WITH LARGE FREE TOY DESIGN SHEET

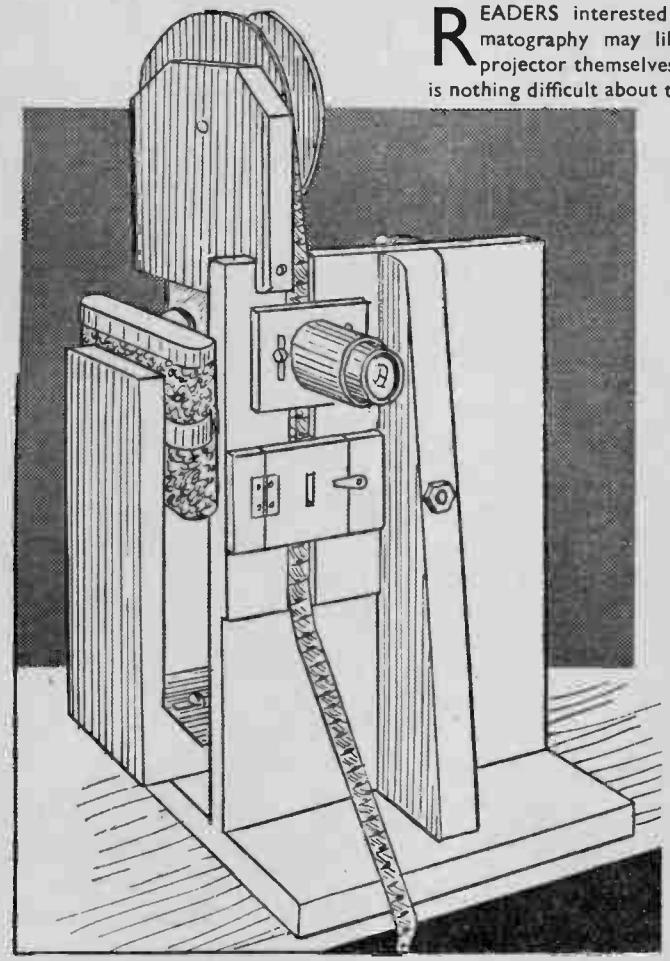
Hobbies WEEKLY

CONTENTS

November 2nd, 1949 Price Fourpence Vol. 109 No. 2818

How the amateur can make a home

CINEMA PROJECTOR



READERS interested in home cinematography may like to make a projector themselves. Really there is nothing difficult about the job, at least to a fairly competent handyman, and the particular design of projector which forms the subject of this article has been purposely simplified to obviate the need for gear wheels, and other difficult parts. It should be remembered, however, that the work needs to be done with care and accuracy if a successful job is to result.

Before starting, it will be as well to get a thorough idea how the machine works. All the working parts are grouped behind the front of the projector, and are shown in Fig. 1. Being numbered, it is easy to identify them from the text. (1) is a cam rotated by the handle, seen in the side view, (2) is a crank moved by the cam and actuates the traveller, (3), which carries the tooth pulling the film down one frame at a time.

Attached to the cam is a compressor (6) which forces the tooth to grip the film. Note that, for clarity, only half of the compressor is on view. Other parts will be referred to later, enough is shown here to make clear how the film is drawn down as the handle is turned. As the film has to be drawn down a frame some 12 times in a second, it will be understood how accurately the parts must work and how carefully they must be cut and fitted.

With care and patience you can make a splendid working apparatus for 9.5 films using a battery lamp or the house circuit. Patterns for parts are shown on page 79. The second part of the article will appear next week.

Fig. 2 shows a front and side view of the stand, as we may call it for lack of something better. A front vertical panel of ¼in. fretwood is fitted to a base of ½in. wood, being supported in the vertical position by a tapered front piece of ¾in. wood, tenoned into the base. This part measures 1½in. at the bottom and tapers to ½in. at the top. It is spaced just ½in. from the front edge of the base, so the panel is fixed 2in. in from the front. The panel is given a little extra support by gluing a small block of wood at the rear.

Having cut these parts, at a distance from the top of 3½in., bore a ¼in. hole through the tapered support for the rod, an iron bolt, on which the cam, etc.,

runs. It will be as well to bore this hole through from both sides, as it must be straight or the bolt will not stick out truly at right angles.

The panel is now taken in hand. At 1in. from the right-hand side draw parallel lines down, ⅜in. apart, and between these saw out the film window (A), also bore a small hole at (B) for the pivot on which the crank works. At a distance from the top of 3½in., saw out a ⅛in. slot, shown at (C). It is important that this slot be exactly central between the lines.

The central hole for the bolt is best bored after the panel is screwed in place, the drill bit being inserted through the hole already bored in the tapering support, and continued through the panel. Countersink the fixing screws. With the panel in place, nail and glue a small block, 1in. high, at the bottom, seen at (D). Get a ¼in. iron bolt, smear glue on the thread and push it through the hole, then fit a nut on and leave for awhile for the glue to set. The head of the bolt can then be sawn off.

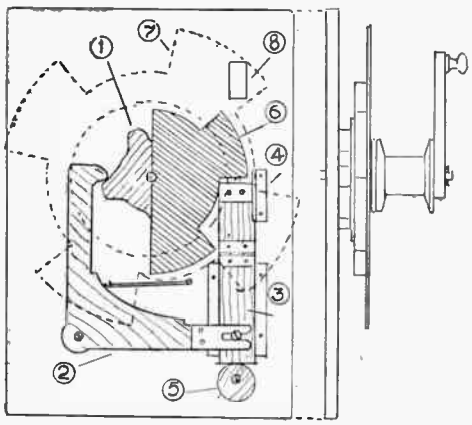


Fig. 1—Plan and elevation showing the parts

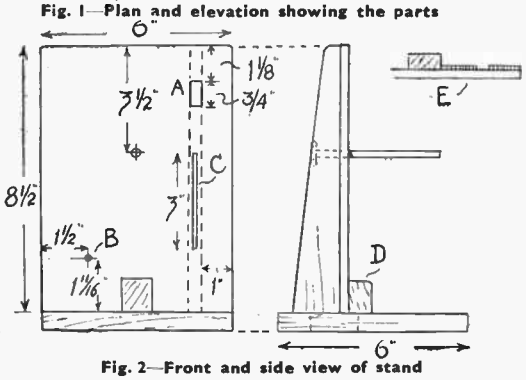


Fig. 2—Front and side view of stand

The Film Groove

Now turn the stand round, and on the face side of the panel draw parallel lines down, exactly opposite those on the back. From ⅛in. fretwood, cut two pieces 5½in. long, one being 1in. wide and the other 1¼in. Glue these each side of the pencilled lines, leaving a groove between, as in plan detail (E) for the film to work in.

It is most important for the groove to be just the width of the 9.5 film all the way, so test it with a piece of the actual film and rectify any irregular places with glasspaper. With a strip of the same useful stuff, fine grade, make the surface of the groove as smooth as possible.

Some parts of the works are shown, full size, on the pattern page, and only need to be pasted down on to the wood before cutting out. The cam and compressor; these, and the crank, are all cut from ¼in. fretwood. Cut them with care and great accuracy, and smooth the cut edges with the glasspaper. Drop the cam on the bolt, then fit the crank in place with a small round-headed brass screw, with a thin washer under its head.

A small screw hook is driven in the crank, shown in the drawing, and a rubber band, or, better still, a helical spring, attached to it and stretched to go over a round-headed screw a little further away, to keep the crank pressed against the cam. Twist the cam with the fingers and see the crank works smoothly.

A brass extension piece, cut from thin sheet metal, is cut out and screwed to the end of the horizontal arm of the crank. This operates the traveller. While on the job cut the regulator disc on the pattern sheet too, from ⅛in. fretwood. Its use will appear later on. The shutter shown on the pattern sheet by a dash and dot line, might as well be cut out now, too. Half only is shown for reasons of space.

The shutter should be marked out on tinplate, any old tin being flattened out for the purpose. Those who wish to mark out direct to the tin can make a light tap with a centre punch, and strike the circles for it, the centre of the shutter pattern being indicated by a small arrow.

The compressor, also cut from ¼in. fretwood, should have the lower edges of its arms bevelled, as shown on the pattern; it can then be dropped on the bolt. The traveller, Fig. 3, can now receive attention. A front view of this part, shows it consists of two pieces of the ¼in. wood, joined together with a small brass hinge. A rear view (F) gives the width and length of each part. The lower part has its side edges slightly bevelled, and is fitted to slide up and down between side strips, also bevelled to suit. The side strips should not exceed ¼in. in width.

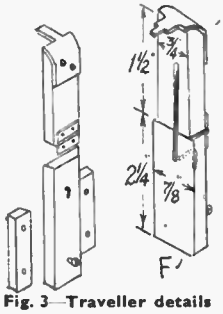


Fig. 3—Traveller details

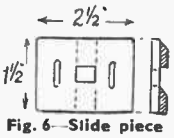


Fig. 6—Slide piece

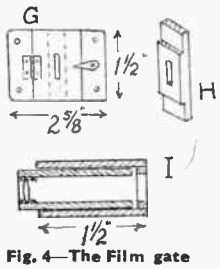


Fig. 4—The Film gate

Spring Holder

The upper part, not bevelled, is lightly hinged, and this movement must be a free one. A piece of spring steel wire is forced through a hole in the lower part and bent upwards at the rear, as in (F) to press on the upper part and force it back. A shallow cut made in the wood, in which the spring can enter, will keep the latter from shifting about.

From a piece of sheet brass, about 1/16in. stuff, bend up the shaped metal piece seen at the tip of the traveller. It should be bent over at right angles to curve smoothly, and should extend beyond the wood just ⅜in., this extension piece being filed to a width of ⅛in. Fix it in position with screws, well countersunk.

It will be as well to shape up the end of the wood part to fit the curve of the metal. Fix the traveller, with its side bevelled strips to keep it from rising, and also as a guide to its movement in the position seen at (3) in Fig. 1. The brass tooth should enter the slot in the panel, and the whole work smoothly up and down with a push of the fingers. The lower part should lie flat, the bevelled side strips ensuring that, but the upper part should be sticking out, owing to the spring behind it.

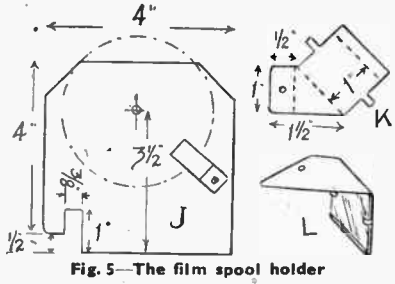


Fig. 5—The film spool holder

The Operation

Turn the cam until the crank rises; push the traveller to nearly the top of the groove, and there, where the brass extension on the crank comes on the traveller, drive a round-headed screw in the latter. On rotating the cam the traveller should move up and down freely. Get this right before proceeding further.

(To be continued)

Camera spools and paper can be used to make this PERPETUAL CALENDAR

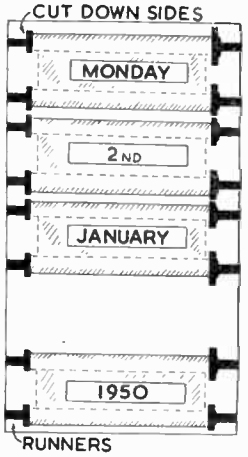
THE perpetual calendar, as illustrated, is extremely useful and pleasing, and can be easily made for quite a modest sum. Before proceeding with the constructional details, it should be explained that no measurements or dimensions will be quoted, as the reader can best arrange these to suit his own individual requirements.

As can be seen, the novelty of the calendar is in the use of old film spools for its actuating mechanism. Most amateur photographers who do their own developing have a plentiful supply of such spools on hand, but in cases of difficulty, most photographic chemists or dealers would be pleased to assist in this direction.

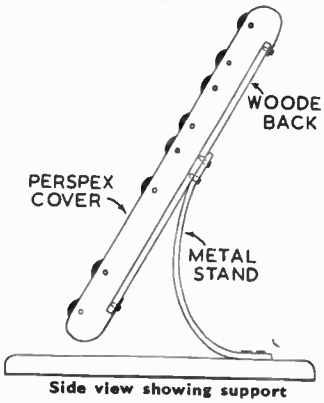
Camera Spools Suitable

A suitable size spool is either No. 120 or No. 620, but as previously stated, the size can be according to the reader's choice. Eight such spools will be required, and if it is possible to obtain the winding paper, so much the better, as will be described further in this article.

Having obtained the spools, reduce the diameter of one end of all eight by $\frac{3}{16}$in. by carefully filing until correct. The two sides of the calendar are



Front view of parts



Side view showing support

preferably made from thin oak or plywood and are shaped as illustrated in the diagrams. The bottom edges of the sides are slightly recessed and a thin piece of oak glued and screwed into place to form the bottom. Care should be taken to see that the bottom fits perfectly flush with the edges of the sides.

Eight suitable lengths of rod, preferably brass or copper, are next required for the spools to rotate upon. These are installed by drilling eight holes, slightly smaller in diameter than the rods, into both sides of the calendar. The holes must, of course, be absolutely parallel and concentric with each other, and correctly placed in relation to the position of the spools.

Backing Paper Used

The spools are then held in position and the rods tapped through. When finally in position, the rods must be tightly fitted in the two sides without any lateral movement. When correctly positioned, the larger end of the spools should all face the same way and project above the sides by $\frac{3}{16}$in.

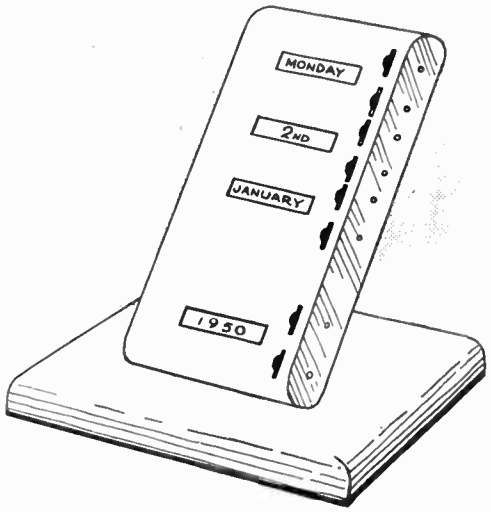
If one has obtained some film winding paper (four lengths needed), the days, date and year numerals are painted in chinese white or process white on the black backing of the three lengths of paper, and allowed to dry thoroughly before being wound on to the respective spools. White figuring on a black background is very effective and dignified, but if one cannot obtain the film paper, strong white cartridge paper, cut to size and painted in coloured inks, is equally effective.

The cover can be constructed from either $\frac{1}{16}$in. thickness sheet copper or coloured Perspex. The latter in pastel shades gives a really beautiful effect, and is to be recommended. The visual slots should be cleanly cut out of the material midway between each pair of spools. Eight slots should also be cut along one side of the cover to allow the larger spool ends to protrude through. Should copper be used, it should be well polished, then lacquered. The two ends of the sheet are then carefully shaped around the sides and secured to the bottom with small brass screws.

Perspex Cutting

The following notes will be found useful where Perspex is used. Perspex sheets are usually supplied faced on both sides with a protective covering of paper. This protective covering should be kept intact during the cutting-out process to prevent the surface being damaged. The sheet may be cut to size with a fine hacksaw blade, using cold water as a lubricating medium.

The visual and spool-end slots are best cut out with a fret-saw, applying water occasionally to prevent the saw



sticking and 'pulling'. During cutting-out, the Perspex must be firmly supported, as in the cold state it is fairly brittle and if roughly handled, may crack. When the cutting-out is completed, carefully remove the protective paper with warm—not hot water. The paper must not be removed with a knife or similar article, but must be well soaked with water, then peeled off with the fingers.

The ends can be held in front of a fire or over steam until they become fairly plastic, then they are gently shaped around the sides and secured with screws. If the surface of the Perspex requires polishing, a good metal polish lightly applied, then finished off with a soft cloth, will be found to give perfectly satisfactory results.

The Base

The stand or base is preferably constructed from oak or even as a two-piece unit. This should be of sufficient proportions to support the calendar without easily overturning. Both the stand and the two sides should be nicely finished with french polish. The stand support is constructed from a suitable length of brass, shaped as illustrated in the drawings and screwed to the calendar and base. It is a good idea to glue a thin piece of felt to the underside of the stand, to prevent the marking of highly polished surfaces.

The operation of the calendar is self-explanatory. The lettering and numerals are changed as required by turning the projecting spool ends with the fingers.

A dial and pointer show the actual direction in this novel

WIND INDICATOR

HERE is a very novel weather vane—one which shows on a dial which way the wind is blowing. Most garden vanes have to be set rather low and are difficult to read at a glance. The design described here overcomes this trouble at once, besides being quite an interesting novelty.

The idea is that the rotating vane actuates, through a suitable gear, a pointer which moves over the face of the dial which is marked with the cardinal points. From the position of the pointer the direction of the vane overhead can at once be determined.

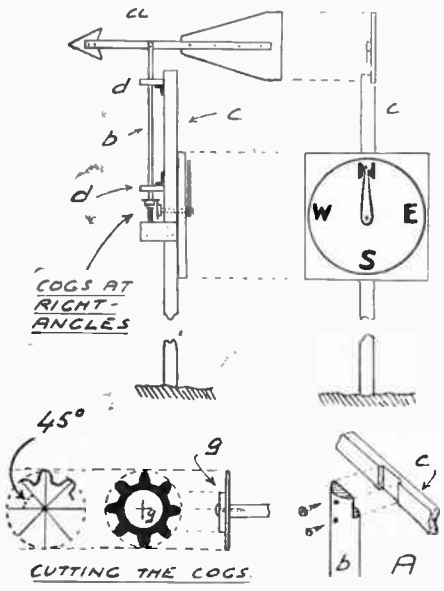


Fig. 1—Details of the main pillar

First let us make the arm holding the arrow-head pointer and vane. This differs from the usual type inasmuch that instead of rotating on top of a vertical axle it rotates the axle as it turns in the wind.

The Indicator

The bar (a) is 1ft. 6in. long, $\frac{3}{16}$in. thick and $\frac{3}{4}$in. deep. This is deeper than usual as it has to fit firmly to the axle, as (A) Fig. 1. At one end is the arrow-head and the other the vane 10in. long and 6in. deep at the back. This item can be made of stiff card as long as it is well painted over to make it weather-proof. A better job can be effected by using light tin or aluminium taken from a discarded cooking utensil.

The vertical axle (b) is a stiff piece of dowel of $\frac{1}{2}$in. diameter and 15in. long. A metal bar would make a more sensitive apparatus but a perfectly straight piece of dowel truly set will do quite well.

The dowel is held to the main pole (c) by the two simple brackets (d) being horizontal pieces held by angle irons (p). The horizontal pieces are bored just to take the rod and the places where it passed through well polished up with black lead which makes a quite easily-turning bearing despite the fact that wood is turning in wood.

A more durable bearing can be made by lining the hole in the wood with tin. This is done by cutting a piece of tin the same length as the circumference of the hole and as deep as the thickness of the wood—a few small tabs as shown in (B) Fig. 2 being left on top. The tin is then bent so that it springs into the hole and the tabs bent over. The dowel, however, should still be rubbed with black lead.

Cog Wheels

Now come the cog wheels. The main thing is they must be the same size so that a complete revolution of the vane gives a complete turn of the pointer on the dial. They are 2in. diameter and are cut out of tin reinforced by the circular blocks (g). Scribe the teeth carefully out first and then cut with clippers. It does not matter if the tin curls a bit in doing this, as it can be straightened out against the blocks.

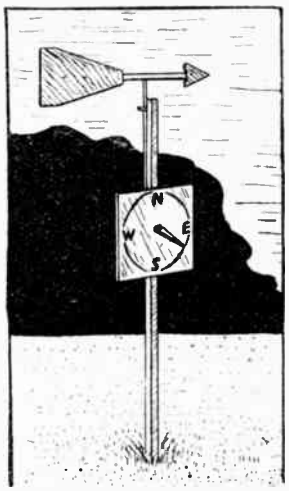
To fasten the block to the axle the end of the dowel is squared and a similar hole cut in the block which is then tapped into position and held by a screw, the screw for the horizontal wheel being round-headed.

To take the weight of the vane, etc., and keep the vertical axle in position a block (h) is placed as shown and into it is fitted firmly a 4in. nail so adjusted that the head of the screw that holds the horizontal wheel just rests on it, while the cogs loosely engage with the vertical wheel. The spindle for the pointer is also a length of dowel rotating in two bearings of wood (k), the hole through the main post being larger than the dowel so that it does not rub there at all.

Dial and Pointer

Finally we come to the dial and pointer. The dial is a piece of wood 12in. square upon which is drawn a circle having N, S, E and W marked in with some sharply contrasting colours. Thus, the board could be dark brown with the letters in white or yellow, or the letters could be dark against a light background. The main thing is they should be easily seen from some distance.

It is secured to the main post with suitable screws and a hole larger than the spindle is taken out in the middle, over which is fastened the small square of bored wood which acts as a bearing. The pointer is a short length of light wood



(the lighter and thinner the better) attached with a screw to the axle. It must be so set that when the arrow of the vane points due north it points to N on the dial.

The apparatus is complete and if all has gone well the fingers will now show on the dial the exact direction of the vane above. The main pole, incidentally, can be any convenient length of wood you have to hand. Its actual size in section does not matter, but it should not be less than 1$\frac{3}{4}$in. square, as it has to take rather more weight than in most cases, and allowance has to be made for the hole to take the pointer spindle.

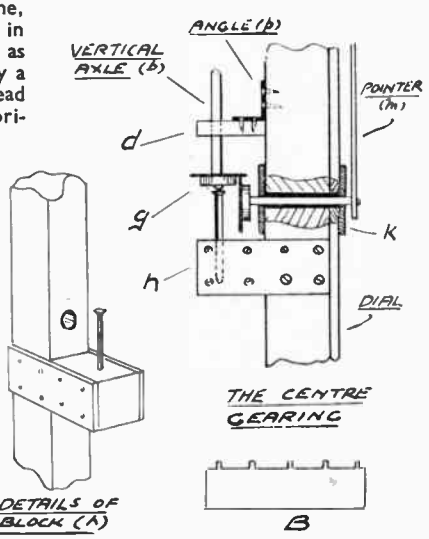


Fig. 2—Gearing and mechanism

A position in the garden will, of course, be found with the dial facing a window so that it can be read from indoors.

Before you start the display on Nov. 5 read these notes on

FIREWORK WISDOM

Fireworks were known several thousand years B.C. They originated in Asia which is rich in natural deposits of saltpetre.

* * *

The Chinese discovered that by adding powdered iron to their saltpetre beautiful effects were obtained.

* * *

The development of fireworks is closely associated with the invention of gunpowder which came in the twelfth century.

* * *

Berthold Schwartz, a German monk, invented the gun by finding that a missile could be fired from a tube by means of an ignited wad of firework mixture.

* * *

The terrible 'Greek Fire' was really a big firework used in the bow of a war vessel. Saltpetre, sulphur and pitch were burnt in a metal tube and masses of liquid fire were emitted at intervals.

* * *

Colours as we know them today did not come into fireworks till the end of the eighteenth century when Berthollet —a French scientist—introduced potassium chlorate which gave heat enough to burn various metals.

* * *

Salts of barium give a bright green colour, copper a deep blue, while sodium salts produce yellow. The vivid reds we see in many fireworks is given by strontium. Coloured fireworks were used a lot in both the world wars—as Very lights.

* * *

For years fireworks have also done a real job of work as distress signal rockets at sea. Rockets also act as rope-carriers in maritime life-saving apparatus, being able to take a cable across an otherwise impassable strip of raging water to some stranded vessel.

* * *

A home firework display can be made more successful, and better value got out of the items if a little thought is put in beforehand. Such things as supports, nails and hammer, spills, matches, flower-pot filled with earth, etc., should be collected and ready to hand.

* * *

Roman Candles should be set off at eye-level, stood in the flower-pot which, in its turn, should be on the top of some short steps. The step ladder can then be used for the Catherine Wheels while its top level makes an excellent stand for golden rain and similar items.

Rockets can be fired from a bottle set in earth and pointed in the direction you want the rocket to go. Flying Demons, Rip-raps and kindred items are best set off from a flat surface like an upturned box. No explosive firework should ever be held in the hand, and there is an increasing number of these in modern pyrotechnics.

* * *

Great care should be taken with fireworks which have apparently gone out. Never look down into them. Many an accident has been caused by this careless act. The best thing is to tap the end against something hard which will loosen the powder at the extremity and then apply a taper. Be particularly careful when examining 'gone out' pin wheels as these are usually at eye level and can spring into life with great suddenness.

* * *

If setting off fireworks for the family have an ordered sequence drawn up beforehand so that quieter and more spectacular items are well intermixed. A good bang to start with, then quieter items with very colourful items spread at regular intervals throughout. Rockets, too, should be spread at intervals. More fun is secured if the items are announced to the 'audience'—especially if the announcement is humorous and comically dramatic. The programme should conclude with another big bang.

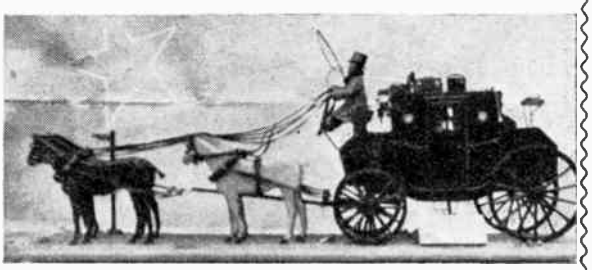
* * *

The lighting of all fireworks is best effected by paper spills which in their turn have been lighted from a spirit lamp kept continually burning in some nearby outhouse where it will not be blown out by the wind. The spills should be long, so that fireworks on the ground can be lighted without having to bend over them. They can be made from newspaper opened out and then folded concertina-like, a little gum-paper holding the folds together if necessary. The main thing is that the spills should be stiff. They should also be perfectly dry.

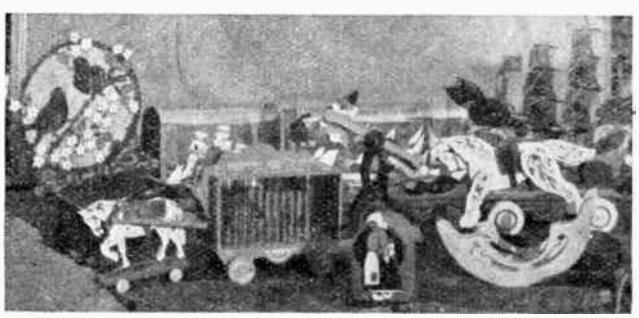
* * *

Even with the best arrangements accidents will happen and every fireworks night brings its crop of burns. The organizer of the display should, therefore, have among the things he collects a small first-aid kit. Included must be one of the proprietory burn dressings which you should obtain from any chemist.

Some examples of work by our readers



MANY interesting additions have been made to the model Stage Coach (Design 236 Special) by Mr. R. Clyde, Kimberley Avenue, Belfast. Lamps are of Perspex with 'birthday cake' candles inside. Luggage includes hat-box, trunks and parcels, whilst the 'road' is glued birdsand, with realistic potholes and stones (no macadam roads then, of course!) There is, apart from the 4in. high driver, a crinolined lady inside. The variety of work below is by Mr. W. F. Parrish of Valentine Road, Warley, Oldbury, who works under difficulties. Living in two rooms with wife and two children, he has to sit or kneel on the floor with an old stool as a work-bench! 'But I get a great kick out of it,' he says, 'although baby is a bit too young for the toys. She just wants to chew them'



You can get lasting entertainment by making this first-class

PATIENCE WOOD PUZZLE

HERE is a wood puzzle which stands out rather from the general run of these things. It is especially interesting, for while not being impossibly difficult, it cannot be worked out in a minute. In fact, unless you are extraordinarily lucky in placing the pieces, it often at first seems to defy solution altogether.

The 'outfit' consists of seven six-sided pieces, each of which bears six coloured or otherwise distinguishable triangles, the bases of which form the sides. The problem is to make up the shape shown in Fig. 1 but with all adjoining colours agreeing. Thus a green triangle on one piece must be against a green triangle on the next, a blue against a blue, and so on throughout the whole layout.

For Entertainment

A puzzle of this kind is, of course, useful to hand to friends for their entertainment, but it is of good interest to the maker, as it will be found that having solved it once, does not mean that you will be able to do it again readily after breaking and reshuffling. Indeed, for quite a long time it will come as a new poser.

Now as to the making. Plywood or composition board about $\frac{1}{8}$in. thick is a suitable material, and the shape as Fig. 1 is first drawn on a sheet of the material. To get the outline correct a square ABCD of sides $4\frac{11}{16}$in. and $4\frac{11}{16}$in. is made and the points a, b, c, d, e, f, g and h arrived at by the measurements shown.

Before cutting, the cross-lines, which give the outlines of the individual pieces and the triangles, are put in. These are also a check for accuracy for most of the diagonal lines must cross on middles. Thus the line that joins 'a' and 'c' must cross the one that joins 'b' and 'e' at the middle of the top right-hand piece—and so on.

All Alike

If they do not cross at the proper places now is the time to make small adjustments to the various points to get everything correct. A main factor of the puzzle is that the pieces must as far as possible be exactly alike, so it is worth spending some time on the original scribing.

Having got the lines right, now comes the colouring. Six tints are required and enamel or ordinary paints (and mixtures of these) can be used. Dyes give a good bright colour but are inclined to run.

As an example of how six tints can be obtained—suppose you have some blue, red and yellow paints. These can first be put on as they are, giving three of the required six colours. A little blue then mixed with yellow will yield a green, red with yellow an orange, while some of the blue put with the red will give a rich puce. Thus six distinct colours can be obtained with three primary ones. Similar mixing can be effected with almost any three 'first colours', even if two of them are black and white cycle enamels.

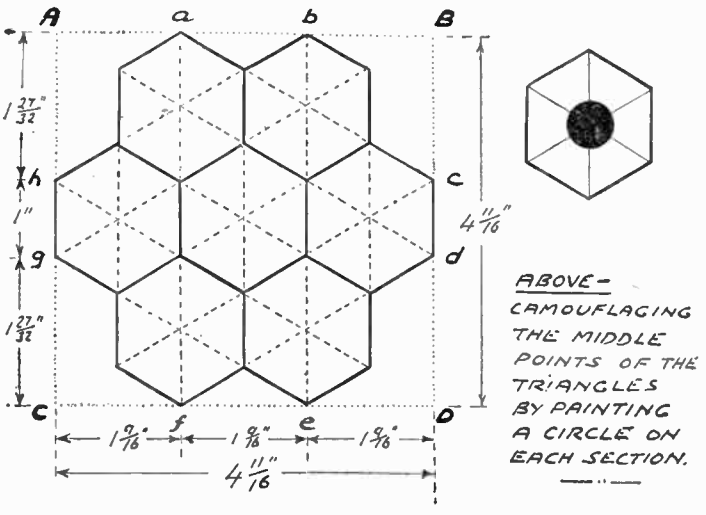


Fig. 1—How to lay out and finish the parts

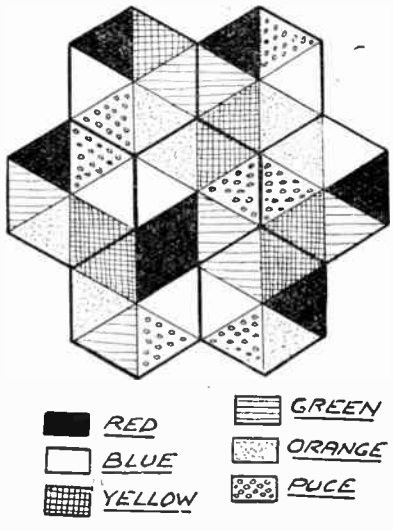


Fig. 2—A chart showing colours to use

The Colours

The colours are put on as Fig. 2. Do the same colour on all the pieces first and let it dry before putting on the second, when again work right through all the pieces—and so on till all the triangles are filled. Enamel paints dry very quickly so the job will not take very long but care must be taken to prevent the paints running together, mainly because the pieces must be indistinguishable one from another and if necessary with fine glasspaper wrapped over a flat surface.

Lastly, as with other puzzles of this type, a stiff envelope for storing the sections should be made with a few words on the outside explaining just what the solver has to do.

Overlay Fixers

WHEN fixing on an overlay a good idea is to use old gramophone needles. They are hardly noticed on the finished article as they have no heads and can be sunk quite deep into the wood.

The handyman could enjoy making this
SIMPLE TEASTAND

THE stand shown here would be found just the thing for afternoon tea by the fireside. It is a sturdy little piece of furniture, and the simple fretted panels give it a light and attractive appearance. We would suggest oak as being most suitable from which to make up the stand, although any kind of fancy wood would be equally suitable if appropriately finished. Regarding the finish for oak, a light stain would be best, although here again some would prefer darker Jacobean stain well rubbed with a wax polish.

Some readers may prefer to have the sides without any fretted work. This will save the trouble of drawing out the design, if they are not draughtsmen, and, of course, reduce the amount of cutting involved.

The stand simply consists of two shaped sides with three shaped shelves put between them and screwed together. The panel decoration and the foot shaping to the sides are all cut in with the fretsaw, and here will be the chance for the home craftsman to show his ability. There are stiffening rails beneath the shelves, screws and glue holding all firmly together.

Some workers will, no doubt, choose to add tenons on the ends of the shelves to fit into corresponding mortises in the sides. Care must be taken, however, if this is done, not to have the tenons too long or the sides would be very much weakened by having correspondingly long mortises.

We think the screws suggested in the case of this design, and as shown, should certainly be successful, providing the grain of the wood runs across the shelves so that the screws do not run into the end grain of the wood.

The Sides

Each side consists of a board 30in. long by 8in. wide by ½in. thick, and the top and bottom will be cut to shape to the detail shown in Figs. 2 and 3; the general outline of the end where it diminishes to take the shelves is shown in Fig. 1. The upper part of the ends is 5in. wide to the extreme top, and the position of the holes for the screws should be carefully set out and drilled. In the diagram (Fig. 2) the foot of the side is shown with a number of ½in. squares ruled over it.

On the full-size board a similar set of squares and centre line will be drawn and the detail outline drawn in and enlarged from the diagram, each square being followed carefully in the process. Trace off the finished half and transfer it to the other side of the centre line thus completing the true shape ready for cutting. The shaping to the top of the sides is easily drawn in by following the figuring in Fig. 3.

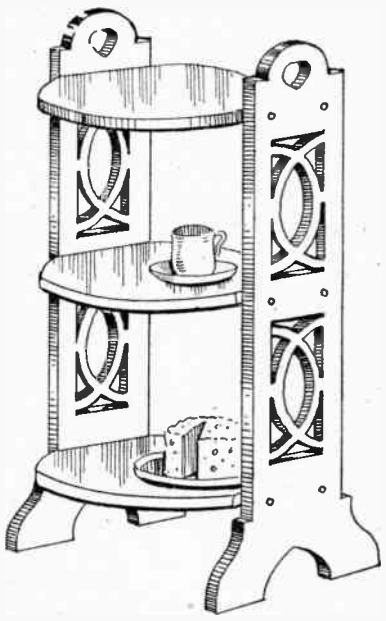
Side Panels

Each of the panels on the sides measures 8in. by 3in. The setting out of the arcs and their centres are plainly seen in Fig. 2. Some little manœuvring will be necessary in cutting the frets, but with a long fret frame it should not be too difficult.

Next, taking Fig. 1 as a guide, set up the measurements shown to get the positions of the shelves, and then bore holes for the screws 1in. in from the outside edge of the sides. The three shelves are identical in shape and size and the centres for striking the arcs are shown in Fig. 4.

The sides of the stand are shown dotted in this diagram giving their exact position. The curved edges after cutting should be cleaned with coarse and fine glasspaper and made slightly rounded. Note the direction of grain in the three shelves.

When boring the holes in the sides to ensure accuracy of fit, the one side which has been cut and bored should be laid on the other side and the outline drawn round it, with pin pricks made where the holes will come.



Beneath the two upper shelves are glued and screwed stiffening rails 10in. long by 1in. by ½in. in section, while under the lowermost shelf a wider rail could be added of, say, 1½in. width and ½in. thickness.

Shelf Fitting

In Fig. 5 a detail is given showing the top shelf with rail attached ready for fixing to the side upright. The three rails can be cut from the waste wood of the sides.

The brass screws fixing the shelves should be countersunk, the heads being well below the wood, filled with putty or wood filler. Or roundhead brass screws might be used, care being taken in running them in not to damage the heads.

The completed stand should finally be rubbed down with glasspaper before the finishing coat of stain is applied. A glossy finish can be obtained by a couple of applications of clear hard varnish or the amateur's french polish which can be put on with a brush.

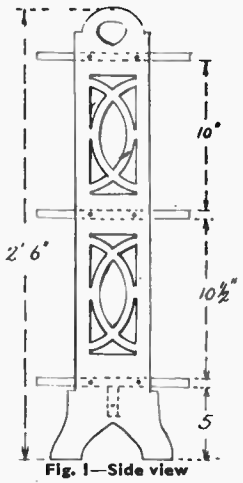


Fig. 1—Side view

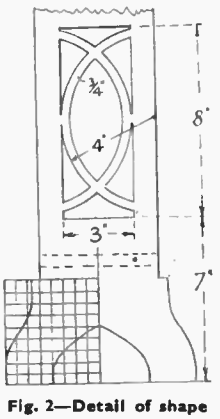


Fig. 2—Detail of shape

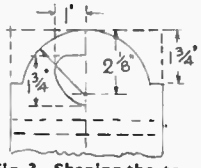


Fig. 3—Shaping the top of the sides

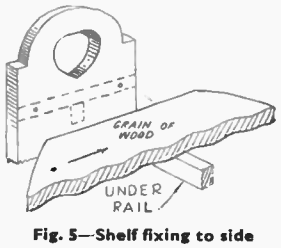


Fig. 5—Shelf fixing to side

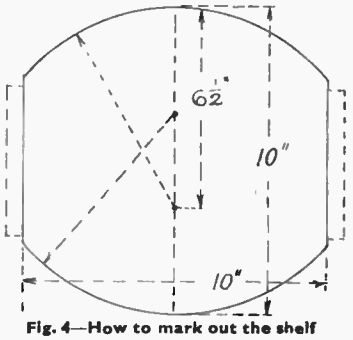


Fig. 4—How to mark out the shelf

Here is the second of our helpful series all about

BASKETRY

THIS article goes a step further from the first details in a recent issue and explains further processes in the making of a shopping basket, besides dealing with things made with a wooden base.

You may be able to buy a base the size of the article you wish to make, but, if you can find nothing suitable, any fiveply wood will do, though oak or birch wood is best. This can be bored about ½in. from the edge with holes about ¾in. apart.

First count the holes in your base. The stakes must be 12in. longer than the height of the article you wish to make, as 8in. to 9in. are needed for working the border, and 3in. to 4in. for the base trac.

The base trac

First trac of double trac border

Second trac

Soak the ends of the stakes for a few minutes in water, then shake them, and put one in each hole, allowing the damp end of each to protrude for 3½in.

The base trac is worked in the following way. Hold the article bottom upwards, and, working from left to right, place each stake behind one, in front of two, and let it rest behind the fourth stake. The last two stakes are worked in the same way, but they must be threaded through the starting canes.

Handles

Turn your tray or basket right way up. If you are making a tray, 'handles' may be formed by putting beads on each end when it is the required height. On the middle stake put three beads, two on the stake on each side and one on the next to these. If you are attempting a basket, the firmest way of fixing the handle is to cut half-way through the cane, which must be much thicker than the stakes, about 2in. from the end, and then taper the end as in the diagram. Put the sliced end through a hole in the base, bend the end over, and fix with a ¼in. nail.

A Tray

A tray is very much easier to work than a basket, as the more weaving you do the more difficult it is to keep your stakes from bulging, and so spoiling the shape of your work.

Work one round of three-rod wale. Leave the ends of two of the canes protruding on the inside of your work, and begin randing with the third, if the number of your stakes is uneven; or pairing, using two of the three rods, if the number is even. Continue with this until your article is the height you wish.

You are now ready for the border and an easy one for use in finishing small articles is the double trac border, for which the stakes need to extend 5in. beyond the weaving. For the first trac commence at any point, and work from left to right. Bend down each stake behind the next one, and thread the last stake through the first turned down one. All stakes will now project outwards.

For the second trac commence at any point, working from left to right. Put each stake behind the first, over the second and behind the third, threading the last two stakes through and cutting off all ends.

Fitting handles to a base

Five-Pair Border

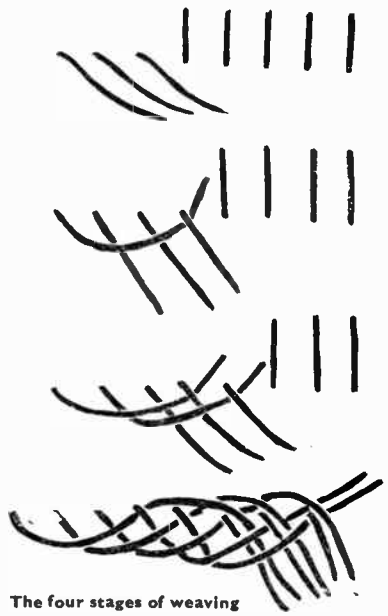
A more elaborate border, suitable for trays or baskets is the Five Pair Border. This is the procedure for that. Bend down three stakes outwards. Place number one over two and three and between number four (the first upright stake) and number five. Bend down number four. Place number two over three and four and between five and six. Bend down six. You will now have three stakes pointing outwards and two inwards.

Take the first outside stake over the second and third, in front of the first upright, and between the first and second uprights. Bring out the first inside stake through the same uprights, and put down the first upright by the one you have brought from the inside. Do this three times.

The Last Stakes

In all the processes so far be careful to leave room to weave the last stakes through when finishing the border. There now should be three pairs of stakes outside, and two ones inside.

Take the first pair over the next two pairs and between the first two uprights, bring out the first one inside, and put down the first upright. Repeat this and you will now have three pairs outside, and two pairs inside.



The four stages of weaving

Repeat thrice as before, but bring out a pair from inside. Now you should have two pairs inside and three sets of three outside. Continue all round the border, using the two longest of the outside threes, and leaving the shortest stake to be cut off when the border is finished.

When you reach the beginning of the border, continue threading through until the pattern is complete. When the border is finished, there should be no sign of where you have finished your work. In threading the last canes, unless you happen to possess the proper basketry bodkin, a stiletto will help in making room for the canes to go through.

Receiver Tuning—(*Continued on page 73*)

be connected through a small coupling winding or condenser, as already described.

A small condenser marked (C) couples the two tuned circuits and the capacity of this governs the 'bandwidth' or selectivity. The smaller the capacity, the sharper does tuning become. A value of ·00005 mfd. or less is usual, and as this is very small, it is best made by twisting together for an inch or so two insulated connecting wires. The greater the length of the overlapping sections, the greater will the capacity be.

So that the coils tune in unison the small trimming condensers which are fitted to the gang-condenser should be adjusted with a screwdriver until maximum volume is obtained. The circuit is not at its best with crystal sets, but with valve sets the sharpness of tuning can be increased to a point more than ample for all ordinary listening purposes.

Separate your radio stations by getting sharper
RECEIVER TUNING

WITH crystal sets and simple one, two- or three-valve sets, tuning is not very sharp, so that difficulty arises in separating stations. But even when such receivers are used under unsatisfactory conditions (such as in an area where a local station is very strongly received and tends to swamp other stations), it is possible to obtain good results if the aerial and coil arrangement is suitable.

The details following apply to crystal sets and all simple valve sets. Large valve receivers always use more than one tuned circuit, so difficulties from flat tuning are not likely to arise.

Using an Aerial Condenser

The simplest way to sharpen tuning is to connect a condenser in series with the aerial lead-in, and this is particularly useful with small valve sets where reaction can be used to maintain volume. The smaller the capacity of this condenser, the more sharp will tuning become. However, very small values reduce volume severely. Because of this a variable or preset condenser of about ·0003 or less, maximum capacity, is best. Such a condenser is shown at (A), Fig. 1. By turning the small knob it can be adjusted to the most suitable capacity.

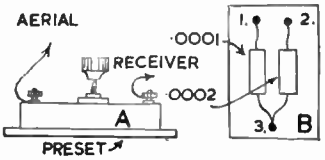


Fig. 1—Adding an aerial condenser

Another method is to use one or more small fixed condensers. If two condensers, such as shown at (B), Fig. 1, are wired to three terminals fixed to a piece of insulating material, different capacities may be selected. Connecting to 1 and 2 will give a capacity of roughly ·00007 mfd. Terminals 1 and 3 provide ·0001 mfd., and terminals 2 and 3 ·0002 mfd. If terminals 1 and 2 are joined the capacity will be ·0003 mfd., and all these capacities can be tried in series with the aerial lead-in.

After adding a condenser in this way, or changing the capacity in circuit, the tuning condenser on the receiver should be adjusted.

Aerial Tappings

In crystal sets and some small valve sets the aerial is taken directly to the top end of the coil, for maximum volume. This also gives minimum selectivity, and by connecting the aerial to a tapping on the coil instead, tuning can be sharpened.

(A) in Fig. 2 illustrates three ways of making such tappings. When the coil is wound, a loop may be made, as at 1. To avoid any danger of the turns becoming loose, such a loop may be taken through a small hole and brought out at one end of the coil, as at 2. If the coil is already wound, a turn may be prised up a trifle and a small piece of thin card inserted under it. The strand of wire can then be scraped and a lead twisted or soldered on, as shown, for tapping 3.

The nearer the tapping is to the earthed end of the coil, the sharper will tuning become. It is possible to make a number of tappings and select the best for particular conditions. As a guide, a tapping about one-third to one-half the total number of turns from the earthed end of the coil is average. With a valve set giving good amplification the tapping can be lower with advantage. With a crystal set, however, it must not be too near the earthed end of the coil or volume will be severely reduced.

Coupling Windings

With some ready-made coils it is easier to add a small aerial coupling winding. The simplest way to do this is to take a strip of ¼in. wide insulating tape and bind it round near the bottom of the existing winding, putting on about two layers. The aerial coupling winding is now placed on top of this tape, and the ends can be secured by passing through small holes in one thicknessonly of the insulating material.

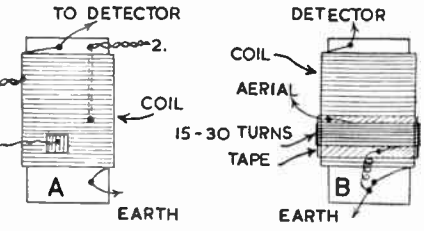


Fig. 2—Tappings and inductive couplings

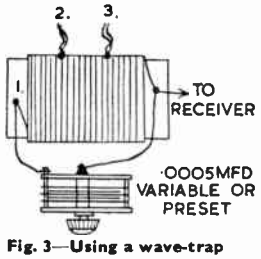


Fig. 3—Using a wave-trap

The smaller the number of turns wound on, the sharper will tuning be. If the coupling winding is moved away from the other winding, tuning will also be sharpened, and a type of variable-coupling can be made if the new coil is wound on a cardboard tube which can be slipped along over the other winding.

Actually, a coil such as that shown at (B) in Fig. 2 can give excellent results. Tuning is sharpened a great deal and volume is not reduced too severely.

In the diagrams neither reaction nor long wave windings have been shown, because these will be left in their present form. Crystal sets will have no reaction windings, of course, and there will be no long wave windings on sets used for medium waves only.

A Wavetrap Circuit

Each of the methods described, though practical and often used, reduces volume slightly. This is unavoidable, and a disadvantage which can only be overcome by using a wavetrap or extra amplification.

A wavetrap is particularly intended to prevent *one* undesired (e.g.—local) station reaching the receiver, so that distant stations can be heard without interference. When correctly set, it does not reduce volume and can actually give a very slight increase in signal power to a desired station. It consists of any efficient tuning coil which can cover the wavelengths required, in parallel with a tuning condenser, as shown in Fig. 3.

It is connected in series with the aerial lead-in, and the aerial may be connected to any of the tappings illustrated. (Points 1, 2 or 3). So that the wavetrap can tune sharply, a condenser may be added between trap and aerial lead-in. The wire from the trap to the receiver aerial terminal should not be longer than necessary.

To use, tune in the troublesome station on the receiver and tune the wavetrap until this station is cut almost or completely out. No further adjustment of the wavetrap is then required, and a preset condenser (A), Fig. 1 can be used to tune it. For medium waves, 90 turns of 32 S.W.G. enamelled wire on a 1in. former will be suitable. Long waves would require about 250 turns of similar wire wound in two compact piles.

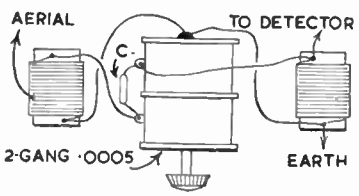


Fig. 4—Bandpass circuit

Bandpass Circuit

This is used in many receivers of the better type and it can be adjusted to pass only a narrow band of wavelengths, removing interference from stations on other wavelengths. It is very suitable for valve receivers and is wired up, as shown in Fig. 4.

For tuning, a 2-gang ·0005 mfd. condenser is best, though two separate ·0005 mfd. condensers can be used if the presence of an extra control-knob is not minded. Both coils are exactly the same and the aerial should go to a tapping near the earthed end of the first coil, or

(*Continued foot of page 72*)

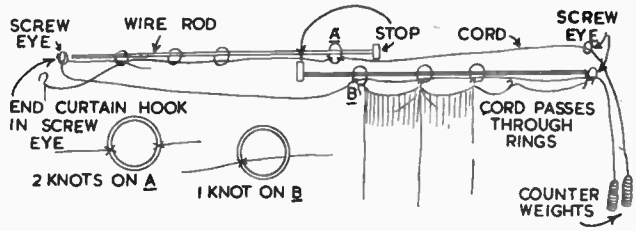
Final details for giving an amateur show with HAND PUPPETS

THE puppets are made, the 'fit-up' and the play-board await them, but, before the curtains part and the drama begins there are still a number of things to be done to make the play complete, and so ensure success.

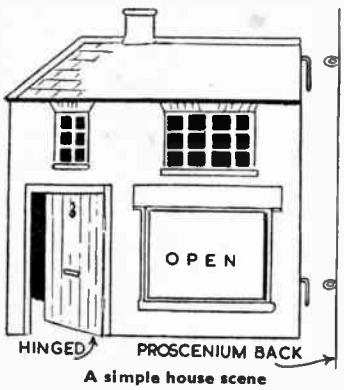
The Curtains, for instance. Many glove-puppet showmen dispense entirely with curtains. Their stage is always on view, because the drama they perform begins and ends in a single act. Or their variety turns follow one another so quickly that a curtain would be useless.

Curtains

Curtains, however, are very useful especially for serious dramatic productions, and, whether they be of the tableau variety, that is, crossing the stage from centre to sides, or whether they roll up like blinds, every care should be taken to make sure that they run not only smoothly but silently. Velvet is the best material, as far as appearances go, and the colour of the 'drapes' should be entirely in keeping with the rest of the material surrounding the frame of the booth.



Details of stringing for tableau curtains



A simple house scene

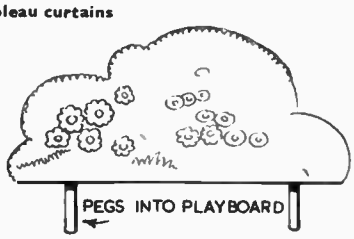
Scenery

Scenery is another important consideration. A well designed, brightly coloured, and cheerful looking backcloth will go a long way towards giving the audience a good impression of the show from the start. The 'décor' of the hand-puppet stage consists, usually, of a back scene, wings occasionally, and sometimes small standing pieces on the playboard.

The back scene should be of the roller type. It can be painted with distemper or poster colours, on a sheet of canvas or linen, which should be lightly sized before painting, especially if distemper is used.

The top edge of the scene is tacked to a wooden batten, which should be 3in. or 4in. longer than the full width of the fit-up, so it can rest on the top cross-bars, allowing the scene to hang in position. The bottom edge of the scene should be fixed to a roller to act as a steadying weight, apart from its duty in rolling up the scene when not in use.

The design of the scene should be very simple. Leave out all small and unimportant details. The audience, especially the back rows would never see them. A pile of fruit in a shop window, for instance, would be painted as a mass of colour, with, perhaps, a little carefully placed shading to suggest form. To paint every apple separately would be not only a waste of time but also a waste of labour.



The ground piece with fixing pegs

Trees would be painted as broad flat masses, and not as thousands of individual leaves. If you are not sufficiently skilled in drawing to design scenes, the best plan is to find a good picture or photograph, and copy the main details, leaving out all that is unnecessary to the scene.

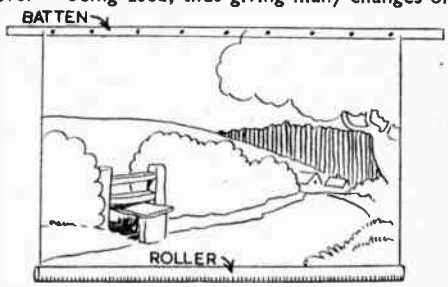
Keep to bright, but not gaudy colours; avoid all arrangements of colour which clash and jar the nerves of the spectators, such as violent contrasts of light and dark scattered about a scene. Keep the main dark masses together so that the eye really sees only a single mass instead of a broken pattern.

For general utility it is nice to have a street scene, with perhaps a shop on one side, an old inn on the opposite side, and in the background, gardens or a church or a harbour, or whatever setting your play demands. A forest or park scene is also very useful, and so is one which shows a country road, with a stile in the foreground and the red roofs of a village in the distance.

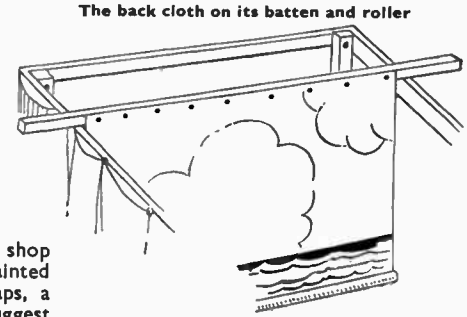
The Wings

In the 'Punch' theatre there is often but one wing, which is usually placed close to the play-board, and generally on stage left. This is invariably in the form of a house-front with an open window through which a great deal of comic business occurs.

On a wide stage there could be wings on both sides. These wings are made to hang on pin-hinges, so they swing out to any angle required. The system allows a variety of such wings being used, thus giving many changes of scenery in combination with the backcloths.



The back cloth on its batten and roller



The back cloth hung in place

'Props'

Properties are 'set' on the play-board and often by the puppets themselves as a part of the act. They may consist of furniture, magic boxes, tombstones, gallows, or whatever objects are needed to assist in the production of a play. If the properties are parts of a scene—flower beds for example, they should be made to peg into or clip on to the inner edge of the play-board to prevent them being knocked over during action.

No 'Punch and Judy' show is considered to be complete without that screeching 'call' by which the traditional voice of Mr. Punch is recognized. This instrument consists of two small curved plates of *silver* bound together with silk thread. The majority of showmen make their own 'calls', and, simple though

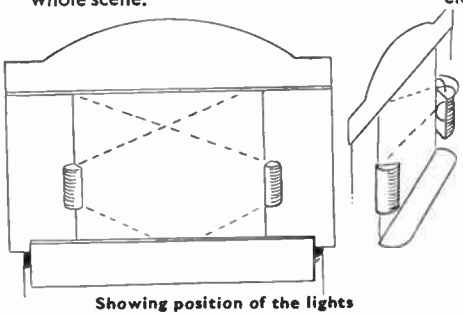
they appear to be, they are clever bits of work.

Being very small they are easily carried under the tongue, and brought into action when Punch is speaking. The beginner is advised to go very cautiously with the use of this instrument, for even expert showmen have made an unexpected, and undesired meal of one before today.

Lighting

In the dramas of the hand-puppet theatre most of the action takes place against or over the playboard, and not, like those of the marionette stage, behind the proscenium. This means that the lighting must come from an outside source, from in front of the proscenium in order to illuminate the puppets.

Additional lighting may be used for the interior of the booth, but it is seldom resorted to by showmen, who depend on the front lights to serve the whole scene.



Showing position of the lights

The lamps can be placed on both sides of the stage opening. They should be masked, to prevent the glare disturbing the sight of the audience; and their cross beams arranged to illuminate the whole of the acting area and scene. *All* electrical installations should be done by a fully competent electrician.

Finally, the Performances should be rehearsed until the operator can give a smooth-running show, with quick changes, and no waiting. The dialogue should be spoken clearly, and brightly, without any dragging or repetition of lines. Delays are dangerous, and long speeches without action are fatal. Keep the sentences short, and if a puppet is not speaking keep it perfectly still so that attention may be concentrated on the figure which is actually talking.

Readers anxious to be really proficient at this popular hobby can learn more by joining the special Guild of Puppetry. The Editor will supply the address or fuller particulars to all who care to write.

Another selection for different jobs of the uses of special HOME CEMENTS

Jointing Steam Pipes

Paper soaked in a mixture of boiled linseed oil and red lead makes an efficient steam-tight packing. Blotting or other porous non-glazed paper should be used for the purpose.

Cement for Iron

Cracks in small iron castings can be filled, and a water-tight joint formed by making up a stiff paste of 20 parts by bulk of iron filings and 1 part by bulk of sal ammoniac. Only distilled water should be used, and the cement well worked into the cracks with an old knife.

Rubber to Steel or Iron Cement

A very simply-made cement for this purpose may be made by taking 1 part of powdered orange shellac and 10 parts of '880' ammonia, mixing them and allowing them to stand for a few days in a closely-stoppered bottle. It is ready for use when it has become a thick treacly mass.

Acid Proof Cement

A fine cement that is acid-proof can be made by mixing 3 parts of fireclay, 2 parts of boiled linseed oil, and 1 part of rubber-solution, so that a thick paste is made. This cement also makes an excellent luting for laboratory glassware, where acid fumes have often to be resisted.

Another impervious laboratory cement is made up with zinc white and copal varnish, made into a stiff paste. It is not quite so strong as the previous recipe.

Cement for Aquarium Glass

Melt together 1 part of raw rubber or gutta-percha, and 2 parts of pitch. Apply to the joints to be made hot, and slightly warm and thoroughly clean and dry the glasses before pressing them into position. The seams may be neatly finished on the outside with the aid of a small hot poker.

Another good cement for the same purpose can be made by mixing zinc white or red lead with good gold-size till a stiff paste is formed. Dryness and cleanliness is only necessary in this case when used, no heat being needed.

Glass to Ebonite Cement

Dissolve 2 parts of bleached shellac in 7 parts of methylated spirit together with 1 part of Venice turpentine, pouring off the clear liquid after solution and using the settlement as cement.

Another good recipe is to heat Canada balsam in a tin until hard, then in 4 times as much benzine. Apply to the ebonite and allow to dry, then moisten with a little benzine and press to the glass.

If the joint between the glass and the ebonite is never to be exposed to dampness, then an equal mixture of glue-size and granulated sugar forms a good cement which was once known as 'lip-glue'.

Marine Glue

The adhesive known as 'marine glue' is made by taking 1 part of ordinary rubber solution and 2 parts of powdered shellac, heating the mixture gently over water till the whole is melted. Pour out into sticks, allow to set, and in use warm both articles being mended and the stick of glue. Squeeze out as much of the glue as possible when making the joint.

Glass Cement

Canada balsam makes the best cement for glass articles, but must be used correctly to obtain the best results. It should be placed in a saucer and baked in an oven till quite hard when cold. The pieces of glass to be joined should be heated gently until they are too hot to comfortably hold, and the balsam spread over the parts to be joined with a stick.

Cements for China Repairs

A useful cement for this purpose can be made by covering ½ oz. of gelatine with glacial (strong) acetic acid, and, after standing a few hours, melting the mixture down by standing the bottle in hot water. This cement is ready for use if placed for a few minutes in hot water.

Another good china cement may be made by coagulating some milk with weak acetic acid or vinegar (after having skimmed off the cream) and washing the curds (casein) in cold water. The casein should then be dissolved in a cold saturated solution of borax, and the clear solution thus obtained mixed with finely-powdered quicklime. The cement should be quickly applied to the broken edges, which should be tied up till the cement is hard set.

The tools to use and an example of working in WOODTURNING

WE deal here with the tools used for softwood turning and for the normal hardwoods which the joiner and cabinet worker uses. The tools used for harder woods (such as ebony), and for ivory and some of the artificial substitutes for ivory, resemble the tools used for metal turning; different principles apply to them.

All turning tools except those which have a scraping rather than a true cutting action have a double edge. The turner's gouge and chisel are examples. The tool edges sever a piece of wood, which should come away in a more or less continuous 'ribbon' in proper working.

Points to Watch

Whether the shaving does in fact come away like this is a test (1) of the accuracy of the tool grinding and sharpening; (2) of the correct positioning of the tool; and (3) of the speed of rotation of the work in relation to the size and nature of the job. Generally the speed can be kept constant, and factor (2) can be altered to suit the nature of the timber and the sort of cut being made.

Scraping tools such as broad chisels,

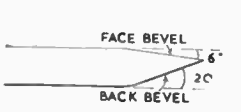


Fig. 1—Bevels for gouge

Fig. 2—Gouge shapes

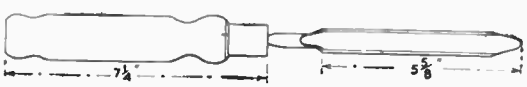


Fig. 3—Length and details of a turning tool

with the edge at right-angles to the shank, are used for smoothing off cylindrical work after roughing down. An ordinary firmer chisel about ¾in. wide will do, and one with bevelled sides is preferable. It must be kept sharp. Turning tools need much more frequent sharpening than the chisels which the joiner uses.

A two-sided carborundum or aloxite stone should be kept for turning tools. Owing to the narrowness of these tools, and because gouges have to be sharpened on it, such a stone will soon be rendered useless for sharpening ordinary joiner's chisels.

For Sharpening

It is a good plan to mount a grinding wheel upon the extreme left-hand end of the headstock spindle. A medium wheel, about 4in. by ⅝in., is the handiest, and here again one made of aloxite can be chosen. Use the edge and one side for general sharpening. Keep the remaining side for jobs where a true flat surface is needed for occasional truing up of a tool.

With such a wheel mounted, the worker can sharpen his tool while the work is still running, and there is no temptation to go on using a tool which has lost its sharpness.

Much of what one might call current sharpening can be done on a medium wheel in this way, with only an occasional rub on the oilstone when a finishing cut is to be taken.

Grinding Wheel Speed

A grinding wheel runs best at a higher speed than is desirable for the lathe, but the practice here recommended is very convenient. If the worker's bench is long enough and a countershaft drive can be contrived, he can fit up a separate grinding and polishing head, to be driven off the countershaft at a higher speed than the lathe speed. This is just a matter of proportions of driving and driven pulley. When not required, the belt can be slipped off the pulley.

Such a grinding head, with a coarser grained wheel, is useful for shaping or re-shaping tools. It is good fun to experiment in making tools for special turning jobs, using old files which have been softened in the kitchen grate.

The turning tool must meet the work at a tangent (see Fig. 6). The bevel on the under side of the gouge is there for this reason, to allow the back of the tool to clear the work when in proper cutting posture. The angle of presentation is modified by raising or depressing the handle end of the tool (Fig. 6). The angles for face and back bevels for the gouge are shown in Fig. 1.

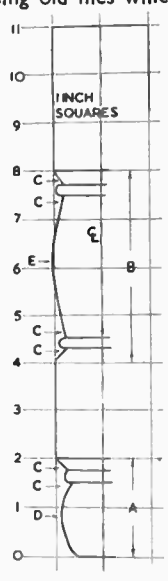


Fig. 4 — Shape marked on wood

Alternative shapes for the snout of the gouge are indicated in Fig. 2. In the left-hand diagram the face is shown not ground; between this and the condition shown in the right-hand diagram there are many variations, due to the preferences of individual turners.

The more pointed form is very useful for shaping grooves and beads. The side of a gouge ground in this way is available for fine cuts in finishing flat sweeps. The nose of a ⅝in. gouge so shaped can be used for roughing down to a cylinder. The side of the same tool is invaluable for the next operation after this roughing down—obliterating the grooves left in the former operation. So it will be wise to keep two tools of this size and shape—one for roughing, and the other for finish-turning (and kept very sharp).

Turning tools have a long handle, to counteract the thrust exerted by the workpiece when rotating (Fig. 3). The tool itself is much heavier and stronger than the carpenter's gouge. This means that the latter type of tool is unsuitable for heavy turning. But a worn-out firmer gouge, as used by the carpenter, can be re-shaped for a turning tool and can do good service for light work.

It should be ground at the end to somewhat the shape shown in Fig. 2, left-hand diagram. A useful job which the beginner can tackle is the making of a handle for such a tool, following the shape shown in Fig. 3. The ferrule can be made of a piece cut from brass tubing and driven on tightly.

Actual Turning

Let us now turn to the actual operation of using the tools in practical work.

The woodworker often finds some difficulty in procuring turned legs which will just fit into his scheme on a stool or on the base of a bookshelf fitment or cabinet. Especially where rails have to be provided for does this problem arise.

Dwarf legs are an excellent kind of job

Fig. 5—Squaring the parts for shaping

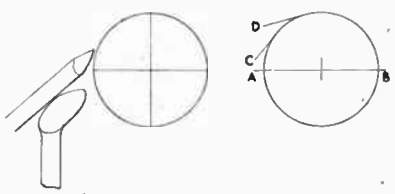


Fig. 6—Holding gouge to the work

for the beginner. Within limits, he can modify the design, provided that the set of two or four legs is made to agree in proportion and symmetry. Two plain legs are often used at the back of a bookcase stand, with turned ones at the front.

The design can be copied from an existing piece or modified to suit the needs of the job. If rails have to be accommodated, the 'squares' for these must be set out accurately; the turned portions above and below the squares admit of some freedom in treatment.

Procure some drawing paper ruled in

1in. squares (probably with ⅛in. divisions as well). Stand a steel rule vertically alongside the leg to be copied, and note the height at which the squared portions come. Indicate these heights on the piece of squared paper. Next, with a pair of 'outside' callipers, take the diameter of the various bulges and necks, and mark these, in the proper places, on the paper.

Callipers Needed

Use metalworker's callipers, with a spring bow and an adjusting screw. Besides a pair of these, some 'in-and-out' callipers are very useful, indicating at one end the distance spanned by the outside jaws, and at the other end the same distance between two projecting parts. Now, in the drawing, sketch in the sweeps and bulges (see Fig. 4), and we can proceed to transfer the basic dimensions to the wood blank.

Plane up the blank, and cut it to the proper length. Usually a piece of wood must be left 'on' at the upper end, for jointing. Indicate this, as in Fig. 5. Carefully centre the blank, for any inaccuracy in this preliminary operation will make our squares come out of centre with the ornamental portion. Lock the blank in position ready for turning.

Here, as in the previous example (roughing down), we shall work with the gouge—a ¾in. tool and a ⅝in. one. The marks squared across two sides of the blank (as in Fig. 5) will show when the work is rotating. With a ⅝in. or ½in. turning chisel, held edgeways, cut a shallow notch near the foot of the blank where the first bead is to start: this is at 1¾in. from the 'ground', or ¼in. below the line indicating the lower limit of the first 2in. deep square.

Cut another notch at 4¼in. and a third one at 7¾in. (see Fig. 4). All these dimensions are taken from the ground or from the 'foot end' of the leg' The width of the beads is shown as ¼in. Three other notches, defining the thickness of the beads, can now be worked, but these may come a little beyond the ¼in. dimension provided none is taken very deep. All we need is a 'safety line' at present.

Forming a Cylinder

Rough off the portions, marked (A) and (B) in Fig. 4, which are to be shaped. Take off no more stuff than is needed to obtain a true cylinder at the widest parts of the design. If this roughing obliterates the chisel notches, deepen them enough to serve as a guide for subsequent work.

Now begin to work out the narrow recesses which show the top and bottom of the beads, but leave the outer face of the bead untouched. These recessed points are marked (C,C) in Fig. 4. The ¾in. gouge is the tool to be used.

With the wider gouge, working from the widest parts of the portions (D) and (E), cut first towards the headstock and then in the opposite direction, gradually removing waste wood until something like the desired profile is obtained. Stop the lathe frequently and examine the work stationary. When rotating, it looks much more smooth and even.

Shaping with Glasspaper

It is worth while at this stage to smooth off the work with some coarse glasspaper at the principal ornaments. Quite a lot of shaping and evening-off can be done by this means, where further tooling in a beginner's hands might prove too drastic. Run the lathe while papering.

The beads can now be taken in hand again, using the front and sides of the narrow gouge as needed. Finish the beads with glasspaper; give a final rub over with finer paper, and this should finish the work. Do not remove the blank from the lathe until you are satisfied that no further tooling is needed. It is difficult to re-chuck the work with a prong-chuck and obtain precisely the same centring again.

STRUTS UNDER BOX (9)
CUT ONE OF EACH
1 4in.

CUT TWO 1 4in.

SIDE OF BOX (5)
CUT TWO 1/4in.

HOLE FOR AXLE

BLOCKS FOR FALSE FLOOR (7)
CUT 8—1 4in.

FLOOR OF BOX (8)
CUT TWO 1/8in.

ARMS (10)
CUT TWO 1 4in.
GLUE TO 2.

PAINT ON

PIVOT B

PIVOT A

LEG (12)
CUT TWO 1/4in.
PIVOT A TO
PIECE 2.

DETAIL SHOWING CONSTRUCTION OF BOX.

PIVOT B

PEDAL

LEG (13)
CUT TWO 1/8in.
PIVOT B TO
LEG 9.

CENTRE

FRONT WHEEL (4)
CUT ONE 1/4in.

HANDLE-BARS.
CUT ONE 3/16in.
ROUND ROD.

FRONT AXLE.
CUT ONE 3/16in.
ROUND ROD.

SECTION

MAIN AXLE.
CUT ONE 3/16in. ROUND ROD.

WHEEL

WHEEL

PANELS OF WOOD REQUIRED FOR THIS DESIGN

ONE H4 ONE Q4
ONE G2

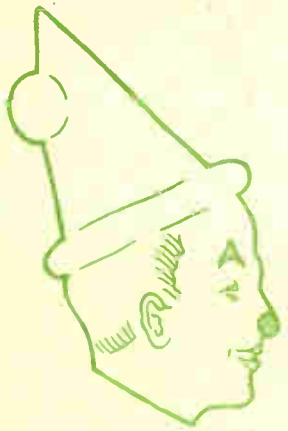
Materials for making this design are supplied by HOBBIES LIMITED, Dereham, Norfolk.
Price on application.

PRINTED IN ENGLAND.

Hobbies DESIGN
No: 2818
2-11-49

SUPPLEMENT TO HOBBIES No. 2818.

A WORKING PULL-ALONG TOY TRICYCLE



THE FACES ARE TO BE CUT OUT AND PASTED TO EACH SIDE OF PIECE 1, FOR PAINTING

THE ARROWS INDICATE DIRECTION OF GRAIN OF WOOD.

PEDAL (SCREW)

CRANK (11) CUT TWO 1/8in.

PIECE (3) CUT TWO 1/4in. GLUE ON EACH SIDE OF PIECE 1.

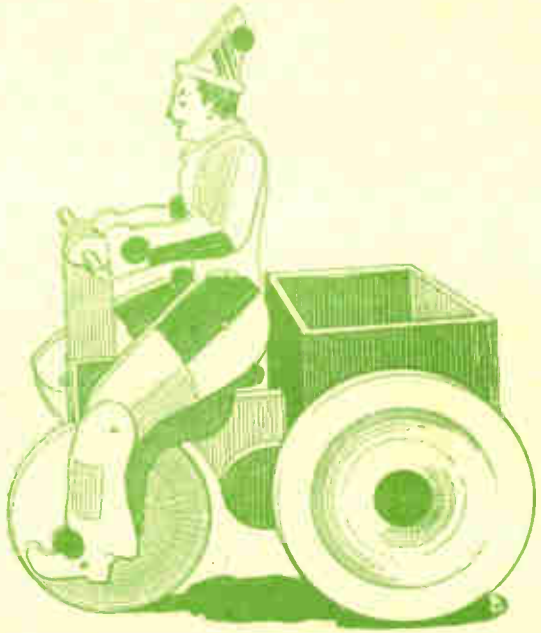
PIECE (1) CUT ONE 1/4in. THE FEATURES ARE TO BE PAINTED ON

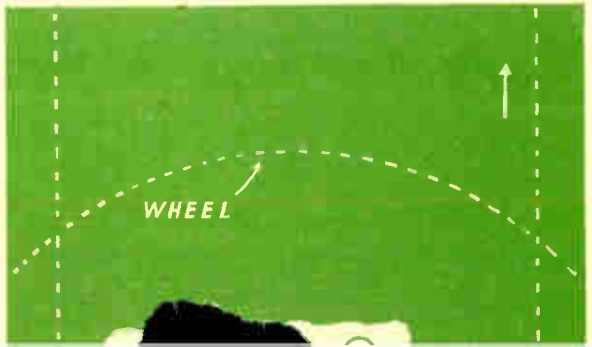
PIECE (2) CUT TWO 1/4in. GLUE ON EACH SIDE OF PIECE 1.

PIVOT A

SIZE—
9ins. HIGH.
8ins. LONG.

NOTE.—This design sheet is only presented free with the current issue of Hobbies and not with back numbers. Further copies may be obtained.





THE TRICK CYCLIST TOY

THIS pleasing little toy is painted in bright colours, and when pulled along, the pivoted legs of the clown pedal away at the wheels in an attractive manner. This simple toy is made from ¼in. and ⅛in. wood to the patterns shown on the other side. If you propose pasting them down, you should read these instructions thoroughly to know the procedure of construction.

Draw off the Parts

A better plan is to trace off the patterns direct to the wood so that these instructions are still available. The parts are cut with the fretsaw to the outline provided, and the kit includes not only the wood, but the necessary screws and axle rods. Piece (1) forms the centre of the figure, and on each side of this is fixed piece (2). The outline of the body comes flush with that of piece (1), and the front straightedge projects below the upright straightedge of part (1) also.

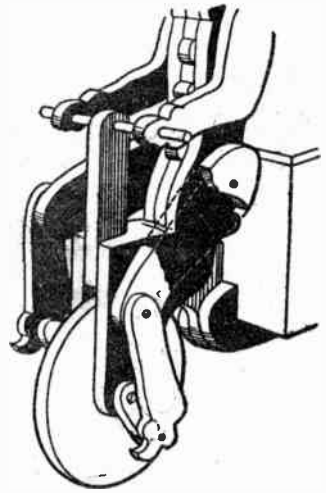
Do not, however, glue both these pieces (2) on until the front wheel has been fixed. Cut this front wheel (4) and then glasspaper it down slightly so it revolves easily in the space later provided. Cut a central hole to take the axle. This is a $\frac{5}{16}$in. rod, 1½in. long. Glue it on to the wheel projecting evenly each side.

Fitting the Wheel

Now fit the axle through the hole in one of the sides, making sure it revolves easily in that hole. The second side (2) can now be glued on. If you attempt to put the wheel in place after the two sides are glued, then you will find it impossible to paint the part satisfactorily.

The two loose parts of the thigh and lower leg (12) and (13) are cut and pivoted by a ⅜in. screw exactly at the point shown. The foot is pivoted to a crank (11) which is in turn fixed firmly on the axle of the front wheel. Glue this axle through the crank portion firmly, adding a tiny piece of razor blade across the axle rod to make a firm joining.

These cranks should be glued about $\frac{1}{16}$in. away from the central pillar so they



Detail of the working figure

may revolve correctly. Remember, of course, to fix the crank pieces projecting in opposite directions so that when one foot is forward, the opposite foot is at the back. Here again the parts should be painted as they are put together, because it is much more awkward to do this work after completion.

The arm pieces (10) are glued to the shoulder of the main figure, and through the hand an imitation handle bar is made of a 2½in. long piece of $\frac{5}{16}$in. dowel. The position of the various parts on the actual handlebar is indicated in the drawing. Part (3) provides thickness to the undercarriage behind the clown, and its position is obvious, even apart from the dotted line showing it. One each of these pieces is glued either side of the projecting portion bringing the right-angle corner flush so that the box carrier itself can bed down firmly.

Box Construction

The construction of the box is shown by the detail on the sheet. The two ends go between the two sides, and the floor is glued inside all of them. Remember to make the hole for the axle in the two side pieces, and see that the axle rod itself moves smoothly in the hole provided. A false floor (8) is raised on a pair of blocks (7) glued into each corner. This false floor merely hides the moving axle beneath, and can be either glued in or left removable.

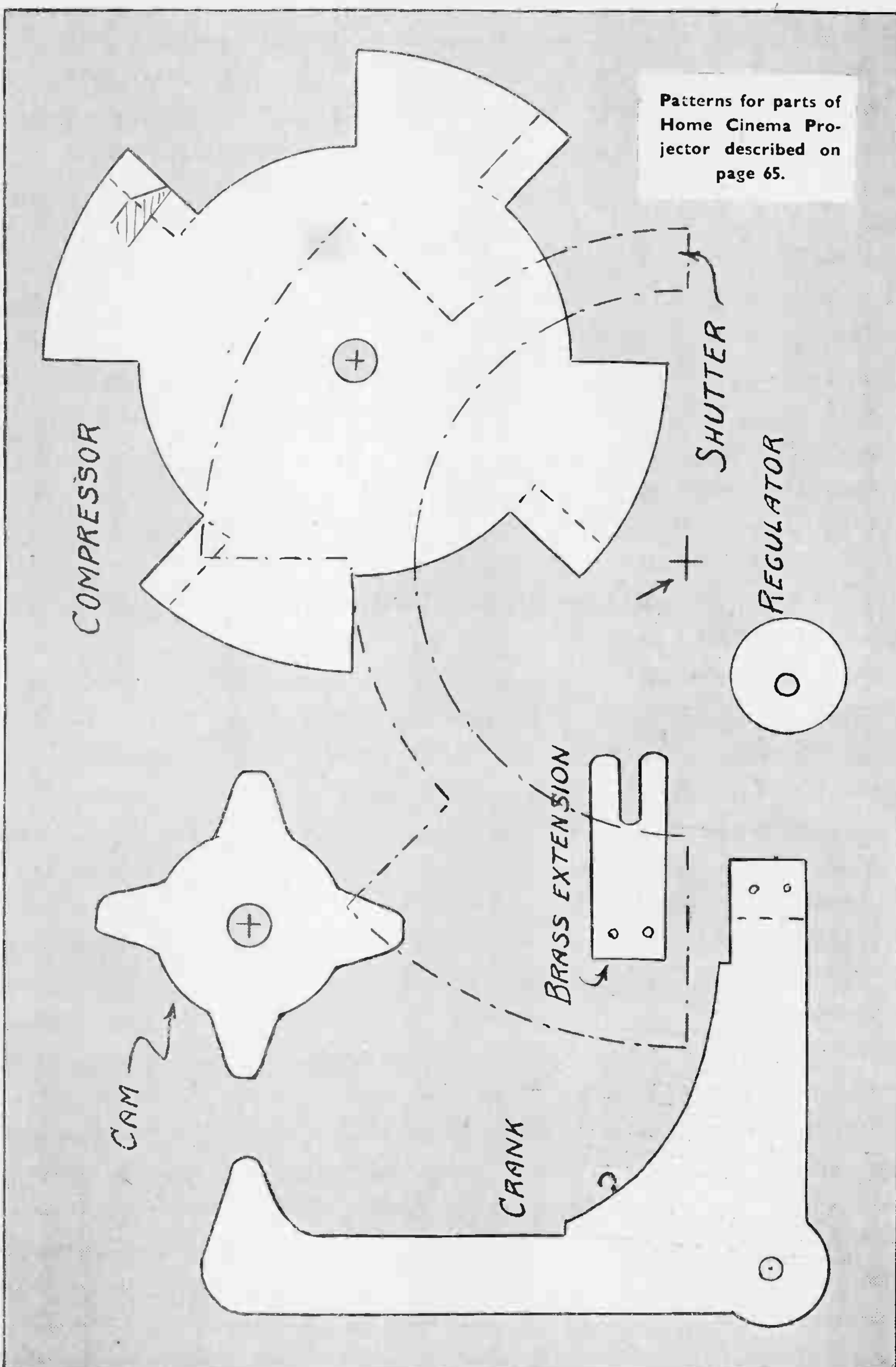
The axle rod has the 3⅜in. wheels glued to each end, allowing a little room between the actual sides of the box and the wheels themselves. If you wish, of course, small metal washers can be fitted over the axle to prevent binding. The struts (9) are glued across the floor of the box towards the wheels, and fit in the right-angle of the projection of part (1). They cannot, of course, be added until the whole box has been glued in place on the thickness provided by the projecting shelf of pieces (1) and (3).

Colouring

The drawing of the finished article suggests the various colourings which can be used on the clown and box, red, green and brown forming the brightness so attractive to any youngster. The face can be completed by pasting the paper pattern provided, for which purpose a reverse face is also printed.

If, of course, you could manage the features painted on the wood, so much the better. They need not be elaborate or too complete, but just the contrasting markings normally found on a clown.

Patterns for parts of Home Cinema Projector described on page 65.



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