CHAPTER IX

RIGGING

Gin poles, "A" frames, ladders-as-derricks, and tripods are used to provide headroom and for supporting block and tackle when lifting or lowering heavy weights or a person being rescued. In choosing poles for rigging, it is important to insure that they are strong enough and long enough to permit the load to be lifted the required height. The shorter the length of the pole, the greater load it can carry, depending on the type and size of the pole in use.

A. GIN POLE OR DEFRICK

A gin pole consists of a single upright pole (or two poles lashed together for strength) with the butt on the ground and the top supported by four guy lines. (See Fig. 69) A gin pole allows the object being lifted to be moved to the left or right in addition to the front and rear.

Steps in rigging a gin pole:

1. Using square lashing, lash a ledger to the pole approximately 18 inches down from the top of the pole. If enough rope is left over from the lashing, a sling like a snatch block sling can be tied so that the upper block will be suspended over the ledger. If there is not enough rope left, a rope sling, wire sling, chain, or an improvised sling can be used. Put the hook of the block in the sling and mouse it.
2. Place the base of the pole where it is to be erected.
3. Place guy lines on the top of the pole. Guy lines should be one and one-half to twice the height of the gin pole. They should never be less than the height of the pole. If the ropes are long enough, a clove hitch is placed in the center of the rope and placed over the pole. Guy lines are secured to the picket holdfast with a round turn and two half hitches. During the raising of the gin pole, only a round turn is used on the pickets. If picket holdfast cannot be used, natural holdfasts such as trees, utility posts, etc., can be used.
4. For the base of the pole, dig a hole six to twelve inches deep (depending on the soil and the weight to be lifted). If the ground is soft, use boards to make a bearing plate to place the gin pole on. An anchor stake
may be used in some cases to keep the base of the gin pole from slipping. Set up the picket holdfast about three feet from the base of the pole, and tie a rope from the base of the pole to the holdfast. This holdfast will keep the pole from skidding while being raised and will hold it in place while lifting. (See Fig. 69 on page 78)

5. When ready to raise, the tackle can be extended and secured to the pole near the base, or it can be chock-a-block with a rope tied to the lower block so it can be extended after the gin pole is raised.
6. Station a person at each picket holdfast to control the guy lines as the pole is raised. A round turn on the pickets controls the guy lines.
7. The gin pole is raised by hand, under the direction of the leader, to near vertical position.
8. The initial luff should not be over one-fifth the height of the gin pole, in order to allow for the stretch in the rope when the weight is lifted. The maximum luff should not exceed one-third the height of the gin pole at any time.

**Note:** Luffing is the intentional movement of the gin pole to move the object being lifted. This is done by taking in and letting out on the guys under the direction of the leader. See Fig. 69 on page 78 for luffing tackle in the guy line.

9. All guy lines are secured with a round turn on the picket holdfast and two half hitches on the guy line.
10. Lash a snatch block sling to the base of the gin pole. Place the hook in the sling, and mouse the hook.
11. The fall line should be pulled in the same direction as the initial luff. This will cause the base of the pole to dig in, rather than slip.

**B. "A" FRAME**

"A" frames are used to lift relatively heavy loads where the use of gin poles is impractical, but they can only be used to move a weight in a straight line between poles. "A" frames consist of two poles with their butts on the ground and the tops together with round lashing. They are held upright by a fore and aft guy, forming an inverted "V". (See Fig. 70 on page 79). Steps in rigging "A" frames:

"A" Frame
Figure 70
1. Select two poles nearly the same length and size. Even the butts and put spacer blocks approximately two inches thick between the poles. Tie the poles near the base with a draw hitch.

2. Lash the poles together with round lashing, starting approximately 36 inches down from the top of the shortest pole, working upward.

3. The butts of the pole should be opened until their distance apart is about one-third of the distance from the butt to the lashing.

4. To prevent the legs from spreading further, a board ledger can be lashed to the legs, using a square lashing, or a 1/2" x 50' rope can be used. Start with a clove hitch and safety knot (clove hitch with an overhand knot) on the first pole. Go to the second pole and tie a round turn and two half hitches. If needed, go back to the first pole and tie a round turn and two half hitches. Coil up the remainder of the rope, and lay it at the base of the pole. (See figure 74 on page 83)

5. A sling is passed over the crotch so that it will rest across the poles and not on the lashing. (See Fig. 71 below and figure 72 on page 81)
A-Frame Sling
Figure 72
An alternative method is to open a sling (six-foot rope sling) and pass over both poles at the top. Take a loop of the sling down through the poles above the lashing and pull a loop up through the poles above the lashing. Take these two loops down and around the poles below the lashing so that they pull the ropes together.

A-Frame Guy Lines
Figure 73
6. Secure the tackle to the sling. Secure a line to the lower block so the tackle can be extended once the "A" frame is raised.

7. Forward and aft guy lines are required. Tie a clove hitch in the center of the rope and place it over the top of one pole, as close to the lashing as possible. The clove hitch should pull from the inside of the pole. Form another clove hitch and place on the other pole in the same manner. The guy lines must be put on so that they draw the poles together when the load is applied. Example: The forward guy is fastened to the rear pole; the aft guy is fastened to the front pole. (See Fig. 73 on page 82)

8. Raising the "A" frame is done under the direction of the leader. A person is stationed at each picket to control the guy lines. A person is stationed at the base of each pole to "heel" it during the raising. Personnel should be used at the top of the "A" frame for the initial raise.

9. Pickets should be placed one and one-half to twice the length of the poles but never less than the length of the poles. Round turns are used on the pickets when raising and lowering the "A" frame but are secured with a round turn and two half hitches when the "A" frame is in the raised position.

10. Luffing tackle may be necessary, depending on the weight to be lifted.

11. The base of the "A" frame may be set in shallow holes. It may also be necessary to set it on a bearing plate.

12. Lash a snatch block sling in the proper manner close to the ground. The fall line should pull to the opposite pole.

13. The permissible luff is the same as with the gin pole.

C. TRIPOD

A tripod is used for loads heavier than those which can be handled by a gin pole or "A" frame. It has three legs and does not require the use of guy lines. (See Fig. 75 on page 84)

The tripod requires very little space but can be used only for making a vertical raise or lower.

Steps in erecting a tripod:

1. Select three poles approximately the same length and same size. Even up the butts and place spacers between the poles (approximately two inches thick). Tie all three poles together near the base with a draw hitch.

2. Lash the poles together, using a figure-of-eight lashing, starting approximately 36 inches down from the top of the shortest pole and working upward. (See Fig. 76 on page 85)

3. After the lashing is complete, raise the center pole and cross the outer poles until their butts are at a distance apart equal to about one-half the length of the poles (from lashing to the base of the poles).

4. A rope sling (or chain or wire) is then placed over the center pole (above the lashing) with the ends of the sling coming around the other two poles in such a manner as to bind all the poles together. (See Fig. 78 on page 85)

5. The tackle can be chock-a-block or extended and can be temporarily lashed to one pole while the tripod is raised to prevent the tackle from swinging.

6. The tripod is raised by hand under the direction of the leader. The poles are set to form an equilateral triangle.

![Tripod with board ledger](Figure 75)
7. The butts should be spaced at a distance apart equal to about half the height from the butt to the lashing. The tripod should be placed so that the sling is as nearly as possible over the center of the weight to be lifted.

8. To prevent the butts from spreading, a board ledger should be lashed on (square lashing) near the butts (knee high), or use a 1/2" x 50' rope. Start on the first pole with a clove hitch and safety knot. Go to the second pole and make round turn and two half hitches.

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Tripod Lashing
Figure 76

Tripod
Legs spread
Figure 77

Tripod
Legs spread with sling attached
Figure 78
Go to the third pole and make a round turn and two half hitches. Finally, go back to the first pole and finish off with a round turn and two half hitches. A third method can be used by driving pickets beside each pole and securing them with a Clove Hitch around the pole and picket, marrying the ends, making round turns around the pole and picket and finishing with a Clove Hitch.

9. A snatch block sling is lashed to the base (near the ground) of one pole. Attach the snatch block and mouse. The fall line should be hauled on in the direction of another pole.

D. JIB ARM

A jib arm is a strong pole or timber with one end anchored down and the other projected over or from a support to allow lifting by means of block and tackle. (See Fig. 79 on page 86)

The actual method of supporting or arranging the jib depends on the conditions. It may be projected over a sill or coping, resting on a piece of timber to spread the load, with the jib kept in position by pads or blocks at either side. The jib may be supported on an “A” frame. In all cases safety must be observed both in respect to the jib itself and the structure from which the rigging derives its support, especially where buildings have been damaged. Sound window sills do not necessarily mean that there is a sound wall underneath them. The tail of the jib should be lashed down with round lashing or square lashing, according to the facilities available. If necessary, floor boards should be ripped up to allow the tail to be lashed. If it is not practical to lash down the jib, debris or heavy objects can be placed on the tail to act as a counterbalance for the weight being lifted.

It is important that the jib not be projected any more than necessary, as each additional inch of projection increases the leverage on the tail counterbalance.

When possible, the jib should be erected above the floor from which you are working.

Steps in rigging a jib arm:

1. Select a pole of adequate size. If one pole is not large enough, lash two poles together.

2. Use a round rope sling or tie a snatch block lashing close to the end of the jib. Hook block and tackle or snatch block in the sling and mouse. Put the lowering line in the snatch block and mouse the safety side lock on the block. Use a figure-of-eight or overhand knot in the running end of the lowering line to prevent the rope from running through the block.

3. Project the jib through the opening and lash the tail or secure in the other suggested manner.

E. LADDER-AS-A-DERRICK

The ladder-as-a-derrick can be used to lift weights, or it can be used for lowering or raising casualties being rescued. It is a very effective method of rescue when the victim needs to be lowered or raised in a horizontal position. (See Fig. 83 on page 89)

Steps in setting up a ladder-as-a-derrick:

1. The ladder is extended four rungs and placed on the ground with the heel of the ladder in position for the lower or raise.

2. Three guy lines are used to support the ladder. The two side guys consist of two or three 1/2” x 50’ ropes. The aft guy is a 1/2” x 100’ rope (or longer). If two ropes are used as side guys, they are put on the top of the ladder with a split clove hitch around the beam and rung. A loop is then placed on the opposite beam, and the rope goes to a holddfast on that side of the ladder. This will pull the beams together, rather than apart. (See Fig. 80 on page 88) If three ropes are used, all the ropes are tied together with a double sheet bend. Find the center of the center rope, and place a clove hitch on each beam. Go to the opposite beam, and make a round turn to draw the beams together. (See Fig. 81 on page 88)
SIDE GUY LINES ON FIRST RUNG
AFT GUY LINES ON SECOND RUNG
PULLEY SLING ON THIRD RUNG

LOCKING SPLIT CLOVE HITCH
SIDE GUY LINE

SIDE GUY LINE

AFT GUY LINE

OBJECT TO BE HOISTED

PULLEY

DIRECTION OF PULL

PULLEY

ROUND LASHING

ROUND TURN & TWO HALF HITCHES

PICKET

LADDER-AS-A-DERRICK

Ladder-As-A-Derrick
Figure 83

Also see insert photo on page 67.
**Note:** Side guys should be 1½ to 2 times the length of the ladder being used, never less than the length. Pickets should be placed forward on the base of the ladder, at least in line with the building toward which the ladder is being inclined.

3. The aft guy is tied to the ladder on the second rung from the top with a bowline. The rope should be put on the ladder so that it passes around both beams and over the rung. (See Fig. 81 on page 88)

4. A rope sling is doubled and laid across the ladder at the third rung. With one end of the sling, take one complete turn on one beam. With the other end of the sling, take a complete turn on the opposite beam. Bring both ends of the sling through the ladder to rest over the rung and over the sling where it crosses the ladder.

   **Note:** If the purpose is to raise a weight or person, block and tackle should be used. If a person is to be lowered, only snatch blocks are needed.

5. A web sling is put on the bottom rung of the ladder in the above manner. Place the hook of the snatch block in the sling and mouse. (See Fig. 82 on page 88)

6. Place the lowering rope in snatch blocks. A figure-of-eight knot is used in the lowering rope to prevent its falling out when being raised.

7. The ladder is now ready to be raised. This is done under the direction of the leader. When the ladder is in the vertical position, the ladder is extended to the required height.

8. The ladder is leaned toward the building, the strain being taken on the aft guy until it is in the

   **Note:** Care must be taken by the leader to assure sufficient clearance between the ladder and the building to lower the stretcher. The above method can be used to lower a stokes basket, or to lower with a double bowline or life basket. In all lowers, tag lines would be used on the stretcher or the casualty.

10. To lower the stokes basket, the lowering rope is tied to the stretcher sling with a bowline and seized. Tag lines are used.

11. To lower a casualty without a stretcher, tie the life basket or a double bowline in the end of the lowering rope, and use a tag line.

   **Note:** Instructions for making a sling for horizontal lower with stokes, using a 1½" x 25' rope (smaller diameter if nylon or polyplus is used): Double the rope. Using the doubled end, make a loop around the top rail at the foot of the stokes, forming two hitches. Take the two ends and tie a locking, split clove hitch and seize at the "D" near the shoulders of the casualty. A rescue person stands astride the stokes with the sling in his hands (one rope in each hand) with the palms of the hands outward. Turn the palms inward, forming two loops. Seize the two loops; this forms the sling for a horizontal lower. Be sure these loops are seized securely to prevent the loops from rolling. A cats paw may be used. Two loops should be formed directly over the belt-line (casualty's navel) so that the stokes will be balanced for the lower.
F. BARREL HITCHES

Shown below are two (2) barrel hitches that can be used to lift barrels in the vertical position.

1. Hitch for lifting a barrel in the vertical position

Using two (2) Body Cords (50' x 1/2" rope can be used) tie a running bowline or timber hitch close to the bottom of the barrel on one side. Then put a half-hitch above mid-line of the barrel. (See Fig. 84-A) Using the second body cord, make ties in the same manner on opposite side of the barrel. Bring the two body cords to the top of the barrel and make a sling for block and tackle (cats paw, or other suitable sling). (See Fig. 84-B, page 91)

2. Hitch for lifting a barrel in the horizontal position

Note: This hitch is used when you cannot get sling under the barrel. This sling can be made with a body cord or other suitable rope.

a. Make a timber hitch (make the running end long) and place over the end of the barrel, put the hitch on the top of the barrel close to the end.

b. Take opposite end of rope and put timber hitch on opposite end of barrel.

c. Make proper sling for block and tackle (cats paw, etc.) at center on barrel.

d. When ready to lift, be sure the two timber hitches are held as close as possible to the bottom of the barrel, (where barrel contacts ground) and the hitches are drawn close to the barrel, (at the top) to insure that the hitches will not slip when load is applied. (See Fig. 85 A & B, Page 92).