

SECTION IX.

TAKING IN AND RIGGING SHEERS.

As it is sometimes necessary at different parts of the world where vessels trade to take in their lower masts, where no shore masting sheers are available, it will be necessary to describe in detail the mode of taking in and rigging a pair of sheers with your own crew.

Firstly, then, we will presume the vessel has a large spar afloat on each side of her, with their small ends pointing aft. These spars should be a few feet longer than the distance from the main cap to the main deck.

Middle a good-sized hawser, say an 8-inch rope—larger, if required, if the spars are very heavy. You are now going to rig a pair of par-buckles.

Make a bight of the hawser fast securely to a bit on deck abreast of the mizzen channels, then lead the bight along the deck to another bit or bollard abreast of the main channels. The distance on deck between where the bights of the hawser are made fast must be several feet shorter than the length of the spars.

Now throw a bight of each part of the hawser over the rail, and overhaul them down to the water's edge, dipping each bight under-

neath each end of the spar, and pull them well tight; then clap a good luff tackle on to each running part of the parbuckle, lead them well athwart the deck, and rouse the spar up to the level of the rail. If it is likely to catch the channels in coming up the side, or any eye-bolts, &c., place two skids up and down the side to keep it clear.

When the spar is up level with the rail, make two ropes fast, one to the mizzen channels, the other to the main channels; pass the ends round the spar, take them down outside the bulwarks, and thence, through a mooring pipe, on deck. These ropes are for lowering the spar on deck after it comes over the rail. When these ropes are well fast, rouse away the parbuckles and top the spar over the rail, lowering it on deck by these ropes.

Shift over the tackles and parbuckles to the other side, and take in the other spar.

After both spars are on deck, rouse them bodily aft till their heels or large ends are about 6 feet forward of where the mizzen mast passes through the deck, and close in alongside of the waterways.

If the vessel has a high poop, and the mizzen mast steps before the poop, get the small ends of the sheers on top of the poop, with a good tackle; but, if she is a flush-decked ship, lash a strong spar across the ship's rails from side to side, well aft, and place the ends of the sheers on top of this spar. This being done, secure the heels of the sheers with stout lashings, one led forward, the other aft, and place good wooden cleats on the sheers to prevent these lashings slipping down. Under the heel of each sheer leg must be placed a large wood chock, hollowed out a little, called a shoe.

Now get the two small or upper ends of the sheers amidships, lay one over the other, the off leg uppermost—that is, if the mast is to come in on the starboard side, put the port leg on top, and pass a good sheer lashing round them both. This sheer lashing is passed right round both sheer heads, but when passing the turns form a figure of eight with the lashing. After several turns have been taken thus, finish the lashing off with a full set of riding turns over all, and securely hitch the end; also place three good substantial cleats on each sheer leg below the sheer lashing, to prevent it slipping down; for, mind, if this lashing was to slip down with the mast hanging on it, there is no telling what damage would occur. When putting the lashing on heave every turn tight with a heaver.

It generally takes a full coil of 3, 4, or 5-inch rope, according to the weight of the mast, to pass a trustworthy sheer lashing.

Now middle two good hawsers, and clove hitch them round the sheer heads above the sheer lashing. These are called sheer guys. Lead the ends of one forward, the other aft, on each side of the ship, having four good luff tackles ready to place one on each side of these guys. The guys should be led as far forward and aft as possible, to ensure steadiness to the sheers.

Now get your upper purchase block, and lash it round the sheer lashing so that it will hang plumb under the crossing of the sheers, and free to turn in any direction. This lashing must be passed through the eye of the purchase block strop, over the sheer lashing, between the horns of the sheers and down through the block again. Some seamen in passing these turns take several turns over each horn of the sheers and through the block. This lashing also takes a full coil of say 4-inch rope, and such a lashing ought, with safety, to lift a 15 ton lower-mast.

This being done, carry forward the lower purchase-block, and with a long pennant, formed by several parts of a good hawser, secure it to the fore bits, then reeve in the purchase-blocks a full fall of 3-inch rope; marry the end of this 3-inch rope snugly to the end of the purchase fall, get a few hands on to this line, and it will reeve the purchase fall without much difficulty. Make the standing end of the purchase fall securely fast to one of the horns of the sheers above the sheer lashing.*

On one horn of the sheers lash a good luff-tackle. The lower block of this tackle is lashed on to the mast just above the cheeks, when it comes above the rail. This is called a topping tackle. Its use is to assist the heel tackles in topping the mast over-end when the heel of the mast comes in over the rail.

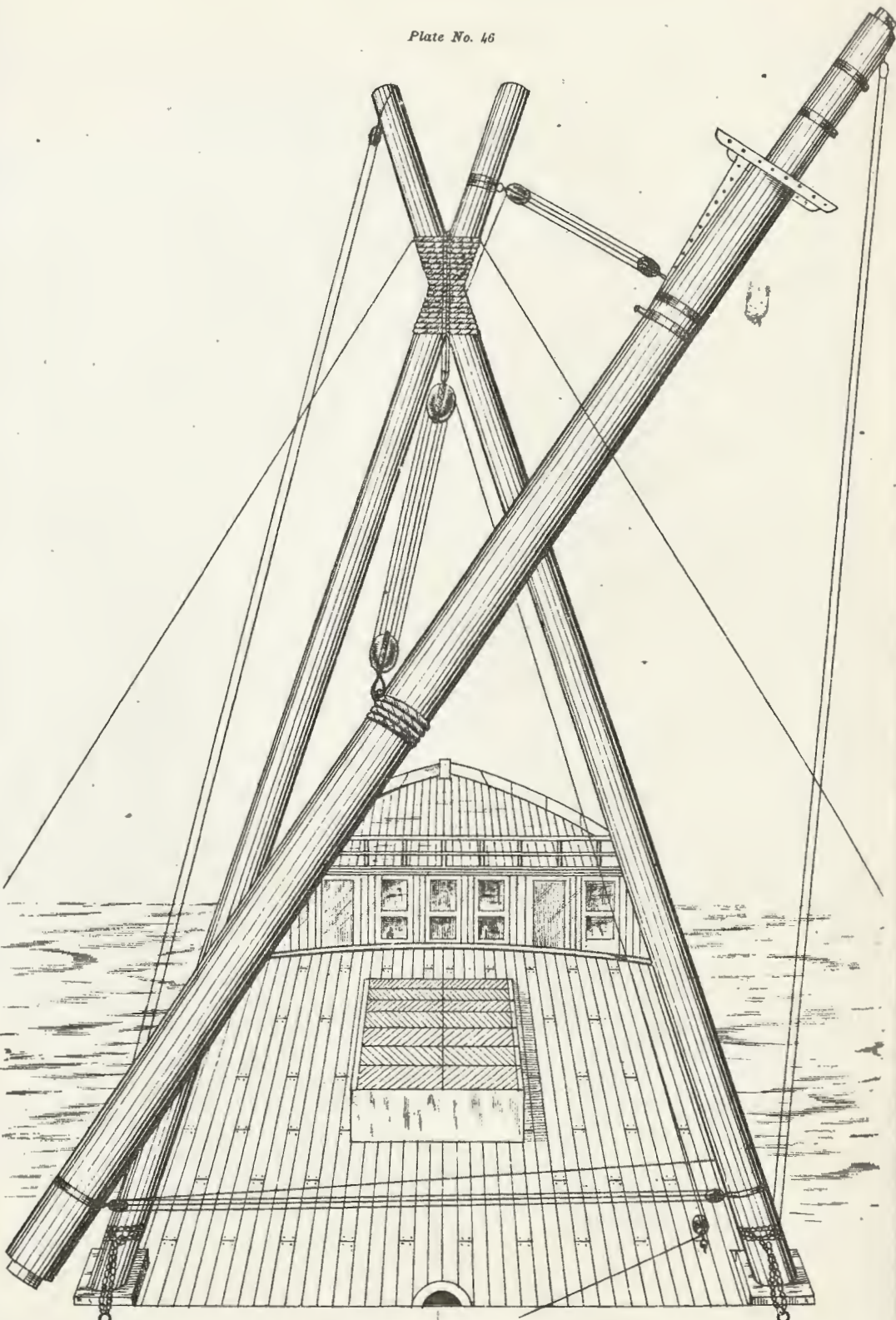
Have two good gantlines made fast to the sheer heads to send aloft the top, and such gear as you may require when rigging the mast.

Whilst this is being done send the carpenter below, and shore well up the deck and beams in the wake of the heel of the sheers.

The purchase fall must now be taken round the windlass or to a powerful capstan, and the sheers hove up in their places.

When placing the sheers give them a little rake aft, as they assume an upright position. Tend well the sheer guys. When they become nearly in a perpendicular position, put on the guy tackles in their respective places.

* The purchase should be rove with a cross, so that the fall will come in the middle sheave, to prevent the block canting in the strop.



TAKING IN THE FOREMAST.

A good lashing must also be placed on the heel of the off sheer, over a strong cleat bolted on to the sheer-leg about 3 feet from the heel, and secured to either strong eye-bolts in the water-ways or round the channel plates, to prevent it lifting, as the off sheer-leg has a great tendency to lift off the deck before the mast gets over the ship's rail.

After the sheers are up in their place get a good weight on all the four sheer guys. When these are well fast and secured, let go the sheer purchase and overhaul it down to the water's edge. Have ready two luff-tackles to place on the heel of the mast as it comes inboard, to guy it into its place.

When overhauling the purchase over the side, mind and send it down *abaft* the sheer leg.

Everything is now ready, as far as the sheers are concerned, for heaving in the mizzen mast.

NOTE.—With very heavy sheers it is sometimes necessary to rig a small pair of sheers over the main sheer heads as they lie on the deck, to lift them out of their place until the purchase can get a fair heave on them. These are called starting sheers.

SECTION X.

TAKING IN LOWER MASTS AND BOWSPRIT.

TAKING IN LOWER MASTS.

(Plate No. 46.)

Generally speaking, the fore and mainyard are taken for sheers, but it may happen that one of these yards is not trustworthy, and you have had to procure a heavy spar to act in its place; if such be your case, then take in the lowermasts on the side of the vessel on which the most powerful sheer-leg is placed; also, if you think the yard-arm which forms the lower part of the sheers is weak, fish it with a good stout spar, and see the wedges of the lashings are put in from the top side, so that they cannot work out.

Now place your sheers properly, nearly plumb, with a slight rake aft withall. See that all the guys are well taut, and the sheer heels are well secured with their respective lashings.

Have three or four good skids up and down the side of the vessel, to keep the mast in coming up clear of channel plates, eye-bolts, &c.

If it is possible, unship the topgallant bulwark in the wake of where the mast comes inboard, for if by any means the weight of the mast gets to bear upon it, it will probably give way.

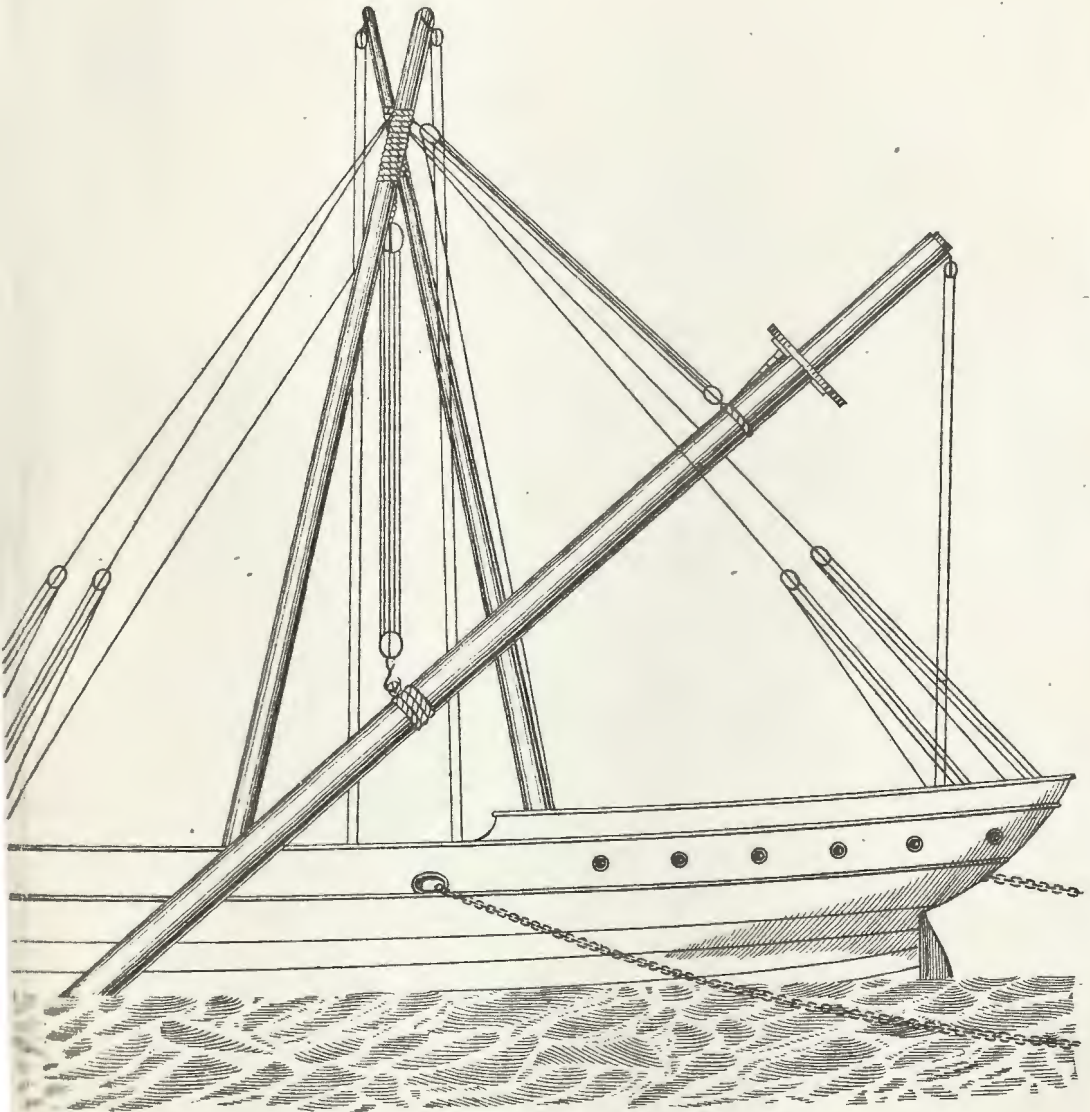
As you will have to transport the sheers from one mast to another, it is best to take in the mizzenmast first, as the ship having more beam abreast of her mainmast and foremast than she has abreast of her mizzenmast, the sheers will have more spread as they go forward, thereby tightening the sheer lashing, and making the sheer heads more rigid. (*Plate No. 47.*)

But there are exceptions to this rule. Thus, say the foremast was stepped close to the break of a topgallant forecastle, it would then be prudent to rig the sheers so that the mast would be stepped forward of the sheers, and work aft, taking in the foremast first, and the mizzenmast last.

Now place the mizzenmast abreast of your sheers with the head aft, overhaul down the lower purchase-block, and lash it securely to the lower part of the mast, *be sure* and measure the drift between the two purchase-blocks; measure from the upper deck to the lower part of the purchase-block at the sheer head, six feet less than this is the place, measured from the heel of the mast, to lash on the lower purchase-block, so that when the heel of the mast is on a level with the rail, with the mast right over-end, there is two or three feet drift between the purchase-blocks, and lash the lower block on accordingly. If you have a very deep ship to mast, the upper part of the mast may be the heaviest above the lashing of the purchase-block; if such is the case your topping tackle will require to be a strong one, and under such circumstances it would be advisable to have a good threefold purchase for this tackle.

Use the *greatest care* in lashing on the purchase-block to the mast, and heave every turn of the lashing as tight as possible with a heaver. (This lashing ought to be well-stretched new rope) for if the mast slips through it whilst heaving over-end with the topping tackles, serious damage would probably occur.

If the mast is very smooth, and you have to lash the lower block on whilst it is lying in the water, a good preventative to the block slipping is to take two or three turns of a 3-inch rope round the lower block seizing, and over the heel of the mast, only be sure before doing so that there is room enough in the partners to admit of this lashing passing through all clear. Another plan is, if the partners are small, seize on the lower purchase-block to the middle of the mast *temporary*,



TAKING IN THE MIZZEN MAST

and lift it up well clear of the water, then hang the mast with a few bights of a good hawser, ease up the purchase, and lash the block on its proper place for good; by this means you can make a secure job of the lashing, then it will require no lashing round the heel.

The writer some years ago saw a large barque taking in a mainmast at Cape Town, and whilst the mast was being lowered the lower block lashing slipped, which let the mast down by the run. Luckily, when this happened the heel of the mast was entered through the between-deck partners, yet nevertheless it damaged the vessel considerably, starting many seams about her bottom, which necessitated the vessel being taken on the patent slip to be repaired before she could take in her homeward-bound cargo.

This will at once show that too great care cannot be exercised when lashing on the lower purchase-block in taking in a heavy mast, and the extra labour expended on heaving the mast out of the water before lashing the block on for good, doubly repays the officer in charge of the work, as his mind is at rest when topping the mast over-end.

We will now assume the lower purchase-block is securely lashed on the mast. Overhaul down the topping tackle, and lash the lower block on just below the trestle-trees, if the latter are on the mast; if not, then just below the cheeks of the mast. Place upon the masthead a good strong tail block and gantline, and have the heel tackles all ready to lash on the heel of the mast when required. All being now ready, take the main purchase fall round the windlass, and the topping tackle fall round the capstan, heave away both together, and when the head of the mast comes just above the main rail, avast heaving and place on the trestle-trees (if they are not already on), as this job is much easier done with the mast in this position than it is when the mast is stepped in its place.

This being done, heave away the mast, and, when it is high enough for the heel to clear the rail, put on the heel tackles and belay the main purchase fall; heave away upon the topping tackle and over-end the mast, steadying well taut the heel tackles as the heel of the mast comes over the rail, and guy it into its proper place. Then lower away the main purchase, tending the topping tackle as required. When the heel of the mast enters the upper deck partners, let go and cast off both heel tackles. Tar well the step and tenon of the mast, and lower it down into its place.

Then place a few wedges in the upper deck partners around the

mast, just to steady it for the time being, and cast off both topping tackle and main purchase from the mast.

Before commencing to transport the sheers forward, bend on the sheer head gantlines to the top, and place it over the masthead, as it is much easier to whip the top over with the sheers than it is to do it when the sheers are removed.

Then pass good tackles forward fast to the heels of the sheers, and take them respectively to the fore winch and capstan; also have good heel tackles led aft to ease away the heels of the sheers, as you heave on the forward heel tackles. Heave the heels of the sheers forward six or eight feet, then top the sheers by the head guys nearly plumb with the heels, and go on thus till the sheers are in the place required to take in the mainmast.

It will be quite unnecessary to describe in detail how to take in the main and foremast, as it would only be a repetition of the above, the evolution being accomplished in precisely the same way.

It may be as well to caution the young officer not to bouse the heels of the sheers too far forward before plumbing them with the guys, as the nearer plumb he keeps the sheers whilst transporting them the safer will the object be accomplished.

Mind and have good trustworthy hands slacking away the sheer head guys whilst heaving on the forward guys, and do not slack them away by fits and starts, but ease them away handsomely, and you will find the sheers are transported along the deck much easier than you anticipated.

Accidents have occasionally happened in transporting sheers, but when such has been the case it has invariably happened through bousing the heels too far forward, and giving the sheers too great an inclination before squaring them up with the head guys, thinking, no doubt, to make long fleets, and get them transported more quickly.

Of course, if you have any amount of men at command, you can heave on the head guys and heels at the same time, and this mode, no doubt, is the best way of transporting the sheers; yet the way ships are manned nowadays in the merchant service, you would not have men enough to man guys and heel tackles at the same time; therefore, you will have to fleet the men about as described above, first to the heel tackles and then to the head guys.

TAKING IN A BOWSPRIT.

Bowspriets are taken in with either the sheers you have masted the vessel with, inclined forward, and secured to the foremast head, or by

a light pair of sheers rigged on the topgallant forecastle itself, or by a derrick.

Firstly: We will presume your foremast is stepped well abaft the break of a short topgallant forecastle; in that case the masting sheers will take in the bowsprit without much trouble, provided your foremast is a reasonable distance from the stem head.

Take aloft the bight of a large hawser, and clove-hitch it round the foremast head, above the hounds of the mast; take the ends of the hawser well aft on each side of the vessel, and set them up moderately tight with good luff-tackles, to help to support the foremast, which must also be wedged up in the partners.

Place on the sheer-heads a couple of good strong topping lifts, two parts of a strong hawser will do, and make them fast to the foremast above the hounds; place extra heel lashings on the sheer heels forward, and see these lashings are *securely* made *fast*, and *cleated*, as they will have a great strain upon them when you are angling the sheers.

Whilst this is being done, lash a good strong tackle on the head of the foremast, with the lower block secured to the head of the sheers.

This tackle is to help the after sheer-head guys when slacking away the sheers if the angle required to plumb the bowsprit is great, it also supports the sheers whilst arranging the topping lifts. When this tackle is fast, haul it moderately tight, and stand by it.

Place on one horn of the sheers a good topping tackle, to over-end the bowsprit when required.

All being now ready for angling the sheers, slack away handsomely on the after sheer-head guys, till they have the inclination forward required. After the topping lifts are secured, and the after sheer guys securely belayed, overhaul down the lower purchase-block, and lash it securely on the top side of the bowsprit, a little inside of the middle of the spar, but far enough out to allow the bowsprit to go in without shifting it, and secure the topping tackle to the outer end of the bowsprit near the cap.

Make fast two guys, one on each side, leading from each cat-head to the end of the bowsprit cap. A good 3-inch rope rove as a gun-tackle purchase will suffice for these guys.

Heave away both the main purchase and the topping tackle at the same time; when the main purchase is high enough, belay it, and top the bowsprit nearly over-end with the topping tackle, and land the heel of it between the knight-heads, in the partners.

Now clap on two good tackles inboard on the heel, and slack away

the main purchase and topping tackles as required, at the same time heaving on the heel tackles, and bed the bowsprit.

To keep the bowsprit down in its place whilst rigging it, the jibboom may be sent out, or a weight may be slung at the end of the bowsprit by a tackle.

In sending down the sheers, it will be best to clap on the after guys, and top the sheers right over-end, and lash them to the rim of the fore-top; as the men, when unrigging the sheers and sending down the heavy gear, can stand in the top, or sit on the lower cap, and work much better and quicker than they could if the sheers were inclined over the bows.

If your vessel has a very long topgallant fore-castle, with her fore-mast well aft, and stepped close to the break of the fore-castle, it will then be compulsory to rig a pair of sheers on the fore-castle-head to take in the bowsprit; a much lighter and shorter pair will suffice to step the bowsprit than is used for taking in the lower masts.

When about to rig such a pair of sheers, mind and securely shore the fore-castle deck in the wake of the heels.

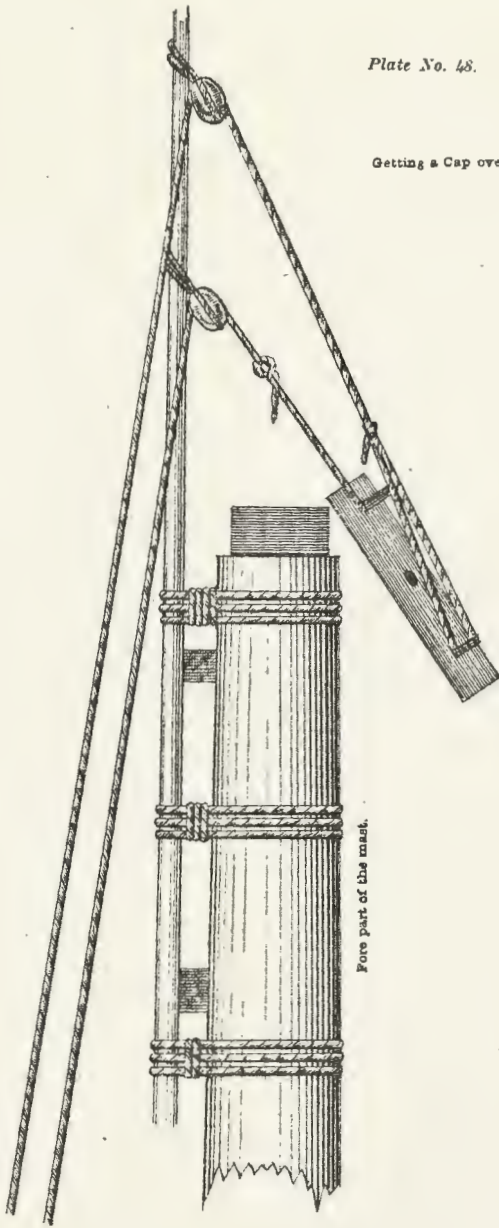
Launch one sheer-leg over the bows, with its small end forward, trending over towards the opposite bow, and secure its heel, temporary, with a lashing; on the opposite side launch out the other sheer-leg, on top of the first, forming a cross with their ends, pass a good sheer lashing, figure-of-eight fashion, lash on your upper purchase-block, and reeve the main purchase fall.

Whilst this work is being executed, get a good tackle on the fore-mast-head, with the lower block lashed on the sheer-heads; and when this is fast, haul it moderately tight, and tend it. Get good heel-tackles on the sheers, and rouse the heels into their proper place, which should be, generally speaking, from 15 to 20 feet abaft the knight-heads, and secure them with strong heel lashings.

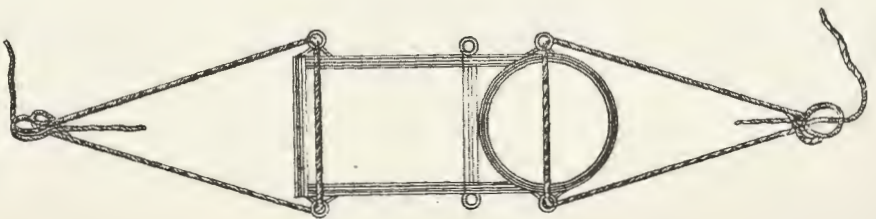
Clove-hitch the bight of a stout hawser round the head of the sheers, and lead the ends up to the fore-mast-head for topping lifts, then heave away the sheers with the topping tackle, taking in the slack of the topping lifts round the masthead as the sheers go aloft, and place them in the required position to plumb the bowsprit. Then proceed as before.

When taking in a bowsprit with a derrick, the heel of the derrick is placed amidships on the topgallant fore-castle against the pawl bitt, and the deck well shored underneath its heel. The topping lift is secured to the fore-mast-head, and strong guys set up from each cat-head to the top of the derrick.

Getting a Cap over the masthead



Fore part of the mast.



Spanning the cap with the girthlines.

Fig. 1.

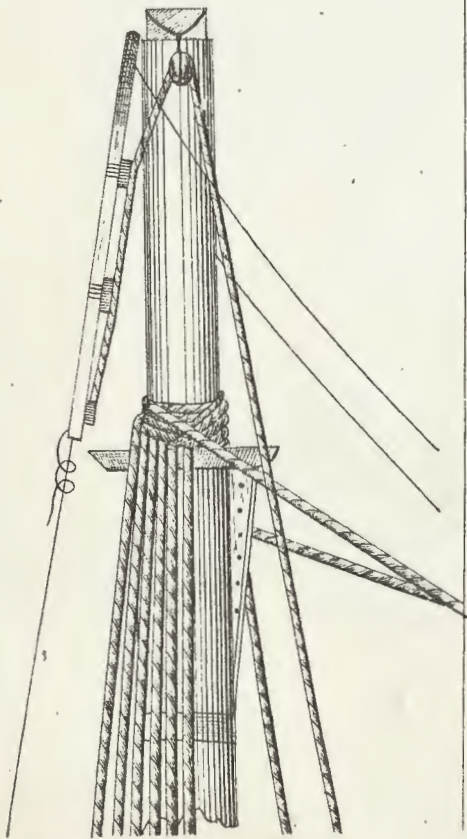


Fig. 2.

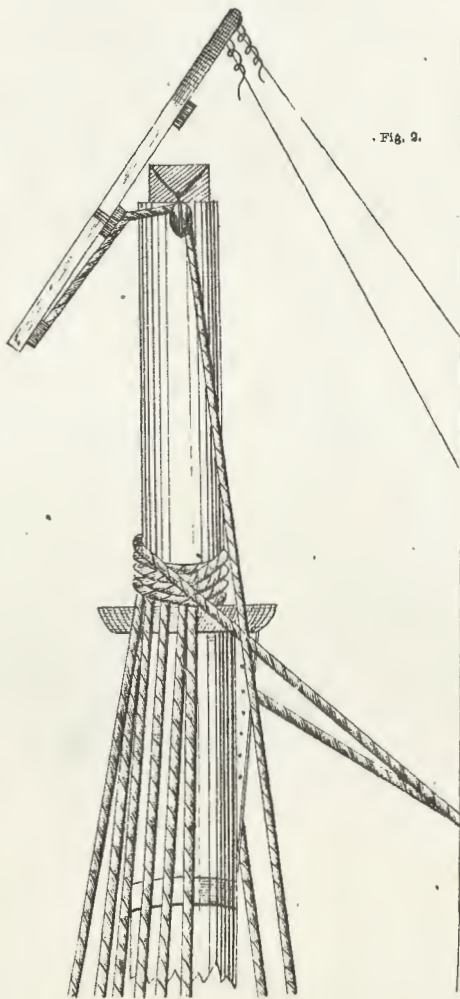
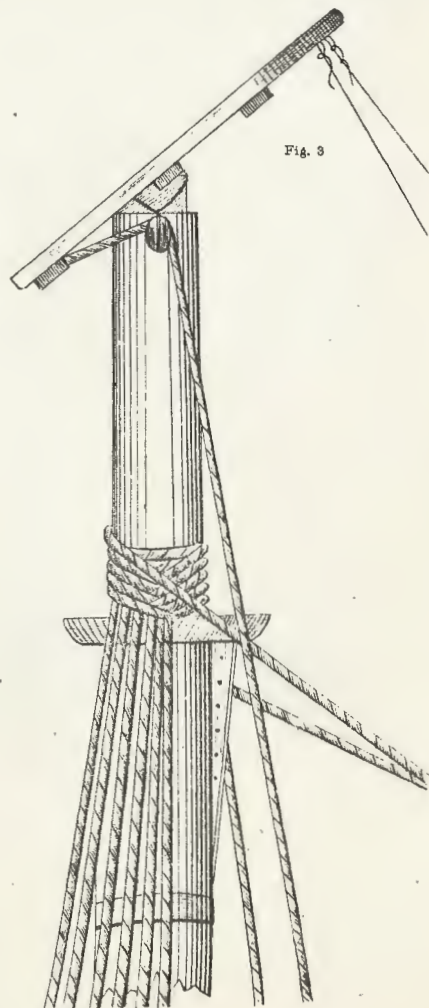


Fig. 3.



SECTION XA.

SENDING ALOFT TRESTLE-TREES, TOPS, CAPS,
AND CROSS-TREES.*(Plates No. 48 and 49.)*

The easiest method by far to get the lower trestle-trees over the masthead is with the masting sheers. (In iron masts they are a part of the mast.)

Take a short piece of stout rope and span the fore end of the trestle-trees. On the middle of this span hitch the sheer-head gantline, make fast to each after horn a tripping line, and pass the ends as far aft on deck as possible on each side of the vessel.

Sway away the trestle-trees till they are just above the lower masthead; then steady well tight the tripping lines and guy it over the masthead, and lower it down into its place.

But, supposing no sheers are aloft, then lash a strong spar on the after part of the mast, so that its upper end will be ten or twelve feet above the lower masthead, and its lower end some distance below the cheeks of the mast. Place between this spar and the mast good chocks, to admit of the after chock of the trestle-trees passing down between the spar and the mast.

On the spar, about six feet above the lower masthead, lash on a good block, and reeve in it a line strong enough to send the trestle-trees aloft; also on the upper end of the spar lash on a small block, and reeve in it a handy line. For the sake of brevity, we will designate these ropes the large and small gantlines.

Overhaul these gantlines down on the fore part of the mast, and bend the large gantline on the after part of the trestle-trees, and the small gantline on the fore part. Then sway away, and when the after chock of the trestle-trees comes a little above the masthead, make fast the large gantline and pull upon the small one, which will cause the trestle-trees to assume a horizontal position above the masthead, and they can easily be lowered into their proper place.

Tops can be placed on the mast with the sheer-head gantlines in the same manner as described above with the trestle-trees.

But if no sheers are available, act thus:—

Place the top athwart the deck on the after part of the mast, with its forward rim uppermost. Overhaul the masthead gantlines down on deck abaft the mast, and hitch their ends on each side of the hole

to the after leg of the top, on its under side, and stop the gantlines to the middle and foremost legs.

Then make two small lines fast to the fore part of the rim of the top, and lead them outside the rigging on each side of the vessel as far forward as possible. These are called guide lines. Also make a tripping line fast to the after part of the top, to trip it out clear of the after horns of the trestle-trees as it goes aloft.

All being now ready, sway the top aloft, and when the rim comes on a level with the lower masthead keep a good weight on the guide lines, and cut the foremost or upper stops. The top will then cant partly over the masthead. Sway up a little higher and cut the middle stops, pulling away at the same time on the guide lines, when the top will go over the masthead, and can be lowered into its place with the gantlines.

NOTE.—The seaman who is sent aloft to cut the above-mentioned stops should be slung in a boatswain's chair, and let him keep on the after side of the mast as far as possible till the top comes down over the masthead as far as the gantlines will allow it, as the fore part of the top generally goes a few feet down with a jerk when the middle stops are cut; therefore the seaman wants to be wary who has this duty to perform.

The lower cap is fitted on the masthead after the top is aloft, and is a very easy matter to accomplish, compared to placing the trestle-trees and top over the masthead.

Of course, if the masting sheers are available, place the cap on with the sheer-head gantlines in the same manner as before described in shipping the trestle-trees.

But if no sheers are aloft, proceed thus:—

Overhaul the masthead gantlines down on deck before all, and bend them on the under side of the round hole in the cap, stopping them on each side to the middle and after part of the cap. Also make two short pieces of rope fast, about a couple of fathoms in length each, to the side bolts in the cap. These lines are to assist the men in the top guiding the cap on, and prevent it capsizing forward when cutting the stops.

Now pull aloft the cap, and when its after part comes on a level with the lower masthead, tend the small guide ropes in the after part of the top on each side, cut the stops as required, ship the cap, and beat it down into its place with a top maul.

A cap may also be placed over the masthead very easily when sending up the topmast, thus:—

Send the cap aloft, and land it in the top with its round hole over the square hole of the lower trestle-trees, and lash it in that position.

When the topmast is well entered through both trestle-trees and cap, cross lash the latter on the topmast, then heave away the topmast, and when the cap comes above the lower masthead, place a large hand-spike in the fid hole of the topmast, with a line fast to its end. Haul away upon the line. This will slew the topmast round, and when the cap comes fair with the masthead, lower down the mast a little, which will ship the cap. Then set it hard down in its proper place. A heavy topmast cap may be shipped in a similar way by help of the topmast.

To send the cross-trees aloft, place two gantlines on the lower masthead, one on the fore-part, the other on the after part, and overhaul them down on deck before all, say on the port side of the vessel, and hitch the ends respectively on the underneath side to the two port horns of the cross-trees.

Stop the gantlines close up to the port side of the trestle-trees, also stop them again half-way out on the under side of the starboard horns of the cross-trees, then make fast a tripping line to the lower part of the cross-trees, to trip them out clear of the rim of the top as they go aloft.

Sway away, and when the cross-trees come above the top, make fast to the upper or starboard horns a couple of pieces of ratline line, to act as guide ropes, and carry their ends over to the starboard side of the top. Station two men to tend them. Sway away the cross-trees till the starboard horns are well above the lower cap, when the upper stops will be close up to the gantline blocks. Haul well taut the guide ropes, and cut the upper stops. The cross-trees will then begin to cant over on the starboard side of the cap. Sway up a little higher, *tending well the guide lines*, and cut the lower stops, when the cross-trees will fall right across the cap. Then pinch them forward carefully, and lash them securely on the cap through the eye-bolts to the lower masthead, with their square hole above the round hole of the lower cap, so that when the topmast is sent aloft it will pass through its proper place in the cross-trees.

Great care is absolutely necessary, when cutting the lower stops, in tending the guide ropes, or the cross-trees may cant off the cap, endangering the safety of the men in the top, and also retarding the work. The man who cuts the stops should remain on the opposite side of the mast on which the cross-trees are sent aloft; then, if the cross-trees were to slip off the cap during the operation, he will be in comparative safety.

If the cross-trees have to be put over the masthead with the topmast

When the topmast is well entered through both trestle-trees and cap, cross lash the latter on the topmast, then heave away the topmast, and when the cap comes above the lower masthead, place a large hand-spike in the fid hole of the topmast, with a line fast to its end. Haul away upon the line. This will slew the topmast round, and when the cap comes fair with the masthead, lower down the mast a little, which will ship the cap. Then set it hard down in its proper place. A heavy topmast cap may be shipped in a similar way by help of the topmast.

To send the cross-trees aloft, place two gantlines on the lower masthead, one on the fore-part, the other on the after part, and overhaul them down on deck before all, say on the port side of the vessel, and hitch the ends respectively on the underneath side to the two port horns of the cross-trees.

Stop the gantlines close up to the port side of the trestle-trees, also stop them again half-way out on the under side of the starboard horns of the cross-trees, then make fast a tripping line to the lower part of the cross-trees, to trip them out clear of the rim of the top as they go aloft.

Sway away, and when the cross-trees come above the top, make fast to the upper or starboard horns a couple of pieces of ratline line, to act as guide ropes, and carry their ends over to the starboard side of the top. Station two men to tend them. Sway away the cross-trees till the starboard horns are well above the lower cap, when the upper stops will be close up to the gantline blocks. Haul well taut the guide ropes, and cut the upper stops. The cross-trees will then begin to cant over on the starboard side of the cap. Sway up a little higher, *tending well the guide lines*, and cut the lower stops, when the cross-trees will fall right across the cap. Then pinch them forward carefully, and lash them securely on the cap through the eye-bolts to the lower masthead, with their square hole above the round hole of the lower cap, so that when the topmast is sent aloft it will pass through its proper place in the cross-trees.

Great care is absolutely necessary, when cutting the lower stops, in tending the guide ropes, or the cross-trees may cant off the cap, endangering the safety of the men in the top, and also retarding the work. The man who cuts the stops should remain on the opposite side of the mast on which the cross-trees are sent aloft; then, if the cross-trees were to slip off the cap during the operation, he will be in comparative safety.

If the cross-trees have to be put over the masthead with the topmast

fitted, the same evolution is carried out as in placing them over the lower cap, only the gantlines will be at the topmast head instead of the lower masthead.

But it is as well to remark that if a very heavy pair of topmast cross-trees have to be shipped with the topmast over-end, the best and safest mode of doing so would be to at once rig a small spar, as before explained in sending up a large pair of trestle-trees; and in fact, all things considered, both in sending aloft caps and trestle-trees, and also in stripping the mast and sending them down, a spar rigged as before described will be found the quickest and much the safest method that you can adopt, if no masting sheers are available.

SECTION XI.

TAKING IN AND RIGGING A LOWER YARD.

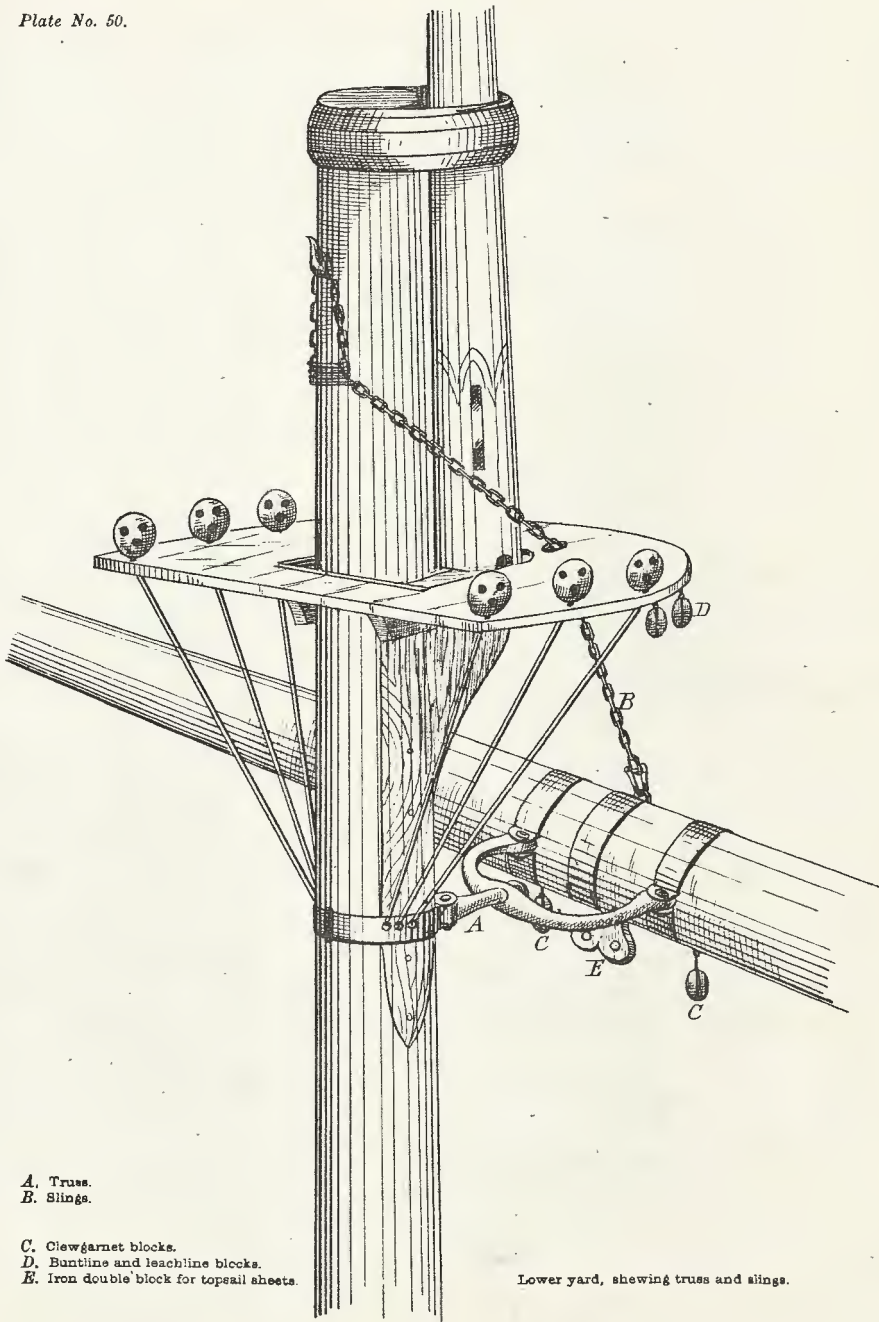
We will presume the yard is on the starboard side. Reeve a three-fold purchase capable of lifting the yard. Lash the upper block of this tackle round the doublings of the mast, just below the top, so that it hangs fair and plumb between the lower trestle-trees on the fore part of the mast; then overhaul this tackle and lash the lower block to the yard close to the sling band. Be sure that when the yard is high enough there will be enough drift between these blocks to allow of getting in the sling shackle.

Heave away the yard, and as it comes on board, guy the port yard-arm underneath the fore-and-aft stay, and land the yard right athwart the ship's rails, keeping considerable weight on the tackle, so as to ease the weight off the rails.

The yard is now ready for placing the rigging. (It is presumed that the lifts have already been fitted and overhauled down, ready for shackling on to the yard.)

Firstly, fit the Flemish footropes—these are generally fitted with clip hooks on the one end, and an eye-splice in the other—the clip hooks are moused upon the bolt at the yard-arm, and the eye-splice seized upon the jackstay, about five feet inside the left band.

The footropes are then fitted thus:—A piece of chain about two feet in length, with a shackle in one end, a large link in the other, is secured to the outer end of the footropes by splicing it through the large link. On the inner end of the footrope is spliced an iron heart-thimble, to which is spliced a piece of ratline line for a lanyard.



A. Truss.
B. Slings.

C. Clew-garnet blocks.
D. Buntline and leachline blocks.
E. Iron double block for topsail sheets.

Lower yard, shewing truss and slings.

Carry out the footrope on the yard, and shackle it on to the iron band abaft the yard-arm. (The lift-band of a lower yard has generally three large eye-bolts in it, which should be clunk or through-welded; one for the lift on top of the yard; one for the reef-tackle below the yard; and one on the after part of the yard, for the brace and footrope.) The stirrups are spliced round the footropes on one end, the other end having an eye-splice in it to seize on the jackstay.*

(The inner end of the port footrope is seized to the starboard arm of the truss, and the starboard footrope to the port arm of the truss.)

Lead along your braces and shackle the pennants on to the eye-bolts at the yard-arms. Then take two good stout lines or tackles, and make them fast to each quarter of the yard, and lead them forward to the winch or windlass.

Send the truss aloft, and secure it in its proper place, and have it triced up ready to receive the bolts. When trussing the yard, the slings also must be fitted in their place. (*Plate No. 50.*)

All being now ready, heave up the yard till it is high enough to get the lifts shackled on. When this is done let hands keep taking in the slack of the lifts as the yard goes aloft.

When the yard is high enough, take a heave on the two lines or tackle you previously made fast to each quarter of the yard, and pull the yard out clear of the truss.

When the yard is high enough, at once shackle on the slings, and when this is done, ease away the purchase-block fall, till the slings have the weight of the yard.

When this is effected, truss the yard by shoving in the truss-bolts. It is often difficult to get these bolts in place; but by topping first on one lift, and then on the other, and tending well the tackles for heaving the yard forward, you will eventually succeed in getting the bolts in. Secure them with good split forelocks or a large nut, whichever way the truss may be fitted.

After the truss is bolted, square the yard by the lifts and braces, cast off the lines, and unreeve the purchase.

Reef-tackles, buntlines, leechlines, and clew-garnets are next rove in

* NOTE.—Footropes are often fitted with a long shaped link in the end of the chain, which fits on over the lift-bolt, but they are best fitted to the brace bolt, being there more out of the way of the sheets, and are also better shackled in their place.

their respective places, and when the gaskets are placed on the yard it is all ready for bending the sail.

The clew garnet-blocks are iron-bound hook-blocks. They hook on an eye-bolt underneath the yard, near the sling-band. Some vessels have a double block, one sheave for the clew garnet, the other for the reef-tackle; but two single blocks are better than a double one here, as each block then lies to its own work.

The buntline blocks are iron-bound hook-blocks, that hook on eye-bolts on the underneath part of the top on the fore side. Here also the leechline-blocks hook on, which are iron-bound hook-blocks. There are also two rope stropped-blocks, one-third of the way out on the yard, seized on the jackstay, that the leechlines are rove in before they are rove in the block underneath the top. The reef-tackle upper block, if reef-tackles are fitted, is hooked on the eye-bolt that is underneath the yard, on the lift-band.

The lower lifts are rove through large iron-bound blocks hooked on the lower cap; the lower lift pennant-block is spliced in the lower end of the lift pennant, and should be a double block, to take the lift fall; the lower lift fall-block hooks on an eye-bolt on deck, close to the mast.

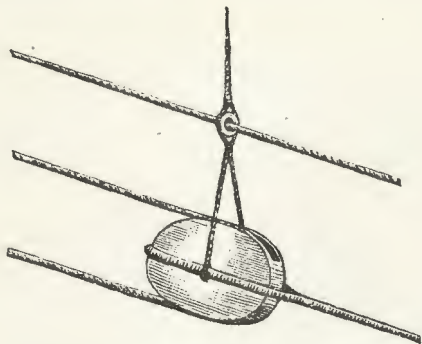
The sheet-blocks of the courses are heavy rope-stropped blocks, with an iron thimble seized into the strop, and one is shackled on to each clew cringle of the course.

Tacks are generally stout round chain, though sometimes of heavy rope; but a tack tackle is used when bousing down the tack, the slack of the chain taken in, and the tack tackle unhooked when the sail is set.

Buntlines, of which there are two each side, can be either rove singly or with a whip and pennant; in large ships the latter is necessary. It formerly was the practice to reeve the buntlines on a bight through a sister block; then the one whip acted for both inner and outer buntline; but this plan is now generally condemned, and each buntline has a whip and block of its own.

Double rope tacks are also to a great extent done away with, as chain tacks are much handier, and can be easily unhooked when going about.

All lower braces should be fitted with patent blocks. Main brace lower blocks are generally fitted with a wire pennant, 3 fathoms in length. The lower block is spliced into one end of this pennant; the other end of the pennant is shackled on to the bumpkin. This block is fitted with a fairleader on it, for the hauling part of the brace to lead through. This arrangement keeps the lower pennant-block from



Lower block of main brace, shewing fair lead for hauling part, and tricing line for keeping block up.

(Plate No. 51.)

getting turns in it. This fairleader has a small line spliced on top of it, about 6 fathoms in length, that is secured well up the mizzen rigging, to prevent the pennant and block falling in the water when the main brace is let go by the run.

SECTION XII.

SENDING TOPMASTS AND TOPGALLANT MASTS ALOFT.

Take aloft a full-sized top-block, and hook it on the lower cap, on the same side of the vessel on which the topmast is lying on deck; place a good mousing upon it, to prevent it unhooking whilst doubling the mast-rope.

Send aloft as stout a rope as the block will take, and reeve it from aft, forward, and overhaul the end down on deck through the hole in the lower trestle-trees before the rigging; if the lower yard is aloft, brace it forward, and send the mast-rope down abaft the yard.

Reeve the end of the mast-rope through the sheave-hole in the foot of the topmast, overhaul through about ten fathoms of the end, and just above the sheave-hole rack both parts of it securely together; let it be a good racking, as it will have a strain upon it when doubling the mast-rope. Hitch the end of the mast-rope through the sheave-hole in the head of the topmast round its own part.

All being now ready, sway aloft the mast, and when the sheave-hole comes above the lower trestle-trees cast off the end of the mast-rope, and reeve it through the eye-bolt on the opposite side of the cap to which the top block is hooked. When the sheave-hole at the topmast-head comes above the lower cap, avast heaving, and place through the sheave-hole a large iron bolt, ease away the mast-rope till the bolt has the weight of the mast.

Then cast off the racking on the mast-rope, and hitch its end securely to the before mentioned eye-bolt in the cap, set taut the mast-rope, and withdraw the bolt.

Your mast-rope is now doubled, and you can either ease it down a few feet to get the rigging and topmast cross-trees over the masthead, or heave away upon the mast-rope, fid the mast, and rig it aloft.

If the topmast goes up very tight the last few inches, as soon as ever the fid-hole comes above the trestle-trees shove a large bolt through it, then if the mast-rope was to carry away just before it was high enough to fid properly, no damage would occur. Why this is mentioned is, that it often happens that the topmast, through a bad fit in the cap, or being too stout in the shoulders, is very difficult to fid, and has often to be eased before it can be got into its proper place.

SENDING ALOFT AND RIGGING ROYAL AND TOPGALLANT MASTS.

We will assume in this description that the royal and topgallant rigging has been previously fitted over the mast on deck, and that it has been sent aloft to the topmast cross-trees ready to place over the masthead.

Royal and topgallant masts are usually made out of one spar, except in a few isolated cases, where large vessels have been rigged with fitted royal masts.

On one of the eye-bolts in the topmast cap hook on a good iron-bound block, reeve in it (from aft forward) the mast-rope, and overhaul its end down on deck through the hole in the topmast trestle-trees and the collar of the topmast stay.

Reeve it through the sheave-hole of the topgallant mast, and overhaul about 5 or 6 fathoms of the end through—enough to double the mast-rope when required. Then hitch the end through the sheave-hole at the head of the topgallant mast round its own hauling part. Now put a trustworthy racking on both parts of the mast-rope just above the lower sheave-hole, and make a small tripping line fast to the heel of the mast, to guide it up clear when swaying it aloft.

If the lower and topsail yards are aloft, the topgallant mast will be easier sent up abaft the yards.

All being now ready, sway away the mast and point its end through the topmast cross-trees, and when the head of the royal mast comes above the topgallant cap a couple of feet, hold on the mast-rope and prepare to place the rigging over the masthead.

Firstly, put over the masthead a good grummet that has previously been fitted tight over the mast on deck. (This grummet is to prevent the eyes of the rigging slipping down over the hounds of the topgallant mast.) Next place over the mast the fore and aft topgallant stay, then the starboard pair of shrouds, then the port pair, and if the topgallant backstays are fitted in pairs, firstly the starboard pair, and then the port, and lastly the lift-strop.

Then commence with the royal rigging, grummet first, then the royal stay, next the backstays, and lastly the lift-strop. When all is secured over the masthead, let a couple of men go in the top to light up the rigging as the mast goes aloft. Sway away the mast a few feet higher, then belay the mast-rope, and double it. When the end of the mast-rope is hauled taut from the racking and well hitched to the cap, cast

off the racking on the mast-rope and sway away till the hounds of the royal mast come above the cap. Set all the rigging tight down on the hounds with a good wooden mallet, then heave away the mast-rope till the hounds of the topgallant mast come above the cap, and set the rigging tight down in its proper place. Then heave away and fid the mast.

When setting up the rigging a man ought to be sent aloft at the topgallant masthead to harden the eyes of the rigging well home with a mallet.

Many vessels that are fitted with wire rigging have either copper or galvanized iron funnels to fit over the masts in the wake of the topgallant and royal rigging. These funnels are to be most highly recommended, for the following weighty reasons:—

They prevent the small wire rigging cutting its way into the mast, which is a most serious objection, and ought to be strictly guarded against. They facilitate sending the mast up and down, the rigging being always ready at the topmast-head to receive the mast when changing masts.

When staying the topgallant and royal mast, set up the fore and aft stays first, the backstays next, and the rigging or shrouds last.

SECTION XIII.

RIGGING AND SENDING ALOFT TOPSAIL YARDS.

Say the yard is on deck on the starboard side, port yard-arm forward; raise it on two chocks and commence work thus, concluding the iron bands, &c., are all in their places on the yard.

Fit the Flemish footropes on the yard, as described in fitting the lower yards. Also the footropes themselves must be fit at the yard-arms with two feet of chain, the same as the lower yard footropes; but not the inner end of the footropes, they must be fit long enough to reach at least eight feet beyond the centre of the yard, from the opposite yard-arm, as they have to be passed abaft the topmast, before seizing them on to the jackstay, after the yard is aloft. Shackle each footrope to the yard-arm; splice round them two or more stirrups on each footrope, as many as are fitted. Then take a temporary turn of the footrope to the sling-band of the yard.

Topsail-lifts are fitted to shackle on the topsail yard at the lift-band, and the other end of the lift has a thimble and lanyard in it. Now

shackle on the lifts to the yard-arm, and take a loose turn with the lanyard end to the slings of the yard.

Reeve the braces, pass them outside of all the backstays and topmast rigging, and shackle the brace pennants temporary on the foremast-shroud of the topmast rigging above the top.

Reeve the yardrope through the sheave at the topmast-head, down and through a top-block lashed a little outside the sling-band on the port yard-arm, and up again to the masthead, making the standing part fast over the eyes of the topmast rigging.

Next take a good line aloft, and reeve it through a block hooked on the topmast cap, overhaul it down on deck before all, and bend it on to the port topsail yard-arm; this topping rope will help the yard rope in keeping the yard well over-end as it goes aloft.

Take the yard rope to a good double winch and heave away, at the same time keeping a good weight on the topping rope.

When the yard is well over-end, and just before it is clear of the deck, bend a good line on to the lower yard-arm; this line, if kept taut forward, and eased away as the yard goes aloft, will keep it clear of the lower yard, and the rim of the top. Brace the lower yard by on the starboard brace, to keep the lower yard clear of the topsail yard.

When the yard-arm comes above the top, hold it there for a few minutes, and shackle on the port lift and brace, and heave away; as soon as the slings of the topsail yard clears the collar of the fore and aft lower stay, slack gently away the topping-rope, and let the yard square a little, so that the upper yard-arm will pass under the topmast stay; send a man aloft with the port lift and make it fast. When you are doing this a couple of hands can jump down on the lower yard and shackle on the starboard brace pennant. After the pennant is shackled on, let go altogether of the topping-rope, and let the yard well square itself. Heave away the yard rope till it is high enough to get the starboard lift fast. When this is done, lower away the yard rope, and parrel the yard. After the yard is parrelled, slack away the yard rope, till the lifts take the weight off the yard, steady tight the braces, unreeve the yard rope, and reeve the topsail halyards, which are generally fit with chain pennants before the mast, and rove thus:— A powerful iron block is shackled on the top of the sling-band. The topsail-tie, or pennant, is firstly shackled on to the topmast trestle-trees, the end taken down on the topsail yard, rove through the iron block on the yard, up through the sheave-hole at the topmast-head, and brought down as far as the top, abaft all; then a large three-fold

or four-fold iron-bound block is shackled on this end, and a stout fall rove through this block, and a corresponding block hooked on deck; this gear constituting the topsail halyards.

With a little modification the lower topsail yard is fitted and sent aloft in the same manner, with the exception that lower topsail lifts are sometimes fitted on the yards, about two-thirds the distance from the slings to the yard-arm. In vessels so fitted an iron band is placed for their reception on the yard.

But most vessels dispense with lower topsail lifts altogether, making the topsail downhauls act in their stead.

The topsail downhaul for the upper yard is first rove through a quarter block on the upper topsail yard, then through a yard-arm block, down through a block on the lower topsail yard-arm, and taken up and shackled or clip-hooked on to an eye-bolt at the extreme end of the upper topsail yard-arm.

Small vessels sometimes reeve the downhaul first through a block hooked on the rim of the top, up through a block on the upper topsail yard, and shackled on the extreme end of the lower topsail yard-arm. This is called a single downhaul.

Lower topsail yards are fitted with a truss, to keep them well clear of the lee rigging when braced up, and are supported from below by an iron standard, which works in a socket secured on the fore part of the heel of the topmast, or else in the top.

The lower topsail clewline-blocks are well out upon the yard, for when the sail is clewed up the clew cringle comes little more than half-way in along the yard.

Topsail sheets are of stout round chain, but it is customary on long voyages to stopper the clews of the lower topsails to the yards, in the trade winds, and slack up the sheets. Yet this cannot be recommended, for if the vessel got hove on her beam ends by a heavy tropical squall, she would probably be dismasted or turn over before there was time to unstopper the clews.

Fore and main topsail braces are generally fitted with a whip and pennant, thus:—A chain or wire pennant, from 2 to 3 fathoms in length, is shackled on to the yard, with a single block shackled on the other end. Through this block is rove a rope pennant. One end of the pennant is secured to the topmast-head; on the other end of the pennant is spliced a whip-block, through which a whip is rove. One end of the whip is secured to a bumpkin; the other part of the whip

is led through a leading-block on the bumpkin through a fairlead in the bulwarks, alongside of the lower brace leading-blocks.

Mizzen topsail braces are led forward. They are fitted as a single whip from the chain pennant.

RIGGING AND SENDING ALOFT TOPGALLANT YARDS.

The topgallant yards have iron bands fitted on the yard-arms to shackle on the lifts and braces. Heavy yards have also three iron bands in the midship part of the yard, one for the halyards, and the other two, one on each side of the midship band, have eye-bolts clunk or thorough-welded in the lower part of the band, to hook on the quarter-blocks. These quarter-blocks are double blocks, one sheave being used for the royal sheet, the other for the topgallant clewline.

We will presume the yard is lying on the port side of the vessel, with the starboard yard-arm forward on deck.

Splice in the footropes as described for a topsail yard; also splice thimbles in the end of the lifts or clip-hooks, according to fancy. These lifts, if rope, must be long enough when the topgallant yard is down on the cap to reach from the yard-arm up to the topgallant masthead (where it is rove through a thimble), and down to the topmast cross-trees, where it is made fast.

Wire lifts are almost always lashed at masthead. Some seamen fit the lifts to set up with a lanyard to the topgallant masthead, but it is far better for the lifts to lead down to the cross-trees, as it saves you mastheading the yard, if you require them sent down in bad weather at sea, where it is anything but pleasant to have a large topgallant yard swinging about at the masthead whilst a seaman is casting off the lower lift; but heavy topgallant yards will always be fitted with wire lifts, which are shackled or lashed at the masthead.

Whilst the lifts and footropes are being fitted, send hands aloft, and reeve a good stout rope through the sheave-hole in the topgallant masthead, for a yard-rope, and overhaul it down on deck. Hitch this securely to the halyard shackle on the midship band of the topgallant yard, lay the bight of it tight along the yard, and put a good quarter-stop round both yard-rope and yard, about 2 feet from the midship band on the starboard side, so that the port yard-arm is much the heaviest, whilst swaying the yard aloft; also put a stop round the yard-arm, to keep the yard well over-end. If you have fitted the gaskets on the yard, these will act well for both quarter and yard-arm stops.

After a loose turn is taken with the inner ends of the footropes and lifts round the yard-rope near the midship band, all is ready for swaying away the yard. If it is a heavy yard it will have to be hove up with the capstan.

As the yard goes up, make a tripping line fast to the lower yard-arm; to trip it out clear of anything it may foul whilst going aloft.

We will presume the braces and parral are aloft, all ready to secure to the yard, and that it is a tub parral of modern construction.* Two men aloft are all that is necessary to cross the yard. When the upper yard-arm comes above the cross-trees, avast heaving. One of the men aloft then passes the starboard brace round outside the starboard topgallant rigging, shackles it on the yard, observing that the brace has no turns in it, and casts off the yard-arm stop.

The other man casts off the lift from the yard-rope, takes the end aloft, and reeves it through the thimble at the masthead, and brings the end down in the cross-trees, taking in the slack a little as the yard goes aloft, or lashes it through the eye if fitted that way.

Then again sway away the yard. When the lower yard-arm comes on a level with the upper topsail yard, take the port brace and shackle it on; cast off the lower lift, and carry the end aloft, and reeve it through the lift-strop at the masthead, or shackle it on, as the case may be. When the yard is well up ease off the quarter-stop, and the yard will square itself; take in the slack of the lifts, and when these are fast, lower away the yard-rope, parral the yard, and steady tight the braces. The yard is then crossed. Pass the footropes abaft the topgallant-mast, and seize them on in their respective places.

Then reeve the topgallant halyards.

Topgallant halyards are generally fitted thus:—A chain pennant is shackled on to the sling-band of the topgallant yard; it is then taken up and rove through the sheave-hole in the masthead, and leads down abaft the mast, and shackles on to an iron-bound double block. A corresponding block is hooked on the after part of the top, and a stout fall rove in these blocks, the hauling part of which leads on deck. This gear constitutes the topgallant halyards.

Very heavy topgallant-yards have a chain-runner abaft the mast, to help the purchase-fall; the end of the chain-runner shackles on in the top close to the lower halyard block.

* These tub parrals are not an unmixed advantage, especially when, as is most usual, they are secured to the *yard*, as they are very much in the way when sending yards up or down. If proper tubs are on the mast, then they are all right; and as the yard stands well away from the mast, it can be braced very sharp up without chafing the lee rigging; but parrals secured to the yard which are common nowadays, are very much in the way.

Main and fore topgallant braces lead aft, and are fitted with a whip and wire pennant, one end of the pennant being shackled on the yard, on the other end is shackled a whip-block. The standing part of the whip makes fast to the collar of the topmast-stay, where also a leading block is fitted to receive the hauling part of the whip, to keep it down clear of the foot of the topgallant sail; it is then rove through another block hooked on to the topmast trestle-trees, and leads down on deck.

Mizzen topgallant braces are led forward, and secured to the maintopmast cross-trees with whip and pennant.

SECTION XIV.

SENDING OUT THE JIBBOOM.

Many large ships now-a-days carry no flying jibboom at all, putting extra canvas in the outer and inner jib to make up the deficiency. In almost all cases the boom is one spar, the separate flying boom being hardly ever seen. There are also many new ships whose jibboom and bowsprit are formed out of a single spar of iron or steel.

In this description it is assumed that the vessel carries no flying boom, and that the outer and inner jibboom is one spar, with an independent bowsprit.

Place the jibboom on the topgallant forecastle, and with a single rope and top-block secured to the bowsprit cap, heave it out till its end is pointed through the cap a couple of feet, then secure it there and double the heel-rope.

Now take the inner guy band (which is fitted with three eye-bolts in it, one for each guy on the sides, and the other right beneath it for the martingale stay to shackle on to), and place the band over the boom end; then take the outer guy band and place it over the boom end (it is fitted precisely in the same way as the inner band); then shackle on the outer guys and flying martingale stay, and beat the band hard down on the hounds of the boom.

Whilst this is being done hands on the topgallant forecastle should reeve both inner and outer jib-stays through all the hanks required for each jib, and stop them together on each stay high enough to clear the boom. When this is executed reeve the outer jib-stay through the hole in the boom, also the topgallant and royal stays, overhauling enough of them through to allow the boom to go out into its place, with the ends

of the fore and aft stays made temporarily fast about the outer end of the bowsprit.

The outer ends of the footropes are generally shackled on along with the guys, or a small piece of chain with a large link is fitted on each footrope to go over the eye-bolt before shackling on the guy.

Make fast both pairs of jib-halyards to the outer end of the jibboom, and station hands by them to ease them away as the boom goes out. This will help to support the boom and ease the weight off the heel-strop.

Have a good heel-strop round the bowsprit and heel of the boom, to prevent it topping up. All being ready, heave away the boom again, and when the hounds of the inner boom come outside the cap, shackle on the inner guys and martingale-stay, and reeve the inner jib-stay through the boom, after having secured the outer end of the inner jibboom footropes to the boom band. Heave away the boom, tending well the jib-halyards and heel-strop till the tenon of the boom will enter the chock on the bowsprit. Then belay the heel-ropes and heave the heel close down to the top of the bowsprit by the heel-strop before mentioned, and when the tenon is in its place, clamp it there with the heel-iron, and let go all the gear.

Whilst unreeving the heel-ropes, &c., set hands to turn in thimbles, or hearts, as they may be fitted, into the ends of the fore and aft stays, ready to set them up to their respective eye-bolts. Parcel each stay well in the wake of where it passes through the boom, and also in the wake of the martingale. Other hands can be seizing on the footropes and getting tackles ready to set up the gear.

Firstly, set up the martingale back-ropes, which will give the boom the required stave; then clap on the guys; and lastly, set up the fore and aft stays.

The jibboom should, whenever possible, be rigged in when entering crowded rivers or docks. A great many American vessels nowadays have their jibbooms rigged with a powerful gooseneck at their inner end, and the upper part of the bowsprit cap forms a clamp iron for the jibboom. Vessels so fitted in harbour unclamp the cap and top the jibboom right over-end; but in large vessels we think this plan is not to be recommended, one of the chief reasons being, a heavy spar, 60 or 70 feet in length, standing right over-end, and only temporarily secured in that position, is dangerous in the extreme in case of a harbour collision.

SECTION XV.

RIGGING GAFFS AND BOOMS.

There are several methods of fitting a gaff to the mast; the old method with jaws to work up and down the mast, and large wooden hoops securing the luff of the sail, is practically speaking now done away with, except in small vessels. The usual method now adopted in fitting a gaff, is with a strong iron gooseneck on the inner end, fitting into an iron traveller that works up and down the mast upon a powerful guide rail.



This method, especially with iron masts, is to be preferred to any other, being both neat, strong, and easily worked.

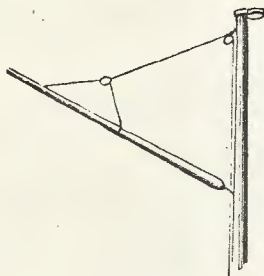
The guide rail is formed by a common bulb-iron or rail plate being spiked upon the after part of the mast. (*See sectional view of guide rail and hanks, Plates 52, 53, 54.*)



The hanks are made of galvanized iron, to prevent them rusting the sail. Some of these hanks are stronger than others, and have an eye on each side of them, on which the brail blocks are seized.



Plates 52, 53, 54.



The peak halyards have on their outer end a stout ring, through which is rove a chain-span near the outer part of the gaff; then rove through an iron block that is shackled on the lower mast-head, and led down to the deck. These halyards (or peak tie) are worked by a luff-tackle purchase on the lower end, and are made of round chain.

Plate No. 55.

The throat halyards are shackled to the inner end of the gaff, and led up through an eye-block shackled on an eye-bolt in a chock on the after lower trestle-trees; they, like the peak halyards, are composed of round chain, and are worked with a luff-tackle purchase on their lower end.

If a trysail or spanker is so fitted, three men can with the greatest ease take in the largest of fore and aft sails in a couple of minutes, by simply lowering away the throat halyards (keeping the peak halyards

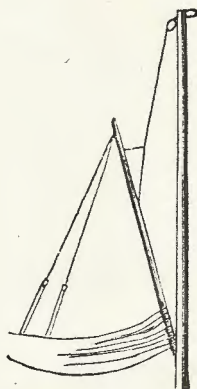


Plate No. 56.

fast,—*mind this*) and taking in the slack of the vangs, when the jaws of the gaff will run close down on the boom, and the gaff will assume a vertical position close to the mast, which will cause the head of the sail to run down the gaff, and it can either be stowed or reefed as the occasion requires.

The head of the sail, when fitted in this manner, runs out and in upon a traveller on the gaff, very similar to the luff, and is worked by a head outhaul and inhaul. The sail requires no brails or foot outhaul, as the sheet cringle of the sail is lashed permanently at the boom end; yet many vessels use a foot outhaul for the sake of letting the clew of the sail come in to the mast in harbour, as it looks neater than if stowed with the clew at the boom end.

When wanting to send the gaff aloft in its place, reeve the peak and throat halyards, and also the head outhaul, and secure them to the ends of the gaff in their respective places; pull up the throat halyards, and ship the gooseneck on the inner end of the gaff in the traveller; then shackle on the vangs, and pull up the peak halyards till the gaff is well above the boom, and bend the sail if necessary.

Many large sailing ships have their gaffs fitted with a gooseneck, that ships into the spider-band on the after part of the lowermast, the peak of the gaff being secured aloft in its proper place by a chain-pennant from the lowermast head, the spanker boom being hung by another chain-pennant shackled on to the gaff. In this description of rig the pennant supporting the gaff requires to be extra strong, as it has the weight of both boom and gaff to contend with combined. The reason why vessels adopt this method in rigging the gaff and boom is, it does away with both topping lifts; the boom always remains in the required position for setting the sail after it has been taken in; it saves the sail getting chafed by the topping lifts; and last, but far from least, the boom requires no special attention when tacking ship in narrow waters.

This rig is termed a standing gaff. Yet remember gaffs and booms so fitted have their weak points, one of the worst features being in reefing, or taking in the spanker when blowing hard, and it is then that the first method described shows itself prominently to great advantage.