

Hobbies

WEEKLY

April 21st. 1943

Price Twopence

Vol. 96. No. 2479

A SOAP BOX WHEEL BARROW

NOW that everyone with a garden, or a patch of fertile soil, is digging up the results of their labour, the need for a barrow is sorely wanted, not only for the removal of garden refuse and other rubbish, but for the crop of vegetables. The need is even greater if the house is some distance away.

So, rather than annoy one's next-door neighbour by asking for the loan of a barrow all the time, we show you how you can make a barrow, the main part being an ordinary soap box! You can make everything, including the wheel, using only scraps of wood. The result is pictured at Fig 1, whereas a suggested size is detailed at Figs. 2 and 3.

The barrow, although cheaply constructed, is quite strong and serviceable. Naturally, it is intended for the small garden holder and, naturally again, light loads. Enamelled in the colours of black, green and light red, the barrow looks most workmanlike.

Selecting a Box

The size of the barrow depends on the size of the soap box obtained or available. Any large, well-built box can, of course, be used; in fact, if you have the wood to spare a box could be made.

A useful size is given at Fig. 2 and 3, a larger box could be used other than one measuring 22ins. by 8ins. by 15ins.

Assuming, then, that you have managed to obtain such a size of box, or one approximate to the size, carefully punch down all nail heads, adding extra nails where thought necessary. The rear end of the box may be cut to the shape shown, using a keyhole saw rather than a bow-saw.

Corner Blocks

Strengthen the corners by gluing pieces of corner blocking to them (see Fig. 1), the blocking running up the width of the sides to be flush at

the top edge. When shaped and spoke-shaved smooth, the barrow body is completed.

The Shafting

You now need two pieces of wood 40ins. long by 2ins. wide by $\frac{3}{4}$ in. thick. These make the shafts, and you could run the lengths of planking from an old door or from floor boards or shelving. If you have an unwanted clothes-line post stuck up in the garden, this—if 2ins. or 2 $\frac{1}{4}$ ins. square—could be sawn up the centre to provide the shafting material.

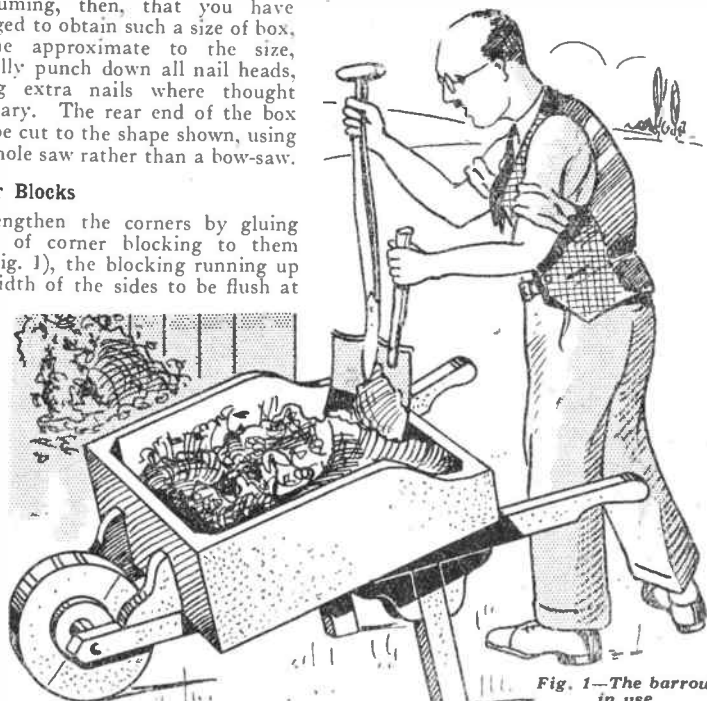


Fig. 1—The barrow in use

The 12in. long by 2in. wide by $\frac{3}{4}$ in. thick leg pieces are doweled to the shafts in the position shown at Fig. 2. Before doing so, however, shape the handle grips and bore a $\frac{3}{8}$ in. hole at the opposite ends.

Bracing the Legs

The legs must be strengthened at the shoulder with wood brackets called "braces." A detail of these braces appears at Fig. 3. You need eight of them, cut from $\frac{3}{4}$ in. wood so the grain runs diagonally.

Drill and countersink holes at the stem ends for flathead screws. Glue the braces against the shafts and legs as at Fig. 2, then drive in the screws.

To find the length and shape of the fore and aft cross rail pieces, lay

so the grains run crosswise with each other.

That ensures strength. It doubly ensures it if you have to use four $\frac{5}{16}$ in. wide pieces of wood to make up the diameter. The pieces are first rubbed together, then cut to shape when dry. They are attached together so the joins run crosswise as shown at Fig. 3.

Centre each side of the wheel disc with 4in. diam. by $\frac{1}{4}$ in. or $\frac{3}{8}$ in. hub discs. Allow the glue to set, then bore an $1\frac{1}{4}$ in. hole through the wheel working from both sides to ascertain the trueness of the boring.

Now, there are two ways the wheel can be fixed between the shaft forks. You can merely bore a $\frac{1}{4}$ in. hole about 2ins. deep in the wheel spindle ends,

If you prefer this idea, have suitable metal washers between the spindle ends and fork.

A Wheel Hoop

As a preventative against inevitable wear, the circumference of the wheel should be hooped with a strip of tin or any thin metal. The metal hoops around beer barrels is just the right stuff to use.

Tiny holes will need to be punched or drilled for the fixing nails. If you use thin tin, it would be a good idea to fix it on with metal heel studs, keeping these in a row (and fairly close together) near the side edges of the rim.

The studs will ensure lasting wear. The intervening spaces between them

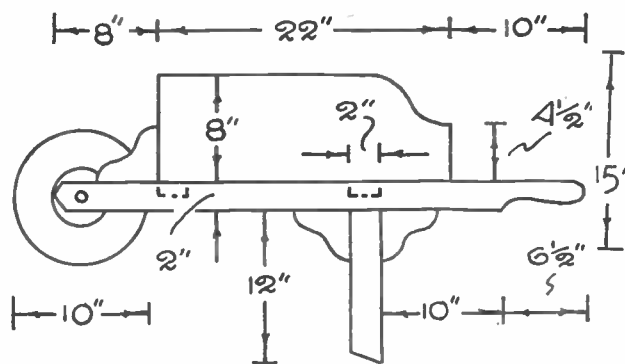


Fig. 2—Side elevation with various dimensions

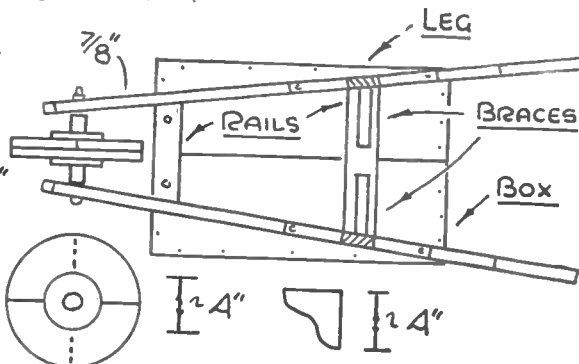


Fig. 3—Bottom view with bracket and wheel detail

the shafts on the bottom side of the body as shown at Fig. 3 and mark the position of both with a pencil. The rails are 2ins. wide, cut from $\frac{3}{4}$ in. stuff.

Nail them between the shafts at the correct distance. The rear end rail must be braced to the shaft legs. This is done when the shafts are attached (by screws) to the underside of the body.

The Wheel

Having attached the front fork braces, i.e., to the body front end and the shafts, the wheel can be made and fitted. It is built from two 10in. diam. discs of $\frac{3}{4}$ in. thick wood, gluing and screwing these together

then screw in "square-headed" carriage wood screws, using a spanner or monkey wrench.

Spindle Washers

Suitable metal washers must be put between the wheel spindle and inside of the forks, with one between the bolt head and outside of the forks. The other plan is to bore a $\frac{3}{8}$ in. hole right through the spindle (doing so from both ends) for a $\frac{5}{16}$ in. thick carriage bolt of the roundhead type.

The bolt is inserted through the spindle and "locked" on at the end with double nuts. The square-shanked end of the bolt will embed itself in the wood and prevent the bolt from turning with the wheel.

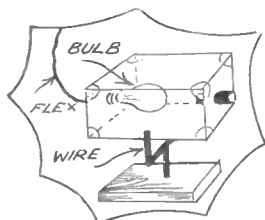
will, in time, become blocked with a hard crust of earth which will act as a preventative against wear.

To finish the barrow, enamel the body and shafts green, keeping the hand grips free. The wheel can be done black or light red, the same as the interior of the body. A single coat may not be sufficient, but in any case, you do not need a bright gloss which, of course, would soon become ruined with stones and rubble and so forth.

Apply a spot of thick oil to the wheel bearings. If the wheel revolves on axle bolt pins that turn in the forks, the best lubricant is graphite paste or even black lead. The latter is used for brightening up fire grates.

Simple Spotlight

HERE is a useful little spotlight— an electric bulb in a box. The casing is about 5ins. long and 3ins.



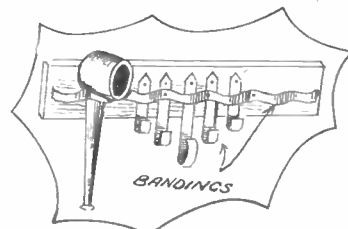
square with a plug at the back end to take an ordinary bulb. The inside of the box can be stiffened at the

corners and the whole mounted on a $\frac{3}{4}$ in. thick baseboard. On this is erected a wire stand which allows the light to pivot and swing in any direction. The lens in front of the bulb can be a magnifying glass from field glasses or any similar piece. The flex from the back leads to the ordinary point.—(D. B. Gardner, Cardiff).

Pipe Holder

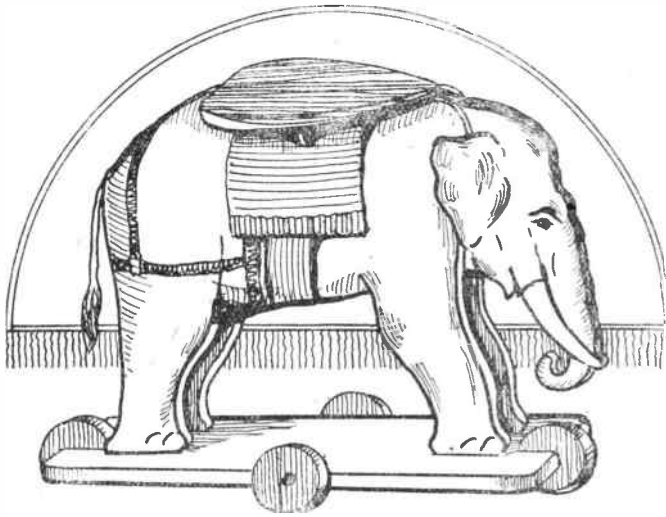
THE illustration is of a simple decorated pipe holder which can be made from a piece of wood and some of the metal banding ribbon strip used around packing cases. The metal is easily bent to form loops for

the pipe stems and nailed in position. Some odd short pieces, with ends curled or shaped can be fixed to make suitable decoration as can be seen in



the drawing. The back can be cut plain or to any ornamental shape desired.—(J. Carey, Blackpool).

Full details and outline drawings for making A TODDLER'S RUNABOUT



THIS little runabout can easily be made from deal and painted in attractive colours; a few screws and nails are all that is required. The fretsaw, of course, is needed for cutting round the shapes to form the body and for the base and seat. Deal $\frac{1}{2}$ in. thick should be used and a coarse grade fretsaw will cut this thickness of wood without undue labour.

The Elephant

The elephant itself is made up in three distinct pieces, two leg sections and one body and head section. These are glued together strongly and cramped up to get a sound fixing.

The squared outlines shown in Figs. 1 and 2 will be found useful for preparing the shapes of the main pieces. Set each out, therefore, upon a piece of deal, one piece measuring 11 ins. by 10 ins. and the other measuring 13 ins. by 8 ins. Through the squares make the enlargement for the legs following each square carefully with the thick line.

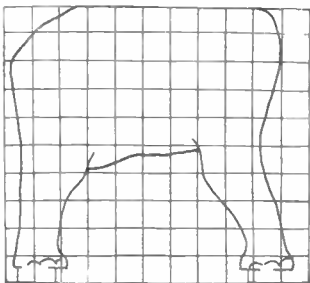


Fig. 1—Outline of legs portion

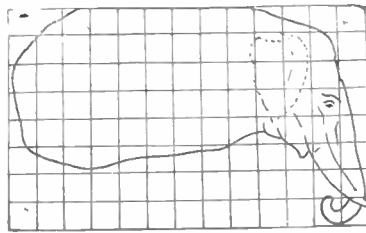


Fig. 2—Outline of body and head

For the body section the smaller piece of wood is used and the outline given in Fig. 2 faithfully copied. Clean round the edges with glass-paper when all the cutting is done.

To get the second leg section out easily and simply, lay the finished part on another board and

draw round it with a sharp pointed pencil.

The Floor

Now prepare the base or floor. The outline of this is given in Fig. 3 and it may also be cut from thick wood. The mortises for the tenons on the feet of the elephant should be marked off direct from the already-cut tenons so that an accurate fit may be made.

The slots for the two end wheels are shown 2 ins. long. These should, however, be made to suit a larger or a smaller wheel than that suggested, viz. $2\frac{1}{2}$ ins. diameter.

The axles, which may be of round iron rod about $\frac{3}{16}$ in. diam. are held by small hard-wood blocks glued and screwed to the underside of the base. Fig. 4 gives an underside view and shows the blocks grooved to take the iron rod axles.

Next glue the leg section into the base and allow the glue to harden before putting on the seat seen at Fig. 5. Wood $\frac{1}{2}$ in. thick will answer for this, 5 ins. wide and 7 ins. long.

After cutting and cleaning and smoothing the edges screw it to the body of the elephant with long sturdy

screws countersunk well into the wood.

Underneath the seat, and glued to the body of the elephant each side, are small thick wooden bracket stiffeners. They should be simple in shape and made smooth before gluing on.

A Padded Seat

Some sort of padding may be added on top of the seat and this covered with Rexine or other suitable material closely nailed round.

The ears of the elephant may consist of an overlay of wood glued on or they may be of some stiffish grey material glued in place.

The elephant should be painted up nicely and the belly-band and covering above done in red and yellow. The trappings may be of red or light brown.

The tusks should, of course, be painted cream colour. The floor would look well painted red, and the wheels coated in some contrasting colour.

Adding the Wheels

After painting has been completed the front and back wheels are put on, and the side wheels screwed in place with necessary washers inserted between wheel and base.

It should be pointed out that a cross bar of hard wood should be glued and screwed to the underside of the base to take these side wheels, and that the centres should be slightly lower than those for the front and back wheels. The runabout can thus be easily swung round by a gentle tilt either to the front or to the back.

Another method is to have the front and back wheel about $\frac{1}{2}$ in. smaller than the central ones. This will provide a rocking movement.

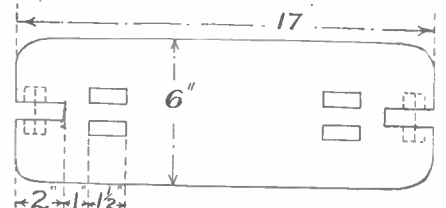


Fig. 3—Details of base and slots

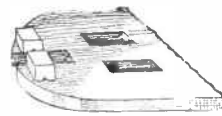


Fig. 4—The axle runners

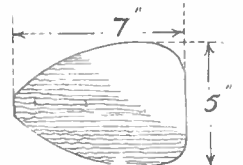


Fig. 5—Outline of seat

Design for King George V Battleship next week!

Another interesting stage to follow for the best in HOME PHOTOGRAPHY

NOW that you have succeeded in making your own negatives, as instructed in previous articles, there is no reason why you should not experience another great thrill—that of print making. To every amateur photographer there is a real delight when he sees a plain piece of paper suddenly produce, as a result of being soaked in a solution of chemicals, a drawing of a scene or person on which he had used his camera a few days previously, to the beginner the making of his first print is somewhat mystifying.

Assuming that you have a dark-room lamp with both ruby and orange glass and that you are still able to borrow the pie dishes, if you have not been able to acquire a couple of the regular photographic ones, there only remains a printing frame to purchase and a packet of Gaslight paper and one of M-Q (Metol-Quinol) developer. The frame is the most costly but it will last you a lifetime.

Sorting Results

One of the first things which every amateur should do when a batch of negatives has been selected for printing is to examine each for density. This is best done by holding each in a slanting position over a piece of white paper on which a good light is thrown.

If the negative is a thin one you will not see a lot of black image and it must be placed in the group of "thins". If it is particularly black and hard to see through, then it is placed in the group marked "dense." But if it is one that was correctly exposed and developed then it will have its dense parts as well as some that are on the thin side, but it will also have some intermediates known as half-tones or gradations. For the purpose we have in mind this group will be named "normal."

Correct Procedure

This grouping is really a very wise move, for it helps you to gauge exposures quickly without wasting time and material and you will soon find that it will help you in many other branches of the hobby.

Some readers may have already tried making prints and perhaps have not been too successful. Well, try to follow the details as we go along and you can be sure that your next efforts will be quite all right.

The packet of M-Q developer should be opened and four ounces of water placed in a measure. The packet contains a small one in which is packed the Metol and the Quinol, (this latter word is short for Hydroquinine). This mixture must be dissolved in the water first and then

you can put the other powder in the measure for dissolving. See there are no particles of chemicals left undissolved. In another measure or tumbler you will require to get the acid-fixing bath ready, so take one ounce of the powder and dissolve it in 15 ounces of water.

Your printing frame should have a piece of clear glass in it. Clean this and make certain there are no "bits" or particles of dust left on it. Place it in the frame again and on top of it put your negative with the dull surface upwards.

Into Orange

Now switch off the white light and turn the orange on. If you have not got an orange glass then you must use the ruby. Open the packet of paper and take out one piece, returning the remainder to the bag or envelope and putting the packet away from the solutions.

The paper is coated on one side only and it is this side which has to be placed in contact with the film. You will note this means that the emulsion side of both film and paper are brought together. Put the back of the frame in position and fasten it down.

Now we arrive at the question of exposure and while it is not possible to give the exact time for any negative if you use the following particulars as a guide you will not go far wrong.

Normal grade negatives placed at 12 inches from the light require six seconds exposure to a forty-watt electric light; the same when an incandescent gas has to be used; and 30 seconds if the source of light is a duplex-paraffin lamp.

Well, there is the exposure time, and you can go ahead. When the sheet is exposed turn out the white and put on the orange light, remove the paper from the frame and place it in

the bottom of one of the dishes with the emulsion side upwards. Gently but quickly put the developer solution over it, taking care to avoid air-bells. If you do make one put your finger on it quickly.

The Picture Arrives

In about half-a-minute you will see signs of the picture and in 1½ minutes it should be complete if the exposure was right. If it is very grey then it wanted longer, if it was very dark after the 1½ minutes then it required less. Remove it quickly from the developer and without hesitating plunge it into the fixing bath in the other dish.

See it is completely submerged and move it about for a few seconds to allow the fixing to attack it completely. After ten minutes in this you may turn up the white light to examine it and to experience the thrill of your first print.

Now place it under running water for half an hour to wash and then pin it in a suitable spot, as free from dust as possible, to dry.

All this sounds particularly easy

(Continued foot of page 23)

Have you tried AZOL? It's a fine developer for Roll Films

Azol is a one-solution liquid developer. It is very easy to use. All you have to do is to add water. A quarter of an ounce of Azol and six ounces of water will develop two eight-exposure films. You can buy Azol from

any good Photographic Dealer in 3-oz. bottles or you can send for the Trial Offer below. It's much more interesting to do your own developing and printing. You miss half the fun of photography if you let someone else do it for you.

AZOL

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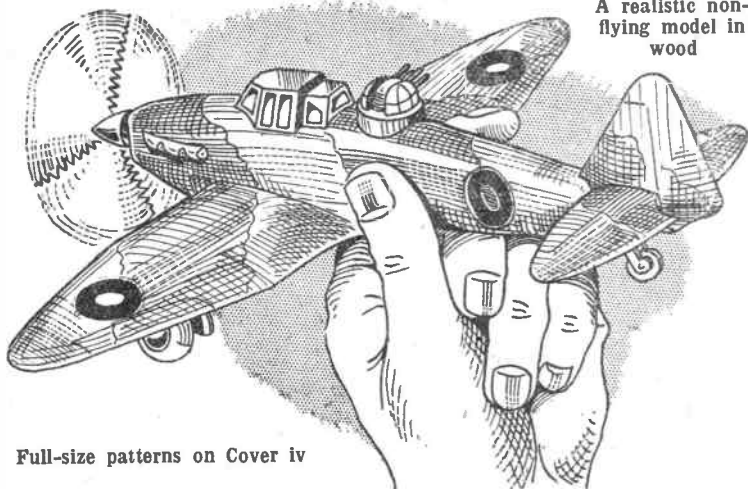
Special Trial Offer :

For 2/3 P.O. Johnsons will send you post free (G.B. only) a trial set of Chemicals, including 1-oz. bottle of AZOL, to develop eight spools 2½ in. by 3½ in., 4-oz. tin ACID-FIXING, making 30-60 ozs. solution, one packet AMIDOL DEVELOPER, enough for 2 to 3 doz. bromide or contact gaslight prints.

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Final details and Pattern Sheet No. 2 for our MODEL "DEFIANT"



A realistic non-flying model in wood

Full-size patterns on Cover iv

WITH last week's issue we gave patterns for fuselage, etc. and instructions for building the main parts. The fuselage, tail, wings and fin were dealt with.

When you have shaped up the fuselage satisfactorily, the base of the gun turret is glued behind the cabin at the distance shown. It is possible that you will have to file the underside of the base to rest correctly on the fuselage.

The best way to ensure correct fitting is to lay a small strip of No. 1½ glasspaper over the work and rub the base on it several times. When glued in place, drill a hole through into the fuselage, then screw on the gun turret. The turret must screw in, so be sure to drill an adequate hole for the bolt thickness. Four guns, merely gramophone needles, are stuck in the gun turret, as shown. It is advisable to drill the holes for them to prevent splitting the wood.

Engine Exhausts

Glue the exhausts to the nose of the fuselage at the position to be judged from the top view (Fig. 2) and side elevation (Fig. 3). The tail is fixed to the rear end by drilling two panel pin holes through the stem, these being driven into the tail wing via the underside.

Use ¼ in. long panel pins. The fin or rudder, is pressed down on the projecting points in line with the fuselage. See that the tail wing is true horizontally and that the fin sits perfectly upright.

It may be necessary to put tiny blobs of plastic wood (or putty) in the corners formed by the rear end of the fuselage, wing and fin. Glasspaper the end of

the stem flush with the fin where it meets at the bottom.

Patterns of Parts

With the No. 2 sheet of patterns (see Cover iv) you can proceed to complete the model. So trace out the full shape of the main wing on a piece of wood measuring 11 ins. long by 4 ins. wide by ¾ in. thick. Pick a piece of decent wood for the wing—a bit free from ugly knots and cross-grains and nail holes (if you happen to be using parts of boxes.)

Cut it to shape, then pare the wings shape as sectioned on the pattern. In this respect, the taper should be planed (at the underside) first. Just do the wing shaping roughly.

The central ends of the wing are bevelled (as sectioned) to fit, as a dovetail into the fuselage, as illustrated at Fig. 4. It may be found necessary to trim the receiving dove-tail in the fuselage, especially at the ends.

The wing should fit fairly tightly into the fuselage, at a slight angle.

Having fitted the wing truly in the fuselage, pencil the bottom shape (at the sides) on the wing centre, then remove the wing and pare the waste wood away to these lines. This results in a perfectly cut and shaped main wing.

Fitting the Motor

As stated in the previous article,

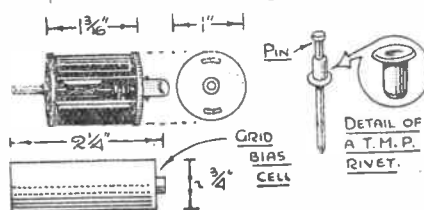


Fig. 5—Details of motor, battery and rivet

we show a drawing of the tiny electric motor used (see Fig. 5). We also show the battery cell sizes, including the type of stud rivet used for the propeller shafting.

Such a rivet is known as a "break" rivet, but is more commonly called a T.M.P. rivet. All you need is the rivet, and not the pin to which it is usually attached. So, take off the rivet and file it about ½ in. long, then insert it in the nose of the fuselage (see Figs. 2 and 4). Of course, any similar sort of rivet can be used—even the bored end of a small key.

The idea of the stud rivet is to give the propeller shaft as much freedom as possible, as well as providing a suitable bearing (which can be oiled) on which to revolve. At the spindle of the motor goes a ½ in. length of rubber tubing (a piece of ¼ in. diam. electric cable wire will give you a suitable piece of tubing, the three copper wires being withdrawn). The tubing is fixed halfway on a spindle of the motor so the shafting can be connected (see sectional side view).

Motor Contacts

Now, the motor will have two brass contacts at one end, as shown in the drawing. These must be cut short, cotton-covered coil wire fixed to them, then be bent over flat so they do not touch each other.

Having fixed the wire to these contacts, with the rubber tubing on the spindle, insert the motor in its chamber and connect one of the wires to the brass contact strip. The latter is fixed in its cavity with a single screw (use a flathead screw) as shown by the sectional side view and the top view.

The other wire stretches over to the rear end of the battery cell aperture where it is fixed by means of a drawing pin which serves as a contact for the "stud" end of the battery.

It will now be seen that the switch contact must be as flat as possible so as not to touch the zinc case of the battery when it is inserted. The contact must touch the cell only when

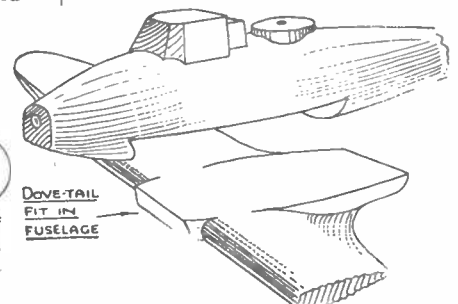


Fig. 4—How the wings dovetail in

forced down by the turning of the gun-turret bolt.

Testing the Motor

When you have carried out the fore-going instructions, insert the battery cell. To keep it pressed against the drawing pin, a piece of thin card should be inserted between the battery and the motor, the card also serving to insulate the battery from the motor contacts.

Push the main wing into the fuselage. By turning the gun turret in a clockwise direction, the bolt should press on the contact and press it against the battery. This action, of course, completes the electrical circuit so that the motor begins to hum and gather speed.

If running O.K., switch off. Do not, of course, use an almost-exhausted battery cell for the test. The motor is primarily intended for running off 3 volts, but experience shows it runs well on half that voltage, providing the cell is full of power. In fact, the motor, if in good condition, will work on a $\frac{1}{2}$ volt, but that is the limit.

Wheels and Propeller

The under-carriage can now be dealt with. Cut out two leg pieces from 3/16in. plywood and two cover pieces from thin, stiff card or 1/16in. plywood or fretwood. The cover pieces are glued behind the legs to make them into rights and lefts, as seen in the side elevation.

Cut suitable mortises for the leg tenons at the underside of the main wing (you could merely drill holes for the tenons, by the way). The position of the leg-holes is about $3\frac{1}{2}$ ins. in from the wing tips and $\frac{3}{4}$ in. inwards from the leading edge of the wings.

Prior to gluing in place, make the wheels, rounding over the edges as detailed. Connect the wheels to the legs with roundheaded brass upholstery tacks. The heads of these tacks, or nails, forms an excellent hub, as you can see.

Fixing the Legs

When attaching the legs to the wing, the covering pieces give a shoulder to the tenons and cause the legs to "splay" outwards at the sides a trifle, this being an effect that is wanted.

When making the propeller hub, mark its length on a piece of $\frac{1}{4}$ in. dowelling about 2ins. long. Drill the shaft hole dead central, then drill the blade holes so the blades will go in upright and at the correct angle with each other. You will have to divide the end of the dowel into three and rule the corresponding lines down the sides of the dowel, following which the three holes are drilled $\frac{1}{4}$ in. deep.

Cut the hub to length, then point it to its shape. The three propeller blades are cut from 1/16in. wood, the edges glasspapered sharp, then the tenons inserted into the hub holes. The wire shaft is glued in its hole in

the hub; incidentally, be sure to see that you have the necessary twist in the blades done the right way, i.e., so they try to pull the model forward.

Other Details

To make the tail-skid wheel fitting, cut the fork shape in thin brass or tin and drill the axle pin holes. The forks are formed by bending the metal flat in the centre and then spreading out the "lugs" suitably for the wheel, the latter being cut from 1/16in. or $\frac{1}{8}$ in. wood.

Round over the edges of the wheel and drill a pin hole in its centre. Put the wheel between the fork, insert a plain pin through, nipping off the projection near the fork. A suitable hole is bored at the rear end of the fuselage, at a slant, then the fork inserted and the hole packed up with wax or plastic wood, or putty.

The Radiator

The radiator is shaped from a small block of wood as shown on the pattern page, then glued to the underside of the main wing in the position indicated by the dotted lines. The oil cooler is also shaped up, as detailed, but it must be only a tight fit in the fuselage. The air vents in both accessories are first made with the end of a bradawl; there is no need to make the vents too deeply.

To complete the model, paint it in the standard camouflage colours of dark brown and green. The "targets" can be painted on later with

yellow, blue, white and red stuff, or you could possibly obtain suitable transfers.

The underside of the model can be done the same as the rest of the work. The under-carriage, legs and covers, however, could be painted black. The wheels are done grey with the hubs black or silver. The exhausts, oil cooler, radiator and the air-screw is coated with silver paint. The cabin and gun turret are painted silver and the window frames painted on with black enamel. All other markings are carried with black ink or paint.

Elastic Motor

As previously stated, if you cannot obtain a miniature electric motor of the type recommended, fit an elastic one. All you need to do is to make a wire propeller shaft with a small hook at one end. Insert it through the nose end of the model, then fix the propeller on to its plain end.

A small hook is screwed to the rear end of the cavity in the fuselage. A suitable elastic band is inserted over the hooks. The elastic band must not be too short in the length: it must be just short enough to hold the propeller properly in place when unwound.

Apply a touch of soft soap to the elastic as a lubricant. Oil the shaft bearing. If the nose is faced with thin plywood, a couple of tiny metal washers, or a glass bead, must go between the propeller hub or the nose of the machine.

Wall Newspapers

MANY of our readers no doubt, would have liked to start your own club, or school or canteen magazine, but owing to lack of paper have had to postpone the idea. Why not, then, start a wall newspaper? All you need is a notice board, a pair of scissors and some tacks.

It is really very simple. You clip cuttings out of newspapers and magazines and pin them on the notice board. Simple, isn't it? But there are one or two tips to know.

Do not pin your notices just anywhere on the board. Keep one column for sports, another for news, club notices, adverts., pictures, cinema news.

The canteen manager, your headmaster or club leader or even the vicar will probably be too pleased to let you have a short article to pin on the board. Any of the lads with any exciting experiences can be induced to write something for you.

Now comes the problem of when to change the notices. Do not change one notice here and another there. Change the whole lot at once. With the writer's newspaper, the matter is changed once a week; people then

know when to look for a new issue. If however, there is an urgent message to be placed on the board and you wish to put it there without changing any other material, put a piece of coloured ribbon round the notice to attract attention. Alternatively, leave a space at the bottom right of the board—head it "Stop Press" or "Late News" and put your item there.

Have a column for advertisements, such as "Bicycle for Sale" or "Guinea Pig Exchanged for 50 Cigarette Cards." All your friends will have something they will want to sell, buy or exchange. Here is their chance to advertise it.

Another feature would be jokes and cartoons which you can either cut out of some of the magazines or write them yourselves. Why not give a prize of some sort for the best joke of the week? This will keep up interest in your newspaper.

There are so many other topics which you can cover such as:—stamps; photos of aeroplanes; notes about your friends in the Services and A.T.C., etc.; exploits of the Royal Navy, the Army and the R.A.F.; New books of interest and short articles on various hobbies.



Piano Key Stains

IS there any substance that will remove the yellowness on piano keys and restore them to their original colour? (K.F.—Bradford).

REMOVAL of the yellowness of piano keys depends on what they are made of. If of ivory, use oxalic acid, or rub the surfaces with very fine glasspaper and polish with whitening.

If the keys are covered with artificial ivory, such as "Nacrolouge," use acetone or amylacetate applied fairly freely at first, until the surface softens, then finish off and re-polish with a clean linen rubber, gradually reducing the amount of acetone until the rubber is practically dry.

This latter process is carried out just like French polishing, but using acetone instead of polish.

Tent Camouflage

WHAT is the best method of camouflage to use upon a new ridge tent? (E.I.P.—Woodbridge).

YOU can readily camouflage your tent by painting it with ordinary oil paint. The usual colours are middle green, yellow ochre and black, applied in wavy bands and blobs of the various colours. This colouring would be permanent and easy to do. For a temporary job you could use "oil bound distemper" in similar colours, but it is not so durable.

Motor Power

CAN you give me any advice on the procedure of making or obtaining some kind of motor power for a small toy car? (G.G.—London, W.C.1).

THE difficulty in advising in a practical way is due to the uncertainty of what can be obtained under the present war conditions and restrictions.

Probably the two most likely forms of motive power for the toy motor car are, either a powerful clock-work motor or an electric motor.

The clockwork motor could be

coupled to the back axle by gear wheels, or by a small round belt. Some kind of stop or brake device must, of course, be fitted to stop the clockwork motor.

In the case of an electric motor, it must be suitable for D.C. current and should have a current consumption of under $1\frac{1}{2}$ to 2 amperes if it is to run for any time off a 6-volt car battery. Reduction gears are essential, as the motor must run at a fairly high speed—usually about 1500 to 3000 r.p.m.—to develop its power, and this calls for a reduction gear of 10 or 20 to 1.

Gear or worm wheels can be used, if they are obtainable, but a simple plan is to fit a small pulley on the motor spindle and drive by a round belt to a wheel, say, five times as large in diameter.

Another small pulley should be fixed to this large wheel, and a belt from this second small pulley should drive to a large pulley on the axle.

Bronzing

I HAVE been making some metal articles from tin steel and I want to give them a bronze-looking finish. Please tell me what to use. (R.M.—Yaxley).

PAINT them with yellow or light brown cellulose lacquer, and while still "sticky," blow "bronze powder" on to the surfaces. The powder is very finely ground metal, and flies about like dust, so do the job in an enclosure of some kind, such as a large box.

A Wet Canoe

A FOLDING canoe was dismantled after use and packed in the carrying bags. When taken out some days later I could not assemble and cracked one or two of the longerons in trying. It seems that the deck canvas must have shrunk to some extent. (F.S.—Cork).

FOLDING canvas canoes should never be packed up wet and left in that condition, as shrinkage and distortion are almost certain to

result from such misuse. The boat should be dried while extended in boat shape. The only remedy would appear to be to replace the cracked longerons by new ones of similar size and material.

The deck canvas, if badly shrunk, might resume its original shape if well brushed over with raw linseed oil and left for a day or two. Otherwise, carefully unfasten the nails or other fixings at the places where the canvas is tightest, assemble the boat and refix the canvas.

Battery Loss

I WISH to make a cycle lamp of a I bias battery. I have made the container of thin wood and the gadget works, but I find it fuses 2.5-3.5 bulbs. What bulb should I use? (W.E.B.—Southampton).

YOU are putting the whole 9 volts output of the grid bias battery through a 3.5 volt lamp. All you need do is to "tap off" the required voltage by putting the plug connector in the appropriate socket. Use a 2.5 or 3.5 volt lamp, put one plug in the + terminal and leave it there; put the other plug into the socket marked - 3 (the second socket from the + end), then when the light goes dim after use, plug into the next socket and so on, until you ultimately reach the last, by which time the battery will be completely exhausted.

Repolishing a Table

I WISH to polish an oak table I have made in the fumed or waxed oak style. Could you please supply me with information? (C.L.W.—Scotland).

THE only way to make it possible to polish it is to strip the whole thing of the waxed surface. The polish cannot be applied over this, and it will, in consequence, be necessary to scrape down all the parts carefully.

This can be done with a scraper or coarse glasspaper, finishing with a fine grade to get a perfectly smooth surface again. Your fuming, of course, will have sunk well into the wood, and it will be virtually impossible to get this away. The wax, however, will have left only a film coat and should not be difficult to eradicate. Then you can start polishing.

Photography—(Continued from page 20)

and simple—and so it is. But gas-light printing is not fool-proof, and there are snags to avoid.

We have told you which of the powders to dissolve first. You have also been told to hesitate to plunge the print into the fixing bath from the developer. If you examine the print after taking it from the developer and keep it exposed for even a minute or two you will inevitably

find brown stains on the print when you take it from the washing water to dry.

Many workers use a between-bath, called a stop bath, which is made by dissolving $\frac{1}{4}$ ounce of Soda Metabisulphite in 5 ounces of water. If the print is placed in this from the developer no stains will occur.

Another cause of stains on prints is due to under exposing and trying to

force development. It is also the result of using an exhausted fixing bath. If you should by any chance spill a few drops of developer on the floor or in the bath or washing bowl mop it up with water before it dries, otherwise stains will arise which cannot be removed. If you are working over the bath see that some water is at the bottom before starting.

