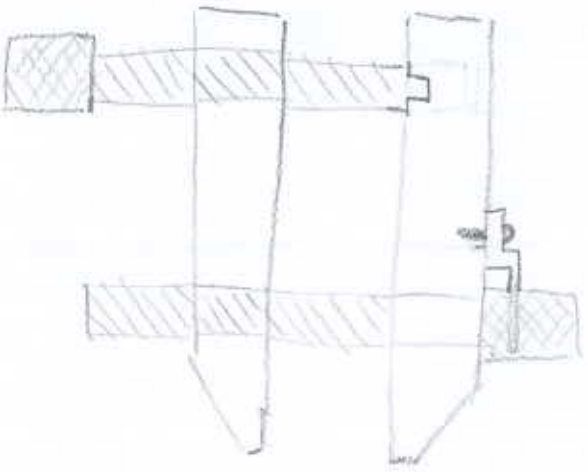
Tool makers Clamp

- Based on mrpete 222 #275 + 276 Shop tips video



material

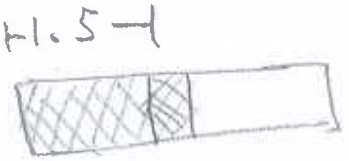
- 1/2 Square Steel 4" long
- 1/2 Round Steel 5" long

Rough Cuts

Steps: Screws

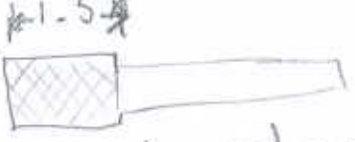
1) Rough Cut material
   - face & center drill Round stock

2) knurl 1.5 inches

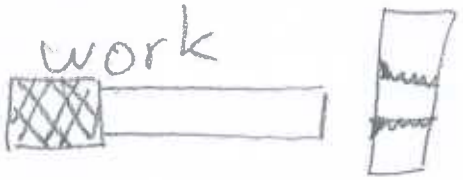


lathe Speed - 300 Rpm
- May need a few passes. do not remove knurl until complete.
- Diamond shaped. Over do the knurl.

3) 5/16" diameter .312"
   5/16 - 24 NF thread
   - turn the remaining round stock to 5/16" Diameter
   - Break corner with a file

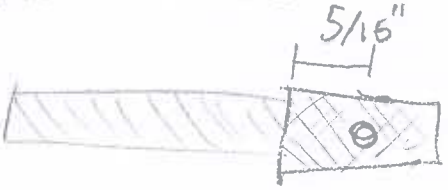


4) .310 - .312
- Smooth finish not required but not rough
- use 5/16-24UF die to thread
- Tapered side of die toward work

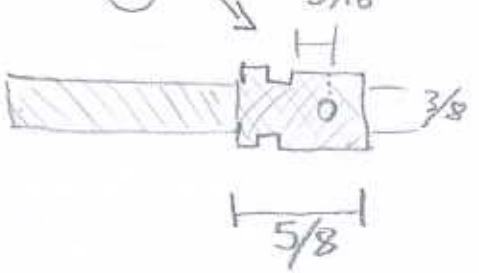


Test with 5/16" NF Nut

5) Drill Cross hole & debur with Counter Sink on ONE OF Them!

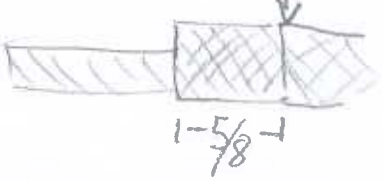


6) Parting



Depth - Parting tool until diameter of cut is 3/8

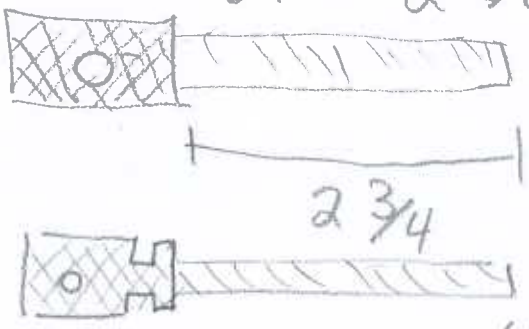
7) cut off excess. knurl length final should be 5/8" long.

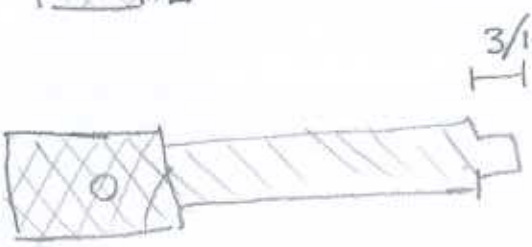


face & chamfer!

- Protect knurl/thread with soft Jaws

8) Cut off excess to have a finished thread length of 2 3/4"

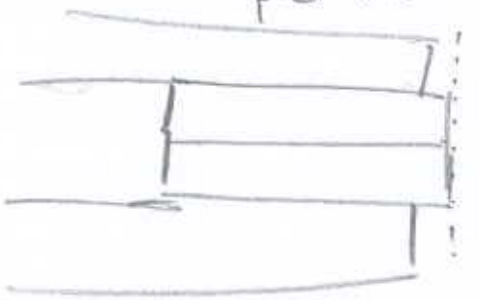


9) 

I 13/64 diameter (0.203")

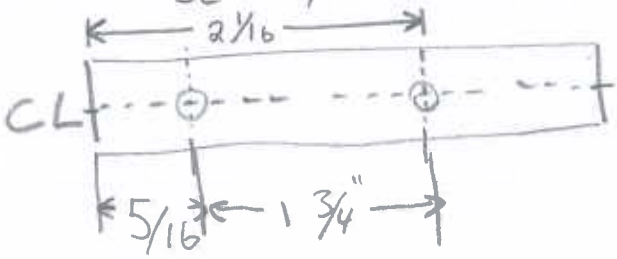
Parallel Clamps

1) Milling Machine
   - Square up ends to have a perfect flat end.



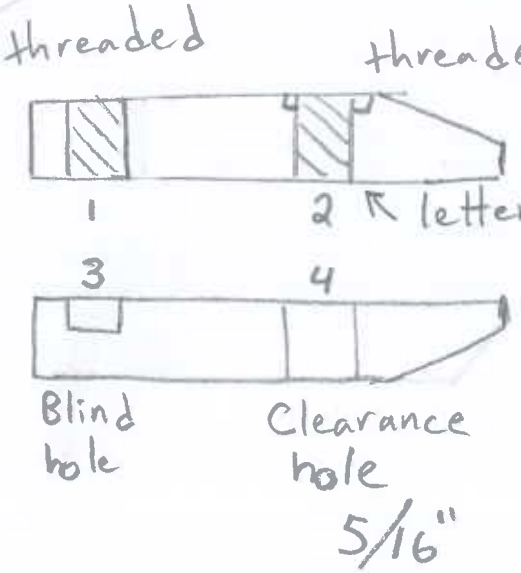
2) Measure & make EXACTLY 4" long on milling machine. Only a little over hang from vice. Use cutting oil! Small slow passes!

3) Layout hole lines. Deep line
   - Scribe, caliper, etc
   - center punch holes
   - must be accurate!



Sharp pilot hole to prevent drift
- drill 1/8" deep

Order of operations matter to prevent starting over.

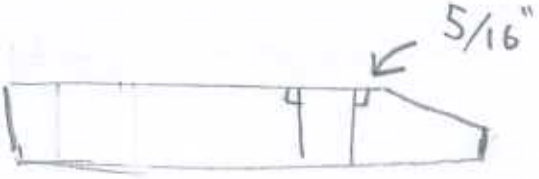


① Pilot hole 3/16 all the way through holes 2 & 4 clamped together in vice.

② Separate & drill hole 2 with a letter I or 9/32" drill bit

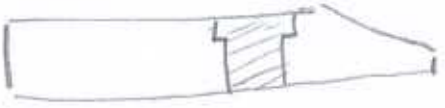
③ Clearance hole drilled with 5/16" all way through

5)



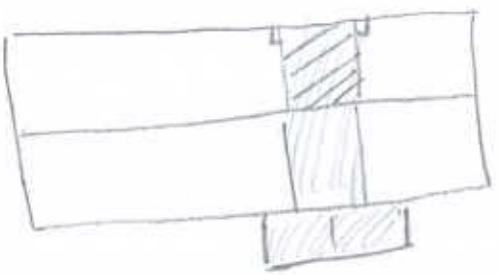
Drill down 1/8" before threading. This helps guide a tapered tap.

6)



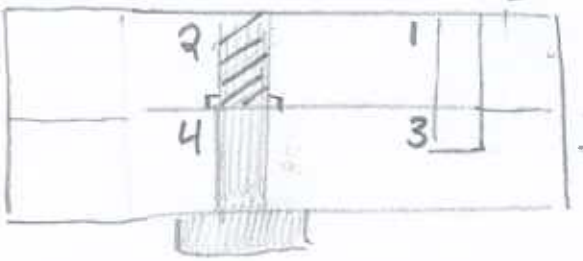
Tap with 5/16 -24 UNF

7)



Bolt together with 5/16 -24 UNF Bolt

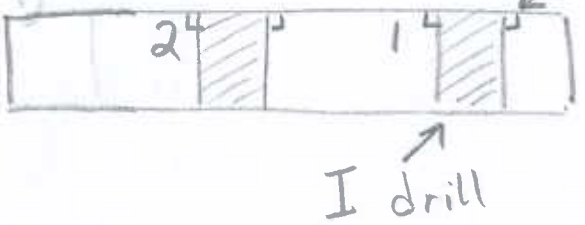
8) 13/64" Drill bit for blind hole



1 3/16 Deep. Set stop to prevent drilling further. This will match the screw piece

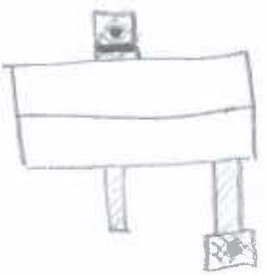
The bolt holds the two pieces together for accurate drilling

9) 5/16" 1/8" deep counterbore then • Drill through with Size I or 9/32" drill bit then "counter bore" 1/8" deep with 5/16" drill bit on the same side as hole 2 to prepare for threading.



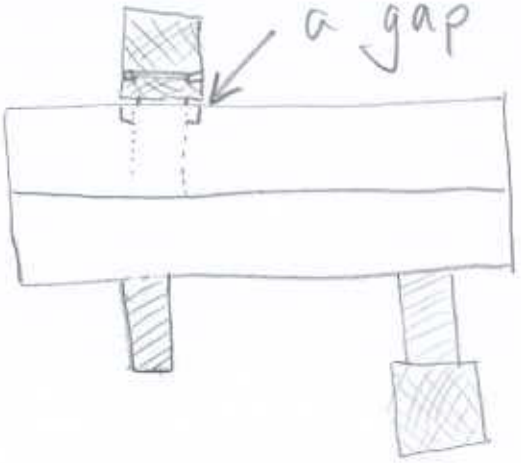
10) Tap hole #1 with 5/16-24 UNF tapered tap. keep it straight!

11) Test fit



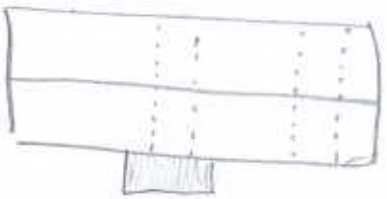
. pieces should be flush. debur pieces before fitting.

12)



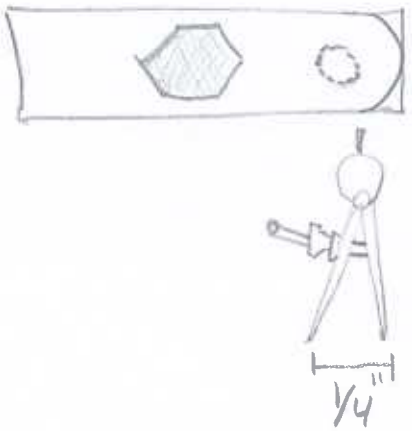
might require a deeper counter bore in the square material.

13)



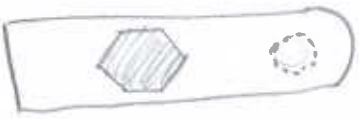
Bolt back together

14)



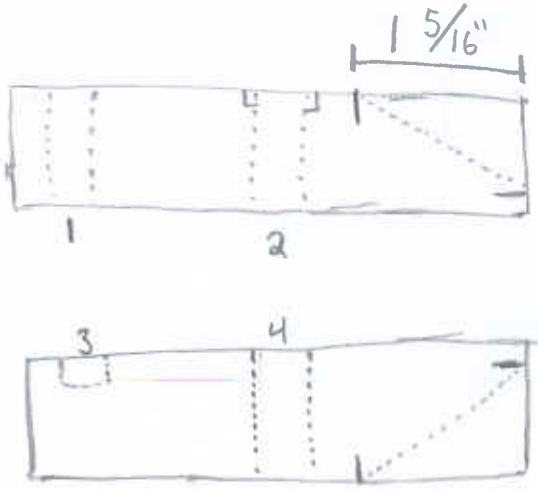
Draw a 1/4" radius or use our 13-14mm circle template. on the end with the hole closest to the end.

15)



Round over end on the belt sander or grinder. Finish will a file and sandpaper.

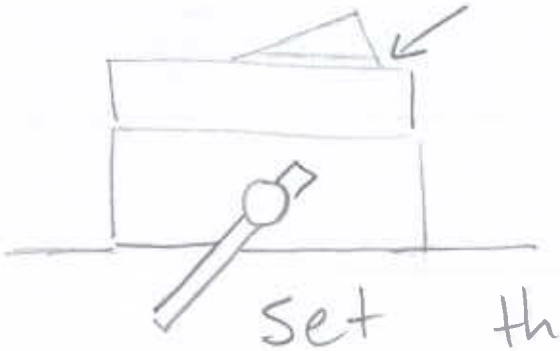
16)



- using layout tools make two measurement for adding the diagonal cuts. Be aware of how your pieces are supposed to join together!

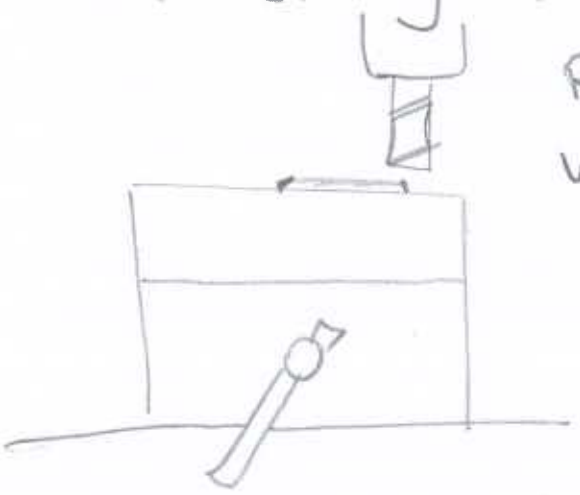
The angle is 16° and can also be completed with a protractor.

17) Milling Machine:



- Clamp both pieces together and make sure the cut line is level and above the vice. Ask for a sneaky trick to set this up.

18) Mill as a pair will small passes and cutting oil. Use a large end mill. Remove and clean up with a file and sandpaper



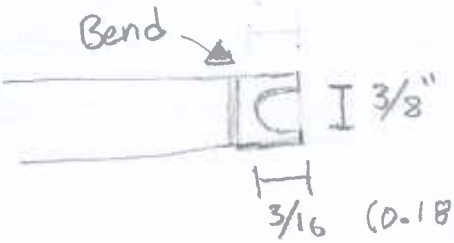
← wow!

1) Keeper  16 gauge sheet metal

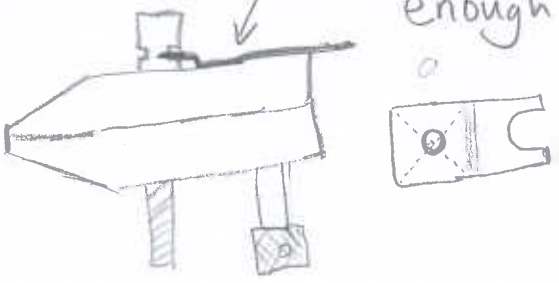
Start with a strip of 1/2" wide 16g sheet metal

2) Use bending jig to do a reverse bend.

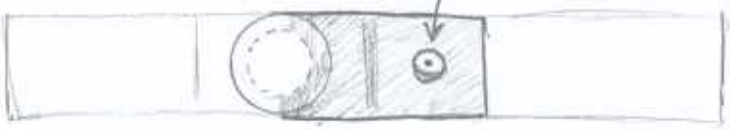
3) Use mill or round file to create the round shape.



4) Figure out your desired length and make your cut with enough space to drill a 9/64" hole centered on the keeper.



5) Transfer hole layout to the square material.



Center punch and drill depending on which small screws we have available in the shop.

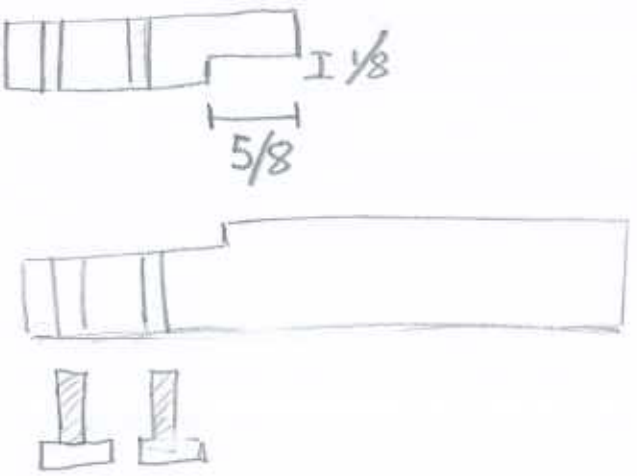
	Drill diameter	Tap drill size
6-32	.1065	No. 36
8-32	.1360	No. 29
10-24	.1495	No. 25

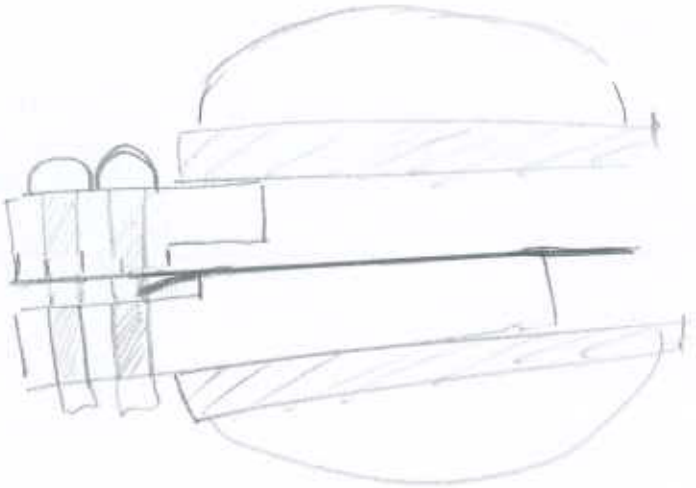
6) Tap the hole and test fit all pieces

7) Sand and smooth all pieces. The keeper looks extra nice with rounded corners.

Try and remove all machining marks in the pieces.

Keeper bending jig





Desired shape