

MANHOLE COVER BOX

With Pop-Up Lid

Keith Gotschall



AAW PRESENTS

Keith Gotschall will present this Manhole Cover Box project in an AAW Presents online demonstration, June 19. To register for this virtual, live, interactive demo, visit tiny.cc/AAWPresents or scan the QR code.



Inspiration!

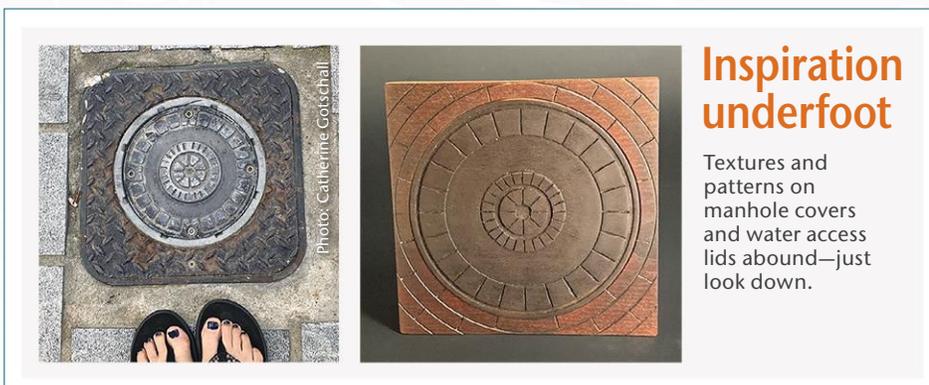
This story is as much about inspiration as it is about making a box. It's about that spark that turns into an idea that gets kicked around and eventually gets put out into the world.

When I attended the final Utah Woodturners Symposium in 2018, I

made sure to see Benoît Averly, who was a demonstrator that year. In one session, he offered a slideshow featuring textures. I have always applauded Benoît's way of showing slides—no more than about two seconds each—which keeps the audience focused. In this demo, he showed an amazing

array of images, all of textures and patterns, meant to inspire. One in particular was of a cast iron manhole cover, the image cropped square, with brickwork around the cast iron. *Bam!* I was hit with a desire to make a square box with a round lid, textured and colored to simulate cast iron, maybe even the brick. And before I knew it, Benoît moved to the next slide. I'm not sure how well I paid attention after that. It was one of those ideas that takes over once started.

When I returned home from the symposium, I started sketching what I was thinking about. At first, I hesitated to search for images of manhole covers, but to my surprise, there are many people in the world who take photos of manhole covers and share them online. I found all sorts of cast



Inspiration underfoot

Textures and patterns on manhole covers and water access lids abound—just look down.

Box blank prep



The author prepares box blanks by cutting squares on the table saw. Tilting the blade to 9 degrees creates an elegant bevel.



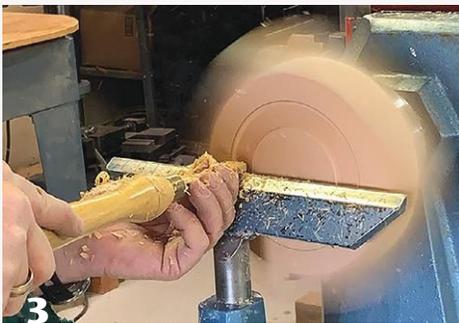
Predrill the blank so it can be threaded onto a screw chuck. The pilot hole doubles as a depth indicator for hollowing.

heavier base would also help in its dimensional stability; thin walls lead to distortion. Working the bottom face to completion and then remounting the box on a recess is a quick way of working, but useful also as a means of remounting the work for decorating. I needed the basic box to be simple, and therefore less expensive to make, so keeping the base flat and square would help. With this in mind, I sent my stock through the planer before cutting blanks to size.

I decided to use 8/4 cherry to make a 7¼" (18cm) square box. If you buy pre-surfaced stock, make sure the top and bottom are clean and parallel.

I also decided to cut the base of the box square on the table saw, and then angle the blade slightly (9 degrees) and run it through on all sides (*Photo 1*). The angled sides gave the box a simple bit of sophistication with little extra effort.

Turn box bottom



With the box mounted on a screw chuck, form a chucking recess in the bottom. Decorate and sand.



Turn a square box

My turning sequence was to first mount the square box so I could turn the bottom, then flip it around and hollow its interior. I decided to start with a screw chuck. The predrilled hole for the screw could also double as a depth indicator when hollowing (*Photo 2*). After planing, my 8/4 stock ended up 1¾" (4cm) thick, so accounting

Hollow the box



With the box now mounted on a chuck in expansion mode, mark and hollow the box. The author first uses a skew with the handle dropped low to make a peeling cut, then cleans up the surface with a gouge.

for a mounting recess $\frac{1}{8}$ " (3mm) deep, I drilled a screw chuck hole $1\frac{1}{4}$ " (32mm) deep. I used a brad-point bit, measuring to include the brad tip itself. This would leave $\frac{3}{8}$ " (10mm) of wood in the bottom, plenty of material to be sturdy, but not so much as to be overly heavy.

With the work mounted on the screw, I formed a recess in the bottom to match my large set of chuck jaws. My recess measured $4\frac{1}{4}$ " (11cm) diameter and just $\frac{1}{8}$ " deep; form a recess to accommodate your chuck jaws in expansion mode. I also turned some crisp beads and a shallow V cut inside the recess to add some simple decoration (*Photos 3, 4*).

After sanding the bottom completely, I took the box off the screw and flipped it around, expanding the chuck jaws into the recess. It held well, with no need to over-tighten. My plan was to hollow the interior but leave a "shelf" for the lid to sit on and a bit of material around the lid (as shown in *Figure 1*). This would leave a healthy wall thickness, even with the angled sides of the box. Use a pencil to mark the diameter of the box opening—in my case, $6\frac{1}{4}$ ", or 16cm (*Photo 5*).

To hollow the interior, I used a skew to make a peeling cut, but a bowl gouge or even a scraper can be used just as easily and will produce similar results (*Photos 6, 7*). Remove the waste wood down to your drill depth. I undercut the interior opening, but was careful not to overdo it. The peeling cut is efficient but doesn't leave a good finish on the endgrain, so a spindle gouge made quick work of cleaning up that area, leaving a clean cut all the way down to the corner.

The shelf, or ledge, that the lid sits upon is $\frac{5}{8}$ " (16mm) wide and $\frac{1}{4}$ " (6mm) deep. After forming this shelf, I needed to address how much "lift" the lid would have by angling the shelf surface slightly deeper at its outside

Form lid shelf



A recessed "shelf" allows the box lid to sit flush with the top. Angling the shelf downward at its outside edge allows the lid to be flipped up for removal.

Sand the box



The box's interior is sanded on the lathe; other areas are sanded at the workbench.

edge. The shelf is inset below the box surface by $\frac{1}{4}$ ", but the outside edge goes $\frac{3}{32}$ " (2mm) below that—just enough to allow the lid to tip up when its opposite side is pressed down (*Photos 8, 9*).

I then sanded the interior of the box (*Photo 10*). Slow the lathe speed down, use good sandpaper, and it won't take long. All of the interior was finish-sanded on the lathe. The sides, top, and bottom of the base were sanded on my workbench with a palm sander (*Photo 11*). ▶



Mounting Tip



When using a screw chuck, you can limit the depth of the screw into the workpiece by adding disk spacers—important when there isn't much material to waste.

I then sanded by hand to ease the edges.

Turn the lid

I used 6/4 (1½"-thick) cherry for the lid, as I had that material on hand, but 4/4 would work as well with less waste. Just be careful how you mount it on the lathe. I mounted the blank on a screw, using spacers to reduce the depth of the screw in the lid (*Photo 12*).

I turned the lid's outside diameter carefully, then formed the "step"

that would sit inside the opening in the base. This notch should be kept very square; undercutting the angle would counteract the tipping action we are trying to achieve. I measured and transferred dimensions from the base to the lid, which requires a somewhat loose fit (*Photos 13-15*).

Using a skew, I scraped a recess to accept my chuck jaws in expansion mode, ⅛" deep, in the middle of the lid. You could make a spigot here and tighten your chuck jaws onto it, but I prefer to expand into a recess so as to have wide stability and not crush the wood fibers. Decoration on the lid's underside is optional; I added a few beads within the recess (*Photo 16*). As you consider decorating the underside of the lid, remember you are shooting for about ½" (13mm) total lid thickness.

Sand the underside of the lid completely, then flip the lid around, expanding the jaws carefully into the recess. Now reduce the thickness of the lid so it will sit flush in the box base. Sand the top of the lid (*Photos 17, 18*).

Remove the lid from the chuck and test its flip-up action in the box. Pushing on the outside edge of

the lid should kick it up a good ¾" (19mm), allowing you to grab it. If the lid is rubbing the base anywhere, re-mount it on the lathe and adjust to a looser fit.

Decoration

With the basic box and lid completed, you can add some decoration quickly on the lathe. Grooves, beads, or bands can be formed on both the lid and box. I almost always include a shallow groove at the outer edge of the top, which helps disguise any tolerance changes in the lid. But go easy here—even small accents make a big impact visually.

Stop the lathe and use its indexing head to lay out any radial lines you might want to use as carving guidelines. I made a simple shaft to fit in my banjo and a wood cross-piece to aid in drawing straight lines. I normally draw in all the lines, hitting every division that is included on my lathe's dividing plate—in my case, that is twenty-four divisions (*Photo 19*).

Another method of decoration is to drill shallow holes in the lid, some of which can run off the edge. I made a jig to hold the lid during drilling (*Photo 20*). Clamp

Transfer dimension, turn lid



With the lid mounted on a screw chuck, transfer critical dimensions from the box. Turn a "step" in the lid to fit into the box.

Decorate inside lid



16

The author forms a chucking recess and adds beads to decorate the inside of the box lid.

Turn and sand top of lid



17

With the lid now mounted in a chuck in expansion mode, the author turns and sands the top of the lid.



18

or block the jig in place, then spin the lid to shift to different positions.

Creative embellishment is up to you. I use all manner of colorants, carving, and burning (*Photo 21*), often making the lid a different color than the box. After adding decorative elements, I usually finish the boxes with a few coats of tung oil.

Some who have never seen this type of box may be stumped as to how it opens, but once the trick

is shown, it quickly becomes a favorite secret to share. ■

Keith Gotschall, a full-time turner and furniture maker, is a frequent demonstrator and teacher of traditional turning techniques. He lives in the mountains of Colorado with his wife Catherine and a very bad dog named Roscoe. For more, visit keithgotschall.com.



Embellish lid



19



20



21

(19) The lathe's indexing head allows for evenly spaced segments to be drawn on the manhole box lid—perfect guidelines for painting, carving, or burning decorative elements.

(20) The author created a jig for holding the box lid to drill shallow holes in it—a piece of scrap squared and recessed to accept the box lid. Simply spin the lid to a new drilling location.

(21) Pyrography is a great choice for embellishing a manhole box lid.