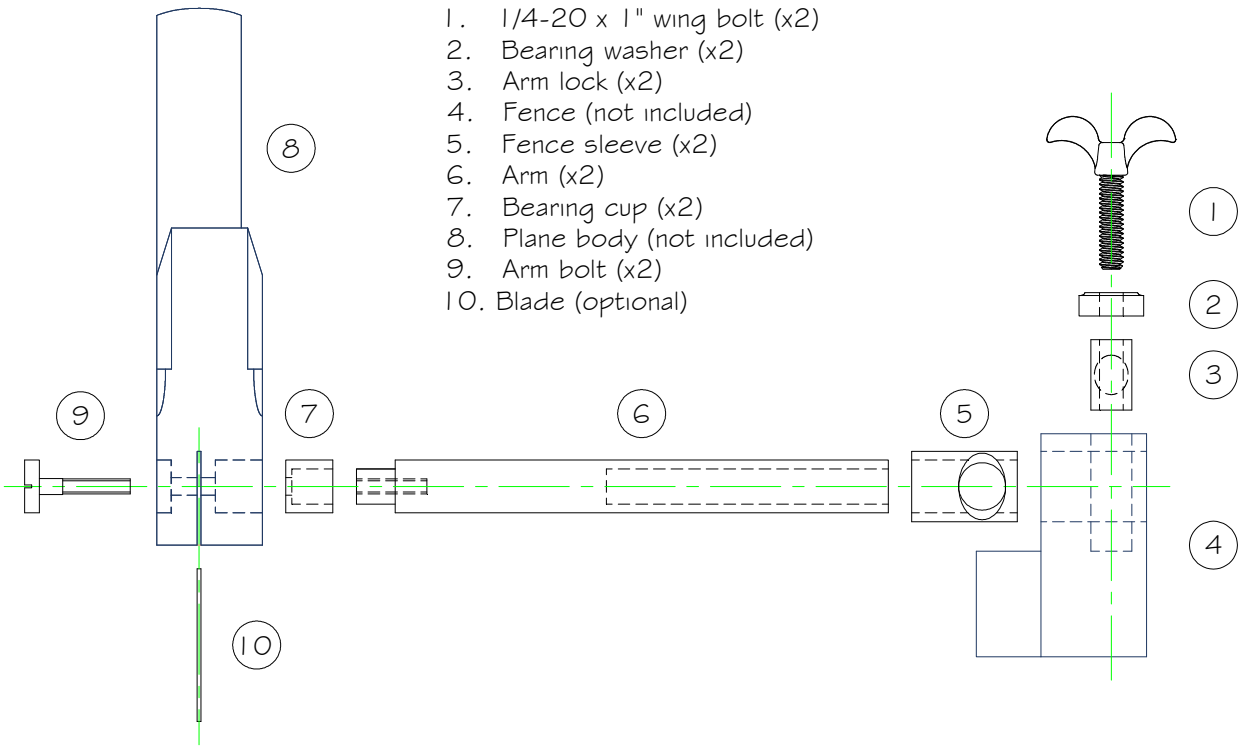
BLACKBURN

SIMPLY CLASSIC

Fence Hardware Instructions (Right-Handed Version)



MADE IN THE USA

Revised 7 February 2016

Blackburn Tools ♦ PO Box 263 ♦ Unionville, PA 19375 ♦ 610.470.3160
BlackburnTools.com

Right-handed Fence Instructions

Required tools and tooling[1]:

- Drill press.
- Good quality 3/16" brad point bit, regular length (Fuller part no. 25100187), available at WoodShopBits.com.
- Good quality 7/16" brad point bit, short length (Fuller part no. 25000437), available at WoodShopBits.com.
- 9/16" piloted counterbore, with 3/16" pilot[3] (McMaster part nos. 3102A22 and 3103A18, respectively) **OR** a 9/16" Forstner bit[4] (Lee Valley part no. 06J71.09).
- 3/4" piloted counterbore, with 3/16" pilot[3] (McMaster part nos. 3102A28 and 3103A64, respectively) **OR** a 3/4" Forstner bit[4] (Lee Valley part no. 06J71.12).
- Epoxy - I use LocTite five minute epoxy, available at most hardware or big box stores
- Drill press fixture (detailed below).

[1]The recommend tools are provided as a convenience and for reference. Other quality brands can be substituted.

[2]A short length 7/16" brad point bit is required so that it can be interchanged with the 3/4" counterbore or Forstner bit without moving the drill press table.

[3] Only one pilot is required; it can be switched between the 9/16" and 3/4" counterbores as needed.

[4] If you use Forstner bits, they must be close in length to the 3/16" and 7/16" brad point bits so that they can be interchanged without moving the drill press table.

The success of this build depends on the precision and accuracy of your construction. Good bits cut more precise holes, improving your odds of success. Counterbores cut more precisely and cleanly than other bits, but their main advantage lies in the ease with which they bore concentric holes. With a little extra care, serviceable results can be obtained with good Forstner bits.

Before drilling your plane or fence, experiment with your bits. Make sure they drill cleanly and accurately, and find which speed works best.

The fence relies entirely on close tolerances of the components and on the precision of its construction. In short, each set of holes in the plane and fence MUST be coaxial, and these two sets must be parallel to each other. Neither the distances between the sets of holes nor the hole depths are critical.

With a methodical approach and a few simple techniques, this project can be successfully completed with just a drill press and good tooling. No precision measuring instruments or expensive fixtures are needed.

Wood selection: Due to the precise nature of this hardware, stock selection is important. Any warping or twisting of the plane body may result in the fence binding.

Use only straight-grained hardwoods that are well-dried. Either air-dried or kiln-dried woods will work.

Modification of parts: If desired or needed, you can shorten the fence arms (cut **only** the end away from the plane body), the fastening bolts, and the fence sleeves (deburr the inside edge after doing this). If rust appears on any of the parts, use 0000 steel wool to remove it.

NEVER cut, abrade, sand, or otherwise modify the mating surfaces of the bearing cup and the fence arms. These have been precisely machined, and any material removed from them will ruin that.

Drill press fixture: The base is made from a scrap of plywood or MDF about 6-10" wide and 12"-18" long. Fasten a straight strip of wood parallel to the long edge of this base. The strip should be about 3/4" tall. Fasten a short strip of wood at a right angle to the first. This strip should also be about 3/4" tall. See Figure 1 below.

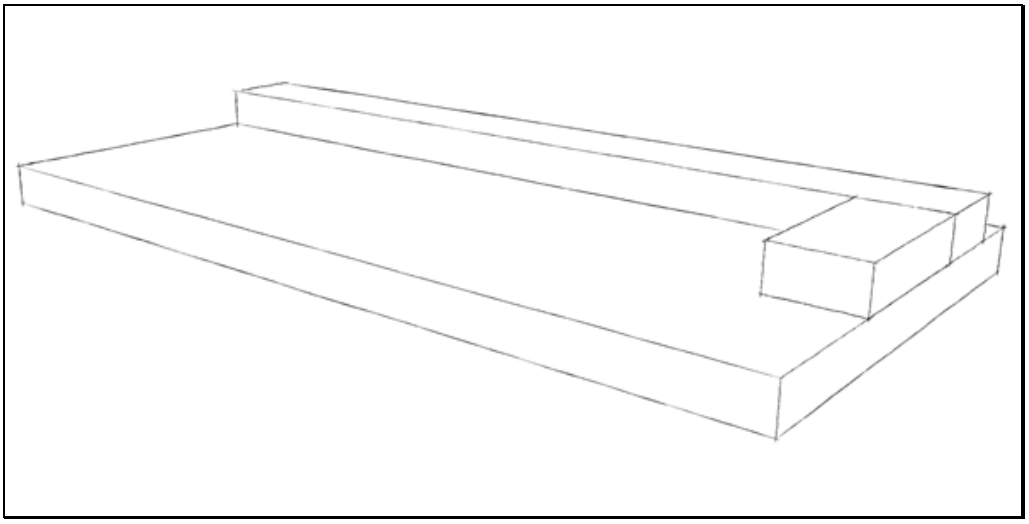


Figure 1. Drill press fixture for drilling saw-plane fence.

Fence Installation

1. **Prepare the saw-plane and fence:** Your plane and fence should be substantially done, with just a light sanding or planing needed to clean them up after construction is completed. Let the parts acclimate for a while to make sure there are no residual stresses left in the wood.

If you are using this fence on a saw-plane, the saw blade must be parallel to both sides of the body.

The front edge of the plane fence is also a reference surface, so make sure that it is square to both the bottom and side of the fence.

2. **Locate arm position:** Lay out the location of the fence arms on either the plane or the fence. The location of the arms is not overly critical. Keep in mind that the further they are from each other, the more stable the fence will be. My design places them five inches from each other; don't put them much closer than that.

3. **Drill the pilot hole:** Clamp the plane and fence together in their desired position. then use the 3/16" brad point bit to drill through the fence and the plane body. This is a deep hole, so clear the chips frequently and don't push the bit too hard. Everything is built around these holes, so they need to be as true as possible.

4. **Counterbore for the bearing cups (with counterbore):** Place the plane body on the drill press table, fence side up. With the 9/16" piloted counterbore in the chuck, align one of the 3/16" holes with the counterbore pilot. There should be no need to clamp the work to the table, but do so if makes you more comfortable. Counterbore to a depth of 1/2", then repeat with the other hole.

4A. **Counterbore for the bearing cups (with Forstner bit):** Leave the 3/16" brad point bit in the drill press. With the plane body loose on the table, lower the drill bit until it is in one of the holes drilled in step 4. Leaving the bit in the body, clamp the body to the table. Raise the bit from the wood, and without moving the drill press table, replace it with a 9/16" Forstner bit. If the plane body has not moved, the bit will be centered on the 3/16" hole. Use the Forstner bit to drill the hole to a depth of 1/2".

Notes for 4 and 4A: When you are counterboring these holes, the depth is not critical. You can use the depth stop on your drill press, a depth stop collar, or a piece of tape on the shank. It is better to go a touch deep so that the bearing cup ends up below the surface of the plane body. If you leave the cup proud of the surface, you need to take great care to not sand or plane the face of the cup. **This mating surface must not be altered.**

5. **Counterbore for the arm bolts:** Flip the plane body over, and repeat step 4 or 4A, but drill only to a depth of 5/32". Depth is not critical for these holes. Unlike the bearing cups, the heads of these bolts can be sanded without consequence.

6. **Drill for the fence sleeve (with counterbore):** Place the fence on the drill press fixture, with the front and top edges against the fixture fences. With the 3/4" piloted counterbore in the chuck, align one of the 3/16" holes with the counterbore pilot. Clamp the drill press fixture to the table, making sure that the edges of the plane fences are seated firmly against the fixture fences. There should be no need to clamp the work to the fixture, but do so if that makes you more comfortable. Bore entirely through the fence. **Do not remove the fixture yet.** See Figure 2 on the next page.

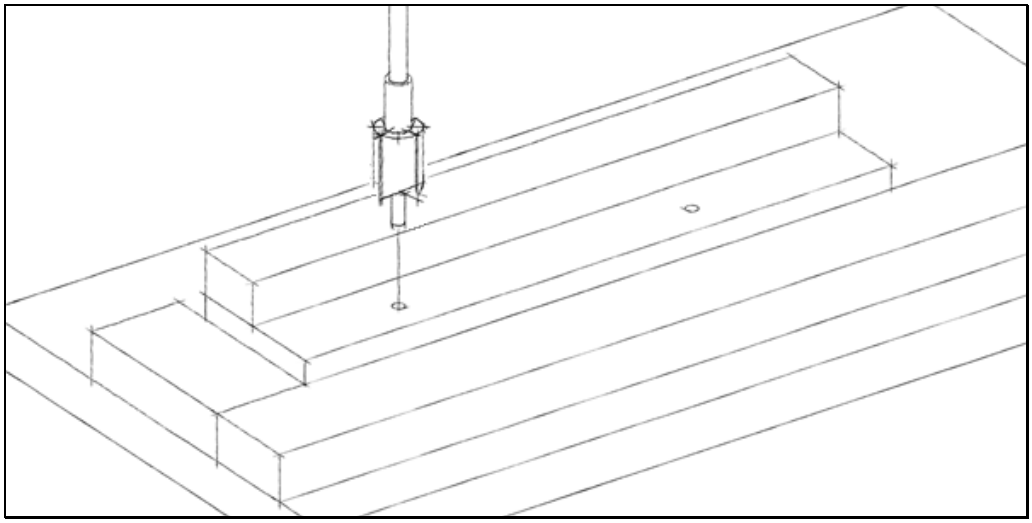


Figure 2. Drill the fence sleeve with a piloted counterbore.

6A. **Drill for the fence sleeve (with Forstner bit):** Leave the 3/16" brad point bit in the drill press. With the plane body loose on the table, lower the drill bit until it is in one of the holes drilled in step 4. Leave the bit in the body, and clamp the fence to the table. Raise the bit from the wood, and without moving the drill press table, replace it with a 3/4" Forstner bit. If the plane body has not moved, it will be centered on the 3/16" hole. Use the Forstner bit to drill through the fence. **Do not move the fixture yet.** See Figures 3 (below) and 4 (next page).

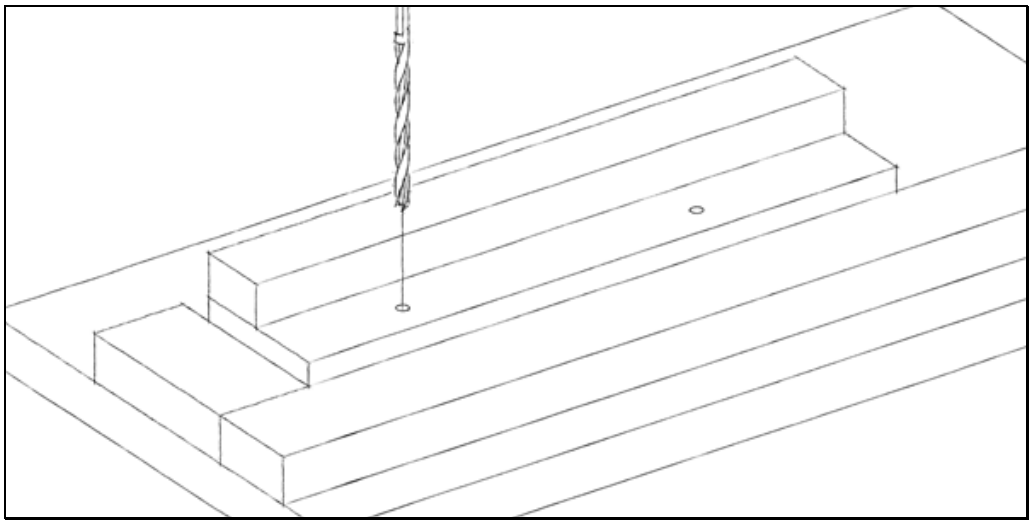


Figure 3. If using a Forstner bit to drill the fence sleeve holes, first locate the center of the pilot hole.

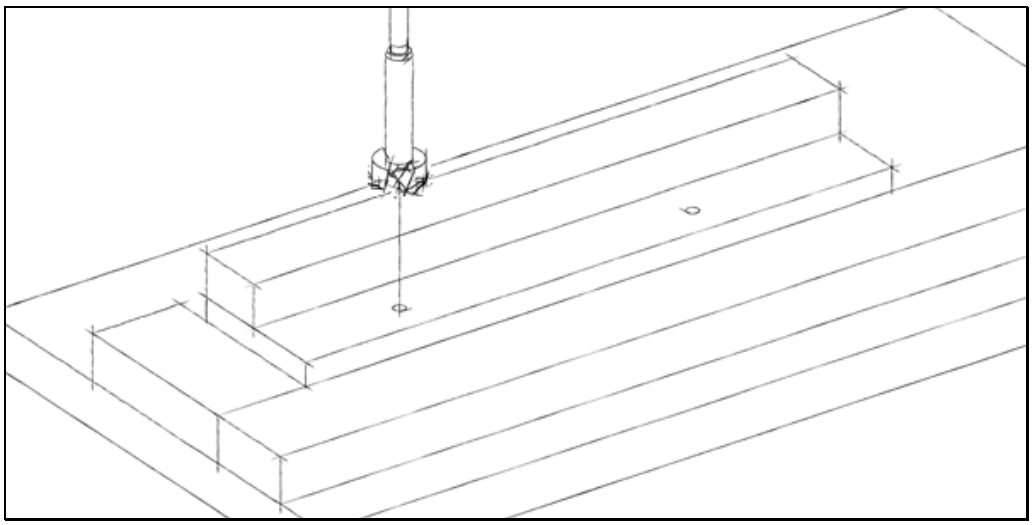


Figure 4. Drill the fence sleeve hole with the Forstner bit.

7. **Drill for the arm lock:** These holes are perpendicular to the fence sleeve holes (step 6 or 6A), but offset from them by 13/32". Rather than measuring this offset, it is easier and better to use a 13/32" shim to shift the work. There are two 13/32" (and two 3/16") ball bearings included for this.

Position the saw-plane fence so that the top edge is up. Place the 13/32" ball bearings between the front edge of the saw-plane fence and the fixture fence. Place the two 3/16" ball bearings between the face of the saw-plane fence and the fixture fence. See Figure 5 below.

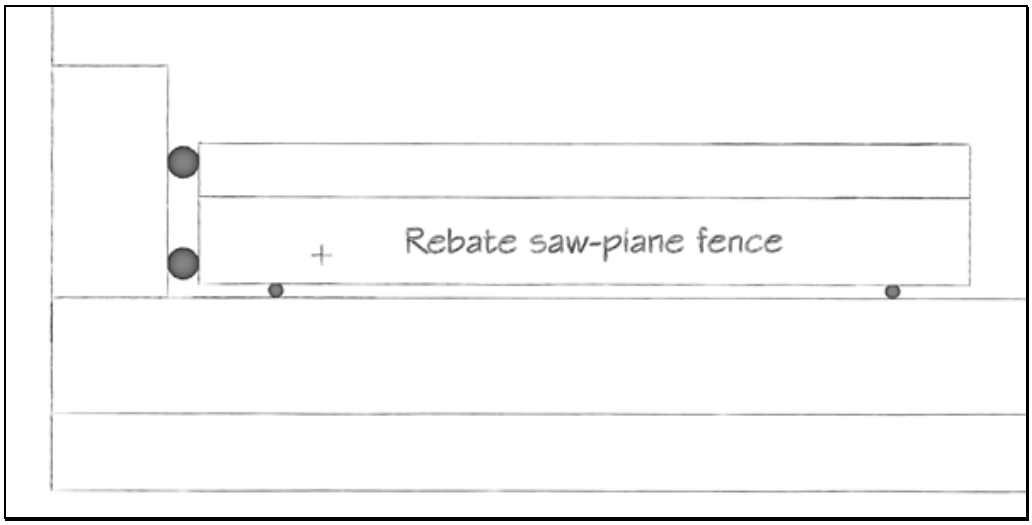


Figure 5. Place the 13/32" ball bearings between the end of the saw-plane fence and the fixture fence. The 3/16" ball bearings go between the face of the saw-plane fence and the other fixture fence.

Without moving the drill press table, replace the counterbore or Forstner bit with the 7/16" brad point bit and drill to a depth of 1 1/4". This hole will partially intersect the fence sleeve hole, so don't be alarmed when that happens. See Figure 6 below.

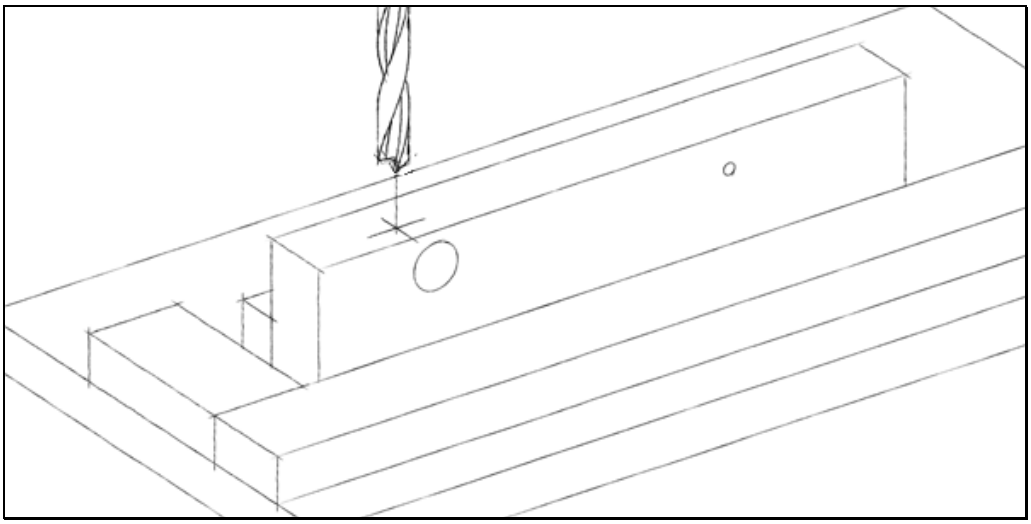


Figure 6. Drill the arm lock hole.

Repeat steps 6 or 6A and 7 for the second arm.

Assembly

Preparation: Do a test fit before gluing anything together. Pay particular attention to the alignment between the fence arms, arm sleeves, and the arm locks. If necessary, you may enlarge the cutout or notch on the arm locks so that the fence arms pass freely through the fence. Try to file only at the top edge of the cutout so that the contact area between the arms and the arm locks is not compromised.

Clean the outside of the bearing cups and fence sleeves with acetone or degreaser.

Oil or wax (paste wax, not paraffin or beeswax) the fence arms and arm bolts. Wax the arm locks liberally, as well as their holes. This will prevent epoxy from sticking where it is not welcome.

Place a small amount of epoxy in the bearing cup holes and the arm sleeve holes. Place the bearing cups in their holes and push them all the way in. Holding the fence arms in place, install the arm bolts. Snug them up, but don't tighten them yet.

Thread the wing bolts into the arm locks and place them in their holes. Looking through the fence sleeves, align the arm locks so that the fence arms can pass through the sleeves.

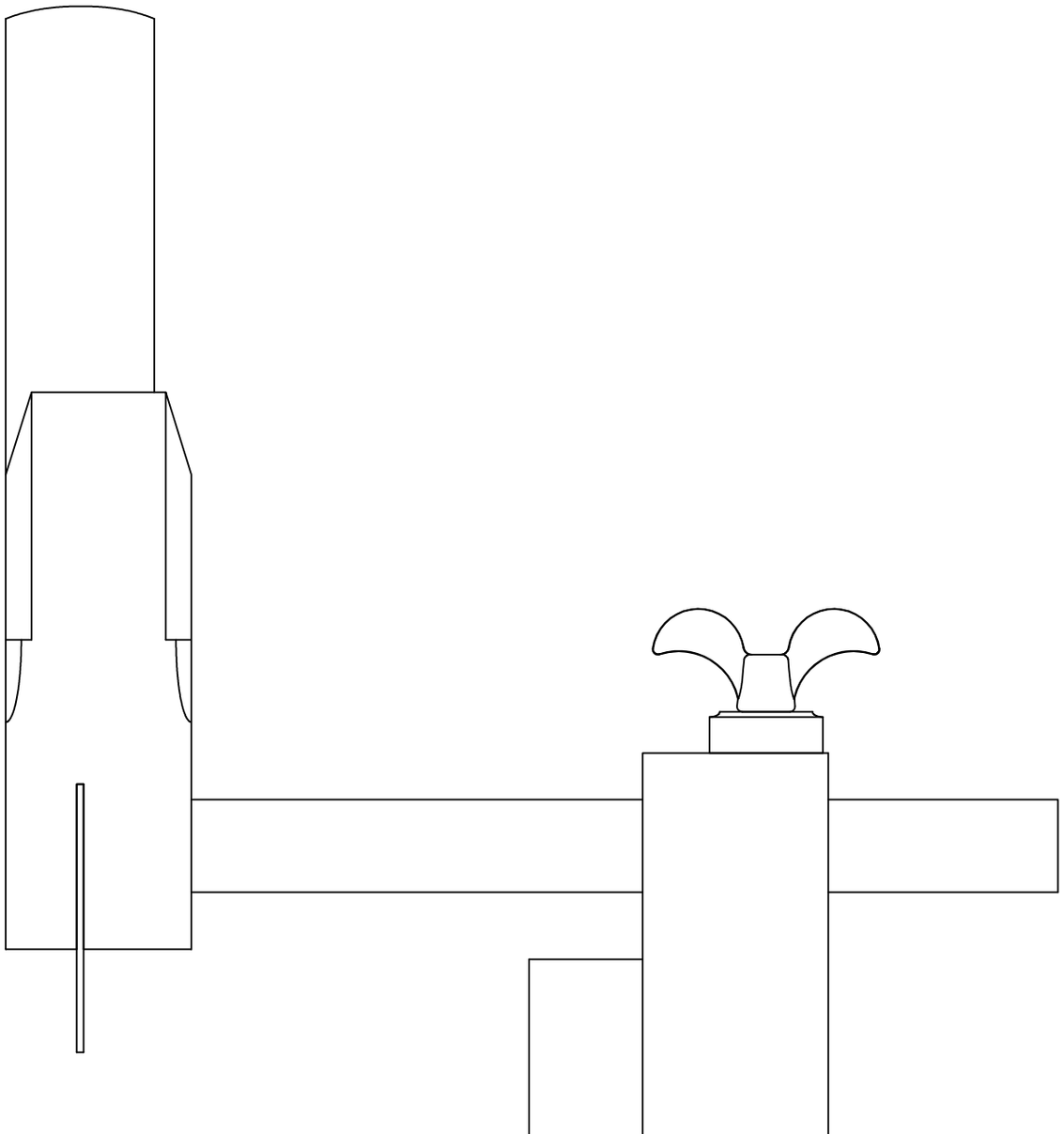
Push the fence sleeves into the fence (start them from the side with the epoxy), making sure that the cutouts in the sleeve are aligned with the arm lock holes. Slide the fence onto the arms and against the saw-plane body. Tighten the arm bolts.

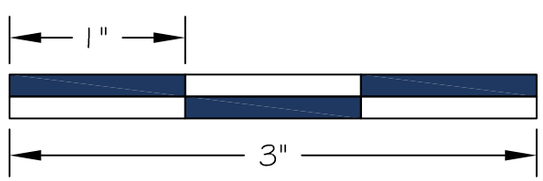
With the arm bolts tightened, slide the fence back and forth along the arms. It should slide freely along their length without binding. Resistance to sliding may vary a bit along the length, but minor variations should decrease with use.

Operating the fence: To position the fence, loosen the wing bolts. Slide it to the desired position and tighten the wing bolts. Moderate force will lock the fence very securely. If the rods and sleeves were installed properly, the fence will remain parallel to the blade at any position along the arms.

Maintenance: An occasional coat of mineral oil or paste wax on the metal surfaces will keep everything moving smoothly and rust at bay (use paste wax for the arm lock holes). DO NOT use paraffin, beeswax, or similar solid waxes to lubricate the fence arms; they are too thick and may cause the fence to bind.

Except for the exploded parts diagram, the drawings on the following pages are drawn at a full-size scale. To use them as a pattern, they must be printed on legal sized paper (8 1/2" x 14"). They may be scaled to print on smaller paper if you are not using them as patterns.





SCALE = 1:1

Date	Scale
7 February 2016	1:1

Notes

Visit www.BlackburnTools.com for rebate saw blades, hardware, and more.

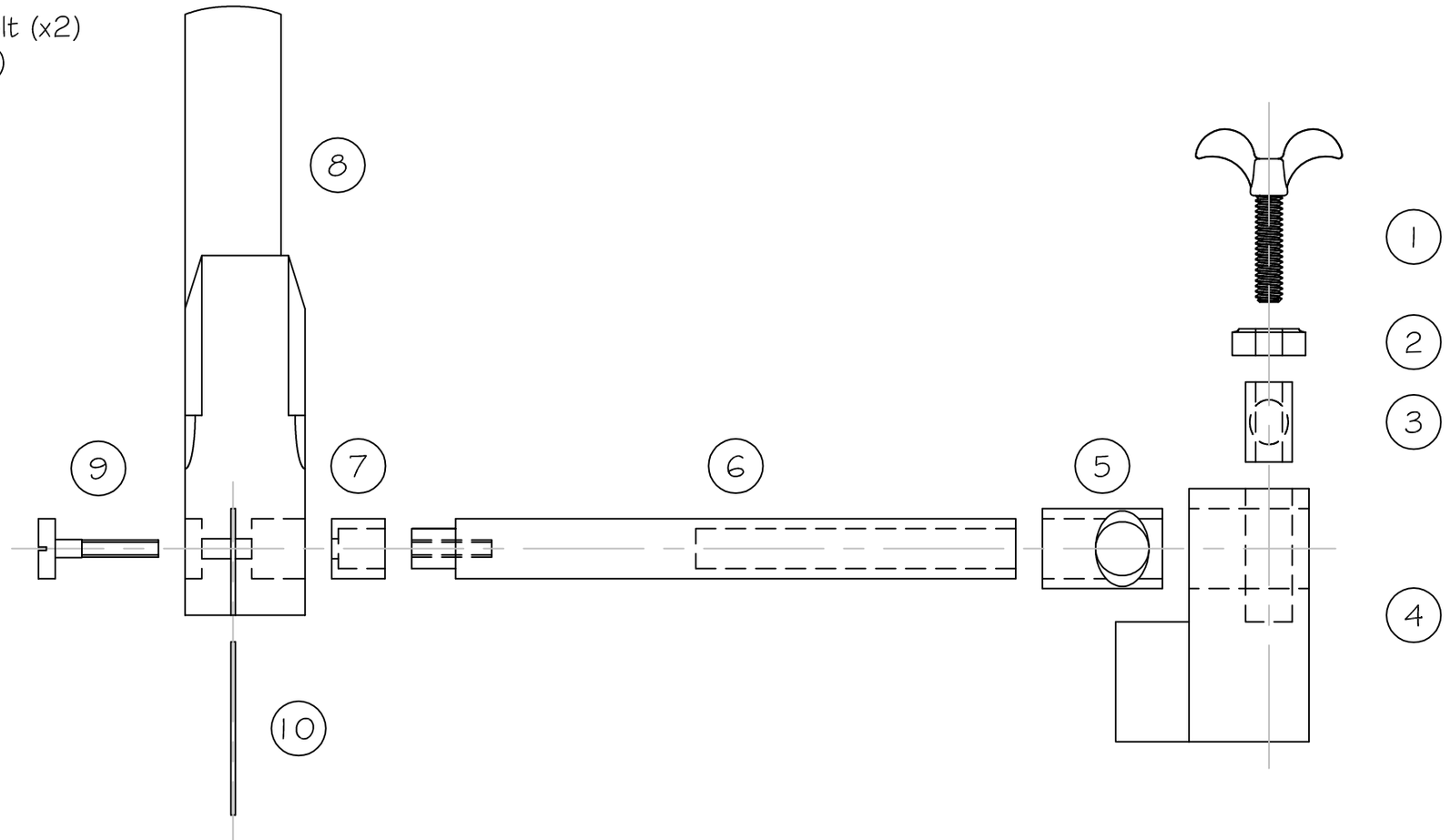
BLACKBURN

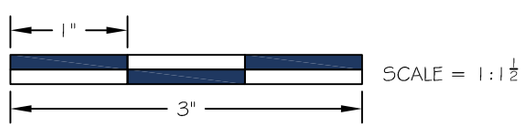
ISAAC SMITH
P.O. BOX 263
UNIONVILLE, PA 19375
BlackburnTools.com

Title

Rebate saw plane
End view, assembled
(Right-handed version)

1. 1/4-20 x 1" wing bolt (x2)
2. Bearing washer (x2)
3. Arm lock (x2)
4. Fence
5. Fence sleeve (x2)
6. Arm (x2)
7. Bearing cup (x2)
8. Plane body
9. Arm bolt (x2)
10. Blade





Date: 7 February 2016	Scale: 1:1 1/2

Notes

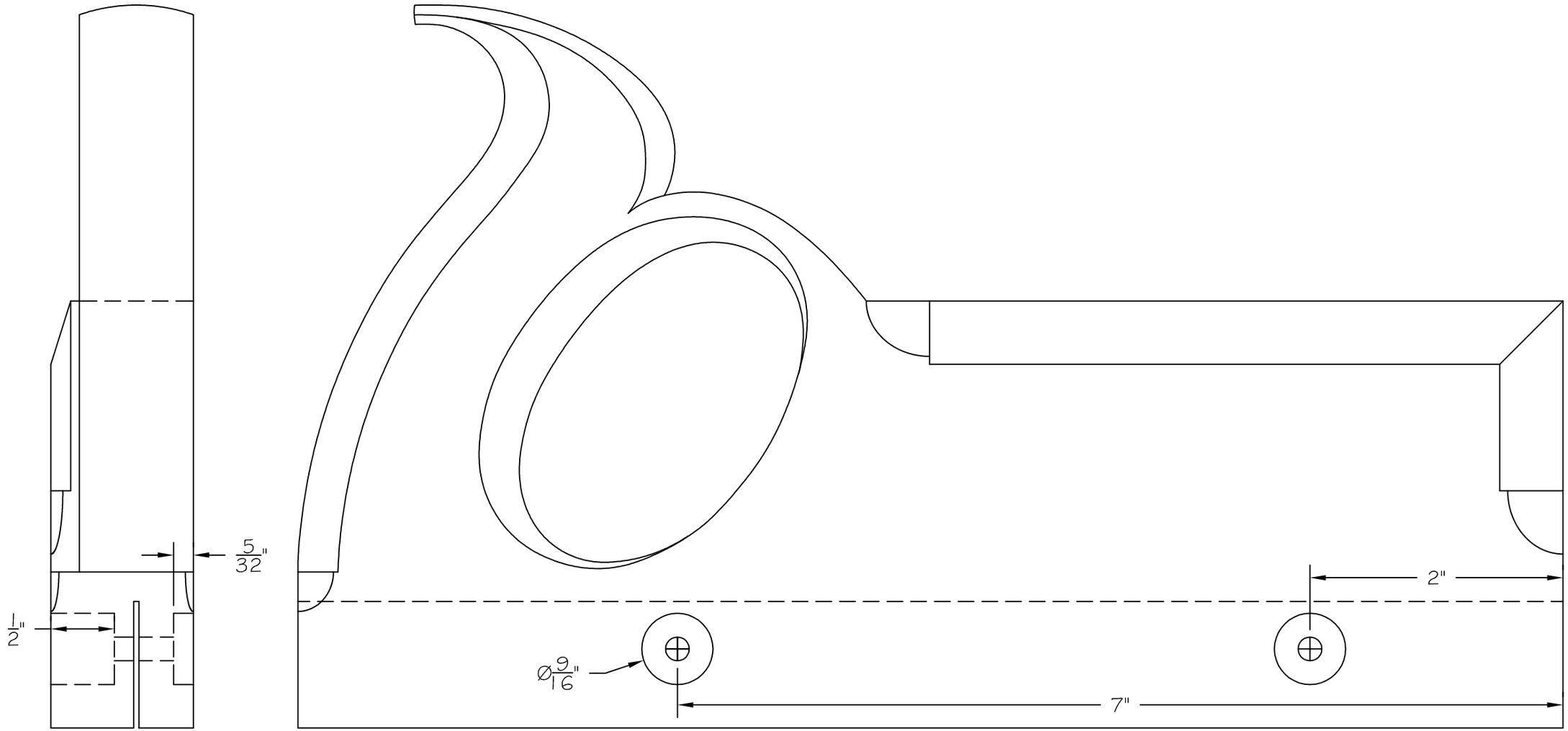
Visit www.BlackburnTools.com for rebate saw blades, hardware, and more.

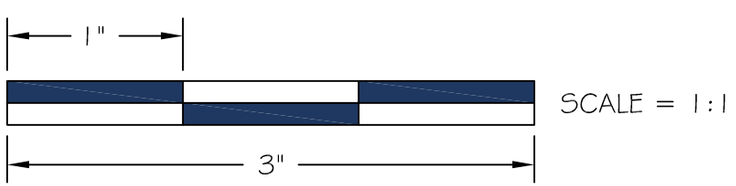
BLACKBURN

ISAAC SMITH
P.O. BOX 263
UNIONVILLE, PA 19375
BlackburnTools.com

Title

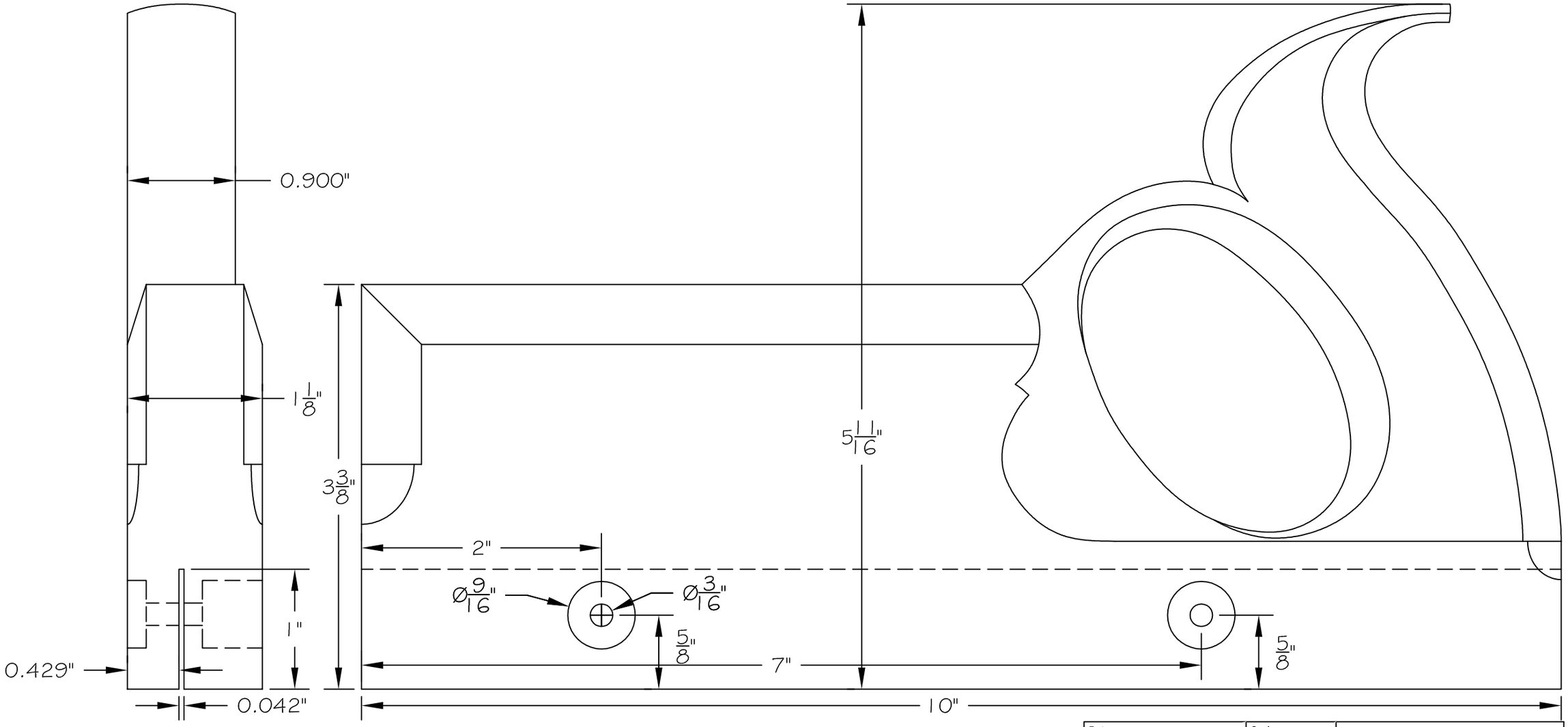
Rebate saw plane
End view, exploded
(Right-handed version)

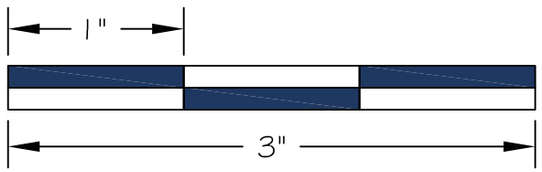




SCALE = 1:1

Date 21 June 2016	Scale 1:1
Notes © 2016, Isaac Smith. All rights reserved. Authorized for personal use only; commercial use or redistribution is prohibited. Visit www.BlackburnTools.com for rebate saw-plane blades, hardware, & more. Thanks to George Wilson for the use of his handle pattern. Page 3 of 6	BLACKBURN ISAAC SMITH PO BOX 263 UNIONVILLE, PA 19375 BlackburnTools.com
	Title Rebate saw-plane Plane body, off-fence side (Right-handed version)





SCALE = 1:1

Date: 7 February 2016	Scale: 1:1

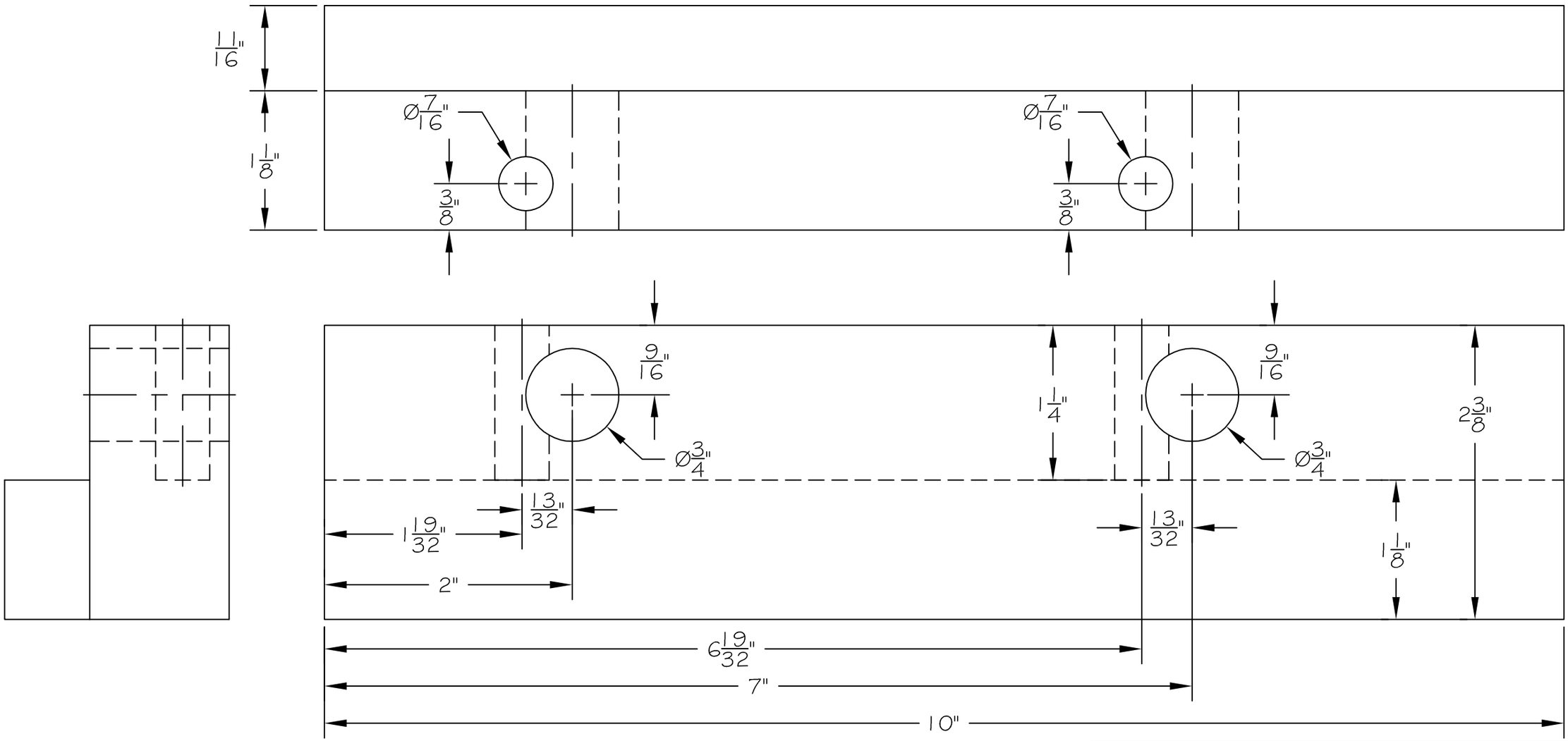
Visit www.BlackburnTools.com for rebate saw blades, hardware, and more.

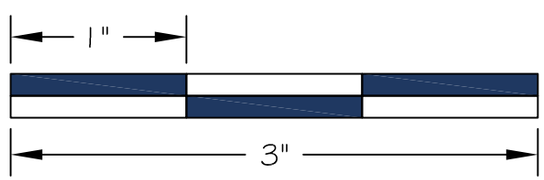
Thanks to George Wilson for the use of his handle pattern.

BLACKBURN

ISAAC SMITH
P.O. BOX 263
UNIONVILLE, PA 19375
BlackburnTools.com

Title: Rebate saw plane
Plane body, fence side
(Right-handed version)





SCALE = 1:1

Date: 7 February 2016	Scale: 1:1

Notes

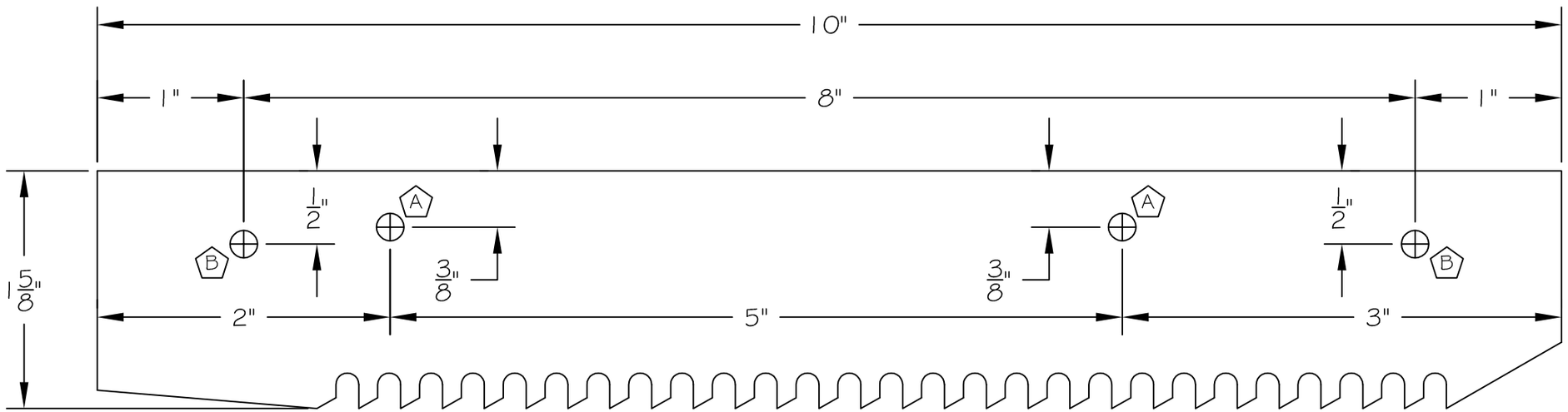
Visit www.BlackburnTools.com for rebate saw blades, hardware, and more.

BLACKBURN

ISAAC SMITH
P.O. BOX 263
UNIONVILLE, PA 19375
BlackburnTools.com

Title

Rebate saw plane
Fence
(Right-handed version)

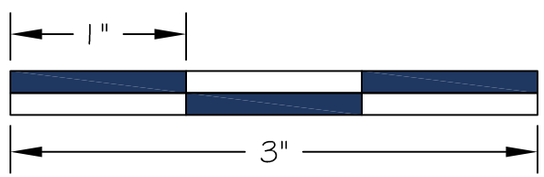


A Holes for fence hardware

B Holes for saw bolts (not used with fence hardware)

$4\frac{1}{2}$ ppi, filed rip; 0.028", 0.032", or 0.042" thick 1095 spring steel

Sharpen points w/ 8" Regular taper saw file; maintain gullets w/ $\frac{5}{32}$" chainsaw file



SCALE = 1:1

Date	Scale
31 January 2016	1:1

BLACKBURN

ISAAC SMITH
P.O. BOX 263
UNIONVILLE, PA 19375
BlackburnTools.com

Title

Rebate saw plane
Blade