strong in their action!

Once the locomotive has been steamed and the radio control installation has been proved to function properly, the front and rear linkages can be given a lick of matt black paint to make them less obtrusive.

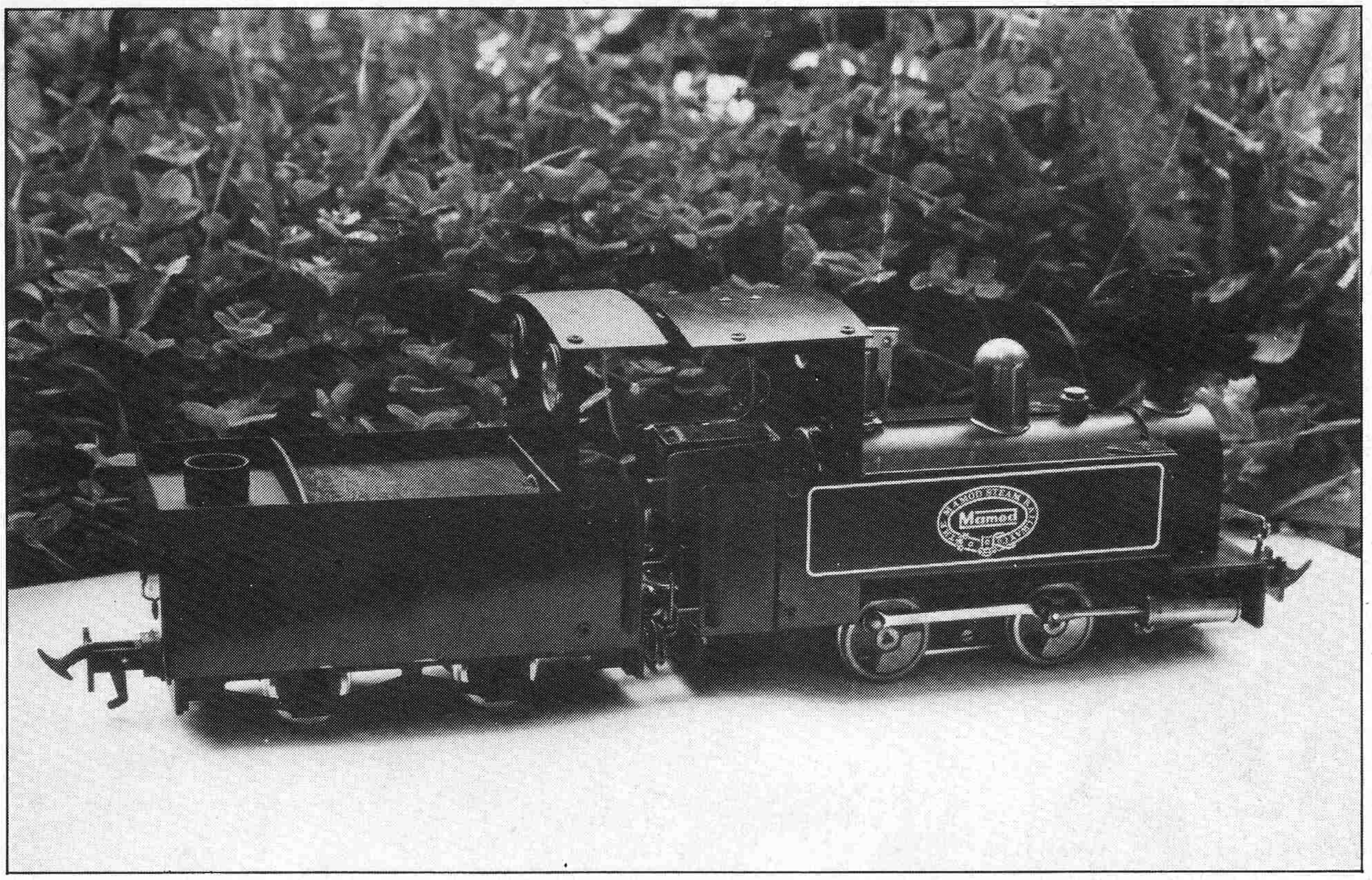


With the exception of 'D' all drawings on this page are full size.
Dimensions shown are in mm.

By the by, although it might look from the photographs that the rear cross-link would obstruct access to the Mamrod burner tray, this is not the case. We have plans to fit either a meths or butane gas burner in the near future, so it didn't bother us too much, but those Mamod owners who do not intend to follow this route can, with care, use the standard item without damaging any of the radio gear.

In order that the locomotive will couple with the rest of our 16mm stock, we decided to fit the new compact version of the *Tenmille* 'chopper' couplings — at least to the outer ends of the combined loco and tender.

As they come, the standard Mamod locos and stock have a thin metal overlay — secured by the bolted on buffers — which are sprayed red to represent the buffer beam. Whilst, at the front, we decided to retain the overlay to make painting easier, the others were removed and one set aside to be made into a jig to aid the fitment of the new couplings. These have four holes for attachment and all that is needed is a means of accurately drilling the beams to take the



Only awaiting lining, coal and tender water filler cap, our conversion looks impressive even amongst the weeds in the editorial garden!

securing bolts. Diagram E illustrates where to drill the overlay so that it will act as a suitable jig and the diameters should be sufficient for pilot holes only; those in the beam would be enlarged at a later stage to suit either of the fixing methods described.

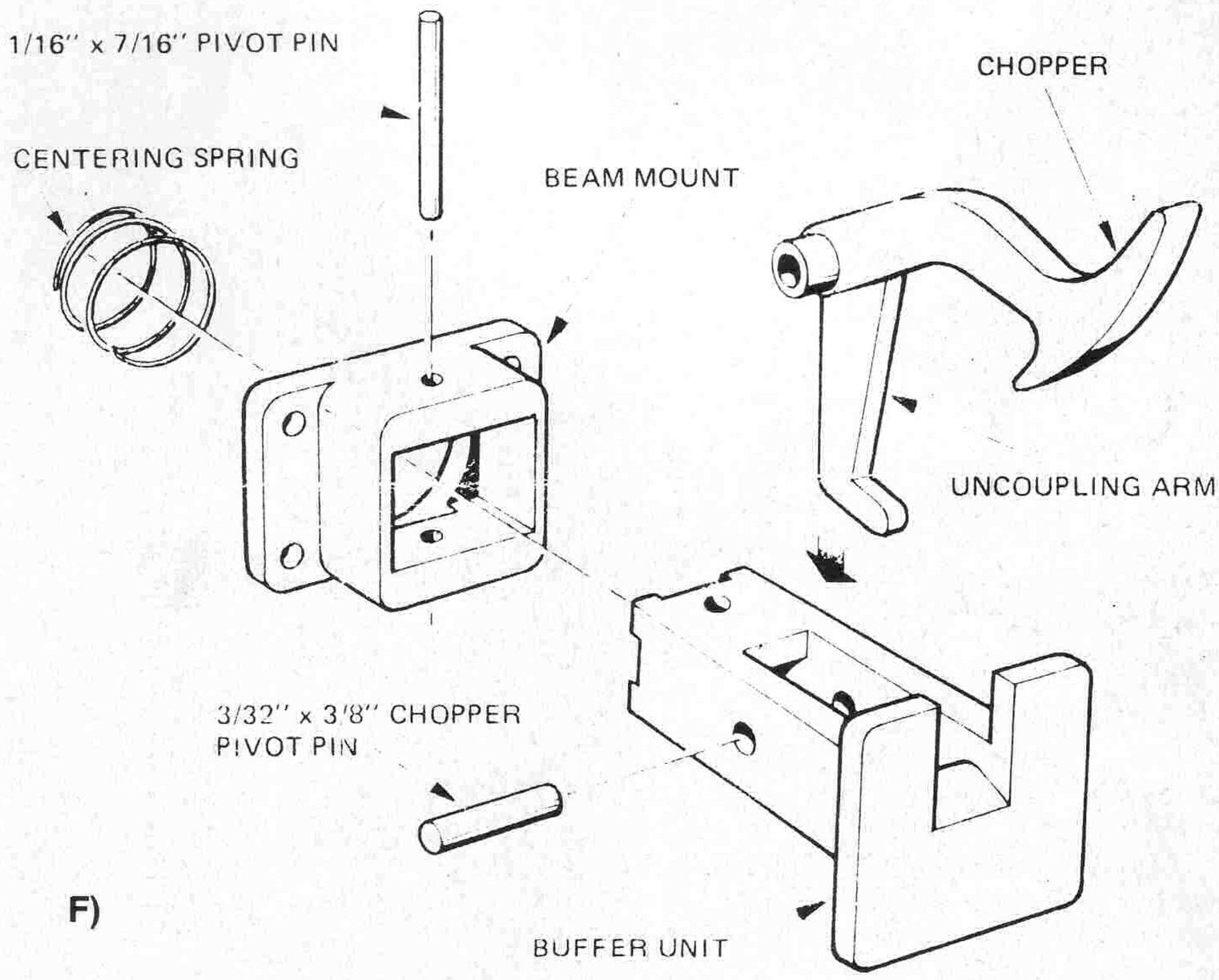
Using the original buffers, bolt the jig in place and drill two holes, then remove, turn it over and repeat the process. One now has four accurately drilled pilot holes. The normal hook coupler can then be sawn off and the buffers replaced by suitable nuts and bolts or, as we did, by ⅛in pop-rivets. As regards the front beam, we left the overlay in place, put the jig on top and drilled straight through them both.

For the tender, as there is easy access to the rear of the headstock, we opened up the pilot holes to clear 14BA bolts and fed them through both the beam and the coupler pocket, making sure that we didn't forget to sandwich the centring spring in place before the assembly was tightened up. After cutting down the shanks of the bolts, they and the pocket were painted red to match the beam and the remainder of the coupler components were fitted as per the instructions (reproduced in drawing F).

The locomotive proved to be a little more difficult as — unless one is prepared to take the whole thing apart — there is no easy way of getting in behind the buffer beam.

After a few minutes head-scratching we hit on the following idea, which at least ensures that the appearance is similar to the fixture on the tender.

Assembly drawing of the chopper coupling is taken from Tenmille's instruction sheet and is not to scale.



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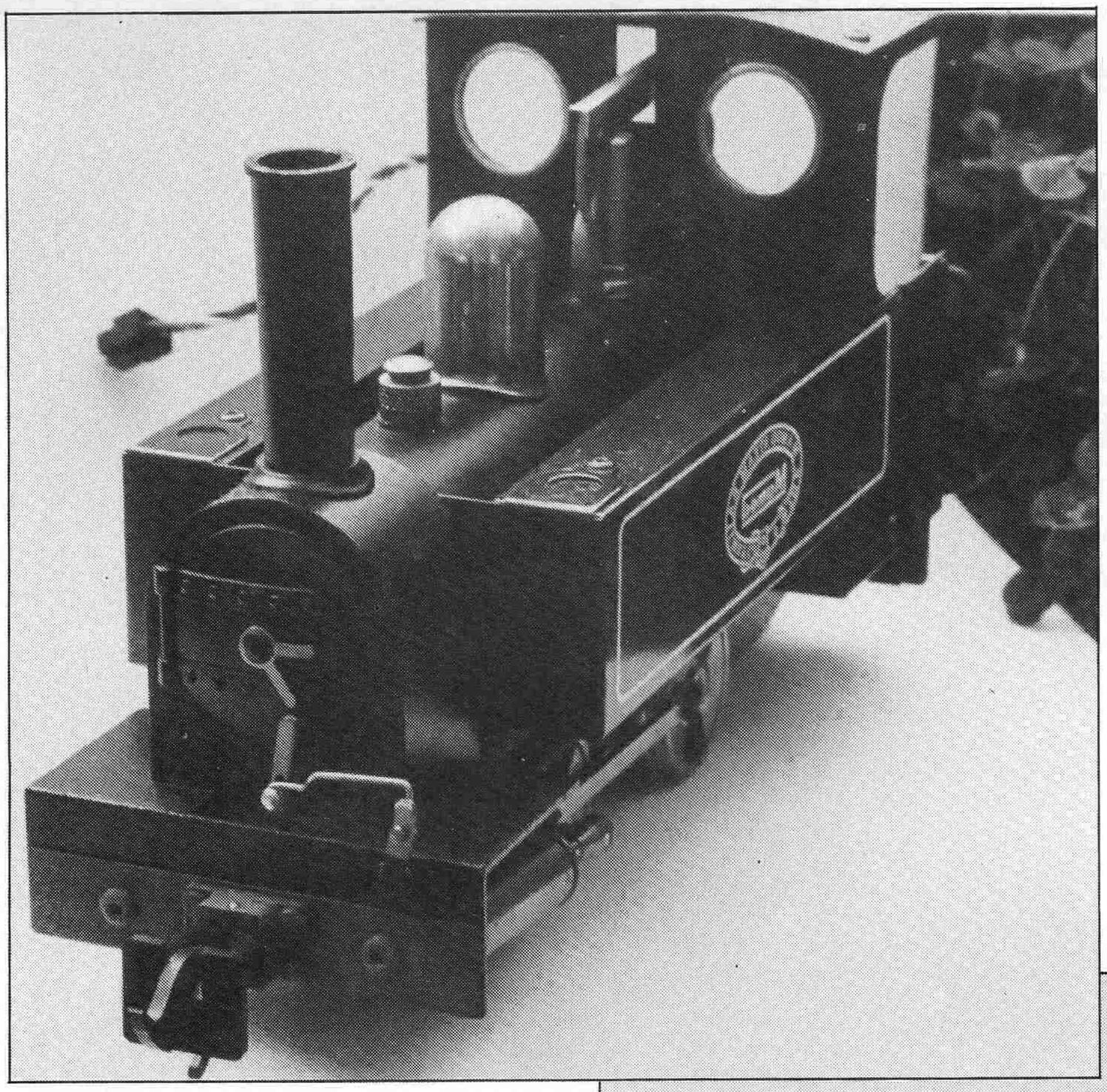


Using 12 BA bolts this time (mainly because it was a Sunday and we'd run out of the 14 BA versions!), we threaded a nut on to each one and ran them right the way up the shank. The holes in the beam were then suitably tapped and the bolts passed through the coupler pocket and into the beam until they projected by a millimetre or two. With the centring spring clipped in between the two, the nuts can be run back down the threads — so tightening the pocket up to the beam — and the section of each bolt now standing proud of the nut cut off; the sequence shown in drawing G illustrates what we mean.

If you don't have a 12 BA tap, then it's down to a bit of fiddling with tweezers to get extra nuts in behind the beam and, if that's the way you end up having to do it, good luck!

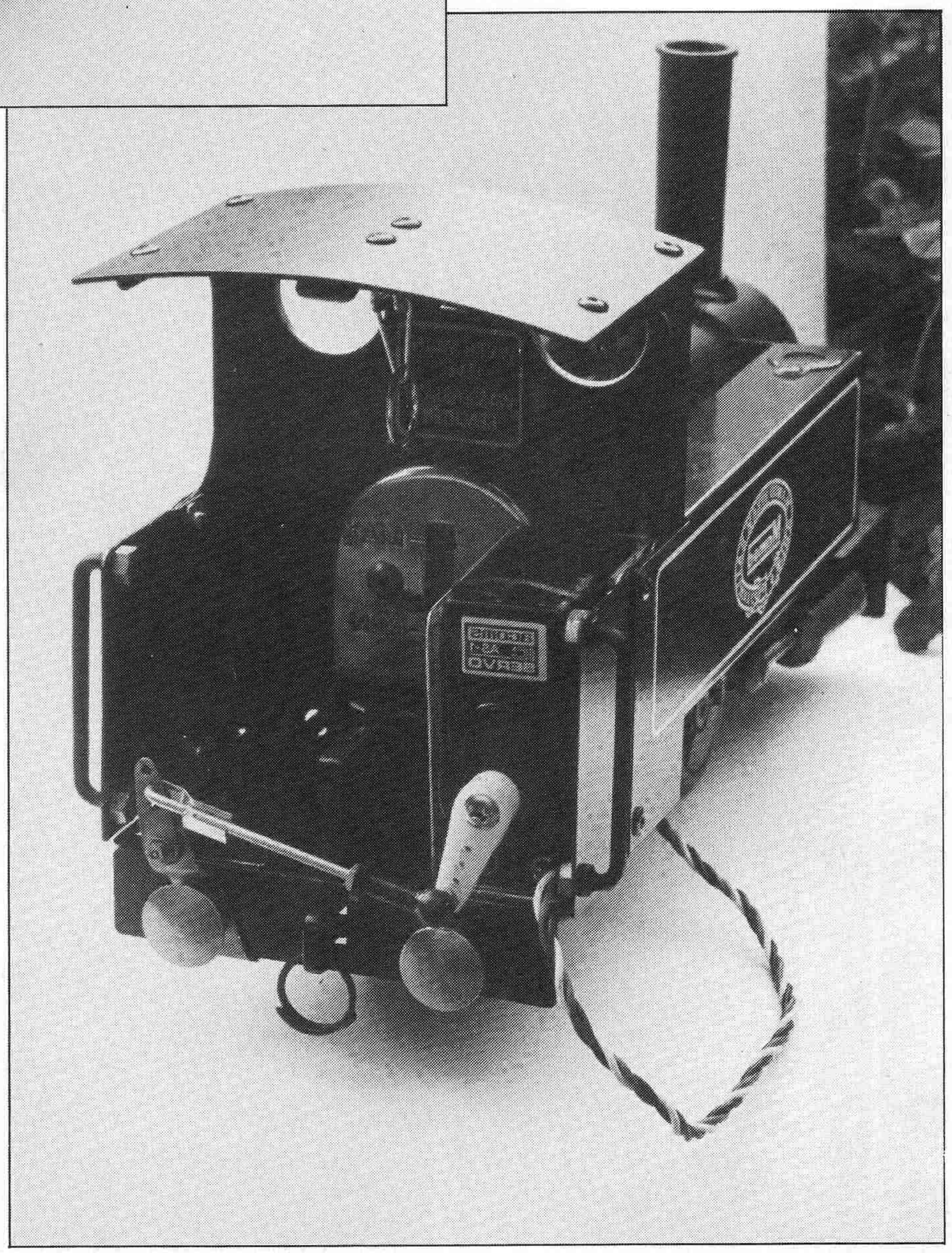
Not yet fitted to our own loco, but easy enought to make, are vacuum pipes. *Tenmille* produce a pack of suitable materials (steel rod and plastic tube) which are simple to use for representing these fittings, or you could enlarge the gauges of wire normally used and follow the practice adopted in the smaller scales. ⅛in diameter welding rod is suitable, bent to the required shape and then 35 amp fuse wire can be wound round it to give the appearance of the flexible section. After painting, the standpipe can be implanted in a suitable hole in the footplate or buffer beam and secured with *Araldite*.

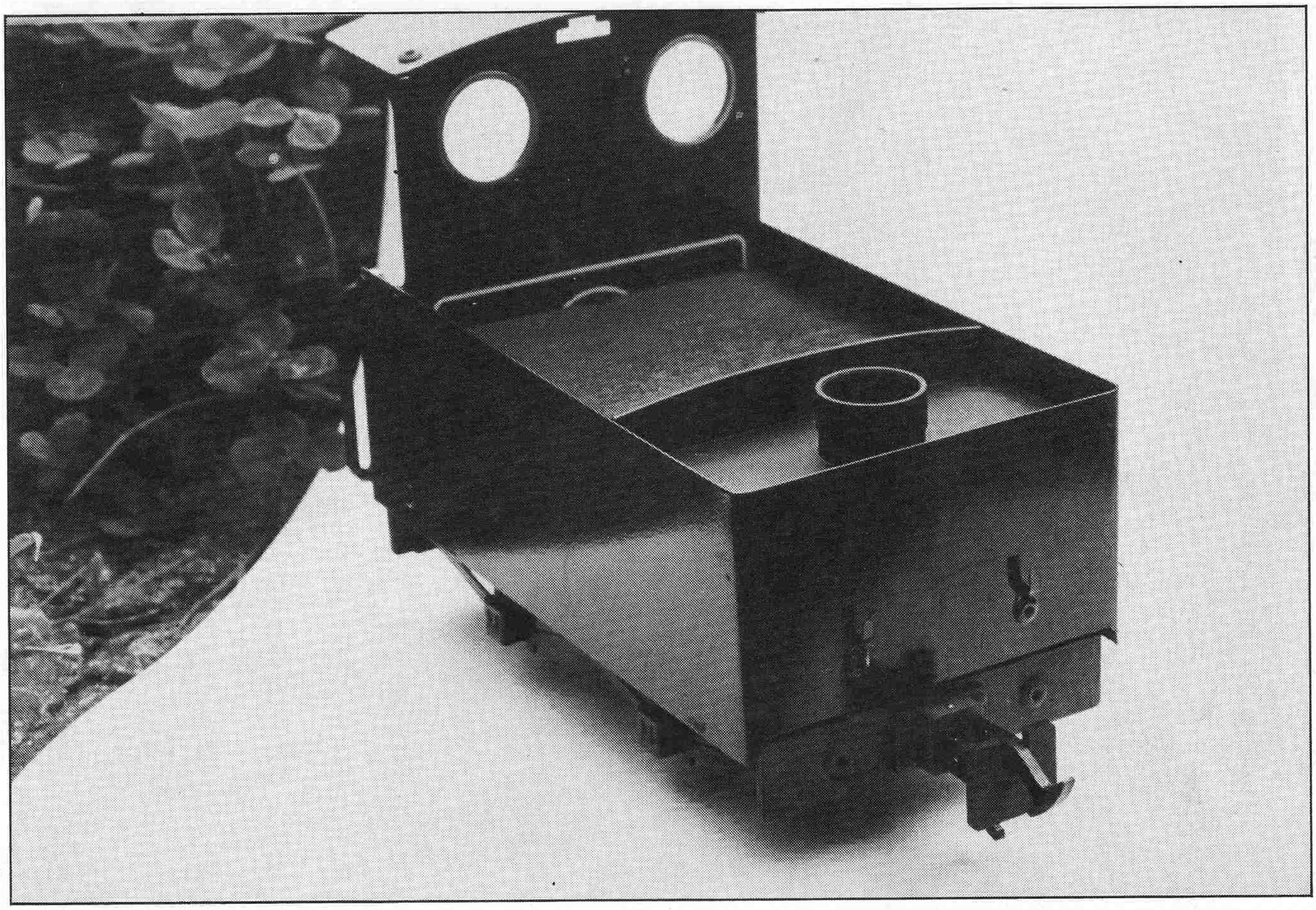
Having kept the cab reasonably clear of intrusions, the loco cried out for driver and fireman figures to add a bit of life and this certainly posed a bit of a problem. *Merlin* do a range of 16mm people, but I didn't feel that Harold Wilson, a nude or an undertaker would look quite right! However, having established that the correct height for a suitable figure would be between 90 and 96mm, I happened to be discussing the ongoing saga of our Kingston Depot project layout with Bob Mumford, when his wife walked in holding some 'Dukes of Hazard' figures which were 3¾in high. As that measurement is just over 94mm, providing one was prepared to undertake a bity of butchery to cover up the pivots for the moving arms, etc, here appeared to be a suitable basis for some crewmen.

In fact, also available in this size range are characters from 'Chips', 'Star Wars' and the *Action Man* series at prices from 49p to £1.80. They are all made in Hong Kong for the *Mego* Corporation and *Palitoy* and most toy shops seem to have a reasonable selection.

Not wanting to have the loco apparently controlled by R2D2, I used a couple of the 'Chips' personnel as the basis, locking the limbs in position with solvent and applying a liberal amount of *Humbrol* filler to cover the

Photographs on this page show front and rear linkages.

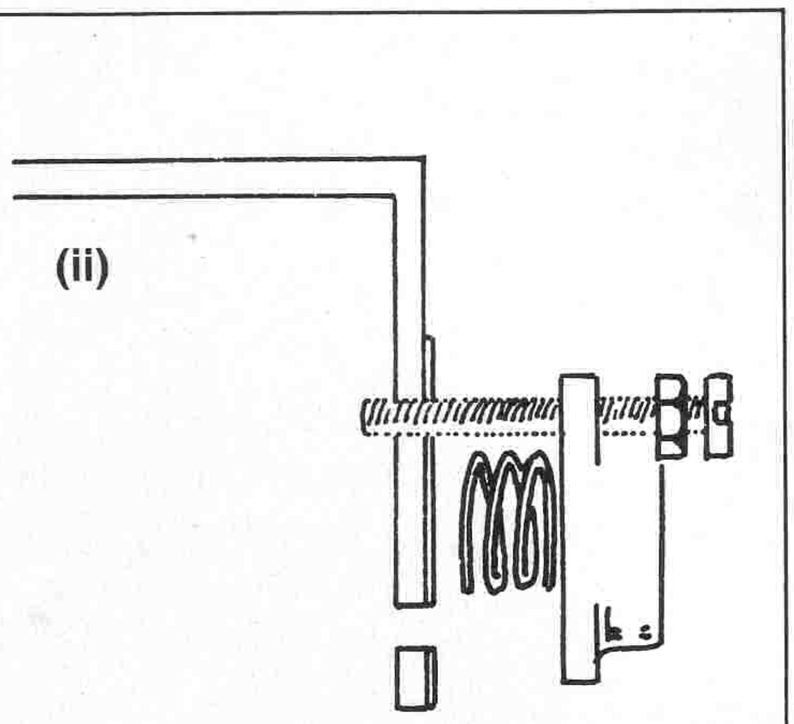




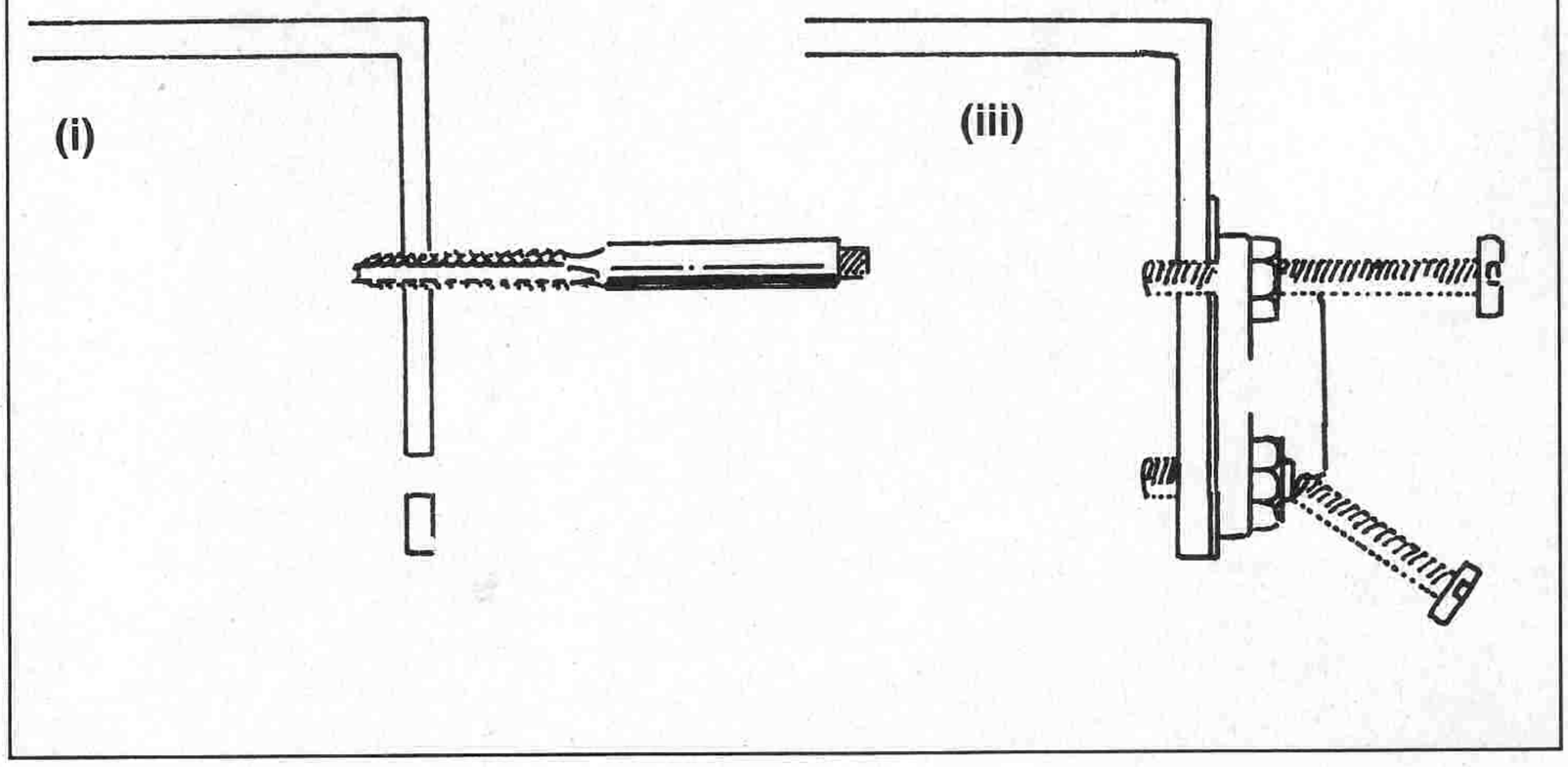
In the picture above, the rear coupling has been installed and lampirons secured with 'Pop' rivets.

unwanted bits after cutting off such non-railwaylike items as Colt ·38 revolvers and California Highway Patrol badges. For the fireman, only the upper part of the body (inclusive of arms and head, obviously!) was used, fixed to the top of the servo with epoxy resin. The driver had to suffer knee level amputation and is held in place with a piece of brass strip furled around his led and retained by one of the handrail securing nuts.

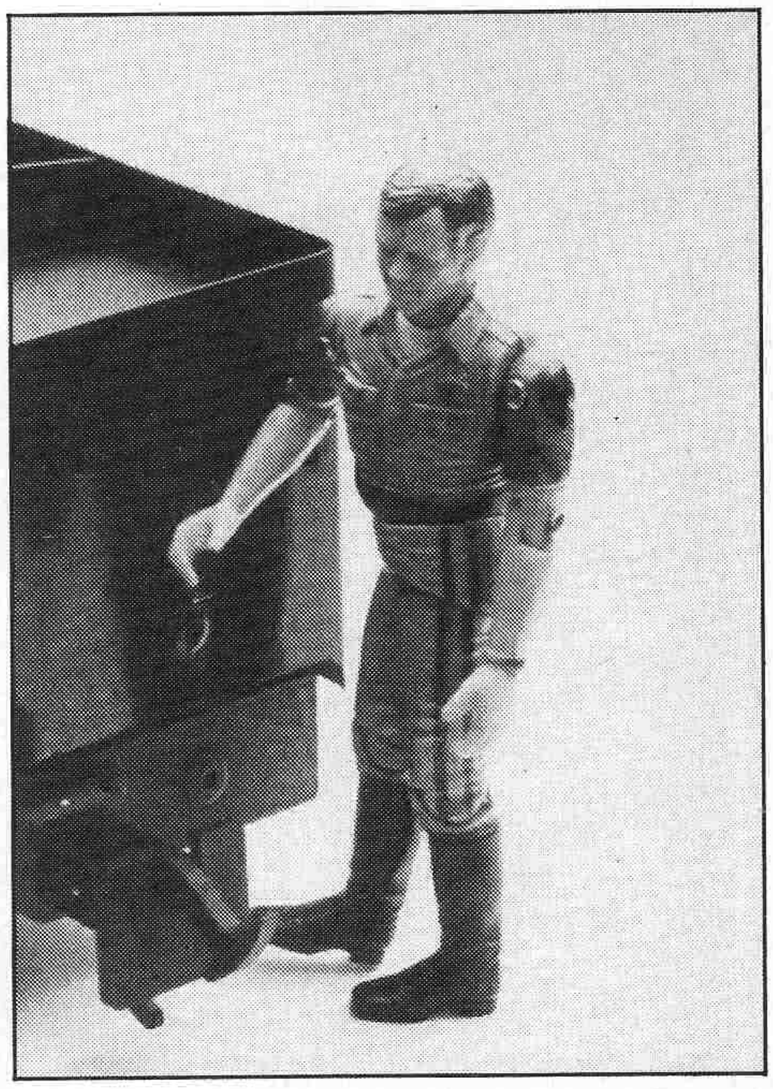
Next month, we intend to get all steamed up and then it's all change when we start our electric powered project in 16mm.



G) Diagram shows sequence for fitting front 'chopper' coupling.



'Sarge' from the 'CHIPS' TV series is shown below, prior to receiving plastic surgery.



Mamodifications part 4

by FRED GAME

AT last the great day had arrived, the mechanical linkage for the radio gear had been checked for full travel, new batteries had been slotted into the transmitter and receiver pack and a quantity of Mamod's little fuel tablets had been split in half ready for feeding into the loco's burner tray.

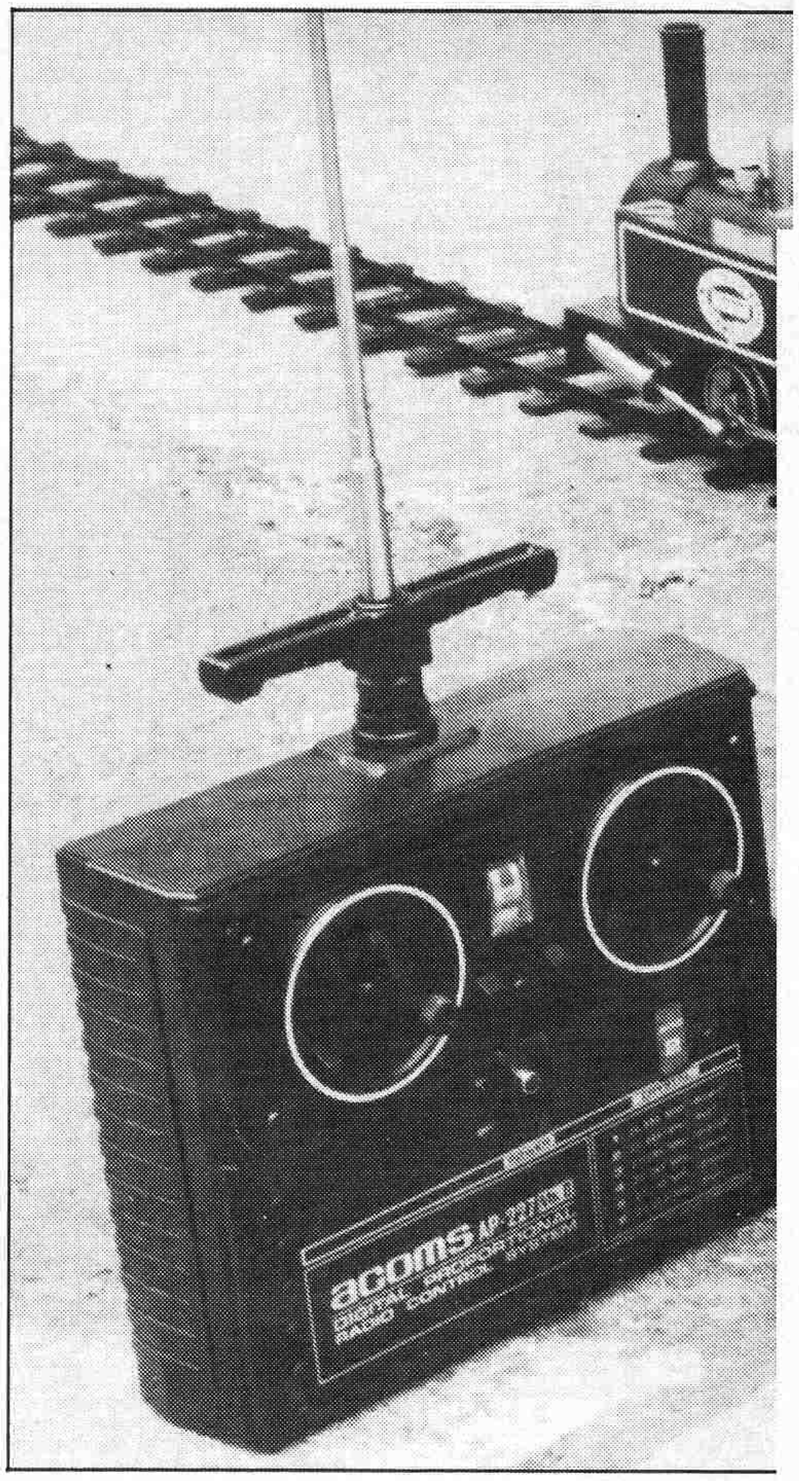
Of course, there were a few snags. One, we had no track; two, it was pouring down with rain; and three, the wife had invited friends round for an impromptu garden party — an idea not exactly assisted by point two! However, as one of the friends was Bob Mumford (partner in crime to the Kingston Depot saga, but eager to make the occasional transition into 16mm garden railways) an answer to problem one soon materialised in the form of some strips of ply nailed onto Melamine boards, making up an eight foot long test section as shown in the photograph.

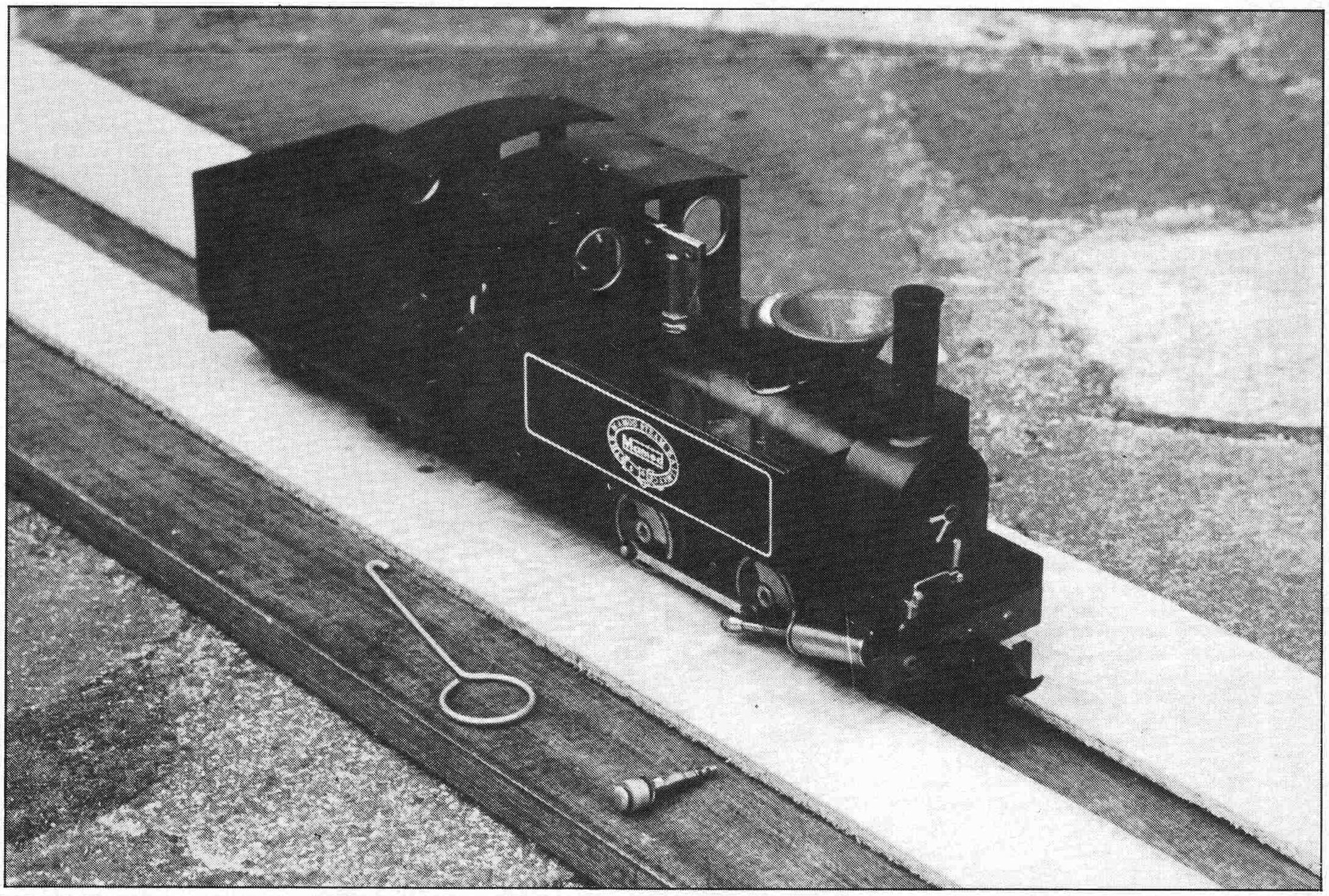
By coincidence, the fact that we could then steam the loco on a solid base also overcame the setback with the weather, as our operations centre then moved into the kitchen, with little or no chance of spent fuel, oil or steaming water pouring straight onto the floor.

Following the Mamod instruction book to the letter meant that we started by flushing the boiler with hot water and washing-up liquid to remove any soldering residue or other contaminants resulting from the loco's construction. This should be done really thoroughly, otherwise traces can make their way into the cylinders, port faces or the control valve, and score areas that should remain smooth to ensure a steam-tight joint.

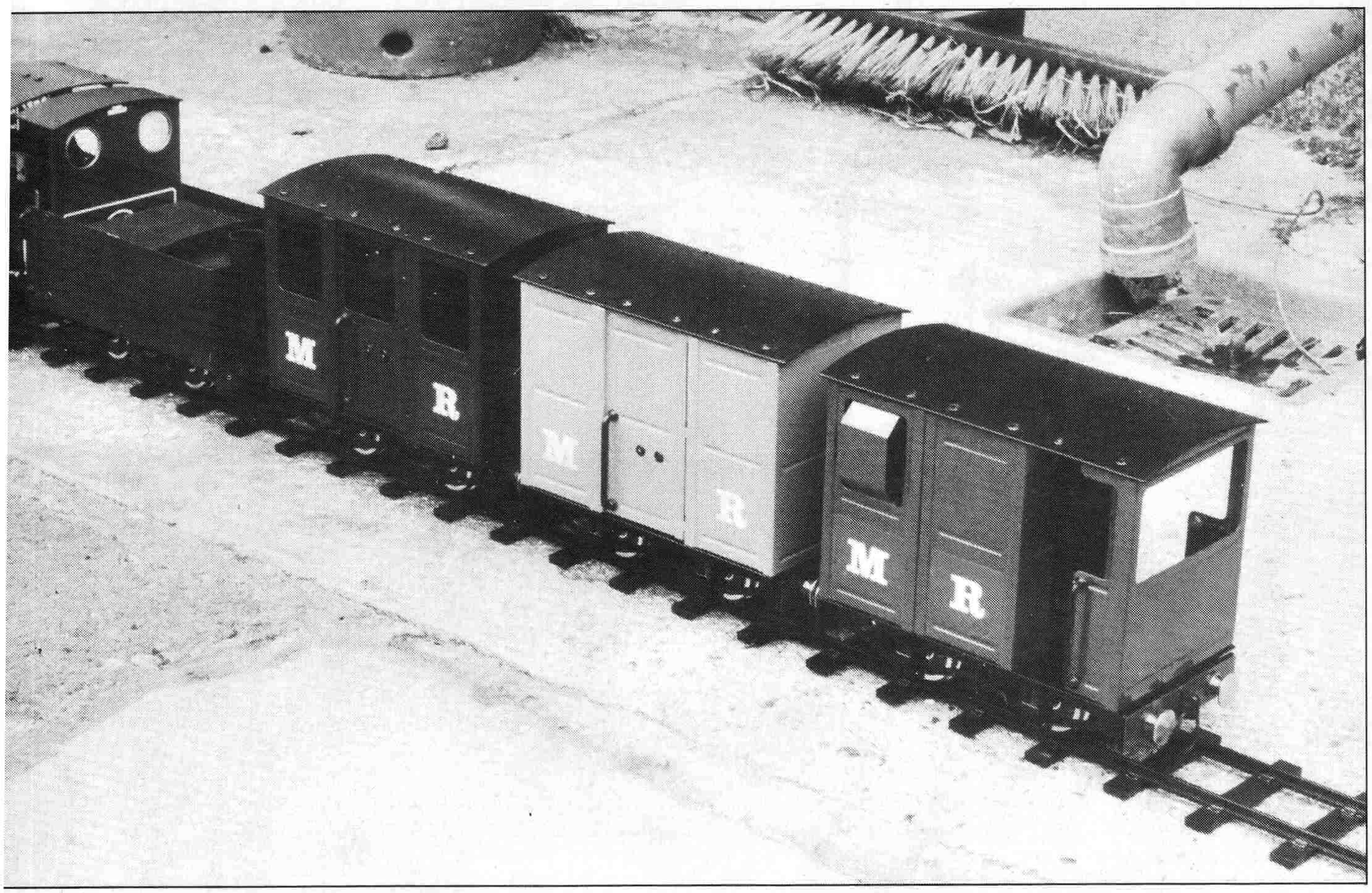
Needless to say, such was our enthusiasm to raise steam that we rather hurried this stage and then had to take off the cylinders and control valve and clean up the faces using very fine (grade 1200) wet and dry taped to a sheet of glass to make certain it stayed flat. How did we know that we'd allowed contaminants to reach places they really shouldn't have done? Read on . . .

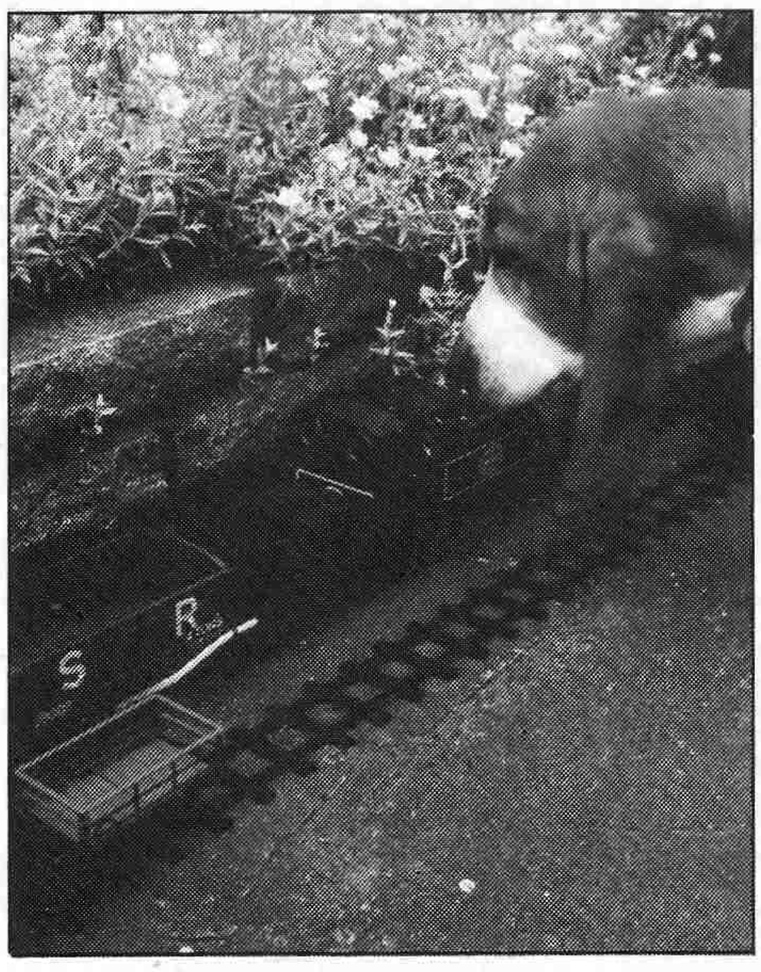
With a boiler full of nice hot water, we set the loco down on two bricks so that the wheels were free to turn and inserted the alrady ignited pellets on their tray. After a minute or two water started to dribble out of the cylinders and from the base of the control valve, but there was little sign of the pressure building up sufficiently to lift the safety valve. Eventually, curiosity overcame prudence and we pushed the control lever to the forward position whereupon the wheels started to turn — albeit reluctantly — and a





IN STEAM AT LAST!





Left: Awaiting a refill of hot water, the Mamod and tender languish on the temporary wooden test track. Above: Enthusiasts come in all shapes and sizes — even Fred's Basset shows a keen interest! Top: Believe it or not, just a little over £100 would buy everything shown in this picture; who says live steam is expensive?

positive deluge of water poured from the front end of the loco. Within a minute the level gauge was down to minimum, even though the tablets were still burning profusely.

Something was obviously wrong.

Turning back to the book of words, we scanned the text for a possible cause — and found it. Hidden amongst the French and German prose was a paragraph on lubrication, something we had overlooked altogether. Several blobs of *Duckhams* 'Hypergrade' later we were back in business but not quite home and dry. This time the pressure was sufficient to make the safety valve/filler plug dribble in a manner which we had been told was characteristic of the Mamod, but the water consumption was still excessive, running low long before the fire died out. All of which proves that one should *always* read the instruction book until its contents are totally understood, and not succumb to over-enthusiasm.

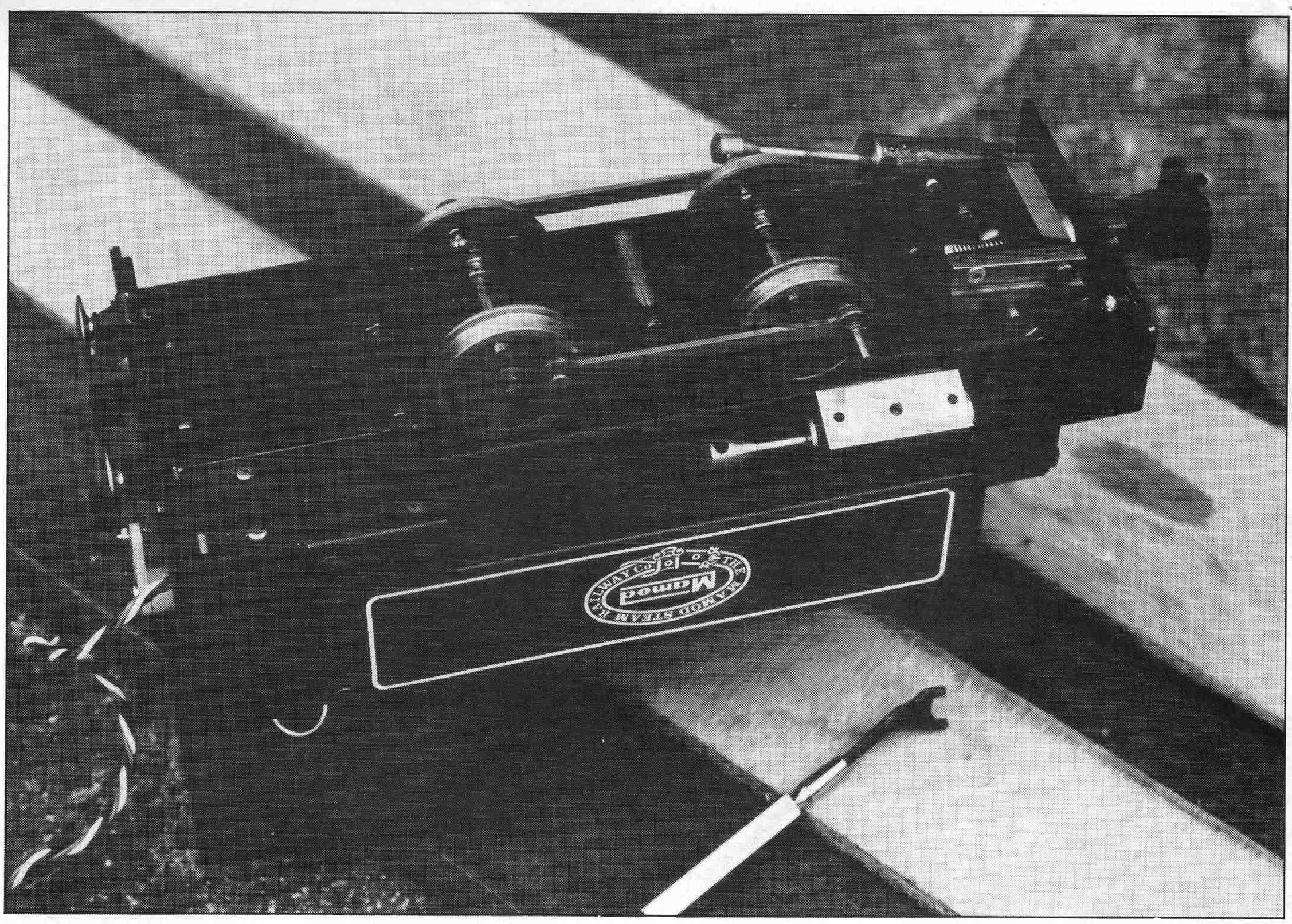
After smoothing off the valve and port faces, as described previously, the loco ran up and down the test track quite happily, managing a minute or two longer duration with each refill of water and fuel.

However, it is a characteristic of most model steam engines that nothing settles them down better than a bout of continuous running, rather than short hops of a few feet in each direction. We therefore acquired some Mamod sectional track and, having set up a sizeable oval on the patio (as the weather conditions were more favourable for this, our second attempt), we filled and fired up the loco once more.

This time the loco trundled round happily after raising steam within two minutes, using more moderate amounts of water and emitting an endearing 'chuff-chuff' until the pressure dropped after a couple of circuits. Following a short pause to regain its breath, the Mamod carried on for a similar distance and then managed to derail itself over a particularly uneven section of crazy-paving.

To anyone who hasn't witnessed a live steam derailment, the first occasion is quite exciting with the wheels speeding up to Mach III velocity and water vapour shooting over everywhere. Luckily, nothing actually caught fire — a testimony to the inherent safety of Mamod's design — but one has to react quickly whilst remembering that care must be taken not to grab at a part of the loco that is red hot. In our case, picking it up by the front coupling and the extreme rear of the cab roof kept the digits free of blisters; the *Tenmille* moulded chopper couplings seem almost immune to high temperature and the one on the front buffer beam (an area that suffers from extreme heat) hasn't distorted one iota.

By maintaining a plentiful amount of oil around the valve and cylinder faces we had now reached the stage where the fuel tablets were expiring before the water supply, and the loco would run for several minutes with only occasional rests to build up pressure.



With the cylinder removed, one can inspect the ports carefully and also check if the sliding faces are in good condition.

Perhaps at this stage a few do's and don'ts might be of help to other novice Mamod users, based on our own experiences so far.

1) READ the instructions.
2) Repeat the above at least twice more!
3) THOROUGHLY flush out the boiler with a weak mixture of washing-up liquid and warm water.
4) Use a lot of oil to lubricate the control valve and cylinder faces (this is one occasion where too much rather than too little is the order of the day) and don't forget the crankpins or axle bearings either.
5) Break the Mamod fuel tablets in half carefully — a lot of wastage will result otherwise.
6) Ensure both tablet halves are properly ignited before placing the burner tray in situ; if one goes out you won't get enough steam to open an envelope.
7) Keep a watching brief on the water level and NEVER let it drop below the minimum mark. Take extra care especially when the loco is running in.
8) Be patient whilst the loco settles down over the first few steamings.
9) Make sure the track is level.
10) Unless you like recreating disasters, don't run the loco flat out round standard radius Mamod curves.

After about ten steamings or so we decided to try a run under the guidance of radio control, so the tender was coupled up and the lead from the servo connected to the receiver.

With both transmitter and receiver switched on and steam pressure up to working level, the control lever was gingerly pushed in a forward direction. Two squelches and a hiss later the Mamod trundled away after a token wheel-spinning scrabble — probably searching for a bit of rail not covered in oil — and started to accelerate towards the first curve. In an attempt to reduce speed, the operating control was pulled back too far and the loco slid to a stop with the wheels spinning wildly in reverse. The Mamod's response to the radio control was certainly instant!

After a little more practice, smooth starts and stops could be achieved with one hundred per cent reliability; not once did the loco fail to answer a command from the *Accoms* radio gear.

Flushed with success, we then hitched up some rolling stock; three Mamod examples which were certainly free running but must have constituted a good pound or two in weight, this time wheelspin was more in evidence, but *even* with the Editorial Director in charge the extra load was easily dealt with to the point where a scale walking speed could be maintained for several laps of a 25-30 foot oval.

Probably because some local CB enthusiast was getting to verbal grips with a 'good buddy' (or perhaps because the transmitter batteries were marginal), we found that the servo sometimes twitched seemingly of its own accord. However, it was never enough of a problem to cause the train to charge off on its own.

With a few runs under our belts we can honestly say that the Mamod loco and Accoms radio are a cheap and very effective way of getting started in remote control live steam. OK, so the combination may not have the finess of an off-the-shelf outfit costing the best part of a thousand pounds — but for under ten per cent of that figure, who can complain? Bearing in mind the limitations imposed by the pauses to regain pressure whilst the burning tablets fight the elements, one can shunt, crawl and speed along at will with a respectable length train — for narrow gauge standards at least.

Our next step will be to test gas and meths burners in an effort to obtain better performance for longer periods both in and out of doors, plus — as we mentioned before — there is still that spare channel and servo crying out for another receiver and piece of motive power to control. More will undoubtedly follow!

Mamodifications part 5

by FRED GAME

SUBDUED euphoria is perhaps the best way to have described our initial steam up with our Mamod conversion. As you may have read last month, we were more than pleased with the way the loco performed after it had settled down and received adequate lubrication. Power was certainly there, in bursts, with instant control response in both forward and reverse, although, like so many models of this type, it had one or two quirks. In our case it was a marked preference for going backwards — being much smoother at low speeds.

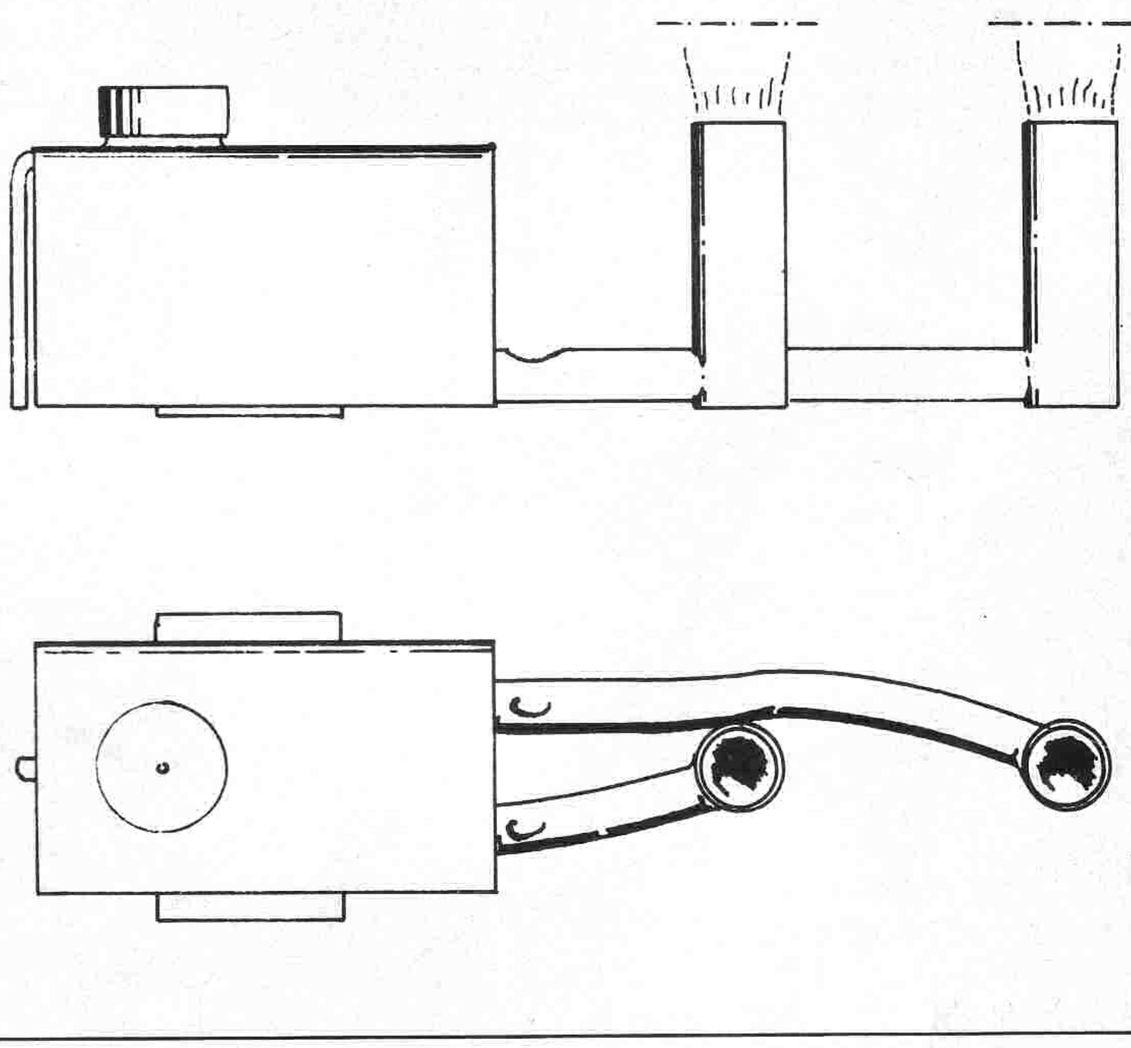
Our only criticism was that the average length of run was about seven minutes, including a couple of rest periods to regain pressure. By this time, water consumption was not a problem and the boiler was always more than half full after the pellets had burnt themselves out, so the answer appeared to be a more efficient method of firing.

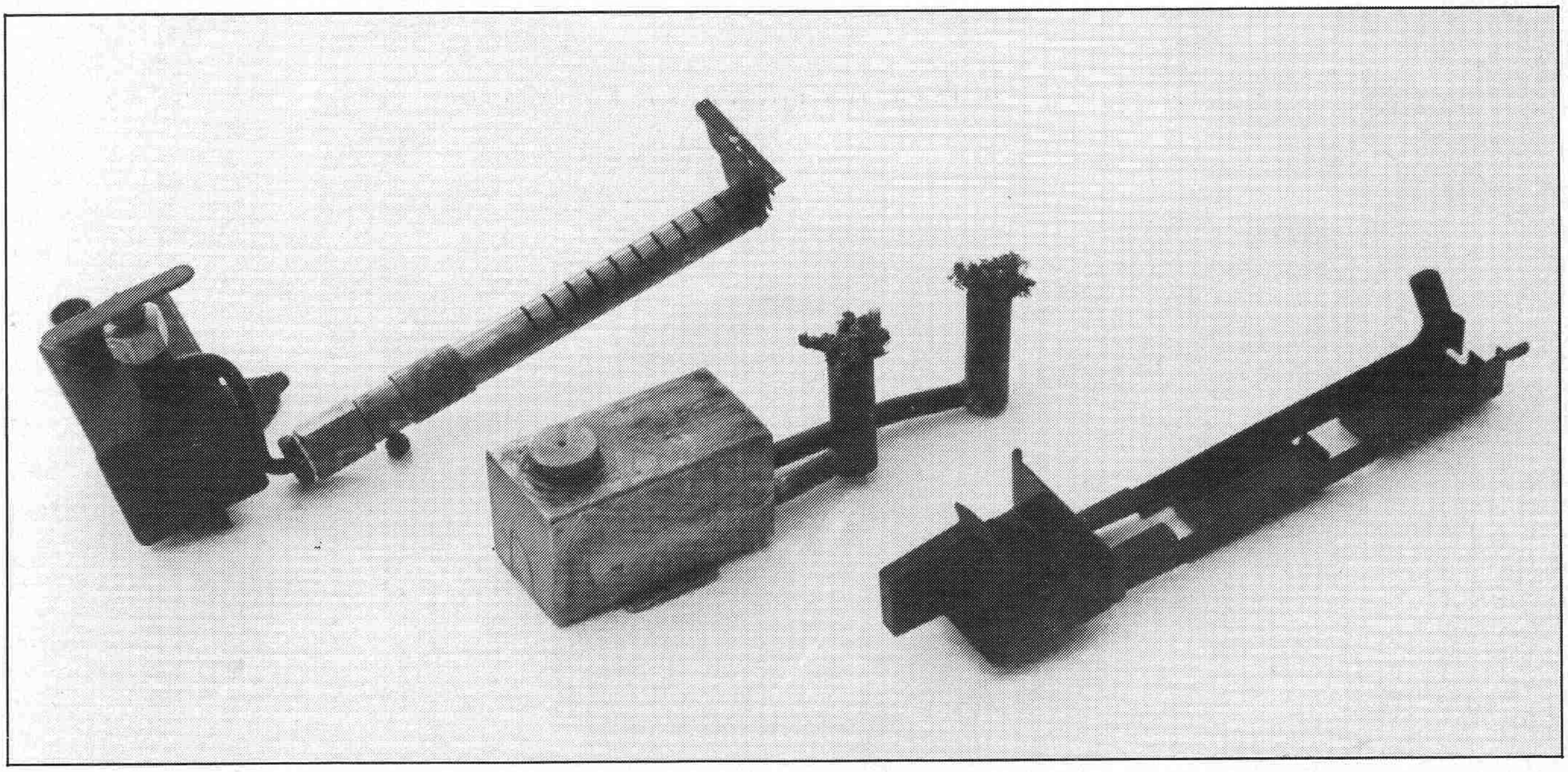
At this point it is easy to point the finger at Mamod themselves and suggest that they should provide something better in this department. However, one must remember that a large proportion of their sales go to the so called 'toy' market where any possibility of the heat source outlasting the water capacity could have very serious repercussions. Product legislation is such that they really have little choice but to retain tablet firing — even if they do have some future plans for alternatives more suited to the enthusiast's requirements. As it is, they noted our comments regarding the wastage involved when the tablets break unevenly and will soon be introducing smaller versions which fit straight into the burner tray.

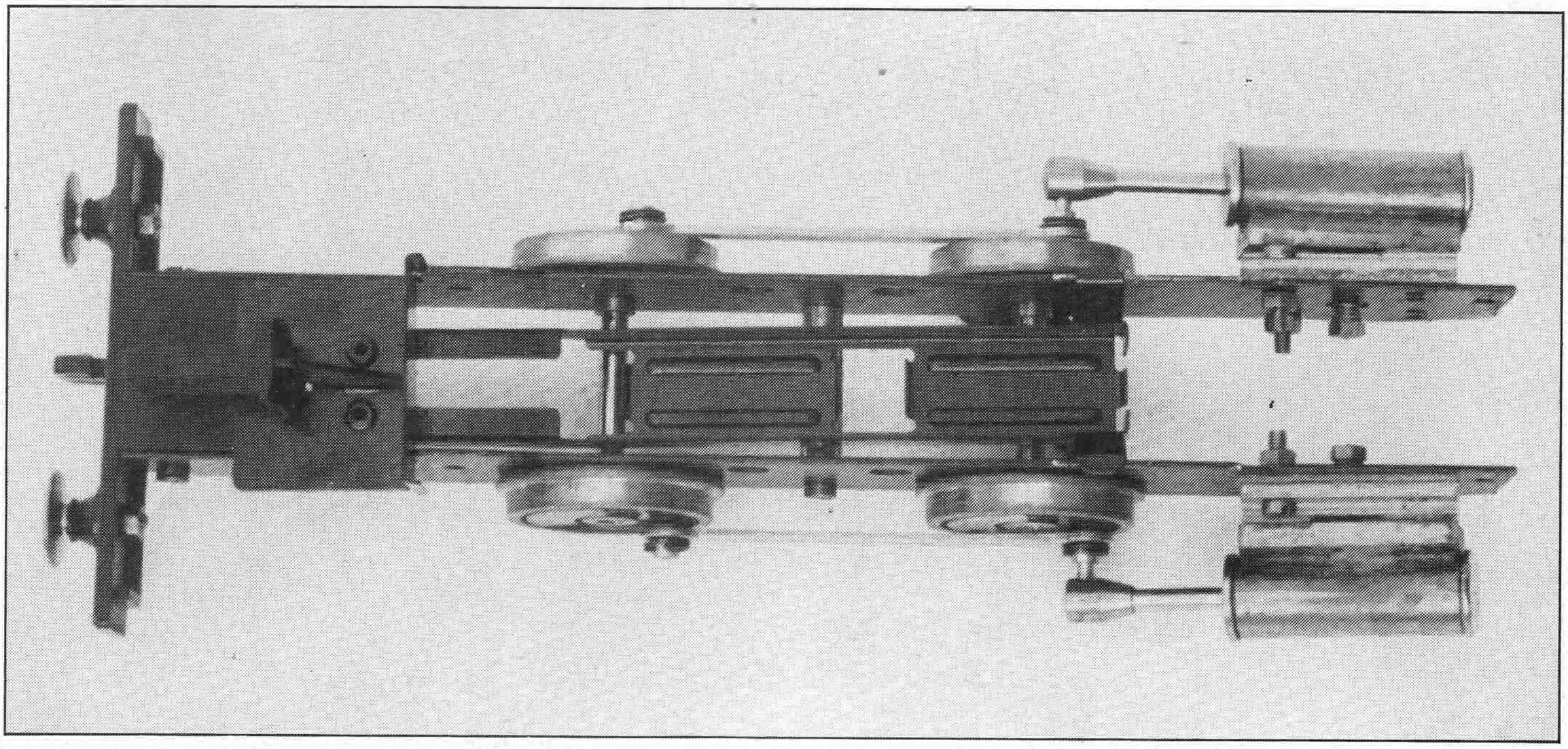
One final point regarding these tablets, we doubt whether they could be made much more efficient than they are already — did you know that the SAS use the self-same fuel for cooking their combat rations? What a mine of useless information we can be!

Still, whilst discussing the merits of the conversion with Roy Scott of *Tenmille Products*, he mentioned that his pattern-maker had made a meths burner for his own Mamod and would we like to give it a whirl? Although he has no present plans to market the device himself, we could reproduce the dimensions for the benefit of any readers who might wish to copy it for their own use.

Consisting of a short length of square section tube, blanked off at both ends but with drillings to accept a vented filler and pipes to the wicks, it couldn't be much simpler, as our drawing shows. If a suitable vented cap is not available, a vent pipe can be added — as we have also shown. Ideally, all the joints should be silver soldered but we have heard of other versions that have not







self-destructed after being assembled with ordinary solder.

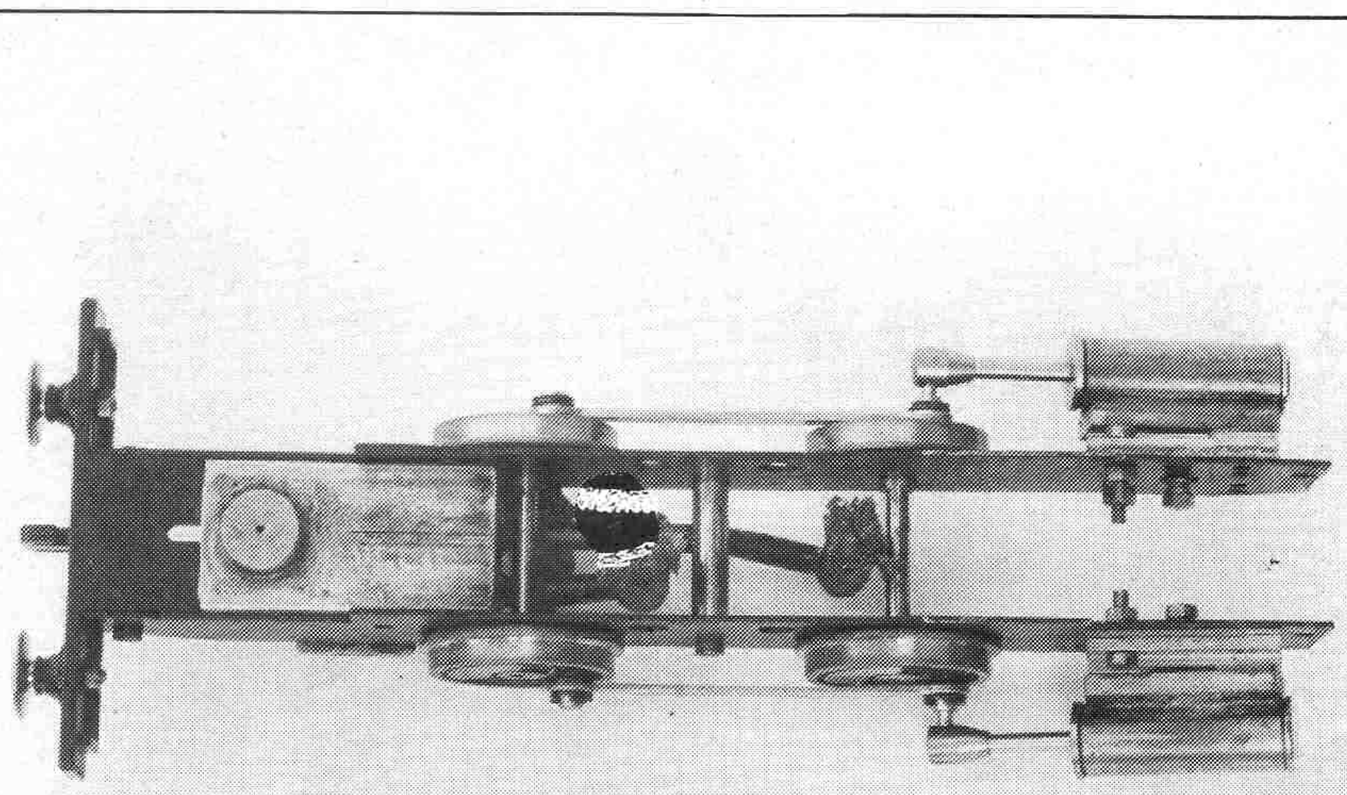
Providing the dimensions are adhered to, the only modifications needed to fit it to the loco are the removal of the front cab retaining bolts and the substitution of the chassis spacer with a piece of strip steel. The burner will then be a firm push fit in between the frames (pinch them in slightly if it isn't) and no further location is required.

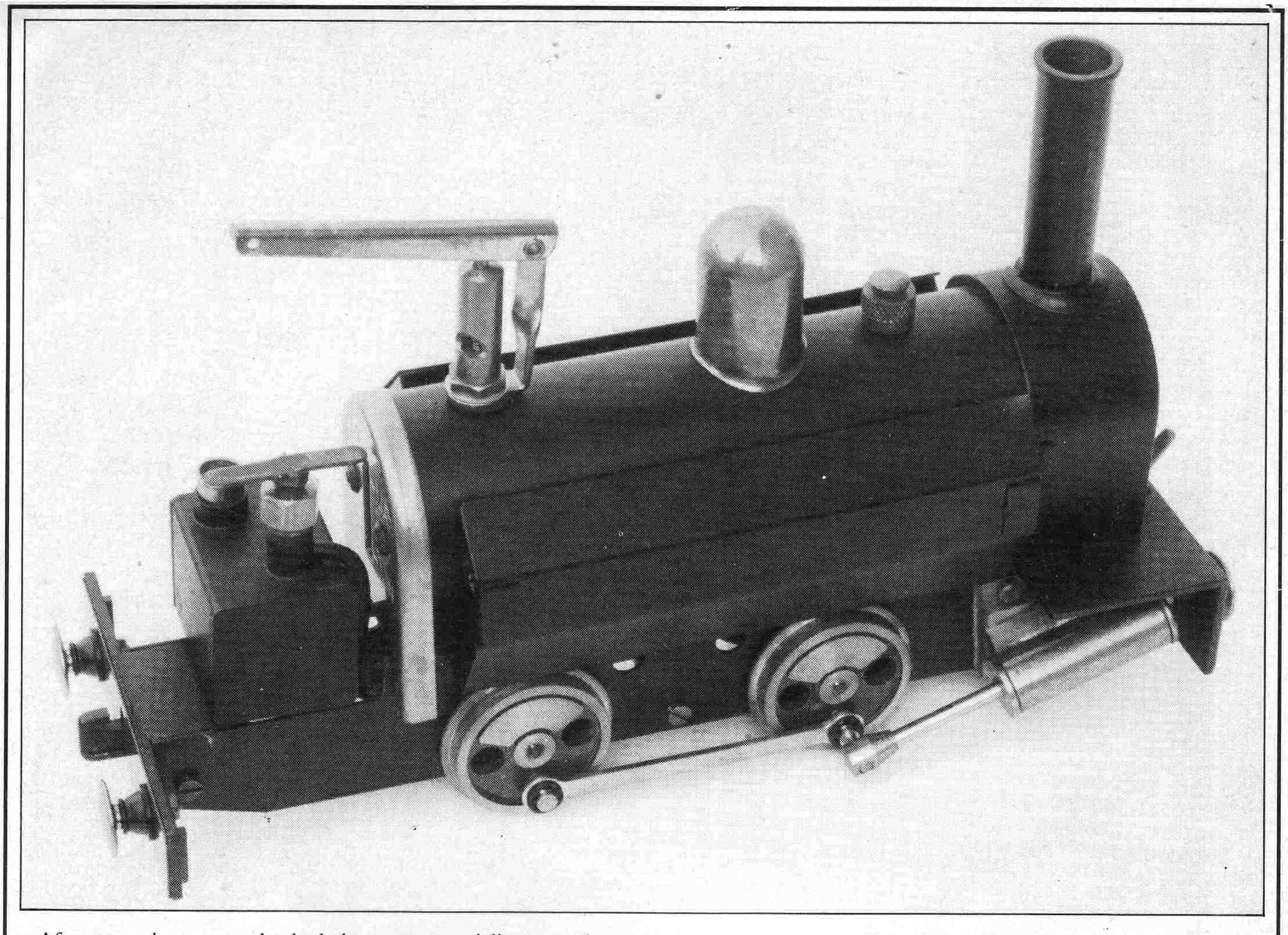
Filled to the brim with meths, the wicks ignite immediately a flame is brought near them and the unit can then be slid in position after the boiler has been filled with hot water. If this sounds like a three-handed operation, it almost is! However, if done carefully the loco can be lifted and replaced before it gets too hot to handle.

The test run was along a sixty feet length of Mamod track, laid straight down on to a far from flat lawn that resulted in short up and down gradients for the whole distance. Still, the problems would be equal for each test.

Firstly we ran the loco with pellet firing and succeeded in achieving six runs over the course with a pause at each end to raise steam pressure. Because of the undulations, driving involved bursts of full power interspersed with rapid throttling back to avoid derailments, so if the distance covered doesn't seem far we feel sure it would have more than doubled had the track been level. Still, it was a lot of fun and made one appreciate some of the problems that must exist when driving a 12in to the foot example — realism indeed! Total running time was just in excess of seven minutes.

Changing over to meths resulted in initial disappointment as it still took about two and a half minutes to raise steam after filling the already warm boiler with water that was only just off the boil. However, once in stream, things certainly did improve and the little Mamod galloped away down the garden doing a narrow gauge impersonation of the Flying Scotsman! Stops were still required to re-establish working pressure, but not too frequently or for so long.





Above photograph shows the small gap between the gas tank and the boiler sight-glass.

After ten minutes we checked the water level but it was still about half way up the scale, so on went the test. Fifteen minutes and a little water was still in the boiler, but after seventeen it was down to the 'MIN' mark on the sight glass so the loco was stopped and the burner removed. Lo and behold, it had just extinguished — good timing indeed!

To test the Roger Marsh gas burner, we had to become a little more athletic as, so it would appear, most people who fit radio gear to the Mamod mount the servo on the right-hand side of the cab. As ours was on the left and the tank for the burner also sat over to that side, we had to remove the servo and resort to manual control. We also shaved a small amount of metal away from the front mount, as shown in diagram 'B', so that it would slide in easily past the feed pipe on the underside of the boiler — perhaps ours was a little lower than normal.

Using one of the large gas canisters, as supplied by *Merlin*, with one of their special adaptors, it is quite probable that butane could be one of the cheapest methods of fuelling the Mamod. With a small Calibri container that was all we had to hand, it certainly wasn't! We've now ordered the bigger can and adaptor and will give some comparative costings in a future issue.

The control feed is via a large red tap which is opened only a fraction of a turn prior to igniting the jets. Correct flame spread and colour is then obtained by sliding a sleeve along the burner tube until the vent holes are partially covered.

With burner and hot water all in their correct places, working pressure was reached in under two minutes and this time the loco chugged away with your editor in close attendance to manually open and close the throttle. Although this procedure sometimes meant that the engine had to travel further to overcome some of the undulations, because I couldn't stoop down quickly enough, it was still a couple of minutes before we had to have a momentary pause to regain pressure.

This time the wait was only a matter of seconds before we were off again on our travels and, as the running time increased, so too did the apparent efficiency of the burner. A chat with Roger Marsh had revealed that as the main tube heats up, thanks to the conductivity of the whole unit, the tank gets warmer and the gas is pressurised — giving a fiercer flame and more power for a smaller throttle opening.

This is really the story of the Roger Marsh burner, as the fuel starts to run out steaming becomes more efficient to the point where no pauses for breath were necessary.

Probably because we hadn't fully charged the tank, the run came to an end just after the eleven minute mark with the boiler water-level only just below the half way position. However, the performance had impressed us sufficiently to make us eager to try again and we will give you a more accurate report once a more economical supply of gas is to hand and we have refitted the servo in the other side of the cab.

To sum up, our brief observations showed good points in favour of all three methods of firing depending upon the sort of use the loco will have.

The Mamod tablet tray is the cheapest (it comes free with the loco!), the safest in less experienced hands and certainly up to the job if short runs are the order of the day.

Our homemade (with Tenmille's help) meths burner costs only a few coppers to make but even a proprietary effort would probably stand in at less than £10. Easy to ignite, running costs are lower than with the tablets and twice the normal running time would seem to be within most people's reach.

Involving the highest initial outlay (approximately £16 odd) from the gas burner returns the investment by giving the best performance and — as we hope to prove — possibly the greatest economy in the long term. Certainly the cleanest, it also makes indoor steaming a more realistic proposition — even if the polished dining room table is still out of bounds.

We still have more in store on the Mamodifications front. Peter Jones has sent in some detailing suggestions, plus we are attempting the construction of an 0-4-2 or 0-4-4 tank based on the Mamod chassis/boiler unit that will take all the radio gear without the aid of a tender. Meanwhile, the batter powered diesel is starting to take shape . . .