TWISTS, WAVY BARS AND WATER LEAVES

In this chapter are described three types of ornament which are very commonly used, and are not difficult to make. In all decorative work, a sense of design is essential if good craftsmanship is not to be spoiled by clumsy lines. If you have the opportunity, study examples of really fine work to see what an imaginative use of the qualities of iron can achieve. The ironwork at Hampton Court is famous, and the metalwork department of the Victoria and Albert Museum contains many beautiful pieces. The list of books on page 97 includes several illustrated studies of designs. As you gain experience you will learn the feel of the work, and will be able to make many interesting and varied designs within the compass of the techniques described here.

Lesson 12 TWISTS

Twists are second only to scrolls as a feature of decorative ironwork.

They may be made from plain square bars, flat bars, or bars forged to some special section; or bundles of bars, either the same or varied in section, may be made up and twisted. To produce a right-hand twist, turn the bar anti-clockwise and vice versa.

Square bars up to $\frac{1}{2}$ inch can be twisted cold, provided that care is taken not to damage the bar where the force is applied, and that the twist is kept straight. The method is to use a wrench wide enough to twist the bar without bruising it and a piece of barrel to keep the bar straight.

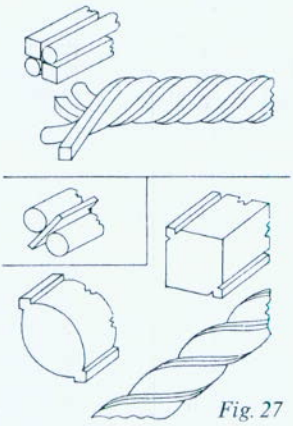
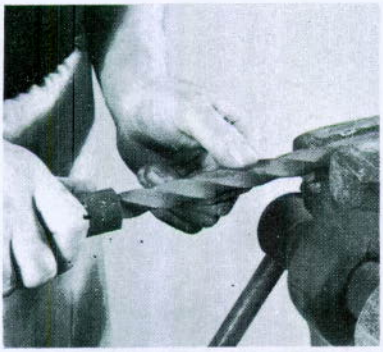


Fig. 27

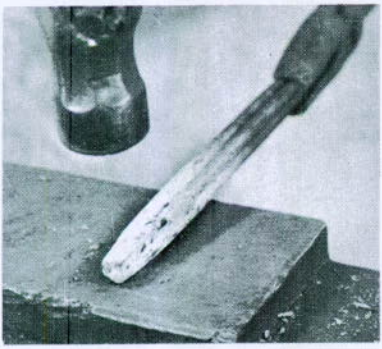
A

Choose a piece of iron barrel which is slack enough on the square rod not to jam when the twist is made. Cut it to the length of the twist required. Mark each end of the twist, and grip the bar in the vice up to one of the marks. Slip the piece of barrel over the part of the bar to be twisted and apply the wrench close to the barrel end. It is convenient to support the end of the bar on a notched piece of wood, as shown here.



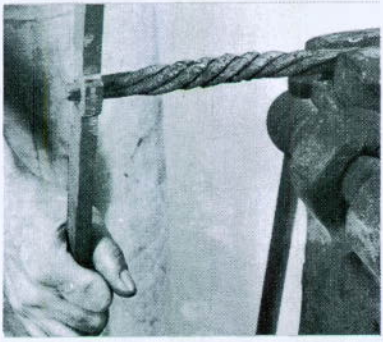
B

Here the barrel is being removed, revealing the twist which has been formed inside it.



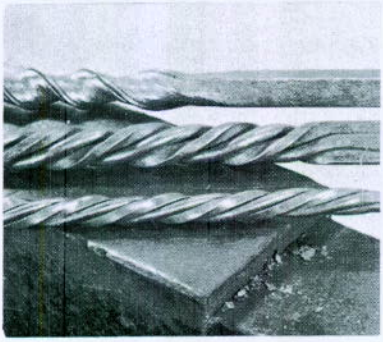
C

The simplest composite twist is made from a bundle of four round rods welded together at the ends.



D

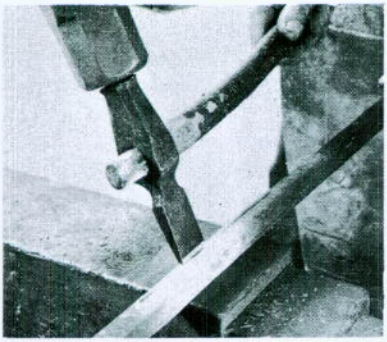
The finished twist is here shown cold.



E

Here, finished and wire brushed, are shown three twists.

The lower twist is made up of two square bars and two round bars. The middle one is made of a flat bar and two round bars. The top twist is a specially-formed square bar, made as shown on next page.

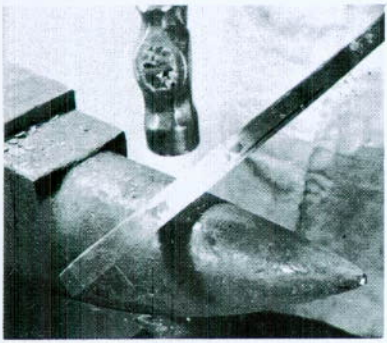


F

Mark off the length of the twist. On each side of two opposite corners scribe a line $\frac{1}{8}$ inch from the edge. Mark this line clearly with a cold chisel or cold set.

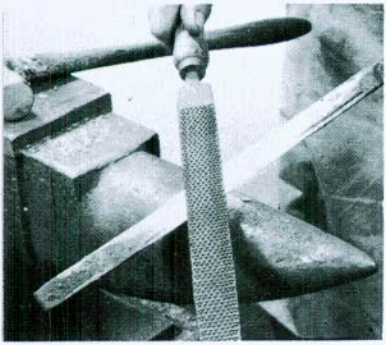
Now take a heat and cut into this line with a hot set held at a slope as shown here.

This is to avoid cutting the corner right out of the bar.



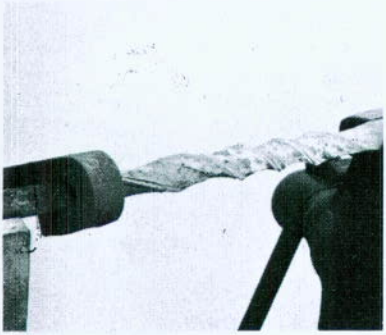
G

The pair of corners which have not been cut are now rounded to an oval section.



H

Clean up now with a hot rasp or old bastard file, as it is difficult to clean up after the twist is made.



J

Now take a heat, just the length of the twist and cooling out evenly at each end. If you can do this without using water, so much the better.

Twist by any convenient means.

K

However much care is taken with the heating, the twist is very likely to form unevenly.

As soon as this becomes noticeable pour water on those parts which are twisting too much, to cool them. Sometimes a twist back is necessary. In this case the parts which are not over twisted are cooled, so that they are not affected as the bar untwists.

Lesson 13 WAVY BARS

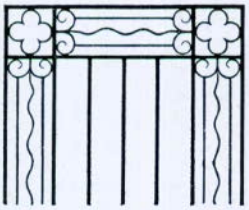
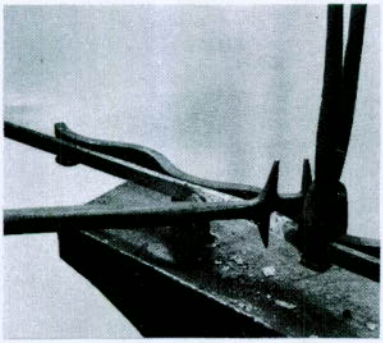


Fig. 28

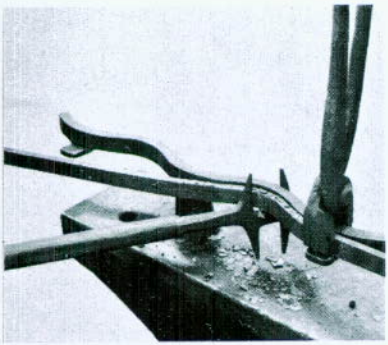
Here is a wavy bar tool in use. It is quite straightforward to make, but it is important that the waves should match perfectly, because each wave in the bar, as it is formed, must mate first with one wave of the tool and then with the next.



A

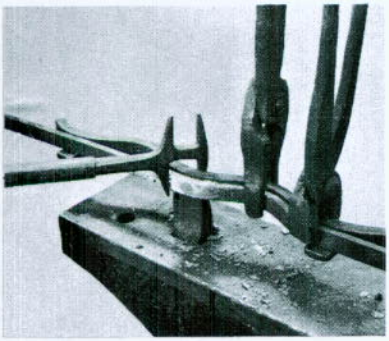
It is difficult to make the first wave exactly where it is wanted, so leave a little extra metal, and trim the bar to length when the waves are formed.

Take a long heat, grip the bar to the end of the tool with a pair of tongs and begin to pull it into the first wave with a wrench.



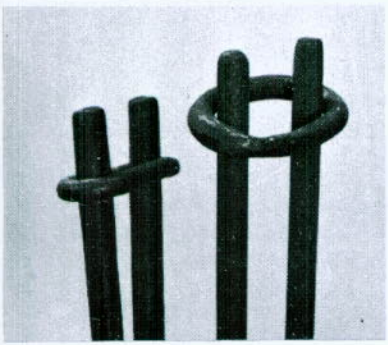
B

The bar will tend to twist sideways. To counteract this, use the wrench from above and below alternatively.



C

Take another heat and grip the bar to the tool with two pairs of tongs.



D

In order to have both hands free, slip chain links over the reins of the tongs. As each new wave is made, move up one on the tool. Set the final bends with horns and wrench and trim to length.

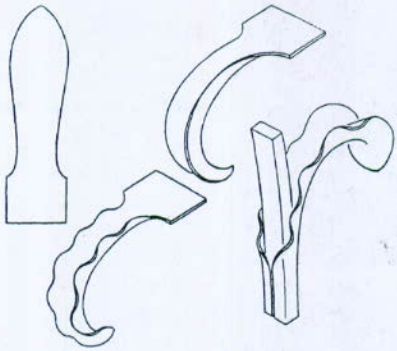
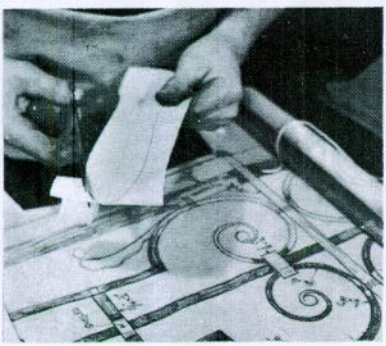


Fig. 29

Water leaves are usually made of 14 s.w.g. metal, a little under $\frac{1}{8}$ inch in thickness.

A

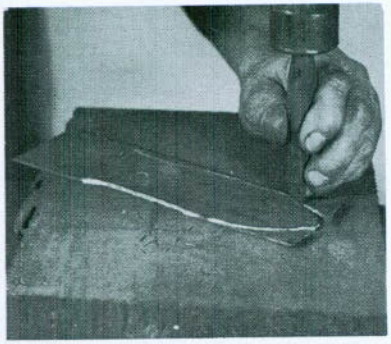
Measure the length of the leaf from the drawing with a piece of string. Measure from the tip along the underside of the leaf as the metal will stretch, but is not appreciably shortened in making the leaf. This will be a rough guide to the length of metal you will need.



B

The width of the leaf plate where it is to be welded on to the bar must be the same as the distance round the bar. The widest part of the leaf is usually the same width.

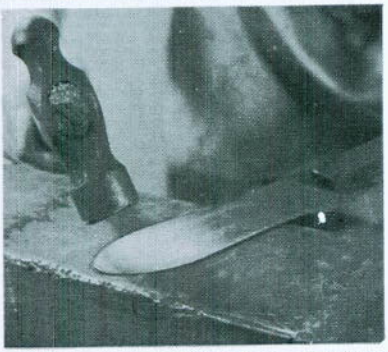
Cut out a paper template. Fold this and compare it with the drawing. If there is any discrepancy make an allowance by eye in marking the metal.



C

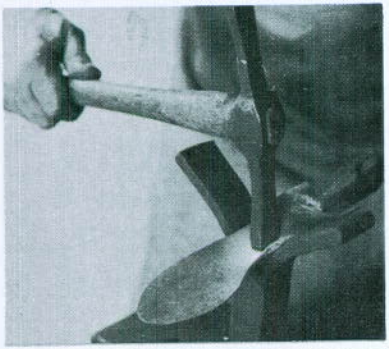
Cut right through the metal with a cold chisel to the shape of the paper template. Use an old piece of plate or an anvil saddle to avoid spoiling the chisel's edge.

File or grind the rough edges smooth.



D

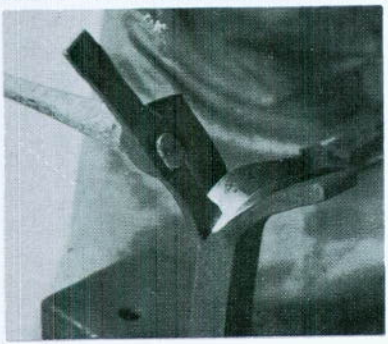
Thin out the edges of the leaf.



E

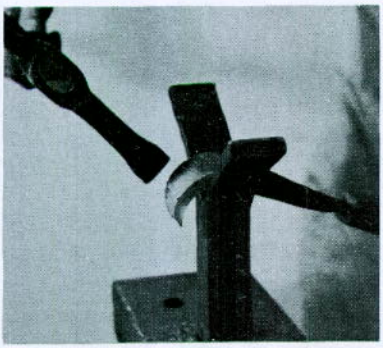
At a RED heat bend the leaf between the leaf hammer and the leaf tool to a 'U' section.

Keep the leaf straight at this stage.



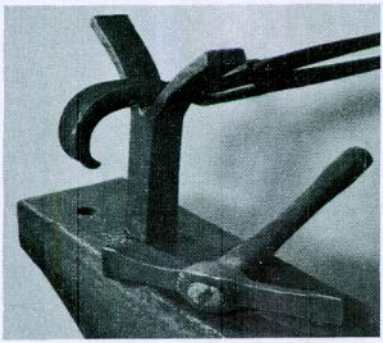
F

Take a short BRIGHT RED heat and begin to curl the leaf at the tip.



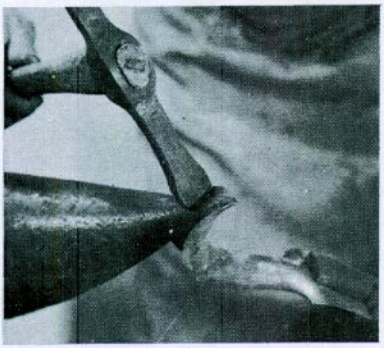
G

Take another heat and extend the curl.



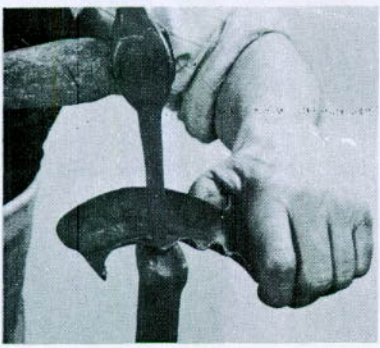
H

This is the result to aim at, shown cold. At this stage the curve should be greater than in the finished leaf, as the crimping will uncurl it slightly.



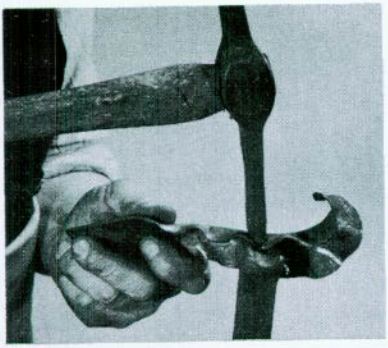
J

The tip of the traditional water leaf is twisted to one side or 'blown over'. The twist is worked over the end of the bick with a leaf hammer.



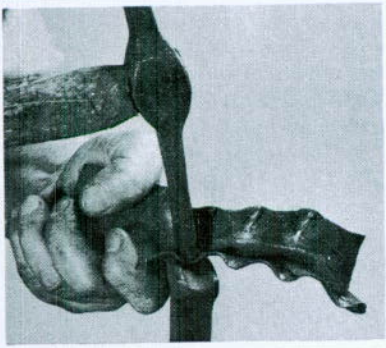
K

Note the number of crimps in the drawing and mark each depression on the leaf with chalk. Make a slight dent at each mark with the leaf hammer over the crimping tool (see Introduction, Fig. 9). Compare the dents on each half of the leaf to ensure that they align, then form the crimps, first from one side then the other, working them down to the flute of the leaf. Hold the leaf at an angle to the crimping tool, so that the crimps form diagonally, but always use the hammer in line with the tool.



L

Move the leaf to and fro over the tool hammering each crimp a little in turn, both on the outside as here –

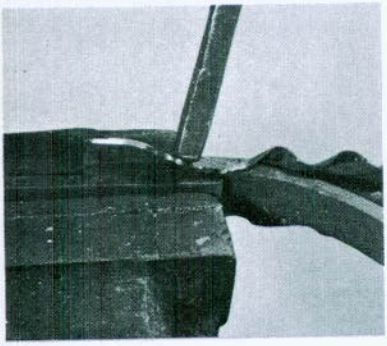


M

– and on the inside. Near the centre of the leaf the crimping is largely a bending action.

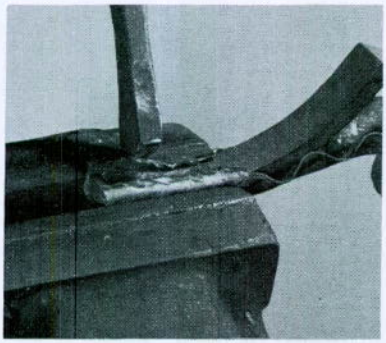
N

But towards the edge the metal is lipped over slightly more. This emphasises the waviness of the edge, and gives added life to the leaf.



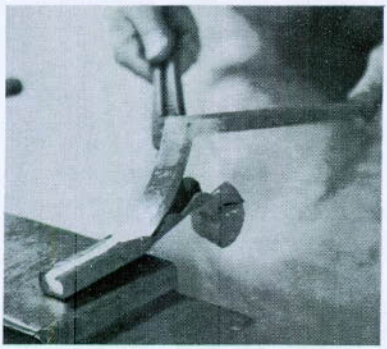
O

Grip the leaf and the bar to which you are going to weld it, in a vice, and fold one edge of the base over the bar. (A distance-piece will be needed to fold the second edge.)



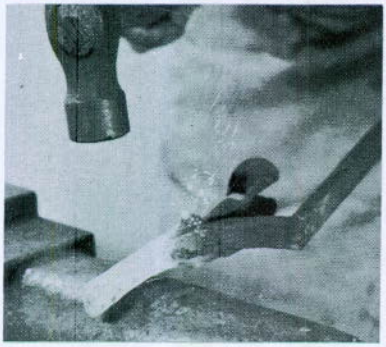
P

Now grip leaf and bar by the edges and fold the base of the leaf right round. If the leaf has been cut as in B of this lesson there will be a gap between the folded edges of the leaf equal to the amount taken up by the corners. This is correct, as the metal will stretch in welding. The bar should be slightly tapered so that the leaf can be slipped off again.



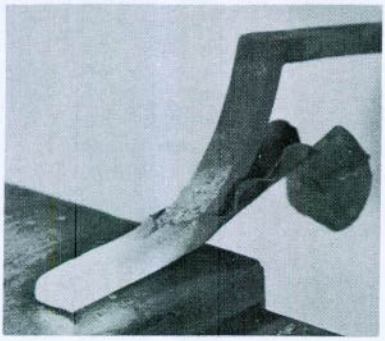
Q

Now weld the two together. First remove the leaf and take a FULL WELDING heat on the bar. Then slip the leaf back, tighten with a hammer and heat both leaf and bar to welding heat. If they were assembled cold the leaf, which is both thinner and more exposed, would burn through before the bar was hot enough. A little silver sand protects the leaf from wasting in the fire.



R

Weld quickly with fairly heavy blows. Do not draw the tip more than necessary or it will have to be upset again in order to weld it on to the next piece.



S

Here, leaf and bar have gone together perfectly, the heat clearly penetrating right through.

Lesson 15 SQUARE BLOCKINGS FOR GATE RAILS

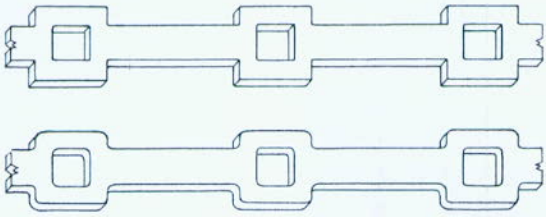
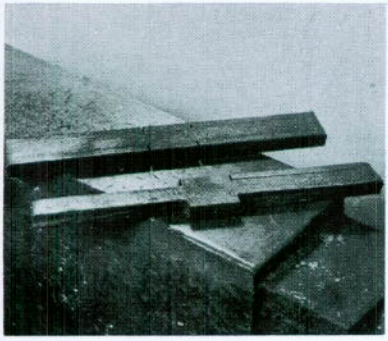


Fig. 30

Square blockings are used when it is desired to reduce the width of the horizontal bars in a gate between the holes where the vertical bars go through them.

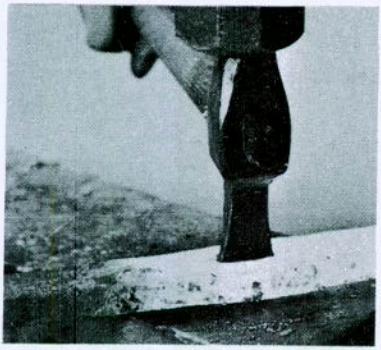
When the design calls for sharp square corners the blockings are cut from flat bar giving a look of precision to the work. Where a small radius on each corner is allowable the blockings are punched, upset, drifted and worked up. This gives a more rugged appearance.

Cut-square blockings are either sawn down or cut with a sharp hot set to the required depth. The sides are then cut away with the hot set, and the raw edges levelled up with a square-edged set hammer. The holes are drilled and filed out square. A series of blockings to measure should all be marked out on one bar, allowing a little for draft on the levelling up. Sometimes it is necessary to upset one which has been drawn too much, or vice versa.



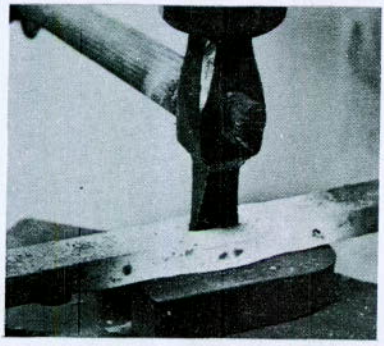
A

When the required length of the bar is greater than can be conveniently handled in one piece, make the blockings in two or more lengths and weld these together.



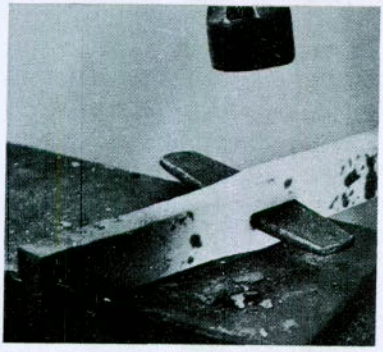
B

To make forged blockings, first upset the bar slightly and slot-punch the hole.



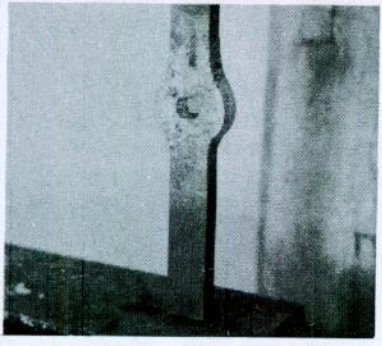
C

Drive out the burr over a bolster.



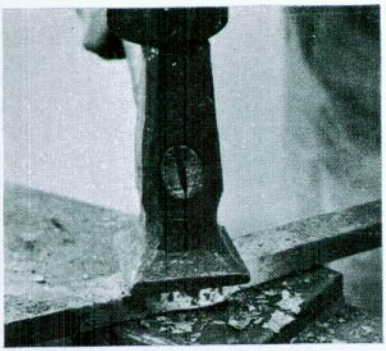
D

Put a drift in the slot and level up the uneven swelling caused by the punch.



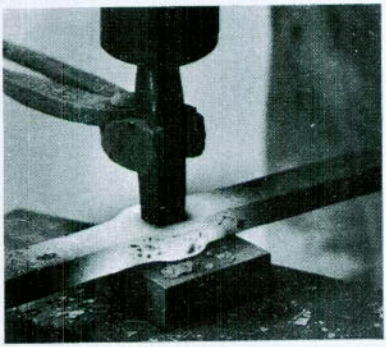
E

Take a NEAR WELDING heat, localise it with water and upset the metal about the slot until the hole becomes round.



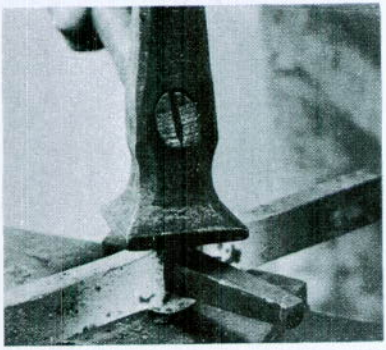
F

Level up with a flatter.



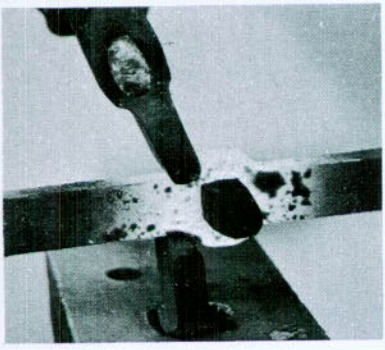
G

Place a drift in the hole with great care, so that it is both square and central, and drive it in gradually from each side in turn, but do not drive it right through yet.



H

With the drift still in place, flatten the side slightly.



J

Now drive the drift in a little farther and forge the shoulders to a small radius, between top and bottom fullers.

To finish, level up the bar beyond the shoulders, flatten the sides a trifle more; knock out the drift, flatten the faces again and finally replace the drift and drift out to the correct size.

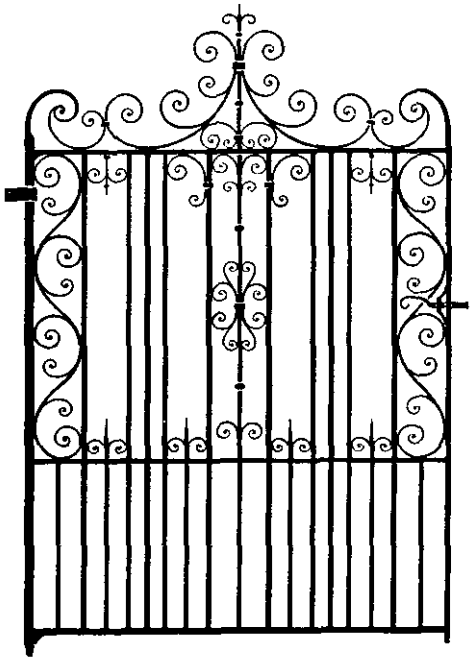


Fig. 31