Another means of communication, to individuals directly, of course, is via the printed word in newspapers, books, and magazines. All these have to be printed by special machines. In Britain, William Caxton set up his press near Westminster Abbey in 1476. The first improved machine for speed and cheapness was that invented by Konig in 1811. In this particular machine the paper was applied to the forme by means of a revolving cylinder which held the paper in its passage across the type. This introduction of the impression cylinder proved a much quicker way of printing. Since that time there has been a stream of inventions and developments of new processes and machining for better and faster printing.

More than 1,000 patents were granted to Thomas A. Edison, a well-known American inventor, (1847–1931). He not only brought out a number of improvements in telegraphy but invented the electric or incandescent lamp, the phonograph, the kinetoscope (or forerunner of cinematography) besides one of the first electric locomotives. The first typewriter to be put to practical use was invented by Charles Thurber in 1843. It was followed by that of A. E. Beach in 1856 for printing embossed letters for the blind. Later, Sholes produced a machine which was embodied in the American Remington of 1874. Many other types of machine followed. During 1827, John Walker, a chemist of Stockton-on-Tees sold what he called 'Friction matches', about the development of which there is an article in this magazine.

Inventions and discoveries, both big and small, are now in great demand. Space projects and electronics have produced their share. Not long ago, as an example, the Americans were seeking a material harder than steel. A British inventor discovered how to make this and it was soon sold.

Perhaps the most famous scientist of early times was Leonardo Da Vinci of Italy (1452–1519) who discovered the laws of optics, gravitation, friction, heat, and light, and foresaw invention of the helicopter and the parachute. Certain writers have also added to scientific knowledge. Jules Verne of France, wrote "Five Weeks in a Balloon", "Twenty Thousand Leagues under the Sea", "Around the World in 80 Days", also "From the Earth to the Moon". (1870–1873) H. G. Wells, a British writer wrote: "The Time Machine", "The War of the Worlds", "The First Men in the Moon", and certain short stories. Both these authors showed remarkable foresight and undoubtedly caused scientists to think about the possibilities of their ideas.

As readers will readily appreciate—*MECCANO* means: "A SET OF MINIATURE PARTS FROM WHICH ENGINEERING *MODELS* CAN BE CONSTRUCTED". (Concise Oxford Dictionary). All kinds of Models have been constructed, including Fair-ground Engine, Eiffel Tower, Optical Telescope, etc. Usually, inventions or discoveries come from those interested in certain trades or professions, or subjects as Chemistry, Physics, General Science, and Electronics etc. Another important point about this work is that a *drawing* of a *MODEL* is essential, showing all parts in proper perspective as Plan, End Elevation, Side Elevation etc. Books on this subject covering Machine Drawing, and Workshop Drawing are available from various publishers.

A Working Model Rowing Boat

A simple electric-powered rowing skiff which draws a crowd wherever it appears.

By Philip Connolly

This full-size plan originally appeared ten years ago in 'Model Maker' and we have had many requests to reprint it.

PERHAPS one of the most amusing model boats to watch on the water is a working rowing boat. This little 10 in. model will run off $1\frac{1}{2}$ v. and with 3 v. battery the man really does work hard.

The motor used is a Kako 01 bolted to the front seat with two cells from a Bijou battery under the rear seat. These can be disguised by covering them with boxes and the people in the boat. The motor draws a current of under $\frac{1}{2}$ amp and this should give quite a long running time. Miniature accumulators such as Deacs could be used if they are available, and would give a still longer run.

As the heart of the boat is the motor and gearbox, the construction of this will be described first. The gears needed are a 40 : 1 worm and pinion set, a 10 tooth and a 30 tooth pinion. These are all nylon gears made by Ripmax. The worm gear can be fixed to the motor shaft by tinning the shaft with solder, and pushing the gear on while the shaft is still hot. Alternatively epoxy resin or any impact glue could be used. Cut out the two halves of the gearbox and drill the holes in the motor baseplate 8 B.A. clearance size. The centres for the $\frac{3}{32}$ in. holes are shown with crosses. These should be drilled as accurately as possible to prevent the gears from binding. Bend both parts of the gearbox along the dotted lines to give the shapes shown in the sketches. Fit the gears on $\frac{3}{32}$ in. brass shafting into the gearbox. Solder or bolt the two parts of the gearbox together making sure that when the motor is held on the baseplate the worm gear engages the pinion. This is not very critical as the baseplate can be bent or the motor packed up with washers to obtain the best alignment.

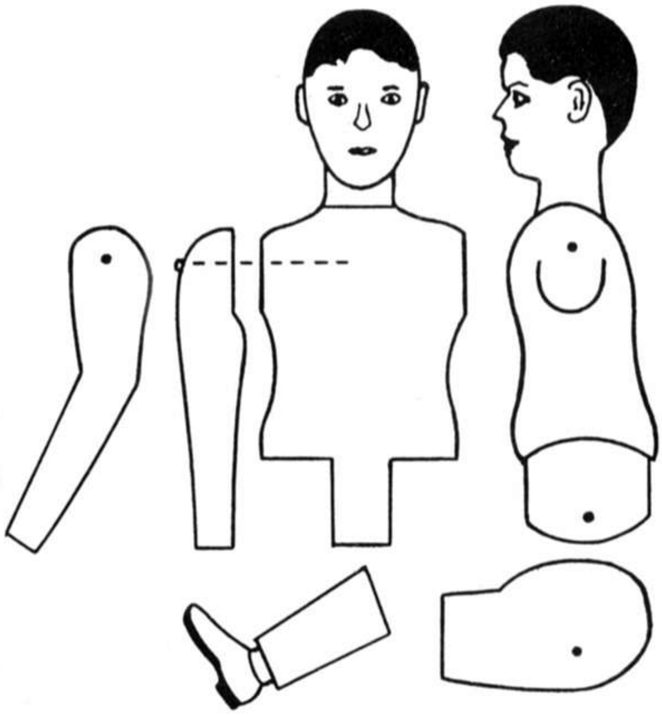
The shaft with the 30 tooth gear has cranks soldered on either side of the gearbox. These are made from tinplate and 8 B.A. bolts.

Hull Construction

The model is built almost completely from $\frac{1}{16}$ in. balsa. Cut out the keel, deck pieces and bulkheads and glue them together inverted on a building board. B1 and B4 should be packed up $\frac{3}{32}$ in. and B2 and B3 $\frac{3}{16}$ in. above the board. This is to give the correct sheer. As the bulkheads have to be cut away almost completely, it helps to cut along most of the dotted line shown on each bulkhead before assembly. Glue the keel support in at the bow and cut out the two bottom skins. Fit these on together using a rubber band over them at the bow as well as pins to hold them in place. When thoroughly dry remove the model from the board, and cut out two side skins. These are almost as shown on the side view of the boat. They may be given a curve by steaming, or, if the wood is soft, by rolling a piece of $\frac{1}{2}$ in.–1 in. dowel over one side of them. Fit the side skins and sand the hull down gently. It should now be tissue covered with lightweight Modelspan, doping this on with aircraft dope. Now remove the centres of the bulkheads.

Bolt the motor and gearbox to the front seat, which is best made from $\frac{3}{32}$ in. balsa as this is slightly more rigid. The rear seat and footrest can be made from $\frac{1}{16}$ in. balsa. Paint the inside of the boat and glue two seats into the hull together with the gearbox and motor.

The oars are made from $\frac{1}{8}$ in. dowel with $\frac{1}{32}$ in. ply blades. The size of the blades could possibly be increased, if the gearbox is well made, and this would increase performance considerably. The rowlocks are shown in the sketch. Two pieces of $\frac{1}{8}$ in. sq. hardwood or $\frac{1}{8}$ in. dowel are needed for each rowlock. Drill a $\frac{1}{32}$ in. hole in each piece to take the T-shaped bearer. A $\frac{1}{32}$ in. hole also has to be drilled in each oar in the same plane as the blades. The position of this hole is shown approximately on the plan, but its exact position should be marked from the particular model. The screw eyes on the end of each oar slide over the two 8 B.A. bolts, and the hole for the T-piece should be positioned such that the screw eye neither slides off the bolt or binds against the other end. The T-shaped bearers can be made from $\frac{1}{32}$ in. brass or steel split pins. Push the pins through the holes in the oars, separate the ends and bend them as shown on the plan. An alternative method is to use a dressmaking pin, and solder a second pin to it to form the T-shape. The head of the pin is again used to stop the oar coming off. The $\frac{1}{8}$ in. sq. rowlocks fit into two holes cut in the deckpiece.

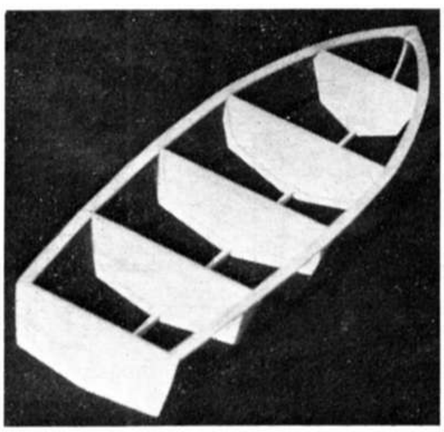


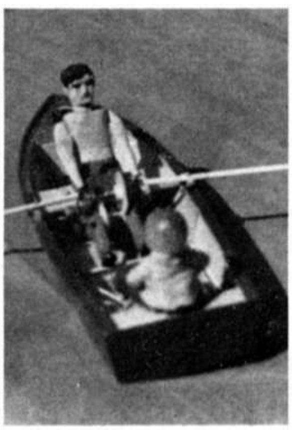
Figures

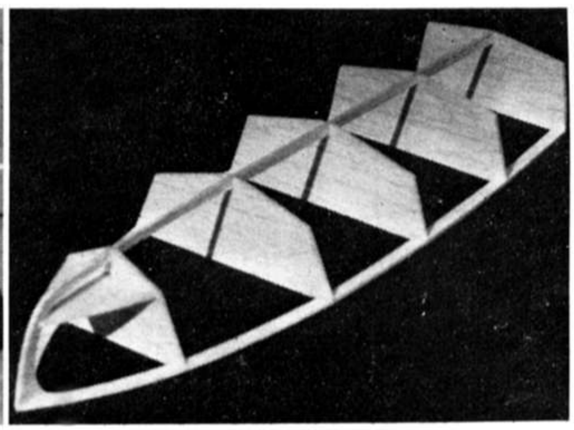
The approximate shape of the oarsman is shown in the diagram. Carve the head on the end of a block of balsa $\frac{3}{4}$ in. sq., being careful not to make it too small. The body is also carved from block balsa and hinges at the thighs. Glue the thighs to the front seat, making sure that the body is free to pivot about the pin. The feet are glued to the $\frac{1}{16}$ in. balsa footrest and rest against the edge of the gearbox. The arms pivot at the shoulders, again using pins, and are loosely tied to the ends of the oars with thread. Paint the figure, making sure no paint is allowed to stick the joints. The girl in the back seat was made from a little doll, but she could be made in the same way as the oarsman. Her legs and dress cover the batteries under the rear seat.

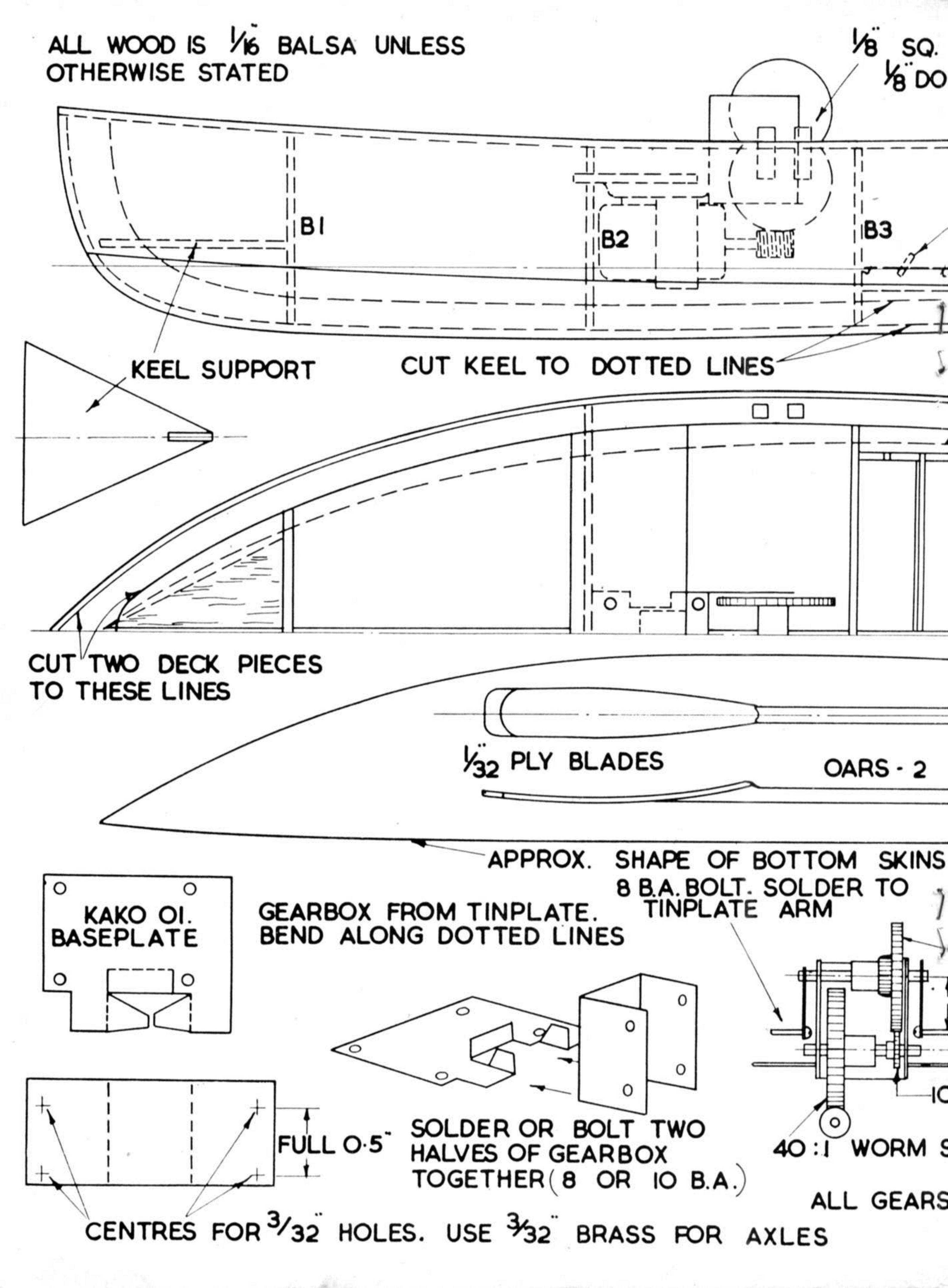
A box under the forward seat hides the front of the electric motor. The switch consists of a pin on one of the motor leads. This is pushed between the cardboard case of the battery and the battery itself to make contact, the other wiring all being soldered in place.

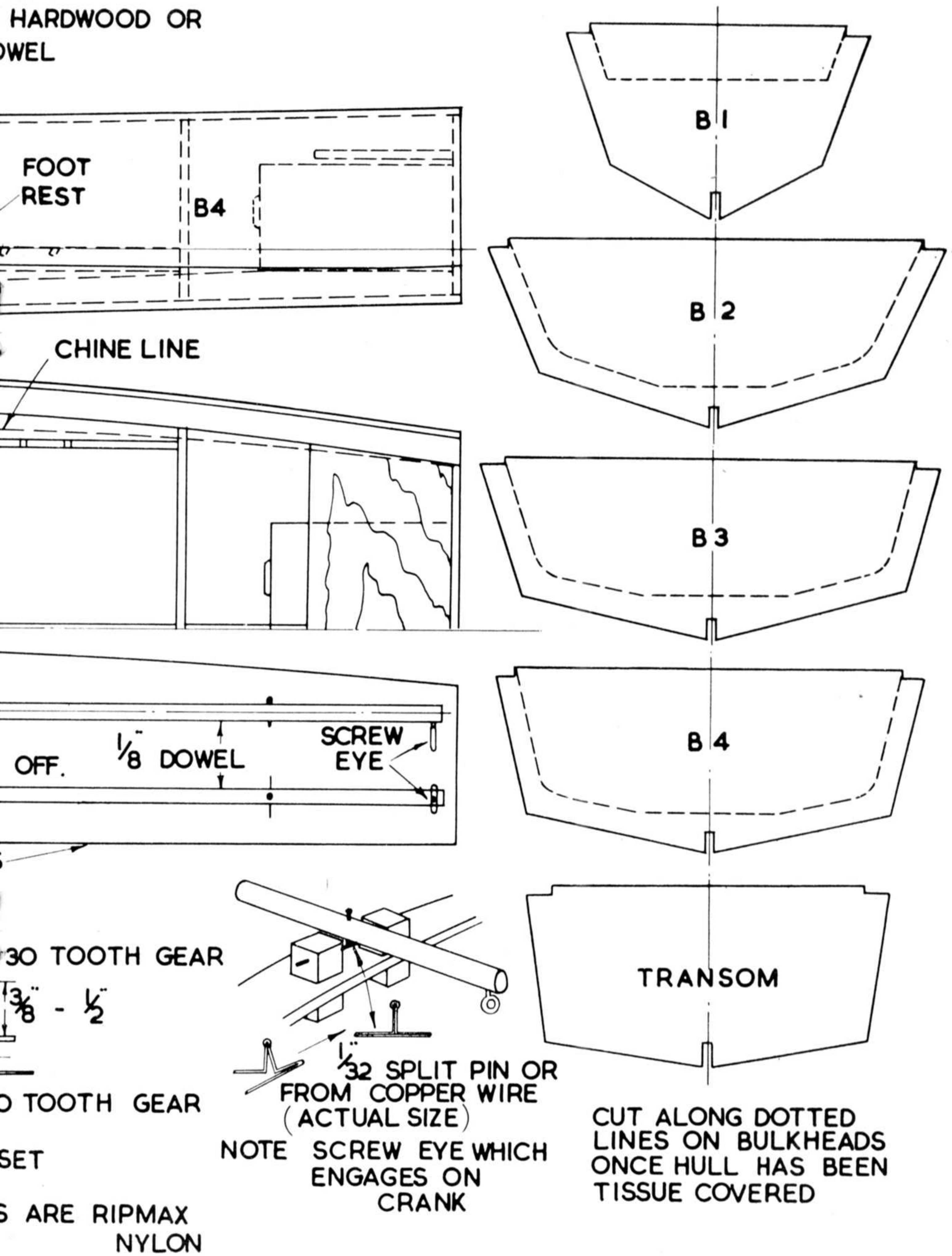
In conclusion, make the gearbox and the joints free, and you will have a boat which although not fast is interesting to watch, especially in the neighbourhood of other moored models.








ALL WOOD IS 1/16" BALSA UNLESS OTHERWISE STATED
1/8" SQ.
1/8" DO
B1
B2
B3
KEEL SUPPORT
CUT KEEL TO DOTTED LINES
CUT TWO DECK PIECES TO THESE LINES
1/32" PLY BLADES
OARS - 2
APPROX. SHAPE OF BOTTOM SKINS
8 B.A. BOLT. SOLDER TO TINPLATE ARM
KAKO 01. BASEPLATE
GEARBOX FROM TINPLATE. BEND ALONG DOTTED LINES
FULL 0·5"
SOLDER OR BOLT TWO HALVES OF GEARBOX TOGETHER (8 OR 10 B.A.)
40 : 1 WORM S
ALL GEARS
CENTRES FOR 3/32" HOLES. USE 3/32" BRASS FOR AXLES


HARDWOOD OR
OWEL
FOOT
REST
B4
CHINE LINE
OFF.
1/8" DOWEL
SCREW
EYE
30 TOOTH GEAR
3/8" - 1/2"
O TOOTH GEAR
SET
S ARE RIPMAX
NYLON
1/32" SPLIT PIN OR
FROM COPPER WIRE
(ACTUAL SIZE)
NOTE SCREW EYE WHICH
ENGAGES ON
CRANK
B 1
B 2
B 3
B 4
TRANSOM
CUT ALONG DOTTED
LINES ON BULKHEADS
ONCE HULL HAS BEEN
TISSUE COVERED