1949

Rope Club Manual: Extension Circular 7-01-2 1949

Virgil Overholt

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Rope Club Manual

COOPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS
UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE, AND THE UNITED STATES DEPARTMENT OF AGRICULTURE COOPERATING,
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**A Revision of Original Publication**

By Virgil Overholt of Ohio State University
Problem I

GENERAL INFORMATION ABOUT ROPE

This circular is a revised printing of Nebraska Extension Circular 700. It is designed specifically for use of 4-H Rope Clubs, but may be used as a handy reference for persons interested in the use of rope.

FIBERS FROM WHICH ROPE IS MADE

The two principal fibers from which rope is made are sisal and Manila hemp. The former, which is the coarser and the cheaper, comes from Yucatan, and the latter, from the Philippine Islands. Due largely to its lower price, sisal hemp furnishes the raw material for the manufacture of more than half of all binder twine used. It is commonly known as "Standard Twine." Manila rope is softer, more pliable, and stronger than sisal rope. Manila rope is to be recommended wherever its use will justify the added cost. Some manufacturers of high grade rope identify their product by weaving into it a yarn, cord, or strand of a distinctive color.

Cotton is sometimes used in the manufacture of rope. Braided cotton ropes are commonly used about the house for clothes lines and window cords, and twisted cotton rope is frequently made into halters for young animals. Cotton makes an especially valuable rope for this purpose. It is soft and pliable, hence does not irritate the tender skin of a young animal. Other fibers sometimes used in the manufacture of rope are common hemp, flax, jute, and coir, or cocoanut-husk fiber.

THE CONSTRUCTION OF ROPE

A rope is made of twisted fibers so intertwined as to form a thick cord capable of withstanding a severe strain. The twisting holds the fibers together by friction, when a strain is applied to the whole; it also has a tendency to prevent moisture from penetrating the rope.

The direction of twist is indicated by the terms "left hand" and "right hand" or "with the sun". To determine the direction of twist, face the sun and point a portion of the yarn, strand, or rope toward it. If the direction of twist is the same as that of the sun's motion, it is said to be "right hand", or "with the sun", and "left hand", if in the opposite direction.
A weight freely suspended by a rope will tend to untwist and lengthen it. Fig. 1 shows the manner in which this tendency is overcome. A number of fibers are first twisted into a yarn in a "right hand" direction as shown in C. From two to twenty yarns are formed "left hand" into a strand at B. Three strands are laid up "right hand" into a hawser-laid rope, as shown at A. In each of these successive steps, the twisting has been in opposite directions. As soon as the rope as a whole begins to untwist, the individual strands forming it are twisted tighter.

The rope can untwist only far enough to bring these opposing forces to equilibrium.

KINDS OF ROPE

Three strands laid up in a right hand direction, as shown in Fig. 2, form a hawser-laid rope.

Four strands laid up in a right hand direction around a central core, as illustrated in Fig. 3, form a shroud-laid rope.
Three hawser-laid ropes laid up in a left hand direction form a cable-laid rope.

Most of the rope used on the farm is hawser-laid. Shroud-laid hay ropes and halters are frequently seen but the principal use of this type of rope is for power transmission. The larger ropes used in well drilling and mining are cable-laid. The size of a given type of rope is varied only by changing the number of yarns in a strand.

THE WEIGHT OF ROPE

Rope of all kinds is usually measured by giving its diameter in inches. It is sold by weight, but is ordered by giving the diameter and number of feet wanted.

To calculate the number of feet per pound of Manila rope divide 3.4 by the square of the diameter in inches. For example, the number of feet in a pound of 3/4 inch rope would be

\[
\frac{3/4 \times 3/4}{9/16} = 6,
\]

the number of feet per pound.

These results will vary as much as 12 per cent from the actual measurements of the weight of new rope. The weight will be considerably increased by storing in a damp cellar or by the addition of preservatives.

<table>
<thead>
<tr>
<th>Diameter Inches</th>
<th>Circumference Inches</th>
<th>Weight of 100 Feet of Rope, Pounds</th>
<th>Length of Each Pound of Rope, Feet, Inches</th>
<th>Safe Load, Pounds</th>
<th>Breaking Load, Pounds</th>
<th>Diameter of Pulley Inches</th>
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<td>0 61/2</td>
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<td>56,700</td>
<td>24</td>
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* From the rules by C. W. Hunt and Spencer Miller.
THE STRENGTH OF ROPE

In choosing a rope for a given purpose, a large factor of safety should be used. For example, to elevate 775 pounds of hay at a time, do not select a rope whose maximum, or breaking strength is 775 or even 1000 pounds, but about seven times this amount. Table 1 shows the breaking strength of a new 7/8-inch Manila rope to be 5440 pounds. One-seventh of 5440 is 777 pounds, or about the same as the load to be lifted. Therefore, a 7/8 inch rope is the proper size for this purpose.

For a new Manila rope, the breaking strength in pounds may be roughly calculated as follows: Square the diameter in inches and multiply the product by 7200. The safe load can be found by dividing the breaking strength by seven. Thus, the breaking strength in pounds of 1/2 inch Manila rope would be

\[
\frac{1}{2} \times \frac{1}{2} \times 7200 = 1800
\]

and the safe load in pounds would be

\[
\frac{1800}{7} = 257
\]

Four-strand ropes are slightly stronger than three strand ropes of the same size. Boiling in water for from 15 to 20 minutes will make a hard rope soft and pliable, but will decrease its strength about 20 per cent. Exposure and wear are the most important factors in decreasing the strength of cordage and a liberal allowance should be made for both when estimating strength of old rope.

INSPECTION OF ROPE

A rope may appear badly worn on the outside and still be much better than another which looks good on the surface. There is chafing of the inner fibers against each other when a rope is bent in going through a pulley. Many of the central fibers become broken into dust and short pieces.

To detect this condition open the rope with the fingers, hold above a light-colored paper and tap. If the rope is chafed badly "rope dust" will fall upon the paper when the rope is tapped. A rope otherwise in excellent condition may have a broken strand. Such a defect can easily be repaired as shown in Figs. 74, 75, and 76. This information is of value in buying a second-hand hay rope.

COILING AND UNCOILING OF ROPE

Rope as it comes from the manufacturers is coiled into bales usually containing 1000 feet each. To uncoil rope from a bale, begin with the end in the center of the coil. When this end is pulled out,
it should uncoil in a left hand direction, or opposite to the direction of motion of the hands of a clock. If it uncoils in the wrong direction, turn the bale over and pull the end through the center of the coil from the opposite side. Fig. 4.

In coiling a piece of rope on a floor or on the ground the direction should be right hand, or with the sun. If rope is coiled and uncoiled in this manner, it will not kink or snarl badly. Fig. 5.

ROPE TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yarn</td>
<td>Fibers twisted together.</td>
</tr>
<tr>
<td>Thread</td>
<td>Two or more small yarns twisted together.</td>
</tr>
<tr>
<td>String</td>
<td>The same as thread but a little larger yarns.</td>
</tr>
<tr>
<td>Strand</td>
<td>Two or more large yarns twisted together.</td>
</tr>
<tr>
<td>Cord</td>
<td>Several threads twisted together.</td>
</tr>
<tr>
<td>Rope</td>
<td>Several strands twisted together.</td>
</tr>
<tr>
<td>Hawser</td>
<td>A rope of three strands.</td>
</tr>
<tr>
<td>Shroud-Laid</td>
<td>A rope of four strands.</td>
</tr>
<tr>
<td>Short end</td>
<td>That part of the rope between the point of work and the nearer end.</td>
</tr>
<tr>
<td>Long end</td>
<td>The opposite end from the short end.</td>
</tr>
</tbody>
</table>

Yarns are laid up left-handed into strands. Strands are laid up right-handed into rope.

Lay means twisting strands together in making the rope. Spliced means joining to another rope by interweaving the strands. Whipped means winding a string around the end to prevent untwisting. Haul means to pull on a rope. Taut means to draw tight.
Problem II

FINISHING THE END OF A ROPE

A dealer handling rope often has several waste pieces which usually are destroyed or disposed of in one manner or another. The short pieces of rope that hold a coil of rope together while it is being shipped are excellent examples of the pieces that cannot be sold. When a club leader or a club member buys a piece of rope, most dealers would gladly throw in a few of these waste pieces which make excellent practice material.

WHIPPING THE END OF THE ROPE

Ropes that are to pass through pulleys or other small openings should be finished by whipping. A rope is whipped as follows:

Make a loop in one end of a 30 inch cord. Hold the loop along the rope as shown in Fig. 6 (a). Wrap the long end b of the cord tightly about the rope in the same direction in which the strands are twisted, as in (b).

When within about one-half inch of the end of the rope, slip the end b of the cord through the loop as shown in (c).

With end a pull the loop beneath the whipping as far as possible, as shown in (d). Both ends may now be cut close to the rope.

The finished end is shown in (e).

Soaking the whipping in waterproof cement makes the job more secure.
A knot proper is a knob formed in a piece of rope by interweaving its strands and serves as a stopper or button, as a wall knot, Fig. 21. A bend is a method of fastening one rope to another, or to a ring, loop etc., by passing the rope through a loop and fastening it back around itself, as the square knot, Fig. 23 (a) or the bowline, Fig. 39. Bends are commonly thought of as knots.

A hitch is a temporary knot or noose by which a rope is fastened around a timber, pipe, or post so as to be readily undone, as the timber hitch, Fig. 45. These distinctions are very loose in their application. Most of the knots ordinarily used are, strictly speaking, bends.

Knots owe their importance to the frictional resistance of the rope which prevents the parts of the rope from slipping and thus untying the knot. A knot or a hitch must be so devised that the tight part of the rope must bear on the free end in such a manner as to pinch and hold it. In a knot, the free end is held against another tight part of the rope; in a hitch, against the object to which the rope is attached.

The elements entering into the formation of knots, bends, and hitches are the round turn, Fig. 7; the open bight or loop, Fig. 8, and the bight, Fig. 9. The reader should become thoroughly familiar with these three terms for they are frequently used in describing the knots found in this circular.

**KNOTS AT THE END OF THE ROPE**

The Simple or Overhand Knot - This knot is the simplest of all knots. It is used to prevent the ends of the rope from untwisting and to form a knob in the end of a rope. It is tied by making a bight in the rope and pushing the end through the bight, as shown in Fig. 10.
The Figure Eight Knot - The figure eight knot is used to form a knot on the end of a rope. It is better for this purpose than the overhand knot which it resembles. The method of tying is shown in Figs. 11 and 12.

The Wall Knot with Crown - The wall knot with crown is used to prevent the end of a rope from untwisting when a distinct enlargement is not objectionable. It also makes a desirable knot to prevent the end of the rope from slipping through small openings, as when rope handles are used on boxes. It is tied as follows:

Unwrap about five turns of the rope. Make a bight in strand a as shown in Fig. 13. Bring strand b down around strand a as indicated by arrow in Fig. 13 and shown in Fig. 14. Move strand c around strand b and through the bight in strand a as indicated in Fig. 14 and shown in Fig. 15.
Draw the knot up tight by grasping it in one hand as shown in Fig. 16. The finished wall knot is shown in Fig. 17. This is sufficient to prevent the end of rope from untwisting.

To make a neat round knob, the wall knot should be crowned as follows:

Move end of strand a between b and c as shown in Fig. 18. Bend strand c between the strand b and loop in strand a, as shown in Fig. 19. Move strand b through loop in strand a as indicated by arrow in Fig. 19 and shown in Fig. 20.
Draw the knot tight, cut off the loose strands and it should appear as in Fig. 21.

As a definite requirement in this lesson, two methods of finishing the end of a rope, namely, whipping the end and the wall knot with crown, must be practiced until they can be tied from memory. This is true of all the rest of the exercises in this manual. Record in your record book the number of times each one of the knots was tied and the time devoted to tying each one.
There are several knots that can be used for tying pieces of rope, twine, or string together. Perhaps the one most commonly used is the square knot, which must be practiced until it can be tied from memory.

THE SQUARE KNOT

The square knot is the most common knot used in tying two cords together. It will not slip but draws tight and is often not easily untied. It is a good knot for tying binder twine together. It is tied as follows:

Bring the two ends together and cross them as shown in Fig. 22 (a). Place end a across b as shown in (b) and then move a around b as shown in (c). Care should be taken to have both parts of one end on the same side of the loop formed in the opposite end, otherwise a granny knot, rather than a square knot, will result. Be sure to observe this difference. The finished square knot is shown in Fig. 23 (a) and the granny knot in (b). The granny knot should never be tied. It will often slip and is still harder to untie than the square knot. It is very often tied by those unfamiliar with the difference between the two.
THE SURGEON'S KNOT

This knot, Fig. 24 resembles the square knot except that the first part has been given two twists instead of one. As its name implies, it is used by surgeons in sewing up wounds. It may also be used in tying any small cords together. The extra twist in the first part prevents the knot from slipping while the second part is being drawn up.

---

THE MILLER'S KNOT

This is the best knot for tying sacks and the one universally used by millers. It is tied as follows: Place the top of the sack between
thumb and forefinger of one hand. Place twine in the position shown in Fig. 25. Bring the long end a around the sack, passing under the arm by which sack is held as indicated by arrow in Fig. 25 and shown in Fig. 26. Give the long end a of twine one more turn, again passing under the arm by which sack is held as indicated by arrow in Fig. 26 and shown in Fig. 27. Place end a of twine under forefinger of hand by which sack is held as shown in Fig. 28. With this finger pull end a up under band as shown in Fig. 29. The finished knot is shown in Fig. 30.
Problem IV

KNOTS FOR FORMING LOOPS

Among the knots discussed in this lesson are two which stand out as being very practical knots on the farm, namely, the bowline and the slip knot. Practice tying both of these until they can be tied from memory.

THE SLIP KNOT

The slip knot is used to form a loop that will slip up tight around an object. It may be tied as follows:

Take the rope in the right hand, as shown in Fig. 31. With the left hand, reach through the bight thus formed and grasp the long portion of the rope, as shown in Fig. 32. Pull loop out through the bight, as shown in Fig. 33.

THE SLIP KNOT AND HALF-HITCH

The short end of the rope in a slip knot is sometimes given a half hitch, as shown in Fig. 34. It is more secure than the ordinary slip knot, and the little time required to throw in the half hitch may be time well spent.

If heavy loads are lifted with a slip knot, it draws very tight and is difficult to untie. For this reason it is not so desirable as the bowline for forming a loop in the end of a rope.

THE BOWLINE

The bowline has rightfully been called the king of knots. It can be used wherever a loop is wanted in the end of a rope. It never slips and is always easily untied.
These qualities make it a good knot for tying a hay rope to a double-tree. It may be tied as follows:

Place end of rope through a ring or around an object. Throw a bight having the long portion of the rope on side of bight nearest you as shown in Fig. 35. Move end of rope through the bight in the direction shown in Fig. 36. Bring end of rope around the long portion as shown in Fig. 37. Next push end of rope up through bight as seen in Fig. 38. The finished knot is shown in Fig. 39.
THE ANCHOR BEND

The anchor bend is used to secure a rope to a ring. 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 half hitches about the rope as shown in Fig. 40.

THE NON-SLIPPING HALTER TIE

The non-slipping type of halter tie is used in fastening a halter rope to a ring. It is tied in the following manner:

Place the end of the rope through the ring and around beneath the long portion as shown in Fig. 41. Move the end of the rope as indicated by arrow in Fig. 41 and shown in Fig. 42. Draw the knot tight. When completed, it will appear as shown in Fig. 43.
Problem V

HITCHES

Several hitches are discussed in this problem. Out of the list two simple ones, the half hitch and the clove hitch must be practiced until they can be made from memory.

THE HALF HITCH

The half hitch is used to secure a rope to a timber temporarily. It is shown in Fig. 44.

THE TIMBER HITCH

The timber hitch is used in moving timbers and large pipe. It is more secure than the half hitch and is made in the same manner except that the short end of the rope is given one or two twists about the long portion. This hitch is shown in Fig. 45.

THE TIMBER HITCH AND HALF HITCH

For lifting heavy timbers the timber hitch and half hitch are safer than either of the two preceding hitches. It is shown in Fig. 46. The half hitch is made first as shown at a and the timber hitch as at b.

Fig. 44  Fig. 45  Fig. 46
THE CLOVE HITCH

The clove hitch is used to fasten a rope to a stake, pipe or post. It is the hitch commonly used for securing ropes to tent stakes. It is tied as follows:

First Method. Give one end of the rope two turns about the post, crossing over the long portion and placing the short end beneath the second turn as shown in Figs. 47 and 48 below.

Second Method. Throw one bight in the rope to right and another to the left as shown in Fig. 49 (a). Move bight a over on bight b as indicated by the arrow in Fig. 49 (a) and shown in (b). Place the hitch over the end of post and pull on long end in any direction.
THE BLACKWALL HITCH

This hitch is used to fasten a rope to a hook. It is made in the following manner. Hold the rope in the position shown in Fig. 50. Place end a in the hook as indicated by arrow. Next place b in the hook on the top of a, also as indicated by arrow. The finished hitch is shown in Fig. 51.

THE SHEEP SHANK

The sheep shank is a hitch used temporarily to shorten a rope, and is tied in the following manner:

Make two loops in the rope, as shown in Fig. 52. Make bight in main part of rope near loop a. Push a through this bight, as shown in Fig. 53. Likewise make a bight in main part of rope near loop b and push b through this loop which completes the hitch, as shown in Fig. 54.
Problem VI

ROPE SPlicing

The principal steps in splicing a rope are (1) unlaying the strands, (2) placing the ends together, (3) tucking the ends of strands.

Two splices are here described, a long splice and a short splice. In each of them, and also in the woven crown, spliced eye, and rope halters, the ends of the strands are tucked in exactly the same way. Hence, if one splice is mastered, the others are easily learned. No attempt should be made to learn how to splice a rope without having pieces of rope in the hands and actually performing operations as they are studied from the text and the illustrations.

THE SHORT SPlice

Where it is not necessary for a rope to pass through a small pulley or where only a small amount of rope can be spared for making a splice, the short splice is very satisfactory. It is as strong as the long splice. The method of making is as follows:

Count seven turns from the ends to be spliced and tie strings about the ropes at these points. One turn of a rope is that part shown in Fig. 55 at a. Unlay the ends back to the points where the strings
are tied, as shown in Fig. 55. Before placing the two parts together, be sure to open each end as shown in Fig. 56, and not as shown in Fig. 57.

That is, no strand should cross between the other two. Bring the two parts together so that each strand of one part alternates with a strand of the other as shown in Fig. 58. With a string tie one set of strands about the rope as shown in Fig. 59 at a. Next begin tucking the strands from the left side by bringing a strand up over the nearest strand from the right side and down under the next as shown by the marline-spike in Fig. 59. The tucking should be done about at right angles to the direction of twist in the rope. Give each of the other two strands, from the left, one tuck in exactly the same manner. The splice should now appear as shown in Fig. 60. Next cut the cord shown in Fig. 60 at a and give each strand, from the right side, one tuck, just as was done with the strands from the left. Fig. 61 shows all
strands tucked once. Give each of the six strands two more tucks, always remembering to bring the strand to be tucked over the nearest one to it and under the second in a direction about at right angles to the direction of twist in the rope.

![Fig. 61](image1)

Next divide each strand into two parts as shown in the left of Fig. 62. Give one part of each strand two more tucks. Cut all the ends off and roll the splice beneath the shoe or between boards to give a smooth appearance. The finished splice should appear as shown in Fig. 63.

![Fig. 62](image2)

![Fig. 63](image3)
THE LONG SPLICE

The long splice is more desirable than the short splice where it is necessary for the rope to pass through small pulleys. It also has a neater appearance.

To make a long splice in a three-strand rope, count fifteen turns from the ends to be spliced and tie string about the rope at the points thus determined. Unlay the strands back to the strings as shown in the lower part of Fig. 64. Before bringing the two parts together be sure to open each end as shown by Fig. 56 of the short splice and not as in Fig. 57, that is, no strand should cross between the other two. Bring the two parts together, making each strand from one end alternate with a strand from the other, as in Fig. 64 at a. Next, beginning at the point where the two parts are placed together, unlay one of the strands to the right. Lay carefully in its place the corresponding strand from the left. This latter operation should follow closely the unlaying of the strand to the right. Stop when within five turns of the end of the strand from the left, as shown in Fig. 65 at b. There are still two pairs of strands left at the point a where the ends were placed together. Run one of these pairs to the left exactly as we ran the first pair to the right. This is shown in Fig. 66 at c. Before starting to
unlay toward c, Figs. 66 and 67, be sure that the two strands remaining at a, Figs. 66 and 67, fit together as a pair. Next cut all the long ends of the strands off about five turns from the main rope, as shown in Fig. 67.

Fig. 67

The next part of the splicing consists in tucking the ends of the strands. There are three pairs of strands. All are tucked in exactly the same way which is as follows:

Fig. 68

Be sure that the ends of the strands pass each other as illustrated in Fig. 68 at a and not as at b. Bring the strand from the right up
over the nearest strand from the left and under the next strand, as in Figs. 69 and 70. Give the strand from the left one tuck, as shown by the marline-spike in the upper part of Fig. 71. The completed tuck is shown in the lower part of Fig. 71. Each strand should now be given two more tucks in a direction almost at right angles to the direction of twist in the rope as shown in Fig. 72. When all three pairs of strands have been tucked, cut the ends off and smooth by rolling beneath the shoe or between two boards. The finished splice should appear as shown in Fig. 73.
MENDING A BROKEN STRAND

It occasionally happens that one strand of rope breaks while the other two are in good condition, as shown in Fig. 74. It may be repaired as follows:

Unlay each broken portion of the strand about six turns. Secure twenty turns of a strand of rope of the same size as the one to be mended. Lay this strand in the space from which the broken strand has been removed as in Fig. 75. Finish the two pairs of strands as in making the long splice, Figs. 68 to 72. The mended rope is shown in Fig. 76.

THE SPICLED EYE

The spliced eye is used for fastening a rope to a ring or for making a permanent loop in the end of a rope. It is made as follows: Unlay five turns of the rope. Tuck strand a beneath a strand in long part of the rope as shown in Fig. 77. Tuck strand b by bringing it over the strand under which strand a is tucked and under the next strand as shown in Fig. 78. Likewise tuck strand c by bringing it over
the strand under which b is tucked and beneath the next strand. The three strands have now been tucked once, each beneath different strands of the main rope. This is shown in Fig. 79. Give each strand two more tucks as in making the short splice. Fig. 80 shows strand a being tucked the second time. The finished eye is shown in Fig. 81.

Fig. 77

Fig. 78

Fig. 79

Fig. 80

Fig. 81

THE SPLICED CROWN

Where a slight enlargement is not objectionable the spliced crown is a desirable way to finish the end of a rope. It is made as follows:
Unlay six turns of the rope. Form a loop in strand a, bringing the end between strands b and c as shown in Fig. 82. Next move strand c between the loop in strand a and strand b as in Fig. 83. Pull strand b through loop in strand a as indicated by arrow in Fig. 83 and shown in Fig. 84. Draw the crown thus formed up tight as in Fig. 85. Give each strand one tuck by bringing it over the strand nearest to it and under the second, as in rope splicing. This is shown in Fig. 86. Fig. 87 shows the first tuck completed. Give each strand two more tucks and cut the ends of the strands off. Smooth the crown by rolling beneath the shoe. The finished crown is shown in Fig. 88.
Problem VII

ROPE HALTERS

Rope halters are inexpensive, yet very convenient and serviceable, especially in handling cattle. For the work in this problem the various halters shown should all be made. Although the knowledge of making rope halters is very valuable, no requirements have been set for learning to make these halters without referring to notes or illustrations.

Rope halters are commonly used in tying cattle. Since cattle grow rapidly, the halters are made readily adjustable. Manila rope is preferred as manila hemp is stronger, softer and more pliable than sisal hemp. Rope of various diameters may be used for cattle of different ages, but a halter made of 12 feet of five-eighths inch rope is most common with club calves. While end splices may be used to finish the rope ends, whipping is usually done for it leaves the end of the lead small enough to be passed easily through tie rings. (Fig. 6, Page 8).

Completed rope halter is at upper right. It has the desirable features of a halter.

THE LOOP

A marline-spike is used to make separation of strands easier. A marline-spike is a round piece of iron or wood pointed at one end, the
other end serving as a handle. The pointed end may be flattened somewhat. After pushing it between two strands of rope, the strands are easily spread by a one-fourth roll of the marline-spike. Take the rope in the left hand. Allow 22 or 23 inches to extend to the right, between the hand and the whipping, for the short end. Grasp the rope between the thumb and forefinger at this point and, with the marline-spike, open the rope by lifting two strands. Bring the short end around, clockwise (to the right) and put it through the opening in the rope. This forms a loop. Close this loop until the inside diameter is about twice the thickness of the rope. A loop that is too small closes too tightly when the halter shrinks upon getting wet. Next, grasp the loop with the right hand. With the marline-spike, open the short end of the rope outside but next to the loop, lifting one strand. Then take the long end of the rope, bring it from the left and push it through the opening made in the short end. This completes the loop with an equal number of strands on each side of the splice. This procedure leaves the inside of the splice very smooth where it bears against the jaw of the calf.

THE NOSE PIECE

The short end of the rope becomes the nose piece of the halter. Measure off 11 inches of it from the loop. With the hands two or three inches apart, one at each side of this point, grasp the rope firmly with one hand and untwist it with the other. Then close the distance between the hands slightly, keeping the rope untwisted. This allows each strand to form a separate loop. These loops may be opened further and brought into line by working the marline-spike through all three at once. Take the long end of the rope and tuck it through all three loops starting with the inside loop. Draw it through until the loop formed becomes the right size for the head stall or head piece of the halter. By putting the long end through the loop at the other end of the nose piece, the halter is completed. This halter is readily but safely adjustable.

The so-called double loop halter in which a loop is made at each end of the nose piece is objectionable for use in tying because the end loop, called an eye splice, usually adjusts too easily to be safe.