

Franco Fissore

# N.S. del Rosario

## 1759 Feluca



2017

Monograph at the 1/36 scale

English Translation by François Fougerat

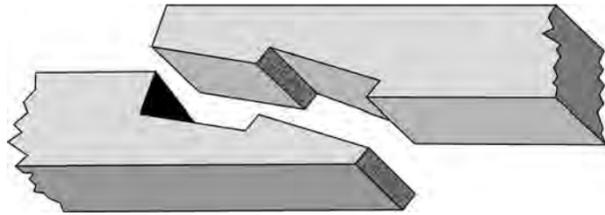
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FRENCH NAVAL ARCHAEOLOGICAL COLLECTION

# Construction of the hull.

## Construction of the keel.

The keel is made up of two pieces that are assembled with a scarf at the stem. The stern and keel are joined with a flat scarf.



Drawing. 6

All pieces of the midship structure are described on plate 3 for a total of 11 pieces with a thickness of 3.83 mm. Other measurements can be lifted directly from the plate. The rabbet (11) must be cut after all the pieces have been assembled. The ends of the hull planking fit into the rabbet at the head and stern. The garboard also fits into the rabbet over the keel length. The angle of the rabbet edge must change along the length of the keel in order for the garboard to fit snugly.

## The hull timbering

The hull timbering is made up of 36 simple frames (plates 4 and 5); on each frame, floors (or crotches at the head and stern) and futtocks are assembled together. Each floor gets three cuts: a middle one to fit into the keelson and

two side ones for let water run in the limber passage. Floors and futtocks are notched and bolted together with two bolts (assembly bolts).

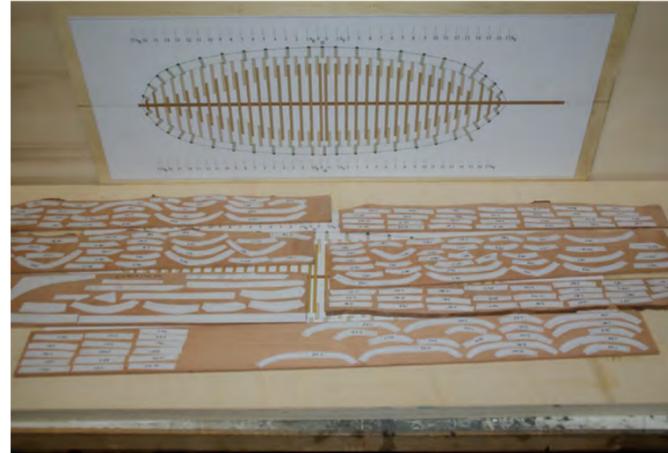


Photo n°7: In order to construct the framing at the 1/36 scale, you will need about ten small boards 8 cm wide and 60 cm long.

To make the work easier, I print each piece of the framing on a contact paper (A4 format), that I then stick on the piece of wood to be cut. Once the pieces have been made, I start assembly.

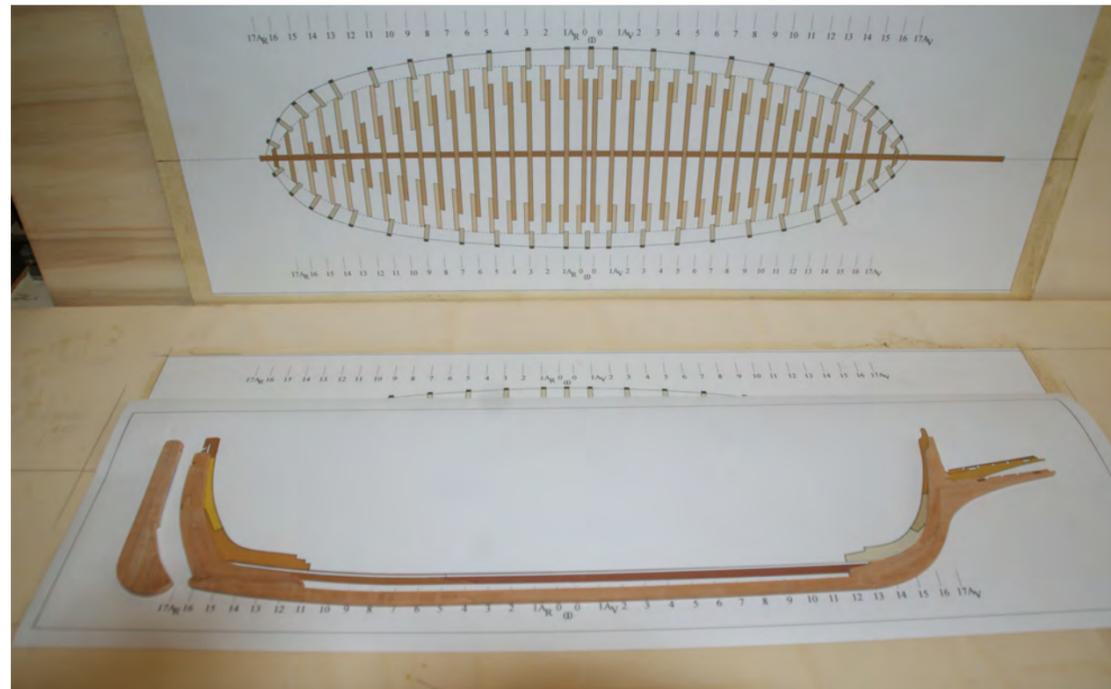


Photo n° 8. Five square notches are cut on the gripe (5), in order to fit the head ledges (46), as well as two diamond-shaped openings for the bowsprit gammoning and notch for the foot of the bowsprit.

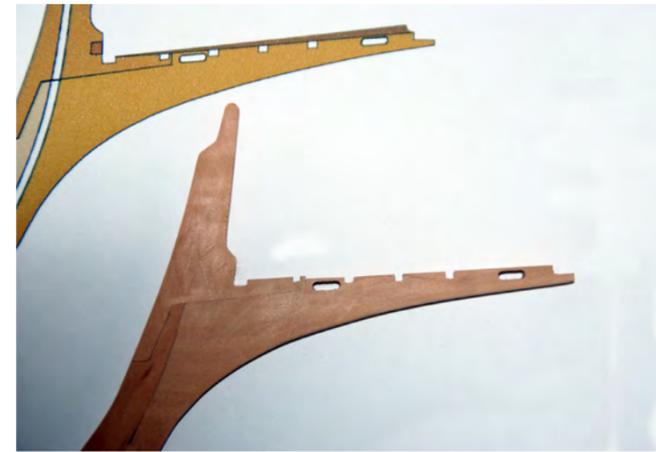


Photo n°. 9: Close-up of the head timber; the notches and slots are quite visible.

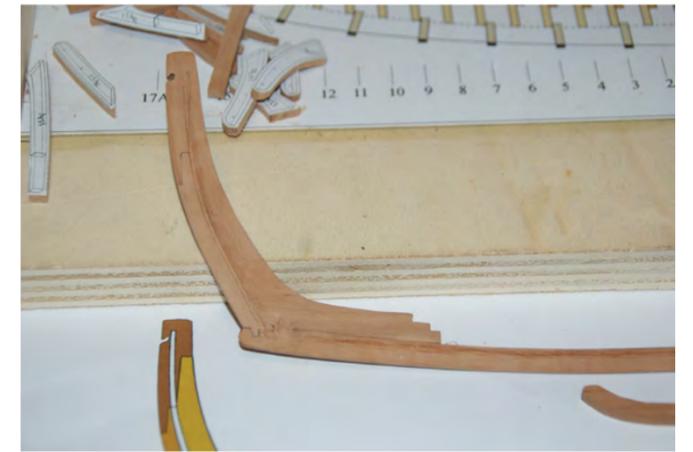


Photo n°. 12: The assembled stern with the completed rabbet.



Photo n°. 10: Front view of the head timber showing the square mortice for the bowsprit step tenon. Once the keel has been completed, cutting of the rabbet can begin.



Photo n°. 13: After completion of the rabbet, the knighthead must be placed (52) at the head, one on each side. See plate 3 for the dimensions.

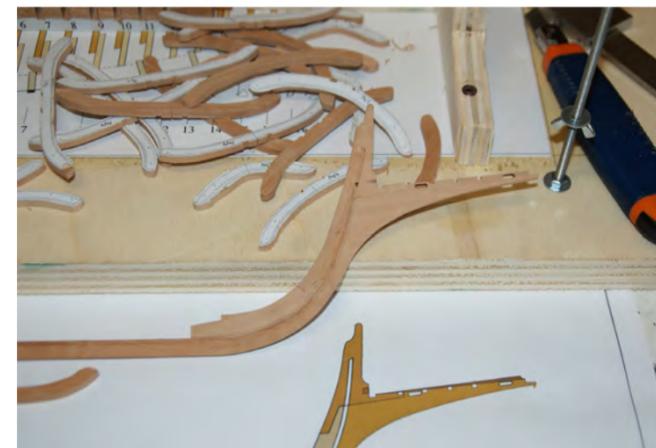


Photo n°. 11: The assembled head with the completed rabbet.



Photo n°. 14: Placement of the knighthead (53). See plate 3 for the dimensions.

## The construction setup.

Building the construction setup requires the use of a plywood board as a b&se, and two additional perpendicular supports, one at the front and one at the back, one to support the stem and the other the stern. In order to facilitate the assembly of the frames, I constructed a « comb » by cutting slots in a piece of wood with a milling machine. These « combs » were then laid down on either side of the keel. The following photos show the details.

Photo n°.15: Cutting of the comb on a milling machine.

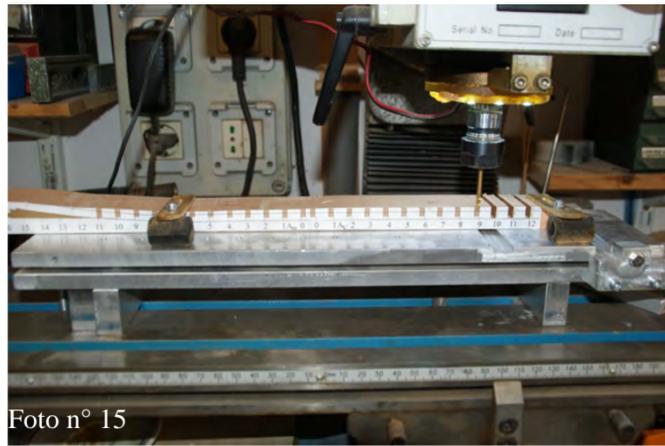


Foto n° 15

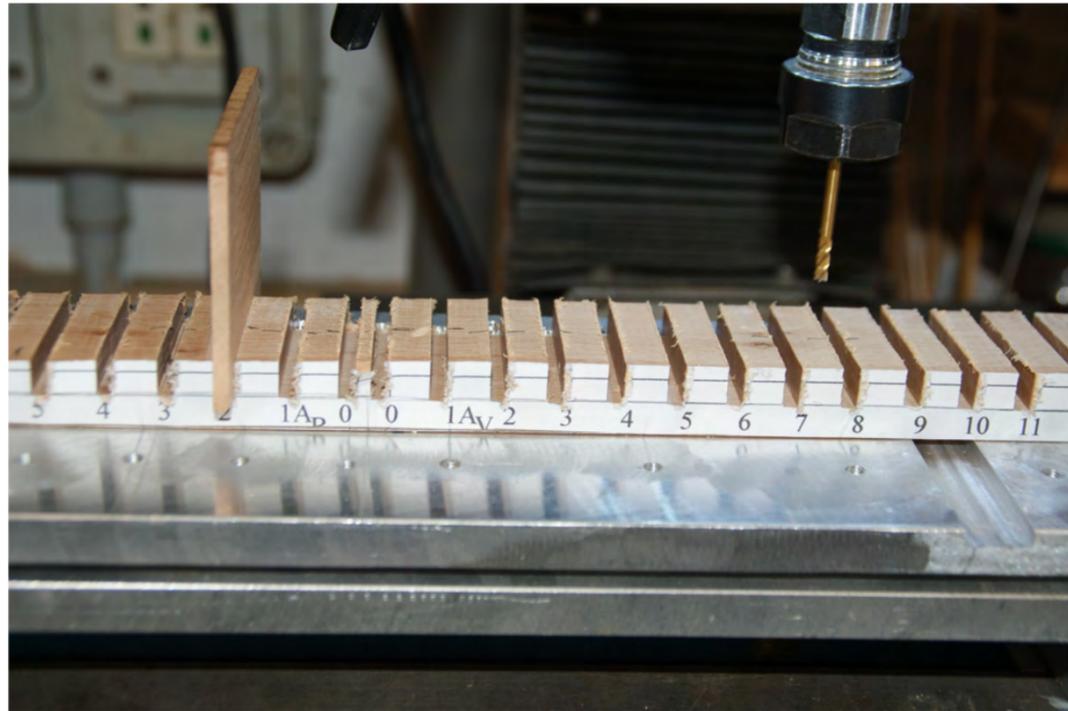


Photo n°. 16: The comb has been completed. I made it double (one for either side of the keel). To do this, I glued two strips of wood of the same dimensions side-by-side that were then unglued after milling was completed. This may be done in two ways: 1 - using a heat source such as a hair drier 2- dipping it in a solvent (acetone). Leaving it immersed until the two pieces are separated.

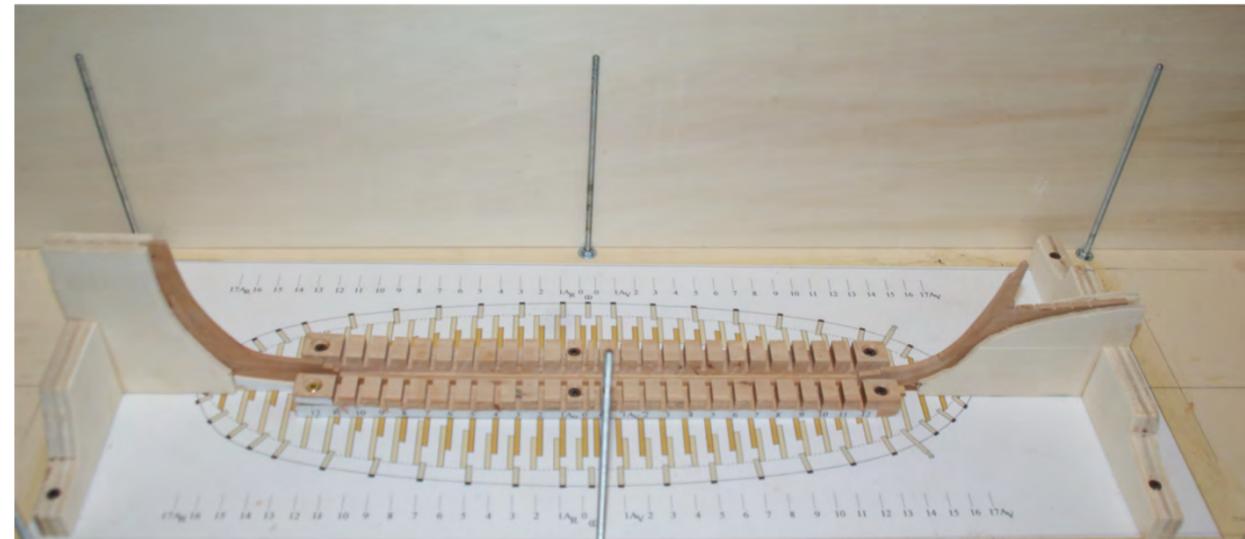


Photo n°. 17: Setting up the keel on the building board, ready to take the frames. I installed six vertical 6 mm threaded rods on the building board in order to install the upper part of the building setup.

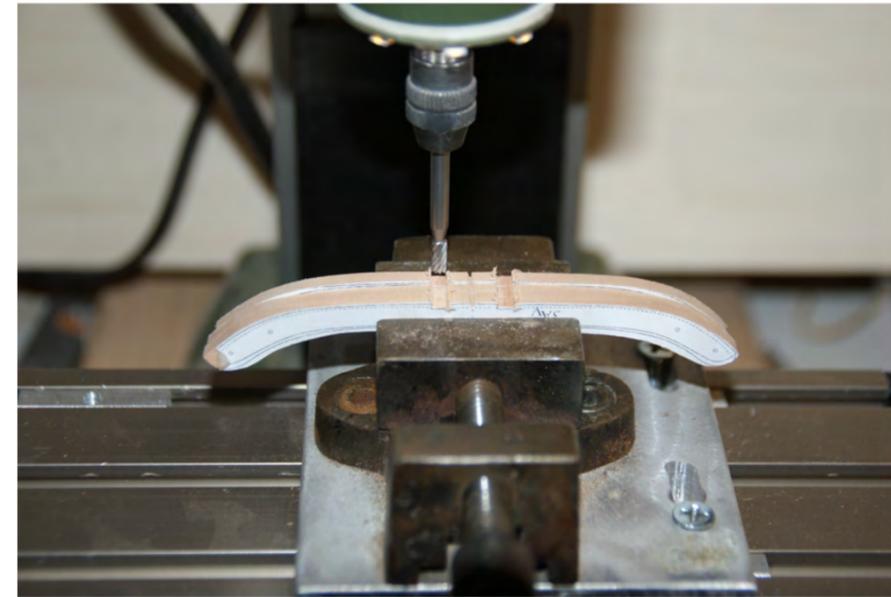


Photo n°. 18: Once the frames have been completed, the notches for the limber passage must be cut in. In reality, the floors did not have a middle slot, they were just nailed on to the keel. In order to make their placement on the keel easier, in addition to the two combs I designed a false keel to reinforced the gluing (in may be seen clearly on photo 19).

Photo n°. 18a: frame - note the notches for the limber passage.

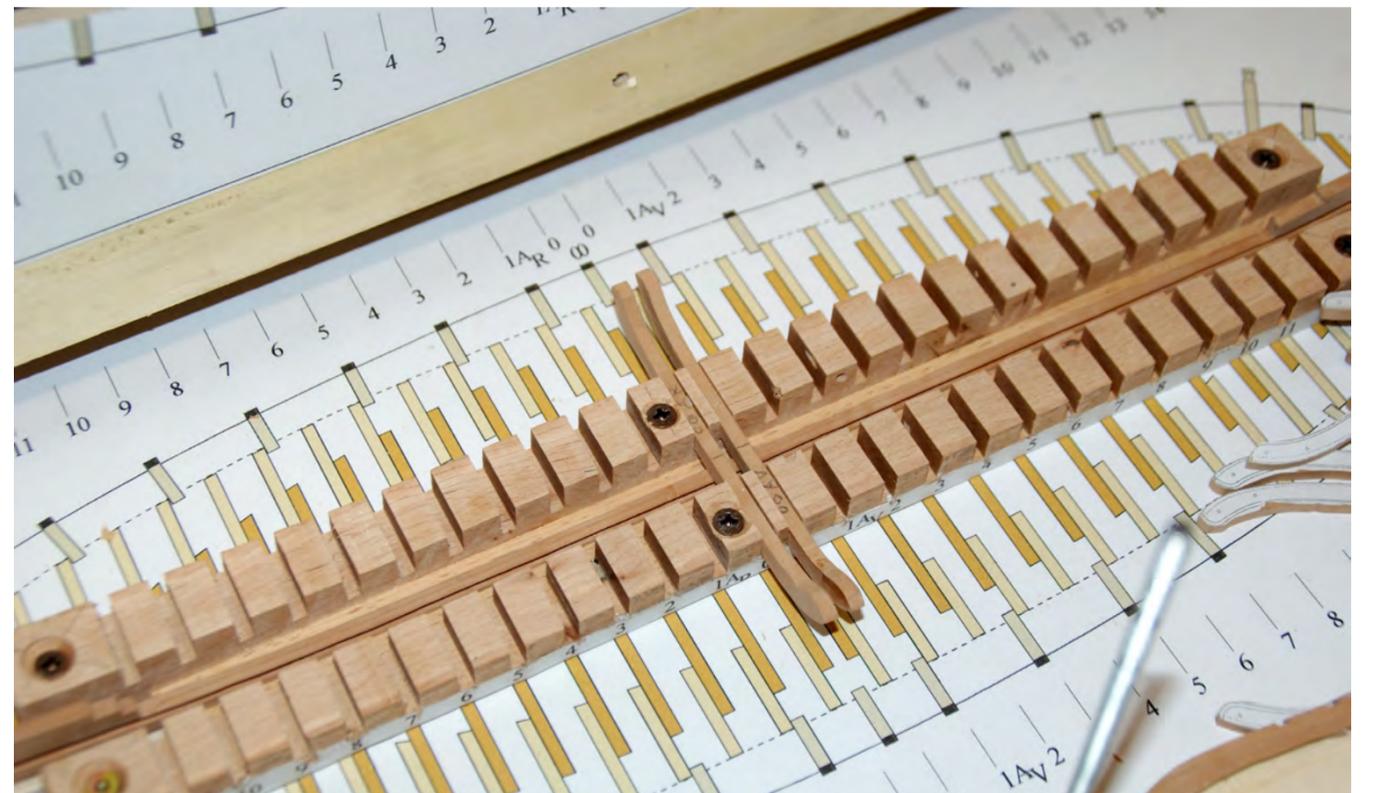
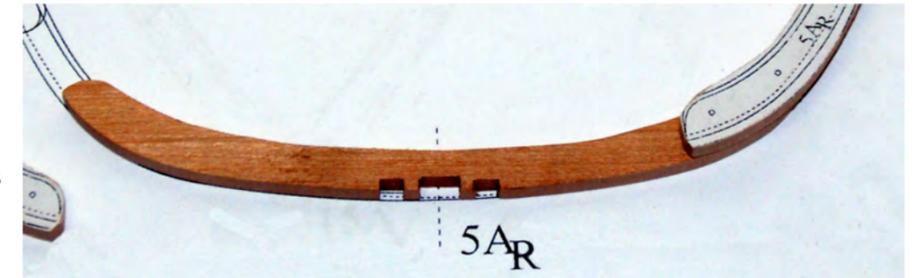


Photo n°. 18b: The combs are set up on either side of the keel and perfectly aligned to receive the frames.

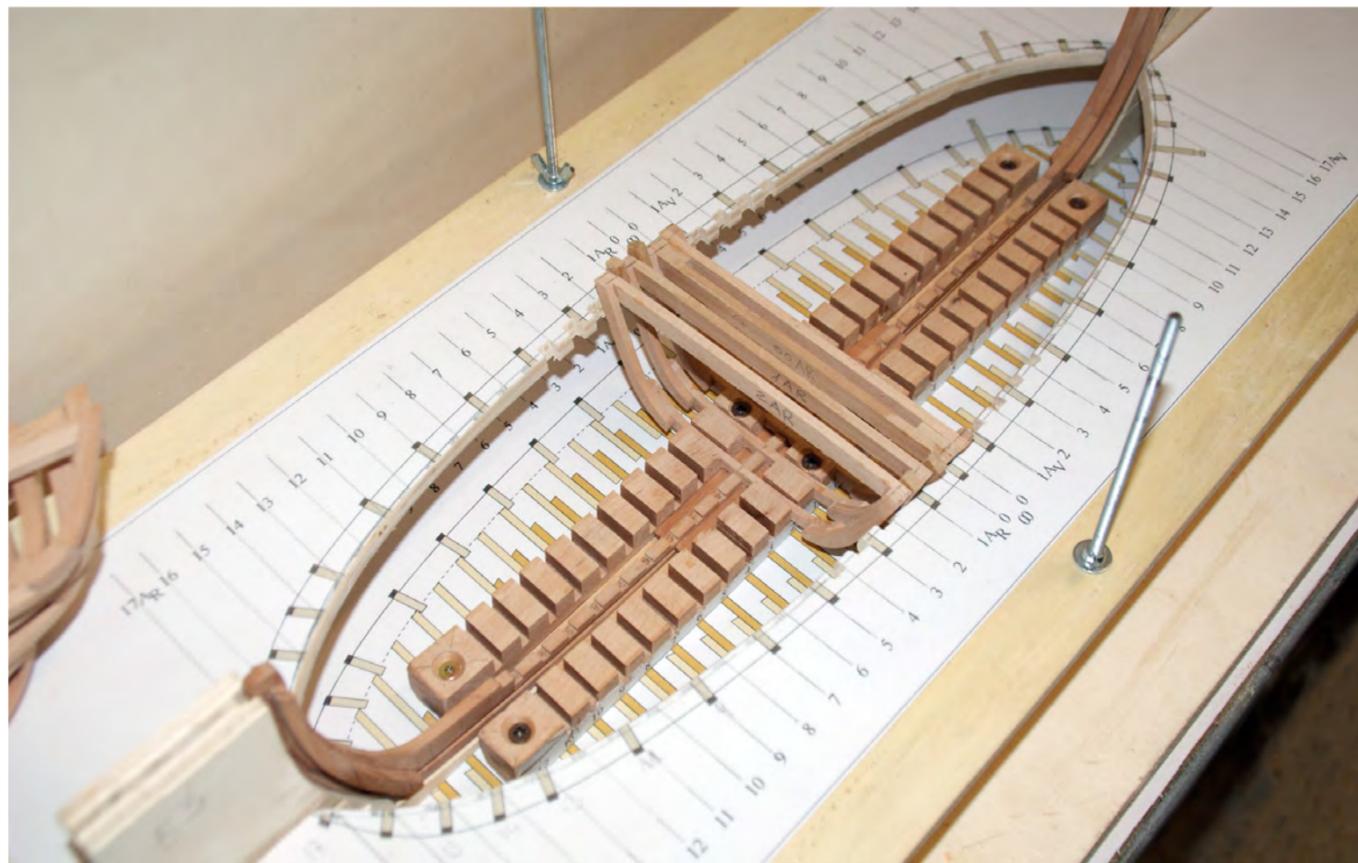


Photo n°. 19: The frames have been inserted in the keel slots, the comb has made the assembly work easier and maintains.

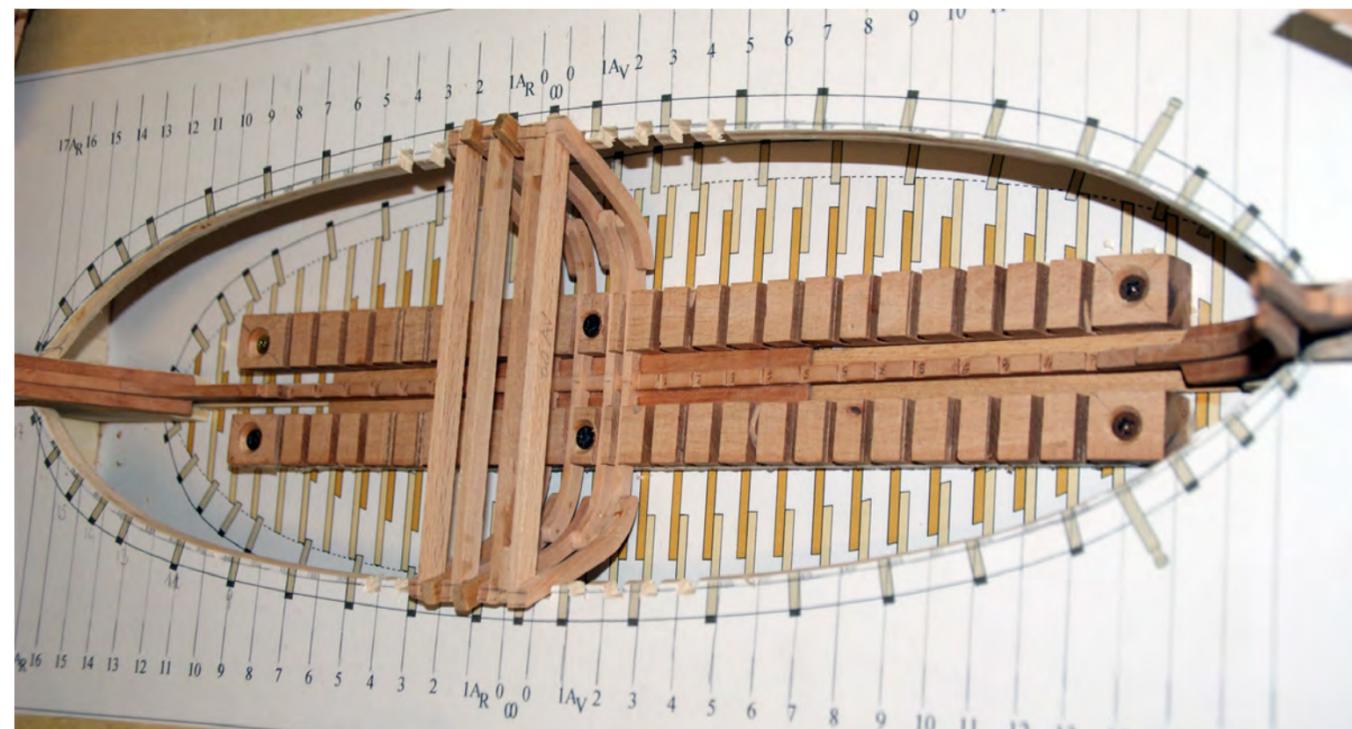


Photo n°. 20: Placement of the frames with respect to the upper part of the building setup.



Photo n°. 21: In order to place the cant frames at the stem and at the stern, the contact angle must be cut at the base of floor (or the crotch as the case may be) and the floors must match the curvature of the hull.



Photo n°. 22: The cant frames and the curve of the wales. Once the frames have been assembled, it is best to place and secure the wales to both sides in order to lock the structure in. The garboard and bilge planks are installed next. We will finally get to the keelson, made-up of three pieces: the middle one takes the mainmast step.



Photo n°. 23: We can see a side view of the three pieces making up the keelson. In the center is the piece that takes the mainmast step.

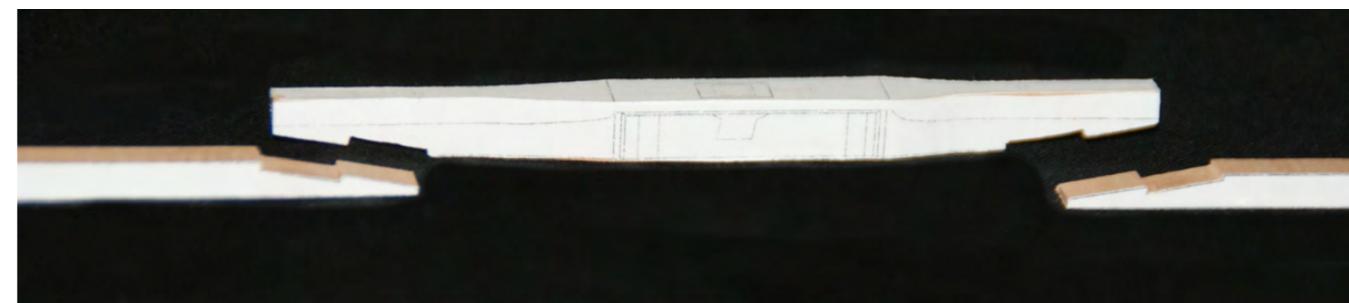


Photo n°. 24: In the foreground is the middle piece. The connection between the pieces is achieved with a hook-and-butt scarf.



Photo n°. 25: Top view of the three pieces of the keelson after assembly.



Photo n°. 26: Side view of the three pieces of the keelson after assembly.

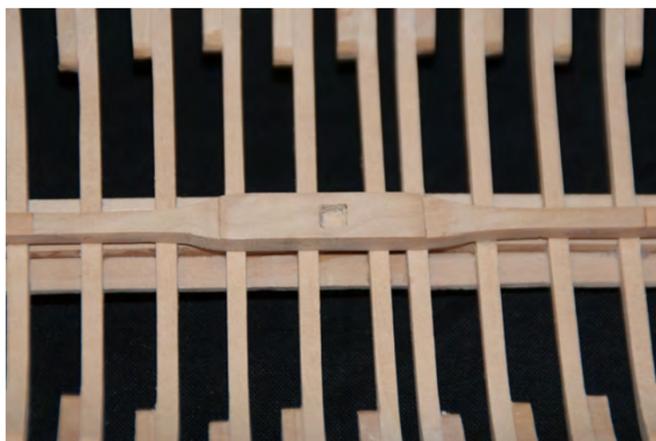


Photo n°. 27: Middle part of the keelson - note the widening of the keelson to accommodate the mainmast step.



Photo n°. 28: The fore section of the keelson that the foremast (22) step is assembled on - note that it is wider than the keelson at that point.



Photo n°. 29: The outer wales (58) and the keelson are in place. The structure is now ready to receive the footwaling (24).



Photo n°. 30: The footwaling has been completed. Following are the dimensions of the footwaling (24); planks: 1.5 x 5 mm; limber board: 2 x 5.32 mm; outer wales (58):

3 x 5.5 mm; Nails for the footwaling planks and hull planking strakes: 0.6 mm.



Photo n°. 31: The frames at the stem, footwaling and planking.



Photo n°. 32: The completed planking (64): 1.5 x 5 mm  
Nails for the planking: 0.6 mm



Photo n°. 33: Installation of the stern-hook (26), Note on the port side of the stern-hook, a notch for the deck clamp. Naturally, there is a notch on both sides.



Photo n°. 34: Installation of the breast-hook (25). The notches for the deck clamp (one on each side) are still to be cut. Note the foremast step on top of the keelson, above the keel.



Photo n°. 35: The breast-hook and stern-hook, the deck clamp (27) and some deck beams all in place.



Photo n°. 36: Overall view of the deck structure: breast-hook and stern-hook, deck clamps, light deck beams (28) and half light deck-beams (28) are all in place. Starting from the stem, the first opening ready to receive the foremast partners (29), the second opening is for the small hatch (36) and the sixth one is for another small hatch (36).

#### Measurements concerning Photo n°. 36:

25	Breast-hook	5 mm.
26	Stern-hook	5 mm.
27	Deck clamp	5 x 4 mm.
28	Light deck beams	4,5 x 4 mm
28	Half light deck-beams	4,5 x 4 mm.

Once the light beams are in place, the placement of the waterways (14) in four pieces can proceed.



Photo n°. 37: Waterways - 12 x 3 mm - outboard thickness 3.5 mm.



Photo n°. 38: We now proceed with the construction of the mast partners and the wedges that are necessary to maintain the masts in place. This photo shows the foremast partners and wedges. The thickness of the wedges (31) and (32) is 4 mm. Before completing the eight-sided hole, it is recommended to complete the masts and wedges in order to insure the correct rake of the wedges. Foreward rake of the foremast: 19.

35 deg., and foreward rake of the mainmast: 10.6 deg.. Two eight-sided holes with a 3.47 mm diam. also have to be provided for the bilge pumps on either side of the mainmast. The drawing shows the mainmast partners and next to it, the holes for the bilge pumps.

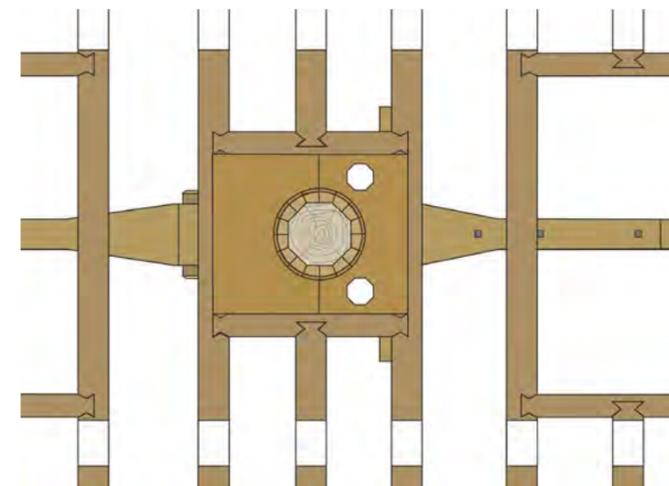
### Mast with masthead.

The head of masts on galleys, as well as on other Mediterranean vessels was square in shape and contained the block sheaves needed for the ropes used to handle yards and to lift weights.

The terminology used for masting similar to that of galleys refers to « mat a calcet, or matadura ». The difference between « mats a calcet » and masts on ships of the Western Oceans is that the former are short and thick, carry only a single long yard called an antenna, and to not have mast tops. Vessels carrying masts « a calcet » were galleys, xebecs, pinkies, tartans, feluccas, ships from Provence, etc . In fact, all Mediterranean vessels.

\* Calcet: A Mediterranean term referring to the head of masts on galleys and other lateen masts. Construction of the « arbres a calcet »

### Construction of the mast head.



Drawing 7: Partners, wedges and openings for the bilge pumps, mainmast. The dimensions for the construction of the foremast (62) may be found on plate 12. In order to make this mast, it is best to start with two pieces with a square section that are joined together with a flat scarf, and then to adjust the whole to the required dimension.



Photo n°. 39: We proceed with the construction of the mast after having joined and glued the two pieces.



Photo n°. 40: Construction with a lathe is best and more precise and simplifies the work. Start with the circular portion of the mast, knowing that the section is not cylindrical but cone-shaped, getting smaller toward the head of the mast.



Photo n°. 41: Next, provide the two sections that will serve to hang the pendants of the switching shrouds.



Photo n°. 42: Once the square sections have been made, we work on the inner section of the eight-sided mast and the square tenon.



Photo n°. 43: Making the eight-sided section.



Photo n°. 44: The section of the masts that is below-deck is eight-sided and ends in a square tenon that engages in the mast step on the keelson.



Photo n°. 45: In the fourth phase, the rectangular-section « calcet » head is being made with two slots for the collars necessary to hang the ties and the two mortices for the placement of sheaves. The blocks were made of olive-tree wood.



Photo n°. 46: The « calcet turned the other way shows the two slots, the hole for the sheave axle and two additional holes used in case of need. They are not rigged on this model.

Photo n°.47: Front and side view of the completed « calcet ».

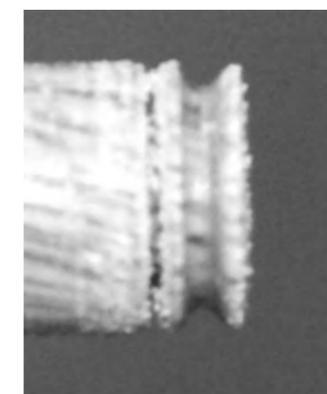
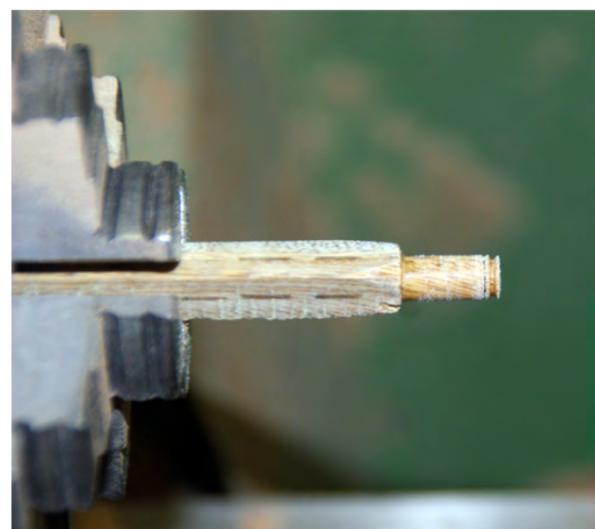


Photo n°. 48: Detail of the construction of the sheave for the tackle at the « calcet » (olive tree wood).



Photo n° 49: Detail of the « calcet » with the two sheaves.

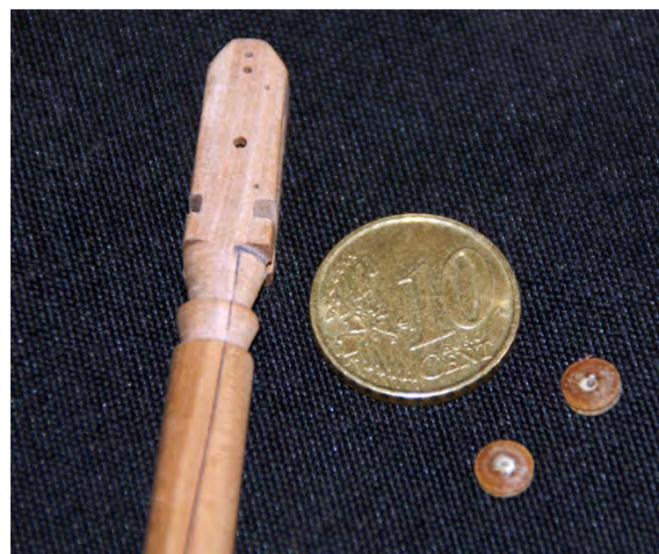


Photo n° 50: Detail of the « calcet » with the two sheaves seen from the other side.



Photo n° 51: The completed masthead with « calcet ». Two eyebolts for the mast-head pole have been added.



Photo n° 52

Photo n° 52: The completed « calcet » masthead showing the two collars, two slots with sheaves and the two eyebolts.



Photo n° 53: The « calcet » masthead with the masthead pole inserted in the eyebolts.



Photo n° 54: Same view from the other side.



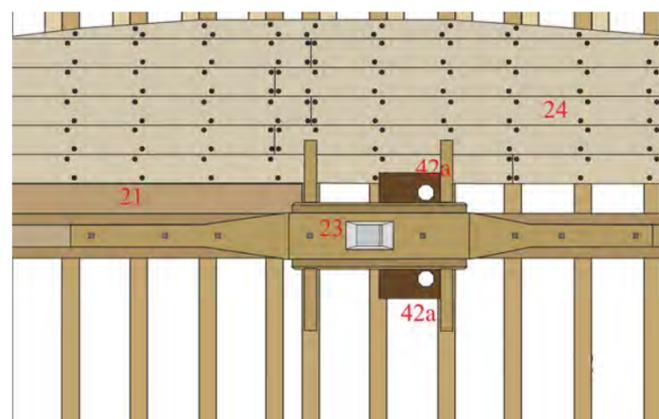
Photo n° 55: The completed wedges assembly.



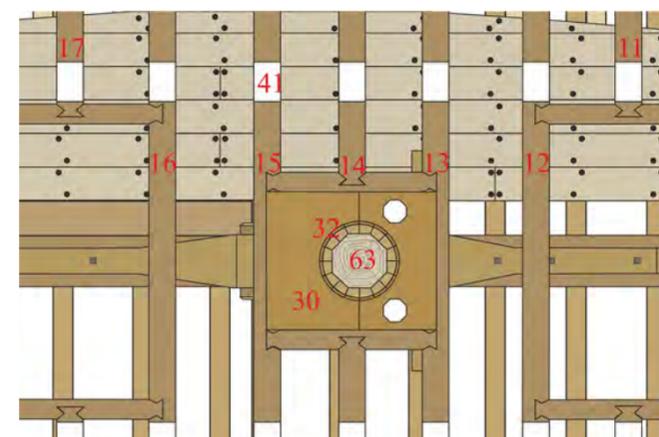
Photo n° 56: Top view of the detail of the completed wedges assembly.



Photo n° 57: Foot of the mast with the wedges assembly in place. Note the strong angle obtained when the wedges were cut on a slant.



Drawing 8: Plate 7 shows the mainmast (23) step - Photo 24, page 71 shows the detail of its construction - The footwaling (24), the limber board (21) and the eight-sided openings (42a) (each with a diameter of 3.47 mm) of the bilge pumps. Once the masts and wedges have been completed, the bilge pumps may be constructed in order to verify that they are perfectly aligned with the holes at deck level, and perpendicular.



Drawing 9: The mainmast partners (30), the mainmast wedges (32), the mainmast (63) and the eight-sided holes for the bilge pumps (42).

## THE BILGE PUMPS.

To make them, you will need a strip of wood with a square 9 x 9 mm section.



Photo n° 58: To start with, the piece is shaped on the lathe. Its length is taken from the drawing. You may retain the dimensions from my plates and follow drawings n° 10 and 11, or you may chose a drawing of your own.



Photo n° 59: As a second step, we shape an eight-sided cone representing the barrel of the pump. Its construction is accomplished easily on the milling machine, using a support bed set on a slant, a dividing head, and a spindle.

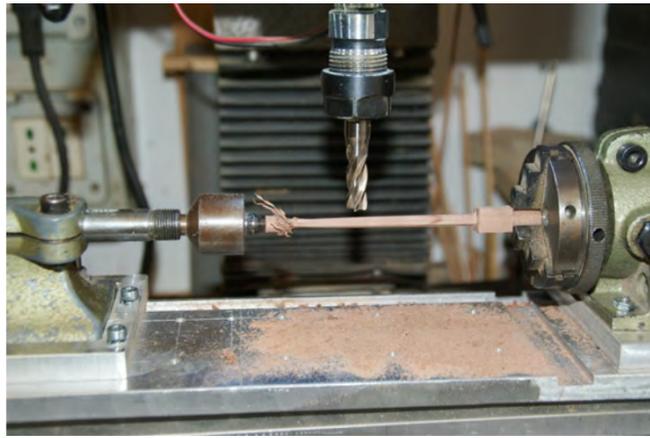


Photo n°. 60: Working on the cylindrical section.

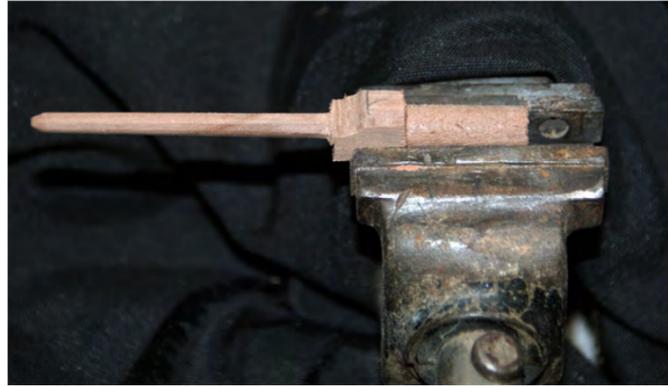


Photo n°. 61: Once the body has been completed, the side supports of the pump brakes.

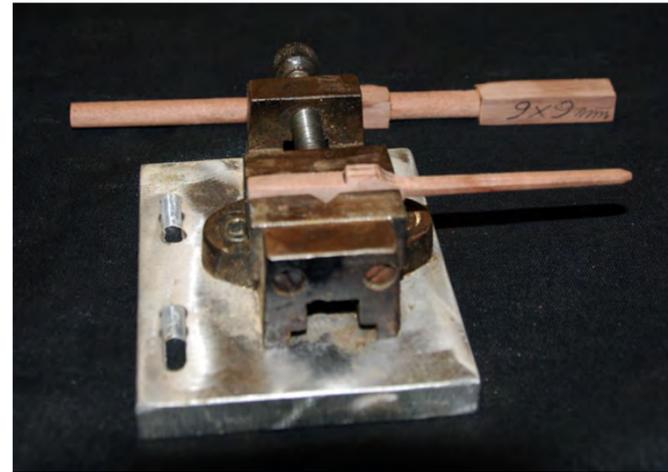


Photo n°. 62: Working on the head of the pump. Note the two milling reference marks.

Photo n°. 63: A slot on the pump head will enable me to create the supports for the pump mechanism: brake and piston.

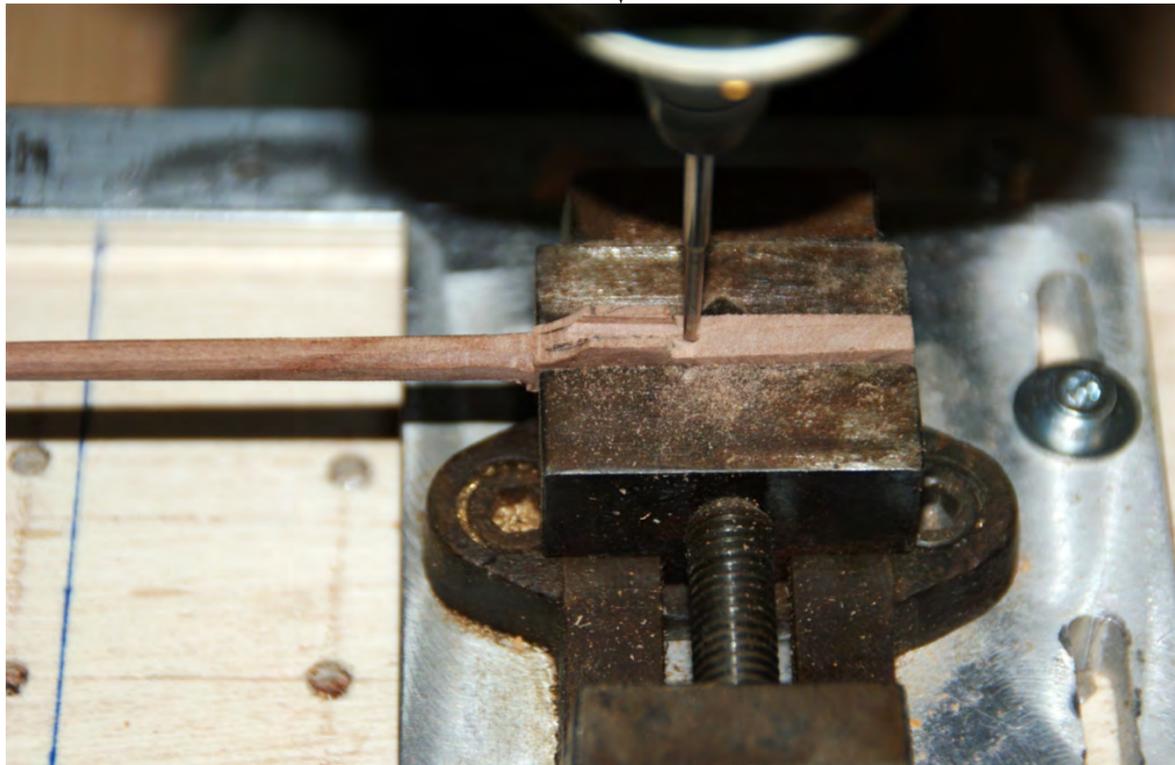


Foto n° 64 - Le guance sono state realizzate. Ora si può tagliare la parte eccedente e poi terminare la pompa.

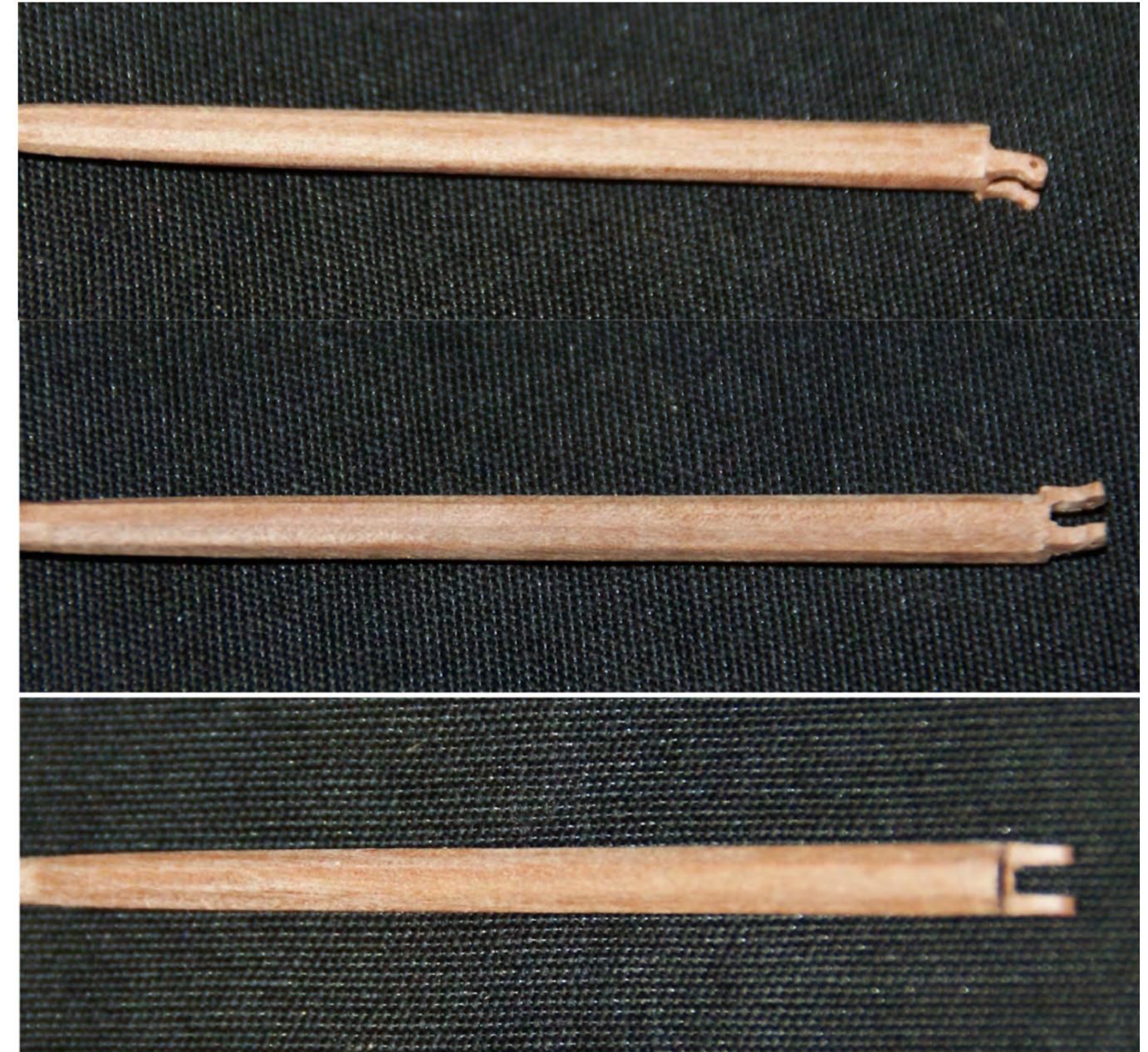
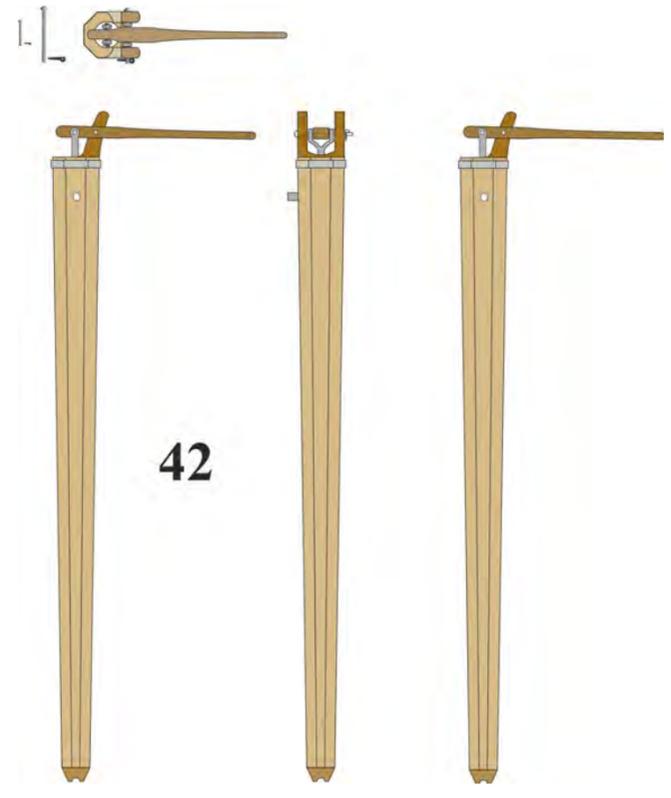


Photo n°. 65: Completed pump bodies seen from three sides.



Photo n°. 66: Completed bilge pumps.



Drawing 10: From plate n°. 15



DECK PLANKING.

Dimensions for this deck:  
 Planking (33) - 1.5 x 6 mm  
 Planking (35) - 2 x 6 mm  
 Coamings (41) - 2.5 x 6 mm.

Drawing 11: From plate n°. 14.

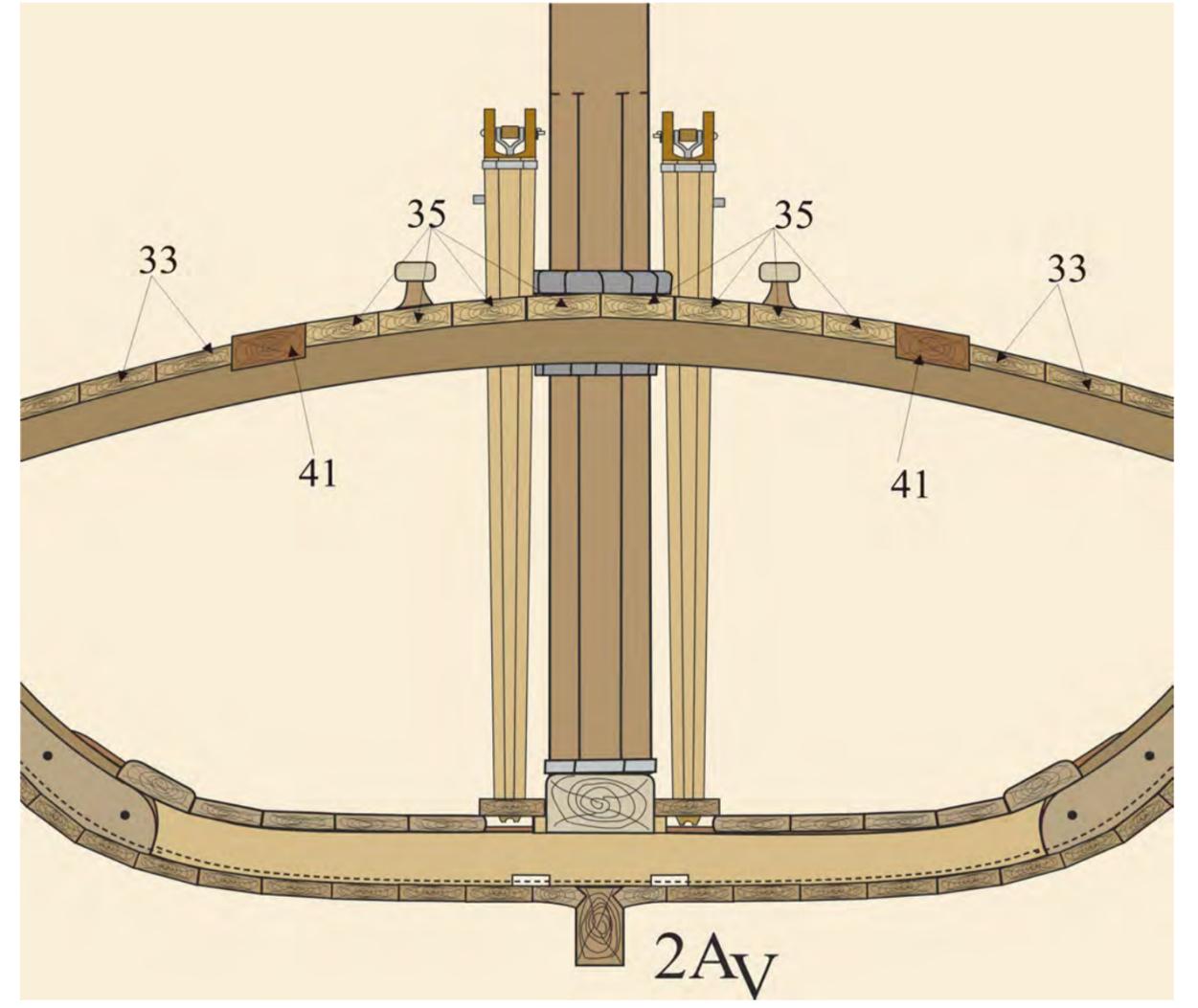




Photo n°. 67: The plank laying and nailing of the deck have been completed. One strake was not installed in order to show the coaming strakes - the planking strakes are thicker between the coaming strakes ( see drawing 11).



Photo n°. 68: Deck planking at the stem - foremast partners and small,hatch.

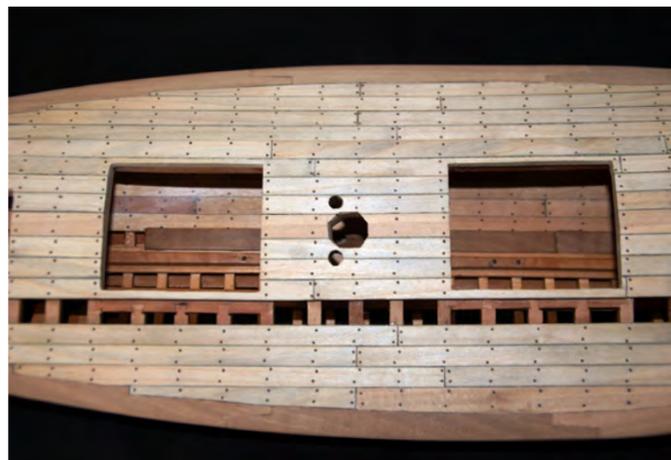


Photo n°. 69: Deck planking, midship view of the two main hatches and the mainmast partners.



Photo n°. 70: Deck planking at the stern and the small hatch. The deck nails are 0.6 mm in diameter.



Photo n°. 71: Completed deck planking forward.



Photo n°. 72: Completed deck planking aft.



Photo n°. 73: Preparing openings in the waterways to insert risers (or half-futtocks).

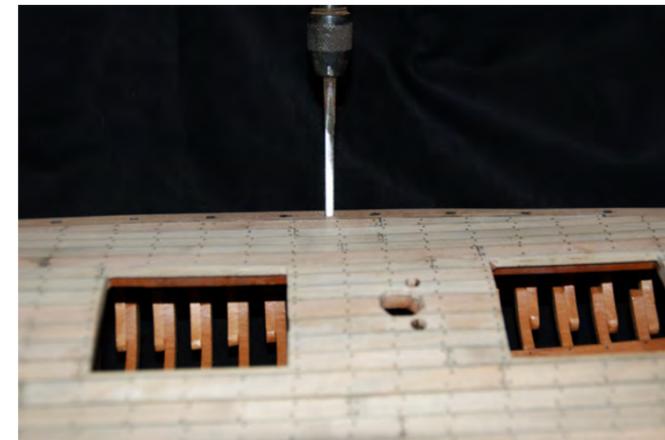


Photo n°. 74: Preparing openings in the waterways..

In order to make rectangular holes, it is recommended to proceed as follows: first draw a line along the whole length of the waterways plank, establishing the distance between the outer edge of the plank and the center of the holes to be cut. Then from the drawing, define the exact location of each hole. Holes are then pierced with a 0.2 mm diameter drill bit, and they are enlarged to 4 x 3 mm. To pierce these holes, I made steel tools with a rectangular-conical shape (pyramidal) from an old file and adjusted it to the required dimensions (see the object in question on photos 73 and 74). Once the holes have been opened-up using this « home-made » instrument, I start preparing the risers. They are drawn in a solid line on the same frames drawing.



Photo n°. 75: The riser drawings placed on a wood-strip and ready to be cut out. Measurements are taken from plates 4 and 5. As anticipated, only those drawn in a solid line are to be cut.

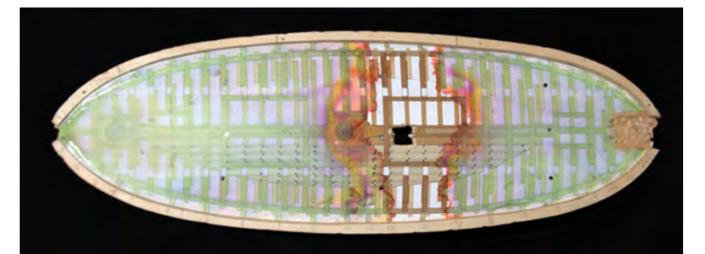


Photo n°. 76: Placement of the risers. As a help, and going back to plate 8, I made this pattern from 4 mm plywood, which has the exact shape of the ship's sheer. The pattern is thin and flexible and can be bent. I also glued two pieces of plywood to the outer edges in order to increase the thickness of the risers support.



Photo n°. 77: Two views of the pattern on photo 78. To insure the correct deck camber and the correct distance between risers, I have used three spacers glued to the underside of the pattern. The square hole in the center is used to secure the pattern.

Construction and installation of the risers.



Photo n°. 77a: Photo of a real ship. Note how the holes for the risers are made.



Photo n°. 77b: Some risers in place. This operation serves to give the correct curvature to the plank sheer and to place the last risers.

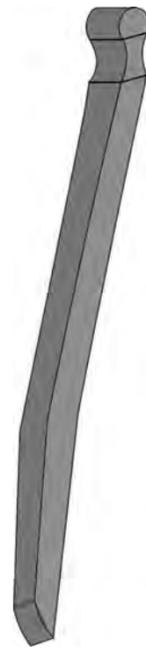


Photo 77c

Photo n°. 77c: Construction of a half-futtock or riser. The bitt may be seen in the upper part. The end is rounded and carved on all four sides.

Photo n°. 77d: Drawing. At its top end, the riser is shaped as a truncated cone, a shape that is necessary to fit it into the waterways. In reality, The fitting of these risers was done with a hammer. This allowed for rapid replacement in case of breakage. We will do the same thing with the model. The risers must be tight-fitted in their lodgings with a small hammer. If needed, a small drop of cement may be used.



Photo 77d



Photo n. 78: The pattern and the risers have been placed. Because of the deck camber, it would be difficult to fit the risers with the proper inclination at the stem and stern without the pattern.

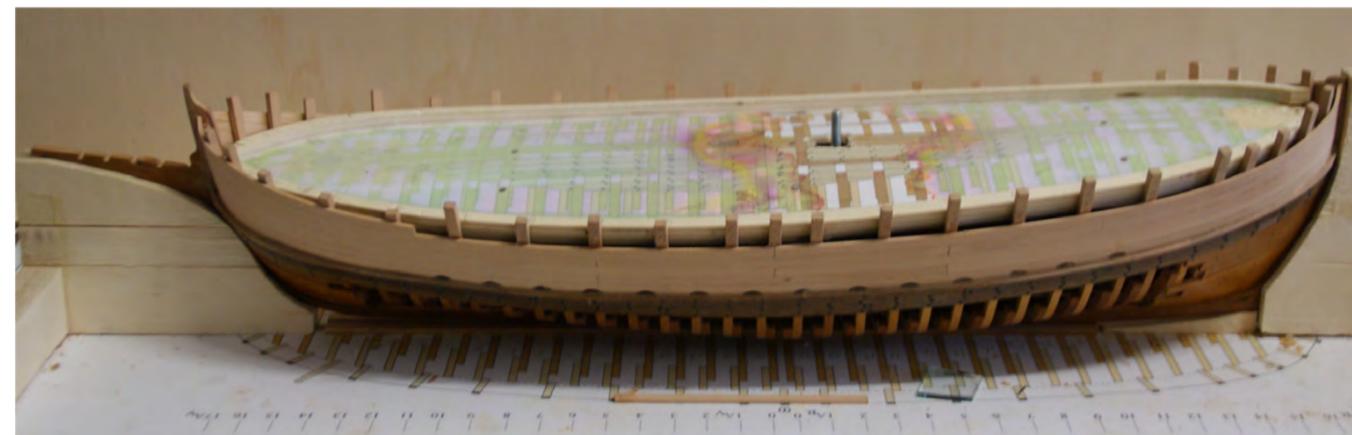


Photo n°. 79: At the center of the deck, a threaded rod juts out of the square hole on Photo n°. 76. The bottom end of the rod is threaded into a square piece of wood placed under the deck at the level of the hatch (photo 69). By

tightening a wingnut at the top, the pattern is held securely against the deck. Once the planksheer has been completed, the pattern can be removed.

Photos 77 a and b are original photos of the leudo Leonidas built in 2004 in a Sardinia shipyard. It was made entirely of wood from original drawings that were slightly modified in order to abide by newer maritime laws. This project was accomplished by Sergio Spina 2003. A leudo is a typical vessel of Eastern Liguria and the Mediterranean. Although centuries may pass, some traditions re-

main intact and show us how ships were built.



Photo n°. 80: Side view of the hull with the gunwale completed but needing to be finished-up.



Photo n°. 81: Port-side view of the gunwale planking and top rail before finishing.

Photo n°. 82: Gunwale planking (65), top rail (47) ready for installation of the gunwale inner planking (39). The top rail (61) is not yet in place. Gunwale planking (65): 1.5 x 5 mm. Top rail (7): 2.5 x 4 mm.

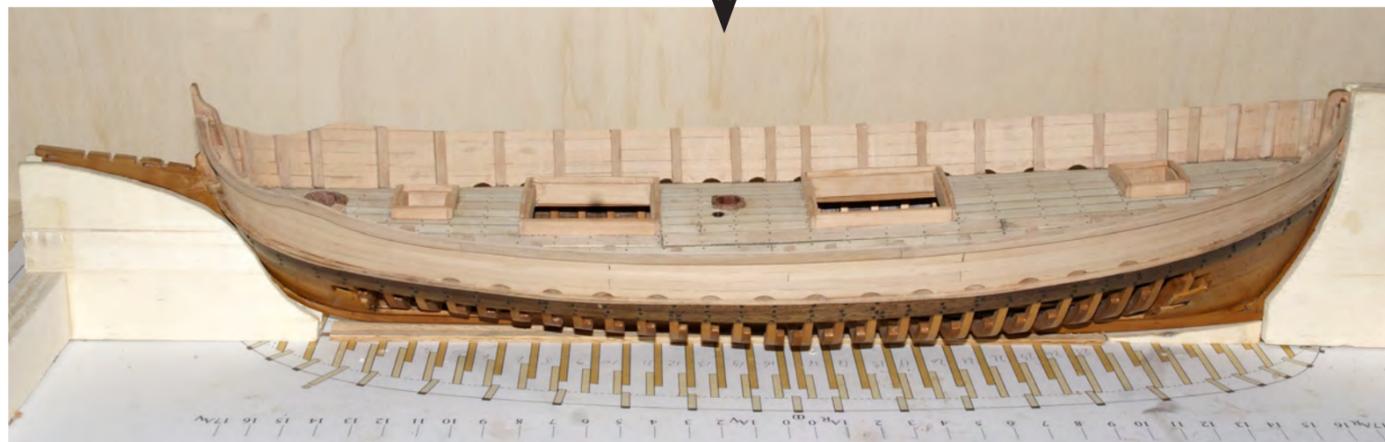


Photo n°. 83: Detail view of the head with the completed planksheer and planked bulwarks. Note the evolution in shape of the bulwark strakes.



Photo n°. 86: Detail of the head with the completed gunwale and top rail. Note the increased curvature of the top rail.



Photo n°. 84: A view of the inside of the completed gunwale at the stern.

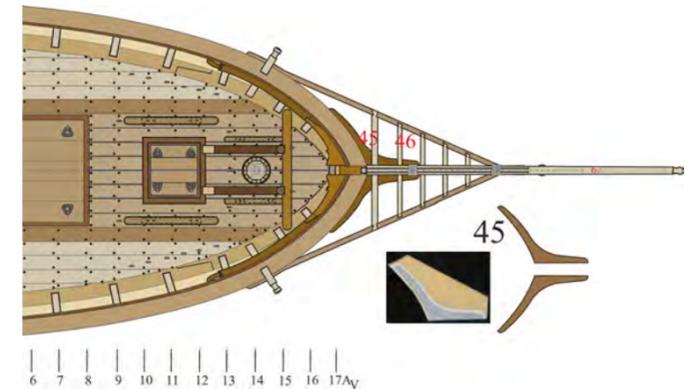


Photo n°. 87: A view of the head from plate 13 and detail of the small knees (45). For the construction, refer to the dimensions shown on plate 15.



Photo n°. 85

Photo n°. 85: Once the gunwale planking is in place, it is nailed on with 0.6 mm diam. treenails.



Photo n°. 88: The small knees, one of which is almost fully molded, using a shaped scraper. (contact paper for the pattern).



Photo n°. 89: The tool used to construct the parts - I use an old hacksaw blade that I file to the desired shape.



Photo n°. 92: A front view of the small knees glued to the hull - we can start the head timber and main rails. Head timber dimensions: 3 x 2 mm.



Photo n°. 90: To cut the molded bead in the best conditions, I glue the part to a smooth piece of board to insure that the tool will slide smoothly. Once the cutting work is complete, I remove the part using a solvent (acetone will dissolve any glue, even cyano).

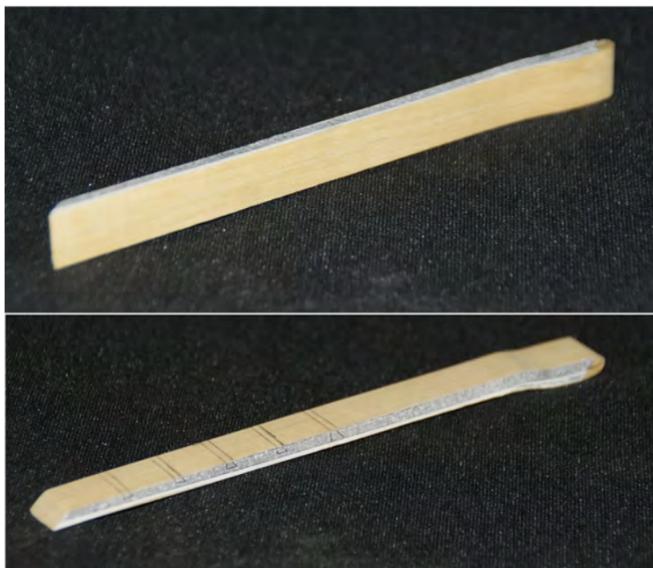


Photo n°. 93: The length of the head rails is calculated based on plate 15. Other dimensions are (46) beak 3 x 2 mm. The main rails are in two pieces that are glued together for construction and finishing. Once shaped, a bead must be cut.



Photo n°. 91: The small knees of the head in place.



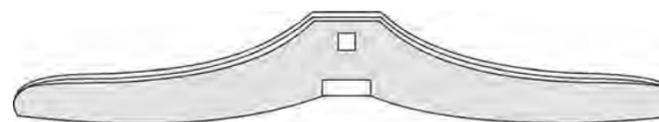
Photo n°. 94: The two parts of the main rail have been separated and ready to cut the bead.



Photo n°. 95: The main rails are in place - The five small beams may now be prepared.



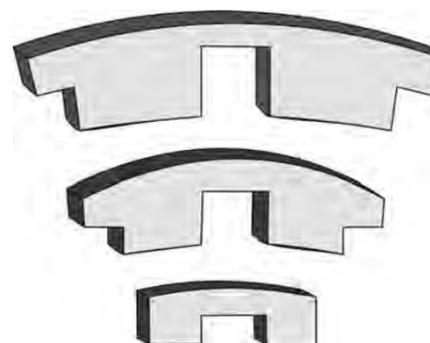
Photo n°. 96: Overhead view of the main rails, beak and small beam n°. 1



Drawing n°. 12: Small knee n°. 1. The square opening is for the bowsprit (bertelot) step; the rectangular notch fits into the beak.



Drawing n°. 13: Small beam n°. 2. The middle, rectangular notch fits on the beak. It is connected at its ends to the main rails with dovetails.



Drawing n°. 14: Small knees 3, 4, and 5. As for small knee n°. 2, The ends are dovetailed to the main rails and the middle notch fits on top of the beak.

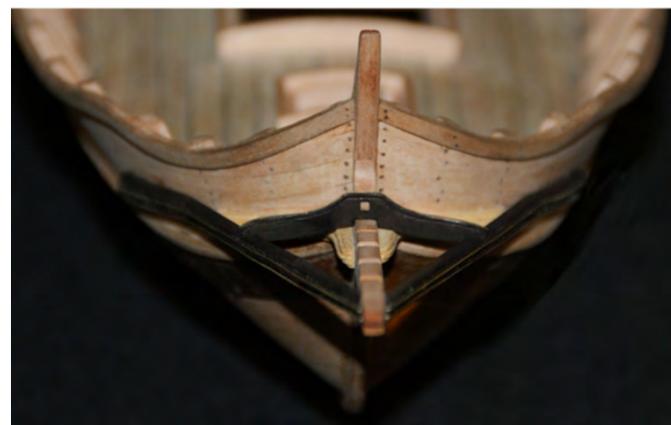


Photo n°. 97: Front view of the same.

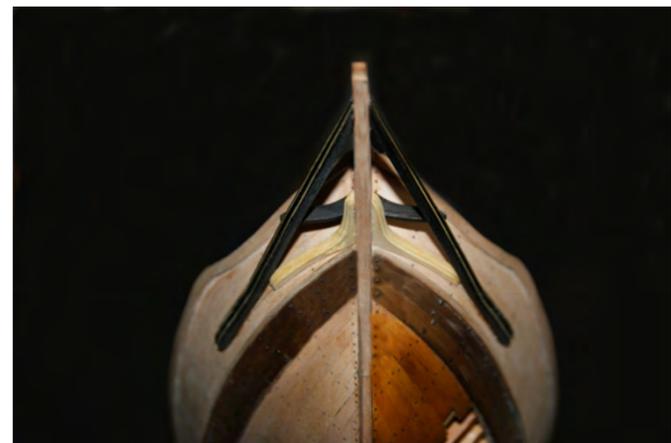


Photo n°. 98: Underside view with the wales, small knees, main rails and small beams.



Photo n°. 99: Side view of the head: the small beams are in place.



Photo n°. 100: Overhead view of the head with the five small beams in place.



Photo n°. 101: Overhead view of the head and deck. The top rail will be installed later.

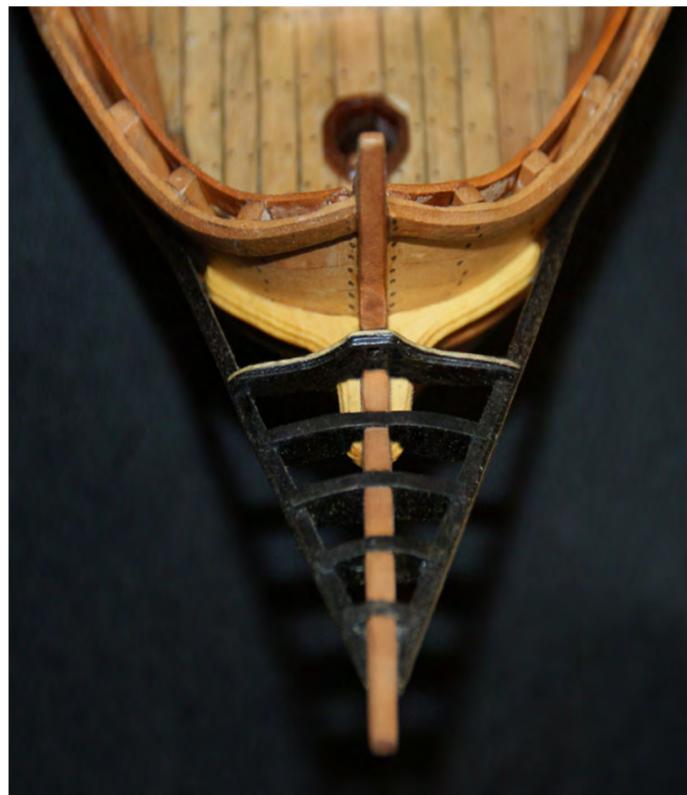


Photo n°. 100a: Enlarged overhead view of the top of the head with the five small beams in place.



Photo n°. 100b: Small beam n°. 1 and the square hole for the bowsprit step

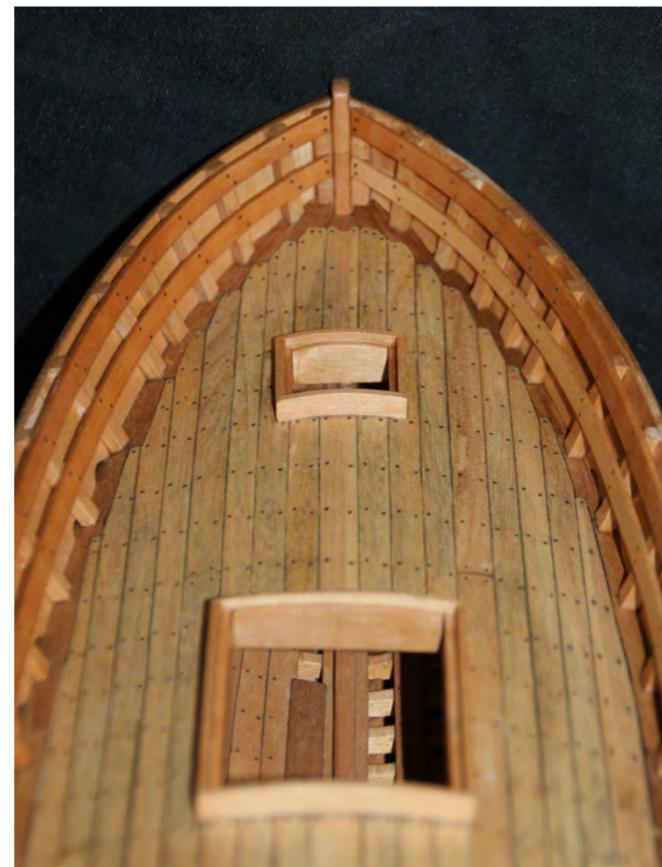


Photo n°. 102: Overhead view of the stern - bulwark planking (38) and ceiling (39).  
Bulwark planking strakes dimensions: 1.5 x 5 mm  
Ceiling strake dimensions: 1.5 x 5 mm



Photo n°. 104: Overhead view of the head with the top rail installed (61). Dimensions of the top rail: 1.5 x 8.



Photo n°. 105: Detail of the top rail at the stem. Note the square hole for the bitt (or knighthead).



Photo n°. 103: Overhead view of the bulwark ceiling.



Photo n°. 106: The top rail at the stern.



Photo n°. 109: Detail of the stern: top rail, sheer rail, bulwark rail, main and small stern hatches.



Photo n°. 107: Detail of the top rail at the stem. Note the two square openings for the bitts.



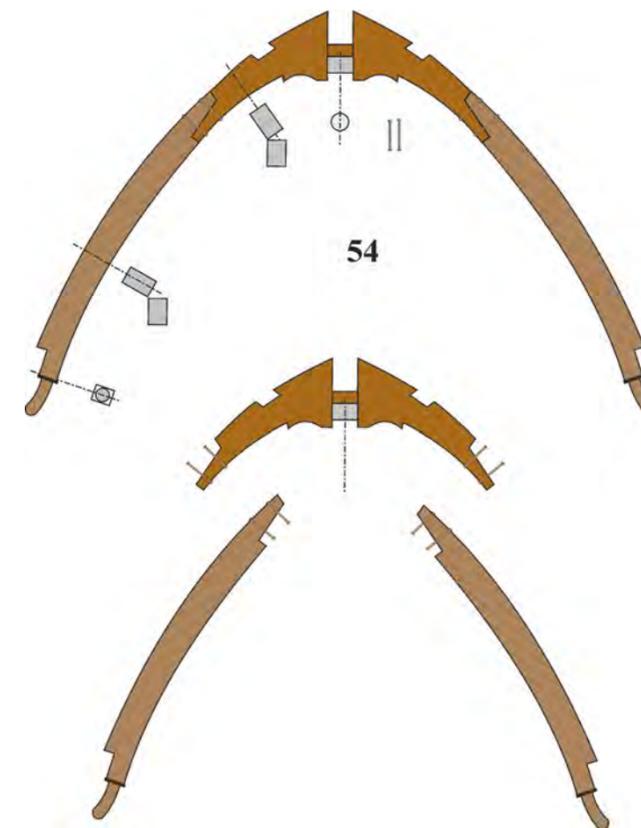
Photo n°. 110: The bitts are in place in the top rail. The foremast wedges (32), the small and main hatches are in place.



Photo n°. 108: This overhead view of the stem shows the holes in the top rail for the bitts. The completed head structure, The foremast wedges (32), the small hatch opening and part of the fore main hatch..



Photo n°. 111: Overhead view of the deck with the breasthook (54) in place.



Drawing n°. 15: Detail of the components of the breasthook.

Photo n° 112



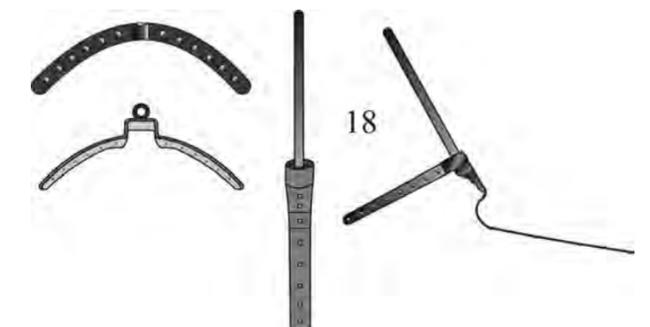
Photo n°. 112: Overhead view. The head and main rails, the top rail bitts, the breast hook (54), the foremast partners, (32), the small hatch and the main fore hatch, the mainmast partners.



Photo n°. 113: Detail of the stem, installation of the rudder ironwork.



Photo n°. 114: Detail of the ironwork.



Drawing n°. 16: The stern ironwork.

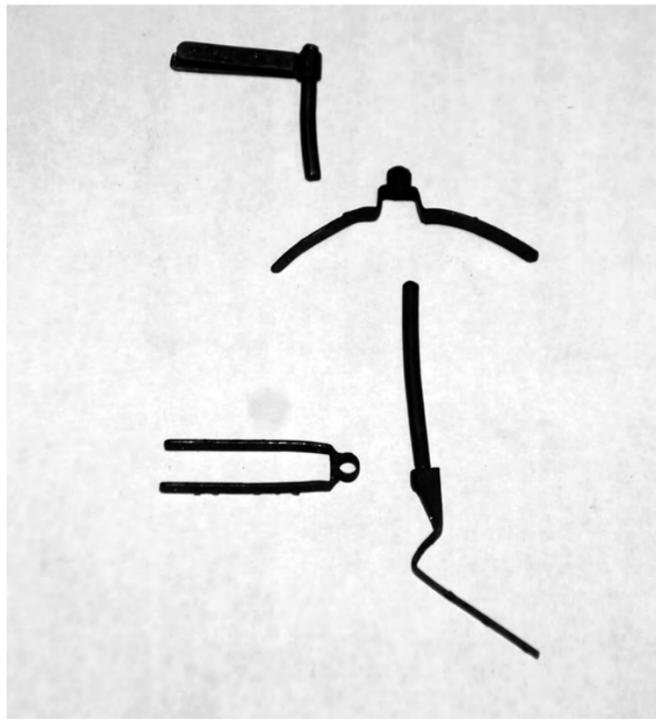


Photo n°. 115: Completed pintles and gudgeons.

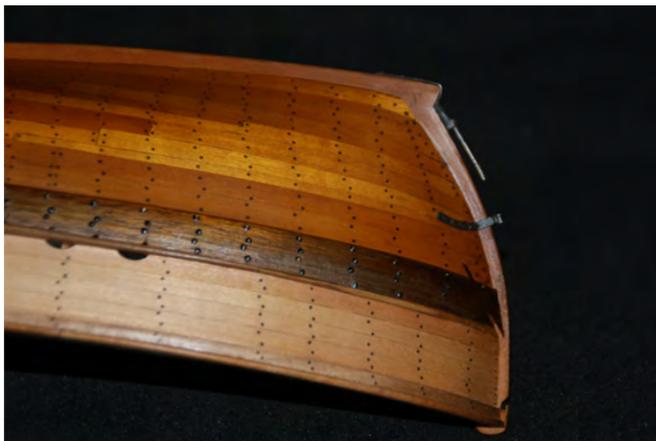


Photo n°. 116: Side view of the upside-down hull. Detail of installation of the ironwork.

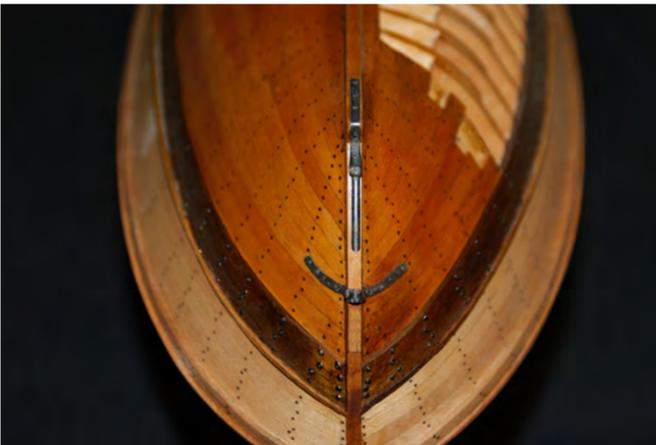
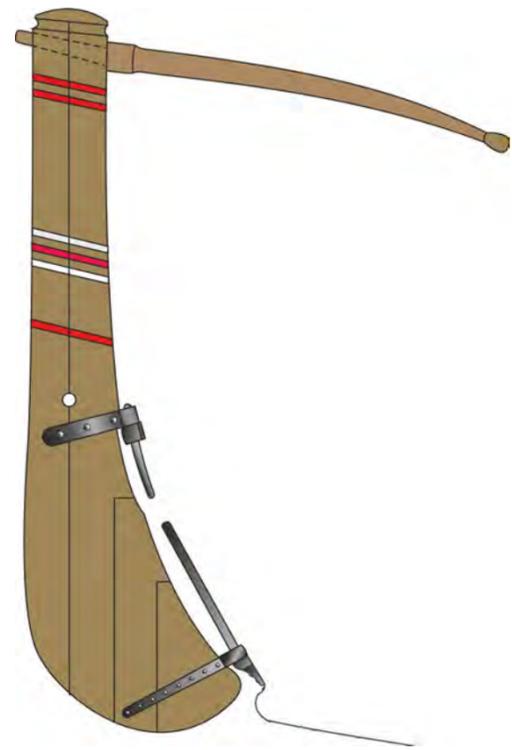


Photo n°. 117: Front view of the upside-down hull with the ironwork; the lower pintle is nailed to the keel.



Drawing n°. 17: The rudder blade, tiller and ironwork.



Photo n°. 118: The completed rudder with tiller in place. A hole for the rudder preventer rope next to a pintle and below, a gudgeon.

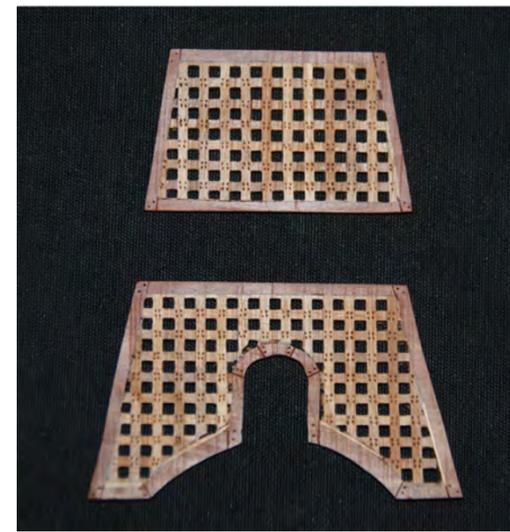


Photo n°. 119: The two gratings.



Photo n°. 120: Construction of the wings, inside view: the gratings and stern board have been installed.



Photo n°. 121: A view of the side of the hull. The two rectangular holes are for vertical risers that; will serve to anchor the sides of the cadrega. Below the longitudinal timbers that support the wings.

anchor the sides of the cadrega. Below the longitudinal timbers that support the wings.



Photo n°. 122: Overhead view of the stern. One may visualize the small beams that support the gratings, the support timbers, as well as a cross-beam underneath.



Photo n°. 123: A view of the underside. The small knees, support timbers for the wings, and cross-beam.



Photo 124

Photo n°. 124: The cadrega. Inside of the wings with completed planking. The wing support posts may be seen: the stern-knee (55) is in place between the bulwark planking.



Photo n°. 128: The wings - starboard view.



Photo n°. 125: Stern knee (55).



Photo n°. 126: Inside view of the still incomplete cadrega.



Photo n°. 129: Outboard view of the wings and the stern board.



Photo n°. 127: The stern knee in the foreground.



Photo n°. 130: Inside view of the stern. Two additional support ports have been added and the wings top rail has been installed.



Photo n°. 131: Overhead view of the stern area, detail of the helm-port for the rudder post.



Photo n°. 132: The cadrega: The outside of the wings; the top rail is in place.



Photo n°. 133: The almost-completed cadrega. Installation of the arch the wings cross-beam.



Photo n°. 134: The cadrega - 3/4 overhead view.



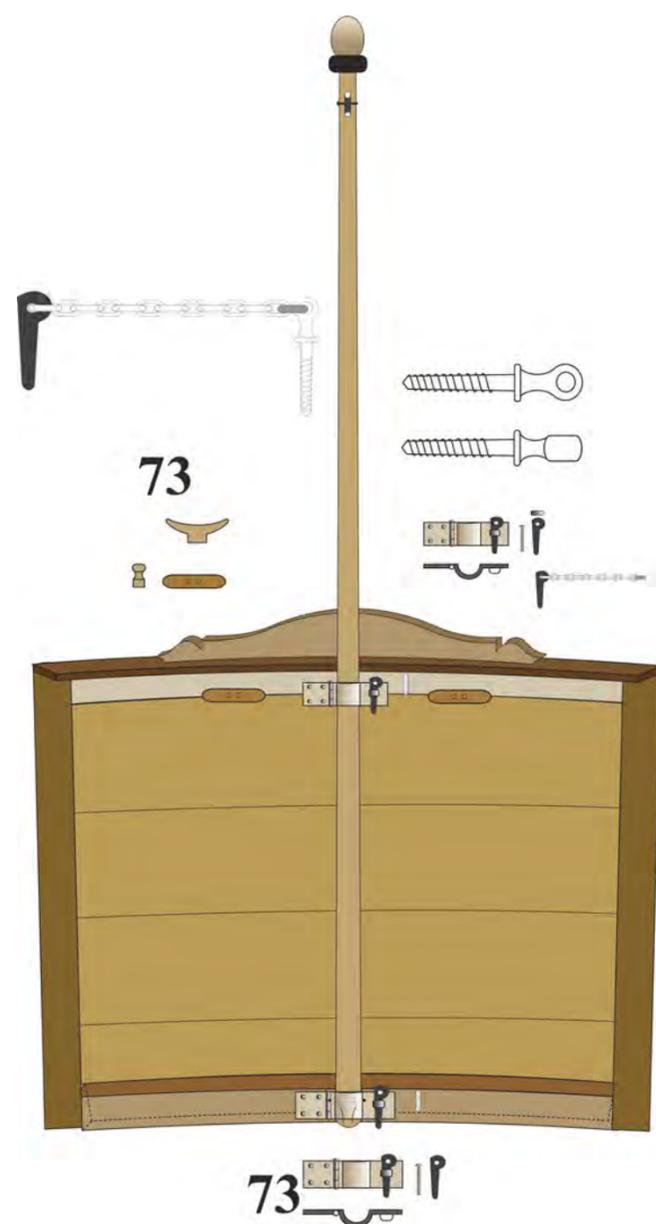
Photo n°. 135: Close-up view of wings structure.



Photo n°. 136: Detail of the inside face of the stern board, ironwork for the installation of the flagstaff. Two hinged collars (73) locked by pins hanging from an eyebolt with a small chain, two small cleats for the flagstaff halliard.



Photo n°. 137: Hinged collars, eyebolts, pins, chains.



Drawing. 18 Tav. 15



Photo n°. 138: Making a pin.

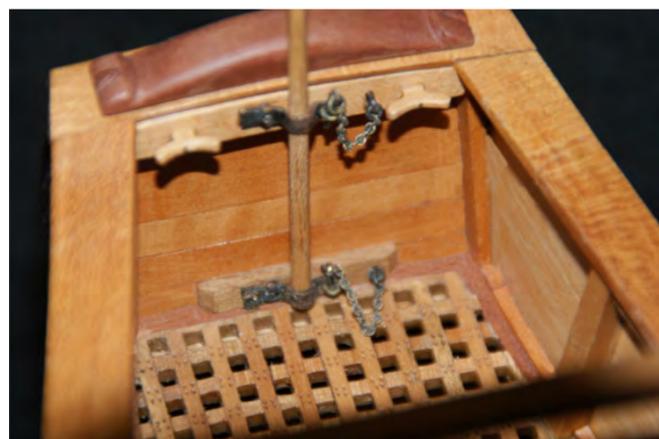


Photo n°. 139: Foreground view of the inside face of the

stern board and experimental mounting of the flagstaff. The pins, retained by their chain have been inserted in the



Photo n°. 140: Completed structure of the stern. The top of the rudder juts through the helm-port and the tiller is in place.

eyebolts.



Photo n°. 141: The completed structure, the wings decoration can be perceived.



Photo n°. 142: Decoration of the wings - They have been painted as on the original vessel. The cartouche on the right represents the Government of Genoa, a coat-of-arms bearing a red cross over a white background. At left, the Vicariat of Porto Maurizio (Imperia) under the Sanremo government represented by a coat-of-arms bearing the three towers. The Vicariat of Porto Maurizio extended itself over a magnificent community made up of eight localities: Bordighera, Borghetto, Vallebona, Vallecrosia and Porto Maurizio.

The two cartouches are topped by a strip bearing a frieze of flowers and leaves. This type of frieze may also be found on the facade of palaces of the same era. The decor may then be either painted or carved in bas-relief.



Photo n° 143

Photo n°. 143 and 143 a: Cadrega decorations seen from both sides.

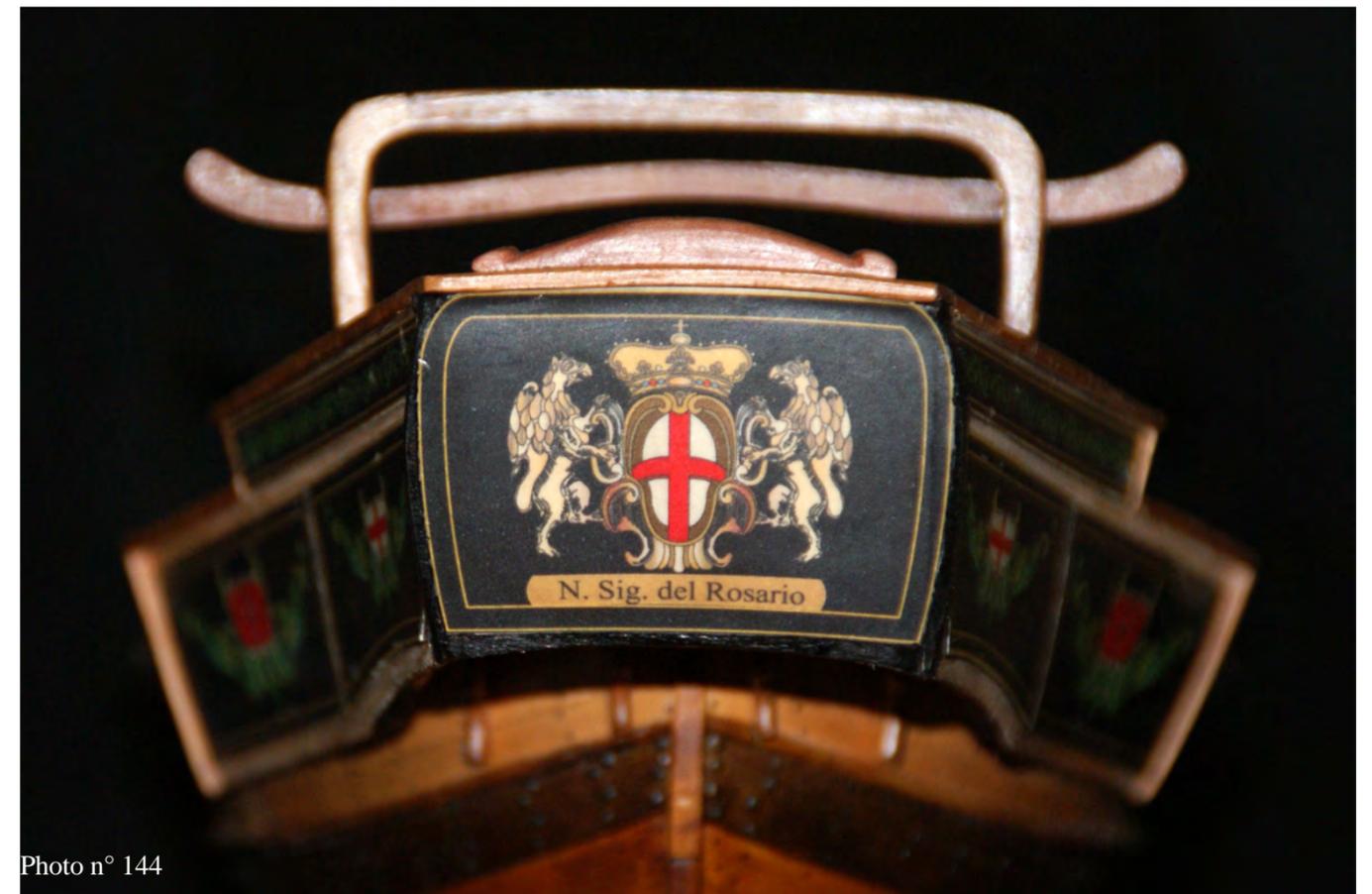


Photo n° 144

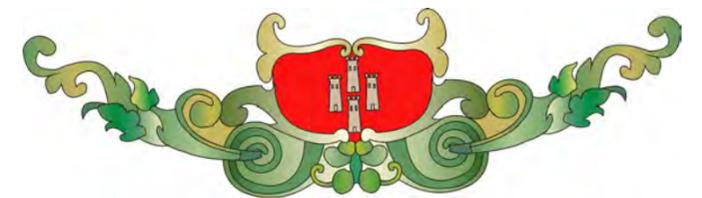
Photo n°. 144: The stern-board bears the coat-of-arms of the Duchy of Genoa and the ship's name. Like the wings, the stern-board and the name of the ship are painted.

### Implementation of the Decorations.

As previously mentioned, the decorations are painted. They may be done in two ways:

1° If one is expert in drawing technique, and decoration, watercolor or wash, they may be hand-painted.

2° If not and we still want to produce an acceptable decor, it may be printed in color and glued on. Once completed, it should be protected by a layer of varnish for tercolor that may be found in specialized stores.



Drawing 19a: Plate 15. Coat of arms representing the Vicariat of Porto Maurizio under the orders of Sanremo: three towers over a red background.



Drawing 19b: Plate 15. Coat of arms of the Government of Genoa: a red cross over a white background.



Drawing 19: Plate 15. Frieze of flowers and leaves.



Photo n° 143a



Photo n°. 145: The rudder is in place as well as the flagstaff. The construction of the stern is complete.



Photo n°. 148: Figurehead - enlarged picture.



Photo n°. 150: The stern is complete! Note the structure of the wings, the tiller, the small stern hatch with its cover and cleats to the sides.



Photo n°. 146: Construction of the stem. At the tip of the beak is a carved bird.

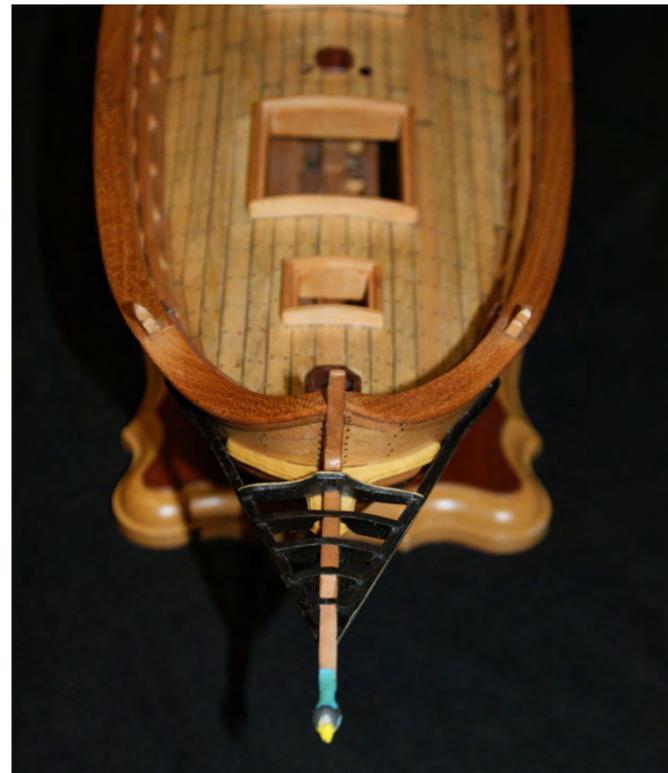


Photo n°. 149: The completed head. The beak can be seen as well as the two bitts, the small and the main hatch.



Photo n°. 147: The head from another angle.



Photo n°. 151: Starboard port. The structure of the wings, the tiller, the small stern hatch and its cover, the cleats on the sides, the open after main hatch, the mainmast with the pumps and cleats to the sides, the fore main hatch and its cover.

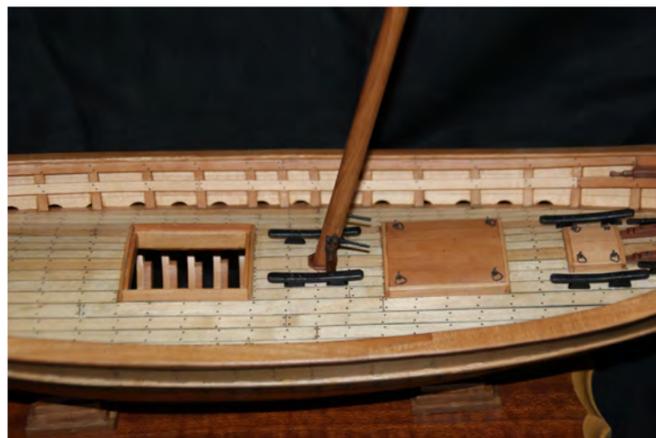


Photo n°. 152: The midship deck. The after main hatch is open, the mainmast with the pumps and cleats, the fore main hatch with its cover, the closed fore small hatch and cleats to the sides.



Photo n°. 153: The forward deck. The open after main hatch, the mainmast with the pumps and cleats to the sides, the fore main hatch with its cover, the closed fore small hatch and the cleats to the sides, the riding bitts and the foremast.



Photo n°. 154: The forward deck. The fore main hatch and its closed cover, the closed fore small hatch, the great cleats and two smaller cleats to the sides of the foremast, the

two bitts in the top rail and the beak.



Photo n°. 155: As before: Detail of the riding bitts and the breasthook.



Photo n°. 156: Close-up of the forward area.



Photo n°. 157: Underside view of the stern decorations, the stern-board, the rudder ironwork, the gratings and the rudder.



Photo n°. 158: Another view of the stern decorations.



Photo n°. 159: Overhead view of the stern.



Photo n°. 160: Side view of the hull with the masts in place. The ringbolts for the running rigging are not yet in place.



Photo n°. 161: Starboard view.



Photo n°. 162: Forward view of the hull aft quarter.

## The Bowsprit (Berthelot).

Pour les navires latins le berthelot est l'équivalent du beaupré. Celui de la felouque est en général un espar très court qui présente une légère courbure vers le bas. Cette courbure se réalise à chaud une fois le façonnage terminé.



Photo n°. 163: The berthelot on the lathe. To make it, you must start from a 6 x 6 mm square piece and refer to plate 16 for the dimensions.

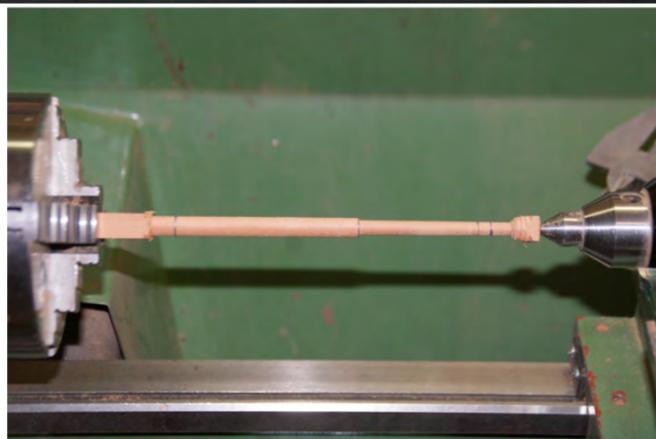


Foto n° 164 - La prima fase di lavorazione al tornio è terminata.



Photo n° 165

Photo n°. 165: In a second step, I use the milling machine to make the eight-sided end part of the spar. I then put it back on the lathe to fashion the rounded head. Finally, I remove it from the lathe to make the tenon that will fit into the gripe.



Photo n°. 166: The berthelot before being bent.



Photo n°. 167: The bending done, the berthelot is now complete.



Photo n°. 168: The comparison with a straight stick shows the amount of curvature to be given the berthelot.



Photo n°. 169: Detail of the berthelot; the eight-sided section with the offset tenon - the lower end of the eight-sided section is cut flat for a better fit to the gripe.



Photo n°. 170: Detail of the berthelot: the truncated-cone section and the ball at the tip. The curvature can hardly be seen on the picture.

Photo n°. 171: Everything is ready to install the berthelot.





Photo n°. 172: The berthelot in lace on top of the beak. The gammoning (1.00 mm line) holds it to the beak.



Photo n°. 173: The berthelot in place, viewed from the port side.

## Rigging.

To begin with, we must prepare ropes of all diameters that will be needed: hawsers and cables. Dimensions are shown on plate 18 and will be repeated along this description.



Photo n°. 174: Completed ropes. We next go on to preparing eyebolts.



Photo n°. 176: An eyebolt being made. Once the piece of wire has been wrapped around a pin of the right diameter, it is partially made. At this stage, I prepare the eyes. To do this, I take a pin or a drill bit of the right diameter and make a spiral by twisting the brass wire around the drill bit. I then cut each turn of the spiral to make rings.



We next go on to the construction of eyebolts.

Photo n°. 175: Eyebolts in two different sizes are made with brass wire of 0.6 mm diameter.



Photo n°. 177: An eyebolt, a spiral and two rings, with the drill bit used to make the spiral. We now go on to finishing the eyebolt.



Photo n°. 178: Completion of the eyebolt. Slip a ring on the shaft, place the whole on a heat-proof pad, and solder with tin solder. The heat-proof pad is a Magnsia Solderin Block and may be purchased in the US: <http://www.ottofrei.com>.



Photo n°. 179: The three elements and the completed and blackened eyebolt.

We now proceed to step three and the construction of tie different types of blocks.



Photo n°. 180: The construction of the large and smaller halliard blocks (tailles in Mediterranean parlance), is similar. I prepare wood sticks that I glue together, leaving space for the sheaves in mortices. Originally these blocks were made of elm wood.

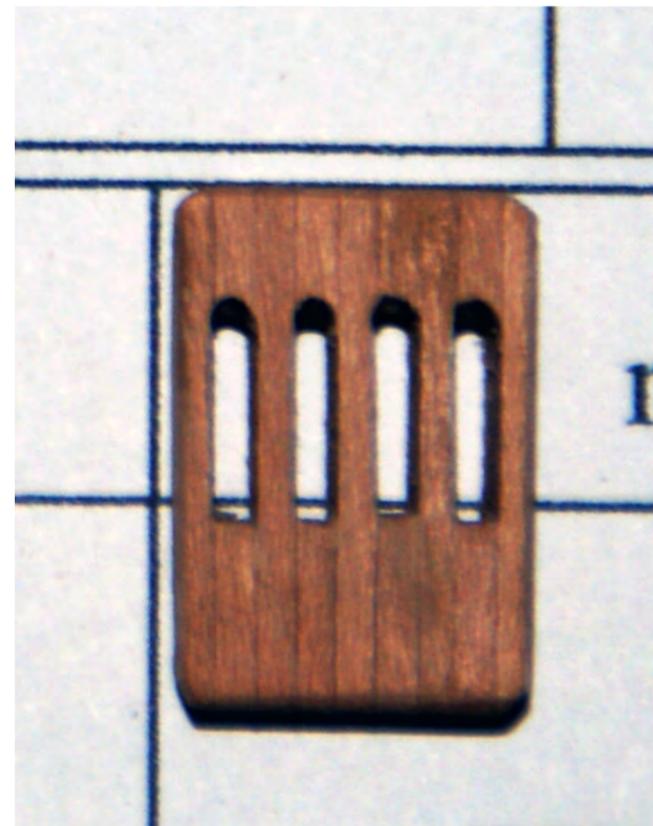
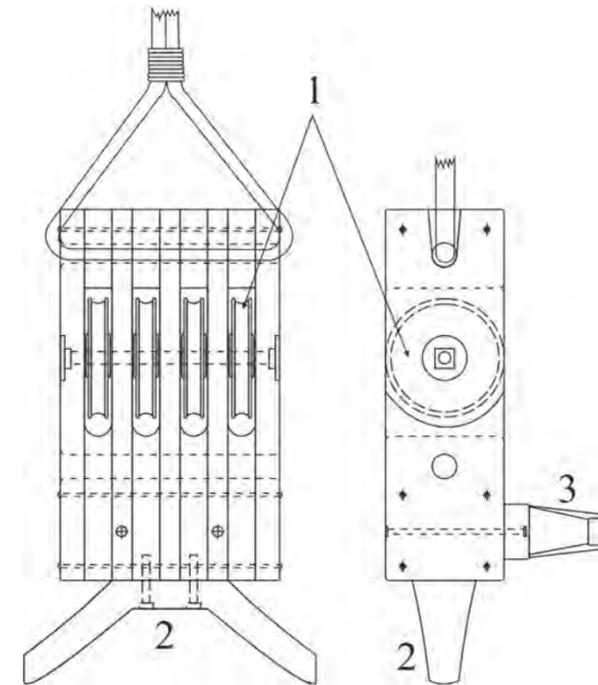


Photo n°. 181: The large block (lower block) is made in four parts. Above, the main part of the block.

## The lower block.



Components of the lower block:

- 1 The sheave
- 2 The cleat
- 3 The spreader

Drawing 20: The lower block (16g) - for dimensions, see plate n°. 16. Note the location of the spreader.

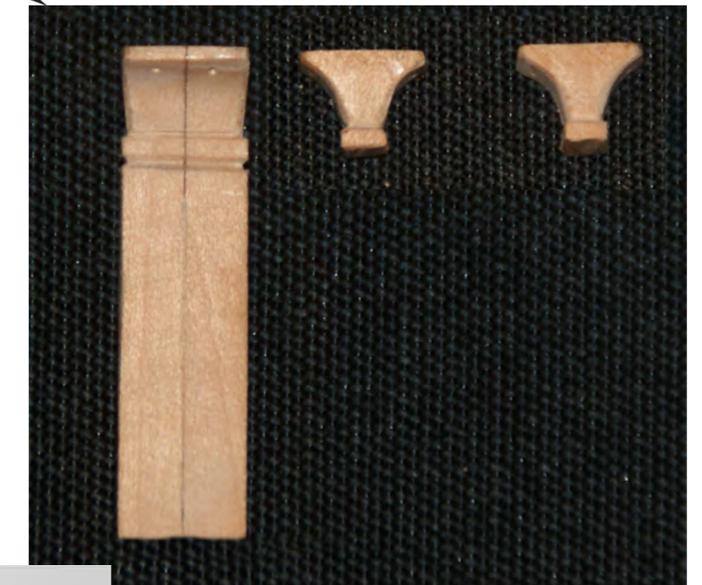


Photo n°. 182: Construction of the two spreaders.

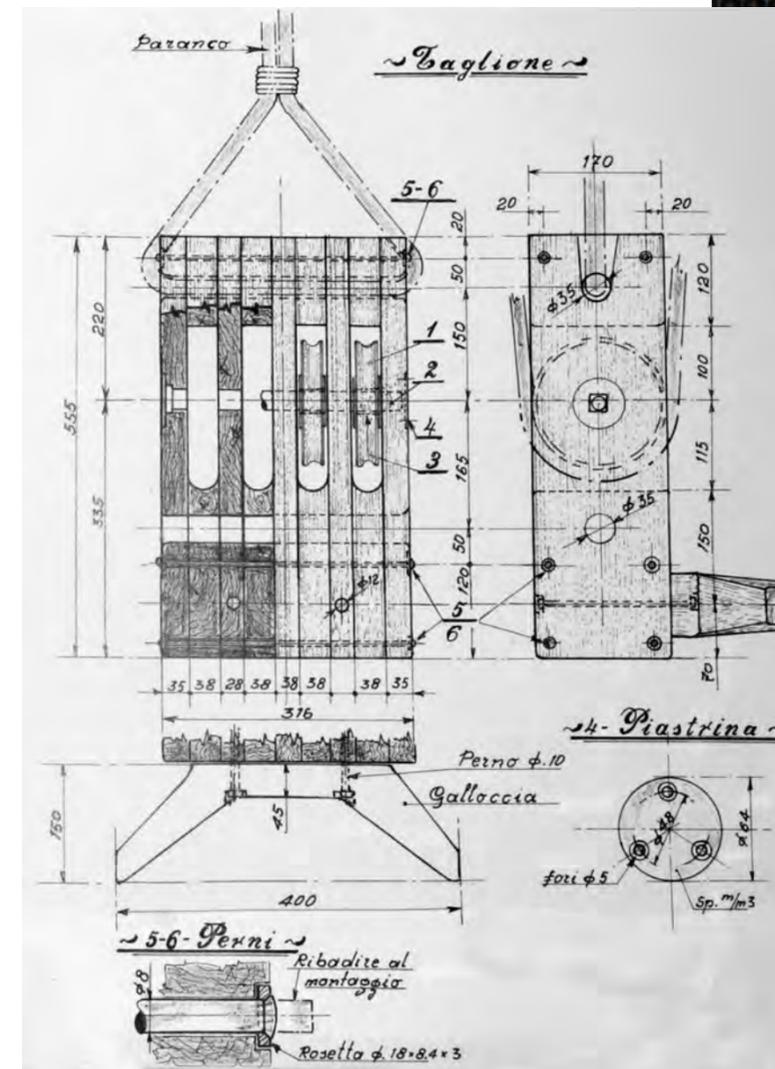


Photo n°. 183: The two cleats.

Drawing 21: Original drawing of the lower block.



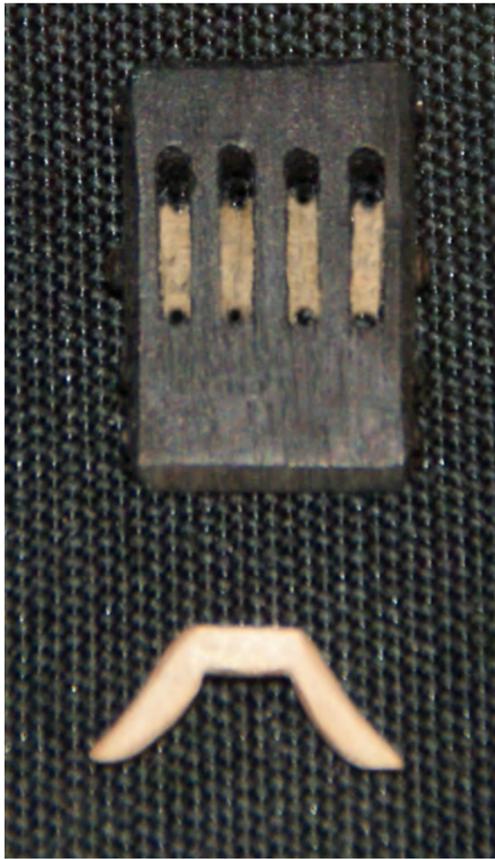


Photo n°. 184: The lower block ready for assembly.

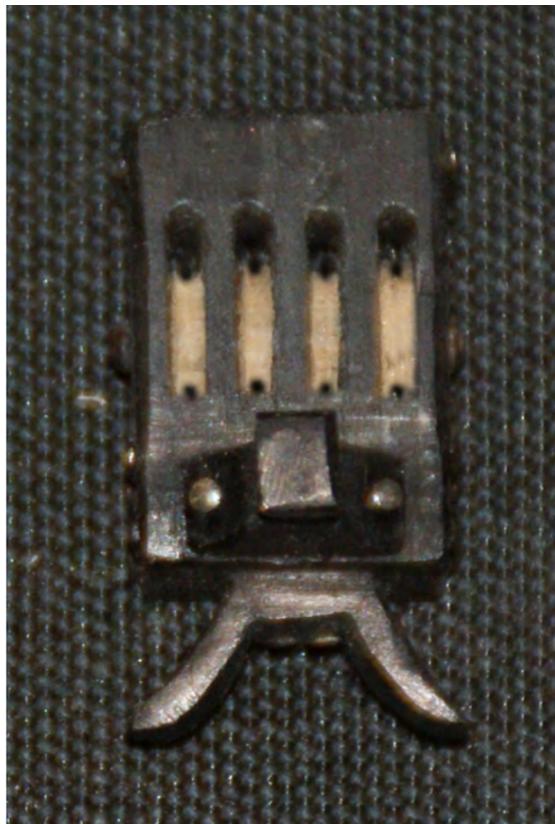


Photo n°. 185: The completed lower block. The spreader and cleat can be seen.

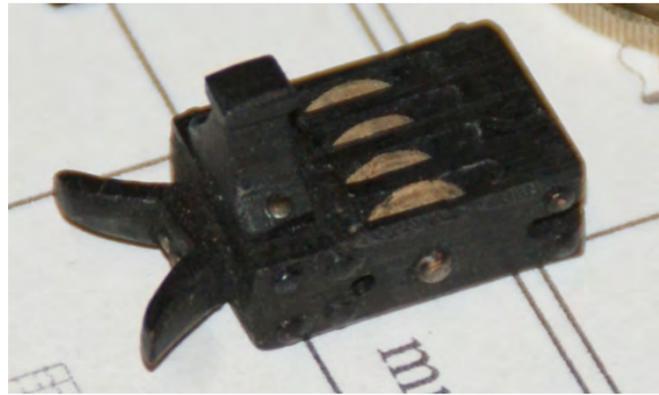


Photo n°. 186: The lower block, complete with cleat, axle and sheaves. The rivets holding the block together can also be seen.

### The upper block.

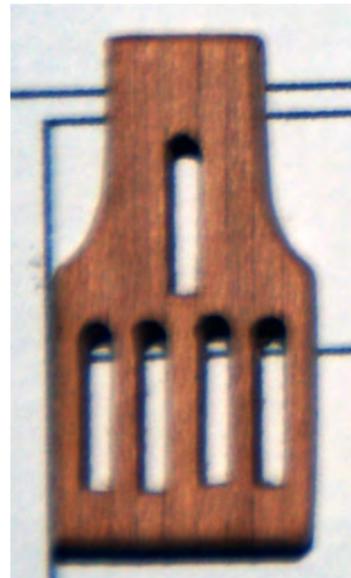
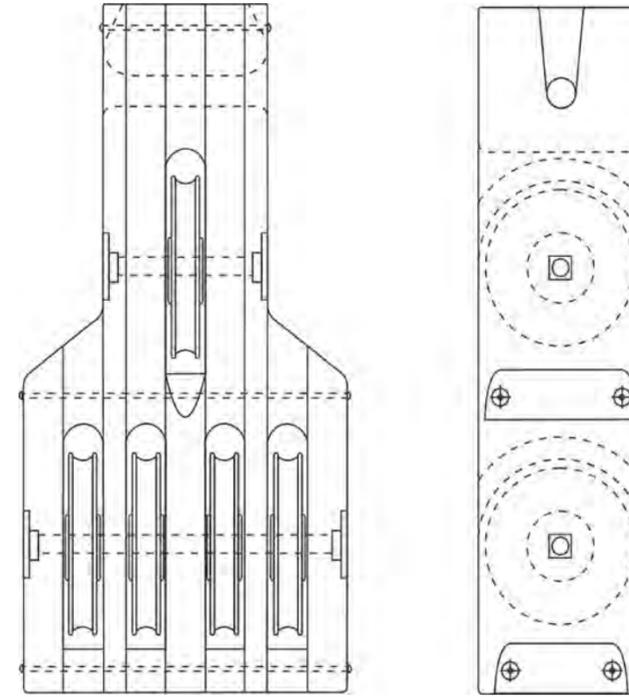


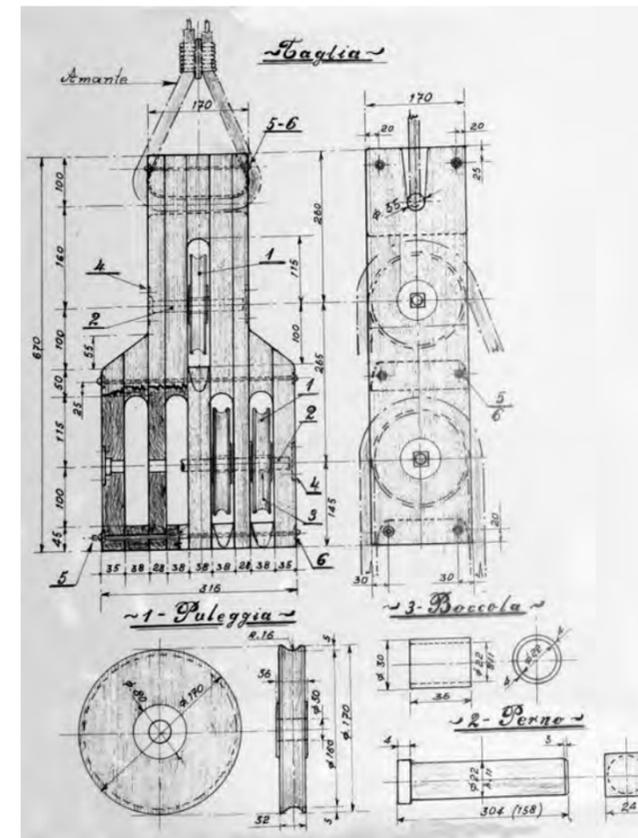
Photo n°. 187: The upper block is made in two parts: the shell and the sheaves.



Photo n°. 188: The completed upper block.



Drawing 22: The upper block (plate 18e) - face and profile.



Drawing 23: The upper block. Original drawing.

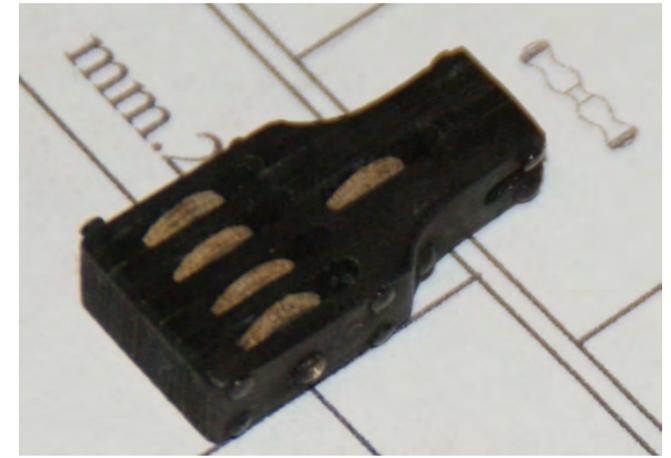
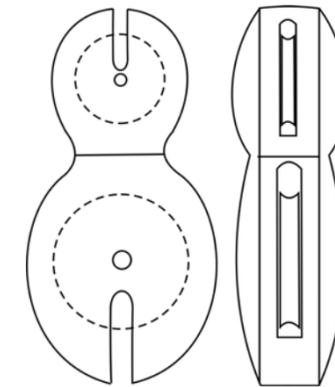


Photo n°. 189: The completed upper block. This picture shows the axles, the sheaves, the assembly rivets of the shell. Note the sheaves on two levels, specific to this block.

### The fiddle blocks.

They are made of two blocks that are joined one on top of the other, with one smaller than the other ( $\frac{3}{4}$  of the other).



Drawing 24: A fiddle block, full face and profile.

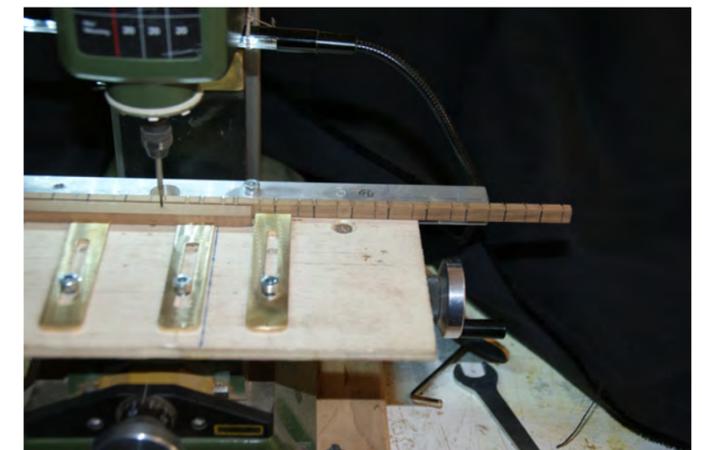


Photo n°. 190: I prepare some wood strips with the required dimensions and then cut in marquing slots.

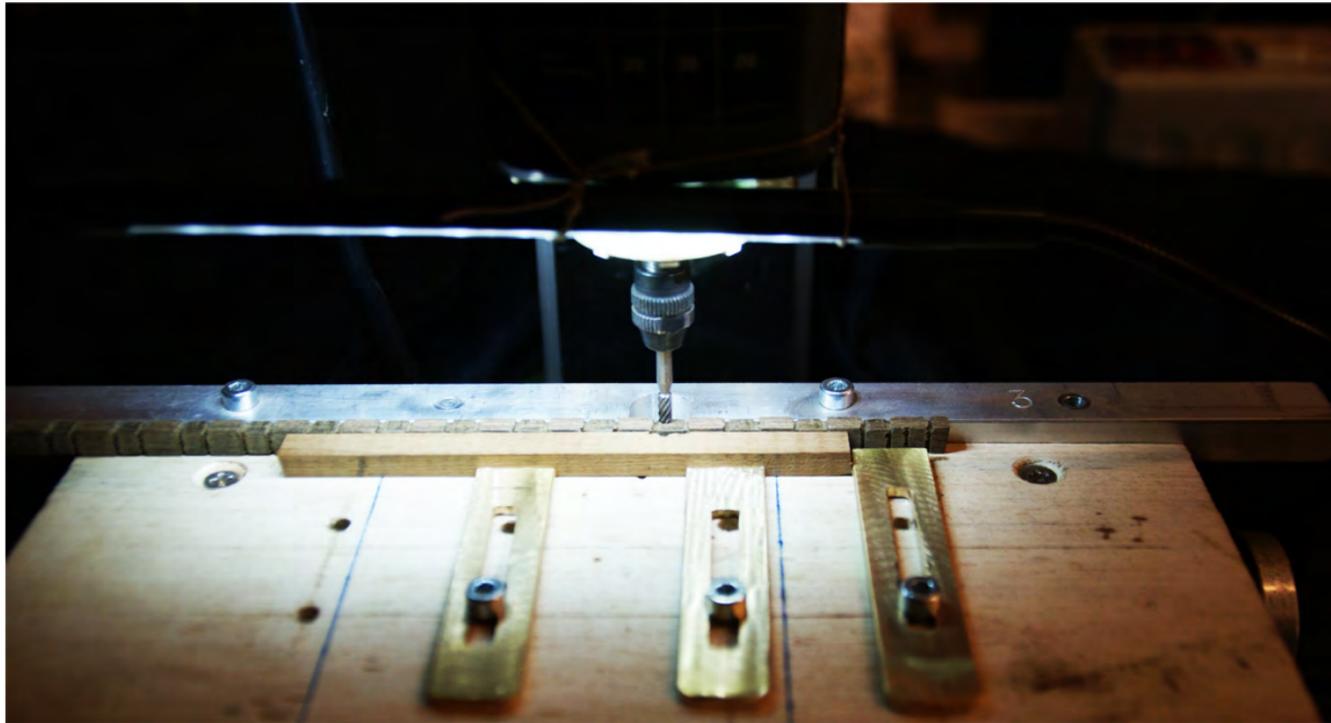


Photo n°. 191: The blocks are roughed-in at the location of the smaller shell.

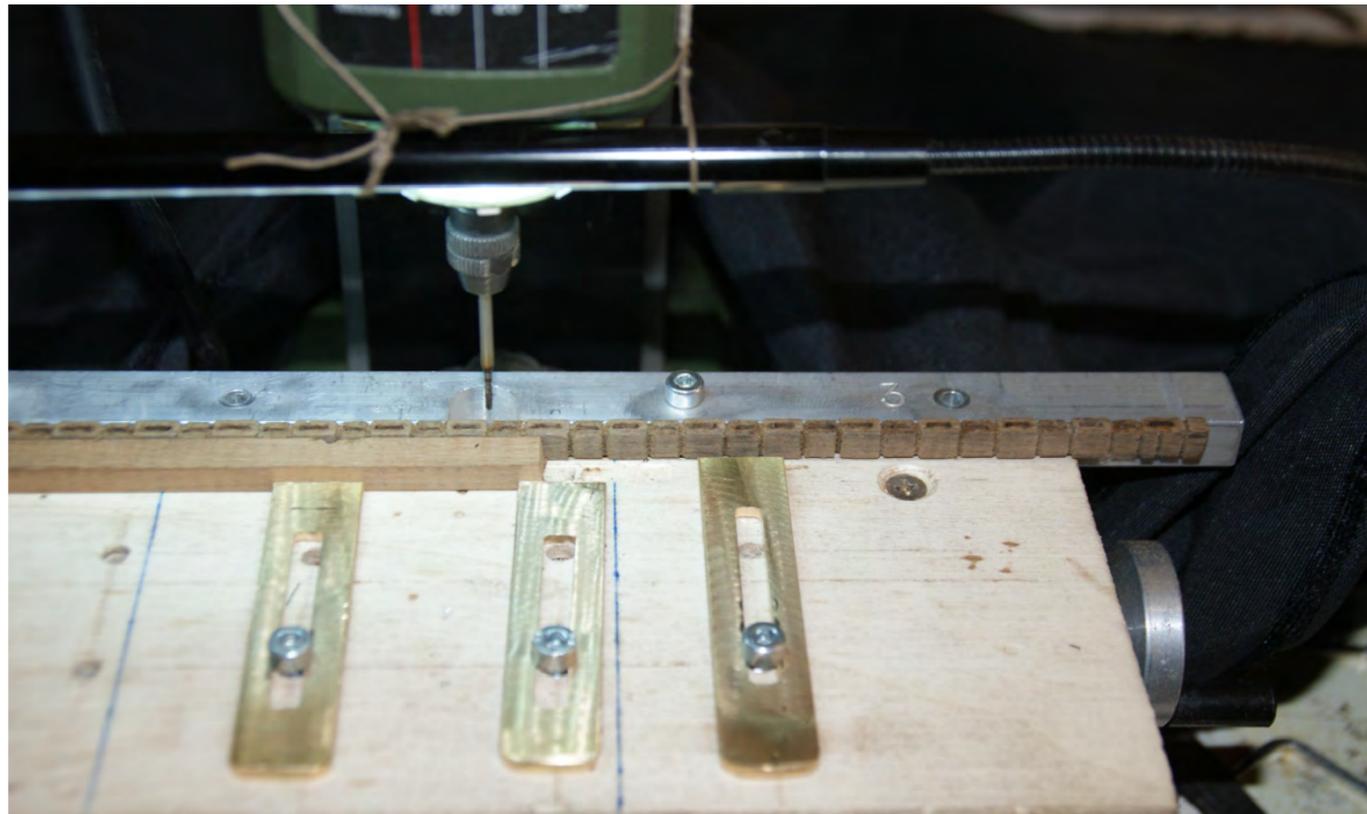


Photo n°. 192: The mortises are cut into the shell. The blocks are now ready to be cut out and shaped individually.

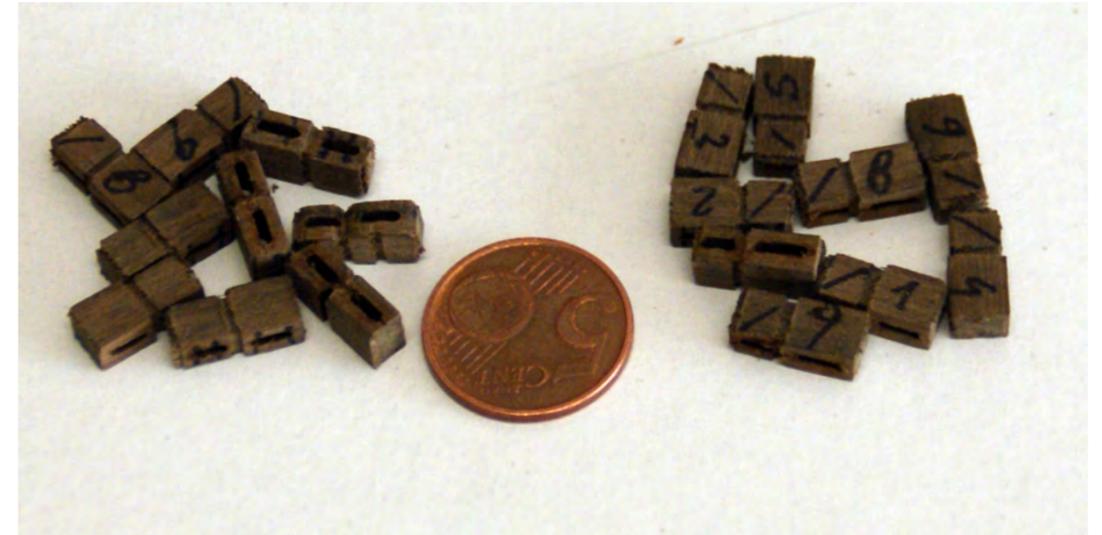


Photo n°. 193: The fiddle blocks have been separated.



Photo n°. 193: The fiddle blocks have been separated.

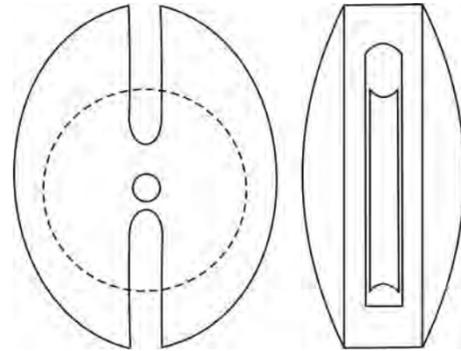


Photo n° 195

Photo n°. 195: Completed fiddle blocks with sheaves inserted.

Single and double blocks.  
The construction process for single and double blocks is similar to that for fiddle blocks as we shall see.

Drawing 25a: Single block.



Drawing 25b: Double block - face and profile.

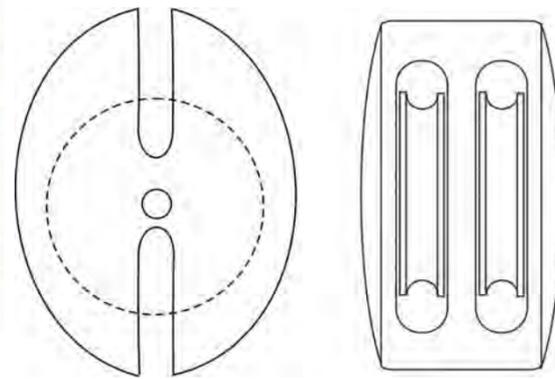


Photo n° 196

Photo n°. 196: In order to produce the blocks using my method, it is necessary to make some cutting tools. Two are needed for each block size. I will explain the use of these home-made tools in the following photos.



Photo n°. 197: I prepare some wood sticks of the correct dimension for the single or double block to be made. I then draw as many sections as needed corresponding to the block size with a pencil.

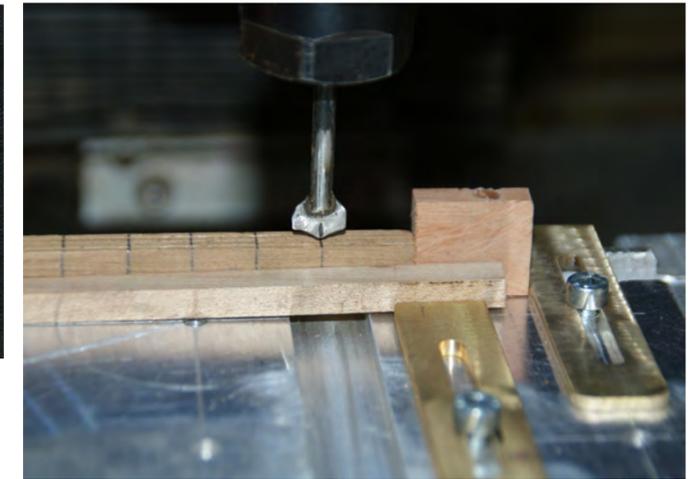


Photo n°. 198: Step two: using my tool n°. 1. I use it as a milling tool to shape the upper part of the shell.

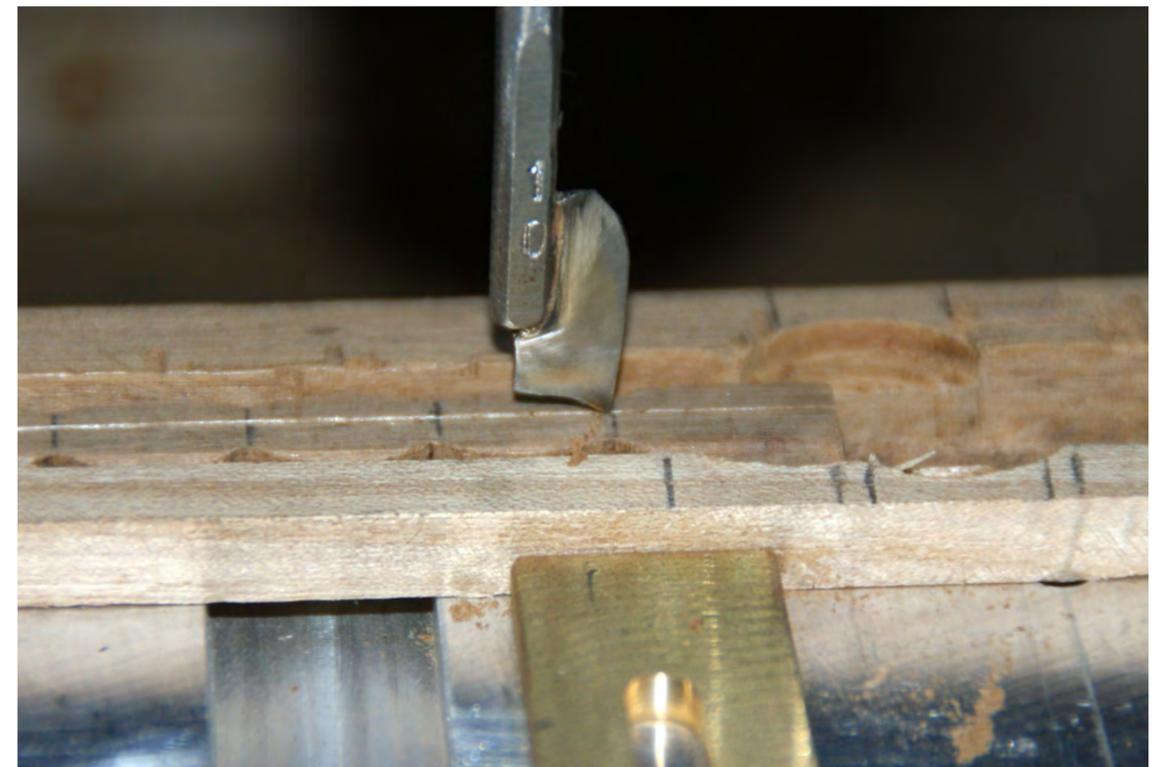


Photo n°. 199: Step three: rounding out the other two parts of the block, using my tool n°. 2.

Photo n°. 199: Step three: rounding out the other two parts of the block, using my tool n°. 2.

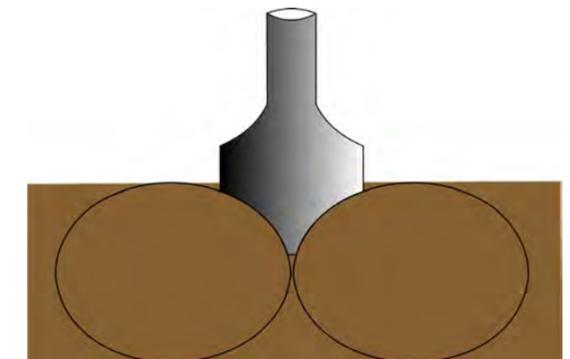




Photo n°. 200: Step four: Drilling out the body of the block using tool n°. 3, a milling bit.



Photo n°. 201: The result, after using tool n°. 1.



Photo n°. 202: The result, after using tool n°. 2.



Photo n°. 203: Last step: milling bit n°. 4 is used to cut the recesses for the strops.



Photo n°. 204: Completed single blocks, ready for the sheaves.



Photo n°. 205: Completed double blocks, ready for the sheaves.



Photo n°. 206: Completed single blocks.



Photo n°. 207: Completed double blocks.

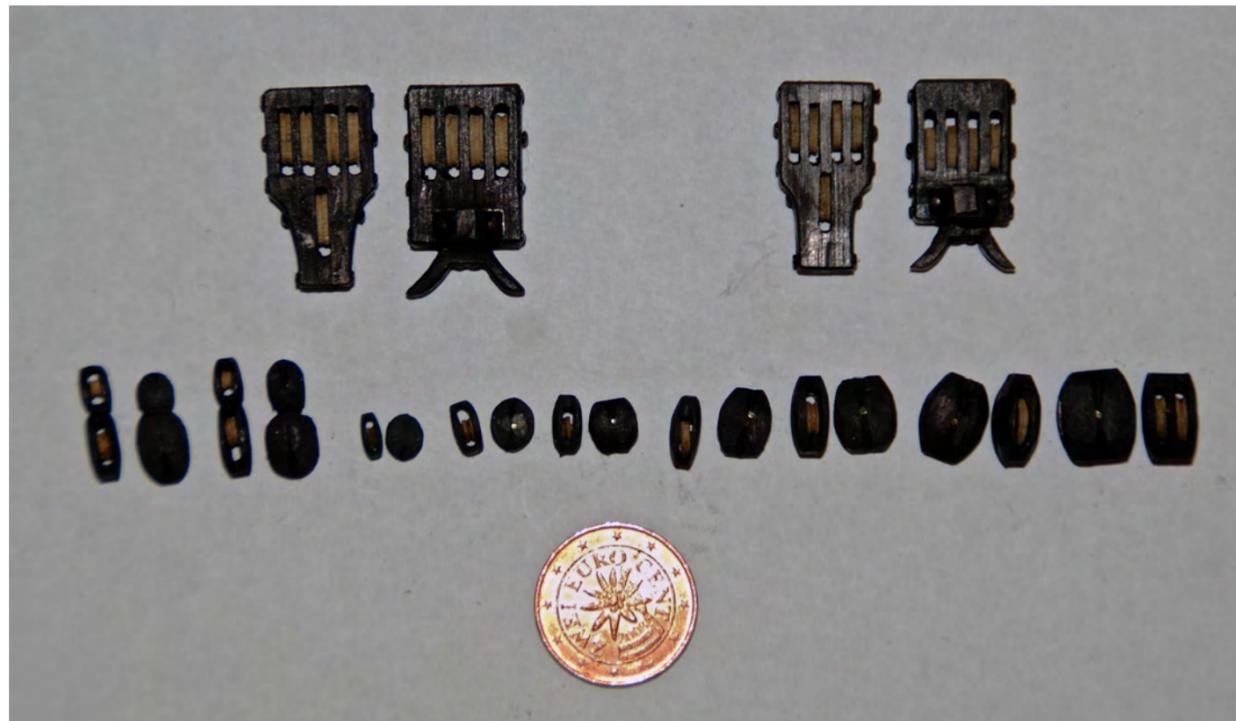
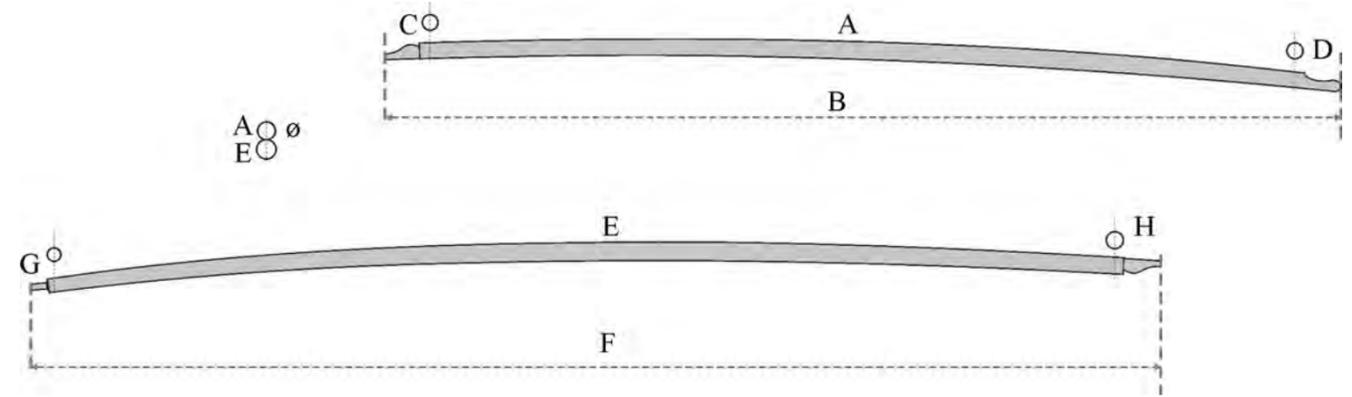


Photo n°. 208: A complete set of blocks.



## The yards

Yard dimensions:

Yard 74 for fishing  
 A - 5 mm diam.  
 B - 26.90 cm  
 C - 4.4 mm diam.  
 D - 4.5 mm diam.  
 E - 5.5 mm diam.  
 F - 31.82 cm  
 G - 3.8 mm diam.  
 H - 4.8 mm diam.

Yard 75 for fishing  
 A - 6 mm diam.  
 B - 33.41 cm  
 C - 5.4 mm diam.  
 D - 5.5 mm diam.  
 E - 65 mm diam.  
 F - 39.25 cm.  
 G - 3.8 mm diam.  
 H - 5.8 mm diam.

Yard 74a for coastal trading  
 A - 5 mm diam.  
 B - 44.47 cm.  
 C - 4.5 mm diam.  
 D - 4.5 mm diam.  
 E - 5.5 mm diam.  
 F - 52.40 cm  
 G - 3.0 mm diam.  
 H - 5.0 mm diam.

Yard 75a for coastal trading

A - 4 mm diam.  
 B - 36.25 cm.  
 C - 3.8 mm diam.  
 D - 3.8 mm diam.  
 E - 4.5 mm diam.  
 F - 42.64 cm  
 G - 2.6 mm diam.  
 H - 4.0 mm diam.

## Yards construction.

Each yard, either fore or main is made of two parts. They are made in the same manner.

## Rigging the yards.

The yards are made of pine wood in two parts and attached in their mid section. The longest spar called a « quart » is left with a circular section. The other piece, the « penne » has a carved channel along the part that connects to the « quart ». Each section is connected to the other at the middle over one third of their length. They are held together with bindings, located at 30 cm from each other and finished with a reef knot. The difficulty in making the yards is in the precise carving of the mating surfaces between the « quart » and the « penne ».

To obtain the correct curvature, several procedures are possible, but the most appropriate is to first make a template.

Once the two spars have been bent to shape, the procedure is as follows:



Foto n° 209

- 1° The two pieces are assembled as in reality.
- 2° The two spars are bent to shape, glued, and bound with woolding.

We should proceed as follows: glue the two spars, carve the two tips and lay the yard against the template. Once the glue has set, carve the other ends. A main yard and its sail may have weighed up to four tons. Their strength but also their flexibility were considerable. The halliard and the tackle had to have a large diameter. The handling was carried out by hand without the benefit of winches.



Photo n°. 210: Forward part of the yard.

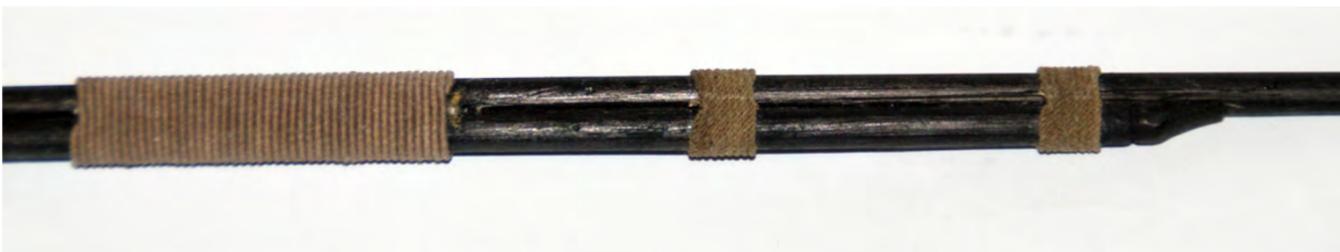


Photo n°. 211: Middle part of the yard.



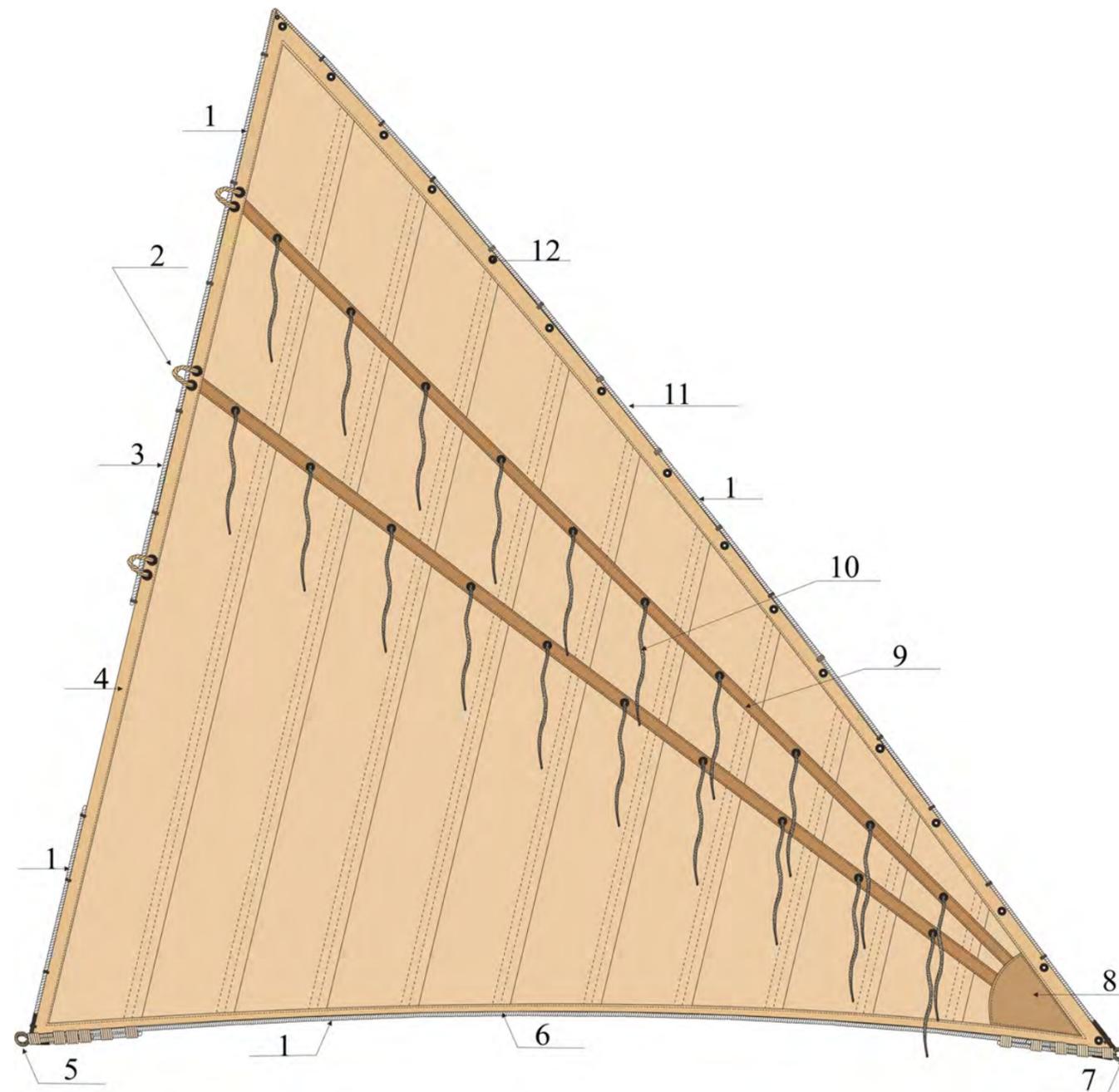
Photo n°. 212: The upper part of the yard, the « penne ».

### The sails.

The fore and main sails are the same in all their parts, except for their size.

A lateen (triangular) sail is bent to the yard with 0.85 mm diam. gaskets (« matafions ») that lead through an eyelet (one for each cloth strip) placed at about 26mm from each other on the main sail and 24 mm on the fore sail. At the point where the yard rubs against the mast,

a reinforcing rope is placed to protect both the mast and the yard. This rope is 1 mm in diameter. In order to reduce the sail surface, each sail has two rows of reefing gaskets. The gaskets are long enough to wrap twice around the yard. At the 1/36 scale, each gasket hangs by about 6-8 cm on one side of the sail. I suggest to place a small drop of fabric cement on each gasket to prevent them from curling. It will give the sail a nice look.



Drawing 27: A lateen sail.

- |    |                  |    |        |
|----|------------------|----|--------|
| 1  | Boltrope         | 12 | Eyelet |
| 2  | Cringles         |    |        |
| 3  | Leech            |    |        |
| 4  | Tabling          |    |        |
| 5  | Grommet          |    |        |
| 6  | Boltrope         |    |        |
| 7  | Brace            |    |        |
| 8  | Brace tabling    |    |        |
| 9  | Reef band        |    |        |
| 10 | Reef gasket      |    |        |
| 11 | Head of the sail |    |        |

## Sail surface at the 1:1 scale.

For sardine fishing:  
Main sail 74.84 square meters  
Fore sail 47.17 square meters  
For coastal trading:  
Main sail 77.99 square meters  
Fore sail 56.97 square meters

Components of a lateen sail (drawing 27):

Sailcloth strips: strips of cloth sewn together to obtain the desired surface.

Tabling: a reinforcing strip of sail-cloth sewn on the three edges of the sail and on which the boltrope was sewn.

Head of the sail: the upper edge of the sail which is bent to the yard.

Foot of the sail: the lower edge of the sail

Thimbles: Rings located at the sail corners

Boltrope: a three-trand flat rope sewn along all edges of the sail in order to strengthen it.

Reef: A general term designating that part of the sail whose surface may be reduced to remove it from the action of the wind.

Reef band: a reinforcing strip of sail-cloth sewn across the sail and through which some eyelets are pierced for reef gaskets.

Reef gasket: A piece of rope placed along the reef band

## Detail of the sails.

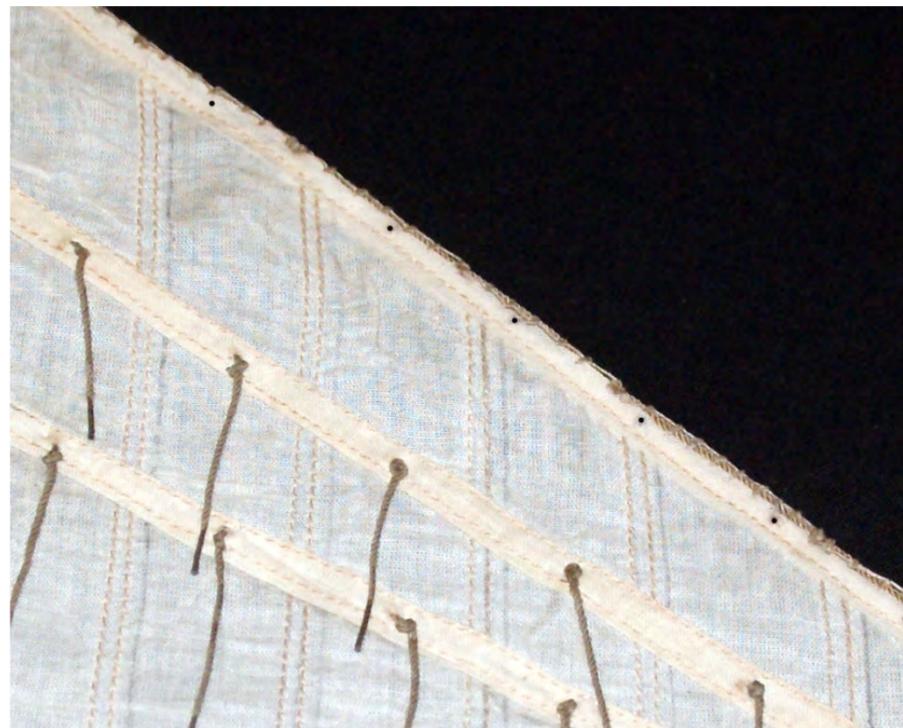


Photo n°. 213: Fore sail - note the junction between the boltrope and the sail edge at the brace point - with the

and used to clench the sail to the yard reduce the sail surface. It hangs on both faces of the sail.

Cringle: A rope ring attached to the leech boltrope through two nearby eyelets.

Tabling: A reinforcing piece of sail-cloth sewn at the angles that withstand strong forces.

« penne » angle: the upper angle of the sail (the head).

brace point: the lower angle of the sail toward the head of the ship.

Leech: The vertical edge of the sail.

## Sail ropes diameter.

As I mentioned in the above, the sails are all made in the same way. From the leech to the head, the boltrope diameter is:

Foresail boltrope: 0.85 mm.

Mainsail boltrope 1.20 mm.

Fore sheet 0.75 mm.

Main sheet 1.15 mm

For the sheets, the diameters are as follows:

The boltrope is also used to fashion the clew and brace thimbles.



Photo n°. 214: Reinforcement at the brace point - note the boltrope that is sewn to the edge of the sail and the thimble.



Photo n°. 215: Detail of the boltrope sewn to the sail edge and the thimble at the clew.



Photo n°. 215: Detail of the boltrope sewn to the sail edge and the thimble at the clew

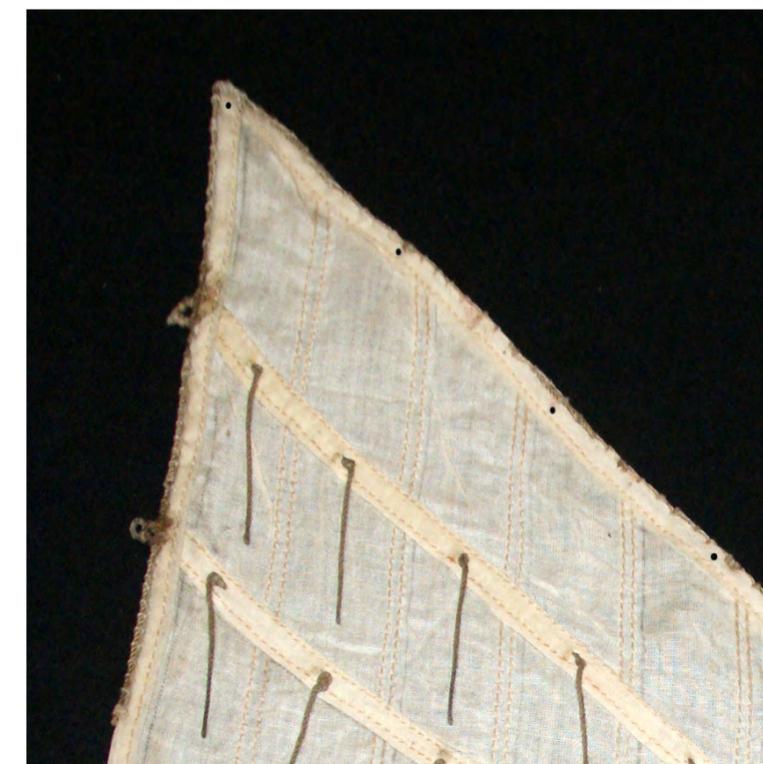


Photo n°. 217: The top angle (penne angle) of the foresail with two cringles and the reef bands and gaskets (matafions).

## The yard.



Photo n°. 218: The sail is bent to the yard with simple bindings.



Photo n°. 219: Binding of the sail on the yard quarter at the brace point.

Photo n°. 220: The sling « polome » (G146 or G 147) - a double rope that wraps around the yard at about 1/3 its length and is used to tie it to a tackle to raise it (see yard halliard). It is wrapped twice around the yard and makes a slip-knot.



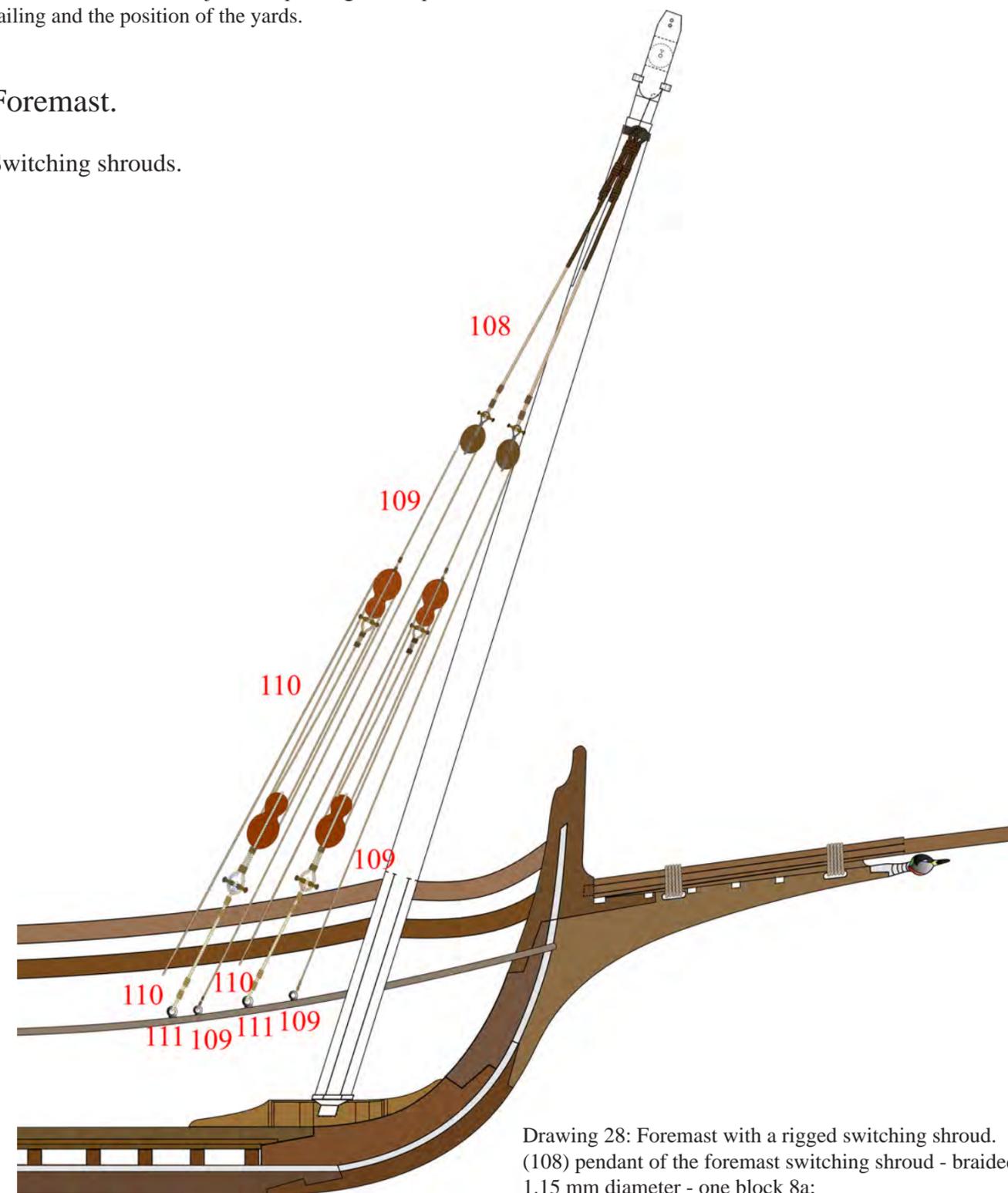
Photo n°. 211: The two sails bent to the yards. Note the difference in size and the number of cringles on the leeches.

## THE RIGGING.

On this type of vessel, the running rigging did not have a fixed location - it was adjusted depending on the point of sailing and the position of the yards.

### Foremast.

Switching shrouds.



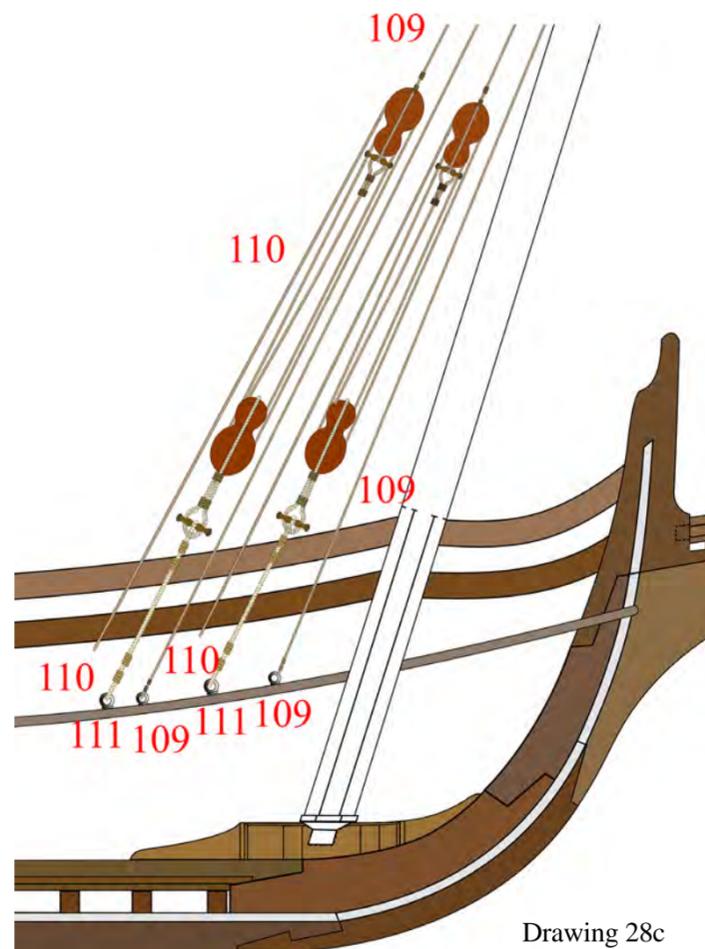
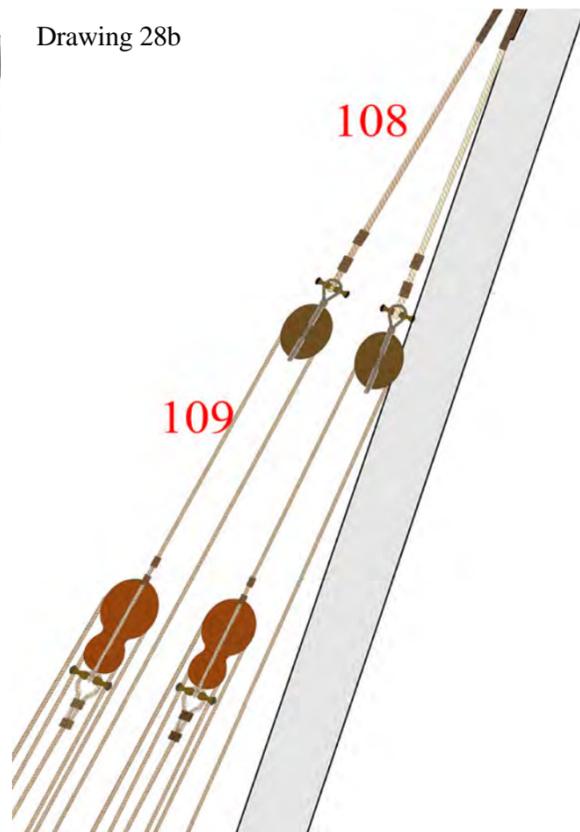
Drawing 28

Drawing 28: Foremast with a rigged switching shroud.  
 (108) pendant of the foremast switching shroud - braided, 1.15 mm diameter - one block 8a;  
 (109) Standing end of a single tackle - 0.95 mm diam. - seized to an eyebolt inside the bulwark - 2 x blocks 10c.  
 (110) Running end of the large tackle - 0.70 mm diam.  
 (111) Lower end of the large tackle - 1.20 mm diam.

Drawing 28a



Drawing 28b



Drawing 28c

Drawing 28a: The standing end of the pendant is seized to the lower slot in the mast, n°. 108.  
 Drawing 28b: The standing ends of the switching shroud.  
 Drawing 28c: Lower standing end and bowser of the switching shroud (110 and 111).



Detail of the foremast rigging with the switching shroud and the main tackle pendant.

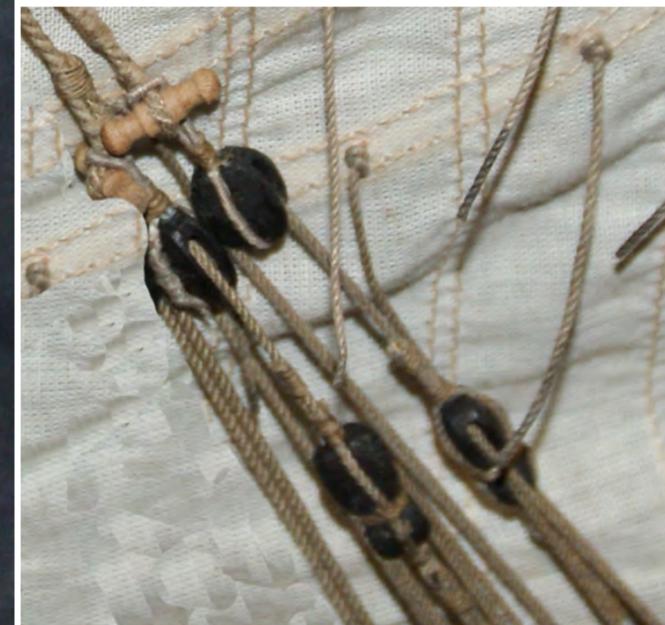


Photo n°. 223: Detail of the standing ends (109 and 113) of the single tackle.

Photo n°. 222: Detail of the pendants - The masthead seizings are identical on both masts, only the size varies. Pendants 108 and 112 (main). The pendant (108) is served over half its length - this rope will need to be seized securely to the mast with very tight turns where it is folded back (see photo). Photo n°. 245:



Photo n°. 224: detail of the lower seizings (111). They are secured at one side by a toggle and at the other by a bight on an eyebolt.

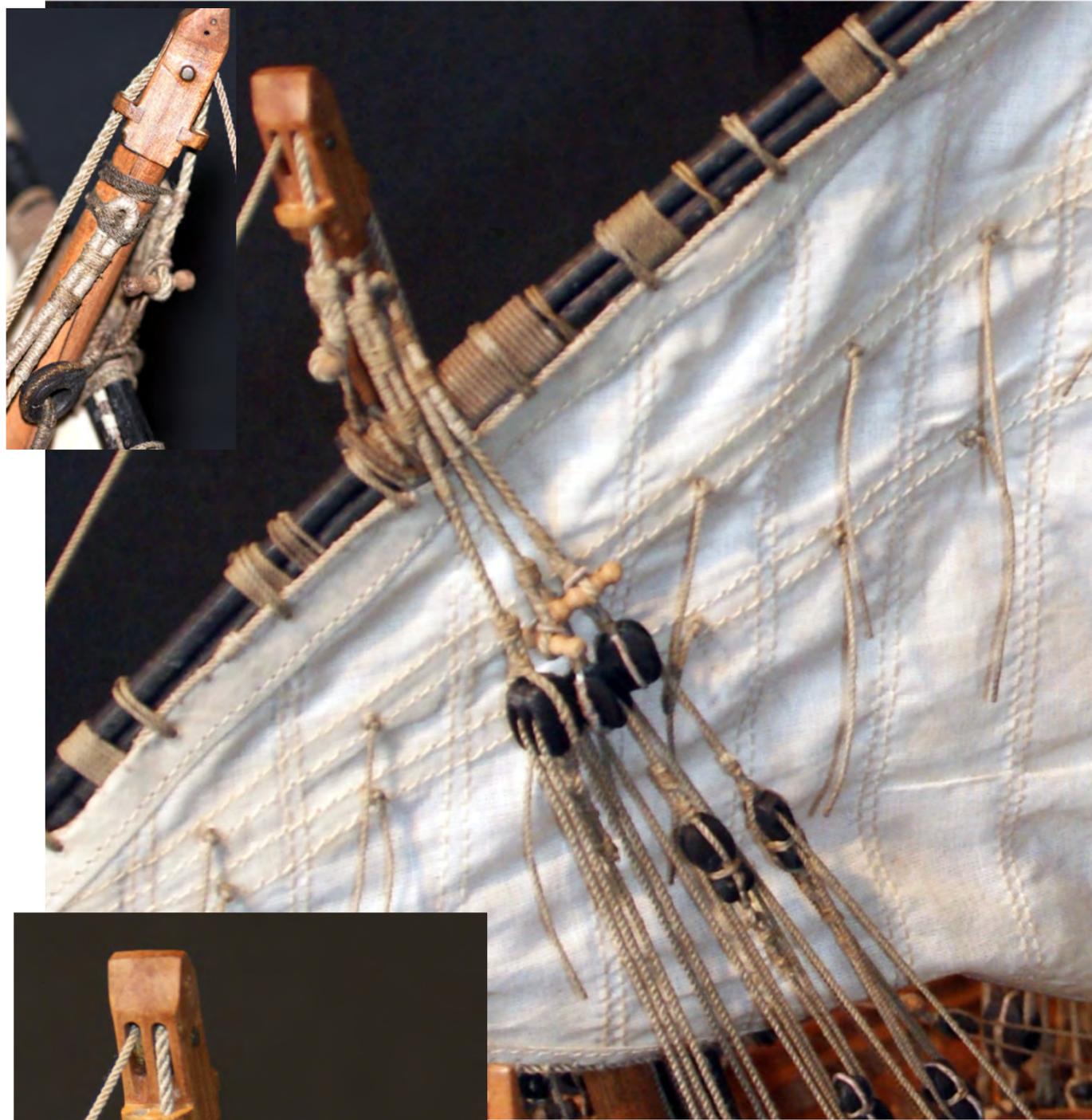
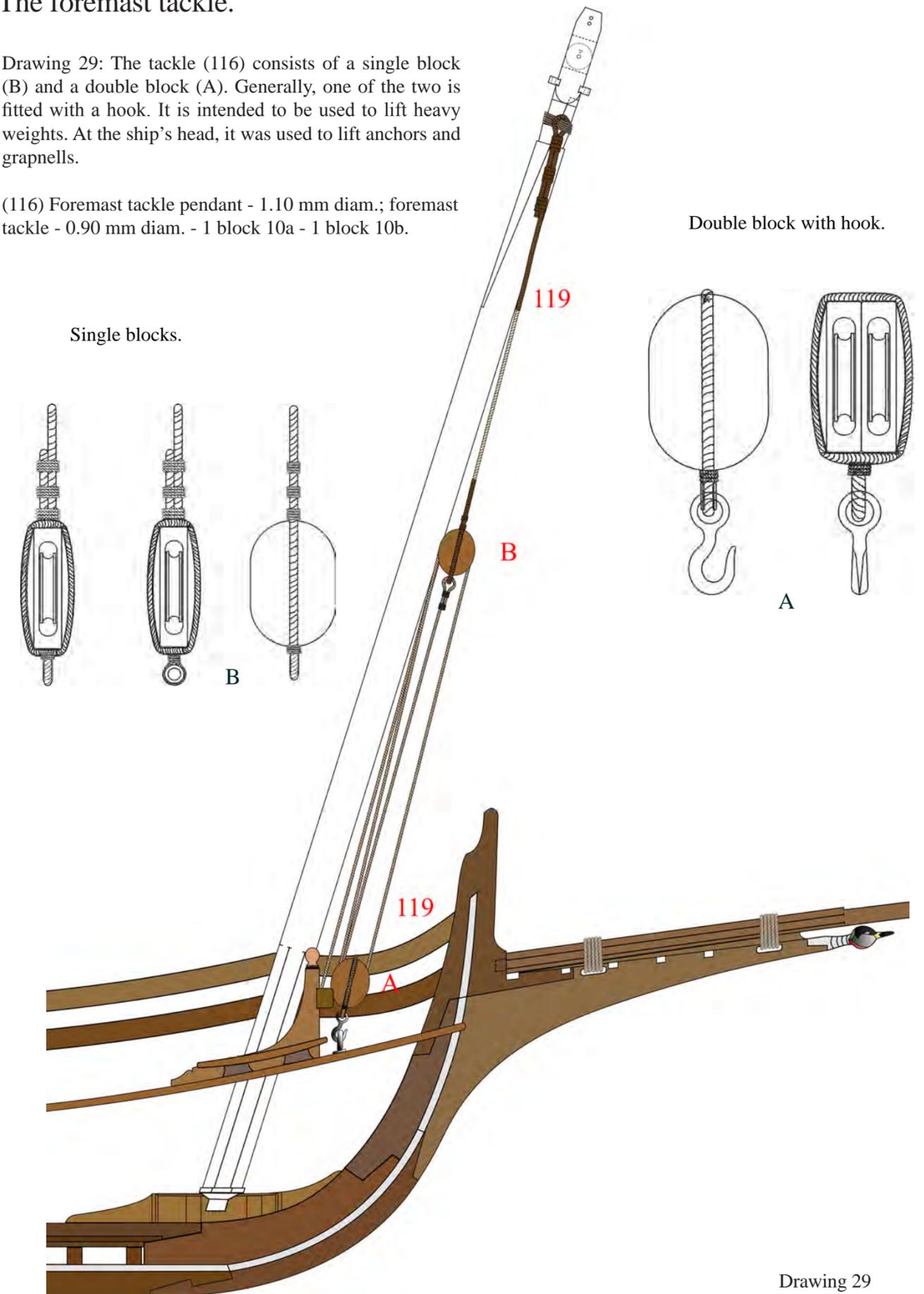


Photo n°. 225: The pendants are made with a single rope that is folded back to make a double rope. Toggles are placed at the ends.

## The foremast tackle.

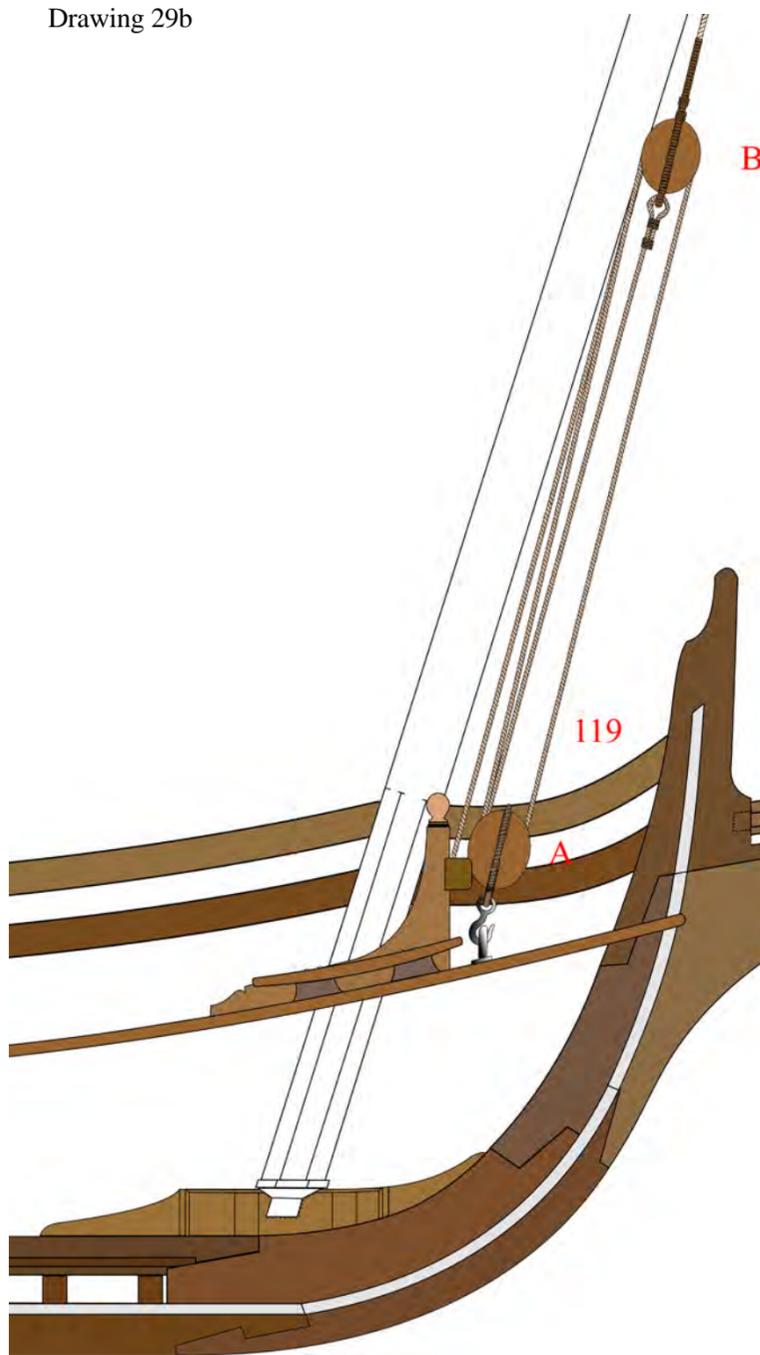
Drawing 29: The tackle (116) consists of a single block (B) and a double block (A). Generally, one of the two is fitted with a hook. It is intended to be used to lift heavy weights. At the ship's head, it was used to lift anchors and grapnels.

(116) Foremast tackle pendant - 1.10 mm diam.; foremast tackle - 0.90 mm diam. - 1 block 10a - 1 block 10b.

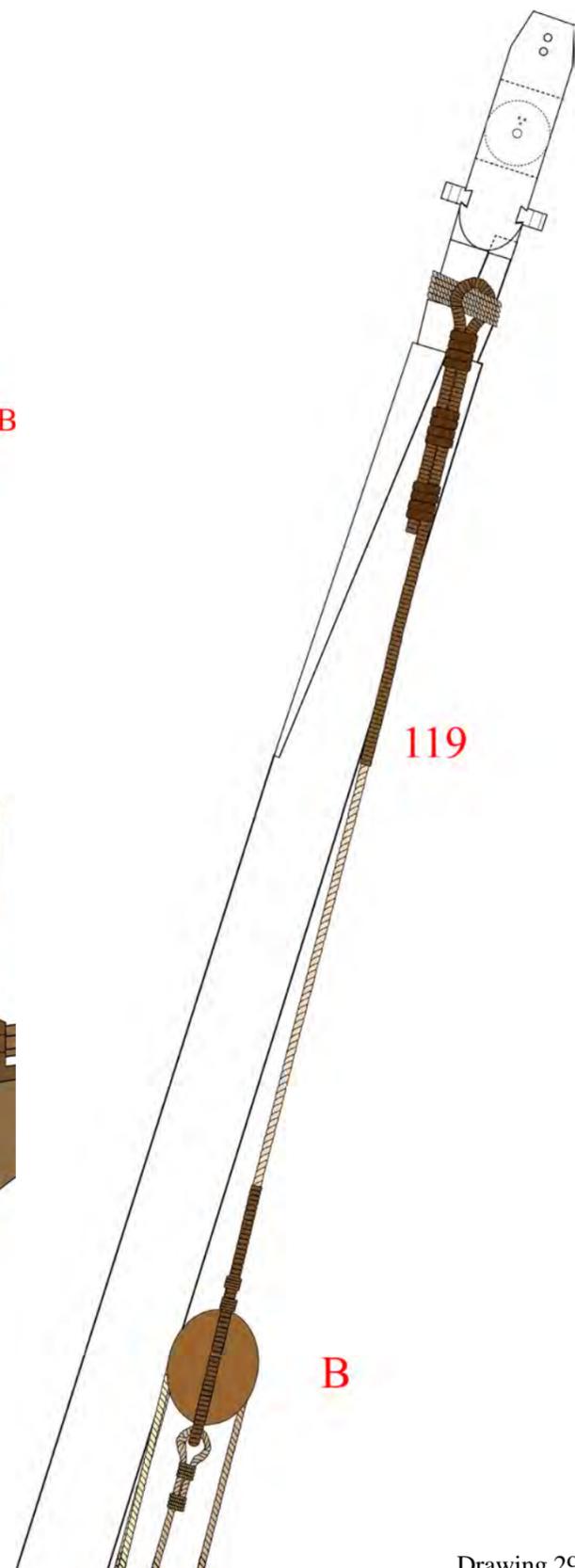


Drawing 29

Drawing 29b



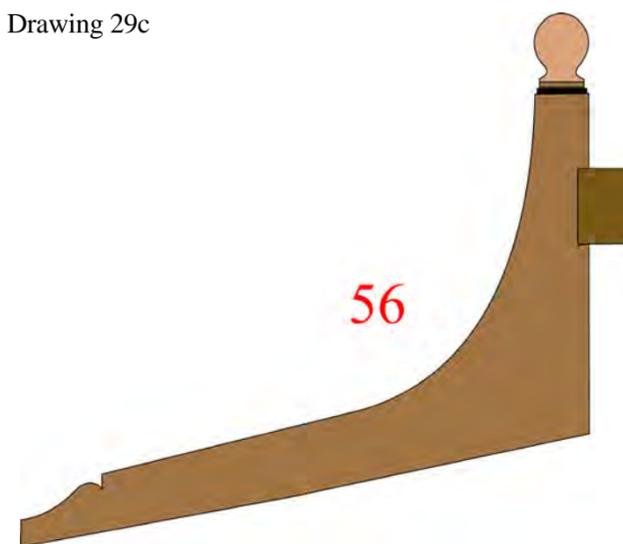
Drawing 29b: Enlarged view of the foremast tackle.



Drawing 29a: The standing end of the tackle is seized to the grooves at the masthead.

Drawing 29a

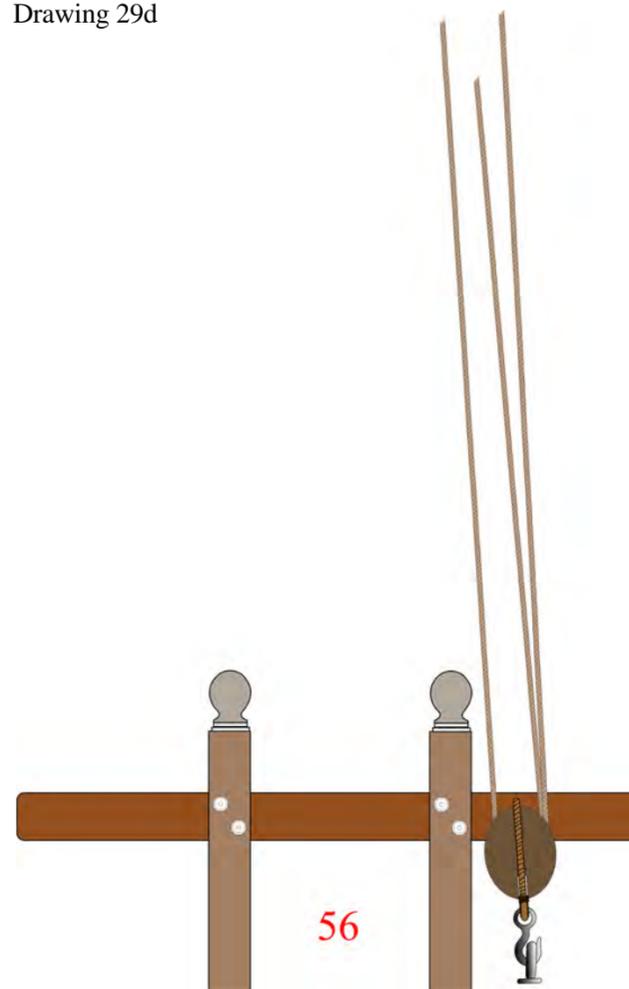
Drawing 29c



Drawing 29c: n°. 56 - riding bitts - The running end of the tackle is seized to the riding knees.

Drawing 29d: Enlarged view of the winding tackle. The double block with a hook is seized to an eyebolt on deck.

Drawing 29d



The truss, the halliard tie, the halliard and their own tackle at the foremast.

A toggle is stropped to the tie, it leads through a hole in the collars and reeves through the sheave at the masthead, back through the hole in the collar on the opposite side and is stropped to the upper large block (20d).

The lower large block is seized to the deck with a strop that leads through its bottom part (16f). The tackle (103) that works with the upper block leaves from this lower block, reeves through the sheaves of the upper and lower block and belays to a cleat under the lower block.

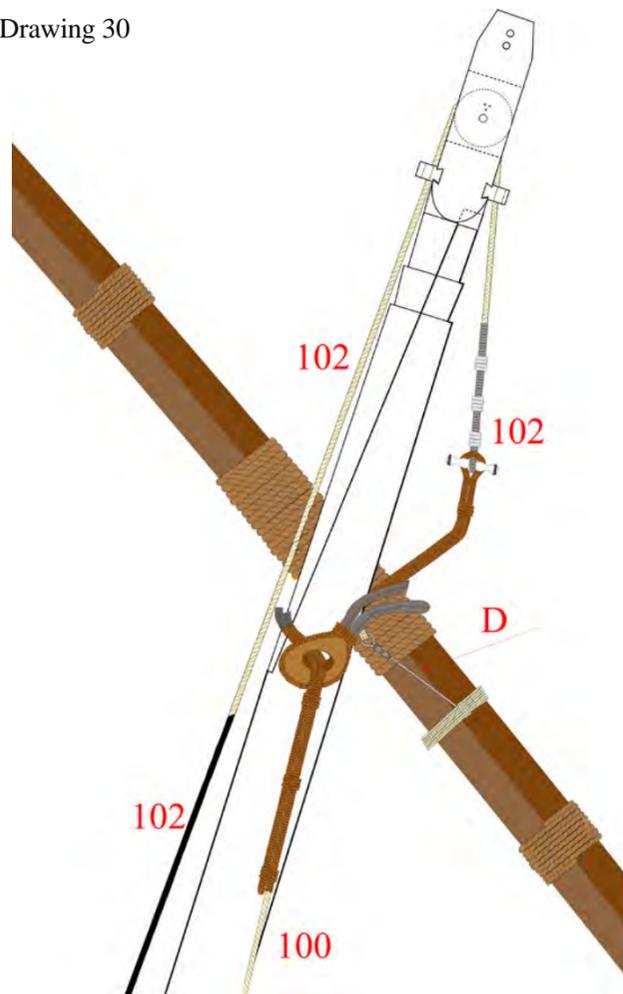
The truss (100) is double and served over half its length and stropped at the masthead to an oval-shaped heart. Since it is double, it starts through the sling, wraps around the yard, reeves through the heart and ends at a pendant stropped to a toggle. The latter leads through a bight in the strop of the upper block of the truss tackle (101). At the other end of the tackle, the block is attached to a toggle that stropps to an eyebolt on deck.

- (100) Foremast truss with heart - 1.20 mm diam. - 1 block 7a
- (101) Truss tackle - standing end 0.65 mm diam. - 1 stropped block 7a. Strop diam: 1.00 mm
- (101G) Strop, 1.50 mm diam.
- (102) halliard tie - fall, 1.10 mm diam. - 1 upper large block (16d).
- (103) Halliard tackle, 0.95 mm diam. - strop 1.15mm diam. - 1 lower large block 14f.

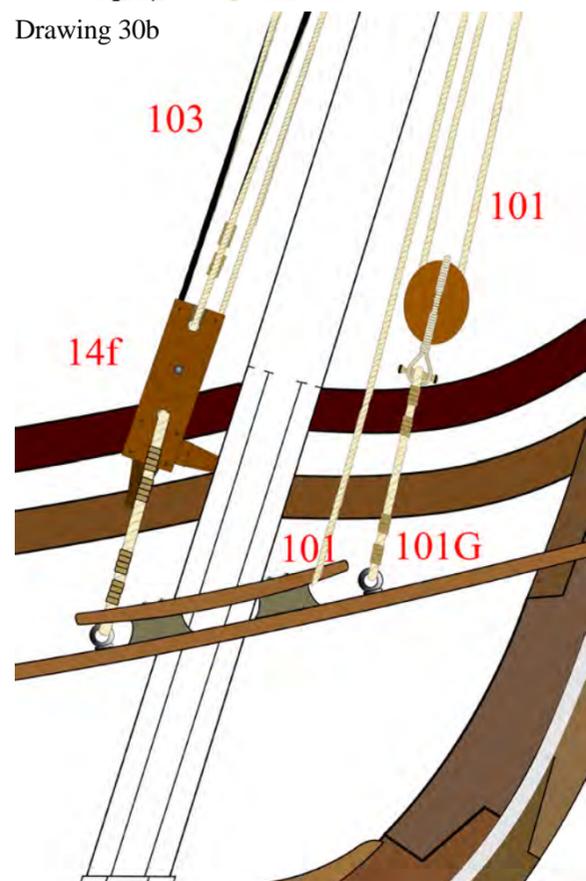
Drawing 30a. Detail of the truss (100) and the truss tie (102) - The truss ends with a toggle leading through a grommet stropped to a single block.

Drawing 30b. The laniard is seized to an eyebolt on deck, with the other end stropped to a toggle that leads through the eye stropped to the lower single block of the truss tackle whose fall belays to cleat 69 at the foot of the mast.

Drawing 30



Drawing 30b



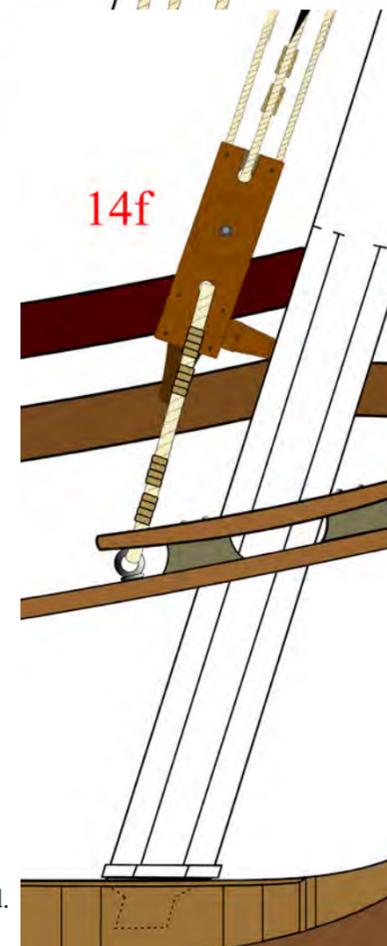
Drawing 30; The complete halliard.

Drawing 30c.



16d

Drawing 30d.



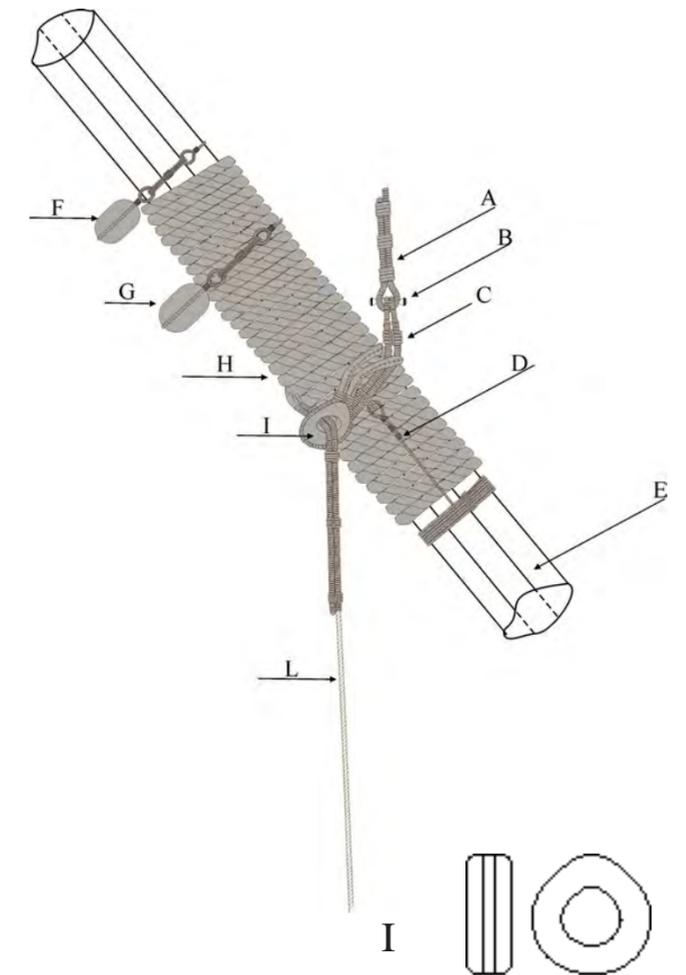
14f

Drawing 30c. Detail of the tackle, the end of the tie 100 and upper large block 16d.

Drawing 30d. Lower large block 14f. The lanyard, the deck eyebolts and the lower hole in the large block. The lanyard reeves through a hole in th lower part of the large block and is seized to two eyebolts on deck.

Drawing 31.

- A The fall of the tie
- B Toggle
- C Sling
- D Laniard
- E Yard
- I Heart
- G Block
- H Woolding



Drawing 31



Photo n°. 226: The yard sling; at the side, the laniard/span. This laniard is a binding that keeps the sling from slipping.



Photo n°. 227: Detailed starboard view of the masthead (calcet), the halliard tie, the sling, the laniard/span, the peak brace formed by the truss with the oval-shaped heart and the pendant of the switching shroud.

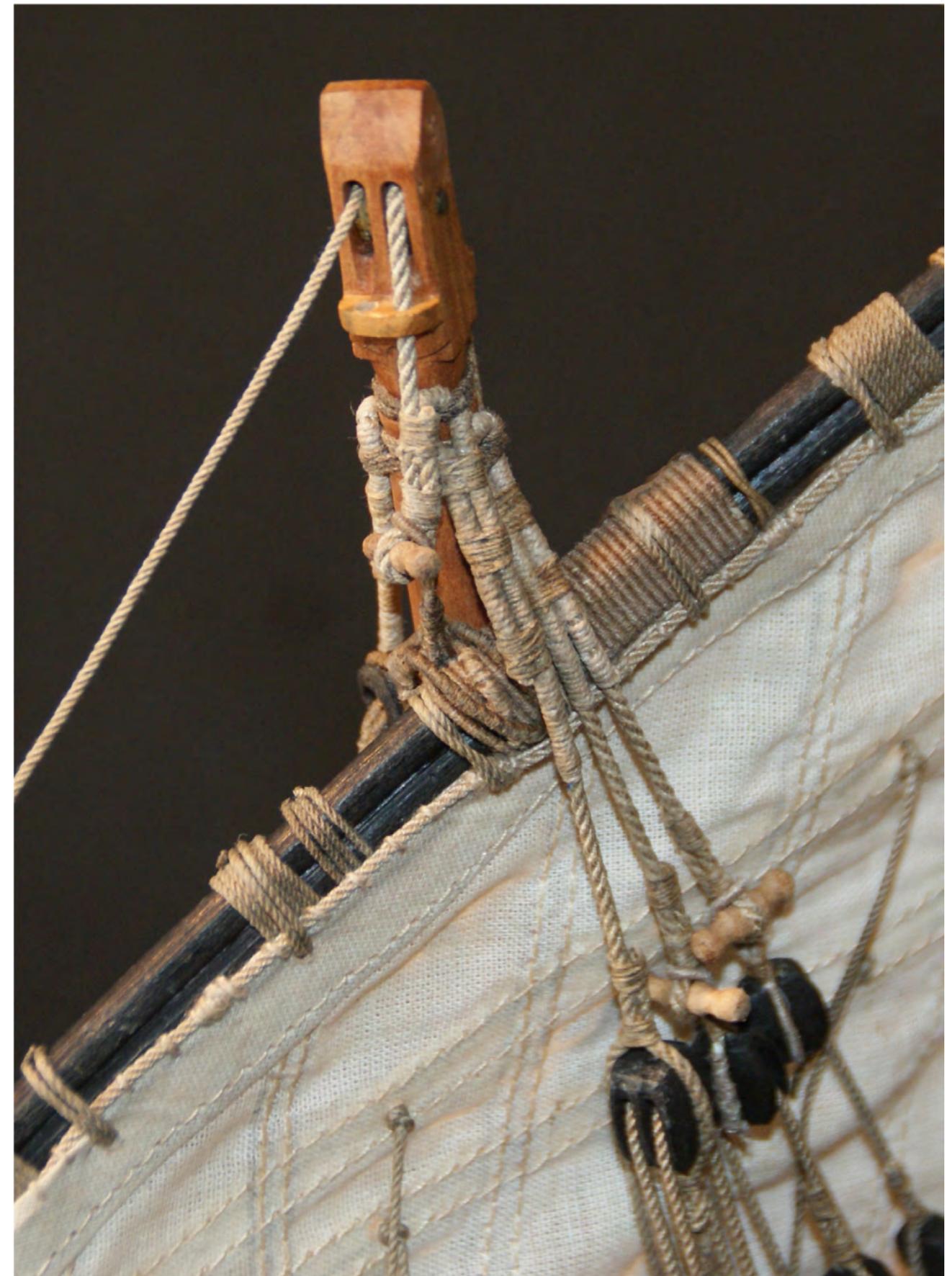
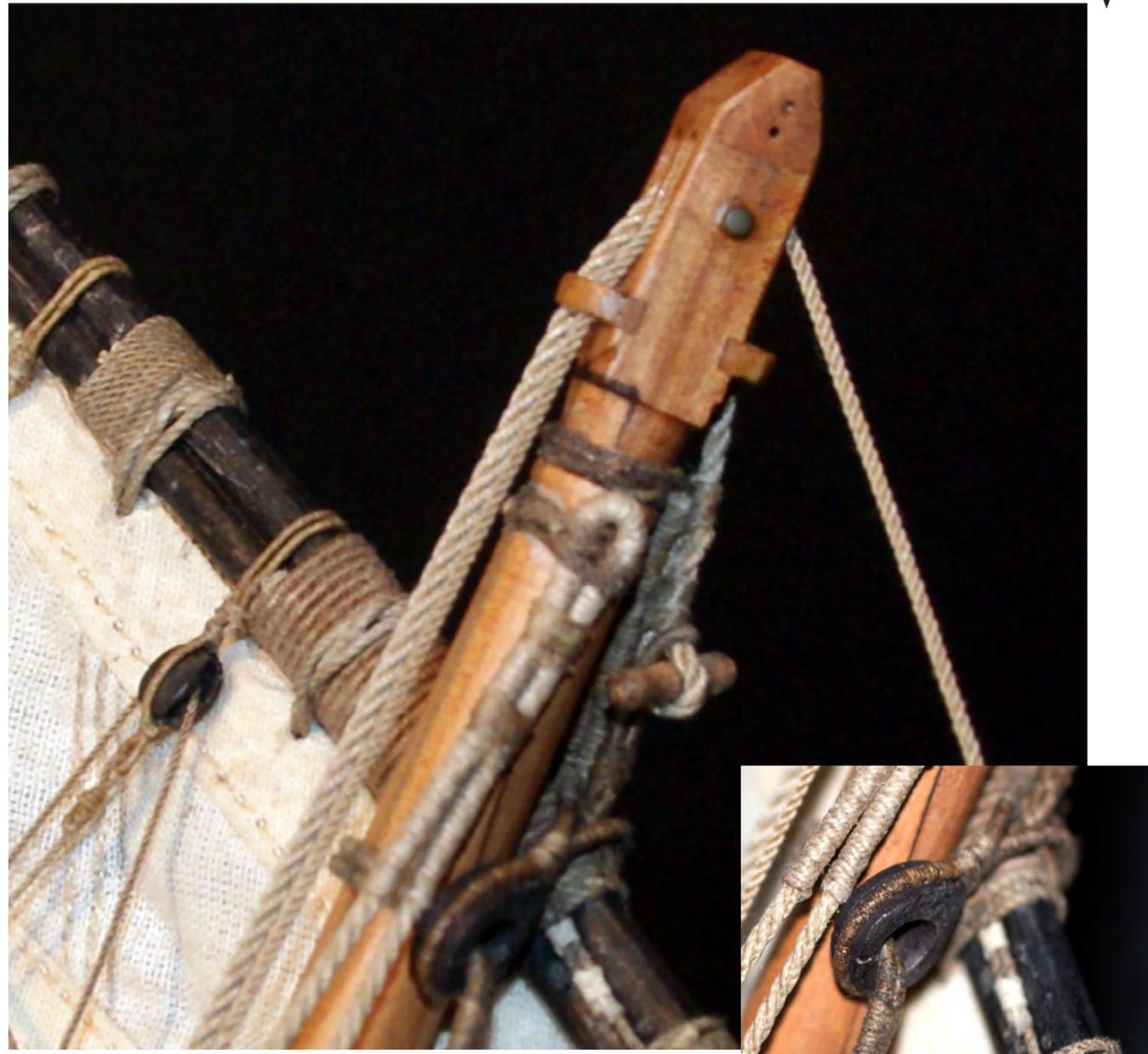


Photo n°. 228: Detailed port-side view of the masthead (calcet): the halliard tie, the sling, the laniard, the peak brace formed by the truss with the oval-shaped heart, and the pendant of the switching shroud.

Photo n°. 229: Detailed view of the halliard tackle (103), 1.15 mm diam. - the two upper and lower large blocks.



Photo n°. 230: Detailed view of the lower large block. The standing end of the winding tackle befalls to the cleat on the large block. A lanyard reeves through the large block and is seized to two eyebolts on deck.

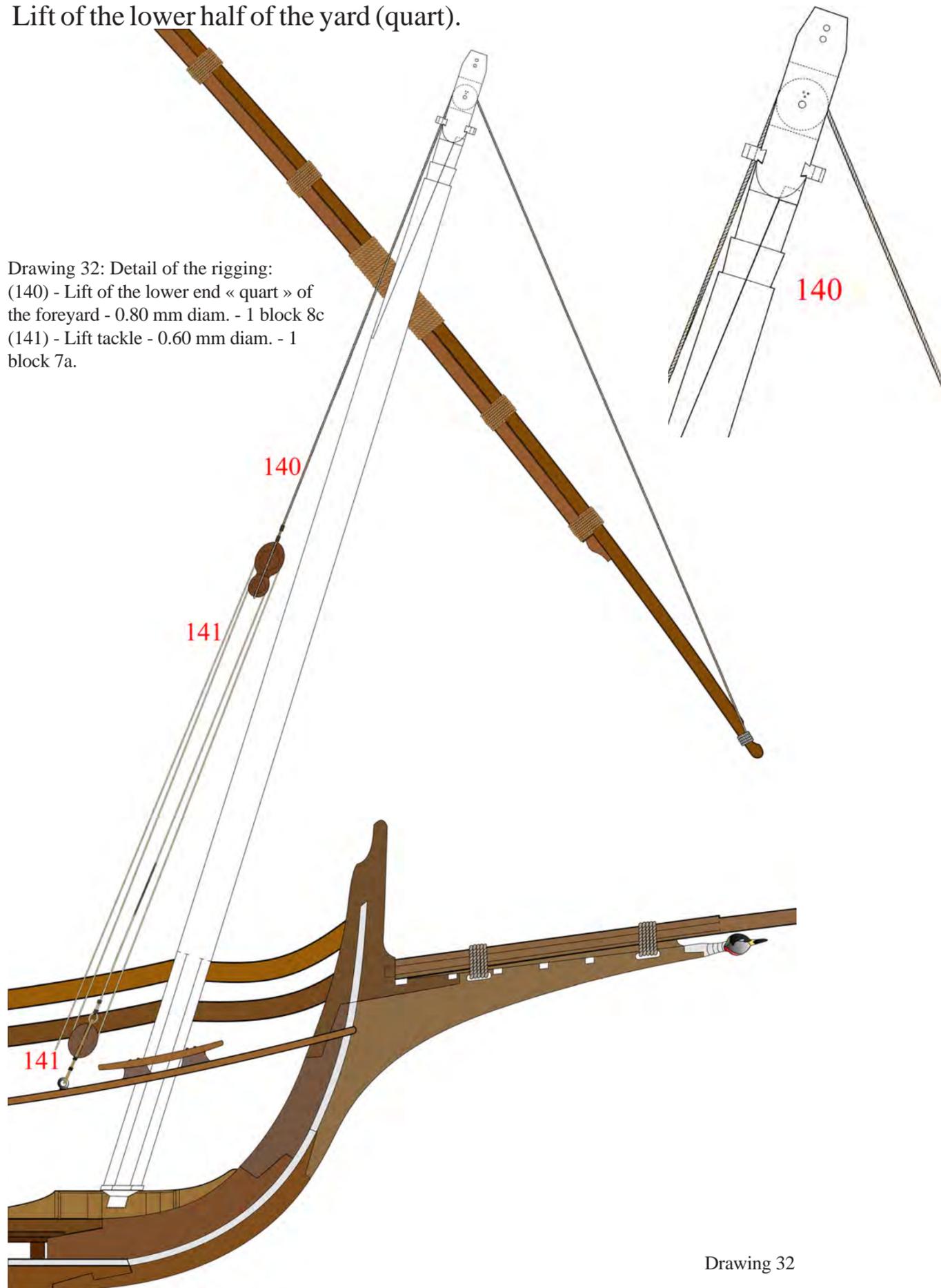
Photo n°. 230a: Detailed view of the lower large block. The strop of the tackle may be seen on the upper part of the large block. It is identical to the lower large block (see following photo).



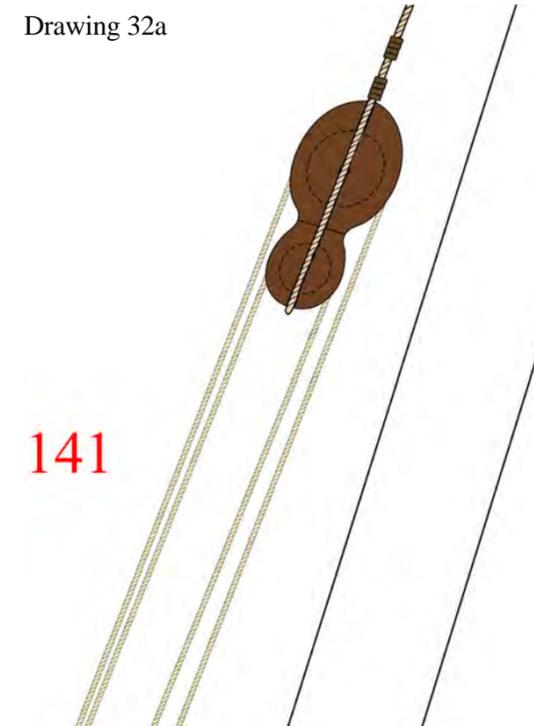
Photo n°. 230b: Detailed view of the upper large block. The fall of the tie reeves through the top of the large block, and is seized back to itself with three bindings.

Lift of the lower half of the yard (quart).

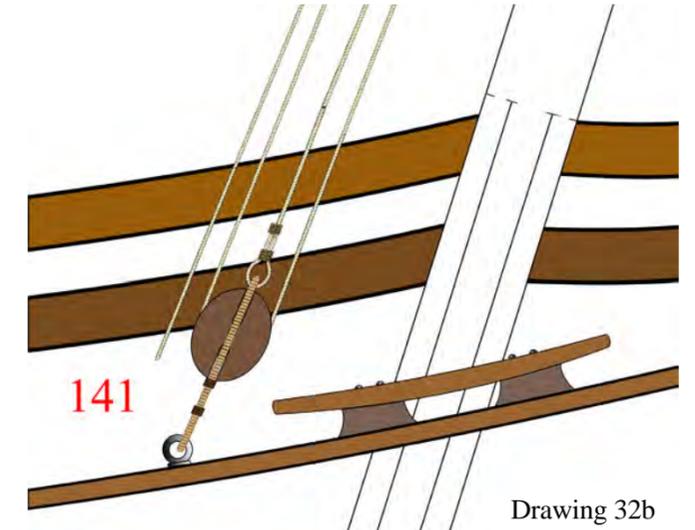
Drawing 32: Detail of the rigging:  
 (140) - Lift of the lower end « quart » of  
 the foreyard - 0.80 mm diam. - 1 block 8c  
 (141) - Lift tackle - 0.60 mm diam. - 1  
 block 7a.



Drawing 32a



Drawing 32a: Lift - the running end is seized to the yard, reeves through a sheave at the masthead and stops a fiddle block.



Drawing 32b: The single block of the lift is seized to an eyebolt on deck. The tackle is seized to the block strop, reeves through the fiddle block and belays to a cleat on the bulwark n° 39.

Photo n°. 232: Detail of the single block of the tackle.



Photo n°. 231: The lift of the « quart » of the yard (140) is used to control the slant of the yard. It is seized to the tip of the « quart », leads through a mortice and a sheave at the masthead and stops to a fiddle block. This fiddle block is part



of a tackle whose other single block is seized to an eyebolt at the foot of the mast. The fall of the tackle belays to the bulwark.

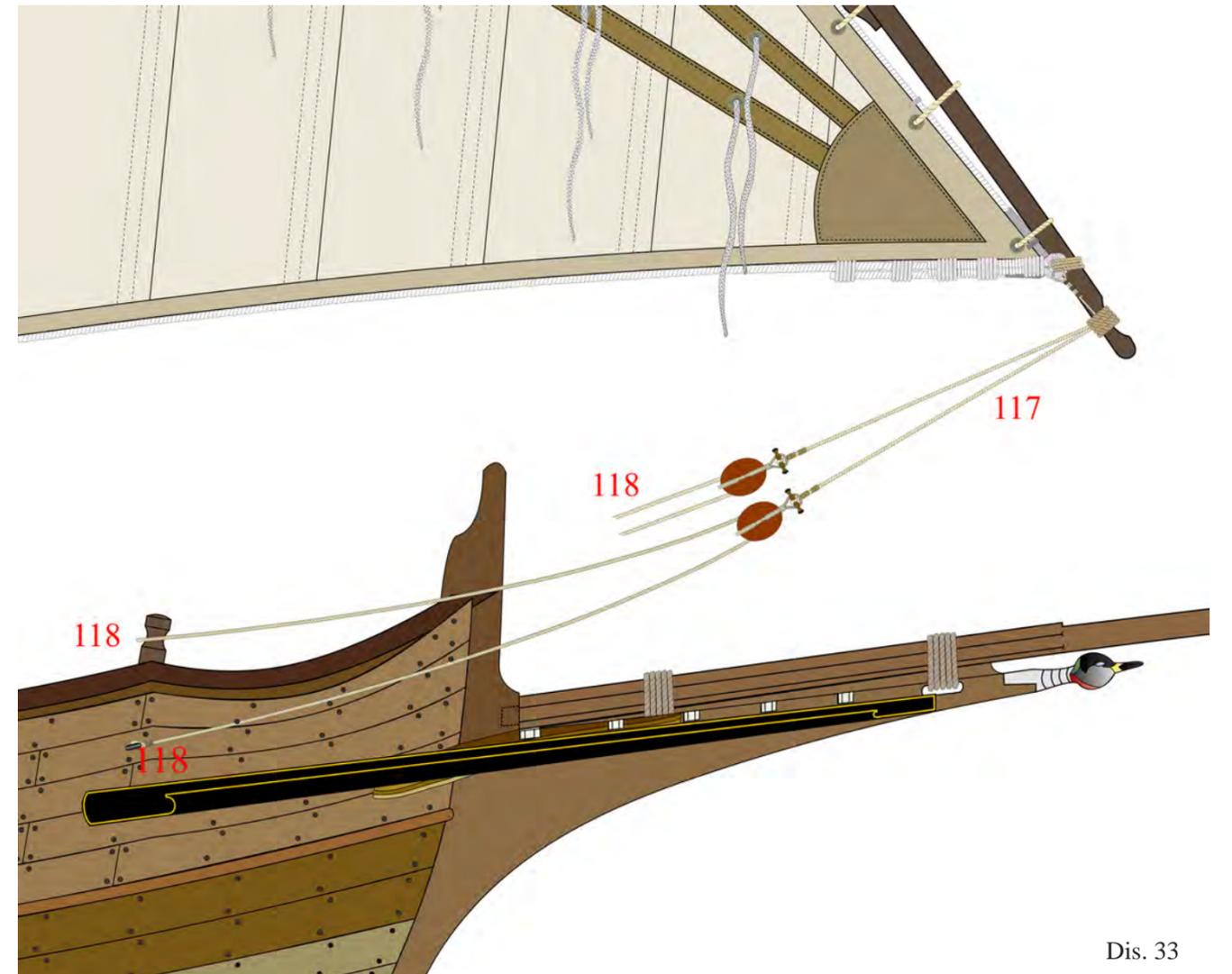


Photo n°. 233: An overall view of the foremast rigging.



Photo n°. 233a: A view of the deck side.

The foremast brace.



Dis. 33

Drawing 33: On this felluca, the brace (117 and (118) is a V-shaped pendant with two simple tackles. The two branches of the pendant are ended with toggles that fit through a bight in the strop of a single block. The standing end of the tackle starts from an eyebolt on the outside of the ship's hull and returns to belay on a knighthead at the head.

(117) The branches of the V-shaped pendant - 0.65 mm diam.

(118) The brace tackle - 0.60 mm diam. - 2 blocks 6a and 2 toggles.

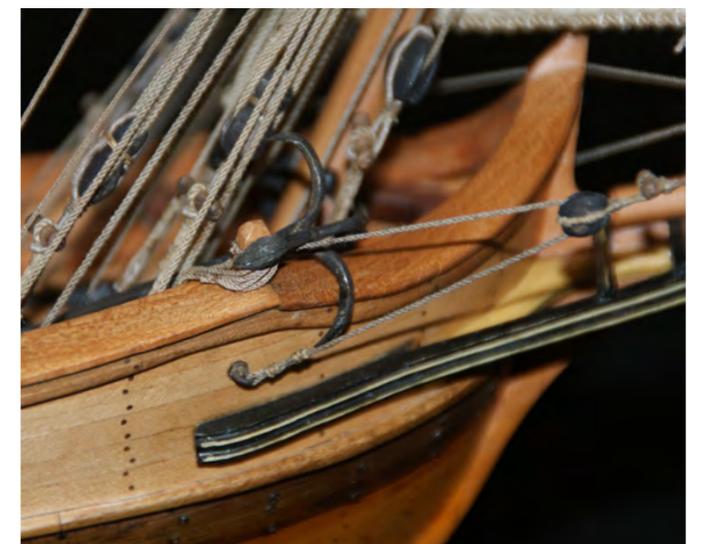
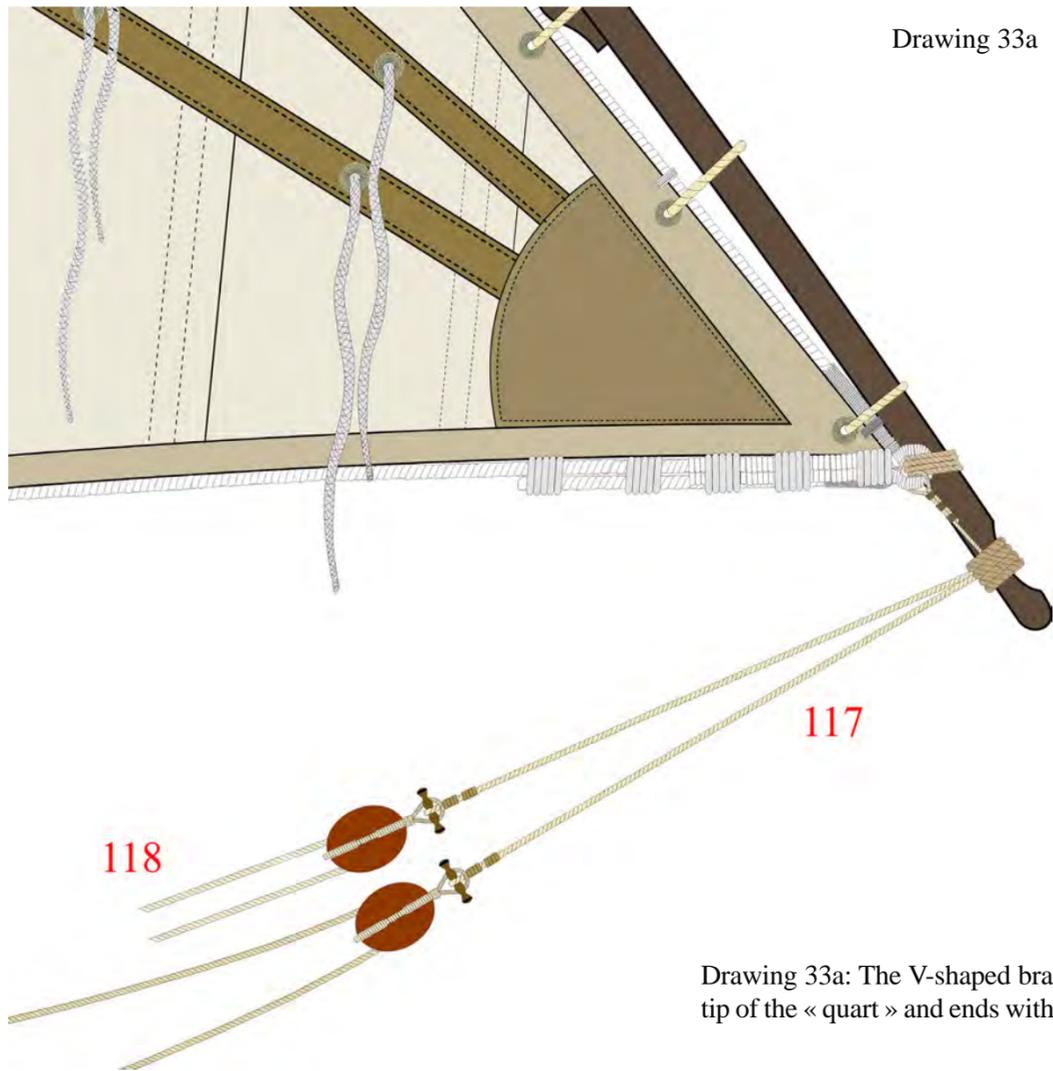
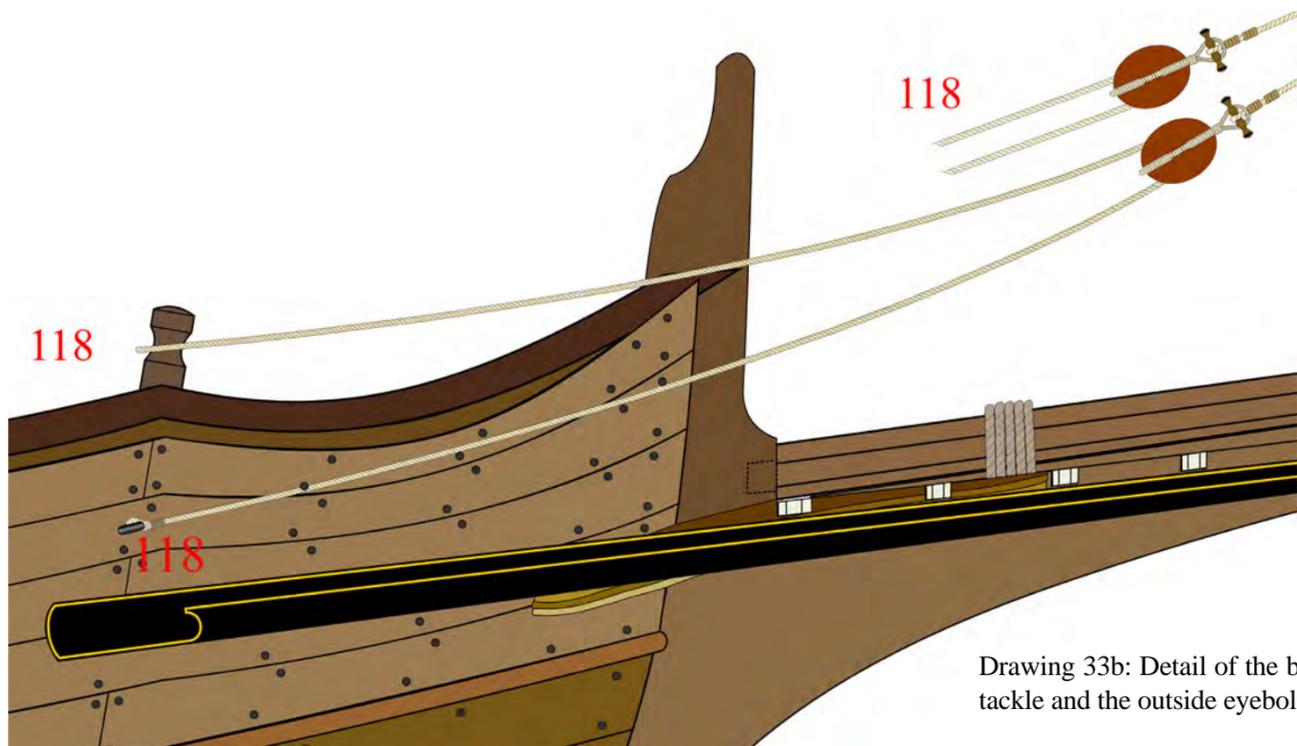


Photo n°. 234: Detail of the starboard tackle.



Drawing 33a

Drawing 33a: The V-shaped branches are seized to the lower tip of the « quart » and ends with two toggles at the other end..



Drawing 33b: Detail of the brace tackle and the outside eyebolt.



Photo n°. 235: Portside view of the foreyard brace.

### The Foreyard brace.

Drawing 34: The brace is used to control the yard laterally and there one on each side. A pendant seized to the yard ends with a toggle that fits through the bight in the strop on the tackle block. The standing end of the tackle is seized to an eyebolt on deck (125) and belays to a strake on the bulwark (39).

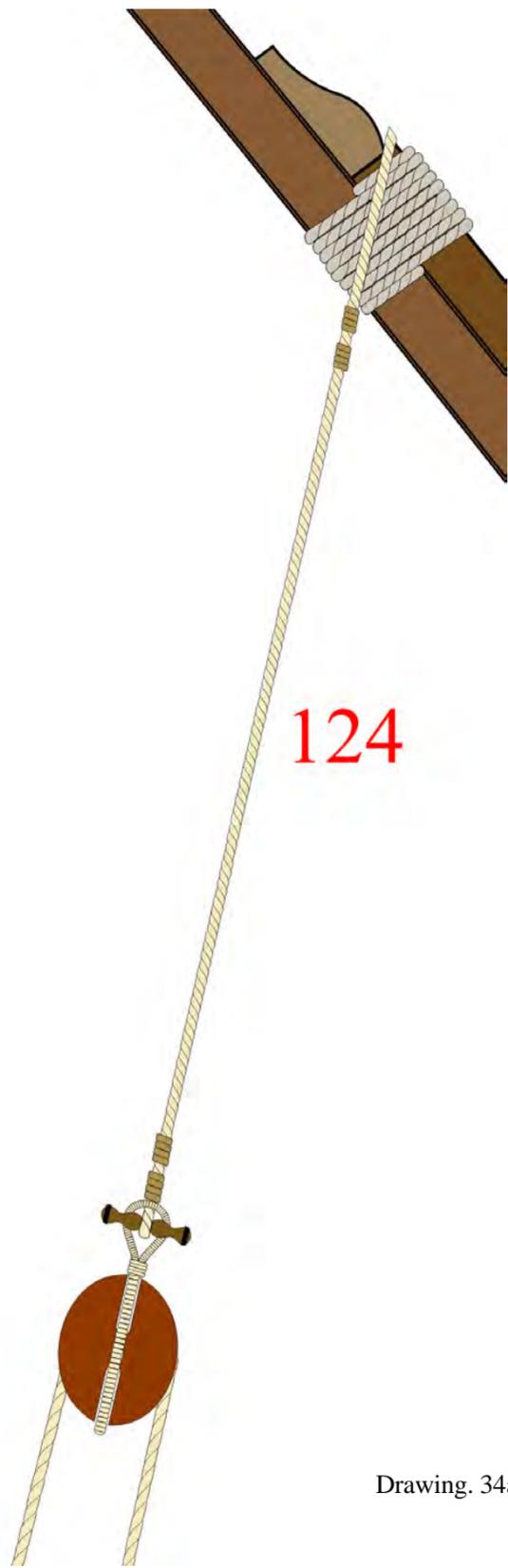
(124) Pendant - 0.80 mm diam<. - 1 block 6a (125) brace (tackle) - 0.65 mm diam.



Photo n°. 236: Detail of the brace.

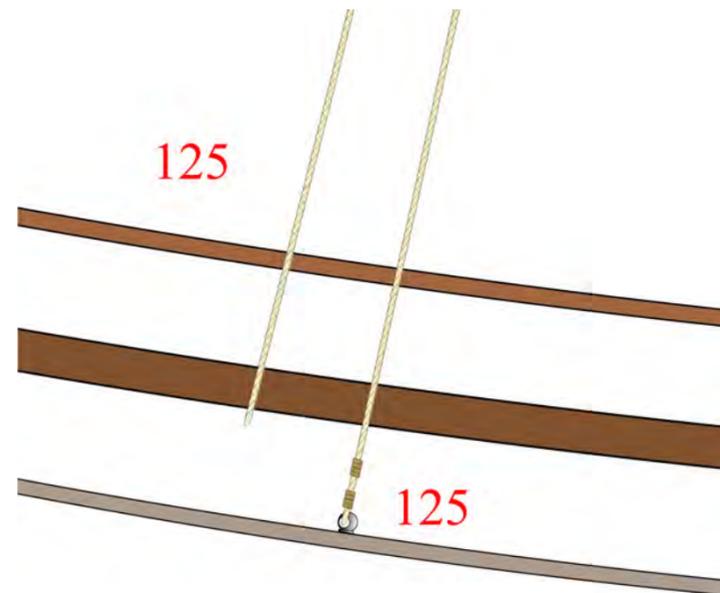


Drawing 34



Drawing 34a: Detail of the pendant.

Photo n°. 237: Detail of the pendant.



Drawing 34b.

Drawing 34b: Detail of the brace: deck eyebolt and belaying point on a bulwark strake (39).



Foto n° 238 - Particolare dell'ostino. Photo n°. 238: The starboard foreyard brace.



## Foreyard downhaul.

(137) Foreyard downhaul - 0.60 mm diam. - 1 block 5a.

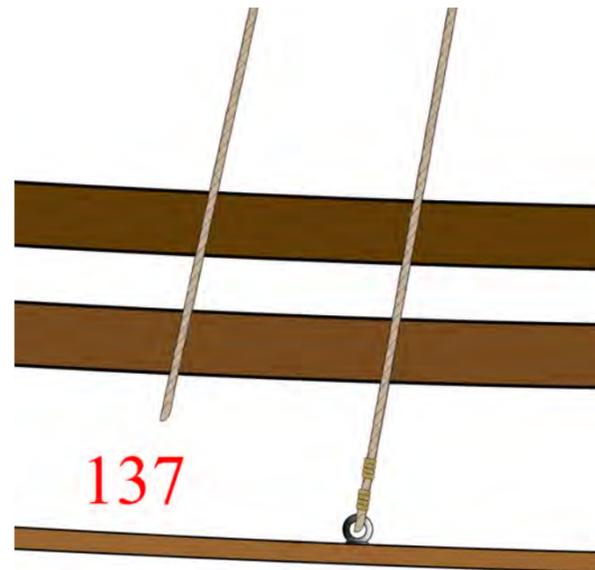
Drawing 35: A simple rig with a standing end seized to an eyebolt on deck (137), reeves through a single block and returns to belay to a strake on the bulwark.



Drawing 35a

Drawing 35a: The single block of the downhaul is stropped to the tip of the yard.

Drawing 35b: Enlarged detail.



Drawing 35b.



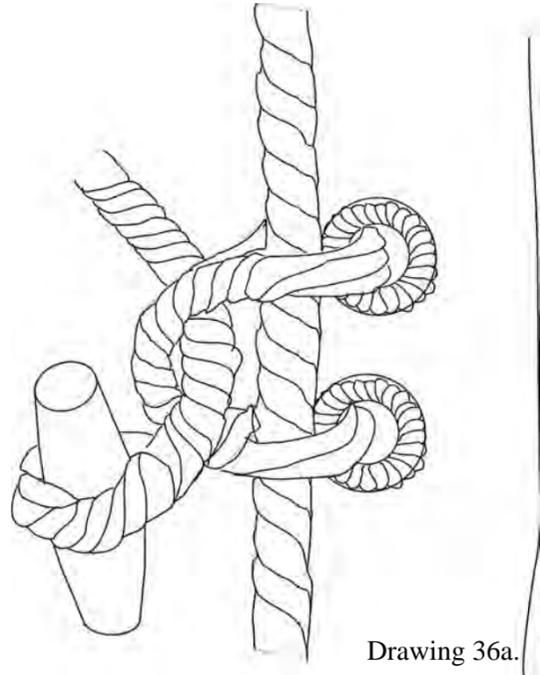
Drawing 35.



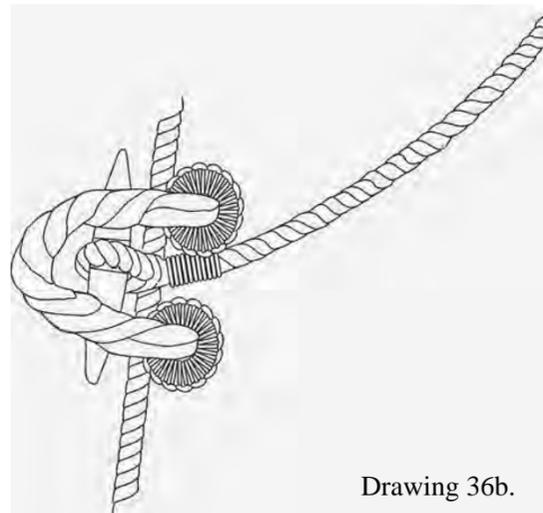
Photo n°. 239: The downhaul stropped to the tip of the yard.

# Top brail.

Drawing 36: (128) - top brail - 0.50 mm diam. - 1 block 4a.



Drawing 36a.

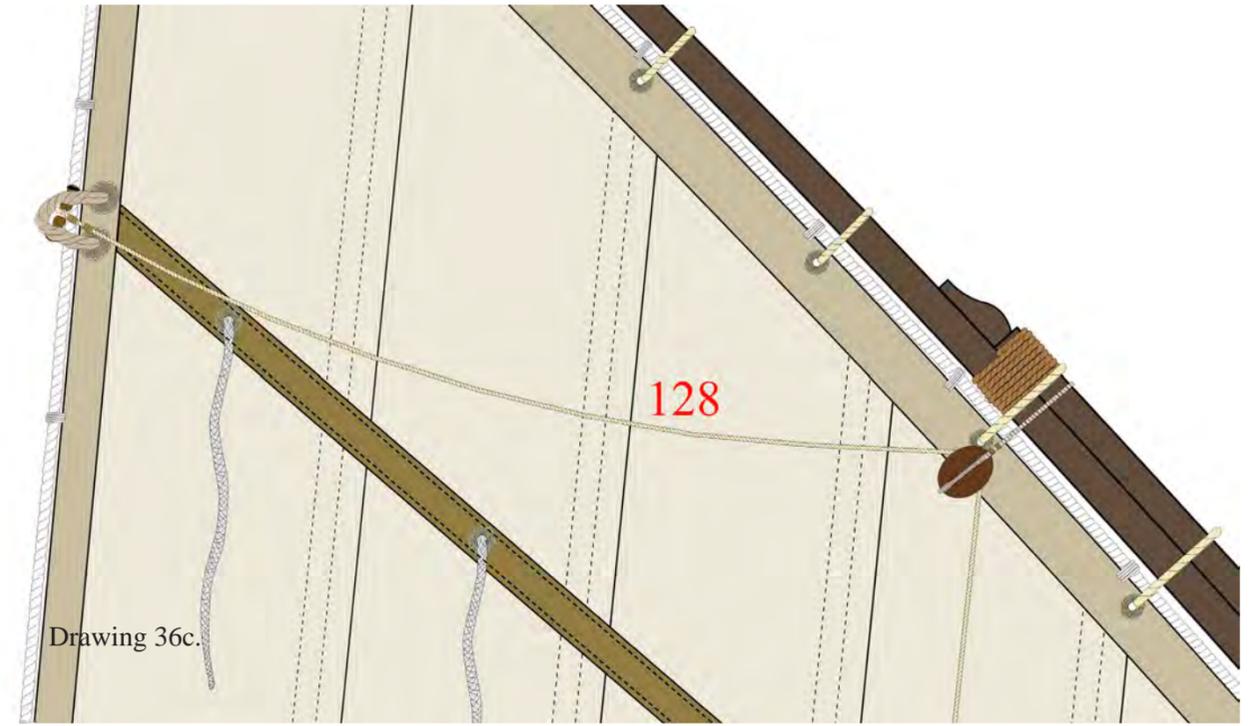


Drawing 36b.

Drawing 36a/b: Close-up view of the leech cringle. The top brail and its toggle through the cringle.



Drawing 36.



Drawing 36c.

Drawing 36c: Detail of the cringle and the block.

The two illustrations on 36 and 37 show identical rigs: at one end the toggle leads through a thimble, reeves through a single block and belays on a strake on the bulwark (39).

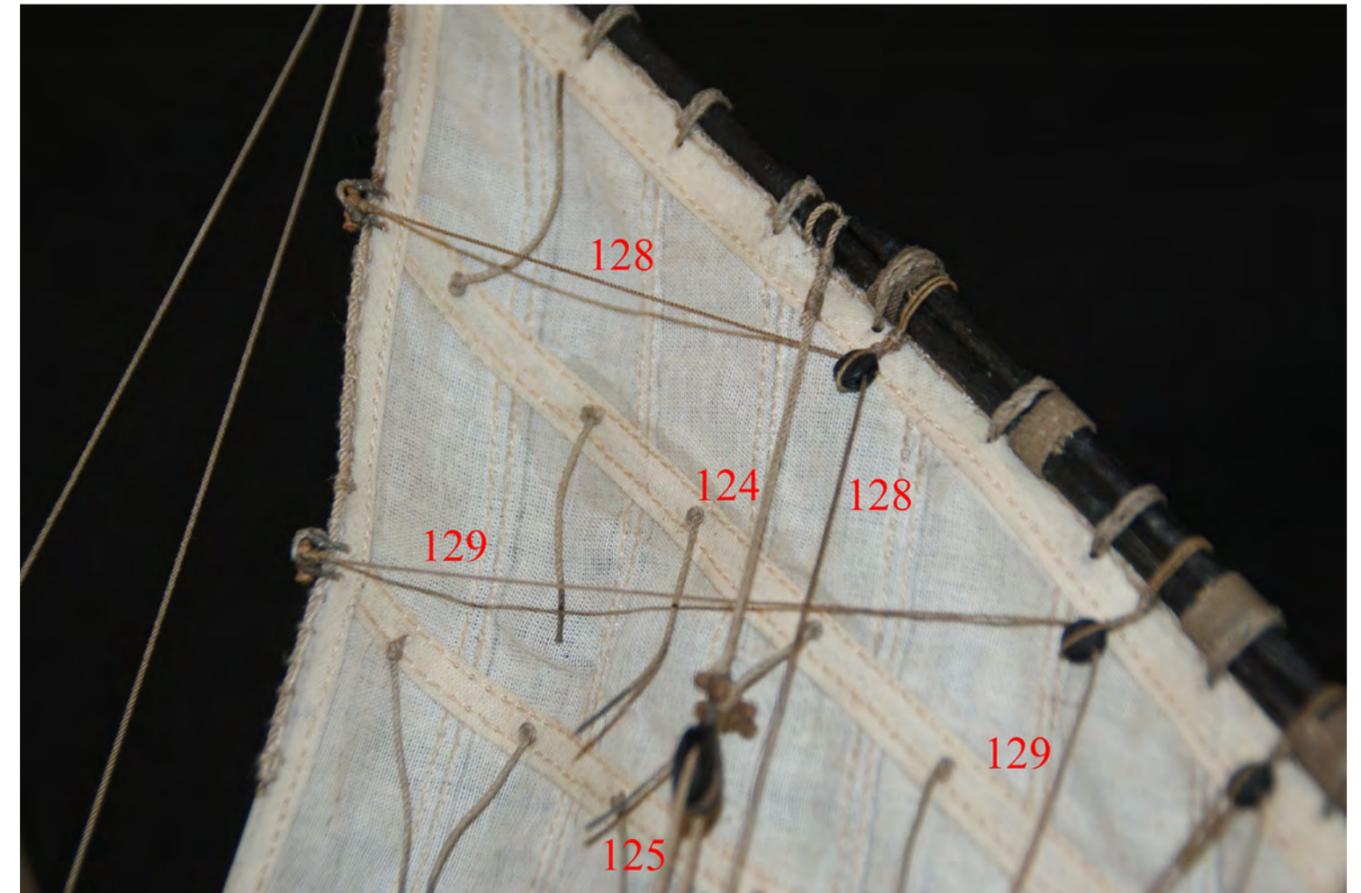


Photo n°. 240: The foremast brace (124/125) and top and lower brails (128/129).

## The lower foremast brail.

Drawing 37  
(129) lower brail - 0.50 mm diam.



## The foresail sheet.

(122) Foremast sheet - 0.55 mm diam. - 1 block 4a.

The foresail sheet has its standing end on a strake at the bulwark (39), reeves through a single block secured to the sheet thimble with a toggle and belays to a large cleat (71) at the foot of the mainmast.

Drawing 38: Mainsail sheet.

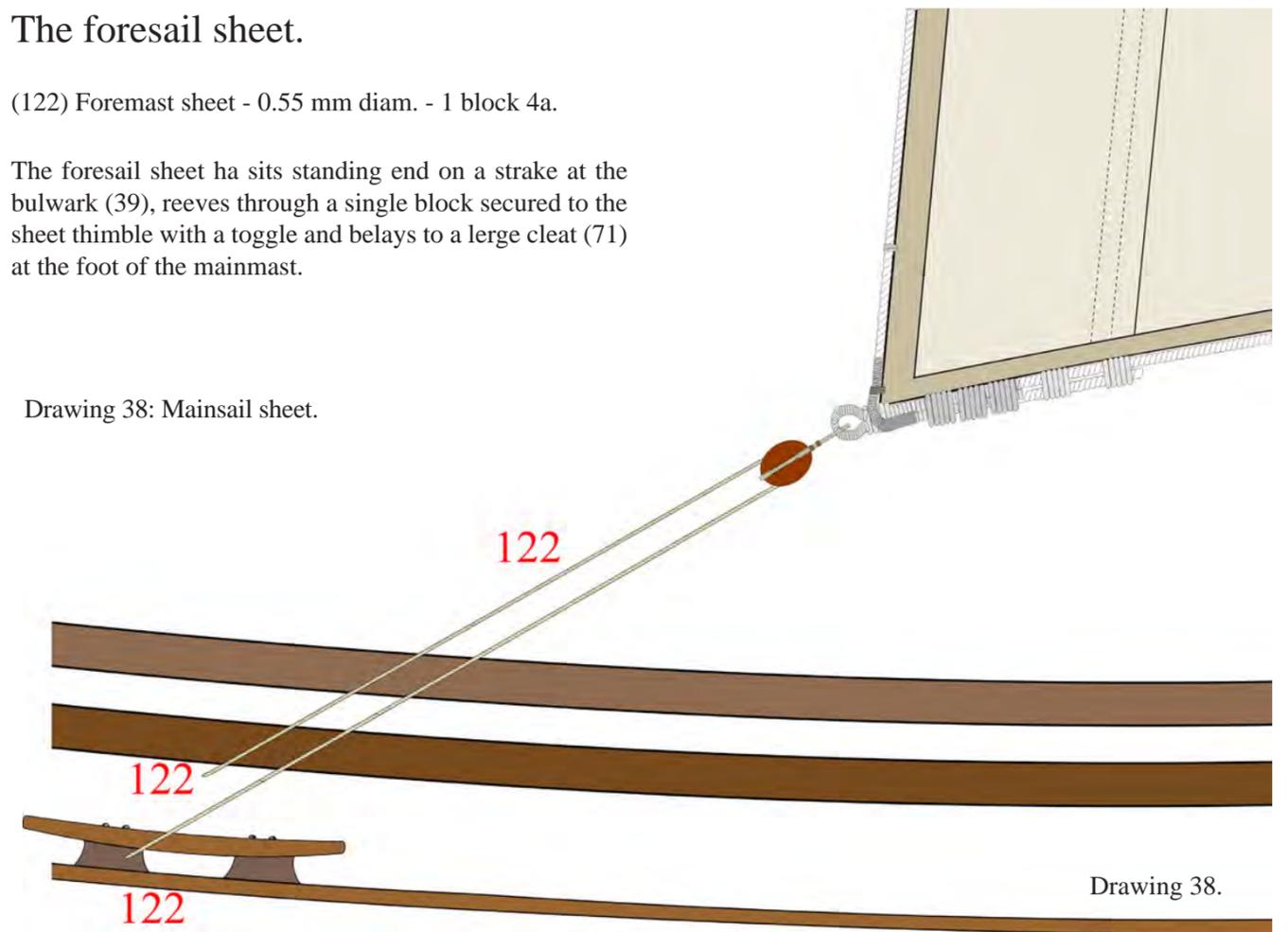


Photo n° 241: Detail view of the foresail sheet. In this case, it belays on the large cleat on deck, reeves through a single block and returns to a strake on the bulwark. The

belaying point is not obligatory and may change according to the setting of the sail depending upon the wind.



Photo n°. 242: The foresail sheet. Detail view of the block and its seizing at the clew (note the tabling).

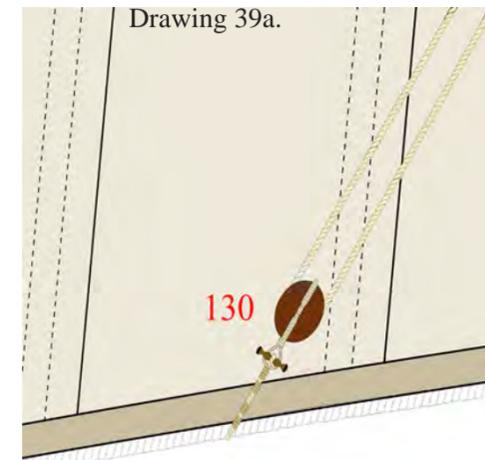


Photo n°. 243: Overhead view of the sheet.

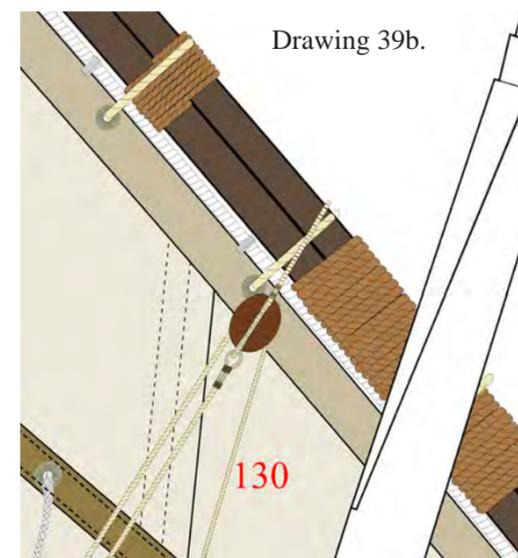
## The foresail.

Drawing 39: (130) foresail buntline - 0.55 mm. Diam. - 2 blocks 4a.

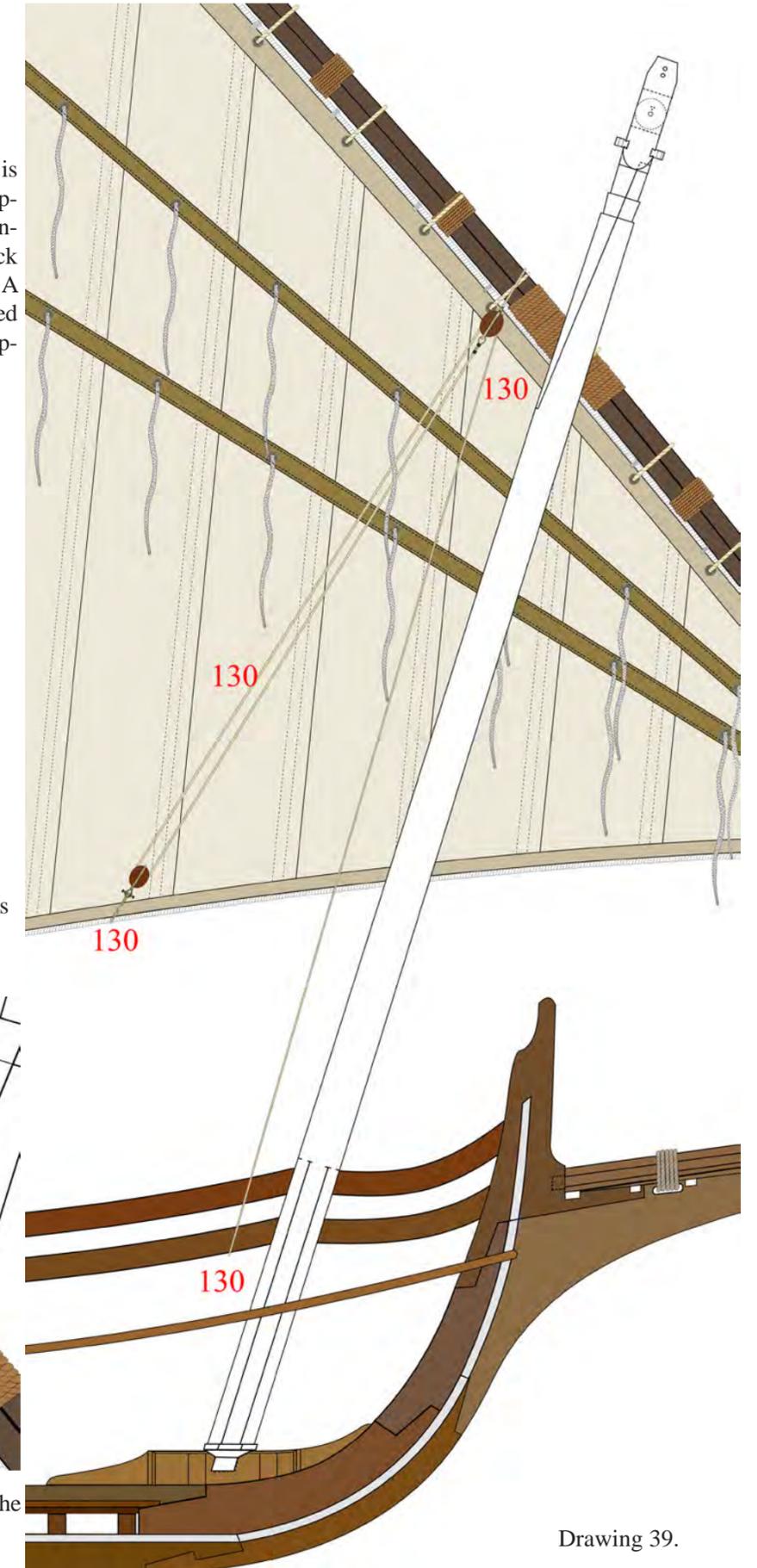
The buntline and its tackle. Its standing end is seized to the strop of a single block (a) stropped to the yard, it reeves through another single block (b), returns to reeve through block (a) and belays to a strake on the bulwark. A laniard seized to the foot of the sail is stropped to a toggle that is lead through a thimble stropped to single block (b).



Drawing 39a: The laniard is stropped to the boltrope and to a toggle - The block strop ends in a thimble that the toggle leads through.



Drawing 39b: Detail of the block seized to the yard.



Drawing 39.

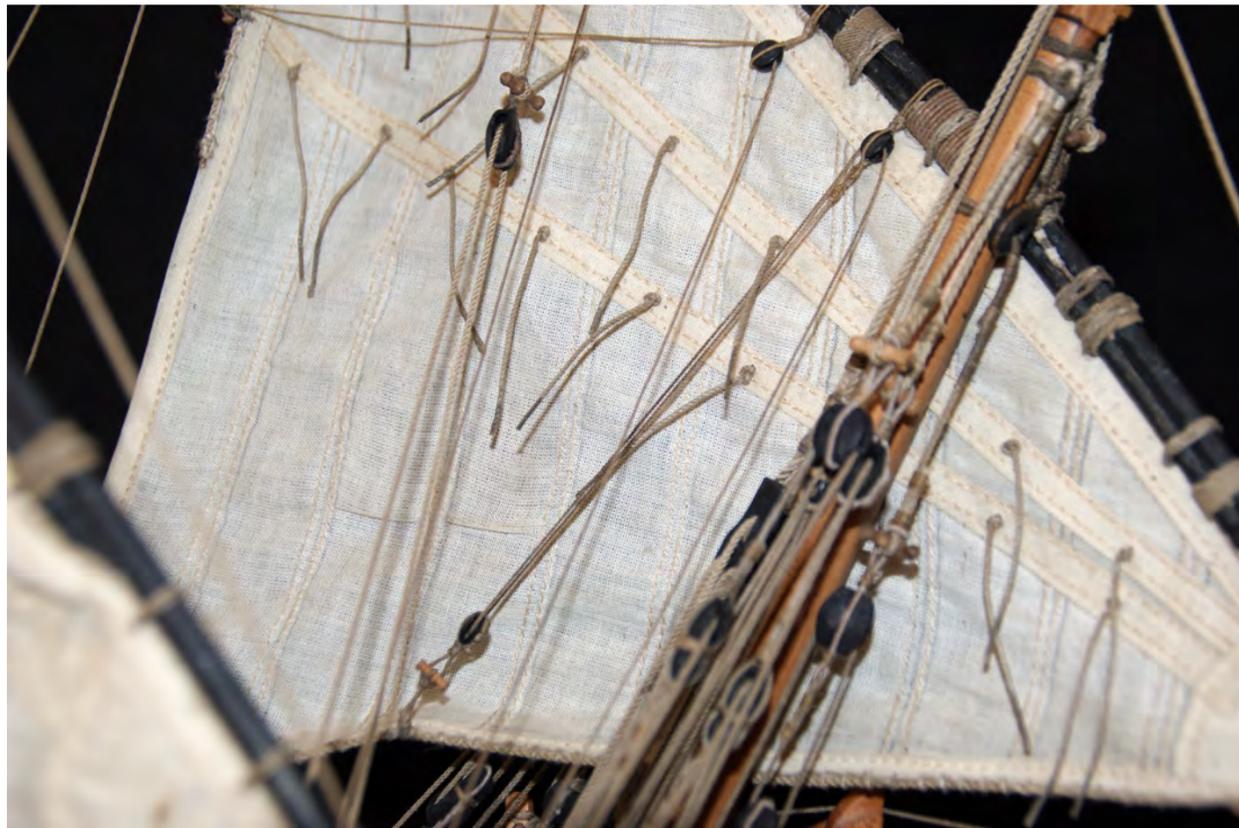


Photo n°. 244: Detailed view of the foresail buntline.

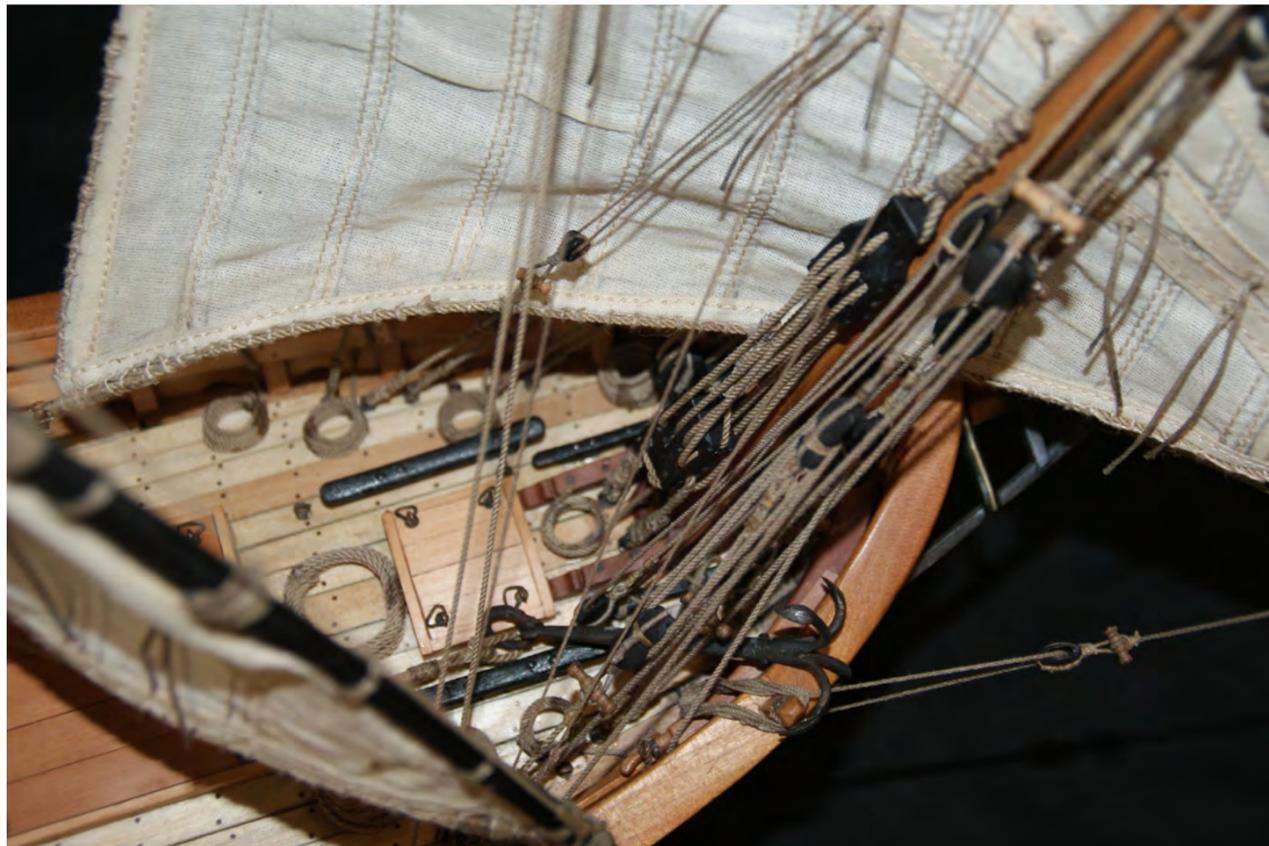


Photo n°244a: Detailed view of the foremast running rigging.

## Main. Mainmast.

### Shifting shrouds.

Drawing 40: The shifting shroud consists of three parts: (112) Shifting shroud pendants - served - 1.20 mm diam. - 1 block 8a  
 (113) Shroud - 1.00 mm diam. - 2 blocks 11c.  
 (114) Running end of the main tackle - 0.80 mm diam.  
 (115) Strop of the tackle.

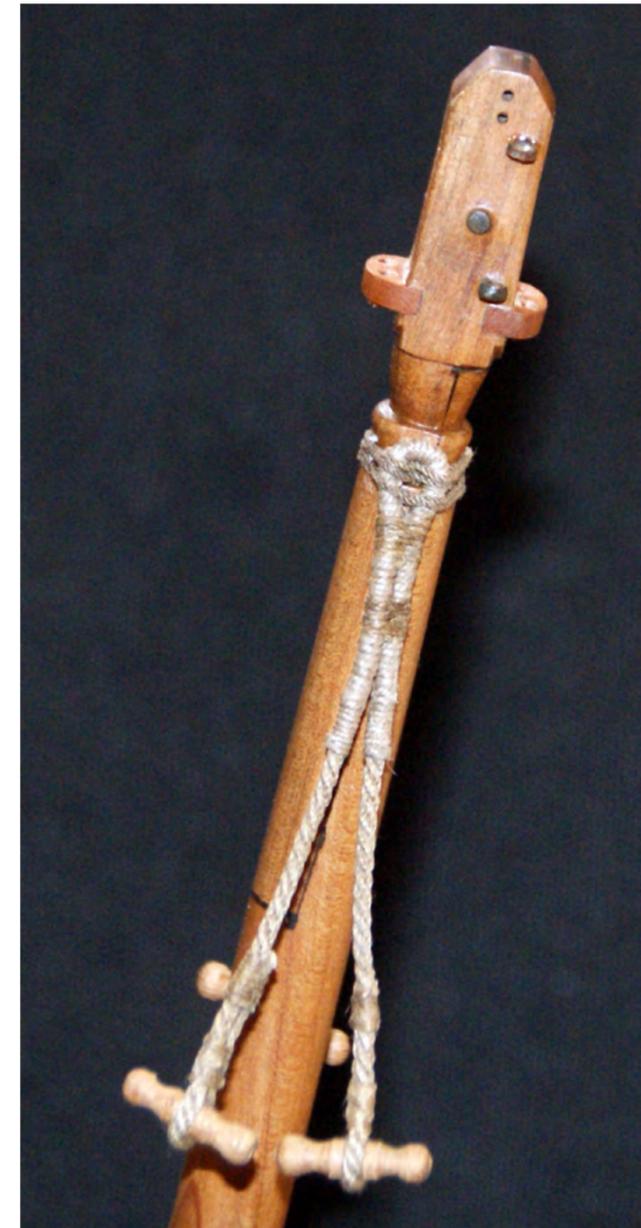
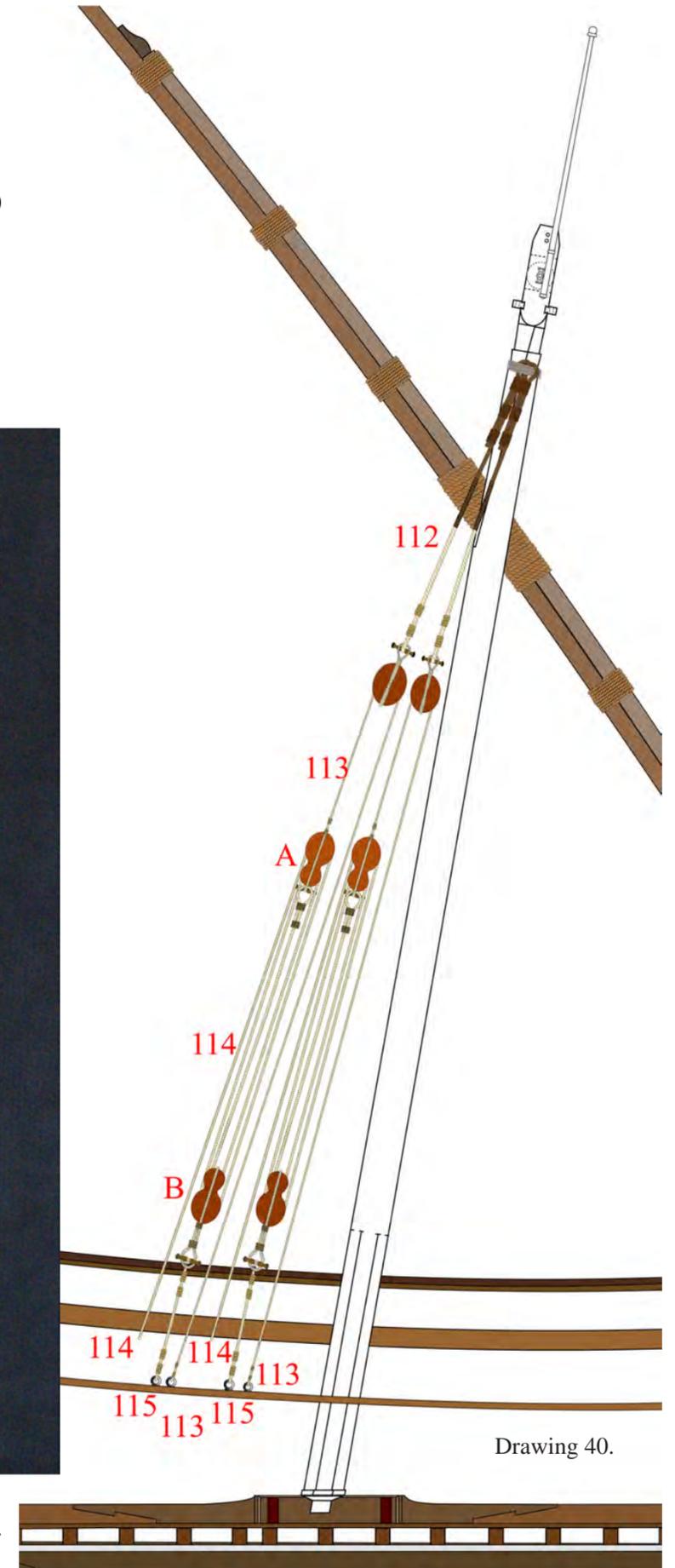


Photo n°. 245: Head rigging of the shroud pendants.



Drawing 40.

The pendant (112) is served over half its length. It is in fact made of a single rope folded at its midpoint and its ends strop two toggles. The folded piece must be bound tightly to the mast with a few tight turns. (see Photo n°. 245). The tie (113) is stropped to the top of the fiddle block (A), reeves through a single block stropped to the toggle of the pendant and is seized to an eyebolt on deck. The tackle (114) starts at the lower strop of the fiddle block, leads down to reeve through a sheave of the fiddle lock, leads

four times between blocks A and B and belays to a strake on the bulwark (39). The block B is seized to the lower strop (115), held at one end by a toggle and at the other end is seized to an eyebolt on deck.



Photo n°. 246: Detailed view of the pendants (112).



Photo n°. 247: Pendants (112), tie '113), fiddle block A and the two tackles.

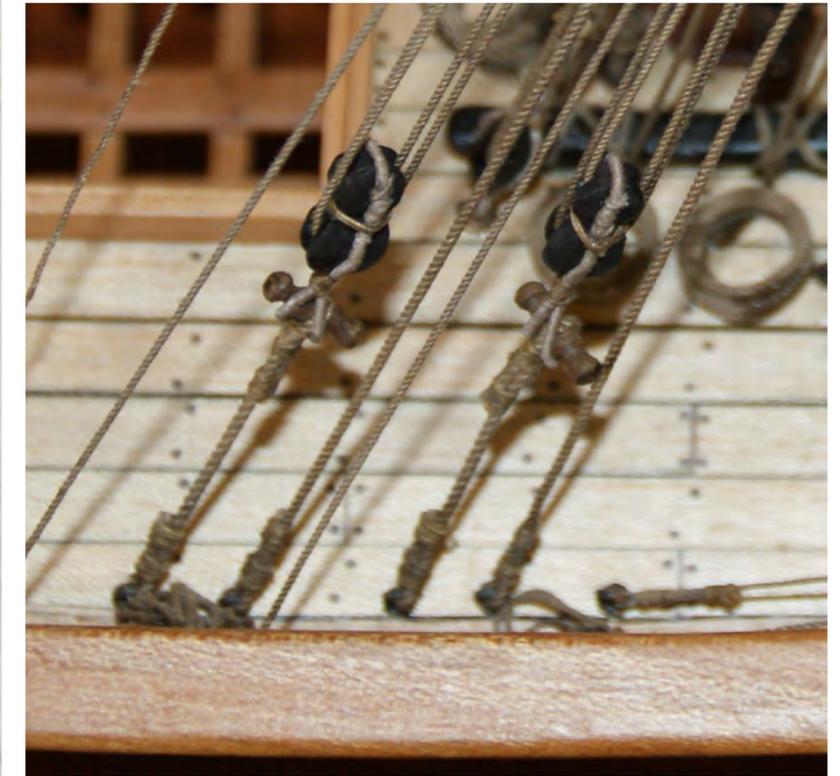


Photo n°. 248: Detail of the laniards.



Photo n°. 248a: Detailed view of the mainmast running rigging.



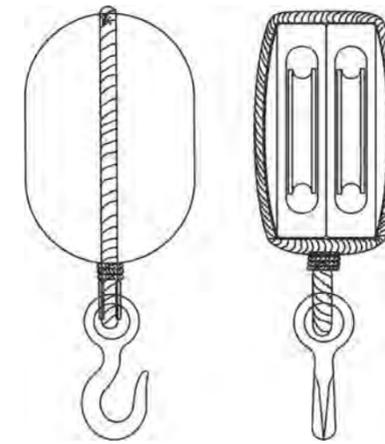
Photo n°. 249: The main mast with all its rigging.

## The main tackle.

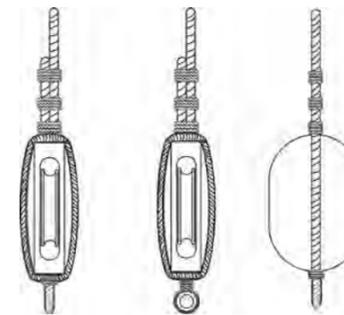
Drawing 41: The main tackle (119) consists in a pendant and a fish tackle.

(119) Maintacklependant-1.20mmdiam.-1 block 10b(135).  
main tackle: 1.00 mm diam. - 1 block 10a.

The pendant is partly served. It is seized securely to the mast head with several turns through the eye formed at the end of the pendant. The fish tackle consists in a single block and a double block, both stropped with a hook. It is used to handle heavy loads. The lower block is hooked to an eyebolt driven into the deck slightly ahead of the mainmast.



Double block with strop and hook.



Single block.

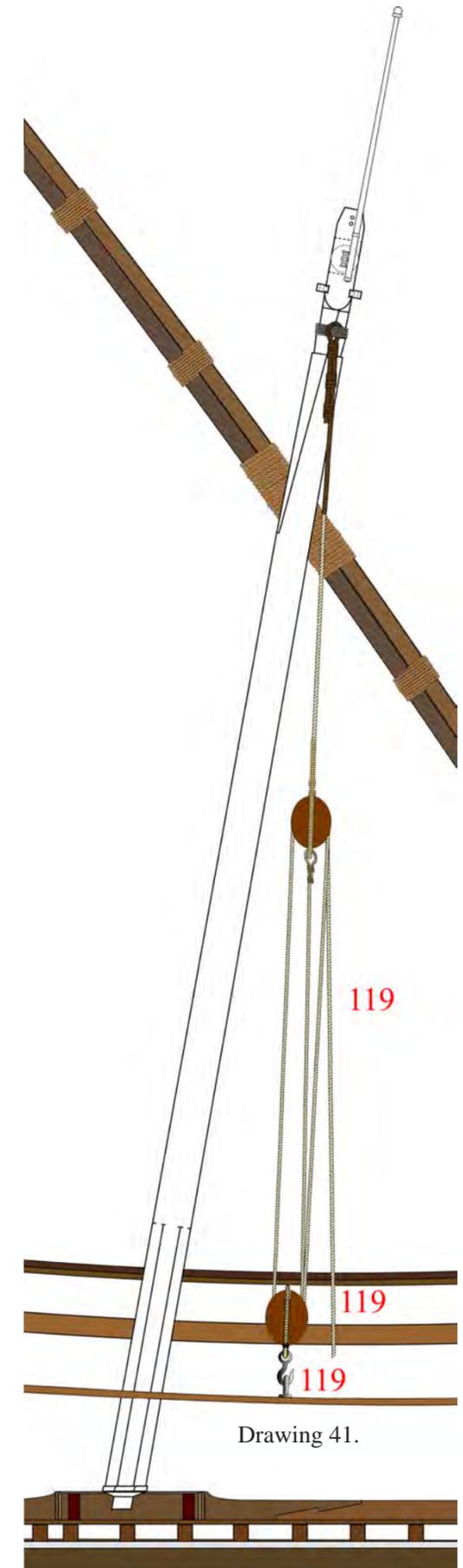




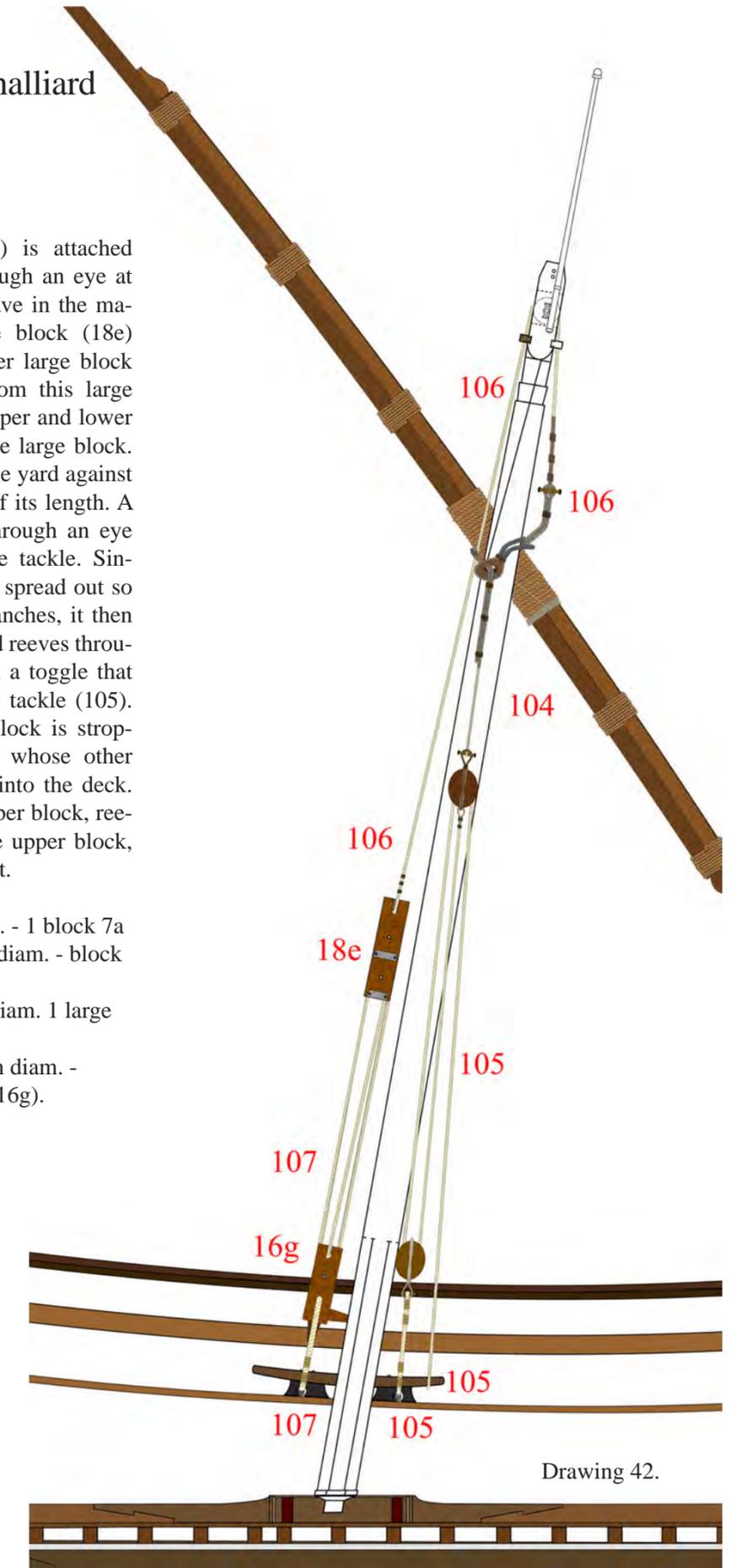
Photo n°. 250: Detail of the main masthead rigging. In the foreground, the main tackle pendant.

## The truss, the halliard tie, the halliard and their tackles.

Drawing 42: The yard running rigging.

The yard halliard: the halliard tie (106) is attached to the sling with a toggle that is lead through an eye at the end of the sling, reeves through a sheave in the masthead and is seized to the upper large block (18e) On deck, a laniard is stroped to the lower large block (16g). The halliard tackle (107) starts from this large block, reeves through the sheaves in the upper and lower large blocks and belays to a cleat under the large block. (104) Truss. The truss is used to maintain the yard against the mast. It is served and doubled over half its length. A toggle is stroped at the end and leads through an eye stroped on the upper single block of the tackle. Since it is double at its upper part, the truss is spread out so the the sling may lead through the two branches, it then wraps around both the yard and the mast and reeves through the oval-shaped heart to terminate with a toggle that is stroped to the upper block of the truss tackle (105). At the other end of the tackle, a single block is stroped to a toggle at the end of a laniard whose other end is seized to an eyebolt that is driven into the deck. The tackle is seized to the an eye on the upper block, reeves through the lower block, returns to the upper block, and back down to belay on the midship cleat.

- (104) Mainyard truss, heart - 1.00 mm diam. - 1 block 7a
- (105) Truss tackle - standing end, 0.70 mm diam. - block strop, 1.10 mm diam. - 1 block 7a.
- (106) Halliard tie - Standing end 1.15 mm diam. 1 large block (18e).
- (107) Halliard tackle - running end 1.00 mm diam. - block strop 1.20 mm diam. - 1 large block (16g).



Drawing 42.



Photo n°. 251: Detail of the halliard tie (106) and the sling. The truss reeves through the oval-shaped heart.



Photo n°. 252: Detail of the main masthead with its two sheaves, the halliard tie and the lift.

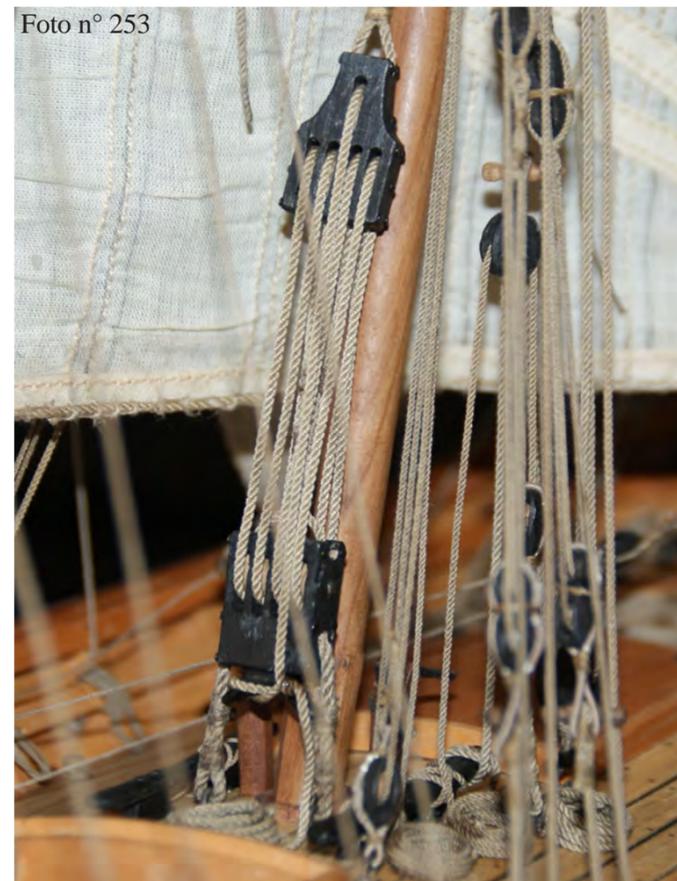


Foto n° 253

Photo n°. 253: Close-up of the halliard tackle - the standing end between the large blocks (16e and 16g) and the running end belayed to the cleat on the lower large block.

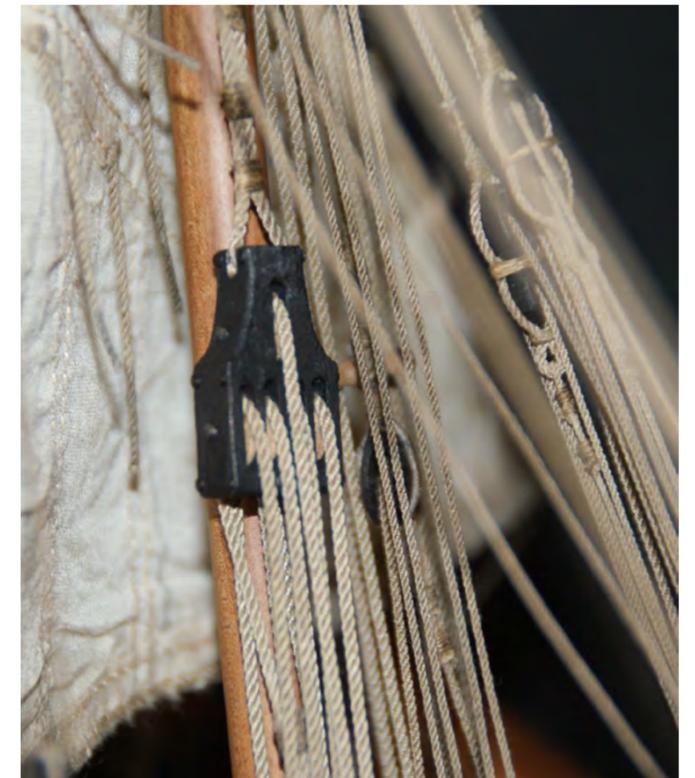


Photo n°. 254: Close-up of the upper large block (18c).

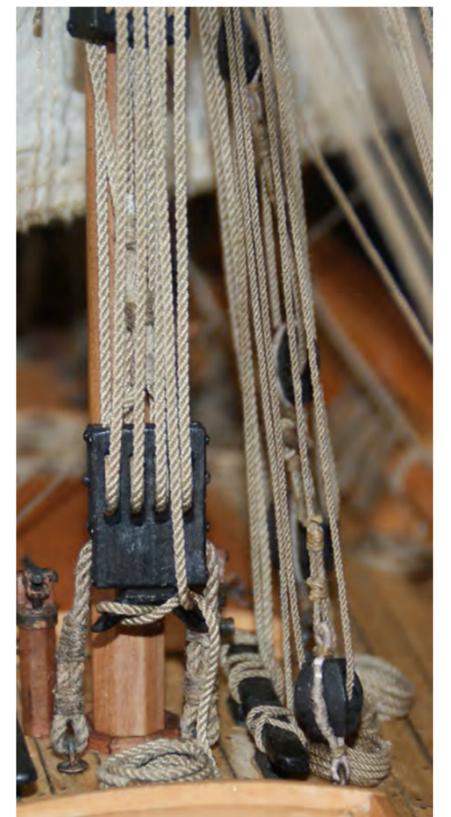
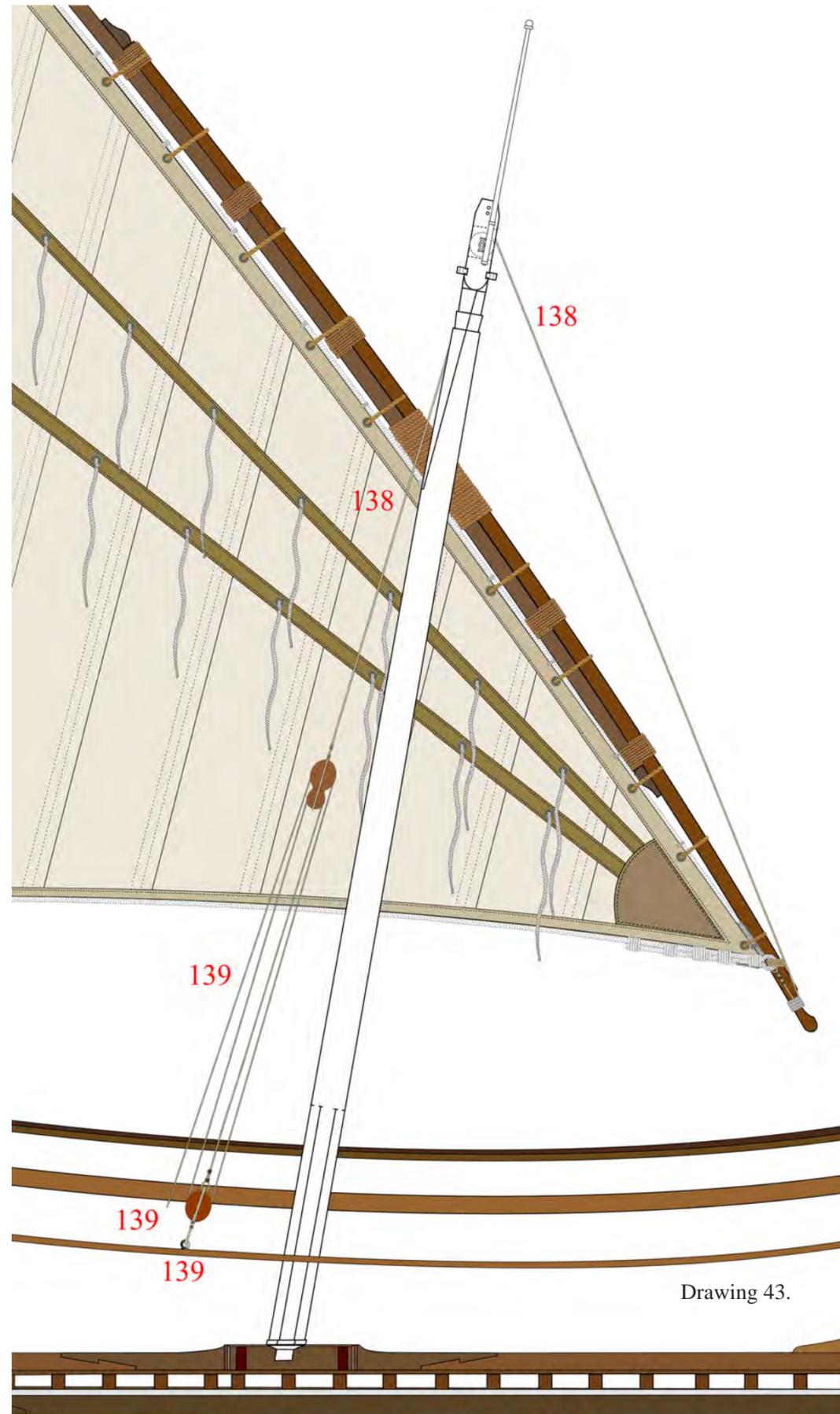


Photo n°. 255: Close-up of the lower large block (16g).

The Lift of the lower half of the yard.



Drawing 43: The lift of the lower half of the yard and its tackle - rigging detail.

(138) The lift of the lower half of the mainyard, 0.85 mm diam. - 1 block 9c.

(139) Running end of the lift tackle, 0.65 mm diam. - 1 block 8a.

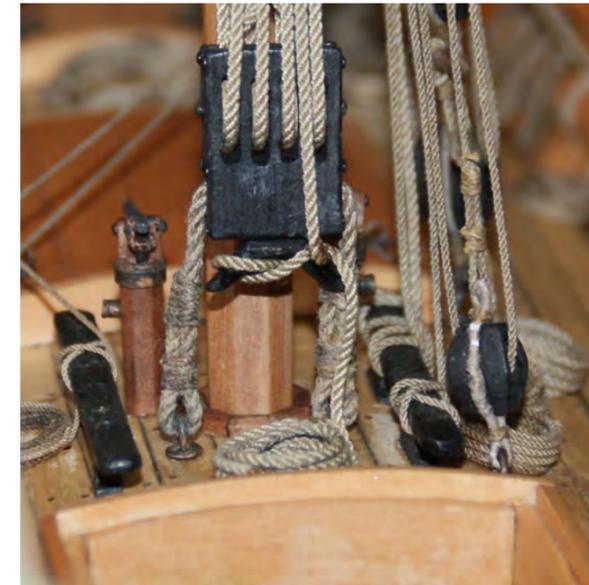


Photo n°. 256: To the lower right, the tackle block.

Photo n°. 257: The lift is seized to the tip of the lower half of the yard, reeves through a mortice and a sheave in the masthead (Photo n°. 252) and is seized the strop of a fiddle block. This fiddle block is part of a tackle, along with a single block stropped to a laniard seized to an eyebolt on deck.



Photo n°. 258: Close-up view of the masthead (calcet) with the lift to starboard and its standing end stropped to the fiddle block.

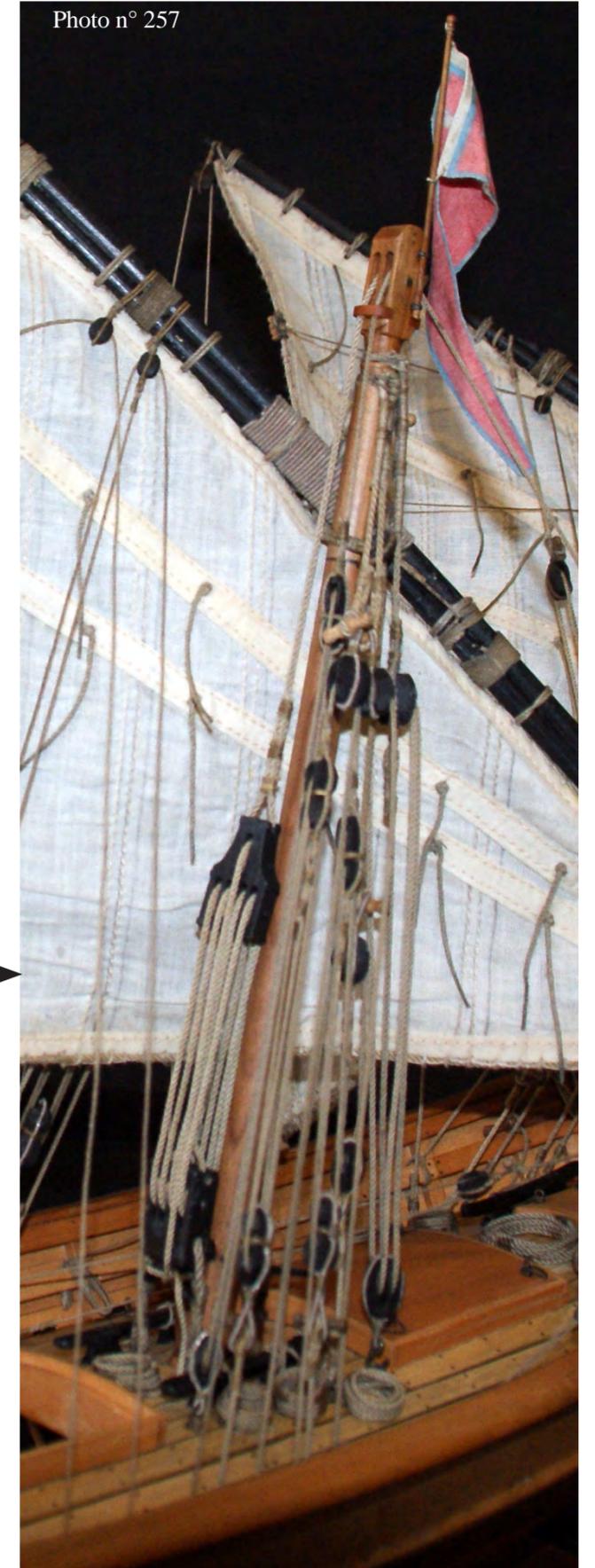




Photo n°. 259: The lift in the foreground (138); At the top, the fiddle block and at the bottom, the single block.



Photo n°. 259a: In the foreground, the lift of the lower half of the yard and at the top, the fiddle block.

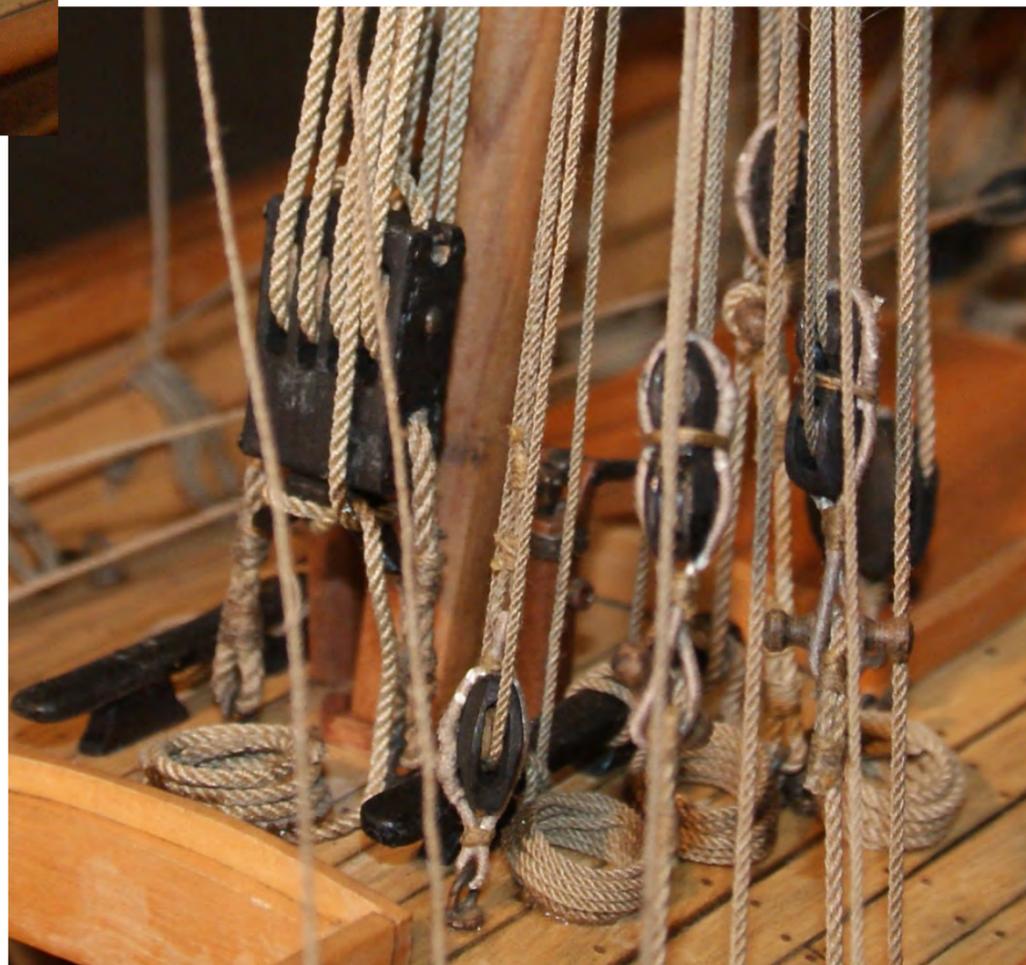


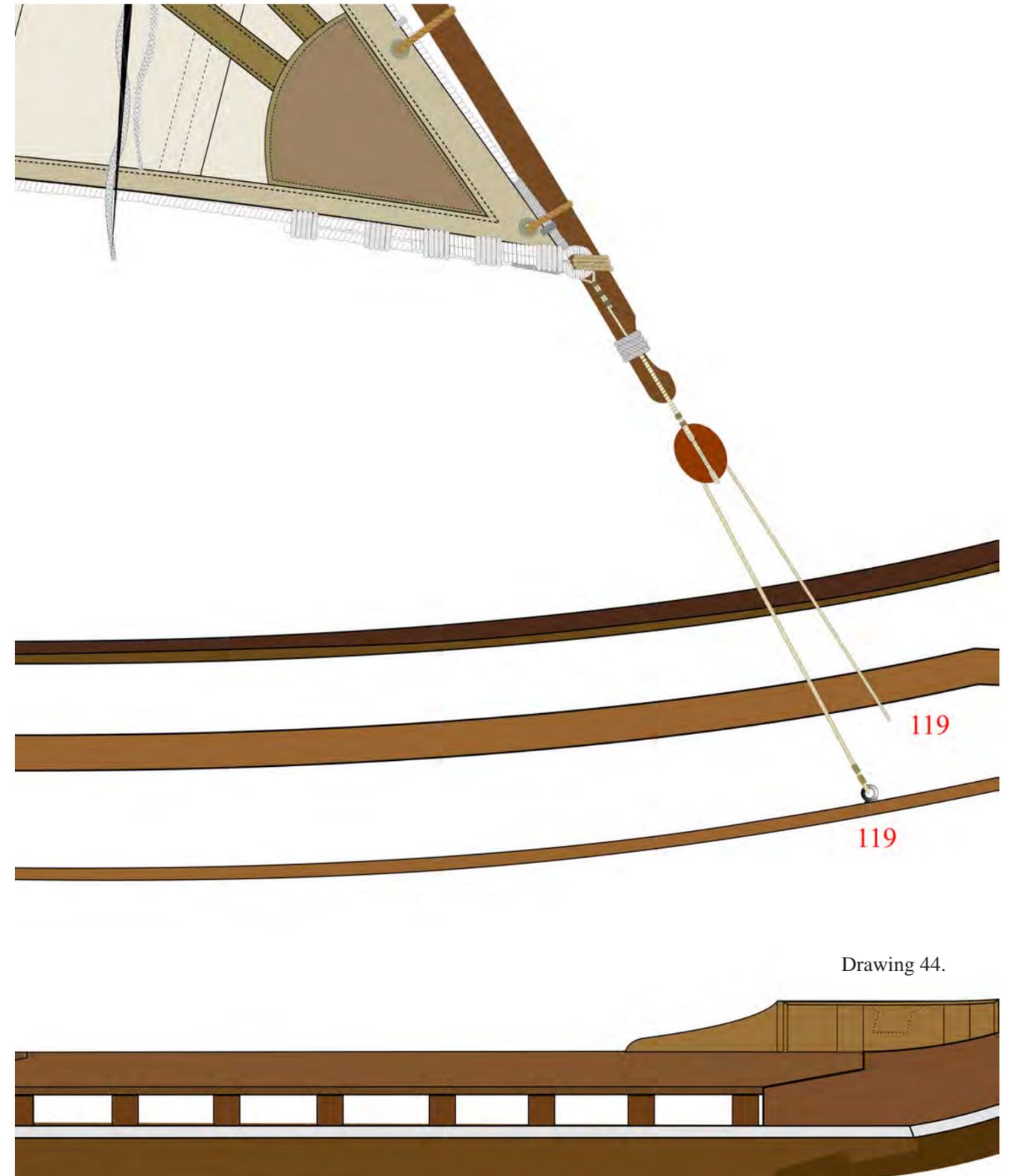
Photo n°. 260: Enlarged detailed view of the single block of the lift tackle.

## The main yard tackle.

Drawing 44: On these Mediterranean vessels, braces are called « bragots ». The lower end of the yard has one called a « orse a poupe » (119). It consists in a pendant seized to the yard and stropped to a block at the other end. The fall of the brace is seized to an eyebolt on deck, reeves through the

block and returns to belay to a strake on the bulwark.

119 V-shaped branches of the pendant 0.70 mm diam.  
119 brace tackle 0.60 mm diam. - blocks 6a.



Drawing 44.



Photo n°. 261: Detail of the V-shaped pendant of the brace.



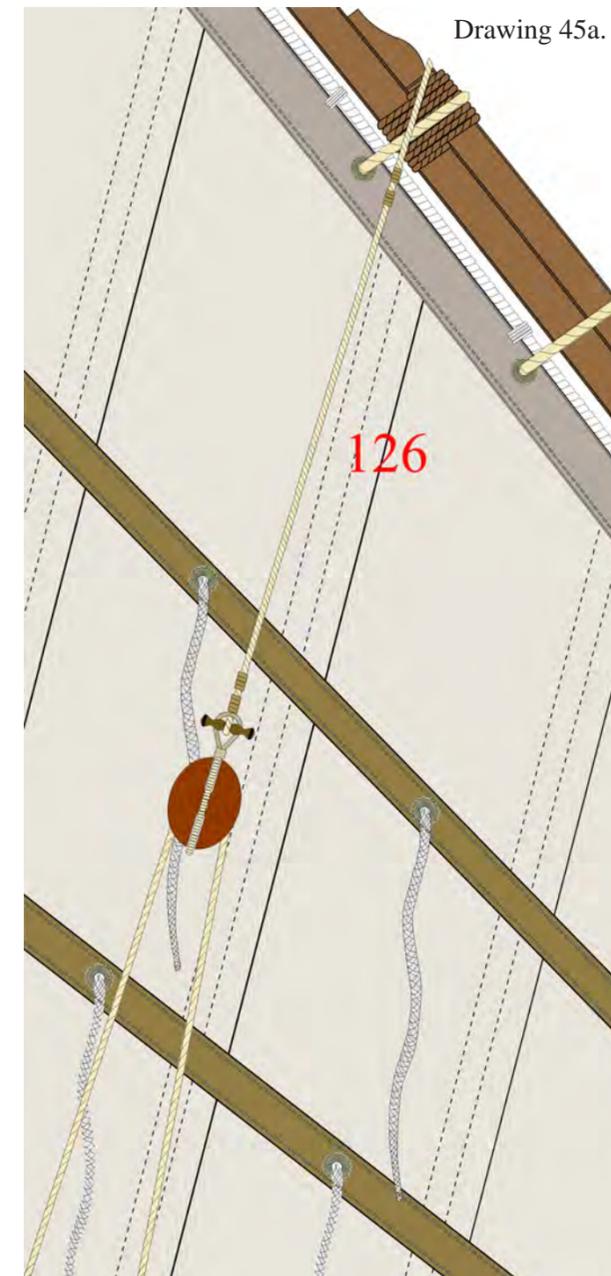
Photo n°. 262: Overall view of the brace.

## Main brace.

Drawing 45: The pendant is bound to the yard and stops a toggle at the other end, that leads through a grommet stopped to the tackle block. The standing end of the tackle is seized to an eyebolt on deck (125) and the running end belays to a strake on the bulwark (39).

(126) The pendant - .80 mm diam.- 1 block 6a.

(127) The standing end of the brace 0.65 mm diam.



Drawing 45a: Detailed view of the pendant.



Drawing 45.



Photo n°. 264: Detailed view of the brace standing end.

Photo n°. 263: The completed brace.

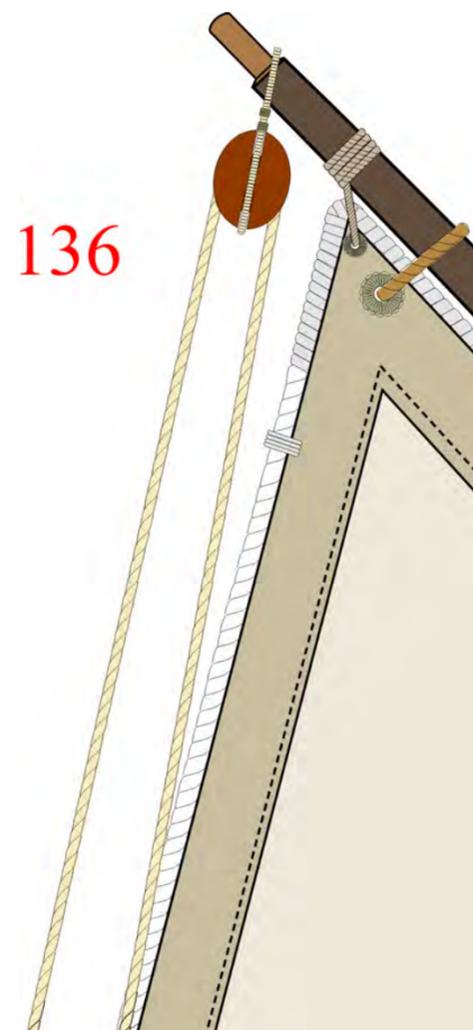


The main yard downhaul.

(136) main yard downhaul, 0.65 mm diam. - 1 block 5a.

Drawing 46: The downhaul standing end is seized to a strake on the bulwark, reeves through a single block stopped to the tip of the antenna and belays to a strake on the bulwark (39).

Drawing 46a.



Drawing 46a: Detailed view of the single block, stopped to the yard.



Drawing 46.

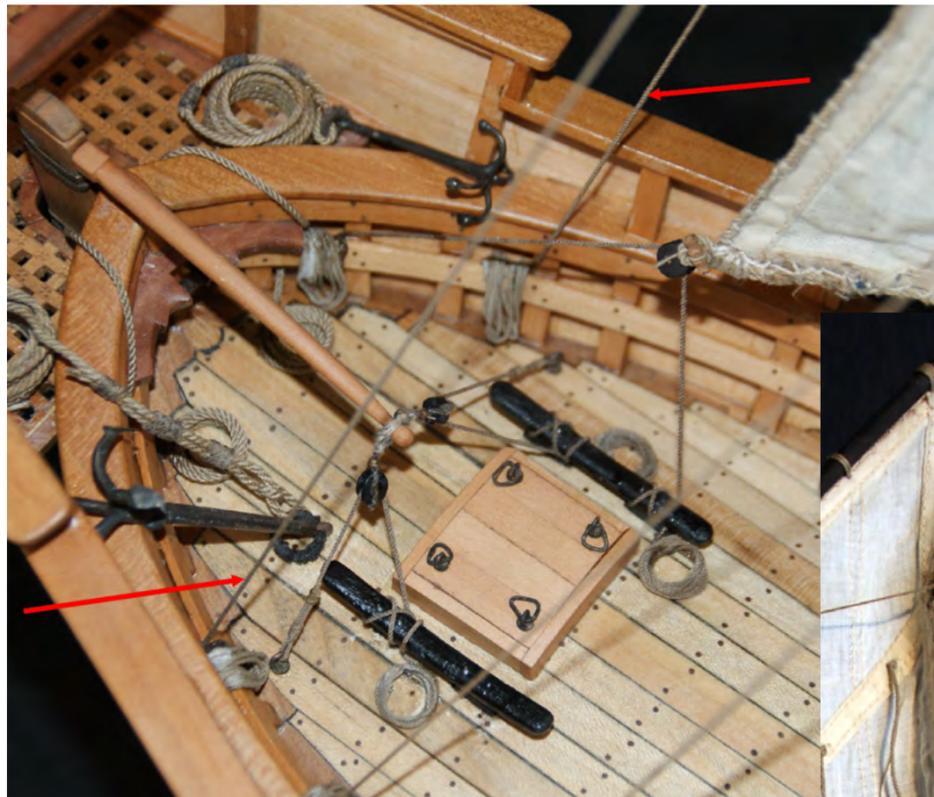


Photo n° 265: The arrows show the belaying points.



Photo n° 266a: Detailed view of the block stopped to the tip of the main yard.

Photo n° 266: The main yard downhaul.

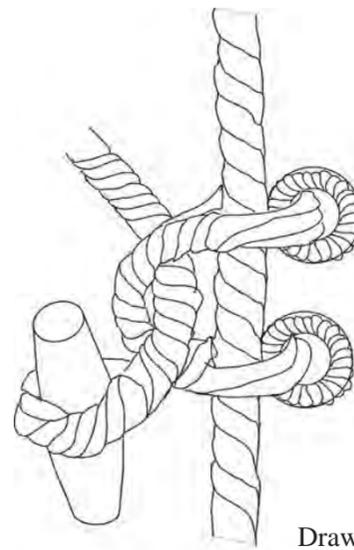


## The main brails.

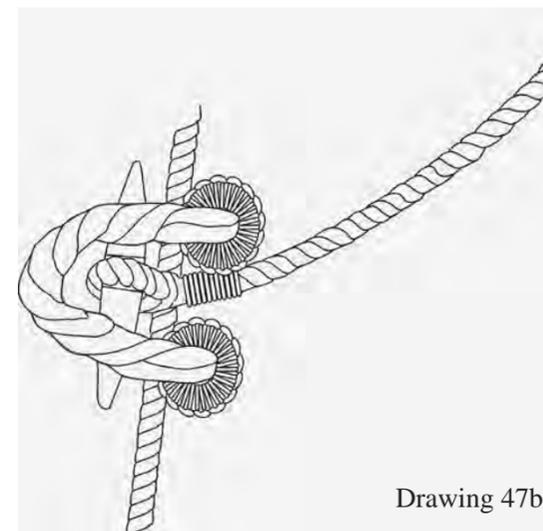
There are three identical brails on the mainsail:

- (131) Top brail - 0.50 mm diam. - 1 block 4a
- (132) Middle brail - 0.50 mm diam. - 1 block 4a
- (133) Lower brail - 0.50 mm diam. - 1 block 4a.

At one end, the brail is stopped to a toggle that is lead through a cringle on the leechrope, it reeves through a single block stopped to the yard and leads down to belay on a strake on the bulwark (39).



Drawing 47a.



Drawing 47b

Drawing 47a/b: Detail of the cringle on the leechrope. The brail is stopped to a toggle.



Dis. 47 Drawing 47.

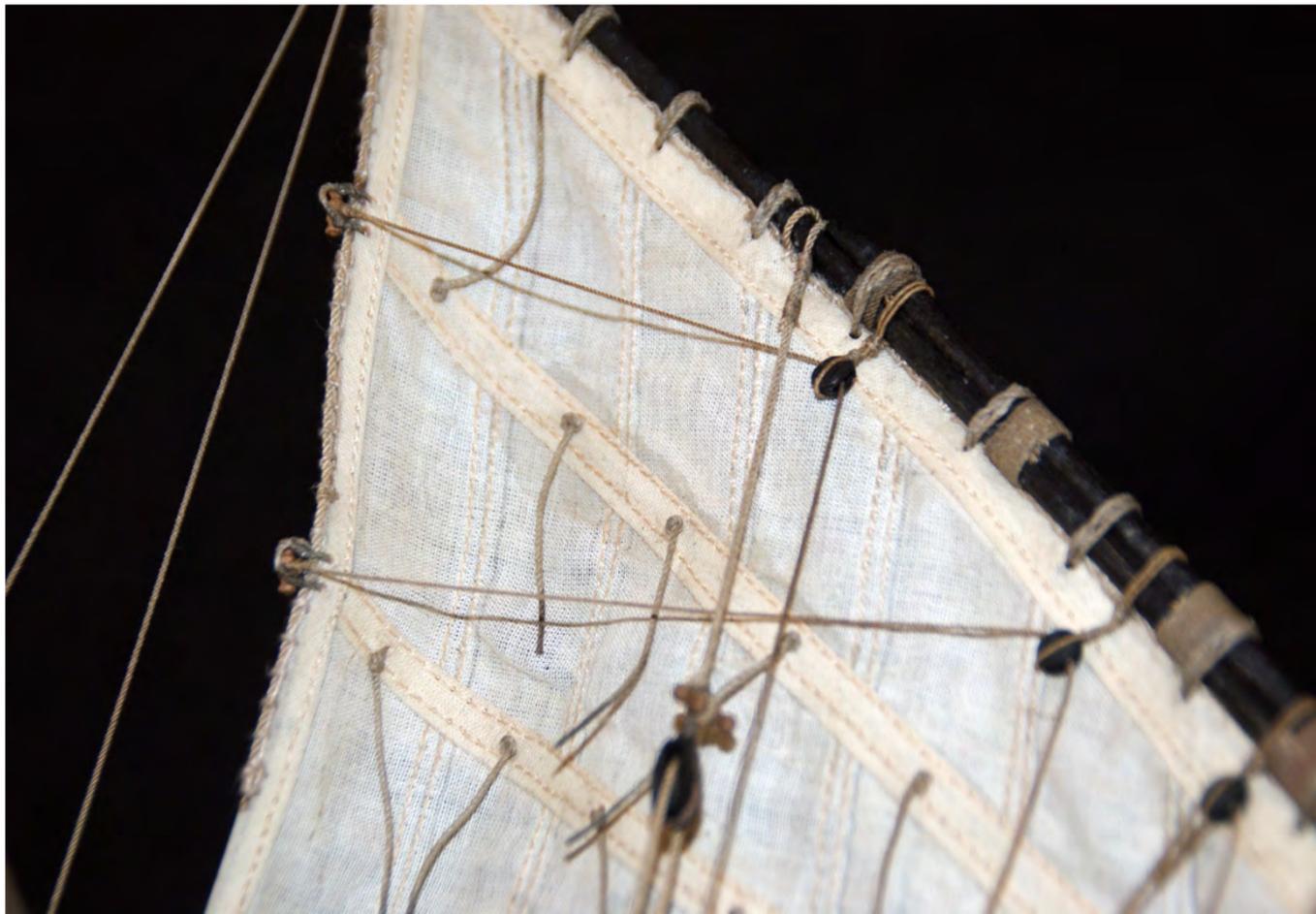


Photo n°. 267: The brails (131) and (132).

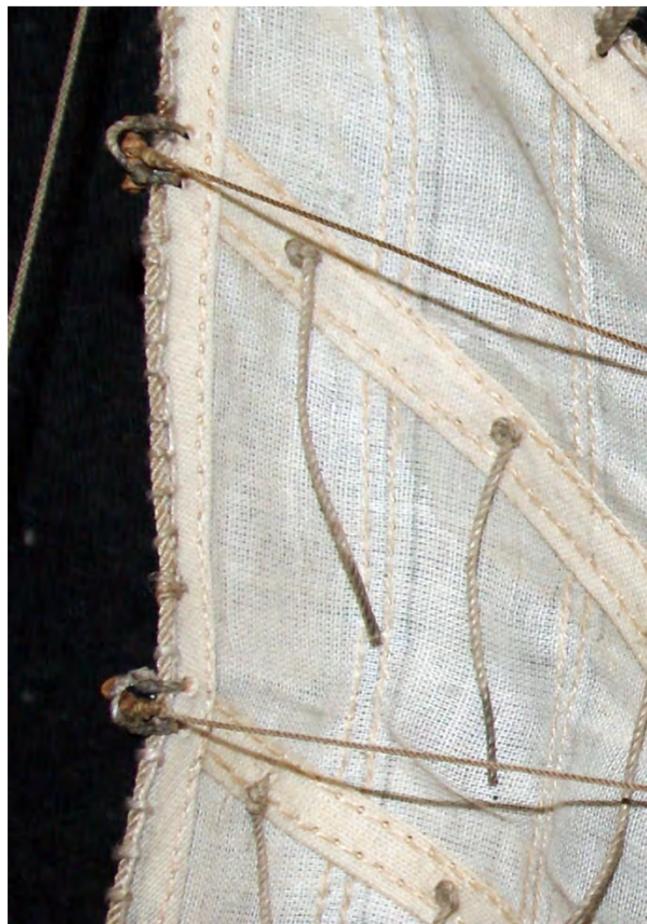
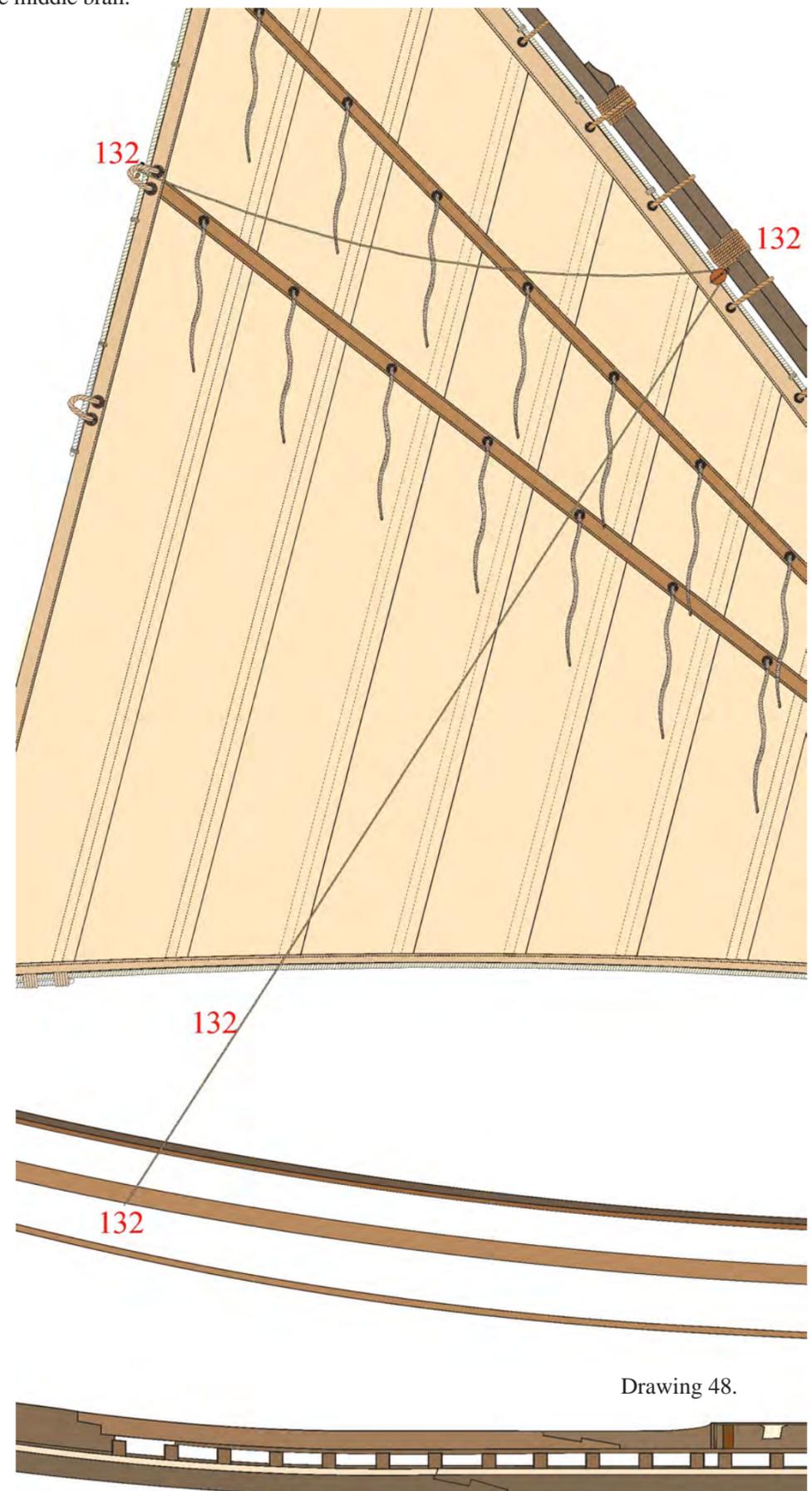


Photo n°. 268: Detail of the cringle on the leechrope for the top brail (131).

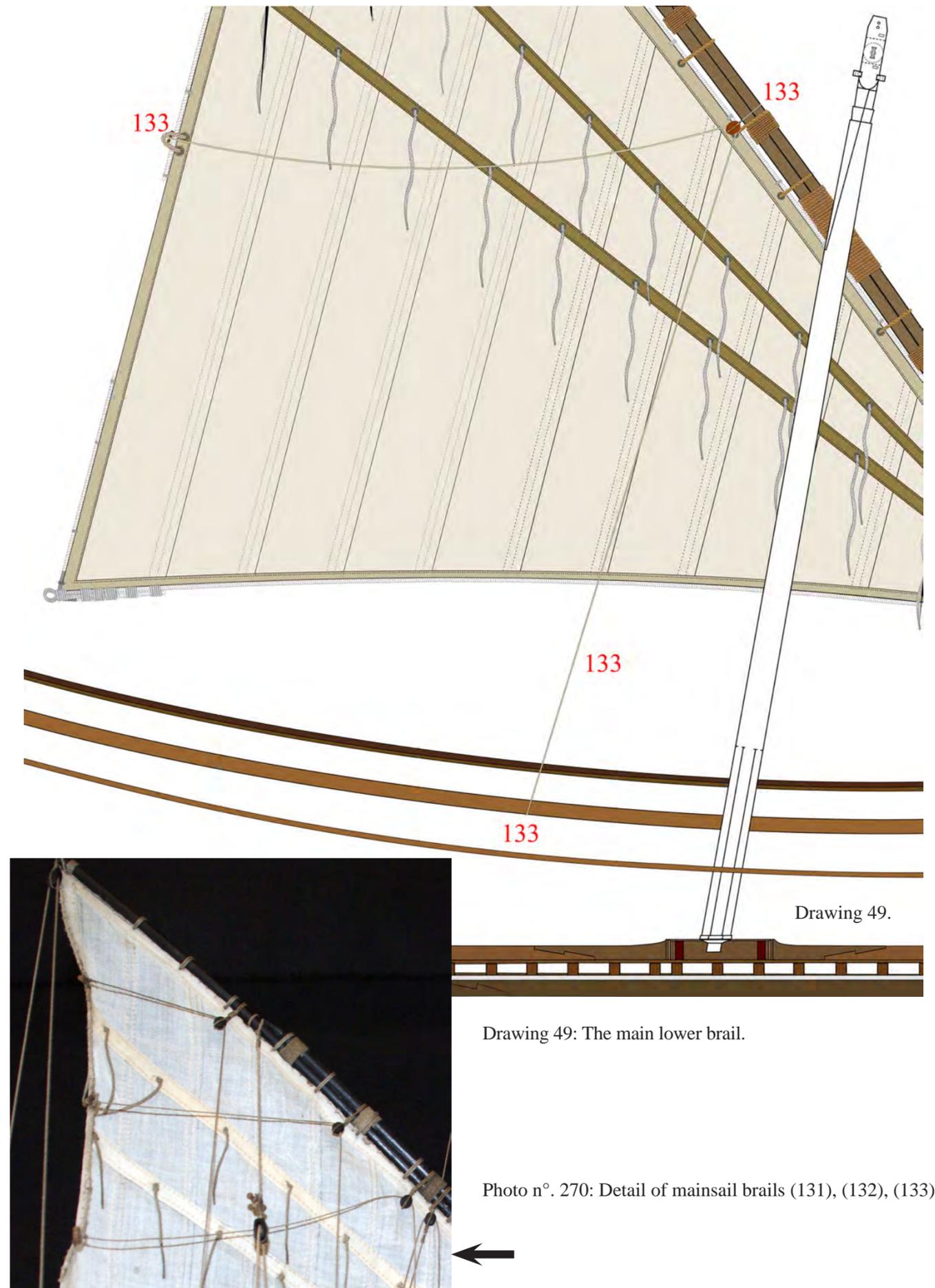
Drawing 48: The middle brail.



Drawing 48.



Photo n°. 269: Detail of the brails (131), (132), (133) belaying points on the bulwark strake(39).



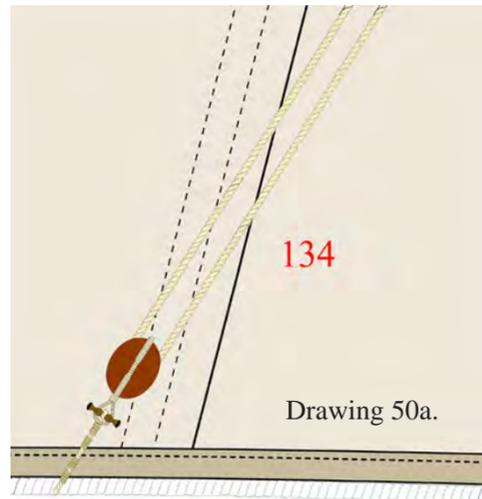
Drawing 49: The main lower brail.

Photo n°. 270: Detail of mainsail brails (131), (132), (133).

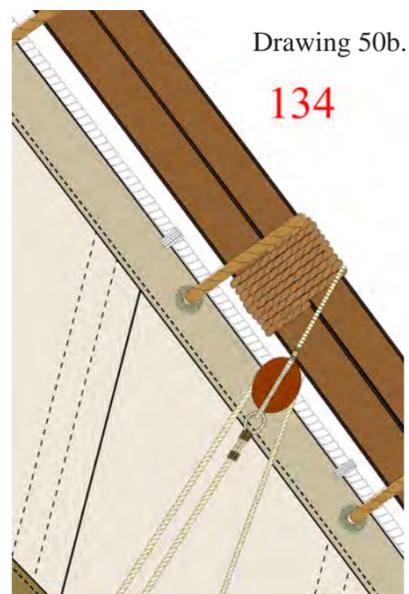
## The mainsail buntline.

(134). The mainsail buntline - 0.55 mm diam. - 2 blocks 4a.

The buntline is stropped to the footrope through a pendant stropped to a toggle that is pushed through the eye on the strop of a single block (b). Another single block (a) is stropped to the yard. The tackle is stropped to the eye on block (a), reeves through block (b), back to block (a) and down to belay on the strake on the bulwark.



Drawing 50a: The pendant is seized to the footrope. At the other end, the toggle is pushed through the eye on the block.



Drawing 50b: Detail of the block seized to the yard.

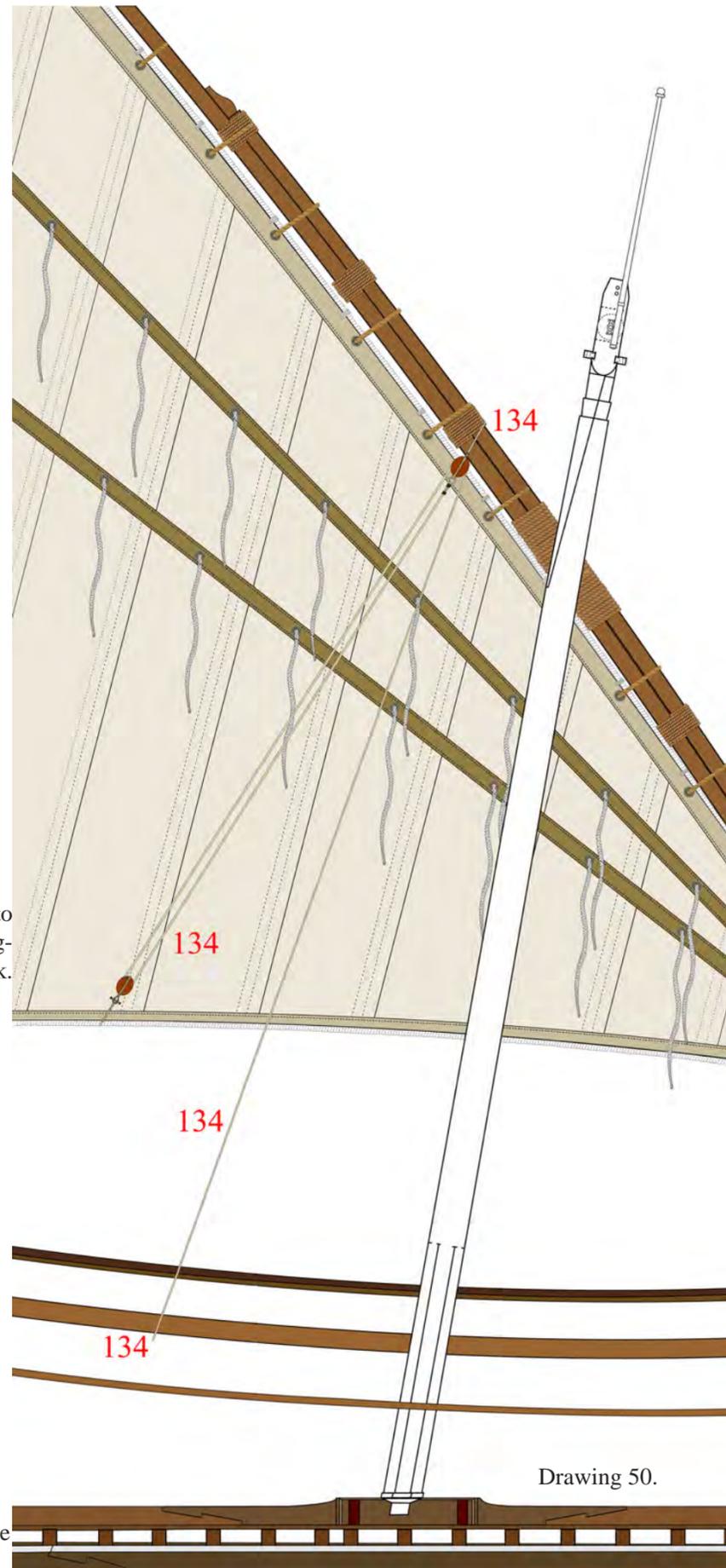


Photo n°. 271: The mainsail buntline.

Photo n°. 272: The pendant stropped to the footrope and a toggle.



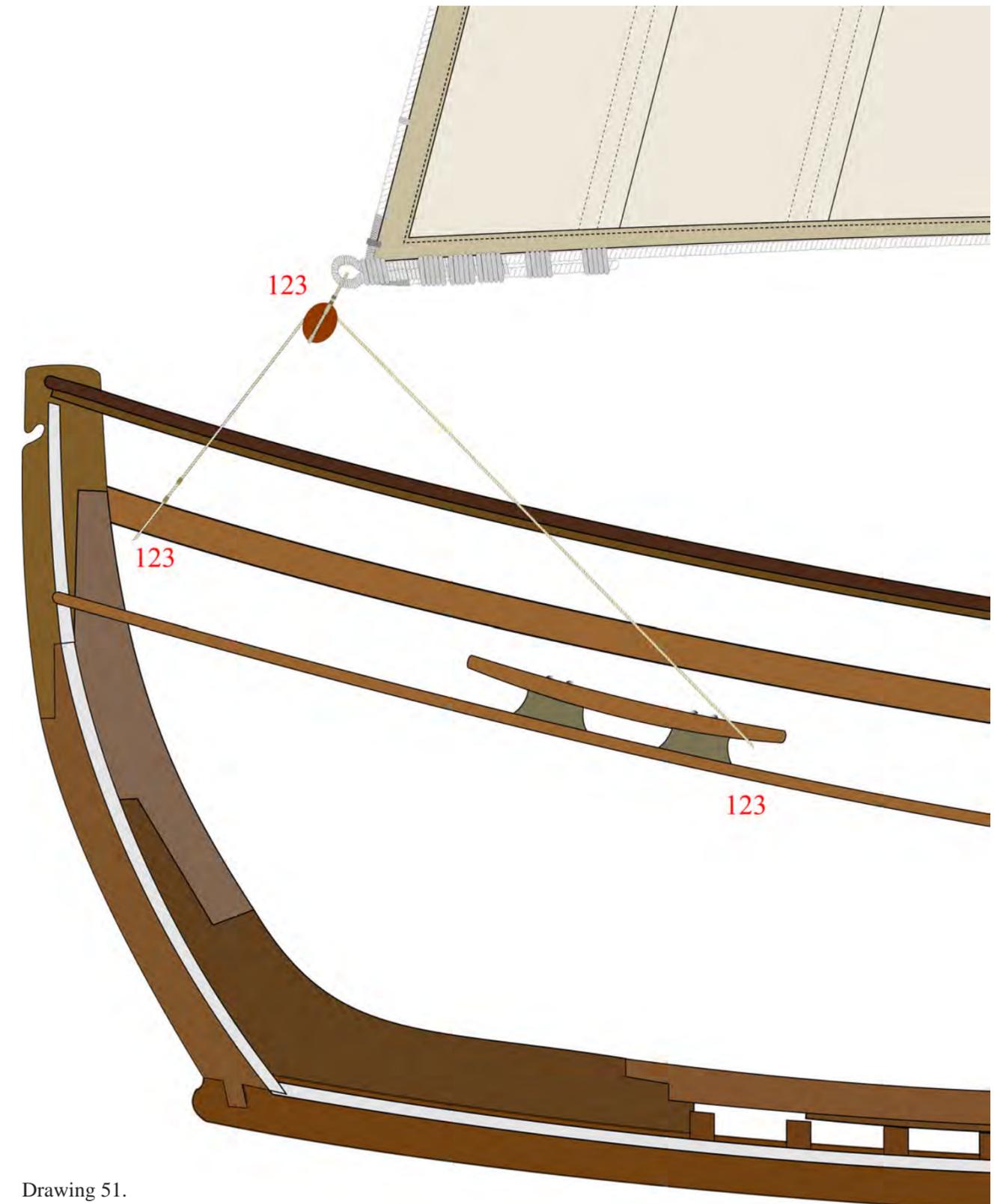


Photo n°. 273: The mainmast, fully rigged.

## The mainsail sheet.

(123) Mainsail sheet - 0.60 mm diam. - 1 block 5a.

The mainsail sheet starts at the bulwark strake (39), reeves through a single block at the clew (it is stropped to a toggle that leads through the grommet) and returns to belay on the deck stern cleat (72).



Drawing 51.

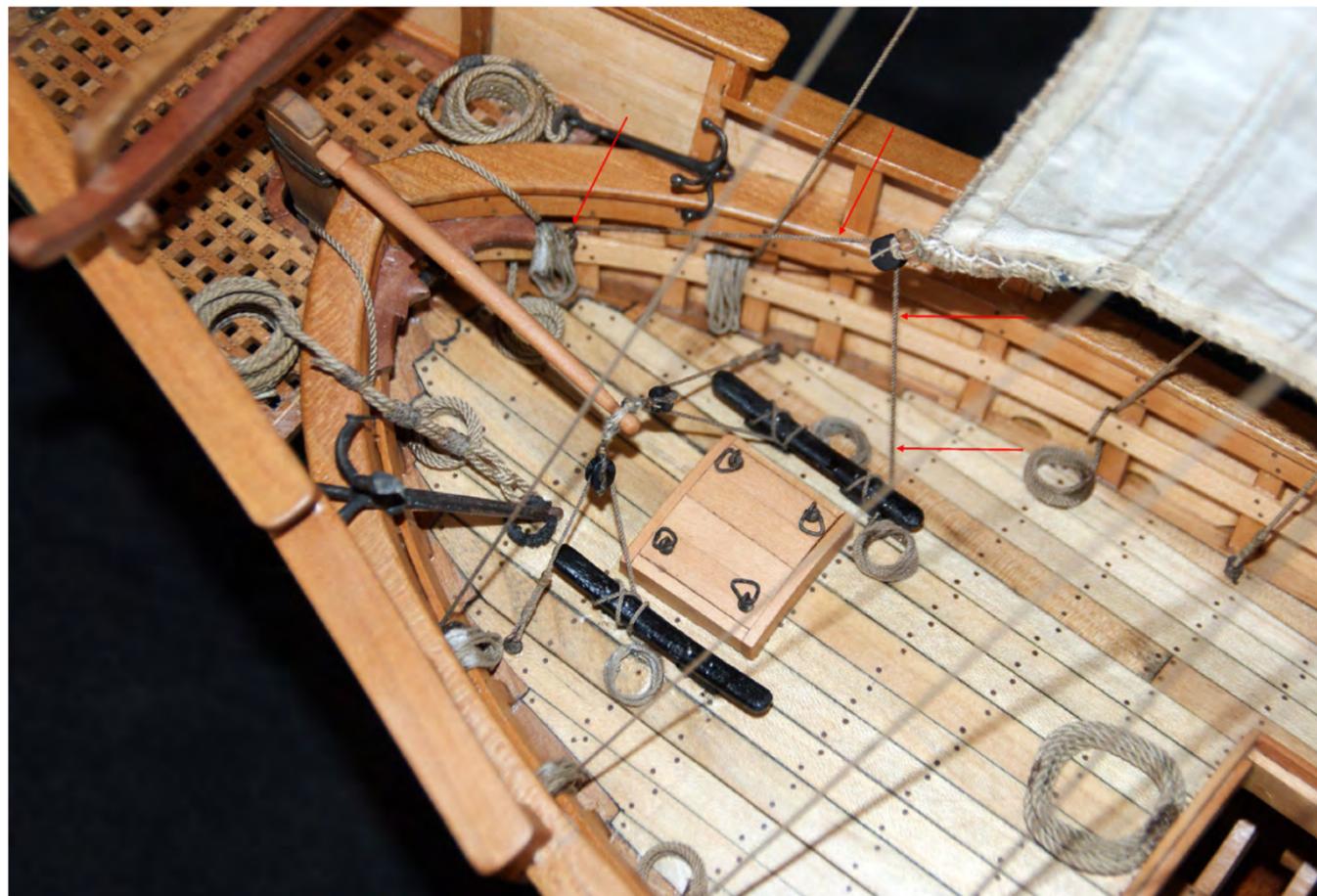


Photo n°. 274: Overhead view of the mainsail sheet. Four arrows show the location.

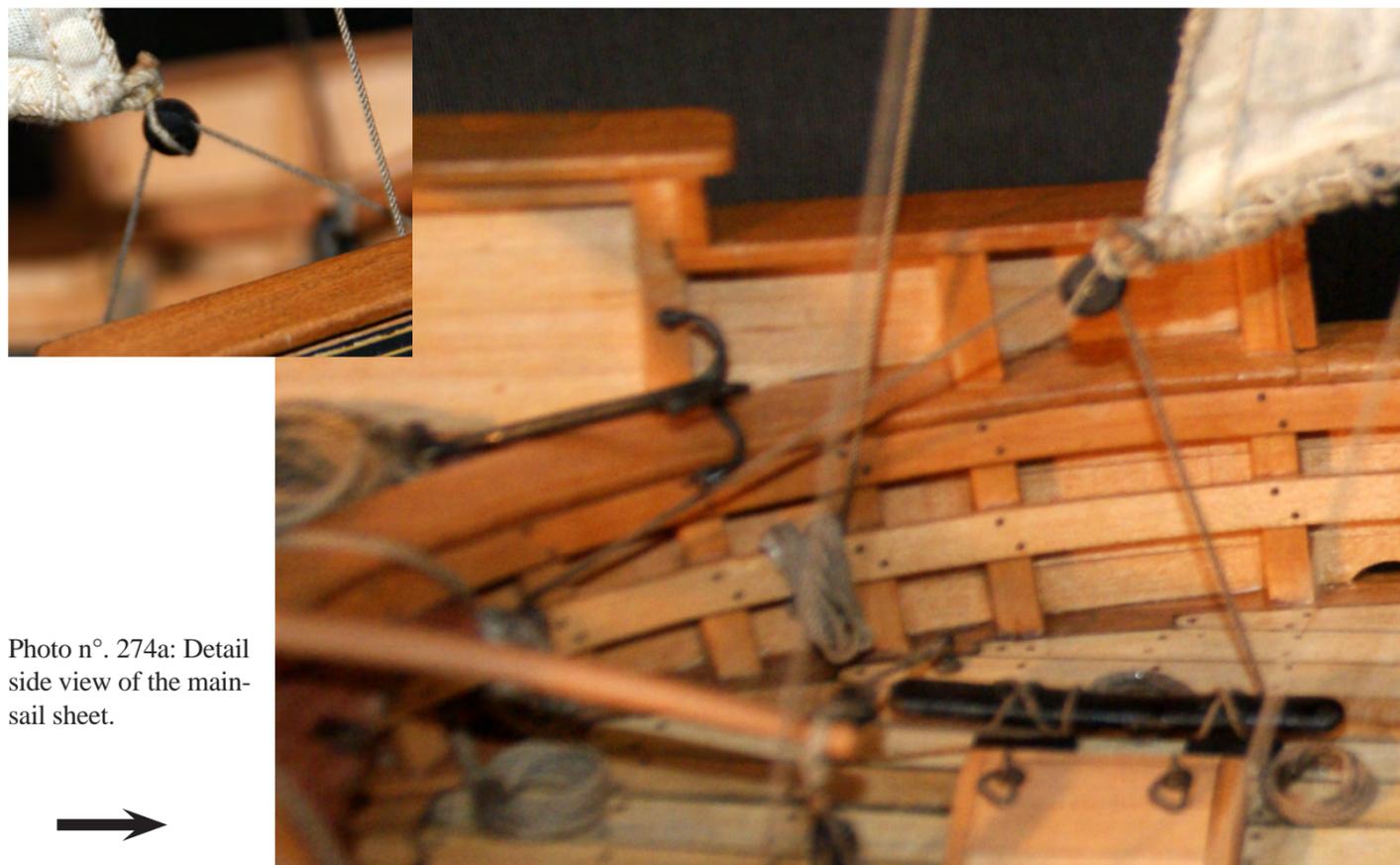
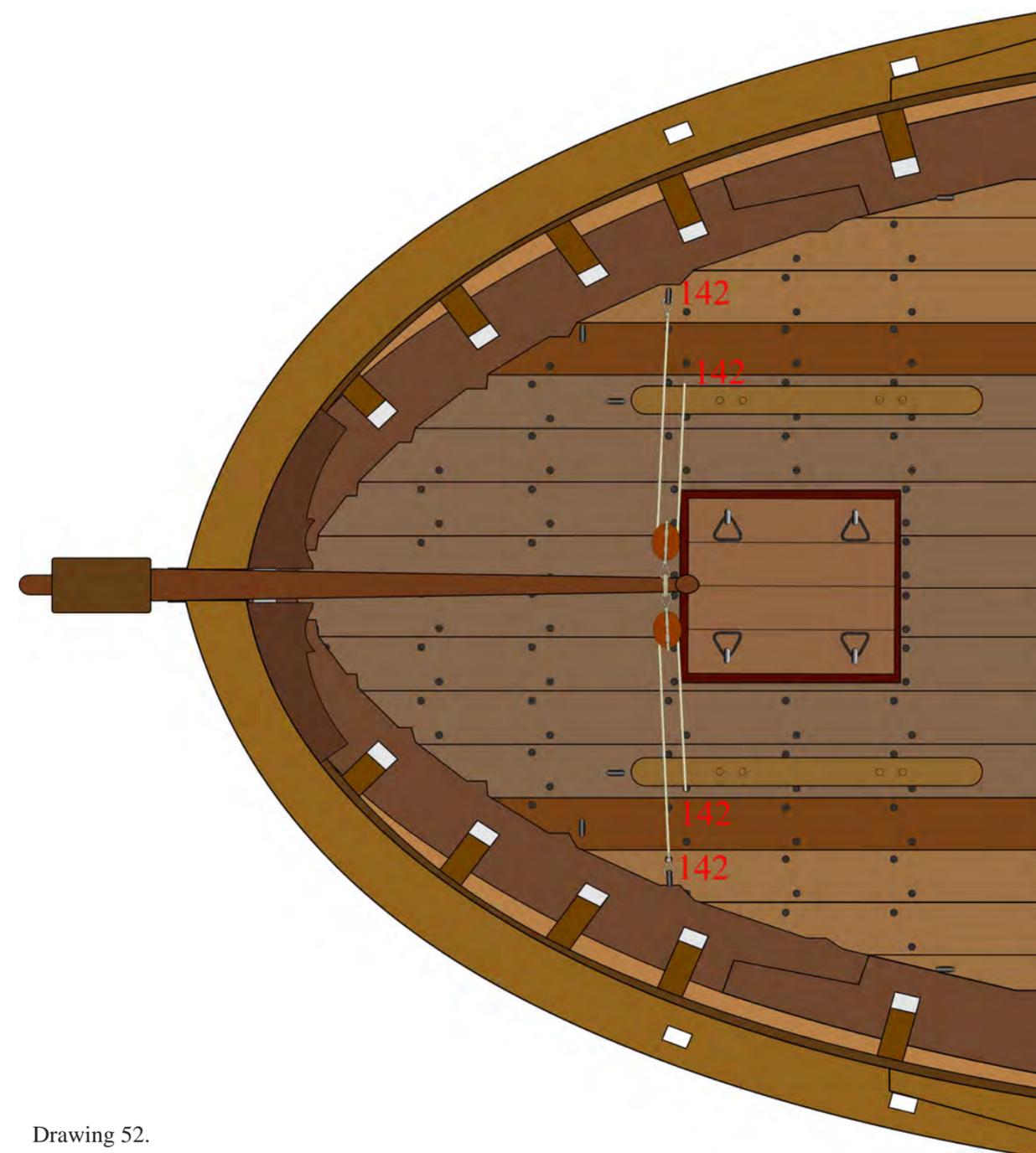


Photo n°. 274a: Detail side view of the main-sail sheet.

## The tiller rope.

(142) Tiller rope, 0.65 mm diam. - 2 blocks 4a. (rope on both sides).

Each rope is seized to an eyebolt on deck, reeves through the sheave of a block that is stropped to the tiller, and returns to belay on the appropriate cleat on deck (72).



Drawing 52.



Photo n°. 275: Deck rigging at the stern.

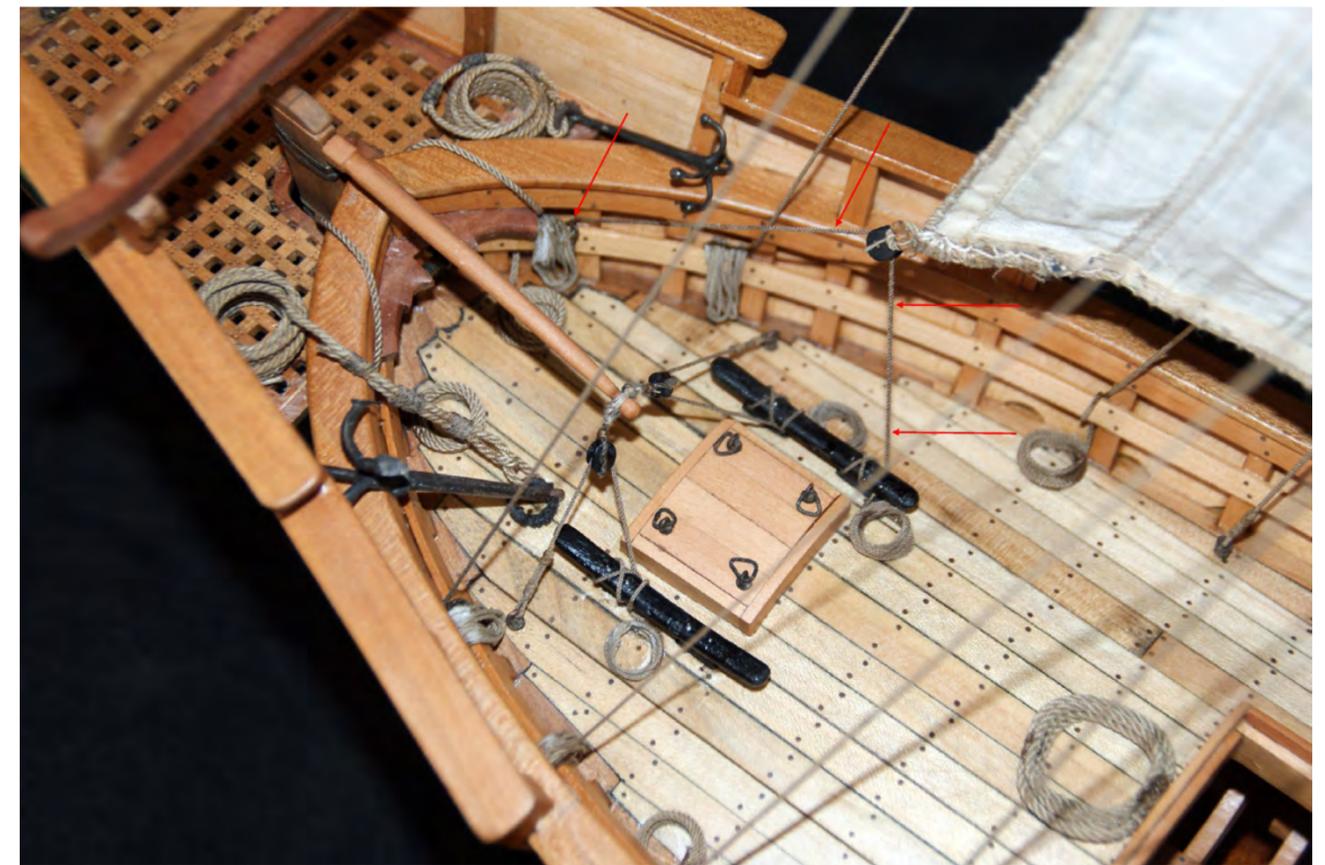


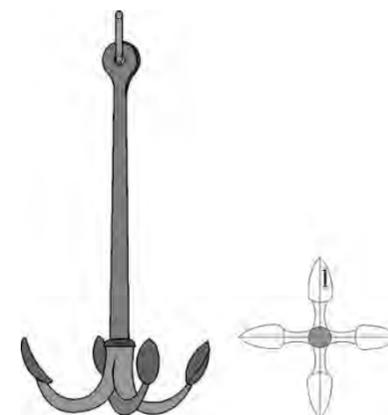
Photo n°. 276: The tiller ropes.

### Bower anchors and grapnell.

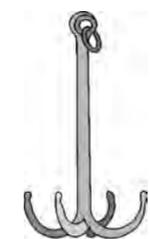
Since feluccas are not very large boats, they are often fitted with small bower anchors and grapnells. Just like grapnells, these bower anchors had four arms with blades, but no stock. Grapnells were similar to anchors, but without blades. They were used to drag the ocean bottom, looking for lost anchors, or to moor to another boat.



Drawing 54: Small bower anchor.



Drawing 53: Large bower anchor.



Drawing 55: Grapnell.



Photo n° 277: The bower anchor after blackening.



Photo n° 279: The shank and then anchor ring may be seen in the foreground.



Photo n° 278: The blades of the bower anchor may be seen in the foreground.



Foto n° 280 - Grappino ancora da brunire.

## Location of the anchors.

Photo n° 281: The bower anchor at the bow.



Photo n° 283: The bower anchor on the rail at the bow.

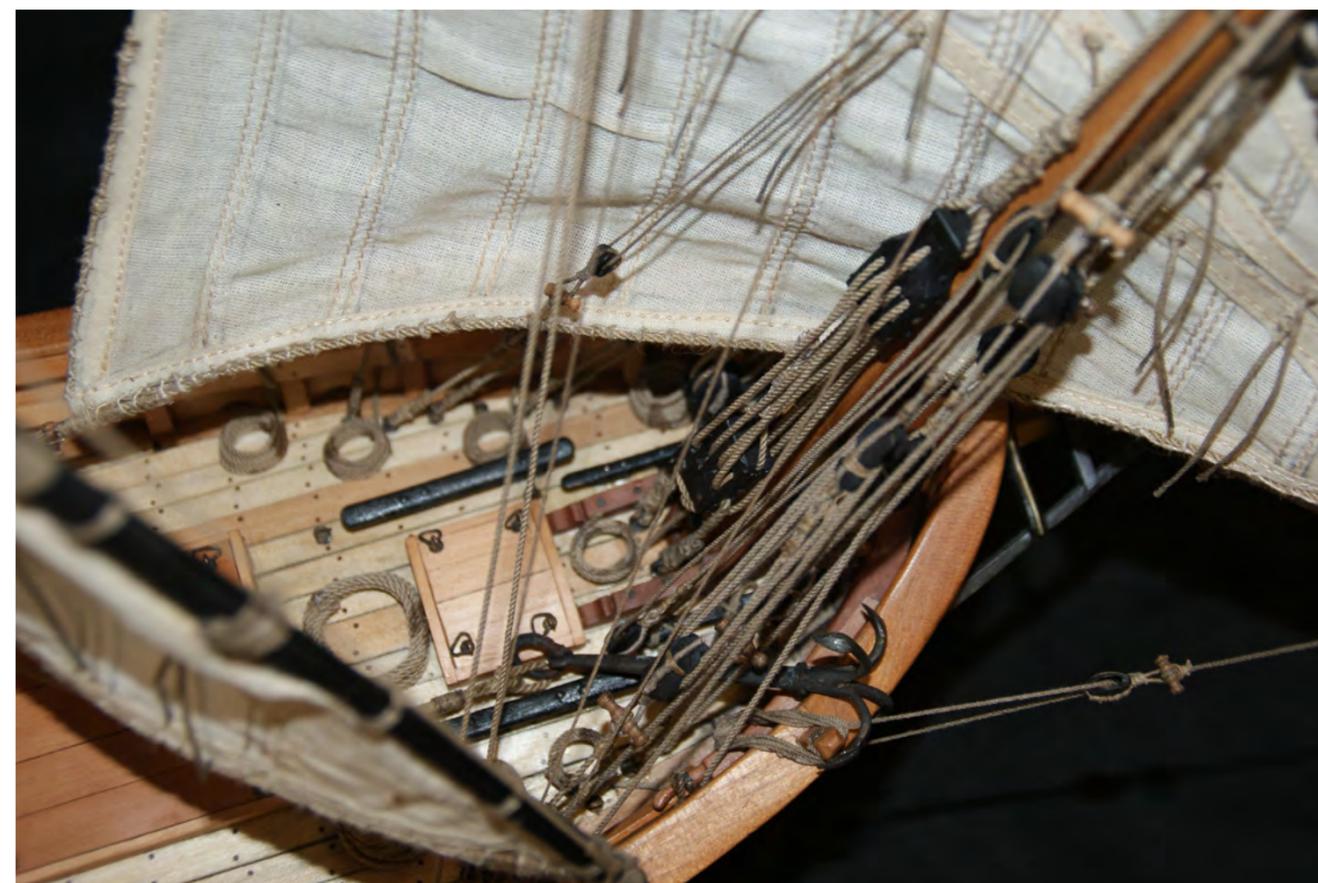


Photo n° 282: Overhead view of the bower anchor at the bow.

Location of the small bower anchor and grapnell.

Photo n°. 284: The small bower anchor at the stern.



Photo n° 286: Anchor and grapnell at the stern.

Photo n° 285: The grapnell.



Photo n° 287.



Photo n° 144



Photo n° 288



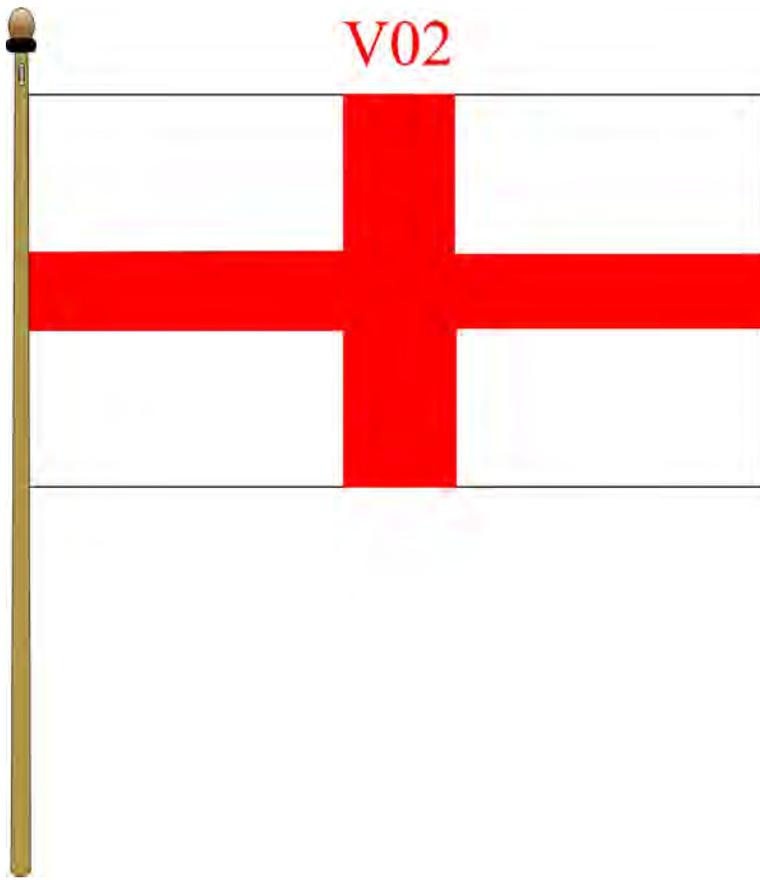
Photo n° 289



Photo n° 290

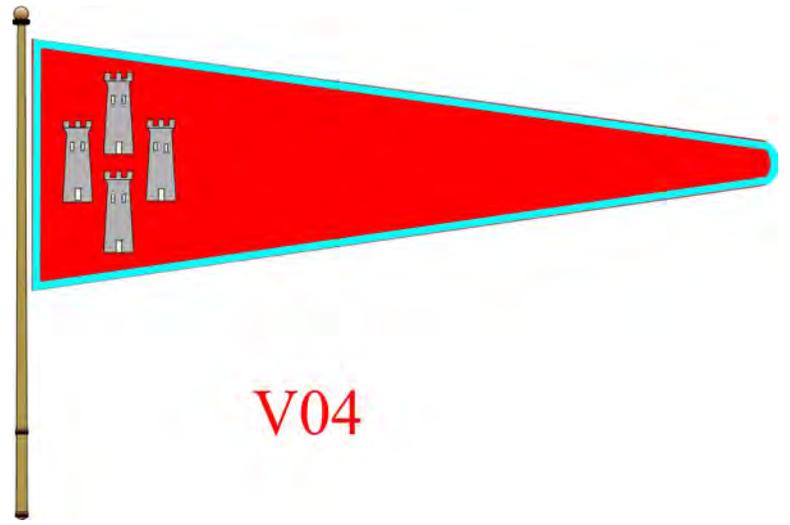


Photo n° 291



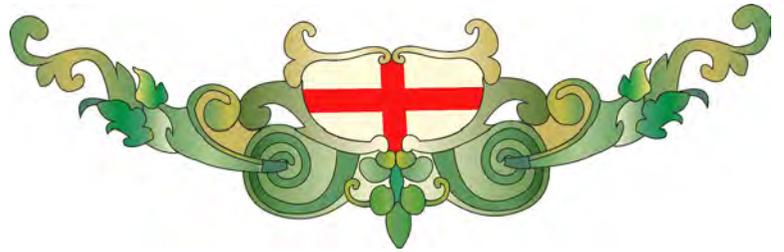
V02

Plate 17 - page 54.

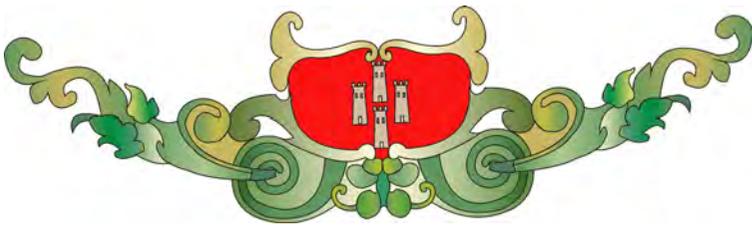


V04

Plate 17 - page 54.



dis. 19b - pag. 103



Drawing 19a - Page 103.



Drawing 19a - Page 103.