

# Hobbies

## WEEKLY

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SUPPLEMENT DESIGN SHEET FOR A TABLE BOOK HOLDER

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## A Working Model of a SWING BRIDGE

WE are giving our model makers another interesting piece of work this week in the form of a Swing Bridge. It is made wholly from wood, and it stands on a base board measuring 14ins. by 9ins. by  $\frac{1}{2}$ in. thick. The completed model is shown below but in this sketch a more or less imaginary view has been introduced, showing realistically the canal or lock-gate channel over which such a bridge would span.

We are indebted to Messrs. Horsley Bridge and Thomas Piggott, Ltd., of Tipton, Staffordshire, for illustrations as a guide for the model. This bridge, however, is not true in its full sense.

It does, nevertheless, amount to more than a mere toy, and could be added to in many respects to make realism in a more finished model.

### Type of Bridge

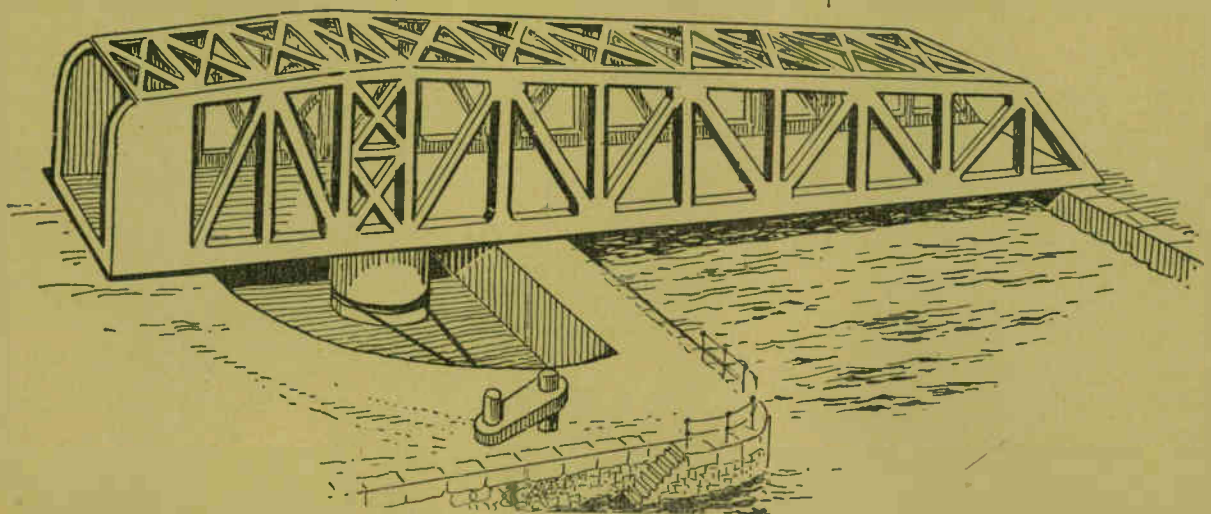
The bridge is of single-span to swing across a river or canal. The mechanism, causing the bridge to open and close, is partly below ground, but there is a semi-circular "well" in which the bearing of the bridge works and is pivoted.

The turning action is by a belt which passes round the main support and runs along to an "underground" vertical shaft at the top of which, and above ground, is located a crank and

handle. All this is clearly seen in the sketch and is described here in detail.

Commencing to make the model, we cut a piece of  $\frac{1}{2}$ in. wood 14ins. by 9ins. in size, to form the base. At one end of this piece, glue on two thicknesses of  $\frac{3}{8}$ in. wood glued together to make the pier or landing for the extended end of the bridge. At Fig. 1 we see these pieces which are 9ins. long by  $1\frac{1}{4}$ ins. wide.

Next there are three pieces of  $\frac{3}{8}$ in. wood to form the main ground work for the working end of the bridge. These are seen also in Fig. 1, as A, B and C, and the measurements to which they will be cut are all shown on the pieces A and C. The radius of



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2½ ins. for the circle is got from a point 1½ ins. in from one edge, while the narrow border edge facing the pier is ¼ in. wide in both A and C. (Fig. 1).

On piece A, however, the front strip may be cut right through and afterwards glued up as shown. Note must be made of the gap on the left of the diagram of piece A. This is formed for the power belt to work in, the upper piece, C, covering it over. The position for boring the holes for the vertical spindle is shown on piece

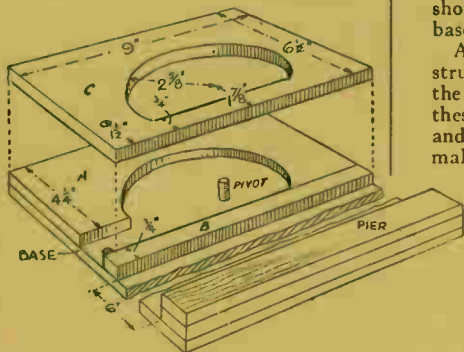


Fig. 1 - Base with pivot pin

C as 1½ ins. back and it should be ¼ in. centre from the edge.

It would be best to set out the whole shapes of the two pieces, A and C, on to paper, and then to lay this pattern on the wood and either prick through the various points ready to connect up in pencil, or to transfer the outlines by means of carbon paper direct to the wood. Pieces, A and C, can now be glued together, and piece B also glued to the underside of C.

### Spindle and Crank

Before these pieces can be glued to the main base, the spindle and crank shown as D, E, F and G in Fig. 2, should be made. First cut a piece of ¼ in. round rod, D, 1½ ins. long and round off one end which will come above the ground level.

Next, make the washer, E, from ¼ in. or 3/16 in. wood ¼ in. diameter. This must fit tightly on the spindle, leaving ¼ in. clear below it. The crank, F, is made about 1½ ins. long and ¼ in. wide at its widest point. A short piece of rod is glued into this to form the handle, G.

Having then the four components cut neatly and cleaned up, first glue on the crank, F, to the spindle, D, and then insert the end of the latter through the ground section, C. The spindle should turn freely but not loosely in piece, C. Now put on the washer, E, allowing, as stated, a distance of ¼ in. below it to act as pulley and end to work freely in a hole in the base which is shown in Fig. 1.

The main base can now be glued on, or if desired, and it may even be preferable, to screw the base to the pieces, A and B, in case it is found

necessary to make certain adjustments to the spindle, etc.

Before commencing construction of the actual bridge, a glance at Fig. 3 helps to give an idea of the working parts. The main base is here shown with pieces, A, B and C, and the outer pier all in position on it. The pivot round which the bridge will swing is formed from a piece of round rod ¼ in. diameter and 1 in. long.

The position of this pivot is shown in Fig. 3 and its centre should come 4½ ins. from the edge of the base, as shown. Glue the pivot firmly in the base.

At Fig. 2 we see the simple construction in outline. There are only the four pieces connected with it, and these consist of the floor, two sides and the top. First then, line out and make the floor 12 ins. long, 1½ ins.

lattice work top to the bridge which connects the two sides is made from fairly stout cardboard, to the pattern given in Fig. 5.

### Girder Pattern Sides

Measurements are here given, but the lattice work and the uprights can be got quite simply by following that of the sides of the bridges as seen when the two diagrams are placed together side by side as Figs. 4 and 5. When a clear pencil line has been made of the complete pattern, and the same transferred to the card, all the cutting through of the spaces can be carried out by using pieces of safety razor blade.

In gluing on the card top to the sides of the bridge, fix the end marked H first, gradually pressing down the card until it comes to the wide end where it may be reinforced underneath by gluing small angle blocks or fillets about the size of wood matches. Gently clean up the surfaces of the wood parts and the card and paint up or stain to individual taste.

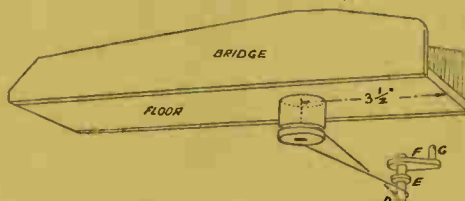


Fig. 2 - Underview of turning mechanism

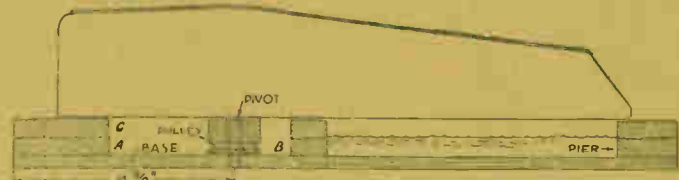


Fig. 3 - Section of bridge, base, piers and pivot

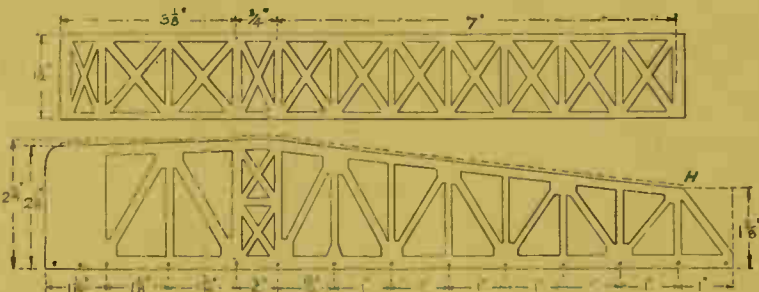


Fig. 4 - How to mark out the lattice side of the bridge  
Fig. 5 - (above) The lattice-work top to bridge

wide and ¼ in. thick.

Next make the sides, and here is where the test of patience and good cutting will tell, because they are both of lattice work girder principle. In Fig. 4 we have the diagram of one of the sides set out with all necessary measurements for drawing out on to paper or on to the ¼ in. wood direct. It would be preferable to make the diagram full size on paper.

Two pieces of the ¼ in. wood should be pinned together, with the pattern, then stuck to the upper surface ready for cutting with the fretsaw. The two sides are thus cut in one operation. When cut and cleaned up they are glued and fret-pinned to the edges of the floor as shown in Fig. 2. The

The underneath support to the bridge where it rests over the pivot consists of an ordinary cotton reel trimmed round and cut to length of ¼ in. A deep groove should be formed round the pulley (Fig. 3). After a final clean up, the pulley is glued to the underside of the floor at 4½ ins. centre, so that it fits accurately over the pivot bar of the base.

It only remains now to put the finishing touches to the bridge, then it can be placed over its pivot on the floor and the pulley underneath connected up to the crank by means of a thin cord or an elastic band. The channel of water between the two piers could be represented by a piece of glass measuring about 9 ins. by 6 ins.

# Hints on how the amateur can easily undertake CASTING LEAD TOYS

**C**HRISTMAS is a time when lead toys, such as soldiers, men on horses, tanks, guns, etc., sell like hot cakes. Of course, these sell easily most of the year round—if low in price. It is, however, towards Xmas that “trade” is good, not only for a shopkeeper, but the manufacturer. Both can show a profit that is reasonable and satisfying.

There is another side to lead toy manufacture. You may, perhaps, have built a model fort and require a regiment of men, with officers. By buying a couple of moulds, you can cast all the men you want—dozens and dozens of them, providing you have plenty of scrap lead. Unfortunately, there is rather a shortage of old lead these days, and as for new stuff, the cost is too high.

Now, to help in keeping down the amount of lead required, manufacturers of toy moulds design the latter so that models are not too bulky—some are quite flat, in fact. This in no way spoils the appearance of the models, but it does certainly save precious lead.

On the other hand, there are moulds which seem to require an awful lot of lead before filling up. These are avoided by the wise home manufacturer, and amongst such heavy castings may be mentioned the larger scale models of individual soldiers, men on horseback, etc.

## The More Popular Size

The more popular scale is the 2½ in. high class. In other words, soldiers, officers, etc., stand no higher than 2½ ins. Men kneeling, lying full

length, etc., are all in proportion to the height of 2½ ins. Some models may be 2½ ins. or 3 ins. high, but this is merely the overall height, as the models may have an arm upraised, or may be shouldering a rifle and so on.

Such models are fairly easy to cast. Often, however, as in the case of the soldier illustrated, there is difficulty in having full detail reproduced in the casting. The gun barrel, or its magazine, for example, is rather thin, and the lead must be poured in via the head end. This means that the lead must work upwardly and horizontally within the mould. Lead, properly melted, will do so easily enough.

## Heating the Metal

It must be “boiled” lead, however. By “boiled” lead, it is meant lead which, upon melting, is heated long after the melting point has been reached. At the beginning, too, the aluminium mould should be heated slightly. If cold, it chills the first casting, and the result will be an incomplete model.

There is no need to “soot” the inside of the mould with the flame of a candle. A “lining” of soot will facilitate the removal of the casting, of course, but the soot is apt to spoil the reproduction of detail.

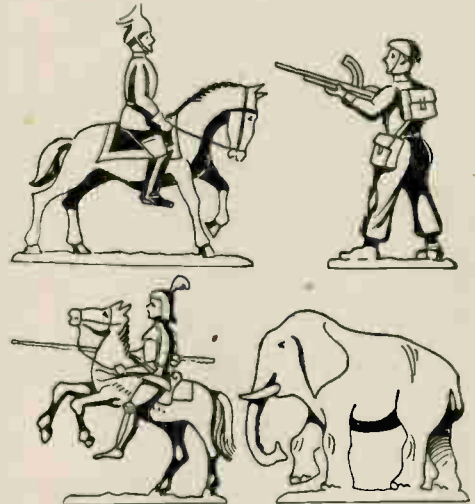
Quite a variety of items can be cast in lead. Apart from modern soldiers, tanks, ships, etc., there are such things as knights in armour, farm-yard animals, domestic and wild animals, and so forth. Moulds are made in brass or a hard aluminium alloy. A complete mould consists of two halves which, by a couple of pins, engage properly together. The halves shown are typical of other moulds.

As the moulds get extremely hot after the first few castings, they need to be held, with wooden handles. These handles, which can be rough pieces of wood, fix upon a screw attached to each side of each half of the mould. Alignment of the two halves must be perfect, otherwise a noticeable “join” will be seen in the castings, which means trimming all the time to

have the models really looking like models.

## Casting a Model

We will assume you have a mould, such as the type shown, and some scrap lead and a melting ladle. The latter can be a type as used by plumbers, or a substitute, such as an old aluminium soup ladle, or even an



A few examples of toys which can be cast in lead.

ordinary cocoa tin with a pouring “lip” bent in its rim.

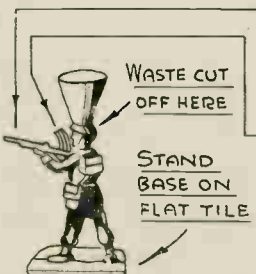
The tin, however, like the aluminium ladle, will burn out in time. Moreover, a tin, or the aluminium ladle, does not preserve the heat in the molten lead to the same extent as an iron ladle. Lead has a low melting point of 620 degrees F. Aluminium is much higher, but in attempting to “boil” the lead in the manner previously mentioned, it is quite possible that the aluminium melting point will be reached. A zinc ladle is worse again. Iron is the best metal so far as melting ladles are concerned.

## The Two Moulds

While the scrap lead is melting, fix the mould halves together, using a clip bent from a strip of sheet metal. Fix wooden handles to the handle screws, then set the mould, pouring inlet upwards, on a flat tile or piece of metal.

When the lead has melted sufficiently, draw off any scum floating on the top, then proceed to pour the lead, in a fine continuous stream, into the mould. Fill the inlet hole right up to the top and tap the mould lightly so the lead “settles”

(Continued foot of page 4



GUN BARREL IS HARD TO CAST COMPLETELY IF LEAD RATHER COLD  
MAGAZINE OF GUN OFTEN INCOMPLETE DUE TO POOR RUNNING OF MOLTEN LEAD

The two halves of a mould for casting the soldier illustrated.

# From a few odd bits and pieces can be made a SIMPLE WOODEN GUN

**H**ERE is a realistic gun made with the simplest of materials. It can be constructed with or without the leading wheels. The latter are, of course, fitted to artillery for transport purposes, being uncoupled when the piece goes into action.

The model copies no special type of gun but has the general characteristics of several kinds and when completed looks quite good.

## The Wheels

The wheels are two "slices" cut from a section of circular rodding, say an old curtain pole, and as the general size of the gun depends greatly on the size of rodding you can get, no dimensions have been given in the diagram. Once, however, you have obtained the discs for the wheels, dimensions for the rest of the gun can readily be gauged.

When cutting discs from circular rodding it is always best to use a fine saw and cut to a rather generous width at first, taking the discs down to the thickness desired by rubbing "flat", on suitable glasspaper secured to a perfectly level surface.

Centres, too, must be carefully found, but this is not hard using a compass. With the central leg placed against the disc the compass is swung and marks made at both sides, where the pencil strikes the circumference. Now move the leg to one of these intersections and swinging again from circumference to circumference make two more small lines where the circle is cut. Now join the opposite pairs of marks and the point at which the lines so formed cross one another is the centre. Using a fine pencil this gives the desired location very accurately.

Once found, drilling should be carried out with some care, as nothing looks worse than wheels running out of centre.

## Gun Body

The main body of the gun is the

## Lead Toys—(Continued from page 3)

properly. Tapping helps to release trapped air.

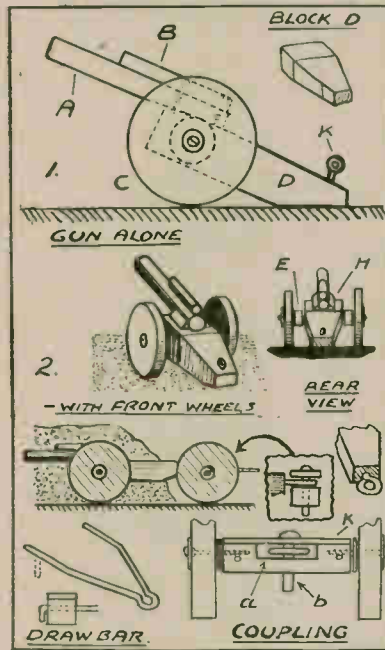
In a few minutes, the casting can be removed from its mould. Do not try to cool the mould under a water tap or by dipping into cold water.

## Touching Up

The casting may cling somewhat to one of the halves. By gripping the "spud" of unwanted lead at the head end of the model with nippers, the casting can be taken away. Do not use great force, otherwise the model will be bent out of its true shape.

block (D). This is shaped out of one piece, the sketch showing the general configuration.

At the back, the under side is cut away to make the gun stand well and the width at the axle end is such that the wheels will require the two spacers



(E) to give the finished gun a well-balanced appearance. The wheels themselves are attached by long small-diameter screws.

## Barrel

The barrel is a length of dowel about half as long again as the diameter of the wheels. A shorter piece is also required for the top (B) as shown.

Both pieces are attached to the block (D) by two long modelmaker's pins and two triangular pieces (H) are fitted, either by further pins or glue, to give extra strength and to add to

the appearance of the finished model.

If making the gun alone, a further addition is the "screw eye" fitted at the end of (D). This both gives the impression of an item of equipment and acts as a place to fasten a "pull-about" string if so desired. The front wheels, however, finish the model off best and are well worth making.

## Coupling Unit

In attaching toy guns to front axles the trouble is that unless a special coupling is made the rear part tends to pull the front section to an unsightly angle—hence an ordinary hook and eye coupling will not do. The coupling shown in the sketch, however, is quite satisfactory.

The front axle is cut out as (a) so the flat part in the middle is about level with the screws through from the wheels. A second strip (K) is then fastened on top by two or three small sprigs.

A hole is now bored down the exact centre of the axle and strip (K) into which a short bolt (b) can be dropped. A screw-eye is firmly secured horizontally in the end of the main block (D) and the coupling is complete. The parts are joined by slipping the hook-eye through the slot in the axle and dropping the bolt through the holes. A small length of chain would keep the bolt from being lost and retain it as a definite part of the model.

This coupling is very strong and keeps the front axle level (which is the main thing) when the gun is pulled along. It also allows of steering and is "universal" in action.

To be quite modern, a simple wire draw-bar is fitted. This is easily shaped out of wire and is attached by the ends going through two horizontal holes. The ends then being bent over.

A draw-bar of this type will do to attach a "pull string" or make it so that the gun can be fastened behind some already existing toy trailer. The gun is finished in buff with patches of dark green to give the impression of camouflage.

The spud of lead is removed with the nippers and the roughness touched up with a file. Joint trimmings are removed by paring with a penknife, and the model is ready for finishing. If incomplete, it will have to be re-cast. After a few trials, of course, you will get into the way of casting models in lead.

## Finishing

Special art enamels of a non-poisonous nature should be used for finishing lead toys in colour. The best kind of finish is cellulose paint

which has the advantage of drying rapidly. Models are ready for packing or handling in about an hour, in fact. Ordinary enamel paint takes about 24 hours to dry.

Use natural colours, incidentally. If a tunic is red, paint it red. Boots are usually brown or black. The base is either brown or green. Horses may be black and white, brown or dappled. Soldiers in battledress, to give variety, can be in various colours, such as brown, dark blue, red tunics, with blue trousers and black boots, etc.

# Patterns, and particulars on how you can make HOME-MADE XMAS CARDS

**A**LTHOUGH Christmas may seem a long way off it is not too early to prepare your own Christmas Cards. Here, and in subsequent articles are details and diagrams of a simple, inexpensive and pleasing method.

Christmas cards printed from home-made lino blocks sometimes look amateurish in comparison with the results produced by the stencil process—a new technique devised by the writer, tested and found successful—even on blotting paper! An example of what can be done is shown at Fig. 1.

Other suggestions are provided, and it will be seen that quite a lot of varied work can be accomplished with stencils. Furthermore, lino blocks have to be cut in reverse. This is not the case with stencils. One can plan out the design as it will appear on the finished card, and if



Fig. 1—Completed card showing attractive novelty and modern appearance

Dozens of simple attractive colourful greetings cards are possible. One may sell them wholesale to shops or retail them to "regular" customers, the latter procedure ensuring more profit, of course.

### Card Manufacture

When the stencils are cut and set for printing, cards can be turned out at the rate of one complete card every 3 minutes. By "complete" card, a card bearing three different "impressions" is meant, i.e., it may have a front design, an inside back greetings section and an inside front verse section.

A two-impression card is illustrated at Fig. 1, actual-size impressions being provided as patterns on page 11. The wording is unusual, but novel and striking. It will be noticed that there is a great deal more in the phrase "Greetings from me to the friend I can always say I have found sincere!" than there seems at first glance.

When the card paper is properly folded, as at Fig. 1, we find that only the end letters of the greetings phrase are shown and these give us the words "See inside!" Thus, you save time and obtain extra words, apart from providing novelty and originality. Naturally, if you wish to cut out the special big kiss, you can do so; but some people might like to see it on the card, so include it in your stencil when preparing it.

### Making the Stencils

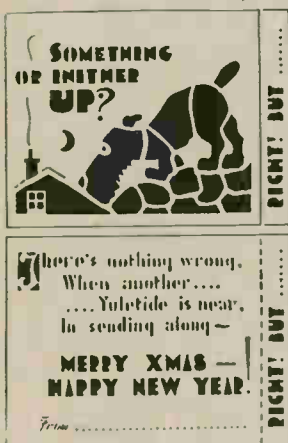
The writer made his stencils from sheets of exposed undeveloped X-ray film. This film, by the way, is

double-sided, super-sensitive stuff, light khaki in colour. A complete sheet of the film (12ins. by 10ins.) provides four 6in. by 5in. sheets, the next largest size (15ins. by 12ins.) giving two extra portions.

The 6in. by 5in. portions just suit the dimensions of the greetings card paper, when folded (see Fig. 2), with enough overlap to prevent smudging the paper with the stenciling brush. A ream of plain white water-marked "bond" typewriter paper is suitable material for card manufacture, using quarto size (10ins. by 8ins.).

You are, no doubt, wondering where you can obtain exposed undeveloped X-ray film. The best place is a local hospital. Accidents will happen, and as spoiled X-ray film is useless for any other purposes, the X-ray operative may give away such film, for it is usually destroyed or thrown out as waste.

It is better to try and obtain undeveloped film, because one can pencil lettering and design on its emulsion surface. Mistakes can be erased with a soft rubber, and besides, if one side becomes badly



Front and inside details of another design you can mark out for yourself

desired, the design—providing there is no lettering introduced into it, such as the words "GREETINGS" or "KIND THOUGHTS"—can be printed in the reverse way to make a change in appearance.

### For Everybody

The preparation of the stencils and the printing of the cards constitutes an ideal hobby for most individuals, whether young or old, of either sex. It will be of particular interest to those with enterprise and a natural aptitude for art and neatness in doing things.

One has three months in which to prepare cards for the festive season.

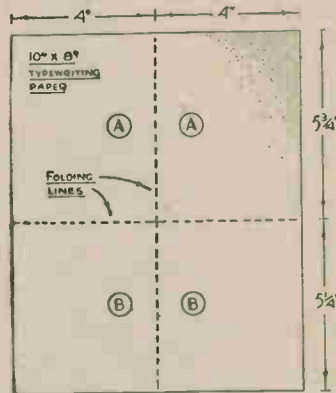


Fig. 2—How the typewriter paper is folded into four section

smudged, the reverse side can be used.

If only old developed film can be obtained, this resembles ordinary photographic film. In order to use it, it is necessary to wash off the emulsion from both sides, this leaving a clear blue-tinted transparent celluloid sheet. All the stencil designs and lettering need to be first pencilled on paper and the cut size of film thumb-tacked on top to prevent shifting when cutting the stencil.

(To be continued)

This is the First Issue of Volume 107

# In buying and selling there are always certain THINGS TO KNOW

**I**N these times of shortages, restrictions and high cost of living, it makes one to be on the alert and keep an eye on the activities of possible "spivs" in all our dealings with various people, particularly strangers. We need to use sheer common sense.

The trouble is, of course, that many of us never realize we are regarded as "easy pickings". We just wonder why all sorts of things are offered us, or palmed off on us. Here, then, are a number of "cases" which are worth reading about.

\* \* \*

**I** RECENTLY purchased a fine-looking portable gramophone in perfect working order, apparently. When I got it home, wound up the spring, and tried to play a record, the motor could not take the strain. It got slower and slower until it stopped. When I tried it, before buying, the turntable seemed to revolve properly. I cannot understand how I have been tricked.

**Y**OU might have been hoodwinked deliberately, or it is just possible that the secondhand gramophone might have been repaired by its owner before disposing of it, such as the spring, which is obviously, rather weak from improper hardening and tempering. The entire spring, rather than the broken parts of it, has been tampered with, spoiled, and the machine sold as being in perfect mechanical order. In view of the fine appearance of the gramophone, it would be worth while having a new spring fitted, and if the dealer had done this, he might have got a better price. If you obtained the machine at a low bargain price, this proves that the dealer realized the spring was weak and worthless and made due allowance for the cost of the fitting of a new spring, in which case you can hardly complain. Dealers often sell things at the face value, and if you are wise, always have the article thoroughly tested in every way before purchasing it.

\* \* \*

**A**LARM clocks, as you know, are scarce and expensive. I got a good secondhand clock the other day at a market. The man had it sitting on its back on the stall counter, and the clock ticked lively and merrily. He held it up for me to see, turned it all about, and set it down again, as before. I thought nothing of this, and bought the clock. When I got home, it had stopped. I wound it up a little, set it on its legs, and after ticking for a few minutes, it stopped. It stopped repeatedly in this way, and finally placing the clock on its

back, I found that it continued to tick and keep going. But, must I always have it lying on its back?

**W**ELL, no, it may only require some little adjustment, perhaps cleaning and oiling. Dust and fluff may have gathered round the balance wheel and is interfering with the action. A hair could do this. Alternatively, the pivot points of the balance wheel spindle may be slack in their bearings. Play safe, and let an experienced clock-repairer adjust the clock mechanism and overhaul the works, if necessary. When you saw the clock on its back, and returned to the same position, did not some sixth sense warn you that something was amiss? It always pays to heed these fleeting warnings which occur at times to all of us.

\* \* \*

**I** BOUGHT a dandy folding camera, a type I have always wanted, at a "I-buy-anything" store. It was an expensive model, and I gave a good sum for it. Unfortunately, I find that many of my best snaps are "clouded" sometimes, as though I had let sunlight shine into the lens. In appearance, the camera is very new, as if hardly used.

**A** new-looking, expensive camera, at a bargain price, is apt to make the best of us too hasty in making a purchase. Where secondhand cameras are concerned, the first rule is to test it for pin holes, particularly the bellows type. Being so new in appearance, you doubtless did not feel that such a test would be necessary. But it is, no matter how a camera looks. That is where you made a bad mistake, and we think that if you inspect the bellows carefully, you will find a small pin-hole or opening somewhere in the folds of the leather. A patch of black cloth adhered within the bellows, will rectify matters.

**M**Y mother recently sent a gramophone cabinet to an auction. It was a good type, hardly ever used, and in good condition. A few weeks later, she received a cheque for the grand total of 40 shillings. The cabinet cost eight guineas pre-war, and would be worth three times that much these days. Surely this is ridiculous?

**I**T is not only ridiculous, but a shame, although it is not the fault of the auctioneers. Your mother, if she had been wise, should have offered the cabinet gramophone for sale at a fixed minimum price, which would be fair to both the owner and the buyer. This would have been arranged by mutual agreement between your mother and the auctioneer. These days people prefer radio-gram cabinets. There were probably few interested buyers. The woodwork of the cabinet alone, however, was really worth more than £2. The motor itself was worth £2. The bidder must have realized what a wonderful bargain he was getting. You must however realize it is all a question of supply and demand and whether the right people are at the auction.

## BOYS - MEN!



Give your varnishing & polishing that professional look!

Here is a unique new woodworkers' Varnishing and Polishing kit produced

by specialists for you. It contains 1 Jar Rustin's Stain, 1 Jar Varnish, 1 Jar French Polish, 1 Jar ' Kwiksolv ' Paint Remover, 1 Bottle Linseed Oil, 1 Bottle Thinners, 1 Bottle Methylated Spirit, 2 Sticks Wood Stopper, 1 Tin Woodfiller, 1 Polishing Rubber, 2 Sheets Glass Paper and Full Instructions. Complete from your local store or carriage paid 10/6d. Get your outfit to-day.

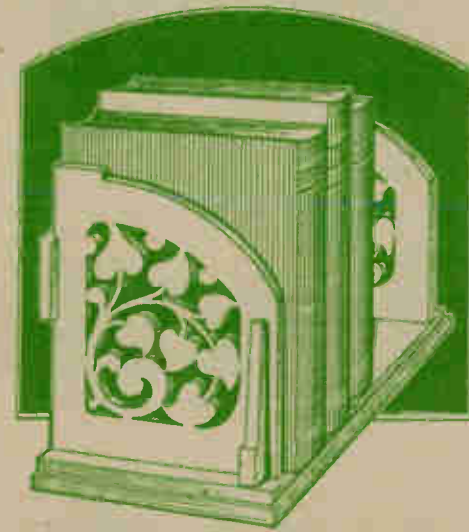
FROM STORES  
ON  
CARR.  
PAID  
from

**Rustin's**  
WATERLOO RD. LONDON · NW2

SUPPLEMENT TO HOBBIES No. 2762.

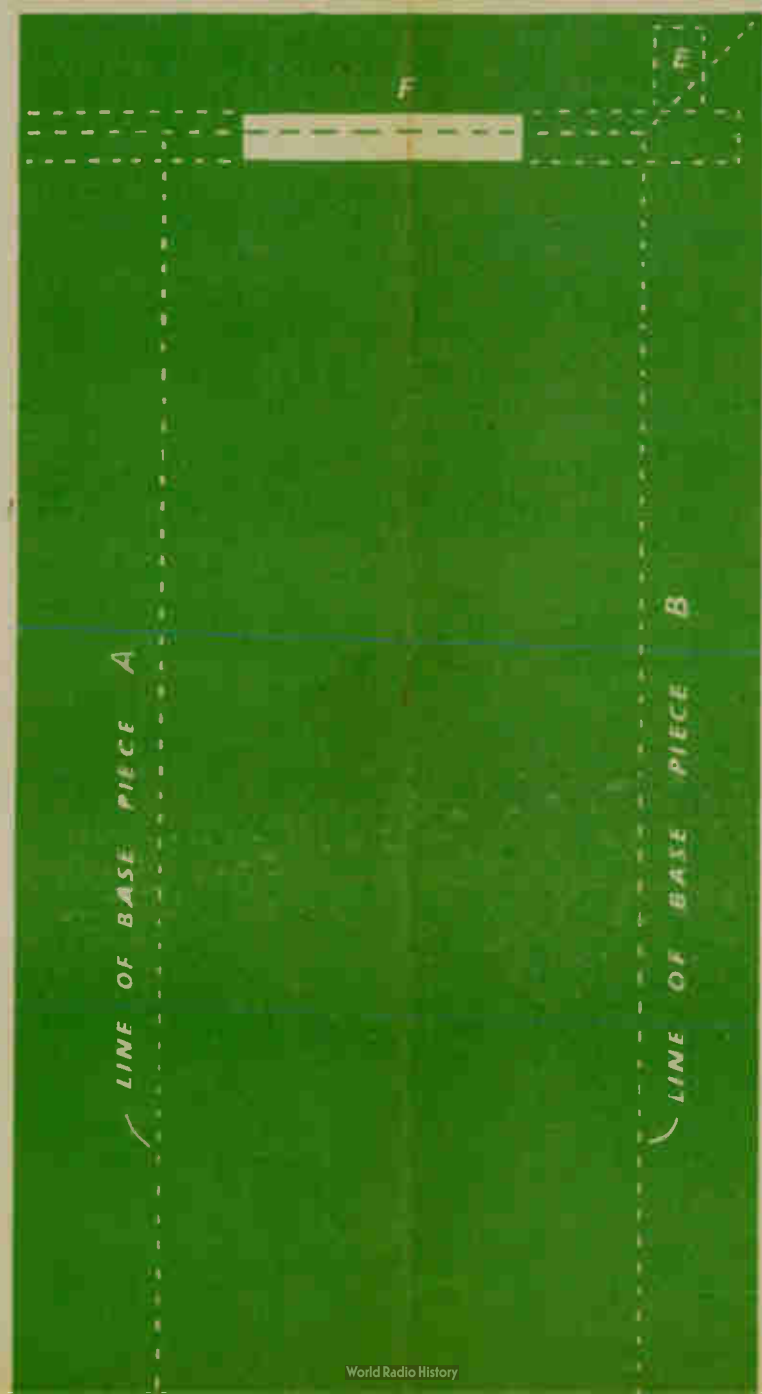
# THE "MIDGET" TABLE BOOK RACK

SIZE—9ins. LONG, 5ins. HIGH.



A VERY USEFUL RACK FOR THE SMALLER SIZE BOOKS.

PANELS OF WOOD REQUIRED FOR THIS DESIGN  
**THREE G4**  
The price is shown in Hobbies Weekly, October 6th, 1948, but is subject to revision. See the current edition of Hobbies Handbook, or write for price to Hobbies Limited, Dereham, Norfolk.



## TABLE BOOK RACK

**T**HIS piece of work is made from  $\frac{1}{2}$  in. wood, and is a useful size to take the small popular books of the Penguin type. The patterns are all straightforward, and the ends are the only parts to contain actual fretwork. This decorative pattern can also be omitted if a more plain result is desired, but in that case it is advisable to put a small transfer or an ornamental button on the end to relieve the plainness.

The three panels of wood supplied, measure 9ins. by 4ins. each, and the patterns are printed in position so that the whole lot can be pasted down exactly as shown. In the case of the base pieces, a single cut between the pattern is sufficient to provide two edges, thus saving a good deal of work. The base is composed of two parts. The lower portion is a hollow frame, and a detail is shown how it is fitted together.

### The Rails

Notice the back rail (A) comes between the two ends, whilst the front rail (B) is mitred to fit. In gluing together, keep all four quite flat until the glue has set hard.

The second or upper base is a complete piece into which the end uprights are fitted at F. Cut the ends out and see that the tenon joint in the base is a satisfactory fit. Then glue the base itself to the framework previously made, keeping the back edge in line with the lower portion.

In erecting the ends (which are

later glued in place) notice the back edge is in line with the back of the base. The front edge is thus set back a little, as you can see in the picture of the finished article. Between the two uprights is a back rail (D). A slight recess is made in the ends for this.

### Assembly

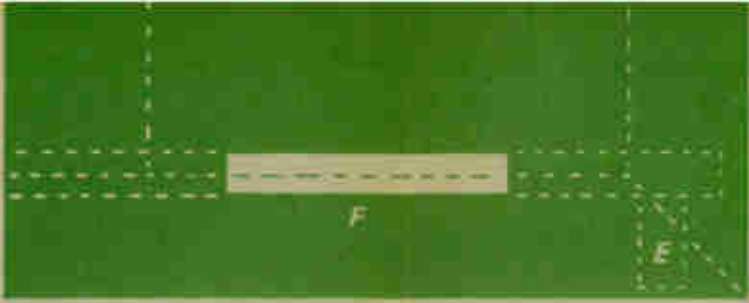
This opening, however, is not the same thickness as the wood, because if it was sunk any further, it would decrease the depth provided for the books. A portion of the rail, therefore, projects beyond the uprights, both at the ends and behind. This rail is glued in place, and if you think fit, a couple of small screws can also be added. If a good fit is made, however, they should not be necessary. The method of fitting is shown in the detail on the sheet.

A little ornamental key piece (E) is glued to the base and along the side of the upright  $\frac{3}{16}$  in. back from the front edge of the latter. Its position is shown on the pattern of the end. Get an accurate rightangle and glue firmly so the part provides a strengthening piece for further rigidity of the whole thing.

The Stand is thus completed, and it merely remains to stain and polish as desired. Further additions can be made by lining the ends on the inside behind the frets to make them more attractive, and to add tiny round feet below the base to raise the whole thing slightly.



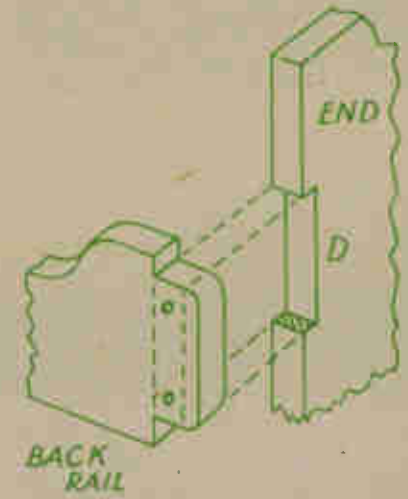
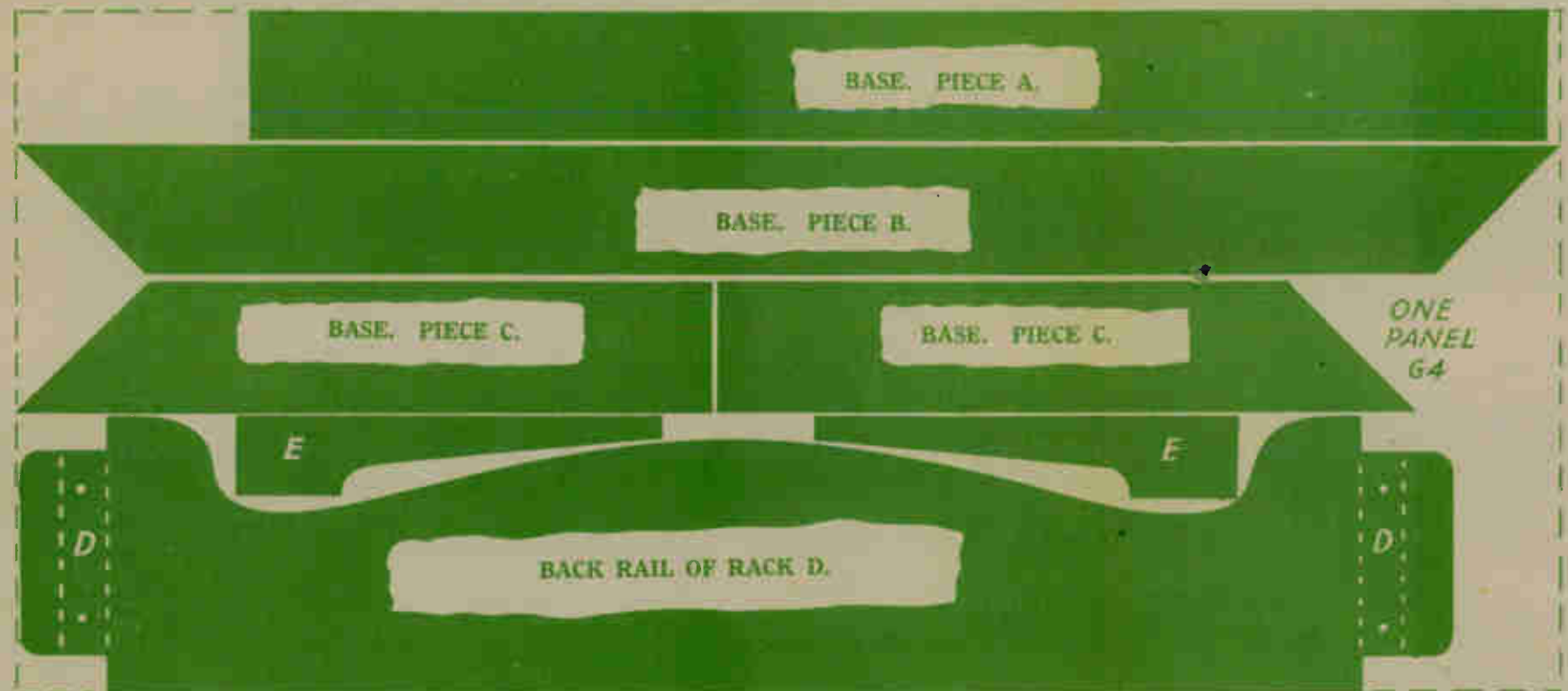
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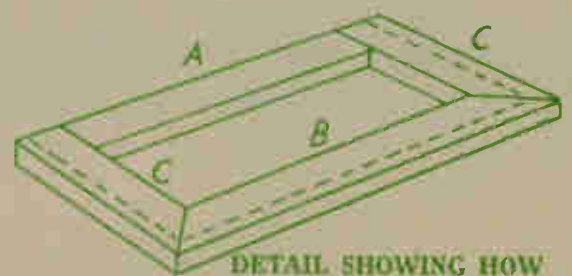
USE A FINE SAW FOR CUTTING THE FRETTED ENDS OF THE RACK.

PATTERNS FOR ENDS OF RACK. THE WHOLE PIECE ENCLOSED BY THE DOTTED LINES CAN BE PASTED DOWN TO THE PANEL OF WOOD, AND THE ENDS CUT FROM IT.

UPPER BASE. CUT FROM ONE PANEL G4.



DETAIL SHOWING HOW BACK RAIL IS RECESSED INTO END.



DETAIL SHOWING HOW THE BASE IS MADE. THE UPPER BASE IS GLUED TO THIS TO THE DOTTED LINES.

PATTERNS FOR BASE AND BACK OF RACK. THE WHOLE PIECE CAN BE PASTED DOWN TO THE PANEL OF WOOD AND THE PARTS CUT FROM IT.

PRINTED IN ENGLAND.



# The second of our interesting articles how to do HOME METAL WORK

**C**ONTINUING our series of articles of metal work for the amateur, we deal, in this second article with soldering. The handyman about the house should be able to solder just as easily as he can fix a kitchen shelf, or put new hinges on the door. Leaking buckets and pans find their way into the dustbin when ten minutes with a soldering iron could make them useable again. Perhaps an effort has been made and the pan or bucket is adorned with unsightly blobs of solder which entirely fail to stop the leak.

Yet—soldering is really quite easy providing you observe the rules. Of these, cleanliness is by far the most important. Ninety per cent. of

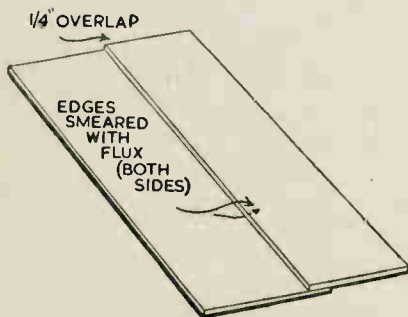


Fig. 1—A practice joint to try

soldering failures are caused by insufficient cleaning of the part to be soldered and, as a result the solder does not strike and sometimes even falls off again as it cools.

## Preparation of Surfaces

Whatever the job—repair or constructive—the part to be soldered must be filed—scraped—or emiered right down to the metal itself. Dirt—paint—galvanising—or discolouration must be ruthlessly cleaned off and only when the whole surface is absolutely bright and clean can you even consider trying to solder it.

This cleaning requires patience and takes up three-quarters of the time needed for a soldering operation, but you will never achieve a satisfactory job if you skimp this part. A job cannot be too clean and perseverance will pay good dividends later.

## A Warning

There is one metal that cannot be satisfactorily soldered in any way—namely—aluminium, and you will only waste your time if you try. This is due to the composition of the metal in itself, and no method has yet been evolved for dealing with it.

True—there are certain liquid

compounds advertised as suitable for soldering aluminium, and may, in some cases, achieve a temporary repair, but, for all practical purposes, aluminium may be classed as unsuitable for soldering.

## Care of the Iron

In order that molten solder may be picked up and transferred to the job, the tip of the iron must be tinned. "Tinning"—by the way—is something of a misnomer, as actually the operative part—or bit—is made of copper.

Now—your iron may or may not be tinned when you buy it, so a word on how to tin it yourself. First—heat the iron to a dull heat in a bright fire—quickly clean the flat surfaces of the tip with a file—dip tip into flux and apply a little solder, wiping smoothly all over the tip with a piece of old rag.

Never—at any time—allow your iron to get red-hot, or the tinning will be burned off and it will require re-tinning, as per above—before you can use it. Always get the iron as hot as possible without actually getting it red-hot. Insufficient heating means extra trips to and from the fire, and, untidy soldering.

By the way—if you are using the kitchen table as a bench, always cover with thick paper as blobs of hot solder may burn the woodwork. Also—most fluxes are both highly corrosive and poisonous and may later be transferred to foodstuffs.

## Soldering a Joint

Take two small pieces of metal—say about 2ins. square and thoroughly clean one edge of each to a depth of about  $\frac{1}{16}$ in. on both sides. Next, mark a  $\frac{1}{4}$ in. margin on one piece and, while your iron is heating, smear a liberal coating of flux all over the cleaned edge on both sides. Put your two pieces together, the edges overlapping up to the  $\frac{1}{4}$ in. mark (Fig. 1).

You have made a simple joint—your surfaces are clean-covered with flux, and you are ready for your first attempt at soldering.

See your iron is the correct heat—quickly dip the tip into the flux to clean it—and touch lightly your stick of solder. You will find that a small blob of solder will adhere to the tip of the iron. In order that the maximum heat may be transferred to the job, let the flat of the iron rest along the line of solder (Fig. 2) and—starting at the end farthest away from you, move slowly and evenly along the joint.

The solder will spread smoothly as you progress, and you should try to do the full length in one operation. If your effort does not look very

presentable, it is due to one or more of the following reasons:—

## Faults and Remedies

1. You run out of solder before completing the joint—dip deeper into your stick of solder before commencing. In the case of a long seam—or an iron too small to retain sufficient solder—melt off a few small blobs from the stick and place at suitable intervals along the joint.

2. The surface is rough and uneven after soldering—your iron is not hot enough—or you used it at an angle that brought only the tip in contact with the job—or—your movement with the iron was not regular and steady.

3. The solder does not readily adhere to the job—either the surface has been insufficiently cleaned or the flux has been applied too sparingly.

4. The iron will not pick up solder—tinning faulty or burned-off by overheating—treat iron as previously indicated.

It will help if you hold the pieces in position with the tip of a file to prevent them moving during soldering.

If you have faithfully observed the rules as outlined, you should now

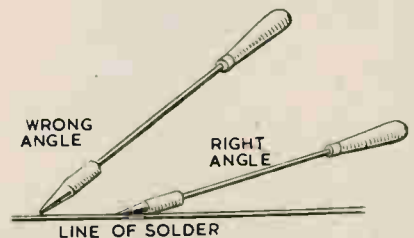


Fig. 2—Correct use of the iron

have a strong smoothly finished joint that should stand bending. Test it yourself.

After any soldering operation, always clean off the flux, as otherwise it would eat into the metal. A brisk rub over with a damp piece of rag will easily remove all traces. Burn the rag after use.

Finally—do not be discouraged if your first attempt is not too successful. Faults can be remedied—clumsiness turned into neatness by diligent practice—and you will be able to repair those leaking pans and buckets.

Remember that cleanliness is the watchword of the successful solderer.

The next article  
will be on simple things to  
repair in the home

# Having made our Home Press, here are some necessary PRINTING ACCESSORIES

**C**ERTAIN accessories needed to practice the art of printing can be made at home without expense. For instance, type cases (which are rather dear to purchase now), also a composing stick. Both these are dealt with in this article, and should prove helpful to those, who having made or bought a small printing press, desire, not unnaturally, to start printing with it.

Small founts of type can be purchased quite reasonably, and the cases to hold them made from any suitable wood handy. Small cases only are required for small founts of type, and the size given in Fig. 1 will serve nicely. Interior dimensions are given, so that any reasonable thickness of wood can be used for the case sides and bottom without amending the figures.

## The Tray

First make a tray, as at A, with sides and ends  $\frac{1}{2}$  in. high, using a simple tongued and slotted corner joint, as seen in the diagram. For the bottom, a thin wood like fretwood or plywood is really best, but as these are both in short supply, moderately thin deal could be utilised.

A few pieces of tongued and grooved  $\frac{1}{2}$  in. thick matchboarding

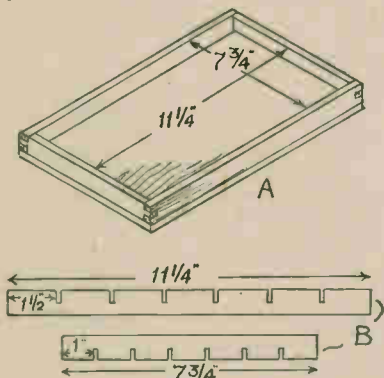


Fig. 1—The shallow tray and its partitions

would suit nicely. Glue together and fix to the tray firmly with small screws. Cover the inside surface of the tray bottom with a sheet of thin white papered cardboard.

For the division pieces, cut 6 of each of the long and short strips of wood, shown at B, from  $\frac{1}{2}$  in. by  $\frac{1}{2}$  in. fretwood. On one of each set out the slots, which are  $\frac{1}{2}$  in. wide and  $\frac{1}{2}$  in. long, spaced as shown. The first spaces only are dimensioned, but the remainder are the same.

Now cramp each lot of 6 divisions together, and saw out the slots through the whole 6 at once. Fit them together with a spot of glue to

each joint, dab a little glue on the ends and bottom edges, and press in the tray.

If the case is for holding a fount of type composed of capital and lower case letters, instead of capitals only, the case should be made double, though two of these single cases used side by side can be used if the size of the double cases is inconvenient.

## The Composing "Stick"

When setting up the type a composing stick is really necessary. It is held in the hand, and when the type is set in lines it is lifted out and transferred to the chase. Fig. 2 shows how to make this desirable accessory from  $\frac{1}{2}$  in. or  $\frac{3}{16}$  in. fretwood, C, being the "stick" minus the slide.

It can be made, say, 8 ins. long, or any length convenient, the two pieces of wood being fixed together at right angles with glue and small fretwood nails. It is usual for the slide to be at the right end, though in

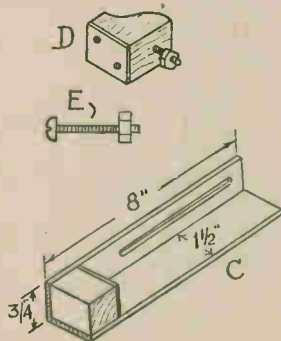


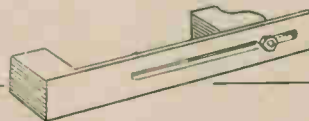
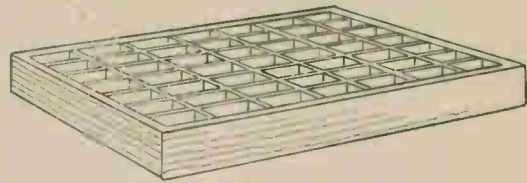
Fig. 2—The stick for setting type

the drawing, C, it would apparently be at the left.

## Metal Faced Block

It is not really a matter of moment, but as it is more convenient to arrange for it to the right the end block should be the opposite end to that shown in the drawing, where it has been reversed inadvertently.

The block is a solid piece of wood, well glued and screwed at the end. The inner face of this should be covered with sheet metal, fixed with two countersunk small screws. The slide, D, is of the same height and width as the block, but a little



longer. It is shaped as shown.

Into this a screw bolt, like that seen in E is driven in tightly. It should project about  $\frac{1}{2}$  in. and, of course, enters the slot in the "stick" where it can be moved along to suit the length of type line to be set. The inside surface of the slide is also faced with metal, like the block.

An important point is to make sure both block and slide form true rightangles to the stick. This can be tested by moving the slide until it touches the block, when both surfaces should close evenly together.

## The Roller

Another important accessory to the printing craft is the roller. This is covered with a special composition, obtainable from any printing stores. A hand roller is often used, even where a self-inking arrangement is in force. It is used for inking the types, preparatory to pulling a proof, and, of course, for all the inking when the press is of simple home construction.

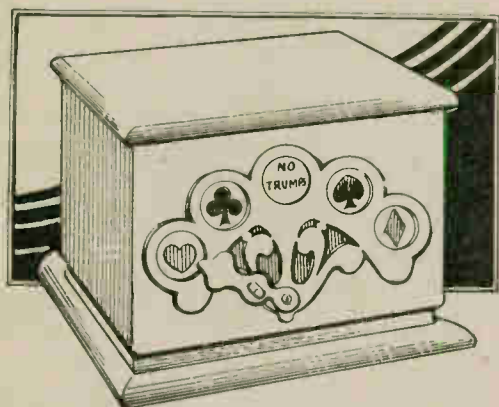
Having decided on the required length of the roller, the "length" being that part to be covered by the composition, cut the roller stock  $1\frac{1}{2}$  ins. longer. The stock can be a round metal rod,  $\frac{1}{2}$  in. diameter for a roller up to 6 ins. long. A mould will be needed in which the composition can be cast.

A useful mould is sketched at F, Fig. 3, a length of brass tubing  $\frac{1}{2}$  in. longer than the length of the roller. The diameter of the tubing should be  $\frac{1}{2}$  in. according to the roller's length, inside diameter. This is closed at both ends by discs, cut from  $\frac{1}{2}$  in. plywood.

As shown in the diagram, the discs are centrally bored to admit the stock,

(Continued foot of page 10)

# A Trump Indicator can be added to the front of this PLAYING CARD BOX



**T**HE novelty Card Box and Indicator given here should be very popular with our readers. It is just the kind of thing that can be made up and given away as a birthday gift or for sale at a bazaar or sale of work. Wood  $\frac{1}{4}$  in. thick is used for all parts, except the decorative overlay on the front which may be of thin wood or composition.

The box is  $5\frac{1}{2}$  ins. long,  $2\frac{1}{2}$  ins. wide and 4 ins. high. On the front of it, as may be seen in the sketch, Fig. 1, there is a movable indicator pivoted to point to any desired suit. The trumps consist of stout paper or card, or even thin metal discs with the motifs painted on. These discs are recessed into circles cut in the overlay, a full-size pattern for which is included here, together with the indicator hand.

## First Operations.

Commence work by marking out and cutting the front and back of the box, as piece A in Fig. 2. Each measures  $4\frac{1}{2}$  ins. by  $3\frac{1}{2}$  ins. and care must be taken to get the angles square so an accurate fit is made later on when the sides are glued up. The ends, B, measure  $3\frac{1}{2}$  ins. by  $1\frac{1}{2}$  ins. and they are glued between the front and the back of the box, as Fig. 2 shows.

The floor, C, is next made, measuring  $4\frac{1}{2}$  ins. by  $1\frac{1}{2}$  ins. A good fit should be made so it fits flush with the bottom edges of the sides and ends. Its position can be seen in the broken section of the box (Fig. 2), and in the circled diagram on the right of it.

At this stage, when the glue has hardened, all the outer surfaces should be rubbed down on coarse and fine glasspaper. Get a flat stout board and glue a sheet of this glasspaper each side. It forms an admirable surface for the process of

rubbing down. The open top edges of the box should also be made level on this board, and the rounded lower edges outside can readily be done on the same board.

The base section, D, is next made, measuring  $4\frac{1}{2}$  ins. by  $1\frac{1}{2}$  ins. It is glued beneath C, care being taken to keep to an equal margin all round, see piece D in the enlarged detail in Fig. 2.

Yet another floor piece is added, to give a good solid foundation to the box. The piece, E, measures

$5\frac{1}{2}$  ins. by  $2\frac{1}{2}$  ins. and after it has been cut square to this size, the top edges are rounded to a "thumb" moulding. Glue the piece to D and let the glue harden before cutting the shallow hinge recesses in the top edge of the back of the box. The depth of these recesses should be sufficient to take the whole hinge so it will not be necessary to cut recesses in the lid which will thus fit down flat and even with the sides and ends

## The Lid

The lid, F, measures 5 ins. by 2 ins., and the edges should be rounded off neatly as shown. Take care to get an even overlap to the lid all round by first screwing the hinges to the box and then by holding the lid in place and marking where the hinge flaps come on it.

The overlay is given as a full-size

pattern in Fig. 3. Whatever material is used, accuracy and care in the cutting must be exercised, as the finished appearance so much depends upon this. If wood is used for the indicator hand, see that the grain runs the length of the pattern for the sake of strength. It need hardly be mentioned that as fine a saw as possible should be used for cutting both overlay and indicator. The indicator hand is put on with a round-head screw, a  $\frac{1}{16}$  in. diameter washer of thin felt or rubber being sandwiched between the overlay and the hand. A short piece of  $\frac{1}{16}$  in. rod inserted and glued into the handle would help the movement of it from place to place.

The trumps are painted on thin wood or paper and cut round neatly with scissors to fit the circular openings designed for them.

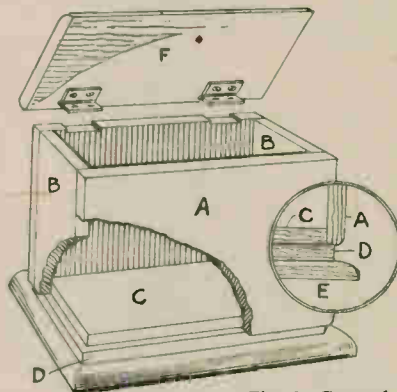


Fig. 2—General view of box construction.

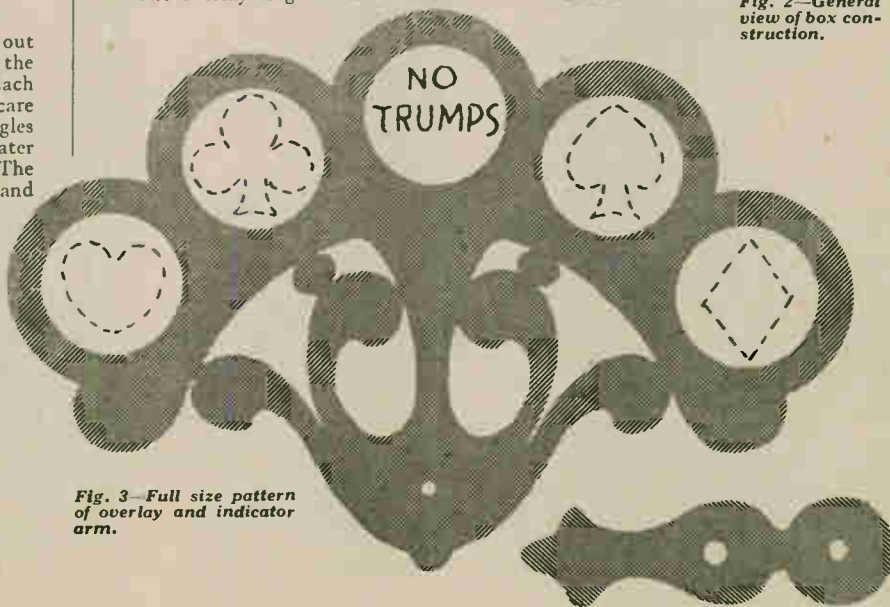


Fig. 3—Full size pattern of overlay and indicator arm.

# Two handy articles to make for the fisherman are a FISHING STOOL AND REST

**T**WO pieces of equipment which every fisherman should have are a folding stool and a rod rest. Both can be made at home and are well worth the trouble taken.

The drawing at Fig. 1 shows the folding stool which is made up in 1½ in. by ¾ in. hardwood such as ash or oak, selecting pieces which are straight grained and free from knots. Plane to size and give the corners a small chamfer to remove any roughness.

## Leg Struts

The top rails are fixed to the sides, using 2 in. No. 10 brass countersunk head screws. Holes for these must be bored in the rails and legs, and the screws should be rubbed with a candle end or dipped into melted paraffin wax before driving them home.

A strut is fitted to each pair of legs

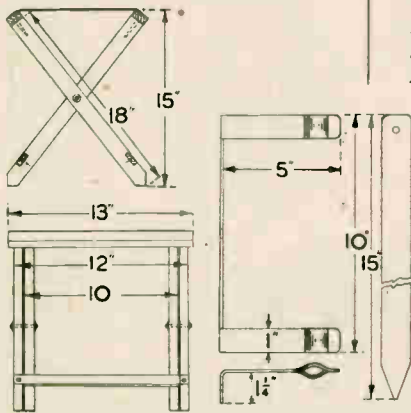


Fig. 1—Details of stool Fig. 2—Rod rest parts

as shown, and is cut from 1 in. by ¾ in. hardwood. It can either be dovetailed into the legs or screwed and lapped.

Iron rivets, ¼ in. in diameter are used to pivot the two pairs of legs. Washers ¼ in. thick are used between the frames to give a clearance when folding.

Thinner washers are used under the rivet heads and also at the opposite end where the rivets are burred over. A strip of deck-chair canvas is used for the seat and is tacked along the underside of the frame top rails, using ¼ in. improved upholstery tacks.

When completed, open the stool and stand it on a flat surface. Check that it rests securely without rocking, trimming the bottoms of the legs as required until it is quite firm.

The rod rest is shown at Fig. 2. This is made in aluminium or Duralumin, though the latter is rather difficult to bend. It is both light and strong and folds up for carrying about.

The rod is placed as shown above, the weight being supported in the front stirrup, with the butt held under the back one. Notice the

generous clearance between the butt and the swivelling arm. When a 'bite' is seen, the butt can be instantly grasped to make a quick strike.

The spike is cut from ¼ in. thick aluminium, and has a hole bored in the top end for the 3/16 in. Whitworth screw used as a pivot. The swivelling bracket is cut out by working down the inside of the arms with a hacksaw and along the main part with a metal cutting fretsaw. Smooth the edges well before bending, and bore the hole for the pivot screw.

## Stirrups

The stirrups are formed by tapping them into shape over a broom handle and bending the lips into position in the vice. Wrap the stirrups with adhesive plastic tape, so as not to scratch the rod or damage the line.

Complete the job by fitting the pivot. This is provided with two washers and a butterfly nut for tightening. Notice that the nut is placed on the outside of the bracket so there is no possibility of catching the fingers when making a strike.

## Printing Accessories—(Continued from page 8)

the top one having, in addition, two openings sawn out, one to allow the composition to be poured in, and the other, the smaller one, to let the air escape.

Mount the bottom disc on a wood block large enough for the mould to stand erect, without danger of toppling over. The central hole in the bottom disc should be continued in the block to a further depth of ¼ in.

## Casting the Roller

To cast the roller, first oil the interior of the tubing, then wind the stock with twine, tightly, to about 1 in. from each end. This is to "key" the composition to the stock.

Insert the stock, with an equal amount sticking out beyond the

tubing at top and bottom. Melt the composition in a water bath, and pour carefully in the mould. Leave for some hours for the composition to set properly, then push out of the

mould. Keep for a day or two before using.

## A Handle

For a handle, many readers will, doubtlessly, make up something from any suitable materials. At G, a suggestion to this effect is sketched. It consists of a pair of metal brackets screwed to a wood strip, the ends of the brackets being drilled to admit the roller stock. A wood handle is affixed to complete.

To prevent the ends of the composition rubbing against the brackets, if the stock rides along, as it may sometimes do, a good plan is to drill a small hole near each end in the stock and push through the holes a split pin.

## TABLE BOOK RACK DESIGN

*This week's supplement Design Sheet is for a useful and simple book rack suitable for side board or bedside table to hold half a dozen popular sized books. Wood for it (Kit No. 2762) is obtainable from Hobbies Branches for 1/9 or post free from Hobbies Ltd., Dereham, Norfolk for 2/6*

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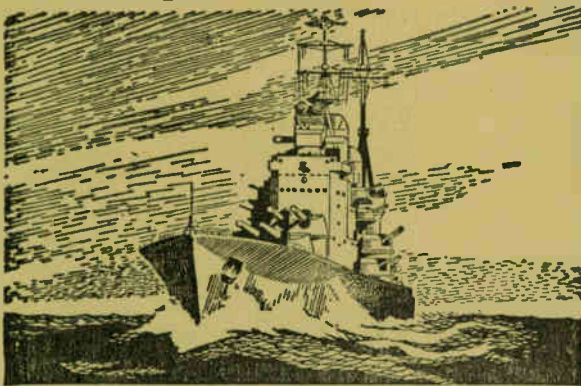


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# Hobbies

## WEEKLY

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Price Threepence

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## Full size Patterns for a MODEL SEDAN CHAIR

**S**EDAN chairs originated in the town of Sedan, France, and were first used in England in 1581, becoming very fashionable as a conveyance in 1650 until 1750 or thereabouts. It was a novel, simple, convenient form of carriage, easily managed by two bearers. In those distant days, of course, the only

individuals possessing dignity were the elite, with plenty of money to spend on style and hired servants.

### A Good Job

Since many of the jobs in the 17th and 18th century were really tough, the carrying of a wealthy person in a special chair was a form of employ-

ment which, apart from being easy and having other good points, was considered an honour, particularly in the case of noblemen.

As a matter of interest, we give a design for a simple form of Sedan chair, and to make the illustration of the finished model more picturesque, we show it in the hands of two bearers. You could, if desired, make models of the figures, using wood and plastic modelling substances.

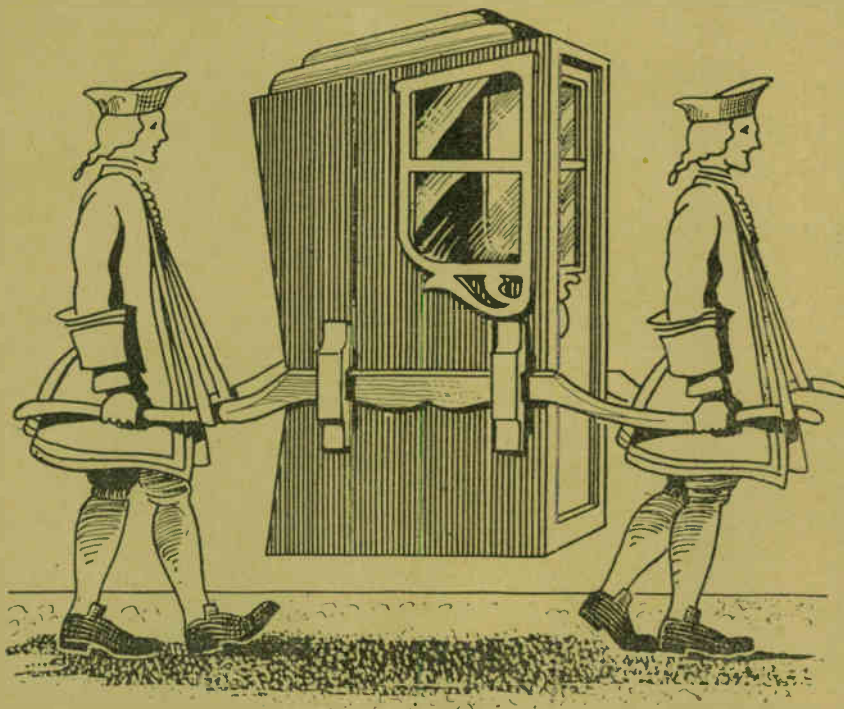
Note that, apart from holding the shafts with their hands, the shafts are also supported by a neck strap so that, if necessary, the bearers could release one or both hands. The straps are an auxiliary support which helped to ease the strain on the arms.

Apart from the diagrams here, a page with full size patterns of parts is provided. These are on page 23 and can be traced through carbon on to wood or be pasted down for direct cutting.

### Cellophane for Glass

The windows in the model are made with transparent paper or cleaned negative film. These materials are simply glued to one side of the window overlays then glued against the window apertures cut in the body sides and the door. A somewhat primitive seat is provided within the body of the work, it consisting of three shaped pieces of 1/4 in. wood.

The door, made a fixture, could be hinged to open outwardly. The trouble here, however, is getting suitable hinges, since the door is only an 1/4 in. thick. It could be pivoted at the top and bottom at one side edge,



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which means that this edge must be rounded. Panel pins could be used as pivots. A strip of adhesive tape could, however, be used instead of metal hinges.

### Construction of Body

We show the overlays on their respective patterns. To go about matters correctly, take a tracing of the body side and the door, and include the window apertures. You

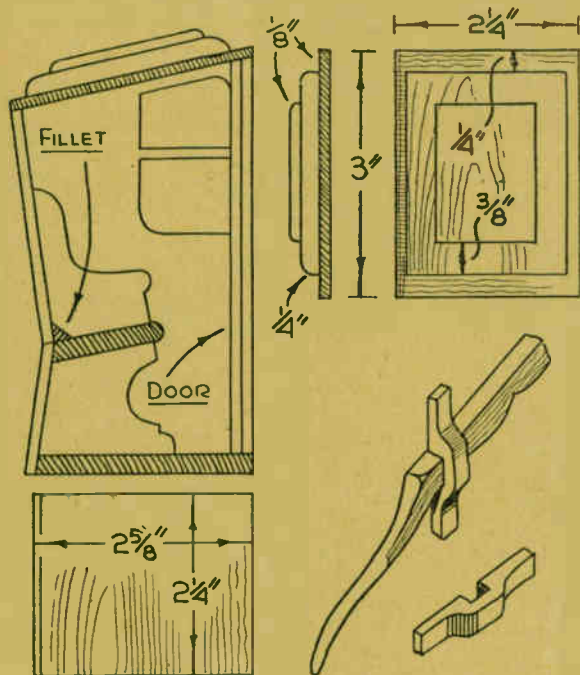


Fig. 1—Sectional side view with details of top and shafting

require a repeat shape of the body side piece, of course.

The top and bottom pieces of the body are detailed at Fig. 1. The bottom is cut from 1/4 in. wood, and the top from 1/4 in. stuff. The top and bottom is nailed between the sides, following which the backing pieces, cut from 1/4 in. wood and fitted neatly into position, are attached.

The seat sides are glued within the body, against the body sides, then the seat inserted into position, with a triangular corner fillet added, as shown in the sectional view. By the way, fit the seat parts together unglued and try the seat inside the body prior to fixing in with glue.

Complete the bodywork by building a cornice on the top, using 1/4 in. and 1/2 in. wood. It is only necessary to round over the edges and ends of the oblongs of wood, which are shown at Fig. 1, on top of the roof piece. Before adding the cornice pieces, have the roof levelled off with glasspaper.

### The Door

The door is cut from 1/4 in. wood, as stated. Its overlay is cut from 1/4 in. or 1/16 in. wood or card. Cellophane or cleaned film is attached to one side of the overlay on the glazing material.

Make sure that there are no wrinkles in the transparent paper, if used. Slight wrinkles, due to the adhesive, will undoubtedly dry out. Try not to have glue smears on the glazing material, as the glue is difficult to remove. If you use

celluloid film, the best adhesive is a film cement.

The inside of the body is painted brown, including the seat. The door, at the inside, is also painted brown. When dry, the door is attached in place with glue and panel pins, or pivoted to swing open, as explained earlier.

The body window overlays, like the

door overlay, are affixed, having attached the glazing material to them. While these are drying on, make the shafts. These are cut from 1/4 in. wood and shaped to form handles, as shown.

Now, the shafts are glued to the body sides, and fixed with a couple of 1/4 in. gimp pins. The wooden holders, which are cut from 1/4 in. wood, are merely ornamental, so to speak, being merely glued over the shafts against

### Full size patterns for most parts on page 23

the body sides. You could affix them with gimp pins, if desired, for the sake of realism, but the wood can be easily split if the pin holes are not drilled beforehand.

This completes the model which may be finished royal blue, with black shafting and overlays. A combination of silver and gold paint would be too showy. Sedan chairs were just a form of carriage without wheels and should, therefore, have the finish of a carriage body.

### Model Bearers

We mentioned the idea of having the chair supported by model bearers. These bearers should have a "core" of shaped wood and wire arms on which to "drape" the modelling clay. Putty could be used as a modelling medium, but will take days to harden properly.

Pyruma or Plastone cement could be used. This can be hardened near a fire, or in an oven. Plaster-of-paris may also be used, including Alabastrine, which is a form of hard wall finish material, ideal for stopping up cracks in walls and ceilings.

It dries quite hard in about two hours, and can be modelled in the dry state, or rather, it can be trimmed and pruned when dry, in which state it is like a hard chalk, easily smoothed, ready for painting. A coat of thin glue size prevents undue absorption of the paint. Alabastrine is obtainable at most wallpaper and paint shops.

### Radio Symbols—(Continued from page 15)

H.T. Plus. The Secondary to Grid and Grid Bias.

### Other Symbols

The sign usually used for Earphones is shown in Fig. 3. Sometimes the letters "Ph" are used instead. Such phones are high-resistance types, usually from about 500 to 2000 ohms.

The Crystal Detector sign is the same as a rectifier, because this is what the Detector does. They allow current to flow in one direction only, and many different kinds are available.

Often the letter "S" shows where the Speaker is to be connected. But

sometimes the signs given are used. Moving-Coil Speakers have a transformer, the Primary "P" being connected to the Output Valve Anode and H.T. Plus.

Where Speakers or Phones have polarity indicated (Red=Plus), this should be observed. Plus always goes to H.T. Plus.

### Wiring, Fuses, Switches

Leads that cross without connection and leads that are joined, are shown in Fig. 3. The signs for Fuses are also shown, the upper symbol being most used. Such fuses are often included in the High Tension Minus lead, to

protect the battery and other parts against short-circuit.

In Figs. 1 and 2 ordinary single-pole switches are shown. If a 3-point switch is used, it is indicated as in Fig. 3. Fig. 3 also shows how other switches are indicated. These are usually easily understood, heavy dots indicating the contacts, with a stroke or arrow for the switch-arm.

Numerous circuits and wiring diagrams have appeared in Hobbies Weekly in the past, and if the constructor compares the theoretical circuit with the practical layout diagram he will rapidly learn how the various parts are indicated.

# An interesting and helpful article of explanation on RADIO PARTS SYMBOLS

THE symbols used in receiver circuits are logically contrived and need not remain a mystery. The constructor who understands them can follow diagrams with more confidence and assurance of success. There may be readers who are just taking up the hobby of wireless so we devote this week's article to a simple explanation of symbols and illustrations which should be very helpful.

## Theoretical Circuit

Fig. 1 gives the circuit of a complete two-valver. The parts are illustrated in Fig. 2, and a comparison should teach a lot.

Next to the Aerial and Earth symbols shown, comes the tuning coil. The top section is for Medium Waves. The bottom section (shown wound in two piles in Fig. 2) is for Long Waves, and is shorted out by a Wavechange Switch when Medium Waves are required. The reaction coil is placed between these windings. Its purpose is to feed back signals from the Detector Anode, thus increasing volume.

good for tuning, because of increased losses.

When wiring, the moving-plates tag or terminal is connected to Earth. This prevents the position of the hand near the tuning knob influencing tuning.

## Grid Condenser and Leak

These may be wire-ended, as in Fig. 2, or have terminals, or clip into holders. Condensers are usually marked in microfarads, abbreviated to MFD or  $\mu\text{F}$ ., although some manufacturers are beginning to use the term  $\mu\mu\text{F}$  (micro-microfarad). This is one-million times smaller; e.g.  $200\mu\mu\text{F} = .0002\mu\text{F}$ ;  $1000\mu\mu\text{F} = .001\mu\text{F}$ ; and so on. Sometimes  $\text{pF}$  is used instead of  $\mu\mu\text{F}$ . Condensers marked "500 $\mu\mu\text{F}$ " or "500pF" or ".0005 $\mu\text{F}$ " or ".0005 MFD" are all the same.

On resistors, a sign like an inverted "U" ( $\Omega$ ) means Ohms". A Megohm = 1,000,000 ohms. Unfortunately some manufacturers are beginning to use the sign "K". This means "Thousands of Ohms". Therefore 100K, 100,000

ohms, or .1 Megohm, are all the same"

A Grid Leak is also used with the Output Valve (.25 megohms, or 250,000 ohms, in Fig. 1). This is to

*If you are taking up wireless this article explains the standard symbols so you can read almost any circuit. Another article for the beginner will follow shortly.*

allow bias to reach the grid, and allow grid current to leak away.

## H.F. Chokes

A High Frequency Choke is sometimes connected to the Detector Anode. It prevents signals passing, thus making them pass through the Reaction Coil. H.F. Chokes are shown in Fig. 2; "X" in Fig. 1 shows where they are wired.

## Valve-Holders

Fig. 1 also shows the connections for the most-used valves. A Triode may also be used for output. If so, a Power, or Small Power valve should be used, this handling more volume

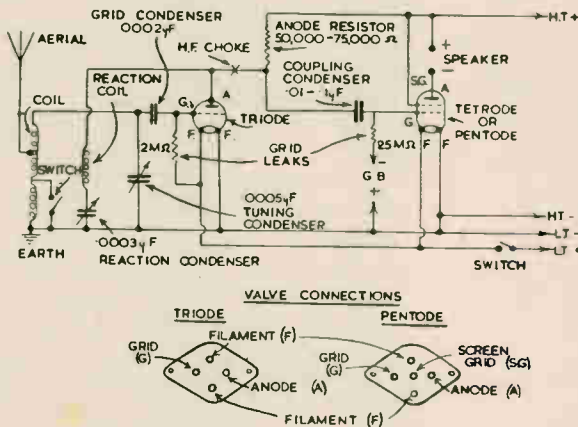


Fig. 1—A theoretical circuit, with valve detail

All windings must be in the same direction, as shown in Fig. 2. If connections to the reaction winding are reversed, no reaction will be obtained. With a former about 1in. in diameter, 90 turns are required for the M.W. section, 80 for Reaction, and 200 (in two piles of 100) for Long Waves. About  $\frac{1}{4}$ in. is left between each section.

## The Condenser

Fig. 2 shows a typical Tuning Condenser, usually air-spaced. The Reaction Condenser is similar, but often has thin insulating material between the plates, so that it is smaller. This is better for reaction because the High Tension voltage exists across the plates, but not so

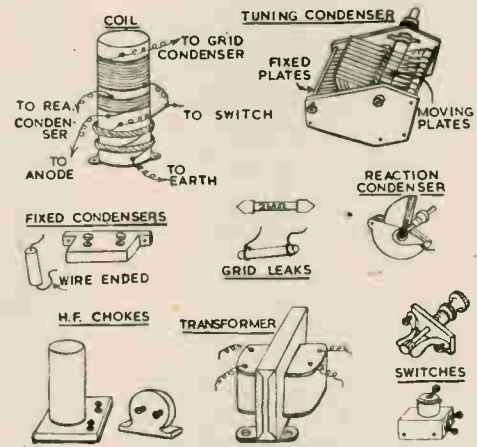


Fig. 2—Drawings of the actual components

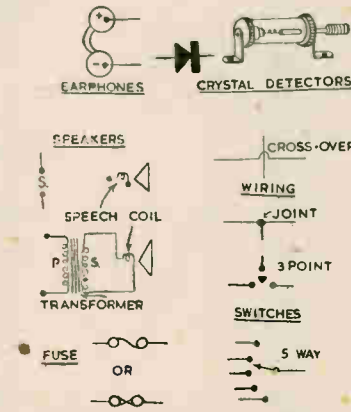


Fig. 3—Symbols of other parts

than the Detector type used in the first holder.

Though Resistance Capacity Coupling is shown in Fig. 1, a transformer can be used. One is shown in Fig. 2. Often terminals or tags are provided for connections. If used in Fig. 1, the transformer would be connected as follows:—Tag "P" to Detector Anode (Plate), or to H.F. Choke, if used. Tag "HT" to High Tension about 60 volts. Tag "G" to Output Valve Grid. Tag "GB" to Grid Bias. The Anode Resistor, Coupling Condenser, and Leak shown, are not then required.

If a transformer is marked "P" and "S" this means Primary and Secondary. The Primary goes to Anode and

(Continued foot of page 14)

# Any gardener would appreciate this handy WHEELED GARDEN BOX

WE show here a very useful type of garden box suitable for use when cleaning up garden and lawn. Instead of carrying round a bucket and depositing rubbish and leaves in this, all we need do is to wheel it from place to place, and when full trundle it to the dump or compost heap.

It is designed for convenient use, with sloping front easy of access and with handle for tipping slightly to bring the wheels into use. The front foot keeps the box at the proper level during filling. At the rear is a useful triangular-shaped compartment for small tools such as trowel, hand fork etc.

At Fig. 1 a side view is given, showing the general construction of the box, the overall height of which to the tip of the handle is 27ins. The box itself measures 12ins. wide, 10ins. high and 14ins. from back to front. It can be made up entirely from wood  $\frac{1}{2}$ in. thick, with the finish of paint work to brighten up.

## Box Sides

Start construction with the sides. Fig. 2 gives a detail of one of these, with all necessary measurements. Cut, for each side, two boards and clamp them together. Add the cross battens as shown for binding them firmly and for the nailing of the back and floor boards. The battens will, of course, be placed  $\frac{1}{2}$ in. in from the edges as shown and they should be about 1in. or so wide and  $\frac{1}{2}$ in. thick.

Where the two boards forming the side meet at the front, and on the angle, a long nail should be driven in to keep them close together at this point (see Fig. 3). Remember that a right and a left side must be laid out,

the fixing battens being on the inside for both sides.

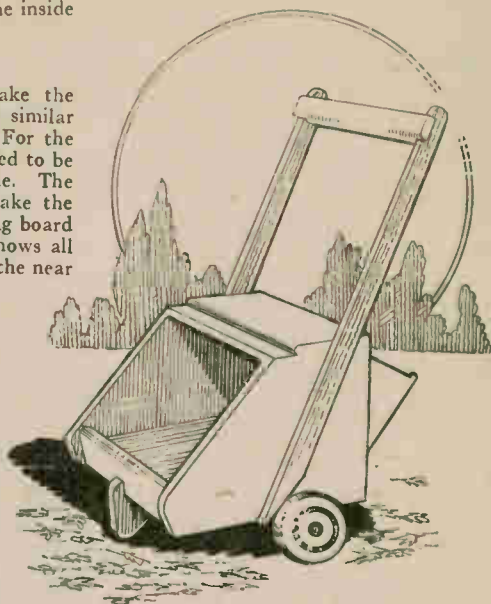
## General Framework

Two 5in. wide boards make the back of the box, while three similar boards constitute the floor. For the latter, the front board will need to be cut and planed to  $2\frac{1}{2}$ ins. wide. The front edge is chamfered to take the rake of the front narrow edging board (see Fig. 3). This diagram shows all the main boarding nailed up, the near side being omitted for sake of clearness. Note how the front board, which is 11ins. long, same as the other back and floor boards, has the top edge rounded and made smooth.

Having the sides, back, floor and front complete, we nail on the top board (Fig. 1). This is another 5in. wide board, 12ins. long, to come flush with the outer faces of the sides. The front edge of the board is rounded off as shown, and if additional strength is needed here again an 11in.-long board could be put between the sides to come just under the main top board. This added board is included in the box shown in the sketch illustrated.

## The Tool Pocket

The construction of the tool pocket is shown in Fig. 4. The two triangular bracket pieces are 4ins. long by 3ins. wide. The pocket is fixed to the box by screws inserted from the inside. The axle and supporting brackets for the wheels are put together as in Fig. 5, the depth of all three pieces of wood being  $1\frac{1}{2}$ ins.



The completed unit is screwed to the floor to the measurement given in Fig. 1 by screws through the floor of the box. The shape and size of the foot is shown in Fig. 6. This should be cut from stouter wood; or two pieces of  $\frac{1}{2}$ in. stuff pinned together would answer well. It is held to the floor with screws from on top.

## Handle Portion

The handle consists of two pieces of  $\frac{1}{2}$ in. wood measuring 2ins. wide at the lower end tapering to  $1\frac{1}{2}$ ins. at the top where it is rounded over and made smooth and safe for handling. At a little distance down from the top end a shallow recess is cut to receive the cross bar or handle.

This handle bar should overlap the edges and therefore be made 14ins. long,  $1\frac{1}{2}$ ins. or 2ins. wide. Screws are used to make a firm fixing. Note how the lower ends of the handle uprights are cut to an angle to afford clearance for the wheels.

The pair of wheels can be supplied by Hobbies, Ltd. They are 4ins. diameter, of hardwood with broad rounded treads, ready for fixing with long screws. Washers are supplied and added each side of wheel.

Clean the woodwork at completion and paint two coats of green paint. The inside of the box might be creosoted, as also might the underside of the floor and the axle etc.

Pattern Sheets from back numbers of Hobbies are obtainable for 6d. each



Fig. 6—The small front foot stand

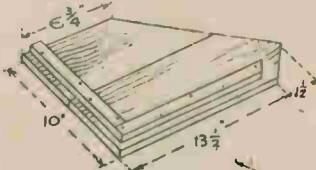


Fig. 8—One of the sides

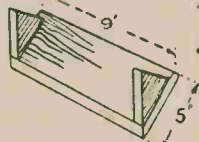


Fig. 4—Back pocket parts

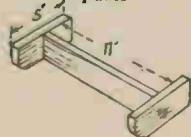


Fig. 5—Axle and bracket

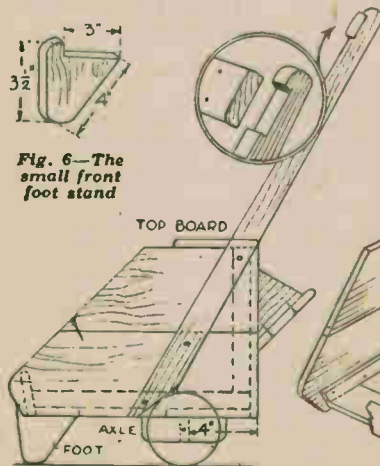


Fig. 1—Side view showing parts

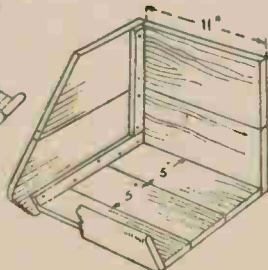


Fig. 3—The box construction

# By the use of thin boards of different colours you can make PICTURES IN WOOD

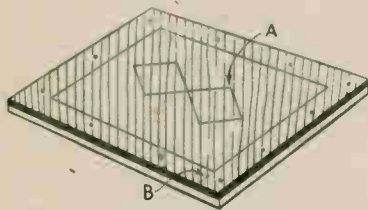
**B**EFORE the war many of our readers thoroughly enjoyed the opportunity of making attractive pictures in wood by using several varieties to form an inlay picture. There was then, of course, a wide range of various coloured boards available in quite thin wood and these were used pinned together and cut out to form all manner of panels and picture subjects which greatly appealed.

It was another form of using the fretsaw which came as a variety from the more usual work with which it is undertaken.

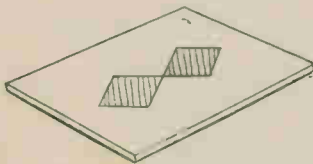
## Colours in Wood

There is indeed still a demand for these inlay designs but it comes mostly from the fortunate countries overseas where different varieties of wood are more easily obtained. So far as we are concerned in the British Isles, the work is almost impossible.

The idea, however, can be exploited in quite a simple way with odd pieces of small wood—if only in two varieties.



Two boards nailed together with design marked on the upper one



The idea can be utilized in simple forms of decoration and, indeed, allows the use of small odd pieces which would probably otherwise be wasted.

The process of cutting is very similar to the ordinary use of the fretsaw except that two pieces of wood are used at the same time instead of one only. The main point, of course, is to get the two varieties quite different—one light, one dark. A way in which they can be used is suggested here but readers will use their own ingenuity and ability in executing the work for any particular style or article they may have in mind.

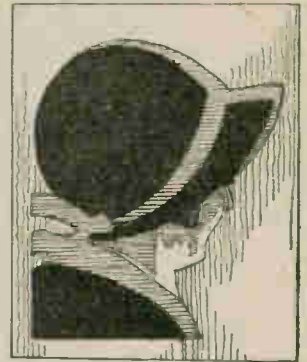
## The Method Explained

If we show you here the method, then no doubt many will be happy to undertake their own styles as they

think fit. The method can be used to ornament small box lids or to incorporate in little pin trays and ash trays, or even to make up a picture or plaque. We give two examples here of the last mentioned, taken from advertising subjects which lend themselves to this particular style of work.



Two simple types of picture cut from three thin boards of varied colours



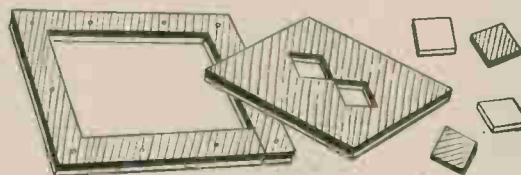
As you can see, light and shade is obtained in the various colours of the wood and the actual result largely depends on the variety you can obtain for this purpose. The finished work, of course, is given a coat of varnish or french polish—a method which is quite simple because the surface of the board finally is perfectly flat and lends itself thus to easy finish.

First of all, let us assume you are incorporating two small square panels

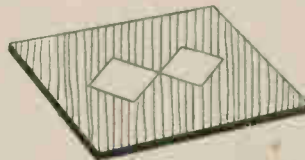
point. This means, of course, that four pieces in two pairs fall out.

Now you can go round the outer line which holds the "framework" together, coming out where indicated by the dotted line at B. This cuts away the waste wood containing the nails holding the parts together. You thus have now the two main pieces and the four small squares.

The next stage in the diagram shows you the result which provides the inlay panel. In the dark board you can put the two little squares from the lighter wood and in the lighter wood frame you can place the small dark squares. Thus you have two complete subjects, each with inlaid central diamond or square-shaped patterns.



The centre diamonds, and then the panel are cut out from the surrounding frame



as a central decoration for a larger background. The pieces of wood are nailed together with fret nails driven through the two boards outside the actual outline of the subject. This is seen in the diagram here where the whole process is laid out.

A small drill hole is made at the least conspicuous point and a very fine saw blade should be used if possible. The principal point to remember is that all the parts will be re-used so that the saw blade must maintain cutting on the line required, for no recut can be undertaken. Have the fretsaw quite tight in the frame and proceed carefully round the outline marked on the wood.

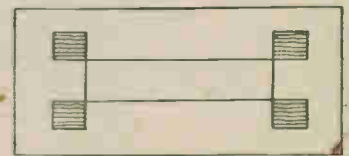
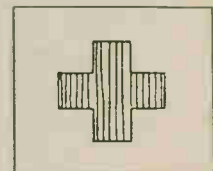
In the example the drill hole is made at point A and the saw-cut goes round the outline of the two squares to return again finally to its starting

## Assembly

If a thin saw has been used the parts will virtually fit together very much as a jigsaw does, and when glued on to a board you have an attractive piece of flat work suitable for polishing for the final result.

You will realise it is essential to have a fine blade because, if a coarse one is used then a much wider cutting line is made and the parts will not fit

(Continued foot of page 19)



Two suggested geometrical patterns

# Practical jobs in the home, in our helpful series of HOME METAL WORKING

**T**HE third of our practical articles of metal work brings us to everyday repairs about the house. Most of the leaks in buckets occur in the bottom and may be roughly divided into three classes—slight leaks—larger holes—and worn patches.

To repair a slight leak, it is only necessary to scrape the part quite clean, removing the galvanising or enamel, apply flux, and solder over. When it is desired to solder a small hole, it is best first to tin round the leak, using the flat of the iron. If it does not tin very easily the first time, apply more flux and repeat the process. It may be necessary to scrape parts that are obstinate.

After the tinning, in order to prevent the solder from running away through the hole, elevate your iron, using only the tip and apply small portions of solder at a time, withdrawing the iron quickly. It is possible to fill up quite large holes in this manner (Fig. 1).

## To Repair a Large Hole

If the leak is too large to permit the use of the above method, it will be necessary to patch it.

With the shears, cut out a circular piece of material large enough to cover the hole and overlap about  $\frac{1}{2}$  in. on to the sound part of the bucket. Apply flux and, using the iron, tin over the whole of one side of the patch, leaving on a thick coating of solder. Tin the bucket as for small leak, covering an area rather larger than the patch, again leaving a coating of solder on the surface.

Place the patch in position, tinned side to leak, and apply the flat part of a well-heated iron. This will cause the coating of solder, on both patch and bucket, to melt and fuse together. While still molten, press the patch firmly on with a file, remove iron and allow the job to cool.

This is known as a sweated joint and is practicable for patches up to  $\frac{1}{2}$  in. in diameter or larger, depending on the size and heat transmitting capacity of your iron.

For a larger patch, it is only

## Non-Splash Water

*Carrying a bucket filled with water is not too easy, and few can do it without splashing over the sides—usually over your legs. A simple preventive is to place a block of wood, with a fairly large surface, to float on top. This will effectively prevent the usual trouble.*

necessary to tin the edges on both sides, and when in position, may be soldered round in the manner prescribed for a joint or seam (see Fig. 2).

## To Re-bottom a Bucket

If the whole bottom is worn, rusted or badly holed, it may be better to substitute an entirely new bottom. This is by no means as difficult as it would seem, and generally speaking, is to be preferred to patching.

With a piece of string, measure the inside diameter of the bucket, near the bottom. If the joint between sides and bottom is badly corroded, it will be better to insert the new bottom a little way above the old one, say, about  $\frac{1}{2}$  in. higher up. In this case, of course, you must measure the diameter at the appropriate place.

Next, mark out and cut a circle of the material to the required size. A good tip when using shears, is to always have the bulk of your metal to the right, and the narrower piece of scrap on the left, allowing the latter to curl upwards as you cut. You will do your cutting easily this way.

Try the circle in the bucket, marking where it fits. This will enable you to clean the exact portion of the bucket requiring soldering. Clean edges of bottom, apply flux to both sides—also on the bucket, insert—and solder smoothly round.

Test the soundness of your joint with water before putting away your tackle.

## To Reinforce a Bath

When a galvanised bath has seen much wear, it usually gets weak right round the joint between sides and bottom, and this is the first place that starts to leak. Remembering the old adage about a "Stitch in time", it is possible to forestall possible leaks by strengthening the joint with solder.

After scraping, cleaning, and applying flux in the prescribed manner, the joint must be soldered right round, but in a certain way, designed to leave a thick coating or "body" of solder for strength.

When carrying out this operation, it will be made much easier if you call in the assistance of your pal, as the actual soldering is, in this case, a two-handed job.

The idea is to thickly solder a small portion of the joint at a time, holding the stick of solder in the left hand and applying boldly to the iron. Like

other liquids, molten solder will find its own level. Therefore, it is necessary that the bath be tilted at the angle needed to allow the solder to form squarely across the joint.

Allow to set, move bath round a shade, and do another portion, taking care that each body of solder fuses well into the edge of the previous one, and so on right round the joint.

When you have finished you will have a body of solder at least a  $\frac{1}{4}$  in. thick to bolster up the joint and if the job is efficiently carried out, will lengthen the life of the bath by many years.

Wash tubs may be treated in the same manner, but the additional depth will make it awkward to use the ordinary straight iron, the usual method being to use a hatchet or spade type.

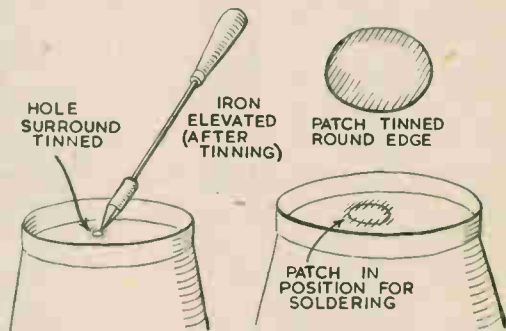


Fig. 1—Filling a hole

Fig. 2—Patching a bad place

## To Mend Spectacles

Even in these days of ultra-modern eyeglasses, many elderly persons still wear the old fashioned metal framed variety. These break very easily, but there is no need to go to the expense of new frames, as they can be soldered quite easily.

Clean the broken ends with fine emery cloth and lay out in their original line, resting on a flat piece of wood. Moisten with flux and, using the extreme tip of the iron, allow a very small blob of solder to unite them. This can be rendered inconspicuous by the judicious use of a smooth file, smoothing over with fine emery afterwards. It is surprising what a lot of knocking about a simple joint like this will stand.

Now that you have acquired the ability to solder, you will discover all kinds of jobs about the house that will enable you to make practical use of your skill.

Next Article—"A Handy Tooth-brush Rack".

# Paraffin and an old tin can be turned into a handy PERPETUAL LIGHTER

IT is a well-known fact that paraffin oil, unlike petrol, cannot be used as a fuel for a lighter. The flame is very smelly and sooty, and the ignition, from a flint spark, is not too good. How about a special "table" model of lighter, however, which has a perpetual sort of light using oil?

Let it be understood, at this point, that by the word "perpetual" we do not mean lasting forever. What is meant is that once the tiny wick has been ignited with a flame, it burns for a long time on one filling—possibly several days.

There is no "lamby" smell, because the flame is quite small—just a mere speck of light. And like a cigarette lighter, the body of the home-made table model is stuffed with cotton-wool. This wool is saturated with lamp-oil. By capillary action, the wick—mixed with the cotton-wool—absorbs a sufficient quantity of the oil to keep its wick alight. As the consumption is extremely low, one filling with oil should last many hours.

## Fed with Oil

Oil, compared with lighter fuel, is very cheap. Such a novel lighter, as illustrated, would be a useful item in a café or road house. It could sit on the counter, where any customer could take a light from it. It may also be used as a simple night light for a child's bedroom.

Due to the packing of cotton-wool and the small flame, such a night light is fire-proof, if accidentally knocked over on its side. When falling, even on its side, the light goes out. And there is no flow of oil from the wick spout.

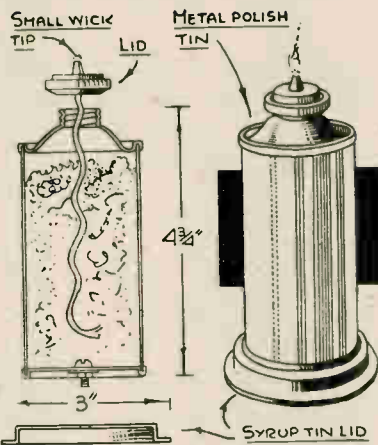
## Pictures in wood—(Continued from page 17)

together as they should to form a solid surface. Even in this case, however, you can rub in some fine sawdust and possibly squeeze glue into the part to make a solid fit.

The diagrams here give you alternative suggestions of simple geometrical designs which can be incorporated in all manner of ways. The picture of the girl's head and of the goat are, as you can see, more advanced subjects and are really carried out in three varieties of wood.

## Use Thin Wood

It is important, of course, that the wood you use should be fairly thin and if you can get any  $\frac{1}{16}$  in. boards they are the most suitable. You will realise that if you have, say, two boards  $\frac{3}{16}$  in. thick that means a total of  $\frac{3}{8}$  in. which is a little more difficult to operate upon. It does make it more simple if the outlines concerned are not straight lines; then if you do run off



A section view and the finished article

As can be seen from the diagram, a special sort of tin is used. It is nothing more startling than a common metal polish tin, such as the Brasso type. All you have to do is to clean out the tin. It will be necessary to remove the "grid" at the top of the neck.

## Bolted Base

A small quantity of paraffin oil, shaken up in the tin, will do much to clean out the old polish. When cleaned, turn up the bottom end of the tin and drill an  $\frac{1}{8}$  in. hole in it centrally. Now obtain a suitable machine bolt, preferably a mild steel one, and sticking it to the end of a screwdriver, insert the screw through the hole, put on a felt washer, then a nut, as shown in the sectional view.

If you have trouble in trying to stick the head of the bolt to your

screwdriver, remember that the screw could be magnetised by stroking it on a powerful magnet a few times. It will cling to the screwdriver. Some hard beeswax, however, scraped into the screw head nick, and the tip of the screwdriver pressed into it, will enable the bolt to be stuck temporarily to the screwdriver.

The bolt is for attaching the base plate to the bottom of tin, the plate being a 3 in. diameter syrup (or paint) tin lid, inverted. Bore a central hole in it, then affix on with a nut.

## The Packing

Having that done, the tin can be enamelled brightly. Meantime, prepare the lid. This needs to be fitted with a wick spout. A simple spout could be easily made from the valve from a bicycle inner tube. A portion of it could be soldered to the lid.

In fact any small bore pipe could be soldered to the lid. The pipe must take an ordinary lighter wick. The wick should be packed in with the cotton-wool, with sufficient at the top for fitting into the wick spout and twisting on the lid. The wick must also be trimmed so that it gives a tiny sootless flame.

The best sort of long-lasting flame should be a bluish colour. A white flame with sooty smoke is wrong. Trim the wick until you get the smallest possible speck of light. Have the packing thoroughly saturated with paraffin oil, but do not overdo the filling. Use just the maximum amount. Once the wick is ignited, it should keep alight for 24 hours. Everything depends on the size of the light, and the size of your tin. The usual size is given. Any similar type of tin may be utilized in the same way.

the cutting mark the error is not so obvious.

## Machine Worker's Advantage

The machine worker has a very big advantage in cutting these pictures because the saw is maintained vertically for him; the handframe worker must be particularly careful to hold the frame upright or obviously the second pieces will not fit in place correctly. The user of the machine, too, can further ensure accuracy by means of tilting his cutting table slightly.

This can be done by loosening the wing nuts under the table and depressing one edge slightly before retightening the nuts. The actual angle of tilt is very slight and must, of course, vary according to the thickness of wood being operated upon. No definite angle can be given but a trial will soon prove what is required.

The idea in this is that the second

piece is slightly larger than the first, and in being put into the other piece presses into the part and so fills up the hole entirely. In doing this the cut has to be maintained in one direction going from left to right or vice versa throughout the whole operation. The actual slope on the edge of the wood is just sufficient to allow the lower piece to be pressed upwards into the upper part, until level with the surface.

Having once tried out the method, you will see it is comparatively easy and certainly makes for a distinctive and attractive work. By a study of drawings and advertisements you can soon pick out subjects which are suitable for incorporating into practical pieces of work, and thus provide a pleasing change in the use of the fretsaw and the results which it will bring.

What about incorporating the idea into making small Calendar Christmas Cards?

# How to cut out and construct a modern type PLASTIC TRINKET BOX

**R**EADERS who are interested in the new plastic work may like to make the novel trinket box illustrated. It is just the thing for the dressing table, and would make an acceptable gift. It is suggested to use Perspex, a description of plastic material, made in pleasing colours, also transparent, and quite easy to work. Readers can of course please themselves as to colours, or clear, for making the box. In either, a handsome article can result which the sketch cannot do justice to.

A pattern for the sides is given in Fig. 1. This should be copied on thin paper, doubled, with carbon paper between to produce two copies. First draw a rectangle the size given. At the centre, with compasses strike the semicircle, then mark off the points, right and left, for the small circles and strike both. These circles are  $\frac{3}{8}$  in. diameter.

## Cutting Out

The patterns can now be lightly gummed to the Perspex and then cut out with a fretsaw. When cut, lay the Perspex in warm water for a few minutes, then strip off the paper patterns and clean away, by washing, any traces still remaining of the gum.

Fig. 2 shows dimensions of the remaining parts of the box. The ends of the box are in one piece, A. Cut this accurately to the size given. It has

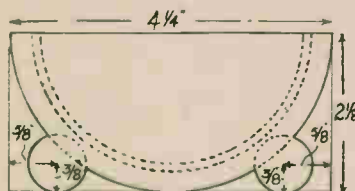
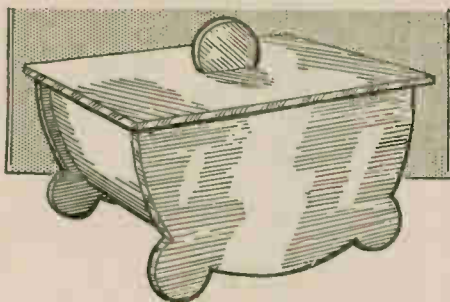


Fig. 1—Side pattern to mark

now to be bent to a semicircle and be cemented to the sides of the box where shown by the dotted marks in Fig. 1.

## Bending Practice

It is as well, before starting to do the bending, to practice a little on a spare scrap of the material, as it is desirable to have a little experience in this part of the work first. The best method of heating is to grip the stuff



with pliers and hold it over a gas jet or oil stove for a while. Too much heat is not wanted, as the material is liable to blister; this is where a little experience is so valuable. Details of the operation have been dealt with in earlier articles in these pages.

As soon as the Perspex is hot enough to bend, it will slightly sag. Then it should be held at each end, using a cloth as the stuff is too hot to handle without, and be bent to a semicircle round a two pound jam jar, which happens to be just the right diameter.

It is advisable to warm the jar first, in case the hot Perspex cracks it. Get a friend to hold the jar bottom upwards on the table, then press the Perspex round it, as in Fig. 3. Before

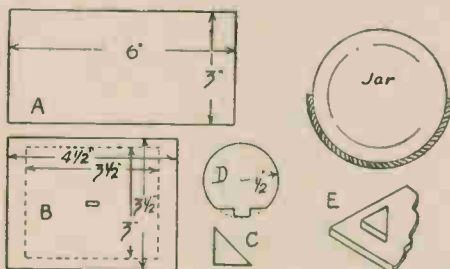


Fig. 2—Other box parts

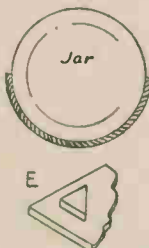


Fig. 3—Shaping the curve

it gets cold, slide it down the jar to touch the table to make sure the bend is a true semicircle, and edges "in winding."

When cold and set, clean the edges of the bend, making them quite flat. Lay one of the side pieces across it and see if the edges touch all round. Correct any inequalities, then if contact is satisfactory apply a little of the special Perspex cement to the

edge (one side only first), of the bend lay on the side piece. Get it accurately placed, then lay a book on to keep it down until the cement hardens, which it quickly does.

When right, cement the second side piece on and weight down as before. Leave for a while and in the meantime prepare the rest of the box parts comprising the pieces forming the lid.

## The Lid

The lid is in two pieces, one of which being smaller than the other and cemented to it underneath, forms a rim. Both are shown at B in Fig. 2, the smaller one being drawn in dotted lines in the larger one to save space. In the larger one, the top piece of the lid naturally, saw out a mortise slot  $\frac{1}{2}$  in. by  $\frac{3}{8}$  in. for the handle to enter in.

Now try the smaller one in the box, it should just fit the opening nicely, not too tightly. If satisfactory, cement the two lid pieces together. No need to spread the cement all over the surface, a little, say a  $\frac{1}{2}$  in. strip all round, will be enough.

As Perspex is rather expensive, an economy in material can be effected here by cutting four angular pieces of the Perspex to the shape, C. Cement one at each corner of the lid, underneath, as at (E). Fig. 3, in place of the smaller rectangle of the lid that is suggested above, to make the rim. The pieces can be quite small, say  $\frac{1}{2}$  in. each way, and will act efficiently, but they must be accurately positioned for the lid to fit correctly on.

## The Handle

The last piece to make is the handle, D. This is a  $\frac{1}{2}$  in. diameter disc of the Perspex, with a tiny piece cut away each side at the bottom, to leave a  $\frac{1}{2}$  in. long tenon, as shown. This could be first marked out on paper and stuck down to the material, as done for the sides before. It is quite an easy method. File the tenon to fit closely to the mortise in the lid, then cement the handle in place.

It may be mentioned here that the measurements given are for making the box in a plastic  $\frac{1}{8}$  in. thick. When finished, polish the box, especially the edges, with the special polishing mediums to be bought for the purpose, and an artistic piece of work should be the reward.

## October Anniversaries—(Continued from page 21)

showing Pierre and Marie Curie—their portraits with a laboratory as the background. Jacques Cartier with his sailing ships in the background. Ampère with the words "Electricity" and "Physics" carefully

placed at the sides. Then Pilatre de Rozier with his balloon in the background. Pasteur looks at a test tube, Berlioz with his name on the music as though it was the title. Victor Hugo having books at his side and the

stamp we speak about first with the name Cezanne on an artist's palette. You should look for these clever ideas which so frequently appear in the designs of the stamps you collect.





## OCTOBER ANNIVERSARIES

**M**ANY stamps are issued to commemorate some function, the birthday or death of some famous man, some battle or some change in government and this month is exceedingly well supplied with such events, and which are noted by particular issues.

The first stamp anniversary in October comes on the 2nd, for it was on that day that President von Hindenburg was born in the year, 1847. Germany has commemorated this man more than once. First in 1927 on the occasion of his 80th birthday, again in 1928 and 1932. The last was re issued with a black border as a memorial stamp in 1934. Hindenburg stamps are very common so we will not use valuable space illustrating them.

On the 4th October, 1669, Harmen van Ryn Rembrandt died aged 63. The stamp illustrated was issued by Holland in 1930 where you see Rembrandt himself and in the background his painting *De Staalmeesters*. In 1941 the same country produced a stamp showing his son Titus.

The next day of the month was when Portugal was proclaimed a Republic in 1910. Previous to this King Manuel was on the throne, but on the proclamation of a Republic the stamps bearing the King's



Anatole France—Oct. 13th

portrait were overprinted "Re-publica"—the second illustration shows a specimen.

October 12th, 1915, was the date on which Nurse Edith Cavell was shot; many of you will have heard the broadcast recalling the events which led up to this. It is to the stamps of Canada that we turn for a reminder of this anniversary. The 1 dollar stamp of the 1930 issue gives a picture of the mountain named after Nurse Edith Cavell in the Canadian Rockies.

October 12th is also America's Columbus Day.

October 13th is the anniversary of the death of Anatole France who passed away in 1924. He was a famous French writer whose works have been translated into English—to mention a few—*The Crime of Sylvestre Bonnard*, *Penguin Island*, *The Gods are Athirst*.

His portrait is shown on the French stamp of 1937, issued as one

Governor General of the Dutch East Indies, a man named Anton van Dieman. So now you see why it was that the Island was first named Van Dieman's Land.

One of the most beautiful stamps that has ever been produced commemorates the event of October 29th. This is the fifth illustration and it was issued in 1935, by Trinidad. Another similar stamp, but slightly larger, having the addition of the portrait of



Rembrandt—Oct. 4th      A Republic—Oct. 5th      Sir Walter Raleigh—Oct. 23rd

of two stamps to assist the fund for unemployed intellectuals. This stamp, which is illustrated, should have special appeal for autograph hunters.

Some of you may have wondered why the stamps of Greece should have the portrait of an Englishman. Actually there are two—Byron and Sir Codrington. The former belongs to another date but the Sir Codrington stamp is one of the set issued in 1927 to commemorate the battle of Navarino which took place 100 years previously. One value has a picture of the naval vessels of that time in action. The reason is that the Turks captured Navarino or Pylos in 1825 and on October 20th, 1827, the British, French and Russian fleets destroyed the Turkish and the Egyptian fleets and thus secured the independence of Greece.

The next day, October 21st, also commemorates a naval battle and one that is far better known to the inhabitants of this country. In 1805 the British fleet under Nelson defeated the French and Spanish fleets at Cape Trafalgar. The stamp which commemorates this is from Barbados and shows the first monument to Lord Nelson. This stamp is one of a set of seven and was issued in 1906.

On the 22nd October, 1659, Tasman died. Although one cannot point to any special stamp as commemorating his death, yet all the stamps from Tasmania must be considered as doing so. Tasman was a Dutch explorer who was sent out by the

King George VI, was issued in 1938. The design shows the discovery of Lake Asphalt by Sir Walter Raleigh who used this stuff to caulk his ships when he called there in 1595. Sir Walter Raleigh died in 1618, on October 23rd.

Another French stamp shows a portrait of Paul Cezanne, a painter who died on October 23rd, 1906. A stamp which was issued to commemorate his birth in 1839 will be used in this instance to recall his death on the 23rd. Here it would be as well to remember that France has issued many stamps to commemorate great men and she has done so very well indeed.

Consider some of these stamps,



Lord Nelson—Oct. 21st

although they are not necessarily October stamps. The issue for the International Cancer Fund of 1938

(Continued on foot of page 20)

**PERSONS** required to make ladies' belts and fancy goods in spare time.—Dept. 3, Somat Plastic Co., Ltd., 8 Middle Marsh, Nottingham.

**A** GREAT new system which enables you to receive two stamps for the price of one. At last boys, this is it. Don't miss this opportunity. Write to—R. T. Akers, X. Dept., 6 Worcester Rd., Redditch, Worcestershire. Enclose 2½d. stamp for postage.

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**P**ICTORIALS free to all requesting my discount approvals. Write now, enclosing 2½d. stamp, to—P. A. Troath, 10 Woodland Ave., Leicester.

**S**TAMPS FREE!! Twenty unused (2½d.).—G. H. Barnett, Limington, Somerset.

**R**EPAIR lighters in your spare time. 3 gross wheels, 5/- post free.—Allen, 88 Beaufort Street, London, S.W.3.

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**40** DIFFERENT stamps free to all applicants for my ½d.—1/- approvals. Includes Mint, Victory, used Coronation, Silver Jubilee, Ship, Pictorial, etc., etc.—J. F. Smith (Dept. H.), 60 Edison Road, Welling, Kent.

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**W**ANTED Hobbies pattern for Eiffel Tower. Reply—John K. Murray, 191 West Street, Durban, South Africa.

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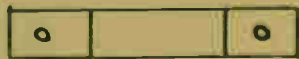
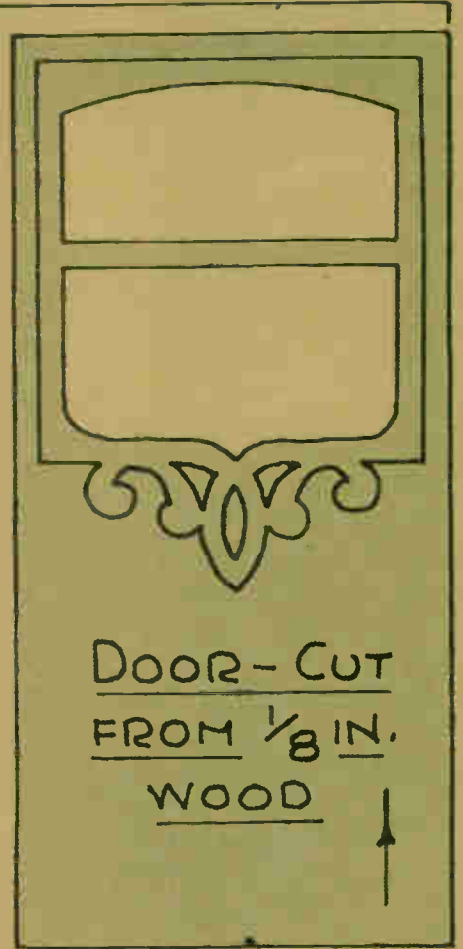
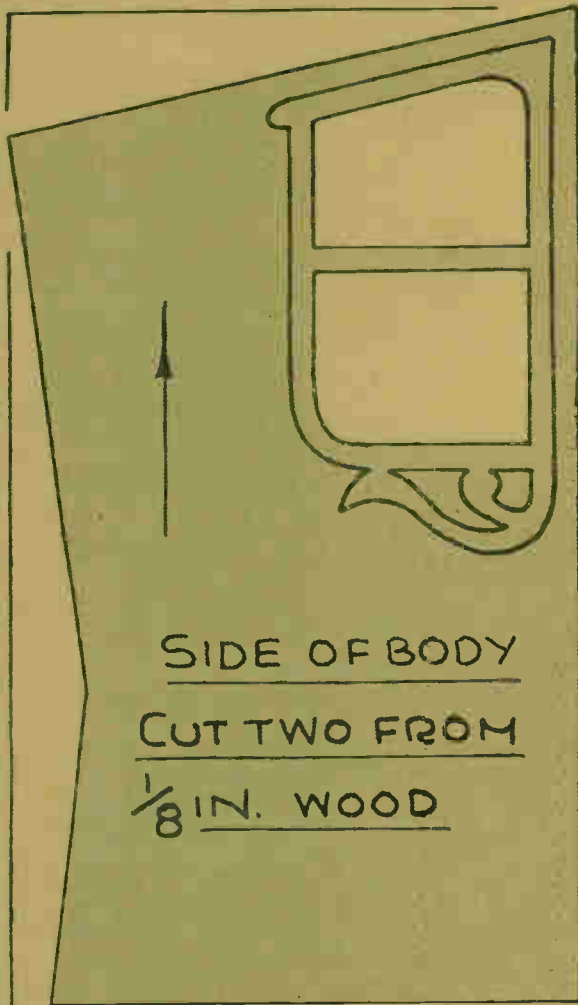
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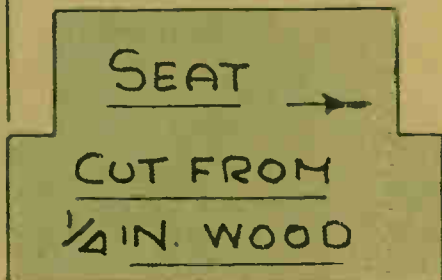
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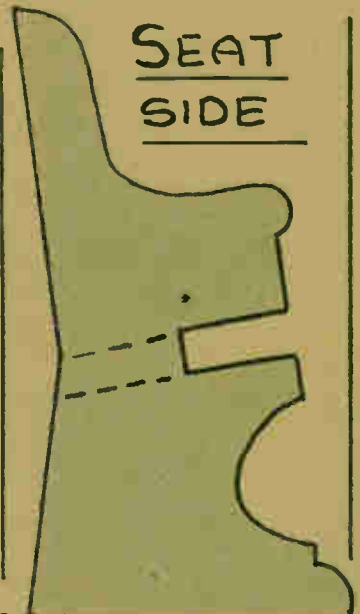
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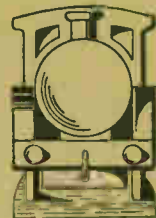
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# Hobbies

## WEEKLY.

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SUPPLEMENT DESIGN  
FOR A MOTOR DRIVEN  
MODEL HYDROPLANE

October 20th, 1948

Price Threepence

Vol. 107 No. 2764

## A ROCKING DONKEY

**W**HY must we always have a rocking horse? Why not, for a change, a rocking donkey?

A fair-sized toy of this nature is shown, as can be seen from the elevation at Fig. 2. It is a dual-purpose toy—one that can be rocked, or pulled along the ground.

Although the old-fashioned rocking principle has been adopted, the rockers are shaped to ensure some measure of safety in use, particularly at the rear end. As for the donkey itself, it is a simplified type, easily cut out, and consists of ten separate pieces of shaped wood, glued and nailed together, all of which, including a rocker, are plotted in 3in. squares at Fig. 1. This enables scraps of 3/4in. wood, or full 1in. thick stuff, to be utilized, and with the grain running with lengths, a very strong model is assured.

### With Wheels

The base board is provided with axles so that 5in. or 6in. diameter rubber-tyred disc wheels can be attached, using suitable coach screws which, being square-headed, can be inserted in a jiffy with a spanner or wrench.

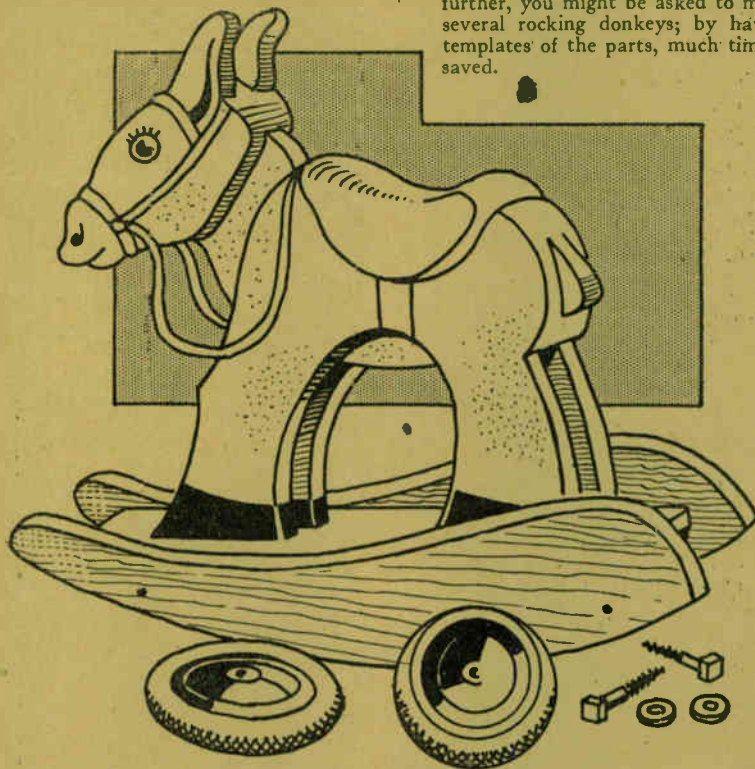
When completed, and coloured with bright enamels, the toy is sure to be welcome in any home where there are children. Steel disc wheels, of course, give a professional touch to the work, apart from making it free, silent, running.

To get the full-size templates of the donkey parts, it is a good idea to get some old newspaper sheets and rule them into 3in. squares, using a blue

pencil. Then, with a red pencil, the outlines are carefully followed, lightly, then more heavily as the shape is obtained. The patterns are cut to the outline with scissors and laid on the wood for re-marking direct on it with the blue pencil, the edge of the paper serving as a guide.

### Paper Patterns

Patterns, in paper or thin card, are very convenient. You can adjust them on the wood this way and that way until you see just how they can be arranged to use up a particular size. And by reversing your patterns, you'll obtain "opposite" shapes. And further, you might be asked to make several rocking donkeys; by having templates of the parts, much time is saved.



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

## JOHNSON TUBULAR TELESCOPIC TRIPODS



WITHOUT a tripod your work is seriously hampered. Exposures of 1/25-th of a second too often show evidence of camera shake, while with 1/10th or 1/5th second you just must have some firm support. It's always better to use a tripod and make certain of pin-sharp negatives than have to choose between under-exposure or vibration. With a rigid, easy-to-carry tripod you are prepared for any subject at any time. See this complete series of strong tubular tripods. Made of drawn brass tubing with chromium plated fittings. Beautifully finished in sea-green polychrome or black enamel. Fitted with English and Continental screws. Three-, four-, five-, and seven section models to suit your need. Very rigid and robust. These British made JOHNSON tripods are fully up to the standard of the pre-war imported product.

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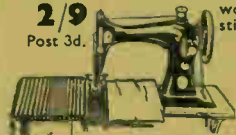
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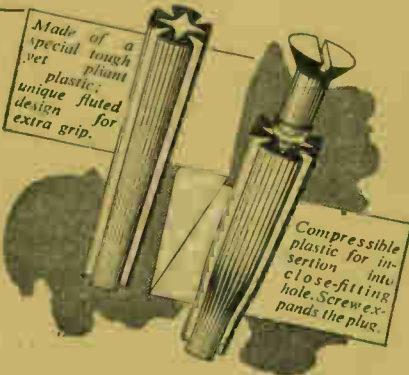
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You will want a single body piece which, as indicated by the squares, needs to be about 20ins. by 10ins. You require a repeat of all the other shapes, cutting same in reverse so that the best side of the wood will be at the outside. The wood is 7/8in. or lin. thick, and deal or pine will serve the purpose, if you possess cuttings.

Be sure to include the dotted lines on your patterns, as these serve as a form of guide when assembling the

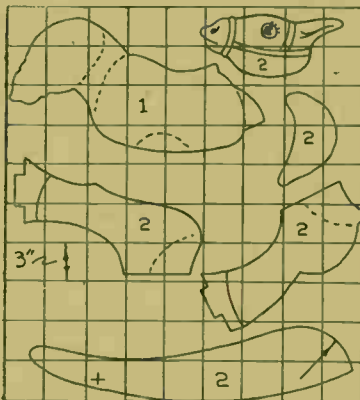


Fig. 1—The main parts outlined in 3in. squares

parts together. The wood is cut to shape with a bow-saw or keyhole saw, keeping the cutting as vertical as possible.

When all parts are cut out, select the body piece and fix a front leg and hind leg to one side of it, then at the other side. Add the head pieces, then the saddle pieces, one at each side. See that the parts are in alignment before setting the work aside to set.

#### The Rockers and Base

Meantime, spokeshave the edges of the rockers neatly. The base board, at Fig. 2, is cut out, using 7/8in. wood. Check the mortise positions with the tenons on the legs of the model donkey to ascertain a true fit.

The base is only 6ins. wide. If desired, however, it could be made 8ins. wide. The extra inches will prevent the toy toppling over on its side easily. When made narrow, the feet of the user can rest on the floor.

The saddle is only 14ins. or thereabouts from the ground, and 16ins. when the wheels are fitted on.

Glue and screw axles to the base board as per dotted lines. The axles can be 6ins. (or 8ins.) by 1in. by about 2ins. The rockers are then attached to the base, using screws, after which the underside of the axles are bevelled to conform with the arc of the rockers.

#### Wheel Fixing

Disc wheels, as previously mentioned, are affixed with coach screws—not carriage bolts, please note. Coach screws are made in a variety of sizes. They have a coarse, wood screw thread, with a square head. Part of the shank, like wood screws, is plain, and this part of the screw forms a good bearing for the hubs of the metal wheels. You should use fairly long coach screws—not less than 4ins.

A lot depends on the width of the wheel hubs and the diameter of the hub holes. The screws should be a neat, free fit. Drill receiving holes in the wood so the screws drive in with a minimum of trouble, using a spanner or wrench. Have suitable metal washers between the head of the screws and the hubs of the wheels, this also applying to the rockers and the hubs.

#### Touch Up the Donkey

The donkey requires to be trimmed up here and there to make it smooth and presentable. You will need a rasp and coarse and fine glasspaper. The saddle needs to be rounded over at the top to make it comfortable. You have five thicknesses of wood to work on, and a fairly decent curvature can be obtained, as can be seen in the illustration of the finished toy.

The donkey's head cannot be left

square. You will need to rough it into shape. A carver could make a good job of it, but so can you, if you remember that simplicity is the keynote of the toy throughout its construction—and finish. A few corner cuts here and there, a few scallops off in other essential parts, will make a passable head. Remember that the paintwork will do much to add further realism to the model.

#### An Easier Method

If all this is going to mean a lot of bother to you, the head, like the hind end, can be left square-cut. The saddle, however, must be rounded over, and this, fortunately, is a much easier task for everybody. Be sure to see that no sharp edges are left on the wood. Remove the arris with coarse and fine glasspaper, then mount the donkey on its base, using glue, with

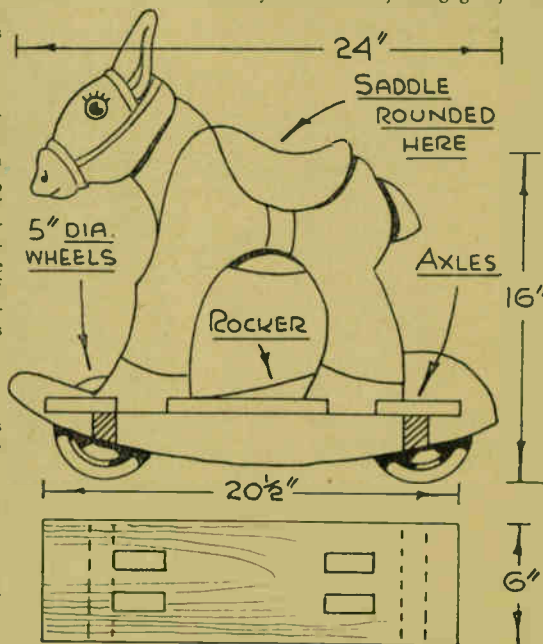


Fig. 2—An elevation and plan of base with sizes

screws driven in via the underside.

To colour the toy, use good enamel paint. The donkey can be dark grey, stippled here and there with brown. It could be done brown all over—a light golden brown, for example, and the saddle painted dark brown, the hoofs being black, with the eyes and nostrils and ears lined up with black.

The base can be light green. Now, when the enamel dries, you could cover the saddle with a piece of brown leatherette, and provide the belly band and reins from the same material. Leatherette banding, or strapping, makes reins, etc. for the head. It can be fixed on with leatherette-covered studs.

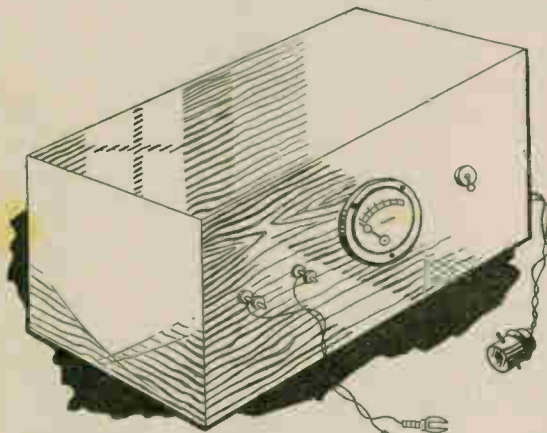
Remember that such a toy is coming in for rough usage possibly, so be sure to make all joints strong and rigid. Then the whole thing will last any youngster years.

## A Polish Outfit for Handymen

**H**OW often we are disappointed in finding a good piece of work spoiled in the finishing operations. Nothing can beat a nicely polished article in wood, glossy and smooth, pleasing to eye and fingers. Evidently it is a matter which readers realise, too, because we frequently receive enquiries about a suitable finish to their woodwork and where they can get the necessary materials. A complete new kit specially for the handyman has been put on the market recently by Rustins of

Waterloo Rd., Cricklewood, London, W.C.2. We have tested out its contents and can recommend them for all jobs where a really professional finish is desired. The Outfit contains polish, oil, spirit, colour stain, stopping, filler varnish, thinners, wadding and cloth for rubber, glasspaper and full instructions how to go to work. If the work involved has already a coat of varnish, a solution for removing it is also included.

# How the amateur radio enthusiast can make AN L.T. MAINS UNIT



A HIGH tension eliminator can provide H.T. current from the mains so a H.T. battery is not required. The unit described here functions in much the same way as regards low tension supplies. For reasons which will be described, it is best to retain one of the accumulators previously used, but as this does not require to be taken away to be charged, all mains operation is obtained. This should prove useful to many users of battery receivers.

## Panel and Case

Fig. 1 shows dimensions of baseboard and panel. None of the dimensions is critical, but a cover consisting of top, back, and two sides should be made to fit over the panel and base. If the measurements given are followed, this cover should be 8ins. wide, 4½ins. high, and 5½ins. deep, inside.

Before any wiring is done, panel, base and cover may be varnished. When the unit is finished, the cover can be fixed in position by screwing it along the sides and rear edge of the baseboard.

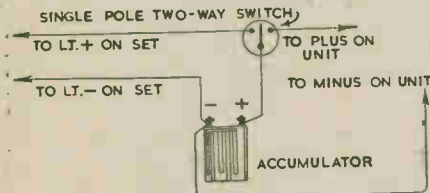


Fig. 1—The battery circuit

Plywood is quite suitable for the panel, and holes should be made for the terminals and on-off switch. A hole about 1½ins. in diameter will also be required for the meter.

## Electrical Parts

The on-off switch must be a proper

one intended for mains use. It is worth while marking the panel to show the "ON" and "OFF" positions.

A low tension rectifier is required, and even the smallest makes will do. One can be bought cheaply. It does not matter whether it is intended for 6- or 12-volt operation, as it will not be called upon to deliver its full output. Positive and negative terminals are frequently shown by red and black, respectively. Often a sign like a small "S" is used to denote the "A.C." (alternating current) terminals.

It is worth while fitting the meter because they are now so cheaply obtainable. One reading up to 1 or 2 amps. is required; or even up to ½amp. is suitable, as a greater output than this will not normally be wanted.

The transformer should have a secondary giving 4 to 6 volts. Most transformers are suitable for this, and any but the very smallest will do. Very small transformers will get rather hot after a long period of use.

A length of twin flex fitted with a mains plug or adapter will also be needed. An insulated staple can hold these to the baseboard so that connections are not pulled off.

## Construction

There are very few connections and all are shown in Fig. 1. The parts should be screwed down. The rectifier will usually be on brackets. Mark the terminals plus and minus and connect them correctly to the rectifier.

If a 2-volt accumulator is connected (be sure to observe the correct polarity) and the unit plugged into the mains, the meter should show ½ amp. or so when the unit is switched on.

If the unit delivers less than ½ amp. this does not matter. It will merely be necessary to operate it rather longer to keep the accumulator charged. On the other hand, up to 1 amp. or more is quite in order except for the very small accumulators. It is best not to exceed the rate which will be found marked on

the battery.

If the unit charges at an excessive rate (as it may if the transformer delivers a fairly high voltage and current), then a resistance should be connected between the meter and minus terminal. Only a few ohms will be necessary. A resistor can be bought or made from thin iron wire.

The more resistance in circuit, the lower will the charging rate become. Therefore, a few trials will immediately show what length of wire to use.

If either rectifier or transformer shows the slightest sign of becoming warm after a long period of use, drill a row of ¼in. holes along the back of the cover, near the bottom, with a similar row near the top. Air can then circulate inside.

## Using the Unit

The unit delivers direct current. Despite this it should not be used to

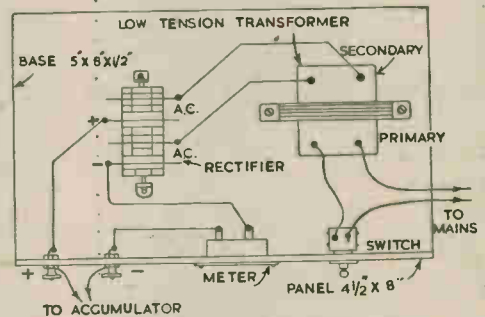


Fig. 1—Wiring plan of the unit

supply the receiver direct. There are two reasons for this. (1) Battery-operated valves require an almost

(Continued foot of page 33)

## Design Sheet for a MOTOR DRIVEN HYDROPLANE

This interesting working model is made from the design sheet presented with this issue (No. 2764). A kit of parts including motor costs 12/3 from Hobbies Branches or 13/- by post from Hobbies Ltd., Dereham, Norfolk.







## REPLIES OF INTEREST



### Bottle Lamps

I HAVE several odd shaped bottles, and would like to make table lamps of them. Unfortunately I do not know the best method of making a hole at the base of the bottle for the wire to go through. (W.B.—London, W.I.).

THE most practical way of boring a hole through a bottle or the like, is to grind it out, using a piece of copper rod or any fairly soft metal, a little smaller than the diameter of the desired hole. Put the metal in a small hand drill and use the coarsest grade of carborundum powder as an abrasive.

To guide the drill, fix a piece of wood with a hole in it, over the bowl or bottle in the required place. The wood can be fixed with Acabond or other adhesive, or some plastic wood could be used instead.

Put some carborundum powder in the hole and on the "drill"; moisten with water and rotate the drill briskly, using only moderate pressure. Wash out the hole with clean water and recharge the drill as soon as it ceases to cut freely. Patience is needed to get the hole through, but it is the safest and best way to do the job.

### Shellac for French Polish

IN what proportion should I dissolve shellac in methylated spirit to make french polish? (W.H.—Ballsbridge).

TO make french polish, dissolve 6 ounces shellac in 1 pint methylated spirit. This is the usual proportion. Shellac is sometimes rather long in dissolving and to expedite the process, proceed as follows.

Break the shellac up very small, lay it on a sheet of paper and leave in a warm spot until it is quite dry and all moisture gone. Place the shellac and methylated spirit in a gallipot and stand in a pan of water. Cover the top of the gallipot with muslin, or some similar thin porous stuff. Now bring the water to the boil to help the shellac dissolve. As the spirit is highly inflammable, no naked light should be brought near the pan.

### Linseed Oil

HOW does one convert raw linseed oil into boiled linseed oil? (W.H.W.—Camberley).

BOILED linseed oil is prepared as follows. Place the linseed oil in an iron pot of sufficient capacity to prevent it frothing over. To every gallon of the oil, add the under-mentioned quantity of driers finely ground.

(A) 3½ ounces red lead and 3½ ounces litharge. Mix with the oil

gradually and stir with an iron rod. When frothing ceases do not let the temperature rise above 22°C. About 2 to 3 hours boiling is enough, when the oil should be poured into a vessel to cool.

In case of difficulty in buying the driers, the following alternative could be used.

(B) The red lead as above, and sugar of lead in place of the litharge.

### Electric Guitar

I HAVE been interested for some time now in constructing an electric guitar, but I cannot find any books which describe their construction. (D.R.—Droylsden).

THE guitar may be ready-made or constructed along the usual lines with one or several strings. An electrical unit must then be added, several methods being possible. A small microphone mounted on the sounding board is often used. If maximum volume is desired, the microphone may be mounted in such a position that the bridge supporting the guitar strings may be secured to it. A few moments testing will immediately show the different results

(Continued foot of page 29)

## You can use an old tin to make A SIMPLE OIL CAN

DO you happen to need an oil can? Providing you have an empty insecticide powder "puffer" tin and an old pencil brush ferrule, a simple useful oil can may be made, as shown in the illustration. The "puffer" tin mentioned, of course, is the new type of container for D.D.T. and similar powder.

There is a small outlet hole in these tins, and the sides of the tins are bulged out so that, by compression, air is forced out of the hole, carrying with it a jet of the powder. Thus, the "dusting" of clothes, corners, etc., is much facilitated.

### A Suitable Spout

These "puffer" tins are not unlike the body of an ordinary oil can. By fitting a "spout" over the outlet hole, the tin container can be converted into a small oil can. This spout is the tin ferrule fitted to a pencil brush. A pencil brush, of course, is a fine type of brush used by artists, and it is quite likely that you have an old one.

If so, carefully withdraw the ferrule from the handle and remove the bristles. One way to do this is to heat the end of the ferrule to burn the hairs which, in an ash form, can be poked away with a darning needle or something similar.

When you have cleared the ferrule, make a suitable hole for it in the powder tin so that the ferrule can be inserted via the inside.

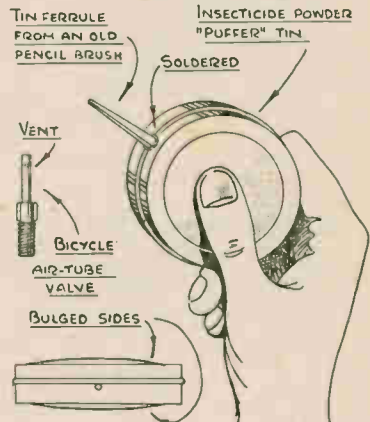
### Air Tight

It should be explained here, perhaps, that the lid on the puffer tin is a tight air-tight fixture, but can be removed. The original outlet hole may be enlarged with a drill. Insert the ferrule, point foremost, through the hole to project as shown, then proceed to solder it at the shoulder. When the lid is replaced tightly

again, the oil can is ready for filling.

Filling is done by suction. Simply press the tin sides and, dipping the end of the spout into the oil bottle, allow the tin sides to bulge out. This sucks a quantity of oil into the tin, and by repeating this action, the tin will soon become partly full. It should not be quite full of oil, by the way, otherwise the oil will squirt out.

The least pressure suffices. Pressure controls the flow. You can have the oil coming out drop by drop, or in a jet. If you find the oil is likely to run out of its container when the latter is left lying on its side, the spout tip can



be fitted with a stopper, such as a tack or a piece of matchstick.

If you do not have a metal ferrule to use, an alternative is the air-valve from an old bicycle inner tube. This can be affixed with a nut, then soldered.

The outlet hole (air vent) in this case is at the side of the valve, as shown. To prevent the oil running out, which is quite unlikely, a piece of rubber valve sleeving can be forced over the stem to cover the hole.

# Full-size patterns are on page 35 for making this NOVEL WORKING TOY

**T**HIS week we provide patterns (on page 35) for a novel cut-out moving figure, an item which should amuse our younger readers. As can be seen, two men are supposed to be at work. One is holding a stake of wood. The other is holding a heavy mallet. By moving a control arm, the man with the mallet moves backwards, thereby raising the mallet.

## What Happens

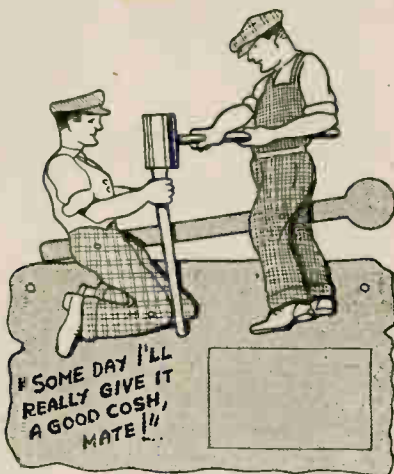
Now, as this man moves back to give momentum to the blow of his mallet on the stake, the other man rather sticks his head in the way. In this position, one wonders if it is the man's head, or the stake, that is going to be hit. "Some day I'll really give it a good cosh, mate!" the man with the mallet is saying.

It looks like he means his helper's noddle, and to see just what happens, everybody simply has to move the control arm so the mallet comes down again. However, a reversal of what took place before occurs. The mallet just misses the man's head and taps firmly upon the stake he is holding. So, you see, it is just a simple moving novelty—a new type which is sure to please.

## As a Calendar

If desired, you can make a calendar out of the novelty. It is only a matter of adhering a suitable calendar pad to the space provided. The whole thing can be affixed to a wall, using a couple of roundheaded brass nails.

When prepared and fixed up on the wall, you will have some fun watching visitors when they suddenly notice the novelty—it will attract the eye much as the "drinking ducks" we see



Suitable for a calendar date pad

in the windows of many shops at present. People are very curious. Everybody will want to move the control arm to see what happens. Such a calendar novelty is sure to come in for quite a lot of attention.

You could make it up for the New Year, or ignore the calendar idea altogether and make the novelty for holding in the hands.

## Fretwood or Plywood?

The patterns are pasted down on  $\frac{1}{2}$  in. wood. This should be plywood, if possible, or well seasoned fretwood. Stiff cardboard could be used, but the pivots of the moving parts need to be small eyelets, fixed with a punch. If you have roundheaded paper fasteners (these are made from thin brass, with tags which bend over easily) in hand,

these can be used for cardboard cut-outs. In the case of plywood or fretwood, of course, panel pins are used.

Owing to lack of space, the control arm is drawn through a pattern. You need to take a tracing of this arm, therefore, after which the figures and support are pasted down on the wood or cardboard, then cut out with a fine fretsaw.

## Holes for Movement

When cut out, make holes in the figures with a fretwork drill point (for panel pin pivots) or a twist drill (for eyelets or fasteners). The holes for the pivots in the control arm and the support should, in the case of panel pin pivots, be done with a finer drill.

The reason for this is that the points of the nails must be a firm fixture in the arm and support, with the stems free in the figure pivot holes. Thus, the nails will not work out.

Attach the figures to the arm first, then the figures to the support. This completes the novelty which is ready for use—or attaching to a wall. There is no need to colour the edges of the wood.

## With Date Pad

If you use a calendar pad, select one which is large enough to cover the writing in the panel space. You can only make one of these novelties. If you are a bit of an artist, however, it would be easy to trace an outline of the figures and fill in the details with ink or crayon pencil. This can be easily done on birch plywood, or a stiff white card, using crayon pencils in the former case. Or get a friend to help you who can do it well.

(Continued from page 28)

with the microphone in different positions.

If the strings are of metal (steel) an earphone, with diaphragm removed, may be secured below the strings at their point of maximum vibration, the earphone being at such a height that the wires of the guitar are very close to the poles of the magnet. This will give very pure reproduction, although volume is slightly reduced.

The output from the microphone or earphone should be amplified by a radio receiver or amplifier.

## Making a Cold Box

**I** WANT to make some form of cold box of about three cubic feet internal capacity for keeping the milk, meat, etc. reasonably cool. (L.D.—Harlesden).

**A** PRACTICAL solution to your problem has been sought for over 50 years, and so far none, other than

the use of a refrigerator has been found.

The most successful cool box is the old-fashioned "ice-box", which was merely a strong box, zinc lined and heavily lagged on all sides. Ice in block form was placed in a compartment, with provision for the escape of the water as the ice melted. The food stuffs were arranged as near the ice as possible.

## Moulds in Gelatine

**I** AM interested in making small scale ship models, so would you please inform me how you use gelatine for making moulds? (H.P.—London-derry).

**G**ELATINE can be used for making moulds for small castings—in plaster or the like—under suitable conditions. A model of the desired article is prepared and the location and number of moulds decided upon, according to the shape of the model.

Undercut parts should, of course, be avoided.

The model is then placed in a small box or container, with the top edges thereof level with that part of the model where the divisions between the moulds are to come.

A suitable quantity of gelatine is then placed in a clear vessel which is placed in a pan of boiling water. As soon as the gelatine becomes liquid, it is poured into the box and the model held in place while the gelatine cools and sets. The surface is then coated with grease, and the remainder of the mould is made in a similar way by placing another box on top of the first, securing the edges with adhesive tape to keep it in place, and the gelatine poured in through a suitable hole or holes in the top.

As gelatine dissolves with heat, its use for moulds for lead castings is impracticable.

# The second article on the simple hobby of making STENCIL XMAS CARDS

As explained in the previous article, all stencils are cut from a thin film. The cutting tool used by the writer was a sharp-pointed penknife, such as the type shown at Fig. 3. Straight lines are best ruled, with curves done free-hand. For neat and true cutting, the film should be fixed with thumb tacks to a drawing board and a small wooden or metal T-square used for guiding the penknife blade.

When cutting, make a light score first, then make a second cut, pressing more heavily on the blade. The precautionary scoring prevents the likelihood of the blade suddenly slipping across the smooth film surface, thus undoing perhaps, a lot of patient work.

Do not wet the tip of the blade in order to "lubricate" it and avoid wetting the coated surface of the undeveloped film, if you use it, as water affects the emulsion, causing it to become soft and swollen.

## Cleaning Film

When the stencil has been cut, that is to say, when all the "black" portions have been removed, the film is laid on a tin tea-tray (or anything similar) and washed with an old nail-brush, using hot soapy water. The water, however, must not be too hot, otherwise the film will wrinkle. Have the water luke warm and allow the film to soak in it for a few minutes prior to using the brush.

The emulsion comes away easily enough, but keep the film flat on the tray bottom. Scrub one surface gently, taking care not to press too heavily in case some of the "ties" in the stencilling are broken. Scrub the reverse side, then hold the film up to the light; minute traces of the emulsion will doubtless be revealed and these must be removed to have the film surface free from any stickiness.

Dots in a stencil design, incidentally, are best made with a fretwork drill point. Larger holes can be made with sharp metal-cutting twist drills. Prior to drilling the film, ensure accuracy by piercing the dot positions with the point of the compasses. Drilling should be carried out at both sides of the celluloid, thereby ensuring neatness. After cleaning a stencil, some dots may need to be cleared with the drills.

## Stencilling Brushes and Inks

Having made a stencil from the film, as explained, a "proof" is printed on plain paper. A proof, of course, reveals small errors and inaccuracies in the cut-outs, and such

require touching up with the penknife, apart from the various dots made with drills.

## Suitable Brushes

The best type of stencilling brush to use was found to be a typewriter brush. This brush resembles a tooth brush in appearance (see Fig. 6) and is used principally for cleaning the face of type.

The bristles, plus the shape of the handle, makes these brushes more suitable for stencilling than old tooth brushes or proper stencilling brushes, the latter being rather coarse and too large for the finer stencilling you are undertaking. So, obtain typewriter-cleaning brushes, three being sufficient



Fig. 3.—How to hold the film down, with brush and cutting knife

for your needs, since you will probably not use more than three different colours, such as red, green and blue or black.

You also need three bottles of indelible stamping ink and three inking pads. The latter are easily made from the lids of three  $\frac{1}{2}$ lb. cocoa tins, hat felt and linen. The lids serve as pans; the hat felt is cut to fit inside, using three layers for each pan. The layers are held together by covering them with white linen, the loose ends and sides of the linen being drawn together with thread at the underside.

## Taking a Proof

To take a proof, pin the stencil over a sheet of paper. A few drops of the stamping ink is allowed to soak into the prepared pads until the surface is well covered and damp. A proof is made by rubbing the bristles of the brush on to the (say) red inking pad and then by rubbing the brush over the stencil—using a firm circular movement.

Results seem uneven until the

paper is drawn away from the stencil plate. That is why you should not attempt to have the ink filling up the black spaces in the stencil too deeply. A light shade only is wanted. If a deeper tone is desired, more rubbing is necessary, but too much rubbing "lifts" the surface of the paper which, naturally, is damp with the ink. This "lifting" is more noticeable on blotting paper and the loose particles of pulp are apt to clog the cut-outs in the stencil plate. The term "plate" is always applied to a finished stencil, by the way.

## Printing a Card

Assuming the "proof" is satisfactory, a "test" card is printed. As stated before, the card paper is the kind used by typists, being sold in reams (480 sheets) in packet form. The writer has suggested "bond" quality white paper, but there are thin cheap-grade "tinted" papers available which, however, you might find too flimsy for your purpose.

Before printing, each sheet must be folded in a certain manner, as shown at Fig. 2, so a  $\frac{1}{2}$ in. margin of the inside back page section shows at the front. To fold the paper, bring A-A and B-B together and crease the fold with the fingers. B-B is turned over on A-A and a second crease made. The measurements give the position of the creases (see dotted lines).

Place the folded paper on the drawing board. Set your stencil over it. Centre the stencil neatly over the folded paper, then drive in a couple of drawing pins through the stencil so the points just touch the top edge of the card paper (see Fig. 3). The tacks act as a guide for the card paper, keeping it even with the stencil.

## The Colours

Having printed the front design in colour (red and green), the inside back greetings matter is printed. The stencil for this purpose is pinned to another portion of the drawing board, of course. The two colours mentioned are suggested because they blend well together, being suggestive of green holly and red berries and thus giving a Xmas flavour and atmosphere to the cards.

It does not matter, moreover, if one colour infringes on the other colour owing to the close proximity of the cut-out spaces in the stencils. You should, however, avoid this overlapping of colour as much as possible.

Having successfully printed one style of card, other types will come easily with you.

(To be concluded)

CUT ONE OF EACH  
3/16in.

10

1

CUT ONE  
3/16in.

CUT ONE  
1/8in.

13

9

CUT ONE  
3/16in.

17

SCREW  
CONTACT

CUT ONE  
3/16in.

11

CUT ONE 1/8in.

CUT ONE  
3/16in.

16

METAL  
CONTACT

BASE  
CUT ONE  
3/16in.

18

CONTACT  
PLATE.  
CUT ONE  
FROM  
THIN  
BRASS.

BASE.  
CUT ONE  
3/16in.

World Radio History

19

CUT ONE  
3/16in.

4

CUT ONE  
3/16in.

12

CUT  
ONE  
1/8in.

5

CUT  
ONE  
1/8in.

42

CUT  
ONE

PARCHMENT

BASE.  
CUT ONE  
3/16in.

**Hobbies DESIGN**

No. 2764  
20-10-48

SUPPLEMENT TO HOBBIES No. 3764.

# WORKING MODEL HYDROPLANE

SIZE :  
LENGTH 14 1/2 in.  
BEAM 3 1/2 in.



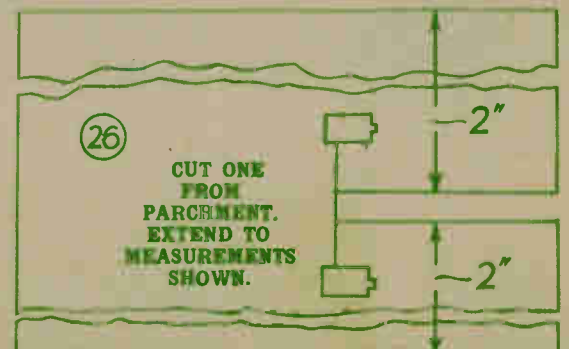
PANELS OF WOOD REQUIRED FOR THIS DESIGN

**ONE H3 ONE G2**

The price is shown in Hobbies Weekly, October 20th, 1948, but is subject to revision. See the current edition of Hobbies Handbook, or write for price to Hobbies Limited, Dereham, Norfolk.

NOTE—This design sheet is only presented free with the current issue of Hobbies and not with back numbers. Further copies may be obtained.

THE ARROWS INDICATE THE DIRECTION OF GRAIN OF WOOD.



# HOBBIES ELECTRIC DRIVEN MODEL HYDROPLANE

through at the shaft join, it will not get into the main body of the boat.

The various upright pieces—2, 3, 5 and 6—are each covered with a piece of parchment virtually making bulk-head doors to isolate any flooding should it happen to occur.

## Motor Tower

Next complete the central "tower" which holds the motor. The parts are shown at Fig. 3, where a dotted line indicates how the motor is fitted. It rests on the hollow framework of part 12 and—above—by the frame of part 14 glued beneath the top—part 13. The motor merely lies in position with the longer portion of spindle projecting towards the stern.

Having the skeleton of the boat available, now undertake the wiring as shown in Fig. 4 and 5. The larger battery lies in the stern on the two formers provided (No. 10). The smaller battery lies across the compartment provided with its side piece (No. 16). The leads are shown in Fig. 4, with the detail of their connections in Fig. 5. The thin cotton-covered wire is let in the small recess where it passes through the framework in order not to bulge when the cover pieces are added.

## Starting Handle

The stop and start handle acts on a rocker provided by the square staple of wire shown. On the inside of part 16 a metal plate is fitted by means of two tabs slipped into the slots provided. A screw is then driven through to form a connection for the wire leading to the battery. The actual wiring circuit is shown at Fig. 6. The small battery is led, as here shown, across the hull and to make good contact, a light wire spring is fitted over the projecting end of the battery to close up to the plate. This is shown in the detail at Fig. 6.

The wires leading to the motor are carried up the inside of the structural pieces No. 4, being fixed with glue. Put the batteries in place and test the circuits to see that the motor runs correctly. A paper clip on the end of the wires will allow simple contact.

Now we come to the covering of parchment. Patterns are shown of various pieces of an unusual shape, but most of them are plain rectangles. The parchment is fixed with Durofix, pins being temporarily placed in position until the glue is set. Do not attempt to cut out the exact shapes first, but glue and pin the complete

rectangle of paper down. When the glue is hard, a sharp knife or razor blade will trim away the paper not required.

Notice that the stern has a raised piece (19) glued on first. At Fig. 7 is shown the side cover pieces butted together half-way along at the points shown. Notice the bending tabs cut to the shape given on the pattern, and then turned over on the underside.

## Keel Covering

Next turn the boat upside down on blocks so you can add the keel covering. As shown at Fig. 8, this is glued and temporarily pinned, and the overlapping portion being trimmed away. Add the pieces in numerical sequence, butting up to each other and being well glued in place.

Fig. 9 shows the fitting of part 25 at the bow, and the piece (26) which goes on the deck round the centre pillar. A pattern is given of this on the sheet, the actual size having to be extended 2ins. before drawing out on the parchment. The peculiar shape allows for the flaps to be turned up and around the pillars holding the motor. When laid flat to the formers, the piece should fit snugly round the wooden uprights, glue being plentifully applied here to ensure a watertight fit.

At Fig. 9 you also see the guide tabs (27 and 28). Note that these are glued only along the outer edge so that the cabin and the stern deck can slide under them. Remember, too, to cut a small slot for the working of the steering handle in one piece of N. 27.

## Sliding Well Cover

The stern well cover slides along the deck and has a strip piece immediately over the stern to help it in place. This is shown in Fig. 10, and further to stiffen the whole thing up, a long staple of wire the same shape as part 19 can be fitted. The stern cover slides beneath the wire and its narrow strip of parchment, and between the side strips, parts 28.

The cabin construction is shown in Fig. 11. One of the sides is laid on the bench and then the actual roof piece bent round it (33) being held in place with pins. Now run glue along the inside angle, when hard, turn the part over and add the opposite side (32). The transparent material is cut to form the windows—as one piece—the length of the side. If cut to the same shape as the side and glued

close in, a rigid cabin top is made.

The parchment covering is also provided to go round the motor structure. Glue it right round and then cut away the front lower portion to come in line with the cabin top.

The propeller is shown at Fig. 12. It is shaped from one 1/4in. piece or two 3/16in. glued together with a capping piece (No. 36) shaped to a pyramid. The blade is given a twisted appearance by careful carving so the right-angle thrust is obtained. Through the centre boss a screw has to be driven, which engages on the end of the motor spindle when this is put in from behind. The end of the screw, of course, has to be filed flat to make contact on the spindle shaft. The prop must not be pushed on to the spindle hard or the motor may be damaged. If you can obtain a ready-shaped 4in. propeller from a model aeroplane shop, it will save your own work of shaping.

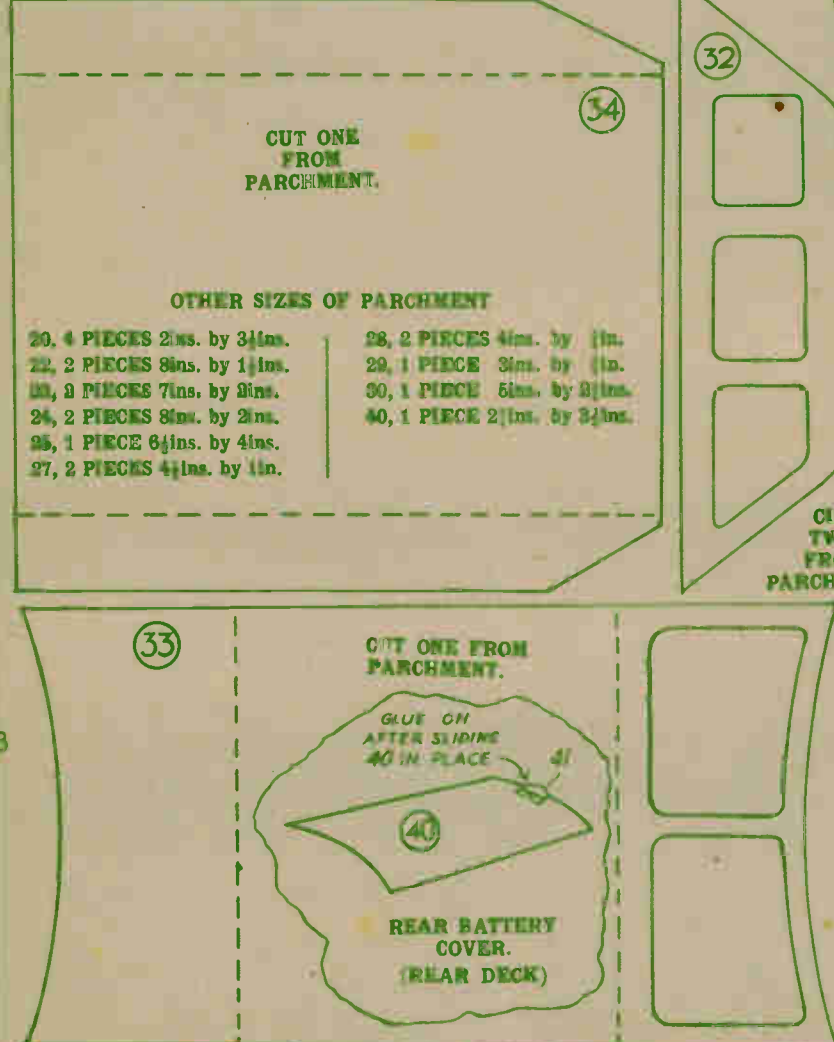
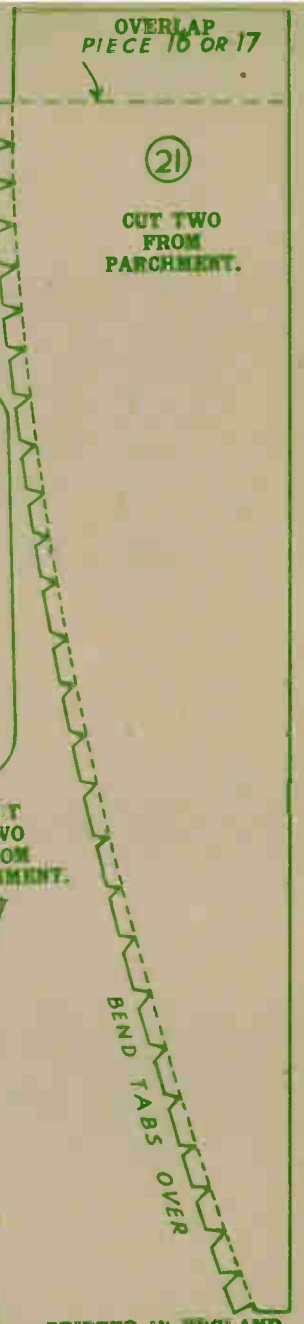
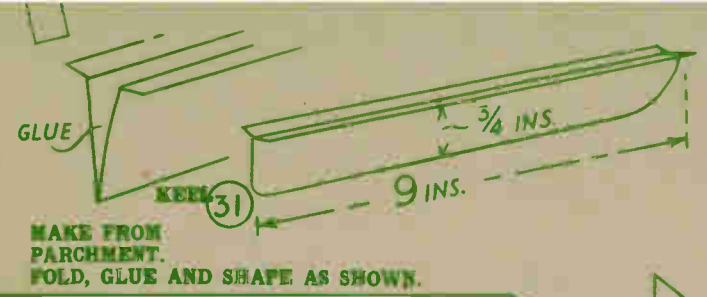
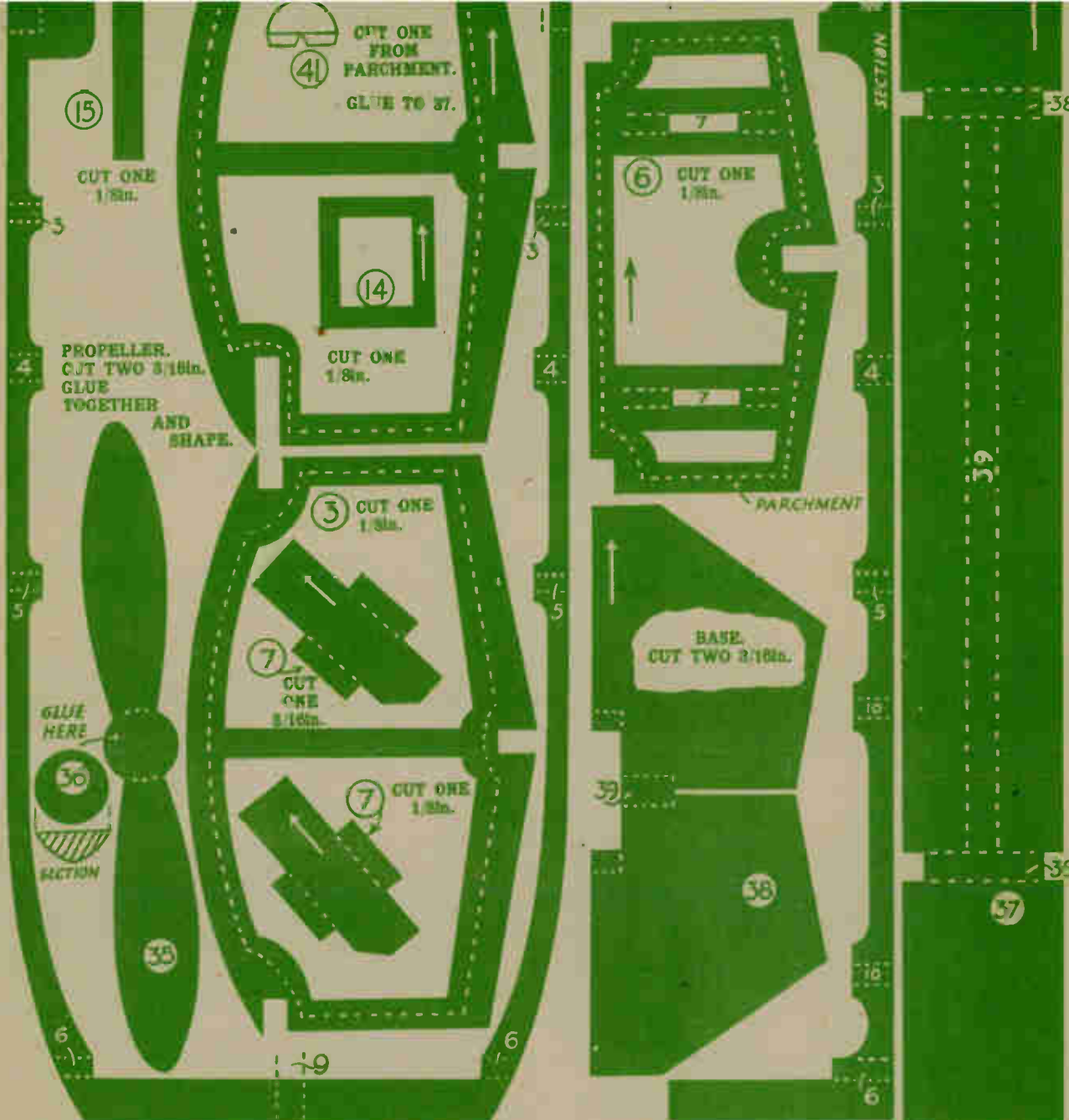
## The Rudder

The rudder is shown at Fig. 13. The piece of stiff wire is framed up, and then two pieces of parchment glued over to form the actual surface. The straight wire is placed through the hull centrally in the rear compartment. A good plan is to glue a length of plastic tubing through this compartment, and pass the wire through that before turning it down as a pillar.

A stabiliser has to be glued along the keel shown as part 41 on the sheet. This is merely a folded piece of the parchment with gluing tabs. It is 9ins. long and fixed 1in. inwards from the stern along the centre of the keel. You can see a piece of it in Fig. 13.

The whole of the model can now be painted. By the way, the inside of the model before the decks are placed on, can well be varnished to give further strength. The outside is given a coat of glossy paint, or you can give a final coat of varnish over ordinary matt paint. The decks can be cream, the hull sides black to the waterline, with red below. The cabin top is in red as well as the motor housing structure.

The steering handle of stiff wire can be covered with a piece of plastic tubing to give added size. The motor should drive the propeller at sufficient pace to lift the model to skim the water at a steady speed. If you find the propeller turning the wrong way, it is a simple matter to reverse the leads on the battery.



PRINTED IN ENGLAND.

**T**HIS new type of model is novel, incorporating the style of motor for wind driven water. The tiny electric motor, an Electrotor, is driven by a battery and turns a 4in. propeller at high speed, so the hydroplane drives steadily along the top of still water for a considerable distance. The model has to be particularly light, of course, and when complete weighs under 6 ozs., with a full 6 ozs. for the batteries.

The model is built on a skeleton framework of wood covered by parchment paper, and finally painted and varnished to render it strong and watertight. If care is taken in putting the parts together according to the instructions, an excellent water model is made, suitable for use on a model lake or any smooth water.

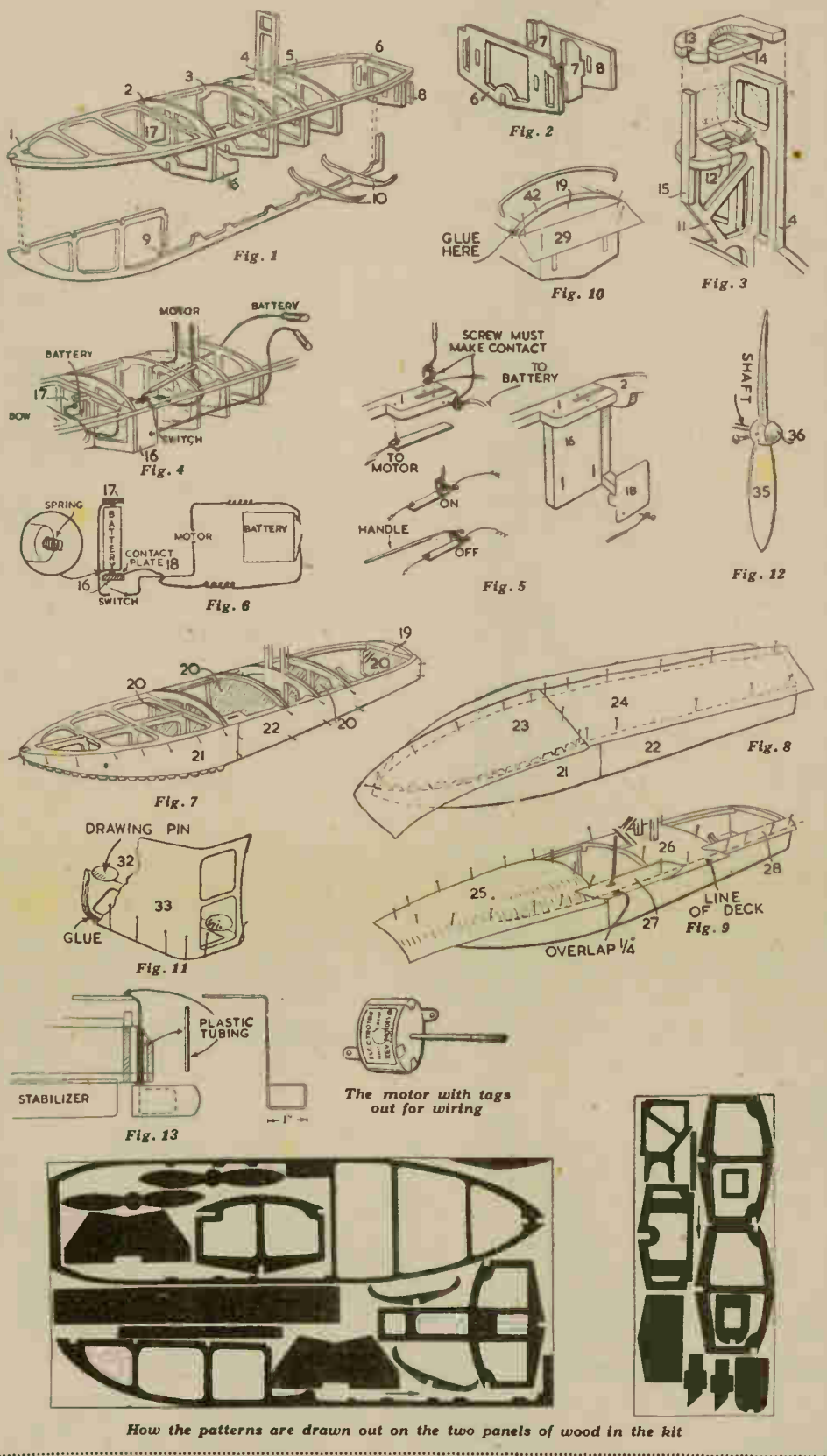
### The Motor

The motor is encased in the central structure and is driven by two batteries—a 4.5 one (flat) in the stern, and a 2.5 (cylinder) in the cabin. The motor is totally enclosed apart from the projecting shaft. The cabin and the rear deck slide to allow access to the batteries and are fitted to make the whole construction watertight as possible.

The kit of materials provided by Hobbies, Ltd., includes wood, parchment paper, transparent material for the cabin windows and stiff wire for steering handle and rudder. The special Electrotor illustrated here is also supplied, so what will be needed in addition, are merely the batteries and sufficient usual covered wire—about 18ins. of it. The wooden parts, of course, are cut to the patterns shown, with the frets cleaned up with glasspaper and being fitted together. The parchment covering is fixed with glue—Durofix is ideal—and the model is completed with a coat of glossy paint or paint and enamel.

### Construction Sequence

Care must be taken in fitting the parts together, but the sequence shown in the drawings herewith and the diagram at Fig. 1 shows the construction of the carcass in numerical order. A detail of the motor is shown at Fig. 2. The special pieces No. 7 allow for the motor shaft to work in a compartment of its own, so that should any water



How the patterns are drawn out on the two panels of wood in the kit

# How the amateur photographer can build A SIMPLE ENLARGER

WE frequently receive requests from readers asking for information and instruction on how to make an enlarger and, in order to satisfy these, we are publishing details which should enable any reader with a few tools, and a knowledge of how to use them, to produce an enlarger of the horizontal pattern capable of giving very efficient work and many hours' pleasure in attaining what almost every amateur photographer will agree to be the highest achievement of the hobby, i.e., picture making by enlarging.

There are four main sections to an

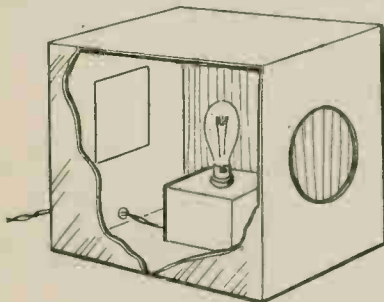


Fig. 1—Cut-away view of the lamp chamber

enlarger, each of which has its own particular function to perform. At the same time each is dependent on the others for the successful working of the whole.

To illustrate this point, the light from the Lamp Chamber has to pass through the Condenser where the rays are bunched so as to evenly pass through the negative, and be again collected in the Camera or Bellows prior to passing through the Lens and then being thrown and spread out as a picture or image on the screen. It will be seen from this that all the light has to be guided from one section to the next and that none must be allowed to escape.

It is now necessary to describe each section and to give some hints as to its preparation or making. You should also study carefully the illustrations of the parts while reading the instructions, for by doing this, you should get a clearer idea of what is required of the part.

## The Lamp Chamber

The Lamp Chamber (Fig. 1) should take the form of a square box about 12ins. to 16ins. each way and made of  $\frac{1}{2}$ in. planed wood. If you are handy in adapting tin boxes, you might try using one of the usual square biscuit tins.

On one side of the box, cut out a square about 6ins. each way and

retain the piece as it must be re-inserted as a door. The opening should, therefore, be wide enough to permit handling the lamp. At the opposite side of the box to this opening a circular hole has to be cut in the centre of the panel.

## Condenser

Next let us turn to the Condenser. It is possible to buy a pair of unmounted condenser lenses and to mount them but it is much better to buy the pair already mounted. Obviously this will save a lot of work and the mounting is likely to be much more accurately done. If your

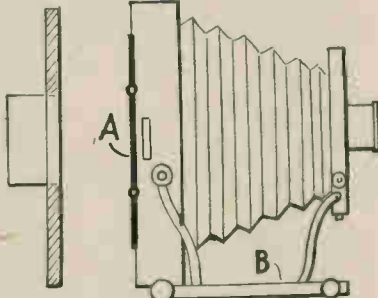


Fig. 2—Section of condenser and panel

Fig. 3—Showing back, double dark slide (A) and rack and pin on (B)

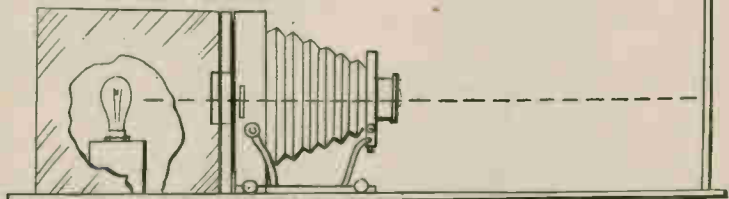


Fig. 4—The complete assembly, dotted line showing line of lamp to easel

negatives are all of one size, say,  $3\frac{1}{2}$ ins. by  $2\frac{1}{2}$ ins., then you will want a 4in. condenser. If the negatives are  $2\frac{1}{2}$ ins. by  $2\frac{1}{2}$ ins., then a 3in. is required.

The size is obtained by measuring diagonally from one corner to the other across the negative. In other words it is only by taking the longest measurement that you will be certain the condenser covers the whole of the negative to be enlarged, and unless "covering" is assured, sharp definition on the easel of the whole of the image is impossible.

These condensers can usually be obtained from any recognised photographic dealer and, of course, at varying prices according to size and condition of the mounts. Round about 25/- is a fair price for a 4in. In any case the condenser must be purchased before much work can be done or even started on the enlarger.

Be very careful to measure accurately the outside of the condenser.

Cut a square piece of wood the same dimensions as the panel of the lamp chamber that is to have a circular hole cut in it. Now with a compass, mark in the actual centre of this piece of wood a circle the same size as the outside of the condenser. Repeat this circle on the back panel of the Lamp Chamber if both edges of the condenser are the same size. If one is smaller than the other, then one of the circles must be equally smaller—it does not matter which.

Be quite certain you have the measurements accurate, then if you cut out the two circles and smooth away the rough edges, you should be able to fit the condenser easily. One side of it goes into the lamp chamber and the other into the separate piece, as seen in the illustrations.

## Camera and Negative Holder

The next section to be considered is the Camera or Bellows which is also the negative holder (Fig. 3). It is best to buy a second-hand stand camera. If you can get one with a lens it will save a lot of bother; certainly it should have a double dark slide.

This slide is fitted with sliding

sheaths to each flap and between these flaps is a thin metal sheet or a card. This sheet or card division must be cut away, leaving a space the same size as your negatives and in its place two pieces of thin glass between which the negative is to be inserted and kept flat. It will be found that the slide very cleverly fits into the back of the camera and this is important as no light other than that coming through the negative must reach the inside of the camera.

## Assembly

Place the camera against the condenser so the negative will be immediately in the centre of it. To get this exact it may be necessary to raise the camera bodily by inserting a false bottom under the camera base but it must be done. The rack and pinion movement on the camera must be retained as this is your means of



focusing the image sharply on to the screen.

If you have to purchase a lens separately, then your dealer should be able to advise you what type will do for the camera and how it is to be fitted to the front of the camera. Anyway it is not necessary to have a very expensive one, a short focus is better than a long focus lens, a simple portrait lens will give quite good results, though one is always wanting something better.

### Prevent Vibration

At this stage most of the preliminary work can be said to be completed but what must be considered as the most important stage is now reached. All the parts will prove to function with greater ease if they are permanently fixed to a base board of 1in. stuff and fairly weighty to prevent the enlarger shaking or vibrating when in use.

It is absolutely necessary that the

centre of the light bulb, assuming that electricity is the illuminant, must be in a direct straight line with centre of condenser and the centre of the negative and the centre of the lens. Thus a perfectly straight line exists from the lamp to the lens stop (Fig. 4). Only by this can you expect even illumination and, when you have got it exactly, the only way to keep it is by screwing each section to the base board.

### Firm Base

In order to centre the light and to enable it to be moved nearer or farther from the condenser as needs be, it will be found advisable to mount the bulb on a block of wood which, of course, must be just high enough for the purpose. Also have a loose flex long enough to connect with the nearest bracket in the room and fitted with a handy switch for quickly switching off the light when working the enlarger. It is not

advisable to use high power lamps for the work; 40 or 60 watt gives the opportunity for control.

The Easel can be constructed to stand on the same table as the enlarger but it will be found much more convenient to have this hanging on the wall in front of the apparatus.

When purchasing the lens buy also an orange cap to fit it. You will want this when placing the sheet of bromide paper in position on the easel.

It is difficult in these days to give even approximate prices of any kind of apparatus. Undoubtedly the camera is likely to be the most expensive item especially if a lens is included. But you can often see such an article in the secondhand window of a dealer or might even come across one at an auction sale of oddments. One or two pounds spent on a good article is less expensive than a few shillings on a piece of apparatus that is beyond repair.

## How the handyman can understand thicknesses in STANDARD WIRE GAUGES

**M**OST readers, at some time or other, are often at a loss to know the exact thickness of a wire specified, by its standard wire gauge number, for a certain job. Not possessing a gauge, the numbers are just meaningless, yet so much depends on using the proper thickness of wire. Various gauges of enamelled or cotton-covered copper wire are used in making tuning coils, transformers and electro-magnets. Plain wire is generally used in making bird-cages, letter-box baskets, soap holders, cake trays, toasting forks, etc. In practically every case, the s.w.g. number is mentioned.

### Converting Sizes

The purpose of this article, therefore, is to help all those readers who are apt to be puzzled by the s.w.g. numbers of wires, particularly the wires they are liable to use, or desire to use, from time to time, from No. 1 up to No. 30. So far as radio components are concerned, a great deal depends on using the correct thickness of wire, apart from the amount, because thickness effects inductance and resistance.

Thickness is not so important in general wire-work, but still, one likes to be able to use the correct thickness of wire recommended. Sometimes the thickness is stated in fractions of an inch, which is very helpful, because the reader has something tangible to work on. He can use a rule to determine the thickness of the wire—an ordinary rule, with 1/16in. divisions.

A standard wire gauge chart, giving

the approximate thickness in fractions of an inch is, therefore, sure to be welcomed by numerous readers. Such a chart, based on a standard wire gauge, is given in the adjoining panel.

S.W.G. NUMBER	FRACTION OF INCH
No. 1	19 32in.
No. 2	5 16in.
No. 3	1 4in.
No. 4	15 32in.
No. 5	7 32in.
No. 6	3 16in.
No. 7	10 64in.
No. 8	5 32in.
No. 9	9 64in.
No. 10	1 8in.
No. 11	7 64in.
No. 12	3 32in.
No. 13	5 64in.
No. 14	(between size)
No. 15	(between size)
No. 16	1 16in.
No. 17	3 64in.
No. 18	(between size)
No. 19	1 32in.
No. 20	(between size)
No. 21	3 128in.
No. 22	(between size)
No. 23	1 64in.
No. 24	(between size)
No. 25	1 128in.

**NOTE:** Sizes, from No. 25 to No. 30, become too difficult to show by the inch marking. No. 30 is the thickness of a fine human hair. To prevent any confusion, there are several between sizes, which are indicated in parentheses.

For the benefit of readers who do not understand fractions of an inch, it should be stated that an inch is divided into four quarters, and the quarters halved, which gives eighths. Thus, a 1/4in. contains two 1/8ths of an inch. An 1/8in. is halved to give two 16ths of an inch. By halving 1/16in., we get two 32nds of an inch. By

halving 1/32in., we get two 64ths of an inch, and by halving 1/64in., we get two 128ths of an inch.

### How to Compute

So, to give a proper fractional size, we mentioned the number of 16ths, 32nds and 64ths that may be necessary. There are, for example, four 32nds in an 1/4in., but that being so, we do not write down 4/32in. We say it is an 1/4in.

Assuming, however, the size is one 32nd more than 1/4in., we take into account the number of 32nds in an 1/4in. and add the extra 32nd to such a number, making five 32nds, which is written with a fractional mark (/) thus: 5/32in. This also applies to 64ths and 128ths of an inch.

A much more convenient way of indicating the fractional dimensions would be to use millimetres. Few readers, however, possess millimetre rules, and the next best thing is a common rule. The use of this rule, in conjunction with the chart provided, will give a fair idea of gauges of wire recommended for a particular job.

### General Sizes

Reference will show that No. 19 s.w.g. wire is half of 1/16in. in thickness, because 2/32in. equals 1/16in. Respecting the finer gauges, from No. 25 up to No. 30, you have a good idea of the approximate thickness. No. 30 is an extremely delicate gauge of wire, like the fine strand of sticky substance used by house spiders. Hitherto, perhaps, you may have thought that, having a high number, the wire must be very thick. The chart shows that the thickness is the other way round.

# Tie rack and box container are fitted to this useful DRESSING MIRROR

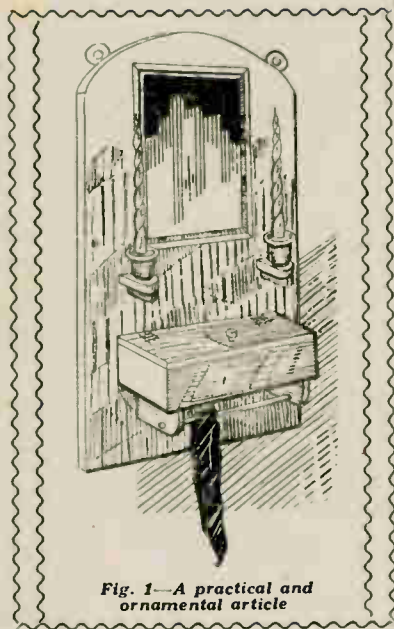


Fig. 1—A practical and ornamental article

THE fitment shown in Fig. 1 should form a useful addition to the small bedroom. It is a mirror frame of modern design having a useful mirror with sockets each side for fancy candles. Below the mirror is a two-compartment box for soft collars, studs, etc. Below this again is a tie rack formed by a stout rod between the two brackets which support the box.

If, instead of the candles each side of the mirror, two small electric bulbs be arranged, then the brackets supporting them could be placed higher and on a level with the centre of the mirror.

The whole fitting would look well in either oak or mahogany, and if any choice is possible these days, the wood should match the room.

If oak is used it should be finished with a coating of medium-light stain and then either wax-polished or french-polished. If mahogany is used, a coating of dark mahogany stain should be applied finished with french polish.

A board measuring 21ins. by 12ins.

## Mains Unit—(Continued from page 27)

exact 2-volt supply and will be damaged if this is only slightly exceeded. Therefore, operation becomes very critical, especially as the voltage output of any mains unit varies with the current taken. (2) Hum may be caused by the fluctuations in the supply, even with smoothing.

It is cheapest, safest and best, therefore, to retain an accumulator, which is connected as shown in Fig. 2. When the single pole switch is

will be chosen, and the simple shaped top marked out and cut with the fretsaw. The centre from which to strike the arc forming the shaping will be set  $9\frac{1}{2}$ ins. down from the top edge, and when the fretsaw has done its work, the edges must be cleaned off.

The position for placing the box can be got from Fig. 2, where the brackets beneath it are also shown. The side view of the fitment is also shown in Fig. 2, with the lid of the box open.

From Fig. 4 it should be possible to set out all the pieces which go to make up the box, and when it is done and put together it should be screwed to the main back with countersunk screws from behind. The lid fits on the box flush on all sides and is held to the back with either plain or ornamental hinges as seen in Fig. 3.

A pair of simple shaped brackets will next be cut to the outline given in Fig. 4, and with  $\frac{3}{8}$ in. holes bored or cut with the fretsaw to receive the ends of a length of round rod which is glued in. The brackets and the rod must be fitted and glued together and afterwards secured under the box.

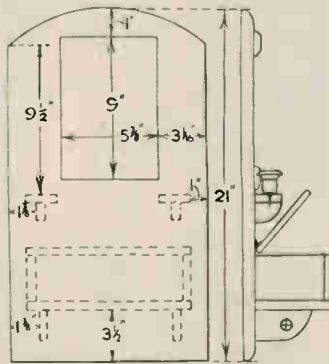


Fig. 2—Front and side view with measurements

The candle brackets will each be made from the two sections shown in Fig. 4. Mark them out accurately, cut and then glue them together in pairs and fix them in position with glue and screws. The metal sockets can be obtained from ironmongers or antique dealers.

The mirror is held in place by first forming a rebate round the opening already cut. Some narrow moulding about  $\frac{3}{16}$ in. wide with an overlap of  $\frac{1}{16}$ in. round inside the opening would give a good and efficient result. Or some plain pieces of wood with, perhaps, a chamfer planed on one edge would answer equally well. Each length of fillet or moulding should be measured direct from the opening, and the mitres cut neatly with the tenon saw after setting them out with a 45 degrees set square.

After the four pieces have been glued on, and the glue given time to harden, some  $\frac{1}{16}$ in. or  $\frac{1}{8}$ in. brass fret pins should be driven in at equal distances round the opening and through the rebate strips to give them additional security. All sharp edges should be cleaned off with fine.

In Fig. 5 a sectional diagram of the mirror and beading is given. The backing board to be cut to the same size as the mirror is also shown. Over this backing board a piece of stout brown paper should be glued to keep out the dust. A simple turned handle might be added to the lid of the box, or a strip of wood shaped simply and glued on would answer quite well.

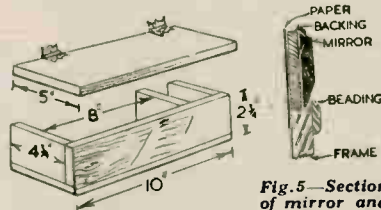


Fig. 3—Details of box

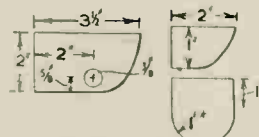


Fig. 4—Bracket portions

It should be mentioned, perhaps, that if a mirror of exact size to fit the opening shown here cannot be obtained, then it would be quite a simple job to mark round one smaller or, perhaps, one a little larger.

thrown to the left, the receiver can be operated as usual. When turned to the right, the current taken from the accumulator is replaced by the mains unit.

When the mains unit is not required it is switched off, of course. It will not be necessary to use it every day—or even every week, unless a very large receiver is employed. But whenever the accumulator shows any sign of being discharged, the unit can be switched on to bring it

back to full power.

If never allowed to run right down, a single accumulator will last for many years, especially if it is a fairly large one in a glass container, containing free acid. Though good, jelly and celluloid accumulators are inferior to the older type where size is unimportant. The accumulator should be looked at every few months and a little distilled water (obtainable from chemists) should be added if necessary.

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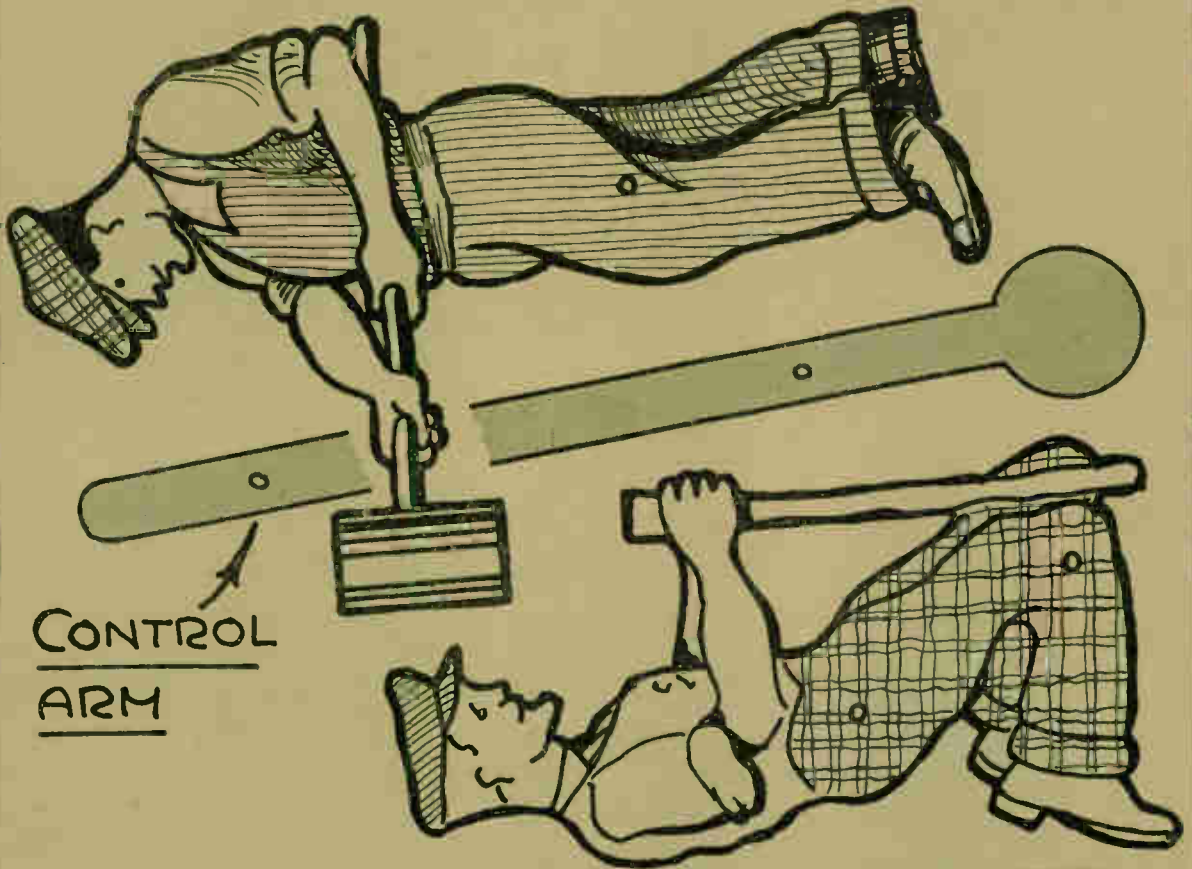
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# Hobbies

## WEEKLY

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October 27th, 1948

Price Threepence

Vol. 107 No. 2765

WE show here two attractive but simply-made plant stands that can be constructed from ordinary deal or from oak or mahogany, if the latter is available. Many such articles as these can now be seen in the shops made from the wood suggested and finished with stain and polish.

Just an ordinary household set of carpentry tools is all that is needed in making up the two stands, and in addition to the hand and tenon saw, the fretsaw for shaped and curved parts is essential.

#### Useful Sizes

In the pictures of the finished articles in Fig. 1, the stand, A, measures 8ins. square and 9ins. high, while that at B is rather larger and

## TWO ATTRACTIVE PLANT STANDS

measures 10ins. square and 12ins. high. Wood  $\frac{1}{2}$ in. thick is required for all parts, but boards  $\frac{3}{4}$ in. thick may well be used for such parts as the extreme top member of stand, A, and the edging strips round the top of stand, B.

The little decorative strips to be added to the two or the four sides of stand, B, can be cut from  $\frac{1}{2}$ in. or  $\frac{3}{16}$ in. wood and glued on.

Dealing first with stand, A, we have two sides measuring 8ins. by 6ins., shaped along their lower edges as in Fig. 2. The measurements here included are ample guide for the setting out in pencil. Then, set

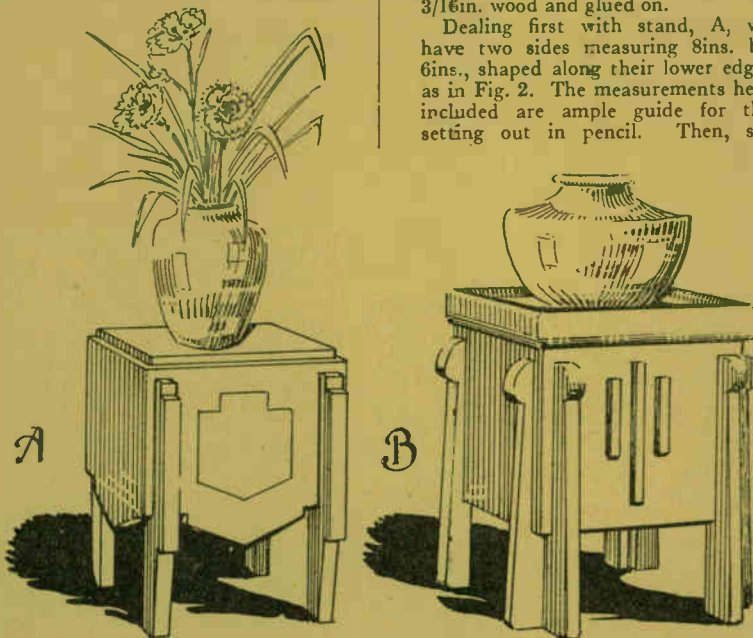
between these two sides, are two others as, B. These are 7ins. by 6ins. and are shaped at the lower edges similarly to sides, A.

After cutting the four sides they must be glued together, and here care must be taken to get them to form a perfect square. A good plan to ensure this is to set the made-up "box" on a flat board or other surface and test the sides with a square. Allow the glue to harden and meanwhile cut four angle blocks as, C, in Fig. 2.

These may be of spare  $\frac{1}{2}$ in. wood and are glued in the interior angles and flush with the top surface of the four sides. Not only do these blocks bind the sides together, but they form a good gluing surface for the extreme top, D, of the stand, see Fig. 2 which shows piece, D, broken across to disclose the blocks, C. Piece, D, is 7 $\frac{1}{2}$ ins. square and the top edges should be slightly rounded off with fine glasspaper.

#### The Legs

The four legs of the stand are next cut  $\frac{1}{2}$ in. wide, thus finishing  $\frac{1}{2}$ in. square, the lower simple shaping being cut in with the fretsaw. Each leg is glued to the "box"  $\frac{1}{2}$ in. inwards from its vertical edge so the joints between the sides showing on face, B, is conveniently hidden by the up-rights. Then, to further strengthen the legs and to also take the weight of the "box", four simple square blocks, as F, are glued on the inside of each leg as seen in the detail, Fig. 3.



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

This completes the stand, except, of course, for a general clean up of all surfaces and the finish of stain, etc. A panel on two of the sides may be outlined as suggested in Fig. 1 and either stained darker than the

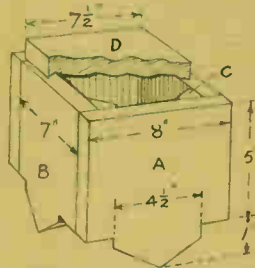


Fig. 2 - Box frame of "A" Stand

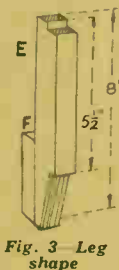


Fig. 3 - Leg shape

to stand, A, as far as the "box" portion is concerned. The lower edges, however, of the sides are square, with no shaping, and the top of the stand, G, entirely covers it and is finished around with an edging, see Fig. 4.

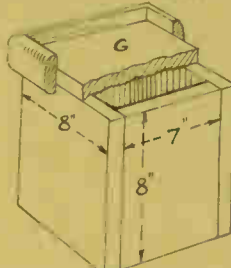


Fig. 4 - Square box of "B"

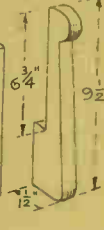


Fig. 5 - Second leg shape

long and 1 1/2 ins. wide, with their ends mitred to an angle of 45 degrees and two edges rounded off as the section shows in Fig. 4. The eight legs for the stand are cut and shaped as Fig. 5, from wood 9/16 ins. by 1 1/2 ins. Follow the measurements given, and form the set-back 6/16 ins. down as shown 1/4 in. from the back vertical face.

Take care to get the top rounded shape of each leg true to shape, and smooth off edge, as these legs are a conspicuous part of the finished article. It would, in this respect be best first to cut one leg carefully, then clean off any ragged edges of this before using it as a template for drawing round to produce the other three legs. Glue the legs to the box in a similar way to that previously advised for stand, A.

Finally clean up the woodwork and carry out the finishing surfaces as mentioned for the first stand. The simple strips glued on the face can be 1/4 in. or 3/16 in. thick.

surrounding border or made as an overlay of thin wood and glued on.

The design of the stand, B, as seen in Fig. 1, is, constructionally similar

Here again the top is shown cut across in section and shows plainly how the edging comes in relation to the top. The edging strips are 9/16 ins.

## For Guy Fawkes night or Xmas Party try your hand at MAKING MYSTERY "ORACLES"

**P**ERHAPS you will have some very tiny people to entertain on Bonfire Night. If so, why not make a few "oracles"? These are quiet little articles of the firework nature and can be exhibited indoors. If it is a really bad night, therefore, the toddlers need not go out at all and yet see something that splutters and burns.

All you require to make "oracles" is a small amount of saltpetre (potassium nitrate) which can be obtained at chemists. Some water is also needed, a clean (if possible, new) small-sized paint brush and some sheets of paper, of the kind typists use.

The paper must not be too thick, nor yet too flimsy, and if you have several grades to hand it is worth making a few experiments to see which works best. To make an oracle a saturated solution of saltpetre is first prepared. That is, you keep adding the salt to a little water till the liquid obviously cannot hold any more.

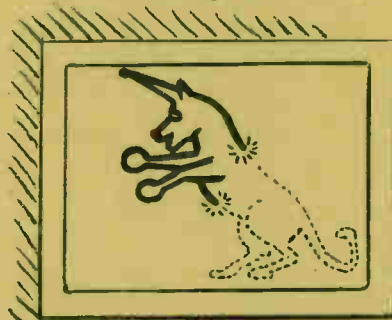
### Marking the Outline

A sheet of the paper is then taken and placed on a clean pad of blotting paper. The sheets being worked with can be any size, but about 8 ins. by 8 ins. is a convenient dimension.

Now dip the brush into the saltpetre solution and sketch out a simple picture on the paper, exactly as if you were using paint, but seeing to it that all the lines you use are joined together—this being for a reason you will see in a moment. When the brush runs out, re-charge with saltpetre solution but start again well back on the line already drawn—there must be no breaks.

While the paper is wet the line will show quite clearly, but when it dries out your sketch is quite invisible, despite the fact that a definite track of saltpetre is left sunk into the fibre of the paper. When dry the oracle is ready.

Now if you take the sheet and, placing it on a tray, apply to the start of your line the end of a smouldering string (obtained by lighting a piece of string and after a moment blowing the flame out) a smouldering, spluttering spot of light appears on the paper. Really it looks like a little dot of fire. This smouldering dot starts to



The burning ends running along the lines—really invisible

follow your line (which, remember, is invisible to the onlookers) and throwing out little sparklets steadily traverses it from end to end, thus tracing out, in brown line of charred paper, your drawing. The success or otherwise of an oracle really depends on the skill with which you make the sketch.

First, the line must be continuous, though it may have branches. The

spot of light at the point of junction breaks into two, one going along one line and the other taking the second line. Secondly, you must make your sketch with a line of fairly equal thickness, or the final sketch left on the tray will not look a bit good.

### A Frame

To make an oracle look neat, put a pencil or ink line around the space when you draw the sketch, as this gives the impression of a framed blank space which is almost asking for something to appear upon it. Also put a small dot where your line commences so there will be no doubt where to place the smouldering string end.

It makes more fun if you have a question written in pencil or ink across the top of the sheet and the sketch answers it. Thus the question might be, "Who jumped over the moon?"—your sketch below being the outline of a cow.

Should you have any doubt about being able to draw the picture with a connected line make a full-sized draft on another sheet of paper and conduct a few experiments how you would get round it with a brush. Remember lines may branch but must not be disconnected.

Finally, do not give "oracles" too much rough handling after being made; you want as much saltpetre as possible to stay in the fibres of the paper. Store them between two sheets of card till required.

"Oracles" are easily made once you get the hang of things and as there are sure to be cries for more once you start showing them, it is a good idea to turn out a really big number once you commence operations.

# The good craftsman should know about preparation of WOOD SURFACES

**H**AVING prepared the wood, the finish can be applied," says the instructions on the making of a piece of furniture. Do you know, however, just what is meant by "preparing" the wood? A run over with a plane, a rub with glasspaper, is what some amateur woodworkers think it means. It is a grave misunderstanding, because so much depends on a real smooth surface—and the nature of the wood itself.

The ultimate result is usually a crude, unsightly finish. The plane marks show up, including the scratches of the glasspaper. This article, then, is devoted solely to those readers who find it difficult to get a real professional finish on the woodwork articles they make. Generally, it is the finish that is blamed—not the wood surface.

## Studying the Wood

The beginner should know just what you would do in order to prepare wood for its finish. In the first instance, you will, we know, consider the wood recommended, which might be white deal or spruce. This is a soft, cheap wood, with odd knots in it. On account of those knots, and the softness of the wood, plus the grain, you will use a sharp, properly-set smoothing plane to remove the roughness or "ripple" produced by a planing machine. You will plane off the minimum of shavings—fine shavings, mere silken wisps, and not thick ribbons.

You will start at one edge of a board and work gradually, in the grain direction, towards the other edge, thereby ensuring that the entire surface is trimmed with the plane. The next operation is smoothing with glasspaper. Being a softwood, the use of S2 paper will be avoided, as this is rather coarse and apt to create deep scores which are difficult to remove by further rubbing with M2 paper and No. 1½ grade paper.

Instead, you will rub the wood with M2 paper, dust it, then rub with No. 1½ paper and No. 0 paper. You will make a point of dusting the wood prior to using a finer grade of glasspaper.

## Dusting the Surface

The reason for dusting is obvious. Small particles of the abrasive (glass) become mingled with the wood dust. Consequently, such particles are coarser than those of the finer grades of glasspaper. The latter, rubbing on top of the coarse grit, grinds it into the wood, thereby scoring it deeply in places.

Such scoring may be invisible to the eye. During the rubbing process, however, you may hear the grit "rolling"

or even feel it jarring beneath the glasspaper block. The scoring, although minute, is accentuated when the application of a stain—especially a water stain.

This stain tends to swell the wood and raise the grain, particularly the softer annual ring portions. The wood is apt to be "broken" at the heavier scratches, and if precautions are not taken, such marks will show badly in the finish.

## Damping the Wood

The experienced worker, if using deal, and intending to colour it with a water stain, always damps the wood after the final smoothing with No. 1½

grade paper. When dry, the wood is glasspapered again with No. 1½ paper, dusted, then rubbed with No. 0 paper, then dusted again for the finish. Thus, when the water stain is applied, the "grain-raising" will be offset by the preliminary damping.

Now, assuming the wood is to be french polished, the proper polish consists of shellac dissolved in spirits, with a colouring pigment added. Assuming the wood is stained black, some lamp black must be added to the polish to convert it into ebony polish. This will not be necessary, of course, if using a colour polish, i.e., a shellac polish coloured with a pigment which matches the stain.

## FLOWER HOLDER FROM A TIN

**A** SIMPLE holder, or vase, for artificial flowers is shown. It consists of a household cleaner container, a syrup tin lid, a small bolt and nut and a strip of 1/16in. plastic material. A good container is Cleana type, which measures 8½ins. long by 2½ins. in diameter, with five sprinkler holes (for the cleaning powder) into which the stems of the flowers can be inserted.

Now, most of these containers are made from card, with tin tops and bottoms. By bending up handles from ½in. wide strips of plastic material, such as Perspex, these can be conveniently adhered to the card, using a cellulose adhesive.

Assuming you have an empty container, wipe it over with a duster, then solder a small flathead iron bolt to the centre of the bottom. Next, obtain a syrup lid, or a similar lid from a paint tin, etc. Drill a hole in its centre to suit the thickness of the small bolt, which could be ½in.

The lid is secured to the bottom of the container with a nut. The handles are then bent to shape from celluloid material. The whole work is given a coat of bright cellulose paint. When dry, the handles are cemented to

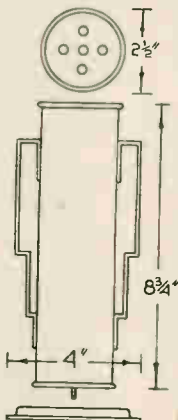
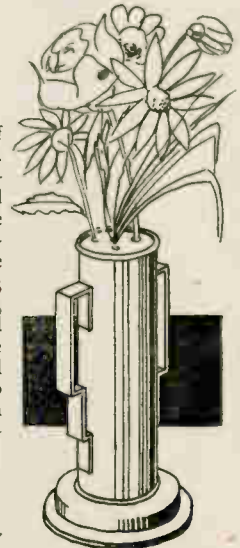
the sides of the container. Stiff cardboard and ordinary glue enable handles to be easily fitted; in this case, plastic wood should be put in at all corners to strengthen the cardboard.

## Filling With Sand

You now need some dry sand. Ordinary seashore sand would do. A quantity should be heated on a coal shovel to dry it, after which it is sifted fine and run into the vase holes. You need the container about three-quarters full of fine dry sand. It is the sand which supports the flower stems.

Artificial flowers, of course, can only be used in the holder. These have a stiff wire stem which drives easily into the sand. If desired, you could make a pair of the vases and finish them off with gold or silver paint. The vases, such as they are, were conceived purely for ornamental purposes. They enable you to use up material which would otherwise be waste.

Take care with the painting to get a nice even surface and use glossy paint for preference. If two colours being used allow one to harden first.



In fact, the polish, being coloured, would save using stain, as it colours as it polishes. The first application, applied with a soft, flat brush, will be light. Additional applications, however, deepen the shade, and this should be remembered.

#### The Four Natural Polishes

The experienced worker never applies light polish over dark woods or dark-stained woods. The coatings of polish show up badly—can be seen to be lying on the darker foundation. The polish must match the colour of the wood, or its stain.

There are four natural (uncoloured) polishes, such as white, button, garnet and orange polish. These polishes consist of shellac dissolved in spirits. No colouring pigment is added. The tint, if any, is caused by the colour of the shellac used.

Garnet polish has a reddish tint, as it is made from natural red shellac. It can be used on oak or mahogany. Button polish is yellowish, and can be applied to boxwood, satinwood and oak. White polish is made from bleached shellac.

It is employed on light-coloured woods which need to be finished in a natural colour, such as whitewood, sycamore, etc. Being a clear, transparent finish, it is excellent for covering a surface bearing transfers. Orange polish, like button polish, may

be coloured with a spirit stain and used as a colour polish.

#### Sizing Soft Woods

Few amateurs ever bother to size the surfaces of soft timbers prior to applying a stain. Deal and pine are soft and uneven in texture, and rather soak up stain like blotting paper.

As a result, the wood stains darker at the softer patches in the grain—at the softer annual rings, and the general effect is rather spoiled. A preliminary application of thin, hot glue size prevents undue absorption.

#### Finishing Hardwoods

When using hardwoods, such as mahogany, the wood must, like the softer woods, be properly smoothed, ready for its finish. As in the case of white deal, the smoothing plane is sharpened up and finely-set to deal with any patches of cross grain in the wood, hard knots, etc.

If using mahogany, with attractive figure, a natural finish is often desirable. In such a case, no staining is necessary. Garnet polish is used, but the surface of the wood must be prepared correctly. Assuming it has been lightly trimmed with a smoothing plane, any plane marks and roughness at cross grain patches (usually around knots) is effectively removed with a wood scraper.

A wood scraper is a piece of sheet

steel, about 4ins. by 2½ins. by 1/32in. thick, the edges of which are treated in such a manner as to produce a sharp edge or burr which, scraped on a hardwood, removes fine shavings, much as the edge of a piece of glass.

When scraped, smooth the wood with M2 grade glasspaper, No. 1½ grade, then damped, allowed to dry, and smoothed again with No. 1½ paper, then No. 0 paper. No damping will be necessary if the polish is to be applied directly on the wood.

Generally, to lend tone to the colour of mahogany, a special stain is used. This may consist of bichromate of potash dissolved in hot water. A quantity the size of a small nut, in a pint of water, should suffice. Allow to dry, then dust off the residue.

#### For Filling

If filling is necessary, use mahogany oil filler, made to creamy consistency with turpentine. Rub it into the grain, then wipe off, thus sealing the pores and crevices in the wood surface. Smooth with No. 0 paper, dust off, and brush on a preliminary coat of polish—a brown polish or the garnet polish. The normal, remaining stages in the french polishing process are then carried out.

If desired, the filler can be dispensed with and the grain sealed by applying extra coats of polish, these being rubbed down between applications.

## From the Editor's Notebook

**WATCHING** the stars is not everybody's cup of tea. But it can become very fascinating apparently if you start young. There seems to be plenty of heavenly bodies to watch. Gilbert Satterthwaite of Ullswater Crescent, Weymouth, started when he was 11 years of age, largely after reading a book called "The Angry Planet". He even went to two lectures on the subject in one day, so great was his interest. Books, lectures, and study followed with keenness and satisfaction. Now the reward. At the age of 14 he is the youngest member of the British Astronomical Association, a friend of Dr. A. F. Alexander, the Dorset astronomer, and is making a full-time job of astronomy. "You see where a hobby can lead you? Isn't it fine to have a job which is your hobby, too? I'll say it is."

**WHAT** would you do with a collection of 35,000 matchbox labels? You could leave them lying about the dining room, there wouldn't be space in the cupboard under the stairs. Anyhow, there it is—Mrs. Margery S. Evans is reputed to have that number. The people who collect

these things are called phillumenists and can be members of a Society for their mutual enjoyment and knowledge. I believe Queen Wilhelmina, and King Farouk collect them, whilst King Chulalongkorn of Siam was the first royal collector. He did rather well in gathering 11,000 labels together. Personally I should not have thought there were so many varieties. But it just shows, doesn't it?

**IT'S** never too old to start a hobby, you know. Here's Mr. Peter Winton, of Carlton Avenue, East Wembley, who at the age of 60—15 years ago—began modelling old-time horse-drawn and hand-borne coaches. Now he has over 30 of them—all of accurate interest. Mr. Winton should know, because, many years ago, he helped to build gigs, hansoms and coaches in Edinburgh. His first effort was a hansom cab, but he has since made replicas of the London Lord Mayor's coach, the gold coach of King George I, the victoria, sedan chairs, etc. By the way, the design I published in the issue of October 13th was a very popular one. Being a simple one it seemed the most suitable from the many varieties

which were at one time in use. Like motor car bodies, you know, they varied in style and "body work".

**YOUNG** Bill Nursey of Hout Bay, Cape Town takes Hobbies Weekly regularly, having a subscription copy sent regularly from England. So do lots of others in South Africa, but the point is that young Bill's copies don't cost him anything! He enters the toys and models he makes in exhibitions and then uses the money prizes he is awarded to pay to have his Hobbies sent out to him. Not a bad idea, is it? His last subscription money, I find, came as a result of 2nd Prize for a Noah's Ark, and 3rd for a Weather House at the Rosebank Agricultural Show. Well done, Bill!

**WILL** readers remember it is often impossible to supply back numbers of a definite date? Almost all issues are sold out because of the shortage of paper, although in a few cases I can supply an odd copy. In any case back numbers are not supplied in "a bundle of old copies" as some readers suggest!

The Editor



# A handy movable stand, suitable for chair reading

## LOW STAND BOOK REST

**M**OST readers are acquainted with the book rest which lies across the arms of a chair and enables the heaviest work to be read in comfort. Valuable as it is, it is of no use without the particular pattern of chair it is intended for, so here is a design which can be used while seated in any chair, as it stands between the legs of the reader. It can also be used for other purposes; for example, painting and sketching, and, as the book board can be swung to a vertical position, as an enlarging easel. Readers will doubtlessly find other uses for it.

The whole article can be made from a short piece of deal, except the book board, which can be made of any thin wood available, imitation plywood or other suitable substitute.

A side and front elevation is given in Fig. 1 with dimensions. These will be found convenient for most people, so no means of adjustment in the height has been considered necessary. For the work, use a wood 1in. thick if possible; in any case not less than  $\frac{3}{4}$ in. to make a firm piece of work.

Make a start by cutting two pieces of 1in. by 3in. wood for the feet. Plane them to size and cut notches in both to half the width, one notch being cut from the top down, and the other from the bottom upwards, so that both can fit together at right angles. It should be noted here that while the notch in one piece is in the centre, the notch in the other is out of centre, being towards the front, as in Fig. 2, A.

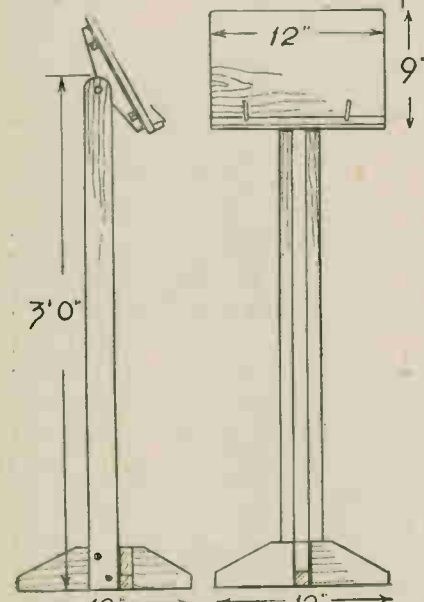


Fig. 1—Side and front elevation

This is to allow the pillar, which fits behind the front cross piece, to come central. Bevel the ends of each piece, not too much, to leave about  $\frac{1}{4}$ ins. flat at the top. Make a tight joint, then glue together. No nails should be needed with a good joint.

### The Pillar

For the pillar, cut two lengths of 1in. by 2in. wood to length given. Plane the edges and trim the tops to a semicircle. In the middle of each semicircle bore a  $\frac{1}{4}$ in. hole. Get these holes in line, as afterwards a  $\frac{1}{2}$ in. bolt will run through them, fitted with a wing nut, as at B, to hold the book board at any desired angle. Fix these pillar pieces to the feet, just behind the cross piece, with screws.

To ensure the fixing being parallel, slip a spare piece of the wood between the pillar pieces, just below the top ends, and push the bolt through and tighten up, then screw them to the feet.

As stated already, for the book board any thin wood or wood substitute can be employed. Cut it to the size 12ins. by 9ins., (Fig. 1) and slightly round off the top corners. Other details of this part of the rest are shown in Fig. 3.

A back piece, C, is cut from similar thickness wood to the pillars. Cut it to the size given, and in the centre strike a 2in. circle where shown. Bore a  $\frac{1}{4}$ in. hole in the centre of the side for the fixing bolt to enter. Now cut the part to the shape, and in the bottom edge at 1in. from each end, saw out  $\frac{1}{2}$ in. by  $\frac{1}{2}$ in. notches. Fix the piece to the middle of the book board behind.

Cut two strips of  $\frac{1}{2}$ in. by  $\frac{1}{2}$ in. wood, 11ins. long, run these through the notches in part, C, to half their length and then screw them to the board, to stiffen the whole, as in the

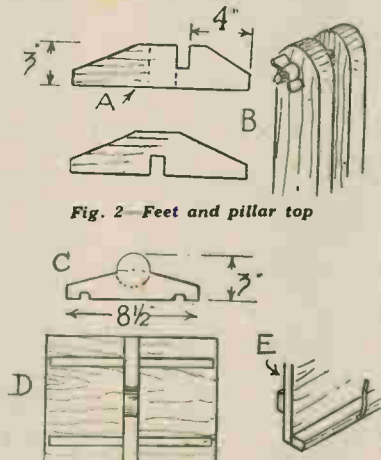
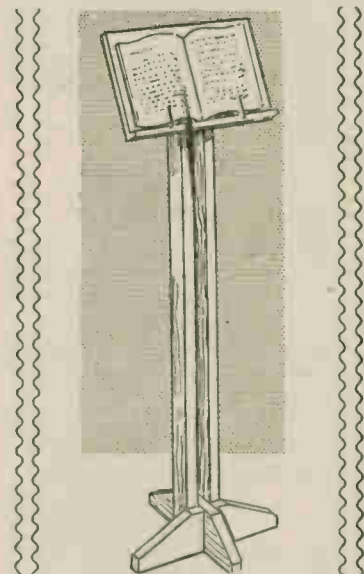


Fig. 2—Feet and pillar top

Fig. 3—Detail of book rest portion



back view, D. Turn the board round, and at the bottom, as a book rest, screw and glue a strip along as at detail E. This strip can be  $\frac{1}{2}$ in. thick and  $\frac{1}{2}$ in. wide. Round off its outer edge.

### Finish

Now go all over the article with glasspaper to make the wood quite smooth. Fit the book rest between the pillars; it should be held firmly at any angle by merely tightening the bolt. It will be as well to purchase the bolt first, then if a thicker bolt than  $\frac{1}{2}$ in. has to be used (supplies of all these items are not so varied now as they used to be), the holes can be bored to suit.

The back rest can be stained a nice oak colour and varnished. It is a good plan after staining the wood to apply a coat of size, or a table spoonful of glue diluted to twice or thrice its bulk with hot water, which will serve equally well. Then if rubbed down lightly a single coat of varnish will suffice to impart a glossy surface. Of course, the article can be painted, and if an enamel paint is used, should give excellent results.

### Holding Clips

To finish off the job, fit a pair of music clips (they can be bought at any music shop), such as are fitted to a piano, to keep the leaves of the book from flying open. These are easily fitted, only requiring a suitable hole to be bored in the "rest" strip for them to work in. The holes, by the way, should be a close fit.

The height of the stand can be made greater by having longer column pieces.

# The home handyman, with a cleaner, can have an efficient PAINT SPRAYER

**M**ANY of our readers have made enquiries, from time to time, for a suggestion for spraying their finished models or articles instead of having to paint them with a brush. They will undoubtedly be pleased to know that there is now available a Spray Gun which is quite simple to use in conjunction with almost any type of vacuum cleaner, and, having tested one out, we can recommend it for use on ordinary articles.

It is simple to operate and will use cellulose paint, oil paint, stains, distemper, etc. A picture of it in use is shown here. Its application is



The Spray Gun in operation

for numerous occasions by the handyman at home, and the amateur. It is not altogether suitable for small models, but for painting fairly large toys and ordinary home carpentry and painting jobs it is ideal.

## Air Pressure from Cleaner

As you see, a jar of paint fits below the pistol type of sprayer in which a trigger action is incorporated at the back. A lead from this passes to the vacuum cleaner, which in turn is linked up to the electric current. The junction to the cleaner is made through the "blower" end rather than the suction pipe. Thus an effective and forceful current of air passes down the pipe and through the gun as the trigger on the back is pressed.

The force of air passing across the top of the jar sucks up the paint or stain which it contains and forces it through the spray nozzle at the front end of the gun. By an ingenious

arrangement of simple adjustments a large or small spray can be obtained and of course the area which it covers is controlled by the distance and angle at which the sprayer is held. Large surfaces can be covered very quickly by holding the gun away from the work, whereas if it is held closely then a small area is covered.

The principal point is to get the right consistency of liquid, because obviously, if it is too thick it would clog the gun and if too thin it would not give a sufficient coat.

## For Colours and Control

The whole apparatus is quite simple to use if one follows the clear instructions. The special jars are made to fit by a screw action on the underside of the gun and can be utilized for the

various colours as required. The spray can be controlled after a very short trial, and careful manipulation of the trigger action which operates the spray effected.

The Spray Gun can be used with almost any ordinary vacuum cleaner. It is supplied by the Domestic Supply Co., 341 Regent's Park Road, London, N.3, at a cost of 75/-, complete with spare jars, instructions and everything ready to start.

The price may seem high for the amateur, but those who undertake home work of painting and distemping in the house, even apart from the making of toys, will soon realise that the outlay is well worth it. The resulting finish is far above the average painted result and the work can easily be given quite a professional style.

## A MODERN BED LAMP

**H**ERE are simple details for making a useful electric light fitted to the head of any wooden bedstead. Its cost is small, and its materials easily and cheaply obtained. The parchment will be the most expensive item.

Cut a circle 4ins. in diameter from the piece of wood with a fretsaw. In the centre of this, cut a smaller circle, the size of the top of the bulb holder, as in (Fig. 1).

### The Holder

Next cut a 1in. cube of wood, and nail on to the outside of the large circle, just overlapping the edge (Fig. 1).

Remove the screw ring from the bulb holder, push the latter through the hole, and replace the screw ring. (Exactly in the manner of fitting a lamp shade to it). You then have a circle of wood, with the lampholder firmly fixed in the centre (Fig. 2).

Next cut your parchment so it measures 8ins. high by 16ins. long,



Fig. 1



Fig. 2



Fig. 3



Fig. 4

and fix it round the circle with drawing pins. These should be equally spaced, with the join overlapping at the back—opposite side to the 1in. block that is nailed underneath. Secure the join with a paper fastener (Fig. 3) and stick on frilling with good glue.

### Bed Fixing

The lamp completed, the next step is to screw it behind the back of the bed, so the lamp is in the centre of the head of the bed (Fig. 4).

It is a simple job to fix the switch to the flex, but make sure that you break the positive wire. If in any doubt, the safest way is to ask somebody who has a knowledge of electricity to fix it for you.

### MATERIALS NEEDED

- 1 bulb holder and bulb.
- Length of flex, from wall plug centre head of bed, plus 1yd. for switch.
- 1 torpedo switch.
- 1 plug.
- 18ins. of pretty frilling.
- 2 1/2 in. screws.
- 1 paper clip and a few panel pins.
- 6 drawing pins.
- Parchment of warm gold or orange colour.
- Wood measuring 4ins. by 4ins. by 1/4 in. and 1in. square.

# Practical constructional hints how the amateur can make SOUND RADIO JOINTS

**I**N radio receivers sound joints are perhaps more essential than in any other kind of electrical apparatus. In some places the signal currents flowing are so minute only the most sensitive measuring instruments can indicate them. So it will be seen how necessary proper connections are.

## Terminal Connections

If these are loose they will cause crackling, weak reception, or even

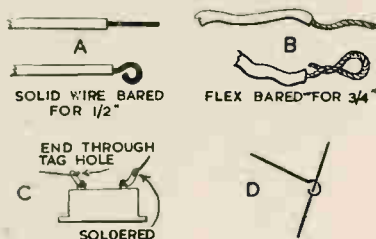


Fig. 1—How to make proper joints

prevent signals being heard altogether. Besides being tight, loose, straggly ends of wire should never be left. Fairly high voltages are necessary in some parts of the circuit; loose ends may cause short-circuits which could damage some of the parts.

"A" and "B" in Fig. 1 illustrates how terminal connections should be made. Small pliers are always useful for handling wire. Do not make the loops in an anti-clockwise direction or they will usually be straightened out and come off when the terminal is screwed down.

With flex, twist all the strands together, then make a loop to fit over the terminal. This will prevent battery leads being tugged away.

## Soldered Connections

Some components require soldering. Actually wiring-up in this way is quicker, neater, more compact and provides better joints. It is always best to use tinned-copper wire, as this

requires no cleaning. If cored solder is used excellent joints can be made easily. It is only necessary to apply the solder and hot iron at the required point, no scraping being necessary.

When soldering in resistors, condensers, and similar small parts, never keep the soldering iron in contact longer than necessary. Prolonged application will begin to melt the wax in the component, and may unfasten the internal joints.

Soldering tags can often be used, as in "C", Fig. 1. When wires are to be joined the end of one lead may be looped round the wire it is to be joined to, for greater strength, as in "D".

## Lead Indications

When using ordinary flex for battery leads, the ends may be identified as illustrated in Fig. 2. Knots are tied in the wire to indicate positive, two knots being used for H.T. Plus 2.

The standard colour code for battery leads is as follows:—L.T. Plus=Pink. L.T. Minus and H.T. Minus=Black. 1st H.T. tapping=Blue. 2nd H.T.

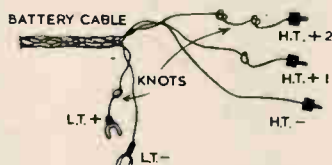


Fig. 2—How to indicate lead connections simply

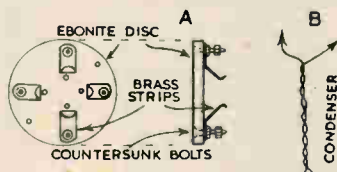


Fig. 3—Some easily-contrived parts

tapping=Green. 3rd H.T. tapping=Yellow. Maximum H.T.=Red. This may help in identifying unknown connections, or may be followed if coloured wire is bought.

## Simple Parts

If a valveholder is wanted and is not to hand, "A" in Fig. 3 shows how one can be contrived. A disc about 1 1/2 in. in diameter has four small holes drilled so that the valve-legs will pass through them. (Their spacing can be found from the valve itself.)

When the valve is pushed through the legs touch brass strips held in place by means of small bolts. (6 B.A. bolts and nuts are readily available and always useful in construction.) The valve should be inserted from the bare side of the disc.

An item which can be made in a moment is shown in "B". Solid insulated connecting wire is used and the capacity will depend upon the length of the twisted portions. (2in. is usually suitable.) Some commercial receivers use such condensers in series with the aerial, and for similar purposes. The capacity can be readily changed by twisting or un-twisting the leads, and will usually be up to about .00005 mfd.

*The second of our articles helpful to the beginner, but equally instructive to those radio constructors requiring the best results. Further similar articles will follow.*

Larger condensers can be made by arranging two metal plates together, with insulating material between.

Insulated terminals for aerial, phones or speaker, etc., can be arranged by cutting washers from odd scraps of ebonite or other insulating material. As shown in Fig. 4, one small washer fits between the two larger ones, the chassis or terminal strip being drilled with 1/4 in. holes to accommodate the former. This assures the terminals cannot move sideways and short to the metal.

Where wood is used, terminals may be mounted directly on this. But the wood should be dry and varnished before use, and the terminals be at least 1 in. apart. Otherwise reception may be weakened.

## Switches, etc.

Dust, fluff, and traces of flux can cause trouble when they come between metal surfaces which should make good contact. If old valveholders are used the sockets may need cleaning. The legs of valves, too, may need attention as a bad contact here would almost certainly prevent the receiver working at all.

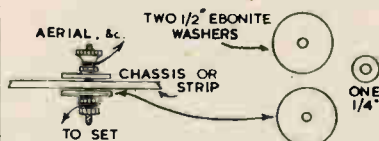


Fig. 4—How to insulate terminals

When switches become noisy, the contacts require cleaning. Battery connectors corrode in time and can result in a background of continuous fizzling and crackling sounds.

As a rule it is worth while keeping all connections tight and clean. This will assure best results and may avoid the trouble of afterwards having to look for some fault which spoils reception.

## Fixing the Blade of a Screwdriver

**T**O fix the blade of a screwdriver in its shaft, make a cut in the back end of the screwdriver blade with a hacksaw, and drive it in the handle. The two ends will then open out and hold the blade securely.

# Readers of our Metalwork articles can make this TOOTHBRUSH RACK

**T**HIS very useful and decorative rack would be an asset to any bathroom. In addition to possessing holders for four tooth-brushes, it also has a fitting designed to hold a water tumbler. It can be made in your spare time, with very little difficulty if you follow the instructions and the explanatory diagrams.

To make it, use if possible fairly stout material, about 16s wire gauge (about one sixteenth of an inch thick). The use of too thin material may cause the finished job to lack stability.

For constructional purposes, we will divide the rack into three main

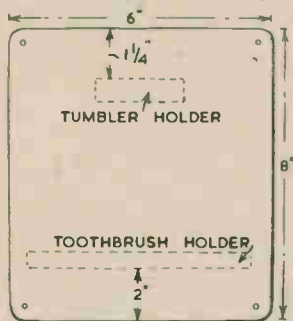


Fig. 1—Detail of back plate

parts—the base or back-plate, the tumbler holder, and the toothbrush rack—and to avoid confusion, they will be dealt with separately.

## The Back-Plate

Cut a piece of flat material to the measurements as shown in Fig. 1, trimming off the corners. Then file off all burrs and sharp corners, smoothing afterwards with emery cloth.

Mark off the position of the screw holes ready for punching. If you have a portable metal drill you will, of course use that, but do not try to do the job with your woodworking drill—you will only spoil the bit. In the absence of a drill, lay the backplate on a flat piece of hardwood, or a piece of lead (which is the ideal thing for the job if you can get it).

Punch the holes through to a size large enough to accommodate your wall screws, filing off the burr on the back side. You will find that you have put a small countersink round the hole, and this must be hammered flat again, or it will prevent the plate from lying flush on the wall.

If this closes up the holes until they are too small for your screws, you can easily ream them out with the tang of

the file or similar type of tool.

## The Tumbler Holder

The primary aim when making the tumbler holder is to make sure it will, when finished, hold a glass without sagging. To achieve this necessary rigidity it is best to use similar material to the backplate. You will require a strip 12ins. long by 3/8in. wide, and it is easier to file up and smooth the edges before going any further.

Mark the strip out as per details in Fig. 2. Bend the 1 1/2in. piece at each end over at right angles with the aid of the bending irons and cramps as shown in diagram, using your wood mallet to avoid marking. Next, bend the middle 8in. portion into a perfect circle by wrapping round a table leg, a straight sided beaker, or even the end of an outside water-spout.

You will find that the 8in. portion will make a 2 3/4in. circle, which is just the right size to accommodate an average tumbler. The size of a tumbler is usually 2 3/4ins. in diameter, 4 1/2ins.

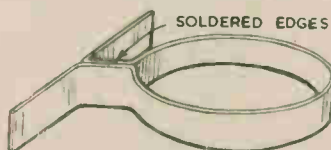


Fig. 2—The tumbler holder strip

deep with a 2in. bottom.

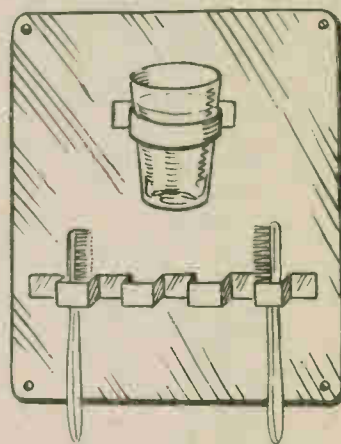
If you intend to use one of the fancy shaped bakelite tumblers, or any other kind that is not the standard measurement, you will naturally have to make the necessary allowance when marking out your initial strip. To complete the fitting, squeeze the 1/2in. portions together with a pair of pliers and solder along the top and bottom edges.

For the toothbrush rack you require a strip of material exactly 7 3/8ins. by 3/8in. wide, and again it is better to file and smooth before bending. Using the bending irons and cramps and starting at one end, fold the strip (Fig. 3), taking care to bend exactly on the marks in order to achieve a uniform finish.

## To Assemble

Now you have completed the three separate portions, all that is required is to fit them together and complete the job.

Take the backplate and mark the



positions of both tumbler holder and toothbrush rack. Apply flux to backplate and fittings, and place the latter in their correct positions. Take particular care to see they both lie square, perfectly central and parallel with the top and bottom edges of the backplate, as nothing spoils a job so much as faulty alignment.

Then, with a well heated iron, firmly solder the fittings to the backplate, going slowly to allow the solder to penetrate beneath the edges, and leave a slight body of solder for additional support.

## Cleaning

After soldering, clean off all traces of flux with a damp rag and file smooth. Do not file all the solder off again. Then give the whole job a good rubbing over with fine emery cloth to prepare the surface for finishing off.

Warm slightly before a fire to dry off all dampness, and impart a good workmanlike finish to the job by

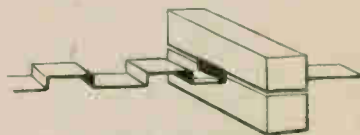


Fig. 3—Binding brush holder

giving three coats of good enamel, choosing whatever colours you consider will best fit into the decoration scheme of your bathroom.

A cream background, with the fittings done in emerald green looks very smart and will make the rack a real tribute to your workmanship.

The Index for Vol. 106 (ending Sept. 29th) is now ready — price 1/- post free

# The falling sand makes the disc revolve merrily in A TOY SANDWHEEL

ALL children like playing with sand, and they also like toys which work. The sandwheel described, combines the merits of both. The toy consists, basically, of an upright column of wood on which is mounted a wheel which has a number of small "buckets" mounted around its edge.

Suspended over it is a tin funnel. Fine sand is poured through the funnel. As it escapes, it impinges on the buckets in the manner of a water mill. The wheel spins merrily round. The sand which falls out again at the bottom is replaced in the funnel and so the wheel continues to turn.

## Buckets and Wheel

Though the diagrams may give the impression that one needs be a skilled geometrician to lay out the wheel, such is not the case. If the simple instructions are followed, it will be found that the buckets more or less fall into place.

First we must make sixteen buckets. These are of card; postcards do very well. Their shape can be seen in Fig. 4; the lay-out is as in Fig. 3. The card will fold much more neatly and accurately if the dotted lines in Fig. 3 are first scored lightly with a penknife blade, run along the edge of a steel rule. It is essential that all these buckets be made accurately and all alike.

The wheel is made from two discs of thick card, of 3ins. radius. One of them must be laid out as in Fig. 2 and seen also in Fig. 1. From the centre, describe three circles of radii  $1\frac{1}{2}$ ins.,  $2\frac{1}{2}$ ins. and 3ins. Draw in the two diameter lines at right angles to each other (i.e. passing through points H and B. Then draw in 45 degree lines (i.e. passing through F) and finally halve HF, so that  $22\frac{1}{2}$  degree lines can be drawn through G and E, etc.



In other words, the circumference of the circle is stepped off into sixteen equal parts. Make dots at points X Y Z etc. The wheel will look like Fig. 2 at this stage, though Fig. 2 shows only a quarter of the wheel.

Now take one bucket, and apply some strong liquid glue to the tabs on one side. Lay it on the wheel so its sides touch dots X Y and Z. Note that corner Y is a right angle. Hold the bucket down for a short time until the glue "takes". Then apply another bucket to the next but one set of dots, and continue thus until you have eight buckets placed. Without gluing, place the other disc over them and on top of this place a fairly heavy book. Leave for the glue to set—say overnight.

It will now be an easy matter to put in the other eight buckets, as they simply fall in place. As well as gluing the flaps, put some glue on the sides

so the buckets are not only attached to the wheel side, but also to each other.

Obtain a cotton reel and cut it so it is exactly one inch long (Fig. 6). This goes between the two discs at the centre. Glue it in, and apply glue to the other flaps of the buckets. Apply the other disc and let the wheel dry under some slight pressure. The resulting wheel is quite strong. A coat of shellac varnish is recommended. A spiral or other design can be painted on one side.

## Pillar and Funnel Support

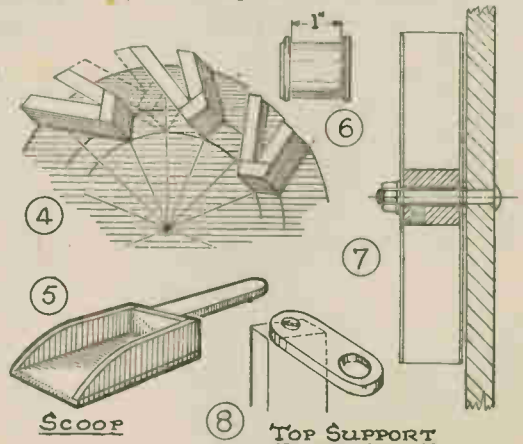
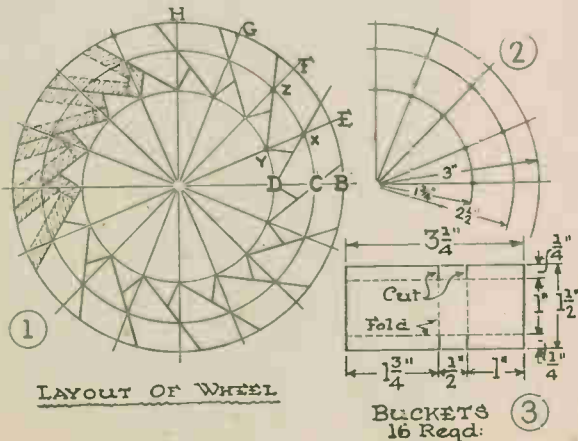
The rest of the job is quickly done. The upright is about 12ins. long and of approximately  $1\frac{1}{2}$ ins. by  $\frac{3}{4}$ in. section. The base is of any convenient size, say 6ins. by 2ins. by 1in. Do not merely nail the upright to the base, make a strong neat job by using a housing or dovetail joint. Do not have the base too small as the model will overbalance.

Half-way up the pillar, a hole is drilled to take, as a fairly tight fit, a  $\frac{1}{4}$ in. bolt about 2 $\frac{1}{2}$ ins. long. This is the axle for the wheel (Fig. 7). Washers are placed between the wheel and the pillar and also under the nut. The wheel should spin easily but not sloppily.

Fig. 8 shows a support for the funnel. The latter is purchased ready-made from any oilshop. The exact size of the support is best found by experiment. One end is screwed to the top of the pillar and is made to pivot slightly so the best position for the funnel can be found.

Fig. 5 shows a wooden scoop which can be made of odd scraps of wood.

If one can spare the wood, a large tray should be made in which to stand the sandwheel, but otherwise an old tin tray will do. The sand is silver sand, obtainable from gardening-supplies shops quite cheaply. Common building sand is not suitable.



# Have a flower display without a garden by making A WINDOW BOX

SO many people, nowadays, living in rooms and flats, and not enjoying the use of a garden, are obliged to tend and display their flowers on the window sill. Even with a garden, it cannot be denied that a row of flower pots in bloom, on any window sill looks pleasant, both from the outside and inside as well.

As the average sill, however, is not really broad enough to provide a safe harbour for the pots, a simple board arrangement, as that illustrated is invaluable. It supplies room for a good number of flower pots, and, being fitted with two rails, better ensures the safety of the pots in a high wind.

## The Base Board

A plan of the board is given in Fig. 1. Its length will, obviously, depend on the width of the window. It should be 4ins. longer than the sill, so overlapping at each end some 2ins., to allow for a batten, screwed to the board at both ends.

As the width of the board is 12ins., as shown in the diagram, two pieces or more will be required, glued and dowelled together to make it. If tongued and grooved boards are available, the dowels will, of course, not be required. The boards can be any thickness from  $\frac{1}{2}$ in. to 1in.

Cut away at each of the back corners to allow the board to cover the sill up to the window frame, then

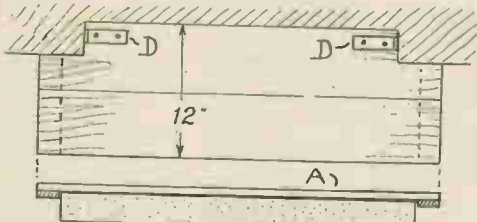


Fig. 1—Plan and front view of base board in place

screw underneath at each end a 1 $\frac{1}{2}$ in. wide batten, so that the board resting on the sill has these battens overhanging, as at front view, A, in Fig. 1. This, of course, shows the board resting on the sill.

## The Posts

The board fitting well, prepare the short posts which carry the wire rails. Cut them from 1in. square strips of wood, to the length shown in Fig. 2. They are bevelled off at the tops to a pyramid shape, and holes for the wires are drilled at distances of 2ins. apart. Mind the holes for the end wires are drilled just above or below the holes for the front ones, so the

wires can pass freely and not foul each other.

The posts are then dowelled to the board in the position seen in the general view of the completed article. They should be positioned to stand  $\frac{1}{2}$ in. away from the edges of the board. Make close joints, and glue the posts securely in place.

Now prepare some strips for edging the board on its front and ends. The strips should be  $\frac{1}{2}$ in. thick and as wide as the combined thickness of the board and battens. Bevel the edges of these strips, then glue and nail them round the board, mitring the corners. Now clean up the work with glasspaper.

As it is desirable for the board to rest level, and usually the sill slopes a little to allow rain to run off, a pair of wooden blocks, as shown at C, Fig. 2 (a section across the board), should be fixed beneath for that purpose.

## Get it Level

Try the board on the sill, then place two wedge-shaped strips of wood underneath it, and tap them with a hammer until they raise the board quite level. Test this with a spirit level, or if a level is not available, with a glass of water, the latter

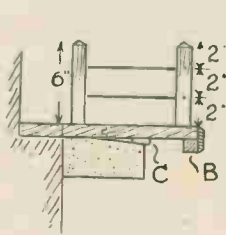


Fig. 2—An end view

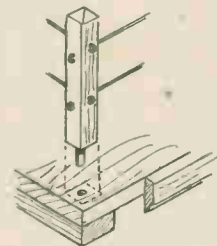


Fig. 3—Post and wiring

with creosote, in fact, and would stand the weather well, but would not look so pleasing, of course. If there is any Solignum, the green kind about, it could well be employed, being a preservative and looking well at the same time.

## Wire Rails

The wire rails can now be fixed. Choose a stout wire for this part, and drill the holes in the posts to suit it. A fairly tight fit is desirable. Cut the wire rails to length, allowing  $\frac{1}{2}$ in. at each end extra. Push the wires through the holes and, with the pliers, bend the protruding end ring shape to keep the wires from working out. The detail, Fig. 3, will show this and other points already dealt with. If galvanised iron wire is used it will not rust, but if iron wire, then it is wise to paint it or the rail will soon rust it.

The completed board should now be securely fixed in position on the sill. A note of warning is not out of place here. Make quite certain the fixing is a secure one, because if through any high winds or other reason, the board should fall, there might well be most unpleasant results. Such a board, with its accompanying flower pots, would prove no joke to drop on anyone underneath.

A simple and good fixing, is to screw a 4in. steel shelf bracket to the board, each side, at the rear, as at D-D, Fig. 1. The brackets are then screwed to the brickwork, making a secure job if properly done.

The wall should be plugged for the screws to enter, but using the modern system of Rawlplugging, the work is quite simple. The brackets could be screwed to the window frame, of course, and then would only need ordinary wood screws, but objection might be made to this course, as damaging to the woodwork, should the house not be personal property.

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