

HOBBIES

weekly

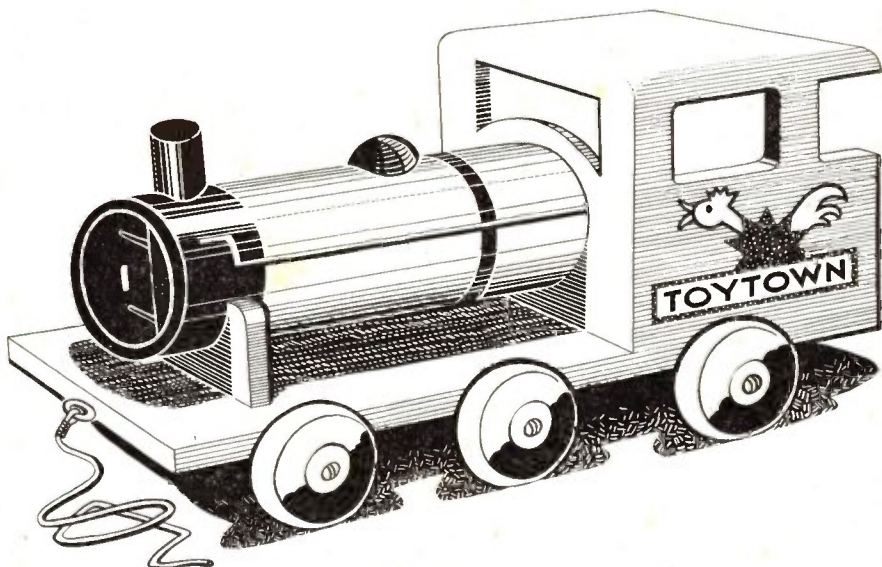
3rd FEBRUARY 1965

VOL. 139

NUMBER 3608

FREE Plan to make

A PULL-ALONG TOY ENGINE



A PROJECT TO FASCINATE YOUNGSTERS

FOR CRAFTSMEN OF ALL AGES

6^D



HOW TO FOLD ROUTE MAPS

THE first road map ever made was during the reign of Hadrian. It was called an Itinerarium and prepared by one Antoninus to include 15 journeys in Britain.

History reveals that after the fall of the Roman Empire our roads fell into disuse and road maps were not prepared until the 14th century.

We have book maps, atlases, folding maps and strips but as hiker, cyclist and motorist I always seem to get into difficulties when the road I am following goes off the particular section. While the present-day folding maps are very good, only too often have I had to open the map out completely and re-fold to the desired section sometimes in rain or high wind. This may sound a small task but it is one that can be exasperating.

Six operations

So here we explain how you can adapt a map for easy folding, when it will show a quarter of the area at a time. Should the road actually run over the fold to the next section it will be visible by turning a single page.

We recommend that the white border surrounding the map be trimmed away but if you wish to save the symbols these can be pasted on the back. Moreover, before folding a map we would suggest you make a trial of this method by using an old sheet of newspaper. When you are sure you know how it is done you may proceed to prepare your map.

Fig. 1. Fold the map horizontally across the centre with the printed side outwards. Crease the fold and re-open the map.

Fig. 2. Repeat this folding process again, but this time in the vertical position.

Fig. 3. Turn each outer edge to the vertical centre, fold and crease. You should now have three vertical creases and one horizontal.

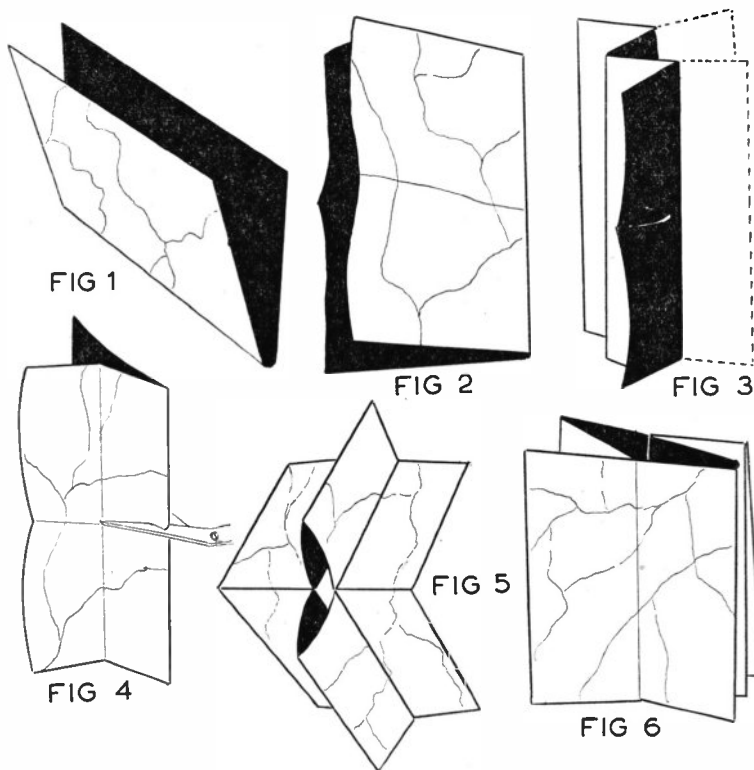
Fig. 4. Take the map in one hand and cut along the horizontal fold of the inside double section. Note that we only cut as far as the next vertical crease.

Fig. 5. The last operation opens the map as shown. If you now fold the map into its original vertical sections and bend it backwards the cut will open.

Fig. 6. This shows how the map is folded back to the smallest section.

Like a book

The map will now open out like a book quite easily or you can turn it over to read the upper half. Trimming away the



edges makes the map slimmer to fit easily into the pocket. Incidentally, we suggest that it is best to obtain flat, un-

mounted maps for this purpose and if the cut part is bound with Sellotape it will not tear. (S.H.L.)

Pin Holders for Flowers

THE art of flower arrangement is becoming increasingly popular, but the special pin holders needed are expensive to buy. However, it is fairly easy to make a useful substitute. It will not be quite as heavy as the shop kind, but can be held in place in the flower container with a piece of Plasticine fixed *before* any water is put into the bowl, otherwise it will not stick.

To make the pin holder you will need $\frac{3}{4}$ in. panel pins, finest grade, and a packet of Alabastine. For a base use any small tin lid of about $1\frac{1}{2}$ in. diameter (e.g. Hienz salad cream top). Using an old cup and spoon mix a small quantity of Alabastine to the consistency of whipped cream and fill the tin lid with

the mixture. Then working as fast as you can, place the panel pins point upwards in the mixture, starting in the centre and working out in concentric circles. The pins should be not more than a tenth of an inch apart or they will not hold the thinner flower stems. The outermost ring of pins can be sloped slightly outwards; the others should be vertical.

When the Alabastine is quite dry paint it and the tin lid with rustproof paint. Finally paint with green or white gloss paint.

When you have had some practice you can try making larger sizes of pin holders, but you have to work very fast to get all the pins in before the Alabastine sets hard. (D.H.N.)

CHEMISTRY

AT HOME

THE human body is continually building up and breaking down protein. One of the waste products of the breaking down process is urea, $\text{CO}(\text{NH}_2)_2$. This is voided by way of the urine. About one ounce per day is thus produced.

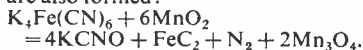
At one time it was believed that substances of organic origin such as urea could never be synthesized because some mysterious vital force was necessary for their formation. Yet in 1828 a chemist named Wöhler prepared it from inorganic sources. Urea was thus the first organic compound to be synthesized. It was soon found that given the right methods more and more such compounds could be made in the laboratory and the old ideas were overthrown.

Wöhler made it by heating a solution of ammonium cyanate, NH_4CNO , when it became converted into urea: $\text{NH}_4\text{CNO} = \text{CO}(\text{NH}_2)_2$.

It is interesting to carry out this classic experiment and synthesize a specimen for oneself. Potassium cyanate, KCNO , is first prepared by heating anhydrous potassium ferrocyanide, $\text{K}_4\text{Fe}(\text{CN})_6$, with manganese dioxide,

EXPERIMENTS WITH UREA

MnO_2 , iron carbide, FeC_2 , nitrogen, N, and manganic oxide, Mn_2O_3 , are also formed:



Dehydrate 30 grams of powdered potassium ferrocyanide by stirring it constantly in a gently heated tin lid until a cold watch glass held close to it no longer mists over.

Grind 20 grams of the dry salt with 10 grams of manganese dioxide. Heat this to just below redness in the tin lid, when glow will suddenly spread through the whole. Adjust the flame so

the water bath. The urea has now to be extracted from the potassium sulphate. This is done with hot methyl alcohol, CH_3OH . Rig the reflux apparatus shown in Fig. 1, put the powdered solid in the flask together with 80 ml. of methyl alcohol and boil for 30 minutes. Filter the solution and wash the residue with 10 ml. of methyl alcohol.

Now distill off about two-thirds of the methyl alcohol from the combined filtrates in the apparatus shown in Fig. 2, and then pour the remaining solution into an evaporating basin. Let it cool and stand a few hours, when long crystals of urea separate. Filter them off, dry them in a warm place and then bottle them at once, for urea is rather hygroscopic.

Urea is a base and so forms salts. Two are used as tests for urea. These are urea nitrate, $\text{CO}(\text{NH}_2)_2 \cdot \text{HNO}_3$, and urea oxalate, $\text{CO}(\text{NH}_2)_2 \cdot (\text{COOH})_2 \cdot 2\text{H}_2\text{O}$. Preparation of specimens will also serve to show the tests.

Dissolve 3 grams of urea in 4 ml. of water and add 6 ml. of strong nitric acid, HNO_3 , (caution, corrosive; any on the fingers should be flushed off with water and wet sodium bicarbonate applied). A white precipitate of urea nitrate appears:

$$\text{CO}(\text{NH}_2)_2 + \text{HNO}_3 = \text{CO}(\text{NH}_2)_2 \cdot \text{HNO}_3$$

Filter it off, dry it on a porous tile and then put it in a warm place for a few hours to drive off the small amount of adhering nitric acid.

To prepare urea oxalate dissolve 3

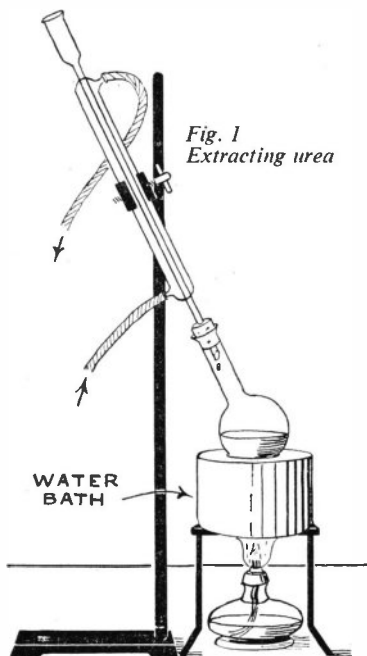


Fig. 1
Extracting urea

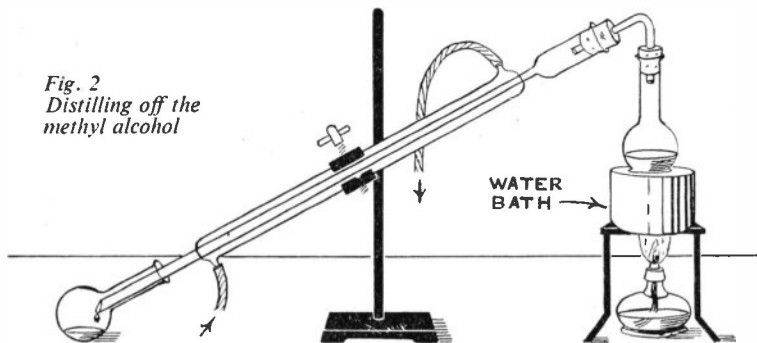


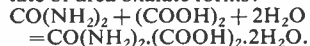
Fig. 2
Distilling off the
methyl alcohol

as to maintain the glow until the mass becomes pasty and then allow to cool.

Shake the powdered black mass with 80 ml. of cold water, filter and then run 40 ml. of cold water through the residue. This extracts the potassium cyanate. Dissolve 20 grams of ammonium sulphate, $(\text{NH}_4)_2\text{SO}_4$, in the filtrate. Ammonium cyanate is now formed in the solution: $2\text{KCNO} + (\text{NH}_4)_2\text{SO}_4 = 2\text{NH}_4\text{CNO} + \text{K}_2\text{SO}_4$ (potassium sulphate).

Boil the solution to low bulk and then continue the evaporation to dryness on

grams of urea in 5 ml. of water and 3.15 grams of oxalic acid $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$, in 50 ml. of warm water. Mix the cold solutions. A white crystalline precipitate of urea oxalate forms:



After standing a few hours the precipitate may be filtered off and dried on a porous tile.

Another test for urea depends on the formation of biuret, $\text{NH}(\text{CONH}_2)_2$, which is formed together with ammonia and other products when urea is heated:

$2\text{CO}(\text{NH}_2)_2 = \text{NH}(\text{CONH}_2)_2 + \text{NH}_3$. Heat a small amount of urea in a dry test tube. It melts, gives off ammonia and also white fumes. The latter are poisonous and should not be smelt, though they almost wholly condense on the walls of the tube. After a few minutes' fusion at as low a temperature as possible the melt solidifies in the bottom of the tube. This consists mainly of biuret.

Scrape out the white solid from the walls of the tube and dissolve the solid residue at the bottom of the tube by warming it with a few ml. of a 10 per cent solution of sodium hydroxide, NaOH. Cool the solution. Dropwise add a solution of copper sulphate, $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$. A violet colour appears. These reactions are an important test for urea.

To prepare a specimen of biuret for stock more lengthy heating is needed, but the heating may be interrupted and continued when convenient. Put 10 grams of urea in a round-bottom flask

and melt it over wire gauze. Now clamp a thermometer so that its bulb just dips into the liquid. Heat to 150 degrees to 170 degrees Centigrade for a total of 4 hours. Remove the thermometer and let the whole cool. Pour in 25 ml. of water and heat the flask in a boiling water bath until the hard mass disintegrates. Continue heating for a few minutes and then boil up the solution over gauze. Filter the solution hot. On cooling the filtrate deposits somewhat impure biuret. Filter off the white crystals and dissolve them in a mixture of 1 ml. of strong ammonium hydroxide, NH_4OH , (specific gravity 0.88) and 10 ml. of water by heating. Pure biuret crystallizes out on cooling and may then be filtered off and dried.

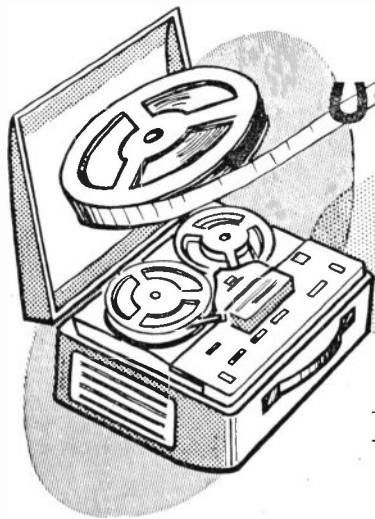
By the action of nitrous acid, HNO_2 , urea is completely broken down into water, and the gases carbon dioxide, CO_2 , and nitrogen, $\text{CO}(\text{NH}_2)_2 + 2\text{HNO}_2 = \text{CO}_2 + 2\text{N}_2 + 3\text{H}_2\text{O}$.

This, too, is a valuable test for urea. The necessary nitrous acid is obtained by

acting on sodium nitrate, NaNO_2 , with sulphuric acid, H_2SO_4 , sodium sulphate, Na_2SO_4 , also being formed:
 $2\text{NaNO}_2 + \text{H}_2\text{SO}_4 = 2\text{HNO}_2 + \text{Na}_2\text{SO}_4$.

Dissolve a little each of urea and sodium nitrate in a few ml. of water and add dilute sulphuric acid. The mixture effervesces due to the evolution of the two gases. The carbon dioxide may be tested for by holding in the tube a glass rod bearing a drop of lime water, $\text{Ca}(\text{OH})_2$. The lime water clouds owing to formation of insoluble calcium carbonate: $\text{Ca}(\text{OH})_2 + \text{CO}_2 = \text{CaCO}_3 + \text{H}_2\text{O}$.

Important, too, is the reaction with hot sodium hydroxide solution. Boil a little urea with sodium hydroxide solution, holding a damp red litmus paper over the mouth of the tube. The paper turns blue indicating alkaline vapours. If you remove the tube from the flame and smell it you will find the change to be due to evolution of ammonia. In fact, the urea forms sodium carbonate, Na_2CO_3 , and ammonia:
 $\text{CO}(\text{NH}_2)_2 + 2\text{NaOH} = \text{Na}_2\text{CO}_3 + 2\text{NH}_3$.



USING YOUR TAP RECORDER

MAKE YOUR OWN MOOD MUSIC

I HAVE written more about sound effects than any other aspect of tape recording in this magazine. However, sound effect is not the only need for tape drama, mood music being just as essential, so let us consider the scope for it from the point of view of the very, very amateur musician.

There are quite a number of instruments that can be played either by people with a good ear for a tune or a little knowledge of the keyboard. Of the former, the first that comes to mind is the gazooka, which is a sophistication of the comb and paper. This is a strong tenor sound which has great possibilities

of carrying the melodies. A bass variation on the gazooka is a comb and paper that is slightly thicker than the usual tissue.

There are many wood wind variations for the novice musician. Perhaps the easiest to learn is the flageolet, generally sneeringly referred to as 'the penny tin whistle'. It is a libel! The flageolet is a proper musical instrument, with a pleasant tone, providing breathing is controlled.

I have found the recorder extremely easy to learn and very useful. Its flute-like tone has a touch of authority about it, and a competent performer can act as

leader to a group. However, the recorder is a good solo instrument, especially in adding pastoral touches. There are of course bass recorders as well as treble and tenor.

When I volunteered for such a mood music group I said that I could play the recorder. 'That's great', remarked the organiser, 'that is a different sound.'

That was very much the correct approach to the peculiar kind of orchestration needed, the art of arranging each instrument to paint a portion of a whole musical picture *within the limitation of the musician*.

I recently heard a demonstration of this in a native chorus my South African tapespondent sent me. One instrument played only one note all the time, yet it sounded such an indispensable sound.

In making up the wind ensemble the clumsy looking piano-flute should not be neglected. It may look grim, but its sound is quite pleasant, and I have been assured it is easy to play.

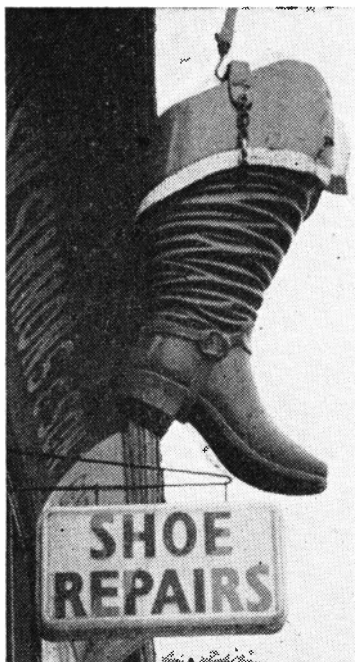
There are a large variety of percussion type instruments that can be played by people with only a rhythmic sense. Into this category come Jews harps; bongo drums, tamborines, castanets, triangles, tumblers filled with varying amounts of water, maracas, etc. Nor should we forget that advertisers claim that the ukulele is easy to play.

For the complete musical ignoramus, great things can be done on the piano. Meandering on the mid-treble keys with the loud pedal on can evoke an eerie atmosphere. Violent discord with both hands may mean that the hero, or heroine, has stumbled upon the corpse!

With a Camera 'COLLECT' INN AND TRADING SIGNS

Says

A. E. Bensusan



These trade signs are rapidly becoming rare

HERE is an all the year round interest for anyone owning a camera. In fact, for reasons which will be explained later in this article, the duller months are preferable to the bright days of summer, so you should have no difficulty in keeping up your outdoor photographic activities even in mid-winter.

Pictorial inn signs are plentiful in all parts of the country, and there is always

something intriguing about them. The main interest may be historical, humorous or just plain artistic, but whichever it is you will find these signs well worth recording.

Although most of them are hand-painted on a wood base, occasionally one comes across a more elaborate wrought iron or carved sign with its details delicately picked out in gilding or enamel. Because of the high cost of manufacture, and the present-day dearth of craftsmen capable of carrying out the work, these signs are comparatively rare and no opportunity should be lost of adding such pictures to the collection.

There are subjects to suit all tastes and, since towns have usually grown up around their railway stations, many inns having names associated with transport are normally to be found in that locality.



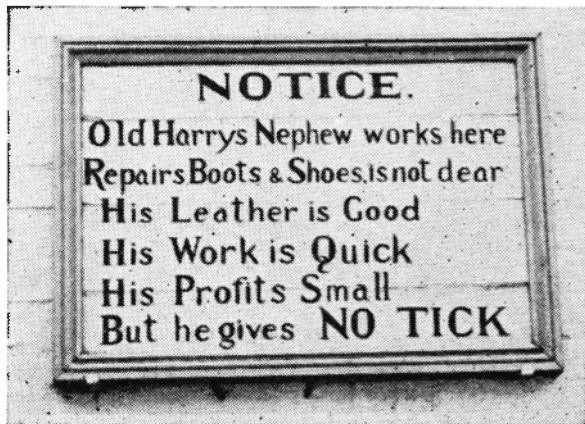
An iron inn sign, gilded and enamelled.

Thus, railway enthusiasts are specially catered for. In fact, it is possible to trace the evolution of the steam engine right back to its early days through the medium of illustrated inn signs alone. Naturally, these illustrations are not always strictly accurate, but that hardly affects their interest value.

Rural scenes and customs, and topographical features peculiar to that neighbourhood, are also frequently found, while birds, animals and fishes are plentiful enough to form the subject of a separate collection.

Never make the mistake of assuming that both sides of a sign are similar, for in some parts of the country it is quite normal to find totally different pictures on either face. Admittedly, both sides carry illustrations suitable to the name of the inn, but one can imagine the effect on a slightly inebriated patron when he finds that the sign has seemingly been changed in the time it took him to quaff his pints. The moral is clear; always check both sides of a sign to see whether they offer something different.

As I mentioned earlier, a dull day gives the best results when photographing these signs. Most have lamps angled in reflectors above them and any sunshine throws a deep shadow to spoil the illustration. Whatever the position of the sun, it is rarely possible to find a time



This amusing sign is passed by thousands of visitors to historic Arundel in Sussex

when the shadow is thrown clear of the sign, so stick to overcast days and you will not go wrong.

Experience shows that filters are seldom necessary or helpful as inn signs are generally very colourful, and it is virtually impossible to accentuate one tone without affecting the others. It is, however, important to use a lenshood as the camera is always pointed upwards and the intensity of the light from the sky is far greater than that reflected from the subject.

The height of the signs, and their distance from the camera, means that anyone with a fixed-lens camera will need to enlarge up the centre of the negative to obtain a reasonable size

print. This presents no great difficulties as long as a slow or medium speed film is used.

If the sign is on a swinging mount, you will have to wait for the moment when it is still to take your picture. If you can use a shutter speed of, say, 1/100th of a second, this will be fast enough to stop any slight movement, both of yourself and the sign, but it is always wise to spend that extra minute or so waiting for a lack of movement just to make sure.

The general recommendations given above apply equally to trade signs, but here the difficulty lies in seeking out the subjects. Each year, as old shops are pulled down to make way for new ones,

the signs disappear entirely. By photographing them, you will help to preserve some small part of our history. Bank signs such as the eagle and the grass-hopper are still common, but the carved and painted real trade signs, which once showed from a distance the nature of the shop, are rare indeed.

Now and again, you will find an amusing trade sign up over a shop door, generally in the form of a public notice, and these are always good subjects for the collection. Once again, they are fast vanishing from the scene so, if you know of one, get out your camera and photograph it now. Next week may be too late!

Taking Fingerprints

CAN you tell me the most satisfactory powder for brushing over fingerprints (e.g. on glass) in order to make them visible. I am very anxious to know what steps should be taken (photographic or otherwise) to enable me to keep such 'brushed-over' prints in a permanent form — I believe there is a 'lifting' technique involving 'Sellotape', but perhaps you can tell me the most satisfactory way of making a 'book' of friends' prints. (J. B. — Ipswich.)

A GENERAL purpose powder for fingerprint detection is aluminium powder. This is mostly applicable to hard, fairly polished surfaces. For softer surfaces, such as paper, heat 12 drops of tincture of iodine to boiling in a saucer standing on a pan of boiling water. Hold the paper, print side down 3 to 4 in. above the saucer, when the print shows up brown.

For permanent prints, non-photographic, use aluminium powder combined with the Sellotape lifting technique, pressing the tape evenly on the print, peeling off and mounting on black paper.

For photographic recording methods must be adapted to the substrate. For darkish surfaces brush with a mixture made by grinding 1 part by weight of mercury with 2 parts of precipitated chalk until the mercury has entirely disappeared leaving a dull grey powder. For white and other light surfaces brush with powdered graphite. Cloth and paper should be dusted with charcoal powder and photographed in a strong oblique light. Soft surfaces, such as soap and cheese, need to be photographed in ultra-violet light.

To make a book of prints the easiest way is to use the ordinary office stamp pad, transferring the print by pressing the finger on the pad and then on white paper. The Sellotape method may also be used with aluminium powder, as



above, or where the surface demands it, by the mercury chalk or graphite method using black or white paper respectively for the last two.

A fluorescent solution

I READ in a book recently that a fluorescent solution could be obtained by pouring hot water over horse chestnut bark. I have tried this several times without success. Could you please give me an explanation for my failure. (T. B. — Kent.)

THE fluorescence of an extract of horse chestnut bark is due to aesculin. The amount present in the bark is highest in spring before the buds are open, but even then it is very small. Here are two causes of the failure, i.e. season and inefficient extraction. It is not sufficient to merely pour hot water on to the bark. It should be reduced to chips and boiled for a short time with water so as to extract the maximum amount. Further causes of failure are a too concentrated extract or one which is

 ★ NOTE TO ★
 ★ CORRESPONDENTS ★
 ★ All correspondence on any sub- ★
 ★ ject covered in this magazine ★
 ★ must be addressed to: The Editor, ★
 ★ Hobbies Weekly, Dereham, Nor- ★
 ★ folk. If a reply is required, queries ★
 ★ should be accompanied by a ★
 ★ stamped addressed envelope and ★
 ★ reply coupon inside back cover. ★
 ★*****

too acid. High dilution should be tried. If this fails, add a drop or two of solution of washing soda to rectify acidity. However, efficient extraction and high dilution are nearly always effective in producing the fine blue fluorescence.

Cleaning a clock movement

I WONDER if you will instruct me as to the best way and the mixture to be used for cleaning watches and clocks. (P. T. — Nottingham.)

AS a cleaning agent for watch and clock movements, benzine is undoubtedly the best. It can be purchased from a chemist or drug store. A good alternative to benzine is petrol, particularly that sold as fuel for cigarette lighters. Both fluids have a high rate of evaporation and should therefore be kept in air-tight containers. As an alternative to using benzine or petrol there are many proprietary cleaning fluids available on the market. Providing they are from a reputable supplier these cleaning fluids have much to commend them.

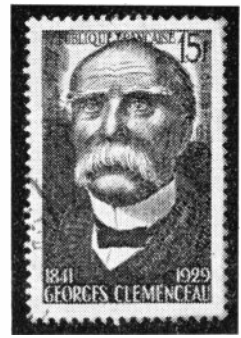
Bakelite Adhesive

I HAVE a bakelite photographic developing tank with a small leaky crack in it. Please could you suggest a method of sealing it which will stand against the photographic chemicals? (A.C. — Rochdale.)

THE best adhesive likely to fill the cracks in your developing tank is Araldite — supplied in two tubes. You mix a little from each and press it into the cracks. It must be left about three days in a warm room to set. It may help, if the cracks are narrow, to scrape them wider so that the adhesive gets a good penetration. Araldite is available from Hobbies Ltd., Dereham, Norfolk. A pair of tubes costs 6s. 0d. plus 6d. postage.



THE ISSUES OF FRANCE—2



*Georges Clemenceau—
is portrait too large?*

UP to 1936 France had been satisfied with postage stamp which denoted that a fee had been paid for carrying a letter from one place and delivering to another. In 1937, however, French stamps were used not only to denote the payment of a fee but also to collect money for some form of charity. These included 'Wireless for the Blind', 'War Victims Monument Fund', 'Red Cross Society', 'Posts, Telegraphs, and Telephone Operators Orphans Fund' and so on.

The holding of the International Water Exhibition at Liege was the occasion for the issue of an excellent design, that of the Marly Waterworks and in 1948 there was another equally good design, 'The Barrage of Genissiat'. One of the three technical achievements, as they were called, was the 'Donzere — Mondragon Barrage' on the 12fr. value. The other two values, the 18fr. and the 30fr. showed the Aiguille du Midi Cable Railway and the Port of Strasbourg respectively. These three are really rather high values but the cost of postage had risen very considerably since 1939.

Cheap printed rate

From July 1946 all postage stamps were over the 1fr. mark except for two values of the 1949 issue which were only 10c. and 50c. We must remember that on the Continent they have a very cheap rate for printed papers. In fact it pays people in England to print price lists here, send them in bulk on to the Conti-

nent and have them posted back to customers in England.

The mention of high prices recalls the air set of 1949-50. It was of five values, showing views of Lille, Bordeaux, Lyons, Marseilles, and Paris (100, 200, 300, 500 and 1000 francs respectively). As unused specimens these are very nice stamps and they have increased in value very considerably.

Judging by all the pictures of monuments that appear on the stamps of France one would be forgiven for thinking that they were the only buildings that mattered. This is not really the case but there are a very great number of these and we must devote a little space to them. One could well start with the two stamps that appeared in 1936 to commemorate the centenary of the death of Rouget de Lisle, who was the composer of 'La Marseillaise'. One value (the 20c.) shows the statue of de Lisle. The higher value (the 40c.) shows the statuary 'La Marseillaise'.

The same year there were two stamps to commemorate the unveiling of the Canadian War Memorial on Vimy Ridge — the 75c. red (illustrated) and the 1fr. 50c. blue. It is rather curious that this stamp is printed horizontally, yet the inner framework has changed the aspect and turned what at first sight one would have said must be a vertical stamp into a pleasing horizontal. At the same time it has given space for the figures of value and the R.F. and 'Postes'.

A rather similar memorial is that at Lyons for the Military Medical Corps. This has been designed as a vertical stamp with the word Postes at the top and the letters 'R.F.' (Republique Francaise) hardly noticeable at the bottom. The value (55c. + 45c.) is rather squashed in on the left hand side and it is not such a pleasing result as the Vimy Ridge issue.

Two stamps which are frequently missing from a general collection were sold only at museums at a premium of 70c. above face value. They were already attached to postcards, and were sold to raise money for national museums. They show the statue of 'Victory' at Samothrace. The postal value was not high — 30c. green and 55c. scarlet — so the premium was well above the postal value. The stamps have now become quite popular. They are worth about as many pounds as they were pence when issued in 1907.

The best known of the French Monuments is of course the Arc de Triomphe. This appeared on the 1929 stamp (illustrated) and gives the best view. Another view was chosen for the stamp which commemorated the 20th anniversary of the 1918 Armistice. It is rather curious that this stamp, although it has 11th November 1918 printed on it was issued on the 8th October. One would have thought it would have been more suitable to have held it back for the month or so and issue it on the named day.



The Canadian Monument on Vimy Ridge

The Arc de Triomphe in Paris

Commando Raid at St. Nazaire

The Arc de Triomphe is shown on another French stamp, namely that which was issued to commemorate the visit of King George VI and Queen Elizabeth in 1938. The Houses of Parliament are also shown on this stamp.

Last war monuments

In 1939 France issued a 90c. stamp bearing a premium of 35c. which went towards the cost of a monument at Lille to the civilian victims of war. It shows a figure standing against a wall, rather a pathetic subject for a stamp design, but then it was not a theme which could be treated lightheartedly. And the same remark applies to a stamp that was issued in the same year for a statue to sailors lost at sea and to be erected at Boulogne. The premium was 30c. on a postal value of 70c.

During the last war the consumption of steel was colossal and Germany had difficulty in getting enough for her needs. She had to import from Sweden and that was a reasonably easy matter

while she could use the Baltic Sea route. But when this route became frozen over another way had to be found via the North Atlantic route from Narvik.

It was obvious that if this route could be blocked up then it would be very difficult for Germany to get enough iron ore. Accordingly, the Allies decided the port must be closed and a stamp was issued in May 1952 to commemorate the raid which took place in 1940. A rather similar exploit was commemorated in 1947 when the French issued the stamp illustrated to mark the 5th anniversary of the British Commando raid on St. Nazaire, a port at the mouth of the river Loire.

These are most of the monuments that appear on the French stamps except of course the Eiffel Tower which was designed by A. G. Eiffel for the Paris Exhibition of 1889. The best illustration of this is on the 1939 50th anniversary issue.

Some of the ship designs from France are very well worth looking at. In 1939

the battleship *Clemenceau* was shown on a 90c. stamp, the liner *Pasteur* on the 1fr. of 1941 and in 1946 battleships were figured on the naval charity stamp. On the 50th anniversary of the death of Jules Verne they showed a picture of the submarine 'Nautilus' — made famous in his book '20,000 Leagues under the Sea'. A square rigged ship 'La Capricieuse' makes a delightful subject for the 1955 centenary of the voyage of this vessel from France to Canada.

Well, there are so many more stamps from France to be considered and I have purposely kept off three subjects which will be considered later, namely French art, music and musicians, and portraits.

But just to give readers something to think about the last illustration is a portrait of Georges Clemenceau. What do you think about it? To me the effect is quite spoiled by the size. A postage stamp is only a small piece of paper and the portrait is too big for the stamp.

WHEN Australians switch to the decimal system of currency in February 1966 they will find their new money a lighter burden in weight and colour than the old — for three of the coins will be made of cupro-nickel instead of heavy silver alloy.

This will be the first time cupro-nickel has been used for coins in Australia. For the past 176 years, Australia's coins have been of silver and copper alloys — and of course gold was in use until sovereigns were replaced by paper notes.

Cupro-nickel is not only slightly lighter in weight than the present silver alloy but is whiter in colour. It has long been used in Britain, the United States, Canada and other countries, for coins.

It consists of 75 per cent copper — of which Australia is a large producer — and 25 per cent nickel. Nickel is the only

NEW COINS FOR AUSTRALIA

base metal not produced in Australia. The only known deposits of nickel in Australia are in a difficult and practically inaccessible region of the continent — in the south-west corner of the Northern Territory and a neighbouring part of Western Australia. The nearest supplies of nickel are in New Caledonia but Australia does not import the raw material as it has no nickel refinery.

Most of Australia's nickel requirements are supplied by Canada.

Australia's present coins, except pennies and halfpennies (bronze), are of 50 per cent silver, 40 per cent copper and 5 per cent each of zinc and nickel.

The new decimal coins to be made of cupro-nickel, 5 cent, 10 cent and 20 cent, will not only be lighter in weight and colour but in intrinsic value. The present 2 shilling pieces — like a number of American and Canadian coins — contain almost their own value in silver.

Australian 2 shilling pieces (florins) minted up to 1946 were 92½ per cent silver and are now worth more than their face value. Most of these coins, however, have been withdrawn from circulation — and many others have been smuggled out of the country.

The only silver coin in the new decimal currency will be the 50 cent piece. Its value in silver will be kept below 50 cents. The new coins will bear the Queen's head on the obverse and native animal and bird designs on the reverse.

(E.)



From left: Silver 50 cent piece bearing the coat-of-arms of Australia (kangaroo and emu) and the cupro-nickel coins 20 cent (platypus); 10 cent (lyre bird); 5 cent (echidna, or spiny ant eater).

EASY-TO-MAKE PARKING LAMP

FOR A TOTAL COST OF A FEW SHILLINGS THE MOTORIST CAN MAKE A HANDY PARKING LAMP

and another bend at the second mark at the same side of the strip.

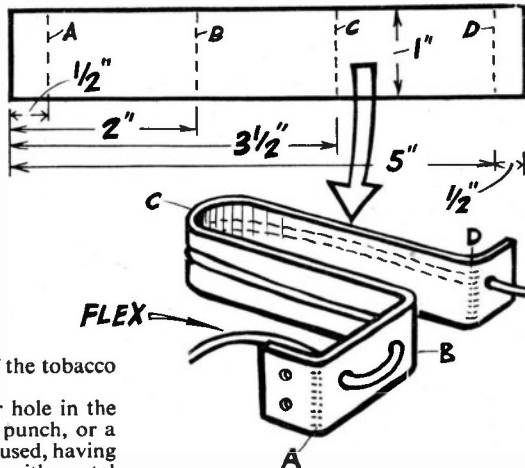
Now carefully make a complete U-bend at the $3\frac{1}{2}$ in. mark. In the final stages of bending, it is necessary to put a piece of hard wood between the bend, about $\frac{1}{8}$ in. thicker than the window glass on which the lamp will normally be fixed. The limbs of the U-bend can then be hammered parallel. A final right-angle bend is made at the 5 in. mark — again on the same side of the bracket.

The next step is to drill holes in the bracket for making the attachment to the lamp housing, and to carry the lead wire.



If you are a do-it-yourself man, and your car is not fitted with a parking light, you can remedy this defect at a maximum overall cost of four shillings. You may even have some of the needed materials by you.

Showing how the lamp bracket is formed from the strip of mild steel. Bend at the various measurements, as described in the text.



is weatherproof. The rest of the tobacco tin is not needed.

Now cut a 2 in. diameter hole in the base of the tin with a 2 in. punch, or a pair of curved cutters can be used, having first scored out the circle with metal dividers. A similar sized hole is made in the lid.

The tin, which forms the lamp housing, now requires a bracket, and this is easily achieved by bending the mild steel strip into shape. Mark off the following distances along the strip — $\frac{1}{2}$ in. — 2 in. — $3\frac{1}{2}$ in. — 5 in., then make a right-angle bend at the first marking,

Drill two $\frac{1}{8}$ in. holes in the first $\frac{1}{2}$ in. length of the bracket, spacing them centrally and about $\frac{1}{2}$ in. apart. Drill a $\frac{3}{8}$ in. hole centrally at the base of each bend of the bracket — including the base of the U-bend, i.e. — four holes in all. Enlarge the hole at the base of the U-bend with a small flat-file so that the hole extends to each side of the limb and becomes a flat socket across which the lead will fit without protruding above the bend.

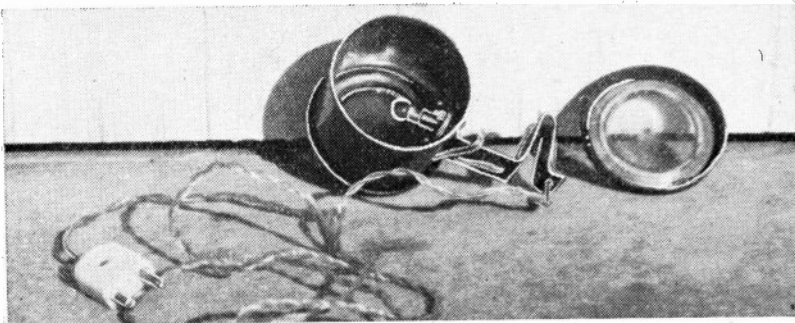
To attach the bracket to the lamp housing, mark off the two $\frac{1}{2}$ in. holes in the bracket centrally on to the side of the lamp housing, and at right-angles to the open end. Drill corresponding holes in the housing and fix the bracket by means of two nuts and bolts. A thin rubber gasket placed between the bracket and the housing will ensure that the joint will be weatherproof.

Now mark out a $2\frac{1}{2}$ in. diameter circle in each of the Perspex sheets. Cut out the circles with scissors and by means of a waterproof adhesive attach

You will require:	Cost
1 flash-light bulb holder (6 or 12 volt bulb.)	1s. 6d.
2 yards of twin-flex, plastic covered,	10d.
2 amp. No. 26	
1 by 2 amp. 2 pin plug and socket, the plug preferably fitting into the accessory socket on the car	9d.
4 nuts and bolts	4d.
Red and transparent Perspex sheet 4 in. by 4 in. and about 20 thou. thick	4d.
	3s. 9d.

One empty tin about 3 in. diameter and $2\frac{1}{2}$ in. deep (Kit-e-Kat or Batchelor peas etc.)
One empty 1 oz. tobacco tin (Lloyds Bondman Virginia). Strip of thin felt (an old hat lining will do). Piece of mild steel strip metal $\frac{1}{2}$ in. by 1 in. about 15 gauge.

The tin would have to be opened with the type of instrument which cuts out the top cleanly, and the lid of the tobacco tin, complete with plastic washer, must make a snug fit on to the top of this tin to ensure that the assembly



Parking lamp with one cover removed

them centrally over the 2 in. holes already made in the housing and the lid. Make sure that when the lamp is fixed on the car door window, the red disc is facing the rear of the vehicle.

The flash-light bulb holder now has to be fixed inside the housing. Mark off the fixing holes on the side of the housing, taking care to ensure that the holder is upright when the lamp is in position on the car. Drill two $\frac{1}{8}$ in. holes, and a further $\frac{1}{4}$ in. hole (to take the cable) in the centre of the side and just clear of the bulb holder when in position. Attach the bulb holder with two nuts and bolts.

When connecting the cable to the terminals on the holder, loop each end of wire and solder the ring so formed to make sure the connection cannot come adrift when the lamp is in use. The

cable is now threaded through the holes drilled in the bracket, as shown in the photograph, although this is best left until the assembly has been painted.

Clean up, file away any rough edges, and give the outside of the whole assembly a coat of enamel, making sure that none gets on to the bright inner surface of the lamp housing. This acts as a reflector. When the whole assembly has dried, the wiring can be completed by attaching the electric plug to the end of the cable.

The final job is to line the U-bend of the bracket with felt, and thus ensure a snug fit of the parking light on the car window. Use glue to stick the felt to the metal.

The gadget will give years of hard wear but repairs need cause no worry for the

components are so readily obtainable.

If your car is not fitted with a connection for accessories, you will need to fit an electrical socket to take the light. Convenient places are underneath the dashboard, or beneath the shelf. A direct tapping can be taken from the battery to the socket. Incidentally, the battery can be charged by simply plugging your charger into this socket. Be sure, however, that the positive red wire of the charger is connected to the positive side of the battery. To avoid any mistake, paint the positive sides of the plugs and sockets with red paint.

This home-made gadget may, during its life-time, prove invaluable as a portable hand-lamp for, say, changing a tyre in the dark, or carrying out some repair under the bonnet. (R.E.)

How to Imagine an Atom

THE word 'atom' means, not capable of being cut or split into anything smaller — and for centuries atoms were thought of as being the indestructible basic units that composed all material substances. Nowadays we all know that atoms *can* be broken — to release incredible amounts of energy and some even smaller particles.

But what is an atom? How can we imagine an object so tiny that, even with the most powerful microscopes, nobody has ever seen one?

Some white grains of table salt will help you to imagine particles that are so small. Dissolve enough salt to cover a sixpence in a big glass of pure 'tasteless' water. In solution the salt grains break up into countless smaller particles that intermingle with every part of the water. We can prove this by noting that all the water has a slightly salty taste — But, to your eyes, the salt has vanished!

However, the salt particles in solution are not quite atoms, although their size is almost atomic. In general we can say that an atom is about one hundred millionth of an inch across. Thus it may take ten million atoms to reach end to end over the top of a $\frac{1}{16}$ in. diameter pinhead.

And the total number of atoms in the ink needed to print a full stop on this page runs into millions of millions.

The idea that atoms must exist originated among the ancient Greeks, over 2,000 years ago. Then, the philosopher Democritus said that, if a piece of wood or stone were cut in half and each resulting half cut into two again — and then these halves were cut in half, we could not go on cutting halves in half like this forever, because eventually we would obtain two pieces which could not be cut up any more.

Democritus supposed that every substance under the sun was made of its own particular variety of atom. Now we believe that only 92 kinds of atom exist in nature, and that most substances are made of combinations between two or more of these 92 basic elements. Thus the smallest particle of salt in solution is not an atom, but a molecule of a compound made of an atom of the element sodium joined with an atom of the element chlorine.

But do not begin to imagine that atoms are solid in the manner of billiard balls. They are mostly made of empty space!

A typical atom can be compared with a minute solar-system having one or more particles called electrons revolving very fast around a central 'sun-like' nucleus made of yet other particles, the largest of which are named protons and neutrons.

Electrons move so fast that they seem to be in many places at once, like the revolving spokes of a fast-spinning bicycle wheel.

Try and throw a marble through such a wheel and it will hit one of the spokes — as if the wheel were solid throughout.

The orbits or paths of electrons around an atom's nucleus are like solid 'shells' packed one within the other — not like the flatter orbits of planets around the sun. The orbits of electrons resemble the hard surfaces of spheres — so atoms seem hard, in spite of all the space they contain.

Our mental picture of what atoms may be like must change as scientists make new discoveries about them.

During the last century Lord Kelvin said that he couldn't accept any theoretical idea in science that could not be imagined as a mechanical model of

some sort. It would be fortunate for us if we could accept Lord Kelvin's view today. Latest findings about atoms suggest that electrons can behave either as particles of matter or as waves of 'non-material' energy.

All this is bewildering and means that ultimately the human mind may not be able to grasp any clear image of an atom's total appearance. (A.E.W.)

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Keep an eye open for Ship Models

MANY people instinctively associate ship model collections with museums. As a hobby, collecting ship models may sound ambitious, but it is quite possible to build up a small most satisfying collection that is quite in place in the modern home.

There are two ways to go about it. One is to acquire ready-made models; the other is to make a series of models oneself over a period of time. The latter assumes building from plans or pictures and not constructing a series of plastic kit models, for while these are extremely good, they are hardly within the scope or purpose of this article.

Compared with, say, stamp collecting, getting together a ship model collection is a slow business, and the number one can house at any one time, if they are other than to a very small scale, is necessarily limited. You can't just walk into a shop, either, and buy a model off the peg. By perseverance and patience, however, much is possible — and it certainly is a hobby with a difference.

Ship models fall into three categories — bottle, cased and uncased. The quality of bottle models varies considerably. Persistent searching of markets and second-hand furniture and junk shops will sooner or later unearth something in the way of bottle models. If the model is a genuine old sailor-made

effort, some fifty or more years old, it will most likely be heavy, solid, somewhat out of proportion, and rather 'varnishy', for the old-time sailor had to make do with scrap materials, thick paint and heavy glue, and probably had no tools other than a knife and a piece of bent wire. The ship will almost inevitably be square-rigged, riding on a sea of coloured putty, with maybe a lighthouse or a tug or small boat alongside. She may be under sail, or her yards may be bare.

The bottle itself may be of round or square section, or it may be the three-

sided dimple whisky bottle type. Models have also been put into electric light bulbs in recent years.

The best way to display round or square bottles is to construct small wooden or perspex stands to hold them securely. Dimple bottles merely stand on their sides. It is advisable not to stand a bottle model where strong sunlight falls on it, otherwise the sails may tend to become distorted or come adrift.

Next is the small cased model — and, because of dust, cases for these are a 'must'. Any rigged model under about 2 ft. long and not protected from dust is a devil to clean.

Some cases have all four sides and the top glazed; some merely the front, and the latter often have a harbour scene or seascape painted on the back and sides.

Cased models can be displayed by hanging on a wall, preferably supported by a bracket, or standing on a shelf or a piece of furniture.

Although they are becoming rarer as the years go by, models of this sort still turn up. I bought a pretty little model of a sailing brig, obviously sailormade and probably about a hundred years old, in the local junk market. The ship is about 14 in. overall from bowsprit to taffrail, and the case some 17 in. by 12 in. Seven miniature carved sailormen, each about ½ in. tall, are on deck or aloft in the rigging. The skipper stands beside the helmsman at the wheel, grey cotton-wool smoke billows from the galley chimney, and the Blue Peter flies from the foremast. On the back of the case is painted a lively harbour scene. The model was included in a miscellaneous lot that comprised a number of pictures, books and other odds and ends as well, and cost 10s. 0d. (E.J.)

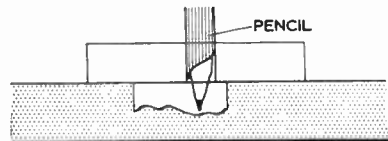


This is Hobbies design No. 2812, H.M.S. 'Bounty'. Length 11½ ins. Kit price 12/6 plus 2/- post and packing from Hobbies Ltd., Dept. 99, Dereham, Norfolk. One of the many kits available from the "Famous Ships of History" range.



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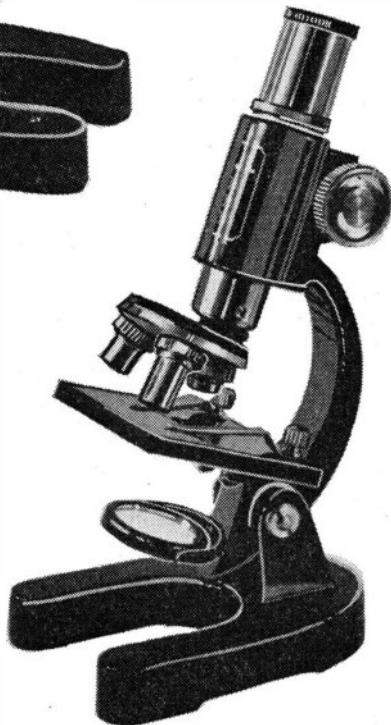
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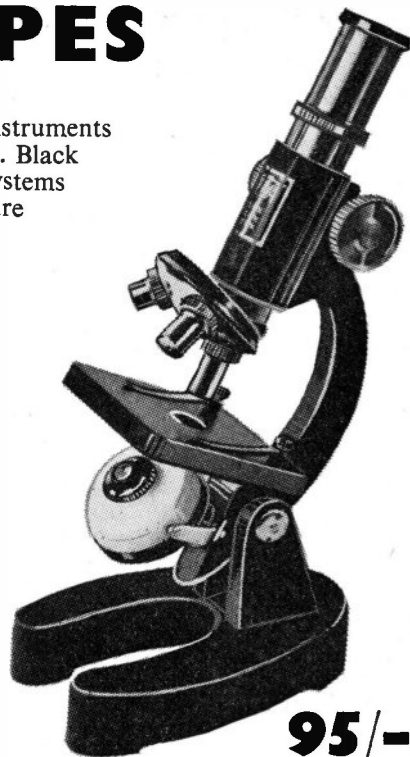
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Swivelling 3-objective turret. Magnifications: 50x, 100x, 200x. Illumination by plane mirror. Height: 6½ in. Base 2¾ in. by 3½ in. Stage: 1¾ in. by 1¾ in. Complete with specimen slide and spare slides.



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3-objective turret. Magnifications: 150x, 300x, 750x. Illumination by plane mirror or by built-in illumination using 2 No. U7 dry batteries. Reversal of the mirror automatically switches on a powerful spotlight. Height: 8¾ in. Base 4¼ in. by 2¾ in. Stage: 2¾ in. by 2¾ in. Complete with specimen slide and spare slides.

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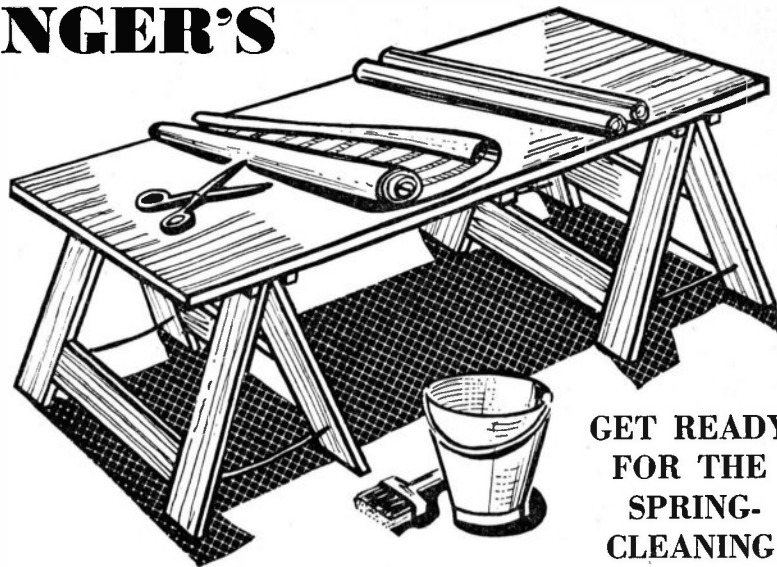
PAPER-HANGER'S TABLE

EVERY do-it-yourself decorator will know how important it is to have a suitably-sized table or flat surface for cutting and pasting the wall paper for hanging.

Many home handymen improvise by using an old flush-panelled door or a spare sheet of hardboard or plywood spanned across some suitable supports. Although this make-do method of working may be quite satisfactory for the odd paper-hanging job, if you find yourself tackling this job regularly then why not add a proper paper-hanger's table to your equipment?

The one illustrated is an easy type to make. The construction is very straightforward and there are no intricate joints. When not in use the table can be dismantled into three units and stored flat.

Start by making the two supporting trestles. The timber used is 2½ in. by ¾ in. softwood which should be planed smooth



**GET READY
FOR THE
SPRING-
CLEANING
ONSLAUGHT**

The best joint to use to join the rails and legs together is the halving joint. Half the thickness of the timber (¾ in.) is

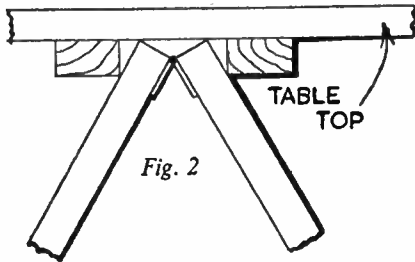
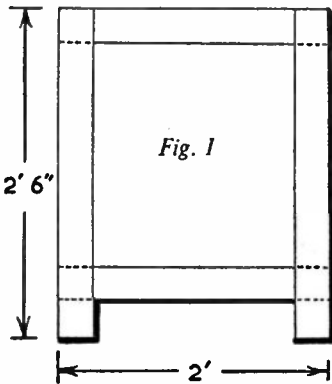
screws inserted from both sides. Make sure that each frame is perfectly square.

The next job is to join the frames together in pairs to make two sets of folding trestles. Use two pairs of broad hinges for this purpose. In order that the trestle legs may be kept apart at a suitable distance when the table is in use attach short lengths of cord or light-weight chain between each pair.

Now we come to the making of the table top. This can be made by simply cutting a piece of ½ in. thick plywood or ¾ in. thick blockboard to the desired size. A top measuring 6 ft. by 2 ft. will be found to be suitable. Alternatively, a light-weight frame can be made measuring 6 ft. by 2 ft. with 2 in. by ½ in. timber and covered on the upper surface with a sheet of hardboard or plywood.

It is a good plan to fix two strips of wood on the underside at each end to form two channels into which the tops of the trestles may go as shown in Fig. 2. This will ensure that the top remains perfectly rigid when the table is in use.

Rub over all the surfaces with glass-paper to remove any rough parts and sharp corners. (E)



all round. Cut eight legs each 2 ft. 6 in. long and a further eight rails each 2 ft. long. The members should be fitted together to form four frames as shown in Fig. 1.

removed from each member so that when they are assembled a flush surface is obtained on both sides of the frame. When assembling the frames the joints should be secured with flat-headed

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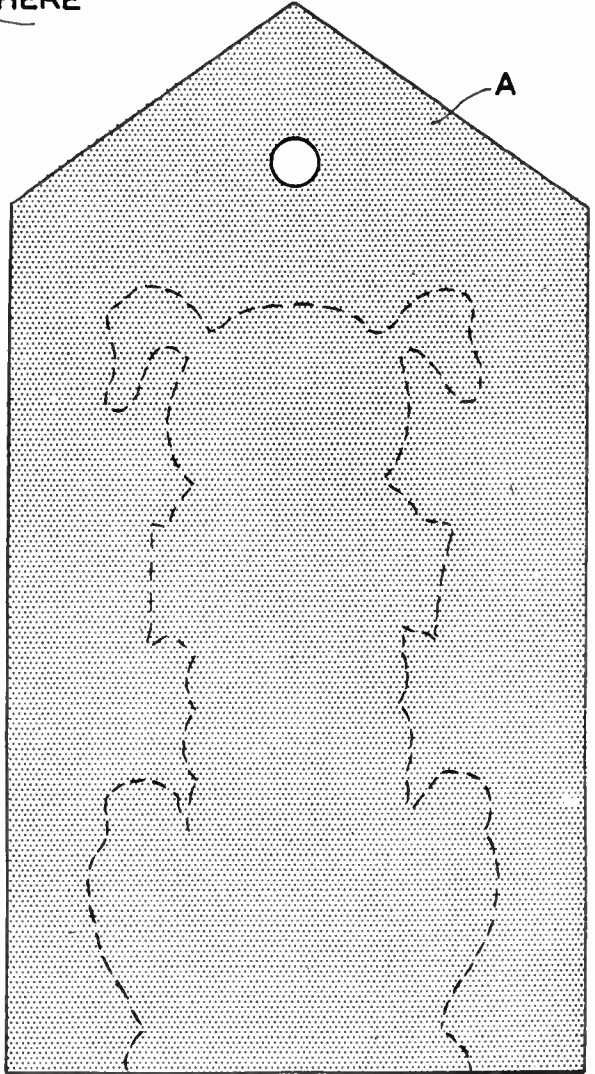
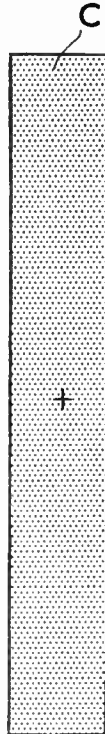
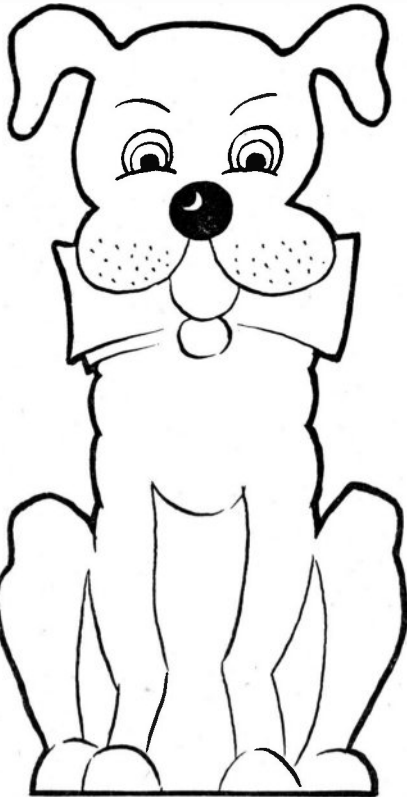
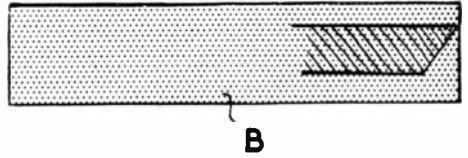
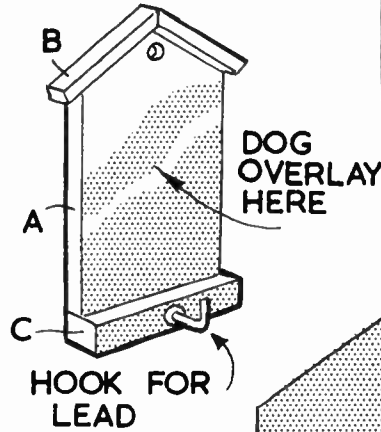
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MAKE THIS 'TIDY' FOR A DOG'S LEAD

THIS useful 'tidy' will be a welcome present to give to a friend with a dog. The tidy hangs on the wall and provides a useful 'parking place' for the dog's lead.

The kennel consists of pieces A, B and C glued together as shown in the diagram. Cut one of A and two of B from $\frac{1}{4}$ in. wood, and one of C from $\frac{1}{2}$ in. Shape pieces B to fit together at the ridge. The dog overlay is cut from $\frac{1}{4}$ in. wood and coloured with oil or poster paints. Paint the kennel green and add a dresser or cup hook to piece C.

(M.p.)



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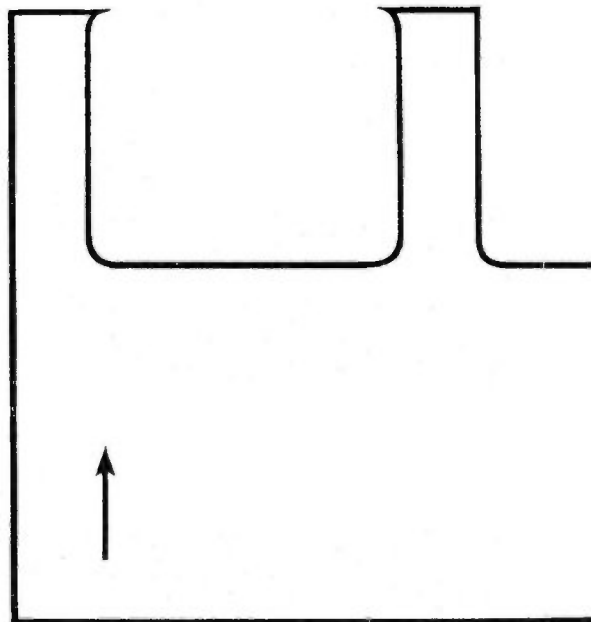
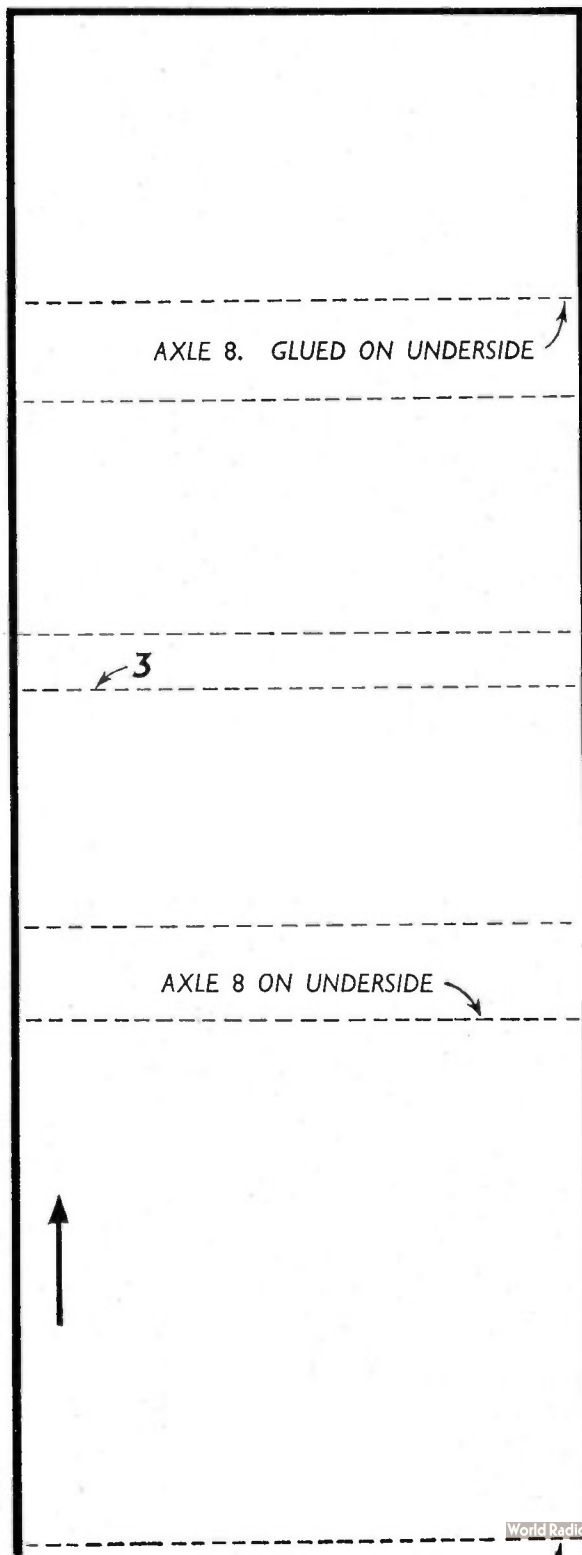
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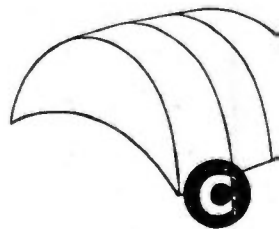
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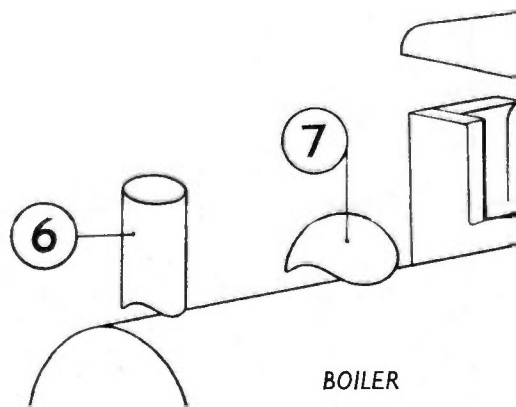
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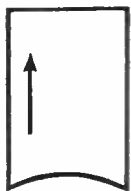


PIECES 4. CUT TWO 1/4 in.

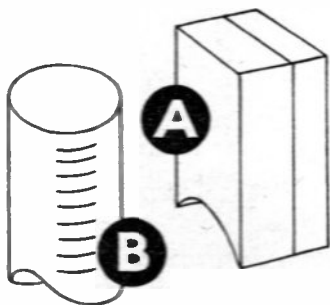
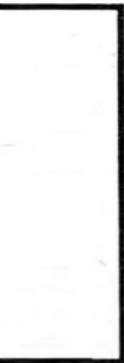


PIECE 7. CUT TWO 3/8 in. AND ONE 1/4 in. GLUE TOGETHER AND SHAPE AS SHOWN AT C AND D.

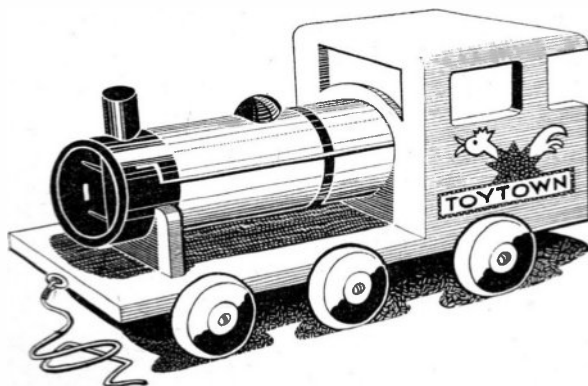




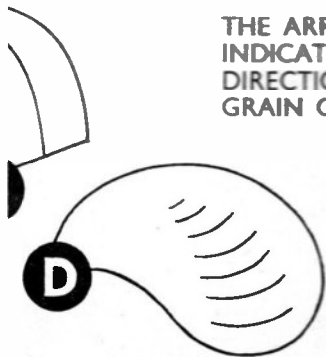
PIECES 6. CUT ONE 3/8 in. AND ONE 1/4 in. GLUE TOGETHER AND SHAPE AS BELOW.



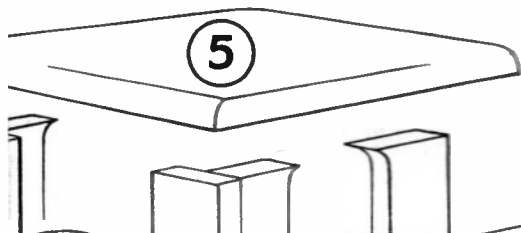
SIZE LENGTH 10 ins.

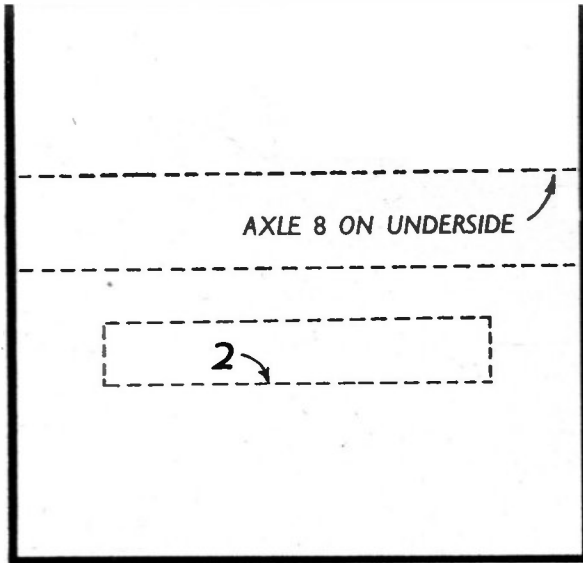


THE ARROWS INDICATE DIRECTION OF GRAIN OF WOOD.

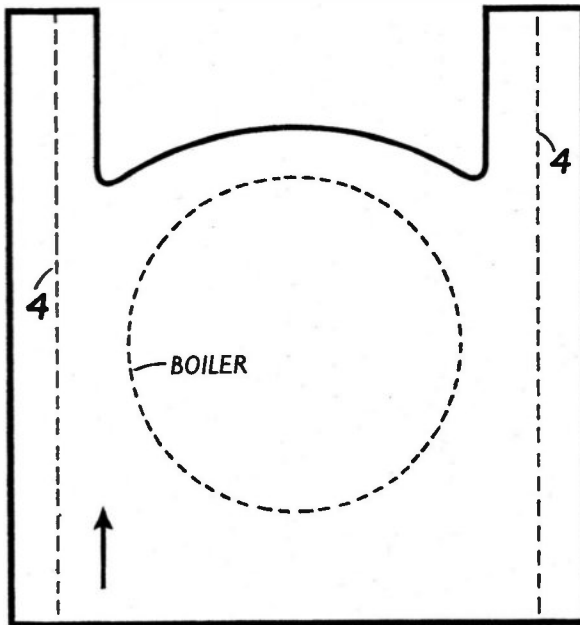
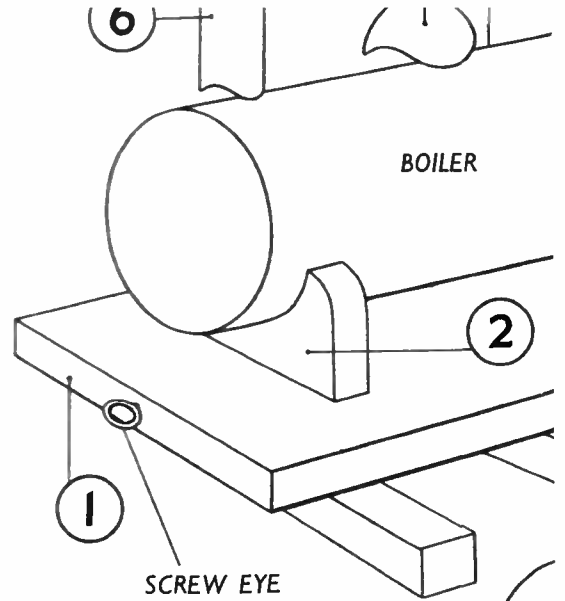


A KIT OF MATERIALS FOR MAKING THIS DESIGN IS SUPPLIED BY HOBBIES LIMITED, DEREHAM, NORFOLK. PRICE ON APPLICATION.

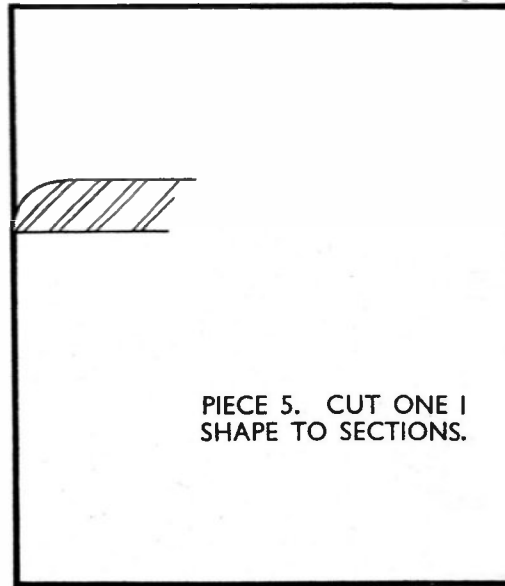




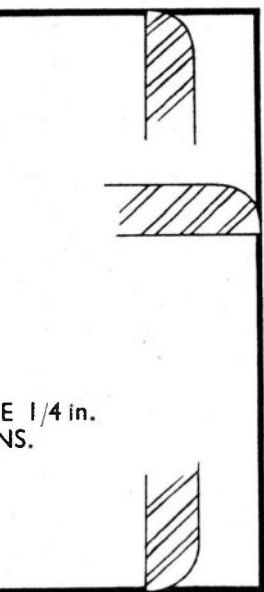
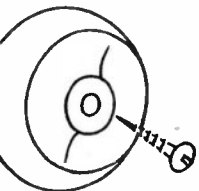
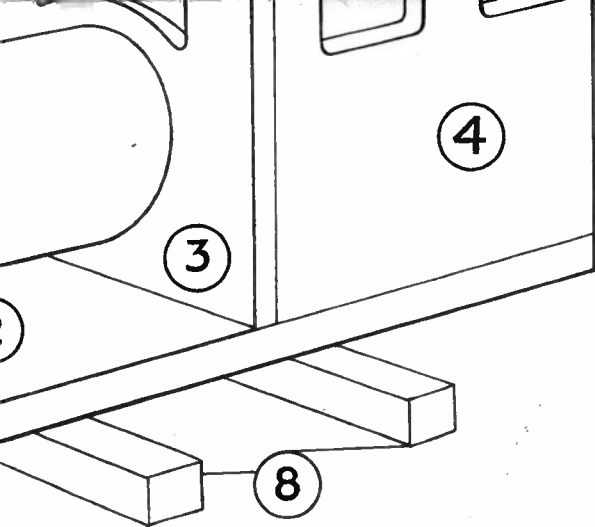
PIECE 1. CUT ONE $\frac{3}{8}$ in.



PIECE 3. CUT ONE $\frac{1}{4}$ in.



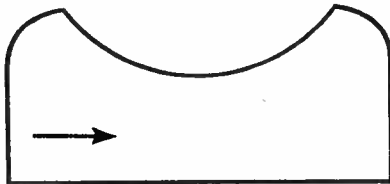
PIECE 5. CUT ONE $\frac{1}{4}$ in.
SHAPE TO SECTIONS.



WOODMITE 'ONE SHOT' THE TOP WOOD GLUE

Built-in hardener for easy application. Gap filling. heat resistant, waterproof. In 3 1/2 oz., 7 oz., 18 oz. tins; from hobbies shops and ironmongers.

Leicester, Lovell & Co. Ltd. Nth. Baddesley, Southampton



PIECE 2. CUT ONE 3/8 in.



PIECES 8. CUT THREE FROM 1/2 in. BY 1/2 in. STRIPWOOD.

YELLOW

YELLOW

BLUE

BLUE

TOYTOWN

BLACK LETTERS ON WHITE

DESIGN TO BE PAINTED ON SIDES OF CAB.

PRINTED IN ENGLAND.