

Ice Screw Sharpening Procedure

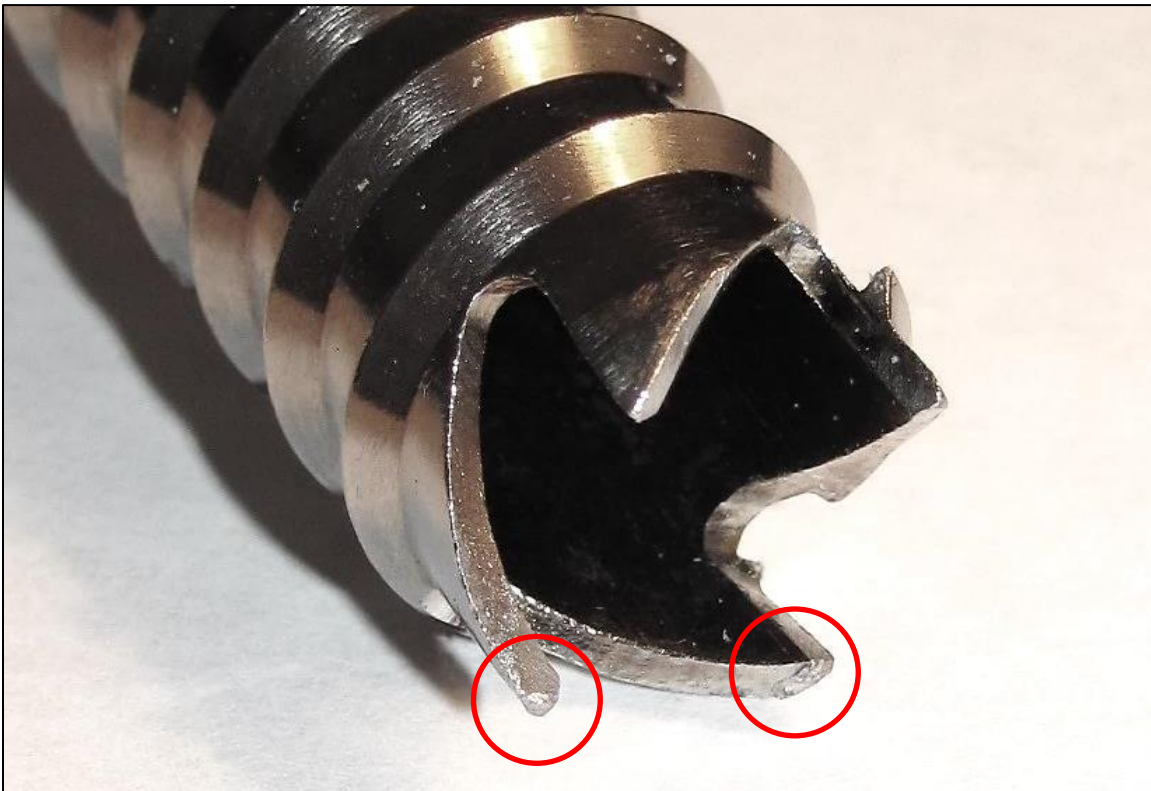
This procedure for sharpening ice screws is effective when done properly. Anyone using this procedure assumes all liability. Practice on an old screw first! This procedure should take about 10-15 minutes per ice screw.

A few general notes about ice screws:

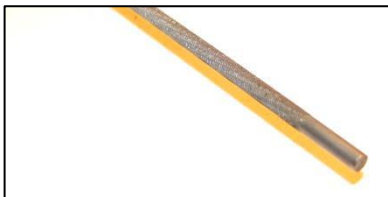
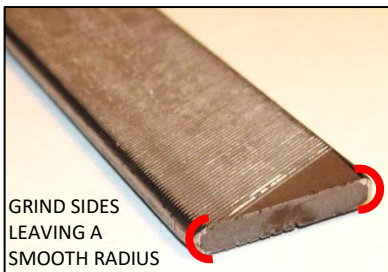
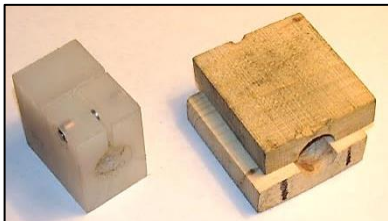
- Modern ice screws are manufactured with CNC machines which are able to cut very precise and uniform teeth.
- Different manufacturers design their screws with slightly different diameters which range from about .750"-.800". Some screws are tapered with the cutting end being a larger diameter.
- Screws are typically chrome plated. This plating will be cut away when sharpening the screw leaving the exposed steel more prone to rusting.
- Cutting or sharpening an ice screw with a high-speed grinder or Dremel can heat up the steel and change the hardness unless a coolant is used. If the steel gets red-hot or any discoloration occurs then the steel properties probably have changed.

SCREW EVALUATION

For efficient placement of an ice screw the cutting point of each tooth needs to be sharp and level with the other teeth. Burrs and flat spots significantly reduce the cutting action of the teeth.

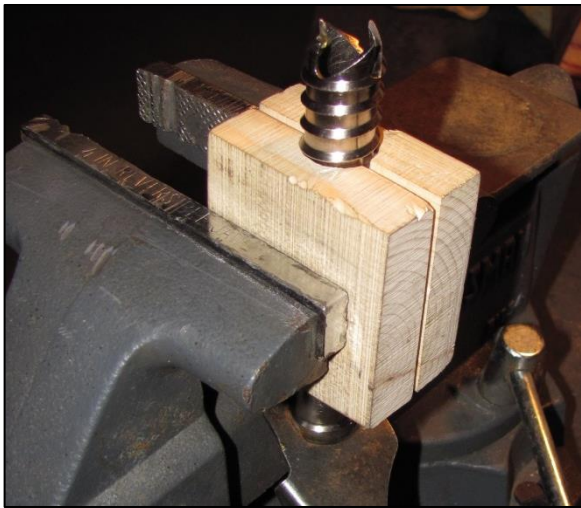


Small burrs can be smoothed out with a file without removing too much material. Large burrs and damaged teeth require that all of the teeth be dressed such that they are sharp and level with each other. Use a wire brush to clean off any rust.



TOOLS REQUIRED:

- Vise
- Ice screw holding block. Do not clamp the ice screw directly in the vise since this may crush the tube.
- Flat file with fine cutting teeth.
Grind sides to leave a smooth rounded “safe” edge.
McMaster Carr item #4254A8 (small file)
<https://www.mcmaster.com/#4254a8/=1dew661>
McMaster-Carr item # 42405A45 (large file)
<https://www.mcmaster.com/#42405a45/=1dew69u>
- 1/8” round file.
McMaster-Carr item #4246A8
<https://www.mcmaster.com/#4246a8/=1dew6be>
- Small tapered half-round file. Needle file works the best.
McMaster-Carr item #4261A32
<https://www.mcmaster.com/#4261a32/=1dew6ki>
- Fine wire brush.
- Something to measure with (6” machinist scale works great).



HOLDING THE SCREW:

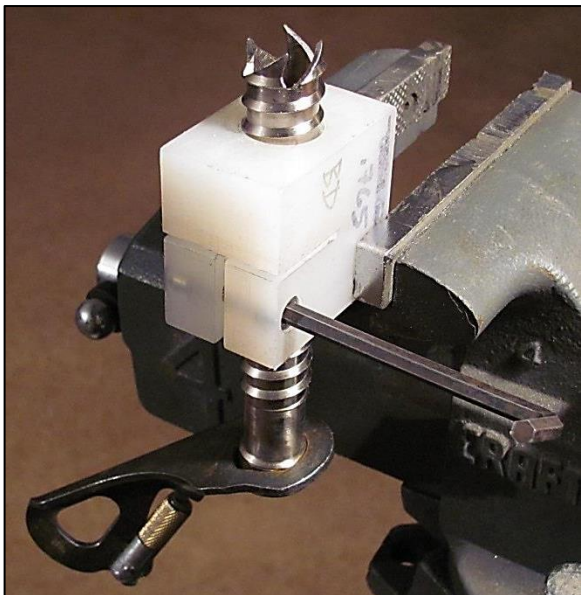
The simplest way to secure the ice screw in a vise is with a block made from a piece of wood.

Drill a $\varnothing.750$ " hole through a piece of wood and then cut along the length of the hole to create a "clamshell" type holding block.

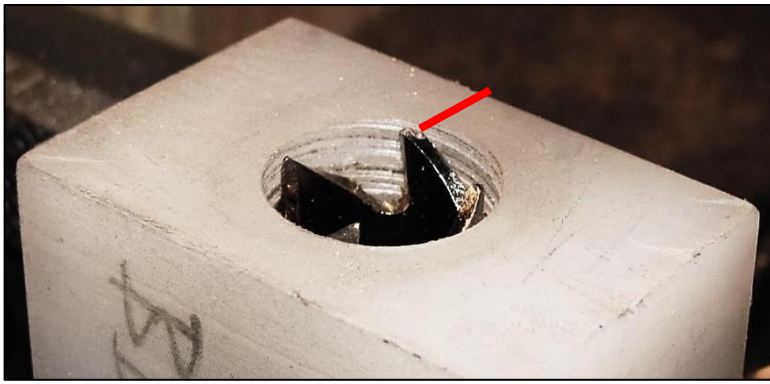
The clamping force from the vise holds the screw in place.



Another option is to make a block from a piece of plastic with a pinch bolt for securing the screw.



The advantage of this method is that the block can remain clamped in the vise while the screw is repositioned by tightening/loosening the pinch bolt.



LEVELING THE TEETH:

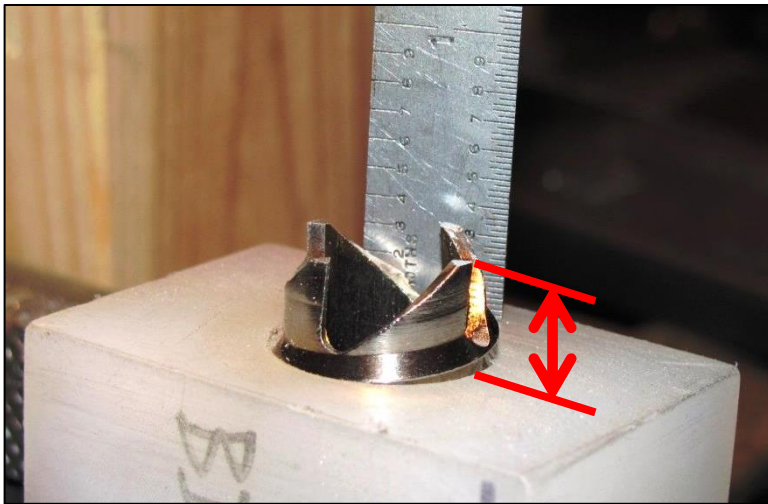
Place the screw in a holding block such that the shortest tooth just protrudes above the surface.



File all teeth down level with the surface of the block (use the fine side of the file).



The teeth should now all be at the same level with small flat spots on the top.

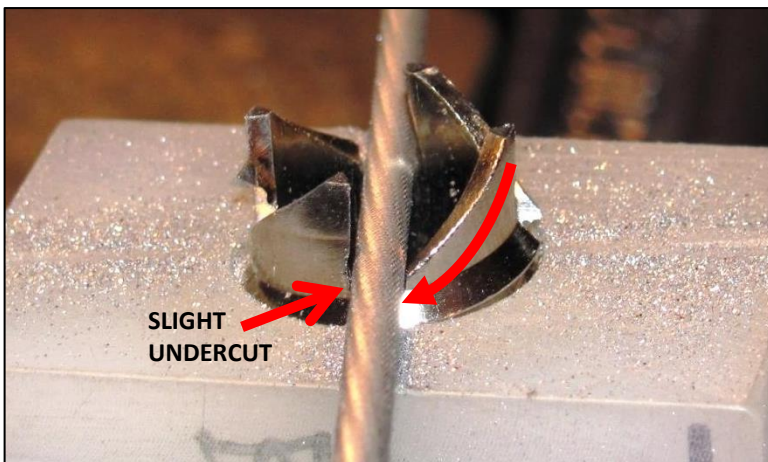


ESTABLISHING TOOTH HEIGHT:

Once all teeth have been filed to the same level, raise the screw in the holding block to a height of about 3/8".



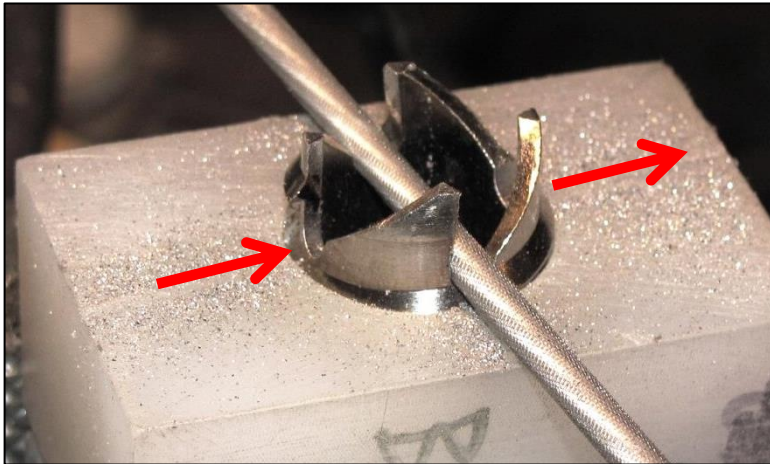
Using a 1/8" round file cut down the root of the tooth (bottom of the "V" between the teeth).



Do not cut straight down but instead follow the contour of the tooth, slightly undercutting the next tooth.



Run the file straight through to the root on the other side.



Take the root right down level with the top of the holding block.

Repeat in the perpendicular direction.

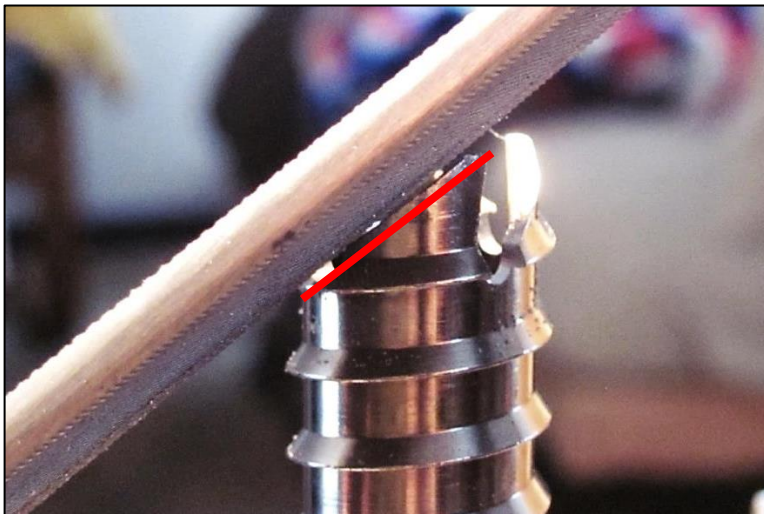


When finished the teeth should all be uniform and at 90° to each other.



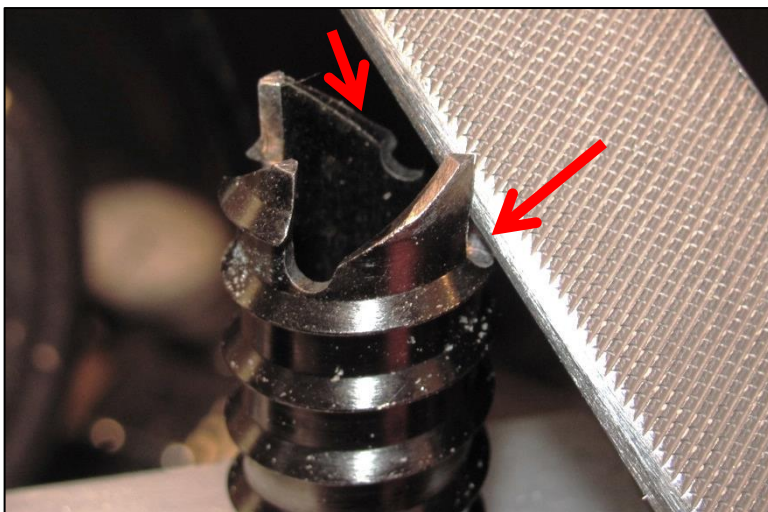
SHAPING THE TEETH:

Raise the screw in the holding block enough to provide clearance for working on the teeth.



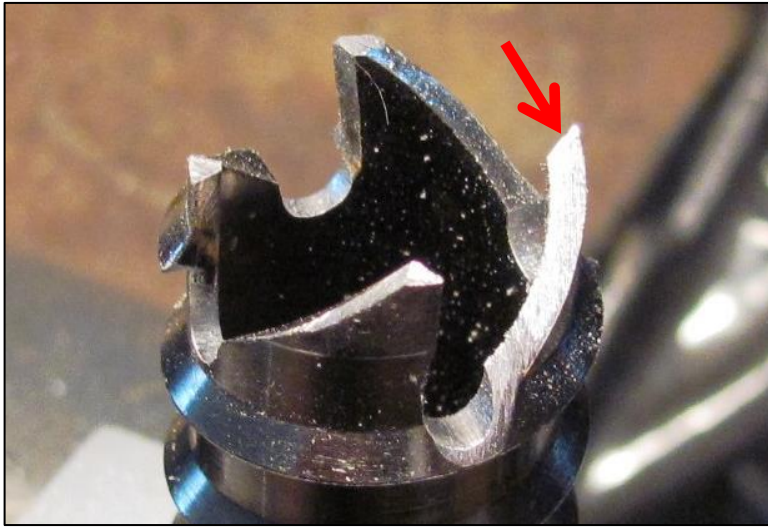
Using the fine side of the flat file cut down the angled top of the tooth. This is sometimes cut as a helix from the factory depending on the brand of ice screw. Cutting this with a file will make it planar.

The angle should be about 45°.

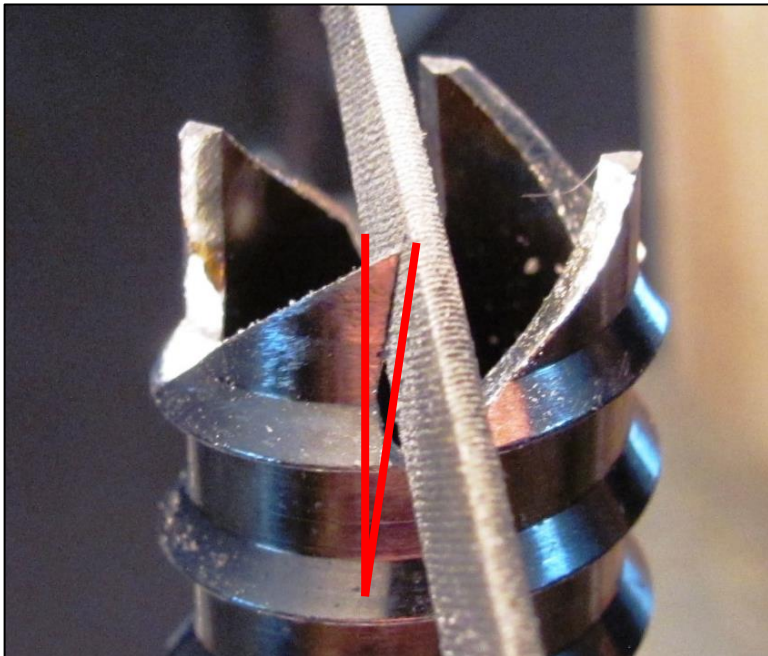


Position the file so the smooth edge rests in the root of the tooth being careful not to cut the next tooth.

The rounded “safe” edge of the file prevents cutting away material from the leading edge of the next tooth.

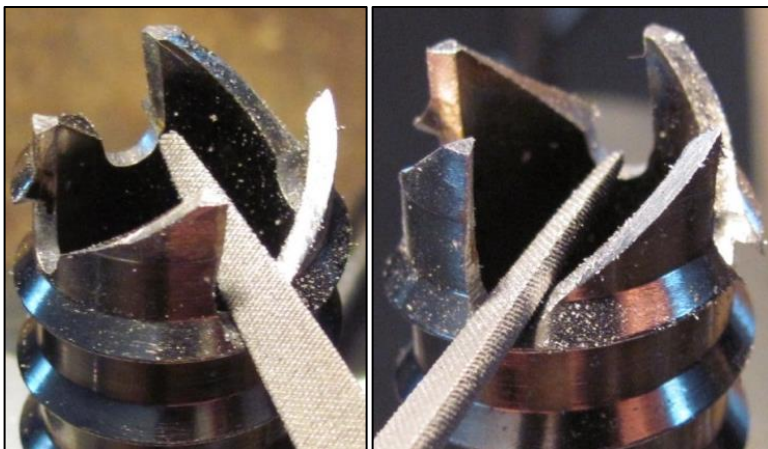


File down until the flat spot is gone and a new edge is formed on the leading side of the tooth.



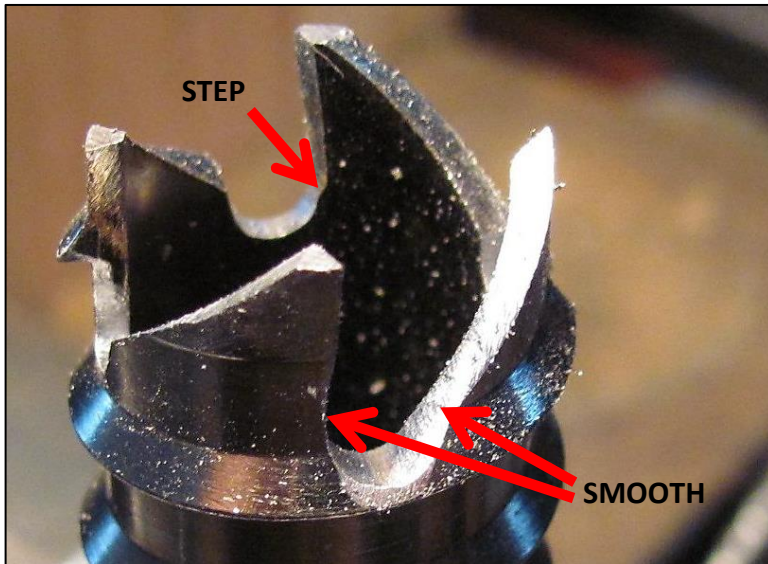
Use the flat side of the small half-round file to back-cut the leading edge of the tooth.

There should be a slight relief angle to this cut.

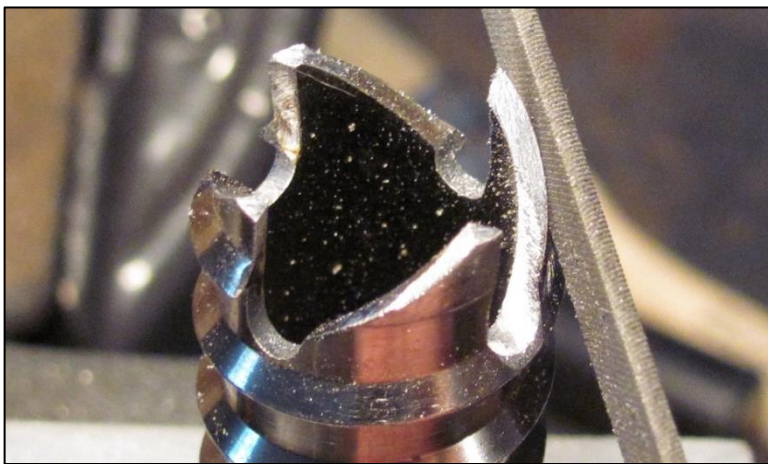


Using the small half-round file blend the root with the top surface of the tooth.

Also blend the root with the leading edge of the next tooth.



When finished blending, the top of tooth should transition into the root without any steps.



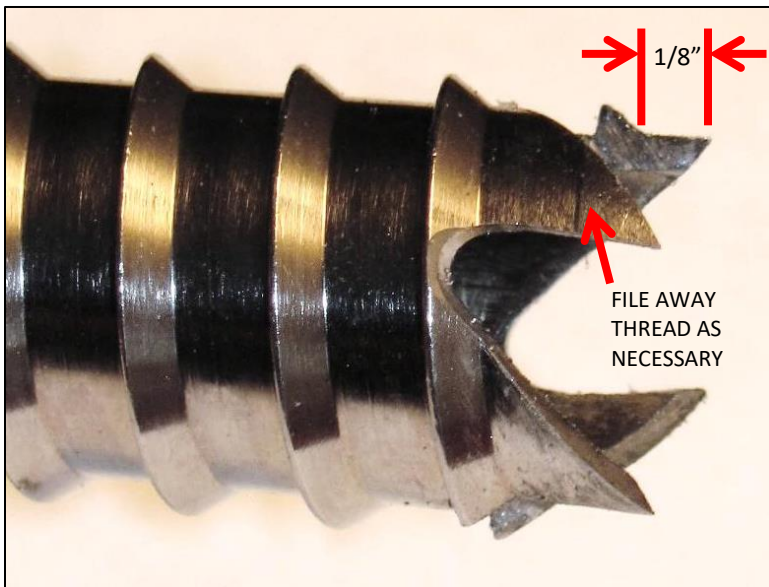
With the flat side of the file remove any burrs along the outer edge of the tooth.



Using the round side of the file remove any burrs along the inner edge of the tooth.

Repeat the process for each tooth.

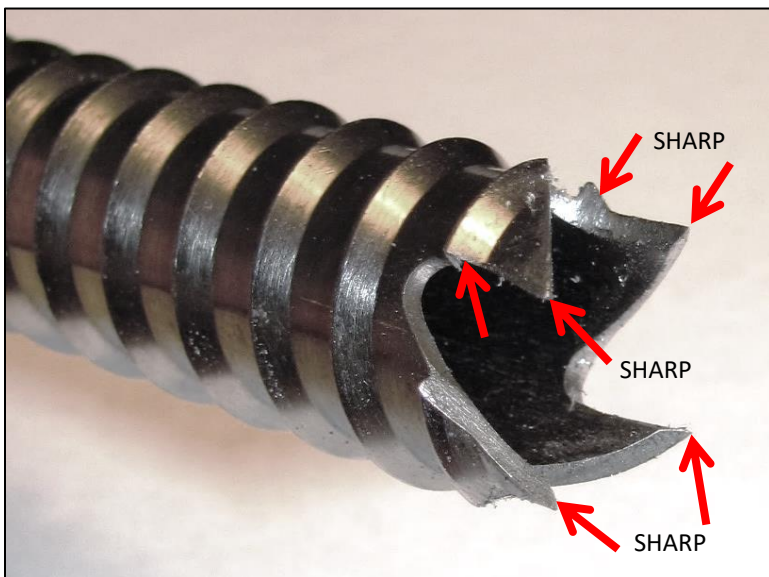
Use the fine wire brush to clean up any remaining burrs or rust.



FINISHING:

The thread should not start right at the point of the tooth; there should be at least 1/8" between them.

As the teeth are repeatedly sharpened the thread will get closer to the point of the tooth; a portion of the thread may be filed away smooth with the outside of the screw as necessary.



The thread should have a sharp leading edge along with the tip of each tooth.

When finished the teeth should be smooth, sharp, and uniform.

Spraying with WD-40 helps with rust prevention especially if the screws are going to be stored for a long time.

Rubber caps for protecting your screw:

McMaster-Carr item# 9753K82

<https://www.mcmaster.com/#9753k82/=1dew6qw>

Any questions or comments please email: mike@clideadv.com