

MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 76

LEVELLING BLOCK

Levelling blocks are very useful in the smithy, their dimensions depending on the size of work chiefly done. For general use, a block, as illustrated in FIG. 1, measures 6 ft. by 4 ft. by 4 ins. thick, numerous holes being left in the casting.

FIG. 1 illustrates a method of bending large bars, by placing tapered pins in holes where necessary. By making use of these together with a lever, the bar is bent, as shown.

FIG. 2 illustrates a method of bending large links. The required size of the link can be obtained by selecting a bolster, placing it over a pin and pulling the bar around it, as shown. A method of clamping plates or bars to be levelled is also shown.

FIG. 3 illustrates a cramp or rail bender, used for bending rails. It can also be used for bending heavy angle bars.

LEVELLING BLOCK - PLATE 76

FIG 1

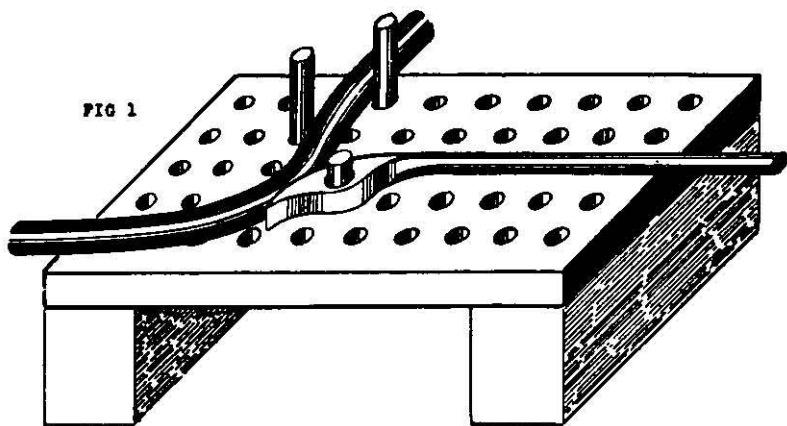


FIG 2

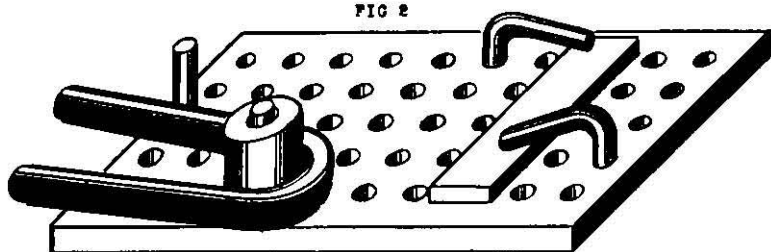
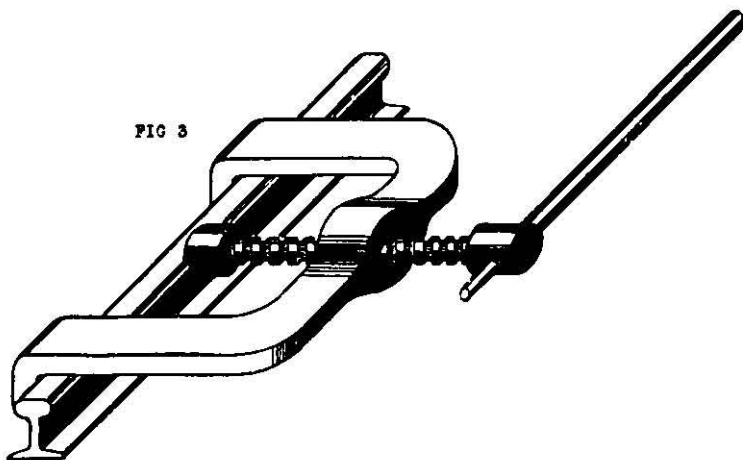


FIG 3



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 77

STAMPS

PLATE 77: FIG. 1 illustrates a half stamp. A method of making such a stamp is given in the following illustrations:—

First operation, FIG. 2: Fuller a 6-inch square block 2 ins. thick, as shown. Next, hammer a small diameter bar into the block (FIG. 3), and gradually increase the diameter until the required size is obtained (FIG. 4).

Second operation, FIG. 5: Place a flat bar on the stamp as shown, and hammer it in, giving the result shown in FIG. 6.

Third operation, FIG. 7: Place a smaller but thicker bar on the stamp as shown, and hammer it in, giving the result shown in FIG. 1.

Repeat these operations on a similar block, thus making a pair of stamps.

By placing a finished forging (FIG. 8) in the stamps (FIG. 9) a correct finish can be obtained.

Pins (FIG. 10) are screwed into the bottom stamp, as shown in FIG. 11, to enable the stamps to be exactly above one another during operations.

Note.—Stamps are generally used when large quantities of the same job are required.

STAMPS.

PLATE 77

FIG 1

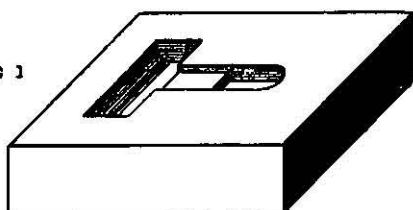


FIG 2

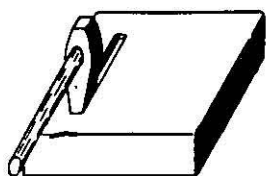


FIG 3

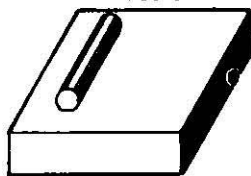


FIG 4

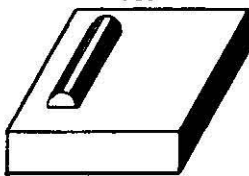


FIG 5

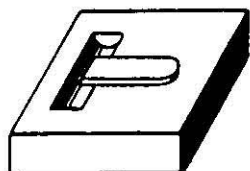


FIG 6

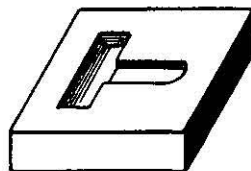


FIG 7

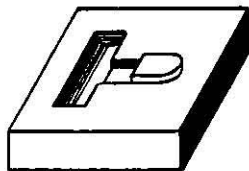


FIG 8



FIG 9

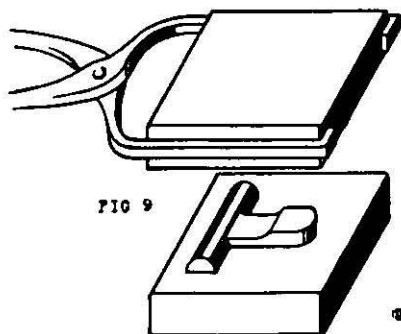


FIG 11

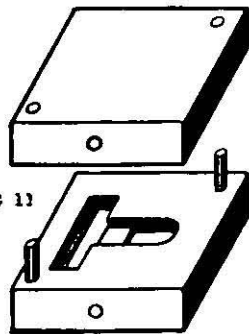


FIG 10



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 78

STAMPS

PLATE 78: FIG. 1 illustrates a finished forging made under the steam hammer, with stamps.

FIG. 2 illustrates a pair of stamps complete with handles. The method of making these stamps was shown on PLATE 77.

FIG. 3 shows the forging after being stamped.

FIG. 4 shows a ragging tool, used under the steam hammer, for taking away the ragged edges from the forging after it has been stamped.

FIG. 5 shows the ragging tool in use.

Method.—Place the unfinished forging on the ragging tool, and place a shaped bar on top, as shown. Strike with the steam hammer, pressing the finished forging through, and leaving the ragged edges behind.

FIGS. 6 to 8 show the preparing of the forging before it is placed in the stamps.

STAMPS.

PLATE 78

FIG 1

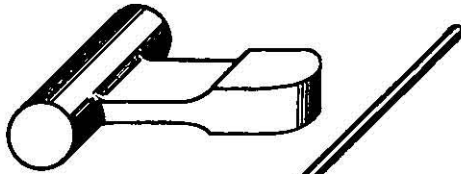


FIG 2

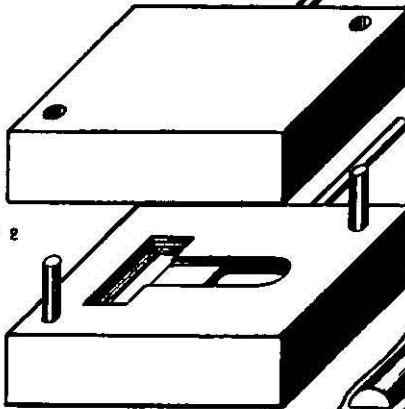


FIG 3

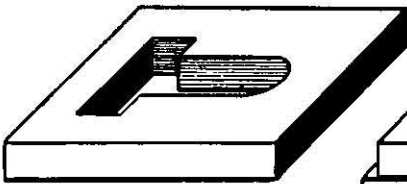


FIG 4

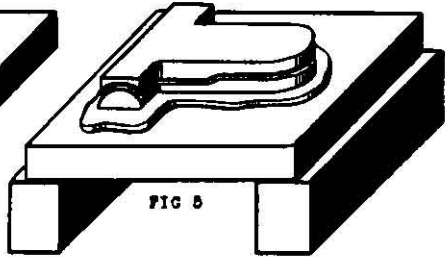


FIG 5

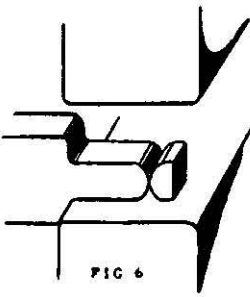


FIG 6

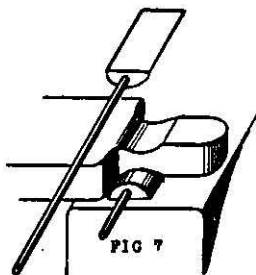


FIG 7



FIG 8

MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 79

SPANNER STAMPS

PLATE 79: FIG. 1 illustrates a double-ended spanner, which can be made in the stamps shown in the following illustrations:—

FIG. 2 shows a pair of stamps used for shaping the material after it has been prepared, as in FIG. 5.

FIG. 3 shows a punch used for punching the jaw in the spanners, while they are in FIG. 4 stamps.

FIG. 4 shows a pair of stamps used for finishing the spanners after they have been shaped in FIG. 2.

FIG. 5 shows a round bar, balled at each end ready to be shaped by placing it in FIG. 2 stamps.

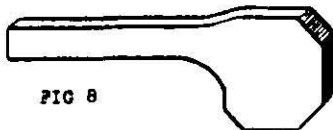
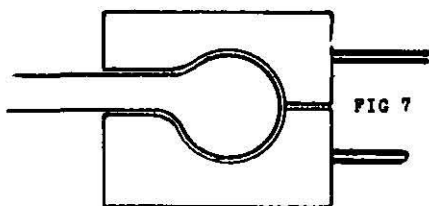
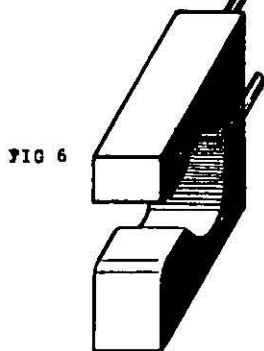
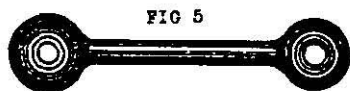
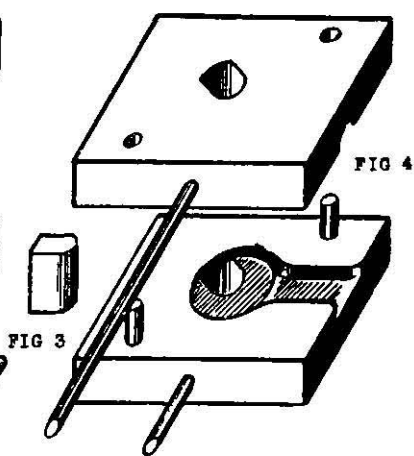
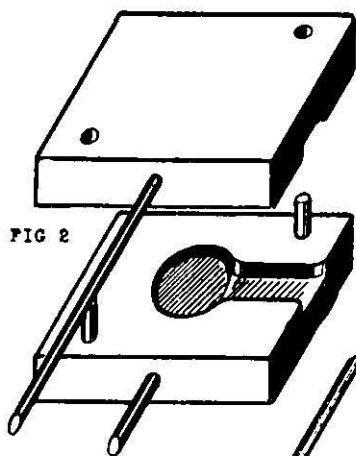
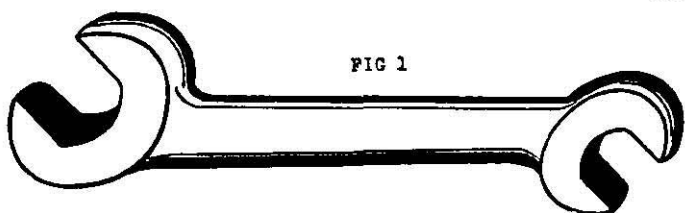
FIG. 6 shows another pair of stamps used for shaping large spanners.

FIG. 7 shows FIG. 6 stamps in use.

FIG. 8 shows the material roughly shaped before placing in the stamps.

SPANNER STAMPS.

PLATE 79



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 80

LOCOMOTIVE FLY CRANK

PLATE 80: FIG. 1 illustrates a fly crank, made from a 5-inch square bar.

First operation, FIG. 2: Draw down the 5-inch square bar, as shown.

Second operation, FIG. 3: Side set, as shown.

Third operation, FIG. 4: Draw down, and fuller at B, then draw down as shown at A, and cut off at the dotted line.

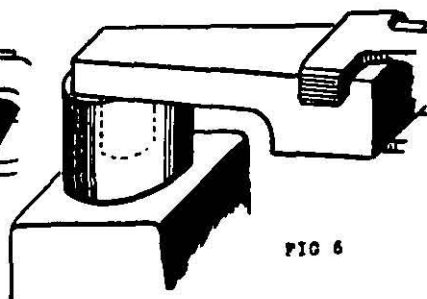
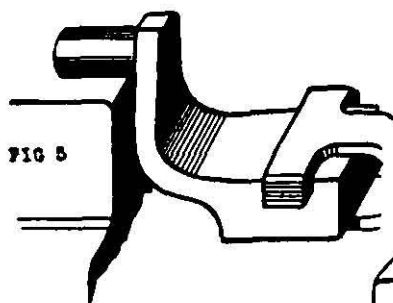
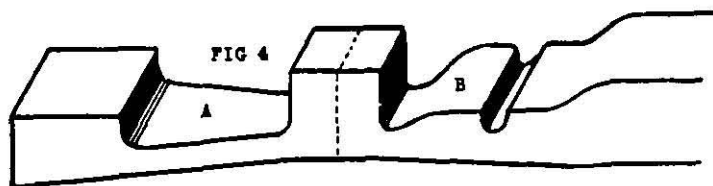
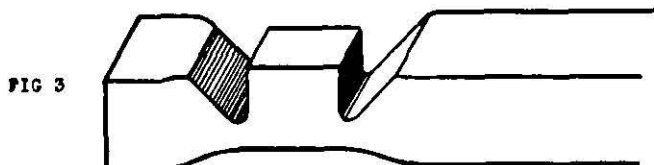
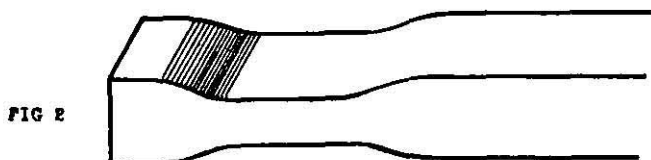
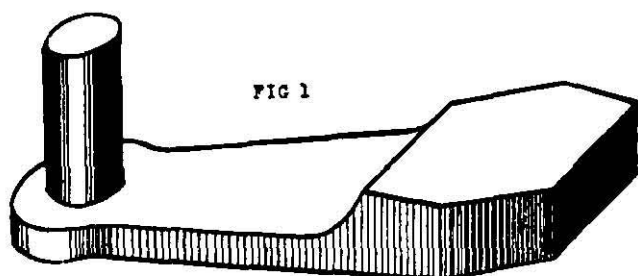
Note.—These illustrations give a method of forging two fly cranks at once.

Fourth operation, FIG. 5: After cutting along the dotted line, bend the forging as shown, in order to swage the pin.

Fifth operation, FIG. 6: Straighten the forging, then place it in a bolster and flatten to size. Finish off by shaping, as shown in FIG. 1.

FLY CRANK

PLATE 80



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 81

LOCOMOTIVE ECCENTRIC ROD

PLATE 81: FIG. 1 illustrates an eccentric rod, made from a 6-inch square bar. The dimensions are :—

A 8 ins. by 3 ins. by $1\frac{1}{2}$ in.

B 3 ft. 5 ins. long and 1 in. thick, tapering from $3\frac{3}{4}$ ins. to $2\frac{1}{2}$ ins.

C $2\frac{3}{4}$ ins. diameter, 5 ins. deep.

The length of material required to make this is 13 ins.

First operation, FIG. 2: Side set $11\frac{1}{2}$ ins. from the end of the bar.

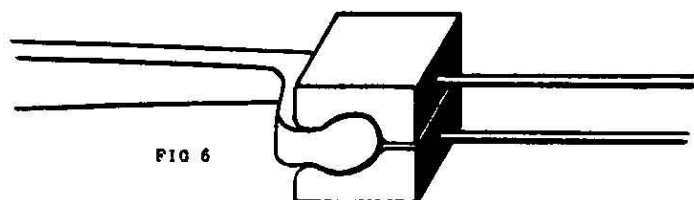
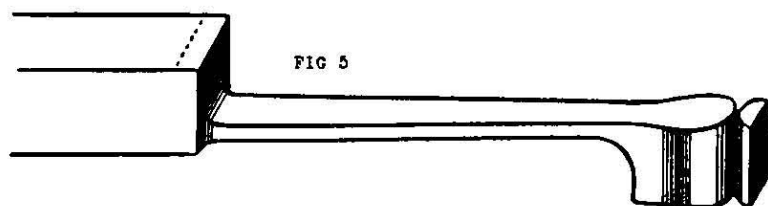
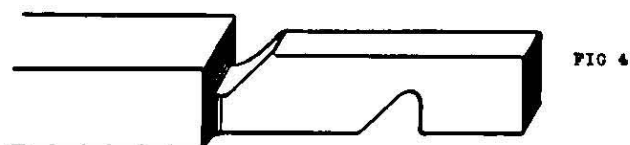
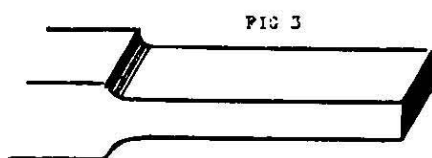
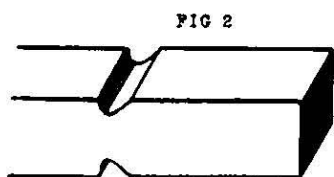
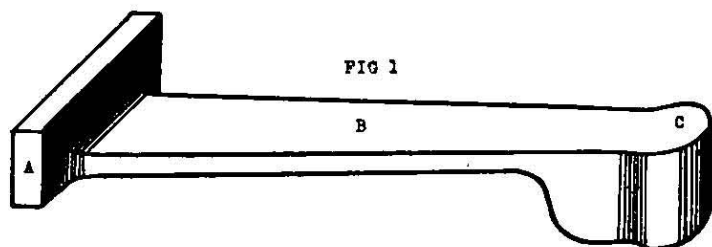
Second operation, FIG. 3: Draw down from 6 ins. square to 5 ins. by 3 ins.

Third operation, FIG. 4: Side set 15 ins. from the 6-inch square bar, and side set again, as shown.

Fourth operation, FIG. 5: Draw down to length as shown, and shape the double eye end, using radius cutters.

Fifth operation, FIG. 6: Finish the double eye end by stamping in swages, as shown. Complete by cutting the opposite end off the bar and hammering down to 8 ins. by 3 ins. by $1\frac{1}{2}$ in.

ECCENTRIC ROD. PLATE 61



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 82

LOCOMOTIVE CROSS BEAM

PLATE 82: FIG. 1 illustrates a cross beam, made from a 4-inch square bar.

First operation, FIG. 2: Fuller the 4-inch square bar, as shown.

Second operation, FIG. 3: Draw each end down and shape, as shown.

Third operation, FIG. 4: Draw the bar down and flatten out to the required width, as shown in FIGS. 4 and 5.

Fourth operation, FIG. 6: Taper the forging from the centre as shown, side set the ends, adopting the method shown in FIG. 7, and draw down the ends to the required diameter (FIG. 8).

CROSS BEAM.

PLATE 82

FIG 1

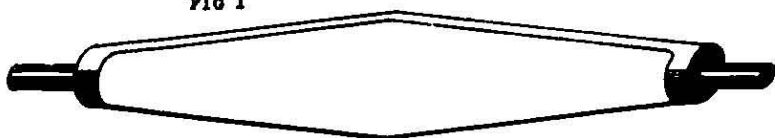


FIG 2

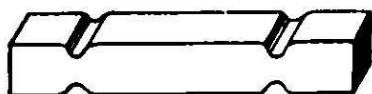


FIG 3

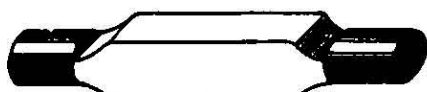


FIG 4

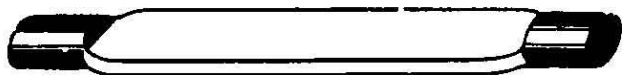


FIG 5

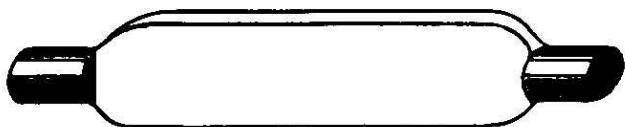


FIG 6



FIG 8

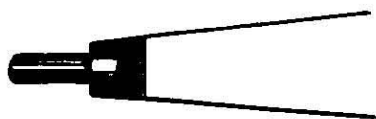
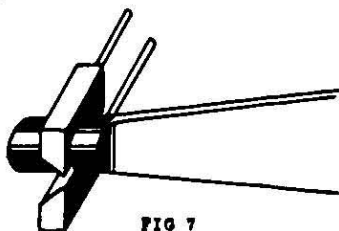


FIG 7



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 88

LOCOMOTIVE REVERSING LEVER

PLATE 83: FIG. 1 illustrates a reversing lever, made from a 3-inch square bar.

First operation, FIG. 2: Side set the 3-inch square bar as shown, adopting the method given in FIG. 8.

Second operation, FIG. 3: Set the bar through, then side set, as shown.

Third operation, FIG. 4: Again set the bar through, and side set, as shown.

Fourth operation, FIG. 5: Partly draw down, and side set, as shown.

Fifth operation, FIG. 6: Draw the bar down, and form the boss, as shown. Next, side set the opposite end as shown.

Sixth operation, FIG. 7: Draw down as shown, then finish off the end, as in FIG. 1.

FIG. 8 shows the method of side setting used in the first and second operations. First, side set at one side, then turn over the bar, and complete by using two side set tools, as shown.

REVERSING LEVER. PLATE 83

FIG 1

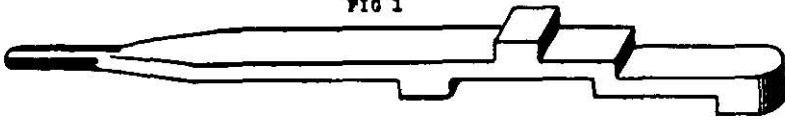


FIG 2



FIG 3



FIG 4

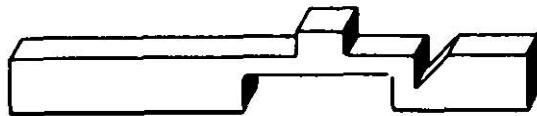


FIG 5

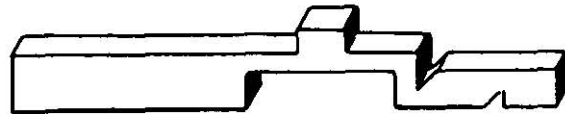


FIG 6

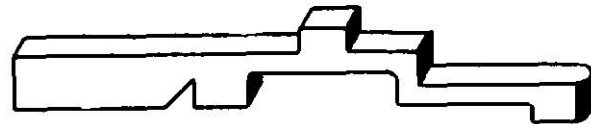
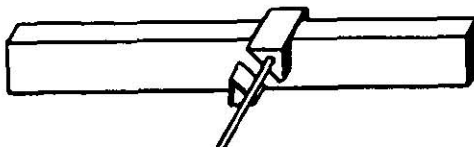


FIG 7



FIG 8



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 84

LOCOMOTIVE BRAKE HANGER

PLATE 84: FIG. 1 illustrates a brake hanger, made from a 4-inch square bar.

First operation, FIG. 2: Side set the 4-inch square bar, as shown.

Second operation, FIG. 3: Draw down and flatten out to the width required, as shown.

Third operation, FIG. 4: Side set, as shown.

Fourth operation, FIG. 5: Draw down to the thickness of the centre boss, and fuller as shown.

Fifth operation, FIG. 6: Draw down to thickness in between the bosses as shown, and then complete the forging by cutting to shape on the dotted lines, as shown.

BRAKE HANGER. PLATE 84

FIG 1

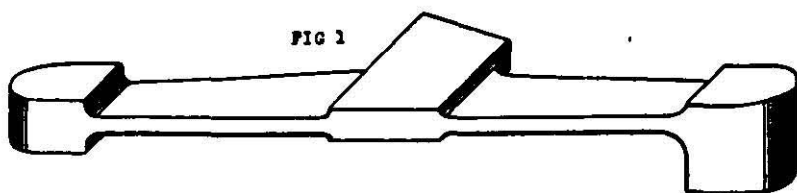


FIG 2



FIG 3

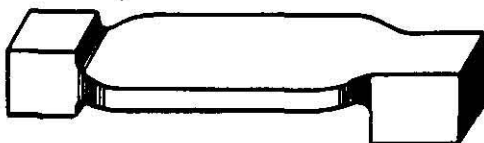


FIG 4

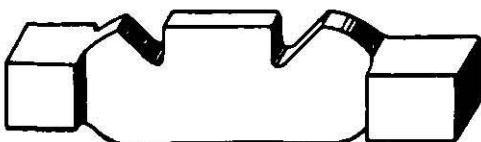


FIG 5

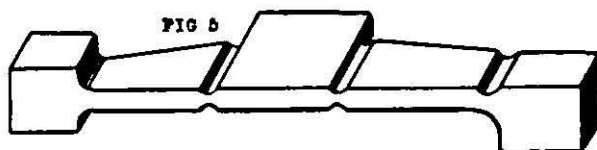
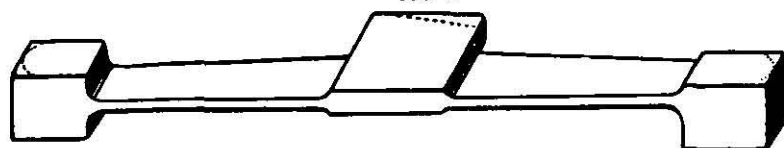


FIG 6



MISCELLANEOUS EXAMPLES OF FORGED
WORK IN DIFFERENT STAGES. PLATE 85

LOCOMOTIVE BRAKE HANGER

PLATE 85: FIG. 1 illustrates a brake hanger, made from $3\frac{1}{2}$ -inch square bar.

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

Second operation, FIG. 3: Draw down to the required thickness. Repeat the above operations, at the other end except that the end to be side set is opposite.

Third operation, FIG. 4: After drawing down as shown, complete by cutting the bosses to shape.

FIG. 5 shows how, by fullering the inside corners, the work is simplified. It is easier to cut the corners off, and this method also prevents the chisel from cutting the bar.

FIG. 6 shows the boss being shaped, after the inside corners have been fullered.

FIG. 7 shows another method of forming the bosses by stamping a pair of loose rings into the bar, as shown.

FIG. 8 shows a split swage on which bosses can be rounded, as shown.

BRAKE HANGER. PLATE 85

