how to build a speedy skimmer

SKIMMERS are minimum-cost hydroplanes—the sort you can knock up in an hour's work from a shillings-worth of balsa and a spare plastic propeller off an old model aeroplane. Power is a 6 in. to 8 in. rubber band—two, three or more bands if you want more speed. The design is so straightforward you can easily try out modifications to see if you can improve the performance. Cut the sponsons off, for example, and fit another pair of a different size or shape. Vary the size and position of the skegs to improve steering at speed. Better still, make several models with variations on the basic design and try them out against each other.

The basic model is assembled around a *hull plate*, which is simply an 8 in. long panel cut from 3 in. by $\frac{1}{4}$ in. balsa sheet. Use very light sheet for this, as the lighter you can keep the model the better it will perform.

Cut a notch in the centre at one end of the plate and into this cement an upright of 1 in. by $\frac{3}{16}$ in. *hard* balsa. Dimensions for this are given on the plan so that you can cut the top at the correct angle. These dimensions are for a 5 in. diameter propeller. If you want to use a larger propeller, add an extra $\frac{1}{2}$ in. to each dimension for each extra inch of propeller diameter—e.g. for a 6 in. diameter propeller, the dimensions should be $2\frac{7}{8}$in. and $3\frac{1}{8}$ in.

Now cut two bearing plates from thin brass strip. These should be $\frac{3}{16}$ in. wide by about $1\frac{1}{4}$ in. long. Pierce or drill each strip with a hole near the top to take the propeller shaft, and another hole a little more than half way down. Assemble the strips on the 1 in. by $\frac{3}{16}$ in. upright as shown, using the pin. Then bind securely in place and coat the binding with cement. Then fit the propeller shaft carrying the plastic propeller. This can be bent from 20 or 18 gauge wire. Bend the tops of the bearing strips at a slight angle and use a cup washer on the shaft behind the prop. Check that the propeller shaft spins freely in the assembled bearing.

A front hook is required, also bent from wire to the shape shown. This is fitted to the front of the hull plate, passing one end up through the plate and then turning the wire over to lock it in place. A coat of cement over the wire will also help to hold it in position to the bottom of the plate.

The sponsons are shaped from very light block balsa 1 in. wide. Start with the standard shape shown, which is 4 in. long and thus cut from 4 in. by 1 in. by $\frac{3}{4}$ in. block. Simply cement these sponsons directly to the bottom of the hull plate. Then add the skegs, cut from $\frac{1}{16}$ in. sheet balsa, also cemented directly to the bottom of the hull plate at the other end.

To improve the appearance of the model you can then cut and fit a fairing strip, as shown; round off the top edges of the hull plate with sandpaper.

Your model should be waterproofed, and the easiest way of doing this is to give it three or four coats of clear dope, allowing time for each coat to dry and sanding lightly before adding the next coat. Alternatively, if you want a really smart appearance, cover the whole model with 'Monokote'. This is an expensive material (costing 25s. per sheet), but you only need a small amount and many retailers will sell you 'Monokote' offcuts, or small pieces cut from a full size sheet. The advantage of 'Monokote' is that you get a waterproof and glossy finish in colour, just by covering.

Experiment with different sizes of motor until you find the right size to give a snappy planing performance, but not too short a motor run. Much will depend on the size of pond you are going to operate on, but your skimmer can come to no harm if it runs out of power in the middle. You will just have to wait until it drifts in.

Here are some tips on performance :

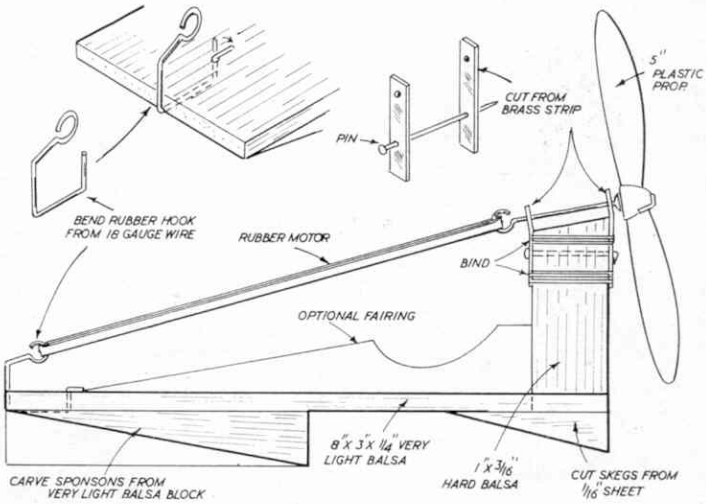
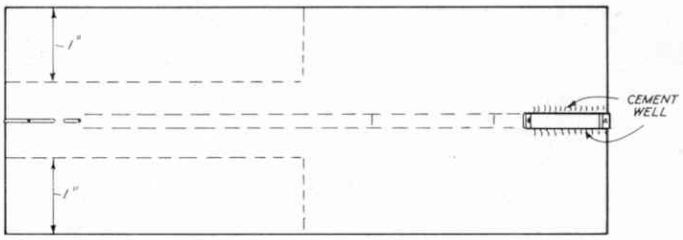
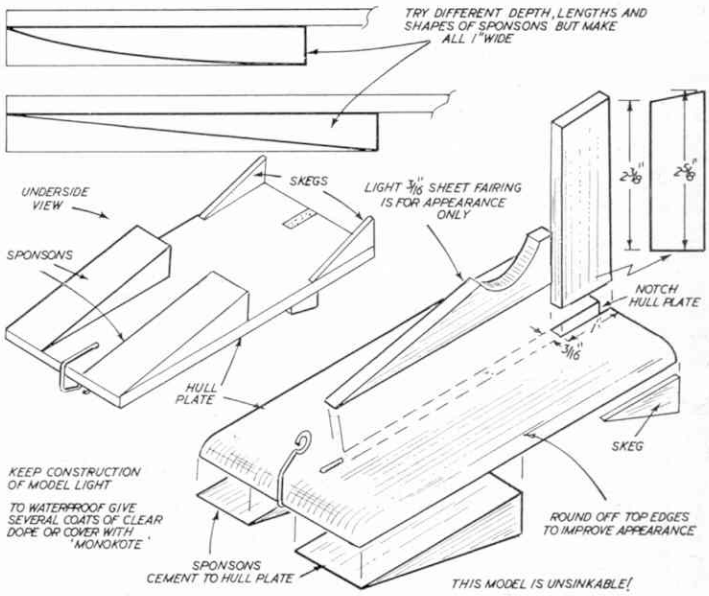
(i) For more speed, simply increase the power of the rubber motor—i.e. add another band or increase the number of strands if the motor is made up from rubber strip.

(ii) For a longer motor run increase the *length* of the rubber motor.

(iii) Use a winder to wind the motor, detaching from the front hook to fit onto the winder hook. Lubricate the rubber with castor oil and stretch the motor out to about three times its normal length as you wind it up. This will enable you to put on more turns.

(iv) For a further improvement in performance, try polishing the hull with wax polish.

(v) Try different propellers. Those with wide blades will usually produce more thrust and speed, but may need a more powerful motor.

(vi) Try larger propellers, but 6 in. diameter is about a safe maximum with this size of model. Anything bigger and you may find the skimmer will tend to roll over.

Finally, since you are using an aeroplane propeller, remember to *wind the rubber motor up the opposite way to normal.* If you don't, the model will try to travel backwards!