

*Notes on Building*  
*Lehigh Valley Rifles*

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**Triggerplates:** Most triggerplates are “boat” shaped, with a flat front, tapering sides to a point at the back end. Held in place only by the tang bolt. Roughly 1/16” thick except for a heavier boss where bolt enters at front.

**Triggers:** Usually simple pinned trigger, with minimal filed decoration. TOTW sells a Rupp trigger that is a good starting point, though is larger than some original triggers I've seen. Kuntz (ca 1810) used a single set trigger, pushed forward to engage.

**Locks:** Early guns by H. Rupp, J. Moll, and Peter Neihart used forged style Germanic locks – Lg and Sm Siler locks are good choices, but have narrow bolsters which limit the width of the wrist. L&R “Classic” has a thicker bolster. File a concave section in the lock above and below the tail. Later guns used English import locks. Chambers Late Ketland is an excellent lock as is, or the plate can be made smaller.

**Lock placement:** Locks are almost always placed with the bolster in the upper third of the barrel. The nose is angled down, and the tail tilted up. It looks strange while in the form of a blank, but allows the wrist to be dished slightly when shaped.

**Triggerguard:** Typically has a larger boss at front of the bow. Pinned forward and back. Forward extension is inlet full depth and has a slight radius (3 facets and front molding). The wood is shaped with the same radius for a seamless transition with little to no step down needed. Reaves #36 is taken from an original Neihart and can be reshaped for many earlier (1785-1800) rifles.

**Buttplate:** Most buttplates in the region are “sheath” style, and are inlet *into* the comb instead of across it. The corners must be filed to allow for the transition from surface installation on the butt to inlet installation on the comb. Reaves #13 and #14 are suitable. Dave Keck also sells Lehigh hardware that is appropriate. Typically have 5 facets across the return. Toeplates are usually simple sheet brass “Fleur de Lis” style with one screw.

**Patchbox:** Varies greatly, but early guns often had domed lid, Fleur de Lis finials. Moll Sr. used a 3 knuckle hinge. Early variations were cast brass, with texture still evident on some installations. Simple one piece button and spring catch, installed through the buttplate and into the patchbox.

**Sideplate:** Variations found, but consistently have “arrow” at back of sideplate finial. Later guns usually inlet flush with thin sideplate, while earlier pieces are inlet ½ depth with beveled edges.

**Ramrod and thimbles:** Thin sheet (<.04”), often faceted with bands on either end. Typically 5/16” diameter rods, even in larger calibers. One option for larger calibers is to make 3/8” thimbles and groove, with a 5/16” hole. This gives lockbolts more clearance and allows for a narrower section through the lock.

**Muzzlecap:** Usually thin sheet (.03”), wrapped around and tucked on either side of the barrel channel. Some rifles by Moll had a full wrap-around nosecap that was overlapped and riveted in the ramrod channel. Close ended nosecaps with shallow grooves for the ramrod are also present. There isn't a significant step down to the muzzle cap, and it should be considered an “extension” of the forestock.

**Barrels:** Breeches range in diameter from 15/16” to 1 1/16” on early Neihart guns. Usually no larger caliber than 54. Mix of rifled and smoothbore guns. Tangs are usually flared and have thumbnail-shaped finial. Some later tangs had pointed V finials instead and were straight.

## **Stock shaping:**

**Buttstock:** The lock, wrist, and buttstock shaping is one of the more tricky aspects of building a Lehigh rifle. Most classic Lehigh guns have a subtle stepped wrist, or step toe. The toe is flat until it meets the rear extension of the triggerguard. Underneath the grip rail, the wrist is fully rounded-over. This round section visually exaggerates the amount of step in the stock. The wood on either side of the tang to the lock panels should be dead flat. This flat continues and fairs into the wrist to help create the “soft diamond” shape. When cast-off is used, the comb is a continuous arc from wrist to buttplate when viewed from above. No straight lines anywhere except the cheek moldings.

**Wrist:** The wrist is stepped, and is slightly rounded underneath the grip rail. It is often wider than tall, and the classic section is that of a soft diamond. There is a soft ridge leading from the tail of the lock panels into the buttstock, and a soft wrist from the tang to the comb. Using a rasp and then scrapers, work from the sides of the tang back towards the buttplate, ultimately creating a continuous arc from breech to buttstock.

**Lock panels:** Lock panels are typically very narrow; 1/16” is a good goal, no more than 3/32”. Slight taper at front and at tail. Jacob Kuntz and occasionally later Peter Neihart guns had an extended forward lock panel. The side panel is typically symmetrical to the lock panel, but the forward upper edge cuts away sooner than the lock side. Wood on either side of triggerguard to lock panels should also be flat.

**Forestock:** Barrel is inlet with 2/3rds of the side flat exposed. Most guns have a “V” section upper forestock. There is a rounded high point about 1/4 the way down from the barrel (apx 5/32”). From there the stock falls away flat to the ramrod groove. Above it is rounded into the barrel. Sometimes you can feel a soft “ridge”, but it is never sharp. The width of the forestock should be about 3/32” to 1/8” out from the barrel (more than with other styles of rifle).

**Lower forestock:** More of a “V” shape than “U” shape, particularly on rifles by Kuntz. Soft transition into the upper forestock, no hard edges.

## **Other notes:**

**Cast off:** Adding 3/16 to 1/4” cast off will make the gun shoulder better and relieves the tendency or the comb to hit your cheekbone during shooting.

All carving is done only after the stock is 100% shaped. Carving is a mix of incised and shallow relief carving, sometimes with “negative” modeling of the details. Moldings on the forestock and toe line are usually double incised line, with the section above the upper line relieved slightly with a scraper or scratch stock – not chisel deep.

**Finish:** Many original guns were finished with red violin varnish. Two primary colorants were used: Dragon's Blood, which is a spirit varnish (applied like a french polish as Shellac), and Madder lake pigment, which is ground into linseed oil varnish. In guns with heavy wear, you can see the bright unstained or lightly stained maple underneath the deep red. In my opinion, Dragon's blood was used by Kuntz on his pistols, but not seen as much elsewhere. Madder lake pigment is commonly found on rifles by Moll and Hess. It is a dry pigment that is mulled into a thick varnish to create a translucent “paint”. This finish cannot be applied as an “in the wood” oil, and must be applied as a surface finish. As such, it is important to keep it from building up too heavily in your carving. Modern spar varnish or Tru-Oil work well for madder pigment. Many rifles have regular linseed oil varnish which has subsequently aged and developed a reddish tint. These are *not* red varnish finishes, but are merely the effect of time and oxidation of Linseed based finishes. More detailed information is available in the Red Varnish tutorial on my website.

## **Resources:**

“Thoughts on The Northampton School of Gunsmithing” by Ron Gabel  
“Lehigh Rifles” CD by the Kentucky Rifle Foundation