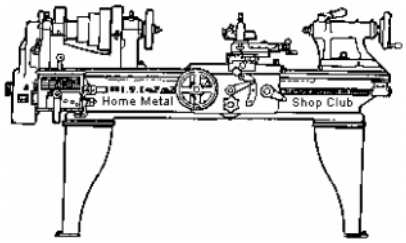
Home Metal Shop Club

July 2009
Newsletter

Volume 14 Number 7



http://www.homemetalshopclub.org/

Since its' founding by John Korman in 1996, The Home Metal Shop Club has brought together metal workers from all over the Southeast Texas area.

Our members' interests include Model Engineering, Casting, Blacksmithing, Gunsmithing, Sheet Metal Fabrication, Robotics, CNC, Welding, Metal Art, and others. Members always like to talk about their craft and shops. Shops range from full machine shops to those limited to a bench vise and hacksaw.

If you like to make things, run metal working machines, or just talk about tools, this is your place. Meetings generally consist of a presentation with Q&A, followed by ***show and tell*** where the members can share their work and experiences.

President	Vice President	Treasurer	Secretary	Librarian
Vance Burns	*John Hoff*	*Emmett Carstens*	*Dick Kostelnicek*	*Dan Harper*
Webmaster	Photographer	CNC SIG	Casting SIG	Novice SIG
Dick Kostelnicek	*Jan Rowland*	*Dennis Cranston*	*Tom Moore*	*Rich Pichler*

About the Upcoming August 8 Meeting

The regular meeting will be held at the usual location at 1:00 p.m. in Looscan Neighborhood Library. A business meeting will convene at the HEB Central Market at 11:30 a. m. The presentation will be on Building Real Airplanes by Lucas Waggoner. Visit http://www.homemetalshopclub.org/events.html for details about upcoming meetings.

Recap of July 11 Regular Meeting

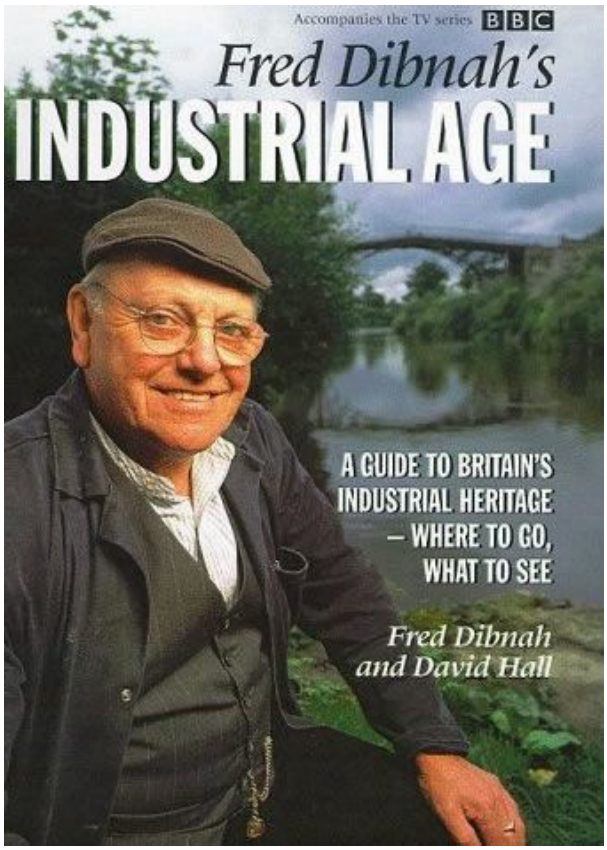
Accommodations and covered parking at the Freed-Montrose Library were excellent. Twenty-three members were in attendance. Dick Kostelnicek asked that all who want to be notified each month when the newsletter is published send an email to the webmaster@homemetalshopclub.org so that their address is accurately recorded.

Recap of July 11 Business Meeting

Thirteen members attended the business meeting at the Black Labrador Pub. Vance Burns showed an advertisement that he placed about club membership on the Houston Chronicle's KAANGO site http://chron.kaango.com/feViewAd/14807013. Dick Kostelnicek discussed the yearly website statistics and suggested that we consider adding member produced videos to the site.

Presentation

Vance Burns showed the first part of a video on English Industrial Heritage narrated by Fred Dibnah. While in England a number of years ago, Vance trekked through the English countryside visiting sites recommended by Dibnah. The video details how the smelting of iron by coke changed the entire face of early English industry. Shown were the sites, most now abandoned, of mills and factories that employed wind and waterpower during the early part of the Industrial Age. Coal eventually became the main source of fuel for industry and transportation. The ever-present problem of keeping the coalmines dry inspired the development of pumps powered by condensing steam engines. The video also featured a number of mill steam engines, operating now solely for display, that subsequently replaced wind and waterpower in that era.



Discussion by Members

Joe Scott brought in a spring winding fixture that mounts in place of a lathe's tool post. However, He can't remember ever using it. He demonstrated how he uses small shipping boxes for storage of the multitude of parts he produces in his gunsmith business. Joe also demonstrated the operation of a vertical collet fixture that he uses to drill evenly spaced holes along a circle on his mill-drill machine.

Dan Harper discussed his difficulties in drilling a small, long, straight hole in aluminum in his lathe. He also showed a modified box wrench that holds a nut's head and fits into a compatible style recess

Dean Eicher (left) demonstrated an electrical test hook-up fixture that he made from aluminum sheet. It snaps onto a multi-contact terminal block. By pushing spring loaded electrical pins against each screw connection on the block, electrical contact is established. A multi-wire cable transmits the signals from the contacts to an electrical test instrument.

Gary Toll (right) discussed his technique for electro-chemical de-rusting of the inside of an automobile's gas tank. He used a water and washing soda mixture as the electrolyte along with a battery charger, all done through the tank's filler neck. The pinholes remaining in the tank were covered with fiberglass mat and resin.

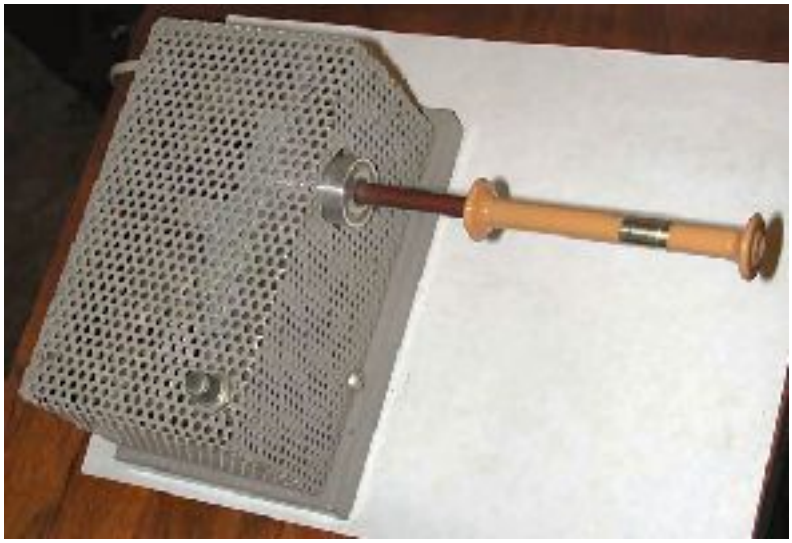
Joe Williams brought in a homemade brass spring winding fixture that clamps in a lath's tool holder just like a tool bit. Everyone has spring winding equipment, however no one seems to wind springs anymore.

Articles

Bobbin Winder

By *Joe Williams*

This device was built using a kitchen-mixer motor and gear head that I obtained from a surplus store. The motor was mounted on a ¾ x 4 x 6-1/2 inch steel base plate. Ballast provided by this plate was necessary to keep the device stationary as thread winds onto the bobbin. The hollow bore output shaft is supported by two ball bearings mounted in an aluminum cylinder that is fastened to a inner bracket. The spindle shafts are tapered to fit the bobbin being



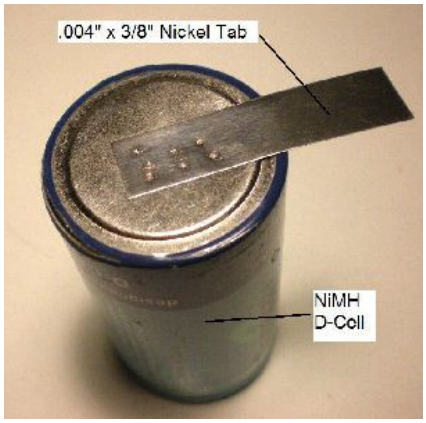
used. Bobbins come in two sizes. The photo on the left shows the smaller one. The long tapers were turned using both a tailstock center and the taper attachment on my old South Bend lathe. The spindles are held in place by a small O-ring and driven by a flat on their shafts. A small push button switch, located on top of the perforated metal housing, activates the winder's motor.

Capacitor Discharge Spot Welder

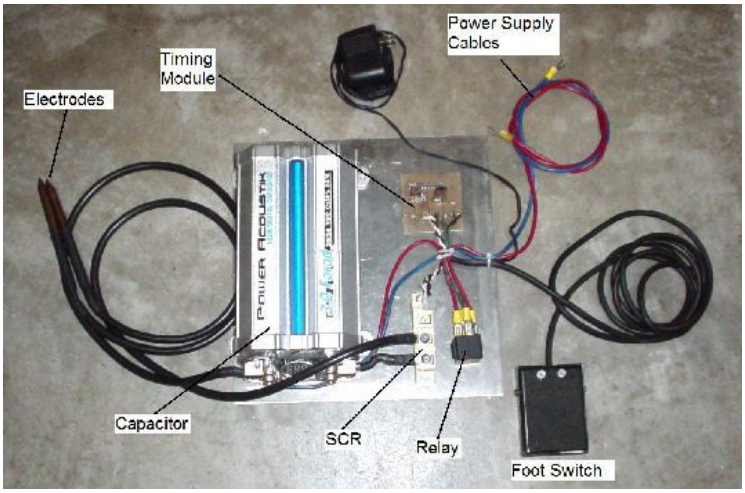
By *Michael Hancock*

I made a 36 Volt NiMH (nickel-metal hydride) battery pack for a bicycle fitted with an electric hub motor. The photo on the right shows the pack attached to the bike's rear luggage rack. Battery tabs, as shown in the photo below, provide electrical connections between cells. An excellent resource describing the construction of a battery tab welder can be found at the following web link:

http://ledhacks.com/power/battery_tab_welder.htm



Thirty NiMH D-cells (1.2V @10 Amp-hr) were connected in series by spot welding the cells together with nickel strip tabs. The basic principle was to charge a capacitor, and then discharge it through an SCR (silicon-controlled rectifier). Both of the welder's electrodes were pressed firmly against the tab overlying a battery's terminal. A subsequent electrical discharge welded the tab to the battery. The weld's quality depends on a number of variables: capacitor capacity and voltage (energy), tab thickness, and electrode pressure. I experimented with these variables until I obtained suitable welds using 0.004-in. thick nickel strips.



The capacitor (Power Acoustik, 3 Farad) was charged to 12-16 Volts with a variable voltage power supply. Note that a supply with short-circuit protection will not work since the discharged capacitor initially appears to be a dead short. An automotive relay was used to connect and disconnect the power supply and the capacitor. This relay was activated from a timing circuit in a 'Basic Stamp' (Parallax) microprocessor. On power-up, the timing module connects the power supply to the capacitor until it reached full voltage. A foot switch triggered the timing module to disconnect the power supply from the capacitor. An electrical pulse was then sent to the SCR's gate. Release of the foot switch triggered relay closure, thereby recharging the capacitor. All this, of course, could be accomplished with manual switches.

Recollections of a Vapor Degreaser

By *Dick Kostelnicek*

Part 1 of 2

One very hot summer I was hired as a helper to the operator of a vapor-degreasing machine. The work was at the Marsh Instrument Co., located in Chicago, Ill. I was between semesters in college and able work full time for 6 weeks. Now, it didn't hurt that I was an electrical engineering student and had just replaced some vacuum tubes in a television set belonging to the company's president, Mr. T. I must have made quite an impression on him since I was hired immediately and without an interview. At Marsh there was no problem with the union. I was given a temporary card and dues were waved. Recall, I was familiar with the man in the head office or at least with the inside of his television set.

The first day I was introduced to Joe, the operator of the machine to which I was assigned. He was an amiable chap and had been with Marsh for 10 years, operating the same degreasing machine. Joe taught me everything he knew in 30 minutes. Most important were his instructions on *How to Get Along with Him and the Rest of the Staff.* Well, that summer I learned more about interfacing with employees and gaming the factory work environment than could ever be gleaned form all my subsequent years in higher education.

On my second day, while punching-in, I was pulled aside by a shop foreman. He told me Joe was in the hospital suffering from a hernia, and that I would take over his machine, *sans* helper of course. Quite a promotion, I thought. Now, I alone would garner that extra cash derived from piecework at or above the *target* rate; more on that later.

Marsh Instrument Co. produced myriad parts for Bourdon tube pressure gages. These ranged from gage cases of several inches in diameter to pinions, levers and gears as small as one-tenth inch in size, Many of the parts were made from brass on automatic screw machines.

That's where bar stock is fed into a rotating cutter, and machined parts drop off into a bin. Those parts were often covered with thick dark cutting oil that cemented them together along with copious amounts of cutting chips and swarf. It was the degreaser's mission to remove the oil, chips and swarf and send clean parts on their way to the next machining operation.

Let me explain how vapor degreasing works and the operation of the machine under my command. It was just a large enclosed metal box; 10 high, 5 wide, and 12 feet long. At about chest high was an opening that allowed access to baskets that magically appeared in the machine's sole portal. Well, not magically. The baskets were 3 feet wide, cylindrical in shape, with guide sprockets attached at both ends. The box-like enclosure contained heated 111-trichloroethane vapor (methyl chloroform) rising to about knee high throughout its length and breadth. This vapor formed into a white cloud that was denser than air. It appeared just like a thick cloudbank hanging along the bottom of an alpine valley during a cool summer morning.

As I stood attending my machine, there was a huge exhaust fan positioned about three feet above my head. It made such a racket that I soon donned a set of earplugs. I really appreciated that fan. The shop floor wasn't air-conditioned, so the fan together with my incessant body sweat kept me relatively cool. Its monotone din masked the noise emanating from the machines nearby, especially those repetitious thuds of the stamping press producing pressure gage cases. Only in the front office and lunchroom could one enjoy silence and the comfort of cool air.

One day, a fellow degreaser confided in me that this new solvent was far better for your health than the carbon tetrachloride used previously. I now realize that the overhead fan's suction spared me from the ill effects of those noxious fumes, sending them outdoors for everyone else to enjoy. During the1970s, an early attempt to control the fire-ant scourge plaguing the U. S. Southwest employed trichloroethane. It was poured onto ant mounds, the vapors descending to the depths of the nest asphyxiating the queen. A subsequent university chemistry course told me more than I ever wanted to know about my chemical exposure. And besides, that was well before the EPA determined the health hazards of chlorinated solvents.

My machine held 20 cylindrically shaped baskets constructed from heavy screen wire. Each basket had a piano hinge affixed to the backside along its entire length. Upon releasing a clasp, placed opposite the hinge, they would flip open into two half round cradle shapes that facilitated unloading and refilling with fresh parts. The sprockets, attached to each end, made the baskets rotate as they were pulled over two horizontal gear racks by two endless roller chains. As the baskets moved through the machine, the relatively cool parts condensed the vapor solvent, thereby rinsing away the sticky machining oil. To this day, as my moistened feet glide through dew-laden grass on a humid spring morn, I think of all those parts being washed clean.

The basket's rotation shook out the swarf and chips, which fell to the bottom of the machine. A mounting pile of debris and the occasional parts dump from a poorly latched basket had to be dealt with eventually. To my surprise the degreasing machine operators were invited in to clean out their machines on Saturday, with overtime pay of course. Joe was still on medical leave. So, during my second week on the job, I came into an unexpected financial bonanza. We paired up as buddies. I donned a mask attached to an air breathing hose. Another machine operator tied a rope around my waste, sent me into the bowls of the machine through an access port, and stood watch outside, *just in case*. Now, *Just in case* meant that periodically he'd pulled on the rope with one quick jerk and I responded in kind with two tugs. I never experienced what would have happen had I failed to respond. But remember, I knew the man in the front office and no one would let the college kid get in trouble, or so I thought.

While inside the machine, I raked the accumulation of brass chips and swarf into neat piles next to the access port. Then, we shoveled the mass into open top barrels for recycling. I still envision all the spent swarf and chips recast into brilliant new brass bars feeding all those hungry automatic screw machines.

Periodically the foreman would stop by and tap me on the shoulder while yelling directly into a plugged-shut ear: TIME TO BARREL OIL. Now, behind my degreasing machine stood a steam heated still. Its purpose, aside from turning my work area into Hades, was to separate the oil-solvent mixture remaining after parts were degreased. The vaporized solvent was returned to the machine while pure cutting oil accumulated in a large storage tank. My job was to transfer the super heated oil into 55-gallon drums and transport it back to screw machines for reuse. I recall that even by donning *glove-over-glove* there was little relief from jostling around those infernal hot drums. I still marvel at the cleverness of all the recycling that went on at Marsh Instrument Co, driven mostly by economics rather that government fiat.

This college kid was getting all the fine treatment, rapid advancement, and extra income. That didn't go unnoticed by the regulars at Marsh. I soon realized that during slack times no one was *shooting the breeze* with me: nary a *How's it going?* or *Where you from*?. My isolation seemed only to increase after several public encounters with the company's president. Periodically Mr. T. would stop and visit with me while making his rounds of the factory floor. You might say this was an early example of *Management by Walking Around*, well before it became popular throughout industry. Mr. T. often brought with him a radio, a lamp, maybe even a hair dryer that needed fixing. This soon to be electrical engineer honored his requests for those take-home repairs. He provided employment and I fixed for gratis what was broken. I had hoped that all those presidential visits would provide immunity from the scolds of my fellow workers, but sadly, I was mistaken.

The conclusion of **Recollections of a Vapor Degreaser** will appear in the August newsletter.