sail-tackle (by one of the means described) and the sail-tackle fall led in the direction of the stay ; it is pulled up steadily, the nips of the lanyards having been well tarred to make them slip through the hearts, while they are also shaken up by levers. When taut enough the lanyard is securely seized to the next part, another turn rove, set up, and seized, till the scores in the hearts are full ; then riding turns are taken. Whilst the first riding turn still bears the strain, all the seizings on the lanyards should be cut off, and others put on when each part has taken over an equal strain. After the riding turns are completed, the end of the lanyard is secured by a clove-hitch and a seizing. Where there is not a sail- tackle a long luff may be used in a similar manner, the double block being secured above the single block of the other luff. It is desirable that both stays on the masts should be set up at the same time, but it is not imperative ; care should be taken that they are equally taut.

A lanyard for rigging with dead-eyes is half the nominal size of rope shrouds and the same size as wire rigging. The knot is inside under the end of the shroud, or is first spliced to a bolt in the chains and then rove through that hole ; it is rove full before commencing to set up. The mast having been stayed, luffs are placed on the shrouds with the double block down and brought to the lanyard as above described ; the up-and-down tackle from the mast-head pendant is secured to the fall of the luff by a cat’s-paw and strop and pulled up till taut enough, the foremost shroud on the starboard side first, then that on the port side, and so on alternately till they are all nearly taut alike (the after-swifters not quite so taut as the others), which is best ascertained by an experienced man shaking them ; if the dead-eyes are not square (even) when finished, it is far better to turn them in afresh than to have an unequal strain on the shrouds. If a pair of shrouds were set up at the same time it would be better for the eye and the seizing. Tar should be used freely on the lanyards as they enter the dead-eyes, whether they are of iron or wood ; it causes them to slip quite as well as grease and preserves the rope, while grease causes it to decay. The lanyards are seized to the next part till a clove hitch is taken above the dead-eye and the end seized down ; the parts of the lanyard should then be made to bear an equal strain, and afterwards seized together lest any part should be injured. The runners should be kept taut till every­thing is secured, then eased up gently, to avoid straining the mast. Lower masts generally have an inclination to belly,—*i.e.,* bend aft. Space will not admit of details being given as to the various parts of the rigging ; the main principles follow the lines of that which has been already rather fully described above. The top mast stays and rigging are set up by means of top-burtons and jiggers, the top-gallant-rigging and that of all small vessels by jiggers and light appliances.

The lower caps were supposed to have been swayed up by the gird-lines and placed in position to receive the top-masts before the lower rigging was put over. To fix one of them in its place, let a top-block be hoisted up lashed to the mast-head close below the square on which the cap is to rest, on the side suitable to the sheave in the top-mast ; through the block reeve a suitable hawser (9 inches for a large ship) ; send the fore end down through the square hole between the trestle-trees ; lay it along the top-mast (the spare one if allowed two) ; reeve it through the live sheave in the heel ; and hitch it round the head of the top-mast and hawser, leaving considerable end ; also place a good lashing round the mast-head and the hoist­ing-part of the hawser and seize the two parts of the hawser together about half-way up, strong enough to bear the weight of the mast. If the top-mast be much longer than the space between the deck and the trestle-tree, the lashing must be placed low enough from the head of the mast to allow it, while suspended, to project above the top outside, while the heel is guided down the main hatchway or fore-scuttle. The capstan is used to heave the mast up ; when it is pointed between the trestle-trees, remove the lashing round the head, and if landed—i.e., resting its weight on the deck— make the end of the hawser fast round the mast-head, the hitch being on the side opposite to the block, and cast off the racking lashing, leaving the mast ready to be hove up by the two parts of the hawser. If not landed, heave up 3 or 4 feet before securing the end of the hawser, so that, when that has been done and well seized, the capstan may be moved back till both parts bear an equal strain ; the racking can then be taken off without fear of a jerk. After the head of the top-mast has been hove 3 or 4 feet through the hole in the cap, it is securely lashed, commencing with a clove- hitch round the mast, the ends being passed through the bolts under the cap on one side and repeated on the other, so that it will be sure to hang horizontally. Heave round the capstan till the cap is above the lower mast-head ; then steer it by means of a handspike or capstan bar in the fid-hole, while men in the top direct the head of the top-mast by handspikes, till the hole in the cap is exactly over the square of the mast, when by moving back the capstan and beating the cap down with a commander it will fit firmly in its place.

If the heel of the top-mast rests on the deck before the head

is free from the trestle-trees, it is as well to lower it down to that position ; but, if it is too short to rest there, the up-and-down tackles must be used to suspend it by strops through the fid-hole, while the top-block is being unlashed and hooked to the after­bolt fixed for that purpose in the cap and the end of the hawser secured to the foremost bolt on the opposite side. In large ships a shore is placed under the fore-part of the cap to support the weight and resist a possible blow from the top-sail-yard. The top­mast may now (unless it is blowing hard) be swayed right up and fidded to prove that it will fit when required (an allowance being made for the wood swelling with wet), and sent on deck in ex­change for the other mast, which when swayed above the lower cap will have a gird-line lashed round the head and then be raised 15 or 20 feet more. One part of the gird-line should be sent down abaft all and bent on to the fore-part of the top-mast cross-trees ; by this, assisted by a guy, they can be swayed up till above the lower cap, upon which the after-part will rest, securely lashed to the bolts to prevent it slipping, while the fore-part will lean against the top-mast at such a distance as to ensure it falling in the right position when the top-mast is lowered and to receive the head of the mast between the trestle-trees as it is swayed up again to a convenient position for receiving the rigging. The rigging is swayed up by gird-lines on the cross-trees, and put over in a similar manner to the lower rigging, the top-burton pendants first, then the shrouds and backstays in succession, and the stays are lashed.

There is usually a chain necklace round each top-mast-head, sunk in the bolsters ; one leg of each is for the top-sail-tye hanging-block to shackle to, and forward there are two other legs for the jib-hal­yards and fore-ton-mast stay-sail-halyards. After the rigging has been placed over tne top-mast-head, the cap is sent up by two gird­lines lashed as high as possible and bent to the foremost part of the cap, with stops to the after-bolts, by which means it goes up before all, with the under-side towards the mast ; when it is high enough the after-stops are cut and it slides up on the top of the mast, assisted by men at the mast-head, who get it over the square and beat it down. Directly the top-mast is in position to receive the rigging the top-rope pendants are rove and the tackles secured, first one to relieve the hawser of the weight and then the other in its place. Copper funnels are sometimes used to receive the top­mast rigging, similar to those for top-gallant-masts.

Top-gallant and royal rigging is sometimes stripped of the service and covered with canvas, which is afterwards painted, for the sake of neatness ; but the durability of the rope is thereby greatly lessened. Another bad practice is that of taking off one of the top­gallant-backstays, thereby directly diminishing the support. But worse still is the trick of forming the eyes of rigging and backstays by two seizings, the ends of each rope going to different sides of the ship ; this gives two eyes over the mast instead of four, and makes everything depend on the strength of the seizings. It is now a very common practice to cross the top-gallant rigging and set it up on opposite sides of the top, instead of reeving it through the necklace on the top-mast and setting it up on the same side. This is done entirely for the sake of saving seconds in shifting the spars, either the top-gallant-mast or the top-mast. Shrouds so treated give no support to the mast whatever ; probably they act in the reverse way, as may be easily shown by drawing a straight line to represent the masts when standing upright and lines in rough proportion at right angles for the top and cross-trees. Draw the top-gallant rigging on one side from mast to cross-tree and thence to the opposite side of the top. The top-mast, having a little play in the cap and at the heel, is bound to go over some inches at the head, taking the cross-tree with it ; it will then be seen that the weather side of the cross-tree has approached the lee side of the top, slacking the weather and tightening the lee top­gallant rigging.

Getting a lower yard on board requires great care to avoid injury to the hammock netting and other things. Spars should be slung over the side for it to rub against and slip-ropes through the ports to ease it over the gunnel. If it is to be hoisted in on the port- side, the starboard yard-arm is towed foremost. A hawser may be rove through the port top-block down through the lubber’s hole and bent round the centre of the yard. The hatch of the lubber’s hole must be open and a strong mat provided. Instead of the hawser the jeers may be partially rove, the standing part being secured to the yard, and also the sail-tackle from the top-mast- head to the lower yard-arm and the starboard up-and-down tackle to the starboard yard-arm, also a burton from the fore-mast to the main-yard, or from the bowsprit if it is a fore-yard. The capstan and jeers will heave up the bulk of the weight, while the other tackles cant it and ease it across the gunnel. A derrick is some­times used to keep it off the ship’s side. When a ship is alongside a jetty, a guy from a strong-hold on shore removes all difficulty, and a list towards the side at which the yard is coming in is desir­able. Lower yards are usually rigged while resting across the gunnel ; they are swayed up by the jeers, and slung with strong chains—the part round the yard being connected with that round the lower mast-head by a tongue and slip. The yards must be