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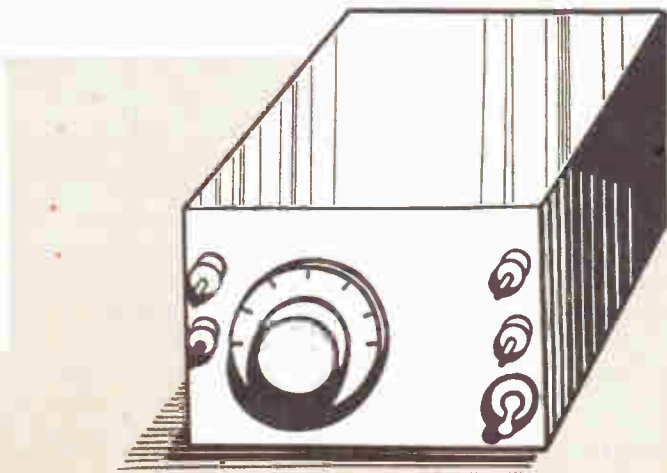
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TRANSISTORS can now be obtained easily, and are particularly useful for small receivers, due to the fact that no large or high voltage batteries are required to operate them. This results in very low running costs. It should be realized, however, that a transistor is not as efficient as a valve, and a two or three transistor receiver should never be looked upon as equal to a two or three valve set, otherwise disappointment is likely. Despite this, even a single transistor can give a very useful degree of amplification, and one such stage is employed in the receiver described here.



DIODE TRANSISTOR SET

Designed by F. G. Rayer

The circuit is shown in Fig. 1, and uses a crystal diode for detector, followed by the transistor as amplifier. A 3-volt torch battery provides current, and will normally last some months.

Results to expect

Quite often circuits with one transistor are shown as being for use with a loud-speaker, and this can prove disappointing to a constructor who expects speaker

results similar to those usual with a battery or mains set. Nothing approaching such volume can ever be obtained from one transistor.

When circumstances are favourable, enough volume for speaker reception can be achieved. For this, reception conditions have to equal those which would give very good phone volume with a crystal set. That is, a good aerial and earth must be used, and a major

BBC station must be within some 30 to 50 miles or so. In very quiet surroundings where lower volume is sufficient (as when listening in bed) there may still be enough signal strength to work a speaker, even in slightly less favourable circumstances.

When conditions are poor, due to a short, inefficient indoor aerial, or in the case of long-distance reception, speaker results cannot be expected. Phones will

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FOR ALL HOME CRAFTSMEN
Over 60 years of 'Do-it-Yourself'

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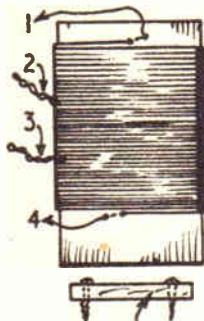
4¹/₂^D

then often be satisfactory, and the circuit can give good headphone listening volume in conditions where a crystal set would be useless.

Components required

Any efficient crystal diode of usual type is satisfactory. The transistor can be of the inexpensive and popular PNP type. An air-spaced $\cdot 0005$ uF condenser gives slightly better results than a solid-dielectric component, though the latter can be used if small size is important.

The two resistors, of 50,000 ohms and 100,000 ohms, are ordinary small carbon types. The $\cdot 002$ uF condenser is a paper tubular component. The 2uF condenser may be of this type also; or an upright block condenser can be used.



MOUNTING STRIP

Fig. 2 Tuning coil

Any small on/off switch is satisfactory, together with a small ebonite or paxolin panel, and four terminals. A small strip of similar insulating material, two brackets, a coil former, and a few small screws and nuts and bolts are also required.

Coil winding

The coil is shown in Fig. 2, and is wound upon an insulated former about $1\frac{1}{4}$ ins. in diameter, 30 S.W.G. enamelled (or similar) wire being used. The wire is secured by passing it through two small holes, thus forming point (1). Thirty turns are then wound on, closely side by side, and a loop about 2 ins. long is made, as indicated at (2). Winding then continues for a further thirty turns, loop (3) being similarly formed. Afterwards, twenty more turns are put on, the wire being terminated at point (4). All turns throughout must be in the same direction. The loops and ends can be made quite secure with a touch of adhesive.

This coil will tune the usual medium wave band. If a smaller former is to hand, it can be used, the number of turns being slightly increased. (E.g., 90 turns in all, on a 1 in. diameter

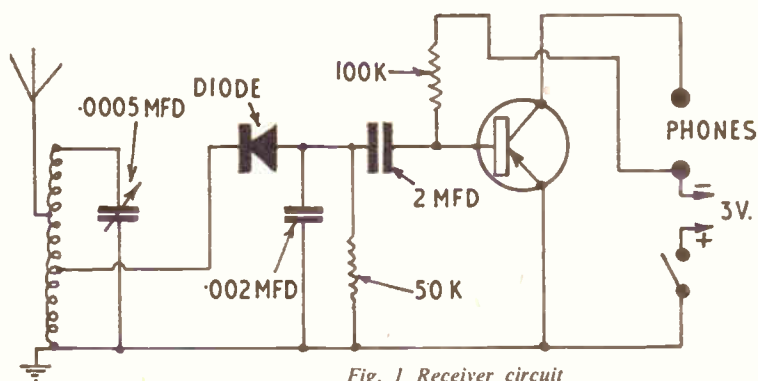


Fig. 1 Receiver circuit

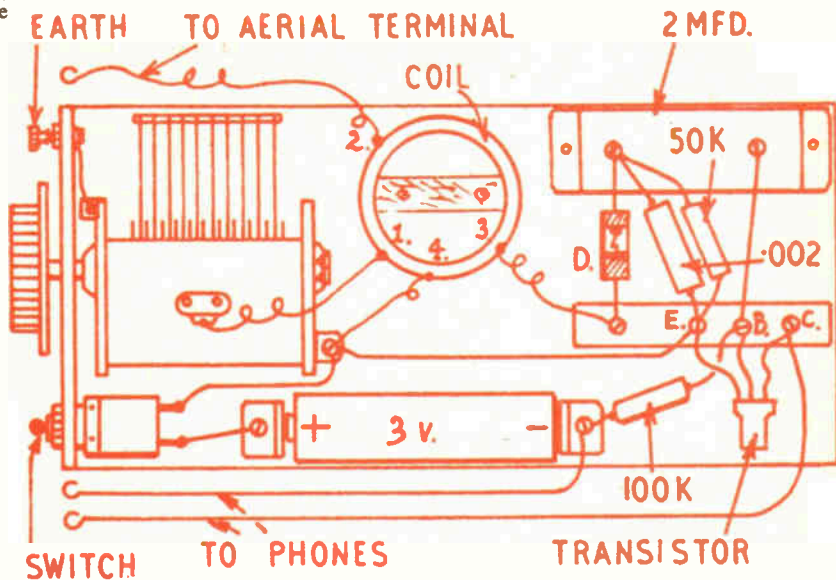


Fig. 3 Wiring plan

former, instead of 80 turns for the $1\frac{1}{4}$ in. diameter former). The finished coil is pushed upon a shaped strip of wood which is screwed to the baseboard of the receiver.

Construction

To keep size down, a compact layout is used, as shown in Fig. 3. With the usual type of fairly small tuning condenser, a panel 3 ins. by 3 $\frac{1}{2}$ ins. will be large enough, the baseboard then being 3 $\frac{1}{2}$ ins. by 5 ins. Larger variable condensers will require a bigger panel. Individual 2uF condensers also vary a good deal in dimensions, so a check should be made with the actual components, to see that the baseboard is long enough.

A front view of the panel appears in Fig. 4. The aerial and phone terminals are not shown in Fig. 3, to clarify wiring. However, all connections are

given in Fig. 3, the looped leads marked 'Aerial' and 'Phones' being taken to the appropriate terminals. The aerial terminal is immediately above the earth terminal, and the phone terminals come over the switch, as in Fig. 4.

As the heating caused by unskilful soldering can damage the transistor crystals, a small insulated strip, with four bolts or terminals, allows screw connections to be made. The left-hand bolt, in Fig. 3, forms a connecting point or one end of the diode 'D'. The other end of the diode is taken to the 2uF condenser. Here, also, a terminal connection is preferable to soldering, unless the wire end of the diode is left its full length, and the iron removed immediately the connection is made.

The three transistor connections are marked 'E', 'B' and 'C', indicating Emitter, Base and Collector. The Collector lead is often indicated by a red

dot. The Base lead is then found at the centre of the transistor, with the Emitter lead farthest from the red dot. It is wise to leave these three leads their full length, simply making small loops at their ends for connecting purposes.

The coil connections are numbered to agree with Fig. 2. Some tuning condensers have a terminal for the fixed plates connection, or a tag differently placed than in Fig. 3, and lead 1 is taken to this. Lead 4 goes to the moving plates, or metal frame, with metal framed condensers. A lead from the Emitter also goes to this point, with one lead from the switch. The earth lead can be taken to this point, or to the condenser frame as in Fig. 3.

Small brackets are screwed to the baseboard, suitably spaced so that a 3-volt (2-cell) torch battery will fit between them. The correct polarity should be marked on the baseboard, by the brackets. The centre carbon rod, with brass cap, is battery positive, and the battery must never be inserted the wrong way round, as transistors can be damaged immediately by wrong polarity.

Notes on using

If phones are to be used, ample volume may be obtained with $1\frac{1}{2}$ volts. If so, then only a single cell is required, and the brackets should be positioned nearer together for this.

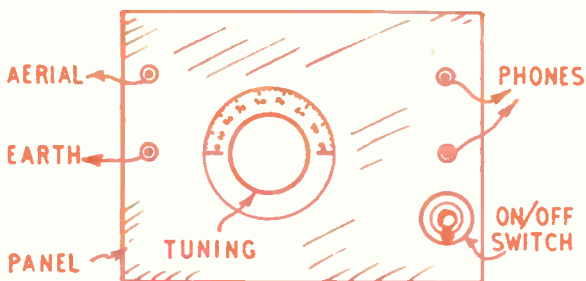


Fig. 4—Panel layout

The battery should not be inserted until all wiring is complete. It is possible to shape the brackets in such a way that the battery will only fit properly when placed in the correct direction.

The usual aerial, earth and phones will be satisfactory. If the aerial is very short or poor, it may be taken directly to the fixed plates tag of the tuning condenser. For phones, indoor aerials will usually be sufficient, and an earth will quite often be unnecessary. The negative phone lead is taken to the terminal wired to battery negative.

In some localities enough volume will be obtained by taking an earth lead to the aerial terminal, and not using an aerial. However, a good aerial and earth will always be helpful in obtaining best volume.

If a speaker is to be tried, it should be

of the usual moving-coil permanent magnet type, as used with battery-operated valve sets. A speaker of average size is best, as a miniature speaker, especially if of cheap, poor type, will not give so loud an output. The usual output transformer must be employed between receiver and speaker. When such a transformer is already fitted to the speaker, no further transformer is required. Any average transformer will function quite well, but best results are achieved with a fairly low impedance or ratio. If the transformer has various ratios, each should be tried in turn, to find which gives best results.

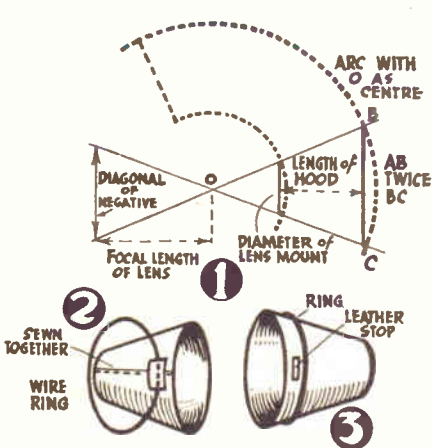
The speaker should be in a cabinet, if possible. It must be repeated, however, that loudspeaker volume such as obtained from a valve set must not be expected.

A Leather Lens Hood

THE use of an efficient lens hood is recommended by most photographic experts, but herein lies a snag, for to be efficient a lens hood requires to be rather longer than most commercial types, and hence too bulky for convenient carrying. It is, however, quite easy to construct a lens hood out of leather, which can be as large as considered necessary, and can yet be folded and carried in the pocket.

First make a paper pattern to about the size of the intended hood. The method of doing this is shown in Fig. 1. The actual length of the hood must be decided, bearing in mind the longer the better, but there is, obviously, a sensible limit, for example 2½ins.-3ins. will probably be found sufficient. The paper model can be roughly stuck together, slipped over the lens mount and examined from inside the camera to check that the angle is satisfactory, and that the corners are not cut.

A piece of supple leather (black) should be obtained. Most leather shops have cuttings for sale; the best type is smooth on one side and quite matt black on the other, giving an excellent surface



for the interior of a lens hood.

The shape of the pattern is then cut from the leather, leaving sufficient for sewing, and the hood sewn together down one side with black thread. It may be necessary to pierce the holes first with a thin bradawl. Care should be taken to see that the narrow end of the

hood is a push fit on the camera lens mount.

To make the hood rigid when in use, a wire ring is made, the diameter of which should be the same as that of the hood about $\frac{1}{4}$ in. from the wide end. An old bicycle spoke carefully bent round a suitably sized bottle and soldered together is ideal. The ring is attached to the hood by means of a small leather saddle sewn on as shown in Fig. 2, and another small piece of leather sewn on the other side will act as a stop over which the ring can be pushed (Fig. 3). If the ring has been made of the correct diameter, the hood will be quite firm and circular when fitted to the camera, and will easily fold flat for the pocket when not in use. (P.R.C.)

£200 COMPETITION

Entries have started coming in for our 1950 Fretwork Competition for which prizes to the value of £200 are offered. Entry is free and full details were published in the issue of Sept. 11th, 1957, copies of which are obtainable, price 6d., from the Editor.

It's a 'push-over'

'Tailor-made' Mantelshelf

YOU'VE really gone to town. You've taken a chance and used those daring contemporary wall-papers. And the room has turned out fine. Just the effect you were hoping for ... or is it?

Something is wrong. It's the fireplace. It's out of tune with the rest of the room. Well — you can't mutilate or remove it. It's the landlord's property. It's a fixture. . . .

Yet, there *is* something you can do about it. Make it a 'new suit' — a mock-up frame that slides over the existing surround. It's not so difficult.

By E. Capper

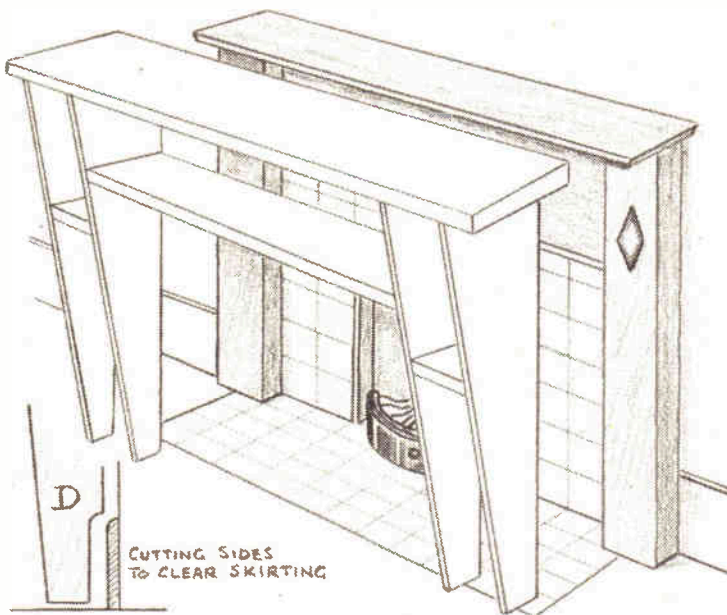
Mantelpieces and surrounds vary, so it is not possible to give sizes. Similarly, the designs vary, so you will have to make an individual 'jacket' to fit your requirements.

Illustrated is the most commonly used old type of fireplace and a suggestion for giving it a 'new face'. Currently very popular, is the use of tapering side pieces as shown. You may be able to use a surround consisting of one side piece at each end, instead of two as shown. If so, so much the better. Or you may prefer it quite plain without any shelf. The result to aim at is a surround of simple straight lines.

The shelf construction is shown at (A) and consists of lin. square prepared deal, covered with 3-ply wood or hard-board, glued and nailed with panel pins. An improvement is also to cover the undersides of the batten with the 3-ply,

although it is not strictly necessary. Note that no battening is used at the back for remember this shelf is to slide over the existing mantelshelf.

The tapering side pieces are made of $\frac{3}{4}$ in. plywood ($\frac{1}{2}$ in. is even better if you can afford it). Do economise by cutting two pieces together as shown at (B). Also, you may have to cut away at each bottom back corner to give clearance for the skirting board (see D).



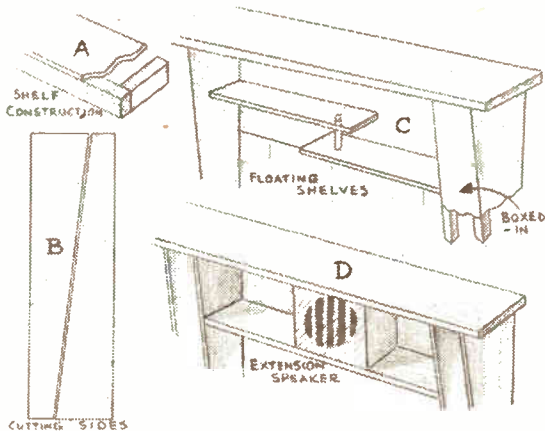
Regarding designs. You will think of all sorts of variations. At (C) we see incorporated two 'floating' shelves made of $\frac{1}{2}$ in. plywood. To hold them a back piece of 3-ply must be fixed between the back edges of the tapering side pieces. The shelves are then held by screwing through from the back of this plywood, in addition to the normal hold at their ends by screwing through the side pieces.

A suitable length of lin. round dowelling also supports them centrally as shown. Hold the dowelling in place by nailing through the shelves with panel pins.

Also shown at (C) are the side pieces boxed-in solid, and their construction, should you prefer this method. Be careful, however, not to use this method if it means having wide cumbersome solid sides.

Another suggestion, for you radio fans and especially if you are already using an extension speaker in the room, is shown at (D). It embraces the speaker, fixed centrally between the two shelves and also giving two rather attractive alcoves for books or ornaments on each side. Incidentally, it is surprising just what a good baffle-board for the speaker this setting makes.

You who like concealed lights will



probably think of one or two good ideas where these could be incorporated.

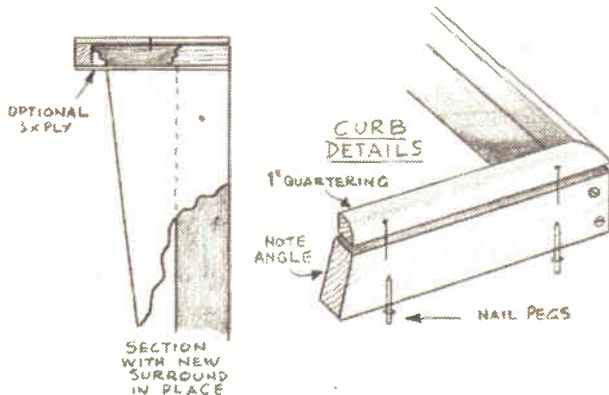
When you have slid your new fitting into position over the old surround, hold it with two panel pins, driven through the top shelf into the old shelf. Similarly, hold the new sides pieces, to the old sides with pins. A $\frac{1}{2}$ in. hold will be quite sufficient. You do not want to damage the old surround. It is landlord's property — remember?

Matching curb

Finally, the 8-day chiming clock and the two candlesticks, you always have on the mantelshelf. Find somewhere else for them. Afford a couple of contemporary pieces for your new fitting. They show off this kind of surround and vice-versa.

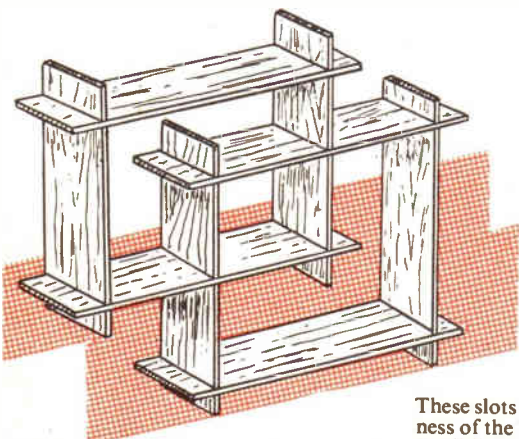
And the box-curb. Agreed, you've had it for years. All the same, it's not going to match your new surround.

Make up a matching curb of $\frac{3}{4}$ ins. by 1in. prepared deal, topped with 1in. quartering moulding, as shown. To pre-



vent the curb 'wandering', drive in two 2ins. nails into the underside of the end pieces, so that 1in. protrudes. Saw off the heads of the nails. In the floor, drill four $\frac{1}{2}$ in. holes, suitably placed, so that when the curb is in position, the nail pegs drop into the drilled holes in the floor.

Do remember to cut the ends of the side pieces at the same angle as the slope of the surround side pieces, so as to make the curb a snug fit. Those of you handy with the metal shears can line the inside of the curb with thin sheet metal, held in place with tin-tacks.



ATTRACTIVE, contemporary wall fittings for displaying bric-a-brac, cactii and the many popular glass figures can be quickly made without preparation of difficult joints. Neither nails or glue are required and the pieces are fitted together simply by making slots.

Eight pieces of $\frac{3}{4}$ in. plywood, or nicely grained solid material, are required, measuring $4\frac{1}{2}$ ins. by 12ins. Cut these accurately, smoothing off all surfaces and edges before proceeding further. You may use glasspaper and a cabinet scraper for the final finish before cutting the slots. If you wish to make the front edges rounded, so much the better. Alternatively, you may glue on half round beading if plywood is used.

Slots are cut as shown in Figs. 1 and 2, four pieces being prepared of each.

These slots must be cut to the exact thickness of the board to ensure a tight fit and careful marking out is essential. The slots are cut halfway across the boards



Fig. 1



Fig. 2

and first requirement is a hole drilled at the base of each slot. Use a fine saw, keep to the lines, and for speed and accuracy

CONTEMPORARY WALL RACK

By
S. H.
Longbottom

you may cut out four pieces at the same time if they are held firmly in a vice. It is then a small matter to clean out the corners with a chisel for perfect fitting.

Reference to the illustration will show that actually there are two overlapping square frames, so that fitting should not be difficult. The centre slots permit the two frames to lock together and if it is necessary to tap them into position with a hammer remember to use a protective piece of waste material.

Finishing depends partly on the material used and partly on personal choice. If plywood is used and you wish to disguise the edges, painting is probably the easiest method of all, and it is suggested that you use two different colours to produce an attractive finish. Where solid material has been used, staining and polishing will provide a good finish, or you can retain the natural beauty of the grain by using wax polish only.

While these fittings are primarily designed as wall decorations, they will stand equally well on a table provided some discretion be used in the placing of the ornaments to balance the weight.

Any normal method of fitting to a wall by means of brackets can be adopted, fastening the latter underneath the top shelf. Another easy way is to fit flat mirror brackets which may be screwed to the wall.

BLOCK PRINTING

ALTHOUGH the term 'block printing' usually refers to a method of making designs on paper by means of wooden blocks, we can use many types of materials. Some, being softer and easier to work, enable us to produce quite intricate patterns, but of course these, while capable of numerous repetitions, are not as durable as wood. Even so, lack of tools or skill is no handicap, and you may experiment with any of the following.

An ordinary potato sliced in half is a good medium for a temporary block, the design being cut out with a sharp knife. The texture makes it unsuitable for intricate patterns but straight grooves can be easily cut, and which, it should be remembered, will show white on the finished design. Moreover, try to make

more patience in working. In some cases it is often advisable to cut out patterns in cardboard, cementing to the block of wood with a good adhesive, using a coating of varnish or french polish for protection.

By S. Longbottom

Another novel way of making a block for printing is by means of a length of string or cord. The string is cemented to a piece of cardboard or wood after tracing out a design. Outlines of signatures, symbols, pictures or shapes can easily be made in this fashion, but again, a coat of varnish is recommended.

Finally, there is vulcanised rubber

small words may be made by tying the blocks together, but the ruler should still be used and it will also be realised that since more vowels are used in our words than consonants it is advisable to make a few extra if you wish to print whole words, rather than each letter separately.

Picture patterns made from patching are quite easy to prepare so long as you remember that it will always be in reverse unless you prepare the sketch on the protective backing. Odd scraps of patching are never wasted, since they can be cut to make up some small parts of a picture, and, combined with pieces of string as already mentioned for sky or background, you have the basis for some really original blocks. It should be noticed that while small letters may be attached direct to wooden blocks, it is advisable to treat larger blocks a little differently. For a picture it is better to first apply a base of patching to the wood block followed by the design.



the cuts at an angle so that the base of the relief portion is stronger.

A cake of soap is very easy to work and much more stable than the potato. Impressions may be made with knives, needles, skewers and all kinds of simple tools.

Cork stoppers are useful for smaller blocks but you must use a sharp blade to produce clean cuts and to avoid chipping or ragged edges.

More durable than the foregoing is linoleum, attached to a piece of wood and the design cut out or scraped away. Razor blades, needles and special gouges for fitting in penholders are useful tools for lino cutting and this material stands up to hard wear, transferring all types of paint and inks quite successfully.

Blocks of wood, and sticks of square section, are also useful but take a little

cycle tube patching which is ideal for making durable blocks. Shapes may be drawn on the protective covering on the back of the patching and cut out with scissors or knife. Letters are easily made by cutting the patching into strips to the required size of the letters, then preparing carefully. Remember that when attached to the block of wood — after removing the backing — the letter is reversed, but if the design is made on the back as mentioned any difficulties will be avoided.

Small blocks of wood cut from square section should be prepared to accommodate the letters, which are attached by a little rubber solution, and a complete alphabet will be very useful for making display bills, posters or notices. Use a ruler to keep the letters in alignment when printing the words. Alternatively,

If you wish to pattern some paper, first measure out at the edges, lay a straight edge across, making the impressions at equal distances every time.

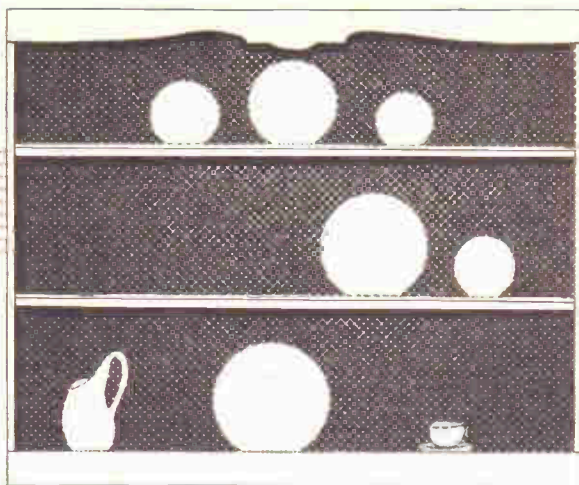
Small labels, bookmarks, and all manner of similar things may be made by one or more of the blocks described, and you may use one or more colours. You may use one block to print one colour, with, say, a border made from string in another colour. Water colour paints are good, or you may use distemper or even emulsion paint. The best method is to make a pad of soft material for the colour, removing surplus from the block by stamping on old newspaper. Ordinary rubber stamp pads, saturated with endorsing ink, are particularly good for all blocks made of rubber patching and these are obtainable in many colours.

Continued on page 247

A CABINET FOR CHINA

THOSE attractive willow pattern plates or treasured pieces of Wedgwood or Royal Doulton can be displayed perfectly in a hanging cabinet made specially for the purpose. It can be painted in contemporary fashion to blend with existing furniture and the colour changed when the room is re-decorated.

The size should be worked out to suit individual requirements, but the measurements shown in Fig. 1 will be sufficient to give room for a small collection. Small coffee cups and jars will stand on the narrow shelves and plates will lean against the back. They are prevented from slipping forward by the beading along the front of the shelves.

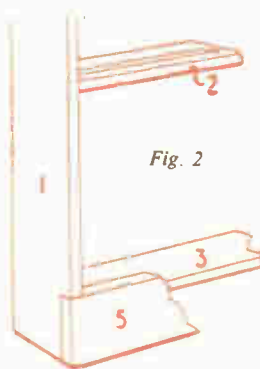
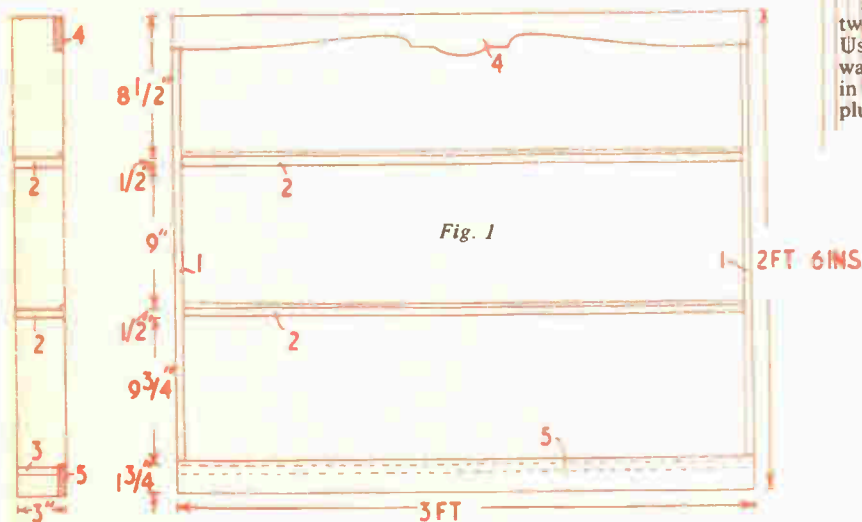


Note that piece 5 forms the head for the lower shelf 3.

The cabinet can now be backed by a piece of pegboard or hardboard. This too can be painted, after giving a coat of hardboard sealer. Painting is not diffi-

cult if the work is well cleaned, give two coats of flat undercoat of the correct shade and glasspaper lightly when dry. A single top coat of high gloss enamel is usually sufficient to give a professional finish.

Fix the cabinet to the wall by means of two screws through the backing piece. Use roundhead screws and slip a small washer on the shank for safety. The holes in the wall will of course be Rawl-plugged. (M.h.)



The ends 1, the shelves 2 and 3 and the front pieces 4 and 5 are all cut from $\frac{1}{2}$ in. softwood. The piece 4 is marked out approximately to the shape shown and is cut with a fretsaw, using a heavy blade. The fronts 4 and 5 are both let into the sides 1 as shown in Fig. 1. All parts are glued and pinned firmly together. The pins should be punched slightly below the surface and the holes filled and glasspapered flush. Strips of $\frac{1}{16}$ in. square stripwood are glued along the front of the shelves 2 as indicated in Figs. 1 and 2.

Continued from page 146

Block Printing

The main thing to remember when inking the blocks is to avoid having too much colour and the ideal print is only made from an evenly inked block. You will find it better to make several inkings before starting to print, working off the surplus on old newspaper. In this way the block receives an even coating of colour which penetrates and on transfer

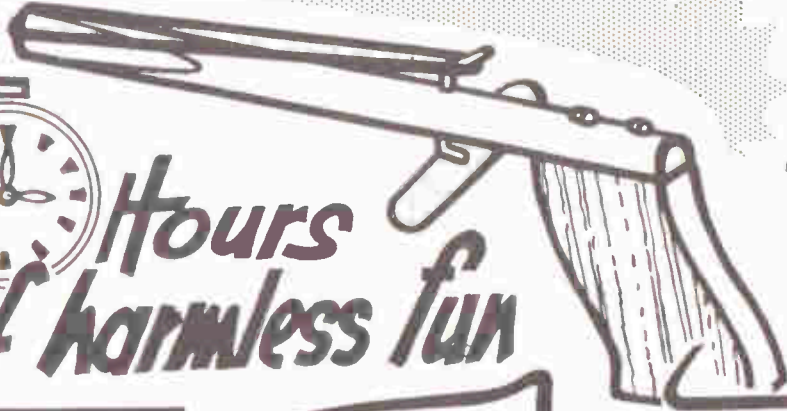
to paper produces a clean print without smears.

The inking of soap blocks also requires some care, since excess will quickly soften the face of the material, spoiling the design. On the other hand, blocks made with rubber patching remain unaffected by moisture, yet excess inking must be avoided.

RUBBER BAND



Hours of harmless fun



HANDLE, CUT ONE 3/4 IN.



TRIGGER, CUT ONE FROM THIN METAL

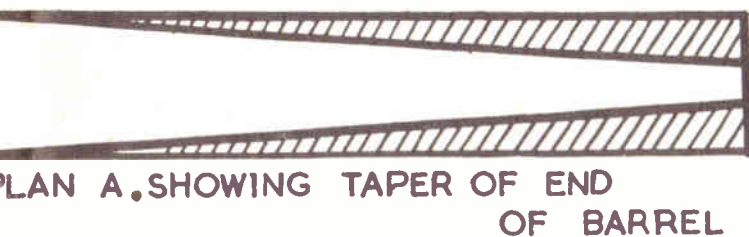
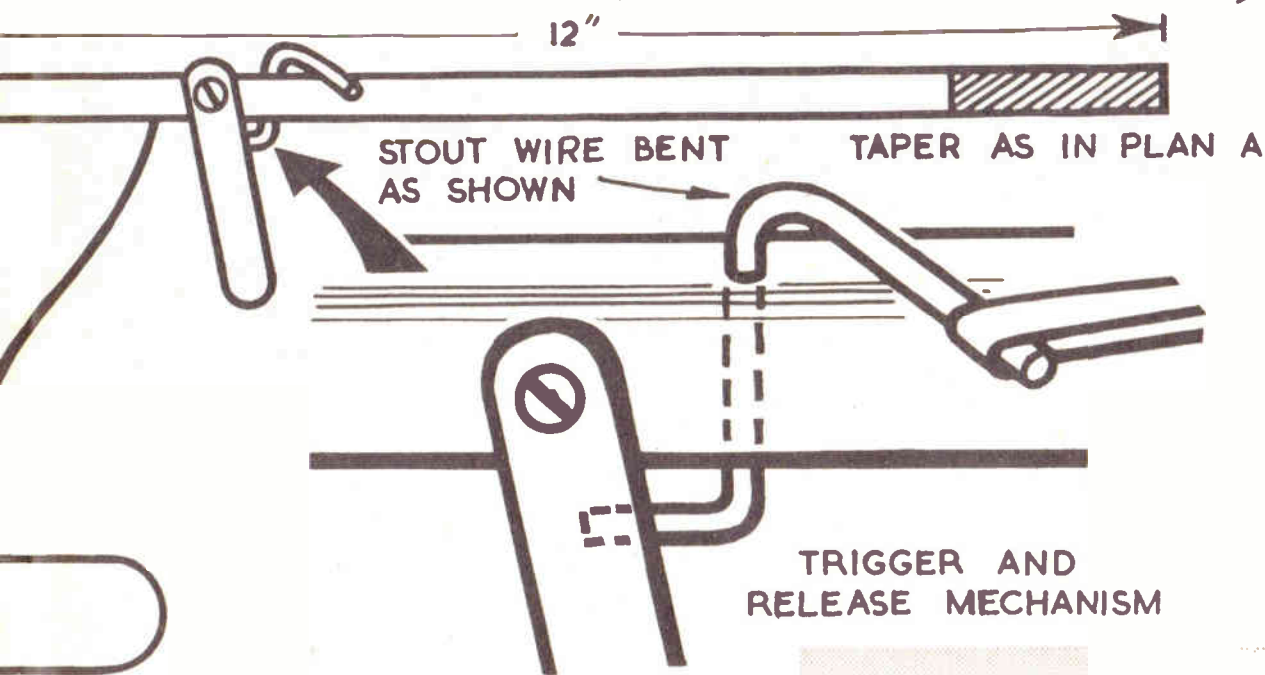
ENLARGE TARGET ON TO 1/2 IN. SQUARES



PLAN A



D GUN A 1 evening PROJECT



INSTRUCTIONS

THE diagram is self-explanatory, but there are one or two points in construction which are worth noting. The barrel may be made from dowel rod or square-sectioned strip wood. The trigger end of the wire, when bent as shown must be just long enough to press against the inside of the trigger when the gun is loaded. This pressure prevents the rubber band from flying off the end of the barrel until the trigger is pulled. Wire should swivel freely in hole in barrel. Rub well down with glasspaper to ensure a smooth splinter-free handle.

Make them yourself

MORE HANDY FORMULAS

WOOD bleaching is an operation the handyman occasionally wishes he could do, but lacks the know-how. So long as one does not expect to make mahogany look like whitewood, the process is effective. In other words, naturally dark woods will not readily abandon their colour, whereas paler woods will come up whiter.

Chloride of lime is the material used. First make a paste of this with water, and then stir it thoroughly with six times its volume of water. Let it settle and pour off the clear upper liquid for use. The wood, of course, should be in the natural state and have no polish or other finish upon it. Swab the wood well with the solution, let it sink in for a few minutes and then swab with a mixture of one volume of glacial acetic acid with five volumes of water. Allow to act for a few minutes and then flush off with water.

Chlorine gas is given off, and so the operation should be conducted in the open air. The treatment may be repeated if the first does not give the whiteness desired. It should be remembered, however, that the wood will dry out lighter than it appears wet.

After the water flushing, scrub the wood with plain water, mop as dry as possible, and leave to dry completely.

Tile cement

If you wish to fix fireplace tiles, it is as well to use a heat-resisting cement. Ordinary cement will give a satisfactory bond if first mixed dry with sand, finely sifted coal ash and asbestos powder, equal volumes of each being used. Mix the cement with water in the usual way.

Carpet cleaner

Dingy carpets can be freshened by a simple mixture. In a quart of boiling water dissolve 2 ozs. of soap shavings and $\frac{1}{2}$ oz. of washing soda. Allow it to cool, and stir in three tablespoons of strong ammonia. This stock cleaner will keep if stored in a large screw-top jar. For use, mix enough of it with warm water to produce a good lather, brush the carpet well with it, then clear it with warm water. Dab nearly dry with a cloth and leave to dry out.

Soldering flux

Zinc chloride liquid flux is effective and cheapness itself to make from hydrochloric acid and zinc. Technical grade hydrochloric acid ('spirit of salt') costs only 1d. or 1 $\frac{1}{2}$ d. an ounce from a dispensing chemist, and the zinc can be

recovered from exhausted dry batteries. Strip the zinc from the batteries, scrape off as much of the filling as possible, and then melt the metal in a tin. Skim off any surface dross and pour on to a clean flagstone.

Put an ounce or two of hydrochloric acid in a clean jam jar, add plenty of the purified zinc, and leave the jar in a safe place in the open air. The acid is corrosive, of course, and should any come in contact with your skin, flush it off with water, and dab on a paste of sodium bicarbonate (baking soda).

The mixture effervesces, giving off inflammable hydrogen gas, so the rule is 'no smoking' when near the jar! When effervescence stops, some undissolved zinc should remain. If there is not, add more until there is. Strain the soldering fluid from black flocculent matter through fine cotton, when it is ready for use. It is usually called 'killed spirits'.

Solder

If you do a good deal of soldering, it will pay to make your own. Granulated tin costs about a shilling an ounce at a laboratory furnisher's. 1 oz. of tin and $\frac{1}{2}$ oz. of lead will make you a supply of solder which would cost you much more to buy. Simply melt the lead and add the tin. Stir with an iron nail, pour out on to a stone slab, and cut into strips when cold.

Iodine stain remover

Housewives sometimes have difficulty in washing out iodine stains from linen, especially if the material was starched. Quite often the stain disappears in the hot wash water, but reappears when the cloth has been taken out and gone cold. A simply-made solution will stop this trouble before it starts, and a small bottle should be kept on hand. Dissolve a teaspoonful of sodium thiosulphate (photographer's hypo) in about half a cup of cold water. Sponge the stain with the solution and then rinse in plain water. The iodine is decolourised immediately.

Ivory bleach

Yellowed old ivory may usually be restored to a much lighter shade by first washing in soap and water, rinsing, and then immersing in hydrogen peroxide for four or five hours. By then exposing the ivory to sunlight, the effect is much intensified.

Inks for glass

These are mostly used for indoor

purposes, such as making measures, labelling and so forth. While the formula for indoor ink will withstand water, it is not permanent enough to endure constant rain. Consequently, a separate formula for outdoor use will be given.

To make the indoor type, dissolve 1 oz. of borax in 12 fluid ozs. of hot water and stir in 2 ozs. of pale shellac. When the shellac has dissolved, the ink may be coloured black, blue or red according to your desire. For a black ink, add 5 drams lampblack and 8 grains of Alkali Blue and stir well. Owing to lampblack being insoluble in the ink base, the ink should be stirred up before use. A blue ink is produced by dissolving in the ink base 1 dram of Alkali Blue, and a red, by using 2 drams Carmine.

The base for outdoor ink consists of 3 fluid ozs. of oil of turpentine (not turpentine substitute), 1 oz. of Venice turpentine, $\frac{1}{2}$ oz. of sandarac and 2 ozs. of pale shellac. Warm the turpentine by surrounding it with warm water, and dissolve the other ingredients in it by stirring. To colour the base, any of the common pigments obtainable from a paint shop can be used. $\frac{1}{2}$ oz. will usually give sufficient depth. Stir the inks before use, since the pigments settle on standing.

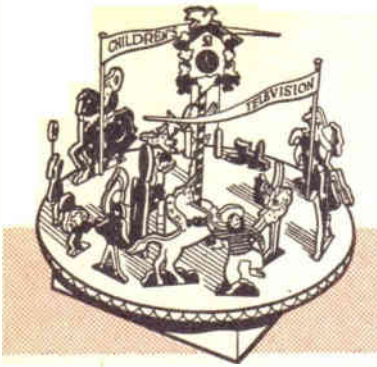
Rust preventer

Steel articles will withstand at least three years of bad storage conditions without rusting if they are coated with a simple preparation. Under normal conditions, the protection is longer. To make the rust preventer, warm 5 fluid ozs. of white spirit (turpentine substitute) or solvent naphtha in a tin surrounded by warm water. Dissolve in this 4 ozs. of lanolin, when the mixture is ready for use.

HINTS FOR SOLDERING SMALL PIECES

SMALL, awkwardly-shaped pieces can be held in position for soldering by pressing them together slightly into a piece of damp clay.

If there are several soldered joints, bury the job in sand or cover with clay so as to confine the heat to the part requiring attention. (E.M.B.)



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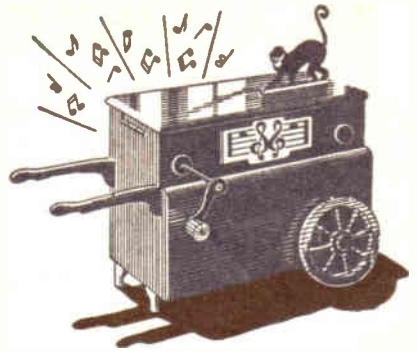
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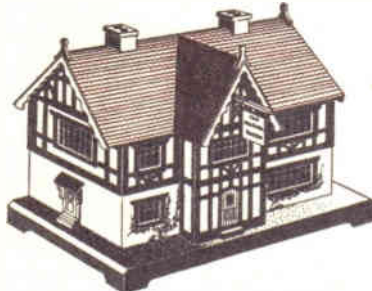
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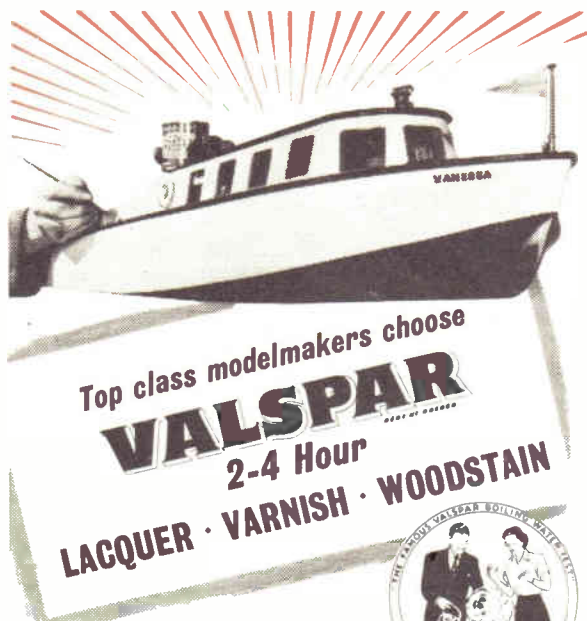
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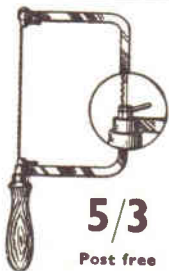
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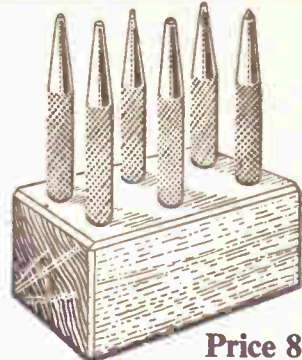
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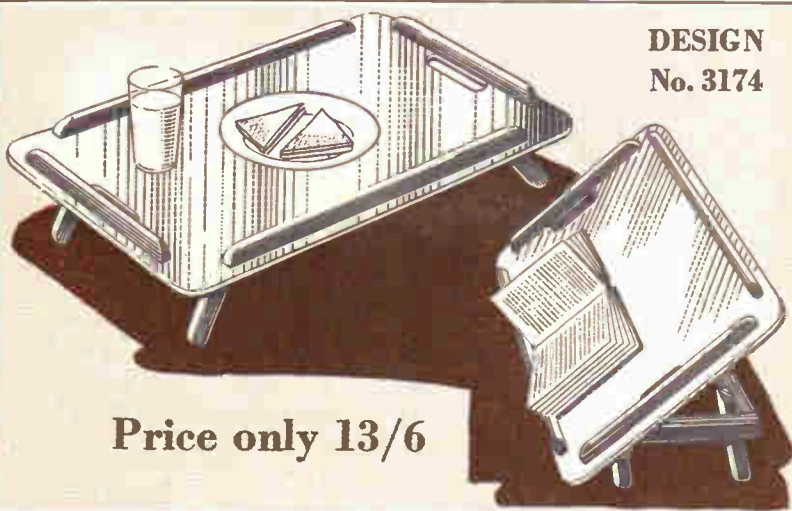
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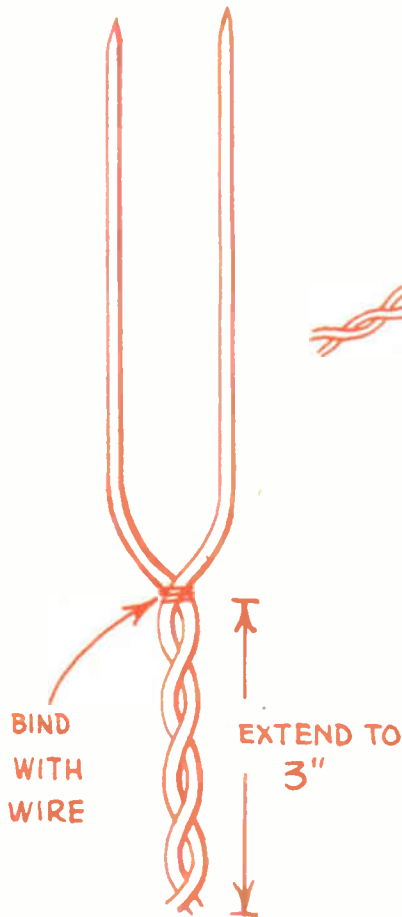
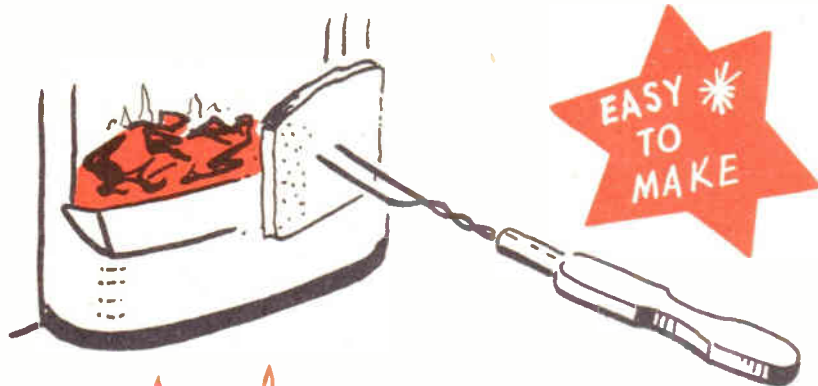
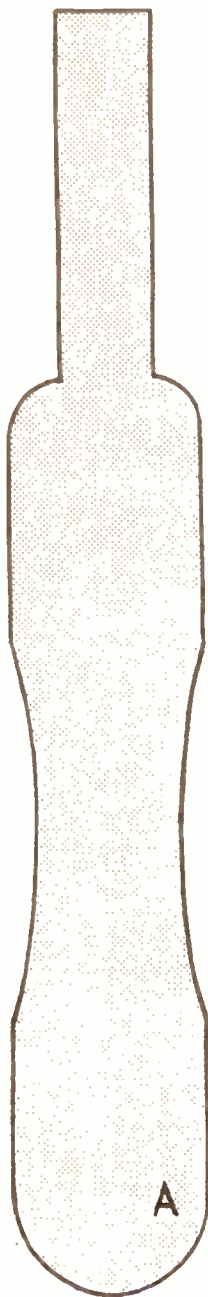
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The narrow end is drilled as shown in the small diagram. Drill to a depth of about $\frac{1}{2}$ in.

The fork is made from wire and twisted to shape. The twisted end is then pushed into the handle as indicated in the sketch.

The handle should be given two or three coats of brush polish or heat-resisting enamel. (M.p.)

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