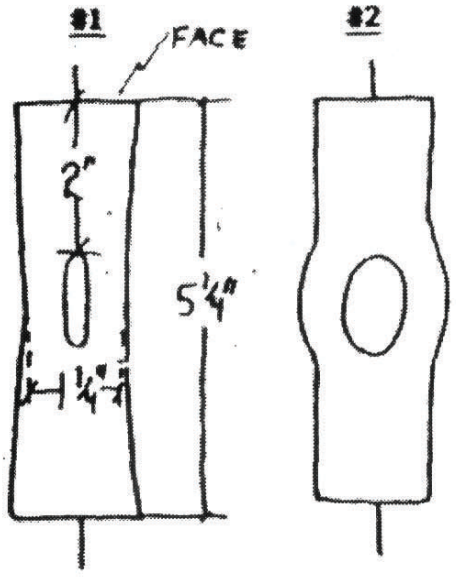
Forging a 3 Lb. Diagonal Peen Hammer

Step by Step Instructions by Jeffrey Funk

1. Begin with 5" of 1 1/2" square stock, or forge 3 5/8" of 2" round stock to 1 1/2" square, I frequently use old truck axles for this, or if you have it, 4140 or W-1 will work well.

2. Forge to a slight hourglass shape as viewed from the top, so that the center of the blank is 1 1/2" x 1 1/4," and the piece tapers back to the ends which remain 1 1/2" square. The blank grows in length to about 5 1/4 ". This forging prevents the eye punching from swelling the center too much. (see figure # 1)

3. Make a single center punch mark on the blank top and bottom at 2" from the end of the blank which will become the face, and centered side to side. (see figure # 1)



top views

4. At an orange heat carefully drive a 1/4" x 1 1/8" slitting punch into both top and bottom about 1/8" deep, using the center punch mark to locate the distance from the face, and your eye to find center side to side. The punch must be adequately tapered to allow for easy removal when driven deep.

5, Now, at a bright orange heat, drive the punch about 1" into the piece from the top, taking care to
cool the punch every four sledge blows, and using coal dust to prevent it from sticking in the hole.

6. Take another heat and drive the punch from the bottom through to remove plug. If punching alignment was good, the plug should come out easily. If it sticks, it may need to be sheared out of the hole with the slitting punch. This is best done at a red heat.

7. At a good orange heat, open the hole with a drift, driving from both top and bottom to keep the hole symmetrical.

8. Also at an orange heat, drive in the final eye drift to nearly the depth required for the final handle fit, from both top and bottom, as with the original drift, If the head is better aligned from either top or bottom, with the drift in it, then mark the head with a center punch near the eye identify that side for later. (see figure #2)

9. Now, heating only the face, either in a coal forge or after some preheat, with a heating tip, upset to about 1 5/8" square. The center of the face is now about 1 3/4" from the front edge of the eye. (see figure #3)

10. Next, determines the orientation of the peen. If you want a standard cross or straight peen the orientation is clear. But a diagonal, peen which works as a cross peen for the right-handed smith will work as a straight peen for one who is left handed, and vice-versa, so you must be careful to mark the head prior to forging to make sure that you forge the diagonal the right way for your purposes. With the face down on the anvil, a right handed cross peen hammer looks like figure #4. A left handed cross peen looks like figure #5.

11. Now, at a bright orange heat, draw out the peen on the diagonal with a gently curved cross peen sledge over the horn of the anvil, or between two drawing dies under the power hammer. I generally forge it so as to come out to be about 3/4" x 2", with a distance from the eye about 2 1/8" and the overall length of the head about 5 1/8". Frequently some trimming is necessary, and I grind it to insure that there will be no cold shuts.

12. Using a coal forge or a torch, I slightly upset the peen to refine the form. (see figure #6)

13. Now, drift the eye up to its final dimension, top and bottom, brush, and allow to cool slowly.

14. Grind the face and peen to the desired form.

15. Preheat the entire head to about 800 degrees (no color showing) and then heat the face only slightly above the non-magnetic temperature (light cherry red, or about 1600 degrees) and quench only the face half of the hammer. Then immediately heat the peen and then quench the entire hammer. I try to do all my quenching of hammers in water. Oil hardening steels can sometimes be quenched in water if heated to substantially less than the critical temperature that would be required for oil quenching, with satisfactory results.

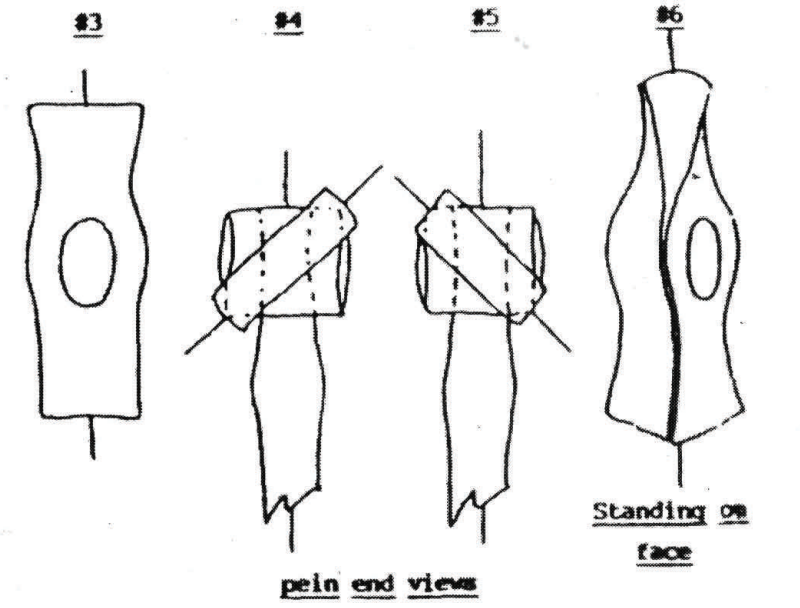
16. After sanding the peen and face with scotch brite or emery paper backed by rubber, preheat the entire head to about 300 degrees (boils water instantly but does not show temper colors) and temper the edges of the face to a light purple with a touch of straw going into the face, and the peen purple on the ends and straw elsewhere. Exact heat treating depends on steel used and personal experiment.

17. Wire brush, mount onto handle, and enjoy!

The following article is reprinted from the April 1993 issue of the newsletter of the Appalachian Area Chapter of ABANA and the July/August 2007, Blacksmith Guild of the Potomac

Jeffrey's Choice of Steel

To figure the length of stock required for a particular hammer weight, simply divide the intended hammer weight by the pounds per lineal inch for the diameter stock to be used (see chart).



Example: To make a 3-lb. hammer from 1%" stock: 3 lb. _ .638 lb per inch = 4.7"
I generally use truck axles, cat track pins, old coil springs and the like to make hammers and anvil tools. Other useful steels include 4140, 4142, S-1 and W-1. Whether you are certain or not of the steel type, it is useful to test it for harden-ability in different quenching mediums. It is also important to do all forging in as few heats as possible to avoid excessive grain growth and decarburization.
Heat-treating need not be as precise as in edged tools, but take care to get the center of the face suitably hard and the edges safely tempered. Experimentation is required to find what is best for any given steel and hammer size. I generally preheat the entire head to about 800°F and then bring the face to the desired temperature quickly using either the coal forge or the torch. Then I quench only the half of the head just heated and immediately heat the opposite end and then quench the entire head. I temper only the edges of the face to light purple, allowing a bit of straw color to go into the face. The tempering of the peen end depends on the shape. 4 March/April 2008 www.calsmith.org California Blacksmith

Useful Data For Making Hammers			
Bar Diameter		Weight in Pounds/ Lineal inch	
Fraction	Decimal	Round	Square
1”	1.000”	0.223	0.283
1 1/8”	1.125”	0.262	0.358
1 1/4”	1.250”	0.348	0.443
1 3/8”	1.375”	0.420	0.536
1 1/2”	1.500”	0.500	0.638
1 5/8”	1.625”	0.588	0.749
1 3/4”	1.750”	0.681	0.868
1 7/8”	1.875”	0.783	0.997
2”	2.00”	0.890	1.134
2 1/8”	2.125”	1.005	1.280
2 1/4”	2.250”	1.127	1.436
2 3/8”	2.375”	1.255	1.599
2 1/2”	2.500”	1.391	1.773
2 3/4	2.750”	1.683	2.145

PEEN, PEEN,PEEN,

By Eden Sanders, San Andreas, California
Reprinted from California Blacksmith, No. 07-05, September/October 2007

"The ball peen hammer was originally used to peen riveted or welded material, bringing the welds or rivets nearer to the hardness of the surrounding metals. Peening is the mechanical working of metals by striking them with a tool such as a hammer or by peppering them with shot. It is a cold work process and tends to expand the surface of the cold metal, either relieving tensile stresses or creating compressive stresses - in other words, hardening the metal being worked:'* The effect is a planished finish with interest.

Hammer varieties used for this process include the chisel peen, point peen and ball peen. The peen end of the hammer is given a very high polish to remove tiny dents, dings and scratches. For pristine results a smooth, flawless surface is required for the texture created on the metal by the hammer to be smooth and free of defects, requiring only minimal finishing.

You can create a variety of unique textured surfaces on metal using a polished peen hammer. Avoid a hammer with a peen that is chipped, badly dented or deeply dinged. To remove scratches and flaws, start with an abrasive grit coarse enough to begin removing the worst of the surface defects. Work through progressively finer grits until all flaws disappear. Then polish the peen on a buffing wheel with polishing compound. Work through progressively finer compounds until a satin smooth mirror finish is achieved.

Start with a piece of clean, polished brass or copper sheet for practice until you are familiar and confident with your peening technique. Work against a hard metal surface that can securely support the work and is free of defects that could transfer to your piece during the texturing process. A highly polished metal surface, such as a bench block or flawless anvil (we all have one of those, right?) will work fine. Begin with light blows, and then vary the force of your stroke until you get the peening or dimpling effect you want. Continue working your way across the piece until the entire surface is covered with dimples. Finish shaping or forming the piece as desired, and buff as needed. Now switch to steel using your peen hammer as a treadle or power hammer tool. If you heat the steel at all, only go to a dark red or black heat. If you are heating the steel, you will want to cool your hammer every once in a while.

CBA member Ron Stafford, of Clements, California, creates shallow vessels with unique textures using ball peens he welded, chiseled and gouged with various design. (See California Blacksmith, July/August 2005). Take another look at distinguishing your work with texture. Play around, share your experience and photo results with the editor.

** Thackeray Taylor, "Creating Texture on Metal Using a Ball Peen Hammer," Rio Grande News & Product Review, Spring 2006.p. 24 Volume 32, No. 2, June 2008*

The Story of Mousehole Anvils

By Bill Pevey

Several years ago, after I joined the Mississippi Forge Council, it became apparent to me that I needed an anvil. Since I like to talk to people, I would ask anybody that looked like they knew what an anvil was "Do you have an anvil?" If their answer was yes, I would then ask if they wanted to sell it.

After about two months of this I ran into a man that had an anvil that he was willing to sell. We agreed on a price that we were both satisfied with and I took possession of my prize.

Upon getting the anvil home, I started inspecting it more closely. There was an inscription on the side of it that said, "Henry Armitage Mousehole." Under these words were three numbers separated by punch marks. They were 2 0 26. All this information was a mystery to me so I started trying to find out more about where and when it was made and maybe some history of the maker.

In an internet conversation someone told me I needed to talk to a Mr. Richard Postman. Who, I wondered, was Mr. Postman and why did I need to talk to him? I was courteously informed that he had written a 550 page book on anvils. Another inquiry produced his telephone number in Barrien Springs, Michigan.

Several days elapsed before I called Mr. Postman. In the meantime I discovered what the three numbers in the inscription meant. denotes how many hundredweights (112 pounds) were included in the overall weight. The second number tells how many 1/4s of 112 (28 lbs) were included. The 0 indicates no 1/4s and the third number denotes actual pounds. So, adding 112+112 gives 224. Then adding 224 +26 we get 250 pounds for the anvil's weight.

A phone call to Mr. Postman produced an interesting conversation. After the required pleasantries I told him I had a Henry Armitage Mousehole and would like to know more about it. Immediately he stated that he did not believe me! As one might imagine I was somewhat taken aback. He explained that he had heard of only two others and he did not know how to contact those owners. We talked some more and he gave me some information on the anvil and where it was made and that it was made between 1835 and 1854. He told me that he was working on a book about the Mousehole Forge, and that if I sent some good pictures and measurements of the anvil he would include those in the book. I took the pictures and sent them shortly thereafter.

After the book was published I promptly ordered one and was excited to receive it in the mail. To my surprise he had used two of my pictures. The book tells of a chance encounter with two ladies from England and how that helped him get started on his new book. He explained what he was trying to do and asked one of them to attempt to get more information for him when she returned to England.

After about six months she did call and gave him some information that would be crucial in the completion of his monograph on the Mousehole Forge. For those of you that are interested in anvils, and particularly Mousehole anvils, I think you will be glad to have this book in your library. Containing 122 pages and measuring 8.5 x 11 inches it is beautifully illustrated with 80 photos, of which 40 are full color and it also has 27 graphics that help give the reader a sense of where everything is located. It is spiral bound and has a full color laminated cover which will help keep it in good condition for many years to come.

Mr. Postman's first book, Anvils in America, took him 16 years to write. He tells about how he came to write it in the story of the Mousehole Forge.

For those of you who are interested in the two above mentioned books, you may contact him at: Richard Postman, 320 Fisher Court, Barrien Springs, Mi 49103. Telephone: 269 4715426

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The Ashokan campus is located in Olivebridge, N.Y., several miles west of Kingston, N.Y. The meets are held the first weekend in May and in the first weekend in October every year. The main demonstration is in the blacksmith shop and there is a "Hands On" workshop for beginners. A main demonstrator is brought in for each meet, food and bunk-house style lodging are provided as part of the cost of the weekend long meet.

Contact : Tim Neu
to register for hammer-ins
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