MAKING A JAPANESE-STYLE MARKING KNIFE
Blacksmith's Gazette

By now, you've probably heard of Fred Holder's Blacksmith's Gazette - a monthly blacksmithing publication. It is designed to provide guidance in blacksmithing techniques and to keep you informed as much as possible with what is happening in the blacksmithing craft. We are not an art publication. Our purpose is to provide good information on technique and news.

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NOTICES

From the President

BSA Metalworking Merit Badge now includes blacksmithing

Due in large part to the tireless work of Drew Hagemann, ABANA member, with the assistance of Jack Andrews and others, the metalworking merit badge includes blacksmithing as one of the options, along with sheet metal/tinsmith, silversmith and founder. Blacksmith merit badge was dropped by BSA in 1952 and metalworking merit badge was substituted. This badge included mostly sheet work with very little hot work with no forging. However, I know that many scout camps across the country continued to or began anew to offer unofficial blacksmith programs without the official merit badge structure or recognition. In this way, some contact and interest in the craft with these young men has been maintained. However, this unofficial situation has now changed. The new merit badge was introduced at the National Jamboree at Fort A. P. Hill in Virginia in late July and includes a substantial level of fundamental forging theory and practical skill. Drew was on hand to work with the scouts and related that the interest was very high for the blacksmith portion of the skill set. As I write this message I am working with BSA to get more information to them on the resources that ABANA and the chapters can give to those scouts interested in this merit badge. I am also working on getting the merit badge pamphlet for the chapters in some form, along with links between the ABANA web site and the BSA site. At a minimum, we will post the requirements. Regardless of the mechanism, I will get this information to the membership.

If you are interested in serving as a merit badge counselor, contact your local Scout office and find a troop close to you. Introduce yourself to the adult leadership of the troop and offer your services as a merit badge counselor. You will need to complete an adult leader application that requires personal information, a brief description of your qualifications to be a counselor, and the approval of the troop committee and the local council. And consider inviting the local scout troop (both Boy Scouts and Cub Scouts) to your chapter meetings and public demonstrations. This is a great group of inquisitive and motivated young men. What better description do we need for one group who is part of the future of blacksmithing?

Doug Learn
ABANA President
Troop 71, Doylestown, PA, Committee Chairman

From the Editor

I received a congratulatory note the other day from a member who liked a recent issue of the Hammer's Blow. I occasionally get notes like this after each issue, and I'd like to take a moment to officially say THANK YOU to everyone who has written.

I really do appreciate these notes, but I think that it's important to remember the two groups who are responsible for the Hammer's Blow... namely you, the members of ABANA, and the folks who serve on the ABANA board.

Your support of ABANA is what pays for the production of this magazine and The Anvil's Ring. Your participation on a national level allows us to pool our resources to further our craft in a number of ways. Publications, scholarships, conferences, libraries... all these activities are ABANA's business and in the best interest of furthering our craft.

Without the efforts of the people who serve on the board, none of this would be possible. If you have a chance, try to attend an ABANA board meeting to see firsthand the kind of energy these individuals put into your organization. It's an educational experience.

So please keep those cards and letters coming... even if you don't like what you see... but remember your board and the ABANA membership, too. It takes all of us, working together, to make our organization work.

-BG

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Steel Rolling Mill
Designed by Hugh McDonald
36 pages, softcover
Published by Norm Larson
700 E State St.,
Jola, WI, 54990-0001
www.krause.com
Reviewed by Brian Gilbert

This isn't really a book, but a folio of design blueprints and construction notes for making a steel rolling mill. The mill isn't designed for cold rolling as I had initially thought, but for hot-working billets for knife-makers and pattern steel users. It is a very high quality machine, and I understand from those who have built one that they work extremely well. However, I have never seen one in action, so I can't give any firsthand comments about performance.

Looking at the blueprints, though, it seems to be well engineered. The design is very thorough, and every part required is clearly shown. A great deal of time has obviously been spent on these plans.

This is not a project for beginners, though. You'll need some experience reading blueprints, as standard welding symbols are used throughout. Since it's an Australian design, many of the dimensions are given in millimeters, which may take some getting used to.

Some of the parts will have to be made on a lathe. A little bit of machine work is required for the cam and roller. The roller bearings are made from cast and machined bronze. The rest of the mill is made from standard section steel, welded or bolted together. Motor requirements are about 1/2 to 3/4 hp, 20 rpm. V-belts are recommended, since they can slip if the mill gets jammed by taking too big a bite.

Surprisingly, the designer claims that tool steel isn't required for the rollers. "Since only hot steel is rolled, mild steel has shown no wear so far. Lower cost for the material and machining of mild steel are an advantage if extra sets of rollers are desired for specific shapes."

It's a fairly large commitment to build one of these things, but it certainly seems achievable. We should be especially grateful to Mr. McDonald for the design, as well as to Norm Larson for publishing this resource.
Some Miscellaneous Ideas

by Brian Gilbert

I got the idea for this nifty ruler from a woodworking supply catalog. They had these flexible rulers for sale... the only problem was that they were plastic and cost about fifteen dollars. Being the frugal type, I figured that a leather version might resist burns better, so I took an old belt, split it down the middle, painted one side white and marked it at every 1/4". It works great for finding the length of curved stock. A light tanned belt could be marked with a Sharpie, or even better, tooled with actual leatherworking tools.

OK, I know this sounds a little crazy, but I had this dream one night. (I really did!) People were moving anvils around at a conference using an "anvil peavy," sort of a cross between a hand truck and a logger's peavy. I thought to myself, there's no way that something like this could be useful, or actually work... could it?

I noticed a similar principle of leverage around a pivot point applied in a joist hook. I found some particularly ugly ones in a catalog, and a blacksmith-made version would look ten times better. It would have to be substantially made, though, or made from spring steel.
Soft hammers and solid surfaces

In the usual curiosity I have and interest in disseminating good knowledge, here are a couple things that I have been experimenting with that may be helpful:

1) When Tom Latane demonstrated at the NEB spring meet, he did a lot of decorative work using chasing and cutting tools. At one point he recommended that one use a very soft iron hammer when using struck tools such as chisels and gouges. He said he learned it from a stone carver friend. Because it is softer than the tool, the tool does not see as much abuse on the struck end and it tends to dig into the hammer face making the tool less likely to slip.

In past days, I had done some stone sculpture and he was right. The stone cutter's hammers are dead soft, usually about 2 1/2 lbs with 8" handles, allowing the sculptor to be very close to his work.

So last week, I took an old hammer and threw it in the fire and then the wood ashes to get it soft. I handled it with a stout 8" handle and tried it out. What a difference. I have not attempted the physics (let's get into that again), but it seemed to give me much better action on the piece I was working. By that I mean it cut better; the hammer did not slide around on the tool. It was very convincing as a much better way to go.

2) As I watched Tom struggle to keep his pieces on his anvil (a 4 1/2 by 15" hard surface) and the addition of a soft saddle didn't help, it occurred to me that when doing decorative work, one would benefit from a much larger working surface, a much higher one, and one that was soft so you would not have to have an intermediate piece between your work and the solid surface. I had a 10 X 14 X 2 1/2" piece of 1018 steel someone had given me, so I took a couple of thin sandbags (cloth bags filled with fine sand), flattened them out on top of a stump and set the steel block onto the bags. It provided a relatively large, soft and very solid working surface to do decorative work. It is higher than my waist (about the height of my post vise) so I am not continually stooped over to do detail work on a surface (anvil) that is set at the right height for serious hammer forging. It makes an enormous difference in the control and hence the quality of the work I can do. Hope this is helpful.

Frederick Faller
via TheForge

More on wrist injuries

First I want to thank you for the wonderful job you are doing with the Hammer's Blow. I always get many new ideas and inspiration from these pages.

I'm sure this has been touched on in the past, but after reading "Preventing Wrist Injuries," I felt compelled to write about my recent experience.

All last summer I spent building a new blacksmith shop, then when late summer rolled around, I had some commitments to demonstrate and I didn't have anything ready. I worked long evenings getting my portable setup ready and then made some simple things to sell as well as a Cub Scout project, all for our three-day gas and steam show. At the show many people wanted things custom made, so I did what I could, then in the evenings at home I would gather stock and prep the next day's projects. Needless to say, I hammered my arm off and at the end of three days I could barely lift my right arm at all and my elbow was killing me.

I did the best I could with ice, but I was off to two more steam shows over the next week, one in Iowa and the other in Illinois. I remembered a recommendation and story shared by Robb Gunter a couple of years ago where he would use a rubber band from a bunch of broccoli (those wide pink ones) and put around his finger tips and spread his fingers to strengthen the muscles that open the hand to balance the already-strong gripping muscles. I started with a much lighter rubber band and built up, as I read that this should not hurt at all and if it does, STOP. This did help and I am hammering much smarter these days, but I call this a recent experience because I still feel it a little in my elbow now and then.

Keep up the good work, I look forward to the next issue.

Bill Mathews
Clarksville, MI
Creative calipers

By Brian Gilbert

I came across the following pair of calipers on an antique tool website, and couldn't help sketching out a pattern to make for my own use. They remind me of a time when the most utilitarian devices were fair game for creative expression. Nowadays we call it art. We can only guess if they thought it was anything special back then.

These aren't the only design for calipers that you could make, by the way. As long as you can draw a straight line between the inside and outside measuring points and put a rivet hole equidistant between them, then your calipers should be accurate. You can change the location for the rivet hole if you wish to make your calipers measure a certain ratio, such as the Golden Section (roughly a ratio of three to five).

The two pieces are identical mirror-images of each other. It might be wise to make a full-size cardboard mock-up of the pattern before you commit your design to metal. While the original was made of sheet iron, they would look nice in brass as well. The originals are unsigned, but you wouldn't leave your touchmark off of something as nice as this, would you?
A Japanese-style marking knife

By Brian Gilbert

This article is really about two subjects. First, it's about making Japanese-style marking knives for woodworking, but it's also about preparing cable damascus. This material can be used for making lots of different tools and knives, and when etched, it's really pretty.

Before we get into this, though, I need to make some disclaimers. First, I'm no knifemaker. This probably isn't the "correct" way to make a knife, but nobody has told me yet that I can't do it this way, so for now, it works for me. The blades I've made aren't going to get me into the Knifemakers Guild, but so far I've made some pretty nice blades without too much loss of sanity or hair. Second, this isn't the way that true Japanese marking knives are made, which is a great deal more difficult. A hard steel edge is welded to a wrought iron body, so that only a very thin cutting edge is hard steel. The edge is supported by a soft steel body. I've heard stories about these blades cutting through nails and still holding their edge. This kind of a blade is called "san mai."

While I'd like to try a san mai blade one day, it seems a bit like overkill for a knife whose primary job is to scratch a line into a piece of wood.

So instead, for this project I decided to use Japanese patterns for the knives' outlines, while the material used for the knives is made from forge-welded cable. There are a couple of advantages to this approach—for one, it's a bit easier to weld up cable than it is to make a true damascus billet. Flaws, when they occur, are less catastrophic in nature due to the wire in the cable. Real damascus, on the other hand, is made from flat sheets. A flaw in one of the sheets often runs through quite a bit of blade before it stops, often resulting in a ruined billet. I've found that I can often cut around flaws in cable, since they most often occur along the edges.

To start, you need to weld up a piece of cable. You can use smaller cable, say 5/8" diameter elevator cable, to make a narrower blade. Larger cable equals a bigger blade. I've used up to one inch diameter, but the big sizes are more difficult to work with. The outer strands of wire will burn up before the core gets hot enough to fuse. It's often easier to weld a longer length of smaller diameter cable, then cut it nearly through and lap weld it. Don't use galvanized cable—the vapors from burning zinc will give you "metal fume fever."

Cut about a three-foot length of cable. While this gets a lot easier with practice, proper preparation will go a long way towards success on your first try. Keep a wire scratch brush handy at all times, you'll use it a lot. You'll also need plenty of borax or boric acid for flux. A comparatively light hammer is used to weld the cable, while a heavier one is needed to forge the welded blade. Once it's welded up, cable is a fairly tough material and will require forceful persuasion to move it. A probe is also handy for checking the welding heat, which is just a length of small rod (let's say 1/4") sharpened to a point.

First you'll need to degrease the cable, since it will have quite a bit of oil in the strands. I do this while my fire is cocking up, laying the cable on top to burn off the oil. Once it stops smoking and you have a nice, well-cooked fire, you can begin welding. Start by scratch-brushing the end well, warm up and flux. Heat the cable slowly or the tiny wires on the outer layer will burn. Rotating the cable frequently will help minimize the problem. Don't weld on the first heat. Bring it up to a red and then tighten the cable by hammering it into a swedge, rotating the

Collapsing the cable

stock as you hammer. If you hammer with the lay of the cable, it will tighten up, becoming smaller and denser in the process. You can feel it if you're doing it the right way. Some like to tighten by twisting in the vise. Wire brush and re-flux before taking the next heat. Repeat if necessary, but take a higher heat this time,
since the outer wires will be less and less likely to burn as the cable becomes more homogenous.

Next you can take a full welding heat. I've welded both in a swage and square on the anvil - either way is a matter of choice. You'll need to square it up at some point, though, so I've been doing my welding on the anvil face lately and have had good results. You will probably need to take a second welding heat just for good measure. In fact, as you shape your billet, you'll want to continue to do all of your forging at a full welding or near welding heat. Working this material below a yellow heat really encourages the formation of flaws. You can really get a good, solid bar by working it hot, wire brushing and fluxing after each heat.

The shape of the blade can range from a simple straight knife to a complicated outline with handles. My favorites so far are thicker at the cutting end, straight and curved right-handed knives. I usually thin the end for the handle, then cut off the blade section. I always use a chop saw for this, since I tried using a hardy once and split a blade.

Refining the blade is done at the grinding wheel. I grind the profile first, then the bevel for the blade, and then flatten the sides until I've gotten rid of the scale pockets. Don't grind the edge sharp - it'll burn when hardening, and the etch will eat into the edge. Instead, try to leave a hairline's thickness. It also makes working with the knife less hazardous while hand sanding.

Before you harden the blade, take it home and do some sanding. I don't have a belt grinder, so I do the preliminary sanding with an 80 grit wheel and backing pad in my sidegrinder. You have to look out, though, because a sidegrinder tends to round over the flat edges, and the back side of a marking knife should be dead flat. I harden my blades at this point, bringing the cutting edge up to non-magnetic and quenching in oil. Then I switch to a sheet of 120 grit clamped to a clipboard to flatten the back, and sand by hand.

Once both sides are clean and flat, I'll sand with a 320 emery paper and remove the scratches left by the 120. If you miss a few,

and I always do, they'll really pop out at you when you etch the blade. I then switch to 600-grit emery paper, and I'm ready to etch.

Etching these blades is fun. You can see the pattern develop as the ferric chloride attacks the lower carbon steel in the weld zones of the wires. I get ferric chloride from Radio Shack. It's sold as "PCB Etchant" and costs about $3.20 a bottle. I dilute it two to one before use. When you dilute, remember to always pour acid into water, never water into acid. It's very mild, but it will stain fingers and clothes. Etch outdoors, and don't get the stuff near your eyes.

Once it's etched, I rub it lightly with 600 grit and etch a second time. Rinse the blade really well under hot water, and neutralize the acid with baking soda (I skipped this step on one blade, and got a mysterious brown spot. I always neutralize now.) Some folks will further treat their blade with a chemical bluing agent, but I haven't tried it yet.

Add a leather case, and you're finished. This project is fairly labor and time intensive, but the results are really beautiful and useful, and your woodworking friends will be green with envy.

A few various outlines
Bow tongs for small stock

By Dick Niefeld

These tongs are similar to a pair of versatile tongs made by Toby Hickman as he was video-taped when at Joe Pehoski’s shop in 1991. That video is available for rent from ABANA. These instructions differ from that video primarily because these are designed to be made using a hand hammer. They can also be made using a power hammer, as did Toby Hickman.

To make these tongs, several blacksmith processes are used: conceptualizing the final product, marking the stock, isolating the different parts, drawing out the shank and reins, upsetting the bit, slitting the bit, bending the shank, punching the rivet hole, riveting, and putting on a finish, if desired.

A good tong steel, particularly for beginning tong makers, is the common mild steel called A36 that typically has a maximum of .29% carbon. More experienced tong makers sometimes like to use a medium carbon steel such as 1045 or 4140 for a stronger tong. An advantage of mild steel is that if it is at a red heat and then cooled in the quench tank, they are not as susceptible to cracking as they might be if made of a higher carbon steel. A36 is also inexpensive and easy to work. A36 is slightly stronger than 1018/1020 (the typical cold rolled) which will also work for tongs. Remember that the stronger the steel, the lighter can be the tongs and vice versa. With this style of tongs, which hold both round and square stock in a very satisfactory manner, it is often not necessary to own tongs which only hold round bar stock.

The dimensions given in this article are for tongs made from bar stock 1/4" by 3/4" by 11". This size is suitable for tongs designed to hold 3/8” material. The same 1/4" by 3/4" bar can be used to make tongs that will hold from 1/4” up to 1/2” material, although these tongs are a little light weight to be holding 1/2" iron. For this size tong, a bit of approximately 1 ” in length (marked at 3/4” on blank bar before forging) and a boss length of 7/8” to 1 ” is typical. Since the reins and the shank (space between the boss and bit) will be drawn out, their final length will be approximately 2 times as long as the original marked distance. The shank on these tongs is marked at 1 1/2” and will stretch with drawing out to approximately 3”. Once you’re famil-

Stock layout for a pair of tongs

iar with the steps in this process, the size of the tongs can be altered depending on the dimensional characteristics you desire in the tong. Larger tongs can be made using larger bar stock with the same approximate dimensional relationships such as 5/16” by 1", 3/8” by 1", 1/2" by 1 1/4” and so on. The key factor in determining the size of stock to use for a particular pair of tongs is to determine a suitable size for the boss. The boss does not change in thickness or width during the process of making the tong. An approximation for determining how long a piece of bar stock is needed is to simply use half the length of the desired finished product. Keep in mind that the shorter the shank the greater the holding power, but at the expense of versatility. Rivet size is not critical except that generally the bigger the tongs the bigger the rivet. A simple guide is to use a rivet at least as thick as the boss on the tong blank.

Both tong halves are made exactly the same. There is not a left and right half except when punching the hole, as later explained. Blacksmiths often make tongs to be used either in the left hand or right hand, depending on which rein falls in the palm of the hand when the tong is opened. Another consideration sometimes discussed is whether, when in use, torque is applied counterclockwise or clockwise. There are a good number of blacksmiths who don’t worry about left or right hand and this article doesn’t worry about it, either. If right or left handed is a concern and the tongs seem to be for the wrong hand, an easy solution is to bend a jog in each rein near the boss. Make the bend so that one rein is directly on top of the other, allowing equal fit for either hand.

Step 1

To isolate the different parts of the tong, first mark with a silver pencil the junctures of the bit, boss, and rein as shown. Then indent the bar on those marks by driving the cold bar into the corner of the anvil to make a small indentation. This indentation
will make it easy to feel those marks on the edge of the anvil when the bar is hot. Without the indented marks, and with the iron hot, it is difficult to find and forge the right spot. Mark and indent both pieces, side by side at the same time. This helps in making both tong halves the same.

**Step 2**
Isolate the different areas for processing. At a forging heat, notch the bar on three places previously marked by driving the bar onto a small radius edge of the anvil. Hold the hot iron above the face of the anvil at an appropriate angle. Holding the bar at an approximate 45-degree angle will work. Then hammer the bar over the anvil edge to the proper depth. Notch no more than 1/3 of the bar's width (1/4") at the juncture of the reins and the boss, 1/3 of bar's width at the juncture of the boss and the shank, and 2/3 of the bar's width (1/2") at the juncture of the bit and the shank. Care must be taken to avoid making these notches too deep, as they then become weak areas. Also, the tong is stronger if those notches have a rounded inside corner rather than a sharp square corner.

**Step 3**
Draw out reins at a forging heat. The reins can be drawn out first in order to provide a built-in handle, eliminating the need for a pair of tongs to hold the work. Be careful not to make the reins too thin or too narrow near the boss. Keep the reins rectangular, with the width wider than the thickness, providing extra strength in the direction needed. Maintain the original bar's 1/4" thickness at least near the boss. Try for a nice even taper, wide at the boss and narrow at the end. Knock off or round up the edges so the reins will feel comfortable in the hand. This 1/4" by 3/4" bar stock tong is easy to draw out by hand, although a "forge-welded handle" is another suitable option. Drawing out this small stock with a hand hammer is good practice for blacksmiths looking to increase their hammer control and, with practice, should be relatively easy and quick. A power hammer is my method of choice when available.

Draw out the shank (between the boss and the bit) at a forging heat. Hammer on the back of the bar over a narrow corner or spot on the anvil to keep the previously forged boss and bit out of the way, avoiding damage to them by an errant blow. While maintaining the original 1/4" thickness, maintain a width of 1/2" near the boss and taper the shank down to no more than 1/4" width right before the bit.

At a forging heat, forge the bit width down to approximately 9/16" in preparation for splitting. The bit will lengthen to about 1" and become a little thicker.

If by chance a cold shut develops anywhere, grind or file it out, as cold shuts are the beginning of a future crack!

**Step #4**
Split the length of the bit, at a forging heat, approximately 1/2 the width. Take care to keep the split centered and straight along the length of the bit. This may take some practice on scrap pieces. A hold-down device is necessary when working alone. Making this centered slit usually works best for me by standing in front of the bit so that I'm looking down the length of the tong. Begin at the shank end of the bit and cut toward you. Stick with the chisel on the 1/4" bar stock to preserve the thin bit, but on thicker stock it is also possible to make the slit with a hack-saw. Making the split now while the shank is straight is much easier than after the shank is bent.

Open the split, at a forging heat, to the proper 90-degree angle by carefully hammering onto a sharp corner or edge of the anvil.

**Step #5**
Heat the shank from boss to bit then quickly cool only the bit in water to keep the bit from being distorted by the hammer in the next bending processes. Then bend the bit end back approximately 70 degrees from the shank. The bend is easily made if the heated shank is placed in a post vise with the bit sticking up and out and then hammering the cold bit over. Use a cover on the vise jaw with an appropriate radius on the top edge to keep the jaw from ding up the tong and preventing too sharp a bend.

Heat the boss and shank area and bend the boss end of the shank approximately 70 degrees (cool boss, if needed, to keep from damaging it). A quality bend is easy if either the shank or the boss is placed in a vise with jaw covers.

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Step #6

Bend the shank at a forging heat between bit and boss into a half-circle curve using a hammer and the horn of the anvil, bending forks, and/or another pair of tongs as needed. Try to line up the slit in the bit with an imaginary line running through the place where the rivet will go.

Punch and drift a hole (or drill) in the center of the boss for the rivet. A drill leaves a nice uniform hole, but a punch leaves more material in the boss. If only a punch is used and not a drill, the rivet joint is inferior, due to the tapered hole made by the typical punch leaving only a small surface touching the rivet. Therefore, punch a small hole, at a forging heat, and carefully drift to size (1/4" for these tongs). Drift over a 5/16" bolster plate (a piece of iron with a hole in it). Set the rivet either cold or hot. Rivet should be trimmed to about 1.5 - 2 diameters before pounding down. Make a nice domed rivet head with a small hammer.

Using heavy hammer blows and/or hot rivets helps expand the rivet inside the tongs, filling up any slop or space. Note that when punching, punch and drift from the inside of the tongs to the outside of the tongs. Punching and drifting will push metal and raise a ridge on the far side of the drifted area and around the hole. These raised areas, if allowed to face each other inside the joint, or unless filed down or in some way eliminated, will result in a loose-fitting joint. Figure out how the tongs will go together ahead of time and keep the abutting sides of the pivot joint flat and smooth. Since sometimes the rivet can be damaged in the adjustment and alignment process, it is often safer to use a bolt and nut temporarily, and then set the rivet in the final stages of completion.

Step #7

Heat the tongs from boss to bit to an orange heat, then roughly adjust shank and bit as necessary so that the tongs hold a scrap piece of 3/8" square bar in the bit. Adjust bit around the scrap piece by squeezing the bit in a vise and/or finessing with a hammer on the anvil. While in the vise, adjust or bend the reins so they are open to the distance that will fit comfortably in your hand when in use.

Use the same heat or, if necessary, again heat from boss to bit. Quench to cool the newly fitted bit leaving the shank, boss and upper reins hot. Then, while holding the scrap bar of bar the tongs are intended to hold, place the reins in a post vise with tongs vertical and bit end up. Bend the shank where appropriate to align everything so the scrap bar stock remains tightly held and also lines up along the tong's length with an imaginary line running through the center of the rivet and the bit. Bending forks, pliers, or another pair of tongs and a light hammer could be useful in this adjustment process. Continue the alignment and adjustment process until satisfied with the results.

Step #8

If the reins are hard to move due to a tight rivet joint, heat the joint and open and close the reins several times until they loosen up. Finish with your favorite finish (wax, oil, etc.).
A kitchen table photography studio

By Brian Gilbert

In a recent issue of The Crafts Report, there's an article about preventing reflections when photographing shiny objects*, like glass. I figured that forged metal has shiny highlights, so some of the principles might apply. The article goes on to describe how to make a low-cost light tent. I scaled up the size quite a bit to accommodate larger objects and used the setup for shooting some of the cable damascus knives as shown on the cover and on page 8 of this issue. The system works fairly well, and costs a whole lot less than a studio photography shoot. Here's how to do it.

The first thing you'll need is a big, flat surface. Since space is at a premium at our house, the best place I could find was the dining room table, but a dedicated 4 x 4 space would be ideal. A half sheet of plywood hinged to the wall in a garage or basement would be ideal.

Next, go down to the hardware store and tell them you want a florescent light fixture diffuser panel. They're thin plastic panels that comes in several surfaces. A smokey white is best, but they didn't have that at my hardware store. I got a white that has little diamond shapes molded in, it seems to work fine. You'll need two. I paid about $4 each for them.

Now you'll need a light source. Some of the larger photography stores sell a tungsten photography bulb with a screw-in base. These bulbs are a zillion times brighter than ordinary bulbs, and the color of the light is slightly on the blue side. With some films, they cast a blue tint on all of your shots, so you'll need a roll of film for tungsten light. The bulbs will set you back around six dollars each. Buy two or three of these bulbs. A few feet of white or grey background paper will be handy, but I just used a piece of posterboard.

The rest of your studio can be equipped from things that you have lying around the shop. You'll need two or three clamp-on work lights. The tungsten bulbs get quite hot, so the old ones with porcelain sockets are best. I use a halogen work light for extra fill light. If you don't have one of these, the three clamp-on tungstens are a good idea.

Now for the set up. First, lay one diffuser so that it forms a gentle curve in the back, then lay the paper or posterboard on top. This will become your background. Form the other diffuser into an arch over the first, kind of like a quonset hut or airplane hangar. The plastic diffusers are pretty flimsy, so you may need to get creative with some masking tape to get it to stand up. I used some books to hold the ends in, and didn't tell Karen about the tape on her antique table.

Set your piece to be photographed in the middle of the arch and position the lights by trial and error. Photos usually look more natural with more light on one side, so I set up the halogens and one tungsten at about 45 degrees and a little to the back. The other tungsten looked best a little lower, and also towards the back, but this will vary depending on what your shooting. I was after a reflection in the blade to highlight the pattern in the damascus. In the color shots, the halogen lights gave a warm look to the highlights, but it looks a touch unprofessional. If you're shooting jury slides, I'd go with all tungsten light and tungsten balanced film.

If you have a flash that can be removed from the camera, then you have another alternative. You can mount the flash on a stand directly over the work, but you'll probably need a good light meter to correctly set the camera's exposure.

One day I was in a rush to shoot some teak samples, so I set up the "hangar" outside in the sunshine. To my surprise, the images turned out great! The big advantage to shooting outside is that while the light is difficult to control, it's plentiful and cheap, and balanced for regular film. Sunlight can be "bounced" with anything big and white. Camera stores sell reflectors that are white on one side and aluminized on the other, but you can get the same thing at an auto parts store. Some windshield reflectors have aluminized surfaces, and they cost a fraction of what a "real" reflector does. The real reflectors do work a little bit better, though. Poster board also works.

So while this setup obviously won't work for a coffee table, it works well for smaller objects. Keeping a photographic record of your work is always a good idea, even if you're not a professional smith. If you are, though, or would like to be someday, good pictures are essential to your business. And while you're at it, you can send some to the Hammer's Blow or the Anvil's Ring!

*Truth or Clare; How to prevent hot spots and reflections from ruining your work's true photographic potential, by Steve Meltzer. The Crafts Report, Aug 2001
Reproducing a Yellin bolt

By Brian Gilbert

Copying a masterpiece has always been considered a legitimate way to learn art technique, and I thought I'd try the same thing with a small Yellin piece to see what I could learn.

The best way to do this would be to examine an actual Yellin slide bolt. Not finding any of these laying around my house, I settled on a photograph from Jack Andrews' book *Samuel Yellin*, Metalworker. It shows three slide bolts made by Yellin for the Theo. Pitcairn estate in 1931.

One of the immediate problems with this approach is the size of the finished piece. There aren't any clues in the photograph as to the dimensions of the stock used, but since this is intended as a practice piece, I took a guess and settled on 1/2"x1" for the main bolt, and 1/4"x1 3/4" for the backplate. (In the end, I used a different sized backplate for my piece, 3/16"x2. It worked well enough. You'll notice the backplate is slightly wider in the photos than the one in the drawing.)

To start, I cut a length of 1/2" x 1" bar stick for the main bolt 17" long, and a piece of 3/16 x 2 for the backplate 15 3/4" long. I used the 1/2" x 1" bar as a tool to help bend and fit the backplate, so forge it last.

The first thing to do is chisel off the corners at 45 degrees and file or grind the edges.

The next operation was to punch the rectangular holes. I did this the "conventional" way, making a rectangular punch from an old railroad rail clip. (NOT the cast kind, but the ones that are forged from 5/8" x 1" bar stock.) I straightened the clip, drew the end down to the correct size, and ground the end square and sharp. The whole thing was then hardened in oil, and used untempered.

I learned something interesting when I went to punch these holes. Since the area of the punch is rather large, it takes a couple of heats to drive it through. It also tends to distort the sides of the hole when you drive the punch over the anvil. I'm certain that you would get better results by making a top and bottom die set to punch these, since the metal would be forced downward through the die, rather than outward. If you had more than one of these pieces to make, then it would definitely be worth

*The original photo from page 92-copyright, used with permission*

*Approximate dimensions for a Yellin bolt*
the time to make. As it was, my punch was just a hair undersized, so I cleaned up the sides of the hole with a file until I got a fairly smooth fit.

I cut the decorative lines in the back side of the backplate next. These were done with a cold chisel.

Now I was ready to bend the backplate. I was afraid that if I did this in a vise, the rectangular holes would distort, so I got the backplate hot, inserted the bar, and used the bar as a lever to bend the backplate into position. When it was close, I removed the bar and cleaned up the bend at the anvil and vise, checking for a correct fit every now and again.

Trying to get the corners sharp and square was difficult using such thin stock. I would imagine that 1/4" would work slightly better, but would still be tricky. I made the bottom 90-degree bend first, and then forged the top section that wraps the bar second. I did this end the same way... insert the bar, make the bend to approximate shape, then clean up at the vise and anvil, always using the 1/2" x 1" stock as a tool to help shape the backplate.

The bar was forged next. It was simply tapered and forged to a gentle curve over the horn.

The last step was to chisel the patterns in. One of the neat aspects of Yellin’s work was chiseled patterns, and his shop excelled in surface treatment of ironwork. One of my favorite Yellin quotes is, “Any mark worth making is worth making boldly,” so I cut the bar fairly deep, though I worked the steel cold.

After a little cleanup filing, the piece was ready for assembly. It went in fairly smooth, although at this point I had to make some guesses about the original details. Since no mounting holes are evident in the backplate, it’s possible that the bar on the original is removable, concealing the mounting holes. But I wanted a bolt that would stay together, so I added two small rivets to the sides of the bar to limit the travel. This means I’ll have to drill mounting holes through the backplate on either side of the bar. Another detail that I had to guess at was whether or not a spring was present. Many of the older slide bolts had a leaf spring that was welded or riveted to the backplate to hold the bolt in the open or closed position. If the bolt is mounted horizontally, the spring isn’t needed. I made my bolt without the spring, but it would be easy to add if you leave a little space between the bolt and backplate.

All told, it was a fun project to do, although I wonder how close I came to the original dimensions. It’s a good practice piece that can be completed in an afternoon. You should experiment with the dimensions and techniques, and you just may add some things to your blacksmithing bag of tricks!
Two for the conference

A ring project for Francis

Thanks to the unstoppable Al Butlak and the New York State Designer Blacksmiths, here are two projects that you or your forge can participate in. The NYSB is going to engage in a Francis Whitaker Memorial ring project during the 2002 ABANA national conference in LaCrosse, Wisconsin, to be held June 5-9. They are looking for volunteers to work on the grille and to fabricate the rings.

The rings will be made from quarter by one-inch hot-rolled bar stock. The outside diameter will be ten inches and must be as close to perfectly round as possible. The rings furnish a frame for any decorative forged item. These can be iron or any other metal, as long as traditional methods of joinery are used (rivets, collars, forge welding, etc). The outside half inch must be free of design or fasteners, as this area will be used for mounting the rings. Don't drill holes... the grille will be prefabricated in western New York and assembled in LaCrosse, WI.

The NYSDB needs your rings. We'd like a reply of intent to participate as soon as possible. Please contact:

Al Butlak Jr.
1352 Walden Ave.
Buffalo, NY 14211-2826
email: butlak1@mindspring.com

A look at the basic layout of the finished project

Individual ring dimensions
Chapter flags in the gallery

The New York State Designer Blacksmiths have been granted space in the gallery to display chapter flags. This may become an outside display, so ABANA chapter members, get out your soapstone and start designing! We'd like to see a pendant or flag with a bracket or pole to hold it. The whole assembly should be portable and self-standing, even in the wind. A forged bracket is encouraged, as in the sketch. The pendant or flag is made of fabric with your logo, chapter initials or name. The whole thing should be able to stand up to the rain without the colors running. We've had ours for several years in all kinds of weather, including snow.

For our overseas members, the bracket could be waived but bring the flag and we'll hang it from a tree limb or clothes-line and we'll know that you're there.

If there are any questions, email Al at the address on page 16.
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2001
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1 First Annual Pig/Iron fest fundraiser for the Peters Valley Blacksmith Shop. 19 Kuhn Road. Layton, NJ 07851. Advanced reservations encouraged. For additional information, contact Peters Valley Blacksmith Shop, (973) 948-2393, or crowlymaegan@hotmail.com or yllwbrn-frm@aol.com

8-9 The Fifth Annual Bighorn Forge Conference. Bighorn Forge, Kewaskum, WI. This year’s event will feature John Medwedeff. For additional information contact Dan Nauman, Bighorn Forge Conference, 4190 Badger Road, Kewaskum, WI 53040 (262) 626-2208 trapper@alexss.net

7-9 Alabama Forge Council’s Tannehill Conference. For info, contact Glynn Holmes, conference chair, (205) 663-3328

8-9 Annual Wrought Iron Conference. Co-sponsored by the Mid Atlantic Smiths Assn. and The Delaware Agricultural Museum. Held in Dover, DE. Demonstrators: David Court from Northfield, NH, and Doug Hendrickson from Lesterville, MO. An iron-in-the-Hat drawing and auction will be held. For info please call 302-734-1618.

8-9 North Texas Blacksmiths Association Hammerfest 2001. Bridgeport, Texas. Peter Ross will be the feature demonstrator for the 13th annual Hammerfest. See the NTBA home page http://www.flash.net/~dwilson/ntba/

For registration contact Verl Underwood, 613 N. Bailey, Ft. Worth, TX 76107-1005; (817) 626-5909. e-mail: vauder@aol.com

15 Blacksmith’s Open House and Tool Swap. Hunterdon Historical Museum, Clinton, NJ. Contact Adam Howard, (908) 735-4101

14-15 North Carolina Blacksmiths Conference, Dixie Classic Fairground in Winston-Salem, North Carolina. The demonstrators will be Jim Batson, Jerry Darnell, Bob Patrick, Billy Phelps, Jim Slining, and Wayne Whitley. Contact Jimmy Alexander at 919-302-1401 or e-mail: JimA136040@aol.com

15-16 CCS Hammer-In. Demonstrators will be Brent Kington and Elliott Pujo. At the Center for Creative Studies, 201 East Kirby, Detroit MI 48201. For more info contact: James Vitte 313-664-7455 or e-mail grumblejunky@hotmail.com

22-23 SOFA’s Quad-State Roundup. Demonstrations by Uri Hofi, Al Pendray, Doug Merkel, and Charles Orlando. Miami County Fairgrounds, Troy, Ohio. Troy is approximately 20 miles north of Dayton, Ohio on I-75. For additional information contact Larry Gindlesperger, SOFA/Quad State 2001, PO Box 24308, Huber Heights, OH 45424 (937) 237-2200.

October
5-7 Regional blacksmiths conference with Bob Patrick, Coeur d’Alene, ID. Sponsored by the Kootenay Blacksmiths Assn., Northern Rockies Blacksmiths Assn., and the Northwest Blacksmiths Assn. John Loeffler (509) 548-4754, bluemoon@televar.com

6-7 Banging On the Bayou - Bogue-Falaya Park, Covington, LA. Demonstrators will be Alice James, Japh Howard, Erik Kreyling

13-14 Salishk First Annual Blacksmithing Conference in historic Guthrie, Oklahoma. Featured demonstrators include Doug Merkel and Jim & Kathleen Poor. This event is supported in part by the Oklahoma Arts Council. For more information contact Marideth or Mike George, 1227 4th Street, Alva, OK 73717. (580) 327-5235, jmggeorge@pdld.net

19-21 Catalan Blacksmith Forge-In, Arles sur Tech, France. Contact Association Ferronnnerie Catalane, Mairie d’Arles sur Tech, 66150 Arles sur Tech, France. Phone 04 68 391222 or contact Mark Constable 01482 863 233

19-21 Repair Days at the National Ornamental Metal Museum, Memphis, TN. Contact Lisa Lochmann at (901) 774-6380. Web site: www.metalmuseum.org

20-21 Frontier Culture Museum Hammer-In, Staunton, VA. Demonstrators will be Tom Latané on the 20th and Steve Mankowski on the 21st. Contact the Frontier Culture Museum for details at (540) 332-7850
20-21 Appalachian Blacksmiths Assn. Annual Fall Conference, Ripley, WV. Contact Dave Allen at (304) 624-7248 or e-mail: anvilwork@aol.com

27-28 9th Annual Blacksmithing Workshop, at The Historic Village on North 27th Street, Mt. Vernon, IL. Proceeds to benefit the blacksmith shop and village. This year's demonstrator will be Bob Alexander. Contact Wilbur at (618)242-1365 or John Lovin (618)756-2331 anvilman@hamiltoncom.net

29- Nov 3 The 4th European Forge Symposium-New applications for the forge professions, École des Mines d'Albi - Tarn (France). Contact Philippe Calder, Editor FORGES & Fèvrières Gare d'Etainhus, F-76430 Etainhus, France. E-mail: phcalder@elementa.asso.fr

November

2-4 Kentucky Blacksmith's Association 2nd Annual Conference. Demonstrators are Tom Clark, Lorelei Sims, and Danny Downs. Near historic Bardstown, KY. For more info contact Larry Zoeller, (502) 361-0706. E-mail: zman92@ntn.net

2002- June

5-9 ABANA 2002 Conference, Lacrosse, WI

Note for more listings and updates, go to the ABANA website, www.abana.org

NOTE: For more information, contact Art & Metal Co. at 243 Franklin St., Hanson, MA 02341. Phone (781) 294-4446, Fax (781) 294-4477, E-Mail: snash@artandmetal.com, www.artandmetal.com

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SculptureBooks.com is accepting photographs for publication in two upcoming books. Contact Arthur Williams, 508 Brandi Ln, Gulfport, MS 39507, or visit http://www.SculptureBooks.com/ for additional information.

Call for Entries

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Metalsmiths from the United States and Canada, you have an exciting opportunity to enter your work in a competition with $18,000 in prize money! The theme for the competition is "tool." The only requirement is that the artist use at least five of the 3M products listed on the prospectus. The dates for the exhibition are June 6-26, 2002 and the event will be held at the Center for the Visual Arts in Denver, Colorado. Deadline for entries is December 1, 2001. For more information contact Anne Hollerbach at alhollerbach@telocity.com
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