

No.
719.

1st

Hobbies

VOL XXVIII.
No. 719. JULY 24, 1909.

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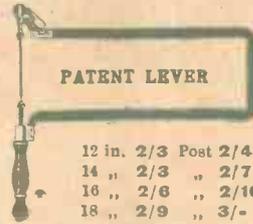
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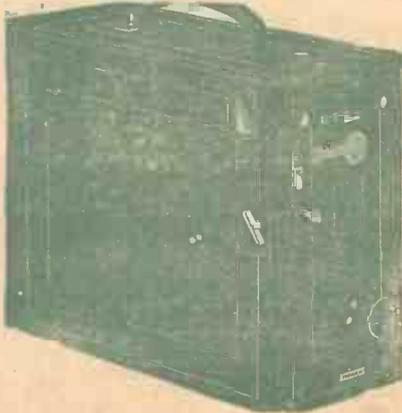
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VOL. XXVIII. No. 719.

JULY 24, 1909.

WEEKLY PRESENTATION DESIGN.

THIS bracket, descriptive of the four seasons, is intended to be cut in one piece of wood, but in the event of workers desiring to utilise some wood of smaller size, they can easily arrange for two wide dove-tail joints, level with the centre shelf, and placed behind the two panels, for Summer and Autumn.

There is plenty of work for the saw here, even for the most industrious worker: but before commencing upon the cutting of the decoration, the careful fretworker would be well-advised to first cut all the shelves and their supports, and after checking their position and cutting the mortise slots in the back of the bracket, fit them together. When taking the shelves out of the slots again, mark each tenon to correspond with a like mark at the mortise slot.

The style of decoration adopted to surround each panel is typical of a particular season. The panel of Spring is surrounded with a suggestion of snowdrops and primroses, the Summer is decorated with the grape and leaf of the vine, the Autumn with wheat, and the Winter with holly and mistletoe.

There are two main stems, or bands, commencing above the letter R in Summer, and above the A in Autumn, and these stems, being

THE "SEASONS" WALL BRACKET.

prominent, the cutting of same must be watched with considerable care, for the saw-blade must not be allowed to deviate from the line, or the stems will have a very bad appearance, spoiling the look of the whole bracket.

There are to be four overlays, cut in 1-16in. white holly. These are the four names of the seasons—Spring, Summer, Autumn and Winter. The holly will be fixed to a piece of waste wood for support while cutting, and will finally be glued into position.

An Opportunity for Inlaying
An excellent opportunity is provided for inlayers to cut the names of the seasons slightly on a bevel in 3-16in. wood, and inlay it into the myrtle, of which the main part of the bracket should be made. Even those workers who are new at inlay work would have sufficient knowledge to execute the modification here suggested. Beginners should read the articles which have recently been appearing in **HOBBIES** on Inlay Work.



The bracket will need a good sandpapering down, and in this connection let us remind our readers of the excellent expedient for safeguarding large work when sandpapering, viz., to replace the parts cut from the interior of the bracket, and then apply the sandpapering block. The myrtle should be polished.

FRETWOOD, &c., FOR THIS WEEK'S DESIGN. No. 719.

FRETWOOD.—For this design we can supply a parcel of $\frac{3}{8}$ in. thick MYRTLE, with $\frac{1}{4}$ in. thick HOLLY for letters. Price 1s. 4d., post free 1s. 8d.

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Hobbies PRESENTATION DESIGN No. 719 (JULY 24, 1909.)

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The Seasons Bracket.

[NOTE.—The small arrow \rightarrow marks the direction of grain of wood.]

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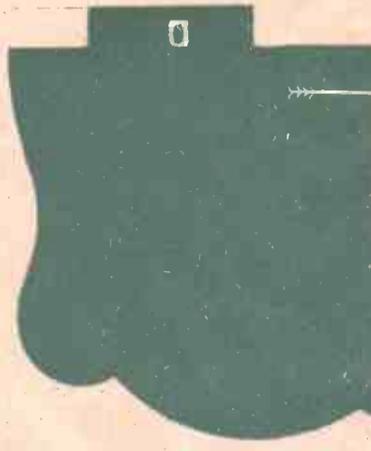
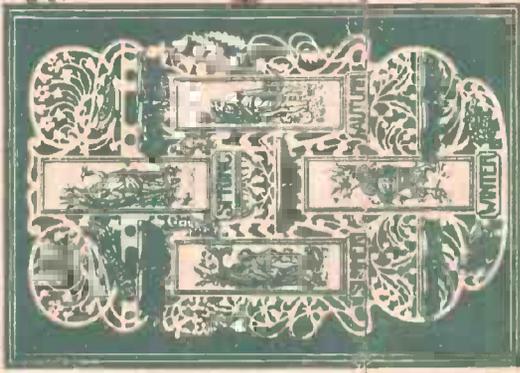
CELLULOID PANEL
No. 6123.
"SPRING."

NOTE.—The four Birds are shown by dotted lines, and should be pinned on to the wood after the fret has been cut, position being marked before cutting.

A
SPRING

Letters here—A.

CELLULOID PANEL
No. 6123.
"SUMMER."

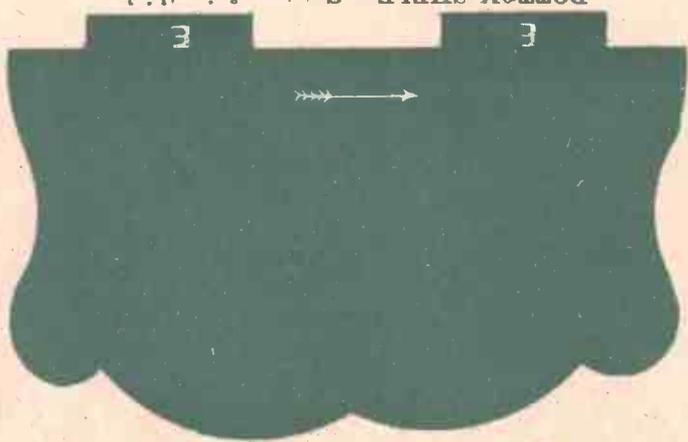
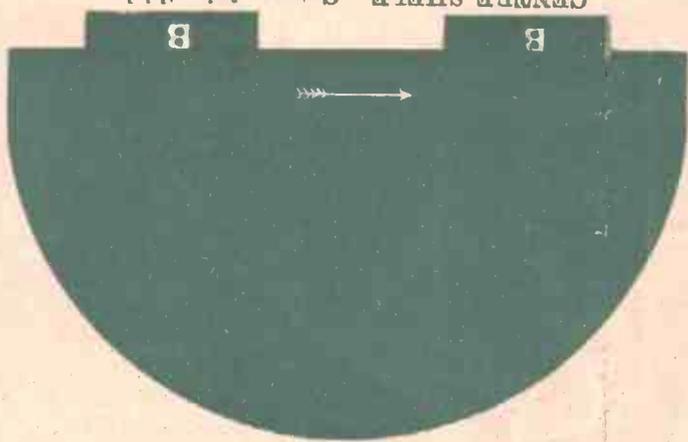


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TOP SHELF.

CENTRE SHELF.—Cut one 1/8 in. thick.

BOTTOM SHELF.—Cut two 1/8 in. thick.



Out one 1/8 in. thick.



AUTUMN

CELLULOID PANEL No. 6123.
"AUTUMN."

Letters here—C.

WINTER

Letters here—D.

CELLULOID PANEL
No. 6123.
"WINTER."

MAIN PANEL to be cut out
of 1/8 in. thick Myrtle.

The OVERLAYS under the
Celluloid Panels:

- "Spring."
 - "Summer."
 - "Autumn."
 - "Winter."
- are to be cut out of 1/8 in.
HOLLY.

SUMMER

Letters here—B.

NOTE.—The two Holly
Sprays shown by dotted
lines are pinned after the
fret is out, position being
marked before cutting.

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THIS week I am giving designs and constructional details for a Smoker's Cabinet. The whole of the work is clearly shown in the various illustrations, which together with the descriptions I shall give, should clear up all difficulties.

The cabinet is a box-like structure having a door covering the whole of the front. The inside is divided into two main parts, the lower one being the smaller and containing only a drawer. The upper one is further subdivided into compartments. These are best arranged as shown, but workers can easily make any alterations they prefer. If finished as shown here, it will hold a cigar box, cigarette box, nine pipes, and a tobacco jar, as well as the various articles such as pipe cleaners and match boxes which will be put in the drawer.

The inlays will be cut 1-16th in. veneers and glued in place in the usual way.

Construction of the Cabinet.

Since the case itself is the most important part I will describe that first and leave the inlays till later. The wood used throughout should be satin walnut.

The base is 12 in. by 9 in. and $\frac{1}{2}$ in. thick. The corners must be carefully tested with the try square and made truly right angled. The top edges of the front and sides of the base may then be chamfered, making the chamfered surface about $\frac{1}{4}$ in. wide. Lines should be drawn at right angles across this board $\frac{3}{4}$ in. from each end, being the places where the inside edges of the sides will come.

The two sides are next taken in hand. They are cut from $\frac{1}{4}$ in. stuff and are 12 in. by 8 $\frac{1}{2}$ in. in size. V-shaped grooves will have to be cut at right angles across these sides at the following places, measuring in each case from the top end, namely at 3 in., 5 in. and 9 in., which will divide the boards into spaces 3 in., 2 in., 4 in. and 3 in. wide, but in the left hand one the middle groove should be 5 $\frac{1}{2}$ in. down. In to these grooves, which should be $\frac{1}{2}$ in. deep the various shelves will fit. The shelves are 3-16 in. thick and the ends should be chamfered to a V-shape, which will fit right into the grooves in the sides of the case. The lowest shelf should be $\frac{1}{4}$ in. thick as it has to sustain more weight than the others.

The Shelves.

The two longest shelves are each 10 $\frac{3}{4}$ in. by 8 $\frac{1}{2}$ in. On one side of each, and exactly across the centre, V-shaped grooves should be cut to take the upright partition. This partition is 6 $\frac{1}{2}$ in. long and 8 $\frac{1}{4}$ in. wide. It should be

= IX.—AN INLAID = marked for grooving 2 $\frac{1}{4}$ in. from the top end on the side on which the shelf is placed, and 2 in. from the top to take the pipe rack. The left hand side will support a shelf cut to fit exactly and the right hand side a pipe rack shaped as shown in Fig. 1.

The back is 12 in. by 11 in. by $\frac{1}{4}$ in., and the top is 11 $\frac{1}{2}$ in. by 9 in. by $\frac{1}{4}$ in. The drawer front and back are each 10 $\frac{1}{2}$ in. long and cut of sufficient width to just slide easily into their places.

The drawer sides are each 7 in. by 2 in. by $\frac{1}{4}$ in., and the bottom is 10 $\frac{1}{2}$ in. by 7 in. by $\frac{1}{4}$ in. The various pieces of the drawer may either be glued together or screwed according to the skill of the worker. If he can use glue in a workmanlike manner it is much more to be preferred than screwing in a small article of this size. The inside of the drawer is improved by lining with black velvet, and a pad of cotton wool under the velvet that covers the bottom will also be an improvement. Small turned knobs should be fitted, and it will be found that if the drawer is pushed well home the inside of the door will not touch the knobs.

The Door.

The door is 11 in. by 12 in. by $\frac{1}{4}$ in., and it will be held in place by hinges, and further fastened by means of a catch as shown in Fig. 2.

The fitting up should be left until the inlays have been cut and glued in place.

The inlay for the door is shown on next page. Seven boards one-sixteenth of an inch thick will be required. The woods that are to be preferred are the following:—

Background, satin walnut; "church-warden" pipes, white holly; mouthpieces of same, padouk; briar pipes, mahogany; ash tray and cigar ash, silverwood; cigar, dark walnut; smoke, tinted holly.

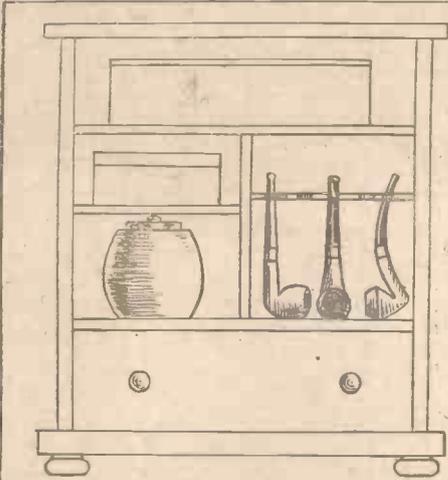
Silverwood is a new variety recently introduced by Messrs. Hobbies.

The mouthpiece part of the briar pipes should when cut, be stained a deep black colour, but if the worker prefers he can cut these of black xylonite. The mouthpiece, in padouk, of the "Churchwarden" pipes represents the part that is usually coloured red in the real article.

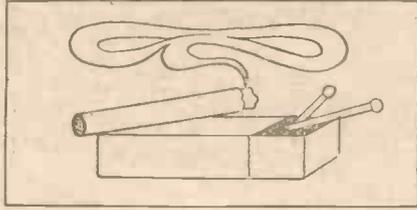
The sides are cut in three varieties of wood. Satin walnut for the background, dark walnut for the cigar, and padouk for the band.

The design for the top should be cut natural size. It represents a match box, slightly open, from which two matches are projecting, and a cigarette resting on the top of the box.

INLAYED SMOKER'S CABINET



FRONT VIEW WITHOUT DOOR



TOP INLAY

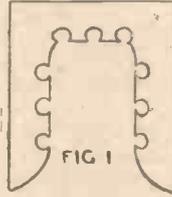


FIG 1

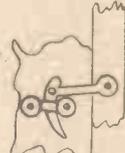
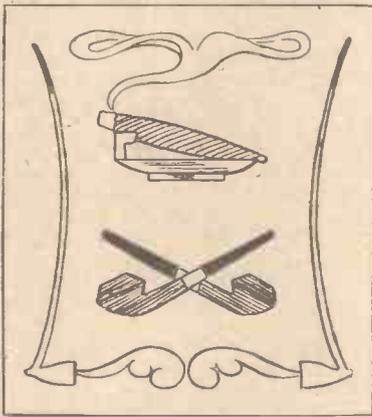
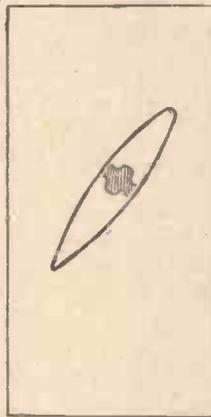


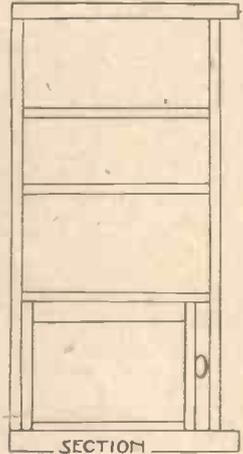
FIG 2



DOOR INLAY



SIDE INLAY



SECTION

The sides of the matchbox are of dark walnut, and the top is of canary wood. The cigarette and matches are white holly, the match heads of dark walnut, and the cigarette ash of silverwood. The smoke will again be of tinted holly, and the part of the inside box that projects may be of cedar or any other wood that will show a contrast.

When these inlays have all been cut, they should be accurately glued in place and put under a heavy weight to dry.

The various pieces should next be polished and the fitting together proceeded with. The sides are first screwed to the base from below, so that there is a space of $10\frac{1}{2}$ in. between

the inside faces, and so that they reach to $\frac{1}{4}$ in. from the back edge of the base. The back is next screwed on to the sides, and then the top is fixed in place, so that the back edge is flush with the back of the cabinet, and so that it projects evenly over the sides. It may be either glued or screwed into place, if screwed, round-headed brass screws should be used, and placed in carefully and evenly.

The various partitions are now slipped into place as shown in the general view and the front is hinged in place and the fastenings are put on.

The case can, if preferred, be supported on four turned toes as shown.

FORTHCOMING SCIENTIFIC EXHIBITION.— Another Scientific Exhibition, on similar lines to that which proved successful in 1907, is to be held in the Royal Horticultural Hall, Westminster, S.W., in October next. The exhibits will include engineering models, electrical and scientific apparatus, lathes and light workshop appliances, model aeroplanes, and technical education equipment. A number of firms have already taken space and a very

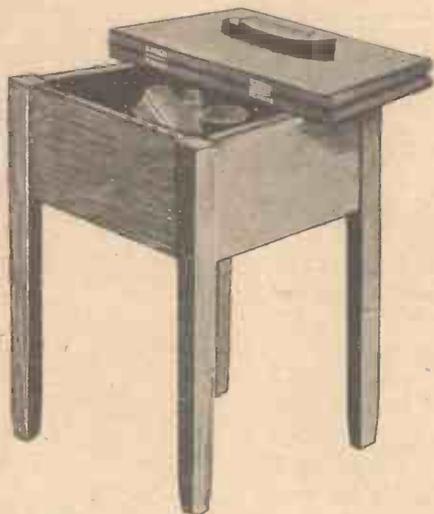
interesting display is assured. An attractive feature will be the exhibits in the competitions for model and scientific apparatus making, several events for both amateur and professional workers having been arranged, for which valuable prizes are being offered. Full particulars may be obtained from the organisers, Messrs. Percival Marshall & Co., 26-29, Poppins Court, Fleet Street, London, E.C.

BOOT-POLISHING TABLE.

A SUBSTANTIAL piece of kitchen furniture which may be used as a small table as well as a blacking case, in which there is a receptacle for brushes, and blacking, and a shoe rest, is shown in the illustration. The wood required consists of the following pieces:—

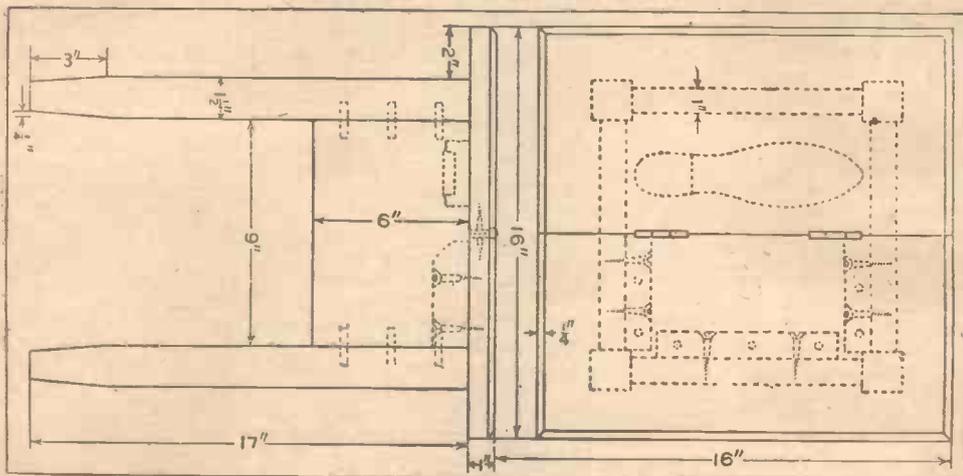
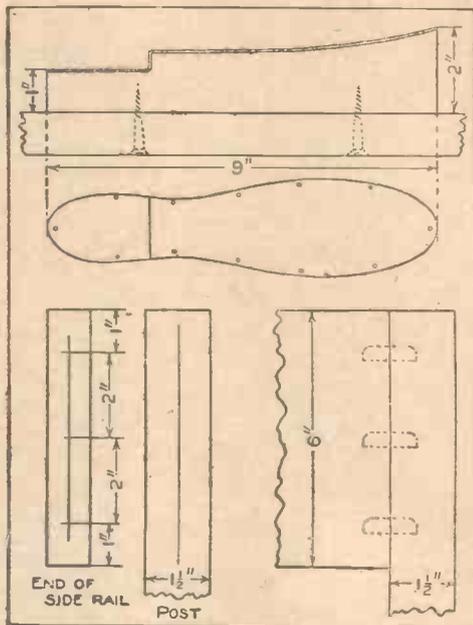
UNIQUE PIECE OF FURNITURE. will simplify the work to a great extent.

Square up the four side rails to 6 by 9in. Cut one end of each post tapering with a chisel; face and sandpaper the posts and side rails before making the joints. The side rails are attached to the posts with three dowels to each joint. The place for each dowel is located by making a line exactly in the middle lengthwise on each end of each side rail. Three lines are made to intersect this middle line, as shown in the detail drawing. Drive a $\frac{3}{16}$ in. brad in each intersection, allowing a small portion of each brad to project, and cut off the heads. Gauge a line in the middle of each post at the top where the joints are



- 4 posts, $1\frac{1}{2}$ by $1\frac{1}{2}$ by 17in.
- 4 side rails, 1 by $6\frac{1}{2}$ by $9\frac{1}{2}$ in.
- 2 top pieces, 1 by $8\frac{1}{4}$ by $16\frac{1}{2}$ in.
- 1 bottom, $\frac{1}{4}$ by $9\frac{1}{2}$ by $9\frac{1}{2}$ in.
- 1 cleat, 1 by 1 by 18in.

The posts and cleat are surfaced on four sides, while the other pieces are surfaced on only two sides. The allowance of $\frac{1}{8}$ in. on the side rails, top and bottom, is for fitting the joints. Be sure the surfaces of the pieces for the posts are square and the ends sawed square off, making the posts exactly the same length when they come from the mill. This



to be made and press the end of a side rail containing the brads against the post. This will mark the places to bore holes for the dowels. Pull out the brads and bore holes for the dowel pins.

When gluing up the side rails and posts, first put on a coat of glue on the ends of the side rails and let it dry. This will fill up the pores in the end grain of the wood which will make a strong joint when finally glued together. The dowel pins are made $\frac{3}{16}$ in. square with a slight taper at the ends. These can be easily forced into the holes, when the ends of the side rails are coated with glue and ready to be put together, by clamps pressing on the outside of the posts.

The bottom is held in position with narrow strips tacked on the lower edge of the side rails. Square up the top pieces to 8 by 16 in. and fasten one piece to the top with cleats and screws as shown in the drawing. The other piece is hinged to the first one with two 2 in. hinges.

The shoe rest can be made from a block of wood and covered with sheet tin, copper or brass, or a cast-iron rest can be purchased. The rest is fastened to the under side of the hinged top. Stain the wood any dark colour and apply a very thin coat of shellac. Put on wax and you will have a finish that can be renewed at any time by wiping with a little turpentine and rewaxing.—*Pop. Mech.*

HOBBIES - WEEKLY - PROBLEMS.

The prize for Problem No. 2 has been awarded to E. H. LIGHT, of Clevedon, whose reply was:—

"Put it down at eleven brother Johnathan and we will alter our watches as we go along."

Of the replies sent in only a very few were correct, most competitors thinking that only five trains would be passed on the journey.

Solution to Problem No. 2.

THE Yankee's question is easily answered if only the facts are carefully weighed.

Every day at the same hour, a train leaves New York for San Francisco,

and *vice-versa*; the journey occupies six days. You will notice we have only to deal with trains actually clear of the two towns, because the question was put *after* leaving New York, and referred to trains passed *before* entering San Francisco.

At the time we leave New York depot there is a train approaching 24 hours' journey away. This is met when we have been travelling 12 hours. Again, following this first train is a second, another day's journey behind, which obviously we pass at the end of a further 12 hours, so that during our first completed day's journey two trains going in the reverse direction have been passed. This experience is repeated each of the six days, or in other words, 12 trains are met in all. As, however, the twelfth train is only on the point of starting as we enter the San Francisco depot, the number actually passed before entering that city is 11.

CAN CARRY AN ARMY.—German army officers seem greatly perturbed over the possibilities of the "Lusitania" and her sister ship, the "Mauretania," as army transports. The two ships, they say, could transport an army of 20,000 men from England to

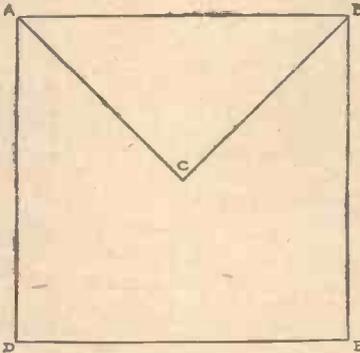
POSTAL ORDER FOR 2s. 6d. OFFERED WEEKLY.

The American's observation as to the difference between New

York and San Francisco time does not affect the result. Actually this difference is about $3\frac{1}{4}$ hours. Trains start by the clocks in one town and finish up by those of the other; this means that one way $3\frac{1}{4}$ hours has to be made up on the road, whilst in the other direction $3\frac{1}{4}$ hours longer may be taken so that the scheduled time is kept.

PROBLEM No. 4.

HERE is an old problem for readers to try their hands at:—



A farmer possesses a square plot of land. He wishes to retain for himself one-fourth as illustrated in diagram. The remainder he divides among his four sons, each of whom shares equally with plots of similar shape.

The prize of 2s. 6d. goes to the competitor who sends in the most neatly drawn, correct diagram, showing how he divided his land.

PROBLEM NO. 4.

REGULATIONS re PROBLEM No. 4.

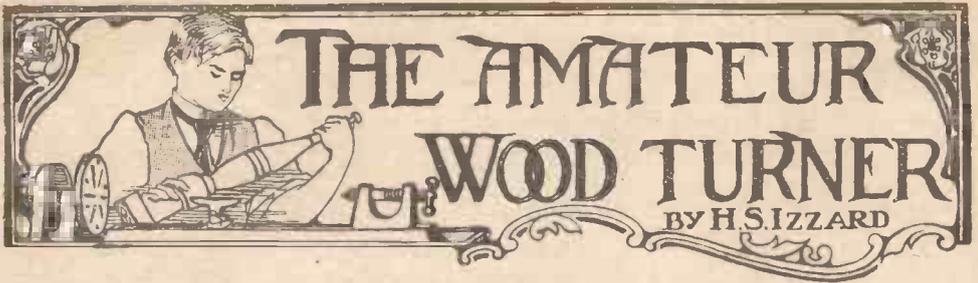
1.—The Competition is open to all readers, and the prize of 2s. 6d. will be awarded to the sender of most neatly drawn correct solution.

2.—Each attempt to be made on the back of a post-card. If solutions are enclosed in envelopes they will be disqualified.

3.—Write name and address neatly under the solution, and send it addressed "Problem No. 4" to the Editor, HOBBIES, 12, Paternoster Square, E.C., to reach on or before August 2nd.

Prize winner's name and solution will be published in HOBBIES of August 14th.

the continent in very short order, if the necessity should arise. The officers and crews are members of the British naval reserves, and the vessels could be turned over to the admiralty with but very little preparation.



THE AMATEUR WOOD TURNER

BY H. S. IZZARD

WHILST the screw chuck is without doubt one of the most useful chucks to the general wood-turner its capabilities are practically limited to comparatively short work, and face-turnery. Any long work, such as a deep box, would not be held firmly on the screw, and would have a tendency to chatter under the action of the turning tool, and if the wood were soft, as birch for instance, the probability is that the screw would draw altogether, seeing it would be run into the end grain. It is therefore necessary to employ some means of firmly gripping the wood by one end only, and for this purpose we employ the Bell Chuck (Fig. 1).



FIG. 1. BELL CHUCK.

This tool consists of a cast iron bell, $\frac{3}{4}$ in. diameter outside, $2\frac{3}{4}$ in. diameter inside, which is screw-threaded to fit on the mandrel. Through its side there runs either four or eight screws (Fig. 1). This chuck is supplied by Hobbies at 4s. 6d., with four screws; or 6s. with eight screws. The eight-screw chuck has an important advantage over the four screws, in that with it, it is possible to hold firmly work of any size or section, but with the four screws it is necessary that the material to be worked should either be wedged, or fit fairly well in the bell; otherwise, it would not be held securely. There is one danger in the bell chuck, viz., in the screws. It is necessary for these to be long, as it is often required to turn work of small diameter in it, in which case, the ends of the screws will not project far beyond the sides of the bell, but when large work is being executed these screws will project a long way, and should the worker's arm or hand come in contact with them when the lathe is working, he will not escape unhurt; in fact a broken finger may result of catching the hand between one of these screws and the T rest. As this chuck is indispensable to the turner, this danger may be overcome by having an extra set of screws, which should be cut down so that they measure $1\frac{1}{4}$ in. long. The short screws should be used for work of large, and the large screws for work of small, diameter. An extra set, cut to the size required, may be procured to order from Hobbies' Engineering Works, East Dereham.

Bell Chuck as Master Chuck.

Besides being used directly to hold wood to be turned, the Bell Chuck also serves as a

ASH, CASH OR PIN = BOWL.

very useful master chuck to hold odd wood chucks. In Fig. 2 we show it acting as a master for a hard wood cup chuck. A set of these wood cup chucks are an exceedingly useful addition to the turner's kit, and are simple to make, and very inexpensive.

As will be seen from the illustration (Fig. 2) it consists of a hard wood block, preferably *Lignum Vitæ*, turned to fit tightly in the bell chuck. The centre is bored with a twist drill, and the hole enlarged to the size required with a left hand, hard wood, side cutting tool. If possible the hole should be lined with a short piece of iron pipe, which should fit very tightly, and may be fixed with Seccotine. The iron pipe should not extend quite to the outer end of the opening, as if it did, it might come into contact with, and damage, some of the turner's gouges and chisels. These cup chucks are exceedingly useful for turning such articles as finials, drawer knobs, etc., the material being simply cut so that it can be driven firmly into the chuck, and turned as required.

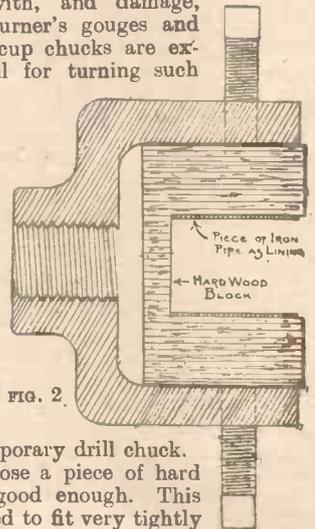
Bell Chuck as Temporary Drill Chuck.

Another use to which a bell chuck may be put is as a temporary drill chuck.

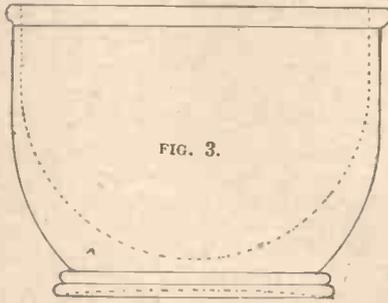
For this purpose a piece of hard beech will be good enough. This should be turned to fit very tightly into the bell, the centre should be bored exactly the size of the shank of the drill, which should be coated with Seccotine and driven in, or another method, and perhaps a better one, would be to do away with Seccotine and bore through the sides of the wood chuck to admit of the screws of the bell chuck meeting and gripping the drill firmly.

Cash or Pin Bowl.

As a first example of bell chuck work, let us take a plain wooden basin (Fig. 3), such as is used in cash tills to hold silver or gold, or by dressmakers to take pins. Although it looks an exceedingly simple article to make it will prove far more difficult to produce than the turner anticipates, unless he has had



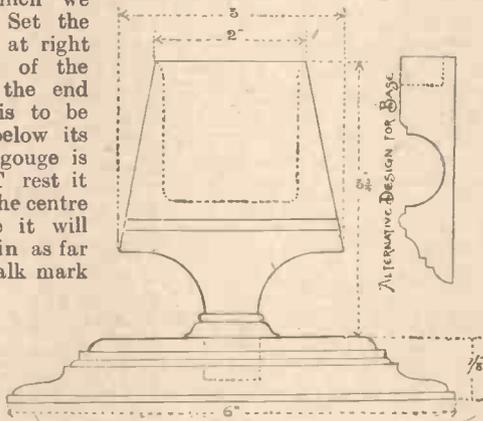
experience of deep hollowing. We give no size, as that may safely be left to the turner to suit his own convenience. The rough billet should be about 2½ in. longer than the bowl is intended to be, to allow of chucking. This 2½ in. should be turned so that it will just fit into the bell chuck, in which it should be firmly held by the screws. With gouge and chisel shape the wood to the outside of the bowl, but do not do any work with the parting tool as the wood will need all its strength to resist the action of the gouge when hollowing it out. When the outside is formed proceed with the hollowing out of the inside. This job, simple though it sounds, will prove rather difficult, and the worker will be surprised at the lack of control he has over his gouge, when he finds it kicking and tearing in every direction, but if the following instructions are carried out, it will be possible to do hollowing-out to a depth of about 3 in. with the gouge. Deeper hollows will require a special tool called



The fingers of the left hand are placed over the blade as near to the work as possible. The cut is taken from the centre to the outer edge of the bowl, the left hand drawing the gouge over towards the worker. When the hollow has been cut to a depth of about 1½ in. the gouge will begin to chatter. This must be overcome by turning the T rest, and getting one end as far into the hollow as possible. The thickness of the sides of the bowl should be tested occasionally by means of the outside callipers. The bottom of the hollow should be turned with the gouge lying on its back with its concave side uppermost.

Turned by this method the inside of the bowl will need scarcely any sandpapering. Sever the bowl from the remainder of the wood by means of the parting tool, slightly undercutting the base at the same time. Fig. 4 is a design suitable for a cigar ash receptacle or a match stand, and will look very well in either a very dark fancy wood, such as Cocas, or in a light wood, such as Olive, both of which can be procured from Short's timber yard, Old Street, E.C.

the hook tool, which we will explain later. Set the T rest so that it is at right angles to the bed of the lathe; parallel to the end of the bowl that is to be hollowed, and ¼ below its centre. If a ½ in. gouge is now held on the T rest it will be easy to find the centre of the work, where it will bore itself straight in as far as required. A chalk mark should be made on the gouge to show the correct depth. When this hole is bored, withdraw the gouge, and proceed with the hollowing. A sharp ¼ in. or ⅜ in. gouge will be the best tool to use, and this should be held on the T rest, with its hollow side uppermost, then turned half over on its left side. The handle should be as low as the bed of the lathe will allow, and should be held firmly with the right hand.



The material required will be: 1 piece, 3½ in. by 2½ in. by 6½ in., for bowl; 1 piece, 6½ in. by 6½ in. by ¾ in., for base. The cost will depend upon the wood used, but will not be great. The bowl will be turned in the bell chuck.

The hollow will be cut in the same way as the bowl (Fig. 3), but the bottom will need to be scraped true with the hardwood turning chisel, and the corners finished with the round nose tool. The base is simple in design, and will be turned on the screw chuck, an alternative design is also given (Fig. 4).

Both the base and upright should be highly polished, with French polish, before leaving their respective chucks.

ELECTRICITY FROM THE SKY FOR AIRSHIPS.

AMONG the possibilities of the future for aerial navigation, according to Hudson Maxim, the great inventor, will be the wireless electric sky road or zones of electric energy, leading from centre to centre of population and industry, along which flying machines will pass to and fro, drawing their power from an

electric system stretched along the earth, thus obviating the necessity of each individual flying machine developing its own energy. Each machine will carry an electric meter, and the consumer will pay for the energy used just as he now pays for the electric current which lights his residence.

CYCLING NOTES.



Lighting Up Time on July 24—8.58 p.m.

Hobbies "Helping Hand" Department will provide Cycling riders with Route Lists, &c., between any two points in the United Kingdom.

The 24 Hours Race.

THE twenty-four hours' amateur cycling Race, held at the Stadium by the National Cyclists' Union on Friday and Saturday, was won by J. H. Bishop, of the Beaumont Cycling Club, who beat the record by nearly thirty-seven miles. Nine of the twelve starters finished as follows:

	Miles.	Yards.
1. J. H. Bishop (Beaumont C.C.)	513	1,430
2. F. H. Grubb (Vegetarian C.C.)	492	1,720
3. P. H. Combes (Veloipedique le Vallois and Paddington C.C.)	486	1,100
4. H. D. Hanks (Pegasus C.C.)	471	1,740
5. E. R. E. Jones (Northampton Poly. Institute)	460	340
6. C. C. Cole (Polytechnic C.C.)	452	1,100
7. V. Norman (Anerley B.C.)	417	860
8. E. Lundy (Hull B.C.)	417	770
9. A. J. Dicks (Wealdstone Wheelers)	365	

The principal prize was the 50 guineas "Weekly Despatch" Cup, and gold medals were awarded to all competitors beating F. R. Goodwin's amateur record of 476 miles 1,702 yards, made at Herne Hill in 1906. It is interesting to note that the foods supplied for the competitors were beef tea, meat extracts, mashed chicken, milk puddings, eggs, stewed fruits, cold tea, sponge cakes, toast, biscuits, bananas, oranges, and chocolate.

Cycloplane at the Stadium.

The cycloplane, which is an appliance for attaching to a cycle with a view of assisting the rider by means of the air, is on daily exhibition at the Stadium, and anyone anxious to try this novelty can do so on payment of a small fee of 1s. Intending trial trippers, however, may be warned that in all probability they may not notice any very great difference to their speed by the use of this machine, unless, of course, it happens that a strong wind is blowing.

Hill Riding.

Many cyclists when mapping out a tour endeavour to do so in a district where they will have as few hills as possible, and in consequence they often miss some of the most beautiful parts of the country, such, for instance, as Devon and Cornwall and the Lake District. Naturally one does not want to spend the whole time struggling up steep hills when out on a pleasure trip, but it is a great mistake to imagine that a successful tour can only be accomplished in a district which is entirely flat. To begin with, the surroundings are anything but picturesque.

A Little Warning.

If you have a bad out, split canvas, or what is known as a "boil" on your front tyre, don't hesitate to attend to it at once, and don't ride the machine till the danger has been removed, it doesn't matter so much about the back, for the peril is not so pronounced. In the event of a burst cover and an instantaneous alighting on the rim, the back wheel will simply subside, and you have to mend the rent, or walk your machine to the nearest repairers; but if the front tyre explodes like a bomb when you are sailing along downhill with only perhaps the slightest holding of the handle-bar—this often is the habit of all of us—the steering is apt to go awry, and before you are able to slam on the back brake or steady the ship, you are on the rocks—very much on them, and the experience is literally shocking.

A Mistaken Practice.

The practice of some clubs in holding short distance sprint races over the public roads on a Sunday is being very much depreciated. Unfortunately the practice seems instead of decreasing to be on the increase, and a considerable amount of annoyance has been caused in various suburbs of the larger cities by the finishes of those races being held close to the residential parts of the town, thus causing a lot of those interested to congregate and crowd the streets with animated and talkative friends of the competitors. Cyclists have lived down so much prejudice and opposition in their time, that it is a pity it should be revived by the inconsiderate action of certain clubs.

Correct Position of the Saddle.

It is amusing to notice the way in which some writers dogmatise on the correct position that a saddle should be placed in. They forget that the question of saddle position is essentially one which differs with every rider. Some men like to be well over their work, others like to be behind it, while it is on record that one rider at least claimed to be able to do better work when his body was in front of his pedals. Again, while general opinion leans to the advantages of having the saddle as near as possible horizontally with the top tube, there are those who prefer the pommel sticking up in the air or pressed down towards the top tube. Every rider must find out for himself the position in which he gets the best results.

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" " 13 to 14 in.	5½d.	6d.	6½d.	7d.
" " 15 to 17 in.	6d.	6½d.	7d.	9d.
" " 18 in. & over.	6½d.	7d.	8d.	10d.
Padcuk, 10 to 12 in.	8d.	9d.	10d.	—
" " 13 to 14 in.	8d.	10d.	11d.	—
" " 15 to 17 in.	9d.	11d.	1/1	—
" " 18 in. & over.	10d.	1/1	1/3	—

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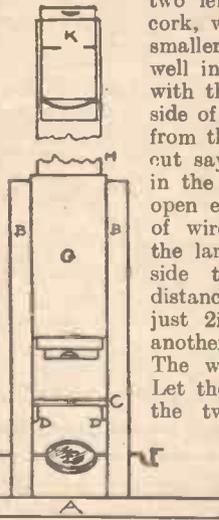
capable of showing an enormous variety of beautiful and interesting objects, and magnifying 200 times may be made by any amateur as follows:

Take a flat piece of hard wood for the base A in the illustration, 6in. by 4in., and on it fix two uprights, or pillars, about 1½in. apart, B, B. Each of these may be 6in. long and an inch square. A strip of wood, C, ¼in. thick, and 1in. wide, is fixed between these at a distance of 2in. from the base, resting upon two ledges, D, D. This forms the stage, and must have a hole ¼in. in diameter in the centre. Three-quarters of an inch from the lower end of the pillars pass a piece of stout wire through holes in each, so that it will turn round rather stiffly, and in the middle of this mount a tiny round mirror, E, an inch in diameter. This can be bought at a toyshop for a penny. Stick it on with seccotine, or better, mount it on a piece of cork ¼in. thick, and pass the wire through the cork, so that the mirror can be turned round. Bend the end of the wire into a little handle, as shown at F. Between the pillars, and flush with the top of them, fix a tube, G, made by rolling a piece of gummed paper round a thick ruler, 2½in. long. It must be quite vertical, and just in the centre between the pillars. Another tube, H, similarly made, but 9½in.

long, and 1in. inside diameter, is to slide up and down in the short one stiffly, so as not to move by its own weight. A cork, half-an-inch thick, is mounted in the lower end, with a hole through its centre ¼in. in diameter. This hole must be widened out to 3-16th inch at the bottom, so that a small lens can be mounted in it. Both tubes must be free from wrinkles, and of the same thickness throughout the length.

Get a set of three lenses from Messrs. J. Lancaster & Son, Colmore Row, Birmingham, asking for microscope lenses magnifying 200

times, and sending them 3s. 7d. to pay for the postage as well. Wipe the smallest of the three lenses, J, quite clean, and press it into the widened out hole in the cork, curved side inwards, keeping it in by sticking a piece of cardboard with an ¼in. hole in it, over the cork. This lens forms the object glass. The other two lenses will form the eyepiece, and must be mounted in a little tube, 2½in. long, that will just go into the long tube, gripping it stiffly enough to remain in any position. Mount the smaller of these



two lenses between two thin discs of cork, with holes in their centres a trifle smaller than the lens, and pushing them well in, so that the outside one is flush with the top of the tube, the curved side of the lens being inside. An inch from this end stick a disc of cardboard, cut say from a postcard, with a hole in the middle ¼in. in diameter. In the open end of the tube fix a little ring of wire to form a ledge upon which the large lens can rest, with its plane side towards the smaller lens, the distance between the two lenses being just 2in. Keep it in position with another ring of wire on the other side. The whole eyepiece is shown at K. Let the end containing the smaller of the two lenses project half-an-inch from the top end of the long tube. Before mounting the lenses, all these tubes and lens holders, except, of course, the 2½in. tube stuck between the pillars, should have been blackened inside by means of dead black paint sold by photographic dealers.

In using this microscope, place the object you wish to examine on a slip of glass. Lay this on the stage G, with the object just over the hole, and turn the mirror about till it reflects the light upwards through both the object and the lenses. Then put your eye to the end of the long tube, and move it very gently up and down till you get the small lens at the right distance from the object.

MELTING LEAD IN TISSUE PAPER.—Take a buckshot, wrap it tightly in one thickness of tissue paper, and holding the ends of the paper in the fingers of each hand, place the part that holds the shot over the flame of a match just far enough away from the flame not to burn the paper. In a few seconds unfold the paper and you will find that the shot has melted without even scorching the paper.

HOW TO MAKE A HOLE IN GLASS.—Cover the glass with clay or putty for a few inches around the place where the hole is wanted. With a pencil or small stick make a hole in the clay or putty the size of the hole required. Pour this hole full of melted lead. The hot

lead will go through the glass and duplicate the hole in the clay.

MR. G. MONTAGU BENTON read a paper on "Stone coffins and skeletons discovered at Thetford, Norfolk," at a meeting of the Cambridge Antiquarian Society a short time ago. It would appear that among recent finds a 12th century coffin has been found a few inches below the surface of the ground near Thetford Gas Works. Others of a little later date have also been brought to light. There were many interesting monastic and ecclesiastical buildings in the neighbourhood in pre-Reformation days and finds connected with those buildings have from time to time been discovered.

PHASES OF PHOTOGRAPHY.

THE poet Wordsworth was not a photographer, but it will be remembered by those who know his works that he says, "Often have I sighed to measure." An amateur when commencing photography soon discovers that his expenses are not so heavy if he makes up his own solutions; some formulæ happily are very easy to make up, but unfortunately some are not. If all formulæ were given in English ounces, grains, etc., as every school boy knows them, all would perhaps be well, but nowadays many formulæ come from abroad in the gramme (metric) system and in "parts," while many of the English authorities write their formulæ in such a manner that the amateur is frequently very much confused. We do not intend to discuss here the merits and demerits of the various systems advocated, but everyone will agree that every worker does not know to convert one system into another, and the sooner things are simplified and a universal system is adopted the better it will be.

Two English Systems of Weighing.

Putting aside for a moment the metric system, it may not be generally known that we have two systems in use in England. There is the avoirdupois weight (437½ grains to the ounce) by which chemicals are usually sold by dealers, and there is the apothecaries weight (480 grains to the ounce) by which most solutions are made up. So there is a difference here of 42½ grains, but fortunately it is so small as to make no appreciable difference in most photographic mixtures. We will not, therefore, worry the amateur with any fractions in the present note, but deal with the figures and the conversion thereof in a rough and ready manner, which will be found quite near enough for all practical purposes.

Writers of formulæ are not always clear in their instructions; when "water" is mentioned in a formulæ it is as a rule safe to start with the amount named and add the chemicals but where it is stated "water to — ozs.," the chemicals are usually dissolved in a smaller quantity of water, and more water added to make up the required amount after the chemicals have been dissolved. There are of course, a few exceptions, but we need not bother with them now. Another point to bear in mind is that chemicals named in a formulæ are generally placed in the order they should be added to the water.

Other Systems.

Formulæ in the metric or gramme and cubic centimetre system are confusing to some. The method of conversion becomes fairly easy when we remember that 1 gramme equals 15 grains, ignoring fractions, of course, because strictly speaking one gramme equals fifteen and two fifths in the solids; while in the liquids 100 c.c. may be taken to equal 1,700 drops or 3½ ozs. roughly.

MAKING UP SOLUTIONS: WEIGHTS & MEASURES.

As an example we give herewith a very good metal hydroquinone developer for plates and papers, potassium bromide being added as required. In Table A. we have the formulæ in the metric system as it came from the Continent. When we convert according to the above rule we get the result shown in B., which, strictly speaking is not accurate because if we included fractions we should get 246 grains of sulphide and 154 grains of carbonate, but it is quite near enough. So is the water, which it will be noted in a trifle more than when converting by another method to be described later.

Metal-Hydroquinone.

	A	B	C	D	E	F	G
	gms.	grs.	parts.	ozs.	grs.	gms.	grs.
Metal	1	15	1	1	30	3	1½
Hydroquinone	1	15	1	1	30	3	1½
					oz.		
Soda sulphite	16	240	16	16	1	50	24
					grs.		
Soda carbonate	10	150	10	10	300	30	15
		c.c.			ozs.	c.c.	oz.
Water	320	11	320	320	20	1,000	1

What are "Parts" ?

Sometimes formulæ are given in "parts" as shown in Table C. Now a "part" may be taken to mean anything from a grain to a ton in weight, or a drop to a gallon in liquids; so long as one keeps to the unit and merely multiplies it is impossible to go wrong. Let us then take the "parts" in C to be ounces and we simply get the result shown in Table D. If 320 ozs. is two much to make up we can easily divide the numbers and make up a smaller lot. Say, for example, we only wanted one pint (20 ozs.) of developer, 20 ozs. is one-sixteenth of 320 ozs., so the whole lot is divided by 16 and we get the result shown in Table E. The water and the sulphite is easy; to get the carbonate we must remember that there are 480 grains in an ounce, as the table gives 10 ozs. it naturally follows that we should have 4,800 grains; this amount divided by 16 gives us 300 which is the amount required for the one pint.

In Table F. we come back again to the metric system and we do so because the method shown in F. is a puzzler even to some advanced photographers. We refer to this method because it is a habit of many writers to give the metric system as shown in F. alongside the English system, and readers will have noticed that the quantity of the total mixture is 1,000 c.c. (one litre) which some authorities prefer to take as a standard. It is, of course, a simple method to convert the metric into the English system by the method previously given, and by so converting F. we should get, roughly speaking three times the amount shown in B., simply because F. is three times B. But what about getting a formulæ of F. form from any English formulæ of odd or awkward numbers? The method is a fairly easy one, thanks to

Lord Crawford who some years ago invented an easy system of conversion. There are three rules which one must obey when making 1,000 c.c. lots for English formulæ:—(1) Call the water 1,000 c.c. no matter what it may be in the English system; (2) Quantities in ounces. Take the ratio of their number to the ounces in the original and write the same ratio of 1,000; (3) Quantities in grains. Divide the number of grains by half the number of ounces in the original and put down as grammes. Now let us convert E. into the 1,000 c.c. system. By rule 1 the 20 ozs. of water becomes 1,000 c.c. By Rule 2 we have only the 1 oz. of sulphite to deal with, the other quantities being grains. One ounce is a twentieth part of the water in E., we have, therefore, one-twentieth of 1,000 c.c. which is 50 grammes. By Rule 3 we deal with the grains dividing them by half the solvent (20 ozs.) which is 10, and we get metol, 3 grammes, hydroquinone, gramme and carbonate 30 grammes.

The "Per Oz." System.

There is yet another system of writing formulæ, namely, that of giving the quantities per ounce of developer as shown in the table in column G.

To make up larger quantities we simply multiply by the total required. If we desired a pint of developer as given in G. we multiply by 20, because 20 ozs. make one pint, and we should get the result seen in Table E. Thus it will be seen that all the seven formulæ given in

the table upon the previous page, although widely different as regards quantities, are practically all of the same working strength, what little difference one gets in converting makes little or no difference.

The "Per Cent." System.

"Per cent." solutions are puzzling, and to go fully into the matter would take up too much space. Opinions also differ widely when fractions are gone into. A rough and ready method of calculating and making them is to go according to the following table, which is for use when water is used and not alcohol or other fluids.

The amount of water stated is taken and the chemical added, not poured on to the chemical to make the quantity. Larger and more concentrated solutions may be made by simple calculation. Fractions are ignored:

1st Prize in June Competition.
By W. H. WHITCOMBE, MAIDSTONE.



PERCENTAGE TABLE.

	To 1oz. of water add	To 2oz. of water add	To 3oz. of water add	To 4oz. of water add	To 5oz. of water add	To 16oz. of water add
To Make	Grains	Grains	Grains	Grains	Grains	Grains
1 per cent.	4	9	13	18	22	72
2 " "	9	18	27	36	45	145
3 " "	13	27	41	54	68	218
4 " "	18	36	54	72	91	291
5 " "	22	45	68	91	113	364

EXAMPLES.—To make 5 ozs. of a 5 per cent. solution add 113 grains to 5 ozs. of water. To make 1 oz. of an 8 per cent. solution add 35 grains to 1 oz. of water, 22 and 13 as shown by the table.

HOBBIES MONTHLY PHOTOGRAPHIC COMPETITIONS

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First Prize, £1 0 0. Second Prize, £0 10 0. Third Prize, £0 5 0.

A SILVER MEDAL and A BRONZE MEDAL, will be awarded in November, for the two best photos sent in for any one of the Monthly Competitions during the Season.

RULES.—Three prints of different subjects, or different aspects of one subject, to constitute an "entry." The prints must be accompanied by a front cover of *Hobbies* of the latest date possible. Each of the photographs must be mounted on card, and the title of the photograph with name and address of sender must be legibly written on the back. No print will be eligible that has already taken a prize in other *HOBBIES* competitions. No photographs can be returned, and the Editor reserves the right to reproduce any of the prints in *HOBBIES*. Photographs must be received not later than the 1st of each month following the month of competition, addressed:—Photos, Editor, *HOBBIES*, Paternoster Sq., London, E.C.

A HELPFUL CRITICISM OF EACH COMPETITOR'S WORK WILL BE SENT IF STAMPED ADDRESSED ENVELOPE IS SENT.

STAMP = COLLECTING = IN — OUTLINE. —

THIS WEEK'S COUNTRY: FRANCE.

AN outline collection of the stamps of France affords a curious instance of the way in which a particular type of design will sometimes survive disasters which bring about the fall of Empires. Between 1849 and 1876 France was successively a Republic, an Empire and again a Republic, yet through all that period the postal officials remained faithful to one stock pattern. The credit of initiating this type belongs to M. Barre, who was chief engraver to the mint at Paris at the time when the Republican Government first decided upon an issue of stamps. From the artistic point of view M. Barre's work was excellent. Enclosed in a frame with Greek ornamentation is a beaded circle containing a really fine head of Ceres, the Roman goddess of agriculture, to symbolise liberty. The one fault is that the words, "Republique Franc." at the top, and the value at the base are too small to be easily read.

This first set (No. 1) began to be issued on January 1st, 1849, and remained current until 1852, when it was enacted that in future the head of the President of the Republic, Louis Napoleon, nephew of the great Napoleon, and subsequently Emperor, should appear on all the stamps and coins of the state. This gave rise to a set (No. 2) exactly similar to the previous one except that the head of Ceres is replaced by the less picturesque features of the President. As the Empire was re-established in the same year, this variety had a very short life; in fact, only two denominations, the 10 centimes bistre and the 25 centimes blue, were ever issued. Unfortunately, both are scarcely unused, but good, clean copies of the 25 centimes could easily be got for 2d.

On the very day that the Empire was proclaimed a decree was put forward directing that the words "Empire Franc." should be substituted for "Republique Franc." in the upper sections of the stamps. This was accordingly done, but otherwise everything was left as before. Every collector has used speci-

mens of this earliest set of the Empire (No. 3), and as unused examples are somewhat expensive, the best way is to look over one's stock and pick

out the one with the lightest cancellation marks. The monotony of French philately is slightly varied in 1860 when a 1 centime olive, intended for circulars and newspapers, made its appearance, a 2 centimes and a 4 centimes of the same type following in 1863. The stamps, which exactly resembled No. 6, except that the head of the Emperor entwined with a laurel wreath stands in the place of Ceres, are almost equally familiar unused or used, so, in pursuance of our general plan, we will have one of the former kind, selecting the example of the

most artistic shade, the 2 centimes, red-brown.

The laureated head of the Emperor, which was drawn by M. Albert Barre, son of the designer of the original set, was universally voted an improvement, and it was arranged to produce a complete set exhibiting this feature. When these appeared in 1867 it was seen that a few other modifications had been introduced at the same time. The classical border is more vigorously drawn and the beads forming the circle round the head are increased in size and

reduced in numbers to 64. We illustrate the large and handsome 5 francs value of this set (No. 4), but fear that most of our readers will have to content themselves with one of the lower values, which are of normal dimensions. Once more unused copies are hard to acquire, but used about, particularly of the 20 centimes blue.

The catastrophes which overwhelmed the Empire, and ended in the re-establishment of the Republic brought the head of Ceres back to its old place in the stamps. A set corresponding in design to the original one (No. 1) was put on sale, and a specimen, we fear it will have to be a used one, of the 40 centimes orange, for the sake of variety, may stand both for the issues of 1849 and 1870. A used copy of the 30 centimes, brown, showing the type with larger numerals of value should be added. The



READING FROM LEFT TO RIGHT THEY ARE NOS.
1, 2, 3, 4, 5, 6, 7, 8.

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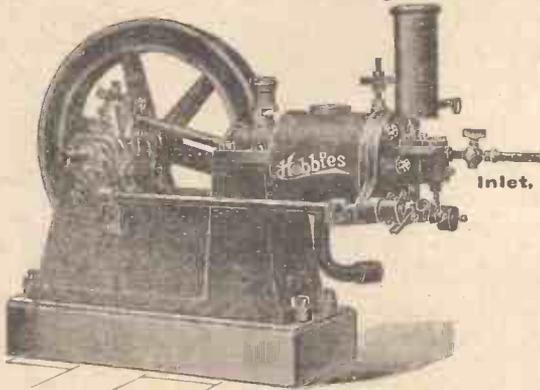
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lowest values were of the type introduced under the Empire (No. 6), and the 1 centime, olive, being a cheap enough variety unused.

In 1876 there comes at last a complete change. As the result of a competition the "Mercury and Commerce" design (No. 7) was brought into use. Unused copies of the five centimes green are most suitable for us.

With the beginning of the new century a further competition introduced the series of familiar types enumerated for convenience' sake in our list below.

Unpaid Letter Stamps.

The unpaid letter stamps of France should not be left out from such a collection as ours.

In the line in our albums given up to the Empire we will place the 10 centimes black of 1859-63, worth about 2d. unused, though superstitiously believed by many young collectors to be excessively rare, and by the side of the Mercury and Commerce stamp may stand an

STAMP COLLECTING IN OUTLINE.

unused 1 centime black of the familiar French unpaid letter series (No. 8).

Stamps to be Secured for "France."

- 1870.—Head of Ceres, engraved, 40 cent. orange, used, 1d.
- 1852.—Repub. Franc., head of President, 25 cent. blue, used, 2d.
- 1852.—Empire Franc., head of Emperor, 20 cent. blue, used, 1d.
- 1862.—Empire Franc., Laureated Head, 2 cents, red-brown, unused, 1d.
- 1867.—Empire Franc., Laureated Head, 20 cents. blue, used, 1d.
- 1870.—Repub. Franc., larger figures of value, 30 cents. brown, used, 1d.
- 1870.—Repub. Franc., 1 cent. olive, unused, 1d.
- 1876.—Mercury and Commerce, 5 cents. green, unused, 1d.
- 1901.—"Postes" at foot of stamp, 2 cent. claret, unused, 1d.
- 1901.—"Postes 10" in square at top corner, 10 cent. carmine, unused, 1d.
- 1901.—"Postes 10" in shield at top corner, 10 cent. carmine, unused, 1d.
- 1903.—"Sower" 10 cent. rose-carmine, unused, 1d.
- 1901.—Large oblong stamp, 40 cent. red and pale blue, used, 1d.
- 1859-63.—Unpaid letter stamps, 10 cent. black, unused, 2d.
- 1881.—Unpaid letter stamps, 1 cent. black, unused, 1d.

TOPICAL STAMP NOTES.

THE set of stamps for the Maladive Archipelago, a group of islets to the south-west of Ceylon, the appearance of which we predicted last autumn, has at length materialised. From "The Ceylon Morning Leader" we learn that the 2 cents, 3 cents, 5 cents and 10 cents were some time ago despatched from Colombo, and that the 15, 25, and 50 cents and the 1 rupee, are still to come. All are of the same type (No. 1), the chief feature of the design, though somewhat suggestive of an antique telescope or a waterworks tower in a provincial town, being in reality a minaret attached to the Muhamadan Mosque at Malé, the capital city of the Maladivian Sultan, who is a tributary of the Empire.



NO. 1.

The delay in the appearance of the stamps is accounted for by the fact that there were mistakes in the Arabic inscription which required rectification. Though none of our contemporaries seem to have noticed it, there are still errors. For example, in the specimen we illustrate, there is distinctly a dot too many in the word "ithani" two at the foot of the stamp.

Speaking of dots, an interesting variety has cropped up in the series of The British South Africa Company, overprinted "Rhodesia," in which, in accordance with the philatelic traditions of that part of the world, the final stop is missing. Up to the present only the 4d., 1s., 2s. 6d., 5s. and 10s. values have been discovered in this condition, but it is quite likely that there are others, in particular the 1d., and we should be glad if our readers would examine their specimens and report discoveries. In time examples of the variety may be of considerable value.

In our articles on skeleton or outline philately we have more than once spoken of the curious way in which political relations affect the designs of stamps.

The change of colour in the 10 centimes Postage Due label of Monaco, from rose to brown, calls to mind an excellent example. The little Principality, in which is situated the too-famous Monte Carlo, is entirely dependent upon France and the correspondents of gentlemen who have spent their last coins in futile endeavours "to break the bank," and cannot even raise the price of a stamp, are appraised of the fact that they must pay double the customary postal rates—or miss the information contained in the letter—by a stamp (No. 2), which exactly resembles the French Postage Due set.



NO. 2.

A strange delusion has somehow got abroad concerning the series of stamps issued by the Spanish authorities in Porto Rico, just before that island was finally annexed to the United States.

As a despairing effort to raise money the officials imposed a tax of 2 centavos—about fourpence—on every letter posted, and produced an issue surcharged "Impuesto de Guerra 2 Cts." (War Tax 2 Centavos). The overprint is found in violet on the 2 cents de Peso, violet, the 2 red-brown and the 5 green, and the 2 Cents de Peso on 2 Mils de Peso red. It also occurs in carmine on the 5 Cents de Peso on 1 Mil de Peso violet, and on the same value in blue. We cannot imagine what gave rise to the rumour, for as a matter of fact all the denominations are quite common, and are likely to remain so for many years to come.

HOBBIES $\frac{1}{3}$ H.P. GAS ENGINE.

THE chimney for the ignition tube is cast with two projections; one is

rectangular in section, and is drilled with a 5-16 in. hole, which may be slipped over the $\frac{1}{4}$ in. stud on the top of the cylinder, the hole is $1\frac{1}{2}$ in. from the chimney centre; the other projection is near the base of the chimney, and is $\frac{7}{8}$ in. diameter, this is drilled to the depth of $\frac{1}{2}$ in., with a 19-32 in. diameter hole, and afterwards tapped with $\frac{3}{8}$ in. gas thread. Two 3 16 in. holes are then drilled each at an angle with the centre as shown in the sketch. It is by means of this construction that the jet of gas is split in two and heats the tube far more evenly than if allowed to come out in a central jet.

The Burner.

The burner consists of two pieces of brass shown enlarged; the larger of the two screws into the chimney casting and the smaller screws into the larger. An ordinary tap screws on to the smaller to regulate the supply of gas.

The first is made out of $\frac{7}{8}$ in. diameter brass, which is centred in a chuck one end, with sufficient standing out to finish the turning in one operation. A 11-32 in. drill is fixed into the loose headstock and used to drill a hole to a depth of, say, $1\frac{1}{4}$ in. Afterwards a $\frac{3}{8}$ in. diameter drill is used to drill up to a depth of $\frac{3}{4}$ in. When the drilling is done the ordinary centre is adjusted up to the brass which is then turned, the other end being turned to 21-32 in. diameter full, and $\frac{3}{8}$ in. long, the other end is turned $\frac{3}{8}$ in. diameter and $\frac{5}{8}$ in. long, leaving a shoulder $\frac{1}{8}$ in. wide between the turned parts.

The outer end should then be screwed $\frac{3}{8}$ in. gas thread before removing from lathe, when screwed the brass may be parted off with a parting tool, the inner bore tapped $\frac{1}{8}$ in. gas thread, two holes are drilled $\frac{1}{8}$ in. diameter at right angles to one another right through the $\frac{3}{8}$ in. end as close to the shoulder as possible, these are the air inlet holes.

The smaller nozzle is turned from a piece of $\frac{3}{8}$ in. brass centered in a chuck and drilled up a distance of $\frac{3}{4}$ in. with a 3-16 in. diameter hole; it is then carefully drilled another $\frac{3}{8}$ in. with a 1-32 in. diameter drill; the centre is again adjusted to it, and the outside turned to $\frac{3}{8}$ in. diameter full to a length of $\frac{3}{8}$ in. on the outer end, then a $\frac{1}{4}$ in. shoulder is left and the rest turned to $\frac{3}{8}$ in. diam. full, to a length of $\frac{1}{4}$ in. after which the metal is tapered off to a point as shown in sketch. It would be best to screw the outer end to $\frac{1}{8}$ in. gas thread before tapering off the nozzle, the other end must be screwed when the nozzle is finished.

PART VII. FINAL INSTRUCTIONS

In fitting the engine up it is the best plan to fit the valve boxes to the cylinder and cover, a good joint being made by means of a strand of asbestos fibre. The valves are fitted in position and their springs filed, being fixed in position by a washer and a pin passing through a small hole in the end of the exhaust and air valves, but in the case of the gas a fine spring is fitted inside the valve box on the top of the valve. A spring made of 16 gauge wire is suitable for the exhaust valve and 20 gauge for the air valve.

The piston is secured to the connecting rod, the crankshaft is placed in the correct position in its bearings with relation to the camshaft as explained in last week's issue. The connecting rod is then loosely secured to the crankshaft, and the piston inserted in the cylinder which is now placed in position and bolted down. Now, if all is well the crank shaft ought to be true with the connecting rod in all positions, if so, the bearings may be bolted up, and fly-wheel put on and finally secured.

Trying the Compression.

When pulled round in the direction indicated last week there ought to be a sound compression of gas on one in-stroke which drives the piston out again on the out-stroke the next in and out strokes being free. The burner is now placed in position, it may be made more efficient by obtaining a sheet of asbestos, and soaking it in water, then cut it out to exactly cover the inside of the chimney, a small gap $\frac{7}{8}$ in. by $\frac{7}{8}$ in. being left for the burner. This is then smoothed

round the inside of the chimney, and forms a non-conducting coat which intensifies the heat of the burner.

To Start the Engine.

The engine is started by lighting the burner for ten minutes until the ignition tube is bright red, then turn on the gas to the engine and pull the fly-wheel round sharply; be sure the bed-plate is properly bolted down before starting.

If the engine runs too slowly, adjust the position of the chimney by means of the two nuts on either side of the stud, the chimney must be lowered to increase the speed, but if on the other hand the engine shows a tendency to knock and stop suddenly, and also if the engine cannot be easily started, but back fires, that is starts in the wrong direction, then the chimney must be raised. The raising and lowering of the chimney determines at what point the charge of gas is ignited.

The governor is adjusted both by means of the weight and the spring until the gas valve is missed at the right speed.

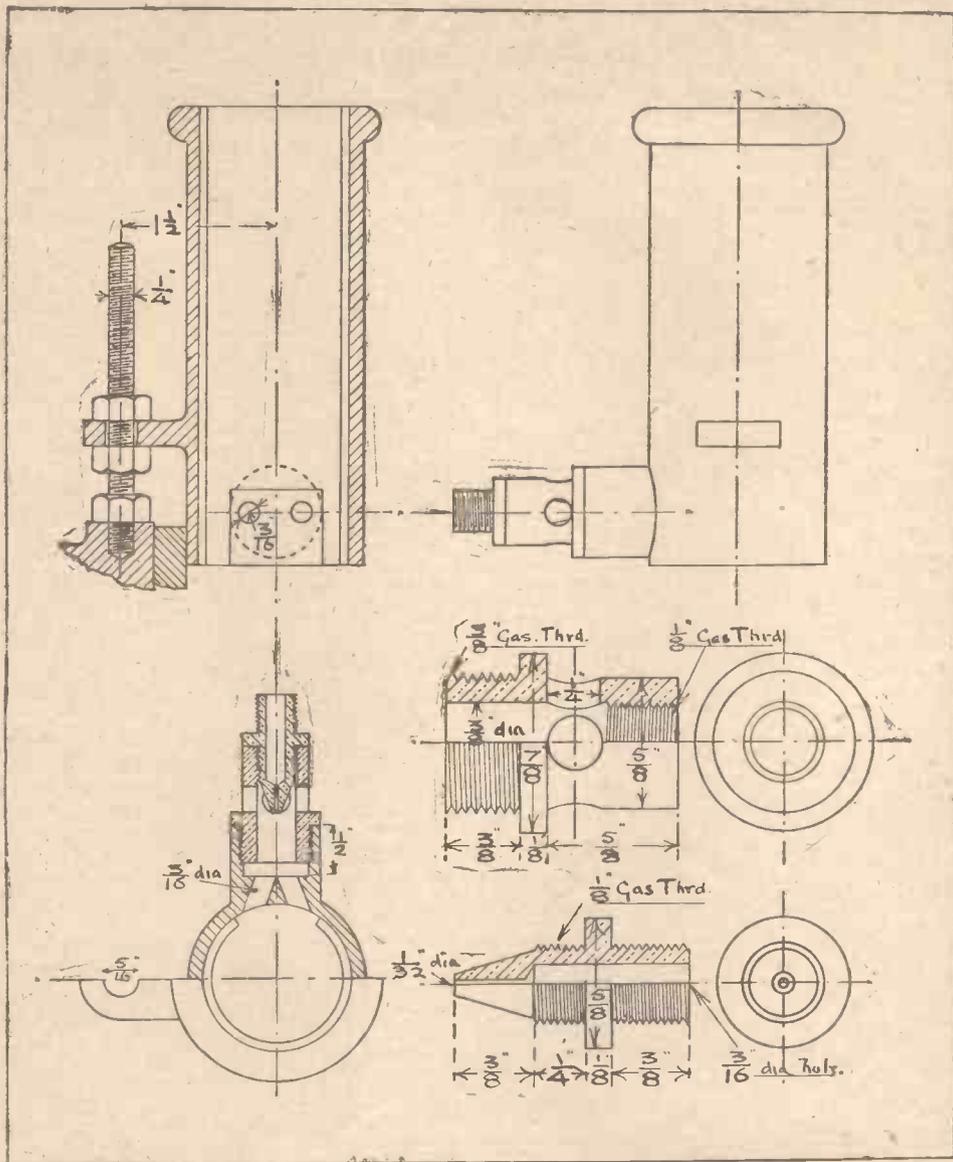
The exhaust must be carried out into the

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SETS OF PARTS.**

**34 CASTINGS
FOR MAKING THIS
ENGINE.**

COST - - 25s.

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open air, and if a long tube be used no silencer will be required, but if a short tube is only necessary a silencer in the form of a strong round tin into which the exhaust tube is led and from

which another tube leads to the open ; the ends of these tubes should be sealed, the gases being allowed to escape by way of small holes drilled in the sides of the tubes.

WHAT A GAS ENGINE IS CAPABLE OF.

THERE is a saying that you can fool a part of the people all the time, all the people a part of the time, but you cannot fool all the people all the time.

We will apply that saying as follows:— Water power will work for part of the people all of the time ; the wind mill, the horse and the steam engine will work for all of the people a part of the time ; but the only thing that

will work for all of the people all of the time is a gas engine.

The only time anybody gets fooled is when they won't give the gas engine a chance to show what it can do, and the only part of the people that gets fooled all of the time are the fellows who insist on doing things by hand "because grandfather did it that way."

THE AMATEURS GARDEN

THE FLOWER GARDEN

MIGNONETTE.—By skilful management this fragrant old favourite may be had in bloom during every month of the year. The seed should be sown thinly in four-inch pots, and the plants thinned out to two or three in a pot, and carefully staked. They should be kept closed to the glass, and when the pots are full of roots should be fed twice a week with liquid manure in rather a mild form. They are best grown in a airy frame during the summer. The giant mochet is the best for pot culture.

ROSES.—Budding should now be in full operation, watering the plants freely in dry weather both before and after budding.

Cut back perpetual blooming Roses, and water them with the richest manure water, such as Hobbies Rose Manure, to encourage a second growth and bloom. Remove faded flowers and seed capsules every morning. Plants which have flowered in pots keep growing freely, as the future bloom depends on their vigorous growth at this season.

CLIMBING ROSES should now be pushing out strong shoots from the ground and main stems. If not required for future training these should be taken off entirely, or have their top pinched off a foot or so from the stem.

THE FRUIT GARDEN.

All trees on walls, such as Apricots, Cherries, Figs, and Plums, should be carefully looked over, and all shoots that are not really useful, or any that are ill-placed or cannot be properly nailed in, should be removed. It is important to do this in time, because if neglected till the fruit begins to ripen, the real advantage of doing it is lost, and it is necessary to be long-sighted, and have an eye to future crops as well as the present one, if even the nailing cannot be attended to, the disbudding ought in no case to be deferred. Figs especially are apt to make strong superfluous wood, the leaves of which throw a dense shade over the fruit, when the heat of the sun is so necessary to its ripening.

CATERPILLARS at this season are often abundant on Gooseberry and Currant bushes, and various ways are propounded for destroying them, as spreading old tan under the bushes and at a certain time, burning it to destroy the larvæ. Some use no other means but picking them off, or shaking them on a cloth or sheet, and by this means they have been freed from them. A little practice in gathering them will enable the operator to destroy thousands in a very short time.

ESPALIER-TRAINED TREES.

—Espaliers and Dwarf fruit-trees should receive attention with regard to summer training and pruning. This is of the greatest importance, since when a bud or small shoot is taken off now the wound is soon cicatrised, and no harm need be apprehended, while this is not always the case as regards the cuts produced in winter pruning.

VEGETABLE GARDEN.

ASPARAGUS.—Cease cutting early this month, unless some parts can be spared for late use, when it must have a rest the following season. Late cutting has the effect of weakening the roots, but they will recover after a season's rest, if they have not been cut too closely. Hoe frequently between the rows.

CABBAGE.—Sow early Cabbage at the end of this month; strew lime or soot over the young plants to drive away the fly. This should be done in the morning, while the dew is on them. Plant out for autumn use.

CARROTS.—If required a sowing of the Horn varieties may be made now, selecting a warm border. These, however, must be pulled when quite young.

CELERY.—During this month the main crop should be got out. If this is planted where Peas had previously grown make the trenches between, not on the rows where the ground has been heavily drawn, or the crops will not be so good. It is very proper to give early crops plenty of room, so that should they not be ready to clear away, such crops as this may be planted between while they are growing.

PEAS.—Dwarf early sorts are the best to sow this month.

SPECIAL OFFER FOR THIS WEEK.

One Shilling Size Tin of Hobbies Famous Insecticide, for Destroying Insect Life on Roses, Plants, &c., &c., with Full and Simple Directions.

Every grower of flowers should possess this effectual remedy, together with one tin of either of the following specially-prepared Fertilizers or manures:—No. 1: Hobbies Concentrated Plant Food; recommended for general use. No. 2: Hobbies Special Chrysanthemum Manure; the foundation of our success with this delightful flower. No. 3: Hobbies Rose Manure; our numerous wins at all the leading Rose Shows is sufficient guarantee as to the unequalled quality of this article. No. 4: Hobbies Improved Tomato Manure; a wonderful food for aiding growth, yield and colour of Tomatoes, whether grown under glass or in the open.

All the above preparations are solely confined to Hobbies Horticultural Department, and cannot be obtained elsewhere.

Our usual price for the above offer is 1/10 including postage, but for one week only we will send post free for 1/8.

This Offer will close July 31st.

HOBBIES HORTICULTURAL DEPARTMENT, DEREHAM. London Horticultural Depot: 17, Broad St. Pl., E.C.

SALE AND EXCHANGE.

PRIVATE ADVERTISEMENTS are inserted in these columns at the rate of 6d. for the first 18 words or less, and 1d. for 3 words after.—For TRADE ADVERTISEMENTS, and Advertisements of FOREIGN STAMPS, the rate is 1d. per word.—Every word, including the name and address, is counted. Initials and numbers, or groups, such as E.P.S. and £1 11s. 6d., are counted as one word. Advertisements offering FRETWORK DESIGNS for sale cannot be accepted.

IMPORTANT:—Copy for advertisements in SALE AND EXCHANGE column must be sent distinctly addressed to:—

“HOBBIES” Advertisement Department, 12, Paternoster Square, London. E.C.,
not later than TUESDAY MORNING for insertion in the paper published the following week.

TRADE.

A useful and profitable spare or whole time occupation is Picture Framing, if you buy your picture mouldings, pictures, mounts, etc., from us. We supply everything required for picture-framing at remarkable prices. Solid oak mouldings from 4s. 6d. per 100 feet, art green and brown mouldings from 3jd. per 9 feet, hundreds of guinea pictures at one shilling each.—Write to-day for grand illustrated moulding and picture list, it explains why we can sell so cheap, sent free to all readers of Hobbies.—Watkins, World's Provider (Dept. H.), Newport, Mon.

Agents Wanted to sell Rubber Stamps, Liberal Commission. Particulars free.—Dept. W, 89, Aldersgate Street, London.

Agents, Private Christmas Cards; choice selection books free, big commission.—Gordon, 27, Worship Street, London.

Do you want a real good Petrol Motor Model and Water-cooled? Then get our machined set of $\frac{1}{4}$ h.p. at 6s. 6d. For Boat, Launch or Stationary see our New Catalogue, anyhow, 4 stamps; many choice patterns.—Madison Dynamo Works, Littleover, Derby.

DRUNKENNESS CURED, quickly, secretly, permanently, unflinching, harmlessly, cost trifling. Sample free.—Carlton Chemical Co., 711, Birmingham.

Earn Money by printing Cards, Envelopes &c. Outfits from 5s. 6d., comprising Printing Press, Metal Type, Roller, Ink, &c. Booklet and specimens post free.—H. Raymond, 20, Rymer Road, East Croydon.

Free.—Pocket rubber stamp of your name and address; also particulars of splendid paying spare time agency, easily worked.—N. Richford, Snow Hill, London.

Oak Picture Mouldings, 1 in., 8d.; 1 $\frac{1}{2}$ in. 10d.; per 12 ft. lengths. All kinds of fancy mouldings. Speciality: Mouldings mitred ready for joining. Complete Catalogues of Mouldings, Pictures, etc., 4d. stamps. Booklet “How to Frame Pictures,” free.—Watts, Department C, Eccles New Road, Salford

Second-hand Books at Half-Prices! New Books at 25 per cent. discount. Books on electrical engineering, building, technical, all other subjects and for all examinations supplied. Sent on approval. Catalogues free. State wants. Books purchased; best prices given.—W. & G. Foyle, 135, Charing Cross Road, W.C.

Tangomator Competitions.—32 cash and other prizes, value £20, for Cardboard Models and smartly written Advertisements. Send stamp for list.—H. Percy Pitman, turbine manufacturer, 3, Willcott Road, Acton, W.

Vandy's Box of 12 capital Tricks, mysterious, amusing, complete apparatus, instructions, hints, salaried work, 200 trick catalogue, photo of Vandy, the juggler, seven pence. Healthy fun for boys and girls, suitable present.—Magical Pastimes Co., 65, Kenilworth Avenue, Wimbledon, S.W.

64 Page Book About Herbs and How to Use Them, post free. Send for one.—Trimwell, The Herbalist, Richmond Road, Cardiff. Established 1879.

PRIVATE

Electrical Installations, by R. Kennedy, 4 vols.; cost 36s., accept £1, or what offers, cash or exchange?—F. M. Brocter, Klrkby Malzeard, Ripon.

Electro-Magneto Machine and Shocking Coil, self-generating, good condition, cost £2 2s.; sell or exchange good $\frac{1}{4}$ -plate Stand Camera.—Smith, County Cricket Office, Newark Street, Leicester.

Exchange Separator Generator, Cycle Lamp, and Cape, as new, for good Camera.—Blount, 8, Long Low, New Tredegar.

For Exchange, 552 Hobbies, with Designs, from 1st January, 1898, to 31st December, 1908; also 8 special Designs. What offers for lot or part? Wanted, Picture Frame Cramp.—Fairweather, 35, Normanton Avenue, Wimbledon Park.

For Sale, Punch and Judy Show, with 11 figures, in good condition; accept 10s.—176, Maldon Road, Colchester.

Fret Machine, 12s., or would part exchange for aviary, three Pigeons, 1s. 6d.—Torrington Cottage, West Hill, Sydenham.

For Sale, Edison Gem Phonograph, 30-inch brass horn floor Stand, 28 Records in case, with lock and key complete, cost £4 8s. 6d., take £2; also Edison Standard Phonograph, nearly new, flower horn, 36 Records in case, with lock and key complete, cost £6 15s. 6d., take £4 10s., or nearest offer.—A. W., Whyland Cottage, Robertsbridge, Sussex.

For Sale, Mandoline, Case and Tutor, all complete, £1; Sandow's 12s. 6d. Grip Dumbbells and instructions, 8s. 6d.; $\frac{1}{4}$ -plate Hand Camera and few accessories, 8s. 6d., post free.—Lloyd, Hockley Heath, Birmingham.

For Sale, 8 vols. “Harmsworth Self Educator” (unbound), 12s.; cost 28s.—Beer, 34, Beechwood Avenue, Plymouth.

Genuine Bargains.—Studio Camera, splendid lens, 2 d. slides, tripod, £2; also number accessories, cheap; Field Glasses, by Lemare, Paris, 50s., cost 65s., perfect, new; Flute and Piccolo, 8s. and 3s., or exchange for Fretwork or Picture Framing Tools.—J. Whitehouse, 19, Jubilee Street, Seadley, Manchester.

No. 1 Frena (3 $\frac{1}{2}$ by 3 $\frac{1}{2}$) Beck lens Working Aperture F8, cost £5 5s.; best cash offer accepted.—Ormandy, Grange Park, St. Helen's.

Sale, a 6in. Circular Saw and Spindle Table and Fend, complete; 150 HOBBIES and Designs. Take 8s. the lot, or set of Carving Tools.—W. Barron, Tunstall Village, Silksworth.

To be sold cheap, Fretwork Treadle Machine.—Apply 8, Granville Road, Stroud Green, N.

Vol. 90 “B.O.P.” 3s.; 50 “Phonetic Journals,” 2s. 6d.; 5 “Wide Worlds,” 1s. 9d.; Gym. Costume, 2s. 3d.; Sandow's 12s. 6d. Grip Dumb-bells, 8s.; 700 Cigarette Cards, 6s.—Coltman, 19, Haymore Street, Middlesbrough.

Wanted, Fretwork Machine or good Fretwork Outfit, or small Turning Lathe, for Pocket Kodak and Outfit, 2 $\frac{1}{2}$ in. by 1 $\frac{1}{2}$ in.—Whitworth, 5, Bar Lane, Astley Bridge, Bolton.

What offers? Good $\frac{1}{4}$ -plate Magazine Camera, Tripod and Case; Fretwork Machine (Roger model); small Magic Lantern, with 4 dozen slides; also small Stage and unused first-aid Wallet.—Gym or call after 7.30, Osmond, 113, Devonshire Road, Holloway.

$\frac{1}{4}$ -Plate Folding Camera, Rectilinear Lenses, and 3 Metal Slides, 17s.; also several accessories, cheap.—Mr. Fletcher, 10, Staines Road, Heston, Middlesex.

$\frac{1}{4}$ -Plate Koles Shutter, with medio-anastigmat Lens—Perfect condition. Accept 25s. Other sundries also.—Martin, 1, Overton Road, Brixton.

2 Large complete Hanging Lamps, for workshop, etc., 3s. 6d.; Oil Can and Tap, holds 5 gallons, 2s.; Weights and Set Scales, all correct, 6s.; American Meat Chopping Machine, complete, 16s., cost 35s.; American Brace and Set Bits, 2s. Seen by appointment.—Richards, 70, Somerset Road, High Cross, N.

250 Hobbies, 320 Designs, and 12 Specials. What offers? —B. Wood, 80, Bellenden Road, Peckham, S.E.

STAMP ADVERTISEMENTS.

All stamp collectors applying for approval books will receive free a rare provisional, catalogued 20s.—Saunders, 108, Hampton Road, Ilford.

Breaking-up Large Collection. Approval selections sent to advanced collectors.—Philatelist, Manor House, Dagmar Road, South Norwood.

Free, scarce Provisional catalogued £1 to all applicants for approvals ($\frac{1}{2}$ to $\frac{1}{4}$ catalogue).—London Philatelic Co., Apsley, Hemel Hempstead.

Stamps.—Colonials my speciality, selections on approval, write requirements; references essential.—R. Jacobs, 24, Glenmore Road, Beisize Park, N.W.

CHESS AND DRAUGHTS.

CHESS.

REGULAR PRIZES. PROBLEMS.

A PRIZE of 8s. is given every eight weeks to the reader submitting the best original two, three, or four-mover Problem published in HOBBIES.

TOURNEY RULES were published in HOBBIES, June 17th.

PROBLEMS.

No. 430.—By STANLEY HOLE.

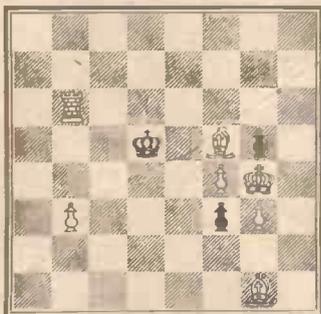
BLACK.—Five pieces.



WHITE.—Eight pieces.
White mates in two moves.

No. 431.—By J. HOEDEMAEKER.

BLACK.—Three pieces.



WHITE.—Seven pieces.
White mates in three moves.

Solutions to be received not later than Friday, July 30th.

SOLUTION of No. 425.

1 Kt—K4.

If 1 K×Kt 2 R—Q8 or B—B7. etc.

If 1 K—K3 2 R—Q8 or P—Q3. etc.

If 1 P—Q6 2 B—B7 ch. etc.

A dual mate occurs also in second variation.

Five points.

1 Kt×P. given by several solvers, is met by
— 1 K—K3; 2 R—Q8, P—K5.

SOLUTION of No. 426.

1 B—Q1.

1 Any. 2 Mates accordingly.

Scores:—G. C. Alvey 59, Fred. Bell 7, T. Birtwhistle 92-2, H. Bogdanor 10, Hugh Doyle 132, E. Eginton 99, W. Enson 131-32, J. H. Folland 113-65, H. Freestone 25,

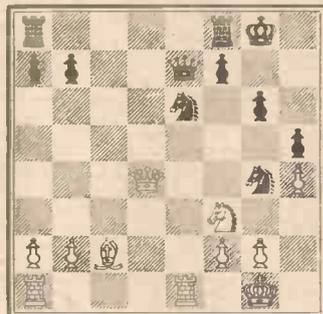
B. Fitzgerald 68, J. Goode 8, H. Geach 8, R. Holgate 82, Stanley Hole 11, J. Hoedemaker 10, F. Knowles 112, H. E. Knott 127-7, G. P. Kitchener 104-5, J. H. Layng 50-24, T. A. Lowndes 39, G. E. Moore 135, F. Masterson 79, Sydney Norman 5, J. F. Payne 123-6, Leo Payne 7, Jno. Poole 49, "Pawnette" 127, C. G. Rumsey 141-11, Fred. Stone 129-1, "Salol" 133-5, J. D. Tucker 130-6, H. A. Tate 121-72, S. Ward 138.

Italics indicate Handicap Tourney entries.

QUEEN'S PAWN GAME.

White.	Black.	White.	Black.
Jaffe.	Marshall.	Jaffe.	Marshall.
1 P—Q4	P—Q4	23 R—Kt3	KR—Q1
2 Kt—KB3	Kt—Q2	24 Q—K4	R—Q3
3 P—K3	KKt—B3	25 Kt—Kt5	Q—B3
4 B—Q3	P—K3	26 P—B3	B×B
5 QKt—Q2	P—B3	27 P×B	Kt—R3
6 P—B3	B—Q3	28 Q×B	Q—Q5 ch
7 Castles	Castles	29 K—B1	Q—Q6 ch
8 P—K4	BP×P	30 R—K2	R—K1
9 P×QP	P×P	31 Kt—K4	P—R3
10 Kt×P	Kt×Kt	32 K—K1	K—Kt2
11 B×Kt	Kt—B3	33 Q—Kt4	Kt—B4
12 B—B2	B—Q2	34 Q—B3 ch	Q×Q ch
13 B—Kt5	B—Kt4	35 P×Q	KR—K3
14 R—K1	B—K2	36 P—Kt3	Kt—Q3
15 R—K5	B—B3	37 R×P	Kt—Kt4
16 Q—Q3	P—KKt3	38 R×R	R×R
17 P—KR4	Kt—Kt5	39 Kt—Kt5	R—QB3
18 KR—K1	Q—B2	40 P—QB4	Kt—Q5
19 B×B	Q×B	41 R—K7	Kt×P
20 P—Q5	B—Q2	42 R×P ch	K—Kt1
21 Q—Q4	P—KR4	43 R—Q7	K—R4
22 P×E	B×P	44 P—B5	R×P
		45 R—Q8 ch	Resigns.

Position after Black's 22nd move—B×P.
BLACK.



WHITE.

TO CORRESPONDENTS.

Communications, &c., must be addressed:—"Chess Editor, HOBBIES, Paternoster Square, London, E.C."

S. NORMAN.—You will see you missed the "cook" in No. 424. There is no need to give so elaborate an analysis as the one you send.

J. HOEDEMAEKER.—Thanks for suggestion; will consider the matter.

DRAUGHTS.

Communications must reach HOBBIES office by Friday each week.

SOLVERS' SCORES.

Problems Nos. 1,127-8 (additional).—Five points: Butterfield.

Problems Nos. 1,129-30.—Five points: Butterfield, Beveridge, Day, Dunn (J.), Fenwick, Goode, Hopkins, Hampshire, Robertson, Race, Smith, Turner. Four points: Allen, Bowers, Bennett, Barrett, Boggie, Browning, Dunn (W. H.), Drew, Green, Hill (T. M.), Hill (S.), Jones, Knight, Nixon, Rouse, Thurlow, Watson.

Problem No. 1,129 admits of a dual "key," by 11-7, as pointed out by a number of the solvers, who thereby gain a point extra.

(Continued on page 358.)

THE HELPING HAND

All letters containing questions should be addressed to *The Editor of Hobbies*, 12, *Paternoster Square*, London, marked "Helping Hand."

Only urgent matters and those requiring enclosures are dealt with through the post. In such a case a stamped addressed envelope must be sent.

REPLIES SENT BY POST.

F. Rylance, Stockport (S.)	H. Starkey, Pontypridd.
G. Brown, Govan.	W. Hill, Thornaby-on-Tees.
G. Parsons, Dorchester.	F. Craig, Oldham.
F. G. Sandford, Leeds (B.)	J. Stephens, Liverpool (W.)
W. Bulman, W. Cornforth.	E. Bond, Southsea.
B. F. Brown, Sunderland (H.)	J. Powell Smith, London (S1.)
A. E. Trotman, Bristol (El.)	N. Bradley, Bolton.

MISCELLANEOUS

Q.—B. C. WREN (Kentish Town).—Please give particulars for making a Hectograph duplicate?

A.—Brief particulars for the making of a Hectograph Duplicator will be found in this column under the name of B. McKay, Quebec, but as so many questions come to us on this subject, we are arranging for a special article dealing with same in the next issue of the paper.

Q.—E. F. B. (Wandsworth).—What journals are published in the interests of the printing trade?

A.—The two outstanding trade journals in the printing line are "The British Printer," published by Messrs. Raithby Lawrence, 231, Thanet House, Strand, London, W.C., and "Sales and Wants," as previously advised. The latter is the better advertising medium, and the former is the better for trade articles, &c.

Q.—A. STUBBS (Stairfoot).—Route from Barnsley to Cleethorpes?

A.—Your best route from Barnsley to Cleethorpes is as follows:—Barnsley, Wath, Mexborough, Conisborough, Doncaster, Bawtry, Gainsborough, Caenby Corner, Market Rasen, Caistore, Laceby, Cleethorpes. The total distance is 72½ miles.

Q.—H. J. MOSS (Burton-on-Trent).—What inks are used for show-card writing by shopkeepers?

A.—The inks used by shopkeepers, &c., are really composed of paint mixed with turpentine, and to which is added a good percentage of varnish.

Q.—J. E. M. (Clapham).—Please give me particulars for making a scout's tent?

A.—Full instructions for making small Gable Tents will be found in *HOBBIES*, No. 709, which may be obtained from your usual newsagent, or from *Hobbies Ltd.*, 12, *Paternoster Square*, E.C., post free, 2d.

Q.—A. R.—How can I clean a leatherette camera?

A.—You do not state how your camera has become dirty. Is it from grease spots or general use? If the latter, we should advise you to use a soft piece of flannel, and clean it with sunlight soap, but do not damp the leatherette more than necessary. As Neasden is not mentioned on the maps nor in the road books, it will be necessary for you to let us have the name of the nearest town to Neasden, and we shall then be pleased to give you the best route.

Q.—C. W. P. (Bristol).—How can I clean old coins which have become corroded?

A.—If the coins are either bronze, copper, nickel, or brass first clean off all grease by soaking in hot soda water, and then place in a warm solution of sulphuric acid 1 part of acid to 40 parts of water, wash in warm water, when the coins are clean enough. Your other question is answered under "Horticultural."

Q.—HOBBYTE.—Please say what kind of subjects makers like for picture postcards, and what price can be obtained?

A.—Picture postcard makers judge a subject from its selling qualities. The variety of subjects is so immense that it is impossible to name them here, but it would be a good guide if you were to look at the cards exhibited in shop windows. So far as price is concerned each subject is judged by the makers, according to its selling value, and one therefore cannot give you an opinion of the value per negative without seeing the subject. Messrs. Raphael Tuck, White Street, Moorfields, E.C., and the Rotary Photographic Co., 12, New Union Street, London, both publish picture postcards.

Q.—J. H. STROUD (Clapham).—How can I clean blue serge?

A.—The best cleansing agency for blue serge would be either benzene or lump ammonia dissolved in water; the former would be safer, as the other would not be likely to be effected by using same.

Q.—A. E. CARPENTER (Hastings).—How much should I get for volumes of "Japan's Fight for Freedom" unbound?

A.—You should obtain about 20 per cent. to 30 per cent. less than you gave for the unbound volumes to which you refer. The best method of disposing of same would be to approach a number of your friends; otherwise you would have to advertise, and that would cost money.

Q.—W. J. PLAYFORD.—Where can I obtain blocks of cork for making cork models?

A.—You will be able to secure what you require from Mr. A. Dyball, Cork Merchant, Catherine St., Croydon.

Q.—CHARLES W. COLLIER (Demerara).—Could you inform me if a water motor, 1/20 h.p., or 1/5, would drive a Hobbies Lathe and Pretsaw?

A.—We should advise you to use a water motor of 1/5 h.p. to drive the above machine.

E. C. A.—Rub beeswax and turpentine on in a circular direction. Very little beeswax would be required; for a roof 11 ft. by 9 ft., a lb. would be all you require. There are, however, several beeswax and turpentine preparations for polishing floors which would answer your purpose, and which may be obtained from any oil shop. An article dealing with the construction of a meat safe appears in this week's issue of *HOBBIES*, July 17th.

Q.—READER (Hither Green).—How to silver a mirror?

A.—Dissolve 48 grains of silver nitrate in 1 oz. of distilled water, then add sufficient ammonia until the precipitate at first formed is almost dissolved. Filter through a good filter paper and make up to 1½ ozs. with water. Now dissolve 12 grains of Rochelle salt in 1 oz. of distilled water, place in an earthenware jar and heat up to boiling point, add 2 grains of silver nitrate previously dissolved in 1 dram of water; cool the liquid, filter through a filter paper, and then make up to 1½ ozs. Clean the glass with a weak solution of nitric acid, wash, polish, and then level the plate. Mix up the two solutions and cover the glass, which should just previously be rinsed with distilled water and drained, with the mixture. After the silver is thrown down pour off the solution, and pour on another lot to thicken the deposit. To finish, apply shellac and then paint.—H.

Q.—H. HAROLD.—Routes from Birmingham to Hull and Hull to Blackpool?

A.—Your best route from Birmingham to Hull is as follows:—Birmingham, Cudworth, Fazeley, Tamworth, Measham, Ashby-de-la-Zouch, Nottingham, Mansfield, Cuckney, Workop, Tickhall, Doncaster, Thorne, Howden, North Cave, South Cave, Hessle, Hull. The total distance is 145½ miles. Your best route from Hull to Blackpool is as follows:—Hull, Hessle, South Cave, North Cave, Howden, Selby, Hambleton, Pointer Inn, Garforth Bridge, Leeds, Halifax, Hebden Bridge, Todmorden, Burnley, Accrington, Blackburn, Sablesbury Inn, Preston, Freckleton, Lytham, St. Annes, Blackpool. The distance is 135½ miles.

Q.—A. BURGIN (Sheffield).—A cycle route from Sheffield to Birmingham?

A.—Your best route is as follows:—Sheffield, Dronfield, Chesterfield, Clay Cross, Alfreton, Ripley, Derby, Burton, Alrewas, Lichfield, Sutton Coldfield, Birmingham. The distance is 75½ miles.

Q.—J. BANKS (Dawley).—A route from Dawley to Wisbech?

A.—Your best route is as follows:—Dawley, Shipnal (take cross road to the Welling-Lichfield Road), Ivetsey Bank, Galfey, Church Bridge, Lichfield, Tamworth, Atherstone, Hinckley, Sapcote, Leicester, Billesdon, Uppingham, Duddington, Wansford, Peterborough, Thorney, Guyrhine, Wisbech. The distance is 111½ miles.

Q.—A READER.—A cycle route from Harlington to Westgate-on-Sea?

A.—Your best route is as follows:—Harlington, Cranford Bridge, Hounslow, Brentford, Hammersmith, Kensington, Westminster Bridge, Elephant and Castle, Old Kent Road, New Cross, Black Heath, Shooters Hill, Bexley, Newtown, Dartford, Northfleet, Gravesend, Rochester, Clapham, Sittingbourne, Ospringe, Boughton Hill, Canterbury, Sturry, Upstreet, Birchington, Westgate. The distance is 83 miles.

Q.—H. CLEGG.—A cycle route from Rochdale to Redcar?

A.—Your best route is as follows:—Rochdale, Ripponden, Soverby Bridge, Halifax, Bradford, Shipley, Otley, Harrogate, Knaresborough, Boroughbridge, Toppcliffe, Thirsk, Fontine Inn, turn to the right just before Farm, Ormsby, Redcar. The distance is 103½ miles.

WOOD-WORKING

Q.—ARCHIE.—I have four oak spirally-turned bed posts, 5 inches diameter, and 5ft. long. Please tell me what I can do with them?

A.—The obvious answer is to make a bedstead. We advise you to take a good look at some wooden bedsteads which you can obtain access to, and make notes and drawings as to their construction. Then make a drawing of the bedstead you intend to make with any modifications you desire, and send the rough drawing to us for criticism before proceeding with the work. Your other reply will be found under our Electrical heading on this page.

DUBLIN.—The method shown in Fig. 71 for fixing the leg support is quite a common method, and is now usually employed in fixing the legs to photo frames. A little difficulty may be experienced in driving the screws, but if the worker proceeds as follows it will be a fairly simple undertaking. First screw the hinges in position on the leg, then mark or scribe the screw holes for the hinges on the back of the frame. Bore the holes for the screws, and to ensure that the screws will drive freely they should be first driven into the back before attempting to fix the hinges. Then place the leg and hinges on the back over the screw holes, and drive in the screws. It will, of course, be obvious that the screws cannot be driven with a screw-driver in the ordinary manner; the edge of the screw-driver should be used for the purpose; the edge must, of course, be thin enough to enter the screw notch; or the screws may be even driven with a pen-knife.—A.P.L.

Q.—W. E. AARON (Demerara).—1. How can face turnery as design enclosed be executed? 2. How can I dissolve glue in nitric ether?

A.—1. The design you give cannot be executed on a plain turning lathe, but needs an ornamental turning lathe, with overhead division plate, ornamental sliding rest, cutter bar and eccentric cutter. The work is not revolved at all, but the design executed by the revolving cutter. To give full instructions would require several pages of our magazine, so we would refer you to the book dealing with this subject, viz., "Simple Decorative Lathe-Work," by James Lukin, B.A., which can be procured from HOBBIES, price 2s. net. 2. Glue is not soluble in nitric ether, hot or cold. We presume you wish to make a glue for some special purpose. If you will write, and let us know that purpose, we may perhaps be able to give you a recipe.

COINS·CHINA·CURIOS

G. W. T. (Blakeney).—From the letters you give on the sketch of the supposed half-guinea, we conclude that it is a gilt (not gold) token or counter. We think if you will have it tested by a local jeweller, you will find that it is as we state. But without seeing the coin, or at any rate a rubbing, we can tell you nothing more about it, other than that the letters you give are probably abbreviations of some trader's name, the last four letters before the date B.I.R.M. clearly show that the location of the trader was Birmingham. Of course, such a piece is of no value.

H. J. CODLING (Staithe).—None of the coins you mention is of any special value unless in mint preservation, in which case copper coins will be worth about sixpence each. The George III. sixpence of 1817 is, however, of current value only.

HORTICULTURE

W. W. WALTERS (Swansea).—The name is *Asclepias officinalis*.

ELECTRICITY

Q.—ARCHIE (Leatherhead).—Please tell me how to make an electrical body belt for cure of nervous weakness?

A.—The small electric currents given out by "body belts" are absolutely useless for the cure of nervous diseases or complaints, and any cures which have been effected while they have been in use are due to other causes. They might, possibly, be of some use for rheumatic disorders in the region about the belt. For nervous complaints a shocking or medical coil is best, such as the one lately described in HOBBIES, and the current should be applied to the patient through a small bath containing water, or through a metal plate upon which should be placed a moistened piece of flannel. To the plate or bath

should be connected one pole or wire, and the other may be held in each hand alternately, or connected to a flannel covered zinc plate which should be moistened and applied to the back of the neck. If you make the coil and insert for this latter purpose, only use about half the amount of wire on the secondary winding. Reply to your other question appears under "Woodworking."

Q.—J. B. (Brockley).—I have a battery of three Bunsen cells for charging an accumulator, giving six hours' light at a charge at 4 volts, using a metal filament lamp. Do you think the battery would charge the accumulator twice without renewal of solution at the lapse of a month between each charge? The sizes of the elements are as follows:—Jars, 6in. by 4in. (inside); porous cells, 5½in. by 2½in. (inside), carbon blocks, 6in. by 1in. by 1in. and cylindrical zincs.

A.—You do not say the size of zincs, but judging from the size of the pot and carbon, and knowing the size of accumulator. We think the cell should be large enough. The method is rather an expensive one to do a large quantity.

PRINTS·BOOKS·PICTURES

Q.—CONSTANT READER.—Please tell me the value of Gibbon's Rome, 1783, and Virtue's Smollett's Hist. 30.

A.—These are not very valuable. About 1s. per volume, if nice.

Q.—S. E. J.—Please state the value of Cotton's Concordance, 1631?

A.—This is of little commercial value.
E. H. (Paddington).—We fear the pictures referred to by you are of no commercial value.

Q.—J. T. ASPAEN (Bamber Bridge).—Book on French gardening?

A.—The following books are obtainable from Lynwood and Co., 12, Paternoster Row, E.C.:—"French Gardening without Capital," 3d. net, cloth, 9d. net; "French Gardening," by J. Weathers, 3s. 6d. net.

R. ELYES (Barnsbury).—Write to Lynwood and Co., 12, Paternoster Row, London, E.C., indicating what you require, and about what price.

Q.—URIE (Glastonbury).—A book on rose growing wanted?

A.—The following books are obtainable from Lynwood and Co., 12, Paternoster Row, London, E.C.:—"Rose Growing: The Whole Elementary Art and Practice," by D. G. McIver, A.R.H.S., 6d. net; "Roses, and How to Grow Them," by Violet P. Biddle, 1s.

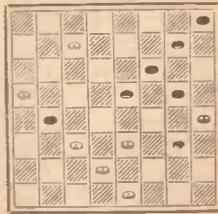
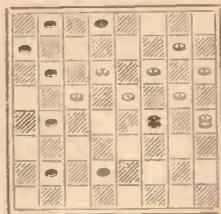
BEGINNER.—You had better obtain a copy of "Modern Photography for Amateurs," one-hilling nett, postage 2d. extra, from Upcott Gill, Drury Lane, London, W.C.

DRAUGHTS.—Continued.

PROBLEMS.

No. 1,135.—By T. HEMBRY, Wellington.
Black.

No. 1,136.—By A. RAE, Edinburgh.
Black.



White.

White.

White to play and win.

White to play and win.

Solutions must reach HOBBIES by Friday, July 30th.

SOLUTIONS.

No. 1,131.—By W. ROBERTSON,
Black: 7, 8, 11, 15, 16, 20, 22. King: 32.
White: 5, 18, 21, 23, 25, 27, 30, 31. King: 2.
18—14 30—22 23 18 15—22 1 17
22—20 21—17 32—23 14 9 W. wins.
30 25 22—13 5 1 13—6
Black: 15, 16, 28. Kings: 21, 30.
White: 14, 17, 26, 32. King: 2.
2 7 21—14 8 26 28—32 26 23
30—23 7 3 16—19 27 24 W. wins.
14 10 14 7 32 27 10—28

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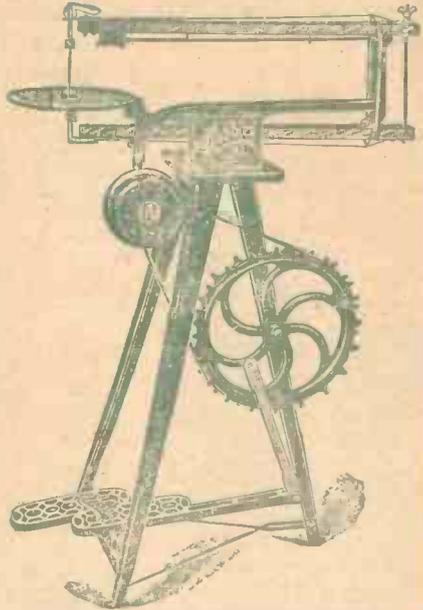
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