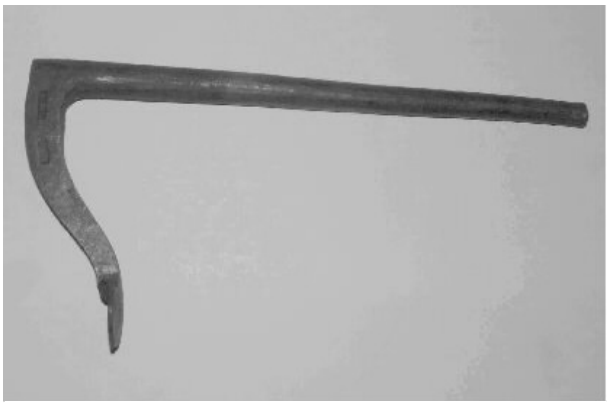
A Day at the Anderson Forge in Williamsburg, VA. Feb 25, 1788

These notes have been assembled by Bruce Freeman, Marshall Bienstock and Don Plummer

The day begins with a general gathering in the office for coffee and donuts at about 8:30 AM. All the resident smiths are in attendance and soon Peter Ross, the former Master of the Shop, also shows up. The blacksmiths include Ken Schwarz, shop supervisor, Steve Mankowski, Shel Browder, Mark Sperry and Chris Furr. Ken gives a few welcoming comments and lays out the days agenda. We deal with some administrative stuff and trek on over to the shop at about 9:30 AM. The weather is largely damp and overcast...about typical for Tidewater Virginia and February.

Ken begins by demonstrating the making of a holdfast such as might be used in a workbench or even in the pritchel hole of the anvil. You insert it in a slightly oversize hole, tap it on to the surface of the piece you want to hold and the slight cant and spring in the device locks everything nicely in place. A simple upward angled whack quickly loosens it.

Holdfasts are frequently made by simply putting a right-angle bend in a bar of steel, then finishing the two ends into a shank and arm with foot. Certainly a most obvious and rapid way to make one. However, this technique gives an internal right angle which could be a bad thing. Ken has recently had the opportunity to closely study three samples he knows to be from the 18th century. All three were welded up of two pieces. The arm is welded to the shaft with a cleft weld.

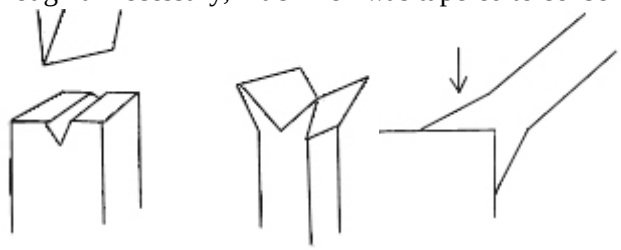


Holdfast; Wrought Iron; February, 2005 by Ken Schwarz, Anderson Forge, Williamsburg.

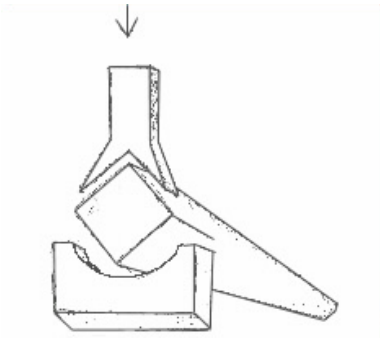
This is what Williamsburg is all about. They do all the ironwork for Williamsburg in the 18th century way. They take the time to study how things were done in Colonial America and then learn how to replicate that task. Ken has learned how to make this two piece, forge welded holdfast in the very same way it was likely done two hundred plus years ago.

A probable reason for welding it up of two pieces has to do with the characteristics of wrought iron. Putting a sharp bend in this sometimes difficult-to-work material will often cause a cold shut that will soon fail. It will begin as a very small tear and soon work it's way across the entire thickness. Forge welding helps assures the tool will do its job for the next couple hundred years. (Shel contributed that the cleft weld to be done here with wrought iron, also works well with standard A-36.)

For his demonstration, Ken had prepared two pieces that would become the shaft and arm for the holdfast. The shaft portion was about 12" long and approx 1" square on the upper end, tapering smoothly to about 5/8" in diameter on the lower end. This had been drawn out from square bar. Ken advised that although unnecessary, much iron was tapered to conserve iron and add to the general appearance. The stock that will be the arm is 3/4" x 1" x 5" long Ken begins by splitting the end of the arm with a chisel, then opens it up over the edge of the anvil. The two sides of the end are thinned/scarfed for welding to the shank. Having a striker like Shel can be a great advantage in making this piece.

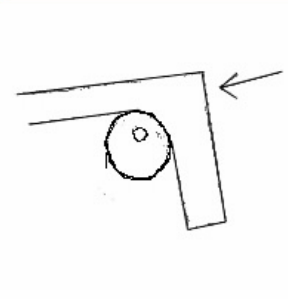


Make sure to keep shaft straight to facilitate the cleft or jump weld. The top of the shaft is placed in the swage, corner up. After achieving welding heat, and using borax for flux (which was true to the period); the cleft of the arm is placed over the corner of the shaft and with the arm vertical; and the end of the arm is hammered downward to make the weld. Note that a swage is used to hold the shank for the weld and to facilitate the rounding of the shank.



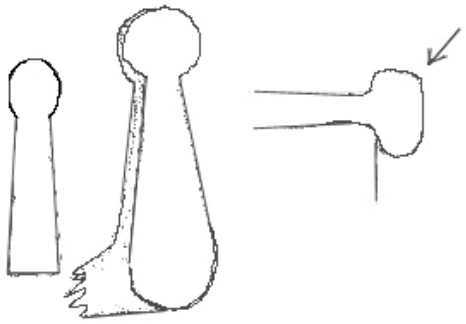
The weldment is again placed in the swage, with the arm vertical, and hammering on the end of the arm rounds off the back of the piece in the swage, while further securing the weld. All at welding heats.

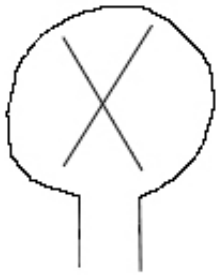
Ken noted that a good weld will cool evenly with no dark colors that would indicate thinner areas not fully welded.



The inner corner of the holdfast is placed over the horn of the anvil. Horizontal and vertical hammering was used to refine the shape. Ken took a few welding heats to finish and refine the weld.

Shape the arm in sequential steps that begin with leaving a small lump on the end that will be the foot. To spread the disk (to make the foot), make an "X" from the top with a fuller. This leaves a transition between the arm and the flat. Then flatten the remaining portions of the foot on the edge of the anvil.

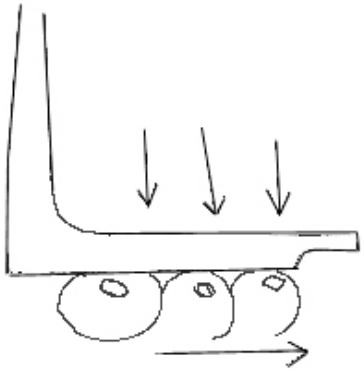




Ken emphasized that the round or oval shape of the foot comes from the forging before the flattening operation. Not from subsequent filing or trimming.

The illustration shows the two fuller marks made from the top of the foot. Notice that at this point, much of the foot remains the full thickness of the metal, with only these two fuller marks thinning the metal.

This illustration shows how Ken put the offset into the arm. He took a high heat on the arm, then quenched the 90-degree angle, placed it upside down over the anvil horn, and hammered on the end of the shaft.



Ken spent some time assuring himself that the angle was square and the foot was flat and square to the shaft. He frequently used various angles of the anvil to help measure these angles.

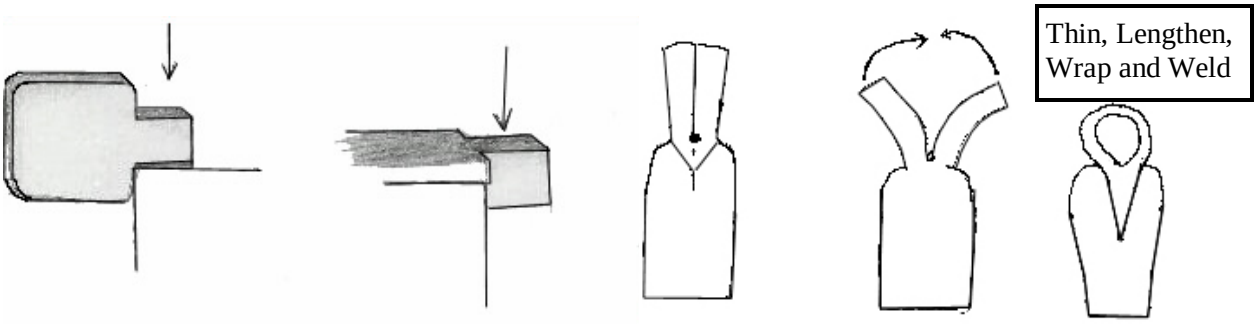
This demonstration took about one hour from start to finish. But Ken says he can make one in about 30 minutes without discussion and questions.

The final dimensions of the holdfast are: Shank length 15”, arm length 6-7/8”, arm width varies from 1” to 1/2”, shank width varies from 1” to 5/8”, foot pad is 2-1/2” x 1-1/2”.

Steve Mankowski demonstrated the forging of a hoe from a single piece of stock.

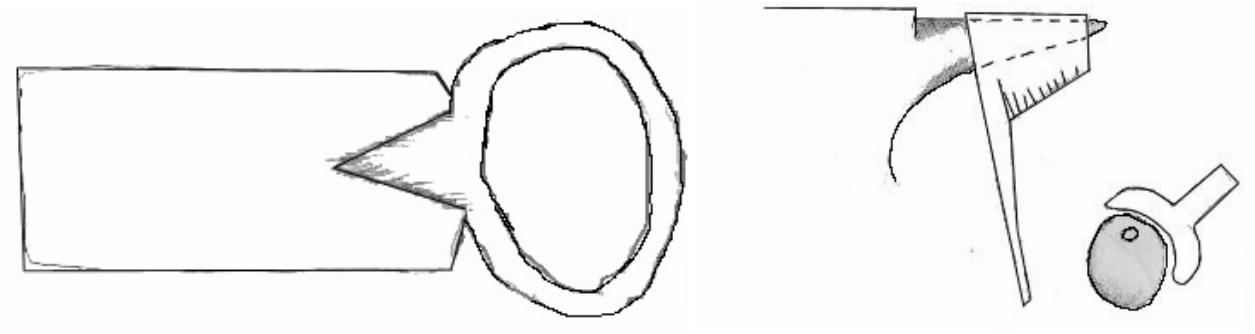
The Anderson forge has explored the traditional 18th c making of hoes from either one or two pieces. Recently, they have been studying those made from one piece. Steve has been working on this and has come up with a plausible way of making these hoes from one piece of stock.

The starting stock was 5/8” x 2" x 5" but he retained the full bar at first as a handle. From this stock the process proceeds as shown below. Steve begins by drawing the handle eye over the edge of the anvil. Some of us might do better with a set hammer, fullering tool or treadle hammer. The eye is then hammered down in the other dimension with half-faced blows.



The eye portion is then punch marked and chiseled open from the top to form a cleft. It might also be punched or drilled at the terminus of the slit. These are opened up, lengthened, dressed and scarfed for welding. At this point Steve cut the hoe from the longer bar he was using as a handle.

After good welding, again using borax as a flux, the eye is stretched and drawn out over the anvil horn and further shaped. A fullering tool and swage can be an big help here.

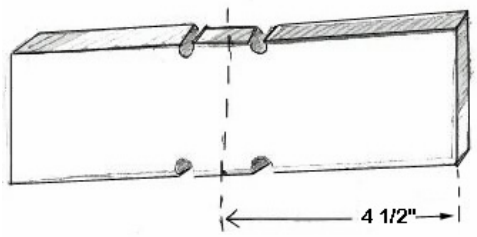


Before spreading the blade it is fullered over the anvil edge to provide stiffness, form and guides. Spread from the center towards all three edges. Use a set tool to help delineate the transition from the eye.

The hoe was also made of wrought iron...which is not without its hazards. While spreading the blade a split occurred at the edge. Steve dealt with this split by first offsetting the two sides of the split. Then he peined them to spread them sideways, so they would overlap. Finally, he welded them together. Steve noted it could also be patched with another piece of wrought iron welded on at cross grain.
Finish any shaping of the eye at a welding heat.

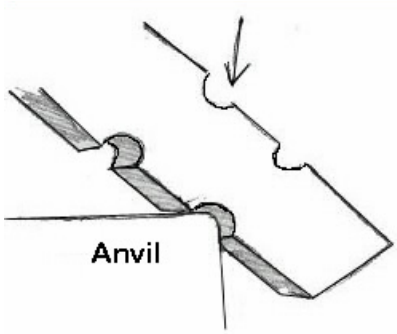
Half-Sized Spade

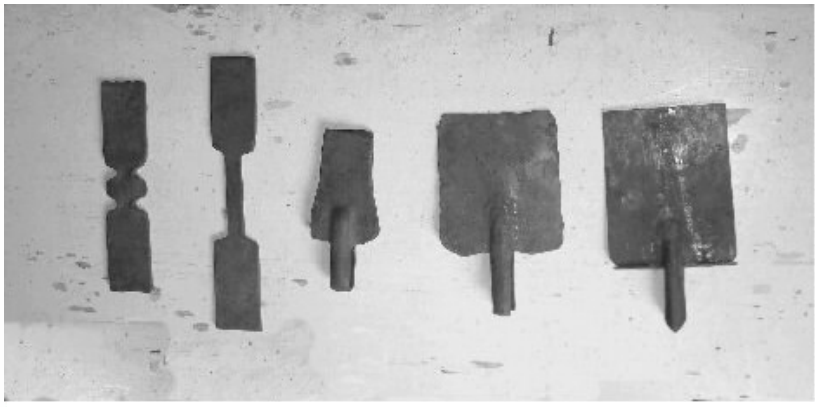
In this demonstration Ken Schwarz made a smaller, half-sized version of a spade. Such spades were made by welding the blade together from two pieces and leaving a socket (with exetensions) for mounting the handle. The difficulty is that such thin stock is difficult to weld together. Imperfect welds result. Hence, they concluded that the weld is made while the stock is thick.



Ken started with 2" x 1/4" x ~9" of stock. Begin by marking to the center of the 9” piece at 4-1/2”. Fuller about 3/4” on each side of the mark. Then draw out and thin the segment between the fuller marks.

This photo illustrates the general sequence of making this small spade. It is first fullered about the center

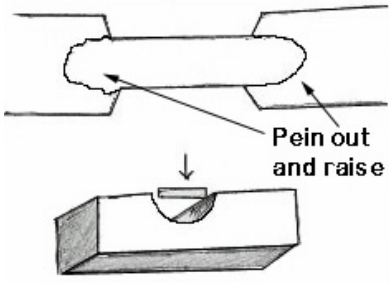




line, then the center section drawn out to about 1/2 the thickness of the original stock. The blade portions are then folded to meet, with the section to be the socket extensions providing the hinge. Note that at this point the blades are still relatively thick. Make sure the shoulders align correctly.

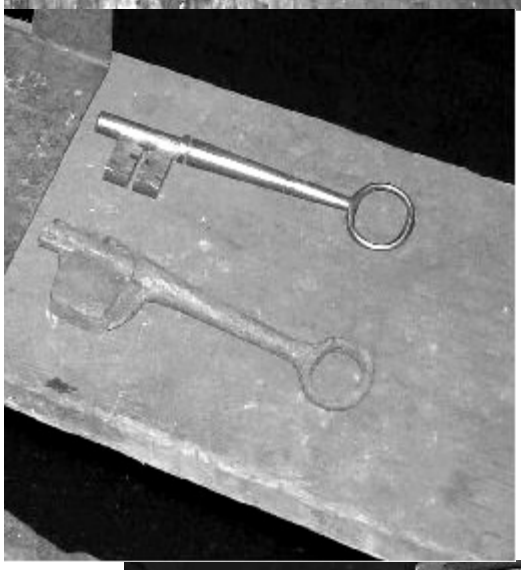
The section for the extensions are thinned down and slightly rounded up before bending. That socket segment where the handle would enter into the blade portion is raised and rounded somewhat to help prevent it from being forge welded. Ideally, some portion of the handle will be fitted into this piece.

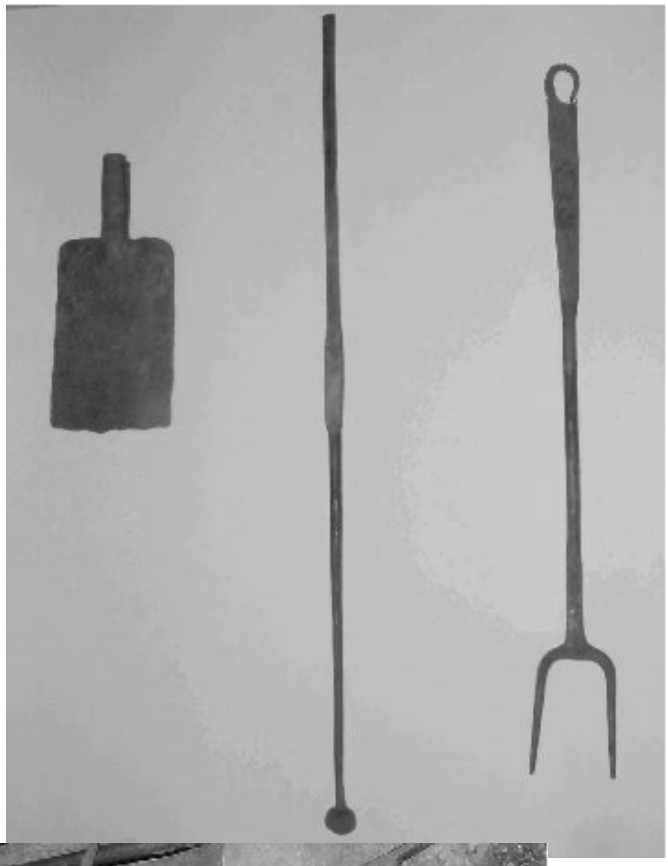
The blade segments are forge welded together. Ken says he can usually get this in three good heats. After cutting the center piece and straightening the resulting pieces, Ken ran a shaft (e.g., a drift) into the socket, and formed the socket around the shaft.

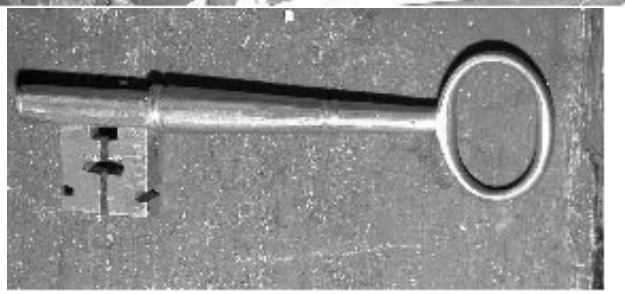


Ken drew the edges out last to reduce the burning. Angle peining was done to keep the corners square. Finish the blade by hammer so that there's little or no trimming to be done.

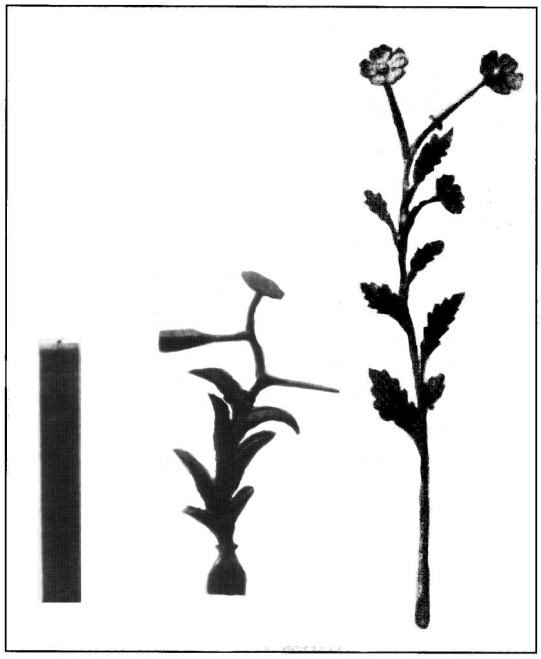
Ken also demonstrated making the foot of a pair of tongs often used to handle meat. Shel made a key and Mark made a fork. Unfortunately, we have run out of time and space. But here are some images. All in all, it was a most excellent event and a great learning experience.

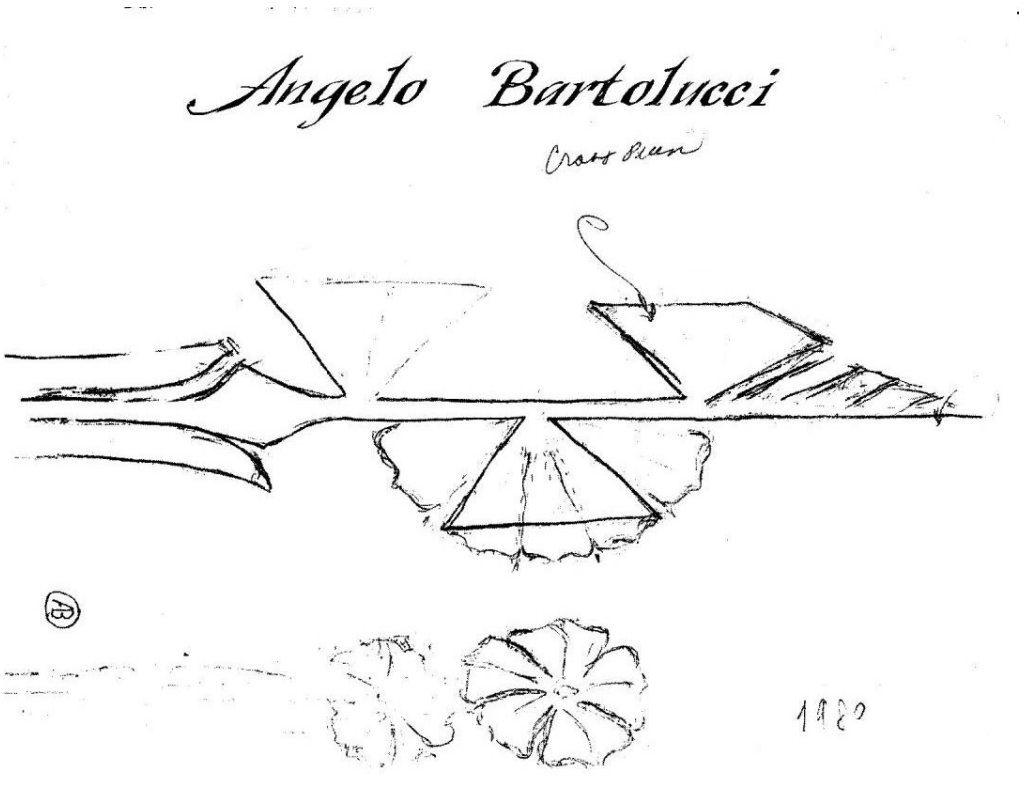






A Flower From One piece of Bar





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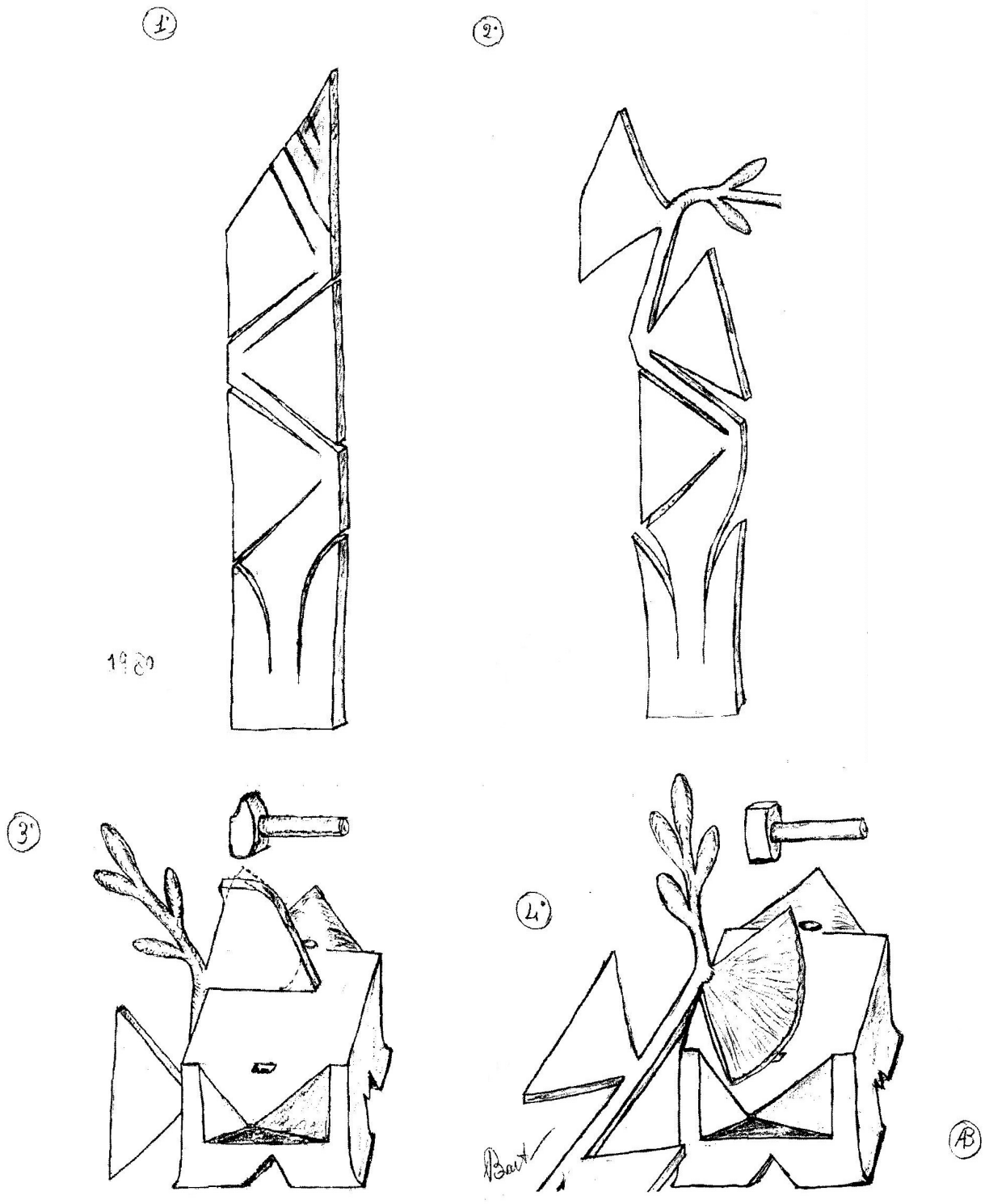
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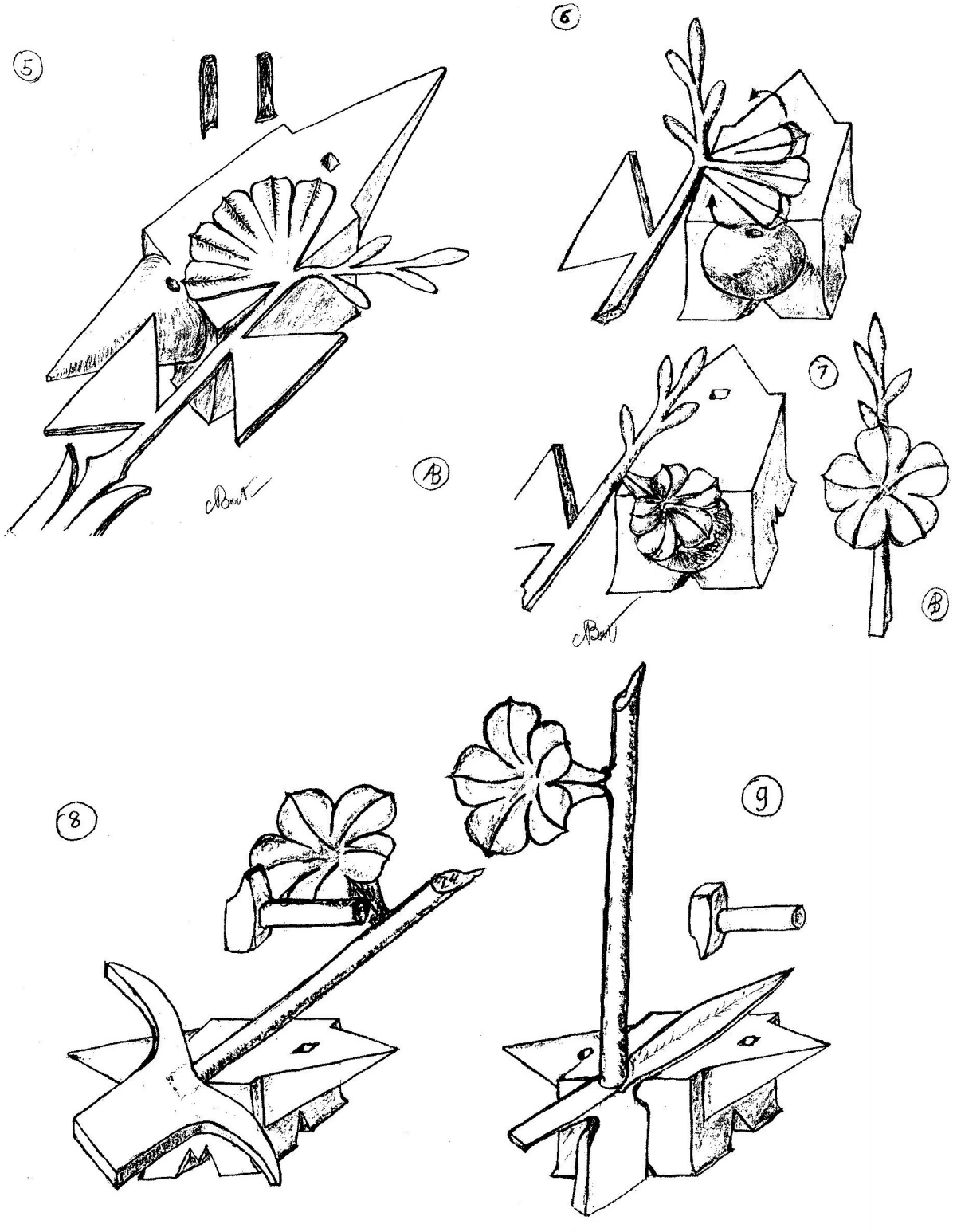
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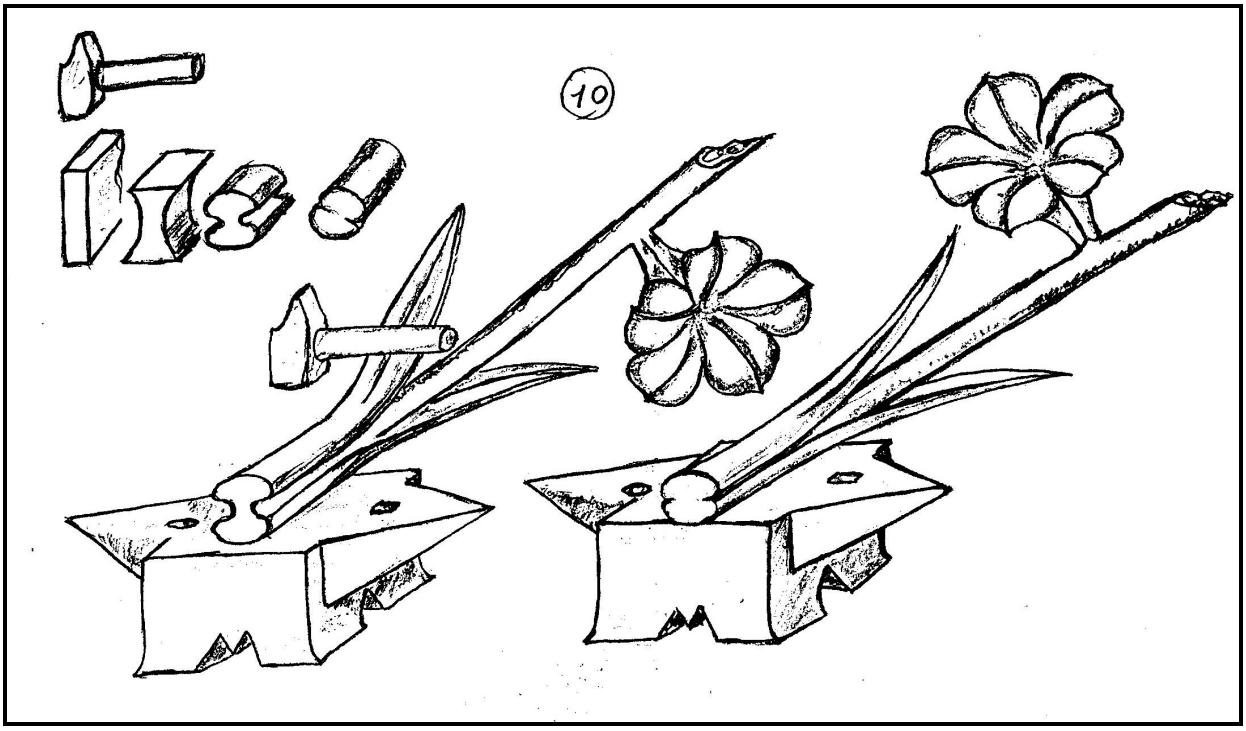

Forged or Fabricated:
Educating the Client

By April Witzke
From The Anvils Horn
The Arizona Artist Blacksmith Association

Recently, I received a spam mail from Chris Topp and Co. Wrought Ironworks in England. I was about to hit delete when the words "One would not use a bricklayer to repair stonework with concrete, or oak beams with MDF." I was ensnared. It seems they were making an issue about restoration of antiquated ironwork being done by welders and fabricators and were looking for support in establishing a specification, or standard, that would require anyone claiming to do "wrought ironwork" to use traditional materials and working methods. They argued that the lack of specifications has architects, blacksmiths, fabricators and customers alike wasting considerable time and money on the bid process.

While I agree that the term "wrought iron" has been bastardized and that a standard would help immensely, what really got my attention was the realization that blacksmiths in England share the same challenge of competing against fabricators as we do. Having recently lost several jobs to fabricators, I have been pondering what we can do to educate our clients on the difference between forgework and fabrication and ultimately win their commission. To uncover some tricks of the trade, I spoke to several full time blacksmiths. Here is what they had to say;

Brian Hughes of Artsmithing in Prescott says, "Ninety percent of people don't know the difference between cast, welded and forged." Several years ago he created a pamphlet that explains the differences and justifies the cost of forge work. Hughes says awareness of the trade has increased substantially compared to when he first got into blacksmithing in 1973 but he admitted that there is still a problem selling expensive iron work. "Blacksmithing (forgework)", he claims, "is for wealthy people."

Peter Sevin of Art Ironwork does no advertising, not even the yellow pages. His clientele come to him strictly from referral. Referrals are ideal because you can assume that the client is already somewhat educated. For instance they would probably know that he does traditional blacksmithing and

that he's more expensive than a fabricator/ welder. One thing that has helped Sevin is having a dedicated showroom with dozens of forged elements organized on tables and hanging on the walls. He says he noticed a difference in how much time a client spent looking and touching the ironwork in the showroom as opposed to when he had items piled on a dusty table in the shop area.

Phoenix Forge, owned and operated by Bill Calloway has several large finished pieces, gates and railing sections, as well as smaller forged elements placed conspicuously around the shop. Calloway says it is important for the client to hold the iron-work in their hand because it engages their senses. He stressed finishing the elements with a pleasant feeling wax sealer. Once their interest is sparked he is able to educate them on the process and labor involved.

Kathy Borthwick of Flag Forge and her partner, Russ, primarily exhibit at art and craft shows. The shows provide an intimate setting which allows the customer an opportunity to see and feel the quality of Flag Forge's workmanship while being further educated about the art of blacksmithing. This often leads to commissions of custom forge work.

Mark Aspery, blacksmith and instructor at Sierra Fire and Forge in California uses a portfolio of his work that shows no finished pieces. Instead it shows close-ups detailing what a traditional blacksmith offers; forgework with traditional joinery, textures and character. Aspery focuses on the design process. His portfolio helps because the design invariably incorporates elements from the photos. A drawing evolves. Aspery then makes some test pieces to support the artwork. The test pieces, he says, give the client an added dimension to the drawing and assist him in the estimate. This method gets the customer more deeply involved and provides them with a chance to see and feel his hand wrought ironwork which makes it harder for them to choose fabricated.

Colin Price of Shadow Mountain Forge in Colorado has been a full time blacksmith for about three years. He has recently made some changes in his "marketing" strategy. Price is bypassing the general public and has begun a campaign of cold calling architects and builders to determine which ones incorporate ironwork into their designs. When he makes contact with one who uses a lot of ironwork, he sends them a brochure then makes a follow up call for an appointment to begin forging a new relationship. Price admitted that it took hiring a financial advisor to mentor him but so far the results have been worth it.

Frank Turley instructor of Turley Forge in New Mexico advises his students to design a sample element then make one out of cold bent and welded metal, leaving some spatter on it, just for fun. Then forge a similar element using traditional blacksmithing techniques that is a deliberate improvement over the other. Turley also advises his students against showing potential clients blacksmithing books, as they may include work they are not confident in reproducing. A photo album incorporating older work is also to be avoided, as their abilities may have graduated beyond the piece pictured and it may not be something they really want to reproduce. Turley's last words of advice were, "If it's the kind of job that you don't care for, try to refer it to someone else. That leaves a good taste in the customer's mouth." At 69, Turley says he doesn't have a problem saying no.

Jeff Fetty of Leaning Oak Forge has one of the most extensive web sites I have come across and he affirmed that it is a great tool in qualifying his potential client. His site literally states "get to know my work. . .and get an idea of my style. If my work is something you are interested in, contact me..." Even then, he still has to educate the client further when they contact him.

The result of my inquiry is this; we must take every opportunity to educate our clients on the differences between forgework and fabrication. The more tools we have at our disposal to do so, the more effective we will be and eventually, our reputation will make it easier. But the theme I heard over and over was simply stated by Colin Price, "We gotta find the right client."
Jefferson Mack at last year's California Spring Blacksmiths Conference shared that he literally asks clients what their income is prior to doing an initial consultation. That takes some moxy, but at least he is sure that he's dealing with the right client..

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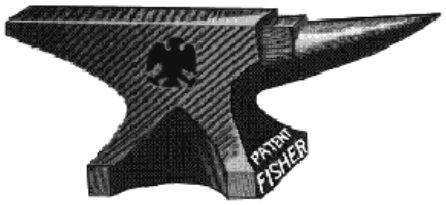

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