

# Hobbies

WEEKLY

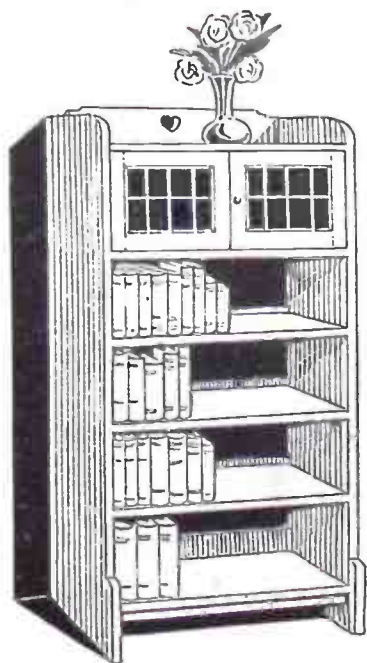
Full Details for  
an Ultra Short-  
Wave Radio  
Inside

VOL. 115

NUMBER 2973

You can make a combined

## BOOKSHELF AND CABINET



construction, and should not be beyond the skill of any home worker.

Figs. 1 and 2 supply the necessary measurements and arrangements of the various shelves, etc., while Figs. 3, 4 and 5 give plain enlarged details of joints introduced into the construction.

### The Sides

The two sides or uprights are made from 7/8 in. thick wood 5ft. long (to finish 4ft. 11ins. when cut and cleaned up), and 9ins. wide. Make a good clean cut along the top edge of the boards and round off the front corners neatly as shown. Then, to add a little character to

the lower front edges of the sides, and also to add stability at these points, the width is increased by the addition of 8in. or 9in. pieces about 1in. wide by 7/8 in. These pieces may be glued and screwed on with countersunk screws, the heads being later filled with putty or other wood filler.

The shelves are all 7/8 in. thick, and, to make a strong job of the fixing between these and the sides, it is suggested that the two top shelves and the lowermost one be mortised and tenoned together in the manner shown in Fig. 3. This diagram shows the lowest shelf with the spacing of the tenons. The two top shelves will be somewhat similar, except that the extreme top one will be 8 1/2 ins. wide, while the second one down will be 8 1/2 ins. wide—this allowing for a 7/8 in. backing board to the cabinet.

### Additional Tie

An additional tie between the sides is formed by the lowermost back rail, which is 7/8 in. thick, being recessed into them and screwed firmly as seen in the open detail Fig. 4. The recess shown will be 5ins. up from the floor line and, of course, 3ins. long as shown. It should be possible to cut the mortises in the sides with a coarse fretsaw, or, if

WE give here details of an article which should prove a useful piece of furniture for the smaller house with rooms of limited size. Such a bookshelf as shown would contain, probably, all the books required to be kept handy, and the cabinet could be used for small china pieces or even as a medicine cabinet.

The whole is of straightforward

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THE MAGAZINE FOR MODELLERS,  
HANDYMEN AND HOME CRAFTSMEN

World Radio History

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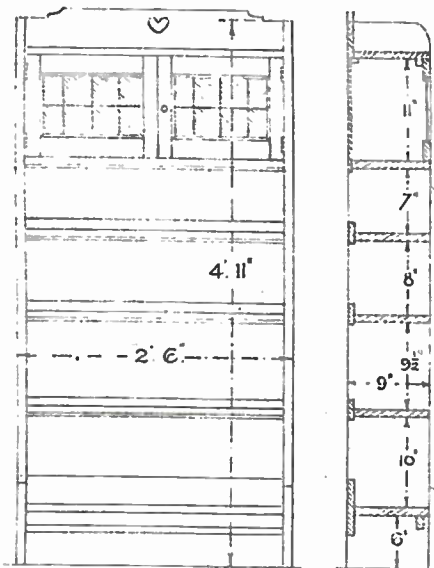


Fig. 1

preferred, as much wood as possible may be removed by using the brace and bit, the remainder being cleaned away with a chisel.

The three intermediate shelves, 8½ ins. wide, should be housed ¼ in. each end into the uprights, and glued and screwed securely. At the back of these three shelves run narrow rails about 2 ins. wide and ½ in. thick. These will be screwed firmly to the backs of the shelves.

The top back or pediment rail, ¼ in. thick, should be recessed into the ends ¼ in. and screwed firmly to the top shelf.

Fig. 2

The simple shaping and fret shown may be cut to the pediment rail with the fretsaw.

The back of the cabinet can consist of a piece of ¼ in. plywood carefully cut to fit in between the sides, and nailed or

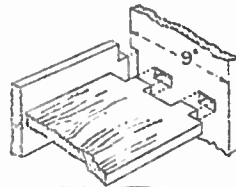


Fig. 3

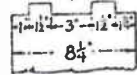


Fig. 4

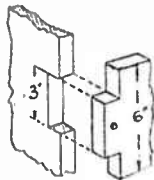
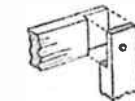


Fig. 5



screwed to the floor of the cabinet. A small fillet of wood put along inside the cabinet at the back will support the plywood, as shown in Fig. 2.

The doors of the cabinet should next be made, and each consists of four rails halved and lapped together at the ends as shown in Fig. 5. The four upright rails will be 11 ins. long by 1½ ins. wide, and the horizontal rails about 14½ ins. long and 2 ins. wide. All should be ¾ in. thick. It would be a good plan to check the measurements first from the actual opening before marking and cutting the wood. Mark off the halvings accurately with a try-square and cut them down with a fine-tooth tenon saw. Glue the joints soundly and either screw them or pin them afterwards with wood dowels.

The openings in the doors can be filled with wood panels held in place by beading as shown in the enlarged section of the door, Fig. 5. The larger beads, to go on the inside or back of the doors, should be mitred and glued round first, then the panels dropped in and the small chamfered beadings added afterwards.

Panels of glass would look well also, and, of course, a pair of leaded lights would make for real effect and improve the appearance of the cabinet in every way.

Brass hinges about 1½ ins. long are added to the doors and a fillet or bead of wood put along inside for the latter to close against. The left-hand door should have a small bolt added inside, while the right-hand door should be fitted with a threaded bolt and tongue for keeping the door closed.

The finish to the woodwork will depend upon the kind of wood used and whether the whole thing is to match up with existing furniture in the room.

(S.W.C.)

fill up the grain of the wood. A coat of clear varnish should make a good surface, or the whole could be painted or enamelled, as desired.

CUTTING LIST	
(A).	4 legs. 26½ ins. by 1½ ins.
(B).	2 rails. 16½ ins. by 1½ ins. by ¾ in.
(C).	1 rail. 20 ins. by 1½ ins. by ¾ in.
(D).	2 rails. 18 ins. by 3 ins. by ¾ in.
(E).	2 rails. 14½ ins. by 3 ins. by ¾ in.
(F).	1 floor. 19 ins. by 15½ ins. by ¼ in.
(G).	1 top. 21 ins. by 17 ins. by ¾ in.
(H).	2 rails. 11 ins. by 1½ ins. by ¾ in.
(I).	1 rail. 21 ins. by 1½ ins. by ¾ in.
(J).	1 rail. 21 ins. by 1½ ins. by ¾ in.
(K).	2 beading. 17 ins. by ¾ in. by ¾ in.
(L).	2 beading. 13 ins. by ¾ in. by ¾ in.
(M).	1 rail. 21 ins. by 3 ins. by ¾ in.

Tell your friends about the useful information to be found in 'Hobbies Weekly'.

## HANDYMEN CAN MAKE IT

# A Handy Desk for the Young Student

THE desk shown in our illustration at Fig. 1 would prove useful to the young student. It is a simple article to construct, and can be made in either soft or hard wood. The latter is preferable, of course.

The article departs rather from the ordinary type of desk as it has a flat top instead of the usual sloping lid, which now appears to be a little outdated, and considered less convenient for holding the various text books, etc. The height is considered about right for the young student, but it can easily be increased slightly by the addition of block feet, or lowered by cutting off a little from each leg.

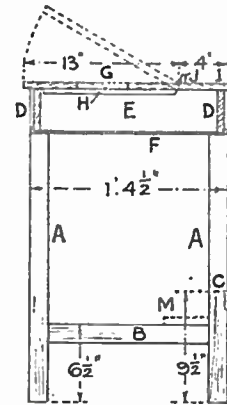


Fig. 2

The general appearance of the desk is shown in the sketch. The lid is shown closed in this drawing, but in the cross section at Fig. 2 it is shown raised. Simple woodwork joints are used in the construction of the desk; plain lapped joints and easily cut open—tenon and mortise joints at the extreme top of the legs.

### The Legs

The legs should be prepared first, and their sizes can be ascertained from the cutting list at the end of this article. Plane up the legs, if necessary, to finish not less than 1½ ins. square and proceed to set out and cut the grooves at the top according to the enlarged detail and plan in Fig. 4. Note from the plan of the leg, shown in the circle, that the grooves

are cut in ¼ in. from the outside face of the legs and are ¼ in. long and ¼ in. wide, so that ¼ in. is to be cut away at the back of each of the rails forming the box. This can be better understood from the sectional detail in Fig. 4, the side rail (E), here being shown ready to enter its mortise in the leg.

### Recessed

In each side pair of legs there is a recess ¼ in. deep and 1½ ins. wide to receive the ends of rails (B), see detail

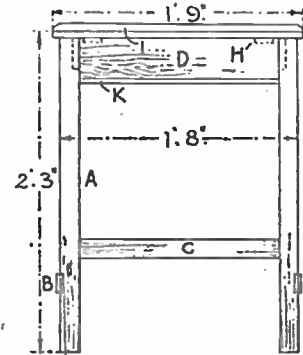


Fig. 3

Fig. 5, which shows also how the ends of rails (B) and (C) will be cut to fit the above recesses. Note that the recesses of the rails (B) and (C) in all cases are not cut in more than ¼ in. so as not to weaken both legs and rails. The pair of legs at the rear of the desk have also shallow recesses cut in them to take the horizontal rail (C). The distance up of this rail is given in Fig. 2, and is shown also in Fig. 3, which is a front view of

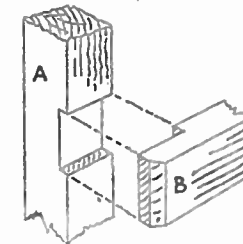


Fig. 5

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Fig. 1

the desk. Care must be taken in marking out and cutting the tenons on the ends of rails (D) and (E) to make them fit accurately and stiffly into the grooves of the legs.

When the rails are glued, some long wire nails can be put through the legs into the tenons as an extra fixing.

The floor (K) may consist of a sheet of ¼ in. plywood carefully cut and fitted. It should be notched out at the corners

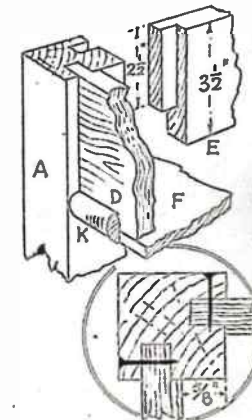


Fig. 4

to fit round the legs. The floor will be nailed or screwed to the bottom of rails (D) and (E), and to cover the raw edges of the plywood, lengths of half-round beading are put round in the manner shown in the diagram, Fig. 4.

### The Top

The top of the desk is made up of the four parts (G) and the two pieces (H). Three pieces go to make the lid, which is hinged to the fourth piece, this latter piece being securely screwed to the side rails (E) and the back rail (D).

(Continued on page 50)

## A Handy Desk for the Young Student

(Continued from page 51)

The three pieces forming the lid or desk are about 4½ ins. wide, with planed edges ready for gluing together and cramping up. On the underside of the lid are two battens (H) which are glued and screwed with countersunk screws, the sharp edges of the battens being lightly planed off. Take care to get these battens properly placed and in the position shown in Figs. 2 and 3, so that they do not interfere with the free opening and closing of the desk.

### Hinges

Use a pair of 1½ in. brass hinges to connect the desk top with its fixed back rail, and recess the flaps of the hinges to form a close joint. Round off the front and two side edges of the desk slightly,

and then fix the narrow rail (I) along the back edge with screws or wire nails. Shape the ends of this rail as in the sketch Fig. 1. A small ledge (J) is fixed just at the rear of the hinges, and should be rounded off at the top and fixed with glue and small nails.

### Angle Plates

If the worker's labour does not result in a perfectly rigid 'table', he should add brass angle plates as required to give added rigidity. Additional strength may also be given by placing a board (M), shown by the dotted lines in Fig. 2, at the back end of the side rails (B) to which it should be securely screwed.

Clean up all surfaces with coarse and fine glasspaper and give a coat of size to

# Three Simple Toys to Make

Full-Size Patterns on Page 63



WE are often requested to print, in simple pattern form, toys which can be made up cheaply from odd pieces of wood, and the three simple designs given here may prove useful to the man who is handy with the fretsaw and a tin or two of paint or enamel.

Quite a bit of extra pocket money can be earned by making up these toys for resale at bazaars, or to toy dealers, and the worker who intends to make quantities should provide himself with templates of the parts of the toys. These templates may be cut in thin wood or metal, or even from cardboard, providing the latter holds its stiffness and that the edges do not burr over too much while in use.

Each template should be lettered for ease in handling, when marking out the various shapes on to the wood.

### The Full-size Patterns

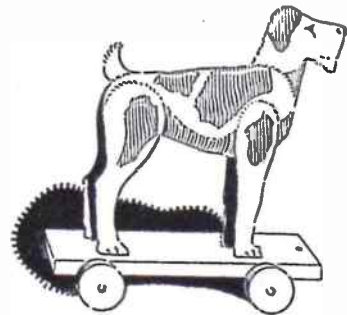
On cover III of this issue will be found full-size outlines for all the parts of the three designs shown in our pictures. Each is a pull-along toy, and is fitted with a base and four easily cut wheels.

Wood 1/4 in. thick should be used for all parts, and if only one set of the animals is being made, then the patterns are traced on to the wood in the usual way, but if a number are being made, then the patterns should be traced on to the template material and the templates prepared.

### The Bodies

Note from the pattern sheet that the bodies of the horse and the dog consist each of three pieces, one, as (A) and (D), being the centre upright which will be sandwiched between the pieces (B) and (E) respectively. The four legs of each animal are then glued on in the positions shown by the dotted lines.

At the foot of each leg there is a



tenon which must be let into the base later on. In gluing the legs to the body, therefore, be sure to keep them level each side so that the animals will stand up squarely from the base.

The cat has only one body section,

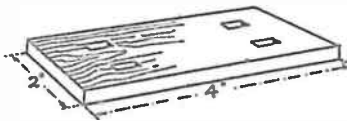
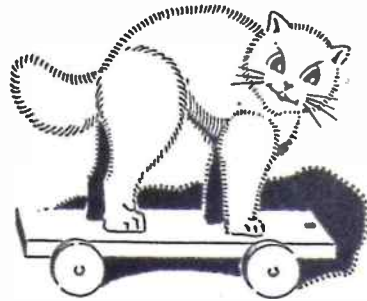


Fig. 1—Details of the bases

the head, as a separate piece, being glued on one side of this. The legs, of course, will also be glued direct to the body part according to the dotted lines on the pattern (G).

When all the gluing up has been finished, certain edges of the bodies and legs may be slightly rounded off with fine glasspaper previous to applying the first coat of paint. This should be a flat coat of cream or white. The second coat should be of a colour natural to the animal concerned, and the markings are then finally brushed on.

The horse would look well carried out as a 'piebald' with dark brown patches on a cream ground. The dog could be similarly treated, while the cat would look well painted white with markings



round the edges to suggest the rough fur coat.

A diagram of the suggested base for the animals is given in Fig. 1. The best way of making these is to cut them to the outline shown, clean off the rough edges and then paint them a bright colour. 3/4 in. or 1/2 in. wood is suitable to use.

### Mortise Positions

To get the exact positions of the mortises to be cut in the bases, simply stand each animal on its respective base and mark round the tenons on the feet with a pencil, previously gauging as accurately as possible the margins at the front, back and sides.

Now line the mortise holes squarely in pencil and cut them out with the fretsaw. It then only remains to glue the legs into their proper mortises.

Cut the wheels from 1/4 in. or 1/2 in. wood, and either nail them direct to the edges of the base or glue simple 1/4 in. square axle pieces to the underside of the base and nail on the wheels to the ends of these. The wheels should be suitably painted in contrasting colours before being attached to the base. (S.W.C.)

### Dissolving White Shellac

I HAVE some white shellac in rock form. How can I melt it to form a gloss substitute? (J.A.W.—Ilkley).

ASSUMING the material referred to is, in fact, white shellac, the easiest way to melt it is first to crush it into powder, then gently heat it in a double pan, taking care to avoid the material catching fire. When liquified, remove from the vicinity of any naked flame and gently stir in a quantity of pure methylated spirits or rectified spirits or alcohol.

Stir thoroughly, strain through a filter and use as a varnish. Usually the shellac will, when crushed to powder, dissolve in spirits without previous heating.

## An idea and a few

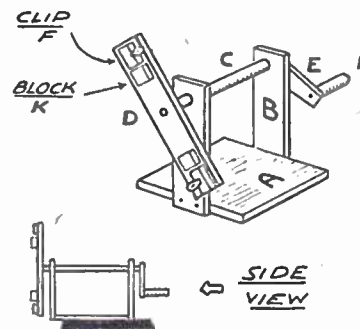
# HINTS FOR FIREWORK NIGHT

HAVE you ever seen those designs built in fireworks which sometimes move, and which are generally put on at the end of a display? These are known as 'set pieces' and certainly give added interest to the Roman Candles of which they are usually composed.

### Set Piece

Why not have a simple moving set piece in your household display this year and so bring in something of a novelty? It can easily be done.

Make the frame shown in Fig. 1 first. This is built up of the base (A), which should be about 1ft. 6ins. square, and the end pieces (B) each about 1ft. high and 5ins. or 6ins. wide. Attach firmly to the base with screws going right through into its ends. Before fitting finally, however, bore two holes, one in each upright near the top, just



large enough to take a section of broom handle. See to it that when the uprights are in position anything passed through the holes will lie quite level.

Now from a discarded brush cut a length of handle (C) about 4ins. longer than the uprights are apart. At one end of this fasten securely the cross-piece (D) with a long but thin screw going into (C). At each extremity of this piece fasten bulldog paper-clips (F). This is done by passing a short bolt through the wood and the hole in the handle of the clip, a washer keeping everything firm (see Fig. 2). Fit also the blocks (K) thick enough to stand a little higher than the clip. A single screw secures these.

At the other end of the length of broom handle attach the simple crank (E). This can either be done with a screw again going into the end of (C), or a section at the end of (C) can be made square and forced into a hole of similar

size in the crank. The hand grip (H) is a further short length of circular wood held by a single screw. Fixed thus it will, of course, revolve in the hand, but if the fingers are held loosely, this does not really matter, as turning will always be quite slow.

The handle and crank are put on first and the piece (D) not finally fitted till the length (C) has been passed through the holes in the uprights (B).

### Using the Frame

To use the frame, put two fireworks, say, Roman Candles or Sparklers, in the bulldog clips and ignite. Then turn the handle slowly and the 'audience' standing in front will get some very novel and pretty effects. The blocks (K) are for the Catherine Wheels. These are pinned on and lighted both together and when going the crank is again revolved. The turning of the piece (D) does not, of course, prevent the wheels revolving on their own axis and some very pretty effects of 'wheels within wheels' are obtained.

### General Hints

And now for some general hints for the fifth. Always remember what might be called the six commandments for the night of bangs, light and fire.

- (1) Lock all pets indoors in a room where they will hear the least sound.
- (2) Make a definite rule of 'no hand holding'. Many of the present-day fireworks are really highly explosive.
- (3) Be careful with fireworks that have apparently gone out. Knock sharply against something hard and re-apply a light. Never examine with the end near the face.
- (4) Start all fireworks by means of spills lit from a pilot light kept burning in a nearby shed.

### Volume Control

I WISH to fit a volume control on to an extension loudspeaker, and imagine there will be a variable resistance in parallel with the speaker. Please advise me as to what value this should have. The speaker has no transformer, and is of 6ins. diameter (D.P.—Ilford).

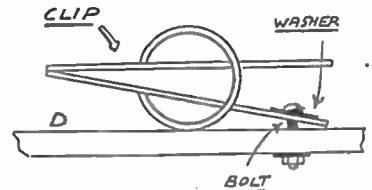
THE simplest form of extension volume control is to include a wire-wound variable resistor of about

(5) See to it that bottles for rockets and pins for Catherine Wheels are firmly fixed, the rocket bottles pointing away from the houses.

(6) Keep an especially close eye on any small 'helpers' you may have around.

### Six Suggestions

Here, too, are six useful suggestions that will help to make the night go with a swing. (1) Have a big plant pot or barrel in the middle of the 'arena' filled with damp earth to hold the various 'candles' and a board handy to lay on top for rip-raps, flying demons, etc. (2) Work out a simple programme for the display, starting with a big bang and then alternating noisy and quieter items throughout. Finish with your most spectacular display piece. (3) Get everything ready and all the necessary equipment collected before dark. (4) Have a small first-aid kit handy to deal with burns if necessary. This should contain a little oil, lint and bandage. (5) Set off items as far as possible at the



eye-level of your audience. And (6), if you are making a real display of the evening, it is generally best to have the onlookers grouped in some one position, as, say, in a French window, the 'arena' being the concrete outside. This way everything can be set off with one certain viewpoint in mind, which is an advantage. (H.A.R.)

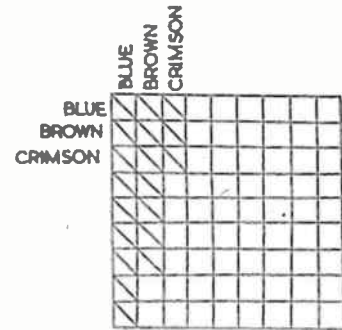
10 to 15 ohms in series with one lead going from the speaker transformer to the speech coil of the speaker. To do this it will be necessary to cut one of the leads coming from the speaker cone. The volume control may be mounted on the side of the cabinet used to house the extension speaker, or elsewhere as convenient. An alternative, less recommended but generally satisfactory, is to use a control of about 10,000 ohms, wired on the high-impedance (e.g. transformer primary) side of the circuit.

# The Art of Tinting Photographs

**D**URING the last few years, quite a number of amateur photographers have added the art of tinting to their hobby, and many have proved it to be a great help in their efforts to excel in picture making by means of the camera. We all know that colour plays a great part in our selection of subjects; in fact, more often than not it is the variety of colours in a scene which causes us to stop and wonder whether a successful result, knowing that it would be in black and white only, could possibly be made of such a beautiful piece of landscape.

## Not Expensive

We cannot all take the plunge and go in for colour films, but it is possible, at very little expense, to turn those black and white prints into coloured pictures, and if you follow the instructions given in this article carefully, you will find the work fascinating, simple and effective.



Colouring chart, showing superimposition of various colours

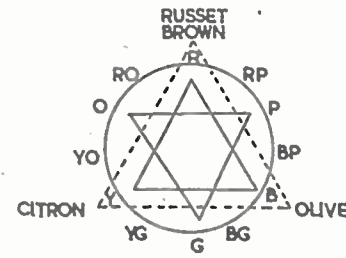
To start, you do not have to purchase any special apparatus, for all that you really need is a set of concentrated tints, and for 5/- you can get a set of Johnson's tints. These comprise nine of the most useful colours, in bottles arranged in a box in upright positions so that the colours can be used without removing them from the box, an important feature. Two or three good brushes are a considerable help, and, of course, one or two saucers for diluting or mixing the tints to get the desired strength of colour.

The word mixing is a reminder that a little knowledge of this branch of colouring is extremely useful, for without it much floundering will occur, and time will be wasted in experimenting to arrive at a particular colour—one which can be mixed quickly and easily if

you happen to know beforehand which tints to mix.

The accompanying diagram of a colour wheel will be found helpful, and the author's grateful acknowledgements are tendered to the publishers of 'The Print User's Year Book 1934' for the idea. On the circle will be seen the three primary colours: red, blue, yellow, indicated by the initial letters R, B, Y. Then, half-way between these, are the three secondaries orange, green, purple, as O, G, P, and the three tertiaries are also clearly indicated; viz., olive, citron and russet brown. Finally on the wheel and between the primaries and secondaries we have the 'three-quarter' shades.

This shows us that each secondary is made up of two primaries as O equals R plus Y; and the tertiaries of equal parts of two secondaries as O plus P equals russet. Now, if you want to break down a tertiary to primaries via the secondaries you will get russet equals  $O+P=R+Y+R+B$ , which, as a simple formula, is



Colour wheel as shown in Print Users' Year Book 1936

just RRYB, meaning that the tertiary, russet brown, contains two parts of its related primary red and one part each of the other two. On the wheel the tertiary is always indicated beyond its related primary. The three quarter shades you should reckon to contain two parts of one primary and one of another.

## Very Useful

For arriving at many combinations of colours this wheel is, unquestionably, very useful, and for those who desire a chart showing the actual colour effect obtained by superimposing one colour over another, nothing better can be suggested than the following. Rule a sheet of paper in squares as a 'graph', having nine squares from left to right and nine from top to bottom, making 81 squares in all. Over the top of those

forming the first line from left to right, write the names of the tints in your set, starting with blue and finishing with yellow. Now repeat these names in the same order alongside the first downward column of squares on the left side.

Your first square now has the word 'blue' over it and on the side. Take a brushful of the blue tint and fill up the first column of squares on the left from top to bottom; the second column should then be filled with brown; the third with crimson, and so on, until all the upright columns are coloured with the tint mentioned at the top of each. Now wash the brushes and proceed to get the effect of superimposing by covering diagonally half of each square on the top line from left to right with blue tint; the second row with brown, and the third row with crimson, and so on, until the whole of the squares have received their two colours. The chart when completed will show at a glance what you will get by mixing two of the concentrated tints in equal proportions. Incidentally the squares should not be less than 1 in.

## Why Amateurs Fail

It has been my experience when judging amateur's tinting work that a large number fail simply because they have only a slight knowledge of the blending and mixing of colours and are, therefore, unable to produce a fairly true record of the actual tint, or a correct harmony of colour, in their results, and it is for this reason that I have gone to some length in describing the two charts. I can assure you that a few minutes spent on the making of these will more than repay, and will certainly make the work much easier and more satisfying.

Now let us consider the best ways of tinting any prints which you have. This work can be done by everybody, because the hardest job of any artist's work is the sketching or drawing of the ground design before it can be painted, and this is already accomplished in the photographic print. There you have all the details in true perspective and formation, awaiting the application of the brush and colour.

A few sheets of clean white blotting paper and a piece of glass is all the equipment required. Do not attempt to tint a dry print for the gelatine surface makes it almost impervious. But this is quickly overcome by soaking the print in clean cold water until the surface becomes softened and absorbent. If the print is very old it may require helping

by using warm water, or, if it is somewhat greasy through handling, then the surface must be clean—by rubbing it with a wad of cotton wool dipped in methylated spirit.

When the print is prepared, place it face upwards on the piece of glass and remove all the extraneous moisture with the blotting paper.

## Dilute the Colours

Do not attempt to do the colouring by using the tints in their concentrated form, you must use very dilute solutions, and apply them in what is known as 'wash' strength, repeating the application until the required depth of colour is attained. To illustrate this let us imagine that the print is one of a beach scene complete with sky, sea, and a sandy beach. The sky is the first part to be tinted. Dip your brush into the bottle of blue and put one drop into the saucer. Then dilute this drop with about thirty drops of clean water and mix well. Now take a brushful of this and pass it over the blue of the sky, carefully avoiding the small fleecy white clouds, and immediately blot it and repeat the brush work, again using the blotting paper. The second or third application will show that the horizon section has received all the tint required, and in the next application this should be avoided and only the middle distance and the actual overhead, so to speak, should be given further 'washes' in order to arrive at a deeper tint.

You will see that by using this method you are building up the colour, and by avoiding the clouds your sky has a very natural appearance. The sea, beach and cliffs should be dealt with in the same way, using their respective main colour, and, if you have used patience and not hesitated to make good use of the blotting paper, your first attempt should be quite presentable.

## Different Subject

Perhaps it would be helpful to consider another and different type of subject, this time a white cottage standing in a country lane and with trees at the side and flowering shrubs in front, together with a green gate. The trees and shrubs should have first attention and 'washes' will enable the dark and light patches in these to be retained. The trunk and heavy branches will require washes of brown with, possibly, certain dark parts left untouched, i.e., let the photographic image do this part of the work. The lane requires attention because some of it is in shadow and there are patches of sunlight. These latter can be 'washed' with brown but leave the shadows. Finally the cottage. It is remembered that the tiles on the roof are a brownish red, and to get this colour it is necessary

to turn to the charts. Having found the right mixture it only remains to dilute and use it as a wash. The cottage, being white, is left free but there happens to be a climbing rose or other flower on part of its wall, and in order to get the effect of these flowers we make an exception and use the concentrated tint. But be very careful not to overdo it, and use the

## Pastel Work

Pastel work is another form of tinting and very beautiful results can be obtained. This is done on the dry prints and only those that have been printed on matt surface paper should be used, as this surface gives a much better 'pastel' effect, and takes the crayon more uniformly. To make the colouring more



The type of print needed for successful tinting

brush with the finest point. The same treatment is applied to the flowering shrubs and any flowers that can be seen in the garden. Small details that require bringing out are best treated with the stronger solutions.

If for any reason you should overdo the colour on any part of the print, it can be lightened by the application of the brush and clean water until the tone required is reached. Should you feel that you could make a better job of the tinting if you did it a second time, then it is easy to remove all or most of the colour by allowing the print to remain in a bath of water for a time. The colours are prepared from aniline dyes and are soluble in water. They are not 'fast' for all time, but will stand for a number of years provided prints are not exposed to strong daylight or direct sunlight.

## Sepia-Toning

Sepia-toned prints offer, in some subjects, a better medium than the ordinary black and white, and the practice of sepia toning will be dealt with in another article, when the subject of bromide printing and enlarging is fully explained.

or less permanent, the finished print is held for a few seconds in the steam from a kettle. Unfortunately, the best pastels are those which are inclined to break very readily, and some workers use the pastel in powder form, applying it with a stump instead of using the crayon on the print.

One final hint. If you do not wish to risk one of your photographic prints on your first attempt at tinting, remember that you can always experiment on a magazine illustration. These usually take the tints well enough to help you in the beginner's stage. (J.J.C.)

The photographic articles appearing in these pages each month are written by an acknowledged expert—an expert whose one desire is to see amateurs make the best of their hobby. If you have any query on photographic matters, he will be pleased to help. Letters should be sent in the first instance to the Editor.

SOME readers appear to wish to build an ultra-short wave receiver, and one of straightforward type is described here. Ultra-short waves are generally considered to be those below 10 metres, but the receiver can be used on higher wavelengths by employing coils with more turns, as will be explained. This increases its utility, especially as many short wave stations are found between 13 and 50 metres, and these can be tuned in.

#### Results

A word should be said about the results obtainable on these low wavelengths. The usual short wave stations will be heard best in the 19, 25, 31, 41 and 49 metre bands. Between these bands little will be heard except occasional Morse transmitters. Wavelengths below 19 metres are somewhat erratic, since conditions affect preparation of radio waves. The set will tune below 5 metres, and the television sound broadcasts will be audible in many areas; loudspeaker reception of these is possible up to 40 miles or so, with this set, under average conditions.

Amateur transmitters will be heard occasionally in the 5 and 10 metre bands. (These also operate in the 20 and 40 metre bands). Between these little will be heard, since few stations transmit here. On these bands, however, long-distance results are possible; on the short wave bands mentioned the set is quite capable of world-wide reception, if properly handled. Usually, U.S.A. and European stations will be

Low-loss construction is essential in the detector stage. Tuning and reaction condensers are low-loss, air-spaced short wave types, mounted on brackets. This method of mounting is necessary for several reasons. It avoids hand-capacity, which can result in stations going out of tune when the hands are removed from the controls. In addition, the spindle of the reaction condenser is not earthed, and consequently must not touch the metal panel. Wiring between coil, detector, and condensers is also very short. This is important. With very small coils only a few inches of wire may be required to wind them. If connecting leads are almost as long as the wire in the coils themselves, the latter cannot function.

A .00005mfd. (50pF) pre-set condenser is added in the aerial circuit. A small mica .0001mfd. grid condenser is used, with 3 megohm leak. The H.F. choke should be a good one, or wound to reliable data. The long and medium wave type of choke is not suitable—a short wave, or ultra-short wave, type is necessary.

#### Low-Loss Holders

The coil holder and detector valveholder should be of low-loss material, for preference (e.g.—ceramic). If not, results will be less satisfactory below 10 metres, though S.W. results will be little impaired.

The tuning condenser is driven through a length of  $\frac{1}{16}$  in. diameter rod, coupled with a shaft coupler. The reaction condenser is similarly treated,

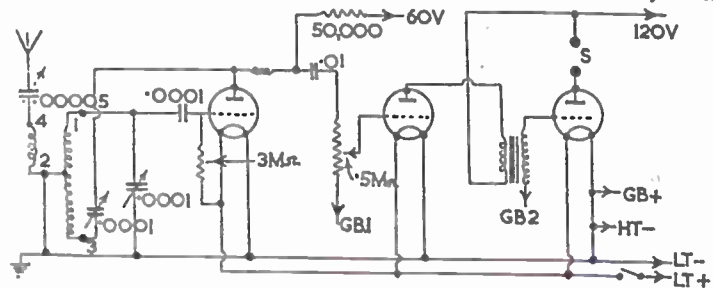


Fig. 1—The theoretical circuit of the receiver

heard at excellent volume. Stations much more distant will be well within range, and many devote periods to transmissions in English.

#### Circuit and Components

The two L.F. amplifying stages are of standard type, employing components such as used in any receiver. A low-frequency volume control is fitted, to keep volume down when using headphones. The value of this is not critical—25 to 1 megohm can be used, if to hand. The transformer can be of any ratio between about 1:3 and 1:5 step-up.

but an insulated shaft coupler must be used. A good quality reduction drive is essential, because tuning is so sharp that otherwise it will be almost impossible to operate the set.

#### Coil Details

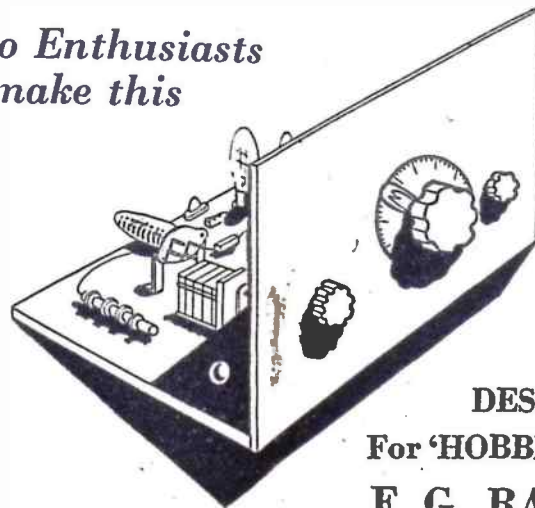
The coils are shown in Fig. 2. The smallest coils are self-supporting; the larger ones are wound upon tubes in the usual way. The bases of scrapped valves are suitable. If no such valves are to hand, some local radio shops may have them, since they are occasionally obtained from receivers, and of no value

for normal use. If not, then the plug-in coil bases available from suppliers of such equipment can be used. Ebonite tube is available in all sizes, and several 2in. lengths of this can be fitted to the valve bases, for the larger coils.

Using formers about  $\frac{1}{16}$  in. in diameter, the larger coils are wound as follows:—

8 to 15 metres. Aerial winding,

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between prongs 4 and 2, 2 turns of 26 S.W.G. insulated wire. Grid winding, between prongs 1 and 2, 3  $\frac{1}{2}$  turns of 20 S.W.G. wire spaced over  $\frac{1}{16}$  in. Reaction winding, between prongs 2 and 3, 3 turns.

15 to 30 metres. Aerial winding, 4 turns of 26 S.W.G. Grid winding, 6  $\frac{1}{2}$  turns of 20 S.W.G. covering 1in. space. Reaction, 4  $\frac{1}{2}$  turns.

30 to 50 metres. Aerial winding, 7 turns 26 S.W.G. Grid winding, 15 turns of 20 S.W.G. covering  $\frac{1}{16}$  in. space. Reaction, 9 turns.

A space of about  $\frac{1}{16}$  in. is left between Aerial and Grid windings in each case, as shown. The reaction windings are really a continuation of the grid windings, as illustrated, a tapping going to prong 2. Bare wire may be used where the turns are spaced. The S.W.G. is not critical—16 to 24 S.W.G. can be used, with 32 to 24 S.W.G. for aerial windings.

The small coils are made by taking a length of 16 S.W.G. or similar tinned copper wire and pulling it straight. An object  $\frac{1}{16}$  in. in diameter is taken and five

turns wound on, side by side. The winding is then removed, and pulled out so that the turns are about  $\frac{1}{16}$  in. apart. A lead is soldered on the centre turn (see Fig. 2). The aerial winding is 1 turn, also self supporting. This coil tunes from roughly 3 metres upwards, according to stray capacity, length of wires to detector and coil-holder, etc. The next coil is similarly made,

may be of any reasonable length. The detector valveholder is mounted vertically on two brackets to shorten wiring. An underneath view of the holder is also given to make connections clear.

If a volume control without switch is to hand, a separate switch can be added in the L.T. positive lead. The actual position of tags or terminals on L.F. transformers differ, and the markings on the actual transformer used should be followed.

A wooden base 7ins. by 11ins. is suitable. An aluminium or other metal panel is preferable, though wood can be used. No polarity need be observed when connecting moving-coil speakers (which must have the usual matching transformer), but the polarity indicated should be adhered to when using phones.

#### Operational Notes

A valve in good condition is essential in the detector position, or results will be poor on very short wavelengths. The

gentle hiss should begin at one point, indicating that the detector is oscillating. The detector should be maintained in this state by operating the reaction control, when tuning. If this is not done, only powerful, local stations will be heard.

Tuning is very sharp, and it is recommended that the set be tried out at first on the higher wavelengths (25 to 50 metres) where tuning will be much easier. When properly adjusted, smooth operation should be obtained over wavelengths from 5 metres upwards.

#### Best Aerial

A short outdoor aerial, well clear of walls and well insulated, is the simplest type which will give good results. For U.S. wave use the length of wire should not exceed about 10ft. or so. For general S.W. reception, almost any average aerial will work well.

Both tuning and reaction controls must be operated very carefully on wavelengths below 15 metres or so,

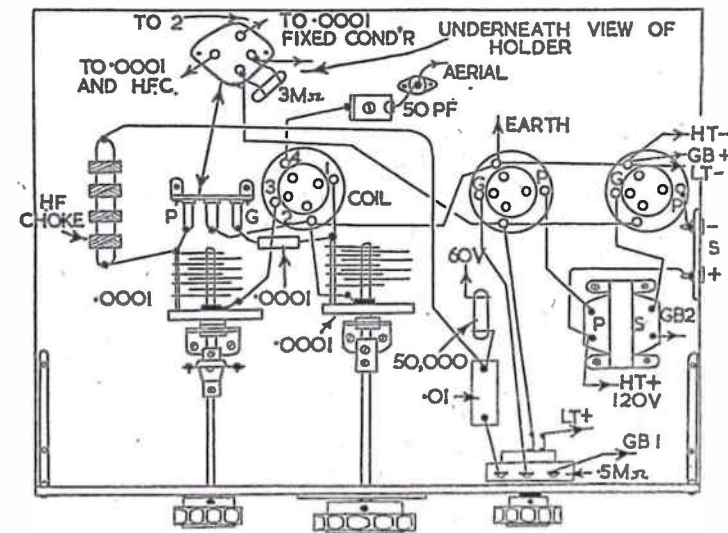


Fig. 3—The complete wiring plan

consisting of 8 turns, centre tapped, with 2 turns for aerial coupling. This will normally accommodate the 5 metre band. A further coil, consisting of 13 turns, with tapping 7 turns from prong 1 end, with 4 turns for aerial, completes those necessary.

#### Other Details

Construction and wiring is clear from Fig. 3. No special need exists for short leads in the L.F. and output stages, while battery and similar leads

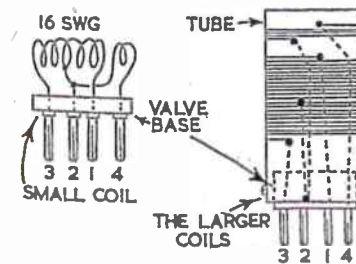


Fig. 2—Details of coil winding

Osram HL2/K is recommended, or the HL2. Any ordinary L.F. and output valves can be used in the amplifier stages, and the grid bias should be adjusted for best results. Normal values would be 3 to 6 V. for G.B.1 and 4.5 to 9 V. for G.B.2. The lead marked 'H.T. 60 V.' may require to be taken to a higher voltage, if the detector is in a poor condition, or the aerial pre-set is too far screwed down. The latter should be adjusted to help secure smooth reaction. Excessive voltage to the detector will cause violent reaction.

When closing the reaction condenser a

otherwise it is possible to tune straight through a powerful station without hearing it. With careful operation many scores of stations can be heard.

#### Where to Get Parts

Ceramic condensers, slow motion dials, plug-in coil formers, etc., may be obtained from Stratton & Co. Ltd., West Heath, Birmingham, 31, or from shops, etc. They can also supply extension spindles, condenser brackets, etc. All other components may be obtained from Coventry Radio, 189 Dunstable Rd., Luton, Beds. (F.G.R.)

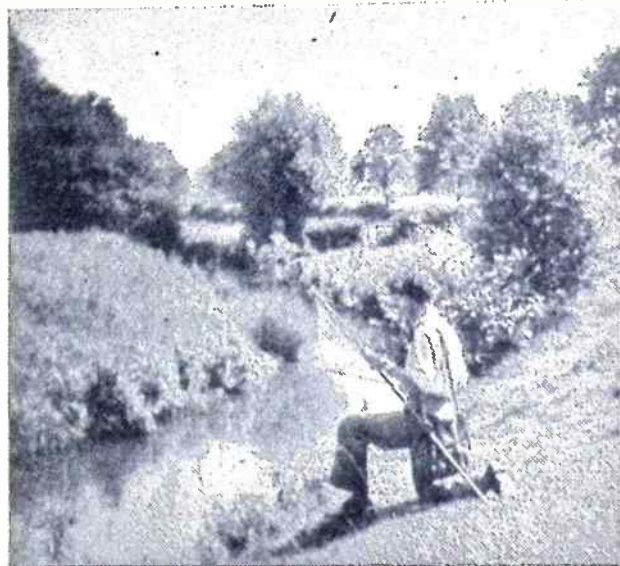
# Fish for Grayling this Autumn

**F**IRST of all, the grayling is looked upon as one of the game fishes. Look at this lovely fish and you will see that it carries an adipose fin, like the members of the salmon family. Unlike the trout, which spawns in winter, the grayling is a spring spawner, and the season for catching it is the same as that of the roach, dace, and other so-called 'coarse' fishes. Thus, the grayling is in its best condition for sport during autumn and winter.

### Pretty Fish

In appearance, it is a pretty fish, slender and symmetrical of form, and has a conspicuous dorsal fin in addition to the adipose fin. The prevailing hues of a well-grown adult fish are slate-blue, shading to black on the back, and the scales on its sides gleam like mother-of-pearl and silver. Viewed at certain angles in the water, the flanks seem to be shot with rainbow colours. The underparts, below the lateral lines, are white with silvery sheen. The head is small and the fish has a much smaller mouth than the trout.

The dorsal fin, as stated, is big and prominent; so big that the fish seems to have a difficulty in keeping it upright, and the fin shows a tendency to lap over when the fish is swaying in a strong current. Altogether a very beautiful fish,



Fishing a 'swim' for grayling on a warm Autumn afternoon

and well worth catching. It attains weights up to 4lbs., though larger ones have been taken. Fish of 1lb. to 1lb. are, on the average, good sport, and give the angler many thrills ere the landing-net can be slipped beneath them.

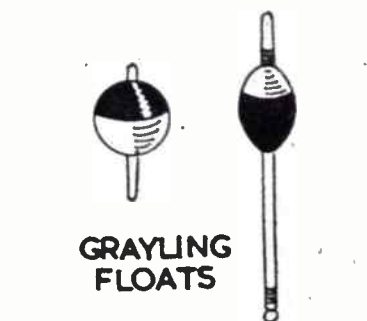
### Distribution

Grayling are not found in every river, but they are fairly well distributed in some parts of the country. Anglers living in Yorkshire are well catered for, grayling being abundant in the Swale, Yore, Costa, Wharfe, and many other streams. In Derbyshire the Derwent and Dove and certain tributaries hold good stocks of these fish. The principal south country rivers for grayling include Avon (Hamps.), Kennet, Test, Itchen, Nadder, Wylde; and in the West country there are grayling in certain stretches of the Exe.

In Herefordshire the Wye at Hereford and Ross; the Lugg, Arrow, and Pinsley Brook; and in Worcestershire the river Temc at Tenbury and Ludlow are good waters. Some parts of the Severn contain grayling, and portions of the Dee in North Wales are well stocked. In the North country the river Till in Northumberland, the Tweed, Teviot, Clyde, and the Isla afford grayling fishers with sport.

### Habits

Grayling go about in small shoals. They prefer waters like the trout-streams and will not stand for rivers that are polluted. Although feeding a lot on surface flies, these fish depend



upon bottom food principally, and have a tendency to keep well down towards the bed of the stream, searching for scraps of food that drift along the pebbly bottom.

As these fish consort in small companies it is only to be expected that where you catch one, there you may catch others, provided you do not

disturb the 'swim'. Though liking to cruise to and fro in small schools, grayling are not so gregarious as roach and the like.

Grayling prefer shallows, runs under banks, tails of pools, long smooth glides, edges of currents, and 'swims' 3ft. to 4ft. deep, with gravel or sandy bottom.

These fish are easier to approach than trout, but all the same the wise angler gives them no opportunity of suspecting his presence; not if he can avoid it.

### Methods of Fishing

There are two popular methods of fishing for grayling. One is with the fly-rod, for they rise well to artificial lures such as Red tag, Autumn dun, Apple Green dun, Wickham's Fancy, Orange bumble, Steel Blue bumble, Claret bumble, etc., during autumn. You fish in the same manner as for trout, and the same equipment does very well.

However, the beginner will, perhaps, do better if he relies upon float tackle. Any light cane rod with an easy-running reel, complete with 40yds. or so of plaited silk line or Nylon, will serve nicely. The rod may be anything from 10ft. to 14ft. in length according to the size of river you fish, but see that it is lightweight and nicely balanced, so that it is easily handled. The top should not be too whippy, but on the stiff side.

You will need a cast of 2yds., or 1yd.

will do if you need to economise. Nylon or other synthetic gut is better than the silk worm gut—at least the author finds it so, and always uses it nowadays. To this cast attach a No. 14 'crystal' hook. These hooks are generally tied on to short lengths of nylon or other gut about 10ins. long, on slightly finer gut than the cast itself, which should be of 3x size. A suitable float, either a small porcupine quill, a quill and cork, or a small round cork, and a split shot or two completes the outfit.

The float should be adjusted on the line so that the baited hook swims along just clear of the bottom of the stream. Always fish out the 'swim' you have selected to try, right from the top to the 'tail' of the run, as far as you conveniently can. A good hand at the game will, perhaps, 'trot' the bait downstream for 30yds. or more.

Watch the tip of the float carefully, for a mere touch may denote a bite. Often, with no preliminary warning, the quill dives under, quick as lightning. Strike instantly. When a fish is hooked, work it clear of the spot as soon as possible to avoid any disturbance of the water where other fish may be cruising around. If you fail to register further bites at that 'swim' during the next ten or fifteen minutes or so, it may justify you in moving to another likely spot. Explore all likely-looking runs and glides under banks and pay attention to quiet deeps of slack water close inshore,

or quiet water alongside a streamy current. Fish from the bank if the river is running fast, as wading might be risky unless you know the formation of that particular stream's bed very well.

### Baits

For autumn grayling fishing the beginner is advised to fish with maggot or worm.

When using maggot it is advisable to scatter a handful in the 'swim' you are fishing from time to time—throwing the larval titbits up and across into the head of the run, so that the current will carry the food down into the spot you are fishing. If you can get the fish interested in your offerings, and keep them so, then you may catch quite a few of them before they suspect that something is wrong and drift away from the danger spot.

Maggot is as good as anything you can find for grayling, though the red worm is not bad, especially when the stream is coloured after rain.

Be sure to take a landing-net along, for, although a grayling may lack the wild dash of a hooked trout, it can battle stoutly in a disconcerting manner, rolling, diving, tumbling, and generally performing tactics which keep the angler 'on edge' until the net is successfully brought into action. Grayling, by the way, may be fished for right through the winter. (A.S.)

## WORKSHOP HINTS AND NOTES (17)

# Etching on Tools

**A** NAME neatly etched on tools adds a distinctive personal touch, and shows pride of possession, and can be done in cases where the use of letter punches is ruled out by the temper of the tool to be treated. For example, it is not easy to punch letters in a hard chisel blade.

### Simple Theory

The theory of etching is very simple. You coat the metal with wax and then scratch through this wax with a scriber. Acid is applied. Where the metal is protected by the wax the acid cannot act, but where the metal is exposed (by the scratched lines) the acid 'bites' and so etches the initials, etc., desired.

But first, before practical details, a word of warning. Acids are dangerous things to trifle with. If slopped about they will make nasty burns in the skin, clothing, lino, etc. There is no need to have accidents, but always be prepared. Have plenty of water handy to slop over any spilled acid. If it gets on your hands, apply olive oil after washing. If

it gets on the lino, etc., scatter whiting over it.

And another hint. Metal to be etched must be perfectly clean. A very thin film of oil or grease on it, even from a finger-point may prevent the acid biting. Clean the tools with fine emery and then apply a paste made with whiting and dilute household ammonia. Wipe off with a clean rag and water and do not touch with the fingers again.

### Dealing with Quantities

If you have a lot of tools to treat, by far the best wax to use is an 'etching ball' (dark) obtainable—perhaps to order—from an art-supplies shop. Paraffin wax (from candles) will serve for simple initials, however, but will tend to crack if small lettering or fancy designs are attempted. With an etching ball, anything may be done. Whichever wax is used, the metal is warmed slightly and the wax applied and dabbed with a pad of rag until there is a thin layer all over. The initials are then scratched with a needle or an engineer's

scriber ground to a fine point. Asphaltum varnish (sometimes sold as 'stove pipe enamel') can also be used as a 'ground'. The ground should extend over a fairly wide area. It is not a bad idea to dam the working area with a small wall of putty.

### Acid to Use

For acid use one part of nitric acid added to one part of hydrochloric acid (a chemist will make this up and let you have a glass-stoppered bottle). Apply this with a small feather to the exposed metal. Keep 'tickling' it with the feather to brush away the bubbles that rise. About ten minutes etching will be about enough but it is impossible to give exact times since a lot depends on the strength of the acid, type of steel, the room temperature, and other factors.

Another etch can be made of four parts of glacial acetic acid and one part of alcohol to which one part of nitric acid is slowly added.

Afterwards wash well, melt off most of the wax and clean off the rest with paraffin oil, etc. (325)

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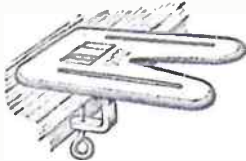
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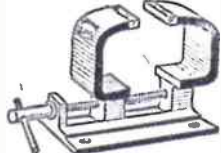
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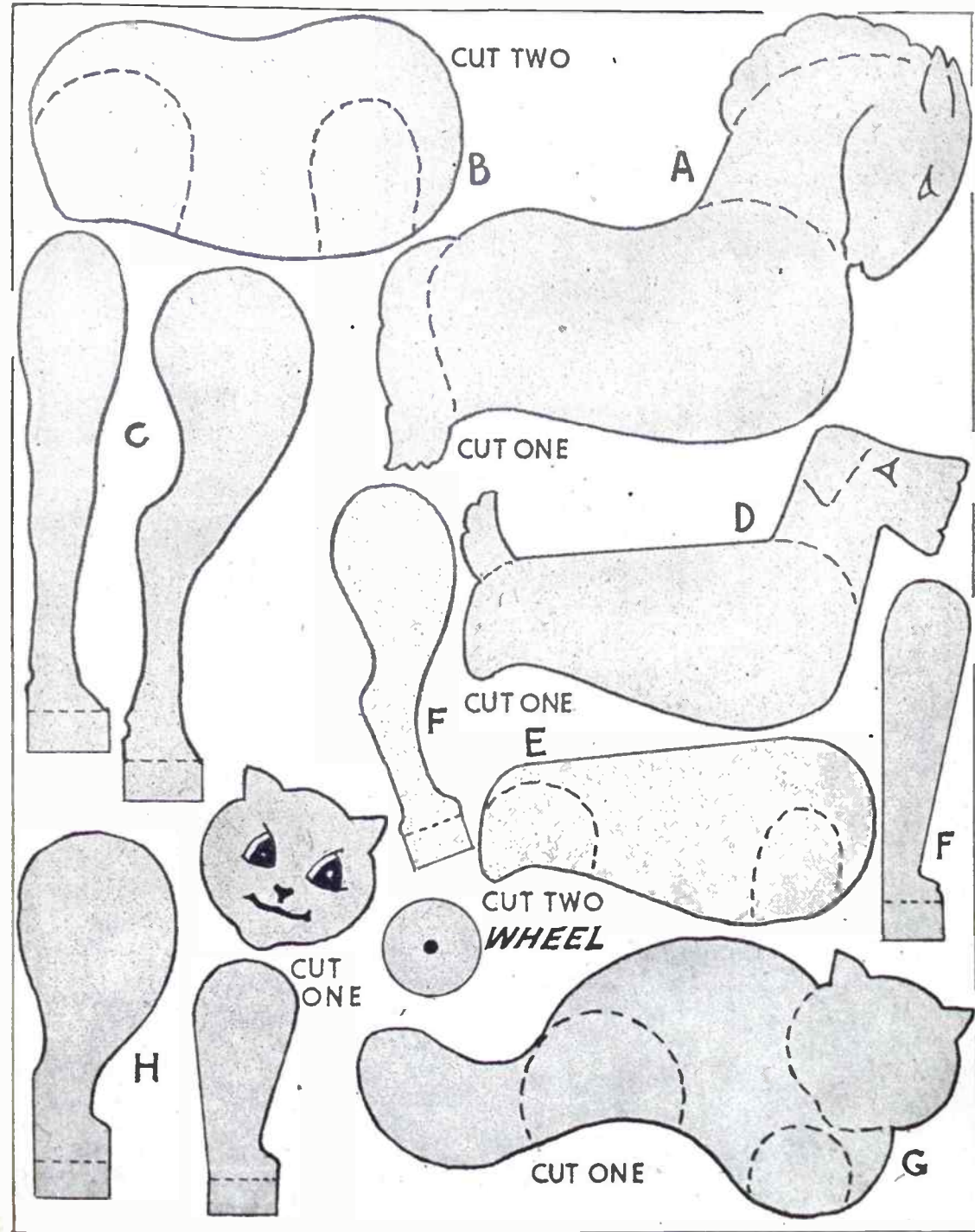
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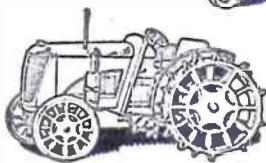
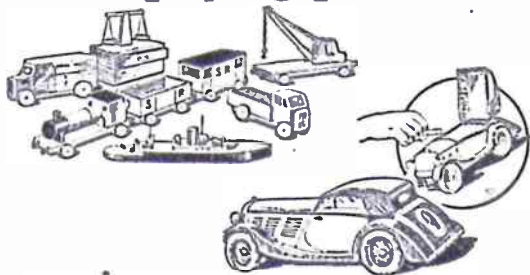


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