

## The Mysterious Hammer By Jim Converse

As I watch most of the people who are interested in taking a swing at this mysterious art of blacksmithing, I notice the same thing over and over again. There is something that holds them back. It slows them down. In a very real way, it frightens them.

What do you do with all that power, that creative force that terrible destructive energy that is in a moving hammer?

It might help the beginner to know that those of us who started "way back when" had the same problems he is having now. The old man says, 'Use the 2-112 pound hammer. Don't choke up on the handle. Get a hold way out on the end and lift the hammer way up by your head. Come down hard and square.'

So the beginner does as he is told but somehow, while that hammer is coming down like a bolt of lightning out of hell, he panics. He thinks, "My God, how do I stop this thing? It's going to wreck everything around

here!' The beginner is afraid of that hammer and he should be. By the time he has got it going fast enough to do any good he has lost control of it. He does not have any real idea of where it is going to land or what it's going to do when it gets there.

The old blacksmiths start all Their showin' and talkin' in the middle instead of at the beginning. Most of us old blacksmiths just figure the beginner knows how to use his hammer as if he had been doing it for twenty years. We are comfortable with the darned thing and it seems useless to waste time talking about that. Well, we are going to talk about the hammer and how to make it work, and not waste time talking about blacksmithing.

One of the first things you need to do is change your way of thinking about the hammer in your hand. This will also apply to any other tool in your hand.

When you take the Hammer in your hand, adjust it, finger it, roll it around until it feels just right, until it feels like an extension of your arm and hand. Allow yourself to think that you can feel the heat and cold coming right up our arm out of the wooden handle.

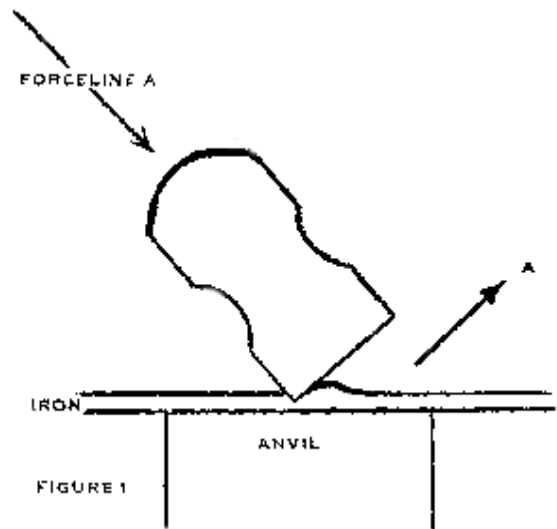
I have had a hammer in my hand for over forty years and sometimes I think I can feel the work with my hammer as well as my fingers. My hammer does what I tell it to do most of the time. So will yours and here is how you do it.

Go down to the hardware store and buy a brand-new one pound ball-peen hammer with a wooden handle. (Never use any hammer without a wooden handle.) I recommend a Stanley. Look over a bunch and pick out one that has a well finished face, nice curves on the edges and with no flat spots. Check the handle for being true in the head, not crooked or twisted, out of line or bruised up. Pick out the best looking hammer in the bunch -- you are going to be using it for a long time.

Buy a ten or twelve inch bastard cut half-round file, a good one. Pay the price. Never buy a cheap tool! It is no economy. Pick up a sheet of 100 grit sand paper. Next go to the lumber yard and buy a good, clear, hard, dry 2x4, eight feet long. You will find one if you dig around a while. If you don't have a saw, have the yard cut this 2x4 into 16" lengths, then split each length so that you wind up with an arm-load of 16" 2x2's. Got it? Now, if you do not have your own anvil yet, find a friend that does and tell him to go away. You want to be alone with his anvil. Be serious, because what you are about to do will have a profound effect on your future blacksmithing.

Pick up your hammer so that about 2" stick out beyond your little finger. Shake the hammer around in the air -- talk to it. Tell it, "Hammer, you and I are about to have an affair." Lay the end of one of those sticks on the anvil like you were going to flatten it.

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Keeping your grip, hit the stick with a fairly light but firm blow, just once. Now, look at the stick. What kind of a mark did it make? Was it a perfect imprint of the face? Was it even all around? Or did it tip a bit this way or that? Try again and, each time, observe what moves or changes must be made to make a perfect mark.

Now, hit harder. Study out each strike you make until you have a good idea of what you have to do and how you must hold the handle. Now, hit several times without stop-ping. Do this in a new spot. What do all those marks tell you now? Practice this for about twenty minutes. Practice to achieve the perfect mark. I will say many times, 'Practice swinging that hammer.'

Your wrist is probably tired by now but do this next. Raise your hammer until the head is 18"-20" above your stick. Observe the feel. Now, mark out a circle about the size of a nickel on a new spot on your stick. Raise your hammer up there again and hit that stick hard right in the middle of that circle seven times just as fast as you can swing it. I mean, hit it, fast and hard. Study your marks and your reaction to this sudden attack. What you see and what you felt will tell you how much practicing you have to do.

The blow you are after in all this is one that, just before hitting the work, is traveling straight down in a plumb line. The hammer center line from face center through peen center is perpendicular to the anvil

face. There is no sideways or front or back movement. All the energy must be in one line of travel-- practice until you have it. Twenty or thirty minutes a day, diligently spent, will pay off.

Today's hammers are made, first to sell, next to use, and with any given high quality brand, they will be exactly alike. But there are no two hands alike. That's why they make gloves in different sizes.

By now you have probably found that your hammer is alright, you guess, but your grip seems strained. Well, it probably is. So think about it a bit and where would you take off a little wood? This is where your file comes in. Don't file yet!

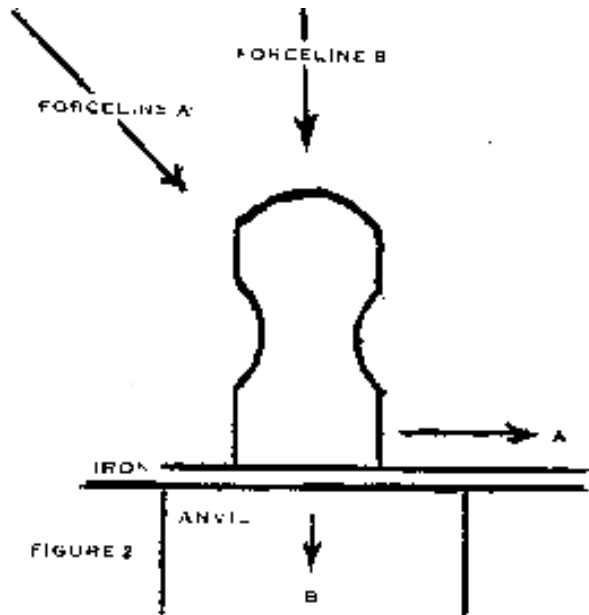
Go over to a standard table, 30" high, and pretend there is a raw egg sitting on it. Take a working hold of the handle in your regular grip. Step back from the table just a little so you sort of have to reach out and strike that egg. Stop the blow just as the egg cracks. When the hammer comes to a stop on the table, hold it there. Don't move. Does the head lay a little to one side, or tip back, or forward? You may want to repeat this several times until you can begin to feel where that "hump" in the handle is.

Now use the file. Be brave. Take after it. A six pack costs more than that handle did. Dress the handle here and there until there is no tip from side to side each time you swing. Polish it a bit with the sandpaper. Sand off all the painted-on finish in the areas of your grip.

Now, for the fore and back tip. If the tip is forward and the handle is high, put some books under the table to bring it up an inch or two more. If the tip is back and the handle is down, then put something under your feet. When you strike you are looking for the handle to be just tipping up. The center line of the handle should be from 1/2" to 3/4" high at the butt end. Remember, you are supposed to be reaching out just a little with this exercise. When you move in toward your work your handle will dip down some. Measure heights you have settled on and that is the correct height for your anvil. It most likely will not

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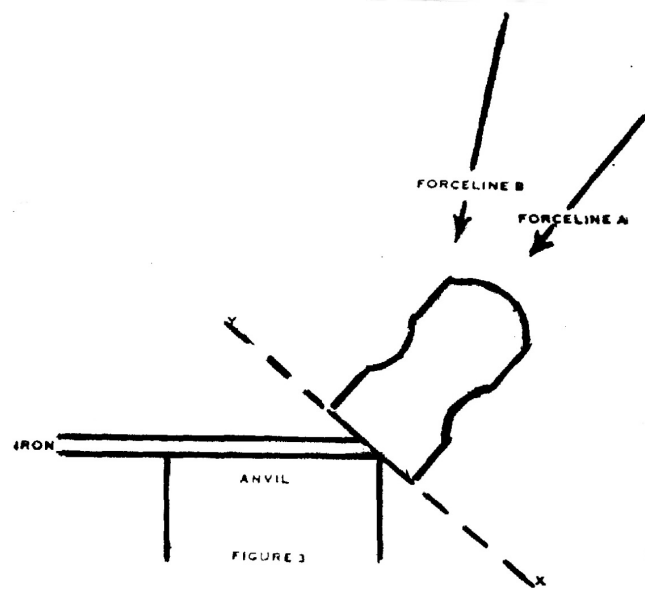
manner you wanted. What you are after in blacksmithing is to have each hammer blow do its share of the work. All the energy that is used in doing that work is coming right out of you so spend it wisely. If you will note the drawings, I will explain what is happening. Note that the hammer is hitting the work out in the middle of the anvil (Figure 1). It is tipped and coming in from the side. All that will happen here is bad for the beginner. The hammer's edge digs a hole and piles up some misplaced metal along the side of the



hole and it is doubtful that you will be able to save the piece. If this blow is intended, O.K., but plan it carefully. In Figure 2 the line of force is straight down. The metal is thinned in the center of contact and then pushed out evenly in the center. Remember that every time you hit, some metal is moved somewhere. It never goes away unless you cut it away. In a wiping blow (Figure 2) the hammer will crush the metal thinner but it will also drag some of the displaced metal along the direction of the force line, as toward A. These wiping blows are frowned on by some. I have no idea why unless they could not master them. But you will find the wiping blow is one you should master. With this blow you can control the line of force in two directions and two strengths, at once. The wiping blow tends to slide the top of the work only and leaves the bottom unchanged. Keep practicing on your sticks. Get some more if you need them. They are your imaginary hot iron and they receive a mark,

good or bad, just like hot iron when you hit them. You are teaching your muscles to place the hammer face exactly where you want it and that is why you practice on the sticks. The wood yields to the blow surprisingly like the hot iron. The stick of wood I describe is big enough to protect the anvil face from being marked up by wild blows. Strike easy, medium, and hard real hard. Practice for perfection. What you are learning you will keep for the rest of your life.

In chamfering you are doing many things at once, as shown in Figure 3, force line A. This action is crushing the end and pushing some of the iron back into itself (dotted line Y). It also is ramming the work back into your hand. The blow in face line B will crush the end, but in the process it drags the iron toward X. Note the tip of the hammer to the line of force. It will help to reduce most of the jamming of the work back into

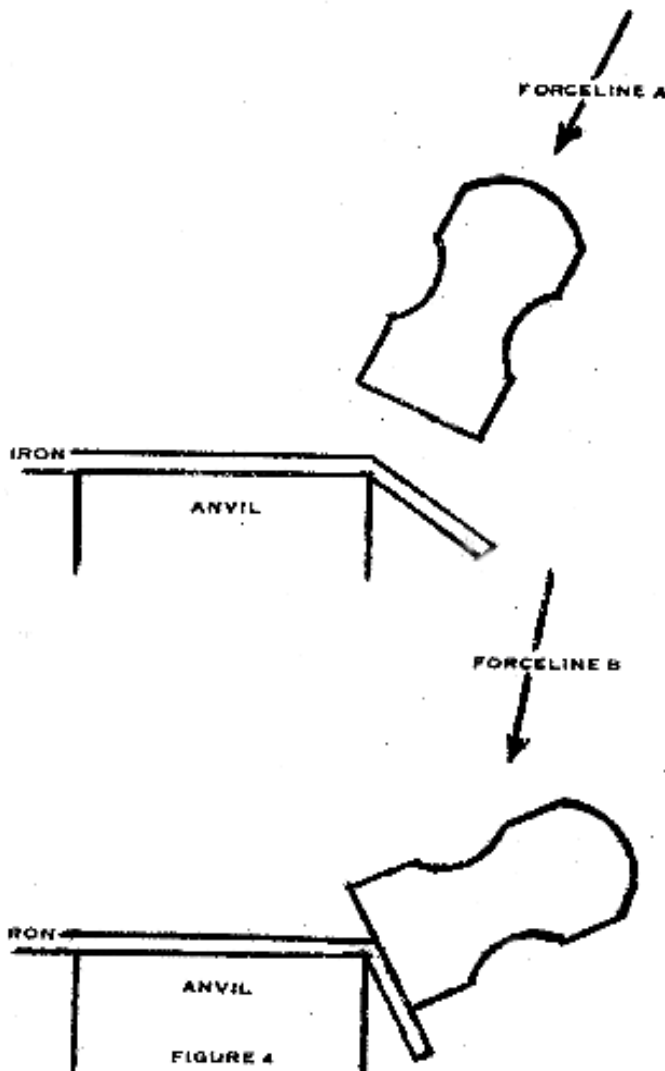


your hand and the drag of the anvil will soak up the rest of the shock. Master this blow. Remember to keep the end of the work exactly at the back edge of the anvil (see Figure 3). When the work or metal is located just right and the hammer control is right, all of the energy of the blow will be soaked up just before the hammer strikes the edge of the anvil. Practice this blow. It is one of the more important types. Practice with your stick. It will be a good idea to wear a glove on your stick hand. Smear some grease all over the end of your

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hammer and work at this blow. You will find the results very interesting and helpful in learning just what is happening.

In Figure 4, force line A, you have three things happening depending on how hard you hit and where on the edge of the anvil the work is. One is a bottom fullering blow, second an offsetting blow, and third a cutting blow. Be sure of your move before you strike any "over the edge" blow. In Figure 4B you have a wiping blow that is very useful. You are turning your iron down, reducing thickness, and elongating the turned down portion, but the portion of the work on top of the anvil face will not be affected.



There is no limit to the number of ways to strike the work. Each move or blow can be good or bad. Think out what you want to do, which way you want the metal to move. Decide on the direction of the force line, the tip of the hammer if needed, and whether there will be reflected energy to mess up something. All these things must be thought out before your iron comes out of the fire. By now you have used up most of your sticks and my guess is that you have learned a lot. Now it is time to buy a nice 2-1/2 pound cross-peen hammer with a nice wooden handle. Again, check the face for trueness of grind. The head should be rather stumpy, not a long piece of iron. I have one I bought from Sears and it is a very nice tool. Go back and get some more sticks and start all over again with your new 2-1/2 pounder. Do every step. Study yourself and learn to marry yourself to the hammer when you pick it up. It must be an extension of you and your thoughts. Then you will find that most of the mystery is gone.

Take this rule to heart and do not let any Johnny-come-lately steer you from it: If the last blow did what you wanted it to do, it was right. If it did not do what you wanted, it was wrong.

Now, go heat up some iron and take after it like you meant it. You are the boss now, not the hammer. Reprinted from the July 1981 issue of the Anvil

I photo copied this article from an Anvil magazine back when it came on newsprint I have done this more than once in my life. Some times when your away from the anvil for awhile or after an injury it helps to be able to re-adjust yourself . I usually use 1x2 or 1x3 furring strip, it helps me to see if I'm back in form. I stepped away from the anvil for a while when I had "tennis elbow", when I stepped back, things weren't working "right", I was babying my elbow and developing bad habits in doing so. The wood is soft and shows what your blows are doing when you hit. Notice at the end he recommends a "stumpy" hammer head like Uri Hoffi's.

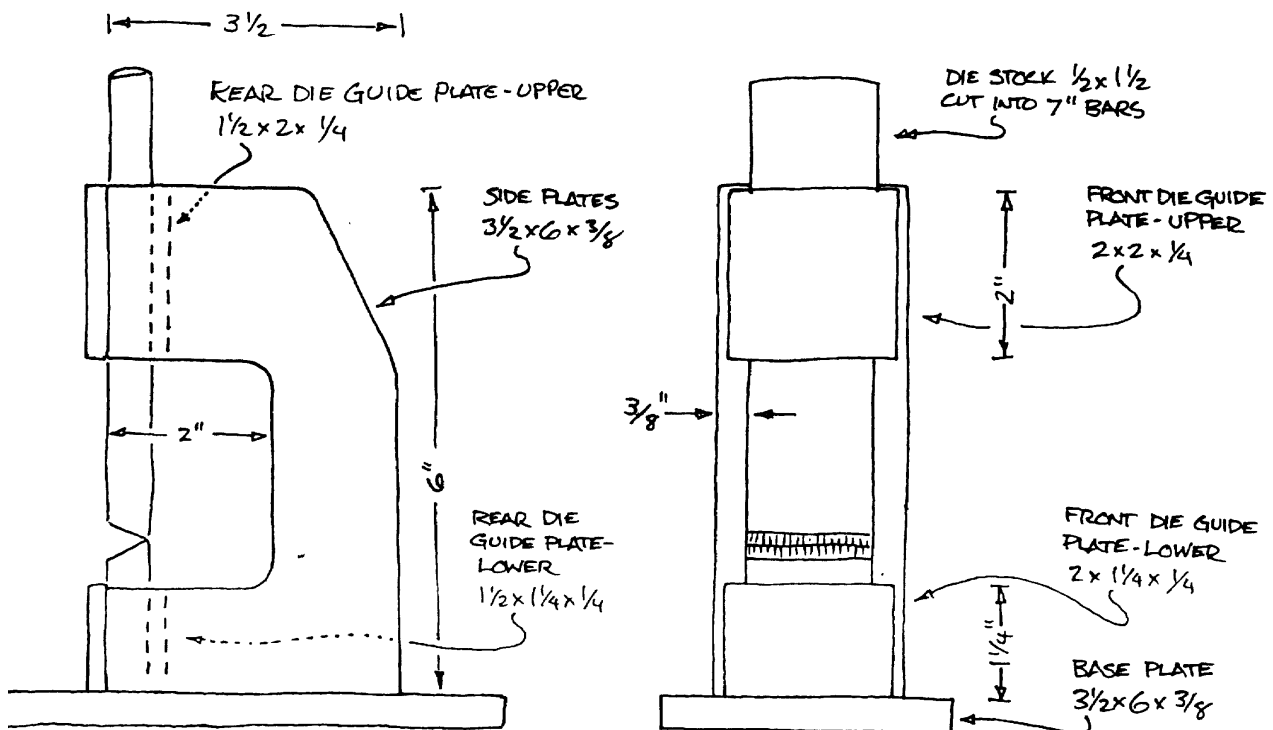
## A Blacksmith's Helper

Here's my design for a Blacksmith's Helper. Basically, it's a frame to hold standard 1 1/2" x 1/2" die blocks. I developed this design based on one that Lou Muller uses. Though Lou's design is a more accurate and finer tool, this design is considerably lighter, cheaper, and quicker to make. (See The Blacksmith's Journal, #98)

Whatever you do, remember to start with the die stock and build the holder around it. You can use tool steel for the dies, but I've been using plain old hot rolled for a couple of years, and the results are quite satisfactory.

A cheap harbor freight drill press vise was used to hold the parts together while welding. I wrapped the dies with two layers of newspaper before welding the pieces together, and had to drive out the die blank with a hammer. Still, most of the holders that I built had anywhere from 1/32" to 1/16" wobble. This could be reduced somewhat by using cold rolled steel for the dies and backing plates, but if you need super accuracy, you'll probably need to machine the guide and use bolts and shim stock to assemble it. This design doesn't allow for any of these refinements. It's designed to get the job done with a minimum of fussing around.

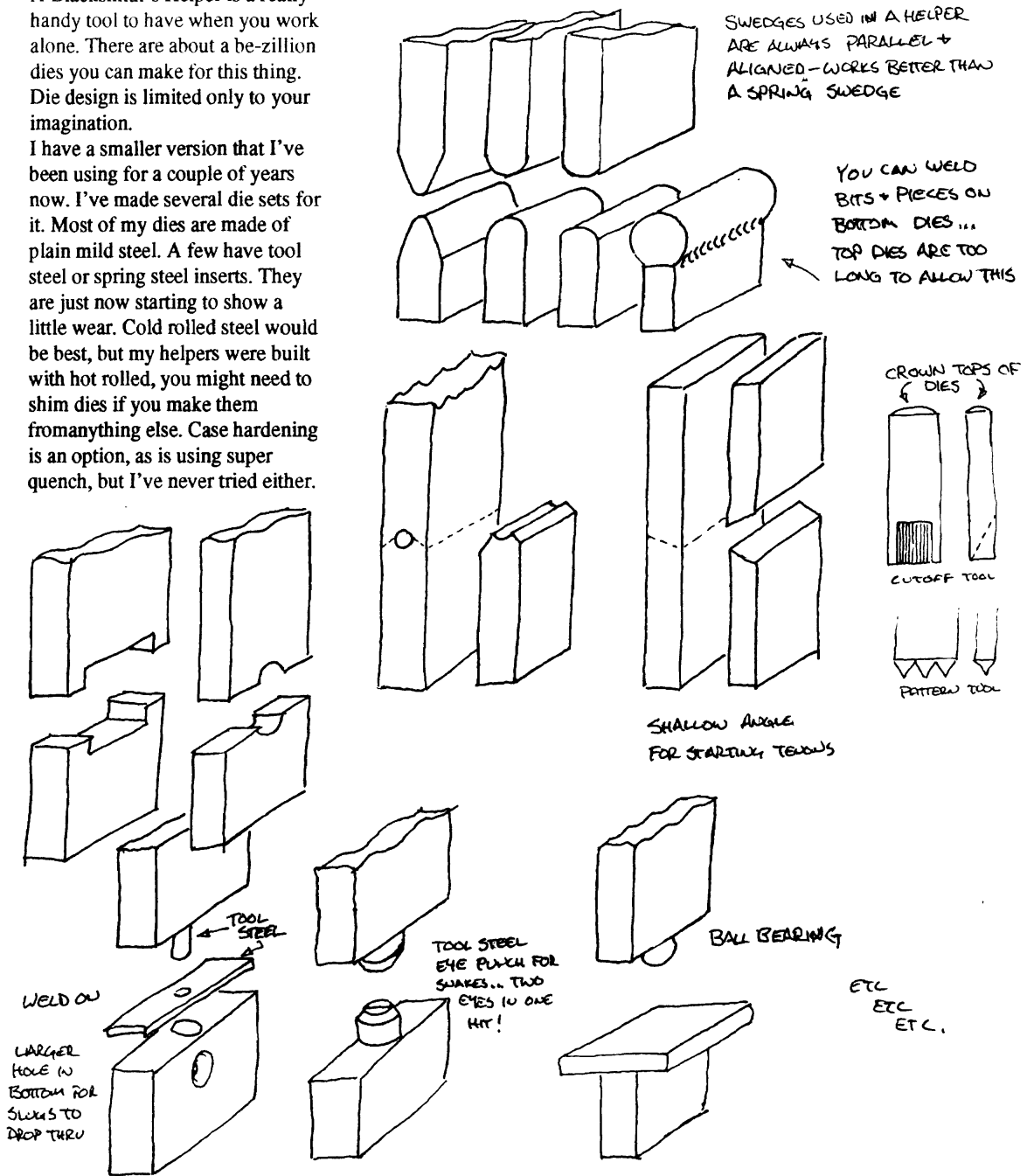
I built several of these to take to the Madison conference for the tailgate sales. Uri Hofi noticed them and said "Is good tool. It will break... here... (the upper weld that guides the forward part of the die) but is good tool." He also said, "I give you tip. I make a lot of leaves with serrated edges... like rose leaf. Take a bolt, weld to the top edge and the bottom edge of die, it will make serrated edges in one hit. In Israel, we have split dies. (I've seen antique two piece threading dies... I believe this is what he was referring to) I use them. You don't have this in America. Is good tool for this."



## Dies For The Helper

A Blacksmith's Helper is a really handy tool to have when you work alone. There are about a be-zillion dies you can make for this thing. Die design is limited only to your imagination.

I have a smaller version that I've been using for a couple of years now. I've made several die sets for it. Most of my dies are made of plain mild steel. A few have tool steel or spring steel inserts. They are just now starting to show a little wear. Cold rolled steel would be best, but my helpers were built with hot rolled, you might need to shim dies if you make them from anything else. Case hardening is an option, as is using super quench, but I've never tried either.



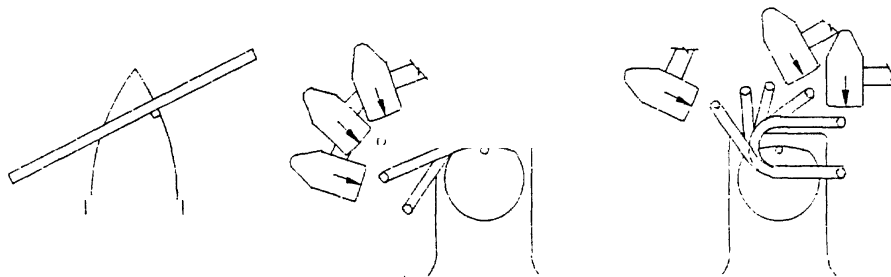
# New Jersey Blacksmiths Newsletter

## How To Forge A Chain Link

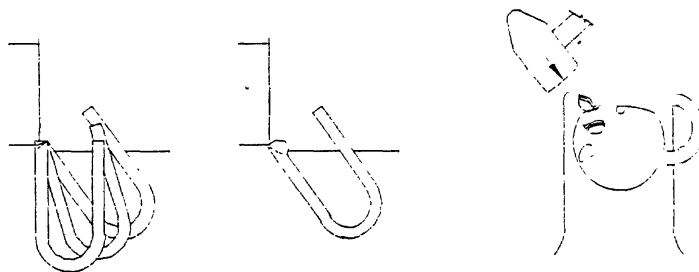
Randy McDaniel has provided us with a summary and variation on chain making from his book "A Blacksmithing Primer, A Course In Basic And Intermediate Blacksmithing" so that you may participate in ABANA's chain link project. It is the perfect project for learning how to forge weld.

"I start with chain to teach forge welding because you only have one piece to hold. You don't have to worry about positioning the pieces that are welded, just forge weld them together.

Heat the center area of the 7" bar. Place the steel on the horn perpendicular to the outside edge and reach past the horn to hammer the bar around. Flip the bar around and hook the bend on the horn. Hammer from this side until the two sides are parallel and the ends line up.



Turn the link around and hold the link with link tongs to forge out the scarfs. Place one end over the near radiused corner. Use half face blows over the corner. Start with the link perpendicular to the back of the anvil and gradually rotate it to the right. This way the left side of the scarf will be the same size as the bar and the far right side of the scarf will be the thinnest area. Only draw out about one third the thickness in order to have enough material to weld. Flip the link over and do the exact same procedure to this side. Both scarfs should be close to the same size.

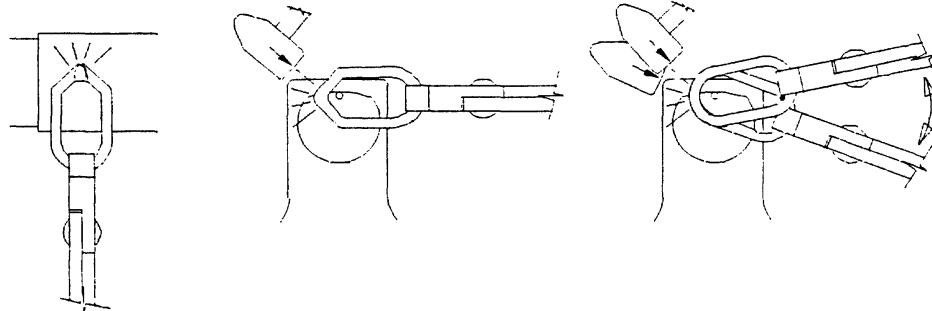


Heat up both sides behind the scarfs. Place the one scarf past the horn and hammer a straight bend down. Turn the link over, place it over the horn and bend this side down. Do not round up the bends. The two scarfs should overlap each other, with the forged sides together and the flat sides to the outside. Place the scarfs flat on the anvil face and lightly hammer them together to produce a tight fit. You may have to hit behind one side to bend it into the other side. Once it is closed do not hit it again or it may open back up.

Do not let it cool down. Put it back into the fire for the forge weld. Metal expands when heated and contracts when it cools so this could affect this connection. Heat the metal to a bright orange heat, bring it quickly out of the fire, wire brush the scale off, flux both sides with borax, and place it back into the fire. Heat it for a while on one side and then turn it over to heat the other side. Watch the metal's color and surface. When the surface, not the borax, is flowing and the metal is white with a few sparks flying, quickly bring the link flat to the anvil face. Hit it with first a snapping blow, to pop the scale and flux out from between the pieces, and then a full hit to weld the pieces together. This is not a killer blow, but one that will put the pieces together.

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Now, before the welding heat is lost, hook the end of the link over the end of the horn and hammer it together there. Quickly, place the link back into the fire.



Bring the link end to a welding heat again and then bring it over the horn. Quickly hammer against the horn while rotating the link up and down. This will weld the inside of the link and round up the link end. Some hammer blows will need to come at an angle to round up the stock back to 3/8" round. You do not need any more flux on the second weld, there is enough there to do the job. On heavier material this could have been done with one weld.

While the metal is at an orange heat or more, wire brush any scale and flux from the link. If you leave the flux on the metal it will show up later as white marks around your weld. Take a look at your weld. Are there big seams in it from not hammering at an angle? Did it pop apart and you couldn't get it back together? There are only two things that can happen if the piece didn't weld. Either it wasn't hot enough to weld or you burned it. Make another one, two or three. It is a perfect practice piece. Or, are you happy with the way it turned out? It really wasn't too bad, was it? Now you can hot punch your touch mark (signature) and do any variation you want for the project."

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If you want more information on forge welding and chain making you can purchase Randy's autographed book through Dragonfly Enterprises, at their new address, 3283 State Hill Road, Dept. CL, Sinking Spring, PA 19608. "A Blacksmithing Primer", ISBN 0-9662589-0-8, is \$20.00 plus \$3.00 shipping & handling, PA residents 6% sales tax. It is also available through the Internet at [mindancer.com/primer](http://mindancer.com/primer) and through several blacksmithing book dealers.

## ABANA 2000 Chain Link Project

The Saltfork Craftsmen Artists-Blacksmiths Association has created and will implement this project. " Every member of every ABANA chapters invited to forge a chain link to be assembled into one ABANA chain linking us all together. The resulting chain will be on display during Conference 2000 and then sold at the auction." "Start with 3/8 round stock 7 inches long, form an oval link and forge weld. You may jazz the link up any way you like, just remember to leave room at the ends of the link for the adjoining links. Don't forget to put your touch mark on your link or use letter stamps to add your name. Also include a tag identifying you and your chapter." Send your link to them as soon as possible, but no later than June 1, 2000. This would make a great chapter project. Why not send the Saltfork Craftsmen a length of chain from your chapter?

Send completed links or chains to:

Saltfork Craftsmen ABA  
1227 4th Street  
Alva, OK 73717

Pittsburgh Area Artist-Blacksmith Association



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**ABANA**

## How to Join or Renew your Membership in NJBA:

NJBA dues are \$15 per year. Please make out your check to:

**“New Jersey Blacksmiths Association.”**

Please mail checks to: NJBA, 222 Laurel Place, Neptune, NJ, 07753

Please include with the information requested below. You will receive the most recent newsletter as an acknowledgment of your membership. Annual dues are due on June 1. If you join in April through June, you will not owe renewal dues until June of the following year. If you join at another time of year, you will owe dues the following June.

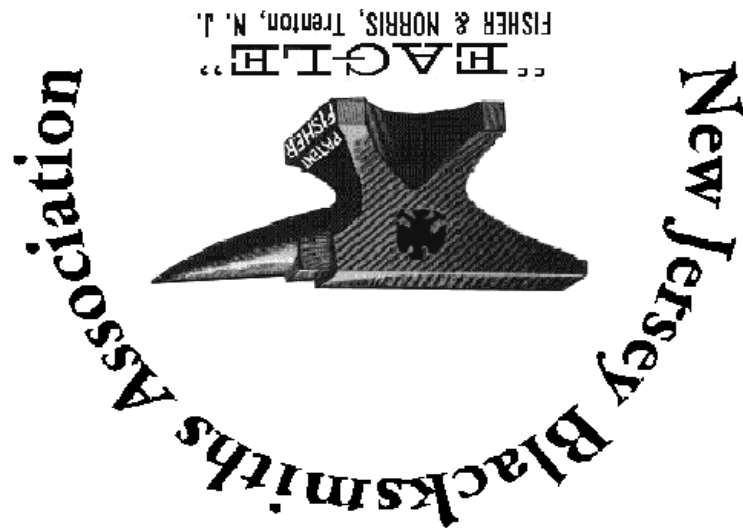
(The following information will be listed in a roster available to other members.)

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