Great Falls Woodturners Newsletter

www.gfturners.org

Volume 8, Number 4 January 2017

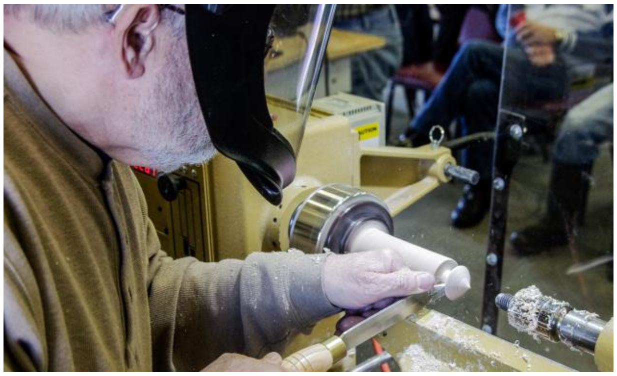
The following Demo Dates are still unfilled and are available for you:

March 7
May 20
June 6
July 15

Club Demonstrations

Turn a Top – Dec 17

On Saturday Dec 17 a few of the club members got together for a little fun turning tops. It was a get together to have a little fun turning and decorating tops and then seeing if and how long they would spin.



We also had some egg nog, hot chocolate, and cookies in the spirit of the season.

Thank you to those who took the time to share a few laughs and comradery.

Tom Krajacich – Jan 3rd

Making a Segmenting Wedgie Sled

NOTE: At the end of this article there will be the web site for the Jerry Bennett Segmentology video conducted by Dave Mueller that will give precise and detailed instructions on making a wedgie sled. It follows the steps that Tom used in his presentation.

On Tuesday, Jan 3rd **Tom Krajacich** gave us an EXCELLENT demonstration on making a wedgie sled. Tom was not feeling good and has been 'under the weather' for some time, but he persevered and took us through the steps to make our 'segmenting life' so much easier.

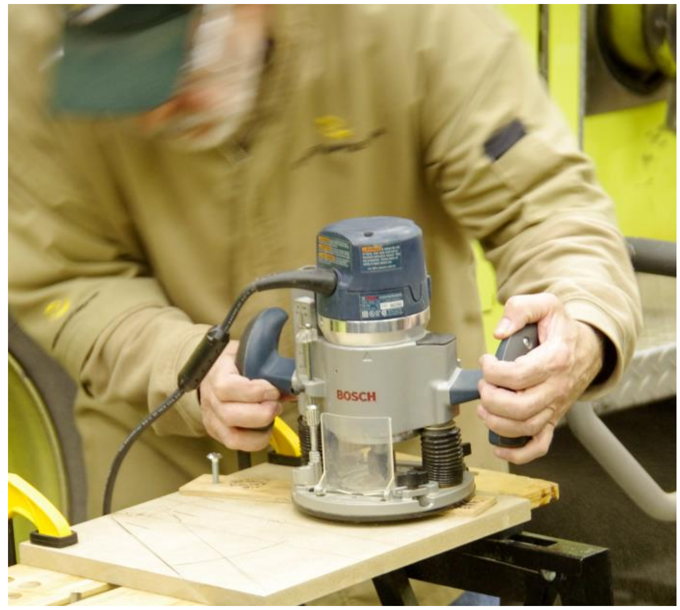
He started out the presentation discussing the advantages of having a sled compared to making segmenting pieces without a sled. Without the sled it is more time consuming, less accurate and possibly less safe than using a sled.

He discussed the necessary materials used to make a sled: MDF (or a material of your choosing), star knobs, washers, carriage bolts, a finish of your choice should you decide to finish the sled.

Then he discussed the equipment necessary to create the pieces of the sled: Table saw, plunge router, ¼" router bit and a 5/8" router bit and the usual drill press, power drill, etc.

Since cutting the necessary pieces are very basic, he had the 12" x 14" and two 2" x 12" pieces of ¾" MDF pieces pre-cut and the 2 x 12 pattern piece of ¼" plywood. Also, he had drilled the required ¼" holes in the pieces since precision is necessary and must be drilled using a drill press. However, he discussed the measurements used in marking where the holes were drilled.

The he showed the process of marking the slots to be routered which will allow the arms to be moved to accommodate the wedgie plates.

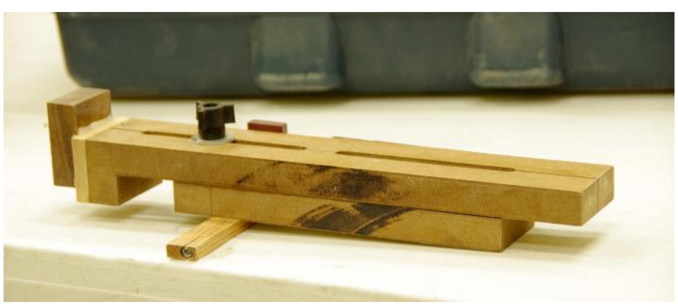


Once all of the necessary markings were completed, he attached the pattern plywood piece to the router with double sided tape. He then routed the ¼" slot for both arms. He took care to mark the arm swing on both sides so he did not route past the swing slot. After both slots were completed, he then used a 5/8" router bit and completed the recess to accommodate the carriage bolt heads so they were recessed on the bottom of the sled to allow free movement of the sled.

Now that the basic sled was complete, he attached the triangular knobs used to hold the arms in place.

Then came the mounting of the slot guide that fit in the slots on the table saw. Tom showed the process of mounting the piece to the sled using the table saw fence and adjusting it to approximately 1/16" past the saw blade. This will allow truing the edge of the sled. He used double sided tape to attached the slot guide and then used five screws that were countersinked.

The final step in construction was to make a kerf in the slot guide, drill a ¼" hole and install a screw in each end to provide for adjusting the slot guide to eliminate any movement of the wedgie sled which will affect the precise cutting of the segmenting pieces.



When all of that was accomplished, he called on Bob Sobolik to make the truing cut. The sled created during this demonstration will be used on Jan 21st to cut segmenting pieces.

This was one of the best demonstrations that we have had in the club. Kudos to Tom Krajacich for all the work involved in this demonstration. We thank you very much!

This site takes you out to the Jerry Bennet Segmentology Site where there are four videos:

https://www.youtube.com/results?search_query=jerry+bennett

This site take you directly to the video where Dave Mueller makes the Wedgie Sled:

https://www.youtube.com/watch?v=hpFNE1CHsc4

Thank You

Take 'n Turn

Take and Turn returns in February

Tips

Not a member of the American Association of Woodturners? You are missing the opportunity to get a great access to a myriad of woodturning information, videos, experiences of great woodturners. You can have a limited access to these resources by going to the following site and sign up as a Guest Member. It doesn't cost you anything to sign up as a Guest Member. Give it a try…..

http://www.woodturner.org/page/GuestMemberLanding

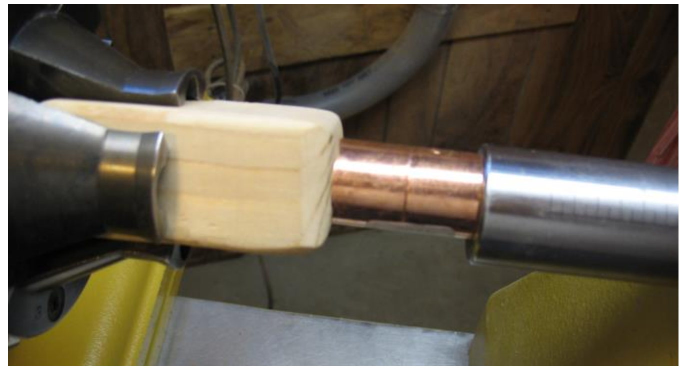
Tips From The Past

Shop Tip – Sam Sampedro

Making Ferrules for Tool Handles

Several times I have made turning tools and needed to make ferrules for the handles. I would purchase 1" copper couplers at a hardware and then had to cut them in half. I struggled cutting them in half due to being able to hold them without damaging or changing the perfect circle they were in.

It finally came to me how to use my lathe to hold the copper coupler. Take a piece of scrap wood and put it in the jaws of your chuck. Place the ferrule on the piece of scrap and move the tailstock close and move the quill snug against the copper coupler.



It will be held firmly so you can use the pipe cutter to split the coupler without any damage.

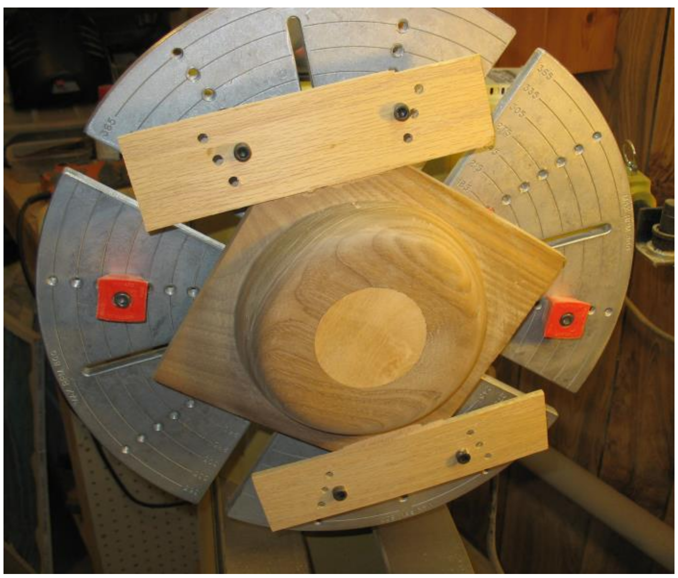
Shop Tip – Sam Sampedro

The other day I was turning a square bowl and I had a sudden design change (yup, I created a funnel). I had to remove the internal dovetail and replace the hole with a plug so I could turn it. My dilemma was: how was I going to put the bowl back on the lathe with it being centered and secured for truing and turning the plug? The answer came in the form of my bowl jaws used to finish the bottom of my turnings.

I installed the bowl jaws and used the grips to center the bowl for turning. I then got two strips of ¼ inch plywood and drilled holes in each one by matching them with the screw holes that are used to adjust the diameter of the holders for the bowl size.

I then used the strips of plywood to secure the bowl with 2 ½ inch 6 mm Allen screws

(which match the Vicmarc bowl jaws holes) on two points of the bowl.



Once I had turned and sanded the bottom of the bowl, I reversed the bowl and turned the inside.

This method held the bowl more securely and safely than trying to use tape or some other means to secure it.

Club's Appreciation

Editor's Comment: My thanks to the following individuals who helped with the content of this newsletter:

Club Officers

President: Sam Sampedro
761-4145

Vice President: Roger Wayman
460-0507

Treasurer: Chuck Kuether
727-2442

Secretary: Dirk Johnson
899-0726

Directors:

Tom Krajacich
727-3464

Wayne Petrini
868-8420

Paul Snyder
750-1999

Meeting Location:

Great Falls Fire Training Station
1900 9th Ave South
Great Falls, MT 59405

Meeting Day

First Tuesday of the Month and
Third Saturday of the Month
(Unless otherwise noted in
The club schedule)

Meeting Time

Tuesdays: 6:30 PM
Saturdays: 12:30 PM

Instant Gallery Photos

(Great Photos by Paul Snyder and Sam Sampedro)

Chris Johnson (Bottle Stopper and Gear Shift)

Chris Johnson

Chris Johnson

Ken Quaschnik

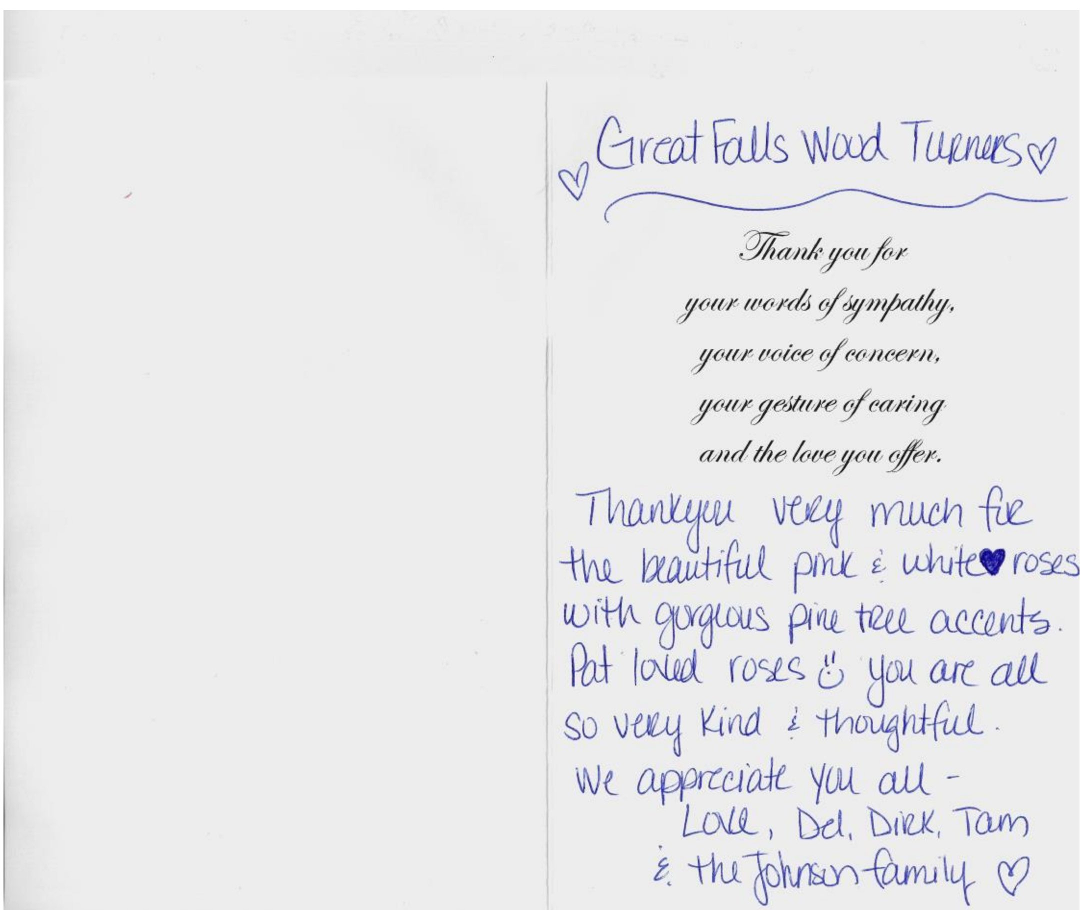
Paul Snyder

Darrell Young

Darrell Young

Quentin Kubas

The following card is from The Johnson Family on the Flowers The club sent to Pat Johson's Funeral



Great Falls Wood Turners

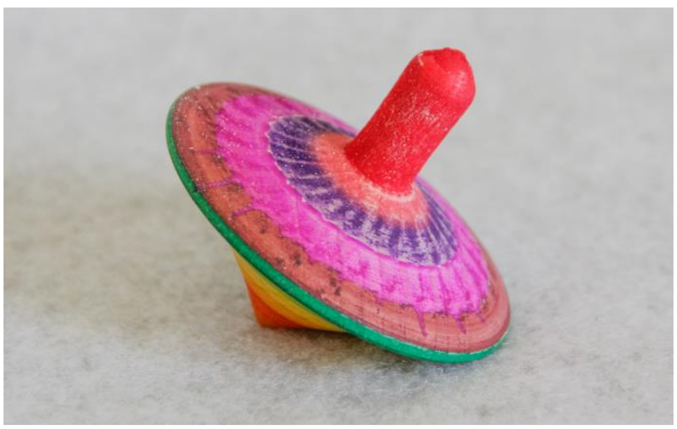
Thank you for
your words of sympathy,
your voice of concern,
your gesture of caring
and the love you offer.

Thankyou very much for the beautiful pink & white roses with gorgeous pine tree accents. Pat loved roses :) You are all so very kind & thoughtful.
We appreciate you all -
Love, Del, Dirk, Tam
& the Johnson family

Turn a Top Session


Darrell Young


David Stratton


Sam Sampedro


Jay Eklund


Dave Stratton


Kathy Stephens


Roger Wayman


Sam Sampedro

Great Falls Woodturners
Meetings/Demonstations Schedule

January 21st	**Creating Rings for a Segmented Bowl – This is a No Charge Event**
February 7th	**Meeting and Demo – Dirk Johnson**
February 18th	**Sharpening Demo – Sam Sampedro & Chuck Kuether**
March 7th	**Meeting and Demo**
March 18th	**Tool Making Workshop – Make a Round Cutter EWT**
April 4th	**Meeting and Demo – The Team of Chuck Kuether and David Stratton**
April 15th	**Demo – Chris Johnson**
May 2nd	**Meeting and Demo – Jay Eklund**
May 20th	**Demo**
June 6th	**Meeting and Demo**
June 17th	**Demo – Ed Austin**
July 5th	**Meeting and Demo (This is a Wednesday since July 4th is on the first Tuesday)**
July 15th	**Demo**
August 1st	**Meeting (Club Elections) and Demo**
August 19th	**Demo**

Please Note: Tuesday Meetings start at 6:30 PM, Saturday Meetings start at 12:30 PM

Director's Meeting Schedule

January 18th	**6:30 PM**	**Sam's House**
February 15th	**6:30 PM**	**Sam's House**
March 15th	**6:30 PM**	**Sam's House**
April 19th	**6:30 PM**	**Sam's House**
May 17th	**6:30 PM**	**Sam's House**
June 21st	**6:30 PM**	**Sam's House**
July 19th	**6:30 PM**	**Sam's House**

Screw Chucks in Depth

Project: Make a screw chuck

Note: To view the graphics in full page size, hold down the control key and click on the picture.

A screw chuck, sometimes called a single-screw faceplate, doesn't get a lot of publicity but it's a very useful item. Many production turners use them when turning platters and small bowls because a workpiece can be mounted or removed quickly. For other turners, a screw chuck can sometimes provide a solution to a puzzling chucking situation.

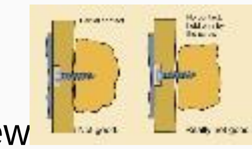
This article provides an in-depth description of a screw chuck and the features that make it work well, or not so well. Included at the end are instructions for making your own that will work just as well, if not better, than what you can purchase.

Overview

Screw chucks can be purchased that screw onto the headstock  spindle, but those available are typically 4” in diameter or smaller.

The most popular type is the screw insert that comes with almost every scroll chuck on the market. The screw mounts at the center of the chuck and the front of the jaws act as the bearing surface. The one manufactured by Oneway is called a *Woodworm.*

Shop-made screw chucks appear in many forms. They may be mounted on a faceplate, held by the jaws of a scroll chuck, or threaded directly onto the spindle. They range in size from very small, like 3/4” in diameter, to rather large, perhaps 8” in diameter. Small screw chucks are sometimes called “threaded mandrels” and are usually made for a specific application.

The *bearing surface* is the circular disk that surrounds the screw . It is important for the workpiece to seat firmly against this surface, for two reasons. One is to ensure that the workpiece will run true and the other is to provide a transfer of "power" from the screw chuck to the workpiece. The workpiece should have a flat surface to seat against the bearing surface.

The screw is typically rather large with deep-cut threads. The end may be pointed or flat. It is assumed that a pilot hole will be provided for the screw so a point is not essential.

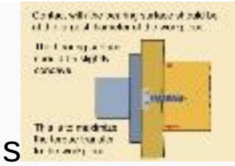
A screw chuck can often be used to advantage when the workpiece is not large enough to accommodate the screws of a faceplate or when the screw holes might penetrate an important feature of the piece. Otherwise, a faceplate gives a stronger hold and has a greater capability for transferring torque to the workpiece.

By snooping around the interweb, I've learned that many turners have had problems or at least limited success with screw chucks. My intent here is to present the basic principles involved so that the capabilities and limitations of a screw chuck can be better understood.

How it works.

It's obvious how it works! The screw holds the piece and the lathe makes it go around. What more is there? Well, quite a bit, actually.

For example, what supplies the torque (twisting force) to the workpiece? For the most part, it's not the screw. It's the frictional force between the workpiece and the bearing surface. All the screw does is to keep the piece centered and pull it against the bearing surface. The more tightly the screw holds the piece against the bearing surface, the greater the friction force will be.

The torque applied to the workpiece depends upon two things . One is the friction force; the other is the diameter of the contact area between the bearing surface and the workpiece. The larger the diameter, the greater the torque for a given frictional force. Because of this, a large-diameter bearing surface is more effective.

Another factor that comes into play is how smooth or slick the bearing surface is. If it is slick and highly polished, it will look good but will provide less frictional force than one with a rougher surface. Ugly and rough is better than slick and pretty.

One consequence of having a slick bearing surface is that the load on the screw will be greater. This is because the screw will have to pull the workpiece more tightly against the bearing surface in order to produce the friction force required to keep the workpiece spinning. At the limit, the wood surrounding the screw will give way. The piece will stop rotating and it may come off the lathe.

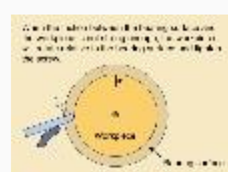
We can now see that the Woodworm type of screw chuck has two disadvantages. One is that the bearing surface (the front of the chuck jaws) has a relatively small diameter. The other is that the jaws are slick. This adds to the load on the screw. The reason the screw is so large, I think, is to compensate for the small-diameter and slick bearing surface. For the most part, however, they work quite well.

A shop-made screw chuck having a larger and rougher bearing surface does not need to have such a large screw.

In slow motion . . .

Suppose we mount a workpiece on a screw chuck and tighten it just enough to touch the bearing surface without being really tight. What will happen when we apply a turning tool to the piece and begin to make a cut?

Because there is very little friction force between the piece and the bearing surface, the screw chuck will not be able to supply the necessary torque to make the piece spin against the cutting edge. Therefore, the piece will lag behind and rotate backwards *relative to the bearing surface*.

This relative movement tightens the screw and pulls the piece more  tightly against the bearing surface. This increases the friction force. However, until the friction becomes strong enough to supply the required torque, the relative movement will continue and the screw will tighten even more.

At some point, the friction will reach a level that is able to supply the torque, and relative movement between the piece and the bearing surface will stop. At this point the two will rotate together as one unit, which is good.

If you take a heavier cut, the friction force may once again be inadequate and again the piece will move relative to the bearing surface. This tightens the screw even more, producing more friction until the two again rotate as one unit.

Now let's *pretend* we get a catch. The tool starts digging into the wood. More and more torque is required to turn the workpiece as the cut deepens. The workpiece moves relative to the bearing surface, the screw gets tighter and tighter until finally the wood surrounding the screw strips out. At this point, the piece will stop turning while the screw chuck still spins.

Will the piece come off the chuck? Not if we're using tailstock support! But we will have to repair the stripped-out threads before we can continue turning. Catches cause trouble and waste your time. I suggest you avoid them.

So what does this mean?

A piece mounted on a screw chuck will almost always tighten while being turned unless you put it on really tight at the beginning. Most of the time this is of no consequence and you don't even notice it until you go to remove the piece after the turning is done.
But if the wood is degraded, as is often the case when turning spalted wood, the screw threads may strip out at rather low levels of torque. It follows that with such wood you should take very light cuts so as not to overstress the wood surrounding the screw as it tightens.

When you use **tailstock support** and crank the live center against the piece, the pressure exerted by the live center presses the piece more tightly against the bearing surface. This increased pressure increases the friction force and makes the piece less likely to move. To put it differently, using tailstock support takes part of the load off the screw.

A screw chuck should not be used for an end-grain workpiece because screws do not hold very well in end-grain wood. The key to getting the maximum holding power from a screw in end grain is first to drill a pilot hole and then to not over tighten the screw. But with a screw chuck, we only have indirect control over how much the screw gets tightened, which it can do by itself without our being aware of it. So even though we do not over tighten initially, it may do so on its own.

Impact Forces

Suppose we mount a 5” square chunk of wood on a screw chuck and propose to make a square bowl or something similar out 

of it. We will be “turning a lot of air” out near the edge where the corners stick out. Each time the tool runs into a corner, it will make a small bump, an impact, as it enters the wood and begins cutting.

If the lathe is running at 1,000 RPM, which is not really fast for a piece this size, these bumps will occur at the rate of about 4,000 bumps per minute which is about 67 bumps every second.

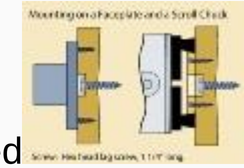
Now think about an air-driven impact wrench being used to tighten a lug nut on the wheel of a car. A lot of fairly small bumps will get the lug nut really tight, in fact, too tight in many cases.

The same thing happens with the square block of wood on the screw chuck. The impact forces will tighten the screw far beyond what you might at first think. And even if you don’t turn square bowls, the protruding corners of a rough-cut blank or the protruding portion of an out-of-round workpiece amounts to the same thing. The impact forces may over tighten the screw to the point where it strips out of the blank. The bottom line is that you should take very light cuts in such a situation.

This phenomenon is not limited to just a screw chuck. If you subject a workpiece mounted on a faceplate to heavy impact forces (hitting protruding corners or bumps on the workpiece), the piece can rotate relative to the faceplate and put the faceplate screws in a strain. In the worst case, the screws may break or pull out of the wood.

Always be careful to take light cuts and make progress slowly when having to deal with impact forces, whether with a screw chuck, a faceplate, or even a scroll chuck.

Construct a Shop-Made Screw Chuck

The first order of business is to decide how the screw chuck will be attached 

to the lathe. The best way is to use a small faceplate that you dedicate to this purpose. Second best is to mount it in the jaws of a scroll chuck.

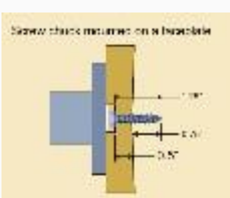
The next consideration is the material to be used for the disk that forms the bearing surface. A good grade plywood 3/4” thick will work, as will any good, sound hardwood. MDF (medium density fiberboard) can be used if the screw chuck is mounted on a faceplate, but do not use it for mounting in a scroll chuck because of its tendency to delaminate when under stress. The tenon may simply break off.

The diameter you choose for the bearing surface should be in line with the size of the workpieces you intend to turn. A diameter of 4” is the norm because the disk will then fit comfortably on a 3” faceplate and will be good for workpieces up to 6” or 8”. I see no advantage in making one with a diameter less than 3” unless it is to be used only on really small workpieces. If you anticipate turning plates or platters in the range of 12” in diameter, a bearing surface 6” in diameter may be a good choice.

The screw: my preference is to use a hex head lag screw 1/4” in diameter and 1.25” long, available at a big box store or any good hardware. This allows for an extension beyond the bearing surface of 3/4” while leaving 1/2” inside the disk.

Directions for making a screw chuck follow. Two separate procedures are given, one for a screw chuck mounted on a faceplate and another for a screw chuck that is mounted in a scroll chuck.

Screw Chuck Mounted on a Faceplate



1. Use a jigsaw or bandsaw to cut a disk to use for the bearing surface. Cut it to a diameter slightly larger than what you want the final dimension to be.

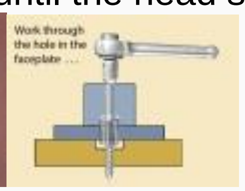
2. Drill a hole at the center of the disk 3/4” in diameter and 1/4” deep. This hole will allow the head of the lag screw to rest below the surface. Also, the hole is large enough to allow a socket wrench to be used to tighten the screw as described farther down. A Forstner or spade bit will give a hole with a flat bottom, which is desirable.

3. Draw a circle, centered on the hole, the same diameter as  the faceplate you are going to use. Install the faceplate inside this circle.

4. Screw the faceplate onto the headstock spindle. True up the edge of the disk. Make a small dimple at the center of the disk to help center the drill bit in the next step.

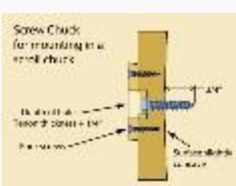
5. Install a Jacobs chuck in the tailstock. Use a 3/16” drill bit to drill a pilot hole for the screw all the way through the disk. Turn the face of the disk to slightly concave.

6. Remove the assembly from the lathe. Using a 7/16” socket wrench with an extension and working through the center hole of the faceplate, screw the lag screw into the hole until the head seats.



Skip down to “The final three steps” and continue with Step 7.

Screw Chuck that Mounts in a Scroll Chuck



1. Use a jigsaw or bandsaw to cut a disk from the material you are going to use for the bearing surface. Cut it to a diameter slightly larger than what you want the final dimension to be.

2. Cut out another disk whose diameter is just slightly larger than the tenon you will need in order to mount the screw chuck in your chuck jaws. Jam chuck this disk against the chuck jaws and true it up. Then drill holes for four screws for reinforcement. Use wood glue or epoxy with the screws to attach it to the larger disk.

3. Jam chuck the assembly against a flat plate. True up the smaller disk and form a tenon on it that will fit your chuck.

4. Working on the tenon side, use a drill press to drill a 3/4” hole to a depth such that the hole penetrates the larger disk 1/4”. That is, the depth of the hole should be the thickness of the tenon disk plus 1/4”. Use a Forstner or spade bit so the bottom of the hole will be flat.

5. Mount the piece in your scroll chuck. Make a small dimple at the center of the disk. Using a Jacobs chuck in the tailstock, drill a 3/16” pilot hole all the way through the

disk. Turn the face of the disk to slightly concave. Remove the assembly from the lathe. (See photo in Step 5 above.)

6. Using a 7/16” socket wrench, screw the lag screw into the hole until the head seats. Continue with step 7 below.

The final three steps:

7. Check the extension of the screw beyond the bearing surface. It should be about 3/4”. If it’s too little, remove the screw and drill the 3/4” hole slightly deeper. If it extends too far, put a washer under the head of the screw.

8. Put the assembly back on the lathe. Rotate the lathe spindle by hand and look for any runout of the tip of the screw. If the runout is noticeable, tap the tip of the screw

gently with a small hammer in an effort to reduce the runout. (It doesn't have to be perfect. Also, the screw threads can give the impression of runout even when there is none.)

9. Remove the assembly from the lathe. Cover the screw head with epoxy. Let the epoxy cure and your screw chuck will be ready to use.