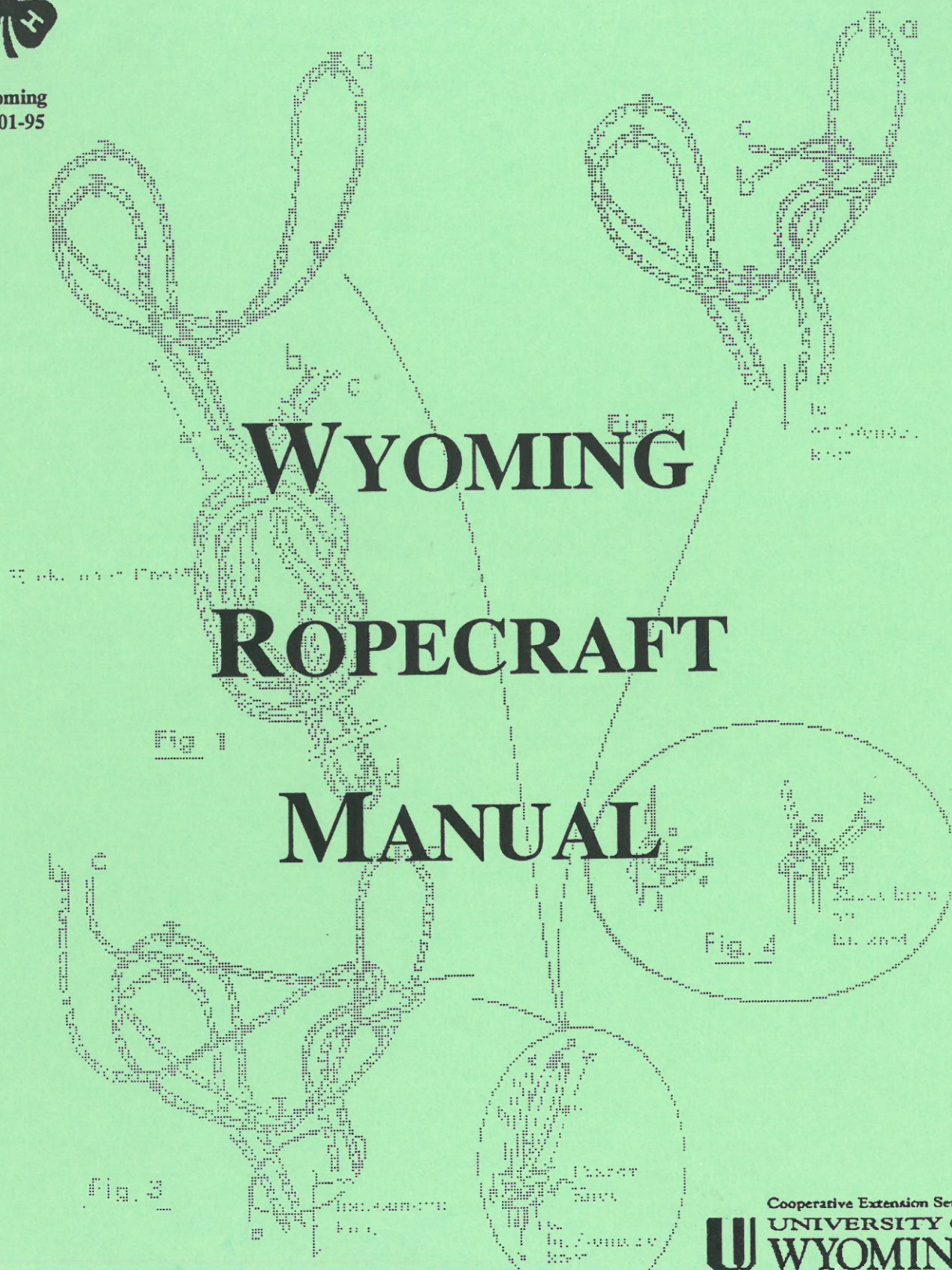




Wyoming
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WYOMING ROPECRAFT MANUAL



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Many of the illustrations and instructions used in this bulletin are reprinted from the Plymouth Cordage Company Manual entitled, "Useful Knots and How to Tie Them", Cornell 4-H Club Bulletin 105, "How to Make an Adjustable Rope Halter", by Harold A. Willman, and Nebraska 4-H Rope Manual, written by Louie Rudman and E. A. Olson. Help in preparing this circular was also obtained from the old Wyoming 4-H Ropecraft Manual compiled by Burton Marston.

REFERENCE MATERIAL

"How to Make Cowboy Horse Gear" by Bruce Grant, Cornell Maritime Press, 1956.

PREPARED BY

J. M. Nicholls

4-H ROPECRAFT MANUAL

INTRODUCTION

Almost every person makes daily use of rope, cord, and other tying materials, and therefore needs a practical understanding of knots, splices, and hitches. Every farmer and rancher uses rope in some way many times a year, and knowledge of correct methods of tying, hitching, and mending ropes is of great value to him.

Because ropecraft is interesting as well as useful, it has become a very popular project for 4-H members.

It is impossible to show in this manual all of the knots, hitches, and splices that can be used for special uses; however, many of the most common and most practical are included.

SUGGESTED ACTIVITIES

1. Learn to tie and identify ten different practical knots.
2. Learn to tie at least three different kinds of hitches.
3. Learn to make at least three different kinds of splices.
4. Make an adjustable rope halter. (optional)
5. Prepare an exhibit of ropecraft as follows (Boards for mounting ropecraft should not exceed two square feet):

Rope halter

Board showing ten mountings of hitches, knots, and ties,

plus set of rope splices — short, long, eye, loop, and end. and/or

Any other rope exhibit not listed above.

6. Prepare and give a demonstration on some phase of ropecraft.
7. Keep a record of your ropecraft project and submit it through your local leader at the end of the 4-H year.

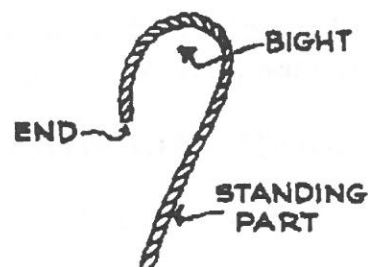
STARTING THE PROJECT

1. If possible to do so, visit a store where rope is sold. Become familiar with the different sizes and grades of rope. Notice how it comes to the merchant in large coils.
2. Learn the structure of rope — how it is made. Become familiar with the terms used in rope "language" and how to prepare new rope for use.
3. Take a piece of rope and coil it in the manner described on page ? and practice throwing the coil.

ROPE TERMS - used in Handling and Tying Rope

In knotting — a rope has 3 parts.

1. The **END** is the part of the rope with which you are working when you tie a knot.
2. The **STANDING PART** is the inactive length of the rope.
3. The **BIGHT** is a bend or U-Shaped curve in the rope.



An **OVERHAND LOOP** is made by crossing the end over the standing part.



An **UNDERHAND LOOP** is made by crossing the end under the standing part.



A **TURN** is taken by looping the rope around an object — often another section of itself.



A **ROUND TURN** is done by looping the rope twice around an object, as shown.



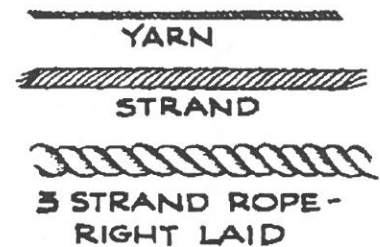
OVER-AND-UNDER SEQUENCE — In tying a knot, whenever two sections of the rope cross each other, one must go over and the other under. Be careful to follow this **over-and-under** arrangement exactly — otherwise you get either an entirely different knot or none at all.

DRAWING UP — Once formed, a knot must be **DRAWN UP** or tightened slowly and evenly to make certain that all sections of the knot arrangement keep their place and shape. Quick or careless tightening may result in a useless tangle.

CONSTRUCTION OF ROPE

Fiber rope, sometimes called cordage, is made up by twisting fibers together. A rope consists of three elements — fibers, yarns, and strands.

A number of fibers are twisted together to form a yarn. Next, a number of yarns are twisted together to form a strand. Last, a number of strands are twisted together to form a rope.



KINDS OF ROPE

NATURAL FIBER ROPE — Manila fiber makes the best and strongest natural fiber rope. Sisal fiber rope, 75 to 80 per cent as strong as manila, is less flexible but more resistant to abrasion.

COTTON FIBER ROPE — used for packaging, clotheslines, sash cords — is not satisfactory for general farm use.

SYNTHETIC FIBER ROPE — Synthetic fiber rope made from nylon or dacron is stronger than manila rope. It is especially useful under wet conditions because the fibers do not absorb water and are not damaged by rot or mildew. Such rope is best adapted for use as towlines, starter ropes, and lariats.

Nylon rope is resistant to damage by petroleum oils, solvents, and alkalies, but can be damaged by acids, paints, and linseed oil. Dacron rope is highly resistant to acids, heat, and insect damage.

Other synthetic fibers used in ropemaking are saran, glass, and polyethylene. Saran rope is resistant to damage by acids and alkalies. Glass fiber rope is resistant to high temperature. Polyethylene rope, being lighter than water, will float.

ROPE CARE

All fiber rope — either natural or synthetic — lasts longer and gives better service if it is used with care from the day it is bought. Crushing, abrasion, and exposure to dirt and dampness are the chief causes of rope weakness and breakage.

New rope is stronger than used rope because it is clean, dry, tightly twisted, and unworn. Frayed, unraveled, and kinked rope does not last long and cannot be depended on for strength.

Do not try to make a small rope do the work of a large one. Safe working strengths of typical sizes of fiber ropes are given in Table 1.

| Table 1. Safe working strength of new fiber rope, by size of rope and kind of fiber (actual breaking strengths are at least 5 times the figures given.) | | | | | | |
|--|---------------|--------|-----------------|--------|--------------------|--------|
| Rope Di- ameter | Natural Fiber | | Synthetic Fiber | | | |
| | Manila | Sisal | Nylon | Dacron | Polyprop- ylene | Saran |
| Inches | Pounds | Pounds | Pounds | Pounds | Pounds | Pounds |
| $\frac{3}{8}$ | 270 | 150 | 407 | 390 | 459 | 150 |
| $\frac{1}{2}$ | 530 | 350 | 704 | 745 | 714 | 300 |
| $\frac{5}{8}$ | 880 | 700 | 1,144 | 1,355 | 1,054 | 620 |
| $\frac{3}{4}$ | 1,080 | 865 | 1,562 | 1,870 | 1,445 | 800 |
| $\frac{7}{8}$ | 1,540 | 1,230 | 2,200 | 2,520 | 1,955 | 1,140 |
| 1 | 1,800 | 1,440 | 3,600 | 3,220 | 2,800 | 1,600 |

Fiber rope is often sold by weight. Refer to Table 2 for approximate length per pound of typical kinds of rope.

| Table 2. Approximate number of feet per pound of new ropoe, by size of rope and kind of rope. | | | | | | |
|---|---------------|-------|-----------------|--------|---------------|-------|
| Rope Diameter | Natural Fiber | | Synthetic Fiber | | | |
| | Manila | Sisal | Nylon | Dacron | Polypropylene | Saran |
| Inches | Feet | Feet | Feet | Feet | Feet | Feet |
| $\frac{3}{8}$ | 24.4 | 24.5 | 26.3 | 28.5 | 35.7 | 18.0 |
| $\frac{1}{2}$ | 13.3 | 13.6 | 15.0 | 15.4 | 21.3 | 10.0 |
| $\frac{5}{8}$ | 7.5 | 7.5 | 10.0 | 9.5 | 13.3 | 5.7 |
| $\frac{3}{4}$ | 6.0 | 6.0 | 6.6 | 6.9 | 9.3 | 4.3 |
| $\frac{7}{8}$ | 4.5 | 4.5 | 5.0 | 5.0 | 6.7 | 3.1 |
| 1 | 3.7 | 3.7 | 3.6 | 3.6 | 5.0 | 2.4 |

PREPARING NEW ROPE FOR USE

It is important to prepare new fiber rope before it is used. Uncoil it from the center of the coil in a counter-clockwise direction. This prevents twists and kinks from forming. Turn the whole coil over if the rope begins to uncoil in a clockwise direction.

To straighten a short length of new rope, hang it from one end and attach a light weight at the bottom.

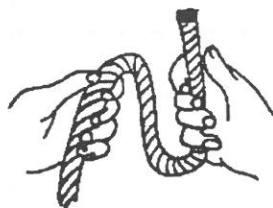
Long ropes can be straightened by dragging them across a smooth pasture or meadow. Do not drag them on a dirt road, on cultivated land, or across sand. Such treatment injures the fibers.

COILING AND THROWING A ROPE

Ordinary right-handed rope should always be coiled to the right, or clockwise. The reason for this is that in so coiling it, each turn tends to loosen the twist a little. Twisting to the left, or counter-clockwise tightens the twist with each turn and causes the rope to kink.

A rope which is to be thrown as a coil — for example to a man in the water, or up to a scaffold — should be coiled in the hand that is to do the throwing and coiled clockwise as shown in the diagram below. **Figure A** shows how the rope is held in the right hand with the end pointing away, and the left hand starting the coiling to the right. **Figure B** shows the first turn of the coil properly made, and **Figure C** shows the completed coil. Properly coiled in this way, the rope will play out smoothly without any kinking or snarling, and will lie in a straight line. The one end of the rope is, of course, to be held in the left hand while the coil is thrown.

In the case of a lariat, the coil is made in the left hand, but the coiling is still done in a clockwise direction, with the end of the coil held by two fingers and thumb and the coil with the other two fingers and thumb, while the loop is, of course, held in the right hand.



KNOTS

SUPPLIES NEEDED

Use about seven feet of small rope to practice tying the knots.

WHAT TO DO

1. Learn to tie the knots illustrated in this manual. Practice until you can tie each knot properly and easily without using the directions.
2. Learn the names of the knots.
3. Learn their uses as you tie them.

HOW TO TIE VARIOUS KNOTS

A knot is an interlacement of parts of one or more flexible bodies, forming a lump or knot — any tie or fastening formed with cord, rope, or line, including bends, hitches, and splices.

Use Stopper knots to keep rope ends from slipping through the opening.

1. **THE OVERHAND KNOT** — This is the simplest and smallest of all knots. In general, use it only on small cord and twine, since it jams and is hard to untie, often injuring the fiber.

To tie — Make a loop near the end of the rope and pass the end under and up through the loop. Draw up tight.



2. **THE FIGURE-EIGHT KNOT** — This is much easier to untie than the overhand knot—is larger, stronger, and does not injure rope fibers. It is the best knot to use to keep the end of a rope from running out of a tackle or pulley.

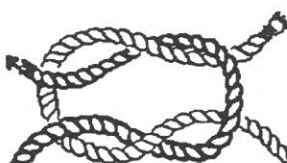
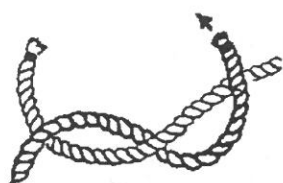
To Tie — Make an underhand loop. Bring end around and over the standing part. Pass the end under and then up through the loop. Draw up tight.



3. **THE SQUARE KNOT** — The square knot is used to tie two cords together and is referred to as the universal package knot.

To Tie — Pass the left end over and under the right end. Curve what is not the left end towards the right. Cross what is now the right end over and under the left. Draw up tight.

Don't tie the weak granny knot. Remember that the Square Knot presents two ends lying under one loop and over the opposite loop—while the granny presents one end under and one over on both loops.

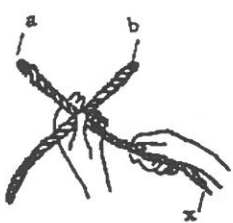


4. **THE SURGEON'S KNOT** — Often used for twine — this knot resembles the square knot except the first part has been given two twists instead of one. It is used chiefly to keep the first tie from slipping before the knot is completed.



5. **WEAVER'S KNOT OR SHEET BEND** — This knot is easily made, is easily untied, and a never draws tight.

To Tie — Place the two ends of the rope together, the right **a** under the left **b**, figure at right. Hold the two in place with the left hand, and with the right hand holding the rope at **x**, pass it around the end **a**, as shown.



6. **THE SLIP KNOT** — This is one of the common knots. It is easily and quickly made.

To Tie — Catch the bight of the rope with the right hand and then give the hand a turn in the direction indicated by the arrow in such a manner as to catch the end **a** over the wrist. Grasp the bight of the rope at **b** and pull it through the loop.



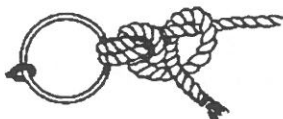
7. **The Bowline** — Used for mooring, hitching, lifting, and joining. Sometimes called the "King of Knots." It never slips and is always easily untied.

To Tie — Make an overhand loop with the end toward you. Pass the end up through the loop, then up behind the standing part, then down through the loop again. Draw up tightly.



8. **THE ANCHOR BEND** — Used to secure a rope to a ring.

To Tie — The rope is given two turns about the ring, thus affording a larger wearing surface than with the common hitches. The knot is finished by making two overhand knots to the standing end of the rope.



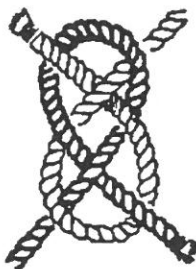
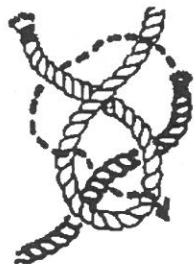
9. **THE NON-SLIPPING HALTER TIE** — The non-slipping halter tie is used in fastening a halter rope to a ring.

To Tie — Place the end of the rope through the ring and around beneath the long portion of the rope. Move the end of the rope as indicated by arrow. Draw up tightly.



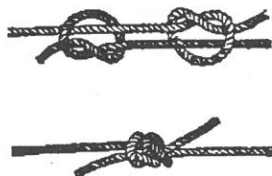
10. **THE CARRICK BEND** — The Carrick Bend is one of the strongest of knots. It cannot jam and it unties easily. Under strain it always draws up tight correctly--which is important, because very heavy ropes usually cannot be fully tightened by hand.

To Tie — With one rope-end form an underhand loop — with both the free end and standing part pointing away from you, start the second rope-end beneath both sides of the loop. Cross it over the standing end of the first rope. Then over the left side of the loop. Cross it under itself — and let the second free end lie over the right side of the loop. Finish by pulling ends so knot is tightened.



11. **THE FISHERMAN'S KNOT** — This knot is very strong and in common use by anglers. It's also a very handy knot to know in case you're short of twine and must join two lengths together for tying up a package.

To Tie — Lay the two ends together — each pointing in the opposite direction. Then tie on Overhand Knot in the end of each — around the standing part of the other. When drawn tight, the two knots slide together and will not slip.



HITCHES

SUPPLIES NEEDED

About seven feet of small rope is needed to practice the hitches described in this lesson.

WHAT TO DO

1. Learn to tie the hitches.
2. Learn the names of the hitches.
3. Learn their uses as you tie them.

How To Tie Various Hitches

Hitches differ from knots because they are tied directly around an object, instead of being tied in the hand and placed over the object. Hitches are generally used as a speedy, temporary means of fastening an object. They are also used for hauling, hoisting, securing guy ropes, tying grain sacks, and shortening rope without cutting.

1. **THE HALF HITCH AND DOUBLE HALF HITCH** — The Half Hitch is generally used for fastening to an object for a right-angle pull.

To Tie — Pass the end of the rope around object and tie an overhand knot to the standing part. Two Half Hitches is simply a Half Hitch tied twice.



Half Hitch



Double Half Hitch

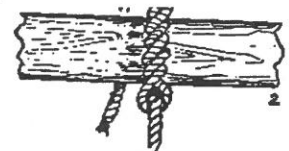


Double Half Hitch

2. **THE TIMBER HITCH** — Used for towing and hoisting of logs, crates, or bales. This hitch does not jam and does come undone readily when the pull ceases.

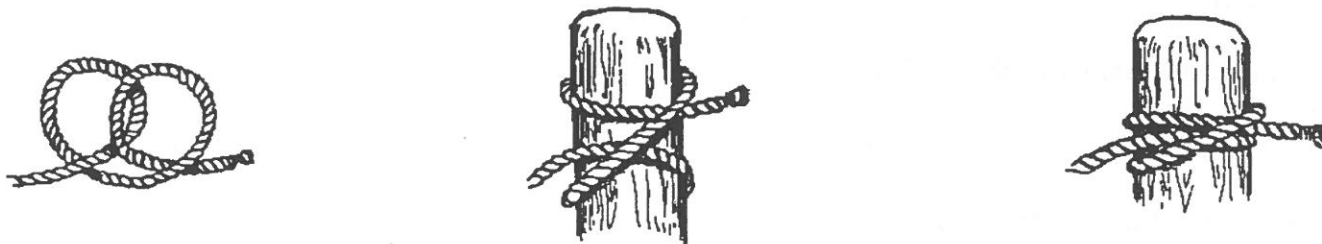


To Tie — Pass a rope around the object and take a turn with the short end around the standing part (Half Hitch). Then as shown in the diagram, twist or turn the end back on itself. Three turns back are sufficient and they should follow the lay of the rope.



3. **THE CLOVE HITCH** — This hitch is a quick, simple method of fastening a rope around a post or stake. (Such as securing ropes to tent stakes.)

To Tie — Make a turn with the rope around the object and over itself. Take a second turn around the object. Pull the end up under the second turn so it lies between the rope and the object. Tighten by pulling on both ends.



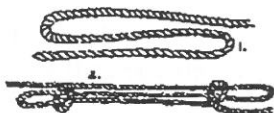
4. **THE BLACKWALL HITCH** — Used to fasten a rope to a hook.

To Tie — Place a bight of the rope behind the hook. Place end a in the hook. Next, place end b in the hook on a the top of a.



5. **THE SHEEPSHANK** — Used to shorten a rope.

To Tie — Form an "S" loop as shown in the diagram 1. Then with one free end make a half hitch and slip it over one of the loops. Tighten, repeat procedure with the other loop. Diagram 2.



6. **MILLER'S TIE** — This is used for tying grain and flour sacks, as a temporary fastening to prevent the strands at the end of a rope from untwisting, and may be used for tying a bandage on a finger. It may also be used in fastening ropes to long beams when the end of the beam cannot be reached. It may be tied with or without a loop. It is never used as a hitch for securing the end of a rope for a pull because it will easily pull out.

To Tie — Grasp the top of the sack in the left hand and place the cord around from left to right. Pass the short end over the long part and around once more, this second turn being below the first. Wind loosely.

Pass the short end over the long part again and around from left to right, this turn being still farther down. There will now be two turns of cord on the side towards you and three on the farther side.

Push the third or last turn on the farther side up between the sack and first two turns. The end may be pulled entirely through or a loop made. Pull on both ends in opposite directions until tight.

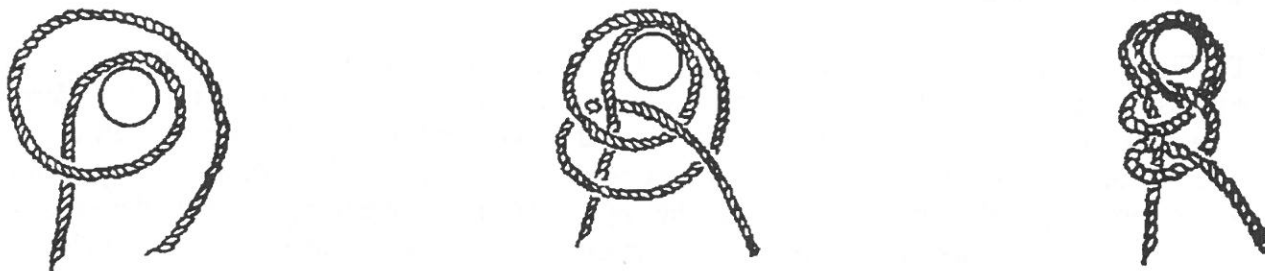


7. **FISHERMAN'S BEND** — This is used for fastening a rope to an anchor, clevis, or ring, tying fish line to a hook, fastening a child's swing ropes to the support, and for general use. It is the best hitch for a very heavy pull. It never slips, is easily untied, and stands wear especially well because of the double loop. It is often used on an anchor or fish line with one half hitch only, lashing or whipping the short end to the long part. It is much more easily untied after a heavy pull than any of the other hitches.

To Tie— Hold the rope in the left hand short end away. Pass the short end around the post from left to right loosely and over the long part from right to left. Place the fingers of the left hand up through this turn and the post.

Pass the rope around the post the second time from left to right, this second turn being above the first one, over the long part again, up through both loops, and over the right side of the loops.

Pull up tight, and if desired, put in the second regular half hitch. The second half hitch does not add extra strength, but if there is considerable slack in the rope at times, it is not so apt to loosen. If the short end is to be lashed to the long part, do not put in the second half hitch.



FINISHING THE END OF THE ROPE

WHAT TO DO

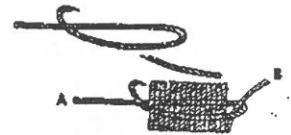
1. Take a short piece of rope and practice whipping one end until you can make a neat whipped end.
2. Learn to tie several rope-end knots.
3. Learn the names of the knots and their uses.
4. Be able to demonstrate them to others.

HOW TO WHIP THE ENDS OF A ROPE

Binding the end of a rope with cord or string so that it will not unravel is called whipping.

Follow the instructions listed below in finishing the end of the rope:

1. Make a loop in one end of a 30-inch cord or string and place the loop along the side of the rope as shown. The loop should extend beyond the end of the rope about $\frac{1}{2}$ ".
2. Start wrapping the long end **B** of the cord tightly about the rope in the same direction in which the strands are twisted.
3. The whipping should stop about $\frac{1}{2}$ " from the end of the rope. At this point, slip the cord end **B** through the loop of the cord.
4. Pull the free end **A** until the loop of the cord is pulled under the shipping and cord **B** is tightened.
5. Cut end of **B** shorter, if necessary.



ROPE END KNOTS

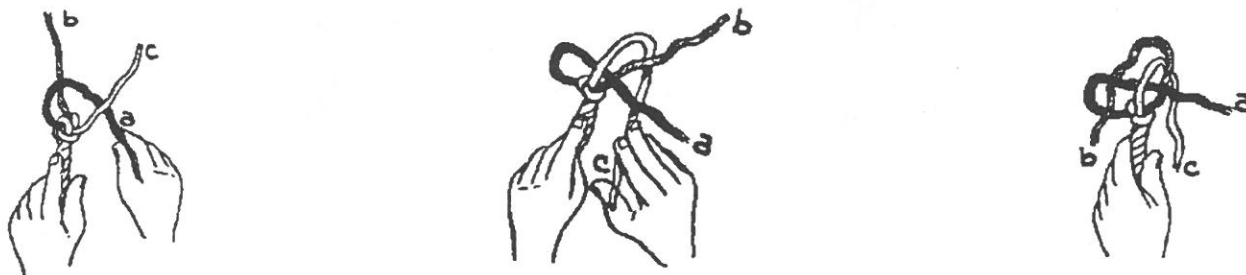
1. **THE WALL KNOT** Among the rope end fastenings that are easily and quickly made, the wall knot is the most used.

To Tie — For a small rope, unlay the strands about 3". Hold the rope in the left hand, loose strands upward. With the right, grasp the end of strand **a** and bring it across the rope, forming a loop and allowing the end to hang free. Hold the loose end in position with the left thumb. Grasp strand **b**, pass it under strand **a** (see arrow in figure) and hold it against the rope with the thumb of the left hand. Again, with the right hand, grasp strand **c**, pass it under strand **b** and up through the first loop formed, as indicated by the arrow and shown in the middle illustrations. Draw each strand gradually until the knot is tight.



2. **THE WALL KNOT WITH CROWN** — A more secure fastening than the wall knot is made by first making the wall knot, then finishing with the crown. This is used to prevent the end of the rope from untwisting when enlargement is not objectionable. It is a desirable knot to prevent the end of the rope from slipping through small openings—such as rope handles on boxes.

To Tie — After tying a Wall Knot proceed to tie the crown. Move the end of strand **a** between strands **b** and **c**, and bend strand **c** over between strand **b** over the loop in strand **a**; move strand **b** over the loop in strand **c** through the loop in strand **a**. Draw the knots tight and cut off loose strands.

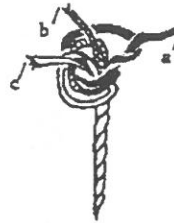
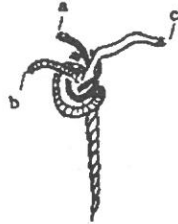


3. **THE CROWN SPLICE** — See pages 25 and 26 (pictures 14, 15, 16, 17, and 18) for directions.
4. **THE ROSE BUD KNOT** — This is a simple and practical end knot.

To Tie — Form the first loop by bringing the left strand **a** down to the left, around the other strands and up through the loop thus formed.

Make the second loop by bending the strand **b** down to the left in front of the first loop, around back of the rope and through the two loops formed.

Form the third loop by bending strand **c** down to the left in front of the other two loops, around the rope and up through all three loops. (Figure 3). Tighten each strand gradually until the knot is formed.



5. **THE MATHEW WALKER KNOT** — This is one of the most permanent of the end knots and one of the most difficult. It can be easily made by loosely constructing the Wall Knot, then continuing as follows:

To Tie — Pass end **a** through the loop with **b**, end **b** through the loop with **c**, and **c** through loop **a**, as indicated by the arrows. Tighten the knot gradually by drawing each of the ends.



SPLICES

WHAT TO DO

Learn to do the following splices:

1. A short splice in a three-strand rope.
2. A loop and eye splice.
3. End or Crown splice.
4. Repair a broken strand.
5. Make a sample long splice.

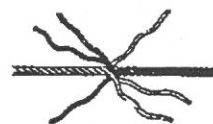
HOW TO MAKE VARIOUS SPLICES

Splices are used for permanent joining of ropes, both for straight pulls and for general pulley work. A broken strand of rope can be repaired by laying in a new strand, thus often saving a long rope. The sharper the bend in a rope under tension, the more damage to the fibers. Therefore, wherever possible, splices should be used instead of knots, since good splices have from 80 to 90 per cent of the full strength of the rope, and knots have only from 50 to 60 per cent of its strength.

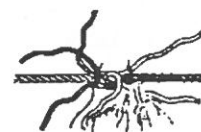
1. **CROWN SPLICE** — See pages 25 and 25 (pictures 14,15,16,17 and 18) for instructions for making the Crown Splice.
2. **LOOP SPLICE** — See pages 20-22 under rope halter for instructions on how to make a Loop Splice.
3. **SHORT SPLICE** — This is used to join two ropes together — or two ends of the same rope, to make a "sling" or continuous wreath of rope. A sling is tied around an object to attach it to a hook for hoisting. The Short Splice, though the strongest of the splices, cannot be used on rope which is to run through a correctly sized pulley.

How To Splice

Unlay the strands of the rope for a short distance, whip ends of the strands to prevent untwisting, and put together as in diagram at right, alternating the strands from each end.



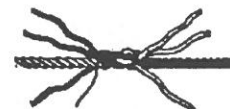
Now tie down one set of strands temporarily. Taking any strand of the opposite set, tuck it over and under one strand of the rope.



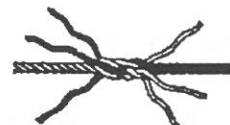
Tuck against the twist or "lay" of the rope. What happens is that the tuck goes over one strand, under the second, and out between the second and third.



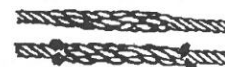
Repeat the same operation with the other two strands from the same end of the rope.



Remove tie from other strands. Repeat operation on the other side of rope. Continue two more tucks for each of the six strands.



To finish, roll and pound rope on hard surface. Don't cut ends of strands off too close! (See top sketch.)

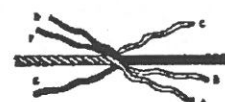


For the tapered splice (see lower sketch) which gives better service, just take two more tucks with each strand, but before the first tuck, cut out one-third the number of yarns from each strand. Then tuck. Now, cut strands again, removing one-half of the remaining yarns—and tuck again.

4. **EYE SPLICE** — This is used in making halters, in the end of a rope for mooring, and in place of the Honda Knot for making a lariat. It is made exactly like the Short Splice, except that it is made with one rope. The end, after being unlaid, is bent around to form the eye, and is spliced into its own strands of the standing part.



5. **LONG SPLICE** — This is slightly weaker than a Short Splice, but allows the rope to run through a pulley without obstruction and lessens wear and chafing of the rope fibers at the point of splicing. A Long Splice should be made only with two ropes of the same size.



To Splice — Unlay the end of each rope about 15 turns and place the ropes together, alternating the strands from each, as shown at left.

Start with any opposite pair, unlay one strand and replace it with strand from the other part. Repeat operation with another pair of strands in the opposite direction as shown at right.



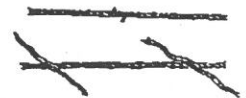
Now tie each pair of opposing strands, as B and E at right, with an overhand knot, tuck each strand twice as shown at right, as in the Short Splice, and then twice more as for the Tapered splice (see A and D), and tie with an overhand knot before tucking. By this latter method a smaller splice results—but at a considerable sacrifice of strength.



Roll and pound well before cutting strands off close to rope.



6. **MENDING BROKEN STRANDS** — It is often desirable to mend a broken strand or even to remove a portion of a rope that is badly worn or frayed. In either case unlay the strands as far as necessary, procure a new strand of sufficient length and relay it, as shown at right and described under Long Splice.



The ends are tied with an overhand knot and finished as described above.

ROPE HALTERS

For practice on a halter, use about six feet of three-strand, small rope. You will also need a piece of rope of the proper size and length to make a full-sized halter for the animal you choose. The size and length of the rope and the amount needed are given in the Table below.

APPROXIMATE DIMENSIONS FOR ADJUSTABLE HALTERS

| Animal | Total Length of Rope | Halter Number 1 | | | | Halter Number 2 | | | |
|-----------------|----------------------|-----------------|----------|---------------|----------|-----------------|----------|---------------|----------|
| | | Small Halter | | Large Halter | | Small Halter | | Large Halter | |
| | | Diameter | End to A | Diameter | End to A | Diameter | End to A | Diameter | End to A |
| | Feet | Inch | Inches | Inch | Inches | Inch | Inches | Inch | Inches |
| Bull | 15 | $\frac{3}{8}$ | 52½ | 1 | 60 | $\frac{3}{8}$ | 26 | 1 | 30 |
| Cow | 13 | $\frac{1}{2}$ | 41 | $\frac{3}{8}$ | 50½ | $\frac{1}{2}$ | 23 | $\frac{3}{8}$ | 25 |
| Yearling Cattle | 13 | $\frac{1}{2}$ | 37 | $\frac{3}{8}$ | 39½ | $\frac{1}{2}$ | 22½ | $\frac{3}{8}$ | 23½ |
| Calves | 11 | $\frac{3}{8}$ | 30 | $\frac{1}{2}$ | 39 | $\frac{3}{8}$ | 16½ | $\frac{1}{2}$ | 22 |
| Rams | 10 | $\frac{3}{8}$ | 24 | $\frac{3}{8}$ | 32 | $\frac{3}{8}$ | 14 | $\frac{3}{8}$ | 18 |
| Ewes | 10 | $\frac{3}{8}$ | 24 | $\frac{3}{8}$ | 28 | $\frac{3}{8}$ | 12½ | $\frac{3}{8}$ | 14½ |

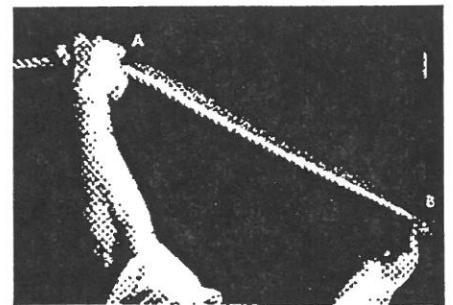
Make an adjustable rope halter.

STEPS IN MAKING A ROPE HALTER

Rope halters are needed on farms or ranches where cattle are kept. They are practical, serviceable, and inexpensive.

If you follow the instructions and illustrations on the following pages, you can easily make a rope halter. You need about 13 feet of a 3-strand rope to make an adjustable halter for a cow or a 1000-pound steer. Use $\frac{1}{2}$ inch rope for halters for cows and smaller rope for calves and heifers.

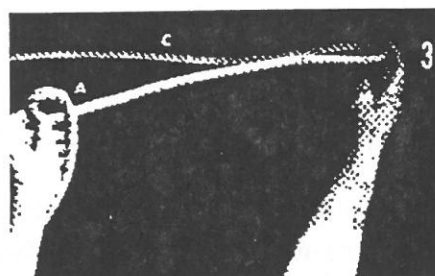
For a cow-sized halter, measure a nose piece in your left hand at A, a distance of 24 inches from the end B. The nose piece should be proportionately shorter for a calf or yearling.



With your thumb and index finger of the right hand, raise the top two strands of the rope at the 24-inch point **A** where it is being grasped by the left thumb and finger. To raise the two strands, hold the rope tightly in your left hand and twist the rope clockwise with your right hand.



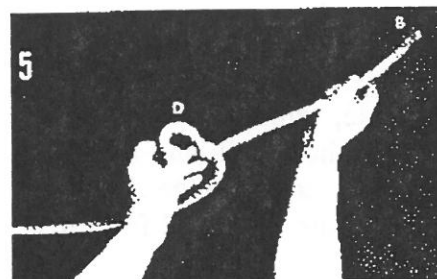
With the right hand, pass the end of the long rope **C** underneath these two upraised strands **A** in a direction away from you. Draw the long rope through far enough to form a loop with an opening about 1 ½ inches in diameter.



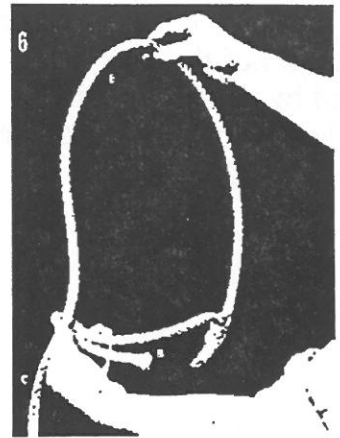
Continue to hold the rope in the left hand at the 24-inch point **A**. Then raise up two strands on the long rope immediately in front of the loop and pass the end of the short rope or nose piece **B** under them in the direction away from you.



Draw the end of the nose piece **B** through far enough to complete and lock the loop **D**. The best sized loop is about two and a half times the diameter of the rope.

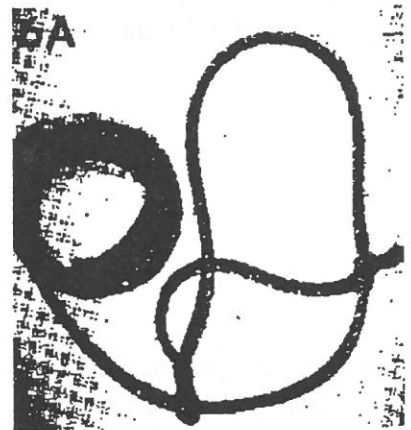


Splice the nose piece tightly around the head piece. To start the nose piece, raise the long rope **C** with the right hand as if to form a head piece **E**. Then with the left hand, bend the last 6 inches of the short rope **B** abruptly around the head piece from the inside.

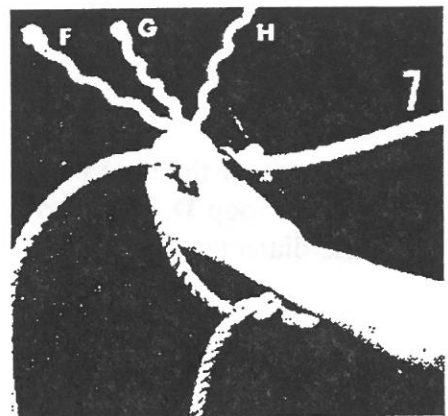


An adjustable rope halter that will not slip.

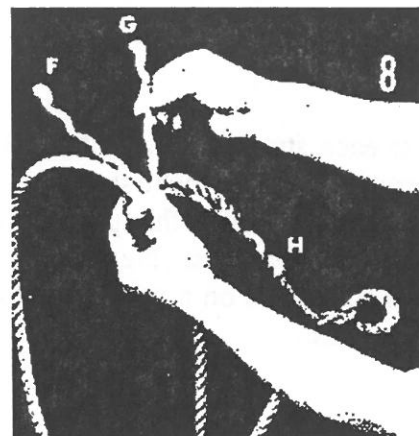
Another method of fastening the nosepiece tightly around the headpiece follows (See 6A): Secure end of nosepiece with hog ring one inch from end of rope. Measure a nosepiece of 22" from **A** to **B** as shown in 1. Make loop as shown in 2, 3, & 4. With loop **D** at left, hold end in right hand, left hand 4" back. Untwist rope and push together until loops are formed in each strand. Three loops should be at right angles to nosepiece. Take lead end and go down through the three loops until desired length of headstall is obtained, making sure that loose end runs to outside of halter. Continue through loop **D** with lead end to make chinpiece to complete halter.



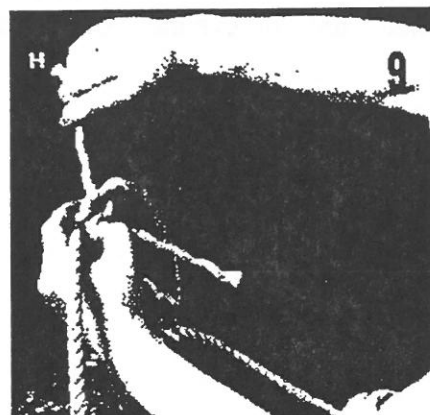
Now, turn the end of the short rope away from you at a right angle, remembering to hold the folded part firmly in position with the thumb and fingers of the left hand. Then, with the right hand, separate the strands by unlaying or untwisting the rope from the short end for a distance of about 6 inches.



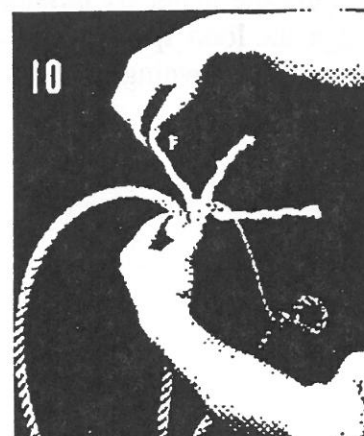
Start to splice the three separated strands (**F**, **G**, and **H**) into the nose piece by tucking them one at a time under corresponding strands on the nose piece and in a direction away from you. Begin this job by tucking the center strand **G** under the first visible strand on top of the nose piece.



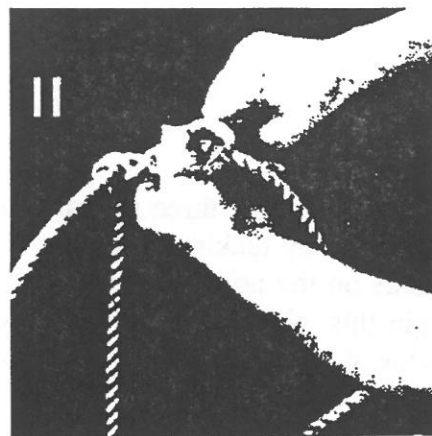
Now tuck the strand closest to your body **H**. To do this, place your left hand under the long rope, then roll the rope away from you to expose the nearest nose-piece strand under which **H** is to be passed. Tuck the strand in the direction away from you.



In a similar manner, tuck the third strand **F**. Place your left hand on top of the long rope, roll the rope toward you, then tuck this strand over the strand closest to it and under the next. Each strand (**F**, **G**, and **H**) must be passed under a different strand and in the direction away from you.



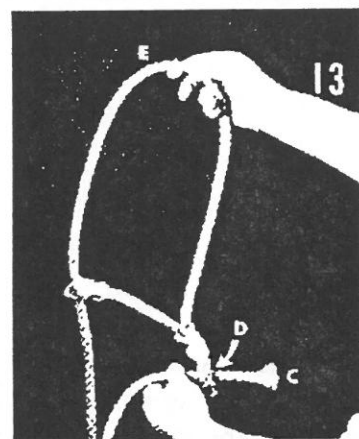
After each strand has been tucked once, each alternately should be passed over the next strand to it and then tucked under the next one. Continue this procedure until you have tucked each strand several times. Next, dampen the nose piece splice, roll it under your foot on a rough floor, and cut off the loose-ends of the strands.



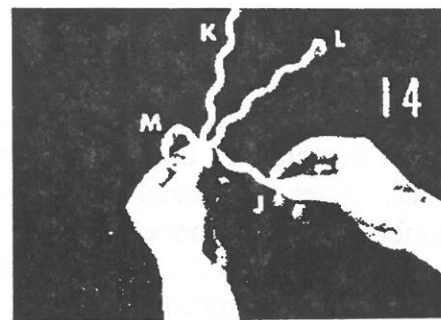
The nose splice is now completed. Note the tightness of the eye splice I and the evenness of the tucking.



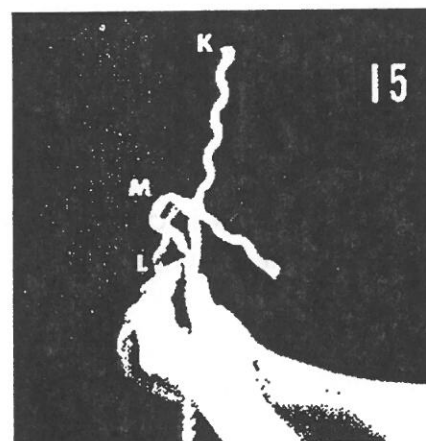
Assemble the halter by passing the end of the long rope C through the loop splice D from the inside. Then finish the end of the rope by crowning to prevent it from unlaying or fraying.



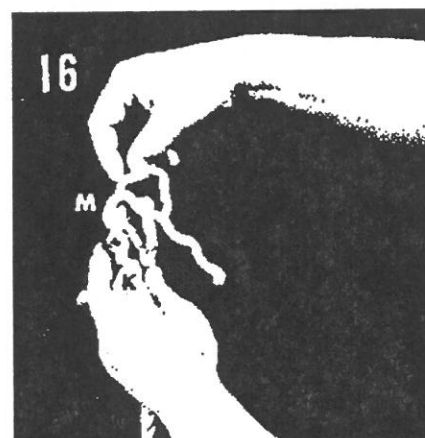
To start the crown, hold the rope in your left hand. With the right hand, unlay the rope about 6 inches from the end. Then place or lay the strand to your left **J** between the other two strands **K** and **L** to form a loop **M**.



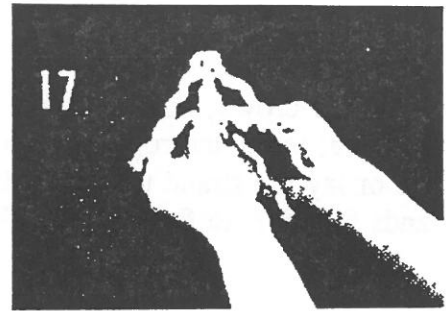
The next step in making the crown is to lay the strand to your right **L** between the loop **M** and the middle strand **K**.



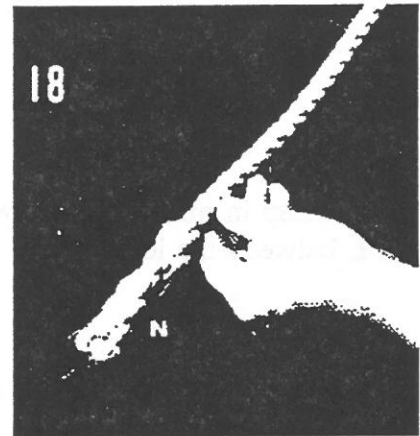
Next bring the end of the center strand **K** through the loop **M** from the rear in the direction toward you.



Draw each strand downward to lay in the same direction as the long rope. Now tuck each strand alternately into the rope as shown in figure 12 until each strand has been tucked several times. After the second tuck, to taper, cut out one-third the number of yarns from each strand. Then tuck, and cut strands again--until finished. Dampen, roll, and then cut or burn off any loose ends to complete the crown.

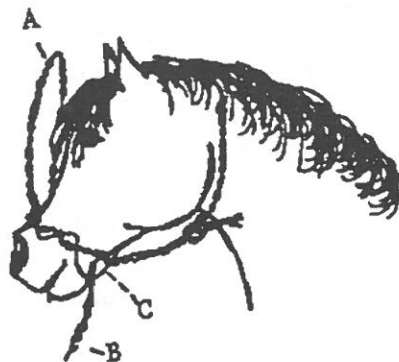


This end splice N is called a crown splice. It prevents the end of the rope from fraying and serves as a hand hold.



THE HACKAMORE — This is a temporary halter used for leading or tying either horses or cattle. It is easily and quickly made and is secure when properly drawn up.

To Make — A long rope is usually used. One end is passed around the animal's neck and tied with a **bowline knot**. A half hitch is then thrown in the rope and passed over the animal's nose. In like manner, a second half hitch is made below the first and passed over the nose. The front part of the first half hitch is then raised above the second and is then passed downward under the first half rope **B** in the figure at the right. To prevent the loops from drawing tight, the loop **C** is drawn down and a half hitch thrown over it with the rope **B**. If the animal is to be left tied for any length of time the rope **B** is passed through the loop **C** below the half hitch.



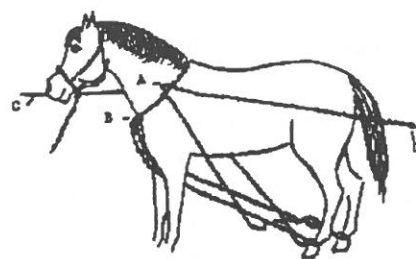
THE NECK HALTER — This simple method of tying a neck halter is in general use on the farm or ranch. It can be used on a horse or cow.

To Make — It consists of one **overhand knot** tied in the end and a figure 8 loosely tied in the bight—far enough back to allow the length needed to go around the animal's neck. The knotted end is passed, as shown in the figure at right, through the knot in the bight—which is then tightened. This forms a loop halter which is then tightened. This forms a loop halter which will not slip and choke the animal and is easy to untie.



TACKLES

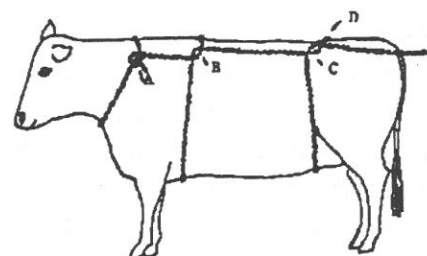
Casting Horses — This is an easy way to throw or cast a horse. Use a rope not less than 30 to 40 feet long. In order to prevent the rope from burning the hind ankles and pasterns, use ankle straps. Hame straps with iron rings placed on the ankles answer the purpose admirably.



How to — Double the rope and tie a **bowline-on-the-bight** in the center. Place over the horse's head and adjust to the size of the neck. Make the loop around the neck loose enough so that it will not choke the animal when thrown. Pass the rope between the forelegs, around the ankles or through the ring on the Hame straps, once around the main rope, and finally through the loop of the **bowline-on-the-bight** at A.

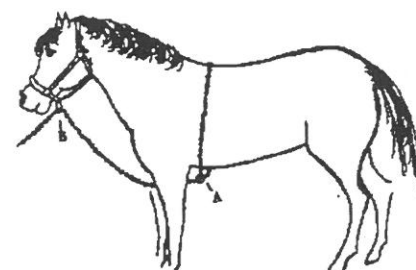
If the horse is to be thrown on the right side, the person holding the rope on that side should stand in front C and to the right, and the one holding the other rope, to the rear on the left side D. The horse is then caused to back and the ropes are pulled, thus drawing his hind feet up toward the body. As soon as the horse is down the person at the halter should twist the head, turning the animal's nose upward as far from the ground as possible. This prevents him from getting up.

CASTING CATTLE — The method shown in the sketch at left is simple and effective. Use a rope 35 to 40 feet long. In throwing a cow, take care that the rope is entirely in front of the udder.



How to — Place one end around the animal's neck and tie it with a bowline knot. Next, pass the rope around the animal's body just back of the forelegs, making a half hitch over the withers at B. Now pass the rope around the body at the hips, letting it draw up into the flanks. It is well to have the rope on one side, as at C, in front of the hip bone, and the one on the other side, as at D, behind it. This prevents the rope from drawing too far ahead over the loin, and also from slipping too far back. To throw the animal, pull to the rear and toward the side upon which she is to be thrown. When the animal is down, turn the head to prevent her from rising.

LEADING OR TYING — A simple but effective method of using a rope for breaking a colt to lead or to tie a horse that has a tendency to pull back and break ropes and bridles, is shown in the sketch at right.

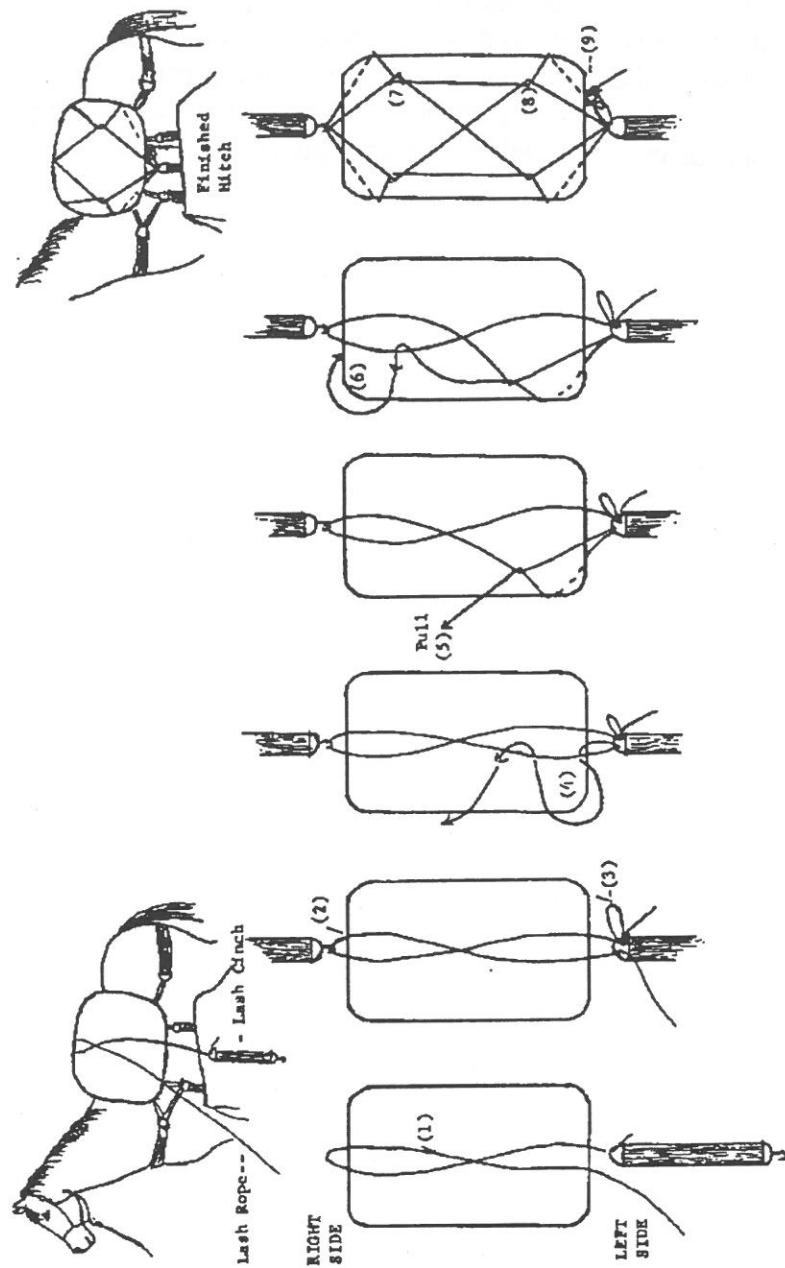


How to — Place a strong leather halter on the colt's head. Use a long rope and pass one end around the body over the withers and just behind the front legs. It is well to have an iron ring in

the end of the rope, or a loop tied with a bowline knot so that the loop which passes around the body will loosen up as soon as the tie rope is slacked A. (A ring is best). Pass the rope through this ring or loop, then between the front legs and over the chin piece of the halter B. When the rope is tightened, the colt will usually lead up with but little resistance, and if he passes the person who is leading him the chin piece of the halter acts as a pulley and his head is drawn around to the side.

THE DOUBLE DIAMOND HITCH

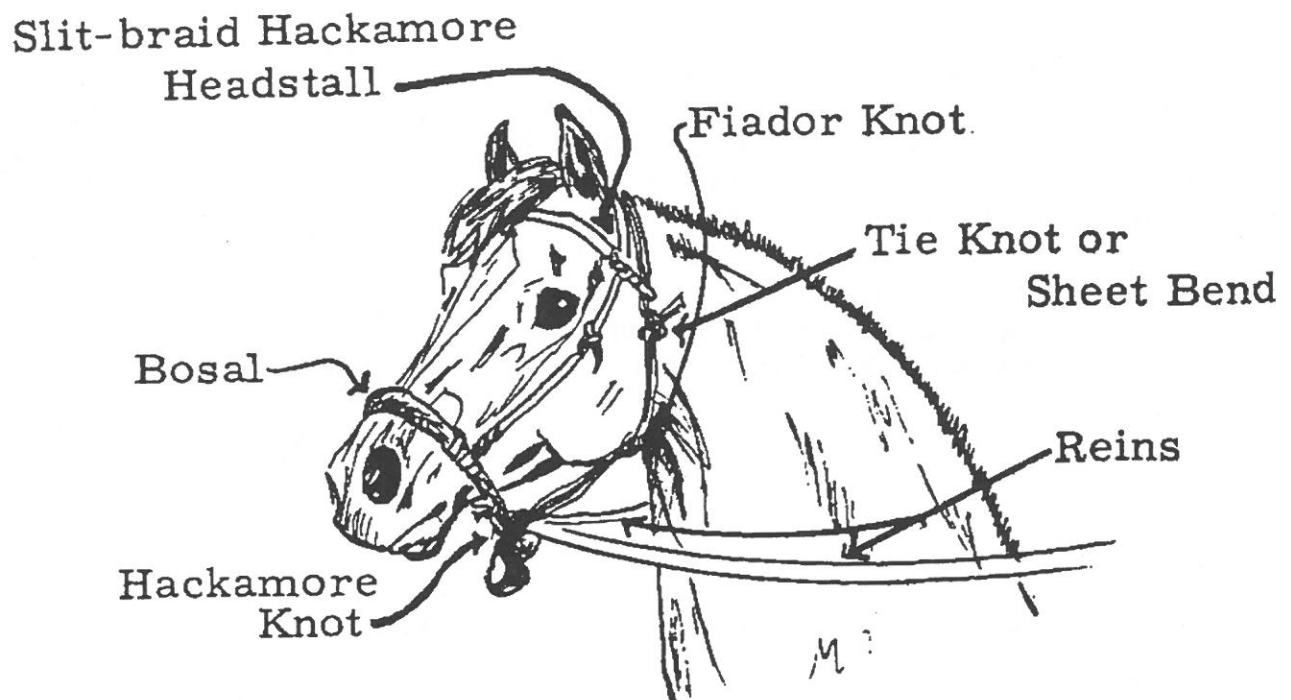
This is one of the easiest and most reliable hitches for securing loads on pack horses. It may be tied by one person, but is more easily accomplished by two. You will need a lash rope $\frac{1}{2}$ " x 30' long and a lash cinch with a hook in one end.



- 1 Starting on left side of horse double the rope about 6 feet from pack cinch and throw doubled end over pack.
- 2 Hook cinch in the doubled loop making sure rope is crossed once on top of the pack.
- 3 Tie off in "D" ring-end-of-cinch leaving a small loop hanging about 6 inches.
- 4 Still on left side of horse tuck lash rope under rope over pack nearest front and pull down under corner of pack. Bring end of lash rope back up, running it under and over rope as indicated by arrows.
- 5 Pull tight towards horse's withers forming the front point of the left diamond.
- 6-8 Repeat (4&5) for each rope and corner of the pack as you go around the horse. Hook rope in cinch on right side as you go.
- 9 Tie off in small loop, with half hitches, left from step (3).

If each corner of the diamonds were pulled tight "SHE'S ON TO STAY"!!

RIGGING THE HACKAMORE



SLIT-BRAID HACKAMORE HEADSTALL

To make the headstall, good strap leather is needed, but a special tanned leather called "latigo" is better.

Use four pieces of leather — one-half inch wide and not too thick — one piece will be 18 inches long, one 34 inches and two 16 inches long.

First, take the 34-inch piece, which will form the offside cheek-piece, as well as the headband and part of the nearside cheek-piece. Soak leather pieces in water for a few minutes so that they are wet through.

Place leather around offside part of the bosal as in Fig. 1, between the side-button and the end of the nose button; or if the bosal has a couple of side-buttons on each side, place the leather around the part of the bosal between the two buttons. In Fig. 1, the long part of the strap is marked **A**. The other is **B** and should be about six inches long. In **B**, cut a slit lengthwise and about the width of the leather. The arrow line shows how **A** passes through slit in **B**. Pull it up tight. Now cut a slit in **A** as shown in Fig. 2 and pass the end of **B** through this slit. In Fig. 3, **A** passes through **B**. Fig. 4 shows this part of the work completed.



Figure 1



Figure 2



Figure 3



Figure 4

Second, do the same with the 18-inch long piece on the near-side of the bosal.



Figure 5



Figure 6



Figure 7

Third, make half of the browband with one of the 16 inch pieces. Start as in Figure 5, passing **B** through **A**, but leaving a loop of about $\frac{3}{4}$ inch in the leather. (The hackamore rope which takes the place of a throat-latch, passes through this loop.) in Figure 6, **A** passes through **B**, shown completed in Figure 7.

The next step is to attach the brow-band to the cheek-piece, Figure 8. Here **B** passes through **A** and then **A** again. The work will look like Figure 9. Do this to the other 16 inch piece for other half of brow-band.



Figure 8

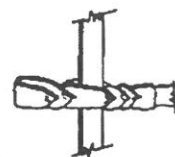


Figure 9

Join the two brow-band pieces in the center as shown by Figure 10, so they are adjustable.

Fourth, a slit is made in the end of the long cheek-piece and the shorter one passes through it to form a know. This makes the headstall adjustable. (A buckle may also be used here.)

The completed headstall is shown in Figure 11.

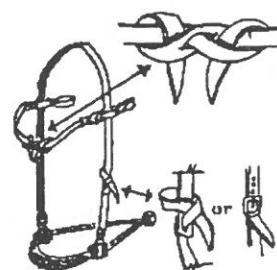


Figure 10 & 11

DOUBLE HACKAMORE KNOT

The double hackamore knot is difficult to tie and will take some practice to do it smoothly and easily.

It is a double knot and requires 18 to 20 feet of braided rope — like clothesline rope. The knot is best tied by working on a flat surface up to Step 7.

Make sure the ropes are not twisted.

Now, DOUBLE the rope and lay it on a flat surface to facilitate tying.

1. DOUBLE the rope again. Grasp it with the right hand at "a" which is about one foot from end of rope. This makes two large even loops. These loops **MUST BE** very LARGE.

Grasp at BIGHT ("i") with left hand in Fig. 1 and bring down to right hand as shown in Fig. 2.

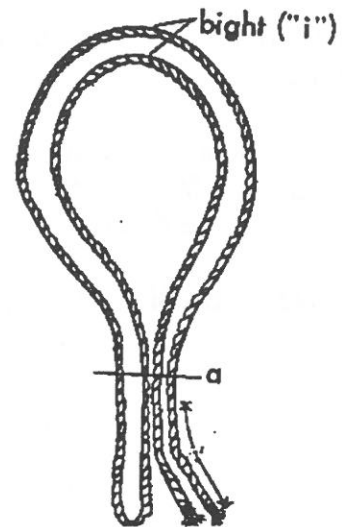


Figure 1

2. Hold "i" with RIGHT THUMB at "a" as in Fig. 2. Now there are two double overhand loops. (The right hand must continue holding the ropes in this position.)

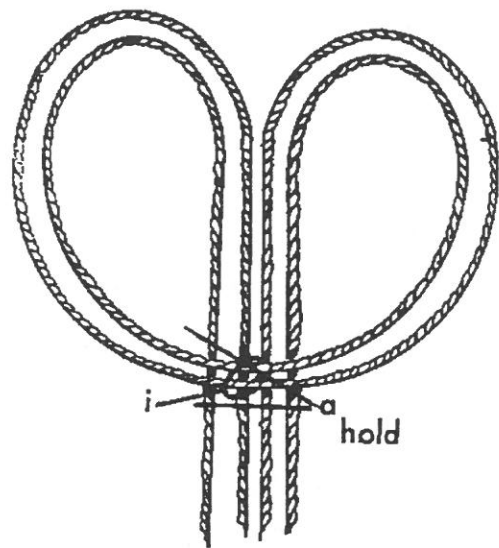


Figure 2

3. With left hand, go down through **LEFT** loops and **UNDER** ropes at "c" and **GRASP** **RIGHT** loop at "s" as shown in Figure 3.

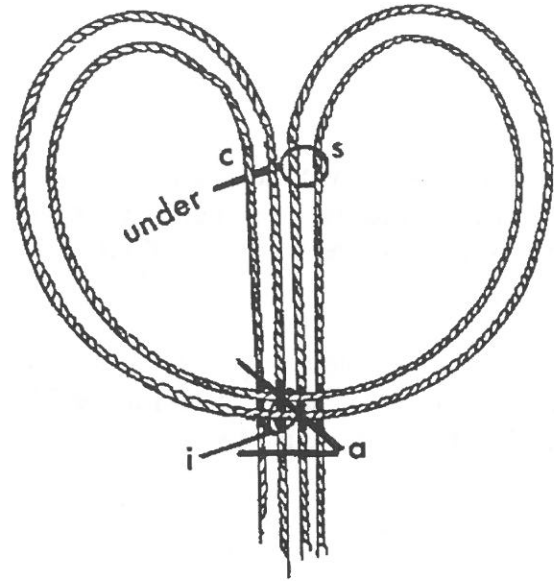


Figure 3

4. Now, pull "s" back the way the left hand traveled, as in Figure 4.

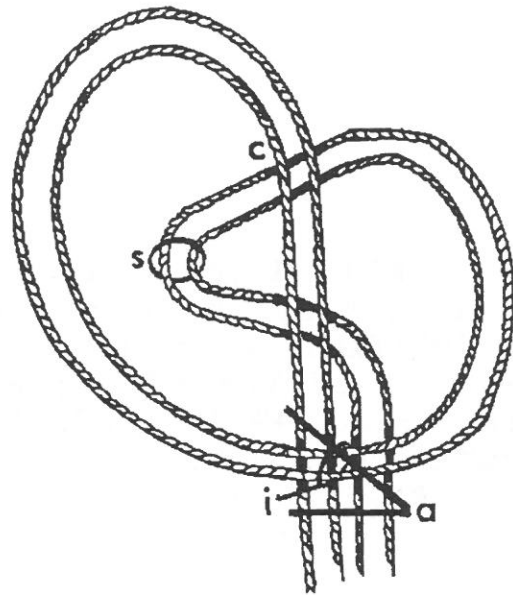


Figure 4

5. Still holding "s" with left hand, flip "s" over all middle ropes while bringing down over "i" to **RIGHT THUMB** at "a" and **HOLD** as in Fig. 5.

With left hand move ropes at "e" over a little to the **RIGHT** to allow room for the **LEFT HAND** to complete next step.

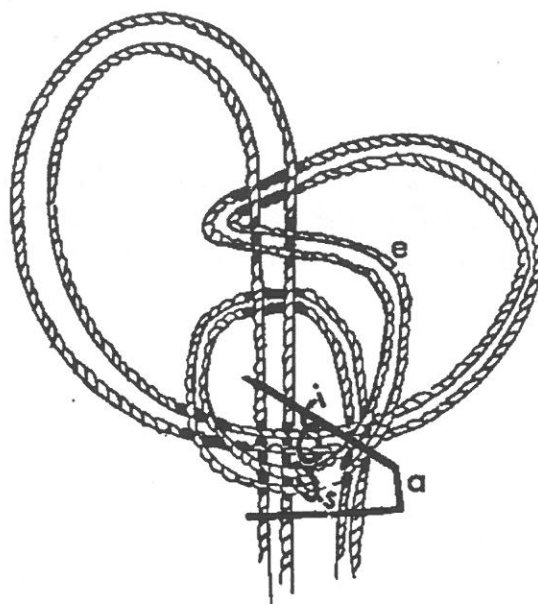


Figure 5

6. With **LEFT HAND**, go down through the ropes as indicated by line and arrows at "x" and grasp the **TWO ROPES AT "i"** with left thumb as shown in Fig. 6. (Caution: When going down through ropes be **VERY CAREFUL** to go **BETWEEN** the four (4) ropes that go down through the **RIGHT HAND**.)

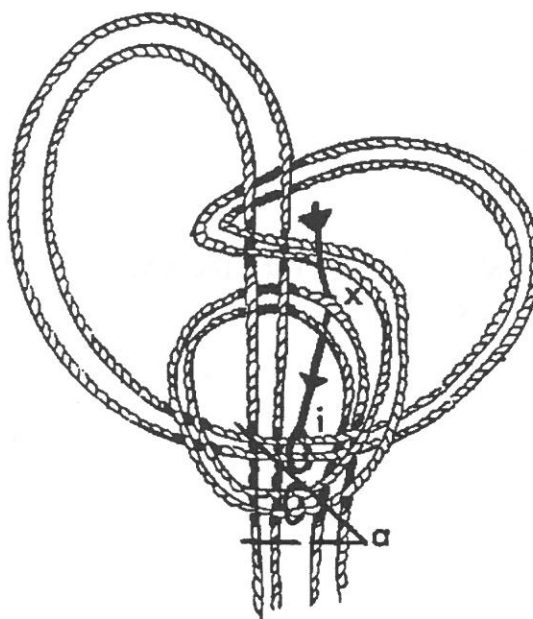


Figure 6

7. Now lift knot off flat surface to complete.

Still, **HOLDING "s"** with right thumb and hand, **PULL ROPES** ("i" picked up with left hand) up through as shown in Fig. 7.

Continue pulling gently with both hands until hackamore knot emerges and just before knot is fairly tight, release "s". Don't pull the knot real tight!

The ropes held in the **RIGHT HAND** will be the **TOP** of the knot and the ropes in the **LEFT HAND** will be the **BOTTOM**.

The ropes held in the **LEFT HAND** will have to be shortened by working them back through the knot so there will be approximately 2 to 6 inches remaining below the knot. When working the ropes back through, be **VERY CAREFUL** to move the ropes a little at a time and on through **all** the knot each time. Move both sides alternately. Care must be taken or the knot will be messed up and unrecognizable!!!

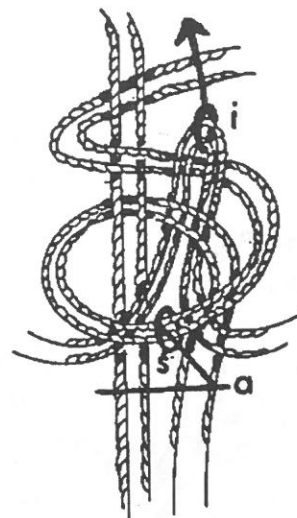
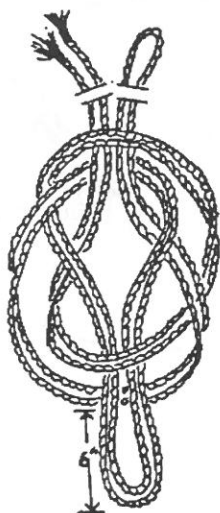


Figure 7

If you are lucky the hackamore knot should look like the knot at the left when finished!



Back



Front

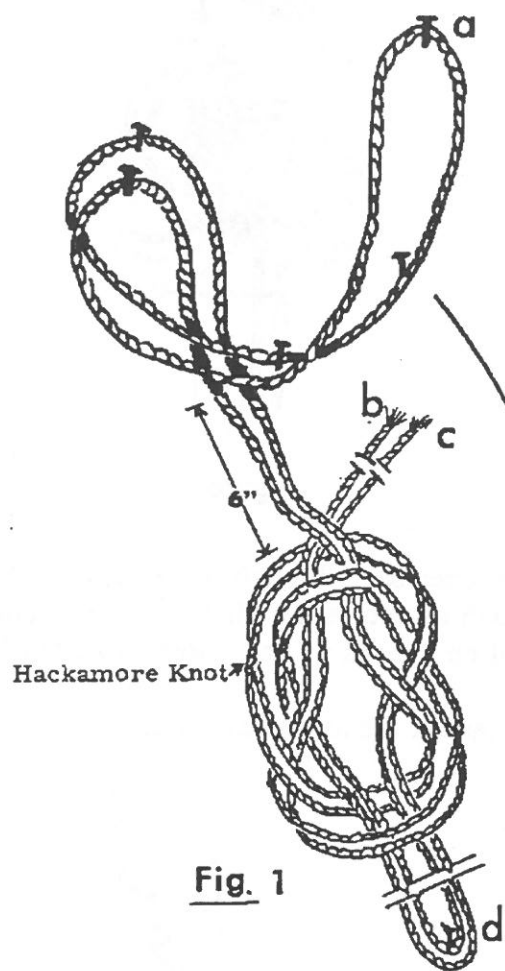


Fig. 1



Fig. 2

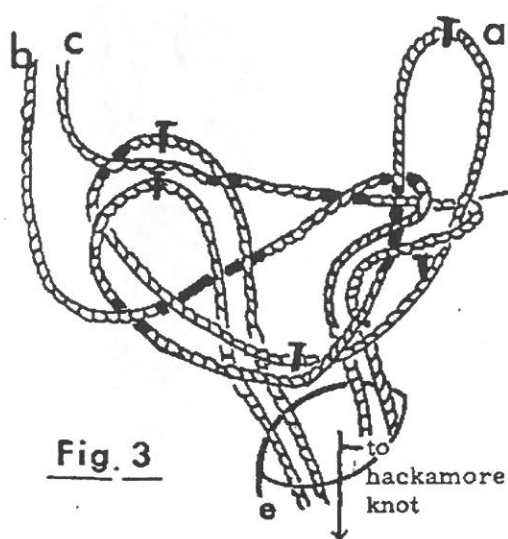


Fig. 3

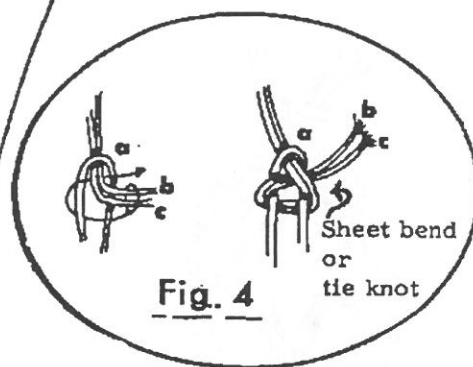
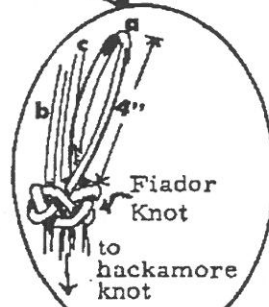


Fig. 4



THE FIADOR KNOT

The Fiador Knot is tied about 6 inches above the Hackamore Knot, but this must be adjusted to suit the horse's head.

To facilitate tying, use a board, a hammer, and six nails and place as shown in Fig. 1. The distance between the bottom nail and the top nail should be about one foot, and between those on the right and those on the left, about 6 inches.

Secure loops "d" of the hackamore knot over the lower nail. Then, working with loop "a" pass it around the nails as shown in Fig. 1. Be careful to cross the strands as shown. Finally loop "a" over the top nail.

Next, work the two ends marked "b" and "c" as shown in Fig. 2.

Complete the knot as shown in Fig. 3.

Now, take the loop "a" and the ends "b" and "c" in one hand—and the ropes at "e" in the other hand and remove the rope from the nails. Draw the hands apart, tightening the knot. With a little coaxing, the Fiador Knot will emerge as shown in the smaller oval picture.

Use the tie knot or sheet bend shown in Fig. 4 to adjust and fasten the rope around the horse's neck.

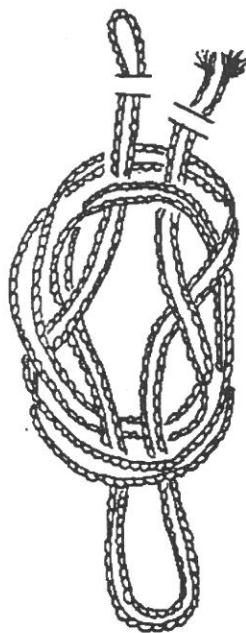


Fig. 5

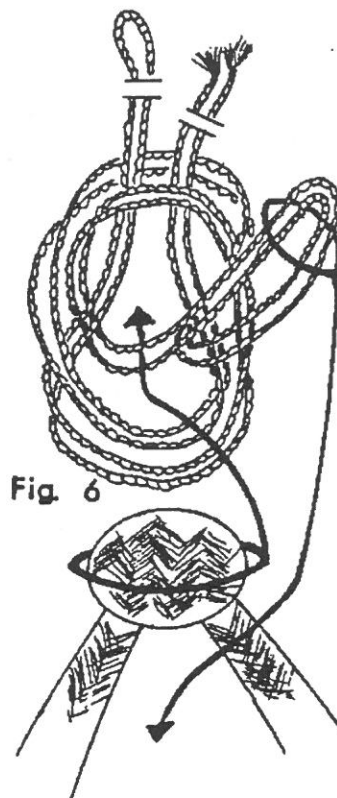


Fig. 6

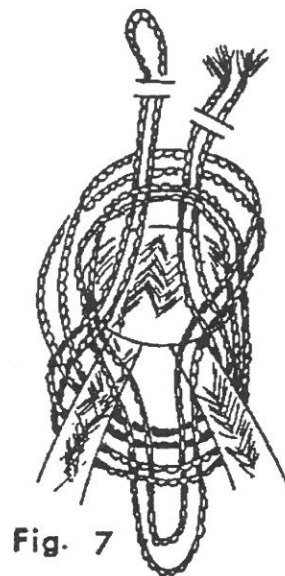


Fig. 7

After the Fiador Knot is tied the Bosal Heel Knot can be put through the Hackamore Knot as shown in Figures 5, 6, and 7.

ASSEMBLING THE HACKAMORE HEADSTALL

The slit-braid hackamore headstall has been attached to the bosal along with the Hackamore Knot and Fiador Knot. All that is left to do is to thread the two loose-end ropes up through the 3/4 inch loop left in the brow band. Thread the ropes through on the off-side first and then through on the near-side. Attach the reins to the bosal in front of the hackamore knot. This can be done in a number of ways.