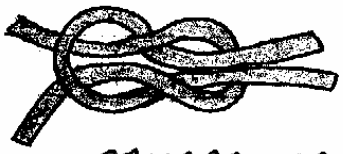
① KNOTS

OVERHAND KNOT



SQUARE OR REEF KNOT

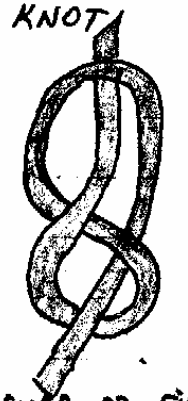
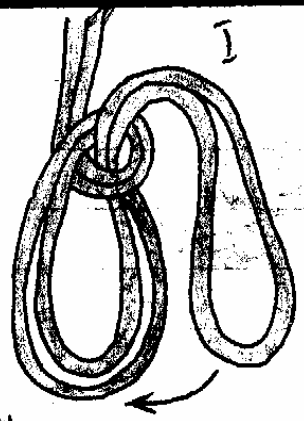


FIGURE-OF-EIGHT KNOT

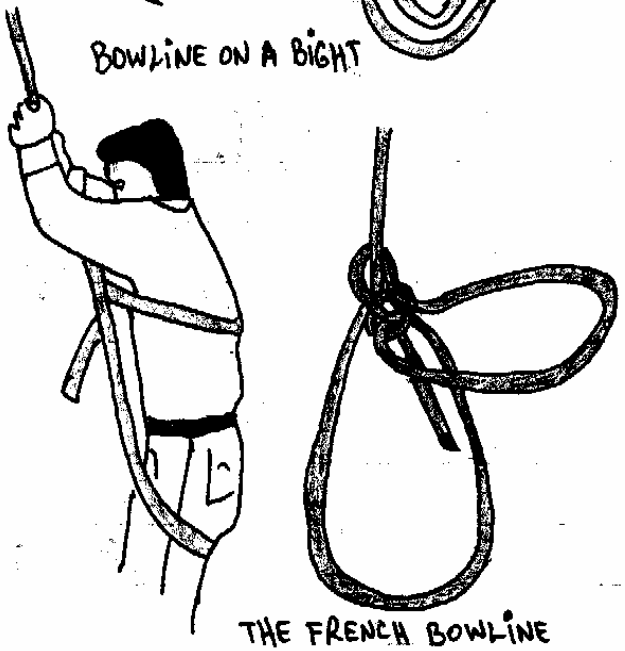
GRANNY'S KNOT

BOWLINE

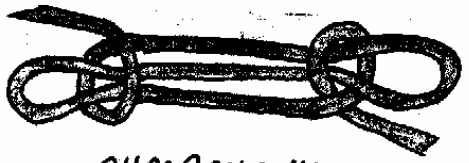
RUNNING BOWLINE



BOWLINE ON A BIGHT

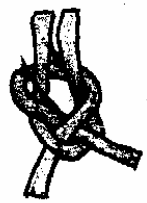


THE FRENCH BOWLINE

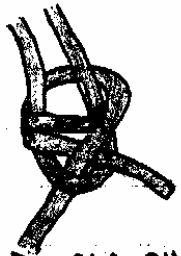


SHEEPSHANK

(2.) BENDS



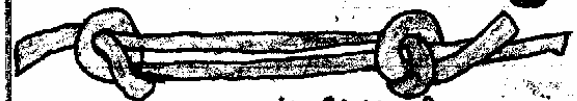
SHEET or BECKET BEND



DOUBLE SHEET or BACKET BEND

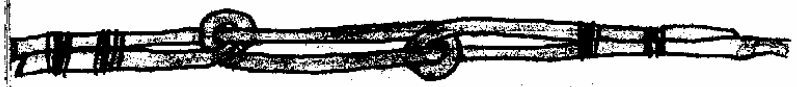
DOUBLE CARRICK BAND

FISHERMAN'S BAND 1



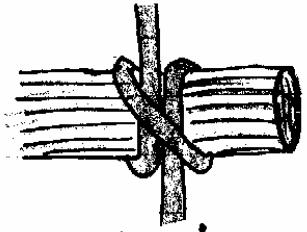
FISHERMAN'S BAND 2

TWO BOWLINES

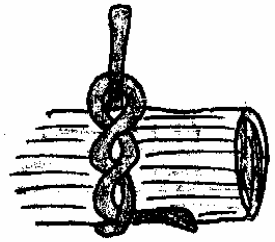


REEVING-LINE BAND

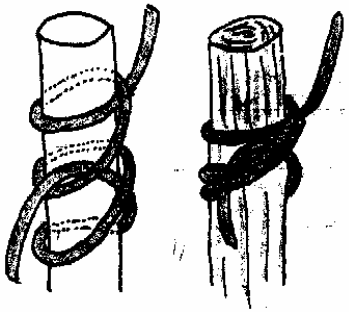
(3.) HITCHES



CLOVE HITCH



TIMBER HITCH

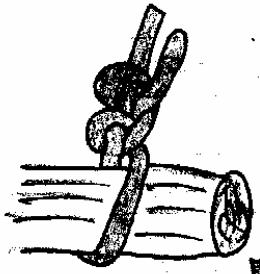


ROLLING HITCH

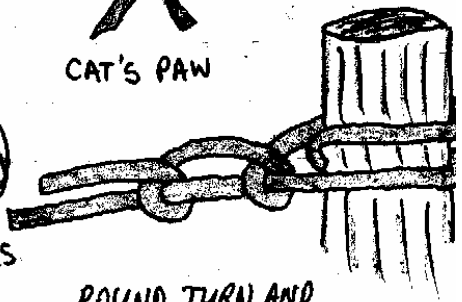
BLACKWALL HITCH

DOUBLE BLACKWALL HITCH

CAT'S PAW



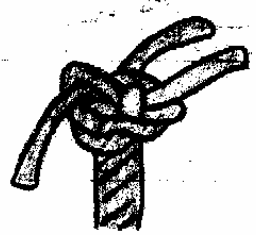
TWO HALF HITCHES



ROUND TURN AND TWO HALF HITCHES

(4.) SECURING THE END OF A ROPE

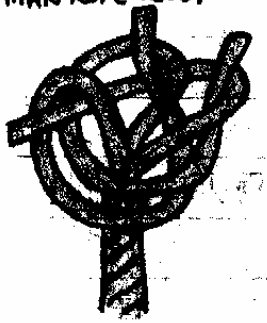
WALL KNOT



WALL AND CROWN

DOUBLE WALL AND DOUBLE CROWN or "MAN ROPE KNOT"

DOUBLE MATTHEW WALKER KNOT



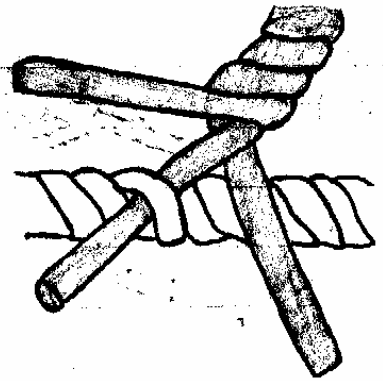
SINGLE MATTHEW WALKER KNOT

LANIARD KNOT

(It is a Single Mathew Walker knot but tied in a 4 STRAND LINE).

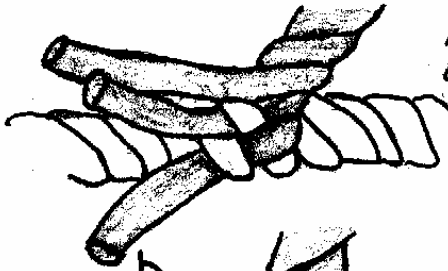
(5.) MAKING AN eye SPLICE

a/



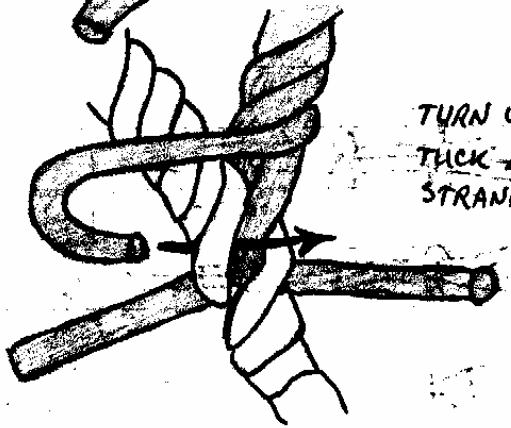
TUCK CENTER STRAND

b/



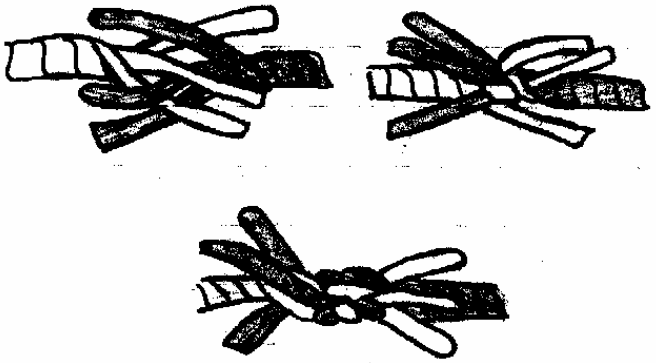
NEXT STRAND GOES UNDER NEXT STRAND ALONG LINE

c/

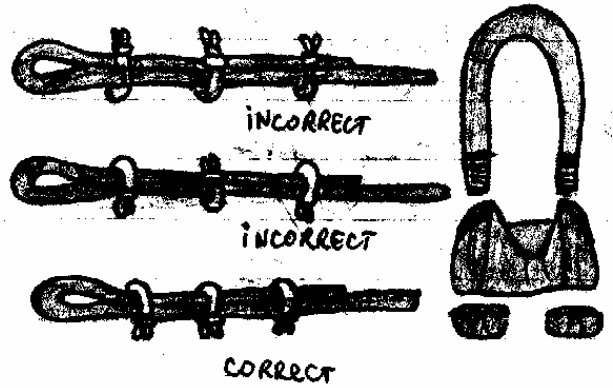


TURN OVER AND TUCK LAST STRAND

(6) MAKING A SHORT SPLICE



(7) CORRECT USE OF WIRE-ROPE CLIPS



MANILA ROPE

BREAKING STRESS:

$$BS = \frac{C^2}{2,5}$$ → CIRCUMFERENCE

FOR CONTINUOUS WORK:

$$SWL = \frac{C^2}{18}$$

FOR OCCASIONAL LIFT

$$SWL = \frac{C^2}{7}$$

TO FIND CIRCUMFERENCE

$$C = \sqrt{7 \times LOAD}$$

TO FIND SHEAVE DIAMETER

$$S.DIA = 2 \times C$$

TO FIND BLOCK SIZE

$$B.size = 3 \times C$$

$$SWL = \frac{BREAKING\ STRAIN}{SAFETY\ FACTOR}$$

WIRE ROPE

BREAKING STRESS:

12 wires ⇒ $BS = 2C^2$

24 wires ⇒ $BS = 3C^2$

37 wires ⇒ $BS = 3,25C^2$

BREAKING STRENGTH

$$BS = 2,5C^2$$

TO FIND SHEAVE DIAMETER

$$S.DIA = 20 \times D$$

SAFE WORKING LOAD

$$SWL = \frac{2C^2}{6}$$

$$HOOK\ SWL = \frac{2}{3} \times D^2$$

$$SHACKLE\ SWL = 3 \times D^2$$

$$RING\ BOLT\ SWL = 2 \times D^2$$

(1) MANILA ROPE THAT HAS A $2,5$ INCHES CIRCUMFERENCE WILL BREAK AT:

$$BS = \frac{C^2}{2,5} = \frac{2,5 \times 2,5}{2,5} = 2,5 \text{ TONS}$$

(2) FIND THE SIZE OF SMALLEST MANILA ROPE SUITABLE FOR LOAD 3 TONS?

$$C = \sqrt{7 \times LOAD} = \sqrt{7 \times 3} = \sqrt{21} = 4,6 \text{ INCHES}$$

(3.) FIND THE BLOCK SIZE AND SHEAVE DIAMETAR TO BE USED WITH 3 INCHES MANILA ROPE?

SHEAVE DIAMETAR $= 2 \times C = 2 \times 3 = 6$ INCHES

BLOCK SIZE $= 3 \times C = 3 \times 3 = 9$ INCHES