

## Model Ship World Data Sheet

### Capstans

Compiled by: Fumble

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#### Introduction

Some of the posts in this compilation on the construction of model capstans from various contributors to MSW have been edited to aid clarity and concision; links to the original posts are provided. Note that it is possible that some of the MSW pages these links refer to may at first display without their images, but refreshing the web page will restore them (F5 on IE).

The MSD contains both a tutorial on capstan building by Allan Yedlinsky. [Link](#) and a document posted by Rex Boocock giving detailed drawings of a capstan. [Link](#)

In his post *Capstan /Windlass Detail* in the Discussion for a Ship's Deck Furniture, Guns, boats and other Fittings forum, of 31 May 2010, [Link](#) Jimlad notes that, "The drumhead type capstan came into use towards the end of the seventeenth century and remained in use for well over a hundred years with fairly minor modifications." He gives this example of Endeavour's capstan:



**Figure 1 – Endeavour's Capstan**

### **Example 1**

In Feb 2008, in the USS Syren 18 gun brig forum, Chuck posted details of his capstan for the *Brig Syren - Chuck Passaro's prototype build* at [Link](#)

The extracts below are from Chuck's posts during Aug 2010 in his build log:

*USF Confederacy - 3/16" Scale (POB)*, in the Scratch build log forum at: [Link](#)

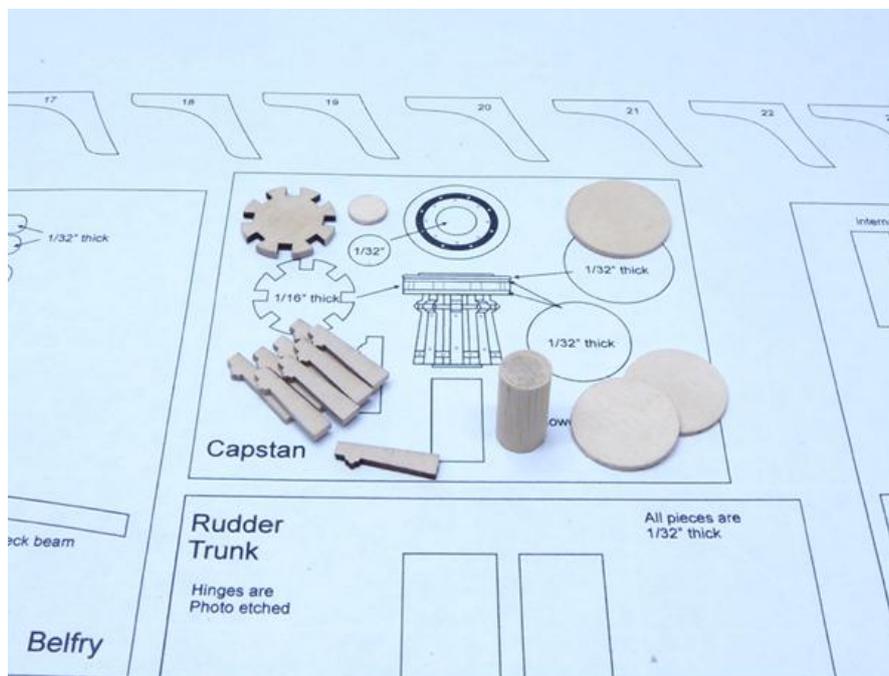
The most tedious part is cleaning of the laser burn. That was tedious but not impossible on the whelps. I left one whelp unsanded (see Figure 2) so you can see the laser burn. I used a variety of homemade sanding sticks to tackle the job.

I am thinking about making the whelps 3/32" thick rather than the 1/16" thick that you see in the photos. But the capstan will be covered up anyway by the quarterdeck and be hardly visible through the deck beams.

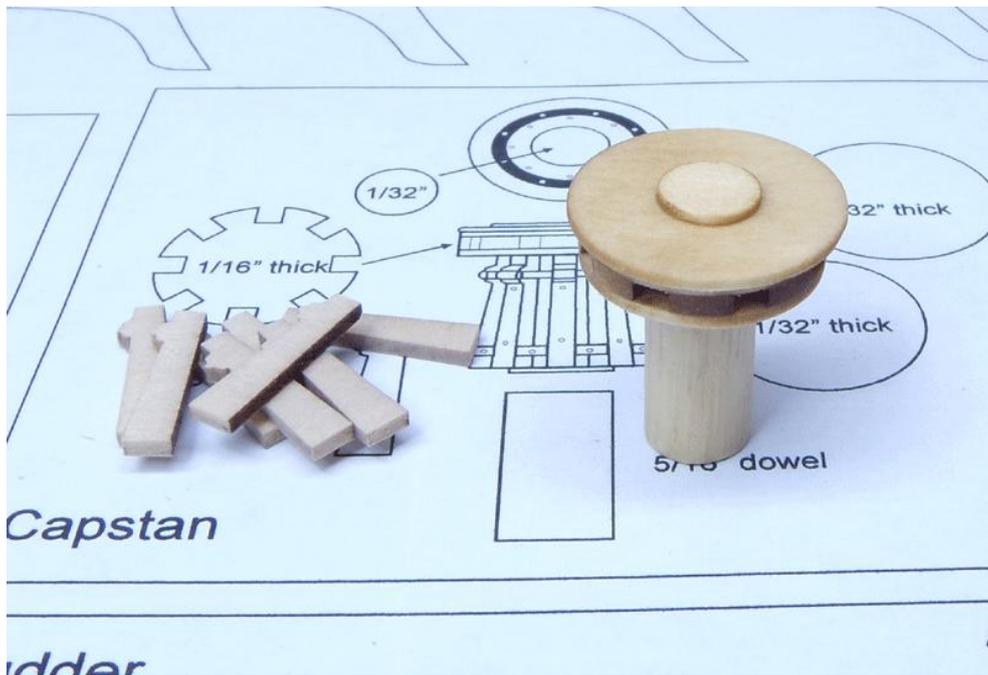
The bolts on the ring were done the same as the hinges on the rudder trunk. The bolts on the whelps are 28 gauge wire inserted into a hole and then trimmed so they are slightly proud of the surface.

The whelps were also laser cut with the grain going the wrong way again. They look dark because of this. The grain should run up and down from the top of the whelps to the bottom. They run across the whelps in the pics.

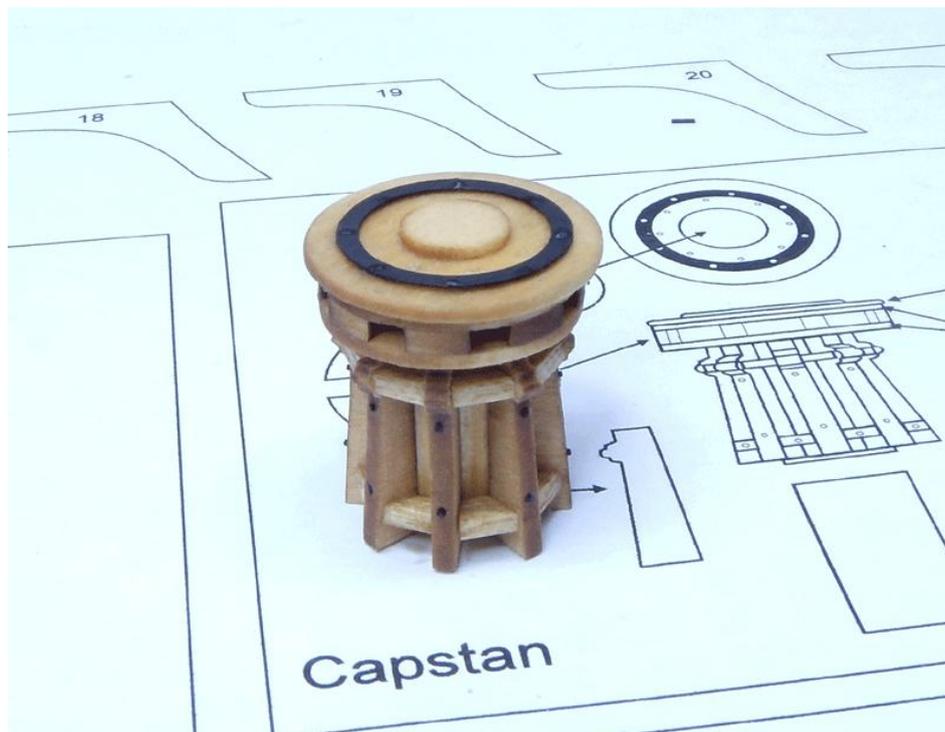
I still have to touch up the outside faces of the wedges between the whelps. Then I will add some bolt heads.



**Figure 2 - Capstan Parts**



**Figure 3 – Capstan Assembly; note unsanded whelp.**



**Figure 4 – Assembled Capstan**

The capstan isn't stained with a color. That gets blotchy on the basswood sheets so I just used Minwax "natural" stain which does the job nicely. One step with very little prep. If I was going to paint it I probably

wouldn't add all of the bolts. I would put the pieces together and paint it so it's clean like this one on the Minerva (Figure 5).



**Figure 5 – Minerva's Capstan**



**Figure 6 – Unpainted version**



**Figure 7 – Painted version**

Based on the responses and the PMs I have been getting, most prefer the capstan in natural wood.

## **Example 2**

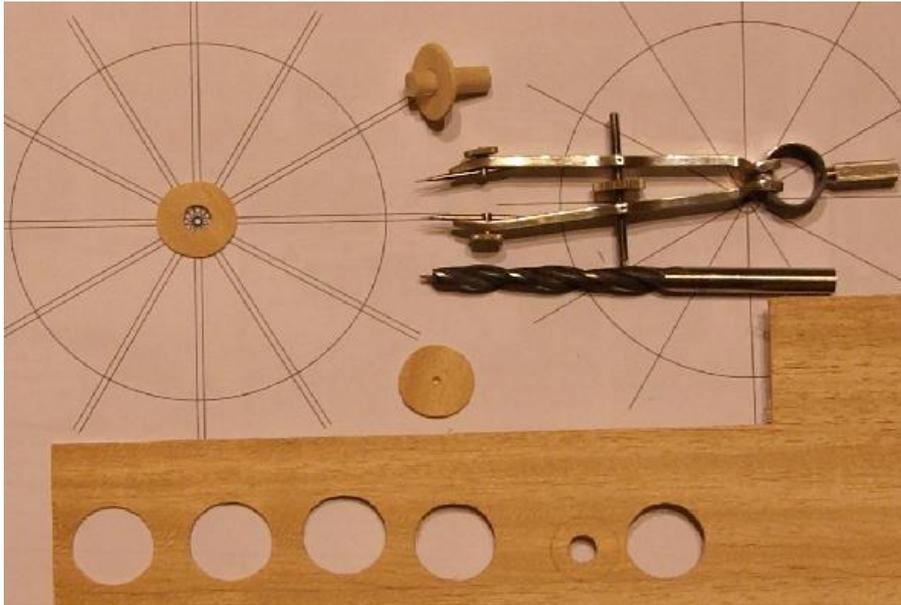
By Revier- Oct 10, 2009: in his post, *Capstan – a simple way for making of* in the Ship's Deck Furniture, Guns, boats and other Fittings forum at: [Link](#)

My way of making the capstans for my frigate "JUPITER". Scale 1:72.

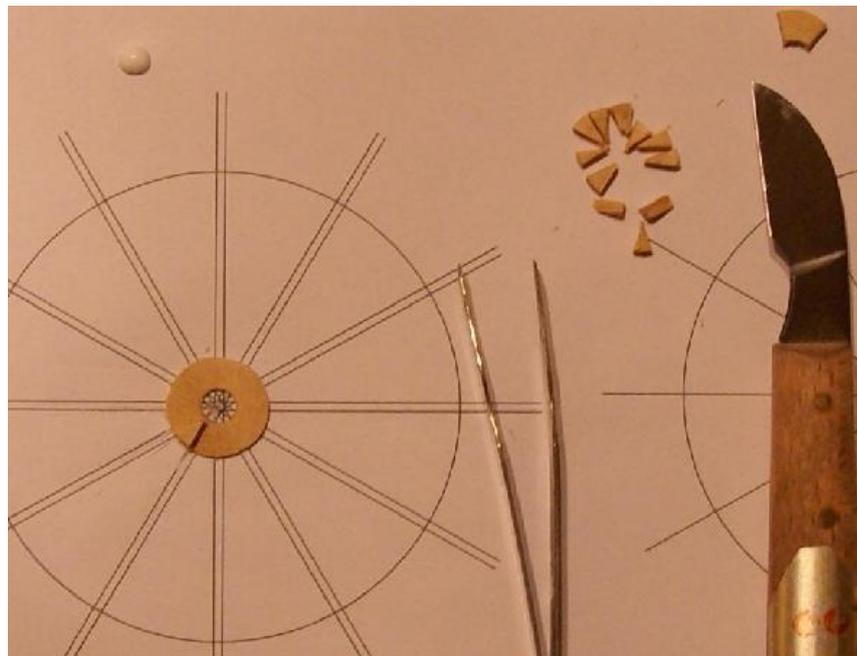
Required: Thin veneer, about 1mm or 1/2mm; either Koto or Maple veneer, but others may be suitable. Squared paper in either millimetres or inches. Tweezers. A copy of your ship's plan with a picture of the capstan detail. Metal tipped dividers. A metal drill for making holes of the right diameter (check your plan).

Using my PC, I created a template circle with lines radiating in 30° steps as a pattern for my capstan.

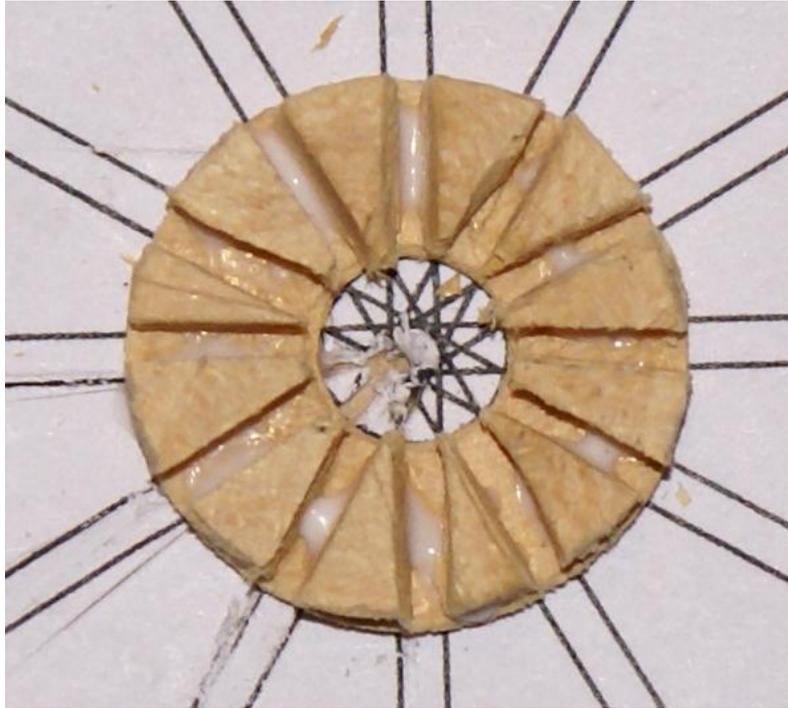
Then I made some disks using the circle as a template, The wood I used is Koto veneer. This is softer than Maple and easier to work.



**Figure 8 – Cutting the disks**



**Figure 9** - The second step is making the wedges which will sit on the disk. I used a print-out from my computer as shown in the picture to find the right place for the wedges. These small parts can easily be make with small strips of veneer using the sharp knife. The angle of the sharp tip is 30°



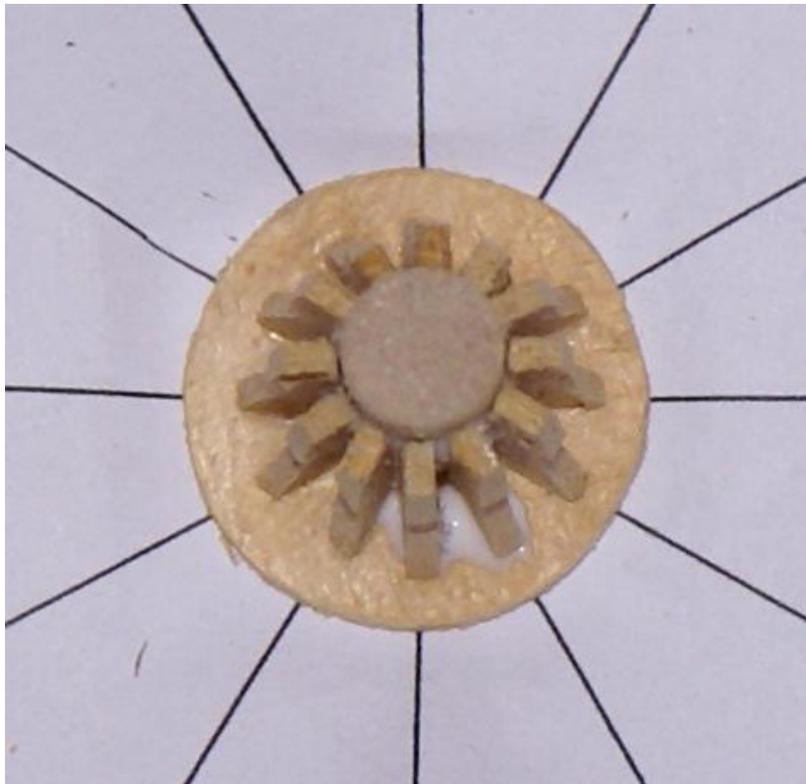
**Figure 10** – The wedges glued in place



**Figure 11** – Third step is making parts for the capstan whelps. Use your plans to find the right size. First, I made a copy of the part, then cut some small strips of veneer and bound them together with Tesa tape. A copy of the part was cut from the plan and pasted on top. Then I cut them on my Proxxon DSH saw.



**Figure 12 – The separated whelps**



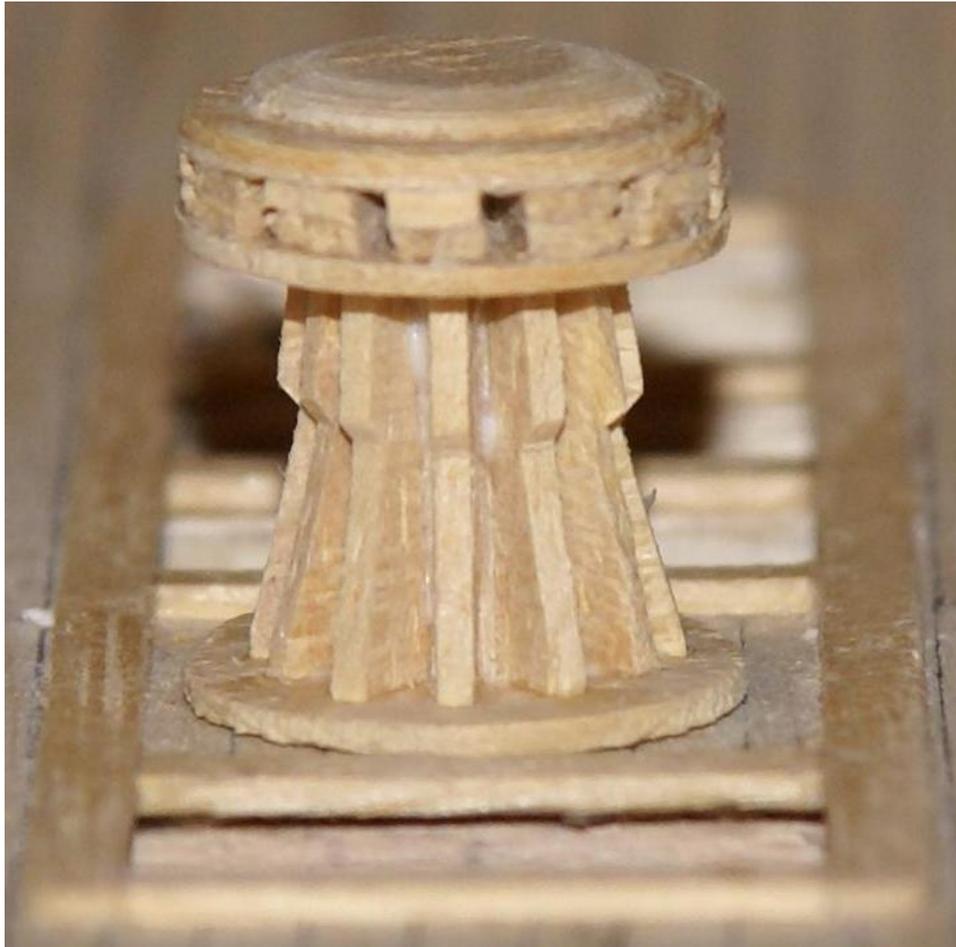
**Figure 13 – The whelps glued in place**



**Figure 14 –The disks which form the head of the capstan glued together**



**Figure 15 – The prepared parts**



**Figure 16 – Capstan fitted in place**



**Figure 17 – The finished capstan**





**Figure 20 – Capstan Detail 2**

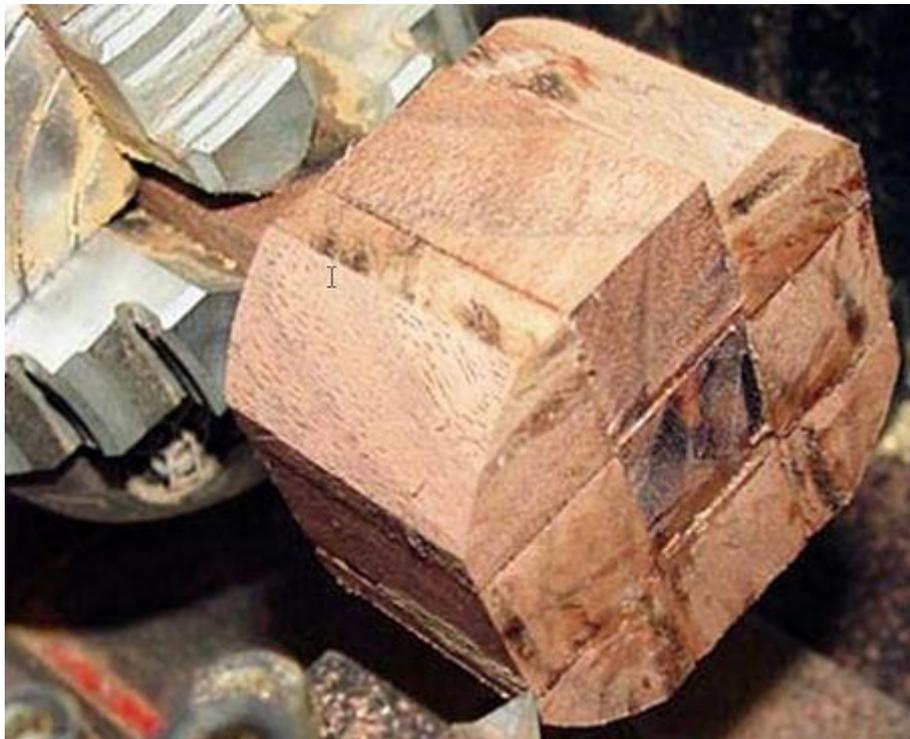


**Figure 21 – Capstan Detail 3**

**Example 4**

Captainpugwash, on 19 Jul 2006, posted views of his capstan build for his *Construction of HMS Diana by Raul Guzman Jr.* in the Ship's plans and Scratch build research forum [Link](#)

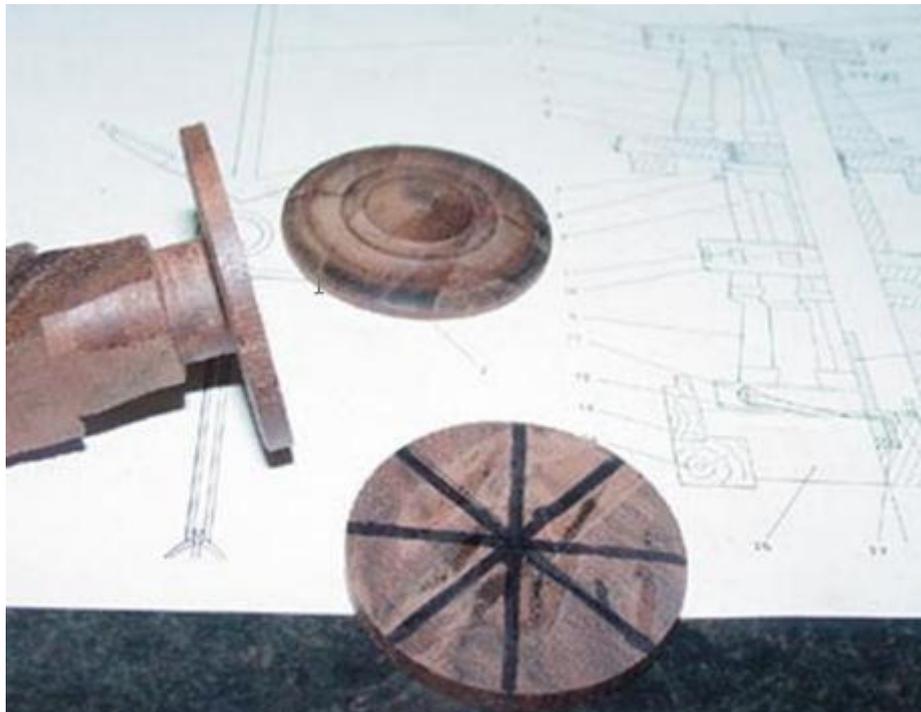
I made the capstan from walnut, but I didn't have a large enough piece, so I had to glue several pieces together. Notice only the drum head section had to be that large. The part that is held by the 4 jaw chuck is much smaller.



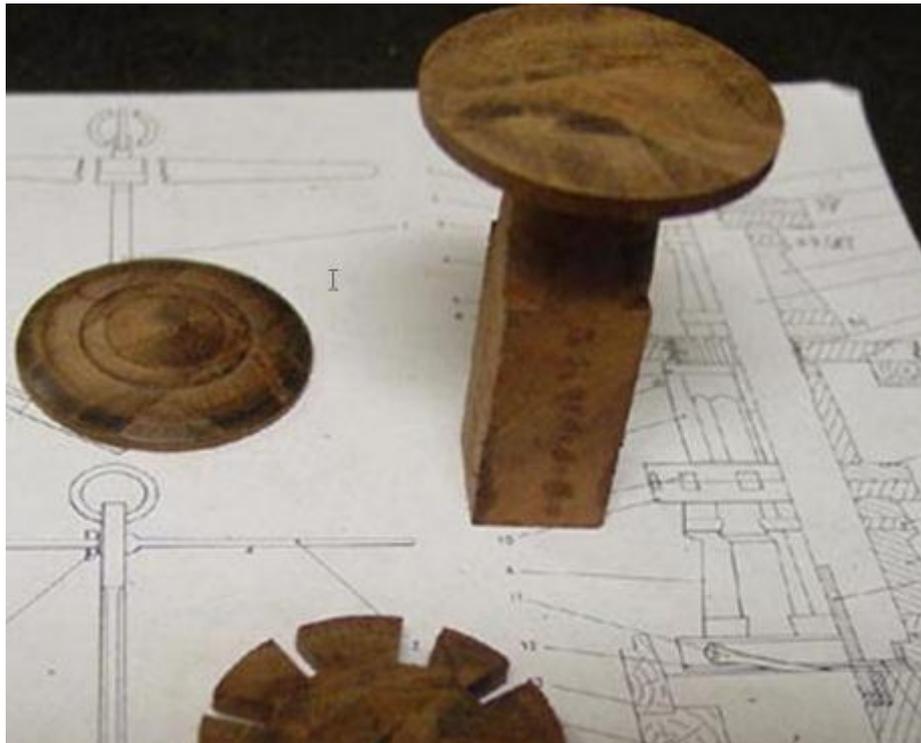
**Figure 22 – Shaping the walnut blocks**



**Figure 23 – Turning the Capstan**



**Figure 24 –** Now that the drum is turned I sliced pieces that corresponded to the drawings. The centre part will have holes for the bars, so they have been marked to have slots cut out.



**Figure 25** – Holes for the bars are now cut. The part that fits into the 4 jaw chuck is still attached because after gluing it all back together, I want to finish it using the lathe.



**Figure 26** – The whelps and chocks are now glued to the capstan barrel.



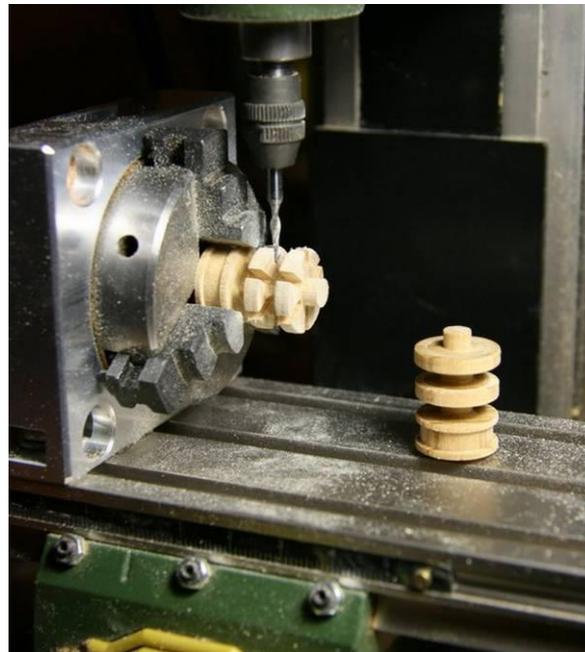
**Figure 27** – After gluing the drum on, I used a natural wood stain to give it a rich walnut color as can be seen in the photo below. I locked it with a washer below deck, so it will turn.



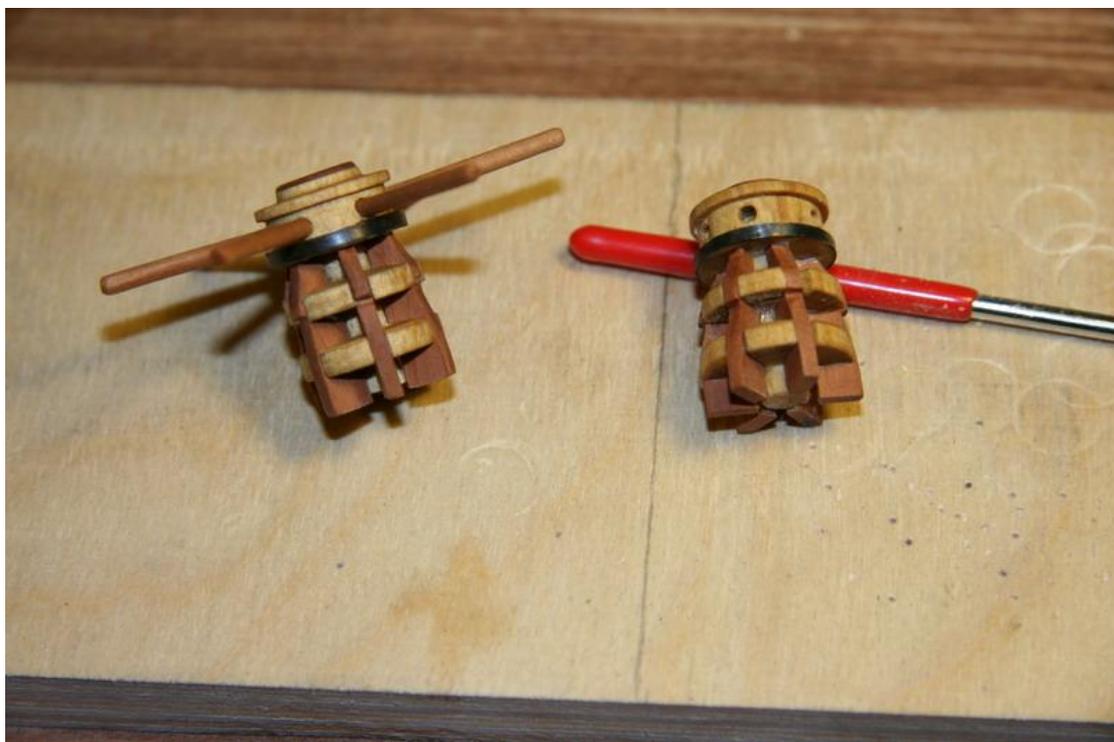
**Figure 28** – The finished capstan in place.

## Example 5

Garward, in March 2010, posted some details of his capstan build in the forum, Build logs for kits, in his post: *Static: Montanes-OcCre by Garward*. [Link](#)



**Figure 29** - Manufacturing of grooves for capstan whelps (pear) with the help of a Proxxon dividing attachment.



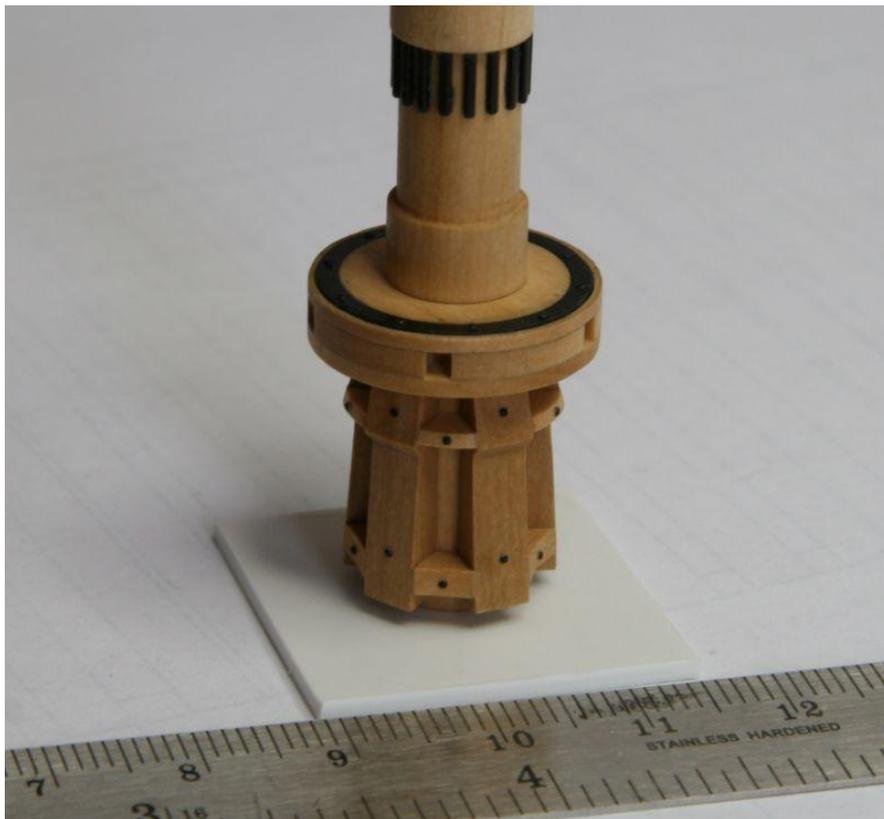
**Figure 30** – Garward's capstans

### **Example 6**

Remcohe posted in Jun 2010 details of his capstan build in his log *Static: HMS Kingfisher #57* in Build logs for kits at [Link](#)

I didn't like the birch dowel supplied with the kit so I made a new one from boxwood. I glued some leftovers from the kit together and turned it on a lathe to make the barrel. I added extra detail with some bolts and the capstan ribs. There are even bolts on the black ring and small holes to lock the capstan bars, but they don't really show on the picture. I had to cut the barrel at the point where the ribs meet the upper half of the barrel to get them flush with the top. To get them even at the bottom I used a temporary plastic ring around the barrel, this worked pretty good.

The top was glued temporarily in place and I removed it to install the parts on the upper part of the capstan so I wouldn't damage the lower part. Getting the whelps shaped correctly was challenging, I ended up with making a small sanding jig to shape them even on both sides.



**Figure 31 – The lower capstan**

*Figure 32* shows work in progress on the upper capstan. You can see the jig I use to taper the whelps. I took a shortcut from David Antscherl's method, and instead of milling slots in the capstan barrel I filed the inside of the whelp

round. Apart from saving myself a tough milling job this method would also have meant I had to make the whelps from scratch since the ones supplied in the kit would not stand out far enough. Anyway the end result will look the same. I didn't dare to try to make the scores in the whelps to fix the chocks I'll just sanded them to fit between the whelps like I did with the lower capstan.



**Figure 32 – Note Sanding jig**



**Figure 33** - the upper capstan, the drumhead is finished and the whelps are installed. The chocks still need to be installed and so do the bolts on the whelps.



**Figure 34** - The finished capstan. I had to make one of the bottom chocks from scratch because the kit-part didn't fit properly.

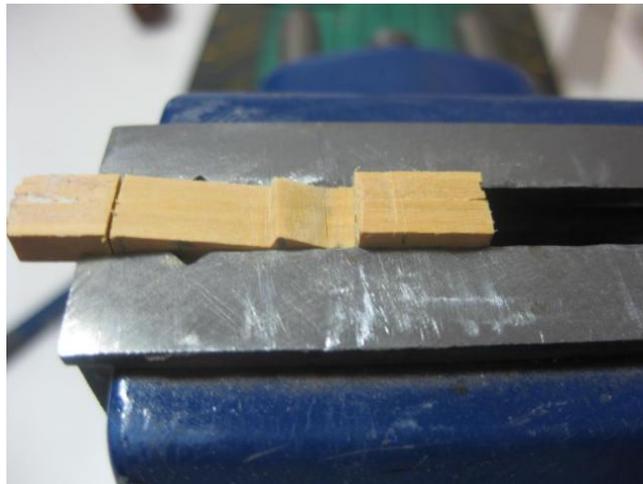
### Example 7

Danvad posted in Jan 2010 details of his scratch capstan build in his log *Static - HMS Supply (AL) 1:56 scale* in the Build logs for kits forum, [Link](#)

AL's contribution to this part was 3 pieces of woefully cast rubbish, as usual. First I turned down a piece of 8mm Walnut dowel for the shaft to 6mm to make sure it was properly round (I wish I'd used something a lot finer grained than a piece of Kit-supplied stuff - it splintered a little bit). I stepped each end down to 4mm for the upper and lower seats.



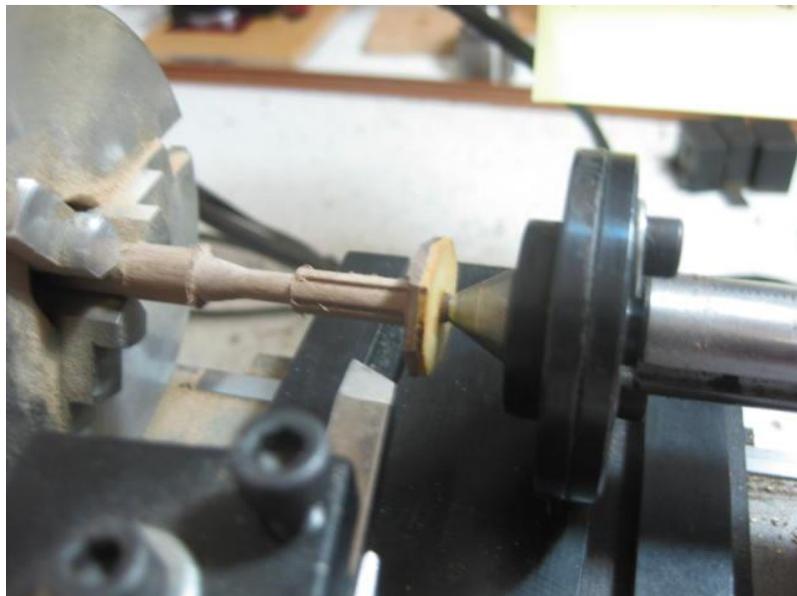
**Figure 35** - Then I set it up in an Indexing Head in my Mill and cut 6 x 1mm grooves along its length for the whelps. (Figure 35)



**Figure 36** - Next I made up the whelps. I contact-cemented 6 pieces of 4mm x 1mm boxwood to a piece of light card edgeways to hold them together while I clamped them in my vice, and then carved and filed them to shape. I sanded the card off when I finished.



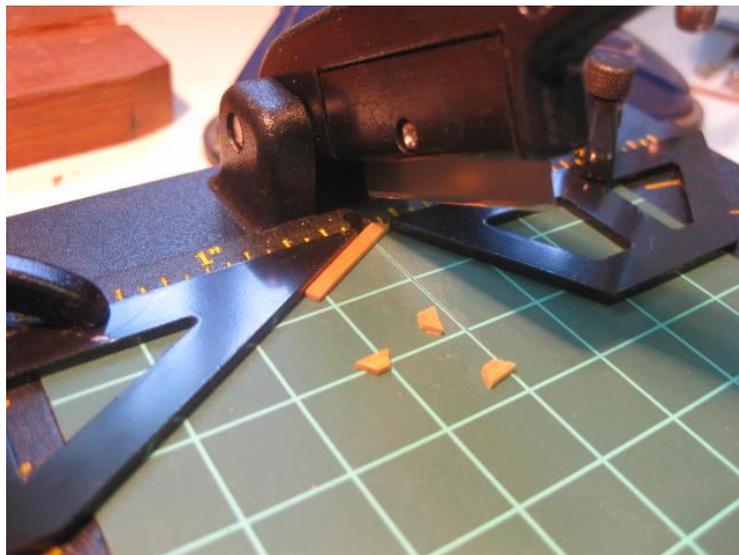
**Figure 37** - I then glued 4 pieces of 5mm x 1mm Walnut pieces edgeways with PVA to make a piece 17mm square (twice) for the upper and lower pieces of the drumhead.



**Figure 38** - Then I glued five 4mm x 1mm pieces of boxwood to the lower one, with the pieces at right angles to the other piece, with CA for the centre piece of the drumhead, and drilled a 4mm hole in the centre of it. I glued the drumhead to the shaft with CA and rounded it off with the whole unit held in the Lathe.



**Figure 39** - Next I set the unit up in the Indexing Head again and cut 4 slots through it for the shaft holes using a slitting saw in my Mill. Then I glued the top of the drumhead to the unit and rounded it on the Lathe again.



**Figure 40** - I cut the chocks at a 30 degree angle with "Chopper II" (very useful for this kind of work).



**Figure 41** - I glued the whelps to the shaft, and then set it up in the vice and glued the chocks in place (very fiddly job).



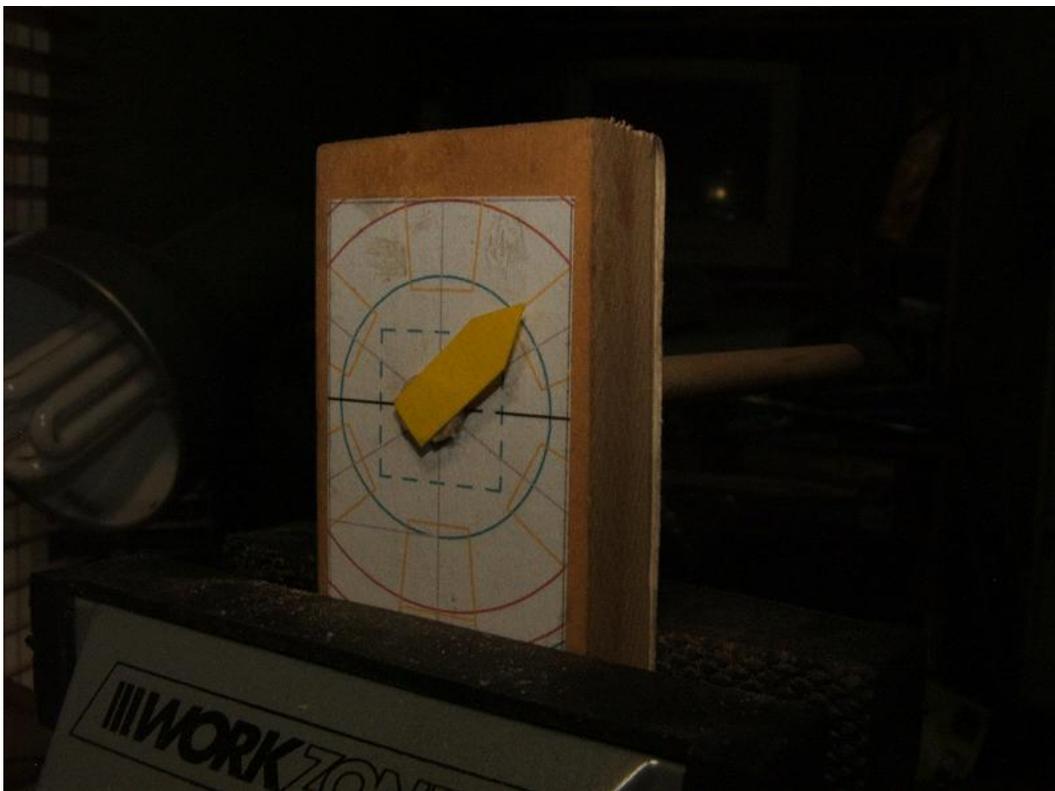
**Figure 42** - The finished Capstan and the piece of garbage it replaced. The photo makes the AL part look half-reasonable - believe me, it isn't!

### **Example 8**

Bernie, in a post of March 2010 *Making Tiny Hexagonal Nuts in the Wooden Tips and Tricks and Making Jigs* forum, showed a method for making hexagonals from dowels, useful in the construction of capstans. [Link](#)

Some time ago I wanted to plane six flat sides on a piece of dowel (for the core of a capstan). First, I printed a circle with 6 lines radiating from the centre at 60 degree intervals and glued it to a piece of MDF.

Then I drilled a hole through the centre of the circle (and MDF) that was a tight fit for my dowel. Next, I pushed a piece of dowel through the hole and glued a cardboard "pointer" to the dowel.



**Figure 43** - By filing a flat on the "upside" of the dowel and then rotating the pointer to the next radiating line and then repeating the process, I was able to get what I wanted.

## **Example 9**

UweK `s post on 24 Sep 2007, Caldercraft / Jokita's new HMS Surprise in the forum, Latest! New kits, tools and reviews: [Link](#) gave photos of the model's capstan.



**Figure 44 - HMS Surprise's capstan**

**Example 10**

*Bahamas\_Diver* posted a picture of the capstan on the modern replica of the Niagara in gleason's build log *Static Model Shipways Niagara build* [Link](#)



**Figure 45 – US Brig Niagara's capstan**

## **Example 11**

Decoyman posted a word of warning on Oct 2009 in his log *HMS Agamemnon - the seven year itch* in the Build logs forum [Link](#)

The problem was that the body of the capstan, which is made from 10 mm dowel, 20 mm long according to the instructions, actually needs to be 3-4 mm shorter than this. I didn't want to trim the end using a saw because I thought it would leave it slightly domed and the top capping would then not sit flat. So I put it in my lathe - big mistake! The tool dug in and pulled the whole thing out of the chuck. Here are the results.



**Figure 45 – The chewed-up Capstan**



## Finally

A discussion is made in MSW on the feasibility of a capstan having its axis on a mast as seen in a movie which featured The Black Pearl [Link](#)

HMVA Bounty's capstan is discussed in cloyd's log *Static: Caldercraft HMAV Bounty* in the Build log forum [Link](#) In this discussion "le mousse" posts a [Link](#) to a French government archive drawing of capstans.

A brief discussion of the stowing of capstan bars can be found on MSW at [Link](#) and their length at [Link](#) while original diagrams of capstans printed in Falconer's (1732-1769) Marine Dictionary may be found on the National Library of Australia site at [Link](#)

An example of a model of Victory's capstan can be found at The Ship Model Laboratory at [Link](#)