

# Paint Can Forge

## by Steve Agoos (Chiro75)

This is a step-by-step tutorial for those wanting to build a simple and inexpensive, yet effective, forge. There are many ways to do this, but you'll see my way here and you can adapt this procedure to fit your own needs as you see fit. The supplies and skills needed are pretty basic. The only catch is that the forge supplies you need are generally pretty tough to find locally in the small quantities you need them, so your best resource for some of these materials is Darren Ellis. It cost me about \$35 to get the stuff I needed, shipping included, from Darren. So, unless you need a 50 pound bag of Satanite, then I suggest you use him as a resource, too! Darren's webpage is at <http://www.EllisCustomKnifeworks.com>. He can be emailed directly at [Darren@elliscustomknifeworks.com](mailto:Darren@elliscustomknifeworks.com). It is assumed that the reader will use this information as a guideline only. Protective equipment should be worn at all times and the reader should read and understand the instructions and proper use for all tools used in this tutorial. Working with hazardous materials, power tools and heat can cause the risk of impairment or death from physical injury or inhalation of toxic fumes and dust, so use this tutorial at your own risk.

The supplies I used, place of purchase, and approximate costs are listed below:

- From Darren Ellis (just tell him you're making a coffee can forge and he'll know what to send you):
  - 2 soft firebricks (you can usually get these locally, but most people find they aren't the REALLY soft ones you need. If I was doing this again, I'd probably get 4-5 bricks from Darren just to be on the safe side, plus they come in handy to block the front and back of the forge and conserve heat)
  - 5 pound bag of Satanite refractory cement (you'll have tons left over for heat treating in the Japanese style if you want)
  - About 2'x3' or so of 1" thick insulating blanket (Inswool or whatever he has)
  - Total was about \$30-\$35 with shipping included
- From Lowe's or any other hardware store:
  - Latex gloves
  - A bar of mild steel measuring 1/8" thick x 3/4" wide x 3 feet long
  - Screws and nuts (I used #10 screws, maybe? They were about 90 cents for a bag of 10)
  - Paint can (find these in the paint section. You want the one with the metal handle, costs about \$2.50). I wouldn't suggest using a paint can that previously had paint in it as you never know about fumes, flammability, etc. You can also use a 2 lbs coffee can, make a forge body from stovepipe material, etc.
- Stuff I already had on hand/junk:
  - Drill press & 1/4" bit
  - Hand drill
  - Permanent marker
  - Ruler
  - Combination square (totally unnecessary, but like I said, I'll tell you how I did this project then you can adapt it however you like)
  - Soup can (empty)
  - A cut off piece of G-10 to use as a palette knife for spreading and mixing my Satanite
  - Respirator (when messing with the Inswool)
  - Hacksaw
  - Knife or something to cut one end off the can

Start by pulling the handle off the paint can. Just pull it apart and it'll come right off. I then prepped the steel bar I bought to use as legs for the forge. Find the center of the bar, mark it, then use the hacksaw to cut it off. If you're used to hacksawing tool steel like I am, this stuff cuts like a dream compared to the good stuff!



Now find the center of each half and mark them, too, in the middle. Prep the can by marking a line a couple inches from center in each direction. I used the seam in the can as my center line, eyeballed about where I thought the legs of the forge should start, marked it about the same distance from the center seam of the can, then used the combo square to give me a nice, straight, square line down the can. This is probably overdoing it, but I had the tools already so I figured why not use them?



You could probably go ahead and mark, center punch and drill the holes in the steel for the legs, but I bent the legs first. In the picture it's hard to see the difference, but on the top set of legs I bent without using heat, and mild steel tends to bend in one spot and not over the length of the steel, so it had a cruddy bend. For the second one I heated the center few inches of the bar with my MAPP torch for about 30 seconds, then bent it like I was Superman bending a steel bar, and I got a nice, smooth, good-looking curve in the bar.

I wasn't sure about quenching this mild steel, so I let it air cool for 10 minutes or so,

then I laid my bars on the can and transferred my lines from the can to the steel. Just line the center mark you had made in each bar up with the center seam, then mark the steel. Do this for both bars. Again, precision isn't really necessary here, to be honest, but it took no extra effort.

Center punch the holes for the screws in each piece of steel, then drill them out. I used my drill press, with a 1/4" drill bit, and that gave the perfect amount of clearance for whatever hardware I used, which I think were #10 screws (although I'm not positive). You can really use anything, so again, just drill holes that are the right size for your hardware to clear.

Then I put the legs back on the can, chucked my drill bit into a hand drill, and transferred my holes to the paint can. So, at this point, you have the legs with their initial bend in them, and you have matching holes in the legs and the can to attach them together later with your hardware.



The next step is to punch a hole in the back of the can. Conveniently, these cans already have seams in them so you can get a pretty nice, round hole. If I did this again, I would just knock out the end of the can using the smallest central hole, but it worked fine going from where I show it. I used my trusty workbench knife, an old Buck XL Ti, for this, and it did great! Once the can was opened up, I



rounded the sharp edges back with a hammer. The other side of the can just has a lid on it, so pop that off and set it aside.

Drill a hole at about the center of just one side of the can. This will be where your propane torch tip goes to heat the forge, so it needs to be big enough to accommodate the torch.

Attach the legs to the paint can. Put the heads of the screws inside the can, and thread the nuts on from the outside. That way you don't have to work around a bunch of screws poking into the inside of your forge later.

Tighten the legs on well, then put the secondary bends on them so the forge is sitting on its legs as in the picture. Again, heating the area you'll bend makes this job easier and gives you a nicer bend, so use your torch to heat the legs near the hardware, then bend them.

Once all four legs are bent, play around with them so the forge sits squarely on them and doesn't wobble around too much.



Now it's time to get the refractory stuff inside the forge. I used a respirator the whole time I messed with the wool, which is like insulation, and I also wore latex gloves from here on in. The stuff you get from Darren will be 1" thick, and you want at least 2" inside, so what I did was cut a 1" section that didn't go all the way around the circumference of the can, but instead stopped a couple of inches short. Then I chopped about 1/3 of one of the firebricks off with a regular miter saw. These things cut like butter!

I placed the 1/3 section I cut off in the floor of the forge and it fit up pretty nicely with the wool I had placed. There was some space where the wool/floor of the paint can/brick didn't come together real tightly, so I cut a strip of wool and stuffed it into that area to fill it in.

Once you're satisfied with the first layer of wool, work something into the hole you made for the burner and get a nice hole through the wool, too.

I figured having a little cement between the layers of wool would be a good idea, so I mixed maybe 1/3 of a cup of Satanite with enough water to give it the consistency of wet concrete (add some water, mix, add some more water, mix, etc) in my soup can. I just used an old cut off piece of G-10 for my "palette knife." Once you get a nice thick, but spreadable consistency (maybe like peanut butter that had been warmed up, if that makes sense), spread it on the inside of the brick and the first layer of wool. This stuff starts to dry quickly, and again,

it isn't necessary to be perfect, so get the goop in there and cut a second section of wool and stuff it in!

I only needed a piece of wool about 5" wide by the length of the can to fill it in. Just play with it until it fits nicely. I left no wool on top of the brick in the forge, although I may go back and fill it in later if my heat doesn't seem enough when I start using it.

Punch through your burner hole again, too.

Now you'll want to mix some more Satanite and you want to get a nice layer covering the brick and all of the exposed wool, including the ends. This stuff is really bad to heat and breathe in, so you're sealing the wool. Make sure you really get it all sealed up (but don't block the burner hole!). Spread it on nice and thick everywhere, and once it's all sealed up you're pretty much done! It's probably a good idea to let it air dry for a day, then it'll cure when you fire up the forge for the first time. Use the remaining firebricks to block the end of the forge completely or part way, as well as at the front to keep more heat in, too (this is why it'd be good to order 5 bricks from Darren). Put your burner in place and fire it up! You'll probably have to play with the bricks and the angle of the torch to get optimal heat, but it works!

