



Chapter Eight Copper Plates/Rudder

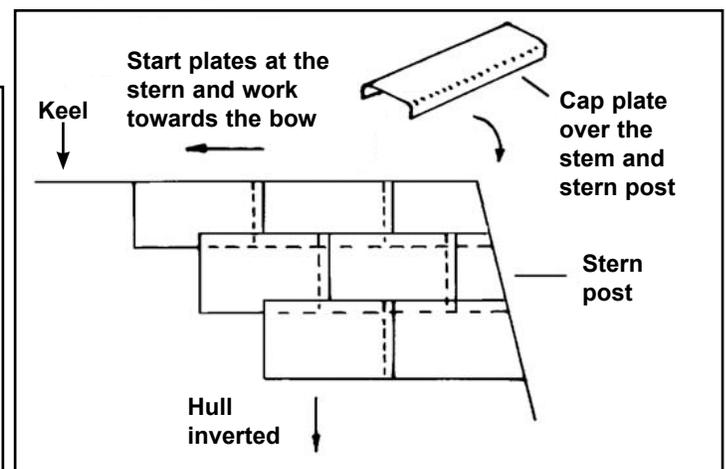
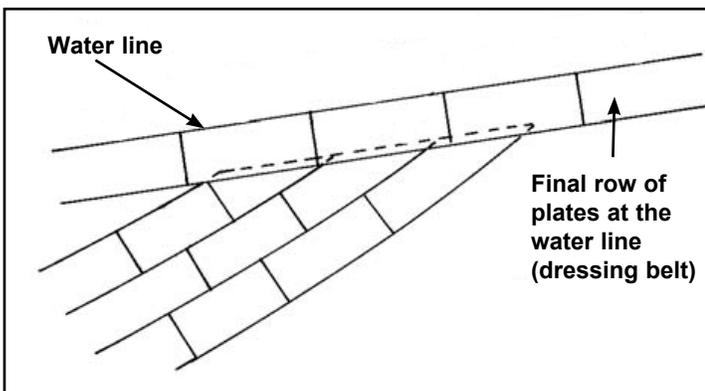
Covering the hull below the waterline with copper plates will add a great deal of detail and interest to your model. Depending on your skill level it can be done in various ways. On the real ship the copper plates would have been nailed to the hull. Some model builders like to simulate these nail heads using either a ponce wheel or a stamping jig. However due to the small scale of our model you might opt to omit such small details and it would be just fine. A stamping jig was created and used to simulate the nail pattern on the prototype. Instructions for creating such a jig are supplied for you just in case you want to give it a try. The individual plates ($1/4" \times 11/16"$) can be cut from a roll of copper tape which has adhesive applied to one side. A sharp pair of scissors will do the trick. The adhesive makes the plating process go much quicker since there won't be any glue needed to apply them. Before doing so make sure the hull is free from any dust. Wipe it down with a damp cloth.

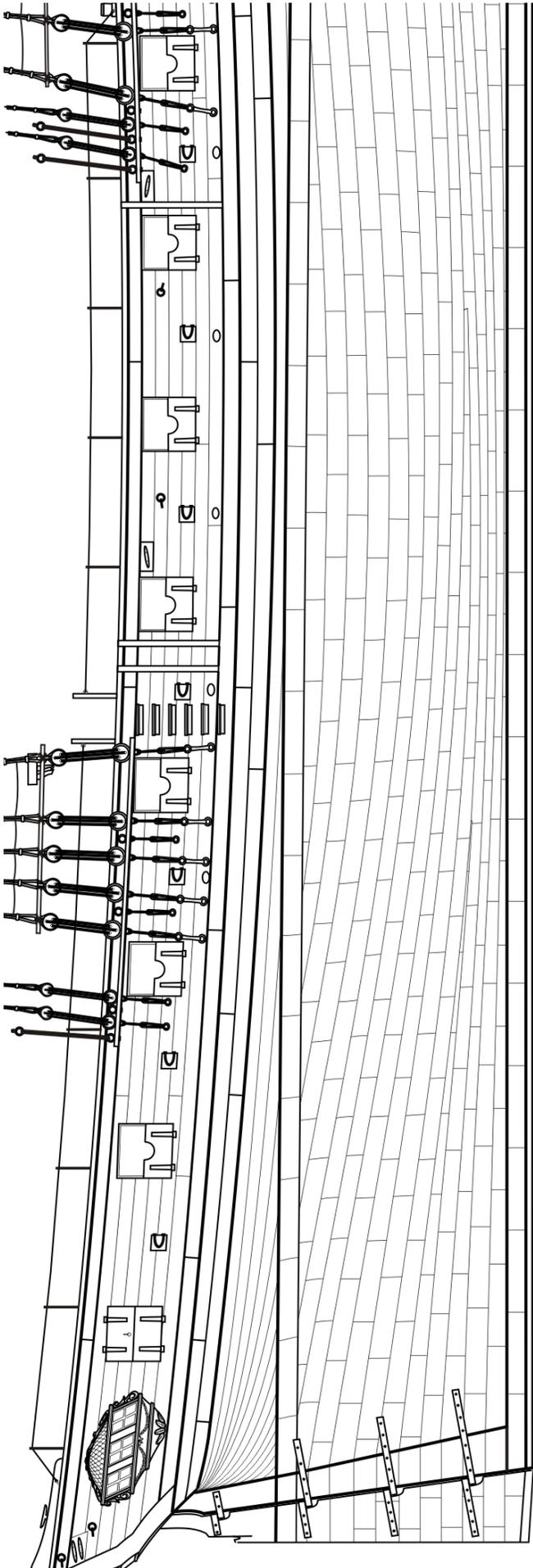
The plates will be applied in rows. The first row will be applied at the keel working your way from the stern towards the bow. Each plate should overlap the preceding plate by about $1/64"$. The remaining rows will also overlap the preceding row by about $1/64"$. Start applying the plates by covering the outside edge of the stem and stern post first. See the illustration provided. Then begin applying the plates in rows as mentioned. Do not place any copper plates along the bottom of the keel. The false keel ($3/16" \times$

$1/16"$ wood strip) needs to be glued there and it is best to glue it onto the bare wood rather than a layer of plates.

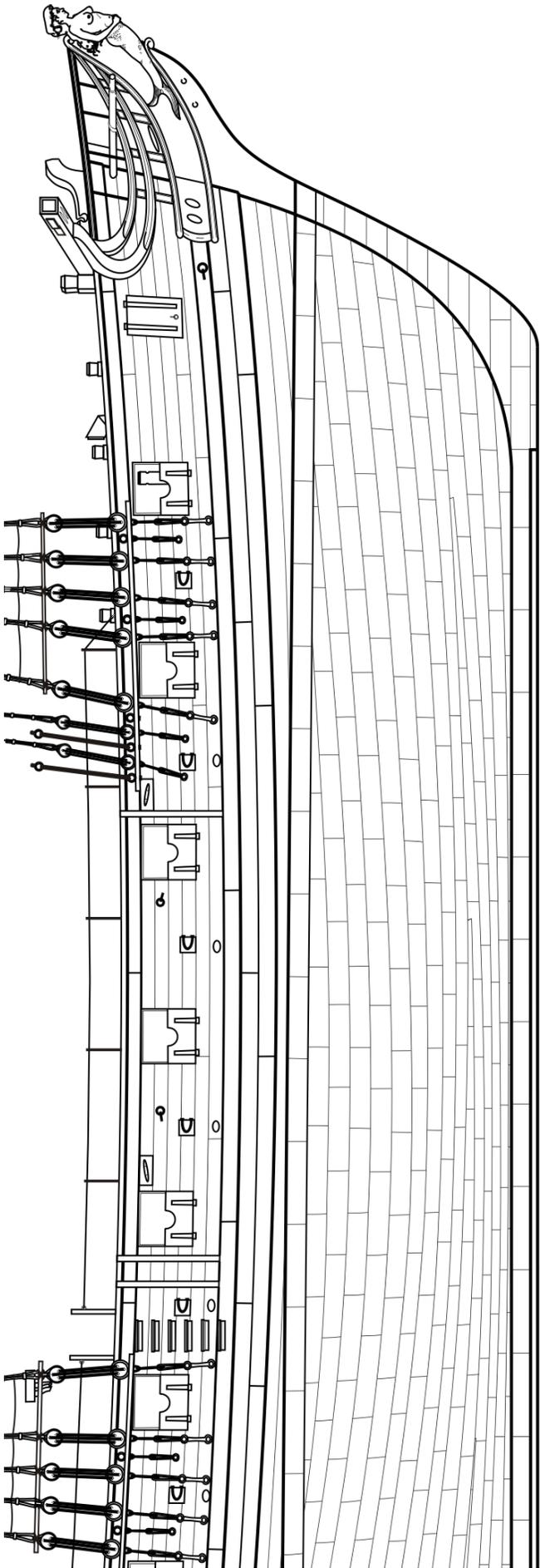
If you examine the standing rigging plan you will notice a plate pattern is shown. Note how the rows of plates work their way upward towards the waterline. A single row of plates (a dressing belt) will finally run along the waterline to neatly finish it off. The dressing belt will overlap the main area of the plates below it. It is easier to draw a reference line approximately $3/16"$ below your waterline before you begin. This will allow you to cut the plates cleanly in preparation for the final dressing belt. Be careful not to touch the plates too much as you progress. The oils from your fingers have a tendency to leave fingerprints which are difficult to remove afterwards as the copper begins to develop a patina.

Some model builders prefer to artificially tone the plates rather than leave them bright and shiny. The decision is purely a matter of personal tastes. Many products are available commercially that will tone the plates and every model builder has their own preference. Some simple home-brewed applications exist also. They can be researched on the internet. Lemon or other citrus juices are one possibility. Once both sides of the hull are completed you can glue the false keel into position. Be careful





For placement of copper plates





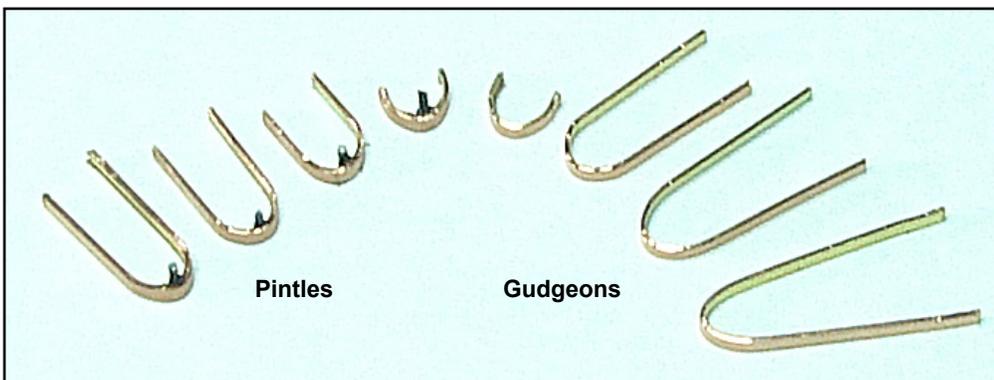
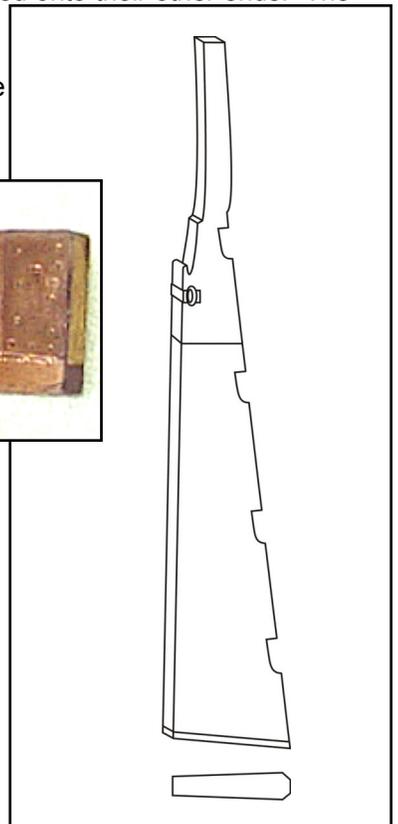
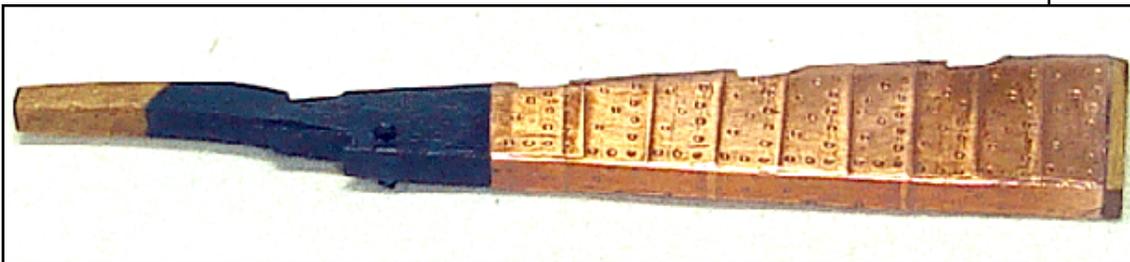
not to get any glue on the plates as it will most certainly show after the plates begin to develop a patina.

The rudder will be plated below the water line also so it would be a good time to create and install it now. It has been laser cut for you. See the illustration provided which shows the general profile that needs to be established. The rudder actually tapers to about 1/8" wide towards its aft-most edge. The forward side of the rudder is beveled on both sides which allows it to easily swing from side-to-side. Hold the rudder against the stern post and mark the waterline on both sides. Keep in mind that the false keel actually extends to the rudder also. A small length of strip wood will eventually be applied along the bottom of the rudder so position it against the stern post with this in mind.

Cover the rudder below the waterline with copper plates. Again it would be easier to start by covering the outside edges first. You can also extend the dressing belt across

the waterline on the rudder since it will create a consistent look across your finished model.

The rudder should be painted black above the water line but only outboard. The inboard portion of the rudder head can be left natural or painted red to match your bulwarks. Two eye bolts should be glued into pre-drilled holes on either side of the rudder as shown in the illustration previously mentioned. The rudder pendants will be secured to these eye bolts later. A small piece of copper tape can be cut and used to simulate the iron strap that the eye bolts are secured through. The rudder pendants would have prevented the rudder from being lost at sea if it slipped out of the gudgeons. The rudder pendants were long chains that had heavy ropes spliced onto their other ends. The ropes were carried over the transom and were belayed to cleats along the bulwarks. These will be added later. Don't forget



Pintles

Gudgeons



to glue a length of 3/16" x 1/16" wood strip along the bottom of the rudder which would have protected it much like the false keel.

The opening for the rudder needs to be drilled through the lower counter. It needs to be large enough that the rudder can swing freely (side-to-side) after it is mounted. Drill the hole from the outboard side first. Only pierce the outside layer of planking on the counter initially. The hole should be positioned against the stern post. Use a small drill bit to start the hole and slowly enlarge it to the final shape with a round file. If you look at the photos provided you can see that the hole on the inboard side sits high on the counter. It essentially follows the angle created by the stern post. Drill through the initial hole up through the inboard layer of planking at the correct angle. This is a tricky operation which is why a smaller drill bit should be used initially. Slowly enlarge both holes until you can successfully fit the rudder head through it. As you enlarge the opening more and more it will become clear what adjustments need to be made. Eventually the rudder should lay flat against the stern post and have enough room to swing freely. Proceed slowly as you continue to refine the shape of the opening making very small and deliberate adjustments. When you are satisfied you can move ahead and create the gudgeons and pintles.

The rudder is secured to the stern post with hinges called gudgeons and pintles. The gudgeon is the portion of the hinge attached to the hull. The pintles are attached to the rudder. They will be made from brass strips that are 1/16" wide. On the real ship the pintles and gudgeons were not made of iron. They would have corroded quickly due to the fact that the iron would have a corrosive reaction when coming into contact with the copper used to plate the hull. The pintles and gudgeons were actually made from the same material used to produce the hull plating. Before shaping them, you can cover the brass strips with some copper tape. They will tone up nicely and match the plating on the hull. Burnish the tape well after you cover the brass strips. Cut the brass strips to length and bend them as shown in the photo provided. You can actually bend them around the rudder to get an exact fit. A scrap piece of 3/16' thick basswood can be used to bend



the gudgeons to shape. The pintles and gudgeons are essentially the same except that the pintles will have pin attached to them. The pins were cut to length using 22 gauge wire. They can be soldered to the pintles for the strongest joint possible however CA (super glue) will work as well. Be careful to center each pin on the inside of each pintle. Test their length in the notches of the rudder to make sure they are not too long before you secure them to the pintles permanently. Glue the pintles on the rudder first. The pintle above the waterline can be painted black. Check the plans for the proper angle. They should run perpendicular to the stern post.

Then slide the gudgeons behind the pintle pins so the entire rudder assemble can be test fit on the hull. They should fit snug behind the pins. If they are too loose then carefully bend the pins inward until they will stay in position. If you were to glue the gudgeons directly onto the hull it would be nearly impossible to attach the rudder through them afterwards. The gudgeons need to be positioned on the rudder and glued onto the hull as one assembly. This procedure is more easily accomplished if you work with the hull upside down. Don't use too much glue to attach the gudgeons to the hull. It will be difficult to remove the glue from the cooper plates without damaging them. Make sure you wipe off any excess that squeezes out from under the gudgeons quickly before it dries. The bolt heads can be simulated on the pintles and gudgeons using a wooden dowel that has been sharpened to a blunt point. You can emboss little divots into the copper tape spacing them evenly along each strip. Examine the photos provided.