

JOB NAME Parallel Clamp

BLUE PRINT NUMBER: 01-A-12

ITEM: Jaw

INFORMATION: Parallel clamps are extremely useful for holding work together while locating holes or machining pieces. The two jaws must be parallel to each other, when clamped on the work in order to hold properly.

PRIMARY SKILL LEARNED:

1. Spotting for transfer of holes.
2. Roughing and squaring stock.
3. Squaring ends on stock.
4. Grind shaper tool bit.
5. Line up work or vise with indicator.

PRECAUTIONS:

1. Mill angle on the 4 jaws together.
2. Clamp pieces together when milling radius.
3. Clamps must be made in pairs so that holes will line up.
4. Clamp jaws together when spotting holes.
5. Make sure tap is perpendicular to top surface of jaw when tapping.

STOCK: 5/8" Square cold Rolled Steel.

OPERATIONS:

1. Cut stock to 4" length.
2. Mill ends square in vise.
3. Mill 5/8" radius on ends.
4. Shape or mill angle.
5. Layout and prickpunch holes.
6. Drill letter "I" drill thru two jaws.
7. Clamp drilled jaw to undrilled jaw and spot thru.
8. Drill 1/4" hole 5/16" deep.
9. Drill letter O hole.
10. Mark jaws as a pair.
11. Tap 5/16" holes.
12. Spot 6-32 holes from clip.
13. Tap 6-32 hole.
14. Case harden.

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ITEM: Screws

PRIMARY SKILL LEARNED: 1. Cut threads with tool bit,
2. Cut recess in lathe.

PRECAUTIONS: 1. Allow 1/2" extra stock for holding in dog.
2. Note that screws are of different lengths.
3. Knurl before turning thread diameter. (To prevent bending piece).
4. Fit screws to jaws, when threading.
5. Do all operations before cutting off extra stock.

STOCK: 5/8" Cold Rolled Steel.

OPERATIONS: 1. Cut off stock to 4" length.
2. Center drill and face off in collet.
3. Turn 5/8" dia. on centers to true up.
4. Knurl.
5. Reverse piece and turn thread diameter.
6. Turn 1/4" diameter. (on clamping screw only.)
7. Cut 1/16" groove in knurl. (On adjusting screw only.)
8. Thread.
9. Cut off extra stock.
10. Face off in collet.
11. Drill 3/16" hole.

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ITEM: Clip

PRIMARY SKILL LEARNED: 1. Drilling thin stock.

PRECAUTIONS:

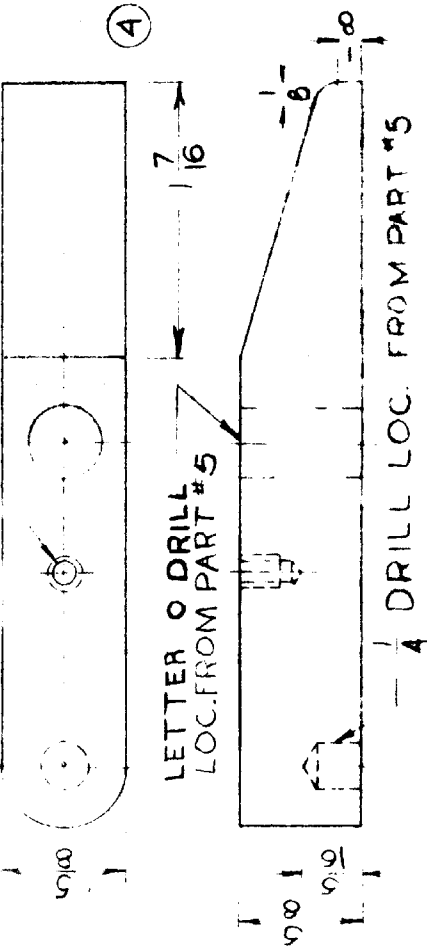
1. Nail stock to a piece of wood while drilling to prevent work from climbing up the drill.
2. Put bend in clip by placing two pieces of 1/16" metal on opposite sides of work and apply pressure in the arbor press.

STOCK: Soft sheet steel 1/16" thick.

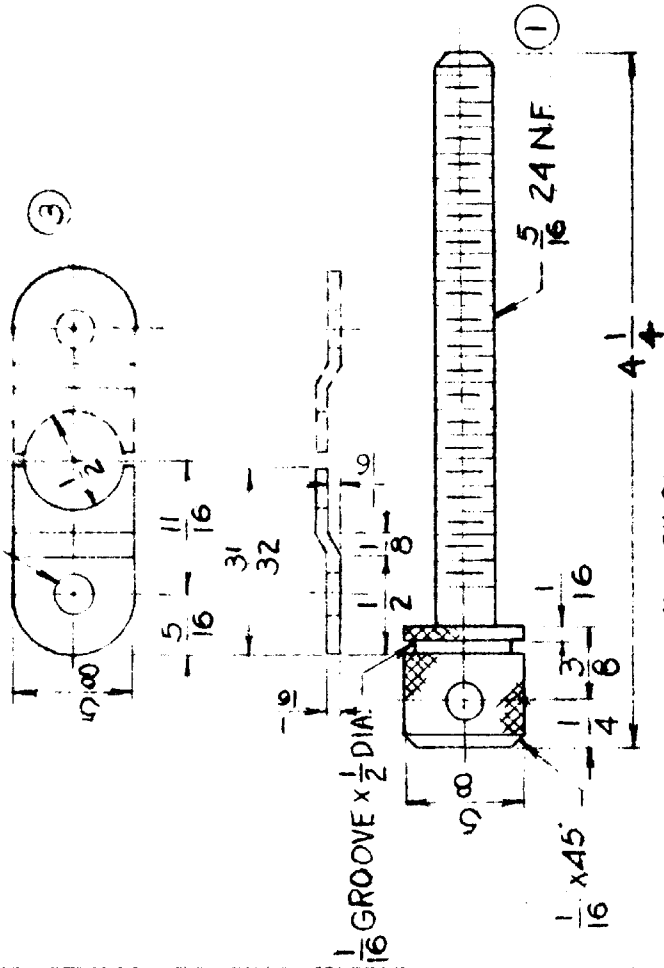
OPERATIONS:

1. Cut stock to length 5/8" x 2".
2. File radius
3. Layout and prick punch.
4. Clamp stock to piece of wood and drill 1/2" hole.
5. Drill #26 holes.
6. Saw piece in half.
7. Bend step in piece.

6-32 NC x $\frac{3}{16}$ DR
LOC. FROM PART #3

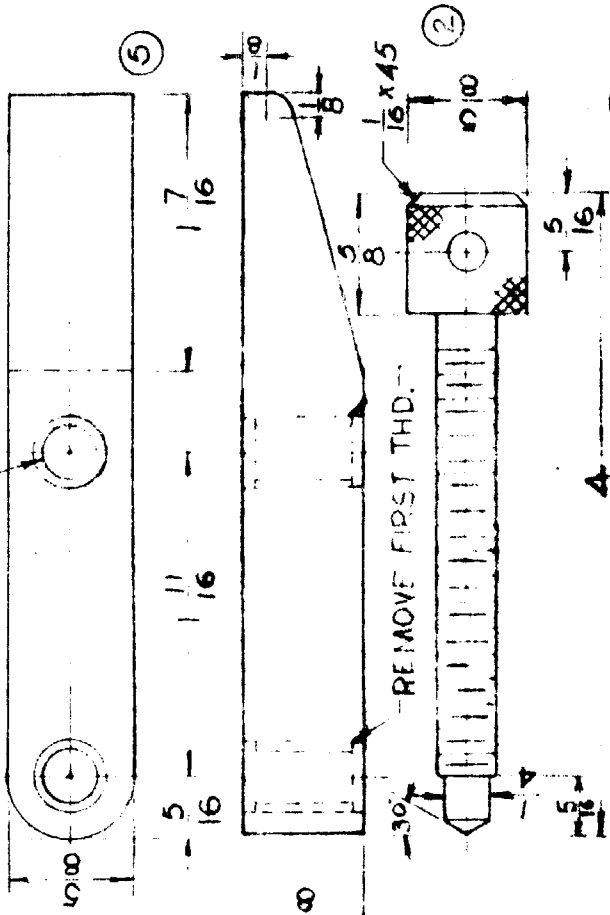


- *26 DRILL

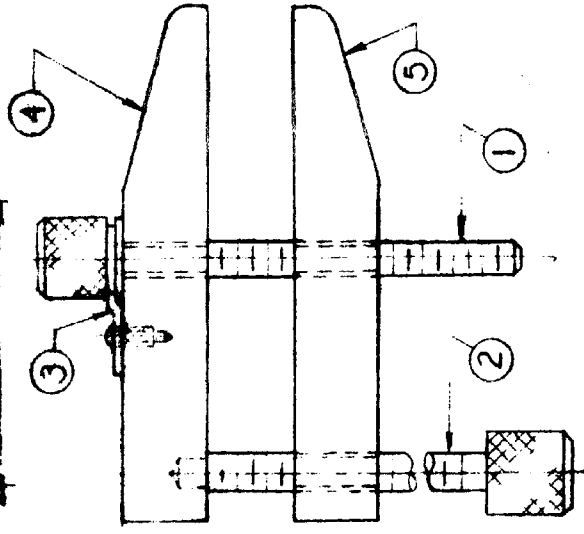


3 7 8

$\frac{5}{16}$ 24 NF - 2 HOLES



REMOVE FIRST THD.



MED
KNURL

BREAK ALL UNNECESSARY CORNERS

ELI WHITNEY REGIONAL VOCATIONAL TECHNICAL SCHOOL

DIMENSIONAL TOLERANCES FRACTIONAL $\pm 1/64$ DECIMAL $\pm .002$
UNLESS OTHERWISE SPECIFIED: - ANGULAR $\pm 1^\circ$ CONCENTRICITY $\pm .001$

MATERIAL

Cold Rolled Steel

HEAT TREAT

PART NAME

PARALLEL CLAMPS

DATE 2-26-64

SCALE: -

DWG. NO.

01-A-12

PARALLEL CLAMPS (2)

Use four pieces of $5/8$ " square cold roll steel, 4" long. Indicate the milling machine vise and mill a $5/8$ " convex radius on all four pieces. Fig. 1

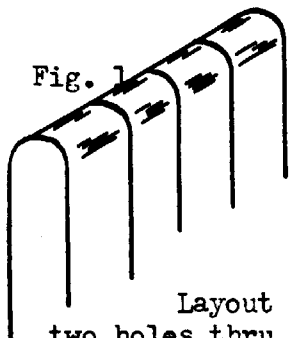


Fig. 1

Use the angle fixture and shape the four pieces at the same time to the $1\ 7/16$ " dimension. Fig. 2

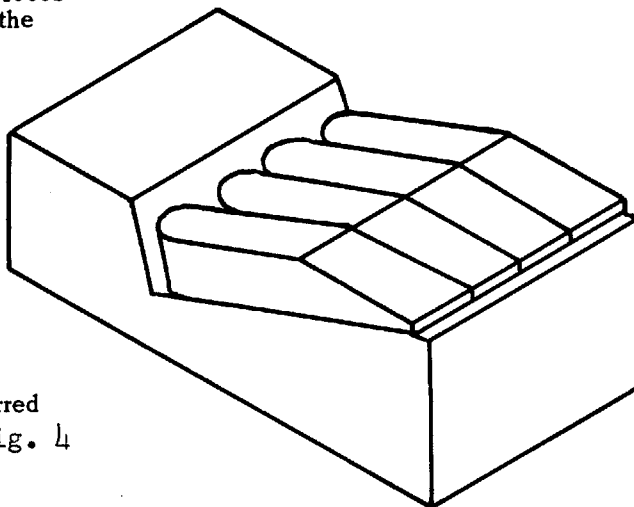


Fig. 2

Layout part #5. Drill two holes thru with an "I" drill in two pieces. Use an "O" drill and counterbore $1/16$ " deep to remove the first thread on both sides of all holes. Fig. 3

Pair up and transfer holes an "I" drill from part #5 to part #4. The transferred holes in part #4 are to be $1/16$ " deep. Fig. 4

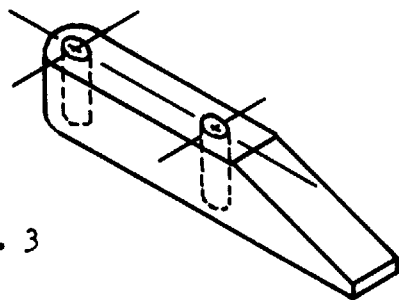


Fig. 3

In part #4, with the transferred holes up, drill a $1/4$ " hole $5/16$ " deep on the end with the radius. Drill the other hole thru with an "O" drill. Remove the burrs. Fig. 5

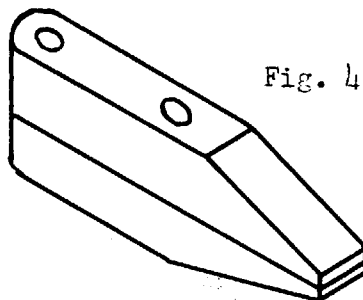


Fig. 4

Tap two $5/16$ " X 24 holes in part #5.

Stamp name and date.

Transfer the 6-32 threaded hole in part #4 from part #3 at assembly.

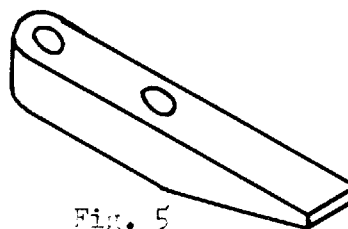


Fig. 5

PARALLEL CLAMPS



Fig. 1



Fig. 2

The screws (part #1 & #2) are made from four pieces of $5/8$ " diameter, cold roll steel, two pieces $4-3/4$ " long, and two $4-1/2$ " long. Knurl the handles $1-1/2$ " long.

Reverse the piece on centers and turn the diameter to $.310$ " and to the proper length. Cut the threads $5/16$ " x 24 to the shoulder.

Note : Undercut the $1/16$ " groove in the knurled area at assembly. Fig. 1.

Turn the $1/4$ " diameter $5/16$ " long on the two pieces that are $4-1/2$ " long. Fig. 2.

Face off knurled end to proper length.

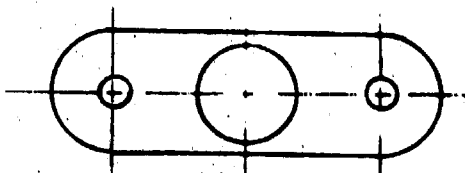


Fig. 3

The hold down spring (part #3) is made from 16 gage sheet metal $5/8$ " wide and 2" long. File the $5/16$ " radius using part #4 or #5 as a guide. Layout center lines and scribe two lines $5/16$ " from each end.

Secure work to a flat piece of wood and drill a $1/2$ " hole in the center and a #26 drill hole at the other two intersections. Fig. 3

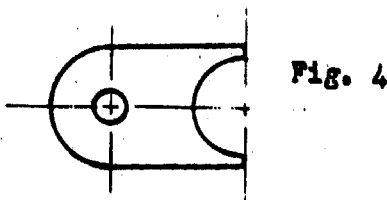


Fig. 4

Saw in half across the $1/2$ " hole and remove the burrs. Fig. 4

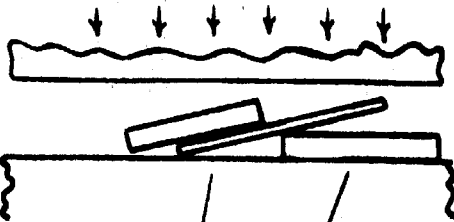


Fig. 5

When bending the spring use two pieces of scrap stock approximately $.070$ " thick.

Place the $.070$ " pieces in such a position so as to provide the proper location for the bend.

Bend in an arbor press.

Figs. 5 -5a - 6



Fig. 5a

Locate the groove in the screw (part #1) from the spring (part #3) at assembly with the clamp (part #4).

When the groove is made, locate the #6-32 tapped hole in part #4 from the spring.

Tap the hole $1/4$ " deep.

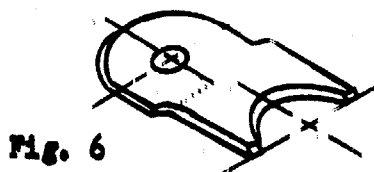


Fig. 6