

Blacksmith Shop



A. BASIC TOOLS. Along with forge and anvil, all that is needed for basic forging:

1. Cross peen hammer - the standard hammer of the blacksmith.
2. Ball-peen hammer - for spreading metal (useful but not essential).
3. Fire poker (make your own).
4. Flat tongs for holding hot metal.
5. A cutting hardie (fits in hardie hole in anvil for cutting hot metal). Actually a bottom tool. Hot metal is placed on the hardie fixed in the anvil and struck from the top. Cuts like a knife through butter.

B. TONGS. Different kinds of tongs depending on the design of the jaws. The handles are called reins.

1. Standard flat tongs
2. Rod or bolt bow tongs
3. Pick-up tongs
4. Box tongs
5. Semi or half box tongs
6. Side tongs
7. Double pick-up tongs
8. Horseshoe tongs
9. Close mouth tongs
10. Bandjaw tongs
11. Bolt tongs
12. Simple twisted tongs
13. Double mouth flat tongs for holding flat stock
14. Rivet tongs

15. Pick-up tongs for large stock
16. Brazing tongs. Held the two ends of the band saw blade along with some brass. The brass would melt when heated and braze the two pieces together when cool.

Tongs are an extension of the arm. Well made tongs permit the smith to hold the hot iron in the forge and on the anvil with nearly the same flexibility as if held by hand.

Tongs are nearly limitless in their design. They come in all shapes and sizes with seemingly endless variations. Many were designed for long-forgotten uses.

UNDERNEATH: A collection of long-handled tongs with jaw designs similar to 1-16 above.

C. TOP AND BOTTOM TOOLS. To be used in pairs

Most "hammers" used by the blacksmith were not really hammers but top tools used in combination with bottom held in the anvil. They are not swung as a hammer but held and struck on the face with another hammer or sledge.

Bottom tools fit in the square hardie hole of the anvil. The hot metal is placed on top of the bottom tool in between the top and bottom tool with the top tool being struck. Traditionally a two-person operation.

1. Hot cut top tool used in combination with
2. Cold cut top tool with anvil face protected by a saddle as the bottom tool
3. Flatters. Top tools used with anvil face as the bottom tool to create smooth and even metal surfaces.
4. Flatters. Top tools used with anvil face as the bottom tool to create smooth and even metal surfaces.
5. Cutting hardie bottom tool
6. Drift for enlarging a hole. Used over the round hole or pritchel hole of the anvil.
7. Square punch for forging a square hole. Also used over the round or pritchel hole or the

square hardie hole of the anvil.

8. Top and bottom fullers. Fullers are used for making notches in metal or for reducing the diameter of metal (necking) such as below the tines of a table fork before forging the handle.
9. Top swage. Used in combination with a bottom swage. Came in pairs with rounded depressions to finish rounding of work such as axles and shafts.
10. Set hammer. A type of flatter "set" against the side of the work and struck by assistant with hammer or sledge.

UNDERNEATH: A collection of bottom tools from the Oliver Tractor and Plow Works located in South Bend, Indiana. Used for rounding of shafts and rods used in the manufacture of early farm equipment.



D. Pedal operated emory (grinder).

E. Treadle operated grindstone for sharpening axes, hatchets, knives, etc.

F. Hand-operated post drill and bit. Sometimes belt driven by a gasoline engine located outside of the shop.

G. Work bench. Top is two period 2" x 2" band sawed oak planks.

H. Cone mandrel. Also known as a bell anvil. Used for shaping rings.



The cone mandrel stands approximately 5 feet high and is 10 inches in diameter at its base. This cone mandrel came from 100-year old blacksmith shop 7 miles east of Winchester, Indiana at Barton. It was purchased July 9, 1983 from Mrs. Bernice Thornburg for \$105.

I. Post Vice or Leg Vice set on a cedar post planted in the ground. The basic design is thought to be the same used by 12th century armorers in Europe.

The shop floor is earth.

All items in the museum are authentic to the period between about 1850 and 1920 and would have been used by blacksmiths during the period represented by The Farm at Prophetstown.

Items D, E, F, and I were generously donated from the collection of Mastersmith Robert Werberig.

J. Leather apron and bill-less cap typically worn by blacksmiths of the period.

K. Tool bench. The tool bench is an exact replica of a tool bench illustrated in Volume 1 of Practical Blacksmithing by M.T. Richardson originally published in 1889 as Figure 33. The heavy wooden frame has a self in the lower part a few inches above the floor as a receptacle for odd tools and other accumulations of a blacksmith shop. The sides are several inches above the top with buggey rails circa 1900 as iron guards

through which handles of various hammers and top tools may be dropped. Slots have been added near the floor to hold bottom tools.

The layout of the forging area is standard to the period 1850 to 1920 when nearly every rural community and some of the larger farms required the services provided by a blacksmith shop. The centrally located forge and blower are typical along with two anvils, horns pointed towards the forge, slack (water) tub, two buckets for linseed oil with daubers for blackening the hot metal in the foreground. Stock metal (mild steel) is stacked on the east wall behind the forge.



L. Forge. The forge is an accurate replica of a forge located in the blacksmith shop in Williamsport, Indiana, owned and operated in the early 1900s by Robert Whitaker. The dimensions are those of the original forge except for the chimney which was destroyed prior to reconstruction.

The original reconstructed forge is located at Fort Ouiatenon and was rebuilt by the Morré's (Jim and Harvey) for the permanent shop at the Fort and for use during the Feast of the Hunter's Moon. The brick is authentic to the period and contains brick in the front panel both from the original Williamsport forge plus brick from the Monon Freight House in Lafayette, Indiana constructed around 1902 from native brick most likely kilned in Logansport, Indiana. The remainder is constructed from brick taken from a demolished grain elevator in the area of the same period. The present forge at The Farm

at Prophetstown was constructed to duplicate the dimensions and brick placement of the Williamsport Fort located at Fort Ouiatenon by Richard Kingery and Sons of Frankfort, Indiana.

M. Hand crank standalone blower

The tuyere, the part where the blast of air enters the forge from underneath to create the intense heat required by forging consists of a cast iron fire pot from an early 1900's blacksmith shop connected by a 3-inch pipe to the stand alone hand crank blower. The history of this particular forge blower is unknown but the blower is of the same type as that used in Henry Morré's blacksmith shop in Drake, Missouri between 1901 and 1936.

N. The anvil on the left is a classic Mouse Hole M & H Armitage Anvil forged in the period between 1820 and 1835 and made in Sheffield, England. It was purchased April 23, 1977 at the estate auction of Grant Gipson, West Point, Indiana for \$120.

O. Sign (above). Authentic. From a community blacksmith shop in Indiana. Acquired from the estate of local Blacksmith Donald McDowell in 1981.

P. The Anvil to the right of the forge

The anvil on the right side of the forge is a classic Peter Wright, manufactured in England weighing 12 pounds. It was purchased in 1901 by Henry Morré (1862-1939), a farmer-blacksmith in the small hamlet of Drake, Missouri, on the Old Iron Road (now Missouri State Road 19) located halfway between the Massey Iron Works near St. James, Missouri and the river port on the Missouri River of Hermann (a well known early German settlement). Iron blooms weighing about 100 pounds delivered by oxcart to Hermann from St. James would be shipped down the Missouri River to St. Louis.

Harvey Henry Morré (1894-1980), the youngest of Henry's three sons, used the anvil between 1912 and 1928 as an apprentice to his father beginning at the age of 16. There he plied the

trade until his 21st birthday when he was free of his indenture and left home for the Central Wesleyan Academy at nearby Warrenton, Missouri. The anvil and shop closed with the death of Henry in 1939 and the anvil was purchased by Harvey at auction a few years later as no one else wanted it. The anvil was sold in 1972 to a Robert Bax of Jefferson City, Missouri for \$25 and later located and repurchased by D. James (Jim) and Jim and Dorothy Morr s grandchildren (Suzanna Morr , Christopher Chalko, Eric Chalko, Katerine Chalko, Matthey Miner, Timothy Miner and Nicholas Miner and Areta and Mariah Rutter), all respectable blacksmiths in their own right, a total of five generations of blacksmithing in the same family.

Q. Welding flux, used in welding two pieces of metal together in the forge. The flux serves two purposes in welding. It combines with the oxidized metal (scale) that forms a liquid barrier over the iron, preventing further oxidation (scaling). The basic ingredients of flux are borax and sand. During the period represented here, flux was delivered in dove-tailed wooden boxes. These are labeled E-Z Weld and were made by Anti Borax Compound Company of Fort Wayne, Indiana.

R. An early 1900's box of 20 Mule Team Borax. Sold as a washing aid, it is still available in most supermarkets. Borax was and still is, widely used by blacksmiths to make their own welding flux either used alone or mixed with sand or iron filings.

S. The great bellows. An alternative to the hand cranked blower to provide the air supply to the forge. The bottom board drops allowing the lower chamber to fill with air through a lower valve. Lever and rod (on chain) lifts the bottom board forcing air into the upper chamber through an upper valve and out through the connecting pipe that runs under the forge to the fire pot. The upper board drops by its own weight forcing air out of the bellows. The bottom board then drops and the lower chamber is refilled.

While the bellows is in operation, a continuous stream is generated. The upper chamber acts as a reservoir. To increase the stream of air, a brick

or stone is placed on the upper board to cause it to drop faster.

T. Smaller Bellows. Either bellows, when in operation, would be hung from the ceiling of the shop, connected to the forge by a pipe, and fitted with a lever and chain or rod to pump the bellows up and down.

U. Hand forged Log Chain. Each link is forge welded together.

V. Colonial Anvil. Colonial anvils built during the colonial period. Being of British origin, the anvil is not dated. Purchased at Chase Antiques, Middleburg, Virginia in June of 1987 at a cost of \$400 possibly dating back to as early as 1650. Dates to period prior to 1753 as it has no horn and no pritchel hole. Style indicates late 1690's to early 1700's.

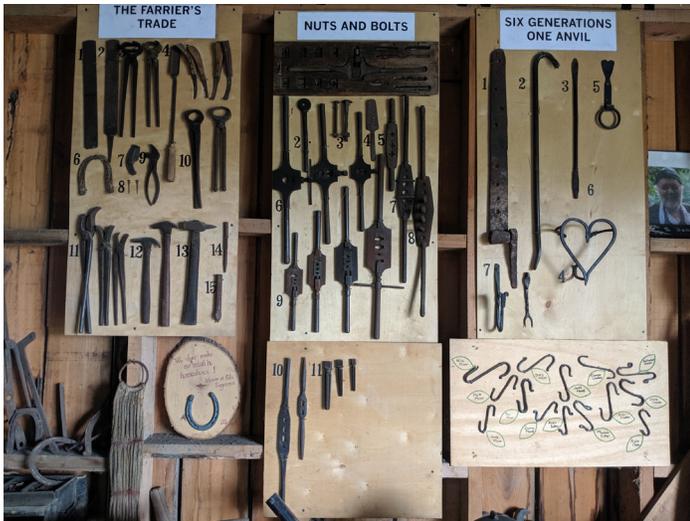
W. Tire Bender. Purchased at Auction of Kenneth Woodruff, Remindton, Indiana on September 12, 1981 (Jet. US 241 and 231, 2 miles south) for \$27.50. Used to bend flat stock (i.e., 3/16 x 2 inches) to produce tires for wagons, buggies, and other implements with wooden wheels. Useful for making stands for iron kettles.



X. Schnitzel Bank or Shaving Horse. Authentic reproduction hand hewed from native ash wood. Used primarily for making handles for hammers and top tools. The blacksmith would sit on the bench (bank) and press downward on the foot rest with the wood firmly held by the "head of the horse." Tools consisted of a draw knife to

shave the wood, a spokeshave for finishing, and a hatchet for rough trimming at the beginning. Handle wood was mostly ash, hickory, or walnut.

Y. A second tire bender donated by Robert Werberig.



Z. THE FARRIER'S TRADE

In the decades before and after 1900, manufacture of horse shoes and the shoeing of horses was a major part of the rural blacksmith's workload whereas, formerly, work relegated to blacksmiths specialized in the shoeing of horses, called farriers. Horse shoeing was the last gasp of a dying profession as the internal combustion engine as a draft animal. With that the profession of blacksmithing also largely ended and, once again, those horses that remain are shod by professional farriers.

Tools used by Farriers are mainly to remove old shoes, prepare the hoof, and attach new shoes:

1. Hoof rasp to file down the hoof.
2. Hoof rasp with tang to receive a wooden handle much like a file.
3. Cutting nippers to cut hoofs and to cut and remove nails in old shoes.
4. Float for evening horses teeth. Blacksmiths also served as veterinarians.
5. COllection of hoof knives with either bone, wood, or metal handles for trimming the undersides of the hoof.
6. Hand-forged horseshoe, worn, and discarded

on the shop floor from the Drake, Missouri Blacksmith Shop of Henry Morr e circa 1900.

7. One half of a set of shoes for the hoof of an ox (Px shoe). Each hoof of oxen required two such shoes.
8. Hoof nails for fastening the shoes to the hoof.
9. Combination tool - hammer and crimper.
10. Farrier's Pincers. Not for cutting nails
11. Crimping tools for bending over the nail ends protruding from the hoof after the shoe was fastened.
12. Farrier's hammers.
13. Drift punch
14. Pritchel tool.
15. Forepunch. Punching nail holes in shoes.

AA. NUTS AND BOLTS

Bolts are a form of fastener with a head on one end with the other end threaded to receive a nut. By 1900, the demand for hand forge bolts and nuts was not great. Occasionally, an odd size was required or a hand forged part required a thread. In 1842, a blacksmith charged \$0.13 to make 2 bolts and the same price to make the nuts. This is about what it would cost today to buy two mass-produced bolts in a hardware store.

Illustrated here is the variety of bolt headers taps and dies used by blacksmiths.

1. Butterfield tap and die set in wooden box circa 1900.
2. Heading tool for forming the bolt head with the bolt extending through the round pritchel hole of the anvil.
3. Examples of hand-forged bolts with threads.
4. Screw plate.
5. Early tap tool for cutting non-standard threads.
6. Assorted blacksmiths stocks and dies. Offered in the 1897 Sears, Roebuck Mailorder Catalog for under \$3.00.
7. Early tap for cutting seven different sizes of non-standard threads.
8. Buggy makers tap and die set from near Burlington, Indiana going back three generations. Pre 1870.
9. Matched set of 4 blacksmith stocks and dies

(No. 11706 to No. 11712) offered in 1897
Sears, Roebuck Mailorder Catalog.

10. Hand-made tap wrenches for turning taper taps.
11. Set of blacksmith's taper taps offered in 1897 Sears, Roebuck Mailorder Catalog. For cutting inside threads on nuts and bolts.
12. Large hand-made threading tool with wooden handles.

BB. SIX GENERATIONS - ONE ANVIL

The Peter Wright anvil to the left of the forge has been in the Morr  family now for six generations. Originally purchased by Henry Morr  (1862-1939) in 1901, it was used by his son, Harvey Morr  during his apprenticeship between 1912 and 1928. Harvey's son, D. James (Jim) Morr , Mastersmith for Fort Ouat n and the Feast of the Hunter's Moon, acquired the anvil in 1975. His son, Jeffery, a Mastersmith in his own right, has carried on the tradition as have Jim's grandchildren, Matthew, Chris, Mastersmith Tim Miner, Eric, Nicholas, and Suzanna and great grandchildren.

1. Gate hinge forged by Henry Morr , Jim's grandfather around 1900 out of several pieces of scrap welded together.
2. Pry bar forged by Harvey, Jim's father. Used to dismantle an old store building in the early 1930's, the lumber from which is used to build the house where Jim was born.
3. The first item forged by Jim at the 1965 Feast of the Hunter's Moon - a fire poker.

Also forged by Jim is the heart trivet, the traditional wedding gift of the blacksmith to newly married couples. A larger version of this trivet has been forged as wedding gifts for each of the Morr  children and grandchildren. Tradition is that as long as the trivet remains intact so will the marriage.

1. Heart with ring forged by son, Jeffery Morr  at the Feast of the Hunter's Moon in 1997.
2. Ram's head hook forged by grandson, Christopher Chalko in 1999.
3. Fork forged by grandson, Timothy Miner in 2011.