

Making Pintles and Gudgeons

Shop Note Topic

MODEL SHIPWRIGHT GUILD WNY

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What are pintle and gudgeons?

A pintle is usually a rudder mounted element that is formed to wrap around and fasten to the rudder sides. At its nose is a pin (or bolt) that extends downward to connect to a receiver in the gudgeon.

The gudgeon is a similar looking device that is fashioned to the ships' hull that accepts the pintle pin or bolt. This enables removal of the rudder for repair and maintenance.

The combined elements create a hinge. Multiple pintle/gudgeons can be found on a typical vessel that has an external rudder.

These elements were made of bronze on period vessels.

Previous Methods Abandoned

Early on I had experimented with soldering cut brass tubing to cut brass strip stock. Between poor results with soldering and misaligned parts I searched for a suitable alternative.

I found that the elements could be fashioned easily using some basic tools and materials described herein.



Tools needed:

Miniature nail pulling pliers, small modelers hammer and soldering iron.



Material:

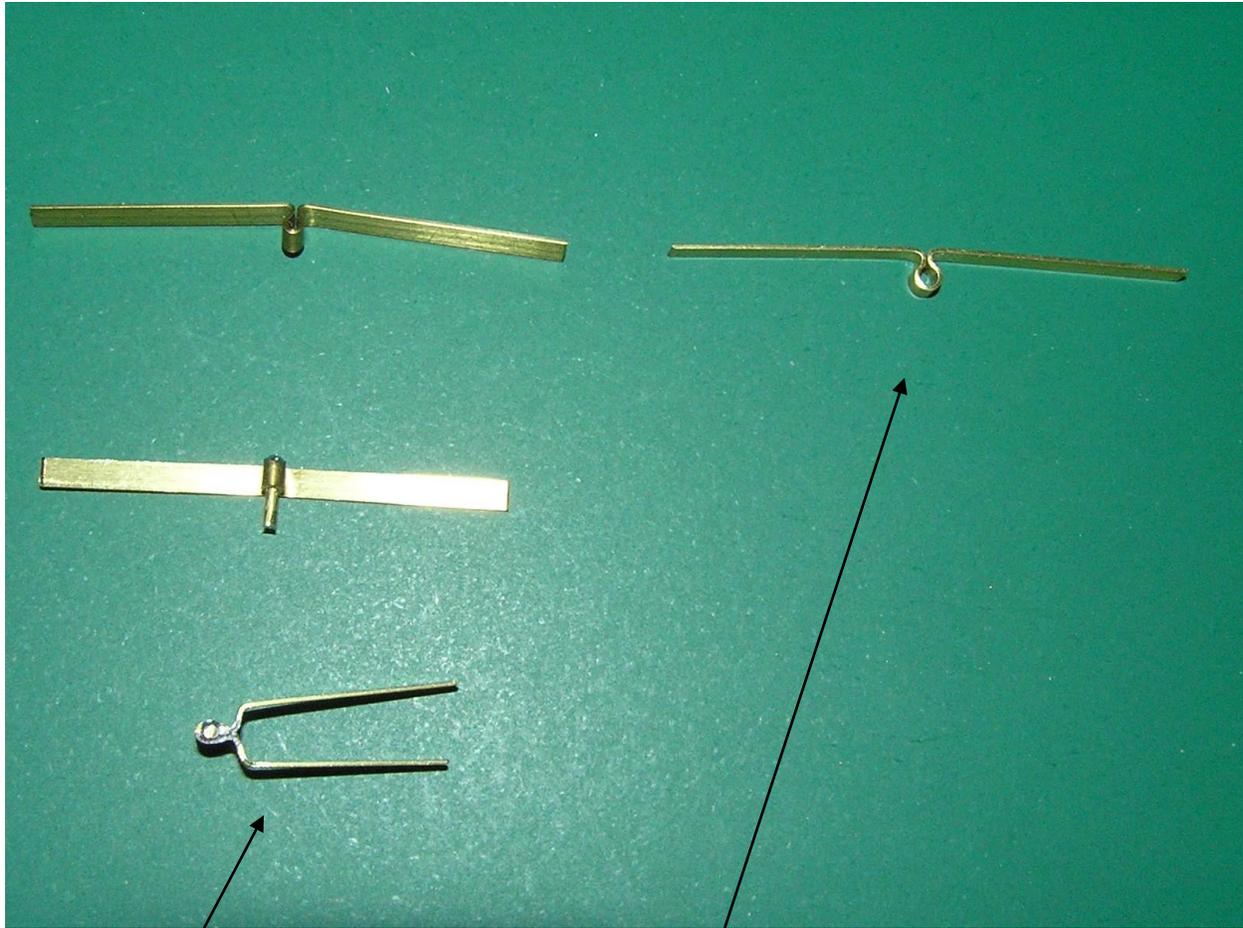
Brass strip stock of appropriate scale. Example K&S Flat Bar in Brass, 1/32 X 3/32 is suitable for 1:48 scale models.

Brass rod stock of suitable diameter. Example K&S Round Brass Rod, 1MM.

Method:

1. Cut strips of brass into suitable lengths, somewhat longer than needed. Say 2 to 3 inches.
2. Scribe a center point, across the inside width, with an Exacto knife.
3. Lightly sand the inner surface to remove oxidation.
4. Cut a section of brass rod to use as a mandrel.
5. Place the brass rod at the center of the brass strip (at the scribe mark).
6. Carefully bend the brass strip around the rod to form a "U". Do not crease the brass strip.
7. Using the pliers, crimp the brass strip around the rod. Use the outside nose of the pliers to do so.

8. Now insert the crimped strip inside the pliers with the straps protruding from the nose of the pliers. Re-crimp and hold the brass strip with some force. Carefully bend each leg of the brass strip flat across the nose of the pliers.
9. Using the model hammer gently tap down the brass strip using the nose of the pliers as an anvil until the splayed strips, either side, are flat against the nose of the pliers.
10. Cut the straps to desired length.
11. Drill the appropriate holes in the straps.
12. Shape the ends if needed.
13. Solder the junction of the joint. Ensure that the brass straps are in the same plane before soldering. You may need to apply some pressure (insulated pliers or even a clothes pin) to the loop to keep the strap sides closed against each other during soldering.
14. Using the rudder as the die bend the straps to wrap around the rudder body. Apply the same technique to the stren post.
15. Repeat the process until you have a suitable number of "pairs".
16. The pintles are simply a gudgeon with a section of brass rod soldered into the hole formed previously in $\frac{1}{2}$ of the parts made.



Pintle construction steps

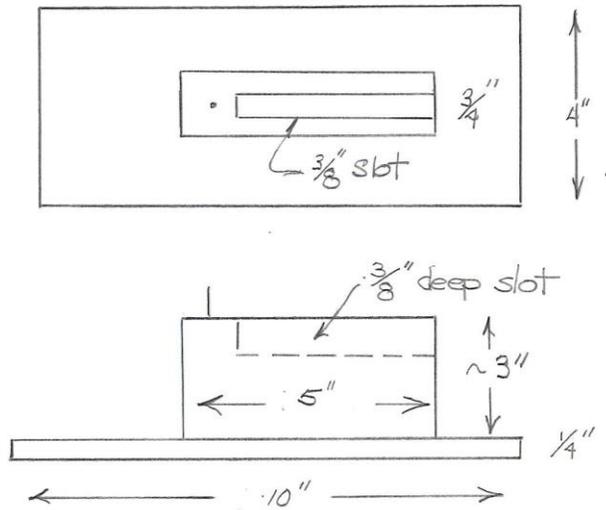
Gudgeon, note the larger diameter hole

Possible process and tool improvements

- The formed loop is a bit of an oval shape due to the configuration of the plier inside surface. That could be ground to a more “hollow” surface to enable the brass strip to be bent closer to a round shape.
- An adjustable die could be made to ensure a symmetrical bend of the pintle or gudgeon about its center point. See the sketch below.
- Fitting the rudder onto the hull can be problematical. You might wish to experiment with a slightly larger diameter brass rod when fashioning the gudgeons to help with the fit.

Pintle & Gudgeon Bending Die

Base



Yoke

