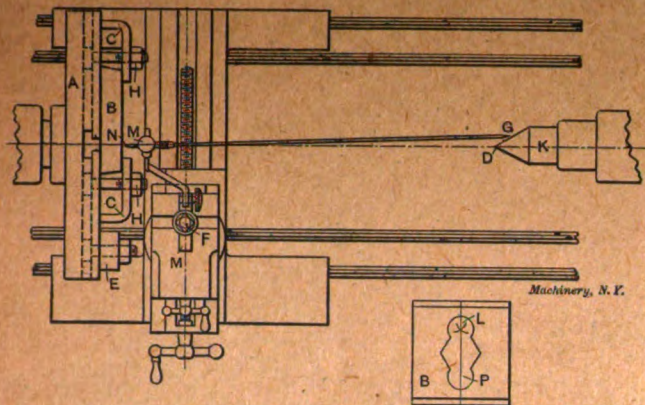


## SHOP OPERATION SHEET NO. 76.

C. F. Emerson.

MACHINERY, October, 1908.



To True Up on the Face-plate of a Lathe a Prick-punch Mark that has been Spotted on the Face of a Die Blank.

NOTE.—The die blank is assumed to have been planed, laid out, and the centers of the holes to be bored or drilled prick-punched, previous to this operation. The die blank, as laid out, is shown in the lower right-hand corner of the sketch. The prick-punch center *L* is to be trued up with the center of the lathe spindle.

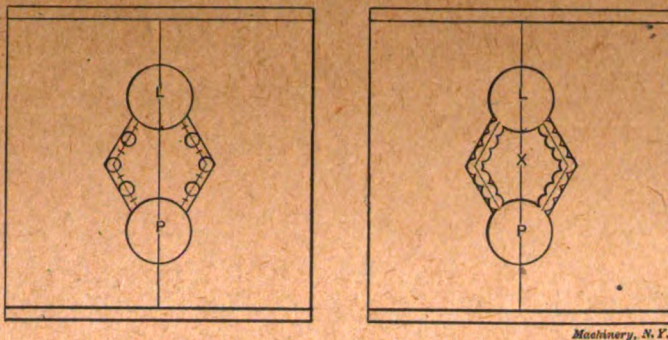
1. Strap die blank *B* on the face-plate *A*, by the aid of the straps *C* and the bolts and nuts *H*. Bring the tail-stock forward, close to the face-plate, and move the tail center *K* forward, so that the point almost touches the die blank *B*.
2. Remove the belt from the head-cone, and let it hang loose.
3. Turn the lathe spindle by hand, and true up the prick-punch mark by lightly tapping die blank *B* until the mark is apparently true with the point *D* of the tail center.
4. Strap weight *E* to the face-plate, to counter-balance the weight of the die blank *B*, which is eccentrically clamped on the face-plate.
5. Revolve face-plate by hand to see if it has been counter-balanced correctly. If not, replace *E* with a heavier or lighter weight, as required.
6. Place the indicator *M* in the tool-post *F* and bring the centering point *N* of the indicator forward so as to enter the prick-punch mark on *B*.
7. Revolve the face-plate *A* and see if the rear end point *G* of the indicator moves. If it does, the prick-punch mark does not run fully true.
8. Turn the face-plate by hand, letting *G*, which will move in a circle, come as close to tail-center *K* as possible. Then tap die blank *B* lightly at a point in a straight line with the center of the lathe spindle, until point *G* remains perfectly motionless when the spindle is revolved.

NOTE.—After having trued up the prick-punch mark, spot and drill hole *L*, and then bore it with an inside turning tool to a taper of  $1\frac{1}{2}$  degree on each side, for clearance. Repeat the operation of truing up, drilling, and boring for the hole *P*.

## SHOP OPERATION SHEET NO. 77.

C. F. Emerson.

MACHINERY, October, 1908.



To Drill Out the Core in a Die, Eliminating the Necessity of Broaching Out the Web of Stock between the Hole.

NOTE.—Previous to this operation the die blank has been planed and holes *L* and *P*, drilled and bored. The core should be drilled out so that the drilled holes incline about  $1\frac{1}{2}$  degree with the perpendicular to the face of the die, for clearance.

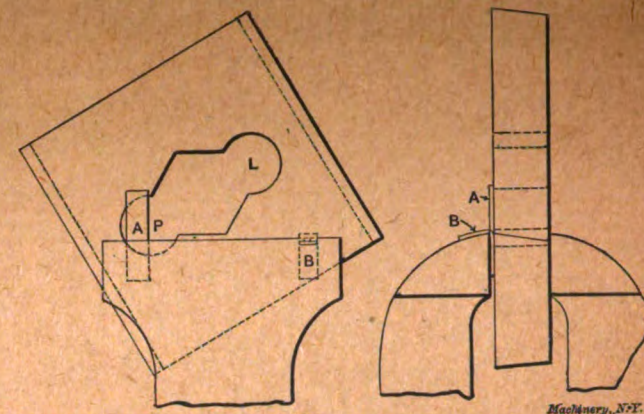
1. Place a drill in a drill chuck, and tighten the chuck jaws.
2. Lay the die on the drill press table, and proceed to spot every alternate prick-punch mark with the drill.
3. When spotting the holes, care should be taken to see that the drill does not run into the scribed outside lines. Where the drill shows a tendency to do so, draw the spotted hole over towards the inside with a small chisel.
4. Place a thin piece of sheet steel under the corner of the die directly opposite the holes to be drilled. The sheet steel piece is put in so that the holes will be drilled at a slight angle with the bottom of the die, to make unnecessary the operation of reaming the holes from the back with a taper reamer, in order to save time in filing out the die, which is filed to an angle of  $1\frac{1}{2}$  degree for clearance.
5. Proceed to drill a hole at every other prick-punch mark all around the inside of the scribed line, as shown to the left in the engraving.
6. After having drilled every other hole, proceed to drill the holes indicated by the prick punch marks between the holes already drilled. When all these holes are drilled, as shown to the right in the engraving, core *X* falls out.
7. With a sharp chisel chip out the remaining projecting points, almost down to the scribed line. In chipping, begin at the face of the die and chip through. If the start is made at the bottom of the die, the stock is apt to break off below the scribed line on the face of the die when the chisel comes through.

NOTE.—When the shape of the opening in the die does not permit the chipping all the way through from the face of the die, chip through as far as the open space will permit, and then begin chipping from the bottom of the die, to meet where the chisel left off when entering from the top.

## SHOP OPERATION SHEET NO. 78.

C. F. Emerson.

MACHINERY, October, 1908.



To File Out a Blanking Die to Fit a Sample Blank or Templet.

NOTE.—It is assumed that, previous to this operation, the die has been planed, the shape of the opening laid out, the holes *L* and *P* drilled and bored, and the core in the center of the opening removed by drilling around the scribed outline of the core as shown in Shop Operation Sheet No. 77.

1. Place the die in a vise with the face of the die towards the back of the vise.
2. Place pieces *A* and *B* in the vise as shown. Piece *A* prevents the edges of hole *P* in the die from coming in contact with the edge of the file when the die is filed out. Piece *B* simply serves the purpose of permitting the die to be held parallel to the vise.
3. A coarse file is first used for rough filing the opening, filing down to the inside of the lines scribed. File to a clearance of about  $1\frac{1}{2}$  degree.
4. Insert the sample blank or templet from the bottom of the die, pressing it lightly forward as far as it will go into the opening in the die.
5. Remove the die from the vise, and hold it up to the light, and mark with a lead pencil those parts of the die where the sample blank bears against the sides of the opening in the die.
6. Remove the sample blank, place the die in the vise, and file out the lead pencil marks. Insert the blank once more, and repeat the operation described in steps 4 and 5 until the blank will pass through the opening. When the die is nearly filed out to the required size, use a fine file for finishing.

NOTE.—In filing out the die opening, care should be taken to see that the clearance is filed straight, and not rounded, as in the latter case, the die will not cut the stock properly and the blanks will not readily drop through the opening. The clearance angle may be made correct and uniform by the use of a die-maker's square, which differs from other squares in that the blade is set at an angle of 90 degrees plus the clearance angle, with the stock.