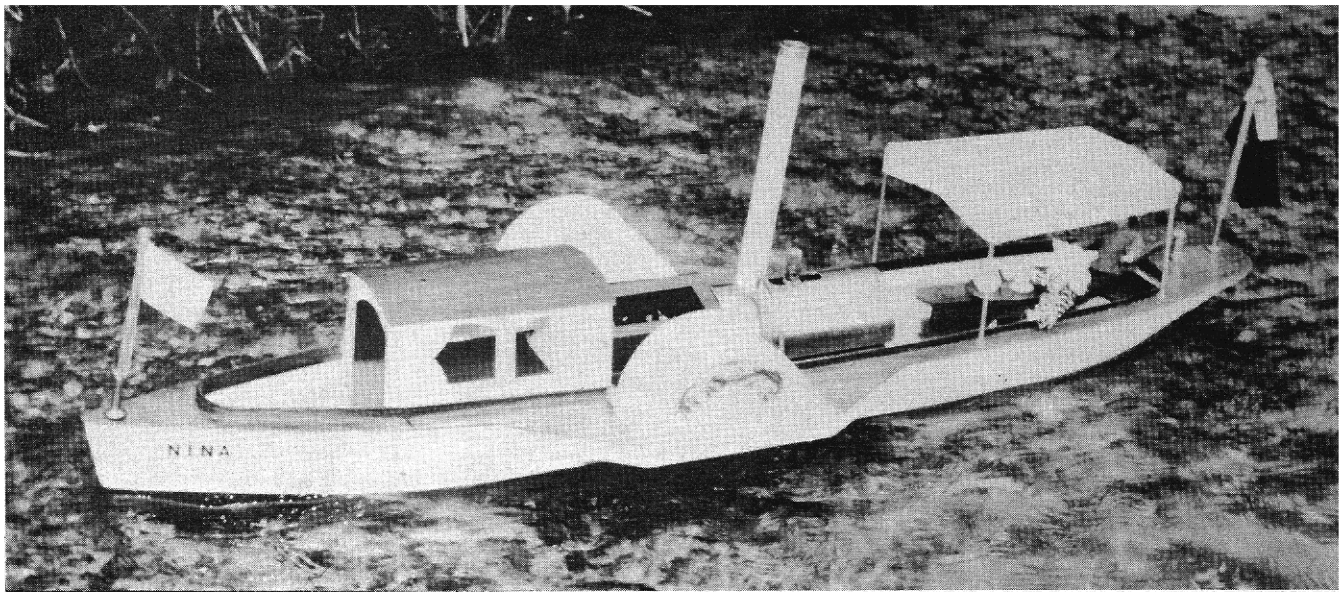


Our Summer Free Plan

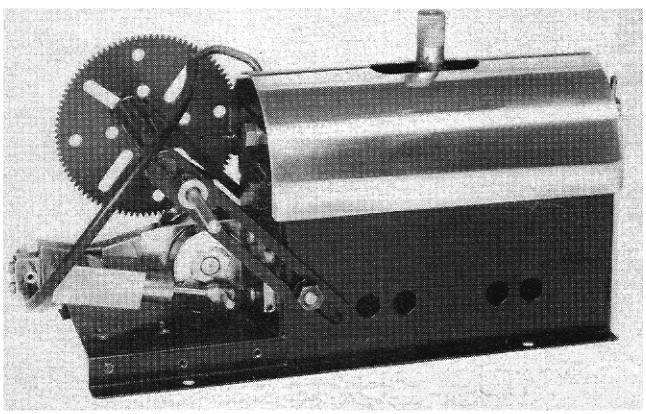
Nina

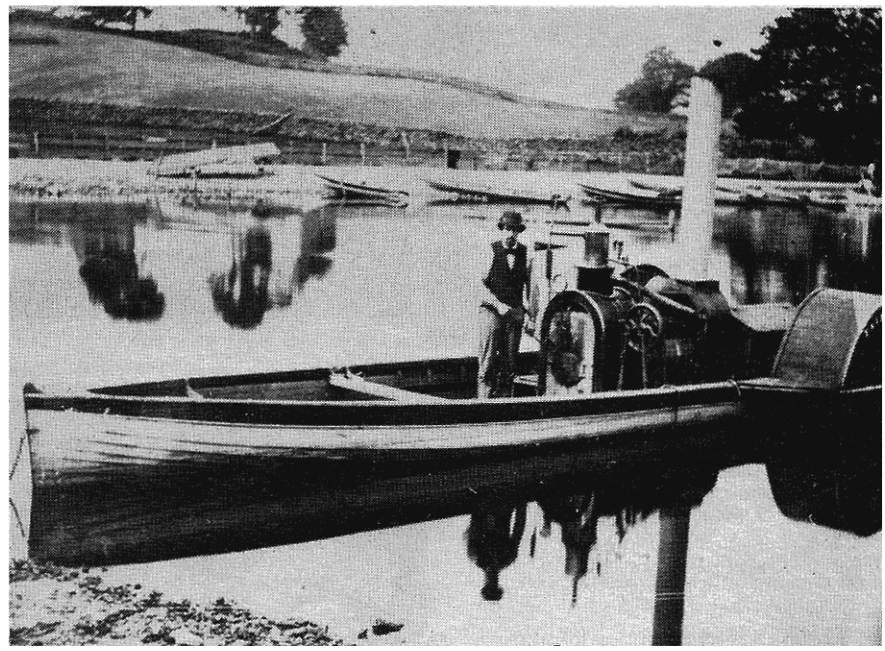
A steam driven Paddle Launch by the designer of Mabel, Basil Harley

I HAVE designed *Nina* as a simple steam driven model paddle launch 'in the spirit of' those open-engined vessels which sailed our lakes and rivers in Edwardian and Victorian days. She is very suitable for beginners and all sorts of modifications can be made to the basic plan to suit individual tastes. She is not a scale model of any particular vessel because none is known to survive. The photograph, from the archives of the Windermere Nautical Trust, shows the open, tiller-steered paddle steamer *Fairy Queen* built on Windermere as early as about 1850 by Charles Fildes which has served as my inspiration.

An outstanding feature of some of Fildes' boats was that the engines and boilers could be removed for use on his garden railway in the wintertime! These lakeland

Power Nina with the USE steam plant — obtainable by completing this coupon.





An extremely rare photograph of one of the Windermere open paddle launches probably taken about 1900. The Fairy Queen was built around 1850 by Charles Fildes. Photograph by courtesy of the Windermere Nautical Trust.

steamers were very much family possessions in the same way that our miniature versions can be today — cabin furnishings and period costumes for the passengers and crew, for example, can very well benefit from the feminine touch. It can become a sort of steam driven floating dolls' house.

Nina has an awning over the passenger well at the stern because I think it adds to her appearance, together with a small cabin for'ard for the same reason and also to provide somewhere to hide and protect the radio control for the rudder. Whilst this adds to the pleasure of sailing her she is fully successful as a free-running boat.

Paddle steamer models would, I'm sure, be more popular if it was not necessary to make the paddles since these do not seem to be available commercially as are propellers. So I have simplified *Nina's* paddles to the limit and as a result they are easy to make without a lathe (and even easier with one), effective on the water and really not too bad to look at. When they are running, of course, you can't see much anyway.

The power plant I have used was described in detail in last month's *Traditional Steam Engines* column. The Unit Steam Engine and boiler fits easily into the hull without any modification. A spigot, either a piece of brass tube or a flat piece of brass bent up as I used for *Mabel (Model Boats* Dec. 1979), will need to be screwed to the copper boiler casing to hold the funnel which in my case was rolled up from a bit of tinplate or it can be made from an aluminium cigar tube. The 'Meccano' steam engine, made by Mamod 80 Ltd and now sold under their catalogue number SP3 is also a suitable power unit but a belt drive will have to be devised to turn the paddle shaft (a design by Geoffrey Deason appeared in *Model Boats* for May 1977).

The hull is a simple box made from three pieces of balsa wood. It is flat-bottomed and will sit on a table with the paddles and rudder clear of the top. Again, it is very similar to *Mabel* with the additions of the paddle boxes and the sponsons — extensions to the hull and deck sides to protect the paddle wheels and stop water being thrown into the boat. As in the previous design I have made the engine/boiler unit to be easily lifted out for filling and servicing (thought hardly for use on a railway). This has meant that the paddle boxes have also had to be made removable as a pair, with the 'engine room' skylight holding them together.

The only items specially purchased (apart from the engine and the radio control) were a 3ft length of hard balsa 4in × ¼in for the bottom, a similar piece 3in wide for the bulkheads, two ⅛in thick × 3in wide lengths of *medium* hard balsa for the hull sides and a 24in × 8in sheet of 1/16 in ply for decking. These, with necessary paints, stains; varnish and glues came to about £10.00. Brass sheet for rudder, ⅛in ply for paddles and a bit of lead for ballast and other minor items were found in the scrap box.

Flags and staffs are very much part of such lake steamers and one of the attractions of the Windermere boats is the quantity of brass and copper which brightens the varnished woodwork. For those who possess even the smallest lathe there is scope for making lots of appropriate fittings — flagstaff sockets, bollards, cable cleats or a polished brass rim for the funnel etc., whereas if you have to purchase them there are many suitable fittings commercially available with which to embellish your boat.

Here then are some notes on building her.

Stage 1

Cut the bulkheads squarely from ¼in thick balsa and make the stempiece from ⅛in plywood to give strength in the event of a collision. Cut the bottom to shape and half cut a narrow V aft of bulkhead C so that the stern can be raised about 1½in without actually breaking the wood. Glue the bulkheads squarely across the bottom. I used Borden's Carpenters' Wood Glue throughout.

Stage 2

The sides are 3in wide *medium hard* balsa. Cut the front ends to the same shape as the stempiece and with the *tops* level with the tops of the bulkheads A, B and C and the forward ends equally in line, glue and leave to dry. It will now look like Photo 1 but bulkhead A had not been positioned when this was taken.

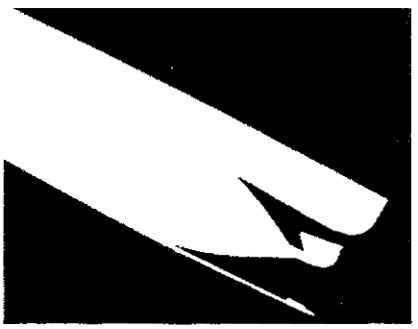
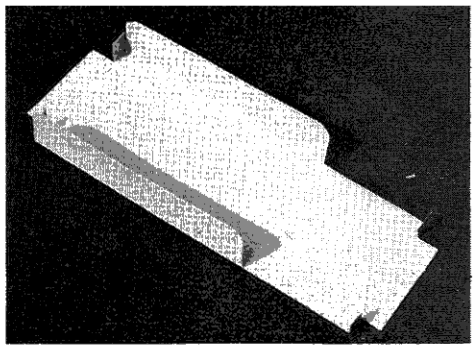


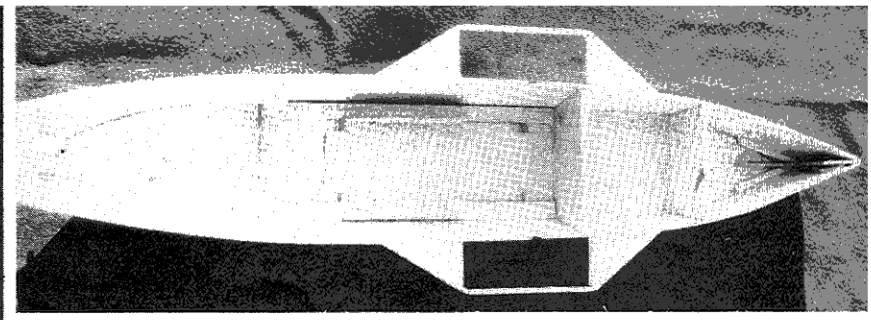
Photo 1, two sides and bulkhead B. Bulkhead A to be fitted before chamfering front edges and glueing.

Stage 3

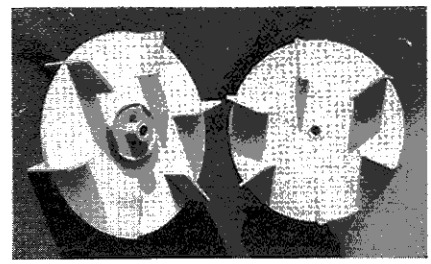
Carefully bend and glue the sides to the stempiece using sticky tape to hold them until the glue sets. Then curve the stern, rasping or sanding the bottom to fit and adding bulkhead D to form the shape. If necessary, damp the sides since the curvature is quite severe. I found this technique for producing a nicely rounded and smooth line aft practical enough but admittedly it is easier to do it in straight lines as I showed for *Mabel*. The secret is patience, lots of glue and lots of sticky tape. Photo 2 shows progress. Lastly, glue on a balsa block behind D and when dry cut, rasp and sand the complete hull to an easy line.

Photo 2. side pieces curved round stern, glued and held with sticky tape to be trimmed when glue is dry.





Left: photo 3, tinplate engine support and location tray. Above: photo 4, hull and sponsons taking shape, engine tray in place. Below: photo 5 paddle wheels - ply and Meccano pulleys.



Stage 4

Glue two lengths of ¼in thick balsa between B and C so that the engine base fits between them with about 1/16in to spare. Add a block of balsa to hold a ⅛in or thereabouts brass tube for the rudder and epoxy it in. Now give two or three coats of sanding sealer inside and out and sandpaper all down to a smooth finish.

Stage 5

Make up a tray for the engine to sit in with guards to stop any flames licking out in high winds and setting fire to the hull. I made mine from a one gallon cooking oil tin and epoxied it to the hull to provide both location and a solid base for the power plant. Give it a coat of paint (underneath as well) before fixing. Photo 3.

Stage 6

Cut the sponson triangles from ¼in thick balsa and glue in position. They should be flush with the top of the hull and really only act as jigs — not much strength lies in them. Then add the ½in × ⅛in hardwood strips as shown. The hull sides take on a curve at this point but the outside strips, edging the paddle boxes, must be parallel and 9¼in across fore and aft. Do this by measurement since the eye is easily deceived and the paddles and their boxes must be square and have adequate clearance. Put more sanding sealer on the new wood. Photo 4.

Stage 7

Each paddle wheel consists of a 3½in diameter disc of ⅛in ply (my first experimental wheels were made of hardboard). These can be cut out with a fretsaw and sanded as accurately round as possible. Six slots are marked out in the time honoured way by stepping round the circumference with the compasses still set to the radius. These slots are then cut squarely with a tenon saw to accept the actual paddles which are each of 1/16in ply 1¼in wide × ¾in deep. The centre holes are drilled 5/32in for a standard Meccano shaft and the paddle discs epoxied to Meccano pulleys of about 1in diameter. With patience a very satisfactory pair of paddles can be made entirely by hand. If a lathe is available it will be easier to turn the discs, and brass centres can be made instead of using Meccano pulleys. Also, if a slitting saw is available it makes cutting the slots easier and with greater accuracy. With such facilities, too, more realistic wheels can be made and George Baker's design for wheels for the tug *Forceful (Model Boats,* March 1980) could be adapted though they are of rather higher standard than is appropriate for a simplified boat like *Nina.* But if any type of wooden wheels are made a couple of coats of sealer followed by undercoat and gloss paint finish will make all waterproof. Photo 5 shows the finished wheels.

Stage 8

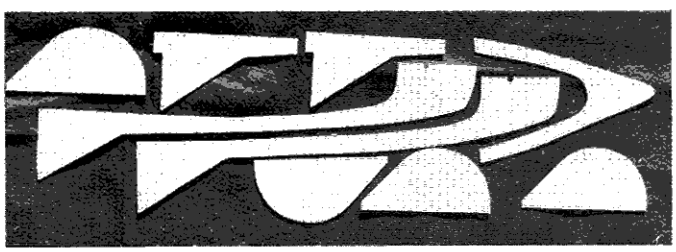
The decking is made from 1/16in birch ply. It can be cut in two pieces from a large sheet but this would be rather wasteful. One way of dividing it up is shown in Photo 6 and in this way the deck (as well as the four paddle box sides) can be cut from a sheet 24in by 8in. Cut all decks slightly oversize for subsequent finishing — about 3/32in beyond the hull all round — and do measure from the actual hull since individual variations from the drawings are inevitable. Glueing the decks down will materially strengthen the hull, particularly the rather vulnerable sponsons.

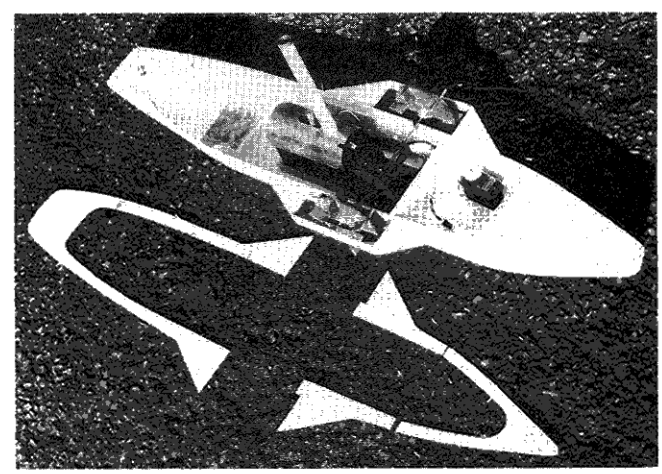
The coaming I made from Conti-strip veneer. This is about ¾in wide and capable of being bent round 2in diameter curves without breaking. Carefully cut a strip in two halves — ⅜in wide — and glue them back to back. Before it has hardened, curve the length to fit inside the edges of the decks, leaving about ¼in showing above. This will give a nice finish with the mahogany showing both inside and out.

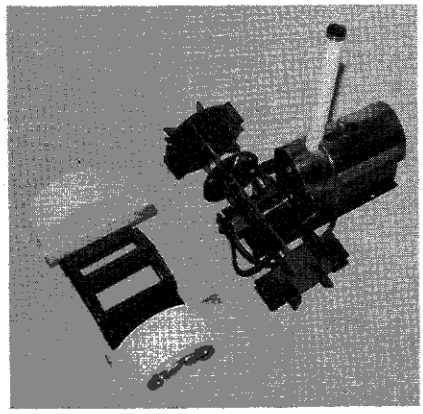
Stage 9

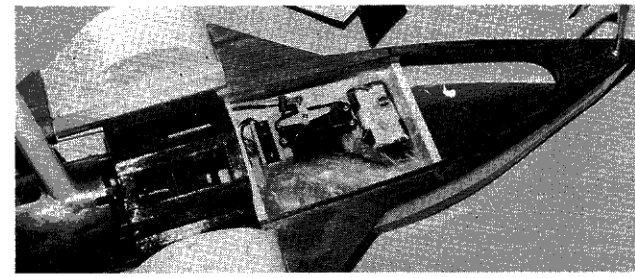
Now the paddles can be fitted to the engine shaft and clearance slots cut in the sides of the hull to allow it to rotate freely. There is some scope for adjustment of the paddle shaft height and the centre of this should be fixed at 2in above the engine base.

Below: photo 6, suggested layout for economical cutting of deck and paddle box ply. Right: photo 7, engine and boiler in place, decking ready for glueing. Radio control servo in cabin space.









Left: photo 8, paddle boxes and engine room skylight assembly. Right photo 9, radio control equipment installed; note polythene bags for waterproofing.

For a boat of this size I don't think it is necessary or desirable to attempt to fit outer bearings since it would only add friction and make the easy removal of the complete engine much more difficult.

A float test in the bath is now appropriate. Fill the boiler with water to the right level and add ballast for trim etc. at the prow and behind bulkhead C. The paddles should be about ¾ in below water level (i.e. the blades themselves just covered) and about 1 lb of ballast will be needed. *Nina* will repay some care at this stage and a steam test will be an advantage before the final trim and ballasting is determined.

If radio control is to be fitted then a Bowden cable should now be cemented between the coaming and the hull side from the servo position in the cabin to the rudder post, going under the paddle shaft. Photo 7 shows where the servo can sit.

Stage 10

The paddle box sides are made from 1/16 in ply. Spacers from ⅛ in balsa or hardboard are glued inside to separate them so that they can drop easily into the spaces between the sponsons. I made the curved tops from card (two thicknesses glued on top of one another) well painted inside and out. They seem to serve very well indeed but tinplate would be even better. Two ½ in × ¼ in strips of hardwood are glued to the inside ¼ in above the bottom edges so as to rest on the top of the hull sides. To maintain correct separation I drilled two holes 3 in apart in these wooden strips and used two lengths of iron wire from cleaners' coat hangers as spacers.

An engine room skylight (unglazed) made from tinplate strips cut from a fruit tin can then be soldered (or epoxied) on to the tops of the two spacers. The skylight needs only one 'end' since the other fits up against the cabin. This skylight leaves the engine visible when running but hides the rather obtrusive 2½ in gear wheel on the paddle shaft. Photo 8 shows the paddle box and skylight assembly.

Stage 11

The for'ard cabin accommodates the radio and is removable (Photo 9). It fits between the coaming and rests on bulkheads A and B. The ends are of ¼ in balsa as are the bulkheads; the sides are from ⅛ in balsa and the roof I made from card, well painted, and then veneered with more strips of mahogany Conti-strip edging. A pair of false 'doors' made from 1/16 in ply and also veneered are glued to the front panel to help to disguise the 'join' and provide a location for the cabin up against bulkhead A. The windows are 'glazed' with clear plastic sheet.

Sheet 12

I finished the boat by giving the hull two coats of undercoat and two of gloss finish Humbrol paint — white inside and out above the waterline, green below, with mahogany stained decks. I used a hot fuel proofer as varnish. The paddle wheels are red and the engine room skylight green. The decorative trims on the paddle boxes are plastic mouldings sold to embellish whitewood furniture and given a gold paint finish. Lots of designs are available and if you like you can put a pair near the prow and have the name on the paddle boxes. The *Fairy Queen* had her name there with a decorative star underneath.

Stage 13

This stage can be as simple or as complex as you care to make it. An awning frame can be made from coathanger wire soldered and covered with striped cotton, dropped into holes in the after deck. Flooring and seats can be added for realism. Plastic figures, a tea set (all from 'Caroline's Home') are about the right scale and can be dressed up in period costume to add atmosphere. The helmsman has had to have some unpleasant surgery to make him easily movable with the radio controlled rudder — most realistic.

Lastly you will see that I have suggested, for instance, that the paddle boxes be made from ply and card, the cabin roof veneered with Conti-strip, and the engine room skylight made from soldered or epoxied tinplate. I have done this to indicate something of the range of techniques which can be used to build a boat of this nature. As a further example of flexibility, the whole hull can be made of soldered tinplate if you have the skills and certainly the paddle boxes would be satisfactory in this material; on the other hand if you are not a metalworker the engine room skylight won't get set on fire if it is made of plywood. So pick the techniques you are happiest with and get started. *Nina* will grow on you and on your family as she progresses and will get a lot of admiration when she is under steam in her natural element.