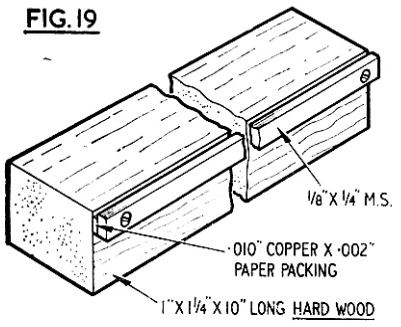
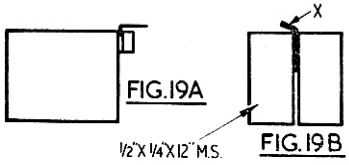
NORMAN DALE

HOW TO MAKE FREIGHT

BEFORE I proceed with a few details on goods van construction there is one other wagon and van jig I feel should be described here. This is a jig for making channel solebars. A good number of wagons and vans with channel iron solebars and headstocks are fitted with 10 in. to 12 in. × 3 in. steel channel. For a good number of years nobody in the model trade appeared to have bothered about making any. I suppose the question of demand does enter into it. There has always been plenty of the 9 in. × 3 in. section about, but even this is not what one might call perfect.

FIG. 19





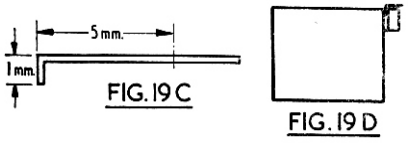


FIG. 19 D

A few years ago I wanted some 12 in. × 3 in. and had to reduce some hard drawn brass channel which was very much oversize and weight. This proved to be such a job that when I wanted some more I decided it called for easier methods. Having a good stock of $\frac{1}{8}$ in. × 0.010 in. copper strip, I thought, "Here is a chance to show show my mettle." The jig (Fig. 19) is quite a simple affair, consisting of a piece of hardwood 10 in. × $1\frac{1}{4}$ in. × 1 in., and a piece of mild steel $\frac{1}{4}$-in. × $\frac{1}{8}$-in. plus a little packing. Referring to the sketch, the copper strip packing is the only job that needs care. The top edge of this packing I made to be 1 mm. down from the face of the jig. Here is the drill for making the channel.

1. a length of $\frac{1}{8}$ in. × 0.010 copper strip is bent over. It will spring back a little (Fig. 19A).
2. a couple of 12 in. × $\frac{1}{2}$ in. × $\frac{1}{4}$ in. mild steel bars are trapped with the strip in the vice (Fig. 19B) to get a perfect square angle. Force and dress down the "X" part flat, the "dressing" down being done with a piece of hardwood.
3. gauge to 5 mm. full (Fig. 19C).
4. trim with scissors close to gauge mark.
5. file straight and also down to the gauge mark. Remove the burr caused by filing.
6. place back in jig and bend down (Fig. 19D). Truthfully speaking, with our sizes the overall width should be 0.145 in. (0.010 copper + 0.125 in. former + 0.010 in. copper). Owing to the method of making it plus the spring of the material, mine came out at 0.157 in., which is spot on for twelve inches in 4 mm. scale. Needless to say I let out a yelp of elation when I "miked" it for the first time. The width, which scaled up to almost 4 in., was soon filed down to 1 mm. or 3 in. scale size.

I do not think there is any need to add that this is an excellent method of producing coach channel solebars or in fact any type of channel iron. For a different size, all that is required is to change the mild steel former. A few minutes with a file will produce a different thickness of former. It would be advisable to use the first former as a jig to drill the screw fixing holes in the other formers.

Well, that about completes all the details regarding private owner wagons. Apart from the painting and lettering, which I shall include at the end of the van construction part of this article, it is advisable to give the wagons a coat of shellac or cellulose sealer. I prefer the latter, put on with a brush. As I said at the beginning, this coat will help to fasten the metal stripping more securely.

Goods van construction

Whilst I did not intend to describe any particular goods van and go through its construction, it may be a help to beginners if I did single out one van because the same methods can be generalised.

Before starting construction of any model—especially a van—I always begin by spending a few hours, sometimes days, in what I call "weighing the job up." This is a kind of courtship before the engagement. I think and dwell on the different methods of construction, the pitfalls and "clangers" I could drop, and how much support I can get inside the van to prevent the sides caving in.

How shall I tackle the corner posts? Shall I put the roof on before the hand rails as in brake vans? What material shall I use for the roof? Think of it from every angle and save yourself hours of needless work.

FIG. 20

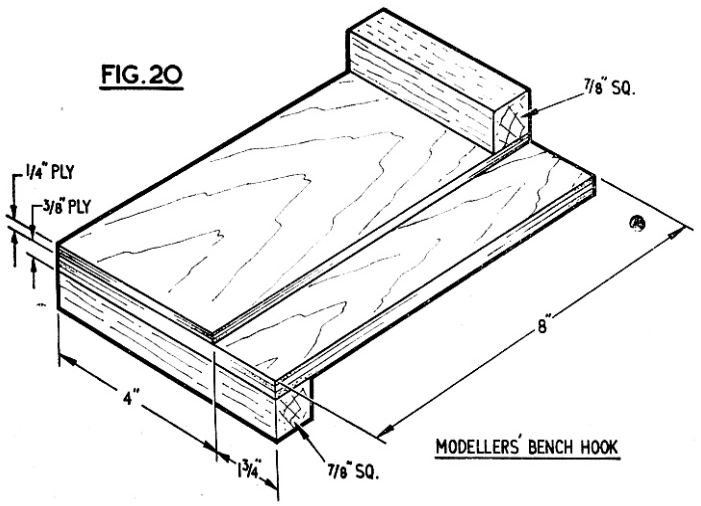
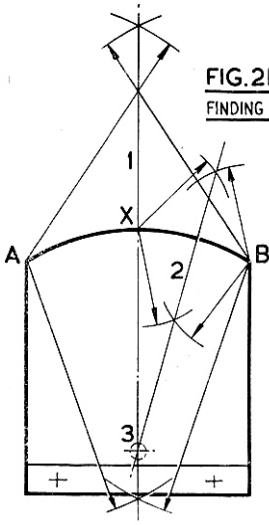


FIG. 21

FINDING ROOF RADIUS CENTRE



1. ERECT A VERTICAL CENTRE LINE BETWEEN A AND B
2. ERECT A NEW CENTRE LINE BETWEEN X AND B OR A.
3. THE POINT WHERE THE TWO LINES INTERSECT IS THE ROOF RADIUS CENTRE

STOCK IN 4 mm. SCALE

Now for the engagement period. My mind is made up and I want to get to know even more about my model before making a start. Although I have a drawing, I start by making a rough drawing of the "vital statistics," the height of the sides to the eaves, the length of the sides between the corner posts or pillars, the width of the ends between the corner posts. Rough sketches of the plan of the corner posts are drawn, showing how they could be built up. The sizes of the internal blocks are decided on, and all the sizes from all over the scale drawing are expressed in millimetres with the full size in brackets. The various materials proposed are noted on each part. Making my own drawings and sketches enables me to feel as if the model is part of my life. This is perhaps very true because it occupies the leisure moments in my mind.

I then lay my home-made drawing on one side for a few days, but in any spare minutes I am running it over it my mind. You say, "What spare minutes?". Well it takes me sixty minutes to travel by bus to and from work every day. Here are five hours a week put to good use, plus my lunch hours which I spend quietly (my mate is usually asleep). There is plenty of spare time if you make it. Spend less or even no time watching that "square box." If you do not, you will never be more than a "castles in the air" or armchair "modeller."

Not getting on with this van, am I? Well, the engagement is over and I am now married to my model, I have committed myself so a start is made. Wherever the van is boarded with vee joints, as the majority of pre-grouping ones were, my V planking tool or gauge is at the ready. I generally run the sides straight through from corner post to corner post and plant the doors on top if they are sliding ones.

If it is an inside-framed all flush van but with veed joints like the C.R. and L. & Y. refrigerator vans or the L. & Y. meat vans, I try to make the corner posts and door pillars in Plastikard, with each piece of side and door ply separately. I call this "marquetry fashion." The ends of the boarding on the L. & Y. flush vans were covered with a half-round moulding. The Plastikard framing used in these vans was a great help in fixing these mouldings. I will explain later. If a few vans are planned, check to see if the planks are of the same width. Time will be saved here if all the veeing can be done at the same time.

All my vans have two half-inch thick blocks of bone-dry wood as cores. Wherever possible I try to get Canary or old mahogany for the blocks. After deciding the method of construction and noting the thickness of ply to be used for the sides and ends, a check with my rough drawings will determine the exact plan size of these blocks. Great care is taken so that they are dead square. We cannot push these blocks in as we could

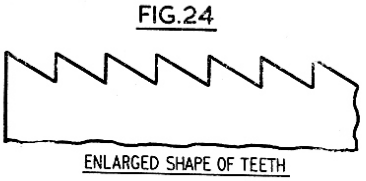


FIG. 24

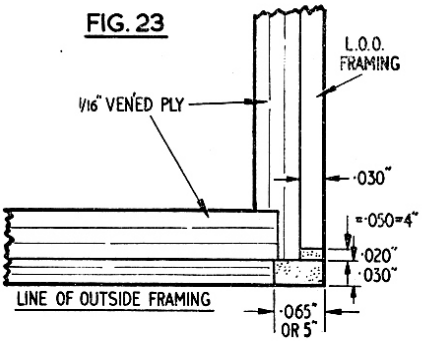


FIG. 23

in open wagons because the van is built up around the blocks. A great help in getting these blocks square is a bench hook. Sorry, I am afraid I forgot I am not talking to woodworkers. When I say "square" I mean that the end is at right angles to the side and that the sides and ends are at right angles to the bottom of the blocks. A bench hook for us modellers is one with a rebate in the right hand side, for right handed modellers (Fig. 20).

A little advice about a suitable plane for modelling will be a help, I feel, at this stage. The one I use is an adjustable-mouth block plane 6 in. long and made by "Record," No. 09½. A Stanley is just as good. You can hold this plane in one hand and take off the odd thou. with the help of its low-set iron.

Must have got sidetracked again, however back on the main line. The vee'd ply can be cut to size, whilst the van ends will also require the roof radius to be cut before gluing to the blocks. Maybe this is elementary drawing, but how I obtain the roof radius is shown in Fig. 21. This of course only applies where the roof has only one radius. The method is also the solution where a wagon has rounded ends as on an L.B.S.C. 10 ton wagon with a sheet rail or an L.N.W. loco coal wagon. There are other methods of obtaining it but I think this method is the simplest.

The sides can now be laid on the bottom block and the position very carefully marked. This, of course, for a van side that does not extend the length of the blocks. A good film of Seccotine is spread on all parts to be joined. Do not forget the steel rule under the bottom block and ends in order to give the bottom rail its correct "drop." The ends will of course have been reduced 1 mm. after veeing as our wagon ends were. This will also bring the plank lines right

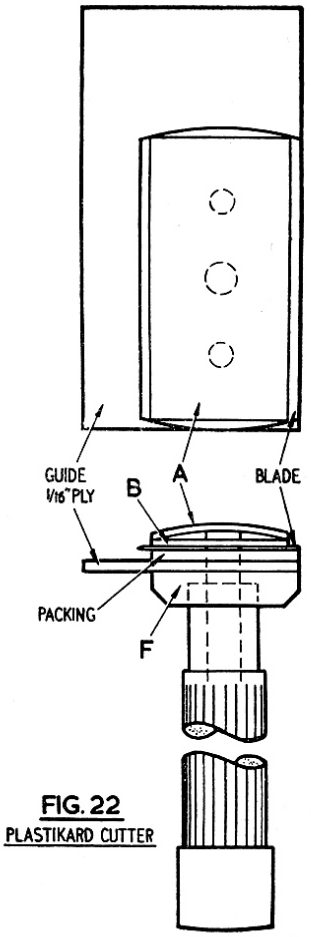


FIG. 22
PLASTIKARD CUTTER

all round the vehicle. The majority of van boards lines do go all the way round but a check with the drawing will be advisable because some do not. Also quite a lot are vertical-boarded.

After gluing the sides and ends to the bottom block, some short bits of 3/16 in. or ¼ in. square wood is glued in the corners to strengthen them and to stop the top block being pushed too far inside the van when gluing. Glue the top block in and a squeeze in the vice will ensure that all the surplus glue has been pressed out. I generally use 1/16 in. ply for van construction, but if one uses 1 mm. or 1/32 in. ply it would be advisable to introduce a ply stretcher in the middle across the van before dropping in the top block. Here again experience counts. My very first vans were four Maryport and Carlisle 10 ton outside-framed vans. I got the bodies glued up at home and then spent many a pleasant hour on the beach sunbathing and sticking the outside framing in place, and there is quite a lot of it. I was using a thickish paper for the framing. This framing job on the four vans went on for weeks—it was a lovely summer. About a month after finishing this outside framing, I noticed to my dismay that the sides had all sunk in. I had used 1 mm. ply, thin block, and no stretchers. I did manage to improve them, only to find when I started to fit the headstocks that the vans were 2 mm. too narrow. It was of course my mistake. Hence the drawings and sketches before a start is now made.

Ply of 1/16 in., apart from being stronger, fits in with a number of corner post

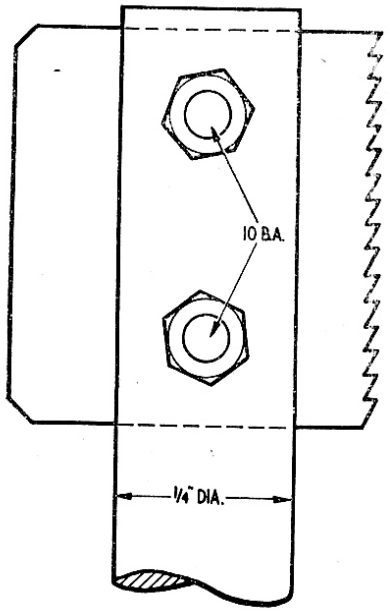


FIG. 25
LOUVRE GAUGE.
THE STOCK FOR THIS GAUGE TO BE AS FIG. 1

or pillars. One can easily remove a layer from the back to help in any corner post trouble. I find that the corner post is the most troublesome feature on a model of a van.

After the glue has set, the top block can be radiused by planing and then sanding down to the van ends. The headstocks, with the buffers already inserted, are next glued on and then the metal solebars can be fitted and soldered as for the open wagons. All the foregoing on vans has been general and could apply to almost any van. But for getting down to the finer details, I think I had better select a particular van.

Looking through all my hand built vans, I think the L. & Y. 10 ton fish van would be a good example. This van has everything, outside framing, end hood ventilators, sliding doors, torpedo ventilators, hand rails, vacuum cylinder, vacuum and steam pipes. Plus what attracted me most, the louvres inset in frames. They were a definite challenge.

Now first things first. After we have got the body glued up we must think about the outside framing. As it is all made of Plastikard, I had better explain how I cut it up to my requirements. You can obtain Plastikard in strip form of various widths but I find it more handy to be able to cut up my own.

The operation is done for me by an adapted Wardonia safety razor (Fig. 22). The only alteration to the original razor is that the convex side of *F* has been planed and filed flat. *B* is a piece of 22 gauge tinplate with the three holes drilled in. A little is filed off the edge cutting side of *A* only to give the blade more depth of cut. Also *B* is filed at the same time whilst both are screwed together. A little trial and error is required to determine what thickness of packing should be used. With my old blades, I find that 1/8 in. ply packing requires the addition of 0.018 in. aluminium packing in order to be able to cut strips of 0.065 in. (5 in.) Plastikard. The reason for the extra packing I put down to the spring of the blades. I do not worry about this because it is the result that counts.

It will now be realised just how easy it is to make framing of the correct size. On the drawing of my L. & Y. fish van the corner posts measure up to be out of 5 in. × 4 in. and the framing is 2½ in. thick. A glance at Fig. 23 will show you just how this size was obtained in 4 mm. with the aid of Plastikard.

As I intended making three of these vans at the same time it was easy, by using my adapted safety razor, to cut from a 0.030 in. sheet of Plastikard a few strips 0.065 in. wide. Then from a 0.020 in. sheet a few strips of 0.030 in. wide were cut. They were then cut to length and stuck in place. Once all is set, a rub with a piece of almost smooth glasspaper gives me my 5 in. × 4 in. corner posts. I will not go into the fixing or sticking of Plastikard as it is too well known to need it, But I will say this, Plastikard is by far the biggest leap forward in scratch-building materials that has ever been made in the modelling game. Needless to add I have no connections with Mr. Slater but regard George as one of my good friends. With all the corner posts fixed, attention can now be paid to the other framing sizes of the fish vans. The bottom rails are of 8 in. × 2½ in., diagonal bracings 6 in. × 2½ in., muntins (uprights) between the louvre frames 4 in. × 2½ in., and the van end pillars 4 in. × 2½ in. A few minutes with my "butchered" razor and a stock of all the sizes in 4 mm. scale were ready, with no marking each one separately.

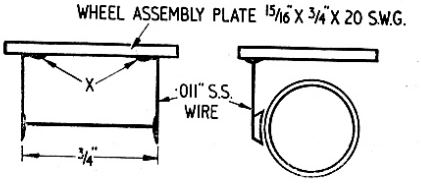


FIG. 26 VAN BRAKE TRUSS RODS

The bottom rails were first stuck on to the vee'd ply, then the middle rails, then the top rails, followed by the door pillars. These door pillars will necessitate removing a piece of the middle rail in order to fit them in. By the fixing of the middle rails before the door pillars we shall get a perfectly straight middle rail on each side of the door opening, and both sides will be at the same height. The diagonal bracing is a treat to fit, so easy with a sharp modelling knife plus a touch of the "magic fluid" and the bracing is fixed nice and clean. The sliding doors were next made. They also had the same treatment and were fixed to the van sides.

Louvres

We have now arrived at what I think was a milestone in my life. This was the putting into practice of something I had thought up after years of "weighing the job up" from every angle. Yes, making louvres; but louvres which looked right. I have talked and listened to all sorts of methods, even asked the trade to supply this long felt want, all to no avail. I had made some earlier vans having louvres made with layers of micro-strip glued on top of each other at an angle. They looked all right but what a sticky job and what a time it took. No, said I, any new method would have to be quick and must look just right. After exploring every aspect of the problem (which included trying to make use of the lathe), I turned my attention to saw blades.

On examining many types in the fine tooth range, I found that the "Eclipse" No. 45 back saw had the correct shape of tooth (Fig. 24). The piercing saw blades made by the same firm have the same shape of tooth, but they were no use to me because of their fineness. There are three blades to fit the backsaw, with 60, 44 or 32 teeth per inch. These different numbers of teeth per inch will give you different numbers of louvres per foot To use these blades here is where I brought into use that fourth adjustable metal gauge of which I spoke about very early in this article.

The ¼ in. dia. rod was slit down one end for about ¾ in. with the aid of the back saw. I then broke a ¾ in. piece from a 32 inch saw blade. This was done by gripping the ¾ in. wanted part in the vice and bending the other part to and fro till it broke. The ¾ in. piece was then pushed into the slot and a couple of holes drilled through the lot for fixing with 10 BA bolts and nuts (Fig. 25). Needless to say, no time was lost in trying this new tool out on a scrap piece of 1 mm. ply.

Of course it worked, and at last I had louvres in which I could easily see which was the top and which the bottom. By having the blade securely fixed and set in a gauge, I could concentrate on the louvres forming themselves under my eyes as I worked the gauge back and to. It did not take more that a few minutes to make about 2 feet × ¾ in. wide of louvre strip. This was enough for the three fish vans and four other vans which required louvres.

For the fish van, all this louvre strip needed was to be cut to length and width plus a Plastikard edging all round. They were made as in the railway shops, in a frame, ready for fixing in the van bodies. I do want to have a try at some G.W. Siphons now that the louvre headache has been beaten. In the same breath these saw blades will not give me the correct number of louvres in a Siphon. As my Siphons must be spot on I have an idea which I am sure will do this for me. I will pass it on when I have proved it.

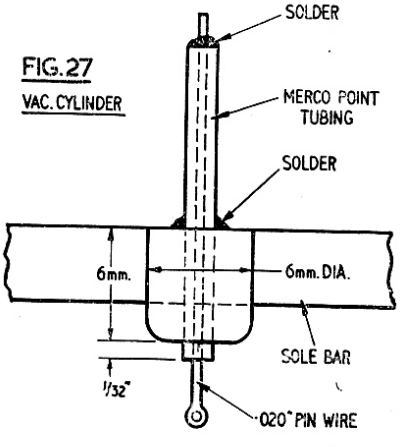


FIG. 27
VAC. CYLINDER

HOW TO BUILD FREIGHT VEHICLES IN 4 mm. SCALE

Now then back to our fish vans; the ends need finishing. The hood ventilators were made with a triangular piece of wood covered with the Plastikard. Also the end framing was cut to lengths and fixed.

On arriving at this semi-finished stage, I think it is advisable to mount the bodies on their wheel assemblies. The roof is always the last item to fix, so it is advisable to concentrate on getting all the brake gear soldered in place. By following the wagon details this should not be difficult. Of course a fitted van is different as regards the brake gear, but the chief difference is in the brake blocks, which are fitted to the truss rods in vans. I had to do a bit of fiddling with these truss rods. Mine are just rods with both blocks attached, plus the block hangers (Fig. 26). The coupling wire has to be free under the van, and this does not permit the full brake truss rods to be fitted. After all, the part which is missing is hidden by the wheels, so why worry ? The parts marked *X* on Fig. 26 are soldered to the tinplate of the wheel assemblies. Care must be taken that the blocks do not touch the wheels if you are working in two-rail.

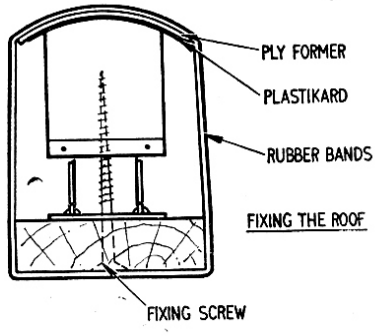
Vacuum cylinders

These I turned up in the lathe from a brass rod (Fig. 27). They were drilled right through, and a length of point control tubing soldered in place. The tubing enabled me to fix the cylinders to the underside of the van by the drilling of a tight hole for the tubing. A piece of 0.020 in. brass wire was soldered to the tubing to represent the cylinder brake pull rod. When these cylinders were painted they really did look the real thing.

In making items like these it is best if one gets the correct size from a vehicle rather than relying on a small scale drawing. One of my modelling friends is a railway shunter, so needless to say the correct size of anything on railway vehicles is easy for me to obtain.

All the brake gear fixed, I turned back to the bodies again and fitted and fixed the door track runners. They were made of " angle iron " complete with the fixing of 0.020 in. pin wire with a turn up at each end. The track was soldered to small brass nails which had been driven into the bottom rail of the van. Lengths of " angle iron " were made in the " shops " for the door stops complete with flying " nuts " imprinted. The various bits of strapping were fixed, also the gusset door plates, all out of my good friend the Stick-a-Sole tubing.

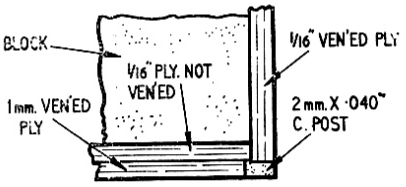
FIG.28



We are now ready for the roof, but in order not to damage any of the work already done, I first fasten the vehicle on to a short length of track which in turn is fixed to a base. The track and base must not be more than an inch longer than the van wheelbase. The reason is that we are going to use elastic rubber bands to hold the roof down, and a longer base will be in the way. The vehicle can be fixed to the track with a long thin wood screw through the base and into the van bottom. Now for the roof, the corners of which are so easily damaged. I have tried fixing the roof at various stages of construction but experience has taught me that it is best done last of all.

Before going on with the fixing of our roof you might benefit from my experiences of various roof materials. As I have said, the corners are the danger spots on any roof. It is for this reason that I would never look at shellacked card. I want my vehicles to run, not be nothing more than show pieces. I once did a couple of (correct sized) M. & C. vans with 0.022 in. brown plastic sheeting.

FIG.29



SECTION OF FLUSH BOARDED VAN FOR MODELLING PURPOSES

It made a lovely roof with really hard corners but was most difficult to stick down to the roof curvature. A few vans were done using 1 mm. ply; this was also difficult to stick down. It is also a bit heavy-looking for a roof. Then came the arrival of Plastikard. No time was lost in trying the material for a van roof. After making about eighteen vans roofed with Plastikard I can safely say that this is the stuff for your own roofs. There are of course a few points to watch, the first and foremost being that the surface of the van top must be absolutely clean and free from pin holes or bad joints at the sides and ends. All these (if there are any) must be filled in and sanded level. The smallest indent will show on the surface of the finished van roof if left.

In filling these small holes, I have tried various fillers and the one I find the best is a stick of hard shellac made some thirty years ago. This stick shellac, when melted, will adhere to almost anything and set rock hard in a few minutes. Once it has set it will not sink and is easily levelled off with glasspaper.

To make this filling, place a good handful of shellac flakes in an old piece of linen. Immerse the whole lot in a pan of boiling water. The flakes will become molten and on lifting out of the pan after a few minutes, allow the " goo " to cool until you can handle it. Then just roll it into a sausage, taking it out of the linen of course, and let it set hard. A match held to it will melt it like sealing wax.

Well, now, I trust our van top is nice and level and ready for its cover. A piece of Plastikard $\frac{1}{4}$ in. larger than is required is cut from a 0.020 in. sheet. Also a piece of 1 mm. ply about the same size. I keep this ply handy because I have bent and flexed it into a van roof shape. A few elastic rubber bands (all the same size) to hand and we are ready. Brush a liberal amount of the solvent on the van top and then very quickly brush the underside of the roof. Bring the two together, place the ply on top and hold in place with at least four rubber bands. Owing to the van's being fixed to the base the bands will not catch any of the bits and pieces underneath, that is of course if you have made the base wider than the van (Fig. 28).

Leave the job alone for a few hours, when the bands and ply can be removed. The surplus overhang can easily be removed giving you what I think is the finest of all van roofs. With this method you have little worry about the position of the roof, because of the generous overhang. If one has the misfortune to knock or break off a corner of the roof, it is easily stuck back again with a dab of the solvent. It becomes part of the roof again, and you cannot do that with card or ply.

It is also quite easy to fix the roof rain strips if one uses the Plastikard roof. I use 0.009 in. copper wire (a strand of 15 amp 3 core) for my rain strips. Where they must be curved I do it before fixing. A three inch diameter tin is handy here. With the rain strip cut to length and precurved it is only a matter of seconds to apply the solvent and it is fixed and permanent.

Four torpedo ventilators will complete our fish van roof. On looking around the model I think only the vacuum pipes remain to be mentioned. This headache was solved for me by Mr. Williams in the M.R.N. for November 1957. A 14 BA die is wanted for this job. A few shillings spent on that item are well spent, because it enables one to get excellent-looking vacuum pipes, not an oversized piece of naval hose about six inches in diameter as some look. The die is available for a lifetime of other jobs as well. I used 0.036 in. brass pin wire for mine, which gave me a $2\frac{1}{4}$ in. pipe unpainted. I do not intend to go into the full description as this is done very well by Mr. Williams. That completes our fish van, apart from the painting, which I intend to cover at the end of this article. Now we have tackled a difficult model, but to my eye a most pleasing one, as as a younger person would say " easy on the eye."

To be continued