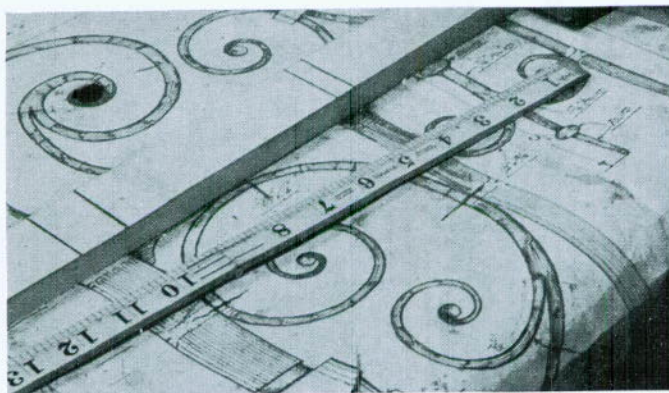


PART II

CHAPTER 4

MAKING AN ORNAMENTAL GATE

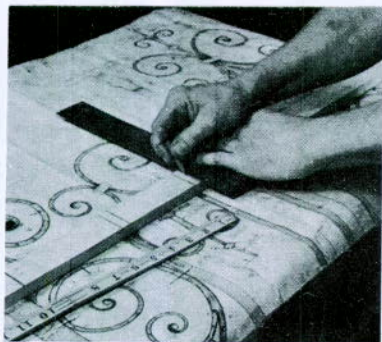


In Part I the making of scrolls was analysed in detail. In Part II these techniques are applied to the making, fitting and assembly of an ornamental gate.

The first stage in making the gate is the framework: the three rails, the front and back stiles, and the vertical bars. First is the making of the bottom rail with its heel; the top rail is similar. The tenons for the centre rail come next and the rail is drilled for the vertical bars during the fitting. The front and back stiles are made in the same way, so only the back stile, with the double running scrolls at the top) has been described. A section has been included on making the latch slot in the front stile. The journal on the back stile is turned or filed during the fitting. When the vertical bars have been tenoned, the framework is ready for fitting and assembly.

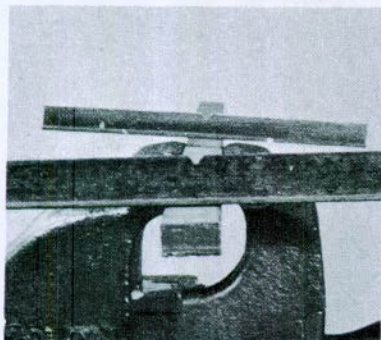
The forging of branching scrolls and balls is described next. These techniques are needed for the centre panel and the scroll-work above the top rail. The construction of one of the side panels, which consist of eight scrolls branching from a stem, is described in detail. Once you have mastered these methods you will be able to see for yourself how to make the rest of the scroll-work for this gate. Finally the dog bars, hanging and latch fitting are explained.

The fitting and assembly of the gate is described in Chapter Five.

**A**

The first step in making a gate is to take a clean straight wooden rod and from the drawing transfer the dimensions of the frame accurately on to it, the height on one side and the width on the other.

Do not trust the drawing or print. Even if the draughtsmen were absolutely accurate, the paper may have shrunk or swollen. Find out the measurements and mark the wooden rod with a rule and square.

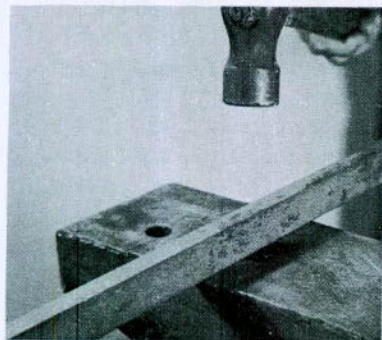
**B****Straightening the Bars**

Cut all the bars to length, and take out the twist. Sight through a pair of winding bars made of 'T' iron notched in the middle.

**C**

To take out the twist with a wrench, grip the bar in a vice and support the end near the wrench with a notched piece of wood, or an adjustable stand.

Remember that it is far easier to untwist a single bar than a whole gate, which you will certainly have to do if the bars you make it from are not straight.

**D**

Next straighten the bars over the swage hole, or one of the notches in the swage block if the bars are heavy.

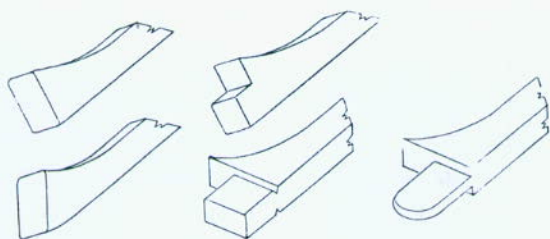
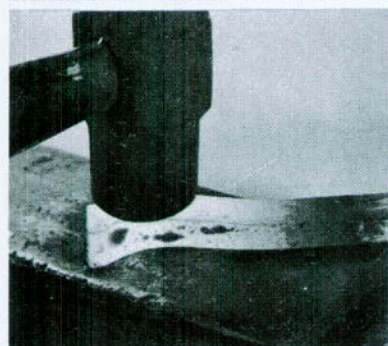


Fig. 32

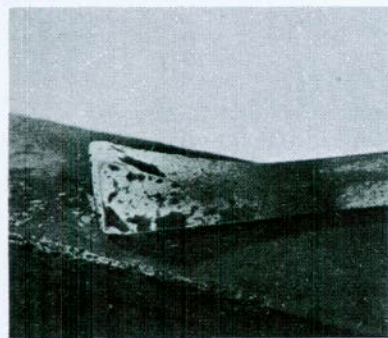
**A**

The next job is to upset on the anvil the heel at the hanging end of the bottom bar.

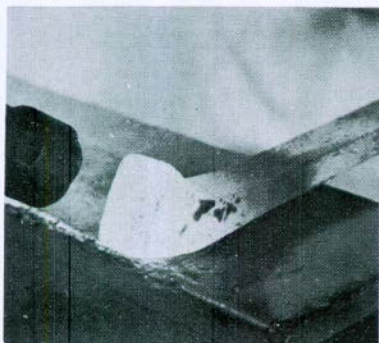
The picture shows the stance and force needed. Take a WELDING heat about 4 inches long and upset by bringing the bar down as hard as you can.

**B**

Do not allow the bar to buckle very much. Let the striker be ready to give a quick straightening blow and return to the upsetting. A really skilled man can complete the upset in three heats, each shorter than the last. A beginner need not worry if he takes six.

**C**

Here is the finished upset.



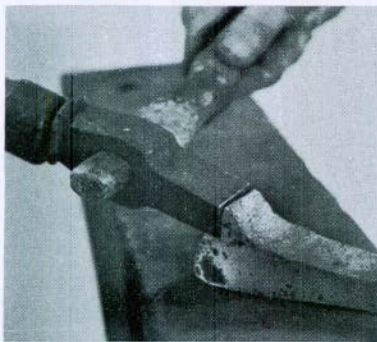
D

Now take another heat, and forge back the corner of the upset to an angle of about 75°.



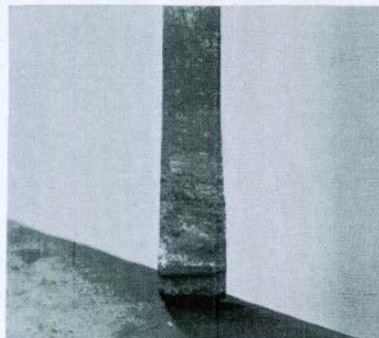
E

Put a square-edged set hammer just below the edge of the upset. Have your mate lower the haft of his sledge, and strike the near side top edge of the set hammer so that the force of the blow is diagonal to it, and drives the far side bottom edge into the metal. This produces an offset shoulder. Both the angle of the blow and its effect are clearly shown.



F

Hand your hammer to your mate, pick up a side-set, and square up the shoulder with lighter blows.



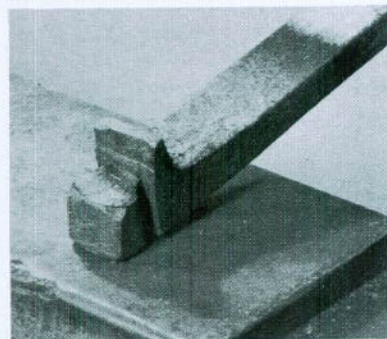
G

Leave the end a little wider than the bar. There are two reasons for this. First, the metal at the edge will be dragged in somewhat when making the tenon and secondly, a little extra width will be needed for final dressing.



H

Take a butcher and notch both sides of the shoulder. Be careful not to drive too deep, or the tenon will be galled in forging.



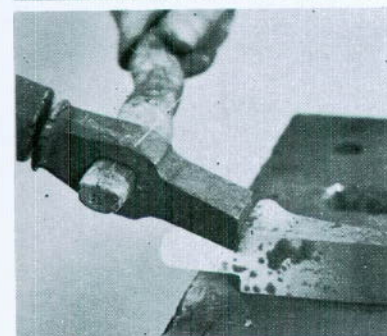
J

This is how the job should look now; it is shown cold.



K

Reduce the tenon with a square-edge set hammer over the near edge of the anvil or a square-edge stake (see page 20).



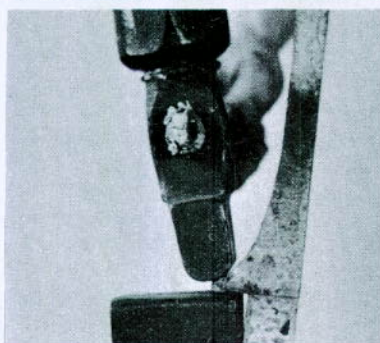
L

Square up the sides of the shoulder with a side set, the striker using a hand hammer as before.



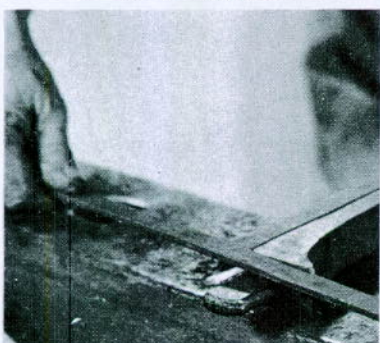
M

Round up the edges of the tenon between swages. This is because a round-ended mortice in the stile is both stronger and easier to make than a square-ended one.



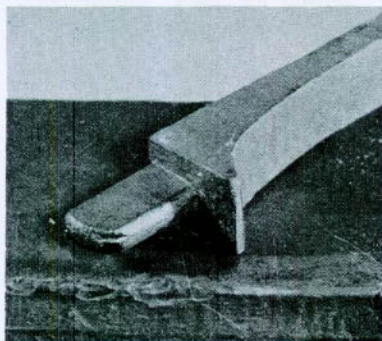
N

Draw out the tip of the heel with a fuller.



O

Finally square up the shoulders with a square-edged set hammer and side set. Test from time to time with a blacksmith's square. By these methods the work can be so accurately finished that little filing will be needed.



P

Here is the finished heel bar. The top rail is made in the same manner.

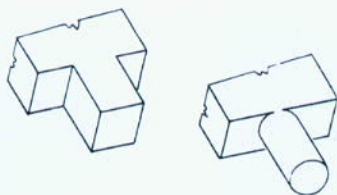
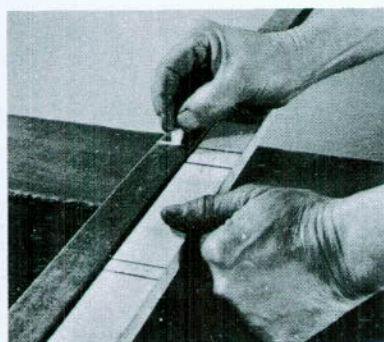
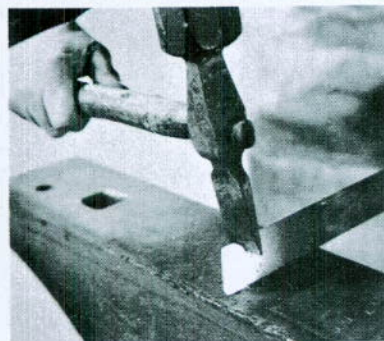


Fig. 33



A

Transfer the marks from the wooden rod to the appropriate bars with an engineer's chalk pencil filed to a chisel point.



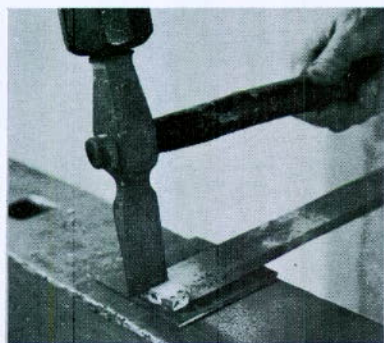
B

Mark where the shoulder is to come. With the bar on edge cut both shoulders to about three-quarters of their final depth with a hot set.



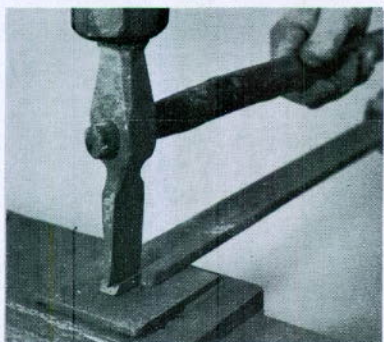
C

Tap down the burr with the back of the set.



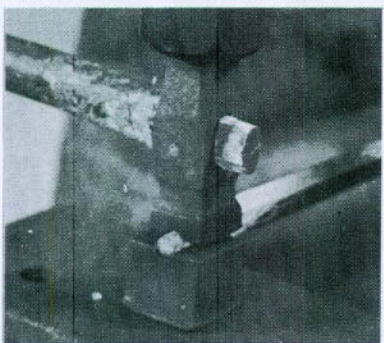
D

Using an anvil saddle or an old piece of plate, cut the sides of the tenon, one from each side of the bar.



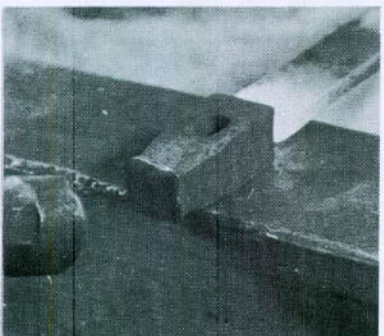
E

On the last of the heat, chisel off the sharp corner left on opposite edges of the tenon by the previous two cuts.



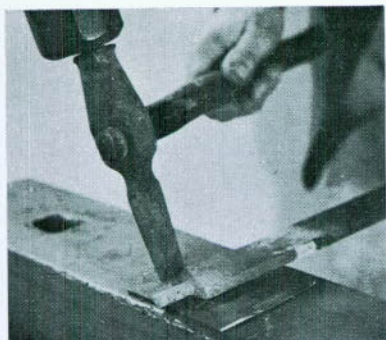
F

Swage the tenon.



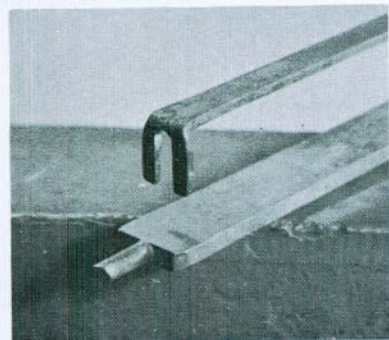
G

Square the shoulder with a monkey tool.



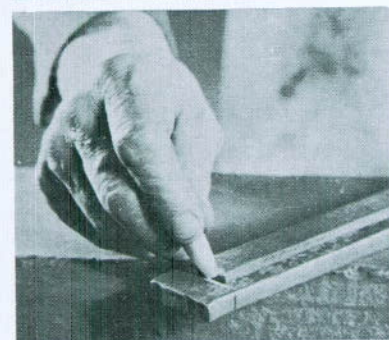
H

Trim the corners of the bar so that the end of the rail is as wide as the stile.



J

For measuring shoulders, make a tenon gauge from any light bar near to hand, with one end bent and forked like this.



K

Mark off the length of the tenon gauge from the height and width rod, and cut it off square. Then mark off the other end of the rail with this gauge.



L

Form the second tenon on the rail, and monkey it up to length, measuring with the gauge. Allow about 1/16th of an inch for shrinkage and fitting with mild steel, slightly more with iron.

Lesson 19 BACK STILE WITH DOUBLE RUNNING SCROLLS

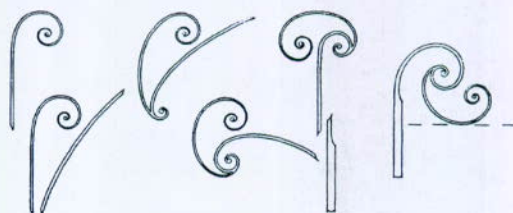
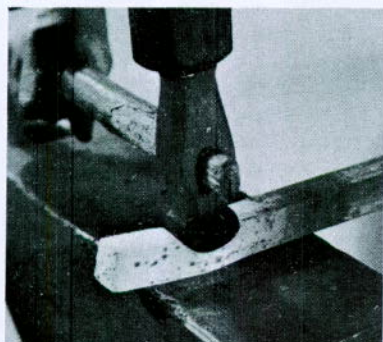


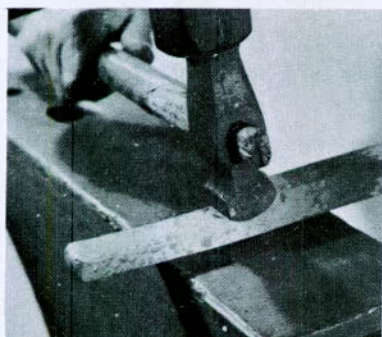
Fig. 34

This stile is finished with a double running scroll at the top. A few inches of the bar are forged out, and the double running scrolls welded to it.



A

Set in with a cheese fuller.



B

Draw out to a taper, with the end the same size as the scroll bar which is to be welded to it.



C

Form the smaller scroll from a suitable bar. Mark the bar at any convenient point near the scroll and mark the plate (see page 67) at the same point.

Also mark the plate at the point where the two scrolls join.



D

Measure the distance between the marks with string. Measure off this distance from the first mark on the scroll bar and centre-punch.

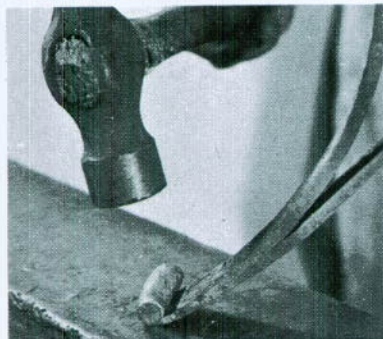
Estimate how much metal to allow for the weld which is to form the tip of the double running scrolls. Leave too much rather than too little.



E

Cut off enough metal to form the scroll between the bolt end and the stile.

Clamp the two bars together with tongs and weld them lightly. Remove the tongs. Then take a FULL WELDING heat and weld to the punch mark. Draw the weld out to a fishtail and form the bolt-ended scroll, as described on page 26.



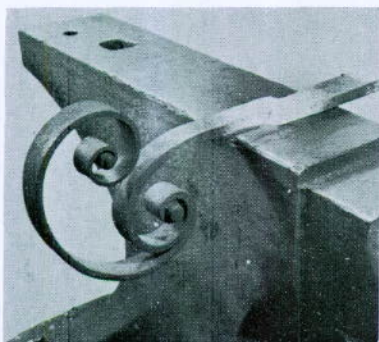
F

Here the bolt is being finally dressed.



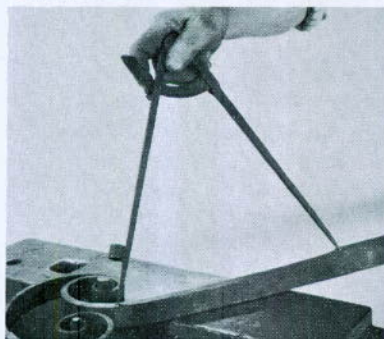
G

Form the scrolls with hammer, horns and wrench. Here one scroll is being rectified on the chalked metal plate.



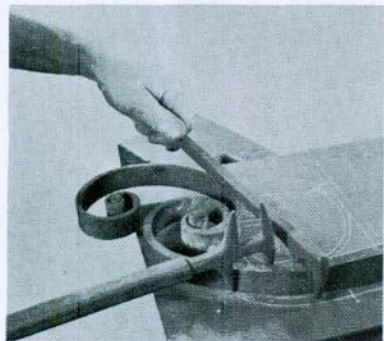
H

Set a part of the scroll correctly to the drawing on the plate. Make a centre-punch mark on the scroll bar where the straight bar leaves the scroll line on the drawing, and a corresponding mark on the drawing. Measure on the drawing the distance with string from the shoulder on the back stile to the mark, and set the dividers to this measurement. Check and cut off the surplus metal, upset, scarf and weld.



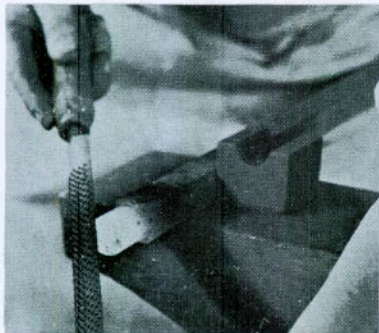
J

Draw to the correct length and check with dividers.



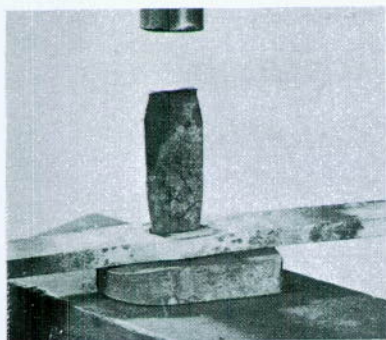
K

Finally, set the scroll-work to the correct curve with two wrenches, aided by the horns if necessary.

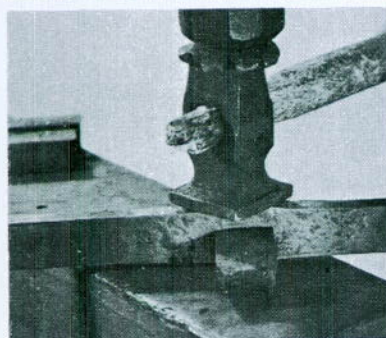


L

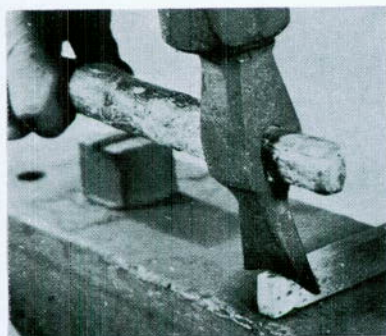
Mark out the back stile from the height and width rod, and cut it to length. Butcher and swage the turning pin; trim to length and dress the round end of the pin with a hot rasp.

**A**

Punch the hole with a slot punch and drive a drift part way in, over a bolster.

**B**

Dress up the edges with a flatter, as shown here. Knock out the drift and flatten the faces. Drive the drift right in and work up with a flatter to a good finish.

**A**

The tenons of the vertical bars are butchered as shown here and swaged up.

Mark out the other end, forge the second tenon and monkey to length as shown on page 64 (F and G).

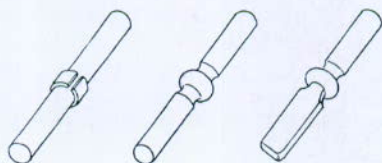
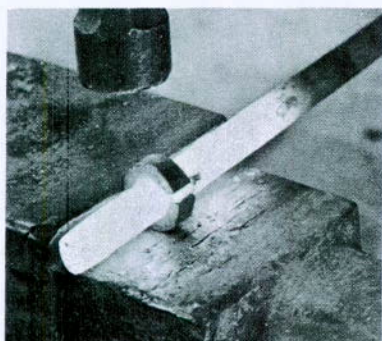
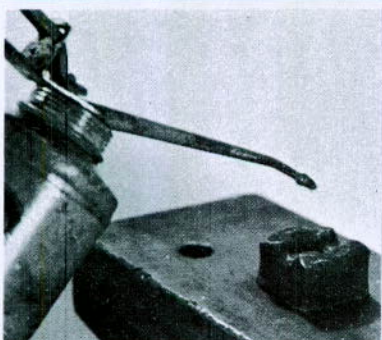


Fig. 35

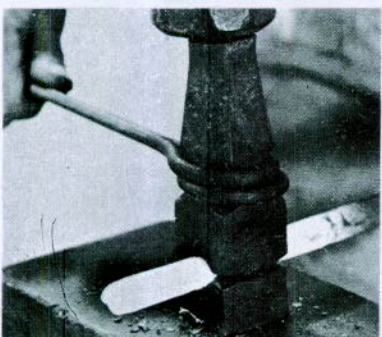
**A**

Balls are a common embellishment of wrought ironwork. They are made by welding a collar to the rod in specially-shaped tools.

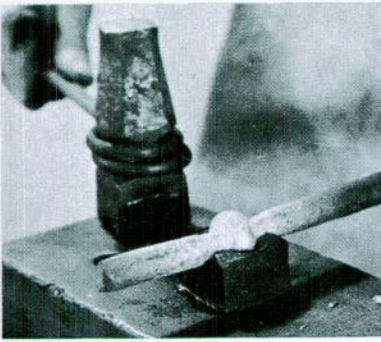
First make a collar to fit the round bar, but leave a slight gap. Close it, cold, on to the bar at a NEAR WELDING heat. Otherwise the collar would be burnt before the welding heat penetrated to the centre of the bar.

**B**

Return collar and bar to the fire, and while raising a welding heat, put a few drops of oil in the bottom tool.

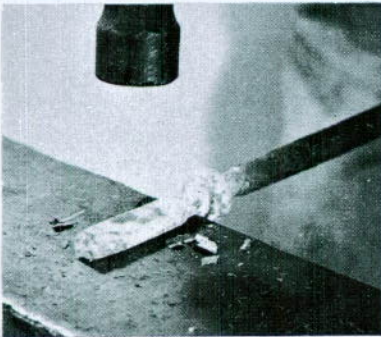
**C**

At a FULL WELDING heat, place the collar between the tools and weld quickly. The oil releases the ball from the bottom tool, where it might otherwise stick, and helps to give a smooth finish.



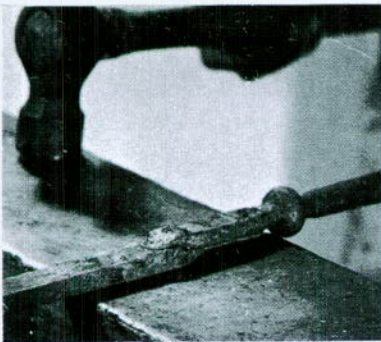
D

Here is the finished ball in the bottom tool. Note that it was made so quickly that it has scarcely cooled yet.



E

Flatten the bar behind the ball.



F

The weld shown here is required in the making of the centre panel.