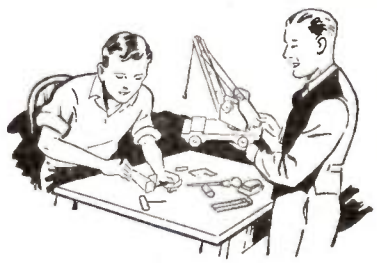
57th YEAR OF PUBLICATION

JUNE 18th 1952

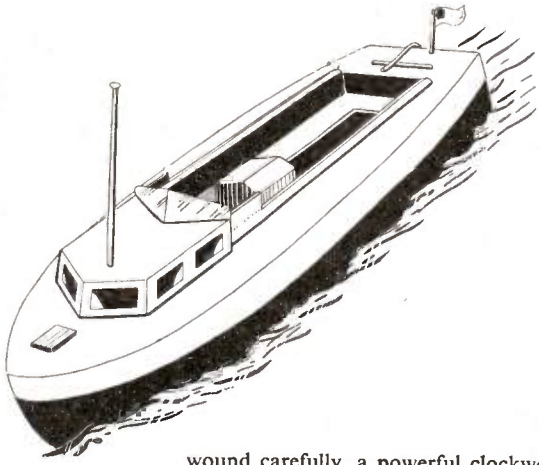
Hobbies WEEKLY

VOL. 114 NUMBER 2955



How you can build

A SEMI-SCALE CABIN CRUISER



THIS model is typical of the full size craft which are so popular on the waterways of Britain nowadays. It is not based on any actual prototype, but represents a whole class of small private owner vessels. Most are powered by a variety of motors, from large outboards up to powerful, compact diesels. Just like the full size job our model is also suitable for several alternative forms of power. The hull has a generous beam and the cockpit is quite large, making installation of any suitable motor quite a straightforward matter.

Scale plans are on pages 189 and 190

Power Units

The three forms of model power units which could be used are an electric motor, a clockwork motor, or a small diesel engine. There are a whole host of commercial units available from which the choice can be made, each with its own particular merits.

For trouble-free operation, the electric motor is, probably, supreme. Once installed it needs very little attention—just a change of battery, as required. The main thing to avoid is getting the motor wet, for this may well ruin the insulation, and thus the windings. For this reason the motor should be totally enclosed with a suitable cover having a hinged lid for inspection. The batteries are stowed forward in the cabin, and so should be well protected. They should be installed only when the boat is required for operation, however, and removed as soon as the day's sailing is completed.

A clockwork motor offers simplicity again and the additional advantage of literally no running costs. Provided it is protected against water, well oiled and wound carefully, a powerful clockwork motor should readily last the life of the hull. The main disadvantage is that the performance will not be spectacular—just a moderate cruising speed with the duration of run limited by the size of the spring.

Diesel

The nearest approach to realism—and a power unit which is capable of propelling the vessel at quite a speed—is to install a small diesel motor, such as produced for model aircraft work. A number of really tiny diesels are now on the market, all under 1 c.c. capacity. Any small diesel from 0·5 c.c. capacity, up to and including 1 c.c. will give excellent results. Performance will be highly satisfactory with the smaller size (0·5 c.c.), and these units are so small and compact that they can readily be totally enclosed like the other power units. Length of run is then

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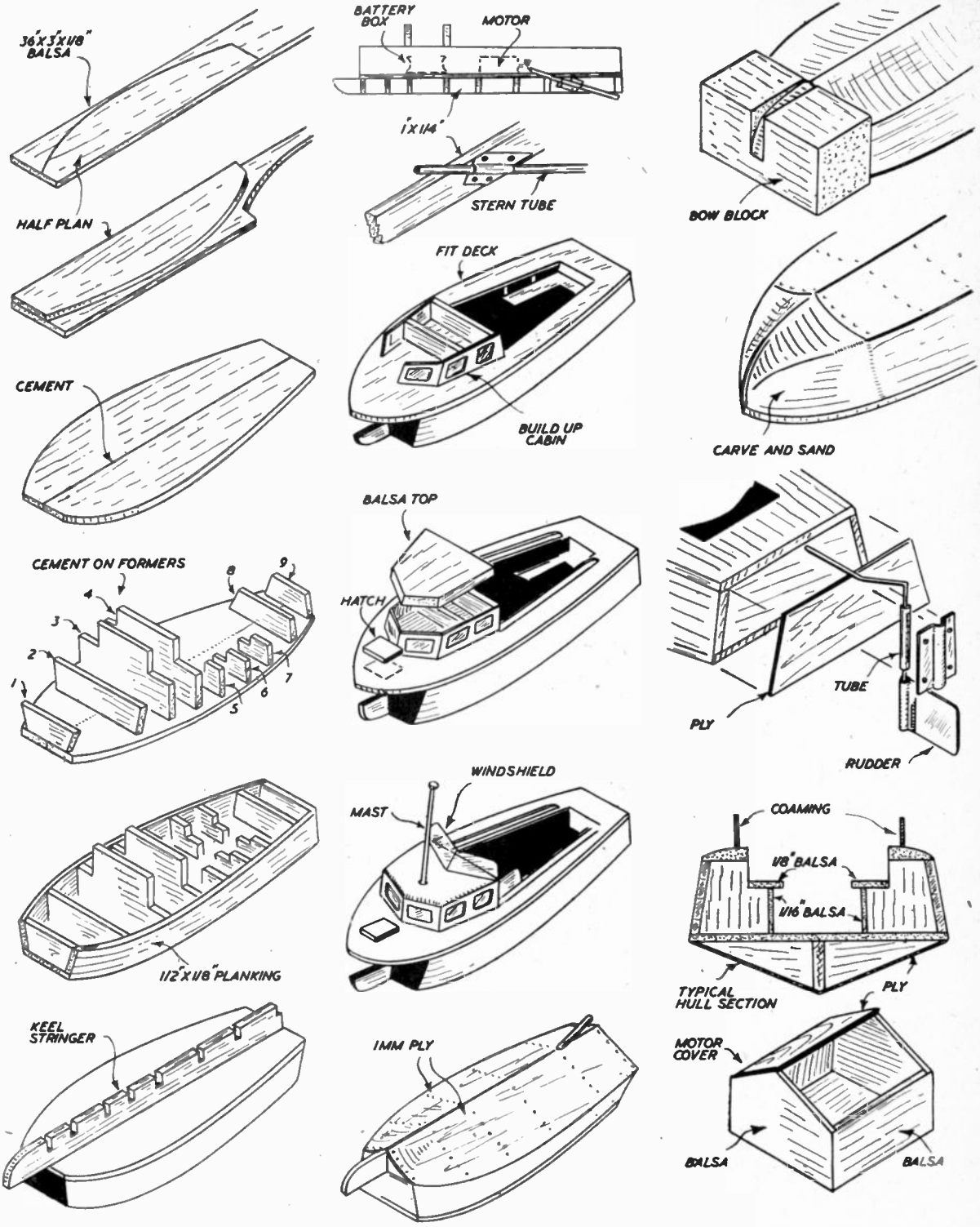
All correspondence should be addressed to The Editor, Hobbies Weekly, Dereham, Norfolk.



These drawings show the steps in construction

virtually governed only by the size of the fuel tank fitted.

This project of a working model cabin cruiser really divides itself into two stages. First there is the construction of the hull, complete with stern tube and propeller shaft, after which any type of power unit can be installed. The work is full of interest, so let us start by describing hull construction in detail. The smaller sketches will help a lot in following this.

Hull construction has been simplified as much as possible so that you do not have to be an experienced ship modeller to complete a successful job. Furthermore, extensive use has been made of balsa wood, which is both readily obtainable and extremely easy to work accurately. This use of balsa, in fact, cuts building time by more than one-half.

Two Plans

Two separate plans are given, one showing the main hull details, etc., and the other the outline shapes of the upper deck and false deck, together with the keel stringer, etc. They are one-third full size and should be scaled up for use, or full size plans obtained. The major part of the construction is based around the false deck, so this should be cut first.

The false deck is cut from ¼in. sheet balsa, choosing fairly hard stock. One 36in. length will be ample and will leave a certain amount spare for other items, like the seats. Normally balsa is supplied in 3in. widths, but if 6in. wide sheet is obtainable, then the whole deck plan can be traced directly on to a 16½in. length of this sheet and cut out. Using 3in. wide sheet it is recommended that one-half of the deck plan be cut out and this half used as a template to cut the other half—as shown in the sketches. The two halves are then cemented together to form the complete deck.

The position of the various bulkheads or formers should now be marked on the false deck. These come to within ¼in. of the extreme edge of the deck. The formers themselves are cut from ¼in. thick balsa sheet, medium hard stock. Former shapes are given on the plan.

When all the formers have been cemented in place, using a quick drying balsa cement, chamfer off the vertical edges to conform to the curvature of the deck outline and then plank in the two sides with ⅛in. thick balsa. This *can* be done with a single piece of 1⅛ins. wide ¼in. sheet, with care, but it is better to use separate 'planks' of ½in. by ¼in. balsa strip, cemented edge to edge. In this way it is easier to follow the curve of the sides. Individual planks must be carefully cemented to each other, and to the formers, so that the finished assembly will be quite watertight.

Next the partly finished hull is turned upside down and the keel stringer of 1in. by ½in. hard balsa strip shaped and notched and then cemented in place along the centre line. All the 'A' formers are then added. These are still ½in. thick but should be cut from light hardwood, not balsa—something like yellow pine, for preference, although even obechi will do. Each 'A' former cements in a notch in the keel stringer and must be true and flush with this stringer when in place.

At this stage it is a good plan to give the whole of the inside of the hull already formed several coats of shellac varnish to waterproof it. Treat generously with shellac, so that this can soak well into the wood. When dry, you can tackle the next stage of assembly.

Before completing the bottom planking, the stern tube should be assembled. The size of this will be determined by the power unit to be employed. If you have still not decided what motor to use at this stage, then fit a stern tube suitable for the most powerful of the three (i.e. the diesel). The stern tube is actually let into the keel stringer and strapped to it with a metal plate. If the diameter of the tube is ⅜in. or more, the necessary notch will weaken the stringer, so reinforce each side with a plate of thin plywood. For even greater strength, which might be advisable using a diesel of 0·75 c.c. or more, make the keel stringer of hardwood in the first place. Assemble the stern tube permanently at the correct angle and fit, complete with propeller shaft.

Those who do not wish to scale up the plans provided in this issue, can obtain full size versions from the Editor, Hobbies Weekly, Dereham, Norfolk, for 4/- the pair.

You can then turn the model right side up once more and complete the decking. The planking must be trimmed to the correct height so that the ½in. balsa deck, when fitted, makes a good joint all round. Patterns for the deck are given on the plan and it is cut in the same way as the false deck. Formers 3 and 4 protrude through the deck when fitted. It is around these formers that the cabin sides and front, cut from ⅛in. sheet hardwood, are erected, as shown in the sketches.

When the cabin parts have been cut, and before fitting them in place, 'glaze' the windows by cementing small panels of thin celluloid behind the frames. Then cement the cabin parts to the deck and the edges of the formers. Trim the tops off flush so that the balsa cabin roof can be cemented in place also.

You can now glasspaper and round the main deck and cabin top and add the remaining detail. The hatch is cut from ⅜in. thick hardwood and simply cemented in place. The mast is a length of dowel and the windshields are cut from ⅛in. celluloid, also cemented in place. The coaming strips are ⅛in hardwood. Leave the seats and other cockpit details until the motor has been installed.

Bottom Planking

The bottom planking is 1 m plywood, glued in place and pin through to each former with tiny n or brads. If possible, use alumini brass or copper nails, as these wi unaffected by water. Since the v hull will be protected with however, there is no great ha using ordinary iron brads, if nec The main thing is to apply the p properly, so that the bottom co ment of the hull is completely tight.

To complete the hull, cut block as shown and cement i Use hardwood for this block, b material which is reasonably carve. Balsa can be used if suitable wood is available. block is notched to fit ove jecting front of the keel stri now acts as a guide to the quired during carving. Bler of the bow block into the m the hull.

The stern is completed b former 9b of thin ply in rudder tube is then attached small woodscrews. Constr rudder assembly should b from the sketches. Note th itself is offset to one side propeller. The tiller is l desired position by bearin rack secured to the de former 8. This rack shou sheet brass.

The whole hull sh several coats of grain down well between ea the final colouring co Aim to get a smooth, when, using cellulose high final finish should

Now set about inst If of the clockwork bolt to a piece of ply this plywood down lining up the drive s the propeller shaft. electric motor an 'c fitted to former 4 wiring led forward battery is located simply resting in p

((

All you need to know about

HOW TO POLISH 'PERSPEX'

'PERSPEX' can be given a very high finish, without too much hard work if the job is understood and the work tackled systematically. This plastic is quite easy to polish by hand, but some of the other plastics require power-buffing to obtain satisfactory results. The polish on plastic is the smoothness of the material itself—not an applied layer of wax or shellac, as in wood polishing. Consequently a properly polished plastic article will keep its shine almost indefinitely.

'Perspex' sheet is supplied with its edges already polished and protected by paper, most polishing has to be done to the edges in the amateur's workshop. The final finish should be borne in mind right through the job and unnecessary work avoided by seeing that nothing happens to damage the surface or deeply score the edges. Vices should be covered by cardboard and the bench top might be covered with clean linoleum. The protective paper should be left on as much as possible during working.

Polishing 'Perspex' is merely a matter of rubbing with successively finer abrasives, each one rubbing out the scratches made by the previous one, until the final scratches are so minute that they cannot be seen and the surface appears perfectly smooth. Thoroughness at each stage is absolutely essential. It is a help in seeing that each stage has obliterated the previous one if rubbing is done at a different angle, so that the new scratches cross the others.

Filing the Edges

After sawing, fretsawing, grinding, or otherwise working to shape, the edges should be filed with a 'smooth' file, which is frequently cleaned with a wire brush. Follow this with a medium glasspaper, say, grade 'F2'. This may be followed by finer glasspaper, but some workers find this unnecessary. Glasspaper marks are removed by rubbing with a damp rag and pumice powder, or one of the domestic cleaning powders, such as 'Vim'. At the completion of this stage the surface should have a dull velvet sheen, which is quite attractive and acceptable for some purposes without further treatment. Wash off all traces of powder and dry the plastic. Give the final bright sheen by rubbing with a clean rag and metal polish. For the finest finish, do this in two stages—first with a polish meant for brass and then with one meant for silver.

There are two special polishes available—'Perspex Polish No. 1 and No. 2' which can be used in place of the pumice powder and metal polish stages. Cotton wool is better than rag for polishing.

Straightforward rubbing by hand will get results, but there are several things which can be done to simplify and improve the work. Strips of felt or thick cloth can be glued to wood and charged with polish, then used either as files on the work, or laid flat on the table and the straight-edged work rubbed on them. Keep one stick always for one stage and do not contaminate it with powder or polish from another stage. For internal work, one end of a cloth can be fixed to the bench, the job threaded on it, and the other end tied to your belt, so that you keep the cloth taut and rub the job on it. Rounded edges can be quickly finished by holding the cloth by the ends and using it see-saw fashion across the edge. (399)

SEMI-SCALE CABIN CRUISER

(*Continued from page* 179)

or box. This battery box course, be fitted before the as cemented in place.

small diesel motor as the it will be necessary to cut shape bearers from hard- can be secured between 6, screwed through to nd 6A. No specific in- be given here, as actual with the type of engine in idea is that the motor ed to *line up* with the o that the coupling on engage the end of the Final alignment can be g shims or washers r and its bearers. It is se bearers be anchored

ish off the rest of the dummy wheel can be ner 4. With a little be linked to the dder can actually be wheel. A suitable d be installed to nit, leaving the top cut from ¼in. balsa in place and filled in underneath down to the deck line with $\frac{1}{16}$in. sheet material. Any deck fitting you then add will be a matter of choice. Fairleads, cleats, and so on add a touch of realism.

A hole must be drilled somewhere in the false deck so that the bilges can be drained. Actually no water should enter the bilges if the bottom planking is properly applied, but it is as well to have such a drain. This, of course, is normally kept plugged. Strictly speaking, all the 'A' formers should be perforated so that bilge water can be drained into one compartment (where the main drain plug is located) and the keel stringer also perforated at this point.

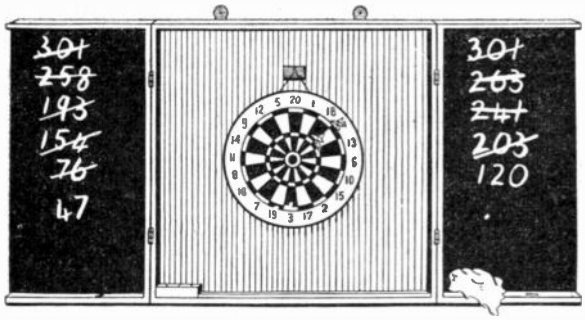
If the vessel is to be operated in choppy water, too, it will be advisable to fit a dummy cabin door filling in the cut-out portion in former 4. This seals off the after portion of the cabin. The main hull is, in fact, divided into a number of watertight compartments forward (between formers) and so should never become completely waterlogged.

One further point, and that is balance. Best performance will only be achieved if the hull is properly balanced fore and aft. If trimmed 'bow down' or 'stern down' it will not be such a good weather craft. Owing to the different weights of the various power units which might be employed, some models may call for the addition of ballast weight, either fore or aft, to achieve the correct trim. Irrespective of the draught, i.e. the depth to which the hull sinks in the water (again a function of the total weight) the water line should remain substantially parallel to the false deck line. Trim your own model accordingly and you will find it an excellent 'sea-boat' on most ponds. (392)

Driving a Dynamo

I WONDER if you could send me a design for a water turbine. I wish to drive a dynamo from a stream. (*A.S.B.—Holywell*).

A WATER turbine would only be efficient if there was a considerable head of water; such conditions are not likely to be found in a stream. The best plan would be to use a large diameter water-wheel, either of the undershot or overhead-overshot type according to local conditions. Such wheels rotate slowly, consequently there would have to be a step-up gear ratio in the transmission between the water-wheel and the dynamo.



For the home player—

A DARTBOARD CABINET

It's a neat, folding job, and will avoid damage to the walls

AS darts is a popular game in the home as well as the club, a cabinet to house the board seems desirable. It is not, after all, quite a piece of household furniture, and can well be hidden when not wanted for playing purposes. The cabinet also helps to protect the wall of the room against damage from darts which miss the board and mark the wallpaper. All players are aware that this only results in chipping the plaster, and causing some understandable annoyance to the householder.

Easy Construction

The construction is simple, and the wood required but a small quantity. The face and back of the cabinet can be made of plywood or plywood substitute. Make up two frames to the dimensions given in Fig. 1, the corner joints being cut as at (A). Both must be identical, so careful measurement is essential. The ends of the top and bottom parts are reduced to half thickness where they join the sides. Wood of ½in. thickness should be employed, as this is quite strong enough, without being too heavy for a light job.

Nail and glue both frames. See they are square and identical—try them together to ensure this, and leave for the glue to get hard. Cut the back and front parts from the plywood to the outside dimensions of the frames, and fix one with glue and panel pins to one frame. This will be the main portion of the cabinet, to which the dartboard will be suspended.

The second frame is to be divided at its centre into two halves. The cuts will not be square across, but at a slight angle, to ensure the doors opening out without jamming. A plan and part front view of the cabinet given in Fig. 2 will explain this. The cuts should be made with a fine toothed tenon saw or the fretsaw, to remove as little wood as possible. It is a safe plan here to, temporarily, nail the plywood covering to the frame before sawing it into two parts, then the halves will not be so liable to get strained and out of square through the sawing.

Cut the plywood into two halves as well, also with the fretsaw, and nail and glue to the frames. You now have a pair of doors, which must be hinged to the body part with brass butt hinges, say, 1½ins. long. The hinges can be fitted to the edges of the frame, but to lessen the strain on them, and when they are flung open and used as scoring boards there is some strain, it would be better to set the hinges to the face side of the frames, and sacrifice appearance for a gain in strength. Mark the position most accurately of the hinges, and recess the leaves of them flush, as in detail (B) in Fig. 3.

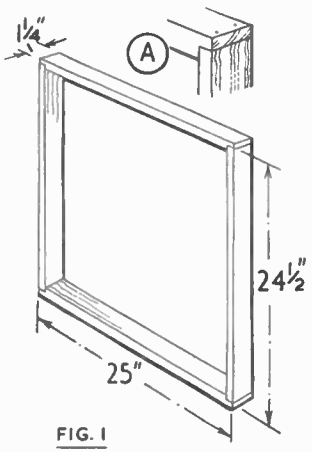


FIG. 1

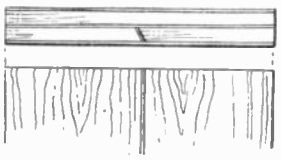


FIG. 2

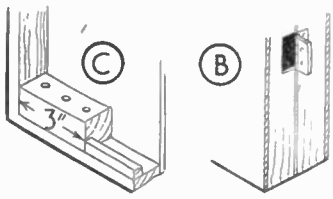


FIG. 3

The recesses should be half the thickness of the hinges in depth, measuring over the knuckles, then, when the doors are opened there should be no ugly gap showing between doors and cabinet. Central in the cabinet, a piece of fretwood about 1½ins. square should be glued to the back, to thicken the wood at the spot where a hook is required, from which the dartboard can be hung. Its position should be such as to ensure the dartboard being in the middle of the cabinet. A brass cupboard hook will serve quite well to suspend the dartboard from.

At the bottom of the cabinet, inside, of course, a block of wood is to be glued in one corner. This is provided with three holes in which the darts can be dropped, when not wanted for playing. This is shown in detail (C) in Fig. 3. Level with the edge and extending from the block to the opposite side of the cabinet, a strip of wood ⅜in. square section is glued and pinned, as shown, leaving a space behind to accommodate the chalk necessary for scoring.

Now give the whole cabinet a rubbing over, first with medium, and then with fine glasspaper. Nails used in the frames should be punched down, and the holes stopped up level. The panel pins used to nail the plywood to the frames should be well knocked down, and any slightly projecting (a rub over with the fingers will reveal this) filed flat.

The inside surface of the doors should be stained black, either with a proprietory stain, or, better still, with a special blackboard black. The remainder can be given one or two coats of varnish to finish the job off. Apply no varnish over the black parts on any account.

Hanging

To the rear of the cabinet, fix a pair of brass wall plates for hanging it to the wall, and fit the cabinet with screws in preference to nails, as a stronger fixture will result with least damage to the wall of the house. For the screws, if the wall is of plaster, plugs should be provided, but this is a simple matter with a Rawlplugs outfit. (415)

DESIGNING AND BUILDING MODEL RAILWAYS

By E. F. Carter

NOW a few words about the production of scenery, without which the best model railway looks bald and unfinished.

It must at once be realised that, on a flat baseboard, the main lines, at least, will be running on the level; so that any ideas of cuttings and tunnels will have to be simulated by building up artificial hills in the path of the line.

Naturally, it is not necessary to go to the extreme length of building a 'hill' and then cutting it in half with a cutting, but that is the effect we have to produce, unless the 'hill' is to look artificially 'stuck' in place—which is just what is *not* required.

Making a Cutting

If pieces of board of a width tapering from zero to about 6ins. are stood on edge about 6ins. from the track on either side, these can produce the top edge of the cutting through the hill. If pieces of old sacking or hessian are then tacked down to the baseboard 1in. or so from the ends of the sleepers, it can be roughly stretched back over the adjacent board on edge, and then brought down to the baseboard level again at a gentler angle than that of the cutting.

Before tacking down the rear edge of the sacking, some rough balls of screwed-up newspapers, brown paper, or old cardboard boxes—partly crushed, should be pushed under the sacking up to the boards on edge, to give the sloping hillside a certain amount of irregularity.

After tacking all the sacking in place over the packing of scrap, it should be treated to two or three liberal coats of size to preserve its shape and to strengthen it before painting; which can be done just as soon as the last coat of size is really dry.

The painting of such scenery can well spoil the whole appearance of the job unless it is carried out with the correct colours and proper kind of paint.

Never use 'high-gloss' paints for the purpose, but flat paints which contain but very little varnish. Alternatively, glossy paints, if ready to hand, can have the bulk of their varnish content removed before use. The varnish is not wasted, for it will find many ready uses on the railway.

Colours

As to colours. Here is, indeed, a trap for the unwary. Always keep to the sombre and more subdued shades of indigo, brown, purple, and—here and there—a little pure black. Never under any circumstances be tempted to use bright red, yellow, blue or green, for it is surprising the amount of blue (as purple) there is in the reds of nature, and the amount of brown in the majority of greens. So try to remember that in a green scene, hardly two trees, fields, or hedgerows will be of an identical shade of green; and act accordingly.

Bear in mind, too, that shadows always should be made to fall in an opposite direction to that from which the 'sun' is supposed to be shining. Nothing looks worse than—say—a farmhouse shaded to the left, whilst the adjacent trees are casting shadows to the right. Such little things, though trivial in themselves, can *en masse*, mar the reality of an otherwise commendable model.

If in Doubt—

If the reader feels for any reason that the production of scenery is beyond his skill, then the best advice which can be given is—leave it completely alone. As one well-known model railway engineer once sagely said—'When in doubt, leave it out'.

By this it is not meant that the railway should be entirely devoid of signal-boxes, bridges, platelayers' huts and the like, but that no attempt should be made to blend the actual model railway lineside scenery into the middle distance and sky backcloth—with fields, farmhouses, built-up trees and other solid models. In any case, if the railway is to be of a purely operational character, the need for such scenic detail is very questionable. (403)

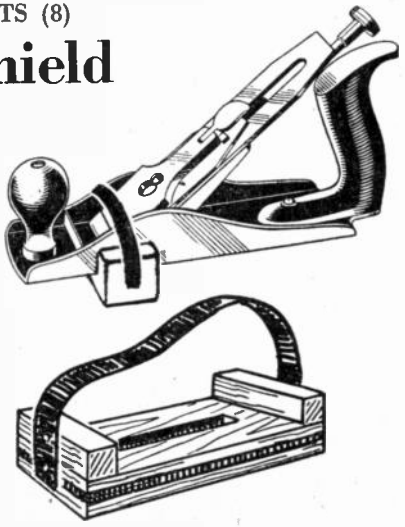
WORKSHOP NOTES AND HINTS (8)

A Plane Shield

MOST fellows are quite proud when they buy their first iron plane and many have a green baize bag made for it. The little gadget here described should also be made, especially by those who have to keep all their tools in a box, in which case the projecting iron of a plane can soon get dulled and even chipped.

True, a plane iron of this type can always be withdrawn into the body of the plane by a few simple turns of the adjusting screw, but it is a nuisance to have to do this every time the plane is put away.

The construction and purpose of the plane-iron shield can be seen at a glance from the accompanying diagrams. The size can easily be obtained



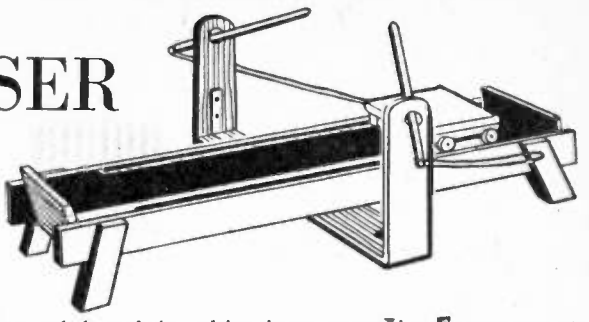
by measuring from the actual plane. The base piece is of plywood with a slot cut in it and the two ends are of square stripwood. A strong rubber band (perhaps cut from an old inner tube) is tacked on.

Make a practice, when putting down the plane, to lay it on its side.

It may be that when acquiring a metal plane, you have 'pensioned off' an old wooden plane. It is as well to keep this old plane in working order and to use it, first, when planing 'second-hand' wood—wood taken from broken-up old furniture, and the like. It should be second nature for the worker to examine this wood for hidden nails but, despite all care, the plane often runs into one and the iron gets chipped. Better this should happen to an old plane than to a new one. The new plane can be used for finishing off, when the danger of snags has been largely obviated. (316)

Keep fit with this

ROWING EXERCISER



ROWING is generally recognised as one of the most beneficial exercises for health, as it brings into play the muscles of both arms and legs. As this pastime cannot be enjoyed by everyone, a home exerciser on the same lines, as illustrated, can be easily constructed and bring the benefits of rowing to every home.

A side view of the appliance is given in Fig. 1, from which the main details of construction can be grasped. A half end view is shown in Fig. 2. All necessary measurements, not given in the drawings, are supplied in the cutting list of timber appended. From the drawings it will be seen that the exerciser consists of a frame with a sliding seat and two oars attached to elastic bands to supply the necessary resistance which the water would otherwise give.

Cut the sides of the frame to length, and at a distance of 1in. from each end, cut grooves ⅛in. deep, to receive the foot and head boards. Note the footboard is to be fitted in at a slight angle. Cut the two boards, and screw firmly in the grooves in the side members. At the bottom of the footboard it will be an advantage to nail and glue a narrow strip of wood across, on which the heels of the rower can rest while exercising.

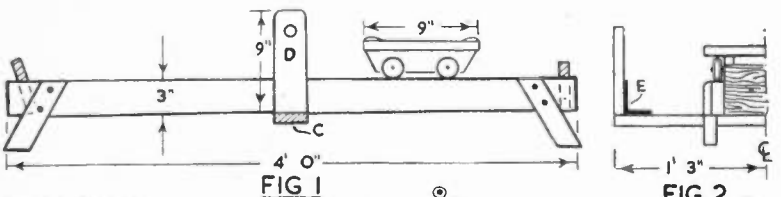


FIG 1

FIG 2

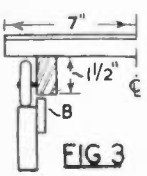


FIG 3

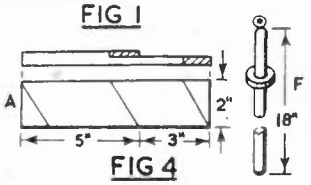


FIG 4

Drawings to help the constructor

The Feet

Four feet will be required. These are cut from pieces of wood, the dimensions of which are given in Fig. 4 (A). Pencil lines across at an angle of 60 degrees, aw off the top and bottom portions, nd reduce the upper half of each to thickness. Fix the feet to the side s near each end with screws. It course, be necessary to treat in pairs, and no mistake need each pair are placed together, inside faces marked as a which side the cutting away is ice.

The sliding seat is a piece of board, cut to the dimensions given. Near the front and rear edge a strip of wood ⅜in. thick and 1in. wide is glued along, the strips being neatly rounded on their upper surfaces. The side view, Fig. 1, shows this detail. To the underside, strips of the board 1½ins. wide are screwed, to which some 2in. wheels, preferably with rubber tyres are to be fitted. Small wheels of this type can be bought at most stores selling toys, etc. Fix the strips so that the wheels can run along the centre of the side members of the frame, as in detail sketch, Fig. 3. To prevent the seat in its travel running off the framework, slips of wood ½in. thick and 1in. wide are glued and nailed along the inside of the frame sides, as at (B). They should extend above the frame ½in.

For the Rowlocks

To carry the rowlocks a bar of wood (C) is fitted across the frame underneath. Where this contacts the side members of the frame, it is grooved ⅛in. deep. It extends each side to a distance of approximately 9ins. At the ends of the bar the vertical rowlocks (D) are to be screwed. These are cut from the board, and at 1½ins. from the top a 1in. hole is bored through to admit the oars.

These holes should be bevelled out a little each side to allow free play for the oars to work. A steel furniture bracket is screwed each side, in the angles between bar and rowlocks, as at (E) in Fig. 2, as some strain comes here when the exerciser is in use. The oars (F) Fig. 4, are lengths of broomstick or ash, if the latter is obtainable. To one end drive in a strong iron screw eye, to which the elastic can be tied. At about 3ins. from the screw eye a ring of wood is fitted on to prevent the unpleasant possibility of the oars slipping right out of their rowlocks during a 'pull'. A thin wire nail should be driven through the oar, on the outer face side of each ring, to keep it in place.

CUTTING LIST

Frame sides (2).	4ft. by 3ins. by ⅞in.
Footboard.	10½ins. by 6ins. by ⅞in.
Headboard.	10½ins. by 4ins. by ⅞in.
Feet (4).	8ins. by 2ins. by ⅞in.
Bar (C).	2ft. 6ins. by 3ins. by ⅞in.
Rowlocks (2).	9ins. by 3ins. by ⅞in.
Seat.	1ft. 2ins. by 9ins. by ⅞in.

Remainder from scrap wood.

At the most convenient spot on the sides of the frame, drive in two more screw eyes, to which the free end of the elastic can be tied. For the elastic, the strands used in home exercisers, and usually obtainable at sports shops, would serve excellently. These are generally provided with a hook at each end, and so only need hooking over the screw eyes on frame and oars. A good substitute for the exerciser strands mentioned is the stout covered elastic, which can often be bought at the drapers or disposal stores. Two or more may be necessary according to the strength of pull desired.

Finish

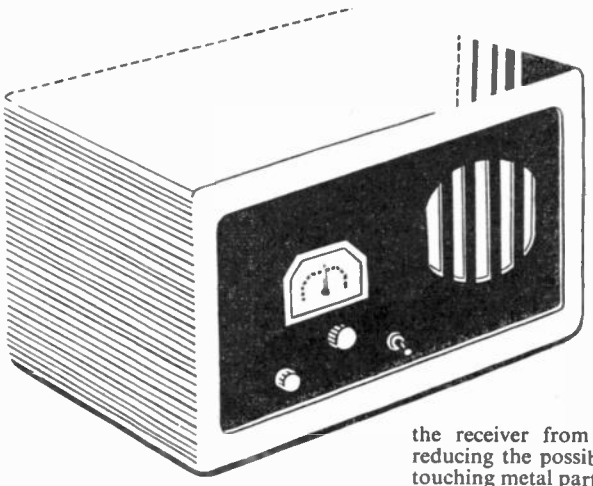
Give the exerciser a good glass-papering, especially the sliding seat, and a coat or two of varnish, and it is ready for service. It may be added that the position of the bar holding the rowlocks can be arranged to suit the rower, a single screw through into each side member of the frame being security enough. A word of warning. It would be as well when hooking the elastic strands to oars and frame to close the hooks so that no possibility exists of their slipping out and causing a backward fall. (420)

PREVENTING BELT SLIP

When driving mechanical models with a string belt which slips, rub with beeswax and this will stop the trouble.

Radio fans have been waiting for this

STRAIGHTFORWARD MAINS TWO



IT seems that quite a number of constructors who have built battery-operated receivers would like to try their hand at a mains set, and this circuit should appeal to them. Mains receivers tend to become rather complicated, but the one described here is of the simplest possible type, consistent with safety and efficiency. It will provide ample volume from those stations which are most powerfully received in the area, and some foreign stations can be heard at fair volume when conditions are good.

The performance does not equal that of a larger set using more valves, of course. Nevertheless, those constructors who have been accustomed to using a simple two or three valve battery set should find this circuit exactly what they have been looking for, and it is always possible to add an extra valve or so later.

The receiver includes speaker, and can be plugged into any 200 to 250 V. A.C. mains supply point. As it stands, it is *not* suitable for operation from D.C. mains, but it can be modified for use with these, as will be explained.

Details of Circuit

High tension current is obtained from a metal rectifier, and the total consumption of the set is about 55 milliamps, so that any rectifier able to deliver this current can be used. Such a type is the Westinghouse HT47 (60 mA maximum), or the Brimar SB2 (70 mA maximum), but many ex-service and other rectifiers of suitable rating exist, and are equally satisfactory. The rectifier is of 250 Volts Working (or greater) rating, and of Half Wave type. The F.W. (Full Wave) or V.D. (Voltage Doubling) types are not required.

The mains transformer has one secondary supplying 250 V. and a second winding supplying 6.3 V. for the valve heaters. For D.C. operation, or A.C./D.C. operation, it can be omitted, as will be explained. Its real purpose is to isolate the receiver from the mains, thereby reducing the possibility of shocks when touching metal parts in the receiver.

The receiving part of the circuit employs detector and output stages, the volume obtained from these being rather more than with a 2-valve battery set. To maintain simplicity, medium waves only are provided for, but a dual-range coil can be added later, if long wave reception is required.

Constructional Points

A rigid metal chassis about 6ins. by 12ins. or larger, gives plenty of room for mounting the parts. A chassis may be made from aluminium or other metal, or purchased very cheaply from ex-government stockists. The latter chassis will probably be drilled with many holes, some of which will not be required, but these can be ignored. The chassis should be about 2ins. deep.

A panel the same width as the chassis and high enough to accommodate the speaker is bolted in place. Many different types of tuning dial can be purchased, and that actually used must depend upon what the constructor is prepared to pay. Tuning dials with station names may be used, but the stations will only tune in at the points indicated on the dial if both tuning condenser and coil are designed for use with the dial. If such a dial is wanted, then dial, condenser, and coil should all be of the same manufacture, obtained for use together.

The coil depicted is that used in the mains 1-valver previously described. It employs 80 turns of 32 S.W.G. enamelled wire, tapped at 30 turns for aerial, between points A and C. The reaction winding, between points D and E, is 50 turns of 36 S.W.G. enamelled wire, ¼in. below the larger winding. A tube 1¼ins. in diameter is used. Ready-made coils can be purchased readily, both for medium wave, or dual-range reception.

In the diagrams several points are marked 'M.C.' and all these are fixed to convenient bolts, so that they are in contact with the Metal Chassis. In the event of a wooden chassis being made up, all these points should be wired together, and connected to the frame of the tuning condenser.

The mains transformer is bolted above a hole through which leads are taken. The better quality type of transformer will have a tag board, and

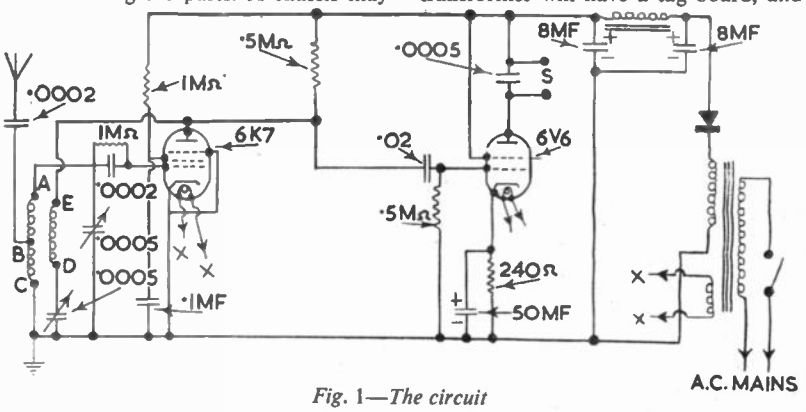


Fig. 1—The circuit

connections can then be brought up and joined to the tags, following the maker's leaflet, which will show which windi... are taken to the various tags. Th... heaters are wired up with twin... reduce hum. These leads are be... first, and kept right against the c...

The two 8 mfd. smoot... densers illustrated are of the ... can be so mounted that the ...

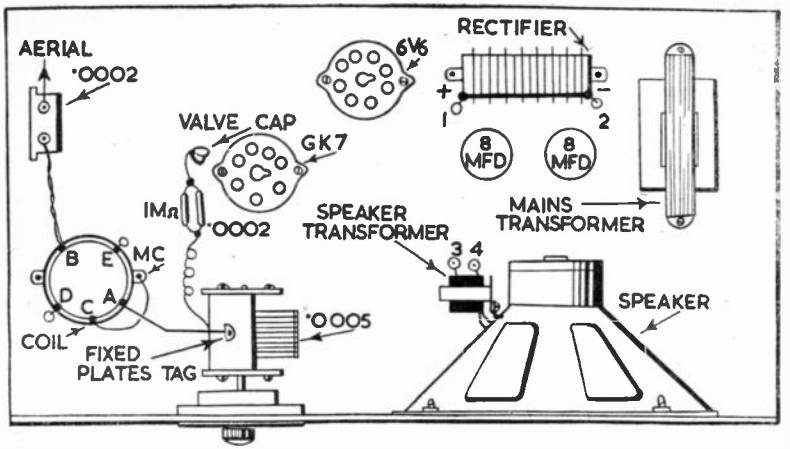


Fig. 2—Plan of the component layout

below the chassis. Other types of condenser can be used, if to hand. Condensers of 16 mfd. are also satisfactory.

The speaker is a permanent magnet one, with transformer for mains-type output pentode, and is bolted or screwed to the panel. A 5ins. or 6ins. speaker is the most usual type. (The dimension given with such speakers refers to the diameter of the cone).

All other wiring will be seen from Fig. 3. Insulated wire must be used throughout, and no joints or other bare points allowed to touch the chassis, or each other.

Using the Receiver

After plugging into a convenient power point and switching on, the valves should reach operating temperature in about thirty seconds. Tuning and reaction controls are then used in the normal way, reaction building up the volume of weaker stations. Best volume will, naturally, be obtained with a good aerial and earth, but an indoor aerial would be sufficient in many areas, and reasonable results are normally obtainable with no earth. Long-range reception must not be expected with a 2-valver, but volume from the local stations should be ample. Range and selectivity of tuning would best be improved, if necessary, by subsequently adding a high frequency stage.

For D.C. Mains

Direct current is still supplied in a few areas, and a transformer cannot then be used. With such supplies, omit the transformer and rectifier. Take one mains lead (the positive) to a 1,000 ohm resistor, and the second lead from this resistor to the point on the smoothing choke to which the rectifier is shown as being connected. Take the second mains lead through the on/off switch to the chassis. It is also necessary to replace the 6V6 valve by a 25A6 or similar type, and to wire the heater in series with the 6K7 heater, and a ·3 amp mains dropper, returning the dropper to mains positive, and the 6K7 heater to chassis. Change the 240 ohm bias resistor to 440 ohms, and add a 5,000 ohm resistor between the S.G. tag of the 25A6 holder and the H.T. positive line.

For operation on either A.C. or D.C. mains (e.g. as a 'Universal' receiver) make the foregoing modifications, but retain the rectifier.

When these changes are made, the chassis will be in contact with one mains lead, so that the usual care must be taken to avoid shocks, and no direct earth must be used. Except for this disadvantage, results will be similar to when using a transformer.

One or two further modifications can also be considered by the experimenter. The smoothing choke may be omitted, a resistor of about 500 ohms being used instead. This reduces expense, but some mains hum will become apparent. It is also possible to use a small separate 'heater' transformer for the valve heaters, if to hand. A tone control could be added as explained in past issues, while the addition of a small dial-light could be considered. (433)

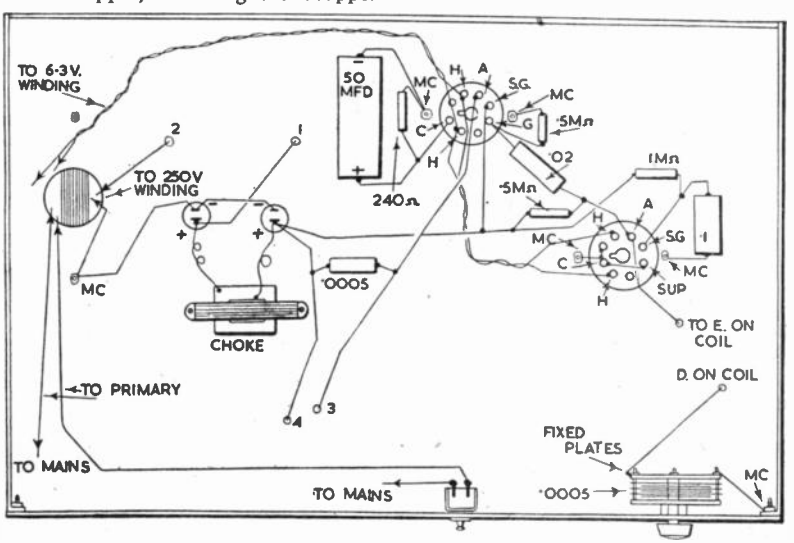


Fig. 3—Complete wiring diagram

Dyeing a Pram Hood

THE gabardine hood of a pram has become colourless and dingy, and generally faded from the sun, etc. I should like to dye it blue if possible, without removing the fabric from the frame. Can you suggest a suitable dye? Can you also recommend a waterproofing mixture for use after that process? (L.T.—Stafford).

IT is difficult to dye some kinds of gabardine as the materials used are often of varied kinds and whereas one will 'take', another will not, and it is impossible to ascertain whether this will happen or not until a trial is made. Any of the well known proprietary dyes could be used, and could be applied with a rag or brush and be well rubbed in; this will avoid removing the covering from the frame, but if the latter is of iron or steel, you may suffer from rust staining. Waterproofing can be achieved by rubbing in—after the dye is bone dry—a 'dope' or mixture of clear cellulose, or stained with blue to enhance the general effect.

A word to the angling enthusiast on

SUMMER FISH WORTH CATCHING

SUMMER is the time for spending holidays by the river. Never was there a better excuse for going off with rod and line than in the sunny days from June to the end of September. We may get bigger and more notable catches in autumn, but there are certain species of fish that 'bite' readily in warm weather. Then the days are long, and everything out-of-doors is pleasant and bright. Therefore, the holiday period affords the angler much pleasure.

Now, let us glance briefly at the prospects and deal with the kinds of fish which are most likely to afford good sport. We'll take them in this order—barbel, bream, tench, carp, chub, roach, and dace. Perch also, but these fish provide better fun in October.

The barbel 'swims' in summer usually have their quota of keen anglers pegged at favourite spots, while punts are occupied on the larger rivers at weir-pools. These fish attain heavy weights, and fight hard, giving grand sport, but, unfortunately, they are not widely distributed. Really good barbel rivers are few—the Thames, Hampshire Avon, Lea, Kennet, and a few of the Yorkshire streams are the principal ones. In summer, barbel congregate in shoals and seek the more rapid parts of streams, also weir-pools and swift clear swims. Best months for seeking them are July, August and September.

Strong tackle is required, and a fairly large goose quill float or a tapered cork pattern. Hooks, sizes Nos. 4 to 6 'crystal'. Baits include lobworms, maggots, cheese paste. Lobworms are mostly used, and the 'swim' to be fished should get a preliminary ground-baiting of the same. To make a proper job of it, dump as many lobs in the swim as you can afford.

In swift water, groundbait with a mixture of clay and bran kneaded into balls, with a handful of worms in the middle. The current gradually washes away the clay and bran, releasing the worms to tempt the fish to 'come on the feed'. Barbel are hefty fish, and you do get a good run for your trouble, if the fish are in the mood for feeding.

Bream and Tench

Bream like warm weather conditions. They have a habit of flitting to and fro in shoals. It is possible in some streams and drains to trace their movements by the discoloration of the water, caused by their feeding on the bottom, rooting in the mud. They may also be seen 'priming' on the surface. When they are settled for a time the angler may enjoy really good sport of a thrilling character where the fish in the shoal run to a fair size—say, 2lbs. to 4lbs. Bream are well distributed in many parts of this country, particularly in the Fenlands, and the Broads of Norfolk. Sluggish streams and drains, lakes, reservoirs, and ponds, canals, meres, all find the bream a suitable home.

Take an Old Towel

One thing about bream fishing. The fish are usually coated thickly with slime, so much so that it is wise to take a cloth or old towel with you to keep wiping your hands after unhooking a captured fish. Some regular bream-fishers don their oldest clothes or wear waterproof aprons when fishing.

Use No. 9 or 10 'crystal' hooks mounted on a 2-yard nylon or gut cast; the float may be a porcupine or goose-quill. Bait with lobs, red, marsh, and brandling worms, paste, creed wheat, stewed barley, wasp grub, and similar baits. For ground-baiting a swim use bread and bran mixed and kneaded into balls, or potato and bread, and brewer's grains. Don't overdo the ground-baiting.

Bream bite cautiously, and may at times blow the baited hook from their mouths the instant they feel the resistance of the line; occasionally they rise with the bait and this causes the float to lie flat on the surface. Wait until it moves and slides away in a sidelong movement under the water, then strike. Hooked bream plunge heavily and bore deep; but mostly a bream gives in if brought to the surface and kept there. When fishing such waters as shallow lakes and Broads, or drains and canals, go to work quietly and keep well out of sight.

The tench is another summer fish affording sport on hot days, or rather mornings, for in tropical-like weather, with blazing sunshine they do not stir much in the noontide hours. Early morn, just after dawn, and late evening are the best times.

Tench haunt weedy ponds, meres, lakes, and canals, chiefly. They are fickle in their feeding habits, and at times the angler may wait days before getting a good hour's sport. On rare occasions they come on the feed eagerly, and then the angler makes a catch worth boasting about. It is possible to collect thirty or more fish at a standing. And among them may be fish of 2lbs. and 3lbs. or over. June, July, and August are the best months to fish for them. Like bream, their bodies are covered with slime and it is as well to take an old towel with you to keep your hands clean.

Baits include worms, slugs, snail, maggots, wasp-grubs, and sweet paste Ground-bait, when you think it will be helpful, with soaked bread and bran in which a few small worms are placed. The fish root on the bottom feeding on the worms in the ground-bait, and when you see tiny bubbles rising up from the baited spot, quietly drop in your bait and hope for the best. Probably in a while the float will 'bob' and then slant away in a leisurely movement. Wait until the tip disappears under water, then strike. Remember a big tench is a powerful fighter, so see to it that your tackle is strong. Don't forget your landing-net—you may need it. Fish your bait well on the bottom, but if getting little response try it at mid-water or even just under the surface, and between the two depths. Keep very quiet and take cover, if possible, behind a clump of reeds or rushes.

The same remarks will do for carp as well as tench, but you can vary the baits with par-boiled potatoes, small; green peas; boiled wheat; sweet paste made with honey or brown sugar. As carp run big, tackle must correspond; it must be strong but fine withal. Carp feed at all depths. On dull coldish days let the baited hook lie near the bottom; on hot days fish near the surface. No. 5 hook is quite big enough to use, seeing that carp have small mouths. Dawn and late evening are good times to go fishing for these subtle creatures.

Chub, Roach, and Dace

The chub is a popular summer quarry. A sturdy fighter, yet a shy and wary fish. A grasshopper, caterpillar, wasp-grub, a ripe cherry or a strawberry, a worm, maggot, cube of banana, strip of maccaroni, slug, and flies natural or artificial—all will attract the summer chub, and be received with a kind of 'Welcome, little stranger!' appreciation. Chub like tree-shaded streams, and lurk under willows, and alders. Roach and dace are taken in June, July and onwards, with the usual tackle and such baits as maggots, bread-crust, small red worms, creed wheat, wasp grubs, hempseed, and paste. Like chub, they will also rise to flies on summer evenings. A cast of three small black artificials fished with fly-rod and suitable line, the flies being mounted on 3x gut or nylon, tapering down to 4x will do nicely. Dace in particular delight to feed on surface flies in summer-time, and they provide good sport on the fine tackle employed.

(430)

An Automatic Seed Sower

THE sowing of seeds can be a very tedious job, especially if the plot of ground is at all large. Many gadgets have been invented from time to time to help in making this task easier.

The subject of this article is just such a piece of apparatus, and by its aid a row of seeds can be sown at any predetermined distance apart with comparative ease and at quite a speed. It can be used in a standing position, and will save many hours of stooping over a row.

Does Two Jobs

It is not even necessary to prepare a drill for the seeds beforehand, as the gadget performs the combined operation of first making the row at the desired depth and then neatly dropping in the seeds at equal distances. The seeds may be sown at different distances apart according to the variety.

The gadget consists of a handle with a rotating wheel attached to one end. On to the hub of the wheel various small tins may be attached, and as the wheel rotates, the seeds drop out of the holes round its edge. By having several tins each with a different number of holes and of varying size it is possible to sow quite a variety of seeds at the proper distances apart.

The drill-making attachment is fixed on to the end of the handle and prepares the row ready for the seed sower which follows.

Make the handle long enough to prevent any stooping when using the gadget—3ft. 6ins. or even 4ft. would not be too much. Round material can be used, but it will be found more convenient to handle if made of 1½ins. by ¾in. wood, and it can have the corners rounded off for a distance of about 12ins. at the end that is held in the hand. Any type of wood will do, provided it is straight grained and strong.

Suitable Wheel

An old pram wheel having a diameter of 7½ins. is just the thing for the rotating portion, but the actual size is not important. The size mentioned, however, is a handy one, as it makes one rotation in 24ins., which can be easily divided up into quite a lot of different numbers.

If for instance, you wish to sow the seeds 1in. apart, then twenty-four holes will be needed round the edge of the tin; seeds 3ins. apart will need eight holes, and six holes are necessary when the distance is 4ins.

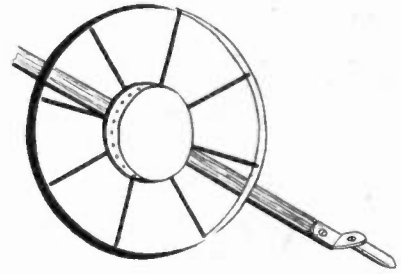


FIG 1

FIG 2

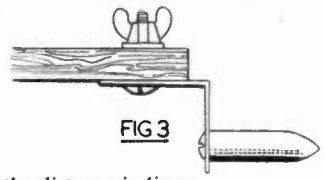


FIG 3

The size of the tin to hold the seeds can be quite small and a boot polish container measuring about 3ins. diameter and ¾in. deep is an excellent choice. Only one lid is required and this is securely fastened to the spokes of the pram wheel.

The best and quite the easiest way of doing this is to cut a small block of wood about 3ins. diameter and fasten to the wheel with staples round the spokes. Then the tin lid can be fixed on to the block with two or three small screws.

The holes can be made round the edge of the tins either with a small punch, which is probably the best way, or by drilling. A wire nail filed up to a point will make an excellent punch and if the tin is placed on a block of lead, no difficulty will be experienced. The holes are, of course, punched from the inside of the tin.

In order to get the holes spaced evenly cut a narrow strip of paper to fit exactly round the inside of the tin and then divide this up into the number required.

When the holes have been punched, file off any rough edges round the outside of the tin, and with a small round file, open them out to the size required. This will depend upon the type of seeds to be sown.

The Drill Marker

The details of the drill marker are clearly shown in Fig. 3. A short length of broom stick or 1in. diameter dowel rod is pointed up and firmly fixed to an angle iron with a wood screw. The angle iron is screwed to the end of the handle with a bolt and wing nut, so that it can be adjusted to suit the type of drill being made.

To use the gadget place a small quantity of seeds in the appropriate tin and clip on to the lid. Carefully wheel it along the ground, keeping the handle steady at the correct angle for the marker to cut an even depth drill. Lifting the handle will make a deep drill, while a gradual lowering produces a shallower one.

A cord can be stretched across the garden to produce a straight row if necessary, but with the aid of our autosower it is possible to make quite a good drill with comparative ease. (432)

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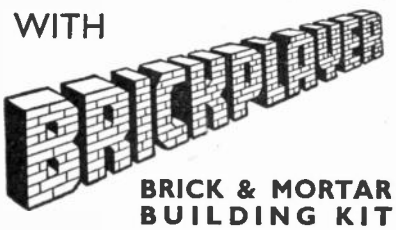

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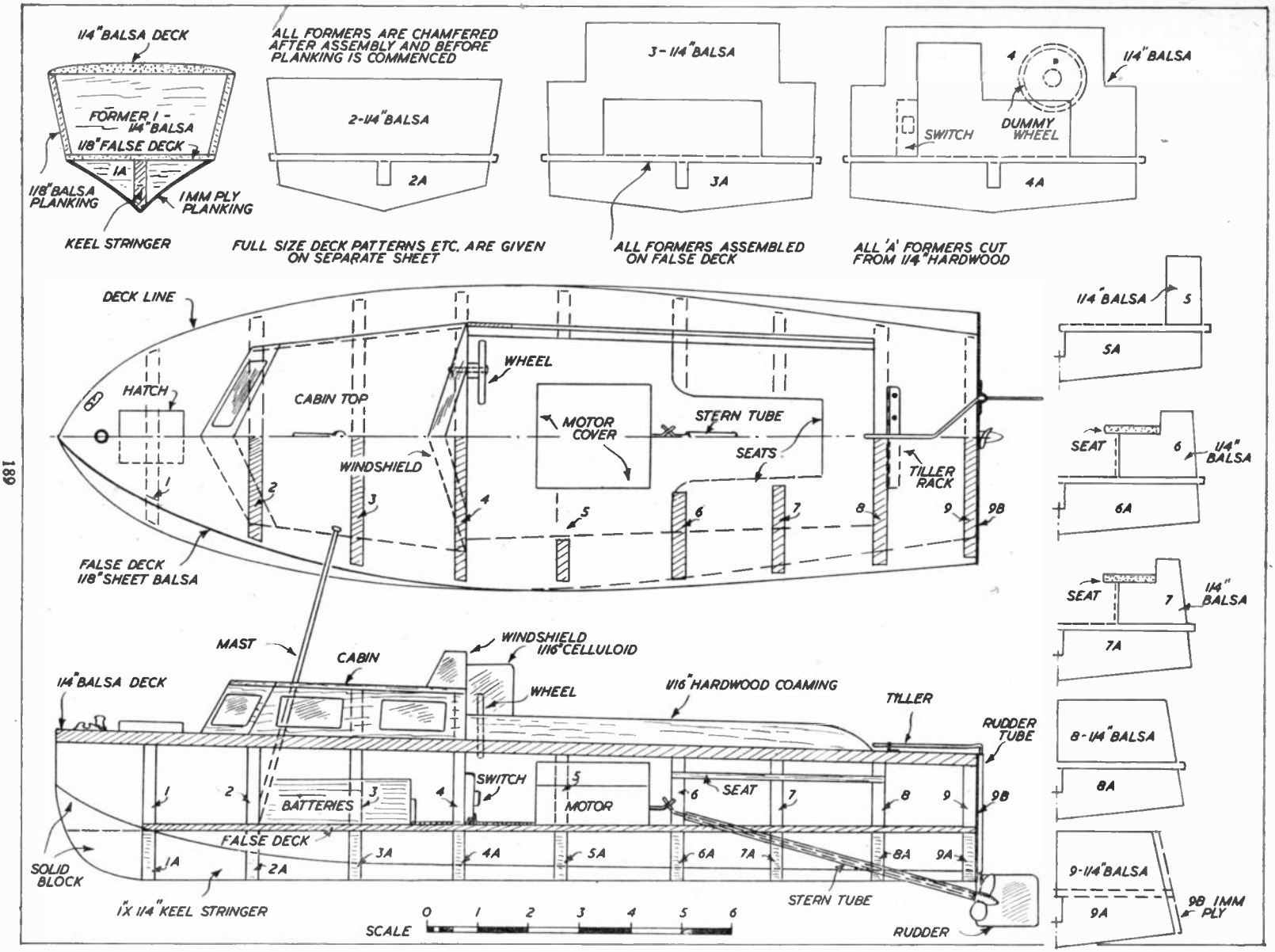
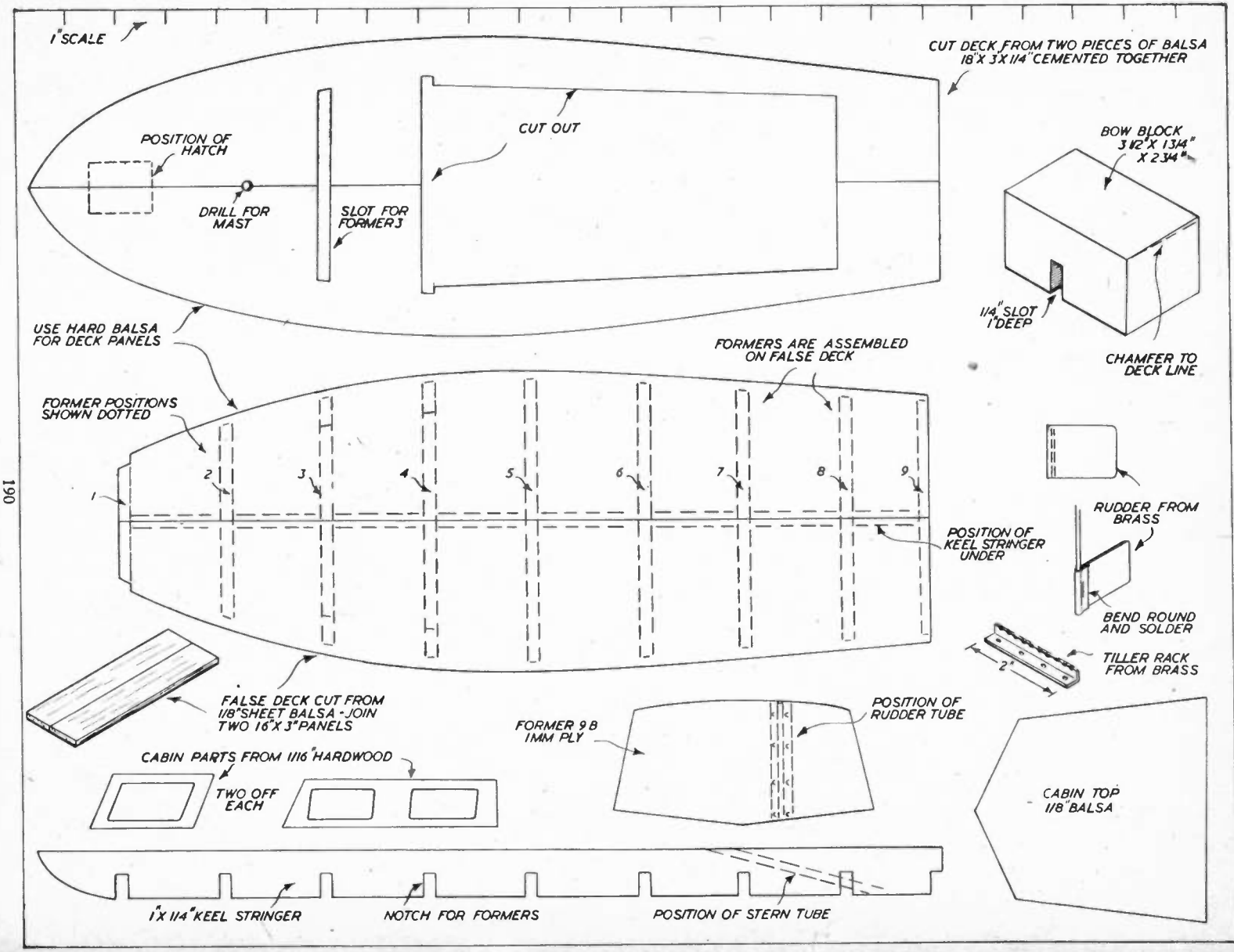

1/4" BALSA DECK
FORMER 1 - 1/4" BALSA
1/8" FALSE DECK
1A
1/8" BALSA PLANKING
1MM PLY PLANKING
KEEL STRINGER
ALL FORMERS ARE CHAMFERED AFTER ASSEMBLY AND BEFORE PLANKING IS COMMENCED
2-1/4" BALSA
2A
FULL SIZE DECK PATTERNS ETC. ARE GIVEN ON SEPARATE SHEET
3 - 1/4" BALSA
3A
ALL FORMERS ASSEMBLED ON FALSE DECK
4
1/4" BALSA
SWITCH
DUMMY WHEEL
4A
ALL 'A' FORMERS CUT FROM 1/4" HARDWOOD
DECK LINE
HATCH
CABIN TOP
WHEEL
MOTOR COVER
STERN TUBE
SEATS
WINDSHIELD
TILLER RACK
FALSE DECK 1/8" SHEET BALSA
1/4" BALSA
5
5A
SEAT
6
1/4" BALSA
6A
SEAT
7
1/4" BALSA
7A
MAST
CABIN
WINDSHIELD 1/16" CELLULOID
1/4" BALSA DECK
WHEEL
1/16" HARDWOOD COAMING
TILLER
RUDDER TUBE
8 - 1/4" BALSA
8A
SWITCH
BATTERIES
MOTOR
SEAT
FALSE DECK
SOLID BLOCK
1A
2A
3A
4A
5A
6A
7A
8A
9A
1"X 1/4" KEEL STRINGER
STERN TUBE
RUDDER
SCALE
0 1 2 3 4 5 6
9 - 1/4" BALSA
9A
9B 1MM PLY


1" SCALE
CUT DECK FROM TWO PIECES OF BALSA 18"X 3"X 1/4" CEMENTED TOGETHER
POSITION OF HATCH
DRILL FOR MAST
SLOT FOR FORMER 3
CUT OUT
BOW BLOCK 3 1/2"X 1 3/4" X 2 3/4"
1/4" SLOT 1" DEEP
CHAMFER TO DECK LINE
USE HARD BALSA FOR DECK PANELS
FORMERS ARE ASSEMBLED ON FALSE DECK
FORMER POSITIONS SHOWN DOTTED
1
2
3
4
5
6
7
8
9
POSITION OF KEEL STRINGER UNDER
RUDDER FROM BRASS
BEND ROUND AND SOLDER
TILLER RACK FROM BRASS
2"
FALSE DECK CUT FROM 1/8" SHEET BALSA - JOIN TWO 16"X 3" PANELS
CABIN PARTS FROM 1/16" HARDWOOD
TWO OFF EACH
FORMER 9 B 1MM PLY
POSITION OF RUDDER TUBE
CABIN TOP 1/8" BALSA
1"X 1/4" KEEL STRINGER
NOTCH FOR FORMERS
POSITION OF STERN TUBE

Printed by BALDING & MANSELL, LTD., London and Wisbech, and Published for the Proprietors, HOBBIES LTD., by HORACE MARSHALL & SON, LTD., Temple House, Tallis Street, E.C.4. Sole Agents for Australia and New Zealand: Gordon & Gotch (A'sia) Ltd. For South Africa: Central News Agency Ltd. Registered for transmission by Canadian Magazine Post.