

# Rocky Forge News

Volume 10, Issue 1 – January 2011

---

## Next Meeting: (1/8/11)

The next meeting is coming up real soon and it should be a fun time. We will have the Rural Smiths of Mid America and the Rocky Forge members attending. The plan is to pair members of each group to work on a project together, a coal shovel.

The reason for choosing a coal shovel is that will be the "trade item" the RSMA had chosen for this month's meeting. What they do is each member makes the trade item and brings it to the monthly meeting and they draw tickets. As your ticket is drawn you can have your choice of the trade items on the table. So if you want to participate in that drawing, then make a coal shovel and bring it to the meeting. Gene, I'll bet a coal shovel made with sheet metal would be a good trade item. Peter Cooper could make a coal bucket!!

I am hoping for good weather so we can use the outside forges, but in case the weather does not cooperate I will have 3-4 gas forges and one coal forge available inside the shop.

Lunch will be a pitch-in meal, so bring a covered dish to go with soup. Our cook, Carol, will not be here that day, but we plan to have a pot of soup to contribute to the meal.

Also, bring your forging tools, metal and items for iron in the hat. Items for iron-in-the-hat. Items for iron-in-the-hat.

Coffee and doughnuts will be ready by 8:30. See you all on the 8th of January. Wow – it's 2011 already!  
Ted



## Last Meeting: (12/11/10)

At our December meeting three significant things happened: Harold Frost demonstrated, there was a IBA Board meeting, and we ate a great meal in the Ted and Carol's basement. Harold demonstrated how to make a candleholder with a copper base and a large forged flower. See the photographs on the next page.

## Jim Hale is Recovering

Our friend, Jim Hale, has had a liver transplant and is recovering at the IU Medical Center in Indianapolis. We send him our best wishes for a speedy recovery.

## Interesting Web Sites

Google's Blacksmithing Books On-line:

[http://books.google.com/books?q=subject:%22Blacksmithing%22&as\\_brr=4](http://books.google.com/books?q=subject:%22Blacksmithing%22&as_brr=4)

ABANA Educational Resources:

[http://www.abana.org/resources/education/education\\_downloads.shtml](http://www.abana.org/resources/education/education_downloads.shtml)

Michigan Artist Blacksmith Association:

<http://www.miblacksmith.org/>

## Dates to Remember

January 8, 2011: Rocky Forge meeting with Rural Smiths of Mid America at Ted's shop.

February 12, 2011: Rocky Forge meeting.

June 3-5, 2011: IBA Conference, Tipton.

Sept. 24-25, 2011: Feast of the Hunter's Moon.

Sept. 23-25, 2011: SOFA QuadState Conference.

July 18-21, 2012: ABANA Conf., Rapid City, South Dakota, "Reunion on the Great Plains".

---

## Contacts

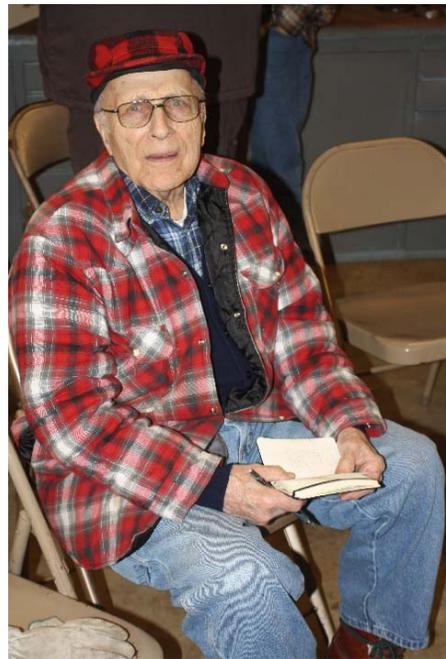
Forgemaster: Ted Stout ([stout8525@tds.net](mailto:stout8525@tds.net), 765-572-2467 home).

Newsletter Editor: Dominick Andrisani ([andrisan@purdue.edu](mailto:andrisan@purdue.edu), 765-463-4975 home).

Web Site: <http://www.rockyforge.org/> (previous newsletters can be found here).



Harold explains where he wants the hot metal to go.



Jim McClure takes notes.



Harold forges at the edge of the anvil.



Harold is a warm-hearted and happy man!

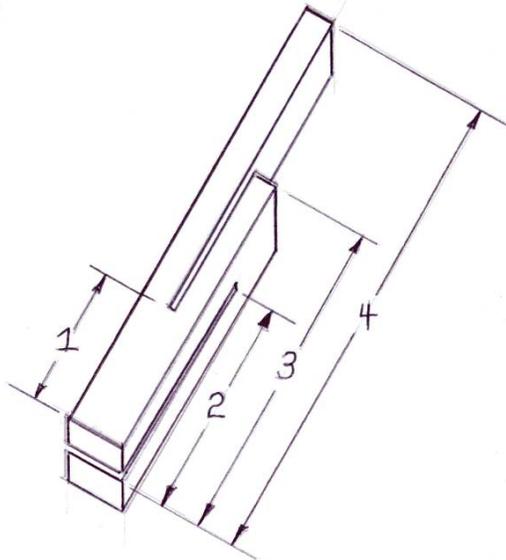
## Split-Cross from a Pipe

By Dominick Andrisani

Many blacksmiths have created beautiful split crosses (a.k.a. Friedrich Cross) using solid square stock cut as shown in the sketch below. It is also fun to use the same technique to make split crosses out of pipe. When you are done the cross appears to be made out of pipe of half the original diameter. Typical dimensions are given in the table below.

Length#	Diameter of Pipe (inch)				
	1/4	3/8	1/2	5/8	3/4
1	9/16	7/8	1+5/32	1+7/16	1+23/32
2	29/32	1+3/8	1+13/16	2+9/32	2+23/32
3	1+7/16	2+5/32	2+7/8	3+19/32	4+5/16
4	2+5/16	3+15/32	4+19/32	5+3/4	6+29/32

Dimensions for lengths shown below.

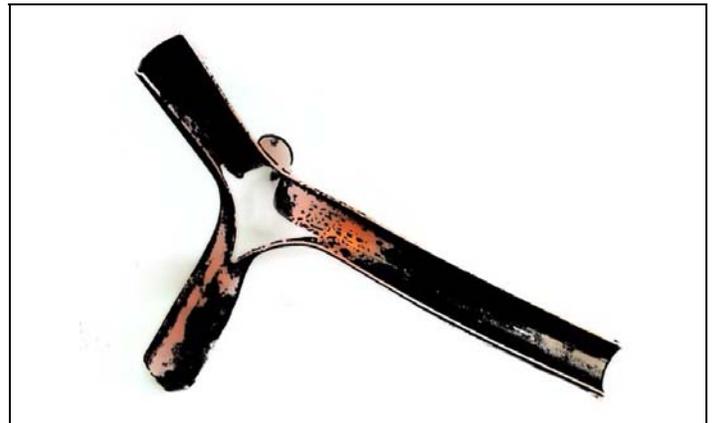


Split-cross lengths defined here for a square bar also work well for pipe (sketch and dimensions by Jeff Reinhardt)

If making your cross out of stiff copper pipe, make the three cuts shown in the sketch above. Cut the metal before annealing or the pipe may become so soft as to collapse while being cut. The second step of annealing the copper (getting it red in the fire) is very important to prevent the copper from tearing in the center where the four arms meet. You should anneal copper only in a space where there is good ventilation as some nasty fumes may be given off. If using soft copper tubing, the annealing step can

be skipped, as the copper is already soft and flexible. Allow the copper to cool or quench it in water. The copper should be worked cold.

Opening the cut-annealed-cooled pipe should be done slowly and carefully. Considerable stretching of the material in the center where the arms meet will occur. The opening should be done equally on each arm with an eye for symmetry. You can use any flat tool to help you open the cross. I used a wide chisel to get it slightly opened and gloved fingers to open it the rest of the way.



Partially opened 1/2-inch copper pipe. Take care that the opening in the middle remains symmetrical.



Fully opened piece, but the four ends have not been rolled closed to form 1/4-inch pipe.

In the photographs above the vertical arms are concave up and the horizontal arms are concave down. After fully opening the cross (as shown in the right photo above) each arm will need to be rolled closed so that the original 1/2 inch pipe closes

into a 1/4 inch pipe. This can be done with a hammer on the anvil. I prefer to use a copper hammer on copper. The vertical arms will close on the top as illustrated, thereby producing a seam in the front, while the horizontal arms will close at the back producing seams on the backside. I find that laying a 1/4 inch diameter steel rod on the cross helps me to align the top and bottom arms and to form a uniform 1/4 inch pipe around the rod. The rod can be slid out with a little elbow grease. The rod can then be used to align and form the horizontal arms. Take care in forming the copper near the center of the cross to get smoothly varying edges connecting the horizontal to the vertical arms.

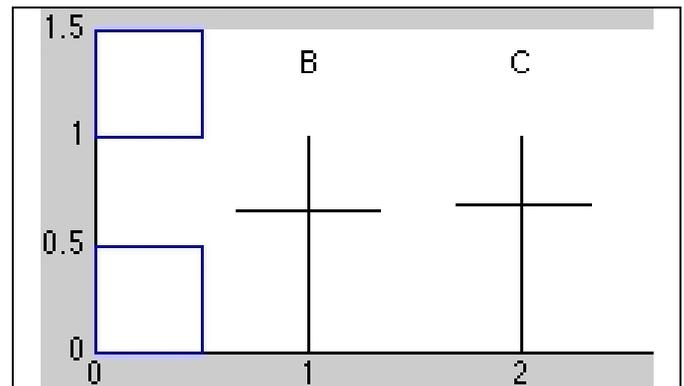
Illustrated below is a finished split-cross made from half-inch copper pipe. The finished dimensions are 6 inches tall by 4 1/4 inches wide and the arms are 1/4 inch in diameter.



Split-cross made from 1/2-inch copper pipe showing seams along the vertical arms. Arms are 1/4 inch in diameter. The top arm is a little shorter than the right and left arms.

To complete the cross, the copper was cleaned in a mild acid pickle (like pH Down available at your favorite pool store), rinsed in water, darkened by dunking in a solution of liver of sulfur (available at www.delphiglass.com) for several minutes, rinsed again in water, scratched with a hack saw blade to make the copper sparkle, and polished with paste wax. Note in the picture above that there are seams on the vertical arms. These can be filled in with braze or left as shown. On the backside of the cross the horizontal arms also have the seams.

A final word about the overall proportions for a cross: throughout history you can find examples of many different cross proportions (ratio of height to width and ratio of the length of the top arm to the height), and you can still see all manner of cross proportions in use today. The one for you to use is the one you think looks better. Several examples of overall cross proportions that I think look good are given in the illustration below.



Two cross proportions drawn to scale. The two blue squares should look perfectly square.

Method	Top Arm/Height	Height/Width
B	0.333	1.500
C	0.301	1.618
Copper Cross	0.333	1.412

Proportions for the two cross designs and for the copper cross pictured at left. The top arm is the vertical portion above the crosspiece. Method C uses the Golden Ratio (ratio of height to width is 1.618) while method B uses round numbers like 1/3 and 3/2. The top, left, and right arms are the same length in methods B and C.