MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 56

BELL CRANK LEVER

PLATE 56: FIG. 1 illustrates a bell crank lever, made from a 2-inch square bar.

First operation, FIG. 2: Bend the 2-inch square bar at right angles as shown, then cut off the bar, making both ends alike.

Second operation, FIG. 3: Fuller it as shown, leaving enough for the top and bottom boss.

Third operation, FIG. 4: Draw down each end to size, then cut the bosses to shape as shown, and finish off as required.

Another method by which the same lever can be made is as follows: Take a 5-inch by 2-inch bar and draw down, as shown in FIG. 5. FIG. 6 shows it drawn down to size. Cut off at the dotted line, and then adopt methods as previously shown.

A third method to form the bosses is illustrated in FIG. 7, by placing a pair of rings, as shown, and hammering them down. This gives the result shown in FIG. 8. Draw down, as in FIG. 9, and finish off by rounding the ends.

Note.—When using rings to shape bosses, as in FIG. 7, the material should be $\frac{1}{4}$ in. thicker than that when the chisel is used.

BELL CRANK LEVER.

PLATE 56

FIG 1

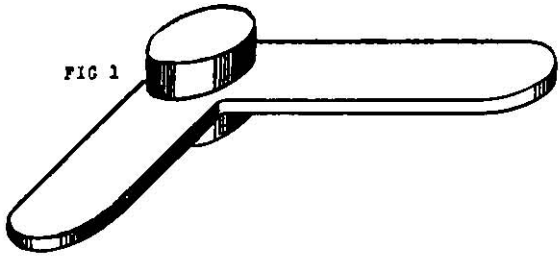


FIG 2

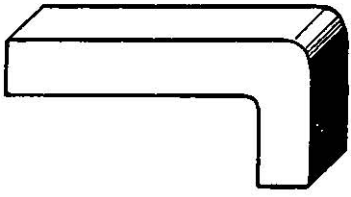


FIG 3

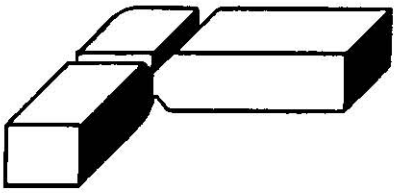


FIG 4

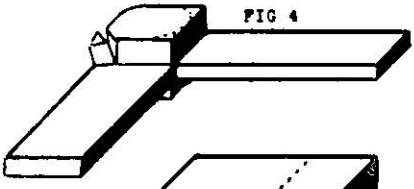


FIG 5

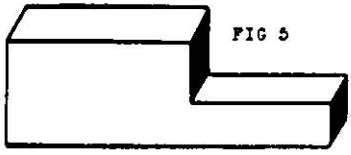


FIG 6

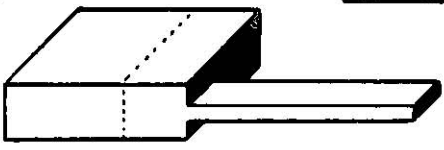


FIG 7

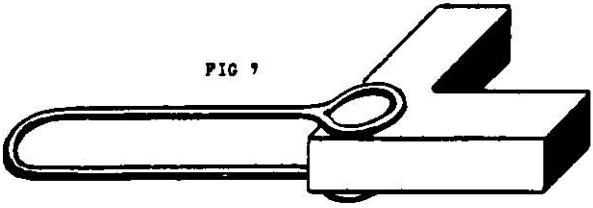


FIG 8

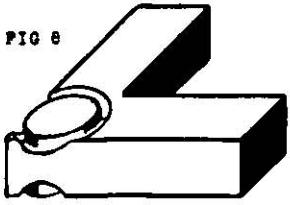
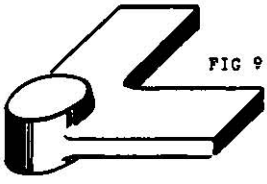


FIG 9



MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 57

BELL CRANK LEVER

PLATE 57: FIG. 1 illustrates a bell crank lever, with the arms at right angles and the boss between them, made from a 2-inch diameter bar.

First operation, FIG. 2: Draw down 3 ins. of the 2-inch diameter bar as shown.

Second operation, FIG. 3: Joggle it by placing the 2-inch diameter bar partly over a swage, using the fuller as shown.

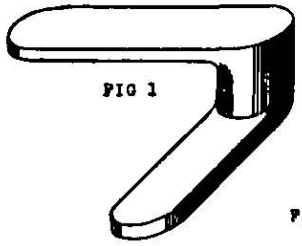
Third operation, FIG. 4: Draw down to size as shown.

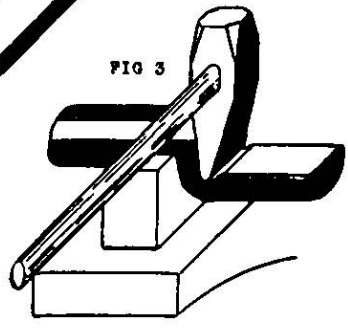
Fourth operation, FIG. 5: Draw down the opposite end, leaving 3 ins. of the 2-inch diameter bar as shown. Next, joggle it as seen in FIG. 6, and draw down to size, bending at right angles as in FIG. 7.

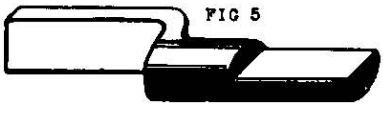
Another method of making the same lever is as follows: Take a 5-inch by 2-inch bar and side set, as shown in FIG. 8. Draw down each end as in FIG. 9, fuller the inside corners, and cut around the dotted lines to form the boss as shown. When this is done, heat the boss between the two arms and twist to right angles.

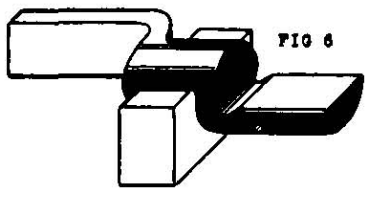
BELL CRANK LEVER.

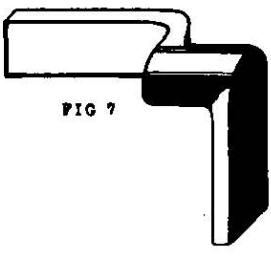
PLATE 57

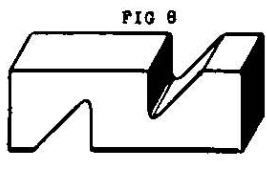


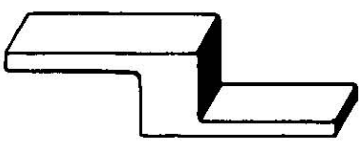


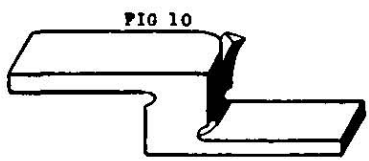












MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 58

LEVER

PLATE 58 : FIG. 1 illustrates a lever, made from a 3-inch square bar.

First operation, FIG. 2 : Form A, using a V-shaped tool as shown.

Second operation, FIG. 3 : Draw down from A to the size required to make the end boss, and side set as shown.

Third operation, FIG. 4 : Draw down between the two bosses as shown.

Fourth operation, FIG. 5 : Draw down the bar at the other side of A before side setting as shown.

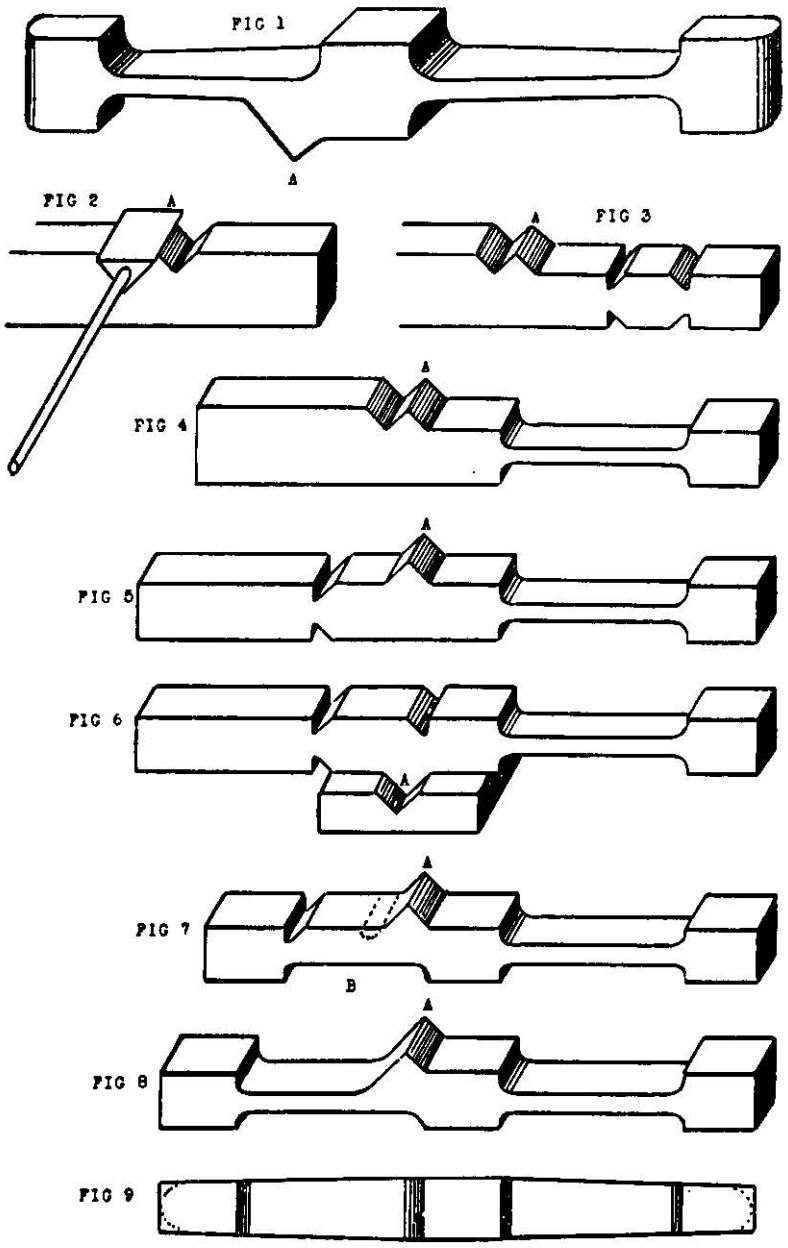
Fifth operation, FIG. 6 : Place A in a V-shaped block, side set as shown, and draw down between the side sets. The result of this operation is shown in FIG. 7 at B.

Sixth operation, FIG. 7 : Fuller along the dotted line and draw down, as shown in FIG. 8.

Seventh operation, FIG. 9 : Taper the forging to the required length, and complete by rounding the ends.

LEVER.

PLATE 58



MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 59

STAY

PLATE 59: FIG. 1 illustrates a stay 3 ft. 2 ins. long, made from a 6-inch by 3-inch bar.

First operation, FIG. 2: Side set as shown, making the distance between the two side sets 6 ins.

Second operation, FIG. 3: Draw down to 3 ft. and cut the ends to the required length as shown.

The same stay can be made from a 3 inch square bar 18 ins. long.

First operation, FIG. 4: Side set as shown, making the distance between the side sets 12 ins.

Second operation, FIG. 5: Draw down as shown.

Third operation, FIG. 6: Punch a hole in each end, then cut and open out as shown.

Another method of making the same stay from a 3-inch by 1-inch bar is seen in FIG. 7.

This shows a piece of 3-inch by 1-inch bar which is jumped in the centre, and fullered, as shown in FIG. 10.

FIG. 8 shows a piece of 3-inch by 1-inch bar which is jumped on the end, as shown in FIG. 9, and then welded together. Repeat the same process at the opposite end.

STAY.

PLATE 59

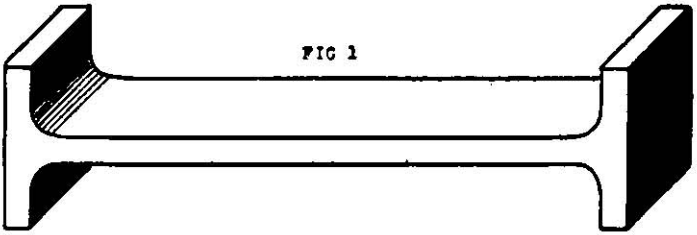
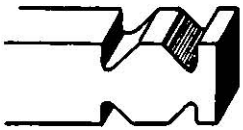
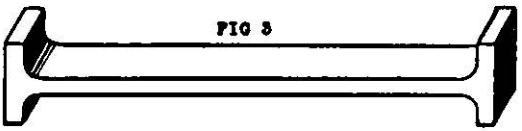
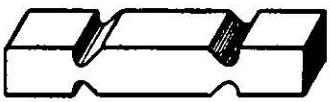
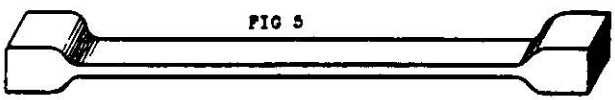


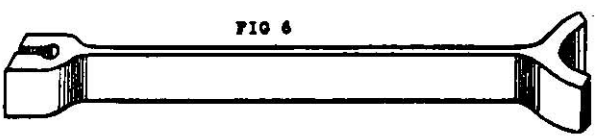
FIG 2

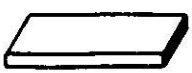


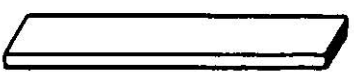












MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 60

STAY

PLATE 60 : FIG. 1 illustrates a stay, 22 ins. long and 1 in. square throughout, having two arms 6 ins. apart, made from a 2½-inch by 1-inch bar.

First operation, FIG. 2 : Fuller 3 ins. from the end of the bar, cut along the dotted line, taking this portion out, and draw down, as shown in FIG. 3.

Second operation, FIG. 3 : Side set as shown, and draw down, as in FIG. 4.

Third operation, FIG. 4 : Repeat the same process as in FIG. 2 at the opposite end.

Fourth operation, FIG. 5 : Drill holes as shown, cut along the dotted lines, and then open the arms out, commencing with one of the middle arms, as shown in FIG. 6. Open out the end as in FIG. 7.

FIG. 8 illustrates how, by bending the forging, the smith is enabled to dress the ends to shape.

STAY.

PLATE 60

FIG 1

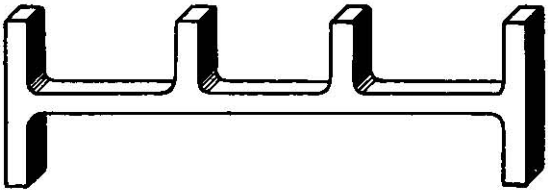


FIG 2

FIG 3

FIG 4

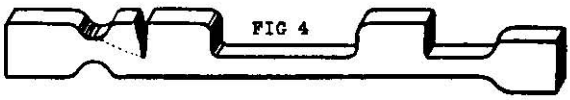


FIG 5

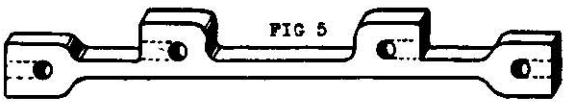


FIG 6

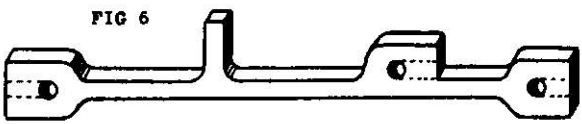


FIG 7

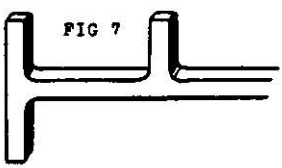
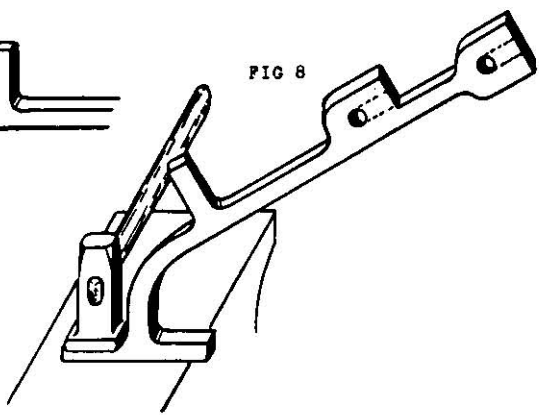


FIG 8



MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 61

FRAME

PLATE 61: FIG. 1 illustrates a frame, which is 5 ft. by 4 ft., made from a 2-inch by ½-inch bar.

First operation, FIG. 2: Cut off two bars of the 2-inch by ½-inch bar, 5 ft. long; cut each end to an angle of 45 degrees as shown, and scarf them ready for welding.

Second operation, FIG. 3: Cut off two bars of the 2-inch by ½-inch bar, 4 ft. long, and follow the same procedure as FIG. 1.

Third operation, FIG. 4: Weld the 5 ft. bar to a 4 ft. bar as shown, and repeat the same process to the other two bars as seen in FIG. 5; next weld A and B together.

Fourth operation, FIG. 6: Complete the frame by holding the two scarfs together with a pair of straps as shown.

FRAME.

PLATE 61

FIG 1

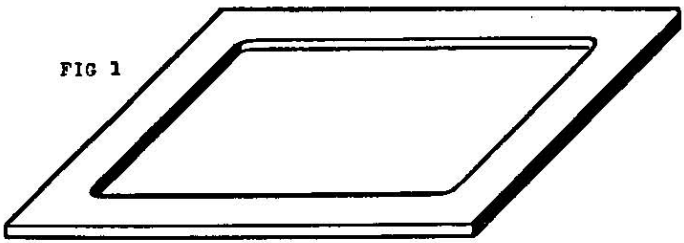


FIG 2

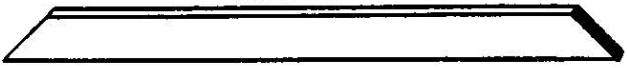


FIG 3

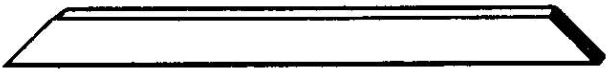
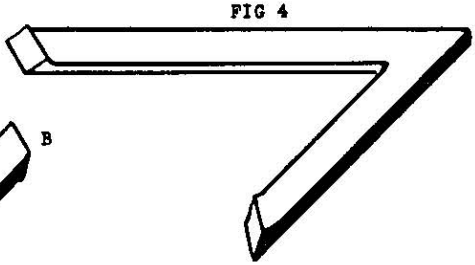


FIG 4



B

FIG 5

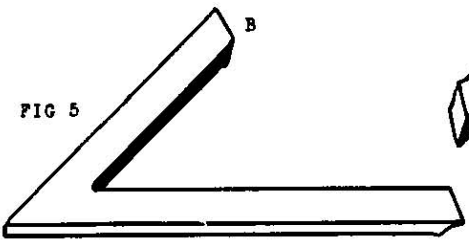
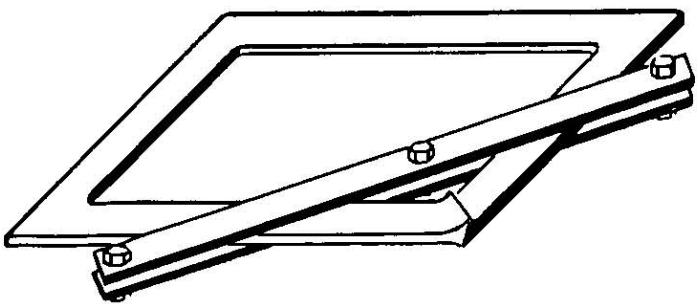


FIG 6



MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 62

BOX SPANNER

PLATE 62: FIG. 1 illustrates a box spanner, made from a 2½-inch diameter bar, 9 ins. long.

First operation, FIG. 2: Punch a square hole in the end of the bar the required depth down.

Second operation, FIG. 3: Hammer a square mandril into the hole. This keeps the hole in shape while swaging, as shown in FIG. 4.

Note.—Mandrils used in making box spanners should have notches inserted, to enable them to be drawn out by a chisel.

Third operation, FIG. 5: Fuller as shown, and draw down as in FIG. 6.

Fourth operation, FIG. 7: Flatten the end to form the T-piece, punch a hole, and split open as shown.

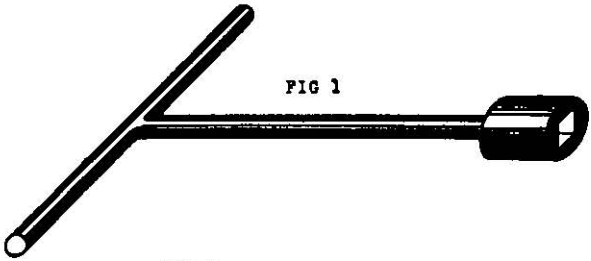
Fifth operation, FIG. 8: Bend as shown. This enables the smith to draw down the ends as shown.

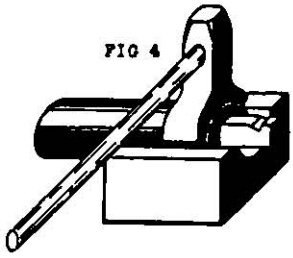
Another method of making a box spanner is as follows:—

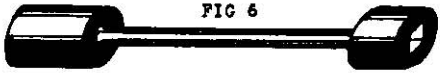
FIG. 9: Make a collar out of 2-inch by ¾-inch bar as shown, and place on the end of a 1-inch diameter bar, as in FIG. 10. Weld the two together, and when this is done, drill a hole into the collar and square it by hammering the mandril in, as shown in FIG. 3.

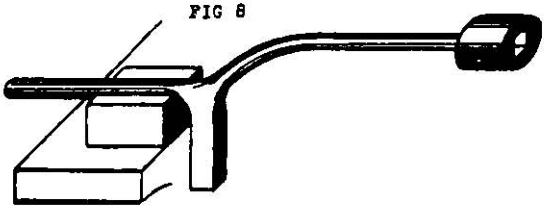
FIG. 11 shows a method of making a T-piece, by welding two round bars together.

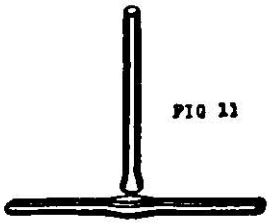
BOX SPANNER. PLATE 62











MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 63

HINGES

PLATE 63 : FIG. 1 illustrates a pair of hinges, made from a 4-inch by 2-inch bar.

First operation, FIG. 2 : Fuller the bar 2 ins. from the end as shown, and draw down as in FIG. 3. Cut off from the bar along dotted line, cut the corners off, and finish off the boss.

Second operation, FIG. 4 : Punch or drill a hole as shown, and cut the centre portion out along the dotted lines. With a little dressing up this will complete the double hinge.

Third operation, FIG. 5 : Make a forging similar to above, and cut the outside portions off along the dotted lines as shown.

In FIG. 6 another method of forming the boss of a hinge, by stamping into a swage, is shown. FIG. 7 shows the result. This only needs one corner cut off.

Another method of making hinges is from a flat bar as follows :—

First operation, FIG. 8 : Point the end, and 2 ins. from it cut through the bar as shown.

Second operation, FIG. 9 : Bend it to shape on a mandril as shown.

Note.—FIG. 9 shows the hinge welded on the top. It can be welded underneath, the latter method being preferable.

Third operation, FIG. 10 : Flatten the two outside eyes down as shown, and cut them off, leaving the single hinge. To make the double hinge, flatten the centre portion (FIG. 11) and cut it off.

HINGES.

PLATE 63

FIG 1

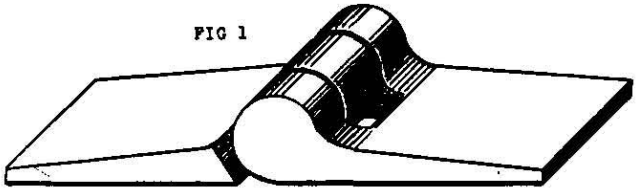


FIG 2

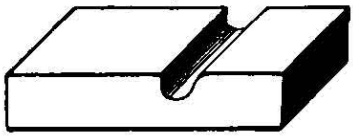


FIG 3

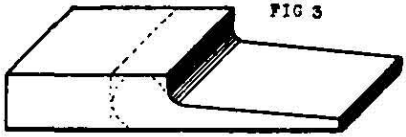


FIG 4

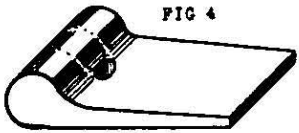


FIG 5

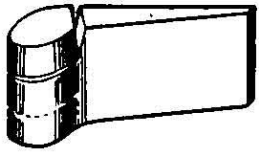


FIG 6

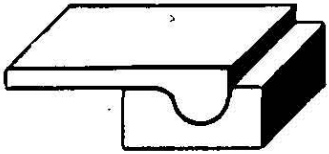


FIG 7

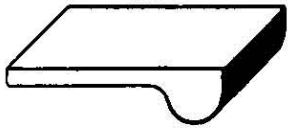


FIG 8

FIG 9

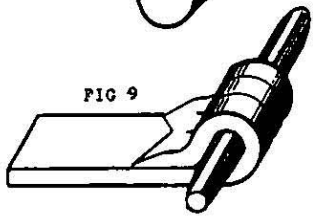


FIG 10

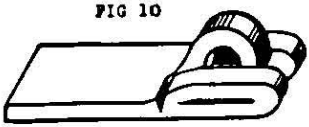


FIG 11

MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 64

CLAMS

PLATE 64: FIG. 1 illustrates a pair of clams, made from 3-inch by 2-inch bar, showing the corners thicker than the rest of the clams.

First operation, FIG. 2: Fuller the bar as shown.

Second operation, FIG. 3: Draw down the ends and centre of the bar, leaving two points. These form the inside corners of the clams.

Third operation, FIG. 4: Bend, in a V-block, the points, as shown in FIG. 5.

Fourth operation, FIG. 6: Shape the bar as shown. This simplifies the bending of the other end.

Another method of forming the corners is by nicking a flat bar, as shown in FIG. 7, and bending it at right angles (FIG. 8). A round bar is then welded across the corner, as in FIG. 9. Finish off as previously stated.

CLAMS.

PLATE 64

FIG 1

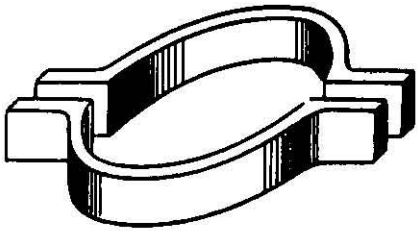


FIG 2

FIG 3

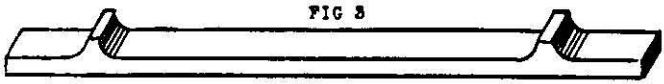


FIG 4

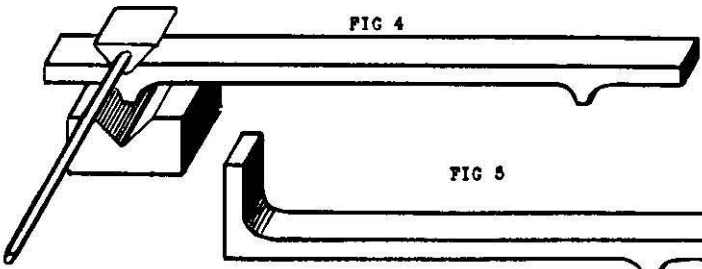


FIG 5

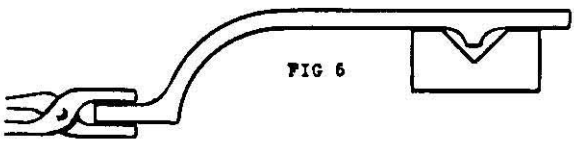


FIG 6

FIG 7

FIG 8

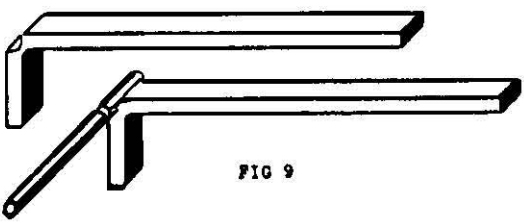


FIG 9

MISCELLANEOUS EXAMPLES OF FORGED WORK IN DIFFERENT STAGES. PLATE 65

AXE

PLATE 65: FIG. 1 illustrates an axe, made from 2-inch by ½-inch iron or mild steel bar.

First operation, FIG. 2: Weld a piece of blister steel, 1 in. by ½ in., 4 ins. from the end of the bar, as shown.

Second operation, FIG. 3: Spread out with a fuller on each side of the blister steel, as shown.

Third operation, FIG. 4: Double over as shown, and weld the two ends together.

Fourth operation, FIG. 5: Prepare a piece of blister steel, wedge shape as shown. Split the end of the forging, and place the blister steel in between, as shown in FIG. 6. Raise to a welding heat and flatten out to form the blade.

When hardening axes, made as described above, heat to a dark red, and after plunging into water, cover with oil. Heat over the fire until the oil ignites, and finish by cooling off.

AXE

PLATE 65

FIG 1

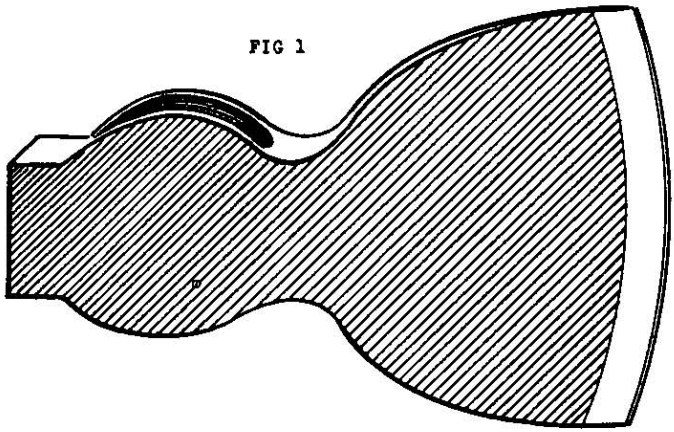


FIG 2

FIG 3

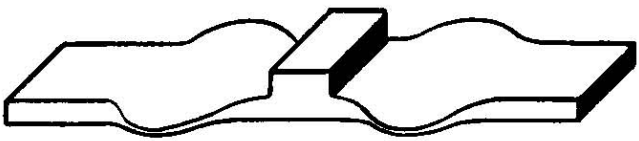


FIG 4

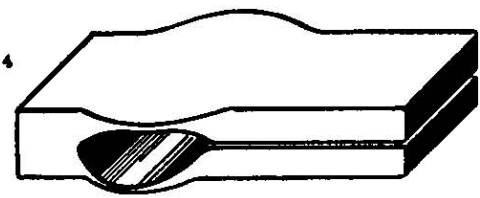


FIG 5

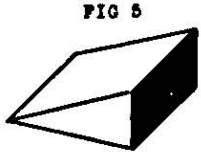


FIG 6