

Rebuilding a Howitzer

By Tony Walsh, official cannon maker for the Canadian Government and his daughter, Sheila Zieman

This article deals with the construction of a carriage and wheels for a 24 pdr bronze Howitzer owned by Fort Saint-Jean, Quebec. The tube was discovered by divers, in remarkably good shape, after spending more than a century in the Richelieu River. Although the date was obscured by abrasion, it can be narrowed down to 1841-1846 by the monogram on the chase and the pattern of the tube.



I was provided with two drawings of the carriage by the Museum; however, the scales were not completely reliable. I adjusted by comparing to known dimensions such as barrel length, wheel diameter and length of axle. I was fortunate to receive a copy of a Royal Artillery photograph of a 24 pdr Howitzer, circa 1860s, which helped fill in details on paint, spoke shape, and so on.

I used dividers and calipers to extrapolate the dimensions and then transferred the

measurements onto full sized patterns. The patterns are matched up to check alignment.

The trail is the longest portion of the carriage. It sits on the ground when the gun is in firing position and has handles for manual moving and an eye for towing. The trail is made from four pieces of white oak, 3 1/4"x 12"x 9' 6", which are stacked on the bolts horizontally. The axle bed consists of two pieces, 3 1/4" x 6 1/4" x 3' 10". The cheeks use 16 pieces, 2" x 3 5/8" x 53" which are stacked vertically. The pieces are all dry fitted using the bolts to check the alignment.



Caption: Laminated trail pieces

Adjustments are made by paring or kerfing in, using West Systems 105 epoxy resin with 205 or 206 hardener used as directed (small batches are mixed at a time to prevent cook off). Some cases call for the use of 404 adhesive filler. Beeswax is used as a release agent on the bolts. It is applied by rubbing it onto the bolts while they are hot. Six mil poly vapour barrier is used to protect work surfaces from epoxy spills. All surfaces to be joined receive a generous coat of epoxy, well rubbed in. Bolts are used as guide pins and as an aid to clamping. Bolts and clamps are tightened slowly to allow the epoxy to soak into the wood.

The trail is done up in halves; then it is dry fitted again. The side taper is marked out and the excess wood is sawn or chopped off with an adze. Next, the center line for the axle bolt and the elevating screw are marked out top and bottom on the inside of both pieces. These marks are connected with a saw cut just the depth of the saw teeth. The sides are then clamped together and the saw cut acts as a guide for the screw in the auger bit. Once the holes are drilled, the trail can be glued and is ready for final shaping and squaring up. It is now ready to be fitted to the axle bed, cheeks, elevation mechanism and the trail plate/towing eye.



Caption: Trail or stock with towing eye

The cheeks can be laid out for the horizontal holes and then sawn out to accept the axle bed and trunnion plates. The cheeks are bolted back to back and the trunnion plates and eye bolts are fitted.



Caption: Fitting cheeks onto axle

A square is used to ensure that the trunnion plates are level and in line. A cylinder that is turned to the same diameter as the trunnions and long enough to span both of the plates is used to fit the cap squares. This ensures that everything lines up when the cheeks are bolted to the stock/trail.



Caption: Trunnion plates and eye bolts for chains



Caption: Cap squares and chains in place

Now the axle is ready to be fitted. The center of the bed is lined up with the center of the stock. The bed is then shifted until the tips of the axle are an equal distance from a point at the center of the tip of the trail. It is then fitted into the stock/trail until the center of the trunnion seat is the same distance from the top of the axle bed on both sides.

The carriage is now ready to check for alignment with the barrel. The barrel is set into position. The alignment can be adjusted, if necessary, by enlarging the bolt holes in the stock. Then holes are drilled for locating pins. This assures that everything is lined up for re-assembly.

The carriage is now dismantled, coated with epoxy, re-assembled and allowed to cure. Two more coats of epoxy are applied before the carriage is painted with two coats of an oil-based paint. Sanding is done between all coats of epoxy.

While the coatings on the carriage are drying, the wheels are being built.

Editor's Note: Watch for the second installment of Tony's article in the Summer issue of ***The Traveller***.