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BOX FOR FISHING TACKLE

MANY fishermen on their weekly expeditions must find that they are carrying a huge pack filled with every conceivable item, and invariably they find that they have to empty all the contents to get enough tackle to set up their rods.

The tackle box described here is designed to carry regularly-used smaller items of equipment, as distinct from the larger items such as oilskins, spare clothes and food. It can be easily constructed by any average woodworker with the minimum of tools required.

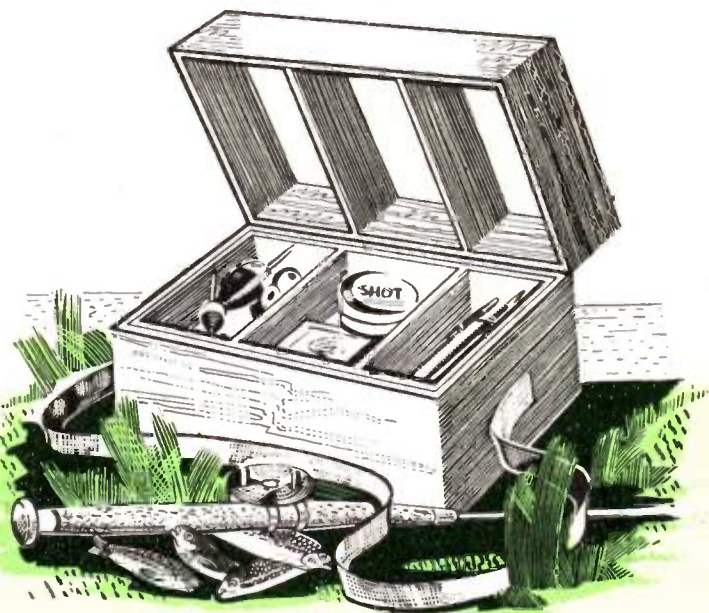
To commence construction, the sides, end pieces and bottom of the box are all cut from $\frac{1}{2}$ in. by 6 $\frac{1}{2}$ ins. good quality seasoned softwood, whilst the reel and spool shelf can be cut from $\frac{1}{2}$ in. thick plywood or hardboard.

Mark out the sides, ends and bottom in accordance with the dimensions shown in Fig. 1, cut and trim them to size,

making sure the ends are dead square so as to give a flush finish. Drill holes and countersink them in the ends and sides to take the No. 6 by $\frac{1}{2}$ in. screws on assembly. Now attach pieces of $\frac{1}{2}$ in. by $\frac{1}{2}$ in. by 2 ins. stripwood to the inside face of the ends and sides. These will act as bearers for the reel and spool shelf and the tray on assembly.

Next cut out the reel shelf, using Fig. 2 as a guide. Obviously the dimensions will vary with the differing sizes and shapes of reels and spools on the market.

The box is now ready for assembly. Screw together the two ends, the bottom and one side. Having completed this, slide the shelf into position and either glue it or attach it with panel pins to



Terry clips can be screwed in the correct position to secure the reel arms to prevent the reels from moving about when the box is being carried.

We can now commence construction of the tray which can be cut from either $\frac{1}{4}$ in. plywood or hardboard.

Mark out the four sides, the two partition pieces and the base in accordance with the dimensions shown in Fig. 3 and cut them to size. Clean up each piece and make sure that they are dead square. Cut

The whole assembly should now be cleaned up, all screw countersinks filled with stopping and sanded to give a smooth finish. The box can either be painted or stained and varnished, but in either case it is advisable to use a waterproof finish because the box will most probably be subjected to all weathers.

When the finish has been completed, attach a spring clip to the front, similar to the type used on gramophone cabinets, to secure the lid in position when the box is being carried. The button section

The box is completed by attaching the carrying strap. This can be made from leather or webbing. An old haversack strap would serve the purpose. Double back about an inch of the strap at each end and make two holes through the double thickness. Now cut two plates from $\frac{1}{2}$ in. hardboard 1 in. by width of the strap and drill two holes equal to the holes made in the strap, to take two No. 6 by $\frac{1}{2}$ in. round head screws. Finally screw the strap ends to the two end pieces, using the plate and round head screws. (J.E.A.P.)

The tray is now ready for assembly. Attach the sides and the base together, using the four fillets and 1 in. panel pins. A spot of waterproof glue at the joins will help to strengthen the tray. Now mark the positions of the partitions, making sure that each side is level with the other. Next waterproof glue or panel pin the slips so that they can hold the partitions firmly in position. Finally insert the partitions and glue them to the base and the sides.

We can now make the lid, which is similar to the tray, although larger and more robust in construction. Mark and cut out the sides and ends from $\frac{3}{4}$ in. by $1\frac{1}{2}$ ins. softwood and the top and partition pieces from $\frac{3}{4}$ in. plywood or hardboard, to the dimensions shown in Fig. 1. Trim and clean all parts dead square and make sure that the lid dimensions are in keeping with those of the box, particularly the partitions, thereby giving a uniform finish. The sides and ends of the lid are screwed together with No. 6 by $\frac{3}{4}$ in. screws and the top secured in position by $\frac{1}{2}$ in. panel pins. The partitions are fixed in position in the same manner as described for the tray.

We can now attach the hinges. Cut small recesses in the lid and the top of

[illegible]

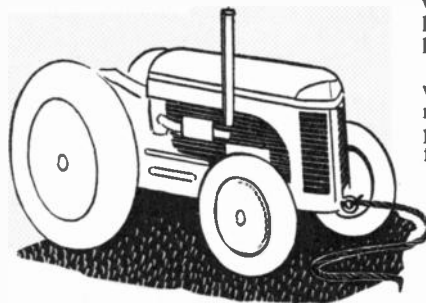
THIS little toy is suitable for children from 2 to 5 years. It can be made in one evening and if carefully painted, makes a good birthday gift.

Cut the main pieces (A) from $\frac{1}{2}$ in. wood. There are two of these, and they should be glued and pinned together. If you have a fretmachine, cut one piece from 1 in. wood. There are two pieces

(B), one glued on each side of (A). Shape these parts, rounding off the top, until it closely resembles the picture.

The wheels are cut from $\frac{1}{4}$ in. wood, rounded, and screwed to piece (A). There are, of course, two of each wheel and they are kept away from (A) by means of $\frac{1}{4}$ in. thick washers. These washers can be glued to (A) and the wheels screwed into the washers, or long screws may be used and the washers left loose.

Paint grey or orange, wheels orange with grey tyres and put the various markings on with wax pencil or black paint. Fix a small screw-eye to the front for the pulling cord. (M.p.). (J.E.A.P.)



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MAKING I.F. TRANSFORMERS

MANY radio constructors can and do make their own tuning coils, but very few seem to realize that Intermediate Frequency Transformers can also be made easily and successfully (as this article will show).

The Intermediate Frequency Transformer (I.F.T.) is an essential part of the superhet type of set, and usually two are needed. A really powerful set will take quite a few. The function of the first I.F.T. is to select the chosen Intermediate Frequency from the Frequency changer valve (the convertor), and the following I.F.T. tunes the signal issuing from the amplifier valve.

As each transformer contains two tuning coils, this means that the average domestic set has five tuning stages (four in the two I.F.T.'s and one in the aerial tuning coil). Hence the superior selective power of the superhet set. Moreover, amplification without instability is rendered much easier by having only one fixed frequency to deal with stage after stage.

The factory built I.F.T. is expensive. A pair costs anything between 12/6 and 16/6. If you make them at home as described in this article you can make a pair for 2/6. This represents a considerable saving. They are very easy to

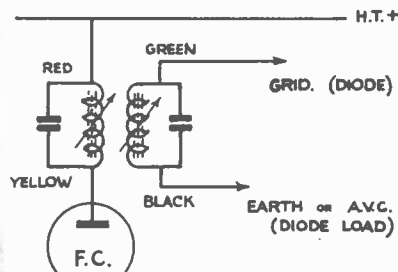
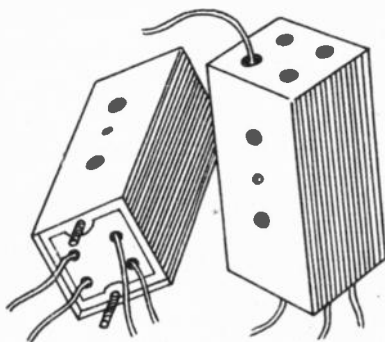


Fig. 1

make and their performance highly satisfactory. So there is every incentive for the constructor to start making his own.

A screening can is imperative for the I.F. Transformer. One can make one's own cans from sheet aluminium, if necessary. (All one needs is ability to bend the metal, and the rivets or nuts and bolts to seal it). But there is no need to go to this trouble even, because cans can be bought new or surplus. Surplus ones are recommended because of cheapness. These can be obtained from J. E. Annakin, 25 Ashfield Place, Otley, Yorkshire. Two sizes are available. The first is 3½ins. by 1½ins. by



1½ins. and is List number 1547, I.F.T. price 6d. The second is 3ins. by 1½ins. by 1½ins. and is List number 1850, I.F.T. price 5d. Either of these can be used, but the larger one is the recommended one,

By A. Fraser

being more efficient and easier to deal with.

Supposing it is the larger (number 1547) that has been bought. It will be seen that there is a bolt head on the side of the can between the two tuning apertures. Unscrew this bolt and draw off the can from the base. On this base is seen the inner structure containing one coil former condensers, resistors, etc. Unsolder the connections of all condensers, etc., and remove them carefully. They will be in very good condition and can be put in the spares box for future radio work. Leave the coil former in position.

Remove the paxolin square, on which the resistors were mounted, by unscrewing the two nuts and bolts holding it to the metal strip. But retain the two nuts and bolts, as they will be needed.

Drill out the soldering tags in the paxolin base.

Next, remove the winding from the coil former and scrape off the wax on the former with a knife. Rag and petrol, or some glasspaper, will get the former completely clean.

Clean all the soldering tags, scraping with a knife to remove resin, etc.

The base and super-structure ready for the fitting of the second coil former, etc., can be seen in Fig. 2.

The reader has a choice of two coil formers, one 5/12in. (or ½in.) in dia-

meter, the other ½in. diameter. These are obtainable from Annakin cheaply — List number 1805, Alladin former, 5/12in. at 4d., or number 1696, Alladin former, ½in. at 3d. The ½in. former is recommended, as it fits the screw holes in the metal strip perfectly. With the ½in. former, the middle bolt hole will have to be enlarged to allow passage of the coil slug. In addition the former will need two holes drilled in its base to coincide with those in the metal strip.

Now to make the coils. Start with the top former already in position. First, take a 9ins. length of ½in. wide gum paper strip and, after moistening it, wrap it round and round the bottom end of the former cylinder, making sure the top edge is even. This paper collar is to hold a washer which is to be slipped on to the cylinder and pushed down until it is resting on the collar which acts as a stop or spacer. (See Fig. 3).

The washer should be of insulating material — paxolin, plastic or even cardboard or plywood (if these are varnished first). A thickness of ½in. should do, or less, if it is strong rigid material. The centre hole should be drilled slightly less than the necessary

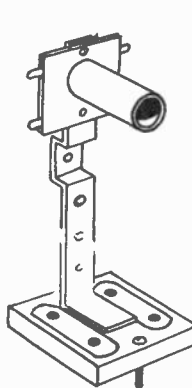


Fig. 2

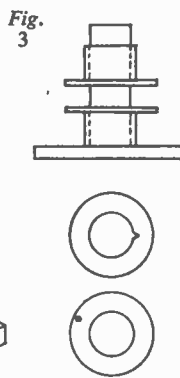


Fig. 4

enlarged (½in. or ½in.) and then gradually enlarged with glasspaper wrapped round some dowel, until it is such a size as to be a tight stiff fit on the coil former cylinder.

The outer circumference of the washer should leave a wall of at least .25in. .25in. would be excellent, so that would mean a washer 1in. in outer diameter, for a ½in. coil former.

A fretsaw can be used to cut out the larger circumference of the washer,

although some materials can be cut with sharp scissors. Two washers are needed for each coil. One of them should have a small 'V' cut out of the inside rim, to allow exit of the wire at the start of the coil. The other should have a small hole drilled or pricked close to the outer rim of the washer. (See Fig. 4).

Push the first washer (with 'V' cut in it) down the cylinder of the former until it rests on the paper collar. Then add the second washer, pushing this down until it is exactly .2in. distant from the first, thus giving a trench .2in. wide and at least .2in. deep all round.

Then wrap more gum strip around the cylinder above the second washer to

right-hand hole in the base. (See Fig. 5). Leave 2ins. free.

Now, wind the coil on the former not yet mounted. A $\frac{1}{2}$ in. former will need 220 turns, a $\frac{3}{4}$ in. former 250 turns.

Then mount the coil on the lower half of the metal strip, using the 6 B.A. holes and nuts and bolts provided.

Solder the leads from the coil to the left-hand side tags on the coil former base, one to each tag. Across the two tags (and, therefore, across the coil) join a .0001 condenser.

From each same tag, also, take a lead and pass through holes in the paxolin base. The lower tag should be black covered and pass through the back left-

set. When fixing the transformers to the chassis, a template is recommended, to facilitate drilling and fixing. This can be made of metal or cardboard and used over and over again. Fig. 6 shows the scheme. The outside holes are 6 B.A., the inside $\frac{1}{2}$ in. diameter.

The connections of the transformer leads are shown in Fig. 1. Those in brackets refer to the second I.F.T.

When valves are used which have the grid as a top cap on the valve (e.g., 6K8 and 6K7), then the green lead should be passed up over, through the top of the can, not through the paxolin base.

Where the reader wishes to use the smaller can referred to previously, the method shown in Fig. 7 is suggested as being of least trouble. Only the can and the two paxolin squares are retained. A coil former (with coil in position) is mounted on each paxolin square and the two formers joined together by a piece of dowel no more than 1in. long. A space of about $\frac{1}{4}$ in. is left between the tops of the formers. Use Uhu or Durofix to fix.

When set, add the .0001 condensers across each coil, and the leads therefrom. The structure is fixed to the can by means of the two screws in the base of the top coil former. A nut or thick washer should be interposed at each screw to stand off the base from the top of the can, otherwise the soldering tags might short circuit on the can top. A hole must also be drilled through the can top centre to allow adjustment of the core screw. A similar hole is also needed in the bottom paxolin square to facilitate adjustment of the lower coil.

When fixed in the set, the transformers are tuned in the usual way by injecting a 465 kcs. signal at the grid of the frequency changer valve, and adjusting the slugs one after the other, for maximum response.

Fig. 5

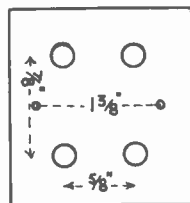
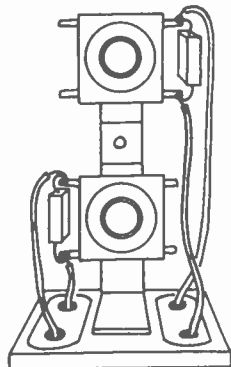


Fig. 6

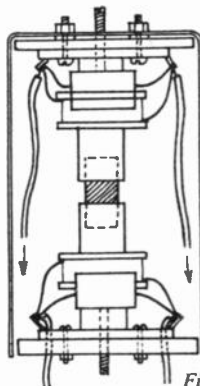


Fig. 7

fix it in place. Uhu glue or Durofix can also be used if desired.

Next, wind the top coil (the former already in position). The Intermediate Frequency will be 465 kcs. Use 32 gauge enamelled copper wire. Thread the end through the 'V' cut in the bottom washer, from the inside of the trench, of course, and draw out about 2ins. Anchor this end round an adjacent tag. Start winding in the trench, placing the turns side by side, working from side to side, building the coil up in layers. On the $\frac{1}{2}$ in. former, a total of 220 turns is needed. Bring out the end of the winding through the small hole pricked in the top washer. Cut the wire, leaving 2ins. free.

If desired, the winding can have a strip of Sellotape run round it to keep it compact and dust-free.

With a razor-blade or emery paper, remove the enamel from the two free ends and solder these to the top right-hand tag and bottom right-hand tag respectively.

Across the same tags solder a .0001 small mica condenser (Annakin, List number 1924, .0001 mfd., 3d. each). From the top tag take a yellow insulated lead, and pass it through the back right-hand hole in the paxolin base, leaving 2ins. free. From the bottom tag take a red insulated lead through the front

hand hole in the paxolin. The upper tag lead should be green covered and pass through the front left-hand hole in the paxolin.

Next, see that the .0001 condensers are sufficiently pressed in close to the tags, to give clearance for the can. Then lower the can down on to the base and secure with the bolt at the side.

The I.F. Transformer is now complete. Two such will be needed for the normal

● Continued from page 309

The Art of Oiling

that a fairly thin oil applied frequently is better than a thick oil.

Most people know how and where to oil a cycle and, provided a good lubricant is used, little harm can be done. Periodical cleaning is necessary to keep as much grit as possible from getting into the bearings when new oil is applied.

A typewriter wants rather more care, and should have all dust and grease removed before any oil is applied. If the machine is used a lot, then regular oiling, say, once a week, is the rule. Use good quality thin oil specially prepared for a typewriter and apply it very sparingly. Carriage bearings and spring drum require most oil, while other moving

parts can do with much less. The typewriter bearings, for instance, only require minute quantity about every six months.

Clocks should only be oiled with a highly refined oil, specially made for the purpose for the bearings and escapement, and too much oil can be just as bad as none at all. Mainsprings may have a slightly heavier grade, but the teeth of wheels and pinions never require any oil or grease.

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★ Next Week's free design will be for an easily-made folding cake stand which will be used as a screen. Also regular feature articles and patterns.

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THE ART OF OILING

ALTHOUGH looked upon by many people as a simple job, oiling is really quite an art, and needs a considerable amount of care in order to achieve success. Anyone can cure a creaking door with a spot of oil applied with a feather, but the same treatment meted out to a wrist watch would be disastrous.

There are so many different kinds of oils, but each has a specific use, and choosing the right one can be most difficult. Equally important, too, is the correct amount which should be applied to each job, so that it may perform its allotted task in an efficient manner.

Generally, oils may be classified under several groups, the chief ones being drying, non-drying and volatile.

Certain oils will absorb a lot of oxygen from the air, and it is this exposure that tends to harden them and make them resinous. These are the drying oils, and are largely used in the manufacture of paints and include linseed, poppy and walnut oil. Most artists' oil colours made in this country are mixed with linseed oil, but in France poppy oil is preferred.

On no account should these drying oils be used for lubricating any form of machinery, especially if it is very small. In spite of this warning, however, there are quite a few people who apply linseed oil to their watches, thinking that any oil will do.

The volatile oils which are mostly obtained from plants are only used for making perfumes or for flavouring and, therefore, have little other use.

Lubricating oils

It is the remaining group of non-drying oils which is used for lubricating purposes, and it is a mineral oil of some kind which forms the base of most of the members of this group. A few of these may thicken very slightly or become rancid and sour, but they never solidify. Unlike the other groups they have only a slight scent and very little

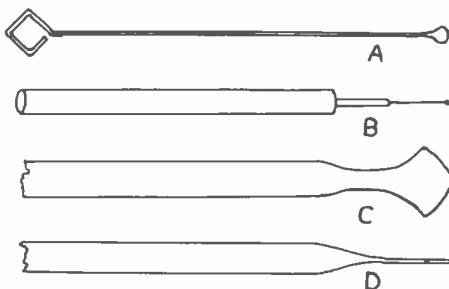
A good lubricating oil should remain fluid at all temperatures, should not gum up after being in use some little while, and be absolutely free from any acidity. Some oils, especially animal and vegetable oils affect certain metals on account of the acids they contain, but pure mineral oils do not damage them in any way.

Much research has been done in recent years, and it is now possible to buy very high class lubricating oil in a

large variety of grades for all purposes. See that you get the particular type of oil which has been specially prepared for the job, and do not be put off with something 'just as good'.

Store your oils if possible in a temperature that is neither too cold nor too hot. The containers, too, need to be kept perfectly clean and well stoppered. Before applying new oil it is advisable to remove as much dirt and old thick oil or grease as possible, otherwise a lot of this may mix with the new oil and probably do serious damage to the mechanism by grinding away some delicate part.

The method of applying oil has a lot to do with the ultimate success of the job. Oil cans in various sizes are quite



satisfactory where the job is not too small, and even a fountain pen filler can be very useful, but for delicate mechanism very great care is needed and special oilers should be made for the purpose.

Half a dozen oilers made from odd pieces of wire will be extremely useful, and will amply repay the time taken. Brass or copper wires are best, and the drawings show how to make them.

Hammer out the end of the wire as at (A) and make a loop at the other end for hanging up. When just placed in a bottle of oil, a drop will cling to the end of the oiler, when it can then be transferred to the job. It is best to use a fairly small oiler and apply several drops, rather than to put too much by using a large one. Too much oil will run away and will help to collect dust.

It is a good idea to file the wire somewhat thinner just behind the end blob as at (C). This keeps the oil on the blob instead of seeping along the wire, which it might otherwise do, especially if the blob is not large enough in proportion to the wire.

The oiler shown at (B) is the type used by the watchmaker for oiling very

small parts, and can be made in several sizes. Into a wooden handle is fixed a small brass tube, and it is this tube which holds the tiny oiler.

For the larger sizes it may be a piece of steel wire with a blob made as before, and fixed into the tube with a spot of liquid glue or with shellac. Nothing could be better for the very small type

by A. F. Taylor

than a human hair pulled out of the head with the root attached. The tiny blob on the end is quite large enough for oiling such as a wrist watch, and is fixed into the brass tube with about $\frac{1}{16}$ in. of hair sticking out.

Application and grade

Having discussed the oils and oilers, now let us see how and where to apply oil to various articles, and the proper grade to use.

The lock on a door or drawer is probably the most neglected mechanism in the house and an occasional oil will not only enable it to work easier, but will add, perhaps, years to its life. The only way to do this properly is to unscrew the plate and apply a good machine oil, but it is well worth the little time taken to do it. If you cannot remove the lock, a little oil on the bolt and also on the key should improve matters.

A heavier grade lubricant is used for all bearings of the lawn mower, and besides this, all the metal parts need well greasing to prevent them from rusting. This treatment is very necessary when the machine is put away for the winter.

Sewing machines usually have the oiling points well marked with the word 'oil' near the small hole. It is best to give a little frequently rather than swamp the mechanism at long intervals, and do not forget the several moving parts underneath the machine which also require their ration. Never put oil on the shuttle or needle; a very lightly oiled rag may, however, be applied here occasionally. A light machine oil of mineral origin is the correct grade for sewing machines. All the fluff which accumulates from the various materials used on the machine should be carefully removed before further oil is applied.

No special instructions are needed regarding the oiling of a mangle except

● Continued on page 308

CHEMISTRY IN THE HOME

EXPERIMENTS WITH RED LEAD

WE have no need to look far to note the wide use of red lead. Engineers use it in steam jointing mixtures, painters in their priming coats, cheaper kinds of sealing wax are coloured with it, many old miniatures were painted with it, and even wise gardeners mix it with paraffin for coating seed peas to stop mice digging them up for supper.

evolved.

What has happened here? Let the tube cool. You will find a residue of lead monoxide. The red lead has split up under the action of heat into oxygen and lead monoxide. This is, then, a way of making both lead monoxide and oxygen from an everyday commodity.

Because it readily parts with oxygen on heating, it is used often in the

this liquid for the time being. Now wash the lead dioxide by decantation several times until one water no longer shows an acid reaction with blue litmus paper — that is, a drop no longer turns the paper red. The lead dioxide may now be filtered off and dried for your chemical stock.

The clear upper liquid which you poured off contains lead nitrate and free nitric acid. You can isolate the lead nitrate by evaporation, but so as to avoid breathing injurious fumes of nitric acid during the evaporation it is better first to remove this by leaving it in contact with more red lead for about an hour. If at the end of that time the red lead has become brown, more must be added and the mixture allowed to stand again. Removal of the free nitric acid is shown by the red lead becoming red-brown, because this proves some unchanged red lead is present, and hence no acid to react with it.

Filter the solution into an evaporating basin. The colourless filtrate is a solution of lead nitrate. Boil it to low bulk over wire gauze (Fig. 1). Occasionally take up a drop of the boiling liquid on a cold glass rod. When the drop crystallises, the evaporation may be halted and the solution set aside overnight. Milk-white crystals of lead nitrate separate. Pour off the mother liquor and drain and dry the crystals on a clean porous brick or on a filter paper standing on a pad of newspaper.

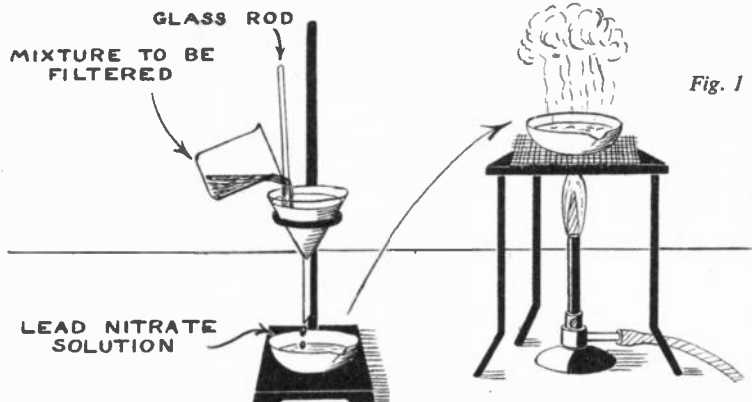


Fig. 1

Red lead is one of the oxides of lead. Chemists call it triplumbic tetroxide. In some quarters it is also known as minium. It is from this name that the word 'miniature' is derived.

Perhaps the first thing you notice about red lead when you pick up a bottle of it is its weight. In common with other lead compounds it is heavier than most other substances. It is, in fact, about nine times as heavy as the same volume of water.

The effects of heat on it are interesting. Put some red lead into a dry hard glass test tube and heat it gradually in a gas or spirit lamp flame. First, the colour becomes a more intense red. It then turns violet and lastly black. Now let the tube cool. The substance reverts to its original colour.

Now try heating up more strongly. After the red lead has turned black, every few moments insert a glowing wood spill into the test tube. As the heat increases to redness the spill will relight with a 'pop'. Oxygen is being given off. When the spill no longer relights, you will know that the reaction is over, because no more oxygen is being

laboratory as an oxidising agent for certain operations.

Another oxide you can make from red lead is lead dioxide, which, because of its purplish-brown colour, is sometimes called puce oxide of lead. Place some red lead in a beaker and pour on

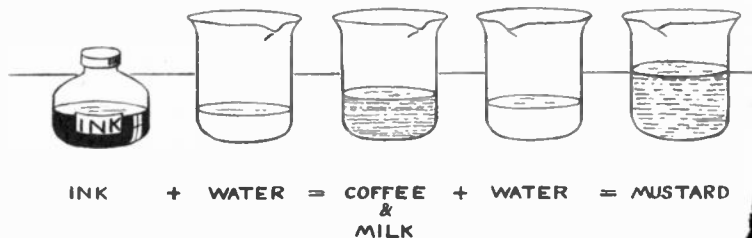


Fig. 2—The Chemist Magician's Equation!

some dilute nitric acid, stirring well. In a few moments the colour of the powder darkens to brown if enough acid has been added. If it is reddish-brown, add more acid in small lots until the colour deepens no more.

Pour off the colourless upper liquid from the brown lead dioxide, keeping

When red lead is dissolved in acetic acid a curious substance is known as lead tetracetate. Take c.c. of glacial acetic acid in a test tube and heat it up in the water-bath and red lead a little at a time, shak-

●Continued on page



IF you wish to save the expense of a special marker for your tennis court, you can do the job quite effectively with the simple arrangement shown in the illustrations. Of course it is not so speedy as the proper machine but none-the-less it proves satisfactory in practice.

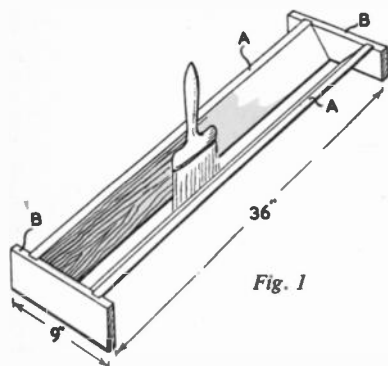


Fig. 1

It consists of a simple trough as shown in Fig. 1 with the sides (A) inclined at an angle. The space at the bottom is about 1 in. wide and the whitewash is applied through this by means of a whitewash or distemper brush. It will be seen that the length of the trough can be increased as desired up to about 10 ft. Bear in mind, however, that a long piece of timber will be likely to warp and throw the trough out of true.

The sides (A) can be butted to the ends (B) and secured with screws or they can be 'housed' as shown in Fig. 2. Mark out the housing joints, making sure that the angles are identical and cut first of all with a tenon saw. Cut down to a depth of $\frac{1}{4}$ in. or $\frac{1}{2}$ in. keeping the saw-cut on the inside of the line. Pare away the surplus wood with a sharp chisel.

Thickness of wood depends upon what you have at hand. The ends should not be less than $\frac{1}{2}$ in. thick and the sides $\frac{1}{2}$ in. These sizes could be increased by $\frac{1}{4}$ in. if necessary.

The approximate measurements of the ends are shown in Fig. 3. With the exception of the 1 in. space all these

measurements may be altered to suit any timber you may wish to use.

The sides (A) are chamfered top and bottom with a plane. The angle will depend upon the position of the sides on the ends.

Finish off by giving two coats of paint to preserve the wood. (M.h)

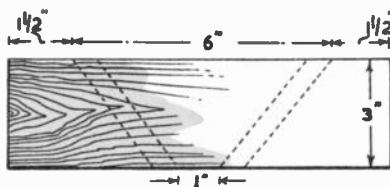


Fig. 3

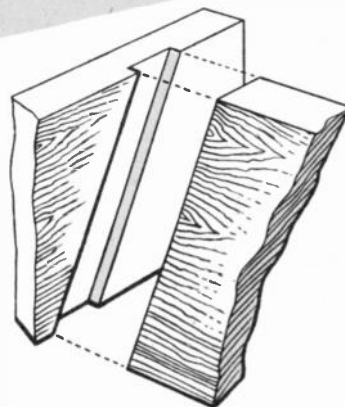


Fig. 2

● Continued from page 310

RED LEAD EXPERIMENTS

tube after each addition. When a faint brown colour appears, pour off the liquid into an evaporating basin to cool.

White needle-shaped crystals of lead tetracetate separate (sometimes they appear in a pale green form), which should be drained and dried on filter paper or on a porous brick. Keep these in a well-closed tube for your specimen collection.

Keep tightly corked

Leave a few crystals exposed to the air on a watch glass. They turn brown owing to atmospheric moisture decomposing them into lead dioxide. This is why the substance should be kept in a tightly-corked tube. Water causes the same decomposition, but more rapidly. Place a few crystals in a test tube and add water. An immediate brown precipitate of lead dioxide appears.

Lead tetracetate is a strong oxidising agent. Prepare a solution of the salt by dissolving a little red lead in warm glacial acetic acid. Add a few drops of this to a solution of iodine in potassium iodide. A yellow precipitate of lead iodide forms. Put a drop of this on filter paper. The absorption ring which spreads around the central spot of lead iodide is colourless, showing that the iodine has been decolourised. This is because the iodine has been oxidised to colourless iodic acid.

Add some of the lead tetracetate solution to indigo solution. The blue colour is discharged and gives place to a light milky-brown liquid. A drop on filter paper will again show a colourless absorption ring.

The oxidising action extends to potassium iodide, too. Add some lead tetracetate solution to potassium iodide solution. First there forms a yellow precipitate of lead iodide, but as more potassium iodide is added, this darkens. Warm the test tube. The lead iodide dissolves, but the solution is brown and, on boiling, the air above the liquid becomes violet coloured, showing iodine to have been liberated. A spot of the liquid on starch paper proves this by giving a blue coloration.

Conjuring trick

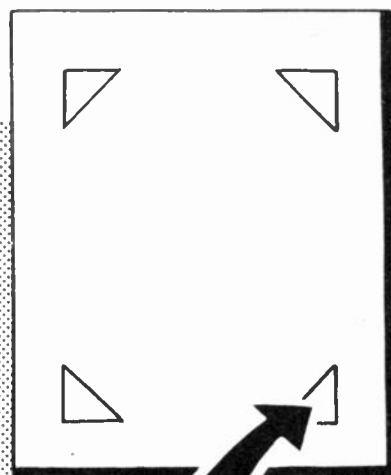
We can make use of these reactions to add a brand new conjuring trick to our repertoire (Fig. 2). In this, you pour ink into water and produce coffee and milk. On pouring the coffee and milk into water you produce mustard!

Certainly astonishing, but quite simple. The 'ink' is indigo solution, the first lot of 'water' lead tetracetate solution and the second lot of 'water' potassium iodide solution.

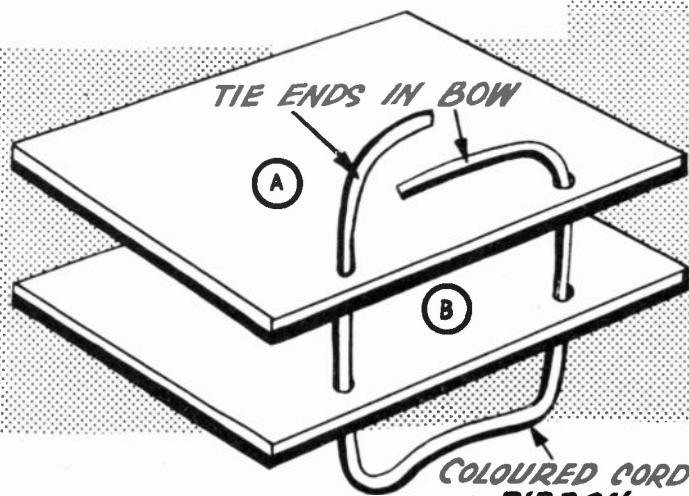
The products of these reactions are poisonous and must on no account be tasted. (L.A.F.)

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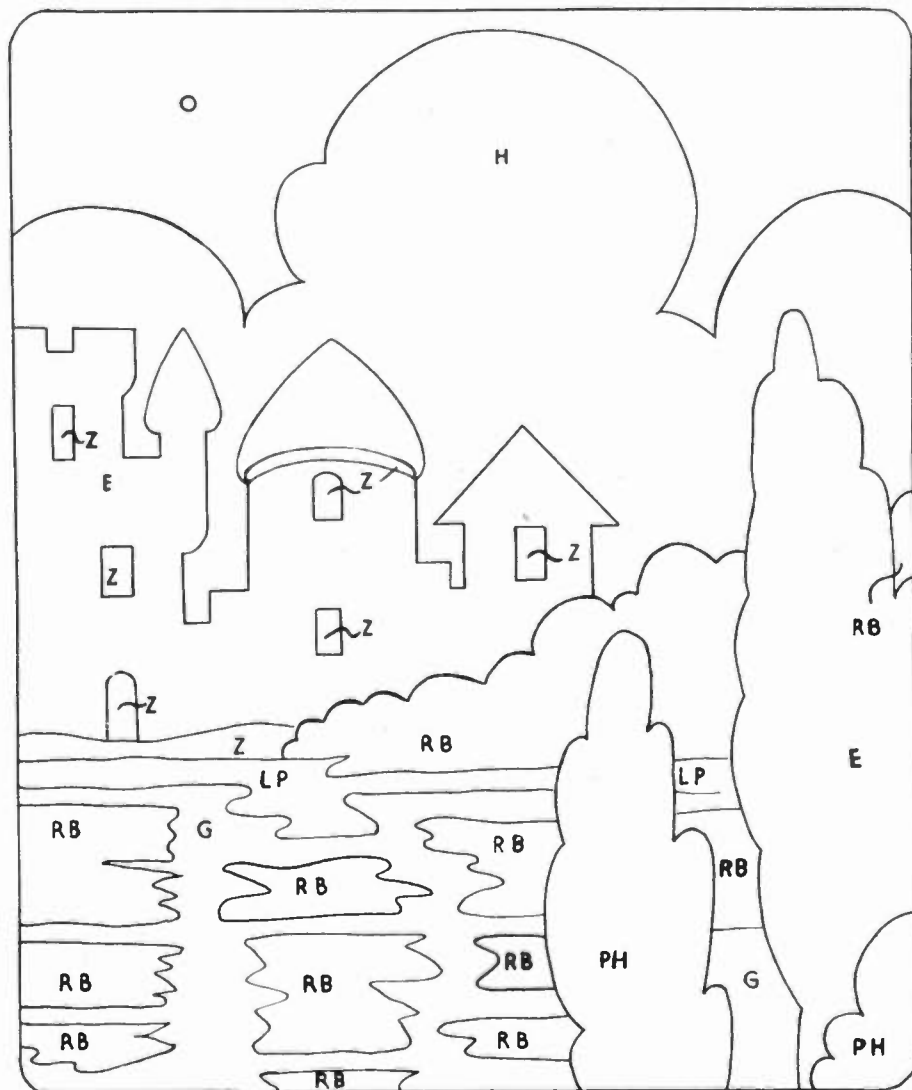
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PIECES A AND B CUT TO OUTLINE

MAINLY *for* MODELLERS

WE now come to what, to me, is always one of the most interesting parts of the work entailed in building a ship model, namely, the rigging; this is not only of interest to ourselves, but it makes or mars the model from the point of view of accuracy.

The shrouds are, mainmast six either

side, foremast five either side, mizzen three either side. These can be built up with the ratlines (or ladders) as outlined in the kit, or better still, one of the methods I have given in earlier articles can be used: (1) They can be sewn through the shrouds with a needle and a spot of glue put on each join, or they can be done in the authentic full-size manner,

Rigging the 'Mayflower' by 'Whipstaff'

that is by using a needle, fasten each ratline to each shroud with a clove hitch.

Next to be erected is the mainstay. This is double and passing on either side of the foremast (A) and (B) in Fig. 1. All other stays are single lines, (C) forestay, (D) fore topmast stay, (E) mains topmast stay.

The backstays are set up with pendant tackles as in the sketch, these must be shown on *both sides* of the model, (F) the mainmast backstay and (G) the foremast backstay.

(H) is the mizzen stay, single line as before.

This completes the standing rigging with the exception of the bowsprit gammoning. Put this on before the fore and fore topmast stays, but do not add the centre fastening until all your standing rigging is up, then, if you have not got them quite taut, this will fetch them quite taut.

Now we come to the running rigging. This is important. All these except the mizzen rigging must be repeated on both sides of the model. They are shown only on one side in Fig. 2 in order that the leads can be followed without difficulty.

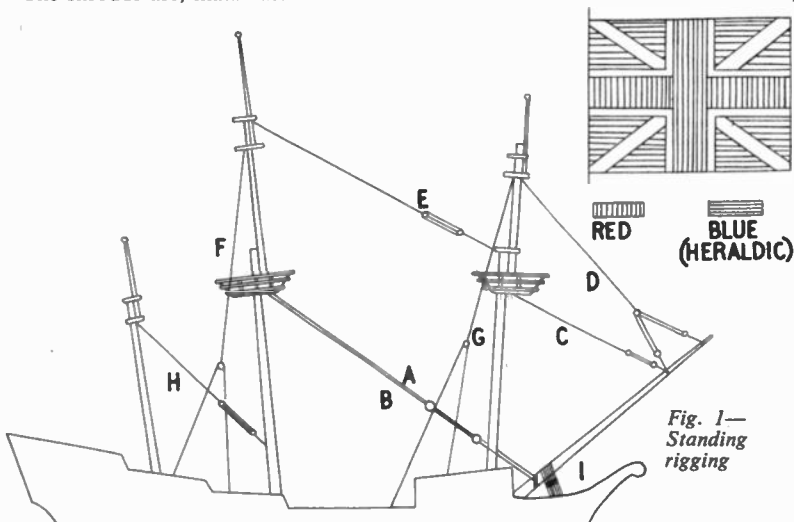


Fig. 1—
Standing
rigging

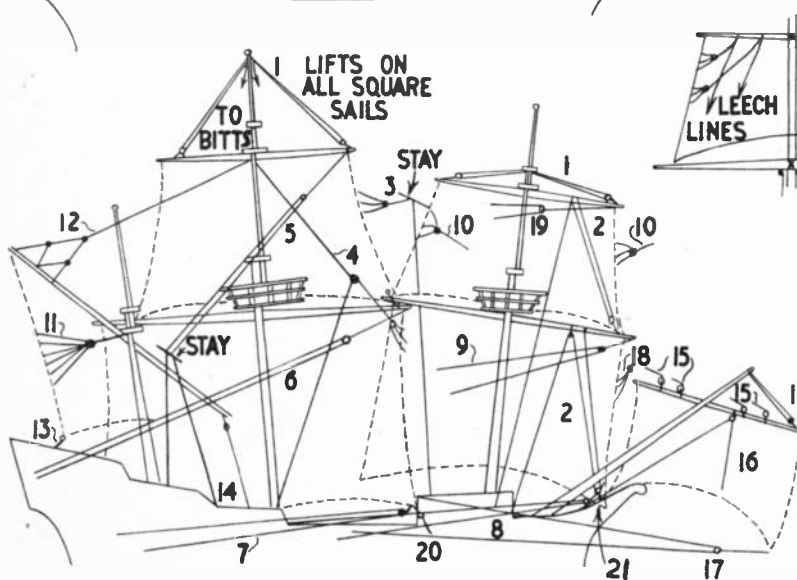
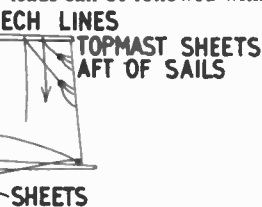


Fig. 2—Running rigging

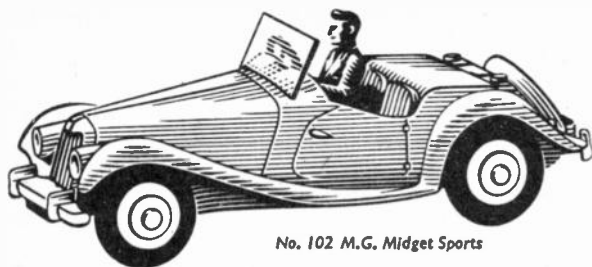


No. 1 is the lifts. They must appear as shown, on both sides and are led down to the masts to the bitts at the foot of the mast.

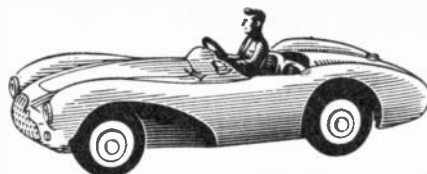
No. 2 is the clew line. These are on all the square sails and in actual practice belay to pin rails bolted to the inside of the bulwarks. For a small model such as this, they can be secured to small eyelets in the deck, just inside the bulwarks.

No. 3 are the main topmast bowlines and are taken to main topmast stay and down to the bitts at the foot of the mast. Numbers 4, 10 and 18 are also bowlines. Lead of the mainsail bowlines is shown clearly but number 18 is taken to the

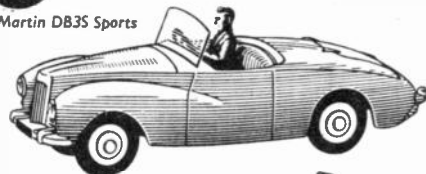
● Continued on page 316



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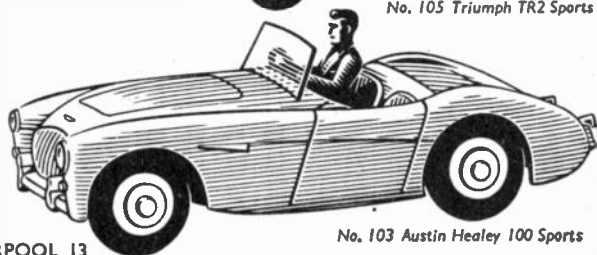
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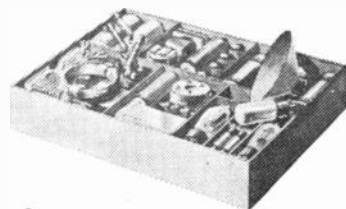
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by *Finlay Kerr*

If the stand is to be constructed to the measurements given in the accompanying illustrations, then use $\frac{1}{2}$ in. thick timber, which is quite adequate for this purpose. You will find that a more elegant appearance is obtained by using thin material than by using thick sections. If, however, you intend increasing the size of the stand to accommodate larger books, then you will

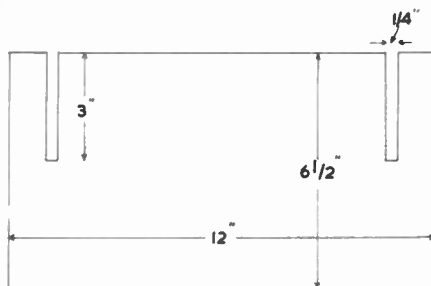
probably have to increase the thickness of your material to $\frac{3}{4}$ in. Use hardwood to match the surrounding furniture in the room.

Start by cutting out the four parts to the sizes and shapes shown in the diagrams. Use your fretsaw for this job and

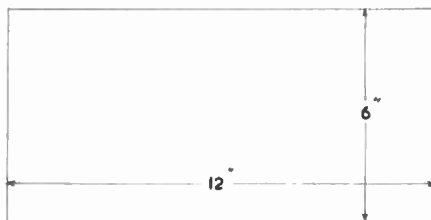
afterwards smooth off the sawn edges with a rub of glasspaper. Be particularly careful in cutting the housing slots for if these are cut too large, the appearance of the finished job will be marred.

Once the four parts have been cut and glasspapered smooth, assemble the two ends and the shelf together. If the housing slots have been properly cut, then you should find that these three parts should remain quite rigid without any nails or glue. It now only remains to attach the back piece in position by means of a few panel pins. Before nailing the back piece in position, however, do ensure that the two end parts are dead square off the shelf.

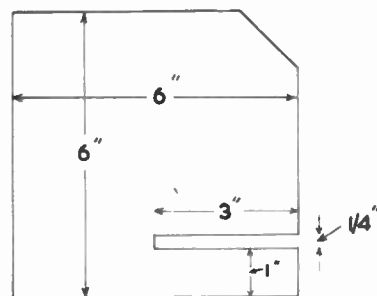
To complete the stand, apply a few coats of french polish.



SHELF CUT ONE



BACK PIECE CUT ONE



ENDS CUT TWO

● Continued from page 314

Rigging the 'Mayflower'

forestay and down to the beakhead deck. No. 11 is the mizzen bowline.

No. 15 shows the four braces of the sprityard. These are taken to the forestay and down to the beakhead deck.

No. 10, for topmast bowlines are taken to the fore topmast stay and down to beakhead deck. Two brass screw-eyes let into the beakhead deck, one either side of the bowsprit will take all these lines, as naturally we use finer cord for the running rigging. For this size model strong button thread in natural colour is suitable. If the standing rigging has been stained black as described in earlier articles the two riggings will be authentic and will show up, one against the other, with nice effect.

The braces are Numbers 5, 6, 9, 19 and 12. The last, being the mizzen is shown once only, but all others as stated above must appear on both sides of the model.

The sheets and the tacks are numbers 7, 8, 17, 13, 14, 20 and 21, one both sides on lower sails only. The sheets run aft and are secured to the hull, the tacks run forward and also are secured to the hull, the fore sail tack to the beak, the mizzen tack only to inside the bulwarks.

The No. 16, clew of the bowsprit goes to the beakhead deck.

For the sake of new modellers I will repeat: lifts, clewlines, bowlines, braces, sheets and tacks are shown on both sides of their respective sails. Leech lines aft side of sails, bowlines on the fore side of sails.

Those who would like to do so can add to each square sail the leech lines and also the sheets for the topsails. These are shown in Fig. 2 inset. The leech lines go to the deck just inside the bulwarks, the sheets along the yard and down to the foot of the mast, to be secured to the bitts.

One point to remember, do not add the Union Jack. The *Mayflower* flew the flag of St. George at the foremast and the flag of the Union of England and Scotland, the Union Flag of 1606, shown in Fig. 1.

I am sure that newcomers to our corner will find an added interest in ship models when they have built and rigged the *Mayflower* as described, especially in knowing that theirs is rigged in authentic manner and as detailed as possible in rigging a model of this size.

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Down: 1. Comments, 2. Entrance, 3. Plea, 4. Singlet, 5. Cryptic, 6. Osiers, 7. Sally, 14. Atremble, 15. Shipment, 16. Rituals, 17. Siberia, 19. Rarefy, 21. Whose, 24. Ears.

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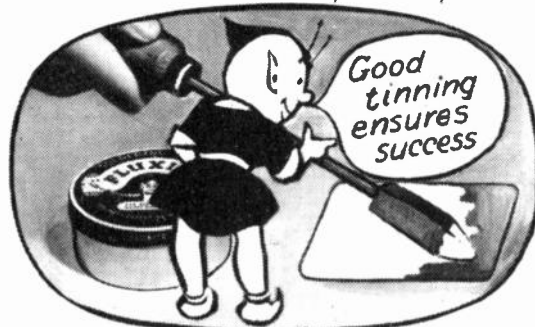


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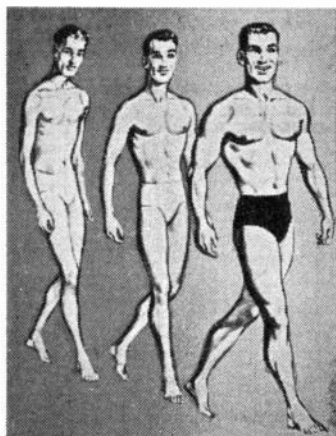
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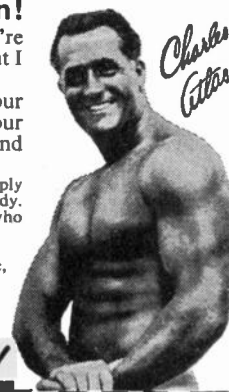
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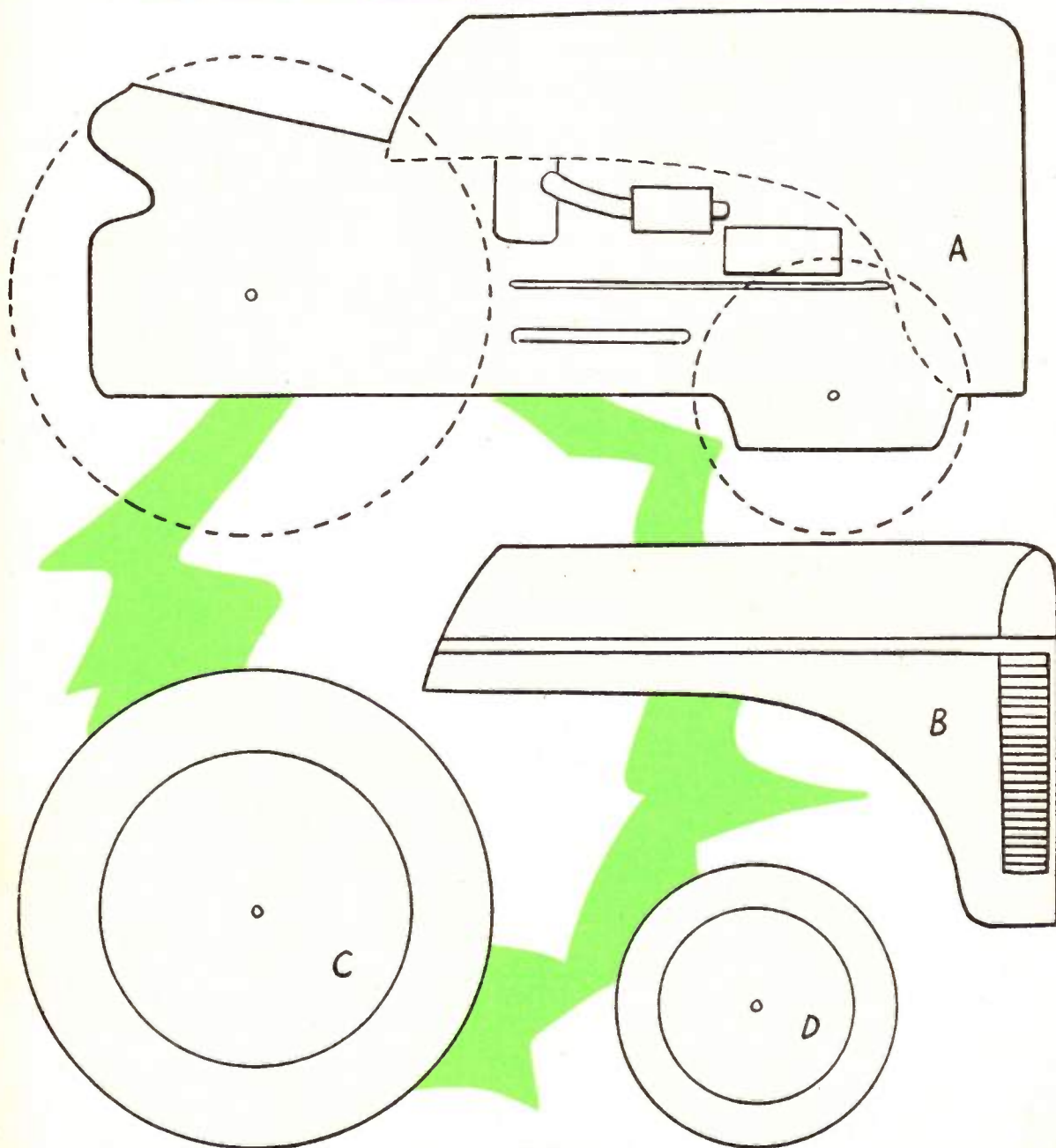
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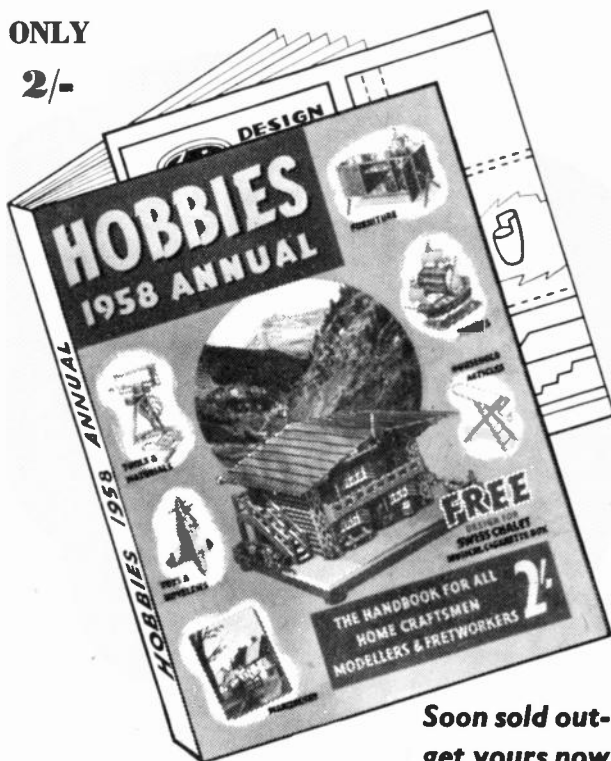
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