Future Events

SW - Nov 22 - Let's get started on our "iron" Holiday Gifts

Report from the Northwest

Billy Christie

Thanks to the Bettinger's, Mike, John, & Ivy of Bettinger Welding in Tallahassee, for one more first-rate meeting that was held on August 9, 2008. We started out with Mike Bettinger doing a power hammer demonstration by making a decorative wine bottle holder out of a solid piece of 1"x1"x7"mild steel. First, he drifted a good size hole in the center and then drew out one end into a long taper, like a vine. The other end was then forged out into a big flat leaf to become the base. It was impressive.

Our next demonstrator was B.J. Noelke from Jacksonville. B.J. started out by making two steel vases (with pedestal bases) out of black iron pipe. To help forge down this pipe, B.J. had previously built a special double V block die for the power hammer. The important angle to remember is 33 degrees. His next demonstration was to make a large flower with leaves, which is used to make a table lamp with the light in the center of the flower. Using a 4' piece of pipe and tapering it down in the center, at the top he cuts out 5 pedals and forges them into a flower. Then he shaped the shaft into a big S curve. To make the leaves he used angle iron (BJ made several different size & shaped leaves, then used the ones that he liked best). Nice work. We auctioned off the 2 vases and the flower with leaves for about $125. The "Iron In The Hat" also did very well, bringing in $174. Thanks Dot Butler and everyone involved.

While all of this was going on John (Bettinger) was busy using the computer controlled, plasma cutting system to make a variety of things. It worked perfectly and was really fast.

A delicious lunch of BBQ ribs & chicken, plus all the trimmings, was served.

There was also a FAB CAD demonstration on designing custom gates & handrails. I heard it was very impressive, but some how I missed it.

I look forward to seeing you at the annual FABA conference in Barberville which will be held on October 10th – 12th, 2008.

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FABA Teaching Trailer - August 2008

Steve Bloom

As part of my continuing effort to work smarter, not harder (it hasn't worked out, so far), I conceived of the idea of a dedicated trailer to support FABA's teaching effort. OK, I was inspired by the teaching trailer that appears at Madison in the Green Coal area, but let's not quibble. What resulted is shown in Figure 1.

The basic idea is a trailer with four complete forge stations (forges, blowers, tools, anvils and anvil stands, slack tubs and coal bins), two post vises with appropriate mounts, and a 10' x 20' carport (pipes, tarp, and bungee balls) - all in a reasonably light package so that virtually any vehicle with some tow capacity (3500 lbs) can pull the unit (see Figure 2 for a diagram of the basic design) . Underlying the concept is that this is a prototype unit - basically build it, use it and figure out how the next one can be better.

The Trailer

As is usual in such efforts, the actual plan changes when the design on paper meets the materials on hand. Originally, a Harbor Freight trailer was considered but since I had a home-made unit already, I decided to just retrofit what I had on hand. That trailer was based on the rear wheel and axle assembly from a Chrysler minivan coupled with 1-ton trailer springs from Northern Hydraulics. The frame was 96" x 53" and made of 2"x2"x1/4" angle iron with corner bracing and a telescopic hitch system (more on that later). The original trailer had a 3/4" plywood bed and cantilevered sides that overshot the wheels. In its new life, the bed would be open and needed more stiffening.

Charles "Hippie" Pate came through and donated most of an old trampoline frame, a bunch of bed frames, a pile of rusty 12" x 96" expanded metal panels, and some miscellaneous

Figure 1: The teaching trailer as of August 2008

bits and pieces. I acquired a couple of large ammo boxes as well as four 110v blowers from the Surplus Center (Lincoln, Nebraska). I also acquired two slabs of stainless steel (6" x 96" x 3/8" and 5" x 96" x 1/4") from the Pioneer Settlement courtesy of the fine scrounging talents of Lester Hollenbeck. Through the good graces of Bill Robertson, we already had a 10' x 20' temporary carport and a pair of 4" post vises. Now all I had to do was assemble it all.

The trailer was stripped down to the bare frame and pipe sections from the trampoline frame were welded across the 53" dimension along with a couple of spare 2"x2"x1/4" angle pieces. In all there where 10 cross members welded in place (maybe excessive but the pipe was light and the welds problematical). The expanded metal panels were approximately 12" x 96" with a 1"x1/8" border tacked on. Four of those were welded to the frame and cross members (leaving a 5" gap down the center). The gap was closed with a 10 gauge strip of steel I happened to have lying around.

The hitch assembly is unchanged from the original design. It consists of a 2"x2" heavy wall tube, mounted in a 2.5" x 2.5" x 3/16" wall piece of square tubing (just large enough to allow the 2"x2" piece to telescope) (Figure 3). The socket piece is welded to the frame at the front, to one of the heavy crossbars at the rear, and to a set of heavy diagonal braces that are welded to the frame and to the socket. There are a pair of diagonal braces (mini-"I"-beams) running from the hitch point (using a 1 7/8" ball) to the corners of the trailer frame. These are secured with 4 5/8" pins. The electrical connections to the lights are attached to a pair of floating rings on the 2"x2" tube. While the hitch end has a small welded foot to keep the hitch out of the dirt, a trailer jack is available to make life easier. It either lives pinned to the front of the trailer frame (as in Figure 3) or slipped over the 2"x2" tube near the hitch end and is pinned in place. There are three legs available to stabilize the unit when parked (two in the front, one in the rear). The legs are sections of pipe with a 2" disk welded on as a foot. They run in the sockets (Figure 3) welded to the frame and are locked into place with a 3/8" bolts.

When towing, the jack is pinned to the frame, the legs are up and locked, and the hitch is secured to the frame with five 5/8" pins (all with safety clips or cotter pins). When parked, the rear leg is dropped and locked and the jack is used to transfer weight to the rear. The front two legs are dropped and locked and the jack can be removed and repinned to the frame. The pins on the braces nearest the trailer and the central pin on the 2"x2" tube are removed . The braces are swung in board alongside the center tube and the whole assembly slides in under the trailer, leaving only the hitch itself sticking out to bang your shins.

The original plans called for a pipe rack running over the forges but I had several of those expanded metal panels left. They became two underslung baskets - lying well above the drop center axle from the minivan and sufficiently outboard from the center to not interfere with the hitch when slipped back under the frame (Figure 4). Anticipating what can go wrong - like giving a heart attack to following motorists when the pipes slide out and onto the road - the baskets are closed with steel doors, locked with a lock bar and safety clips. The safety clips are chained to the frame, making losing them less of a good excuse for why the doors weren't secure. The rear leg and shields around the lights are also shown in Figure 4 (Yes, Clyde, there are lights!).

The fenders were frankensteined together out of lef over military shelving and are welded to the frame. Just to the rear of the fenders are two sections of the 2.5" x 2.5" material. The post vises are mounted on 4x4 posts and those post have a bolted bracket with an offset 2" x 2" section. That section

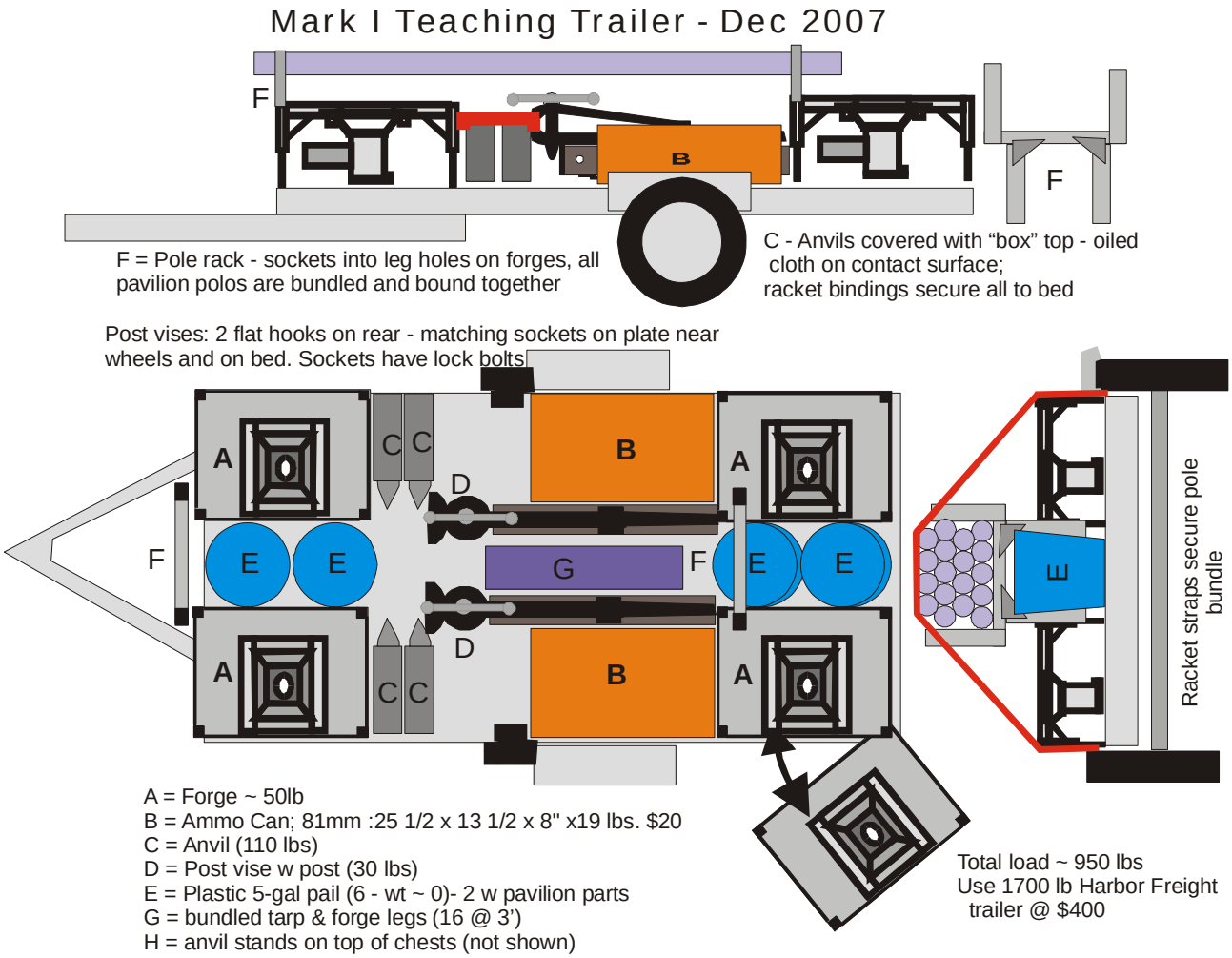

Figure 2: The original concept for the teaching trailer

sleeves into the sockets on the frame and are secured with a bolt (Figure 5). The combination of the legs and the post vise posts ought to give a pretty stable platform.

Under the rule that a heavier tongue weight beats a wildly swinging trailer, the anvils and post vises are located between the hitch and the wheels. The anvils are locked in place in anvil stalls (Figure 6). The stalls consist of a welded base on which the anvils can be slid onto and off the trailer and a rear (in board) wall. The wall has welded rings to accommodate the horns and to keep the anvils from moving in any direction except out. The anvils are secured with a covering top plate (complete with oiled cloth on the face-side) and a massive bolt that runs through the cover plate and the hardy hole and screws into a nut welded to the frame. On the rearward stall, there is a heavy horizontal plate welded to the stall assembly. In travel mode, the post vises lie against the fenders with the end of the post under the rear forge and with the vise itself clamped to the horizontal plate.

The tool boxes are located on the front and rear of the trailer between the forges (Figures 3 and 4) and are bolted to the frame. They are large enough to hold the blowers, hammers, tools, and ancillary equipment. There is also an auxiliary box that will ride behind the front tool box and will contain all the miscellaneous stuff we seem to need (borax, matches, paper, chalk, etc.).

Ancillary Items

The anvil stands, the tarp, and 6 5-gallon pails ride between the fenders and the forges and toolboxes. The connector pieces for the carport, the bungee balls, and any miscellaneous stuff rides in the pails along with any coal that is being carted along. The choice of using pails was simple - they are light and they were free. Drop by virtually any hydraulic shop and they have pails to give away. Even if a student forgets that the walls are plastic, the damage is minor and the advantage of light, stackable, and free containers for coal and water is hard to beat.

The Forges

The forges are 22" x 15" units with 12" sockets on each cor-

Figure 3: The hitch assembly

ner. The frame is made from bed rails (tough stuff!) and is welded to the sockets with diagonal braces (2" x 1/4" material). Each socket is provided with a 3/8" lock point (welded nut with a bolt that can be tightened without tools). The pipe used for the sockets is Sch.40 1.25" black pipe that happens to nicely sleeve 1 3/8" thin wall top rail (from chain-link fences). The legs are 32" sections of top rail with a 6" wooden dowel driven into each end (to keep the lock points from crushing the legs). In travel mode, the forges sit slightly off the trailer bed and rest on a pair of sockets welded to the frame. The frame sockets have a light rod welded in place at their bottom ends. The legs run through the forge sockets and into frame sockets. When the lock points on the four sockets (two on the forge, two on the frame sockets) are tightened, the forge cannot go for a walk by itself. The other two legs simply sleeve into the remaining forge sockets and are locked in place. This scheme is why the overall appearance of the trailer looks like a weird drill rig, but it is a very efficient way to store the

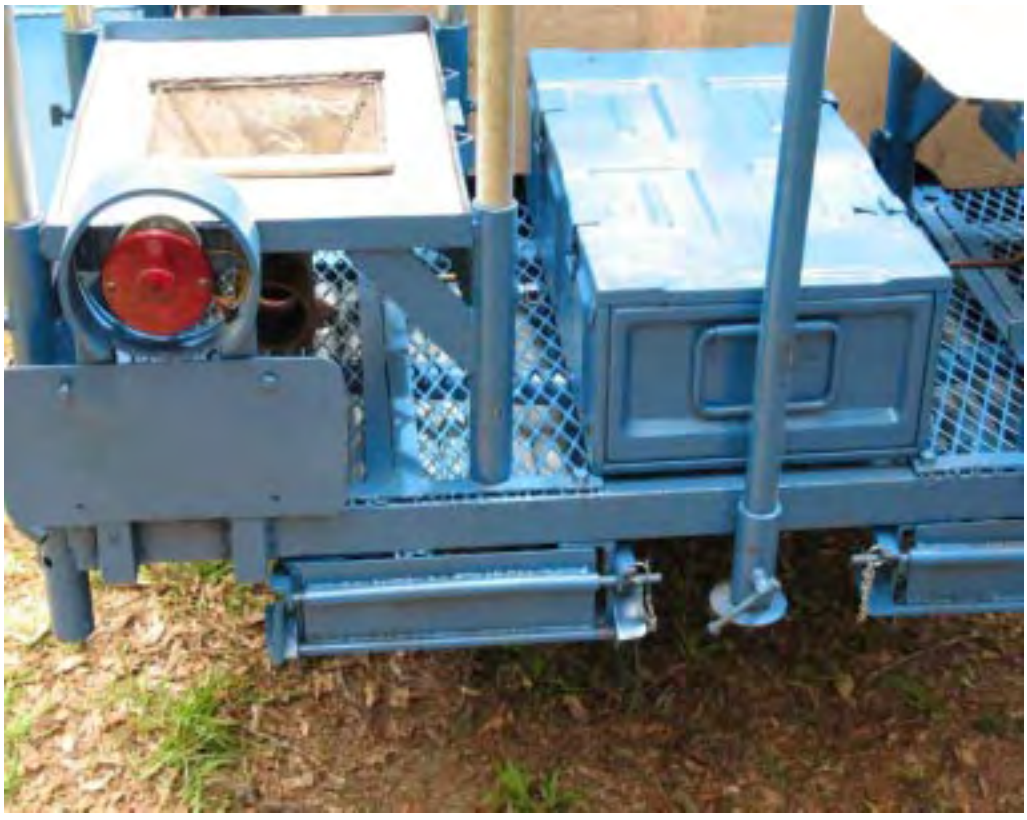

Figure 4: Trailer rear showing baskets, rear leg, and lights.

Figure 5: Post vise mount system

legs for travel.

The deck of the forges are made of light aluminum plate and are supported by a pair of bed rail material running front to back and separated by the width of the forge pots. The decking is pop-riveted to the frames. If time and materials permit, short walls will be added to the frames to cut down on wind messing with the fire.

The forges could be used while locked to the bed but they are really designed to be used when pivoted off the trailer (Figure 7). This allows the students a bit more elbow room and also allow the forges to be detached and moved away from the trailer as needed. Since the legs sleeve in the corners, the height of the forge can also be adjusted as needed.

The forge pots ought to last awhile -- they are made from 3/8" thick stainless steel and were welded using stainless electrodes (Figure 8). I want to express my real appreciation to Ben Rogers for letting me use his plasma cutter. Without that, the pots would still be slabs. The pot dimensions approximate those of the rectangular cast pots available from Centaur Forge. The front and back edges are more or less on level with the forge deck and the pots are supported on flanges welded to the right and left side of the pots proper.

The pots are supplied with a clinker breaker - either a composite of stainless pieces or a welded stack of 1" mild steel plate. All of them have a 3/8" crank and are secured with a lock bolt.
The tuyeres are made from 4" long pieces of 3" square tubing with 1/8" wall thickness. To them are welded 5" long pieces of 3" diameter black pipe. The ash dump consists of a swing plate, a piece of angle-iron acting as an alignment shelf and a pivot made from scrap light pipe and 1/2" bolts scavenged from the trampoline frame.

The blowers are 110v approximately 125+ cfm units and come in two flavors - a Fasco blower requiring a capicator (available from the Surplus Center) and a blower scavenged from a copier (also from the Surplus Center). The blowers ran about $25 each (including shipping). They are equipped with an adapter that

Figure 6: Anvil stalls and vise mounts

Figure 7: Forge deployed for use

funnels the output into a 2" to 3" section of 3" pipe and have a slide plate and control lever that cuts off air to the blower - hence air control. Both of these blowers have independent air supplies to the motors, so overheating ought not to be a problem. The blowers mount to the forges with a sleeve of commercial vent pipe and a couple of radiator clamps.

Both blowers put out sufficient air to be usable - see Figures 10 and 11 for why I think they'll work out.

What is still in the works are break down or portable anvil stands. What we have (and shown in the initial figures) will work and can be transported but eat up a lot of space. I'm

Figure 8: Forge pot & clinker breaker

Figure 9: Tuyere and blower attachment

working on a Mark I design (see Pg.9) because I have the sheet of 3/4" ply that used to be the floor of the trailer before its reincarnation. There are also three-leg pipe and chain designs that I might try if I can get some cheap pipe.

The tarp and buckets ought to stay in the trailer when towing but I'm working on fitting a cargo net to some leftover trampoline pipe (which just happens to sleeve over the leg pipes). If it works, the net will simply drop over the internal legs and act like a roof to prevent bombarding the following motorists with plastic pails.

Those internal legs also offer a another nice opportunity. The trampoline had right angle brackets that easily sleeve over the legs. A carefully measured piece of leftover trampoline pipe and a pair of the brackets make a handy bridge across a pair of the internal legs (say the front placed internal pair of the rear forges and the rear-placed internal pair of the

Figure 10: Forge with copier blower

Figure 11: Forge with Fasco blower

front forges). Bolt a spare piece of 5-V crimp steel roofing to the bridges and you get a partial cover over the bed. Toss a tarp and use a few bungee cords and the trailer is secure from any leaks in the roof of my trailer shed (and yes, there are a few - but hey, it's 20 years old and was roofed with used tin!).

The concept behind all of this is convenience -- when it's teaching time, just hitch and go. At the site, other folks can help deploy the materials and then switch the unit back to travel mode at the end of the event. Drive home, park it, and go looking for a beer -- sure beats dragging everything from storage, dumping it into a trailer, dragging it out at the event, dumping it back into the trailer when the event is over, then (at home) dragging it all back to storage.

Figure 12: Anvil stand internal view

Come by the classes at the October conference to see the beast in action.

Anvil stands:

Using the basic idea and dimensions of what the guys from Tallahassee designed, I cut out two sides with feet and glued/screwed strips onto the inner edges to form slots (Fig.12). Two other sides were cut to fit into the slots and a top with "ears" for the anvil was fabricated. The trick is somehow lock all five components into a strong, single unit. My solution was to embed a slab of steel in the underside of the top and cut a slot in the slab. I drilled two 3/4" diameter holes in the sides with feet about midway along the center line. I fabrictaed a "T" bar that slots into the slab and can be twisted 90 degress to lock in place. The bar started life as a seat-elevation knob and 1/2" diameter screw on an office chair. . I dug out a circular piece of steel that came from the side of the tuyere square pipe when I drilled a 3" hole for the side pipe. That "washer" had a 1/2" diameter hole drilled in the center and had two lengths of old snow-tire chain welded on (I've had those chains for better than 30 years - I knew I would find a use for them!). Figure 12 shows the layout. The chains go through the hioles and the last link is twisted as shown in Figure 13 -- that's a pretty cool idea, no? Then the knob is turned to pull the slack out of the chains and to pull the top down onto the sides. Voila - a breakdown anvil sand (Fig,14). We'll test it at the conference.

Figure 13: Chain lock

Figure 14: Anvil stand assembled