Running A Small Business

By Harold Hilborn

I have been a small business owner for 1 1/2 years now and work by myself most of the time. I have had the most difficulties trying to price my work. Am I charging to much or not enough? When you're done with the quote you look at it and say, that's to much they will never pay that because I would not. So you lower your price get the job, complete it. Then look back at it and feel you left some money on the table. Figuring the costs of a job has always been easy as far as materials and time goes but when it comes on how much to charge per hour is a different matter.

Looking on the internet I found this article which seems to work well for me. Just plug in your own numbers and may be it will help some of you also.

Business of Blacksmithing

How to Price and Charge for Your Work. by David Robertson
DavidRobertson@artistblacksmith.com

Blacksmithing like any craft takes a lot of thought when your price your work. We all struggle with what we think should be a fair price. Often we enjoy the work so much it seems hard to price the work at what it should be priced to make a proper living.

Lets look at the reality of pricing your work when you work in a specialized, labor intensive craft. The numbers I will use may be a bit different for your country or location, but I am sure you will be able to adjust the numbers to your situation. In my area minimum wage is about $8.00 an hour. This gives a bare subsistence in quality of living. So what is a reasonable wage for the type of work we do?

Lets look at the nature of our business first. We use specialized equipment to create precision pieces of metal work. We assemble our creations into complex shapes and functional items.

There is a high degree of skill, and planning involved in many of our projects. We also have to deal with customers and suppliers on a daily basis, solve problems and quote projects as well do our own accounting and bookkeeping. There are many hats that we have to wear as one person business operators.

The manual skills required in the blacksmithing business as well as the technical knowledge are closely related to the skills of a welder, or auto mechanic, or a machinist. There are some differences in each of these trades but the skill level is about the same.
In my area auto shops and machine shops charge $75.00 to $100.00 an hour. Individual mechanics and welders get paid $25.00 to $35.00 an hour.

So lets take an average of $30.00 an hour over a 40 hour week. That gives $1200.00 a week times 50 weeks (remember that you should be able to take a two week holiday and this is paid). So 50 weeks gives a total income of $60,000.00 . This is considered a good solid income in my country.

You only get paid for the work you sell. The time you spend consulting with your clients you are not paid for. The time spent designing the gate or grill is not paid time. The time spent getting materials and supplies you are not paid for. You are not paid to do your own bookkeeping. If some one else takes care of your bookkeeping then you have to pay them. There are many areas that you have to spend time on that you do not get directly paid for. Everything is paid for by what you sell so you have to take into account all the time spent other than smithing.

To calculate what your time is worth when you are working on actual blacksmithing you will need to at first keep strict records of how long it takes you to make your items. You must include the time to paint and finish your work.

If you ship to your customers you need to include the time it takes to package it up.

You also need to keep a log of all the time spent that is work related but you can't charge for. You will need to keep your log-book very detailed so you can isolate what proportion of time actually brings income in, and what proportion supports your income but that you don't get paid for. You also need to calculate all your consumable costs, electricity, rent, business insurance, vehicle costs, etc and add to your wage costs. This will give you the total that you need to bring in a year.

The next step is to calculate the number of hours used on non paying work. This includes the running around and consultations, or the sitting at the craft show selling your products. This should be part of your log book as well! If you keep track of all the time spent on your business, and the time of actual making of the products you will probably find a 60 / 40 ratio. That is 40% of your time is actually working on salable products. 60% of the time is spent on related but unpaid work. You will have to determine this ratio from your own log book. Lets take a look at some sample numbers in the equation. These are rough yearly totals.

Wage $60,000
Shop Electricity $1200
Shop Rent $3600
Business Insurance $ 1200
Vehicle Costs $6000
Show Fees $2000
Advertising $2000
Equipment Repairs $1000
Total $77,000

You may have other expenses that you only incur since you are in business. These will need to be added to this list. Everyone is a bit different, and check with your accountant.
Our actual equation looks like this:
Hourly Shop Rate = (target yearly wage + business expenses)
(ratio of paid hours per week x 40 hours a week x 50 weeks in a year)
Now lets plug into our time ratio.
0.40 x our a available paid hours (40 hours a week x 50 weeks in a year)
0.40 x 2000 = 800 smithing hours in a year So $77000 / 800 = $96.25 per hour plus your material costs. This should be your shop rate. As you can see your actual wage is much less than what you have to charge.

Going back to the beginning of this article you can see why my local auto mechanic and machine shop is charging $75 to $100 an hour.

Your blacksmith work is the same value!

Lets add another twist to this scenario. Suppose you hire an employee. Obvious expense is wages and deductions. When I was hiring employees it would take a month before they had been trained well enough that they were making me significant money. It took a week before they would break even and I could use the components they were making. If you pay $10.00 per hour, the first week they may just break even. The second week they may get up to $20 per hour in production for you.

After a month I found that they could bring in about $40.00 hour if I kept them busy. If you have the work rolling in this is when you start to make money. Remember you are still paying them $10.00 an hour. If your work dries up, paying employees is a fast way of going broke.

In short you need to start keeping a log book of how much time you spend on each facet of your business. Time for everything. Then break it into time spent directly making your products and time spent on non-billable supporting hours. Do the simple calculations to find what you should be charging in your circumstances. It will probably be more than you guess.

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From The Anvil's Horn

The Cut Nail

By Bobby Floyd

This is a very brief summary of the most important piece of metal of the 19th Century, the common cut nail. It was the most critical part for building homes and buildings of this time period.

Can the "common "cut nail help in dating of historic homes and other items? Yes, somewhat. The more you understand the physical characteristics of the cut nails you are examining the closer time period that it was manufactured can be judged. Just because a newer machine came out that improved on the older machine, not everyone replaced the older machines.

Unless you have an interest in historic dating this subject can and has put people to sleep when discussing it. I will try and explain some simple factors that will help you identify the time periods of general heavy use of the common cut nails. These are some of the more easily identifying factors that others and I have used but there are many other factors that one can use to get a more precise date of heavy use.

All the nails in my study were made with wrought iron that by its definition has a grain. They still make the cut nail but it is made of steel and is easily identifiable especially when broken apart for it shows no grain.

First: which way is the grain going, straight down the length of the nail or side ways?

If side ways, it dates of heavy use is between 1791- 1847.

If length, it dates of heavy use is between 1834-1885.

Second: Is the bottom of the nail (the so called point) somewhat rounded?

If rounded 1791-1847

Third: Are the burrs on the length of the nail on the same side or opposite?

Opposite 1791-1836 Same side 1808-1885

Other identifying factors are the length of the pinching under the head, which side it was pinched on, shape of the pinch, degree of pinch: cut-face splitting or front-face spitting of the head plus many other things related to the head. All the above have dates of heavy use starting and ending.

Remember, the more items that you can identify in the cut nail the narrower the dates will be.

Once the cut nail is removed you can often see the grain with the naked eye or magnifying glass but sometime, when this would not work, I would etch it with muriatic acid to see which way the grain went. The last resort was to cut into the nail a little with a hacksaw and break it to see the grain structure.

I was able to tell the approximate date of the four-different times that my buildings additions or alternations were made with the study of over 40 nails removed. In conjunction with other identifying factors like screws, glass, design, moldings, wood rings, saw marks, etc, I was able to more precisely identify the dates of construction and alterations.

Like any other things used on a historic home one needs to find out the approximate date that they were available in your area. I my case I was able the to find some store records that documented the cut nail first arrived in this area around 1808. Surprisingly, the cost of the same size cut nail and hand made wrought nails were the same on this date. A few years later the cut nail was much cheaper. It is said that the hand make wrought nail was still being sold and its heavy use started declining ca. 1830.

The real advantage of the hand made nail over the first cut nails was in its ability to clinch the batten doors. The new cut nails grain was side ways and would often break when bent. All my batten doors in the manor house, cookhouse and smokehouse had hand made wrought nails. All buildings on our property have been documented as being build ca. 1825.

Interesting facts:

In 1816 two-third of all rolled wrought iron in the U.S. was devoted to nail production. In certain areas of the U.S. the cut nails began to overwhelm hand-wrought iron nails completely, driving them into the special purpose market. In 1839 the Burden railroad spike machine is introduced. It forges a complete spike in one operation and produces 50 spikes per minute, permitting more rapid laying of track than had been possible when only hand-forged spikes were available.

In 1850 eighty-seven U.S. naileries are listed in the census..

By 1870 hand wrought nails accounted for less than 5% of total U.S. nail production.

In 1887 the price of Bessemer steel billets is low enough to make wire nail-making an economic success. Virtually all wire nails are of steel.

By 1891 three quarters of all cut nails are manufactured from steel.

By 1892 half the nails made in the U.S. are now of wire.

By 1920 only 5% of the U.S. production was now in cut nails.

Advertisements of cut nails stress their greater holding power.

Most all the above information above came from studies of the cut nails from three different sources: Historic Louisiana Nails (Aids to the Dating of Old Buildings) by Jay D. Edwards and Tom Wells, Nail Chronology as an Aid to Dating Old Buildings by Lee Nelson and The Dating of Old Houses by Dr. Henry Mercer. For those really interested in this subject I recommend getting a copy the Historic Louisiana Nails for it is by far the best researched and the one used by most Architectural Historians in our area.

What caused the disappearance of the blacksmith made hand wrought nails and then the cut nails to the wire nails?

Like today in the U.S., it's all about the cost of production that caused the demise of the hand made wrought nails to the cut nails and then the cut nails to the wire nails. Both the hand made wrought nails and the cut nails, in my opinion, have superior holding power compared to the wire round nail and when made of wrought iron they had build in it better rust protection than steel wire nails.
The next time you have an opportunity to get your hands on an old cut nail see if you can estimated the time it was manufactured using some of the above factors.

Now you can wake up!

SHOP THEORIES

Ernie's Law of Horizontal Surfaces

"The volume of clutter expands exponentially in relation to the combined sums of the areas of the horizontal surfaces in one's shop."

Ernie's Second Law of Horizontal Surfaces

"Any increase in horizontal surface areas intended to lessen the concentration of clutter in one's shop will eventually result in a proportional increase in the volume of clutter."

Pigott's Theory of Work

"The volume of work accomplished in a given period of time can easily be determined by the amount of blood on the floor of the shop."

Ward's Law of Thrown Tools

"A tool thrown in a fit of anger can always be expected to strike and damage an object of greater importance than the original project."

Ward's Second Law of Thrown Tools

"A tool thrown on purpose will never strike its intended target."

Ward's Third Law of Thrown Tools"

Regardless of the intention, throwing tools is always satisfying."

MISSISSIPPI FORGE COUNCIL
THE UPSET JANUARY 2008

It's "steel" pretty hard to understand!

The recent "Introduction to Knife Making Workshop", presented by Justin Mercier at John D'A-bates, and Mark Aspery's demo at the Atlantic Coast Blacksmiths Conference both helped me understand steel as a mixture of elements, in crystalline form. This form changes with temperature and blacksmiths need to be able to capitalize on those changes when making tools for both hot and cold use.

This article, gleaned from the internet, explains what "stuff' alloyed with Iron does to the resulting steel alloy. We'll pursue addition explanations in future newsletters.

Effects of Elements on Steel

Steels are among the most commonly used alloys. The complexity of steel alloys is fairly significant. Not all effects of the varying elements are included. The following text gives an overview of some of the effects of various alloying elements. Additional research should be performed prior to making any design or engineering conclusions.

Carbon has a major effect on steel properties. Carbon is the primary hardening element in steel. Hardness and tensile strength increases as carbon content increases up to about 0.85% C . Ductility and weldability decrease with increasing carbon.

Manganese is generally beneficial to surface quality especially in resulfurized steels. Manganese contributes to strength and hardness, but less than carbon. The increase in strength is dependent upon the carbon content. Increasing the manganese content decreases ductility and weldability, but less than carbon. Manganese has a significant effect on the hardenability of steel.

Phosphorus increases strength and hardness and decreases ductility and notch impact toughness of steel. The adverse effects on ductility and toughness are greater in quenched and tempered higher-carbon steels. Phosphorous levels are normally controlled to low levels. Higher phosphorus is specified in low-carbon freemachining steels to improve machinability.

Sulfur decreases ductility and notch impact toughness especially in the transverse direction. Weldability decreases with increasing sulfur content. Sulfur is found primarily in the form of sulfide inclusions. Sulfur levels are normally controlled to low levels. The only exception is free-machining steels, where sulfur is added to improve machinability.

Silicon is one of the principal deoxidizers used in steelmaking. Silicon is less effective than manganese in increasing as-rolled strength and hardness. In low-carbon steels, silicon is generally detrimental to surface quality.

Copper in significant amounts is detrimental to hot-working steels. Copper negatively affects forge welding, but does not seriously affect arc or oxyacetylene welding. Copper can be detrimental to surface quality. Copper is beneficial to atmospheric corrosion resistance when present in amounts exceeding 0.20%. Weathering steels are sold having greater than 0.20% Copper.

Lead is virtually insoluble in liquid or solid steel. However, lead is sometimes added to carbon and alloy steels by means of mechanical dispersion during pouring to improve the machinability.

Boron is added to fully killed steel to improve hardenability. Boron-treated steels are produced to a range of 0.0005 to 0.003%. Whenever boron is substituted in part for other alloys, it should be done only with hardenability in mind because the lowered alloy content may be harmful for some applications.

Scrap Box 2008 New England Blacksmiths

Boron is a potent alloying element in steel. A very small amount of boron (about 0.001%) has a strong effect on hardenability. Boron steels are generally produced within a range of 0.0005 to 0.003%. Boron is most effective in lower carbon steels.

Chr omium is commonly added to steel to increase corrosion resistance and oxidation resistance, to increase hardenability, or to improve high-temperature strength. As a hardening element, Chromium is frequently used with a toughening element such as nickel to produce superior mechanical properties. At higher temperatures, chromium contributes increased strength. Chromium is a strong carbide former. Complex chromium-iron carbides go into solution in austenite slowly; therefore, sufficient heating time must be allowed for prior to quenching.

Nickel is a ferrite strengthener. Nickel does not form carbides in steel. It remains in solution in ferrite, strengthening and toughening the ferrite phase. Nickel increases the hardenability and impact strength of steels.

Molybdenum increases the hardenability of steel. Molybdenum may produce secondary hardening during the tempering of quenched steels. It enhances the creep strength of low-alloy steels at elevated temperatures.

Aluminum is widely used as a deoxidizer. Aluminum can control austenite grain growth in reheated steels and is therefore added to control grain size. Aluminum is the most effective alloy in controlling grain growth prior to quenching. Titanium, zirconium, and vanadium are also valuable grain growth inhibitors, but there carbides are difficult to dissolve into solution in austenite.

Zirconium can be added to killed high-strength low-alloy steels to achieve improvements in inclusion characteristics. Zirconium causes sulfide inclusions to be globular rather than elongated thus improving toughness and ductility in transverse bending.

Niobium (Columbium) increases the yield strength and, to a lesser degree, the tensile strength of carbon steel. The addition of small amounts of Niobium can significantly increase the yield strength of steels. Niobium can also have a moderate precipitation strengthening effect. Its main contributions are to form precipitates above the transformation temperature, and to retard the recrystallization of austenite, thus promoting a fine-grain microstructure having improved strength and toughness.

Titanium is used to retard grain growth and thus improve toughness. Titanium is also used to achieve improvements in inclusion characteristics. Titanium causes sulfide inclusions to be globular rather than elongated thus improving toughness and ductility in transverse bending.

Vanadium increases the yield strength and the tensile strength of carbon steel. The addition of small amounts of Vanadium can significantly increase the strength of steels. Vanadium is one of the primary contributors to precipitation strengthening in microalloyed steels. When thermomechanical processing is properly controlled the ferrite grain size is refined and there is a corresponding increase in toughness. The impact transition temperature also increases when vanadium is added.

All microalloy steels contain small concentrations of one or more strong carbide and nitride forming elements. Vanadium, niobium, and titanium combine preferentially with carbon and/or nitrogen to form a fine dispersion of precipitated particles in the steel matrix.

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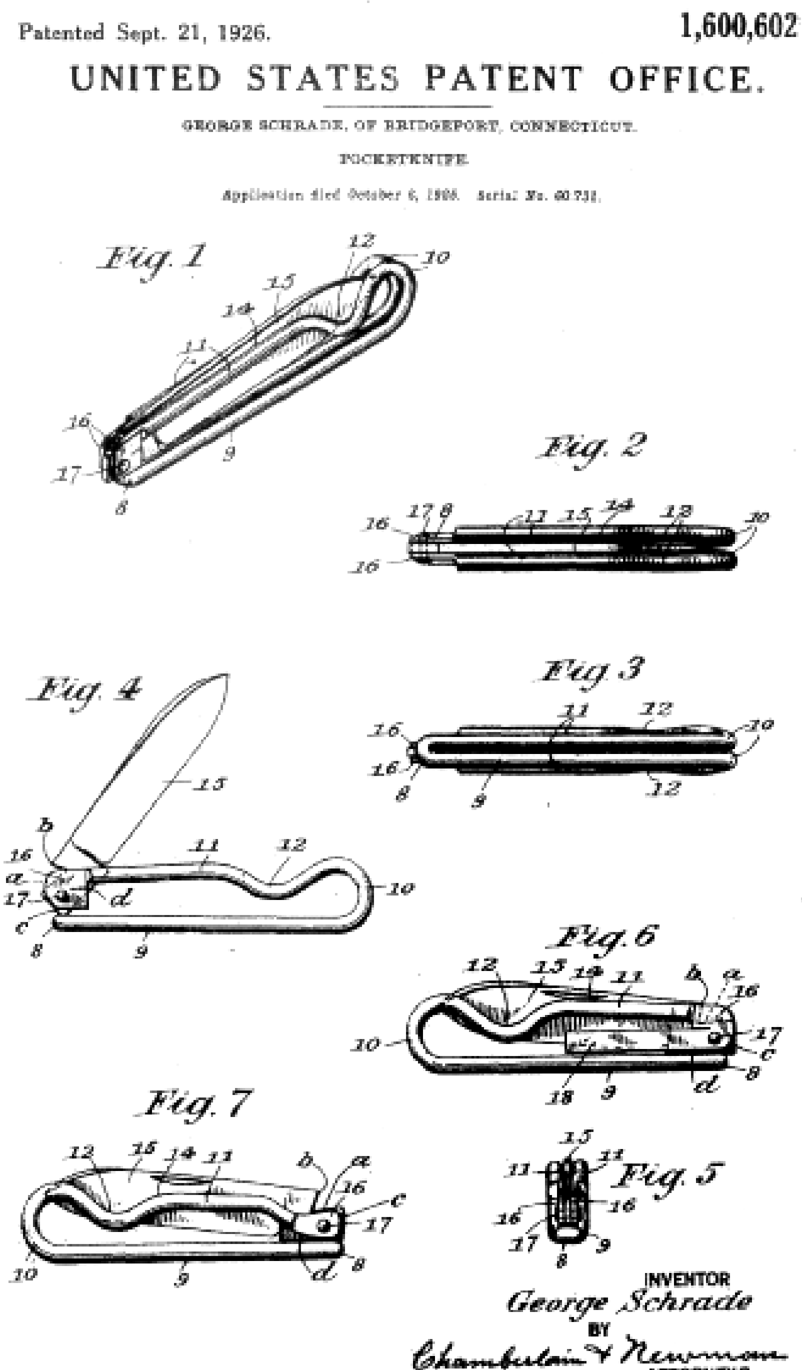

Editors Note: The entire patent can be seen on the US Patent website: www.uspto.gov
-search by patent number.

Excerpts from the patent text.
Fig. 1; shows a perspective view of my improved form of pocket knife;
Fig. 2; is an edge view of the same;
Fig. 3; is a back view as seen from the opposite side of that shown in Fig.2
Fig. 4; shows a side view of the same knife with the blade in open position;
Fig. 5; shows an end view as seen from the near end of Fig. 1;
Fig 6; shows a side view of the knife illustrating a slight modified form of wire handle, and
Fig.7; Shows a further side view of knife including a simplified feed form of handle.
As before suggested the handle is formed throughout of a single piece of heavy wire, that is bent and shaped to form a handle.

Finding the U.S. Patient reminded me of this small pocket knife that was made by Brent Cole, a MABA member-
The blade is made of L-6 (a band saw blade) and 5160 for the spring handle.

Photo and text by Steven Spoerre

THE UPSETTER
NEWSLETTER OF THE MICHIGAN ARTIST BLACKSMITH'S ASSOCIATION
NOV/DEC 2008

TIPS FOR DEMONSTRATING BLACKSMITHING

Reprinted from The Hot Iron Sparkle, Volume 27 No. 2, 2nd Quarter 2009

General Tips for Demonstrations

1. Keep it simple, especially when you demonstrate to the general public. Short and quick items like hooks, nails, and leaves are good demo items because the audience is only there a short time. Most of the crowd is happy just to see you hammer on a glowing piece of steel.
2. Talk to the audience. Let them know what you are making and explain the steps as you work on a piece. Example: I'm going to draw this out to a point by repeatedly hitting (striking) it with the hammer, rotating it and striking the adjacent side. The causes the metal to get longer and taper to a point. If you are uncomfortable talking to the audience you can get another blacksmith to tell the audience what you are doing and to answer questions from the onlookers.
3. Keep the fire cooler than you normally do so it takes longer to heat the stock. Doing this will help keep you from burning up the stock and give you time to answer questions.
4. Get another blacksmith to help hold larger objects when using a chisel to cut or split a piece, or drifting a hole. While you can do these tasks by yourself, it increases the risk that the chisel, punch, or stock will fly off the anvil (see rule number 1 in the Safety Issues below).
5. When making more elaborate pieces, have samples of it at various stages of development so you can show the audience what you started with and how the work progresses. This is especially useful as spectators come and go during the demo.
6. When things go wrong, just toss it in the safe area and start another piece.
7. Be courteous to the other demonstrators, Lend a hand when they need it and stay out of the demo area when not working. Keep conversations to a low volume.
8. Have stock precut and prepared before hand. It simplifies your demo.
9. Be prepared to answer the most popular questions repeatedly.

a. Do you make horse shoes? Answer: No, shoes are mass produced in various sizes now.
b. Do you shoe horses? Answer: No, farriers shoe horses today.
c. How hot is that? Answer: Dull Red: 900 - 1000 F ... White: 2000+ F

Safety Issues

1. Don't burn the audience or other blacksmiths in the area. Try to avoid sending sparks, scale, welding flux, or hot metal towards the audience. When hot cutting at the anvil, position the waste so it is not pointing towards the audience, and to not cut all the way through the stock. Instead of hot cutting you can use a hacksaw. When wire brushing point the stock towards the ground and direct the scale to the dirt.
2. Avoid welding (see rule number 1 above) if possible. If you must forge weld, use as little flux as possible and use a safety shield in front of the anvil to catch the molten flux.
3. Quench all items and test it on bare skin (yours preferably) before handing a demo piece to the audience. Also cool hot tongs and tools before putting them on the workbench or hanging them up.
4. Have a safe area, like under the forge, for hot objects where everyone knows it is hot. Put hot objects in the safe area to cool.
5. Wear safety glasses.
6. When cutting with a hardy tool work parallel to the anvil (not towards the audience) and don't cut completely through the work. Cut partially through the piece and break it off.
7. When you walk behind or around another smith at the forge, let them know you are there so they don't turn around with a hot object and burn you.
8. Use mild steel for demonstrating. Avoid brittle or hardened steel that might shatter like files or planer blades.
9. Do not leave hardy tools in the hardy hole, especially cutters or horns. When you finish using the hardy tool remove it and drop it in the dirt (it's hot).
10. Use tongs to pick up any object lying on the floor and check to see if it is hot before grabbing it with your hand.

Make your Stainless Steel Glow

From an article by Pete Stanaitis of the Guild of Metalsmiths

A situation that often comes up is, "Hey, my stainless steel is rusting! Why? What can I do to fix it?" Stainless steel is stainless because of the protective chromium oxides on the surface. If those oxides are removed by scouring, or by reaction with bleach, then the iron in the steel is exposed and can be rusted. Stainless steel is also vulnerable to contamination by plain carbon steel, the kind found in tools, food cans, and steel wool. This non-stainless steel tends to rub off on the surface (due to iron-to-iron affinity), and readily rusts. Once rust has breached the chromium oxides, the iron in the stainless steel can also rust. Fixing this condition calls for re-passivation.

Passivating stainless steel is normally accomplished in industry by dipping the part in a bath of nitric acid. Nitric acid dissolves any free iron or other contaminants from the surface, which cleans the metal, and it reoxidizes the chromium; all in about 20 minutes.

But you don't need a nitric acid bath to passivate. The key is to clean the stainless steel to bare metal. Once the metal is clean (and dry), the oxygen in the atmosphere will form the protective chromium oxides. The steel will be every bit as passivated as that which was dipped in acid. The only catch is that it takes longer, about a week or two.

To passivate stainless steel at home without using a nitric acid bath, you need to clean the surface of all dirt, oils and oxides. The best way to do this is to use an oxalic acid based cleanser like those mentioned below, and a non-metallic green scrubby pad. Don't use steel wool, or any metal pad, even stainless steel, because this will actually promote rust. Scour the surface thoroughly and then rinse and dry it with a towel. Leave it alone for a week or two and it will re-passivate itself. You should not have to do this procedure more than once, but it can be repeated as often as necessary.

Oxalic Acid based cleaners

There are oxalic acid based cleansers available at the grocery store that are very effective for cleaning stains and deposits from stainless. They also work well for copper. One example is Revere Ware Copper and Stainless Cleanser, another is Bar Keeper's Friend, and another is Kleen King Stainless Steel Cleanser. Use according to the manufacturer's directions and rinse thoroughly with water afterwards.

Not all stainless steels behave the same and you'll have to do more research on your own if you want more details. To get the list of hundreds of Internet hits, through which I searched, I simply typed in the word "passivate" and went from there.