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AMATEURS OF BOTH SEXES

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## Weekly Presentation Design.

### SWINGING CHRISTMAS PHOTOGRAPH FRAME.

**T**HE fretworker hardly requires to be told that this is a beautiful ornament. The accompanying miniature shows him this. Photograph frames are always popular, Christmas ones are even more so, but most popular of all is the frame which takes the form of a swing-glass. Here we have the Christmas frame and the swing glass combined, and we have

with back numbers. Additional copies may be had from the publishers, price threepence each.

**FRETWOOD.**—Parcels of selected White Sycamore, for making the complete Frame, may be had for 1/7, or post free for 1/11 per parcel.

**HOLLY SPRAYS.**—Sets of Eleven Gilt and Coloured Metal Holly Sprays (5451), very superior, with green leaves and red berries, specially made for this Design, may be had for 1s. 6d. per set of eleven, post free. These



NO. 577.—CHRISTMAS PHOTOGRAPH FRAME.  
Size 14½ ins. x 9½ ins. x 6¼ ins.

little hesitation is saying that, for Xmas purposes, the design could hardly be equalled.

The oval frame is decorated with the HOBBIES Holly Spray emblems, now so long associated with our designs, and when cut in attractive woods the result is an exceptionally fine piece of work. The oval space might, if preferred, be used for a mirror instead of a photograph.

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sprays have been stamped from a very finely-cut Die. They are all coloured by hand, and when mounted in position, as shown, have an exceptionally handsome appearance. Each Spray is provided with small nails for fixing.

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# FIREWORKS



## A VISIT TO A FAMOUS FACTORY.

By "PYRO."

**I**F you were to visit a fireworks factory you would not see one large building in which the work was concentrated, but you would find instead numberless small wooden huts scattered over many acres of ground. These huts are of two principal classes, viz., mixing sheds in which the firework proper is made, and "expense" magazines where the finished article is dried and stored. In the former class of building, men, women and boys will be found at work engaged in one or other of the various operations which assist in the completion of the popular November 5th Blue Devils and Roman Candles. Not more than four workers are allowed in each shed at one time and, owing to the dangerous nature of the materials used in firework-making, the most stringent precautions are taken to ensure their safety. No one is allowed to enter the shed without stepping into an enormous pair of leather over-boots which are placed just within the door, and each worker, on leaving, takes care that the soles of his ordinary outdoor shoes do not come in contact with the floor. This is to ensure that no grit is brought into the shed containing the explosive materials, of which chlorate of potash and sulphur are two of the principal substances. It is an interesting sight to see the workmen filling tubes of cardboard with the dark powder, and pounding it down with the indifference born of long practice and experience. We stood and watched large gerbs, coloured lights, Roman candles, streamers, rockets, and other mysterious and graceful devices being got ready for the historic "Fifth," soon to find their places in shops in every corner of the country. In one shed, women were occupied in winding the favourite Catherine wheels; in another several men were giving the finishing touches to some small set pieces, while in a larger shed at some distance away, we were shown a great number of barrels of gunpowder stored for use as and when required.

### HOW THE SET-PIECES ARE MADE.

The most costly of all fireworks are naturally the great set-pieces, and Guy Fawkes' Day is responsible for no inconsiderable expenditure in this direction. It has been computed that £100,000 is spent every year in celebrating the Fifth of November, and a large proportion of the fireworks which are let off next week will have come from the Sutton factory of Messrs. C. T. Brock and Co., the leading pyrotechnists of the world. The first operation in connection with a great set piece is the design, and the picture is sketched out and painted in the exact colours and size of the "firework" of which it is the prototype. Estimates are then made of the quantity of wooden laths and cane, of coloured lights, &c.,

which will be required, and then the design is drawn, in sections, in chalk on the floor; over this device, lengths of cane and laths are fastened so that they cover it exactly, and upon this framework the lances or coloured lights in tubes are fastened by nails running through the cane. A long quick-match passes from end to end of the design, and when the firing rockets have been placed in position, the picture is completed. A large set piece of this character may cost anything up to several hundred pounds. No less than 50,000 square feet of framework were used in the construction of the biggest "firework" ever produced—"The Battle of Manilla," which was displayed by Messrs. Brock at the Crystal Palace at the time of the Spanish-American War. It cost £800, and lasted less than three minutes! Yet, it was a magnificent sight, no less than thirteen warships being introduced into the fight, and nearly a mile of coloured lights being used. "The Battle of Trafalgar," another great set-piece, was produced at a cost of over £500, and at each display over fifty thousand coloured lights were employed.

### GREAT FIREWORK DISPLAYS

are arranged at Sutton for almost every part of the habitable globe. Nearly all the important industrial exhibitions which have of recent years been held in Europe—Dusseldorf, Liège, Milan—have had fireworks and illuminations "made in England," and the Kaiser himself has added the now British art of pyrotechny to his many other accomplishments. America came to England to obtain a series of displays in connection with the Columbus celebrations, which were given from the Brooklyn Bridge, and completely dazzled the cute Yankees. In fact, it might almost be truthfully said that firework displays are given "from Greenland's icy mountains to India's coral strand." They reach the most out of the way places imaginable in every corner of the globe. To give an interesting example: Early in 1897 the Blantyre Sports Club considered the best way to celebrate the Diamond Jubilee. Blantyre is the chief town of British Central Africa, and the majority of the white inhabitants are members of the Sports Club. Major Forbes (Administrator of Northern Rhodesia), who is president of the club, promised on behalf of the Chartered Company a donation of £50's worth of fireworks and also agreed to pay all expenses. News came from Chinde, at the mouth of the Zambesi River, about the beginning of June, that the goods had been landed and were on their way up the 360 miles of shallow rivers, Zambesi and Shire, to Chiromo, from where they had to be transported to Katangas by the very shallow canoes for some eighty miles of sandbank and mud. During the whole journey

## HOBBIES.

great care had to be taken to protect the cases from fierce sun by day (the river water is frequently 110 degrees) and heavy dew by night. From Katangas a further journey of thirty-five miles on land commenced, with a rise of 3,500 feet. When duly fixed for display the fireworks were covered with canvas until the time of firing, to protect them from the dew. The operator, who had not handled fireworks for ten years, was assisted by several of the Chartered Company's officials—then the display went off without a hitch.

China, the original home of fireworks, continues to supply us with crackers, but the elaborate devices of modern pyrotechny are quite beyond her powers, and she practically confines herself to the simple kinds of fireworks. Li Hung Chang was dumbfounded when he was taken to the Crystal Palace to see a remarkable display that had been specially arranged in honour of his visit, and he returned to the Far East more imbued than ever with the greatness of the British Empire, as typified by the magnificence of the illuminations which he had witnessed.

manner. We believe that the motor omnibus is almost the only thing which has not yet been reproduced as a fire picture, but as many thousand fretworkers are already cutting a complete model of this vehicle in *lemonwood*, perhaps it has been thought unnecessary to provide a further replica of it in *fire*!

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**DID HANNAH THINK?**—The theorists who claim that animals do not think have to account for the wisdom of Hannah, the pet of the O'Connell family in New York. Hannah is a bulldog and she slept under the crib of the O'Connell infant of a few months. The mother of the family rescued five of her older children from a fire in the house early in the morning, and then thought of the youngest. She rushed back into the flames and smoke to the crib, but the babe was not there. Hannah had dragged the child from the crib and to the door of the room, and was trying to get by the door with her charge to escape from the confusion.



FIREWORKS AT THE CRYSTAL PALACE.

### WONDERFUL FIREWORKS.

Some of the fireworks that are made to-day are remarkable examples of ingenuity and graceful novelty. There are Japanese daylight fireworks for children in which nursery rhymes like "The House that Jack Built" are given in a wonderful series of illustrations, and fireworks exploding into showers of paper figures and india-rubber toys. During a display at Hurlingham this summer, some ladies used their parasols energetically to catch the india-rubber toys and balls which were showered upon them from overhead, and the air was filled with paper animals as varied as the inhabitants of Noah's Ark. One of the most remarkable mechanical set-pieces of the present season is an immense transforming star, measuring nearly 200 feet in circumference, parts of which change, interchange, and blend in colour, and form, while the piece is burning, three kaleidoscopes, the centre of which exceeds 100 feet in circumference. These three beautiful effects continuously change shape and form in an unexpected and fascinating

The intensity of the heat and the blinding smoke was of the degree from which all animals shrink with horror, but the faithful little bulldog had stayed with the helpless infant till she found no one was coming to rescue her charge, and then she thought it was time to take the child out of danger, and she carried out her thoughts to the best of her ability. The fire started in the room in which the dog was with the baby, and both of them were singed before they were taken out. The dog had abundance of opportunity to escape alone, but stayed by the infant, and the doctor who dressed the burns of the child also rubbed a salve on the nose of the dog which was burned while the faithful creature had her grip on the clothing of the infant. That doctor thinks animals have some form of thought, though it may differ from the human way.

No watch keeps perfectly correct time. Even the best chronometers used in observatories and on board ships require regulating according to tables which fix the variations to which all watches are liable.



# JEWELLERY AND TRINKET-MAKING

## V.—CHAINMAKING.

**T**HE principal qualities required in a chain-maker are patience and care; the actual skill needed is not so great as the necessity for careful manipulation. The wire used is usually fine and has to be drawn to the required size through a drawplate. The drawplate illustrated in the first article of this series contains a number of graduated holes, and the wire is placed in the next hole smaller to the one through which it will easily pass, and is pulled through, becoming longer and less in diameter in consequence.

We will first take a length of wire, say about 24 inches and sharpen one end, and next place the drawplate in the vice with the countersunk holes at the back. Now place the pointed end of the wire through the hole and pull it through with the pliers. Fig. 1 shows a section of the drawplate with wire in position. File up the end again and

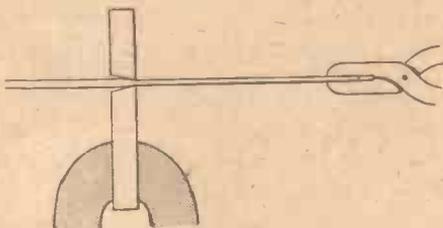


FIG. 1.

insert into the next hole and continue until the wire reaches the required diameter. It will be necessary to grease the wire, and the best way is to use ordinary beeswax, rubbing it along the wire before drawing it. It will also be advisable to anneal the length once or twice during the process of drawing, if it has to be much reduced. The annealing should be carefully done, rolling the wire into a band and tying up the ends with binding wire to prevent them melting when held in the flame.

Before leaving the operation of wire-drawing it will be useful to point out that a half-round wire may be drawn with an ordinary drawplate in the following way. Take two lengths of wire, flatten a few inches of each and taper off the ends, place them together and insert in a suitable hole. Before pulling the two pieces which should be tightly held together in a hand or pin vice, place a knife at the back of the drawplate, separating the two pieces. If the wire is kept straight, it should pull out in two semi-circular lengths. In the same way a quarter-circle or third of a circle may be drawn, providing the necessary dividing division can be devised and

placed behind. For fligree work, and in cases where wire of particular shape is required, specially made draw-plates may be purchased, but much work may be done with the ordinary plate described above.



FIG. 2.

Having drawn a length of wire, we may proceed to wrap it round a suitably-covered mandrel, as shown in Fig. 2, and after burning the paper off, remove the coil of wire, and carefully place in vice, or otherwise securely hold it and saw across the rings. We have now a number of round rings which we can practise with. Take one of the rings, cover the cut portions with borax solution, press together, place on the block with a small snip of solder, and then play the blow-pipe flame on until the solder runs. Practice will soon show how much solder is required for each joint, for too much will leave an uneven lump at the joint, but the correct amount of solder may be so accurately gauged that the ring will be well soldered without any unevenness, while at the same time it should be difficult to see exactly where the joint is. Having made one ring, take another and place the soldered one inside. Cover the joint with borax, close up and solder again; being very careful that the joint in the first ring is as far away as possible, and that the blowpipe flame is limited to the exact surroundings of the joint in hand. When a few links have been soldered up satisfactorily, the worker may attempt other varieties of chain, and will always find it advisable to make a few experimental links for any chain before commencing on the actual work.

### LONG LINKS

are made by taking in the place of the round mandrel, a strip of thin metal, according to size, and truing up to shape, covering with a layer of thin paper as in the case of ordinary round mandrels. Such mandrels as these have nearly



FIG. 3.

always to be made to sizes required, but should be most carefully done.

Oval mandrels, if not too small, may be purchased, but for very small links, a short length of wire should be drawn through a suitable oval hole in a drawplate.

Twisted wire links are often used in com-

bination with others, and are made from wire twisted as described in a previous article. The wire in this case has usually to be fairly small, and should be carefully drawn and annealed first



FIG. 4.

and tightly twisted. The soldering of twisted wire links will prove somewhat troublesome, as the wire is very apt to run along the twist; this may be avoided by covering the link with whiting and leaving only the two surfaces of the joint exposed. This method of covering the work with



FIG. 5.

whiting, which should be placed on in a creamy state and allowed to dry, will be found very useful, and should be remembered in any case where the solder will not run just where it is wanted.

There are so many varieties of links and such a large number of combinations of them in making up chains that it is impossible within the scope of this article to describe them all. The most

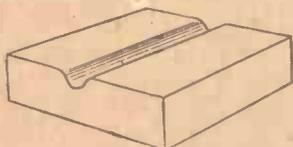


FIG. 6.

useful kinds are those known as the round link, oval link (described above), the Fetter and Ring (Fig. 3), the Curb (Fig. 4) and the Fetter and Curb (Fig. 5). The fetter link is made on a flat mandrel, but the curb, made in the form of a bent oval, is usually machine made, but may be made by placing an oval ring on a grooved stake (shown in Fig. 6) and striking it into the groove, the link being placed across the groove, so that the line (shown in Fig. 7) coincides with the groove.

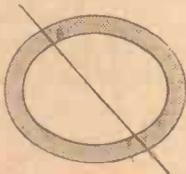


FIG. 7.

In many cases it will be found advisable to introduce a fancy chain, and here the ingenuity of the jeweller will be called into use by experimenting with the many different links he may manufacture; it will be possible to make up a new arrangement of links to meet the particular case.



FIG. 8.

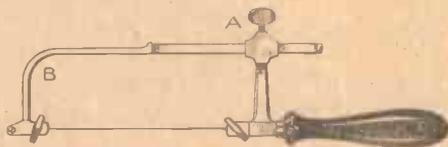
A very useful double link, which may be made with or without solder, is shown in Fig. 8. The wire should first of all be bent, as shown in Fig. 9, and then held in the pliers and twisted up, the ends being nicely fitted round the main stem. These links, in order to get them uniform, require very careful work and the exact shape of the



FIG. 9.

bend and length of wire used in the first one adhered to all through. The twist given to round and oval links and fetters is very effective in making up chains, but the great difficulty is to get uniformity, and the worker will be advised in cases where a considerable length of chain is required to buy the chain made up in the rough and finish it himself, for the making of long lengths of chain is apt to become monotonous.

**A JEWELLER'S SAW FRAME.**—We illustrate here the correct form of saw-frame used for jewellery making. This tool is, of course, almost as essential to the jewellery worker as the hand-saw is to the fretworker. The saw-frame we have received from Messrs. Calipe Dettmer and Co., of 21, Poland Street, W. The frame is about 10½ inches long, and holds an ordinary 5-inch metal-cutting fret saw-blade. The handle is of wood, the metal part being of bright steel. The saw-blade is held in the usual way with effective clamps, and the



necessary tension can be secured by means of the screw A which adjusts the sliding back of frame. The curve at B affords the necessary play, and between the saw and the frame-back is a clear space of two inches. From the illustration it will be seen that the sliding back may be adjusted so as to permit the use of broken saws down to about 2½ inches in length. Amateur's jewellery-making outfits are comparatively inexpensive, and beginner's sets may be had for the matter of half-a-crown. For five shillings a complete outfit, including saw-frame, benzoline lamp, blowpipe, jewellers' hammer and all other essential articles, may be had.

## Correspondence.

### STAMPS.

J. H. (Paddington).—We will endeavour to illustrate the two dies of the penny red English in an early number. (2) The English stamp posted in Belgium would have no actual cash value, but is worth keeping as a curiosity.

### MISCELLANEOUS.

- E. B. (Ilford).—Many thanks for information. Printers are necessary evils; mistakes will sometimes occur even with the most careful management.
- B. C. M. (Winslow).—Your letter has been read by us with much interest.
- W. A. (Keighley).—Any French magazine can be obtained from Messrs. Hachette and Co., King William Street, Strand, London, W.C. One of the best and latest of the illustrated monthlies is "Je sais tout," the price of which we believe is one franc. A weekly humorous magazine, printed in colours, is "Le Rire," price five centimes. It has an enormous circulation throughout France and Belgium.
- O. J. S. (Bridgend).—Beads for making beadwork can be obtained from Messrs. Wakeford Bros., King's Road, Sloane Square, London, S.W.
- B. BODLEY (Wolverhampton).—If the periodical volumes of abstracts of patent specifications are not taken in the Wolverhampton Public Library, you would be able to see them at Birmingham Free Library.
- H. F. (Hamilton).—We think that 1/4 small line advt. in HOBBIES would be likely to bring you into communication with reliable breeders of fancy mice.



## A Writing Table and How to Make It.

**W**RITING table such as is illustrated in Fig. 1 forms a useful piece of furniture, and is suitable for placing in any room where a table of this description is required. As far as construction is concerned there is nothing in the table which may be termed out of the ordinary run of the amateur workshop and all the joints are of a simple nature. The table-top measures 3ft. by 1ft. 6ins. and should be 2ft. 3ins. from the ground, although if the article has to be made for individual use, it is advisable to make it to a comfortable height which may vary with the person's taste.

The number of pieces required to make the table is few, their sizes being as follows:—

*Base.*—Four legs turned from stuff measuring 2ins. by 2ins. by 2ft. 2ins.; two front rails, each 2ft. 6ins. by 2ins. by 1in.; one back rail 3in. by 6ins. by 2ft. 6ins., two sides 3in. by 5ins. by 1ft. lin.; two side rails 1in. by 3ins. by 1ft. lin. one top and one bottom centre drawer rail each 1in. by 3ins. by 1ft. 2ins., one drawer partition 1in. by 4ins. by 10ins.; one partition "facing" 1in. by 2ins. by 6ins.; one top, two sides each 1in. by 2ins. by 3ft.; two ends 1in. by 2ins. by 1ft.; and one centre board 1in. by 1ft. by 2ft. 6ins. In the construction of the ornamental-top portion the following parts will be required, viz.:—Two end uprights 1½ins. by 1½ins. by 6ins.; two centre uprights 1½ins. by 1½ins. by 9ins.; two side panels ½in. by 7ins. by 8½ins.; one centre-panel ½in. by 2½ins. by 1ft. 3ins.; and one shelf 6ins. by ½in. by 2ft. 10ins. The fronts of the drawers are ¾ inch thick, the sides and ends being ½in., while the bottoms can be cut from 3-ply birch panelling which can be obtained very cheap and in useful sizes for cutting up. There will also be required a couple of turned-wood spindles, a pattern for which is shown in Fig. 2. In all the sizes given above no allowance has been made for tenons, or for trimming and cleaning up, so that the worker will have to take this into account when cutting the various parts.

The four legs of the table are turned, an out-

line of the pattern being shown in Fig. 3, the top portion marked "A," being left square for a distance of 7 inches in order to admit of the rails being tenoned into the legs. Fig. 4 is a sketch of the lower carcase of the table, the two front rails which go to form the openings for the drawers being tenoned into the legs, the centre upright piece being tenoned into the rails. The two sides are each made up of two pieces, viz., one rail and one panel, the rails projecting inwards a sufficient distance to admit of their being used as drawer runners, while both rails and panels are tenoned into the legs. The panel of the back is in one piece and is also tenoned into the legs. In order to form the centre runners for the drawers it will be necessary to tenon the two rails mentioned in the list of pieces into the top and bottom front rails and also into the back panel and between the top and bottom drawer runners the draw division runs, this being glued and bradded into position. Strips of 1in. by 1in. stuff back to be glued on the inside of the side drawer runners, in order to keep the drawer straight while it is being taken in and out, these pieces being tech-

nically known as drawer guides. It is assumed that the reader is conversant with the correct methods of constructing drawers and therefore we shall not detail this part of the work. The carcase is now complete and the construction of the top board can receive attention. This has to be covered in the centre with real or imitation leather, an operation which is termed "table lining" the lining or leather being fixed to the wood by an adhesive and afterwards bordered with a plain or gilded design. The work of lining a table requires skill and dexterity besides the proper tools, and it will be found more satisfactory to place this in the hands of a professional "liner" who will supply both material and labour at a nominal cost. That part of the table top which contains the leather has to be sunk, and in order that the woodwork may not warp, the polished border of wood which surrounds the leather, in this case to a depth of 2½ins., should be made up in the form

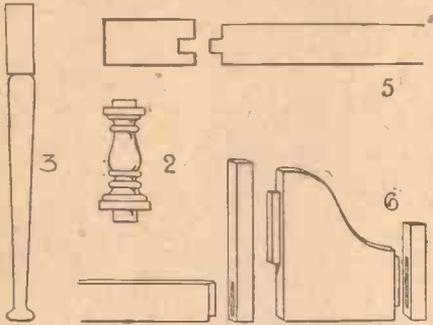


FIG. 1.

# HOBBIES.

of a framework, using mortice and tenon joints at the corners and grooving the centre board (which should be flush with the underneath of the table top, and  $\frac{1}{8}$  in. below the level of the outside framing) into the stiles and rails, this method of construction ensuring an absolutely

and also into the table top, prevent the shelf from bearing down under weight. The opening above the shelf between the two centre uprights is filled in with a short curtain of pleated pongée



FIGS. 2, 3, 5 AND 6.

firm top. Fig. 5 shows section of one end of table top and describes method of grooving centre board into framing. The table top is fixed to the lower carcass by means of screws driven through from the underneath of the top-front rail, and from the inside of the side and back panels, the screws in the latter case being run in an oblique direction. In fixing the top it should be noted that the back finishes flush with the back of the lower carcass, while the sides and front project a distance of one inch beyond the level of the outsides of the legs.

We now come to the construction of the top ornamentation, and from Fig. 6, which is a sketch of one-half of the top framing separated up in order to show methods of jointing the various parts, it will be seen that the back is made up of two side and one centre panel, the former having ornamental openwork tops, and two long and two short stiles or uprights, the sizes of each of the parts being given in the lists at the beginning of this article. Fig. 7 shows pattern of fretted side panels, while Fig. 8 is an

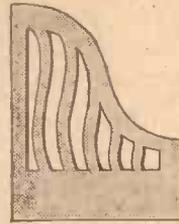


FIG. 7.

outline of one-half of shaped shelf, which depends for its support at the back by running on to the top of the centre panel and being screwed through from the back of the side panels, and at the front, the two turned spindles, which are illustrated in Fig. 2, and have  $\frac{3}{8}$  inch dowels turned on their ends to fit into corresponding holes bored into the underneath of the shelf

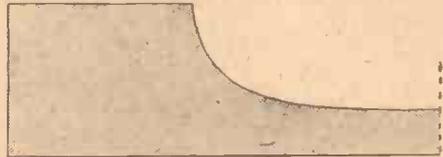


FIG. 8.

## LIST OF ILLUSTRATIONS.

- Fig.
1. Writing table complete.
  2. Turned spindle for supporting shelf.
  3. Pattern of turned legs.
  4. Framing of lower part of table.
  5. Section of part of table top shewing method of grooving centre into framing.
  6. Half of back framing, shewing method of jointing.
  7. Pattern for fretted side panels.
  8. Half of pattern of shelf.

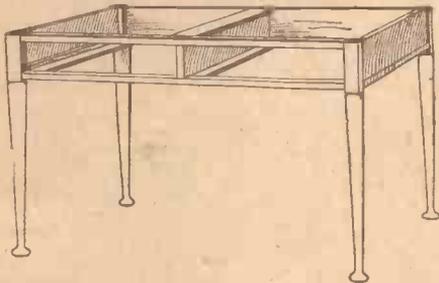


FIG. 4.

outline of one-half of shaped shelf, which depends for its support at the back by running on to the top of the centre panel and being screwed through from the back of the side panels, and at the front, the two turned spindles, which are illustrated in Fig. 2, and have  $\frac{3}{8}$  inch dowels turned on their ends to fit into corresponding holes bored into the underneath of the shelf

SMALL sponges of good quality are very useful in a dark-room. They may be used for a great many purposes, such as, for example, the cleaning of beakers and the corners of dishes, and the mopping up of chemicals which have been accidentally spilt. A sponge, too, is useful for removing superfluous backing when preparing backed plates, or for applying mountant to the backs of prints. It may also be used instead of a brush in local development. Needless to say that sponges used for a purpose should be kept for that purpose, and not used for other things. They should also be thoroughly cleaned after employment, and not allowed to dry with the chemicals, &c., still in them. This would quickly spoil the sponge and render it useless for photographic purposes.

EACH man-of-war is built upon paper before a single plate of steel is forged. Not only are the length and breadth of a ship decided upon, but the naval constructor can tell to an ounce how much water she will displace when her armour and guns are mounted upon her, how many times her propellers will revolve in a minute with a given pressure of steam, and how many tons of coal an hour must be consumed to attain a certain rate of speed.



# LADIES - WORK

## More About Cretonne Crockery.

(Continued from Last Week's No.)

**I**N our next illustration (Fig. 4) we have a piece of crockery that is rather more elaborate than the examples we have already given. It represents a straight-sided jug in shape and is dignified with a spout and a handle, both of which, it must be confessed, will add something to the troubles of the amateur. The jug is made up somewhat on the principle of the drain-pipe already described so far as its body is concerned, but the spout has to be made in the cardboard tube before the cover is put on.

The shape of this detail is given in the diagram in Fig. 5. The sides marked A A have to be joined to the body of the jug, the upper edge of the spout being indicated in the diagram by the letters B B. The damping and warming process will have to be resorted to in order to get the spout to fit properly into each edge of a slit made for it down the foundation of the jug. The edges of the two pieces of card—the jug and the spout—may overlap slightly and they should be held together with stitches of strong thread which can afterwards be strengthened with a little gum.



FIG. 4.—JUG-SHAPED HOLDER FOR HAT PINS.

The cretonne cover for the spout can be cut out from the model provided by the cardboard detail. A slit to receive it must be made in the cretonne and the raw edges turned in and neatly sewn together. The insertion of the spout will remind many workers of that of putting in a gusset in plain sewing. In other respects the making of this jug requires no detailed instruction until we come to the handle.

The method of making this must be slightly varied according to whether the jug is large or small. If the former it is well to use ribbon wire, or feather-bone, by way of foundation for the handle, but if it is quite small, a strip of ordinary cardboard will answer all the purpose, as it is not required for actual use. The foundation, whatever it be, must be covered smoothly and neatly on both sides with the

cretonne and attached with strong stitches to the side of the jug in the position shown in the sketch. It will be noticed that the handle is here rather large and reaches from the top edge to the base.

When once the amateur worker has made one such jug successfully from these directions, she has but to look round the house to find other models that differ somewhat in shape if not in the general principle of construction. Plain tube-shaped vases, without any spouts, may be made very prettily with two short handles whence hang little rings of coloured cord. Others may have two spouts, one opposite the other, and from the upper edge of each of these may start a short but well bowed-out handle, that will make a really elegant form of vase. Indeed, there is a large number of vases of ordinary and simple classical shape that may be very successfully reproduced in cardboard. Some of these may be made large enough to serve as wastepaper holders, or for containing good-sized pieces of needlework, stores of wool or discarded small articles of lingerie. Everything in their appearance will depend upon their resemblance to pottery, so the greatest care must be exercised in the choice of the material for the cover. Sometimes it is possible to find a blue and white cretonne that bears a very near resemblance to dragon china when it is made up, the Chinese willow pattern is also produced in this material and some of the old Indian chintz designs lend themselves remarkably well to our purpose.

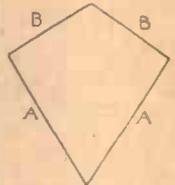


FIG. 5.—SPOUT FOR JUG IN FIG. 4.



FIG. 6.—A FERN HOLDER.

Our next illustration (Fig. 6) gives some idea of a very pretty cretonne vase that may be modelled after some of the inexpensive metal jars that are sold now for holding small pots of ferns. A vase of this sort may be made quite

## HOBBIES.

large, or so small that it will contain only the smallest size of flower-pot. Needless to say, the cardboard foundation will not stand damp so the plant will have to be taken out when it requires watering.

The make of the vase as shown in Fig. 6 is by no means complicated. It is built up of a base (Fig. 7) and four side pieces of which one is given in Fig. 8. These are covered with the chosen material and sewn together in the usual way. If the vase is specially destined for a flower-pot holder, it is a good plan to line the sections with American cloth which will prevent the cretonne from becoming stained with damp. It will be found more convenient to fix these linings into place with seccotine than to attempt to sew them. If it can readily be obtained, American cloth that matches the chief colour of the cretonne should be used, as it will add to the general ornamentation of the whole thing. White oil-cloth may be employed if the coloured is not to be had.

Our fern-holder is made still more decorative by the addition of four brass knobs to serve as feet. If the jar is of a sufficiently large size to admit of the weight of these, the small brass balls often screwed on to wooden boxes will answer the purpose. They may be slipped along

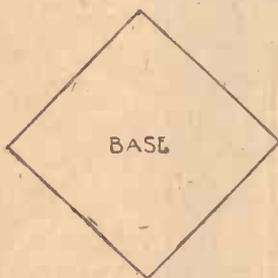


FIG. 7.—BASE OF FERN-HOLDER.

the edge of the angles of the vase before the sections are sewn together, and a few stitches taken over the screw portion of each foot will hold it in shape and will not be visible. Everywhere the sewing must be strong, but as neat as it is possible to make it.

Another and a very good way of arranging the feet if the vase is small, is managed with the help of four round-headed hat-pins all exactly alike. The pin part must be snapped off to a length of about an inch-and-a-half. The fact of its being blunt will not matter in the least, for it has to be sewn to the edge of the cretonne-covered card in the way already described. To prevent the pin from slipping out of the stitches that are intended to hold it, a few touches of seccotine may be put here and there among the stitches. The slightest impediment of this kind will do away with the natural slipperiness of the pin. It will be noticed that the fern-holder as sketched in Fig. 6 is dignified by the possession of a couple of handles. These may be made in exactly the same way as are those already described; that is, with a stiffening of feather-bone, wire, or merely of cardboard, according to the size and weight of the holder. They will greatly improve its appearance and rings may be added, if desired.

Those amateurs who are possessed of artistic powers and can draw as well as paint a little

may make quite elegant vases covered with dull red linen upon which they have sketched bold and effective designs to be covered in with black paint. Some of these may be in the style of the ancient Greek and Etruscan patterns, but if the figure patterns are beyond her powers

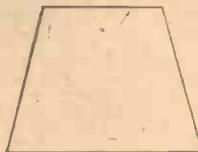


FIG. 8.—DETAIL OF FERN-HOLDER.

the amateur must be content with the best effects she can gain with plain bands and dots and simple running designs of the desired colour. Wedgewood china may be imitated in a similar fashion, but requires to be carried out with more delicate materials than the red pottery, or it will be too coarse to deceive anybody.

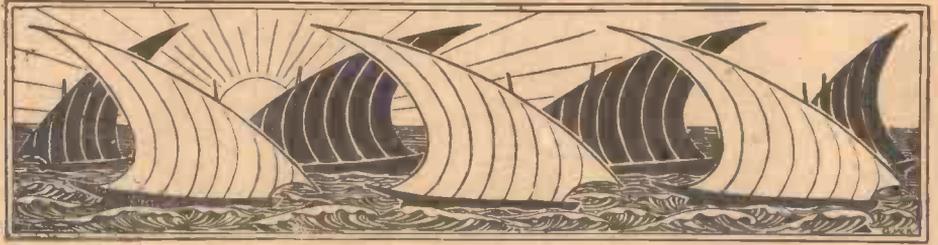
A good deal may also be done to improve this imitation crockery by the addition of gold paint. This may be applied in the form of lines, with dots and spots in between them. Or, it may be sprinkled among the details of the pattern in the form of solid blotches wandering off at the edges into a mere sprinkle of the metal. This will remind our readers of the way in which lustre paints are used in Chinese and Japanese lacquers.

Yet another variation can be obtained by carrying some very fine greyish lines in and out between the details of a floral pattern to make a likeness to crackle china. This will look specially well if the sateen, or cretonne, has a design representing almond, or cherry blossoms sprinkled over the ground. All this will tend to show the amateur what a vast field is open for the exercise of her powers in the making of cretonne crockery provided only that she has taste and skill to guide her. Failing these, she will have to be content with the mere sewing together of covered cardboard shapes, leaving practically the whole effect to be given by the shapes and by the cretonne or sateen that she has used. Even then she may produce some exceedingly novel and pretty trifles, and she must be prepared to put into them the best workmanship of which she is capable.

A CURIOUS mode of catching turtle is practised in the West Indies. It consists in attaching a ring and a line to the tail of a species of sucker-fish known as the remora. The live fish is then thrown overboard, and immediately makes for the first turtle he can spy, to which he attaches himself very firmly by means of a sucking apparatus arranged on the top of his head. Once attached to the turtle, so firm is his grip that the fisherman on drawing the line brings home both turtle and the sucker. The latter is then ready for a new excursion.

IN Abyssinia it is considered a crime to smoke. The law forbidding tobacco was at first intended to prevent priests from smoking in church, but it was taken too literally, and nowadays even foreigners have to be careful not to be seen smoking.

BLUE coral, which is probably the most precious kind, is fished up in the Bay of Benin.



## Notes of the Week.

**R**ECALLING last week's Double Number of HOBBIES, we may remind comparatively new readers that copies of this special number, with its large presentation sheet of Christmas fretwork designs, may still (for another week) be had for twopence. Our ordinary presentation designs are never given away with back numbers—that is, they are only included with copies supplied during the week of issue. When a new number appears, the designs for the previous week are all withdrawn, and can afterwards be had only for threepence each. In the case of Double Numbers, however, the privilege of securing a sixpenny design with a twopenny copy of HOBBIES is extended over a second week. Thus, until November 10th, the Double Number, complete, is still on sale. After that date, the sheet of Christmas designs will revert to its real price of sixpence.



Did any reader—especially any fretwork reader—omit last week to ponder over the announcement which appeared under the heading "One Thousand Guinea Treadle Fretsaws to be Given Away?" If so, he should at once hunt up his last HOBBIES, or else turn to the somewhat similar announcement which appears on an advertisement page this week. What, in a word, we really want, is to get seven thousand new fretwork readers before December 31st, and in order to secure these we must have the active help of one thousand present readers. A guinea treadle fretsaw will be given to each of these thousand who gives us the help we ask. We need not here repeat the details of the scheme. These were given fully last week. The scheme is in no way a competition. We have at present

in contemplation plans for the coming year which will be of great advantage to fretwork and other readers, but in order to make these plans practicable we want from five to ten thousand new fretwork readers. If we get help from present fretworkers, we are willing to pay for it. The reader who offers to help us has, of course, to spend some time and take some trouble, but for this we make him a payment of a guinea treadle fretsaw. He has himself no outlay to make, and as the treadle fretsaw is sent carriage paid to his door he incurs no expense whatever. If, in spite of his best efforts, he is unable at the last moment to bring us the seven new fretwork readers we ask him to get, and can only get six, or five, or even four, we will send him a proportionately handsome present. What we ask is not much, however, and the full payment is well worth having.



We find we omitted, a month or two ago, to mention that Mr. J. Beers, of 16, Kinahan Street, Dublin, was fortunate in securing the first fretwork prize, for his Nelson Column Model, at the Industrial Exhibition held at Ballsbridge in June. For this honour Mr. Beers has been awarded our special prize of a copy of



THIS WEEK'S DESIGN (NO. 577) USED AS A MIRROR INSTEAD OF AS A PHOTOGRAPH FRAME.

HOBBIES delivered weekly at his address for one year.



We illustrate here an alternative treatment for the present week's design. Instead of being used as a photograph frame, it can be made up as a mirror—an oval silvered plate being substituted for the clear framing glass. On the whole, however, we prefer the photograph frame treatment, which, moreover, will likely be the more popular.

The Collie.

(Continued from page 91.)

**T**HE eye is only a small part of the Collie, but is of the utmost importance, for it is the shape, colour and setting of eye that gives that keen, alert, and intelligent expression so much admired, sought for, and so seldom obtained.

The eyes should be small and of an almond shape, and set obliquely in the head. A full or staring eye is fatal to the desired expression; a light eye, too, is detrimental in the same degree. The eye should be dark brown in colour and show no haw. In Blue Merles blue or wall eyes are the correct thing, and add considerably to the appearance of this very pretty, but somewhat neglected variety of the Rough Coated Collie.

Some fanciers, in looking over a Collie, seem only to notice three points, viz., Head, ears, and coat, and no doubt frequently wonder why a judge puts a dog back which in their eyes is entitled to more recognition in the judging arena; but the critical eye of the practical judge looks all over the dog, and places, or should do, the utmost value on a good set of legs and feet. And if a dog is a cripple, cow hocked, and a bad mover, he penalises him accordingly; and justly so, for the great essential in a sheep dog is a free and racy movement, and a dog which cannot move with grace and freedom is not built properly for this breed.

The fore legs should be straight, and not too wide apart, and set flat on at the shoulder, and must not show the elbow and shoulder turned outwards. They must be muscular and fleshy at the forearm, with a fair proportion of bone, without being clumsy. The pasterns should show elasticity without weakness. The feet should be oval and cat-like, the toes arched and close together, not spread out; they must be well padded and hard underneath.

The hind legs play an important part in the action and symmetry of a dog. The stifles should be well bent, the thighs very muscular, the hocks must not be set too high up the leg, but low down, and full of strength and propelling power. The hind feet, it will be noticed, are slightly longer and flatter than the front ones, which is correct.

A common fault is cow hocks, which is a very serious one, the hocks converging inwards, until they sometimes almost meet. No dog with this fault can be a graceful and free mover.

The coat, or coats, consist of a top coat of hair and an under coat of soft furry wool, which

should be so dense as to almost hide the skin; a full coated dog of this nature could withstand continuous rain and never get his skin wet.

The coat should be most abundant on the frill, neck, mane, and cape, with long feathering on the chest and hind legs above the hocks.

The feathering on the fore legs should not be too long, yet must be fairly so. We hear much of the "texture" of coat. This is a wrong term, as the harsh texture of the coat can only be felt when the under coat has been cast. A dog in full coat feels soft to the touch rather than harsh, as the under coat holds the top coat up, and the coat becomes more pliable. The hair on the brush should be very profuse, and forms a very pleasing feature and a good finish to this the most graceful dog ever bred. A few minutes grooming daily will keep a Collie in good form.

It is extremely difficult to define in words the general outline and symmetry of a Collie, but it may be summed up in one word, "Type." A well-balanced dog should be typical all over.

A Collie should show speed, activity, and high intelligence, and be quite free from cloddiness.

The brush should be profusely covered with hair, and hang with a graceful curve at the end, which helps to complete that line of beauty spoken of previously. It is natural for the tail to be curved higher when the dog is excited, but it must never be curved over the back. The tail should hang quite straight, and not be twisted or screwed in any way.

The body must be of a fair length in the couplings, with ribs well sprung. The frame

of being well-knit together, compact, and yet not heavy. Dogs should not be of excessive size and weight; still, as few show Collies are used for sheep dog work (although many are perfectly efficient), the show dog must possess sufficient size to hold his own in the ring. A dog might be considered quite large enough if he stands anything over 24 inches at the shoulder, and scales (in good working condition) 55 pounds.

A bitch should stand about 22 inches, and weigh from 40 to 50 pounds; yet weight must always be to a certain extent deceptive, as a small dog may be so heavy with fat as to be altogether unfit for show or work.

The Smooth Collie, which is a very charming variety of the Sheep Dog, has made very rapid strides in popular favour, and deservedly so. It is identical in shape and points as his rough-coated relative, and only differs in coat, which must be "hard, dense, and quite smooth."



SABLE AND WHITE ROUGH COAT COLLIE.

LETTERS written on linen or woollen materials with sloe-juice will not wash out.



# POPULAR MECHANICS



## How to Tune a Piano.

(Continued from Page 82).

**A**GAIN there are many instruments in which the first octave of lower notes consists of single strings wrapped round with stout copper wire, the second and third octaves are strung with two wires for each note, while the succeeding octaves have three strings to each note. Now it is very evident that in striking a note on a bichord or trichord piano, although the ear will instantly detect by the peculiar waviness of the sound produced, that the note is out of tune, it is not immediately evident which of the two strings is out; and this observation applies with greater force in the case of a "trichord." In many instruments of the cheaper class, it will be found, on applying the soft pedal, a kind of blanket is lowered between the hammers and the strings; in the better class instruments the pressing of the soft pedal shifts the action bodily about  $\frac{1}{4}$  in. forward, so that the hammers no longer strike on two or three strings, but upon one only. In instruments of this latter class it is easy enough, by gradually depressing the soft pedal and continually striking the note at the same time, to ascertain which string (if any) is out of tune; but in any other case the operator will do well to insert the wedge of his damper between two of the strings, leaving one only undamped and free to vibrate.

He will carefully tune this string by screwing up very gradually and carefully (or by unscrewing, using the same precaution) the wrench pin, by the aid of the tuning key, until the note it gives forth is absolutely identical in pitch with that elicited from the tuning fork, when struck. There should be no wave perceptible, both sounds should coalesce and be undistinguishable the one from the other. When this result has been obtained, we move the damper one string forward, and so permit the next string to vibrate; this second string we now tune by screwing or unscrewing until it agrees perfectly with the first string, which we tuned from the fork, and lastly, if the instrument be a trichord, we remove the damper from the third string and tune that in a precisely similar manner, employing the first two strings as guides to the determination of the pitch of the last. The damper should be pushed in between the hammer shanks, seen from the front of the instrument; but should not be inserted between the hammer shanks of the notes about to be struck, but obliquely, somewhat to the right, otherwise its stick will get in the way of the hammer of the note struck, and thus prevent it sounding.

By working in this manner the operator will have succeeded in tuning the middle C of the pianoforte, and from this using the tuned note



as a guide, he will proceed in precisely the same manner to tune C<sub>1</sub>, one octave below. The greatest care must be taken not only to screw up, or to unscrew, the individual strings which constitute any given note, until they produce absolutely one sound only, with no indications of waviness, but also to use the same care in tuning any note from its octave above or below, until when both notes are struck together one single sound only may be heard. From the lower C just tuned, but proceeding in precisely similar manner, string by string, until both strings (in the case of a bichord), or all three strings (in the case of a trichord), are in perfect union, the operator tunes the middle G. This will present no difficulty to anyone who has a fairly accurate ear, and the tyro would do well to practise often whenever opportunity offers, to sing or whistle this interval of the fifth, and testing after having made the attempt to sing or whistle this interval, either from C, D, E, F, or from G, whether the note that he has attempted to produce as a fifth to the lower note he has struck on the piano corresponds accurately to the sound emitted by the piano when the test notes G, A, B, C, D, &c. are struck. We place stress on this point because the plan we are here recommending for tuning a piano is based entirely on the power of appreciating correctly the intervals known as the fifth and the octave. We must here point out, that if we were to attempt to tune any instrument in *perfect fifths*, starting from any given note, and continue so doing until we reached a note of the same name as that from which we started, we should find that the note last tuned instead of being a true octave would be disagreeably sharp on the note which was originally used. This would take place on reaching the 13th fifth. It is, therefore, necessary in tuning "up" from any given note, in fifths, that the upper note should come out a trifle flat; or, to speak more accurately, until the ear detects a distinct wave of 2 beats per second when the two notes are struck together. The proper way to effect this is to tune one string of the upper fifth absolutely correct, and when this object has been attained, to lower

it gradually until the 2 waves or beats per second are distinctly recognisable. The other string or strings are then brought into unison with the one just tuned, the lower or starting note not being struck at all. From this G, the G<sub>1</sub> is now tuned as an octave which must come out perfectly true, without any burr or wave whatever. From this G<sub>1</sub> we proceed to tune the middle D, which being a fifth above this G<sub>1</sub>, must be treated as before described to ensure it being a shade flat, by producing the 2 beats or waves per second. In precisely the same manner we tune up from this last D to the A above, and from this A to the A below (A<sub>1</sub>) as an octave. From this lower A, we tune as a fifth to the E above, using always the same precautions with regard to flattening slightly the upper note after having firstly obtained a perfect fifth. When this has been done, we can strike three trial chords to test the correctness of our work, viz. :—(G<sub>1</sub> C<sub>1</sub> E), (C<sub>1</sub> E<sub>1</sub> G<sub>1</sub>) and (A<sub>1</sub> C<sub>1</sub> E) when these chords should come out with a smooth sound, no one of the components standing out more prominently than the other. These trials being satisfactory we tune from E to B above, and thence to B below (B<sub>1</sub>). Returning now to our middle C, we tune the middle F, first as a perfect fifth, which we afterwards sharpen slightly so as to produce the "2 beat per second" effect. It will be noted that as we are tuning to a fifth below, we obtain this result not by flattening the upper note (which is already in tune), but by sharpening the lower one. From this middle F we tune as a perfect octave the F below (F<sub>1</sub>). We can now make another trial by striking (F<sub>1</sub> A<sub>1</sub> C<sub>1</sub>), (C<sub>1</sub> F A), (D F A), (G<sub>1</sub> B<sub>1</sub> D), (B<sub>1</sub> D G), (B G D) and (D F G B). If the operator finds that all these trials produce smooth chords, he may proceed; if not, he will correct his work by going over it again. Presuming all to be right he will tune downwards from the middle F to B<sup>b</sup>, thence to the B<sup>b</sup> one octave above. From this B<sup>b</sup> he proceeds to tune the E<sup>b</sup> one fifth below it, using the same precautions, as already recommended, to produce the 2 beats by sharpening the lower fifth, after having in the first place tuned it to a perfect fifth. The tuner will bear in mind that in tuning *ascending fifths*, he will always have to flatten the upper note by 2 beats, while in *descending* he will have to sharpen the lower note to the same extent. From this E<sup>b</sup> he tunes the A<sup>b</sup>, and from this again the A<sup>b</sup> one octave above. At this point a few more trials should be made, and the chords (E A<sup>b</sup> B), (A<sup>b</sup> C<sub>1</sub> E<sup>b</sup>), (E<sup>b</sup><sub>1</sub> G B<sup>b</sup>) struck. If the results of these trials are satisfactory, we proceed to tune D<sup>b</sup><sub>1</sub> from our A<sup>b</sup> and from it again the G<sup>b</sup><sub>1</sub> by fifths. From this we tune as an octave the middle G<sup>b</sup>. By following the above plan we shall have tuned every note, both tone and semi-tone, between F<sub>1</sub> and C on the treble clef. This operation is called "laying the bearings," and if on trial of the several chords that can be produced in that compass the effect is found to be satisfactory, and no burring or wave of any kind perceptible, we proceed to tune from this central portion, upwards and downwards in octaves, until every note in the piano is perfectly in tune with the corresponding note in the tuned "bearings" which formed the first part of our operations. In order that the learner may not have to read up the above details when tuning, we present here in a tabular form the sequence to be fol-

lowed in tuning from the middle C<sub>1</sub> (the C in the third space of the treble clef):—

C C<sub>1</sub>, C<sub>1</sub> G, G G<sub>1</sub>, G<sub>1</sub> D, D A, A A<sub>1</sub>, A<sub>1</sub> E. Trial chords (G<sub>1</sub> C<sub>1</sub> E), (C<sub>1</sub> E G), and (A<sub>1</sub> C<sub>1</sub> E). E B, B B<sub>1</sub>. Returning to the middle C, C F, F F<sub>1</sub>. Trial chords, (F<sub>1</sub> A<sub>1</sub> C<sub>1</sub>), (C<sub>1</sub> F A), (D F A), (G<sub>1</sub> B<sub>1</sub> D), (B<sub>1</sub> D G), (D G B), and (D F G B). Starting again at middle F, F B<sub>1</sub>, B<sub>1</sub> B<sup>b</sup>, B<sup>b</sup> E<sup>b</sup>, E<sup>b</sup> A<sup>b</sup>, A<sup>b</sup> A<sup>b</sup>. Trial chords (E A<sup>b</sup> B<sup>b</sup>), (A<sup>b</sup> C<sub>1</sub> E<sup>b</sup>), (E<sup>b</sup> G B<sup>b</sup>). Then A<sup>b</sup> D<sup>b</sup><sub>1</sub>, D<sup>b</sup><sub>1</sub> G<sup>b</sup><sub>1</sub>, and lastly G<sup>b</sup><sub>1</sub> G<sup>b</sup>. The intelligent reader will have observed that we have not mentioned *sharps* in our plan of tuning; but he will remember that on the piano, A<sup>b</sup>, D<sup>b</sup>, G<sup>b</sup>, &c., are the same as G sharp, C sharp, F sharp, &c.

## Freak Engine Inventions.

THE advent of the steam engine was the signal for a host of ingenious and amusing inventions, and the writer is enabled, through the courtesy of an official of the Patent Office at Washington, to afford this brief account of these old railway patents.

One inventor, who appears very early on the scene, was very sure that in winter the steam-engine would be comparatively useless, because the thin coating of frost that would gather in the morning upon the rails would effectually hinder the wheels from moving along. Of course, this objector had a remedy to offer. His rails were to be hollow in order to allow hot water to circulate through them, thus keeping the metal warm and preventing the formation of frost.

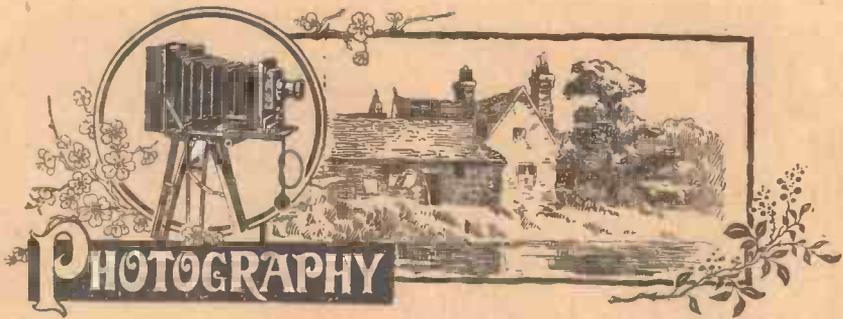
Another ingenious spirit, fully persuaded that no smooth-wheeled vehicle could be made to move along ordinary roads, fitted his piston rods not to the wheels, but to a set of legs that kicked into the road beneath the engine, moving it much as a punt is poled in the water, only in this case there were to be found several poles instead of one.

Decidedly more interesting than an engine that kicked its way along was one that was to actually walk on four legs. There were several varieties of these steam-walkers, one of which burst on its trial-trip and killed ten persons. It was not till Hedley exploded all these ingenious theories by simply trying how a smooth wheel would really act on a smooth road that the wonderful inventions ceased.

The idea of danger was always a very prominent one in the minds of these early inventors. One was so convinced that "accidents on railroads would be frequent," that he proposed to minimise the loss of life by attaching the train to the engine by a long rope, so that in the event of collision only the enginemmen would suffer.

Another adopted the expedient of a feather-bed placed between the buffers of the cars, so that "a shock could not be transmitted," and a third and still more ingenious patentee, proposed fixing a pair of rails along the top of the train, falling at a gradient fore and aft, so that in the event of another train meeting or overtaking it, the two could pass over and under each other and both could go their way rejoicing.

TO HOBBIES READERS.—Have we got your name and address in our book? If not, you might send us a post-card. It will be worth your while.



## PRACTICAL NOTES ON PICTURE POSTCARD MAKING.

**T**HE picture postcard has come to stay, and one reason for its popularity with amateur photographers is that its thick substance does away with the necessity for the troublesome and messy process of mounting. About this time of year there comes the desire to make the appearance of the card as attractive as possible, with a view to making it suitable perhaps for Christmas; thus the use of border negatives, either home-made ones or those bought ready-made, and the choice of subject and the tone of the card, etc., are all carefully dealt with.

Postcards being made now in P.O.P., bromide and gaslight varieties, one has a good choice of material, and whilst the two latter are very convenient on account of their being worked by artificial light at night-time, printing out cards possess many advantages in having a visible image, and thus the effect of a border negative can be watched and the depth of printing nicely controlled. A card looks so much better for even a narrow white border that the use of a mask in printing is strongly to be recommended. Such a mask may be made easily enough by taking a piece of black or good red paper of the size of the negative, or at least the same size as the postcard, and cutting out a rectangular hole the size you want to have the picture. Thus, if the postcard be  $5\frac{1}{2}$  by  $3\frac{1}{2}$  in. in size, and you cut out a hole  $5$  by  $3$  in., you will have a white border a quarter of an inch in width round the picture. Another may be cut  $3\frac{1}{2}$  by  $2\frac{1}{2}$  in. in size, as this will allow two inches of space left unprinted on where something may be written.

To cut a mask lay the piece of paper on a piece of glass, such as an old negative, and mark out first the rectangular space in pencil. Then, using a flat steel rule, or if this is not to hand, a flat box-wood rule, cut out with a sharp penknife, held as nearly vertically as possible, following carefully the pencil lines. A good clean cut can thus be made, without the jagged or uneven edges that are often seen in a home-made mask. Oval masks, or circular ones, can only be cut out with scissors, but these can almost always be obtained of your dealer.

Trouble is sometimes experienced from using a paper mask for P.O.P. for some time, and then using the same one for gaslight postcards; the gaslight cards stain on development where the mask has been in contact. This often causes a lot of trouble, but the remedy is simple enough. The cause is the silver nitrate present in P.O.P. getting into the mask, and contaminating the

gaslight film, which is very sensitive. Mark one side of the mask with a cross or some distinct mark, and use this side for P.O.P., the *other side* for gaslight and bromide cards. In this way the trouble will be avoided.

Many amateurs like to use the combined bath for toning printing-out cards and yet wish to get a warm reddish-brown tone. This may be done by making use of a *supplementary bath*, containing hypo only. The cards are put into the combined bath until the desired tone is reached; this may take three to five minutes; they are then well rinsed for a minute or two in running water, and finally placed in a bath containing three ounces of hypo to the pint of water for ten minutes; in this way a great variety of warm tones can be obtained, which, of course, depend on the length of time the cards are left in the toning and fixing bath.

A good and simple combined bath for postcards may be made up as follows:—

Water	..	9	ounces
Ammonium sulphocyanide	..	100	grains
Alum	..	$\frac{1}{4}$	ounce
Lead acetate	..	16	grains
Hypo	..	$1\frac{1}{2}$	ounces

When dissolved, add 2 grains of gold chloride dissolved in a quarter of an ounce of water. Shake up the bottle from time to time for a few hours, then leave over-night, and next day pour off the clear solution, which is ready for use.

Postcards have a good deal of wear and tear, and experience has proved that the glossy cards stand this the best. Bromide and gaslight cards will take as high a glaze as printing-out cards, and it is astonishing how clear and "liquid" the blacks or shadows become when a black-and-white picture is well glazed.

To get a thoroughly good gloss on any kind of postcards the following method will be found suitable. Before washing (*after* fixing and a five minutes' wash) place the prints to be glazed in a bath of:—

Potash alum	..	$\frac{1}{2}$	ounce
Water	..	10	ounces

Leave them in this for ten minutes then wash them in the ordinary way for about an hour. Whilst they are washing, take a clean sheet of glass, or a ferrotype plate, and polish it well with

## HOBBIES:

a clean rag; then rub it over with a few drops of the following "stripping solution":—

Spermaceti wax .. .. .	1 ounce
Benzole .. .. .	5 ounces

Wipe the glass well, and let it dry. On this a glossy postcard is laid, taken straight from the wash water, and is gently but firmly squeezed down; the film side thus adheres to the glass, and like this it is allowed to thoroughly dry in a warm room. When absolutely dry, raise one corner with a penknife and then peel the card off; it will have a highly glazed surface. Failure is certain if you attempt to peel off the card before it is quite dry, but this is the only stumbling block in the process.

A method of toning gaslight or bromide cards when finished, washed and dried, by means of a brush, so as to obtain two or more colours in one picture, was described many months ago in **HOBBIES**, and will bear repetition on the present occasion, as very novel results can be so obtained. Two solutions are prepared; one containing five grains each of potassium ferricyanide and uranium nitrate in an ounce of water with two drops of glacial acetic acid; the other containing five grains of ferric chloride in an ounce of water. These should be made up in two ounce bottles, the bottles being filled up with glycerine. The first solution can be applied with a brush to tree trunks, bricks, ground, building, etc., in a photograph, and will colour them reddish-brown, or sepia, according to the time it is allowed to act; when the desired colour is reached, hold the print under a tap and wash away the solution, which will not have run from the part to which it was applied on account of its sticky nature. By applying this solution first, then washing it off and painting over with the ferric chloride solution, a green or blue colour is obtained, suitable for grass, foliage, skies, water, etc., the tone being green first, then rapidly changing to blue, it must be washed off the moment the colour wanted has made its appearance. Clean brushes should be used for applying either solution; and only just enough solution used to properly moisten the film.

### Winter Developing.

As the winter evenings approach the photographer is enabled to devote more time to gaslight printing and developing than in the longer days. Probably he will do most of his developing at night. As the autumn draws to an end and winter comes in it becomes unpleasant to dabble about in the cold with developer. Hence the stand system of development is the best. The plan is to obtain a tank—preferably with a light-tight top—provided with grooves at the side to accommodate the plates. This should be filled with developer about a quarter its normal strength and the plates slipped in. They may be allowed to stand for a considerable time. For ordinary exposures about half an hour should be enough, but as to the time no definite rule can be laid down. The plates can safely be left for a while, and looked to now and then. It matters very little if they are over-exposed, for too great density can be readily reduced. Pyro-soda is not suitable for stand work, as it tends to cause stains if the developer is not rocked. Otherwise almost any developer will do, provided it is diluted.

## Prize Competitions.

### FRETWORK PHOTOGRAPHS.

[CLOSES ON MONDAY.]

FOR the best Photographs of a Fretworker at Work, we offer three prizes:—

First Prize, Two Guineas.

Second Prize, One Guinea.

Third Prize, Half a Guinea.

The photograph may be that of a fretworker seated either at a treadle machine or at a bench or table with hand fretsaw. The size and treatment are left to competitors, but preference will be given to the pictures which most clearly represent the actual operation of amateur fret-cutting. Elaboration in surroundings and background should be avoided.

The name and address of sender must be legibly written on the back of the photograph.

Photographs cannot be returned, and the Editor reserves the right to reproduce any of those received in **HOBBIES**.

Photographs must be received not later than Monday (November 5th), addressed: Fretwork Photograph Editor, **HOBBIES**, 12, Paternoster Square, London, E.C.

### MOTOR OMNIBUS MODELS.

As many fretworkers will, during the coming season, be exhibiting Fretwork models of the **HOBBIES** Motor Omnibus, we offer:—

A special award of ONE YEAR'S FREE SUBSCRIPTION to "**HOBBIES**" to all fretworkers who, before October 5th, 1907, obtain a prize at any Industrial Exhibition with a Fretwork Model of the Motor Omnibus, cut from the design presented with **HOBBIES** 1907 Catalogue.

The only conditions we impose are (1) that the Model is made according to the published Design, (2) that the value of the prize gained shall be not less than Five Shillings, and (3) that in the Fretwork section, in which the prize has been awarded, there shall have been not less than Five entries.

The award will, in each case, be made on receipt of a written statement by the Secretary of the Exhibition certifying that the prize-winner is entitled to the Free Subscription to **HOBBIES** according to the particulars given above.

### PHOTOGRAPHY.

**SUBJECT FOR NOVEMBER:—Architecture:—Views of Cathedrals, Churches and Chapels, Public Buildings, Castles, Old Houses, Mansions, &c.**

PRIZES: First, £1 ls.; Second, 10s. 6d.; Third, 5s. 0d. In addition to these prizes, Hobbies Certificates of Merit of the First and Second Grade may be awarded, according to the standard of excellence.

Not less than Three nor more than Six Prints may be sent in. These must be mounted on card mounts, and the title of the photograph and name and address of sender must be legibly written on the back. No print will be eligible that has been entered in other competitions. Photographs cannot be returned, and the editor reserves the right to reproduce any of those received in **HOBBIES**.

Photographs must be received not later than October 30th, addressed:—Photographic Competition: Editor, **HOBBIES**, 12, Paternoster Square, London, E.C.

**FORTUNATE SUSSEX PARISH.**—No parish rate will be made at Rotherfield, Tunbridge Wells, for the ensuing half-year, as the treasurer to the Parish Council has enough money in hand to meet the estimated expenditure and to leave a substantial balance besides.

ONE ton of coal yields nearly 10,000 feet of gas.



## Ships that Pass in the Post.

**T**HE Philatelist's gallery of marine pictures receives one more addition by the issue of the Tercentenary stamp of the Barbados, with its view of the sailing vessel "Olive Blossom." It is singular, perhaps, that Britannia, although she rules the waves, has never issued a ship stamp. The newspaper correspondent who recently urged that ships should be pictured on our national postage stamps to typify our naval supremacy had both reason and sentiment on his side, and if we should ever



so far depart from tradition as to issue a series of pictorial stamps there can be no question that war vessels as well as ships of peace would be entitled to a prominent place in the series. The Colonies have already shown us the way, for in addition to the new stamp of Barbados the philatelist can point in his album to the ship stamps of Grenada—the issues of 1898 and 1905, each showing "La Conception," the flagship of Christopher Columbus. The people of British Guiana have remained remarkably faithful to the ship as a postage stamp device, while in Bermuda we have the stamps of what philatelists have dubbed the "dockyard" series. A ship is also a prominent feature of the latest issue of the Turks and Caicos Islands. In the postage-due stamps of the Soudan (1901) the central design shows a "Dahabeah" or Nile Boat. Two of the most interesting of the world's ship stamps are the Maltese 4d. and 5d. of 1899, which illustrate respectively a native fishing boat and an ancient Maltese galley. The stamps of yet another quarter of the British Empire—British New Guinea, to wit—give us a picture of a pirogue, a typical South Sea craft.

In other parts of the world there is an equally large sprinkling of ship stamps. The Argentine Republic gave us a sea-scape on its jubilee issue of 1892, and ten years later came a commemorative stamp showing a view of Rosario Harbour, with the ships of various nations riding at anchor. The German Colonial stamps of the current series—Cameroons, Marianne Islands, Samoa,

&c., &c.—are adorned with the picture of a twentieth-century merchantman. The stamps of the first issue of Panama depict two trading vessels sailing the Pacific and Atlantic Oceans, with only the narrow isthmus of Panama to prevent them joining company. The issues of various steamship companies, naturally enough, are of the ship order. Turning to Peru we find a steam vessel the subject of the upper panel of those long and artistic postage-due stamps of 1874. Portugal and the Portuguese Colonies are large contributors to the marine section of postage-stamp design, and notably so in the issues commemorative of the deeds of those doughty explorers of the sea, Vasco de Gama and Dom Henry "the Navigator." But one may safely allot the highest praise for beautiful ship stamps to the United States of America. The first of these appeared in the small square pictorial issue of 1869, where, on the 12 cents value, we see an emigrant ship struggling with a stormy sea. In the "Columbus" issue of 1893 we get pictures of "the Fleet of Columbus," "the Flag Ship of Columbus," &c., while subsequent exhibition issues from the same country have also contributed to the list. Many of these "ships that pass in the post" are of great historical interest and artistic beauty. A complete collection of them would constitute practically a review of the world's shipping past and present.

### CATALOGUE VALUES AND ACTUAL PRICES.

(Concluded).

In the following notes, concluded from last week's **HOBBIES**, an attempt is made to show wherein the chief differences occur between "catalogue values," as exemplified by the latest edition of Messrs. Stanley Gibbons' Catalogue (British Empire) and actual prices as quoted in a list just issued by Messrs. Bridger and Kay. To indicate the two publications we use merely the words "catalogue" and "list" respectively.

**GIBRALTAR:** Here the prices for the earlier issues average well over "half catalogue" in the list before us.

**GOLD COAST:** Stamps of the issues 1875 to 1883 average "half catalogue" or more. The 2d. orange of 1898 is evidently esteemed a fairly good stamp in unused condition, for it is listed at 2s. 9d. as against the catalogue quotation of 3s. 6d.

**GRENADA:** Half, or rather more than half, catalogue valuation is the rule for the issues 1861-1883. An interesting variety of the 1888 surcharge—the 4d. or 2s., with the space of 5

## HOBBIES.

millimetres between "4d." and "postage"—is listed, unused, at 8s. only, whereas the catalogue deems it worth 20s. Another provisional, the 2½d. on 8d. of 1891, is offered, unused at 1s. 2d., while the catalogue value is 3s.

**HONG KONG:** Two of the surcharged stamps of 1891 call for attention. The list quotes the 14c. on 30c. mauve, unused, at 2s. 6d. (one-quarter of catalogue price) while for an unused copy of the 10c. on 30c. of the type without the Chinese surcharge, the full catalogue figure of 10s. is demanded. Otherwise the list prices for Hong Kong are approximately half catalogue.

**INDIA:** The quotations given in the list are mostly on the usual "half catalogue" basis. The 4 annas, red and blue, 1854, is offered, used, for 4s. 9d., as against the catalogue quotation of 7s. 6d. If in perfect condition we should regard this as well bought at the price.

**JAMAICA:** The series with pineapple watermark are quoted at half catalogue prices. That interesting error of 1890, the 2½d. or 4d., showing the word "Penny" mis-spelled "Pfnny," is valued in the catalogue at 20s., used or unused, while in the list it stands at 10s. 6d. used and 12s. 6d. unused. Personally we should always prefer fine used copies of stamps of this class.

**LAGOS:** Prices here are rather better than "half catalogue," the only exception being the 6d. sage green of 1884, which is offered at 2s. 3d., the catalogue value being 5s. A stamp which is left unvalued in Gibbons' Catalogue, the 6d. lilac and carmine of 1887, is quoted in the price list before us at 5s. unused.

**MALTA:** Some interesting comparisons present themselves here. The ½d. buff of 1864, perf. 14, is quoted unused at 8s. 6d., though catalogued at 20s. The brown-orange variety of the ½d. stamp is offered at 10s. as against a catalogue valuation of 40s. The 5s. rose, on the other hand, appears in the list at 5s. and in the catalogue at 6s. 6d. for a used specimen.

**MAURITIUS:** "Half catalogue" is the general rule for such stamps as are given in the list, but of course the very great varieties are not quoted.

**NATAL:** The 3d. rose and 6d. green of 1857 are offered at "from 15s." and "from 20s." respectively—a method of pricing that involves questions of "condition." The catalogue values are 45s. and £7 respectively. Half catalogue, or a shade over or under that mark, is otherwise the general rule.

**NEW SOUTH WALES:** Values in the case of the early issues must so largely depend on condition that it would be idle to make comparisons. There are many quotations at half catalogue and some at less. The 20s. ultramarine of 1890-98 is offered at 5s., whereas the lowest price we can find in the catalogue is 40s. The 6d. emerald of 1897 is offered at a very big discount from "catalogue"—viz., 4s. 3d. unused and 1s. 6d. used, whereas the "book" says 15s. unused and 5s. used.

**NEW ZEALAND:** The first quotation in the list for this country is the 2d. blue on blued paper of 1856, offered in used condition for 8s. 6d., whereas the catalogue valuation is 14s. Many of the rarer early stamps are not quoted, but where prices appear the average is about "half catalogue."

**NIGER COAST:** "Half catalogue," and in the case of the surcharged on-British series of 1892 rather less than this rate.

**ST. CHRISTOPHER:** Two marked departures

from the "half catalogue" rule may be noted—the 1d. lilac rose, C.C., perf. 14, used, list price, 3s. 6d., catalogue 7s. 6d., and the 1d. lilac rose, C.A., perf. 14, used, list price 20s., catalogue 30s.

**SOUTH AUSTRALIA:** Some early issues are quoted at prices a little over "half catalogue." The 1s. orange of 1856 stands at 16s. in the list as against 40s. in the catalogue.

**SOUTHERN NIGERIA:** From a half to two-thirds of catalogue values is the rule here, but a notable exception is the 5s. orange yellow, quoted at 8s. 6d. as against the 20s. of the catalogue.

**TOBAGO:** The average is above "half catalogue." For instance, the 1d. Venetian red of 1880 is catalogued at 20s. and is quoted in the list at 8s. 6d.

**TRANSVAAL:** There is a low quotation in the list for the 1d. black, fine roulette, of 1870, catalogued unused at 15s. and offered here for 5s. Many of the early stamps mentioned are difficult to identify, and on the score of condition, perhaps comparisons would be of little value. In the later issues there is a fairly steady adherence to the principle of "half catalogue prices."

**TRINIDAD:** The first prices are distinctly better than half catalogue for the early issues, as indeed they should be.

**VICTORIA:** There is perhaps no British Colony in which the question of condition has a greater bearing upon values than this. We therefore make no comparisons as between the list and catalogue prices for the earlier issues. After 1876 the list quotations average rather less than half the catalogue valuations.

Readers of HOBBIES will probably glean from these notes some idea of the trend of the market in British Colonial stamps; but it is important to remember that the catalogue values are generally understood to be for specimens in first-class condition. To be offered this or that stamp at "half catalogue," or less, is no proof that one is on the track of a bargain. "Comparison of price without reference to quality is no criterion of value."

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The growing popularity of gum-bichromate and similar photographic processes has led to a considerable increase in the number of bichromate poisoning cases. These usually lead to sores and ulcerations on the fingers, more especially should there be any cuts or bruises upon the skin. It is wise therefore to exercise every precaution in dealing with these somewhat unpleasant chemicals. Much relief will be given in cases of soreness and ulceration by the application of an ointment made up of mercury 1 ounce, lard (prepared) ¾ ounces, nitric acid 3 fluid ounces, olive oil 8 fluid ounces. These should be dissolved carefully at a temperature of 212°Fahr.

SEVERAL breakwaters formed of seaweed are to be found in the central part of the North Atlantic Ocean and in the Pacific, north of the Sandwich Isles. The inclosures are called Saragosso Seas. In appearance they are not unlike undulating meadows, consisting of a succession of yellow feathery bunches. The plant of which these breakwaters consist frequently grows to a length of between 300 feet and 400 feet, and the tangled mass, swaying like a ponderous curtain in the water, most effectually dulls the power of the tremendous rollers.

VENUS, Mercury, and Vulcan are the three planets which have days shorter than ours.



## Greenhouse Plants.

HAVING obtained a greenhouse, the question often arises, "What shall we grow in it?" We will presume that it is a small house, fitted with heating apparatus to keep out frost during winter, and will consider, in alphabetical order, a few of the most desirable plants to grow in it.

The man who possesses a light greenhouse can laugh at many of the enemies to plant life in towns. Even though his greenhouse is not situated in a sunny spot, he still has Ferns to rely upon, and what can be better? They may be kept in the room for a time, and then replaced in the greenhouse to recuperate while others take their place, thus insuring a satisfactory supply of fresh plants. This interchanging of plants between living room and greenhouse is equally applicable to flowering and other foliage plants, and thus even where the glaze structure cannot be constructed in such a way as to form a conservatory it may be made very useful as a nursery and plant hospital combined.

First on the list come Abutilons, flowers deserving a far greater popularity than they have obtained up to the present. Six inch pots will be found quite large enough to grow these in. The Arum Lily must, of course, be well represented. It should have a fairly large pot to thrive well in, and an abundance of water when in active growth, as it belongs to the order of semi-aquatics. Asparagus Sprengeri will make an excellent basket plant if given a fairly peaty soil and plenty of moisture. Sixpence a leaf seems a long price for Aspidistras, but when grown in a good greenhouse they quickly make large plants, and may be safely divided at any time during March.

Begonias, especially the tuberous rooted section, are already too popular to need any recommendation. When growing freely they like a little weak liquid manure occasionally. They resent drought, and are even more impatient of excessive moisture at the root.

Campanula Mayii and Campanula Isophylla Major do remarkably well, both in pots and borders, their trailing habit of growth making them most suitable for hanging plants. Both species are wonderfully floriferous, especially if fed with liquid manure during the flowering season. The white and blue varieties of both species are obtainable. Cannas are ideal plants for the amateur greenhouse, as their foliage is noble, while the flowers are amongst the most brilliant of "Flora's" productions. Cannas are gross feeders and require abundance of water, plenty of liquid manure, and plenty of root

room, though in the winter months they prefer to be kept on the dry side. The Cinnamon plant is a splendid plant for both room and greenhouse, as the leaves, in addition to being very ornamental, give off a pleasing Cinnamon scent. Coleus, as all know, are sun-loving plants and like plenty of room. They are also gross feeders and soon show unmistakable signs of resentment if watering is neglected. A new race of flowering Coleus is now fast becoming popular, that of *C. Thrysiodes*.

*Diplacus Glutinosus* is a hard-wood plant that deserves mention. Eucalyptus, especially the lemon-scented one, should be grown. These are exceedingly thirsty subjects, and, being natives of Australia, are also fond of sun. Fuchsias and Geraniums should, of course, be well represented, especially the many forms of the scented Geranium and the Ivy Leaf varieties, the latter being especially suitable for hanging basket work.

Heliotrope, if grown where it can be frequently syringed, is always a success indoors and never fails to please, especially that charming new variety, Lord Roberts. *Kalanchoe flammula* is a magnificent novelty and if watered carefully, given a well drained soil and plenty of light, it may be easily managed. Lantanas are exceedingly showy subjects, and like the Heliotropium, require frequent syringing to keep down red-spider. Marguerites, especially the yellow varieties, produce a display over several months if fed and watered liberally both at the same time. Musk is a most accommodating subject, the common variety even thriving under the stage and in other out-of-the-way places. *Plumbago capensis* is an old favourite, and does well either as a climber or as a bush. Primulas, especially *P. verticillata* and allied species, and the *Obconica* type, are very useful and of the simplest cultivation. The *Smilax* (*Mediola Asparagoides*), if given a rich soil and grown in a basket or up strings, is a splendid plant for small greenhouses. For training up a rafter and producing a brilliant effect *Strip-tosoler Jamesonii* is a most useful subject, and if given a peaty compost, is quite easy to grow. *Swainsonia Galegifolia alba* is a good companion to the last-mentioned subject, and is always seen to the best advantage when grown on a rafter or against a wall.

From the foregoing selection many plants are omitted, being too well known to need special mention. The list includes several kinds which are not generally known by the amateur, but quite as easy to grow as many commoner subjects.

## Daffodils.

From time to time many different methods of planting and growing Daffodils have been recommended, but in the writer's opinion there is nothing to equal the scattered or "natural" system which has lately gained so much popularity in our gardens. A few years ago this method of planting was never adopted. Some objected that it caused injury to the grass and interrupted the uniform style of bedding, while others were of opinion that the bulbs would never thrive, but would degenerate. Now we see them in their natural style, planted in plantations, dells and nooks. In many localities in the South of England we see them even in the orchards, flowering and thriving in the grass without any artificial support being given them. It is this style of planting that we recommend our readers to follow. Not a place in the garden should be unoccupied. Bulbs are so cheap that even the humblest of gardeners can afford them. Besides being decorative, they are useful for cutting, lasting well when standing in water. The popular section of Daffodils includes such well-known sorts as Van Sion, Horsfieldii, Incomparabilis, Barri conspicuus, Albus Plenus odoratus (double white), and Golden Spur.

## Seasonable Hints.

THOSE who grow Roses in pots for spring blooming should not keep their plants under cover to ripen up the wood, but expose them quite in the open. Wherever they are wintered, endeavour to keep them quite at rest, until required in the spring. Those which are wintered in the open should have their pots buried up to the rim in ashes, and during very severe weather it is advisable to place long litter between them in order to prevent the pots from bursting.

Soon as ever the weather permits, attend to the training of wall trees. If they have been infested with aphid or other troublesome pests, see that they are now well washed with an insecticide and that every crack in the wall is thoroughly dressed with the same material.

Sweet Peas that are through the ground should have a little soil carefully drawn up round the plants. Where cuttings of evergreen shrubs are plentiful they may be utilised for protecting the plants during severe weather. Only use them when the weather is severe, however, or they will cause the young plants to draw and consequently do more harm than good.

Now that the leaves are off the Creepers, take the opportunity of examining the fastenings or nailing up any new wood that may be required another season, and thus avoid that very common disaster of the whole plant falling away from the wall when in full growth.

At this season of the year plants require but little root nourishment. When too wet they are sure to suffer, no matter whether hardy or tender.

Whenever the ground is hard with frost it allows a capital opportunity for wheeling manure on to the land. To wheel manure on muddy soil is a very laborious and disagreeable work; besides, it has a very bad effect upon the soil.

At present there is not much that can be done in the open garden; but spare time may be utilised in preparing for the rush of the spring

by getting labels, sticks and layering pegs ready, and by laying out the garden by means of a plan so as to gain an idea of the coming season's work. Even in the smallest garden this latter hint may be acted upon. It will save much time and trouble and often expense. For instance, plants often spoil by being kept back for flowering at a date when some other subject is flowering. Often, too, the amateur discovers that he has more plants than can be comfortably accommodated. Not liking to throw any away, he crowds them, with the inevitable result that all become weakened.

It is an evil practice to crowd plants in a bed, but far worse to crowd vegetables.

Roll the lawn occasionally to keep down worms, and sweep it over with a birch or bass broom.

## Our Weekly Special Bargain.

Our Horticultural Department will offer each week in this space an exceptional bargain to the Gardening readers of HOBBIES. The object of the bargain is to convince Amateur Gardeners of the high quality of the goods supplied from our Nurseries and Seed Establishment.

### Special Offer for This Week.

50 *Scilla Siberica* or Blue Snowdrops. A grand sample now ready for planting, all one size bulbs. Our ordinary price for these is 1/9, but for one week only we are offering them for 1/3 post free.

This offer will close Nov. 10th.

NOTES ON SPECIAL OFFER.—The Blue Snowdrop is one of the most charming of Spring flowers. Now is the time to plant the bulbs. Cover them with soil about two or three inches deep, and let nature do the rest. They look well when mixed with *Crocus* or *Snowdrop*, and thrive well in almost any soil.

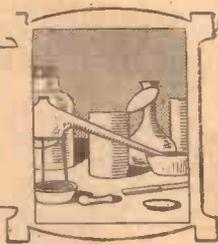
HOBBIES LIMITED, Norfolk Nurseries, Dereham. (London Depot:—17, Broad Street Place, E.C.)

WHERE ANCIENTS SCORE.—A curious fact in regard to the artistic representation of a vehicle and horses in motion was, remarks a writer in "Vanity Fair," pointed out to me the other night by a well-known artist. In the average modern picture, the horses are represented in a position of arrested movement, and owing to the influence nowadays of instantaneous photography, the position is frequently artistically grotesque, whereas the wheels of the carriage are represented as with a thousand spokes and a triangular high-light flickering within the circle of the whole. We have here depicted two conflicting principles. If the wheels are to be represented with a thousand spokes, the horses equally should be drawn with a thousand legs. It appears, therefore, that the ancients who, upon Etruscan vases and Roman bas-reliefs, represented their horses in motion, but the wheels of the chariots as stationary, were nearer the truth.

RECTOR'S COMPLAINT.—Complaining of the silence of his congregation at worship, the Rector of Winchelsea, Sussex, says in the Parish Magazine the Sussex people are true Catholics, because they leave the conduct of the services entirely in the hands of the priest.



# POPULAR SCIENCE



## II.—THE CHEMISTRY OF FOOD AND DRINK.

**T**HE present article contains a short account of the chemistry of bread, and in it will be found some very interesting experiments which may be performed with the same. Bread is made, as everyone knows, by making dough out of flour and water and adding a little yeast. Salt and sugar are also used in manufacturing bread. The yeast is sometimes discarded in favour of "baking powder," which is made of bicarbonate of soda and "cream of tartar." The flour is the most important part of the bread and this compound will, therefore, be dealt with first. Flour consists almost entirely of two bodies—starch and gluten. This latter body contains carbon, hydrogen and nitrogen, together with oxygen and traces of sulphur. Starch, however, is only composed of carbon, hydrogen and oxygen. Good wheaten flour contains about 12 per cent. of gluten. To separate these two substances, proceed as follows:

Make a little dough, by mixing together flour and water, tie this up in a small piece of old handkerchief, and knead it gently with the fingers in a basin of warm water. The water at once becomes milky, and, when the turbidity becomes very noticeable, pour away the water into a glass and put it on one side. Fill the basin up again, and continue kneading, changing the water from time to time, until the milkiness ceases to be produced. Now open the cloth and examine the residue—it is gluten. The starch, which is soluble in warm water, caused the milkiness of the water, in which the bag of flour was kneaded. In our former series of articles in *HOBBS'S* on Chemistry, a test for starch was given, but for the benefit of those who did not read the above-mentioned chapters, the *modus operandi* of that test will be again given.

Dissolve a few crystals of potassium iodide in a tumbler of water, and to the solution thus obtained, add two or three crystals of iodine, stirring the mixture well with a glass rod. A clear yellowish-brown solution is formed, which must be decanted into a bottle and labelled "Iodine Solution." This liquid will show the presence of starch in anything which contains it. For instance, try a drop on your handkerchief and observe the result, a blue stain is produced; again, cut a potato in half and apply a few drops to the cut surface. Small blue dots will be seen to be formed where the starch granules in the potato exist. To test, therefore, for the starch in the milky water, add a few drops of iodine solution. The whole liquid at once turns a dark blue. Pour a little of this liquid into a test tube and boil it. After a time the colour will disappear, but, as the tube cools, it will again be produced. This is an extremely delicate test for starch,

and can be used for the detection of very small quantities. We must now examine the gluten, and note its more characteristic properties. Freshly prepared gluten is a yellowish-grey compound, and has been shown to be insoluble in water. It is free from taste and smell, and is rather like india-rubber; that is, it is springy, and when pulled out, it is found to be both tenacious and elastic. If this substance be dried in an oven, its properties change. It becomes brittle and quite hard, and it will be found to be difficult to remove from the basin. Break a piece off and soak it in water. Notice that it is impossible to restore it to its former condition. Heat a small piece of dry gluten in a small test-tube and observe what happens. It first of all becomes black (showing the presence of carbon), then it melts and gives off fumes, the smell of which will remind the operator of burning feathers. This peculiar odour indicates the presence of nitrogen. The composition of gluten is almost the same as that of "albumen" or "white of eggs," although its appearance is quite different. Both these compounds belong to a large group or class of bodies, called "proteids," which are important from the fact that they contain nitrogen. Only in the form of proteids can this absolutely necessary element be made use of by animals. Although nitrogen is breathed into the lungs at every breath, it is expelled into the air again unchanged. Proteids easily decompose and putrefy. Place a piece of moist gluten in a dish and put it on one side for a few days. It soon acquires a most offensive smell, probably due to the formation of sulphides. When an egg becomes rotten, the same putrefaction takes place, and a similar smell is observed. This smell is caused by the formation of sulphuretted hydrogen. Silver spoons used for eggs often become black or stained. This stain is due to the sulphur in the egg combining with the silver of the spoon, to form the black sulphide of silver. So much for the proteid contained in flour. Let us now observe a few of the peculiarities of starch, which contains carbon, hydrogen and oxygen only. Heat a little crushed starch in a test-tube. The mass gradually blackens, and water condenses in the cooler parts of the tube.

No smell of nitrogenous matter is produced, showing that the element nitrogen is absent from starch. Starch belongs to a large class of chemical compounds, known as "carbo-hydrates," which contain carbon and oxygen and hydrogen in the proportion of 2 of hydrogen to 1 of oxygen. Thus when water is extracted from starch, sugar, glucose, etc., only carbon remains. Try the effect of "de-hydrating" a little starch with a few drops of concentrated sulphuric acid in a test-

## HOBBIES.

tube. The mass swells up, and turns black, owing to the fact that the water is extracted by the acid and the solid carbon is left. If the test-tube be touched a very apparent rise of temperature will be noticed. Starch can also be made to, "add on" water, with the formation of a sugar. To test this, make about a tumbler full of thin starch solution, and add to it a few drops (about 20) of dilute sulphuric acid; put this mixture in a flask and place it in an oven. After about ten minutes, take out a few drops of the fluid in a test-tube and test with iodine solution. After the heating of the solution has continued for some time, the colour produced by the iodine solution changes from a dark blue to a reddish brown. This indicates that some change has taken place in the tumbler, and this, indeed, is the case, for "dextrin" or "British gum" has been produced. Now remove the flask and boil the liquid for a quarter of an hour. No apparent change has taken place, but if the iodine solution be added, very little coloration will be produced, which shows that something has indeed happened. As a matter of fact, a solution of glucose is now present in the tumbler. To test for this substance, take a few drops of the liquid in a test-tube, and add to it a little "Fehling's Solution," then warm the whole. The above-mentioned "test" is prepared by adding to a solution of copper sulphate a little tartaric acid, and then caustic soda solution till the whole is clear. (This liquid



TESTING FOR CARBON DIOXIDE.

should be kept in a blue bottle and always shielded from the light.) The effect of adding Fehling's test to a solution containing glucose is to produce a reddish precipitate. Thus the starch changes first of all to dextrin, and then to glucose or "grape-sugar."

Mention was made of yeast, which is put into bread to make it rise. If none were used the food would be heavy and too solid for ordinary use, in fact, it would be "unleavened." As baking-powder has the same action on bread, and is a far more simple body to deal with, an experiment with this compound will be here given. Baking powder, although called a compound, is not really one, for it consists of a mixture of tartaric acid and bicarbonate of soda. Now when an acid, in liquid form, acts on a carbonate, carbon-dioxide is produced which can be tested for by shaking lime water with the gas.

Take a pinch of baking powder in a test tube, and add a few drops of water. The powder at once begins to effervesce, and a gas is evolved. Take another test-tube, filled half full of lime-water (made by dissolving a small piece of lime in water) and hold this in a slanting position with its mouth against that of the one containing the baking powder, as shown in the sketch. The heavy carbon dioxide will pass from the one tube to the other. Place your finger on the test-tube "A," shake it well, and the lime water inside becomes milky, a transformation which shows carbon dioxide to be present. Yeast, when it ferments, also gives off the same gas. It will be

understood now why the dough rises when yeast or baking powder is mixed with it. The gas formed forces the paste up, and makes it light and spongy, while the little holes or pores in the bread are formed by the gas blowing out the elastic gluten.

So much for the legitimate components of a loaf. Sad to relate, however, various adulterants are occasionally added by unscrupulous bakers, chiefly to enable them to use damaged flour.

The two chemicals most often used are alum and sulphate of copper; as the latter is the easier to detect, a method for testing for it will be given first. Take a large piece of the crumb of the suspected bread, and place it in a basin containing warm distilled water, to which a drop or so of dilute acetic acid has been added. Stir the bread round, and, after a time, pour off a sample of the supernatant liquid into a test-tube. To this now add a few drops of a dilute solution of potassium ferrocyanide, a chocolate precipitate shows the presence of copper.

Alum is rather more difficult to expose, but its presence may usually be shown as follows:— Prepare a solution of carbolic acid by dissolving four parts of the acid in one hundred parts of water. After the liquid is quite cold, pour a little of it into a basin and add to it some of the crumb of the bread to be tested. Allow the bread to soak for an hour, after which time, filter off a sample of the fluid through a piece of blotting-paper. Pour into the filtrate so obtained, a little dilute nitric acid and then a few drops of barium nitrate solution, a white precipitate indicates the presence of alum.

Ordinary new bread takes about 4½ hours to digest, while stale bread only takes 3½ hours.

The above experiments if carried out carefully will give the amateur analyst a very good idea of the chemistry of bread.

The next article will deal with milk and butter.

### Photographic Hints for Amateurs.

A good plan for the making of enlarged negatives is to work from a contact print. This is best made on P.O.P. It should not be toned, but placed under a sheet of glass and copied. This method will be found to give excellent detail—none of which is lost by toning and fixing. In addition, the presence of the glass does away with that granular appearance which mars so many enlargements.

#### PASSE-PARTOUT MOUNTING.

This style of mounting consists in covering the paper-mounted print with glass, and securing it by strips of binding-paper or tape. It is an excellent occupation for the photographer in the winter months. The paper on which the print is mounted should be carefully chosen, and should be of a tint which suits the picture. If a border of more than one colour is required two sheets of paper of different sizes should be employed. They should be so placed that a margin of one paper shows beneath the other. In this case great care must be taken to select tints which blend well. A fairly stout cardboard backing should be used and secured to the glass by means of stout paper or binding tape. The portion which overlaps the glass should be so cut as to fit neatly at the corners and form an even edging to the frame.

# HOBBIES.

## Chess.

NOVEMBER 3, 1906.

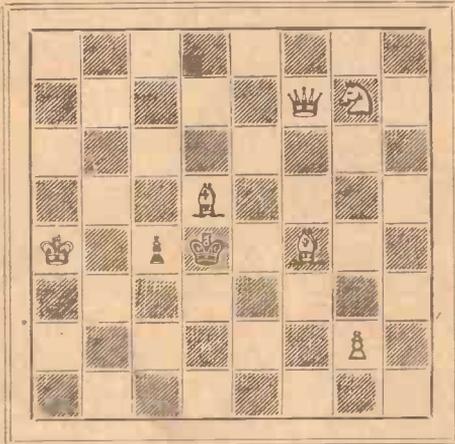
### TO CORRESPONDENTS.

\*\* All communications will be answered in HOBBIES. Readers desiring replies through the post should enclose stamped envelopes.

J. HART.—The position seems to be a drawn game.

### PROBLEM.

No. 227.—By JAMES BLAND, Bradford.  
Black.—Two pieces.



White.—Six pieces.

White to play and mate in two moves.

Solutions should be received by Wednesday following issue.

### SOLUTIONS.

No. 222.—By W. FAULKNER.

1 Q—K4.

- |            |               |
|------------|---------------|
| If 1 Kt×Q  | 2 Kt×Kt mate. |
| If Kt—K6   | 2 Q—K4 mate.  |
| If Kt—Kt5  | 2 P×Kt mate.  |
| If B—Q2 ch | 2 Kt×B mate.  |
| If Other   | 2 Q—Q5 mate.  |

The "try," 1 Q—Q7 is defeated by R—Kt3; and 1 Q—B3 or Kt2 by Kt—K6. 1 point.

Solvers' list, with scores to date as follows:—  
G. C. Baxter 1, L. C. Brown 2, A. Bernstein 2, J. Bland 2, H. W. Bick 2, W. Blackwell 1, W. Chandler 2, D. Croft 2, Harry G. Driver 2, H. W. Dawson 2, E. Eginton 2, W. Eason 2, S. D. Fresco 2, J. Goode 2, W. Geary 2, H. Goodwin 2, A. J. Head 2, C. J. Howell 2, T. L. Heath 2, W. J. Heath 2, H. Horsley 2, G. P. Kitchener 2, H. Lawton 2, W. McLoughlin 1, E. Perrin 2, F. Page 1, Ernest Roome 2, Jos. Rust 2, C. Rich 1, E. Robins 1, A. L. Sanders 2, C. F. Simmons 2, A. Spalding 1, R. G. Thompson 2, J. D. Tucker 2, A. J. Williams 2, A. J. Walker 2, E. Whiteley 1, H. Zaak 2.

The prize of 3s. for the best problem published

during the eight weeks ending October 6th is awarded to Mr. Howard Lawton for No. 215.

Mr. Goodwin's No. 221 is noted as a good composition, and also No. 222, by Mr. W. Faulkner.

Problems contributed may be either two or three moves, and should be diagrammed and accompanied by full solutions and name and address of sender.

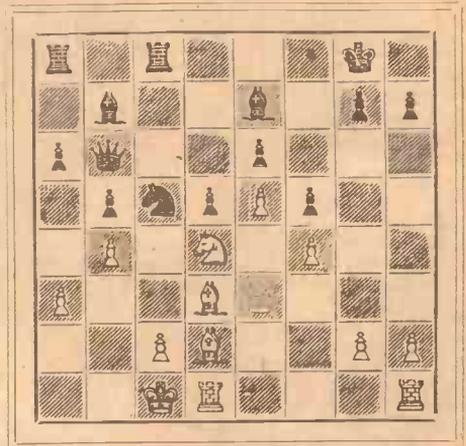
### FRENCH DEFENCE.

Played in the Tarrasch-Marshall match:—

White. Tarrasch.	Black. Marshall.	White. Tarrasch.	Black. Marshall.
1 P—K4	P—K3	22 Kt—Q6	B×Kt
2 P—Q4	P—Q4	23 Kt×B	B—K1
3 Kt—QB3	Kt—KB3	24 Q—Kt3	Q×Q
4 P—K5	Kt—Q2	25 P×Q	B—B3
5 P—B4	P—Q4	26 Qk—K1	K×K ch
6 P×P	Kt—QB3	27 K×R	K—K1
7 P—QR3	B×B	28 K×K ch	K×K
8 Q—Kt4	Castles	29 P—Kt4	K—B2
9 Kt—B3	Kt—Q5	30 B—B3	P—Kt3
10 B—Q3	P—B4	31 P—B5	P—B3
11 Q—K3	P—QR3	32 B—Q1	P—QR4
12 B—Q2	P—Qk4	33 K—Q2	P—Kt5
13 Castles QR	Kt×Kt	34 P×P	P×P
14 Q×Kt	B—Kt2	35 K—K3	P—Kt4
15 Kt—K2	Q—Kt3	36 P—Kt3	P—R3
16 P—Qk4	B—K2	37 B—B3	K—Kt1
17 Q—K3	KR—Qb1	38 B—K5	K—B2
18 Kt—Q4	Kt—B4	39 K—Q4	B—Kt2
	See diagram.	40 B—Kt7	P—Kt4
19 B×BP	P×B	41 P×P	P—Kt5
20 Kt×P	B—B1	42 P—Q7	Resign.
21 P×Kt	Q—Kk3		

Position after Black's 18th move—Kt—B4.

Black.



White.

**LARGEST ROD-CAUGHT CHUB.**—Some excitement was caused in angling circles in August by the capture of a fine chub of 7lb. 2oz. by Mr. Zerfar, a member of the Gresham Angling Society, the fish only scaling 3ozs. less than the English record chub taken by Mr. Walker, of the Piscatorial Society. These two great chub have now been excelled by one of 7lb. 6½oz., which fell to the rod of Mr. F. W. Smith, a member of the Weybridge Angling Association. The three notable chub were all taken in the Hampshire Avon, the two heaviest in the Christchurch district.

# HOBBIES.

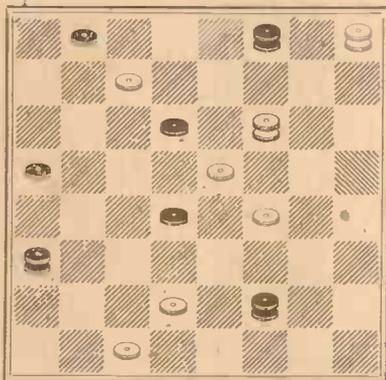
## Draughts.

Communications for this department must be addressed to "Draughts Editor, HOBBIES, 12, Paternoster Square, London, E.C." Replies cannot appear under three weeks.—November 3rd, 1906.

### PROBLEMS.

No. 862.—By A. COLLINGS, Northampton.

BLACK.

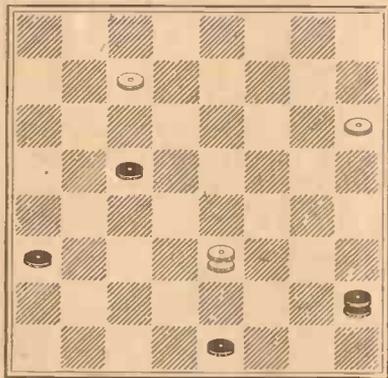


WHITE.

White to play and win.

No. 863.—By E. HOPKINS, Walsall.

WHITE.



BLACK.

Black to play and win.

### SOLUTIONS.

No. 858.—By T. LAVIN.

Black : 1, 6, 13. Kings : 7, 8, 23, 32.

White : 14, 18, 19, 31. Kings : 15, 21.

81	27	6—22	17	10	A-17—22	15	18
23—16	21	17	13—17	14	10	W.wins	
15	10	32—23	10	15	22—26		

A.—2—7, 14—9, 17—21, 9—6, &c., White wins.

No. 859.—By A. LAMBERT,

Black : 2, 4, 12, 13, 17.

White : 10, 19, 20, 25, 30.

19	15	18	14	5	1	5	14	23	19
(1)-17—21	17—22	29—25	22—17	17—14					
25	22	14	9	1	5	14	18	20	16
4—8	22—25	25—22	17—13	14—18					
22	18	9	5	10	6	18	23	16	11
13—17	25—29	2—9	13—17	W.wins					

### VARIATION (1).

4.	8	23	19	26—31	19	15	16—19
25	22	17—22	11	4	23—19	7	3
17—26	20	16	31—27	A-4	8	19—10	
50	23	22—26	15	11	B-19—16	11	7
13—17	16	11	27—23	10	7	W.wins	

A.—11—8 allows Black to win neatly by 2—7, 10—3, 19—10.  
B.—12—16, 8—12, 16—20, 11—8, &c., White wins.

### SOLVERS' LIST.

PROBLEMS Nos. 854-5.—Four points are scored by the following solvers:—J. C. Ashford (Westminster), J. Bruce (Liverpool), J. Bland (Bradford), F. P. Binington (Gateshead), K. Barlow (Radcliffe), S. Bates (Northampton), A. Berrisford (Stoke-on-Trent), A. Bernstein (London), T. Boardman (Farnworth), A. Collings (Northampton), S. Crean (Hyde), H. H. Cudmore (Clapton), W. Crichton (West Calder), D. Campbell (Dunoon), J. W. Coulthead (Hartlepool), G. W. Copping (Gillingham), S. E. Cousins (Northampton), G. Clark (Hart's Hill), T. Chatterton (Heaton Mersey), W. Cummins (Warrington), A. Dearden (Bushmill), F. Dodson (London), T. Duncan (Perth), J. Edmondson (Salford), H. Ferguson (Brierley Hill), A. Fellows (Dudley), A. Glover (Birkenhead), J. S. Gov (Newcastle-on-Tyne), C. Goff (Maidstone), J. Goode (Rugby), J. Hart (Wigan), P. Hyndman (Paisley), E. Hopkins (Walsall), A. Howie (London), W. Hardy (Newton), W. Hampson (Manchester), J. Henshall (Tunstall), G. Hodson (Oldham), H. Horsley (Cheadle Hulme), A. Hampshire (Great Stanmore), E. J. Hewitt (Bilston), P. E. Hawkins (Newbury), A. J. Head (Paddington), W. F. Jackson (Somerstown), J. H. Jones (Ayles), J. A. Knight (Northampton), E. Lloyd (Tooting), T. Lavin (Highbury), A. Lambert (Longstone), F. Lawrence (Paddock Wood), J. Metcalf (Hasland), J. Moore (London), J. McIntyre (Bury), J. McCallum (Greenock), D. McPherson (Stonehouse), W. Martin (Barking), S. D. Madderu (Torquay), T. Oakes (Dulwich), T. H. Phillips (Smithfield), W. E. V. Petit (Guernsey), G. Paul (Greenock), J. Rodgers (Duns), W. A. Kule (Widnes), C. T. Record (Maidstone), W. Stebbings (Sunderland), T. E. Sandham (Glasgow), R. Sallaway (Shadwell), A. Stewart (Linton), A. L. Sanders (Ilford), G. M. Strachan (Rushden), T. S. Smith (Northampton), F. F. Smith (Birmingham), R. Scott (High Wycombe), F. C. Spratt (Somers Town), W. Thorn (Southsea), J. Taylor (Manchester), A. Thomson (Shotts), J. H. Tennick (Sunderland), W. Tomkinson (Warrington), S. Tully (Paddock Wood), W. Wilson (West Calder), A. Wells (Lewes), J. Watkin (Grimsby), J. Watkin (Warrington), R. Watkin (Pulford), H. Wright (Accrington), J. Worsley (Northampton), G. Woifindale (Holton), A. C. Wheeler (Deal), P. C. Wells (Fulham), M. Billingham (Quarry Bank), W. Lushey (Jool Green), G. W. Clare (Warrington), J. Rowe (Warrington), J. Tricker (Woodbridge), A. A. Wheeler (Plumstead), and J. Wood (London).

Two points : J. E. Dean (Shirebrook) and O. Gibbons (Eastbourne).

Re PROBLEM No. 854.—At the fourth move of the solution, the best defence for Black is the sacrifice of the piece by 14—18 or 13—17. Quite a number of the solvers omitted this important variation in their solutions, and one solver gave it as a draw. Obviously the solutions from which it was omitted were not strictly correct, but this being the first problem in the competition we have allowed all solvers who sent the shorter solution full points. But in future all solutions that do not show the strongest defence will be treated as incorrect, and will not be awarded any points.

We are glad to note the great and widespread interest taken in the competition, as evidenced by the long list of solvers; and we take this opportunity to thank collectively a great number of our correspondents for their appreciative remarks on HOBBIES "Draughts" page, which we can assure them are highly valued.

"WANTED, capable girl, for dairy farm, able to milk. Four good-looking sons in the family." Thus runs an advertisement in a New Zealand journal.

## Nesting Boxes.

THE current number of "Bird Notes and News" devotes a page and a half of its space to the subject of "Nesting Boxes for Birds." In view of the fact that the enchanting pastime of watching birds "At Home" is growing in popularity in this country, the suggestions of Mr. Mead-Waldo for attracting such delightful little denizens of our country as tits, nuthatches and wrynecks to settle will be interesting.

Mr. Mead-Waldo thinks that the most suitable nesting boxes are those with a hole too small for any bird, so that the desirable tenant will chip it away to the size required, placed securely from five to eight feet above the ground, the hole, with a bit of thorny branch tied near to keep off the cats, facing the east if possible. Between October and February is the time suggested for setting up a box, and the birds may be fed throughout the winter with scraps of meat, &c., while at the same time they are getting used to the boxes. It is of little use to put any kind of building material in the boxes; birds have their own views on such matters.

Boxes are only of use for birds that build in holes; but after providing them with food, thrushes and blackbirds, the warbler family, the chaffinch and the bullfinch, may be enticed to build in an adjacent hedge or shrubbery.

The Royal Society for the Protection of Birds, Hanover Square, W., supply suitable boxes, which may be seen at the Society's office.

**YOUTHFUL ORGANIST.**—Master E. Harding, a Tunbridge Wells choir boy, who has exhibited unusual musical ability, has been given the post of organist at the local church of St. Matthew.

It is stated that those M.P.'s who are fond of a hobby usually return to their work at the House fresher than the other members.

**CASE AND INDEX FOR VOL. XXII.**—A handsome Red Cloth Binding Case for Vol. XXII. of HOBBIES, with Index and Title-page, may now be had for 1s. 3d., post free. The Index with Title-page alone may be had for 2d., or post free for 3d. Indices for previous volumes (except for Vols. IV. and V.) may also be had. Bound Volumes of HOBBIES, XIII., XIV., XVIII., XIX., XX., XXI., and XXII., may be had, price 3s. 6d., each, post free. (The other volumes are out of print.) HOBBIES LIMITED, 12, Paternoster Square, London, E.C.

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## Puzzles.

### XCVIII.—NUMERICAL PUZZLE.

I am a word of ten letters meaning a famous battle, which is still to be fought.

My 5, 9, 10, 6 means not here.

My 8, 6, 10 means a hole in the ground.

My 3, 4, 7, 6 means fashioned.

My 8, 2, 6, 1, 3 means a mere vision.

My 3, 4, 10 means a mere man.

My 7, 9, 10, 6 means finished.

My 5, 6, 3 is precious.

My 3, 4, 10, 1, 5, 6 means to contrive.

My 7, 4, 3, 1, 5, 6 means to injure.

My 5, 4, 3, 6 is something children like.

### XCIX.—DOUBLE DIAGONAL PUZZLE.

```

X . . . . X
. X . . X .
. . X X . .
. . X X . .
. X . . X .
X . . . . X
    
```

Replace the crosses and dots in the above figure by six six-letter words which read from left to right, mean:—

1. Ceasing.
2. Intellectual conceptions.
3. A prize.
4. Part of a bicycle.
5. A common saying.
6. Mean.

Then the letters which replace the crosses in the figure, read downwards, will mention a boy's name and a girl's name.

### C.—WORD SQUARE.

1. Defy.
2. Old.
3. Learned.
4. Whirlpool.

## Answers to Last Week's Puzzles.

### XCV.—CHARADE.

COTT. AGE.  
COTTAGE.

### XCVI.—SUBTRACTION PUZZLE.

BRICK—RICK—B  
OVERT—VERT—O  
ABOUT—BOUT—A  
DRINK—RINK—D  
IDEAL—DEAL—I  
CRASH—RASH—C  
ESCOT—SCOT—E  
ALONG—LONG—A

BOADICEA.

### XCVII.—CURTAILMENT.

C O R A L  
C O R A  
C O R  
C O  
C

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| 1 pair Jewellery or Soldering Tweezers.                          | 1 Pair Pliers.                                   |
| 1 Hank Jeweller's Charcoal Binding Wire.                         | 1 File and Handle.                               |
|  | 1 Jeweller's Hammer.                             |

#### Contents of 5/- Size (post free, 5/6) Outfit.

- |  |  |
|--|--|
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| 1 Compound Charcoal Block.                                       | 1 Bundle Metal Saws.                     |
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| 1 doz. Borax Brushes.  | 2 Files and Handles.                     |
|  | 1 Jeweller's Hammer.                     |

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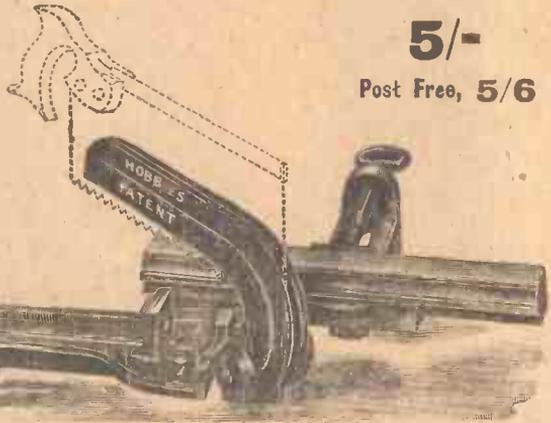
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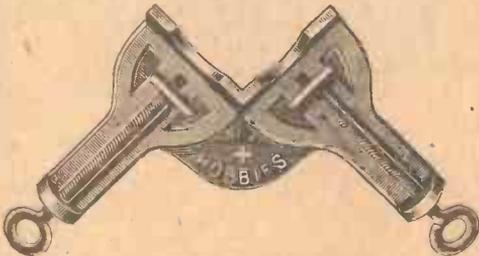
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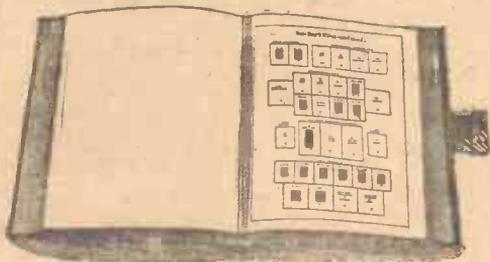
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- |                        |   |                          |
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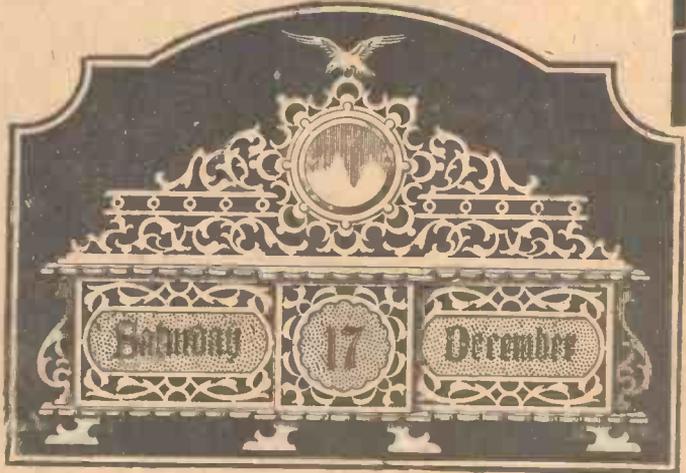
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Size 19½ ins. by 13 ins.

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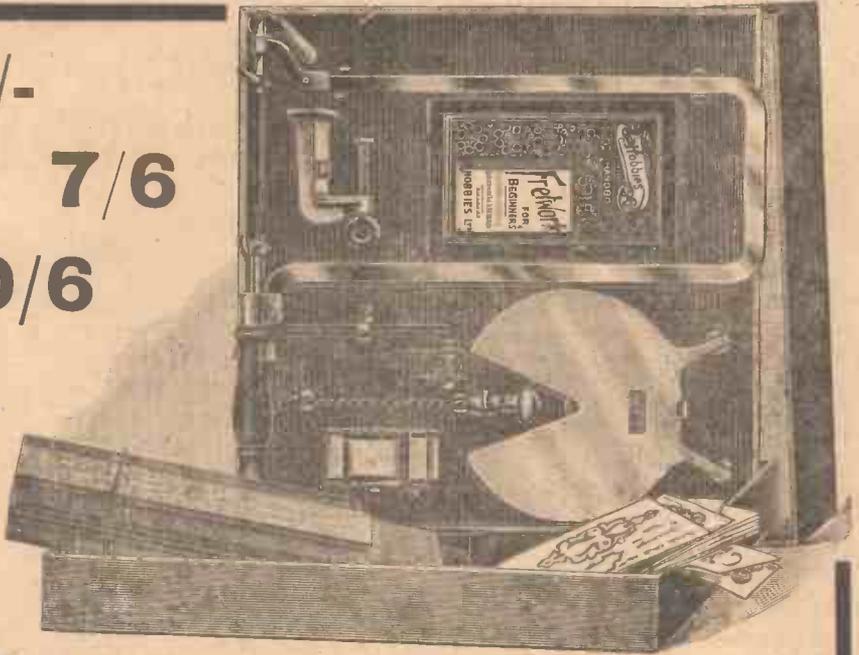
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5/-

7/6

10/6



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