

MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 66

AXE

PLATE 66 : FIG. 1 illustrates another type of axe, generally used in and about coal mines, made from $1\frac{1}{2}$ -inch square iron or mild steel bar.

First operation, FIG. 2 : Prepare a piece of blister steel $1\frac{1}{2}$ in. square by $\frac{1}{4}$ in. thick as shown, and a wedge-shaped piece, as seen in FIG. 3.

Second operation, FIG. 4 : Fix the blister steel (FIG. 1) on the end of the $1\frac{1}{2}$ -inch square bar as shown, and weld them together.

Third operation, FIG. 5 : Fuller the corners of the bar, 1 in. from the end, as shown.

Fourth operation, FIG. 6 : Punch a hole as shown, hammer a mandril in, and draw out each side of the eye while the mandril is still in, using a fuller, as shown in FIG. 7. When this is done, replace the former mandril with a larger or finishing one, and cut the required length from the bar.

Fifth operation, FIG. 8 : Split the end as shown, and place the blister steel (FIG. 3) in between. Raise to a welding heat, and flatten out to form the blade.

This axe is hardened by the same method as the axe on PLATE 65.

AXE.

PLATE 66

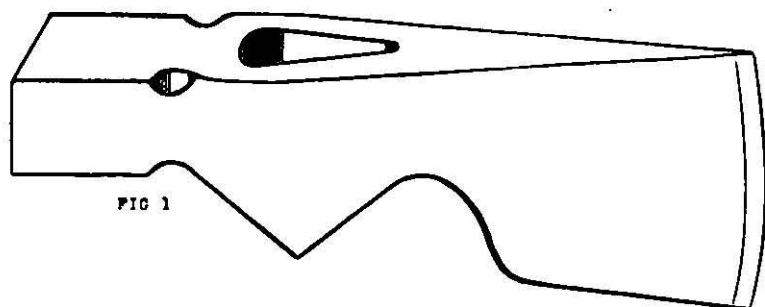


FIG 1

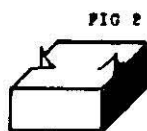


FIG 2

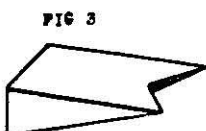


FIG 3

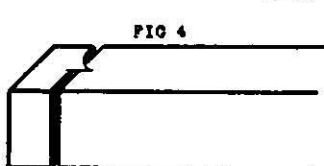


FIG 4

FIG 5



FIG 6



FIG 7

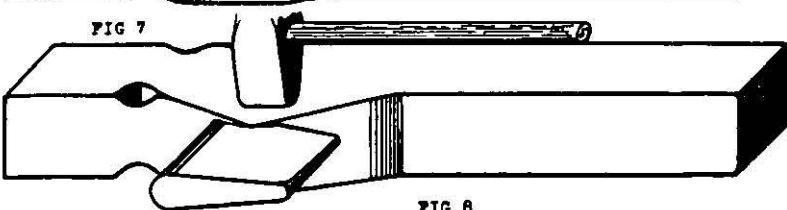


FIG 8



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 67

THUMB SCREWS

PLATE 67: FIG. 1 illustrates a thumb screw, made from 1¼-inch square bar.

First operation, FIG. 2: Place the 1¼-inch square bar into a pair of 1-inch swages corner-wise as shown, using the swages in this case as stamps; result is shown in FIG. 3. Next cut along the dotted line, leaving the result as shown in FIG. 4.

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

Third operation, FIG. 6: Hammer two narrow blocks down as shown, then cut from the bar, leaving the result as seen in FIG. 7.

Fourth operation, FIG. 8: Cut out along the dotted lines, leaving the result as shown in FIG. 9. Complete by cutting the corners off.

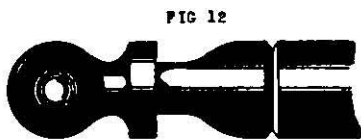
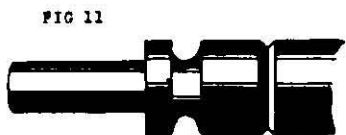
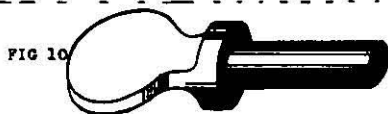
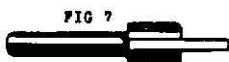
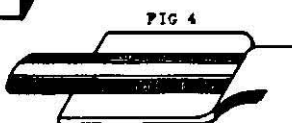
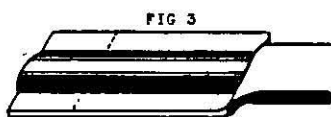
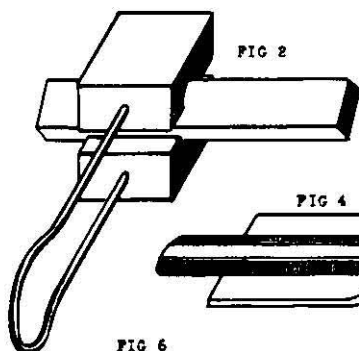
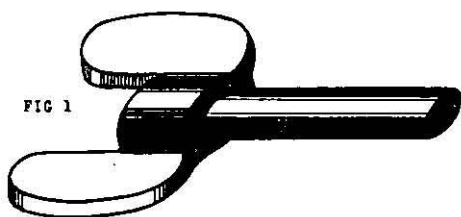
FIG. 10 shows another thumb screw, made from a round bar, as follows:—

First operation, FIG. 11: Draw down to the required diameter, fuller as shown, then cut to length from the bar, and complete by flattening to size.

Special spring swages can be made to form the ball and collar at the same time.

FIG. 12 shows the result after using these swages.

THUMB SCREWS. PLATE 67



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 68

TUB CROOK

PLATE 68: FIG. 1 illustrates a tub crook, made from $2\frac{1}{2}$ -inch square bar.

First operation, FIG. 2: Side set the bar and draw down, as shown.

Second operation, FIG. 3: Fuller, using two small bars as shown, then flatten down, as seen in FIGS. 4 and 5.

Third operation, FIG. 6: Side set as shown, and draw down, as in FIG. 7.

Fourth operation, FIG. 8: Bend down as shown, and cut to shape at the dotted lines.

Fifth operation, FIG. 9: Hammer into shape, then cut and swage the corners on the outside and inside of the crook along the dotted lines, as shown.

TUB CROOK.

PLATE 68

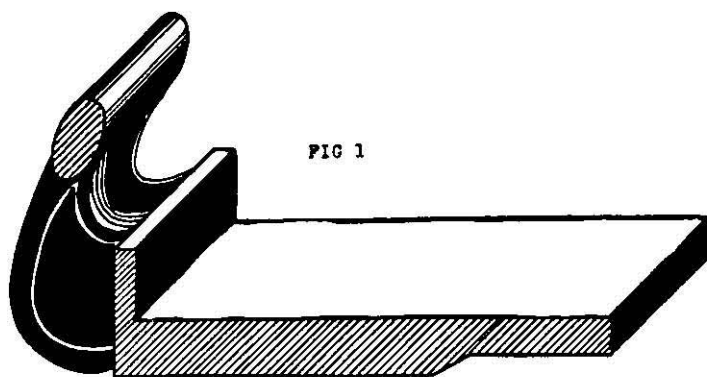


FIG 1

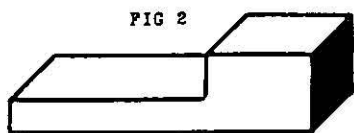


FIG 2

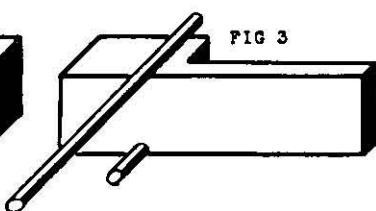


FIG 3

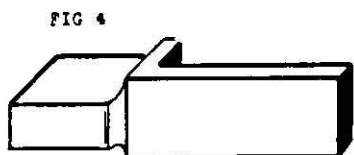


FIG 4

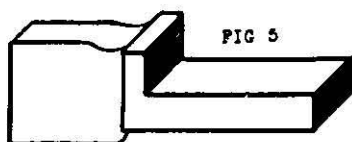


FIG 5

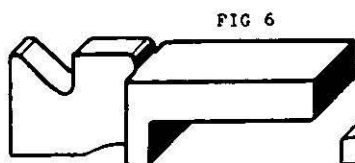


FIG 6

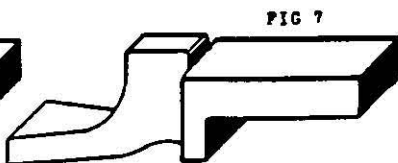


FIG 7

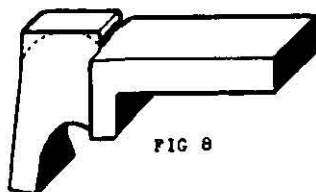


FIG 8

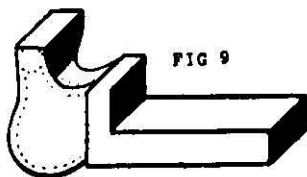


FIG 9

MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 69

HOOKS

PLATE 69: FIG. 1 illustrates a hook, made from $1\frac{1}{2}$ -inch diameter bar. A very useful rule to follow, when the diameter of the hook is given, is as follows:—

Total length of hook from the neck to the end to form bend should be diameter multiplied by 8, e.g. a 2-inch diameter hook would require 16 ins. of material from neck to point.

First operation, FIG. 2: Form a ball on the end of the 1-inch diameter bar. This is done by using ball swages, as shown in FIG. 8.

Second operation, FIG. 3: Flatten the ball as shown, and punch a hole.

Third operation, FIG. 4: Set the neck of the hook through, using a radius fuller, as shown.

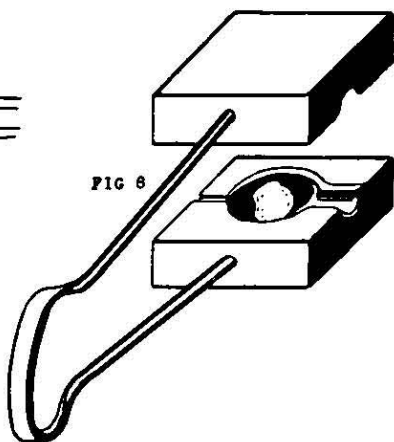
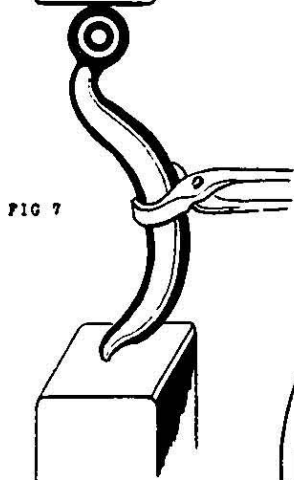
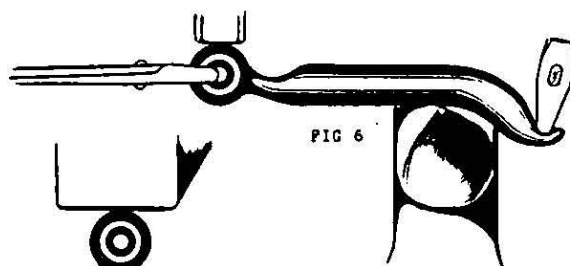
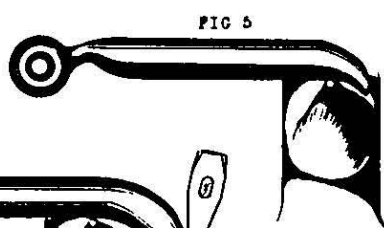
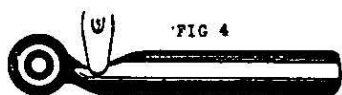
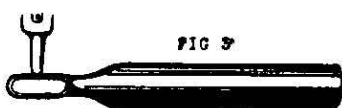
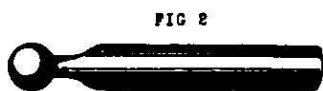
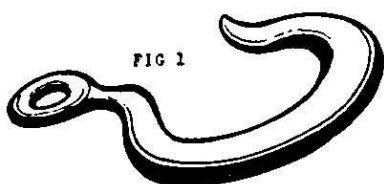
Fourth operation, FIG. 5: Taper the end to a point, and bend it over the beak of the anvil, as shown.

Fifth operation, FIG. 6: Bend to shape, by placing the fuller on the end, which is kept cool. Finish by hammering on top while some one is holding on with a hammer, as shown.

FIG. 7 shows how, by careful handling, a hook can be bent to shape under the hammer.

HOOK.

PLATE 69



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 70

DOUBLE "S" LINK

PLATE 70: FIG. 1 illustrates a double "S" link which can be used, in an emergency, to connect a broken chain. This can be made from any small size diameter bar.

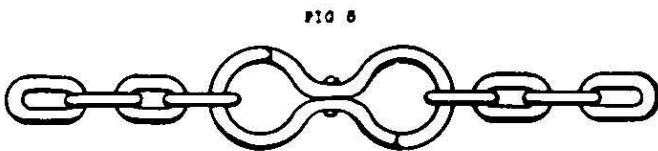
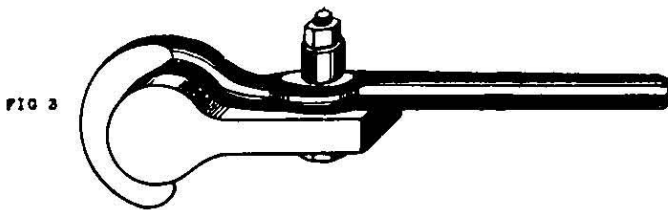
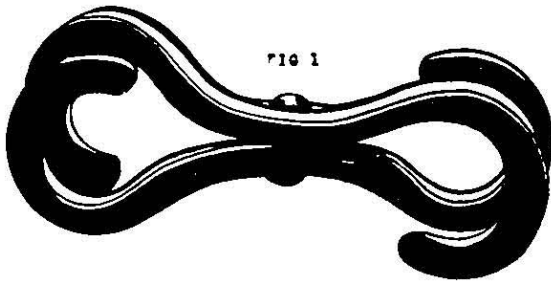
First operation, FIG. 2: Punch a hole in the centre of the bar, and draw each end down, as shown.

Second operation, FIG. 3: Bend the bar edgeways around a template, as shown. By using this template, all the ends can be made alike.

FIG. 4 shows the shape of half the double "S" link before the parts are riveted together, as shown in FIG. 1.

FIG. 5 shows the link in use, connecting a broken chain.

DOUBLE S LINK. PLATE 70



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 71

SOCKET

PLATE 71 illustrates a socket, used for haulage ropes.

These are made in different sizes to suit the various sizes of ropes. FIG. 1, as an example, is made from $1\frac{1}{2}$ -inch diameter bar, 6 ins. long.

First operation, FIG. 2 : Fuller 2 ins. from the end of the bar, and draw down, as shown in FIG. 3.

Second operation, FIG. 4 : Punch or drill two holes as shown, then cut out between the two holes, as shown in FIG. 5.

Third operation, FIG. 6 : Taper the $1\frac{1}{2}$ in. diameter down to $1\frac{1}{4}$ in. diameter as shown, then drill a hole through, as shown in FIG. 7.

Fourth operation, FIG. 8 : Bend over as shown, to enable a tapered hand mandril to be hammered in, as shown in FIG. 9, then straighten to shape again.

FIG. 10 shows the method of socketing, by putting the rope through. A wire is then lapped around 3 ins. from the end, and a $\frac{3}{8}$ -inch split ring fixed on, as shown in FIG. 11. Complete by opening the end of the rope out, turning over the ends, and bending together by overlapping with wire, as shown in FIG. 12.

SOCKET.

PLATE 71

FIG 1



FIG 2



FIG 3



FIG 4



FIG 5



FIG 6



FIG 8

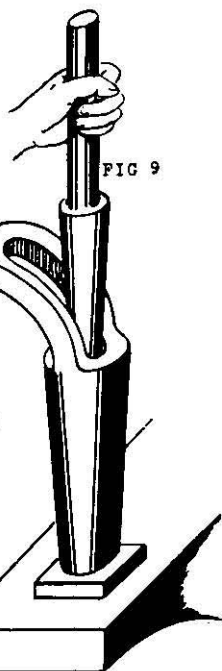
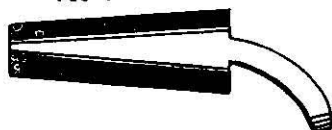


FIG 9

FIG 7

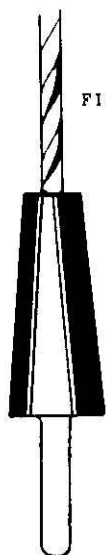


FIG 10

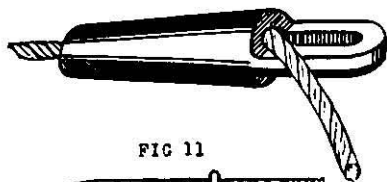


FIG 11



FIG 12



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 72

KNOCK OFF

PLATE 72: FIG. 1 illustrates a knock off, generally used in coal mines. These are fixed to the coal tubs, as shown in FIG. 7, and automatically release the tubs from the haulage rope. At the point where the tubs have to be released, a bar is fixed above (FIG. 8) which knocks back the lever and releases the pin at the same time. The method of making a knock off is as follows:—

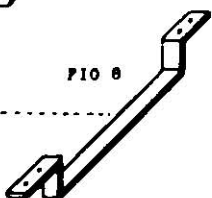
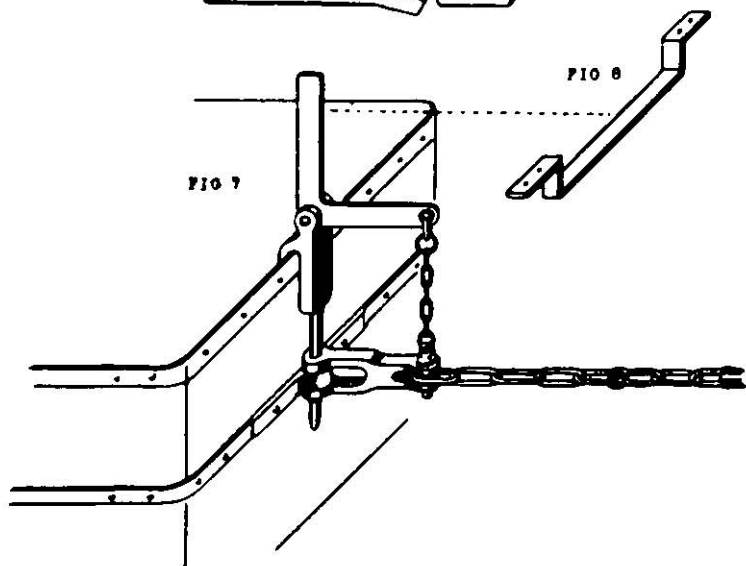
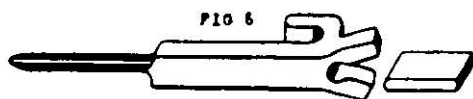
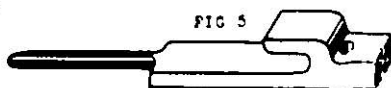
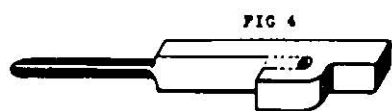
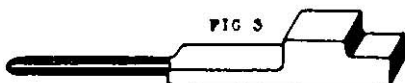
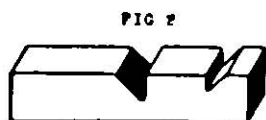
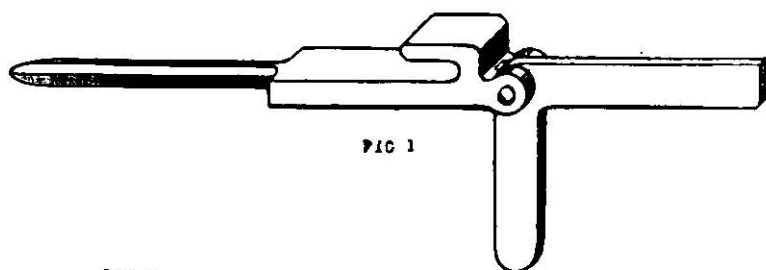
First operation, FIG. 2: Side set a $2\frac{1}{2}$ -inch square bar as shown, then draw down, as in FIG. 3.

Second operation, FIG. 4: Punch or drill a hole as shown, and cut out at the dotted lines.

Third operation, FIG. 5: Punch a hole and split open, insert a flat mandril, as shown in FIG. 6, and flatten down. To complete, as illustrated in FIG. 1, bend a 2-inch by $\frac{3}{4}$ -inch flat bar at right angles, making one end 10 ins. and the other 8 ins., then rivet together, as shown.

KNOCK OFF.

PLATE 72



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 73

DRILL STAND

PLATE 73: FIG. 1 illustrates a drill stand, showing the lever arm. This arm can be altered to any convenient height or direction.

First operation, FIG. 2: Side set a 3-inch by $1\frac{1}{2}$ -inch bar as shown, then draw down, as shown in FIG. 3.

Second operation, FIG. 4: Bend the ends around as shown, and complete the forked end by placing a mandril in, and hammering down, as shown in FIG. 5.

Third operation, FIG. 6: Jump a $1\frac{1}{2}$ in. diameter as shown, and weld together, as in FIG. 7.

Another method of making the forked end is shown in FIG. 8. Bend two flat bars and weld them together.

FIG. 9 shows another method by drawing down two $1\frac{1}{2}$ -inch square bars and welding them together.

FIG. 10 shows a piece of 3-inch by $1\frac{1}{2}$ -inch bar drawn down, the radius cutters having been used to form the end.

FIG. 11 shows the hole drilled, and a key-way cut through.

FIG. 12 shows a method of making the key by drawing down the end of the bar and turning the end up.

DRILL STAND

PLATE 73

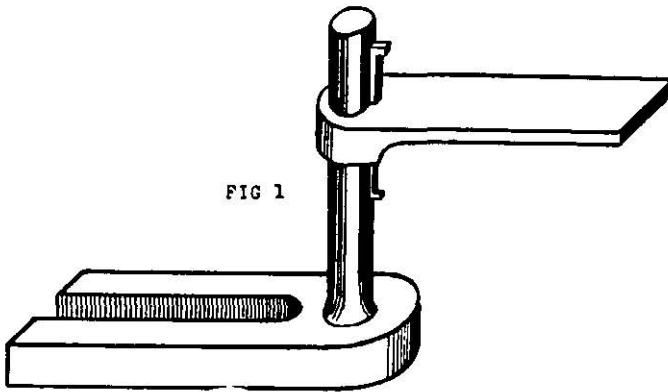


FIG 1

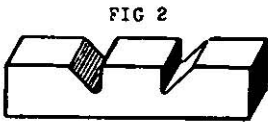


FIG 2

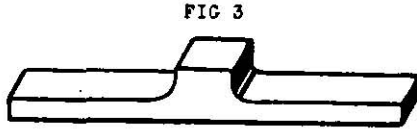


FIG 3

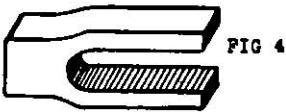


FIG 4



FIG 5

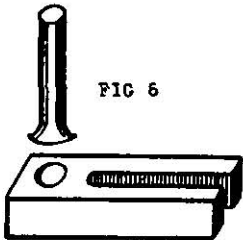


FIG 6

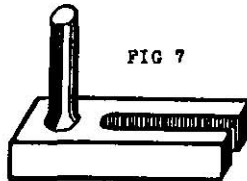


FIG 7

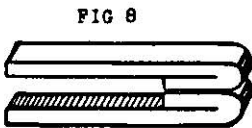


FIG 8

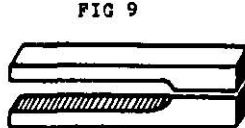


FIG 9

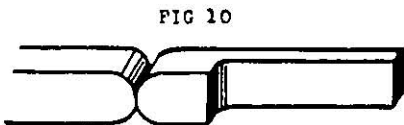


FIG 10

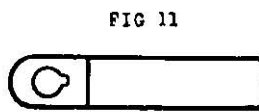


FIG 11

FIG 12



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 74

FORGING

PLATE 74: FIG. 1 illustrates a forging, made from a 6-inch square bar. The dimensions of this forging are given herewith:—

A is 10 ins. by 6 ins. and $1\frac{1}{4}$ in. thick.

B is $2\frac{3}{4}$ ins. diameter and 4 ins. high.

C is 4 ins. by $2\frac{3}{4}$ ins. and 4 ins. deep.

First operation, FIG. 2: Side set the bar as shown, then draw down to $2\frac{3}{4}$ ins. diameter, as in FIG. 3. Cut off from the bar at the dotted lines, 6 ins. long.

Second operation, FIG. 4: Place in a bolster, and side set as shown, then hammer down, as in FIG. 5, to $1\frac{1}{4}$ in. thick.

Third operation, FIG. 6: Use two $\frac{5}{8}$ -inch bars and fuller as shown, then draw down as in FIG. 7, and complete by cutting to length.

FIG 1

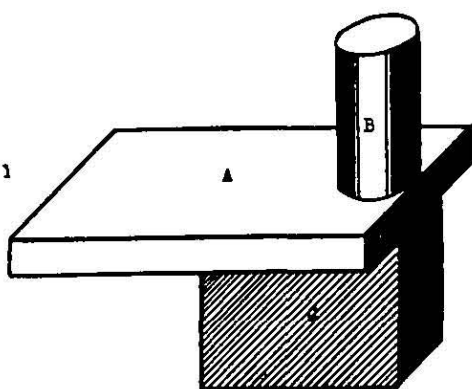


FIG 2

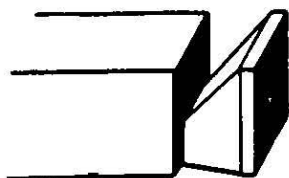


FIG 3

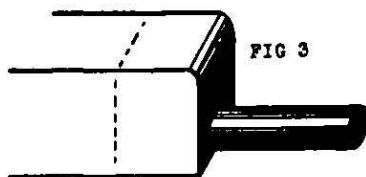


FIG 4

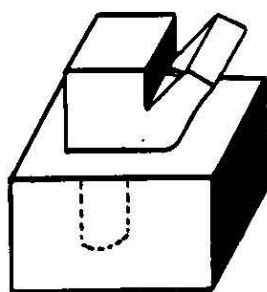


FIG 5

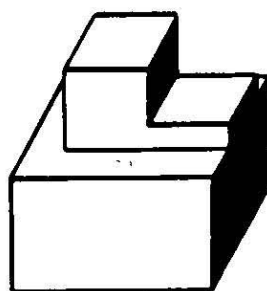


FIG 6

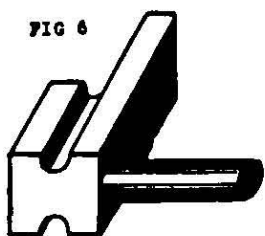
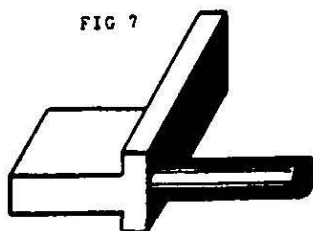


FIG 7



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 75

FORGING

PLATE 75 illustrates a rather complicated forging made from a 6-inch square bar. The dimensions of this forging are here given :—

A $3\frac{1}{4}$ ins. square.

B 2 ins. diameter, 4 ins. long.

C $3\frac{1}{2}$ ins. by $\frac{5}{8}$ in. by 7 ins. long, and the height from the bottom of C to the top of A is 6 ins.

First operation, FIG. 2 : Side set two sides of the 6-inch square bar as shown, and draw down to $3\frac{1}{4}$ ins. square, as in FIG. 3.

Second operation, FIG. 4 : Side set the $3\frac{1}{4}$ ins. square on each side as shown, then draw down to 2 ins. diameter, as in FIG. 5. Next cut it off the bar at the dotted line, $3\frac{1}{4}$ ins. long.

Third operation, FIG. 6 : Side set as shown, and draw down, as in FIG. 7, then cut along the dotted line, leaving the result, as shown in FIG. 8.

Fourth operation, FIG. 9 : Fuller as shown, and cut the two portions off along the dotted line, or flatten them down and cut to shape, as shown in FIG. 10.

FORGING.

PLATE 75

