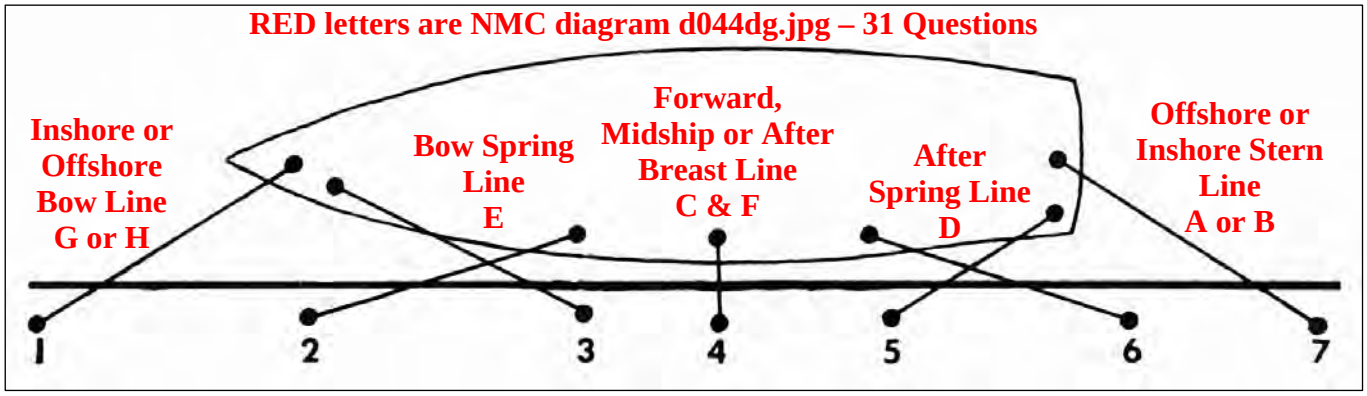
NAMING OF LINES



(1) Bow or head line (2) After bow spring line (cross spring) (3) Forward bow spring (4) Breast line (waist breast) (5) After quarter spring line (6) Forward quarter spring (7) Stern line

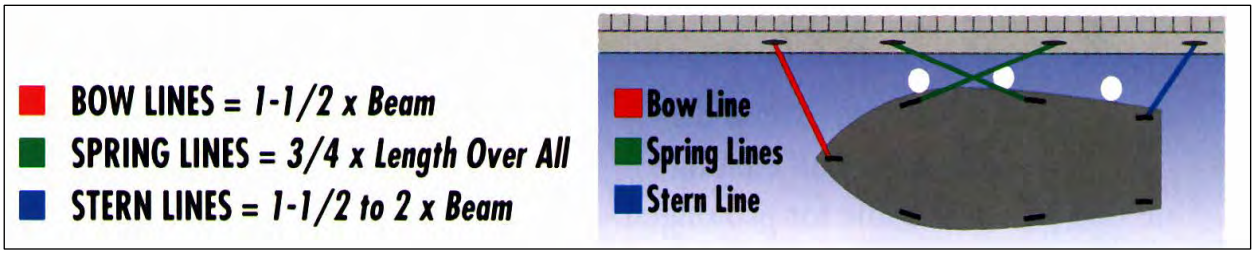
Bow Line(s) or Head Line(s) is a mooring, warping-rope or hawser leading forward from the bow. There may be both offshore and inshore bow lines. If a vessel has very bluff bows, an offshore line will lead from the outboard chocks to a bollard far enough down the dock so that there will be no danger of it chaffing on the stem. The angle the bow (and stern) lines make with the centerline of the ship is sometimes called *drift*. It should be at least 30° if the placement of bollards or bitts on the dock permit.

Breast Line(s) is a mooring-rope or hawser leading approximately at right angles (90°) to the wharf from the vessel lying alongside. May be used from the bow, midships, or stern. Their function is to keep the ship snug against the dock. When used, breast lines should lead as far away from the ship as possible so that they will not have to be tended with the rise and fall of the tide.

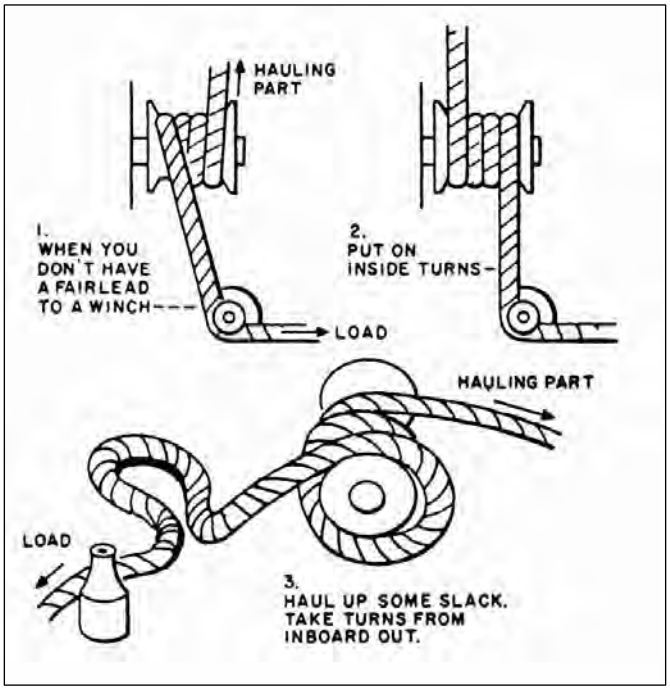
Spring Line(s) is a mooring or warping-rope leading in a fore-and-aft or diagonal direction from the ship's side. In the merchant service a spring line makes an angle with the dock and leads toward midships. If it is a bow spring, it will lead aft; if it is a quarter spring (or located on the stern), it will lead forward. In the Navy, the term is used to denote any line at an angle with the centerline of the ship regardless which way it leads. Spring lines are among the most useful for handling vessels alongside docks, whether for mooring, warping, undocking, or “springing” a ship away from the dock. The spring line is one of the first lines sent out when mooring and often the first. As its name implies, it “springs in” and “springs out” a vessel and, for the purpose of warping, may lead from any chock. The bow spring gets the brunt of the work in docking a ship.

Cross Spring Line(s) is a mooring or warping-rope leading in a fore-and-aft or diagonal direction from the ship's side. Lead across the spring lines, sometimes called “back spring lines.” The bow cross spring leads toward the bow, and the quarter cross spring leads toward the stern. Cross spring lines will generally be parallel to the bow or stern line depending on where located. They are extremely useful when mooring a ship and keep her in position once alongside. If the ship is moving forward alongside the dock and needs to be slowed or stopped, checking the bow spring and quarter cross spring will help do the trick.

Stern Line(s) is a mooring, warping-rope or hawser leading aft from the stern. There may be both offshore and onshore stern lines as well as bow lines. The stern line serves exactly the same function on the stern that the bow line does on the bow.



Fairleads are used when the lead of the line is not in direct line with the hauling apparatus. Fairleads may be chocks, bollards, cleats, snatch blocks or any other device used to lead a hauling line fair and true to the winch, capstan, or gypsyhead. Fairleads may cause some friction loss, but far less than hauling a line around a sharp object which is unseamanlike, unsafe, and hard on the line.



Fire warp is a line, preferably a wire, led from the ship to the end of the pier, a buoy, dolphin or hung at the water's edge on the offshore side of the vessel to pull or heave the vessel in an emergency. If a ship is moored with no power on her engines, it is good practice to run a hawser from her forward winch to the stream or seaward end of the dock so that if a fire breaks out on the dock, it is possible to warp the ship to safety by heaving around on her winch. She could then drop anchor, or a tug could move her farther away from danger.

Some harbor regulations require that if a ship is tied up alongside a dock, a wire with an eye splice be led through a chock on the off-dock side of the ship so that in the event of an emergency a tug can come alongside, take the wire without requiring assistance from the vessel, and pull her away from danger. This is sometimes called an “insurance wire,” but the terms are not exact and some seamen may also think of this as a fire warp.

COMMANDS FOR LINE HANDLING

"Avast or avast heaving (around)" means cease or stop heaving the mooring line.

"Belay" means to secure or make the mooring line fast.

"Check" means hold the mooring line, but if it begins to take on an excessive strain, surge or payout enough line so that it is in no danger of parting.

"Dipping the eye"
When two lines with eye splices are placed on a bollard, it may not be possible to remove the bottom line until the top line is removed. By dipping the eye, both lines can be placed for easy removal.

"Double up and secure" means run additional mooring lines or bights (parts) or mooring line as needed to make the mooring secure.

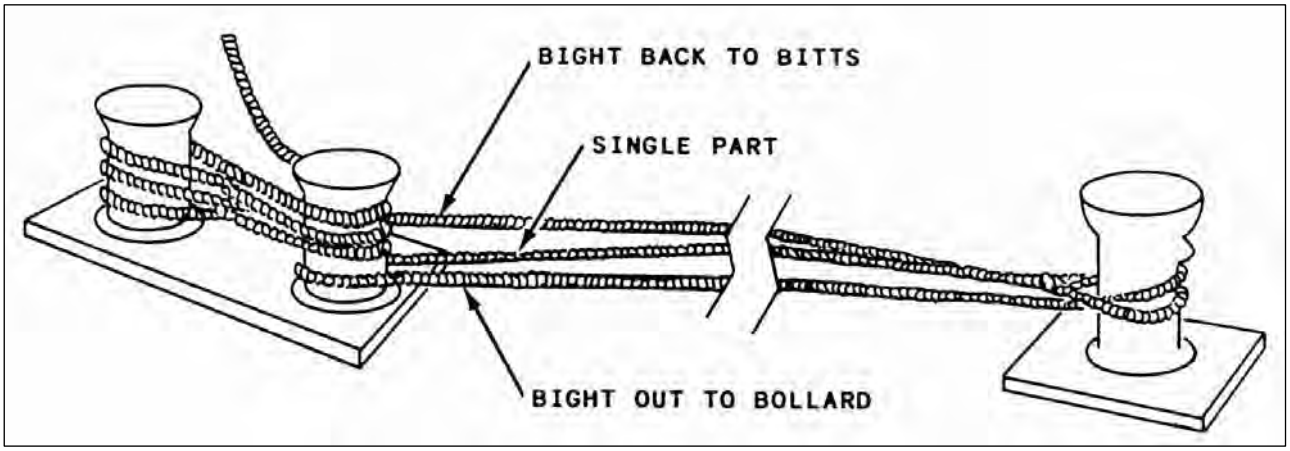
"Ease" means pay out or start to slack the mooring line, but do not take off all the tension.

"Hold" means take enough turns on the windlass, capstan or bitts to hold the mooring line where it is. Do not surge or pay any more line out. If the mooring line begins to take an excessive strain and is in danger of parting, report this to the bridge immediately.

"Let go, Take in, Cast off" are essentially the same commands, meaning the same thing. The proper command to the dock is "cast off." Technically, the bridge should tell the mooring station, "Take in the mooring line." "Let go" formerly meant the mooring line should be slacked smartly so that the dockhands could cast it off.

"Single up" means take in all mooring lines but a single standing part at each station. Aboard training ship when the command, "single up to one and one forward and aft" is given, it means to take in all mooring lines except one head or stern line and one spring line forward and aft.

"Pass a bight" means to pass the bight of a mooring line to the dock. The eye of the mooring line is made fast on a ship's bitt and the standing part made fast on board as well.



"Slack" means surge or payout and allow the mooring line to form an easy bight.

"Stand-by mooring lines" alerts the mooring stations to the fact that the ship is ready to get underway, and is about to leave her berth.

"Surge" means slack or payout and allow the mooring line to form an easy bight.

"Take a strain" means heave in on the mooring line and place it under tension. If the mooring line is not on the winch already, take several turns on the windlass or capstan and heave around. This command means about the same thing as "heave round."

"Take in the slack" means heave around on the mooring line just enough to take out most of the slack, but do not take a strain.

"Take the line to the capstan" Lead the end of the line to the capstan, take the slack out of the line, but take no strain.

"Up behind" means to take up the slack behind the capstan.

"Warping" means to move the vessel by hauling on lines.

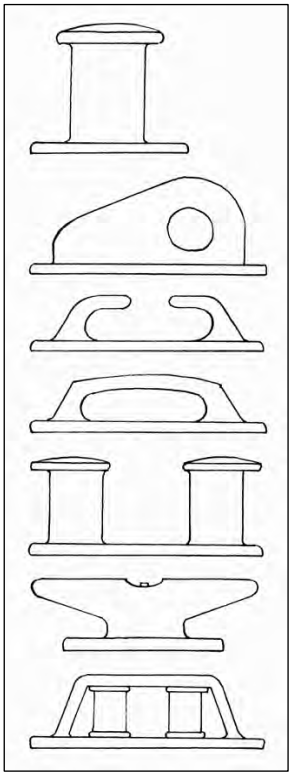
USE OF STOPPERS

When a ship is secured the lines are removed from the gypsy heads or winches and made up around the bitts. Stoppers are used to hold the line temporarily while it is being moved from the winch to the bitts without permitting any slack to get into the line. After the mooring line is made up on the bitts, the stopper is removed. Fiber stoppers were formerly made of 3-inch Manila and secured, sometimes with minor variations. When used on a mooring line a standard stopper hitch tends to jam and frequently must be cut to be removed. A standard stopper hitch is limited to hoisting small boats or on smaller lines. Nylon stoppers should be used with nylon line.

Over the last several years the so-called "Chinese" stoppers have come into wide use for mooring lines and are strongly recommended. They do not jam, and are quick and safe. Sinnet stoppers have better holding power than regular stoppers, but should be oversized if used. In any case, a stopper should be of the same material as the mooring line on which it is used. If Swedish wire is employed, a Manila or synthetic stopper is desirable because chain would chew or cut the wire. However, for conventional wire rope a chain stopper should be used. If used on wire rope, a regular stopper hitch rather than a "Chinese" stopper is recommended.

WARNING: When passing stoppers <u>never</u> straddle the mooring line. Stand back, keep your hands at least three feet (3') away from the bitts or cleats to prevent being pulled in to the mooring fitting by a sudden strain on the line.

CHOCKS AND BITTS



(1) Bollard,

(2) Towing pad eye

(3) Open chock

(4) Closed Chock

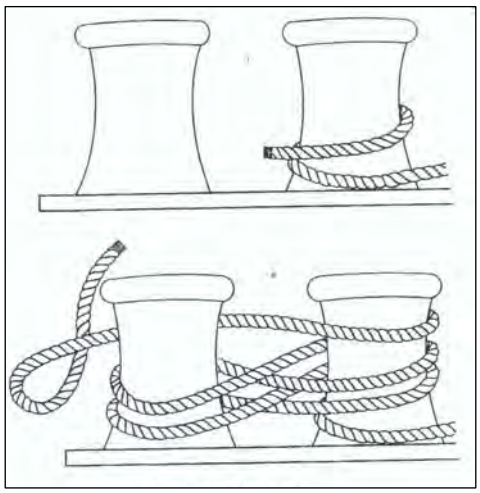
(5) Bitts

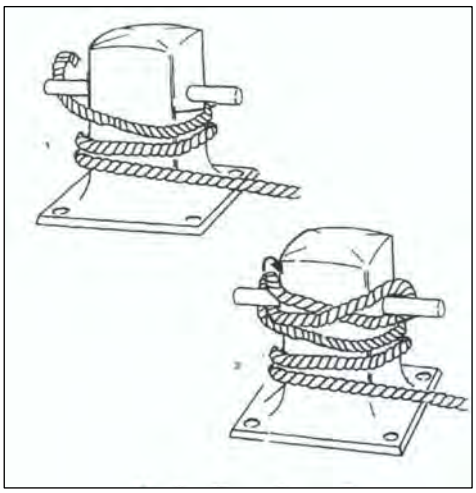
(6) Cleat

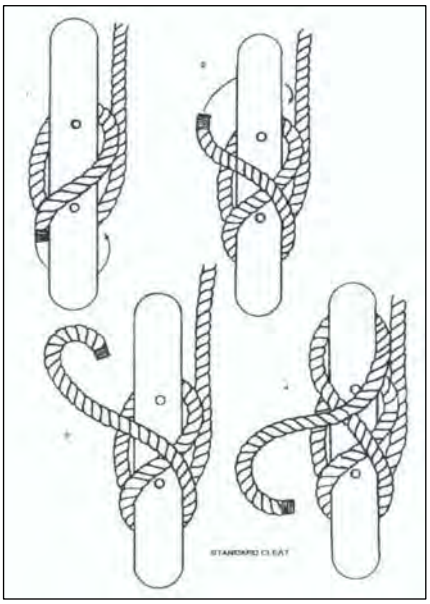
(7) Roller chock

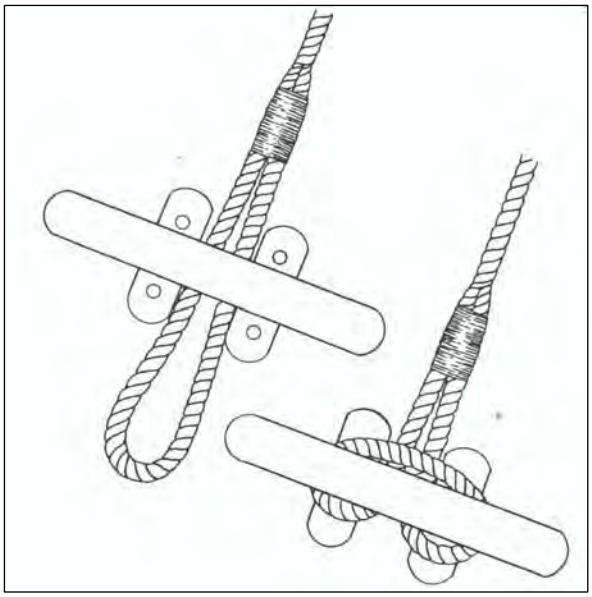
Securing a mooring line to a bitt deserves some attention. The first turn(s) should be made around both bitts, and then the Figure eights should be started. Synthetic line is far more difficult to hold than Manila, and it is necessary to take more round turns with it than with Manila. When securing a synthetic hawser to the bitts, take three round turns and then three figure eights. With Manila, one round turn and four figure eights are generally adequate.

If wire is made up on bitts it should be given three complete round turns around both bitts and the figure eights made in the same manner as with synthetic. In addition, lashing should be placed around the wire between the bitts to keep it in place. If wire is used on a gypsyhead, five turns should be taken to insure against its slipping.







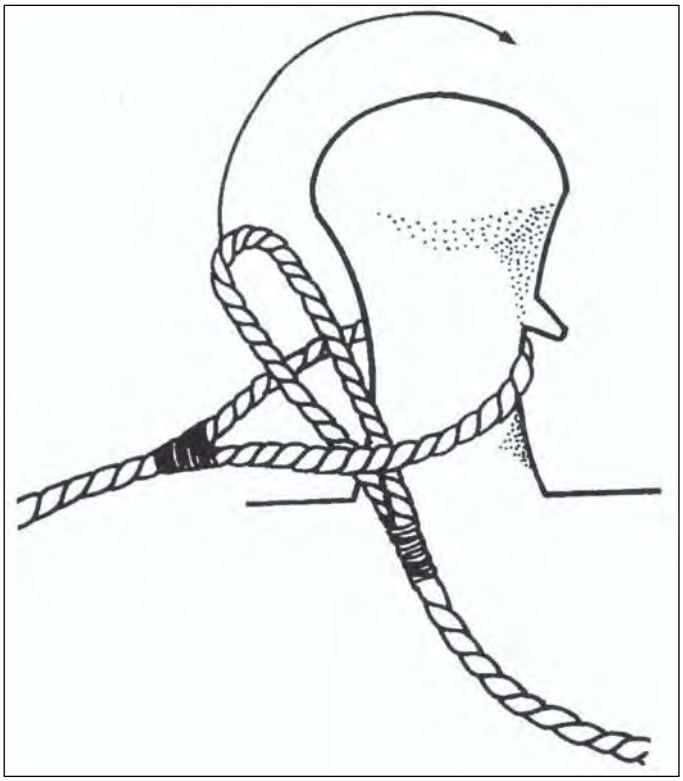


Animated knot tying directions:

http://www.ropeworks.biz/

DIPPING THE EYE

If two mooring lines are placed over the same bollard, the second one is led up and through the eye of the first, before placing it over the bollard. This makes it possible for either line to be cast off independently of the other and is called *dipping the eye*.



HEAVING LINES

Heaving lines, bolos, and *line-throwing guns* play an important part when going alongside. The speed with which the lines are sent to the pier is often critical, especially in strong winds or currents. When a successful throw has been achieved, this heaving line, with a monkey fist on the end, can then be bent to the mooring line that is needed first. The heaving line is bent on to the eye of the mooring line. Hawsers should have short messengers attached to them so that the heaving line does not part during delivery to the pier. This measure will in turn alleviate the problem of the heaving line jamming between the eye of the hawser and the bollard.

GANTLINE

A line or sometimes a whip purchase used to hoist up rigging, staging or personnel aloft. When used during mooring operations, the gantline is bent on to the heaving line and use to haul heavy mooring wires or lines aboard ship or to shore. Gantlines are usually made of 3" manila or synthetic line of various lengths.

FENDERS

A *fender* is a shock-absorbing device used to absorb the shock of the contact between a ship and pier or between ships. The fenders that are ready to be used topside are a matter of concern to the deck seaman and the officer bringing a ship alongside. The most important item among fenders is the "big" fender, frequently a pneumatic fender made of inflatable rubber, about four feet long and three feet in diameter. It should be lowered to a point just clear of the water at the extreme beam amidships. This fender is normally the only one the ship rides against when alongside another ship, and the perfect maneuver in mooring, ends with a gentle "one point" landing on this fender.

In addition to the fender amidships, a number of additional cylindrical fenders, depending on the size and type of ship, are kept ready on the forecastle and on the fantail. These are normally smaller pneumatic fenders or "home made" manila fenders about four feet long and a foot in diameter. On board a destroyer, it is normally desirable to place one of these with its top about one foot above the deck edge just forward of the forecastle windbreak and another similarly placed abreast the after end of the deckhouse. The other cylindrical fenders are kept available for "immediate use" to protect the forecastle and the propeller guards respectively.

Finally, several ball fenders made of manila are ready to be placed at the point of contact when the side of the ship comes into contact with the pier or the other ship. These are not as dependable as the cylindrical fenders because they are more easily squeezed out from between the ships, but they are easier to handle and can be put in place quickly if necessary.

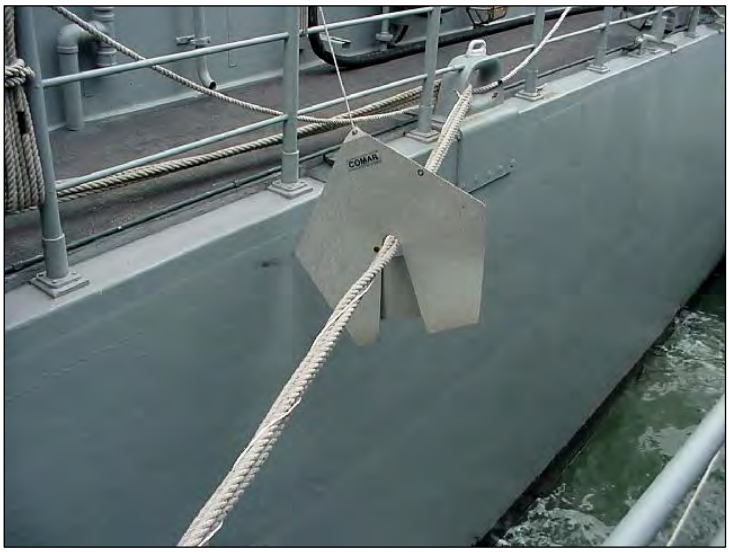
CAMELS

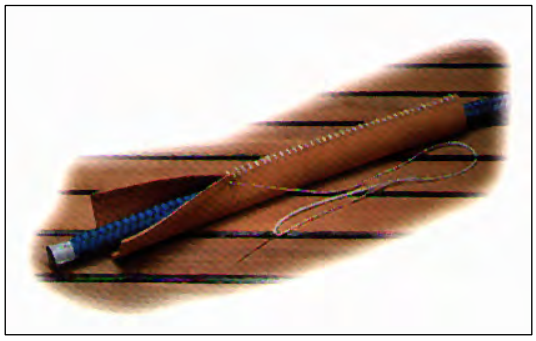
A camel is a heavy raft of metal or timber used to fend a ship off a pier or wharf. It can be from 10 go 60 feet in length and 3 to 20 feet in width. Its purpose is to separate the ship from the pier face in order to prevent contact between the ship's side and projections from the ship's side and the pier, such as screws, or elevators on carriers. The use of several camels prevents the ship's sides from being damaged by working against the supporting structure of the pier. The camel must hold the ship far enough off so that it not only prevents contact at the time of mooring but also guards against projections of the ship's structure from being brought down on top of the pier as the tide ebbs. Sufficient clearance must be provided for the full range of the tide.

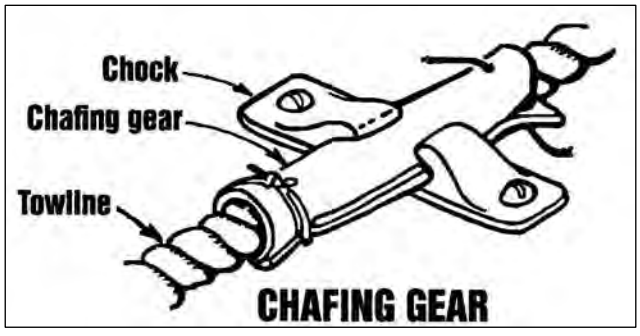
Camels serve another very practical purpose. They allow the ship's crew to clean and paint the ship's sides down close to the water line when the ship is moored alongside a wharf, pier, or another ship.

RAT GUARDS

When moored to a pier, *rat guards* are always put on mooring lines to prevent rats from climbing on them to come aboard. These rat guards consist of a circular galvanized metal disk, made in halves, which can be lashed together on the lines. They usually dip toward the center, and the concave side faces the pier. Chafing gear, usually canvas secured by small stuff, is applied to the mooring lines before putting on rat guards.

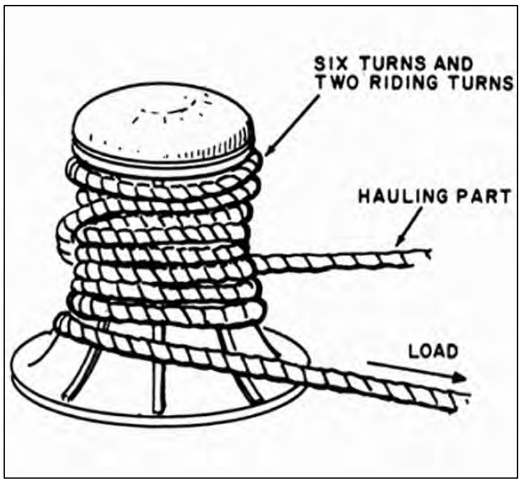




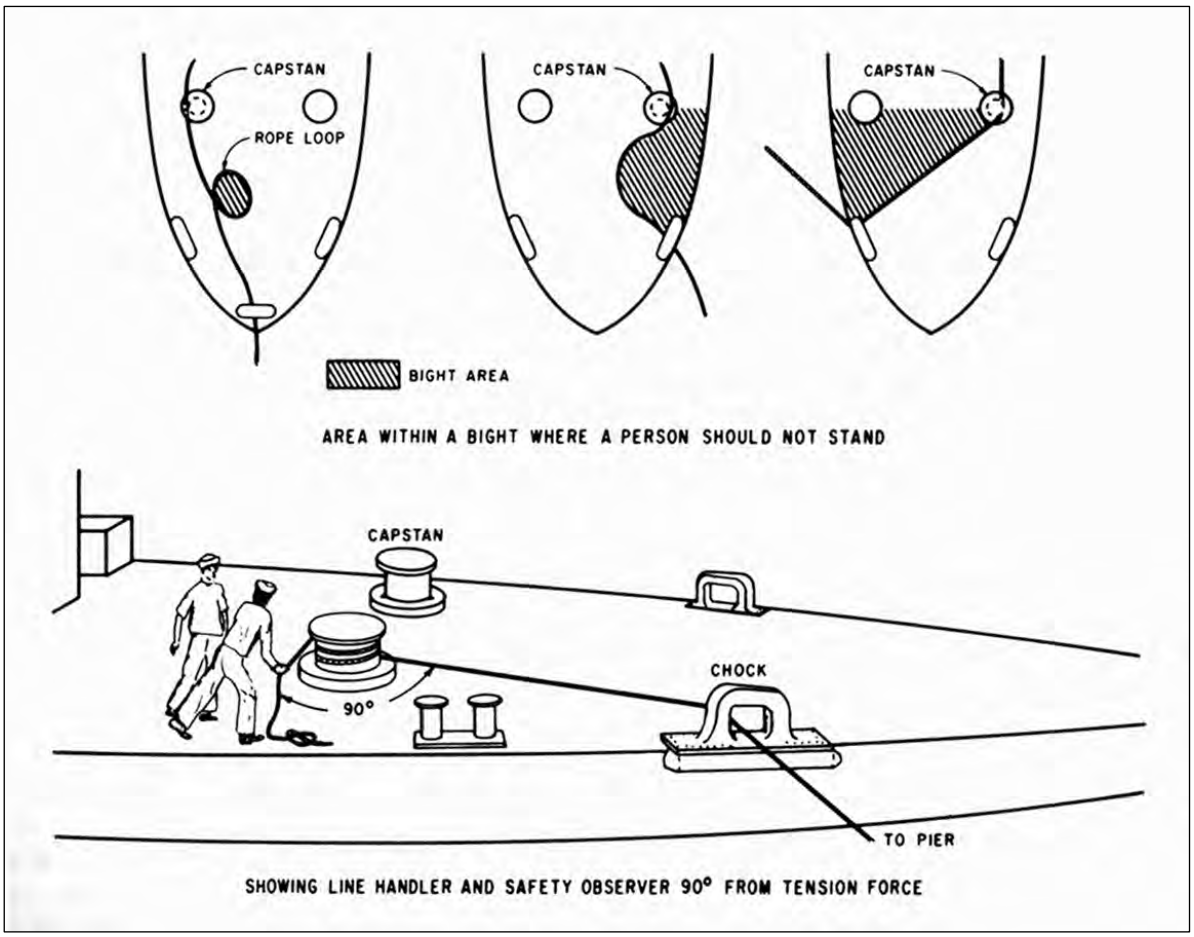


CAPSTAN & WINDLASS

With new synthetics use at least six full turns on a capstan. As the rope wears in, the turns can be gradually decreased. When nylon hawsers are used on capstans for heavy towing or impact loading, take six turns on the capstan and two turns overlaying the last four turns. This procedure reduces the hazard of sudden surges on rendering out. Keep slippage of line on the capstan at a minimum.



Never allow anyone to stand in line with or within 45° on either side of a rope under tension. Should the rope fail or other parts of the assembly fail, the recoil force could cause serious injury or damage, especially if nylon rope is in use.

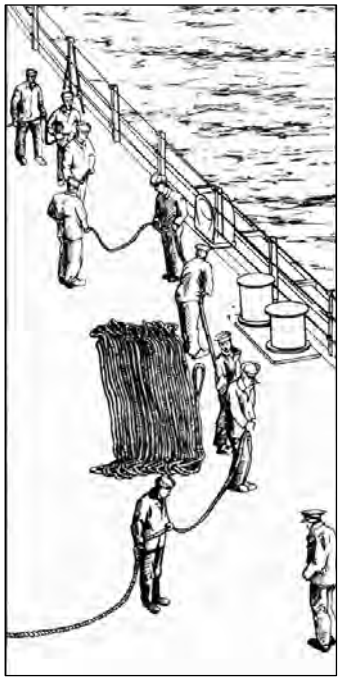


FLEMISHING, COILING, FAKING

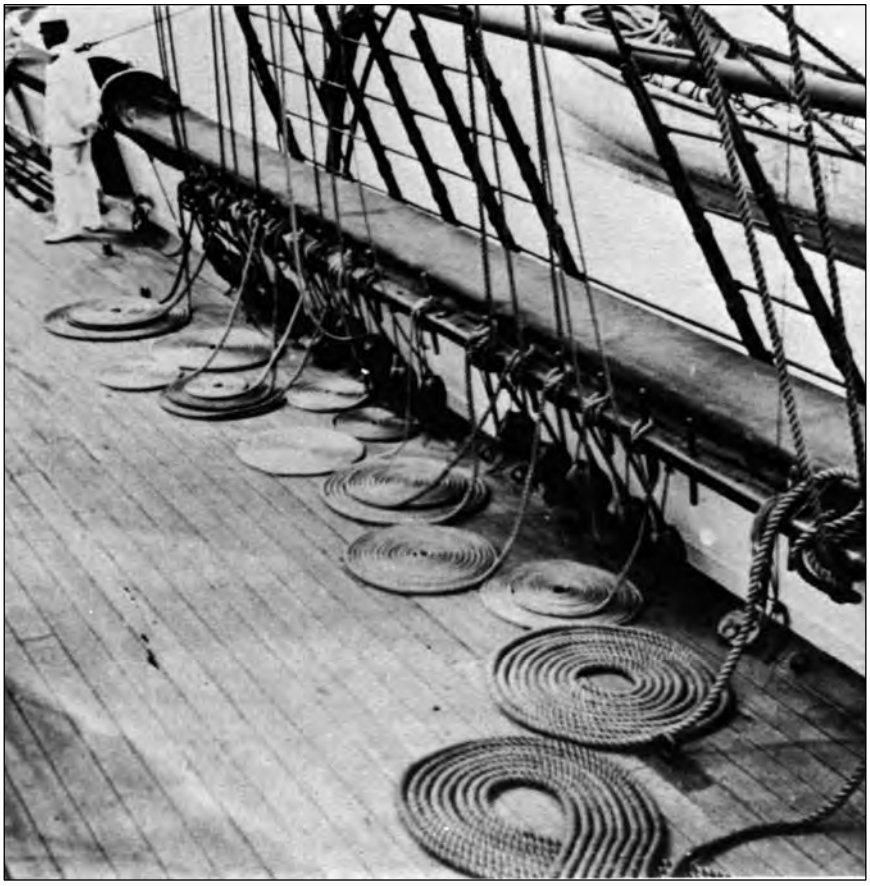
The object of making up line by any method is to stow it on deck in an orderly fashion and have it available for running if needed. A line dumped on deck, besides being unsightly, becomes snarled or fouled so that it will not be able to be run through a chock or bitts. This is dangerous. Flemishing a line is rarely seen except as a means of making up the halyards of sailboats. Mooring lines are sometimes coiled, but are more often faked down.

1. Coiling down - a line is laid in a circular coil on top of itself (should be done with the lay).

2. Faking down - laid out in long, flat rows, one beside the other.



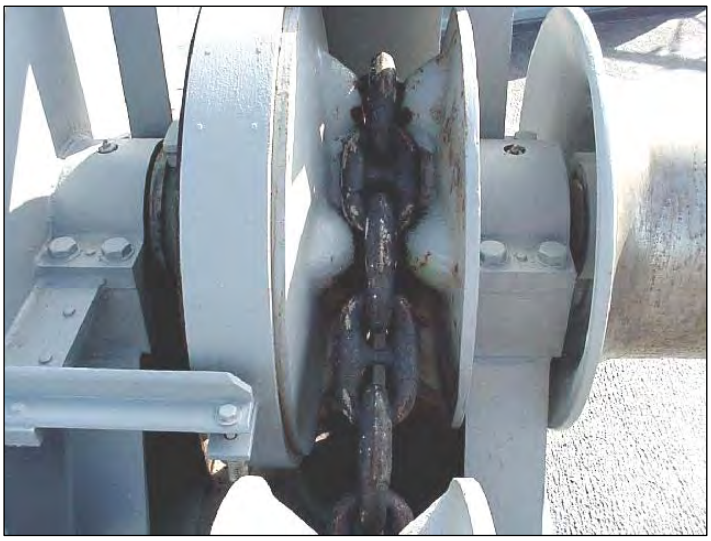
3. Flemishing - a series of close, helical turns being laid close together (in a counter-clockwise direction).



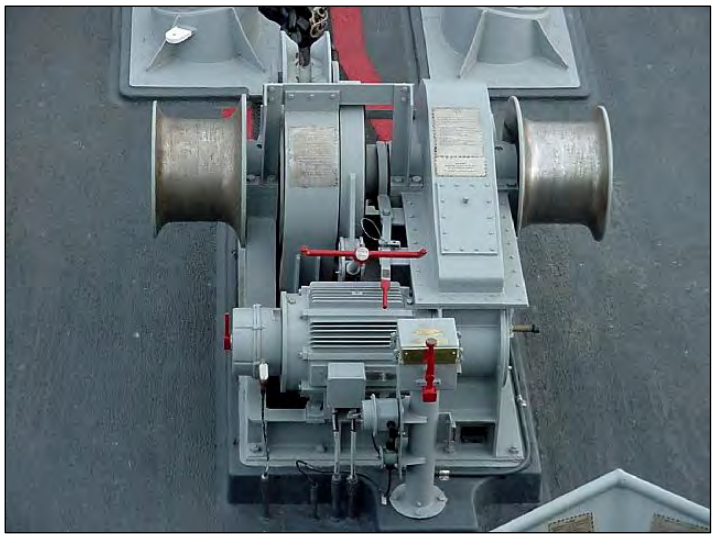
MOORING EQUIPMENT

Tanker at Berth

Constant Tension Winch



Anchor Wildcat



Windlass with Two Gypsy Heads

Quick Release