

Forging acorns from steel pipe



To forge acorns from 1" pipe, you need two important tools: a “pipe stake” and a “spring pipe fuller”.



Pipe Stake

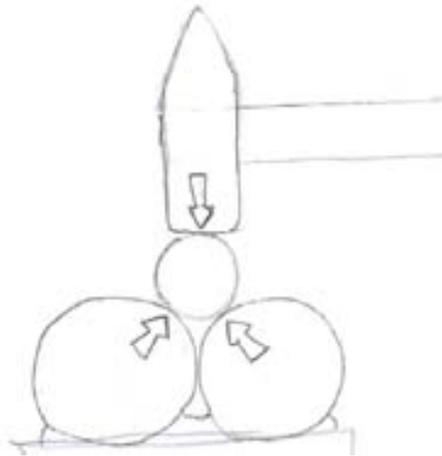
A pipe stake is made by welding two 5" sections of 1.5" round bar to a flat plate, and welding a 3" piece of 1" x 1" bar to the plate to serve as a tang to fit your hardie hole or to clamp in your post vise.



The “spring pipe fuller” jaws need to match the size of the pipe you will be forging. The width of the opening needs to be about 1.5 times the pipe diameter, and the height of the opening should be about one-fourth of the pipe diameter.

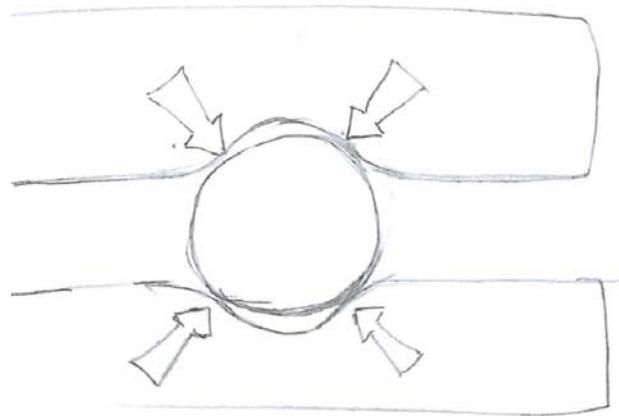
The edges of the jaws should be rounded. The shoulders of the tool, which will meet when the tool is closed, should also be rounded. The pipe stake can be mild steel. The spring for the fuller can be water-quenched mild steel, but it's a good idea to use tool steel for the jaws of the spring pipe fuller, because it takes quite a beating.

Spring Pipe Fuller



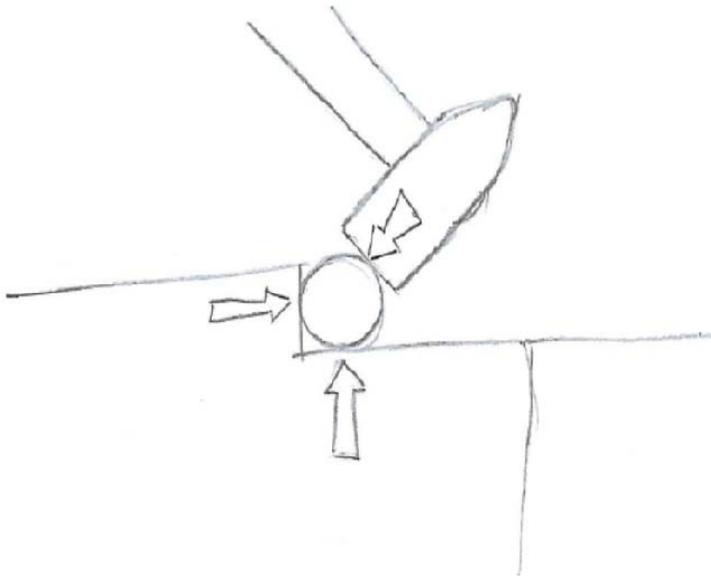
In order to forge pipe, it is important to hit simultaneously from at least three directions, toward the axis of the pipe. The pipe stake ensures this providing two “anvil” supports that hit upwards as the pipe is struck downwards by your hammer.

A spring pipe fuller actually hits the pipe from four directions at once.



It's possible to forge a pipe using the step between the horn and face of your anvil, too, because the step provides two impact points.

The Spring Pipe Fuller in action



Pipe forging on the anvil step

Materials:

- About 8" of 1" *black* iron pipe.
**WARNING: Do not use galvanized pipe!
It produces toxic zinc vapor when heated.**
- About 12" of 1/4" diameter mild steel rod.

Forging the Cap Overhang

First step in forging an acorn is to forge the overhanging part of the cap.

Use the spring pipe fuller to neck down the pipe at an orange or yellow heat 1.75" back from the end of the pipe, about . Always rotate the pipe about a quarter turn between blows. If you let the necked-down portion get too far out of round, it may be difficult to correct it. Neck it down to about half its original diameter.



Using the spring pipe fuller

WARNING: when you quench pipe, make sure it is pointing in a safe direction, because it is very likely to blast scalding water for 10 or 15 feet!



Nut end quenched to the neck

At an orange-to-yellow heat, quench *both* ends of the pipe. The end that will be the nut should be quenched all the way to the neck, and the end that will be the cap and stem should be quenched not quite to the shoulder above the top of the neck. Work quickly at this point, because the neck and shoulder will cool quickly. The purpose of quenching is to minimize distortion of the pipe except at the shoulder that will become the acorn's cap.



Drive the cap end over the nut end

Now drive the cap end into the nut end. The hot shoulders of the cap end will swell slightly and roll down over the cooled nut end.



Rolled-over cap edge



Forge the nut tip down to nearly 1/4" diameter



Insert 1/4" rod through the pipe

Now use the pipe stake to forge the short end of the pipe down to a shape suitable for the nut of the acorn. As soon as the hole at the end is nearly down to 1/4" diameter, insert a 1/4" rod through the pipe, then forge the nut all the way to its tip. Just forge the tip of the nut down small enough to clamp the rod firmly in place. The rod gives your acorn some extra strength, prevents a hole from remaining at the tip of the nut, and helps if you plan to forge weld the acorn's stem to a branch and leaves later.



Continue forging tip to shape



Forge on anvil's edge to clamp rod



Neck down above the cap



Finish neck in the flat part of the jaws

To complete the acorn, form the stem on the cap. Do that by using the spring fuller to neck the pipe down again, just above the rolled-over portion. Neck it down as far as it will go in the opening of your fuller, then move to the shoulder of your pipe fuller to neck it down to the final size.



Drawing out pipe for the stem

Draw out more of the pipe to form a longer stem if necessary. Cut off the unused portion of the pipe.



After it's cut off the pipe

Finish forging the stem and the tip of the nut, using the edge of your anvil. Forge the tip thinner and thinner until the end of the rod drops off.



Forging is finished



Grind scale off the nut

Sand or grind the scale off the nut, leaving the cap rough. If you want to get really fancy, you can use a suitably shaped bolster to hold the acorn, and a “v” punch to texture the cap further. Apply wax or acrylic spray to prevent rust, and you're done!



A finished acorn!

Steve McGrew
Incandescent Ironworks, Ltd.
Spokane, WA 99224
509-456-8321
www.incandescent-iron.com
stevem@incandescent-iron.com

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