



The Mud Ring

The Newsletter of the Cinder Sniffers Inc.

Winter 2013 Issue

STEAM RAILROADING ALIVE AND WELL IN URBANA

By Chuck Balmer

Until the mid 1950's, steam powered railroads were the transportation lifeblood of our nation for over 100 years. They brought materials to communities for homes and businesses, and they took the products made locally to manufacturing and retail centers across the country. They also transported the people making America one of the most mobile societies in the world. Since railroading is mostly an established business with no large-scale expansion in the near future, it has essentially become a utility. The romance of an expanding frontier and the promise of great wealth are largely gone.

Like a lot of small rural communities, Urbana has had a rich historical connection to the railroad. The city was at the crossroad of two major lines with many trains passing through the city every day. The New York Central line ran north and south while the Pennsylvania railroad ran east and west and each had a station for both passenger and freight service. Several sidings and a rail yard also served local businesses.

In the late 1800's the Lincoln funeral train stopped in Urbana on the East West line while on its way across the country. In the early 1900's Urbana was also the site for the Illinois Car Company that manufactured boxcars in a plant located on the North East side of town. In the 1960's a munitions train derailed on the Pennsylvania line just west of Main Street causing an evacuation of several blocks in the middle of the city. In 1976 the steam powered Freedom train passed through Urbana on its way north to the

Bellefontaine maintenance shops for overnight servicing.

In this country steam locomotives have for the most part been relegated to hauling historic or amusement park trains. However, steam is still being commercially used in China and some third world countries

In the mid 20th century, the diesel engine began to replace steam as the primary source of heavy mobile power. Ships, trucks, and eventually locomotives began using these engines because of their low maintenance and operating costs. Since coal was a cheap fuel and because of the massive capital investments in locomotives, steam engines were one of the last forms of power to be replaced. During the last 30 years of their life, the super power locomotives could still outperform several diesels. The last advantage of the steam locomotive was overcome when automatic electric controls allowed multiple diesel units to be ganged together providing increased horsepower while still being operated by a single crew.

All forms of transportation have been the subjects for modelers for thousands of years.

Model railroading is one of the largest hobbies and is dedicated to the preservation of railroading as a driving force behind the industrial and commercial revolution that built this and other countries. Hobbyists are composed of highly skilled historians, engineers, artists and others that build and operate electric, steam, and internal

combustion powered railroads. Because of the necessary skills, the equipment needed, and the time required to build these locomotives and layouts, it has long been considered an older person's hobby. However, smaller projects are well within the capabilities of younger modelers and many of the established modelers would be happy to encourage them.

One of the best examples of G scale electric model railroads is at the Entertainement Junction show in Cincinnati Ohio. For those interested in live steam railroading, the Cincinnati Cinder Sniffers and the Dayton Carillon Park railways are excellent examples. Information about all of these railroads is available on the Internet.

Train scales range from the smallest Z scale electrics to full size passenger and freight carrying lines. The smallest scale that an operator can easily ride behind is 1:16 scale or 3/4 inch to the ft. These engines run on 3 1/2-inch gauge track and typically weigh less than 200 pounds. Because of the narrow width of the riding cars, many of the tracks are elevated so that the riders can straddle the cars to improve stability. While this scale is still being used on older club tracks on the east coast and in Canada and Europe, it is not as popular as it once was. The most popular small scale for hauling passengers is 1:8 scale or 1 1/2 inch to the foot. These larger trains run on 7 1/2-inch gauge track and can weigh anywhere from 300 to 2000 pounds and require heavy equipment to build, transport and operate.

My son Jim and I represent steam railroading in Urbana by operating the Balmer Locomotive Works and Oak Hill Railroad at our shop. Our track is a 250 ft. oval that is elevated 6" off the ground. We use extruded aluminum rail and wooden ties. Since I model in 1:16 scale, the rail gauge is set at a 3 1/2-inches. We are also members of the Cincinnati Cinder Sniffers Live Steam railroad club. The club track is located just over the Indiana state line and is a multi gauge railroad about 2500 ft. long.

I am a graduate of University of Dayton with a BSEE/68 and MSEE/70. I have held various positions from project engineer to engineering

manager until I left to start my own business in 1982. I began doing consulting work as AVATEC Electronic Systems. The business evolved over several years and settled into designing and building electronic production test equipment for the aerospace industry until I retired in 2006.

Jim Balmer is also a graduate of UD with a BSEE/06. He is currently a senior design engineer working on embedded motor controls for medical power tools. Jim helps me with welding, casting, decals, and heavy lifting of the railroad equipment. He is also the primary operator of the engines

After I graduated from UD in 1968 I began buying electronic and machine shop equipment to put together a complete workshop. The first project was building a propane-fired 1:16 scale operating steam locomotive based on the famous New York Central 4-6-4 J3A Hudson. I was an engineer at Grimes manufacturing at the time and was able to use some of their large tool room equipment to make a few of the parts. I was also able to use some of the equipment in Urbana High School's industrial arts machine shop. Eventually I acquired my own large lathe and milling machine and became independent of these other shops. This engine was completed in 1971 and is still operating today. A six-minute video of it running at the Cinder Sniffers track in 2011 can be viewed at the Cinder Sniffers website or at www.youtube.com/embed/WQz-cxJFWgw. Over the next 5 years I built two more small coal fired steam locomotives, and an F7 diesel electric. Recent acquisition of other engines has brought the total number to 9. With the completion of the model described below, we will own and operate steam powered model locomotives from the Civil War era to the super power engines of the Second World War.

In 1975 a business trip to Detroit allowed me some free time to visit the Henry Ford Museum where I saw the large historic steam locomotive on display there. One of the largest locomotives ever built, it is a 2-6-6-6 H-8 Allegheny coal fired engine built by the Ohio Lima Locomotive Works in 1941. The locomotive is an articulated engine meaning that the front and rear engines pivot in

the middle to allow it to make it around tight curves. These engines could develop 8500 horsepower and were capable of traveling at speeds in excess of 70 miles per hour. The total weight of the engine and tender was over 600 tons. They were heavier and more powerful than the famous 4-8-8-4 Big Boy's. These large engines were used on the Chesapeake & Ohio and the Virginian railroads for hauling coal and ore through the hills from Virginia through West Virginia, Ohio and Indiana. Sixty-eight of them were built through the war years and some were even used to haul passenger and troop trains. Only two have survived the scrap yards, the one in Detroit and one at the B&O Museum in Maryland. Unfortunately these super power engines were built at the end of the steam era and were eventually replaced by diesels, even though it took up to 5 diesels to produce about the same power. The reduced maintenance and operating costs of the diesels gave them a significant economic advantage over steam.

In 1976 I decided that the next engine I would build would be the Allegheny. I bought a set of about 100 original blue prints and began making the wooden patterns for the wheel castings. I built a small foundry and made most of the 20 cast iron wheels for the engine. But then the demands of work and raising kids put the project on hold for almost 30 years.

When I retired in the spring of 2006, my son Jim persuaded me to finish the locomotive. We decided that the best source of detailed information was at the Henry Ford so we took a weekend trip to Detroit and spent an entire day crawling over the engine taking pictures and measurements. Several months later Jim made a second trip to the museum to take additional pictures of things of things we missed. We even made a trip to the Allen County Historical Society in Lima Ohio and were given access to their archives of documents and photographs about the Allegheny. With detailed drawings, pictures and books, we had gathered sufficient information to begin.

At the outset, it was apparent that if I thought about how much work it was going to take to

build this huge complex engine, I might never have started it. Over the years I had taken on several long-term projects and knew that if I built a couple of parts every day, eventually even very complex projects could be completed. With enough will power, even bad days and mistakes wouldn't derail the project.

Work began full time in late 2006 by making the patterns for all of the custom parts that needed to be cast. It took about 6 months to construct about 60 different patterns. Most were wooden and designed for 2 part sand molds but a few were also designed for 4 and 5 part plaster molds. Casting began with the parts made of aluminum. Parts that needed to be welded were made of bronze, while all of the 20 wheels for the engine and the 14 for the tender were cast in iron. Over 100 individual parts were produced during many casting sessions throughout the next summer.

During the summer of 2007 Jim and I took a six weeks welding course at the local vocational school. While I was proficient at gas welding and silver soldering, learning to TIG and MIG weld would be crucial to building the engine frames and all of the heavy transport equipment. As part of the course you could bring in a personal project. So Jim and I brought in the rear engine frame and cylinders to weld together. After the course ended, the instructor allowed us to bring in the front engine frame and use their equipment to complete the welding. This convinced me to buy a TIG and MIG welder of my own. Both have been invaluable for building the engine and moving equipment.

Over the next 3 years steady progress was made. The completed engine chassis was run on 100 psi air. The boiler was made from a 4 foot long piece of 7" diameter copper pipe and weighs over 100 lbs. After welding was complete, it was hydro and steam tested before being jacketed and readied for mounting on the chassis. In 2011 all of the detail piping and accessories were installed and tested. By the spring of 2012 the engine was almost completely finished except for the air compressors. The tender was completed in the summer and testing began on all of the auxiliary systems. After almost 14,000 hours of work,

thousands of parts and untold dollars, the engine is expected to be fully operational by the summer of 2013. The engine and tender are almost 8 ft long and weigh about 300 lbs. Because of its length, the engineer cannot easily see the water level sight glass or the steam pressure gauge from the riding car. So a small TV camera was mounted in the cab and an LCD display can be connected at the rear of the tender so that the operator can monitor these gauges. An electric powered compressor in the tender provides air pressure for the brakes and auxiliary systems. Propane fuel comes from a 20 lb cylinder mounted on the rear of the engineer's riding car.

The next locomotive model in the planning stage is an EMD SD70ACe six-axle diesel electric, one

of the latest generation of heavy diesel power. We are also planning to convert a 4-6-4 steam engine chassis that we purchased to a 2-6-0 narrow gauge switcher.

So I have plenty of future work to keep me busy during retirement.

The hobby is a great way to express your talents from building scenery, locomotives, and rolling stock, to operating layouts, collecting train memorabilia or investigating the history of the railroads. It can also be a great hobby for the whole family. For those interested, the Internet is a great source of information about local train shows and railroad clubs.



Chuck and Jim pose with the Allegheny in their welding shop (photo by Chuck Balmer)



Jim prepares to leave the yards at the Cinder Sniffers club track driving a coal fired 4-4-2 Atlantic locomotive (photo by Jim Keith)



Chuck enters an elevated trestle with an F7 diesel electric at the Cinder Sniffer's club track (photo by Jim Keith)