

KNOTS, SPLICES
AND ROPE
WORK

A. HYATT VERRILL

KNOTS, SPLICES and ROPE WORK
A PRACTICAL TREATISE

By

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INTRODUCTION

The history of ropes and knots is so dim and ancient that really little is known of their origin. That earliest man used cordage of some kind and by his ingenuity succeeded in tying the material together, is indisputable, for the most ancient carvings and decorations of prehistoric man show knots in several forms. Doubtless the trailing vines and plants first suggested ropes to human beings; and it is quite probable that these same vines, in their various twistings and twinings, gave man his first idea of knots.

Since the earliest times knots have been everywhere interwoven with human affairs; jugglers have used them in their tricks; they have become almost a part of many occupations and trades, while in song and story they have become the symbol of steadfastness and strength.

Few realize the importance that knots and cordage have played in the world's history, but if it had not been for these simple and every-day things, which as a rule are given far too little consideration, the human race could never have developed beyond savages. Indeed, I am not sure but it would be safe to state that the real difference between civilized and savage man consists largely in the knowledge of knots and rope work. No cloth could be woven, no net or seine knitted, no bow strung and no craft sailed on lake or sea without numerous knots and proper lines or ropes; and Columbus himself would have been far more handicapped without knots than without a compass.

History abounds with mention of knots, and in the eighth book of "Odyssey" Ulysses is represented as securing various articles of raiment by a rope fastened in a "knot closed with Circean art"; and as further proof of the prominence the ancients gave to knots the famous Gordian Knot may be mentioned. Probably no one will ever learn just how this fabulous knot was tied, and like many modern knots it was doubtless far easier for Alexander to cut it than to untie it.

The old sorcerers used knots in various ways, and the witches of Lapland sold sailors so-called "Wind Knots," which were untied by the sailors when they desired a particular wind. Even modern conjurors and wizards use knots extensively in their exhibitions and upon the accuracy and manner in which their knots are tied depends the success of their tricks.

In heraldry many knots have been used as symbols and badges and many old Coats of Arms bear intricate and handsome knots, or entwined ropes, emblazoned upon them.

As to the utility of knots and rope work there can be no question. A little knowledge of knots has saved many a life in storm and wreck, and if every one knew how to quickly and securely tie a knot there would be far fewer casualties in hotel and similar fires. In a thousand ways and times a knowledge of rope and knots is useful and many times necessary. Many an accident has occurred through a knot or splice being improperly formed, and even in tying an ordinary bundle or "roping" a trunk or box few people tie a knot that is secure and yet readily undone and quickly made. In a life of travel and adventure in out-of-the-way places, in yachting or boating, in hunting or fishing, and even in motoring, to command a number of good knots and splices is to make life safer, easier, and more enjoyable, aside from the real pleasure one may find in learning the interesting art of knot-tying.

Through countless ages the various forms of knots and fastenings for rope, cable, or cord have been developed; the best kinds being steadily improved and handed down from generation to generation, while the poor or inferior fastenings have been discarded by those whose callings required the use of cordage.

Gradually, too, each profession or trade has adopted the knots best suited to its requirements, and thus we find the Sailor's Knot; the Weaver's Knot; Fishermen's knots; Builders' knots; Butchers' knots; and many others which have taken their names from the use to which they are especially adapted.

In addition to these useful knots, there are many kinds of ornamental or fancy knots used in ornamenting the ends of ropes, decorating shrouds of vessels, railings, and similar objects; while certain braids or plaits, formed by a series of knots, are widely used aboard ship and on land.

In many cases ropes or cable must be joined in such a way that they present a smooth and even surface and for such purposes splices are used, while knots used merely as temporary fastenings and which must be readily and quickly tied and untied are commonly known as "bends" or "hitches." Oddly enough, it is far easier to tie a poor knot than a good one, and in ninety-nine cases out of a hundred the tyro, when attempting to join two ropes together, will tie either a "slippery" or a "jamming" knot and will seldom succeed in making a recognized and "ship-shape" knot of any sort.

The number of knots, ties, bends, hitches, splices, and shortenings in use is almost unlimited and they are most confusing and bewildering to the uninitiated. The most useful and ornamental, as well as the most reliable, are comparatively few in number, and in reality each knot learned leads readily to another; in the following pages I have endeavored to describe them in such a manner that their construction may be readily understood and mastered.

THE AUTHOR.

JANUARY, 1917.

CHAPTER I

CORDAGE

Before taking up the matter of knots and splices in detail it may be well to give attention to cordage in general. Cordage, in its broadest sense, includes all forms and kinds of rope, string, twine, cable, etc., formed of braided or twisted strands.

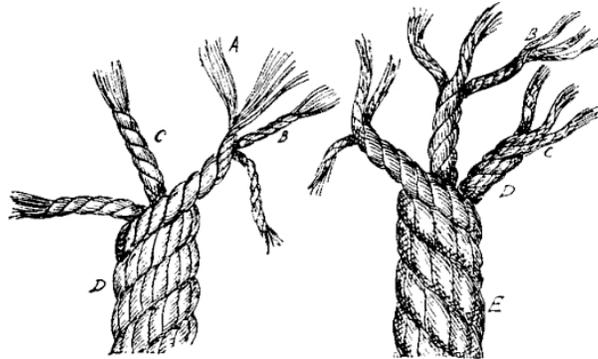


FIG. 1.—Construction of rope.

In making a rope or line the fibres (*A*, Fig. 1) of hemp, jute, cotton, or other material are loosely twisted together to form what is technically known as a "yarn" (*B*, Fig. 1). When two or more yarns are twisted together they form a "strand" (*C*, Fig. 1). Three or more strands form a rope (*D*, Fig. 1), and three ropes form a cable (*E*, Fig. 1). To form a strand the yarns are twisted together in the opposite direction from that in which the original fibres were twisted; to form a rope the strands are twisted in the opposite direction from the yarns of the strands, and to form a cable each rope is twisted opposite from the twist of the strands. In this way the natural tendency for each yarn, strand, or rope to untwist serves to bind or hold the whole firmly together (Fig. 1).

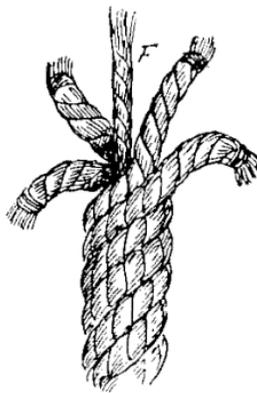


FIG. 2.—Bolt-rope.

Rope is usually three-stranded and the strands turn from left to right or "with the sun," while cable is left-handed or twisted "against the sun" (*E*, Fig. 1). Certain ropes, such as "bolt-rope" and most cables, are laid around a "core" (*F*, Fig. 2) or central strand and in many cases are four-stranded (Fig. 2).

The strength of a rope depends largely upon the strength and length of the fibres from which it is made, but the amount each yarn and strand is twisted, as well as the method used in bleaching or preparing the fibres, has much to do with the strength of the finished line.

Roughly, the strength of ropes may be calculated by multiplying the circumference of the rope in inches by itself and the fifth part of the product will be the number of tons the rope will sustain. For example, if the rope is 5 inches in circumference, $5 \times 5 = 25$, one-fifth of which is 5, the number of tons that can safely be carried on a 5-inch rope. To ascertain the weight of ordinary "right hand" rope, multiply the circumference in inches by itself and multiply, the result by the length of rope in fathoms and divide the product by 3.75. For example, to find the weight of a 5-inch rope, 50 fathoms in length: $5 \times 5 = 25$; $25 \times 50 = 1,250$; $1,250 \div 3.75 = 333\text{-}1/3$ lbs. These figures apply to Manila or hemp rope, which is the kind commonly used, but jute, sisal-flax, grass, and silk are also used considerably. Cotton rope is seldom used save for small hand-lines, clothes-lines, twine, etc., while wire rope is largely used nowadays for rigging vessels, derricks, winches, etc., but as splicing wire rope is different from the method employed in fibre rope, and as knots have no place in wire rigging, we will not consider it.

CHAPTER II

SIMPLE KNOTS AND BENDS

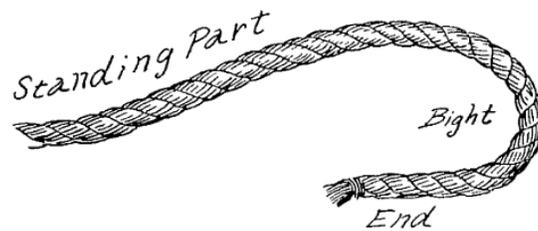


FIG. 3.—Parts of rope.

For convenience in handling rope and learning the various knots, ties, and bends, we use the terms "standing part," "bight," and "end" (Fig. 3). The *Standing Part* is the principal portion or longest part of the rope; the *Bight* is the part curved or bent while working or handling; while the *End* is that part used in forming the knot or hitch. Before commencing work the loose ends or strands of a rope should be "whipped" or "seized" to prevent the rope from unravelling; and although an expert can readily tie almost any knot, make a splice, or in fact do pretty nearly anything with a loose-ended rope, yet it is a wise plan to invariably whip the end of every rope, cable, or hawser to be handled, while a marline-spike, fid, or pointed stick will also prove of great help in working rope.

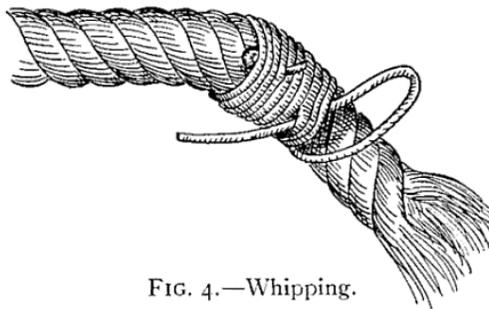


FIG. 4.—Whipping.

To whip or seize a rope-end, take a piece of twine or string and lay it on the rope an inch or two from the end, pass the twine several times around the rope, keeping the ends of the twine under the first few turns to hold it in place; then make a large loop with the free end of twine; bring it back to the rope and continue winding for three or four turns around both rope and end of twine; and then finish by drawing the loop tight by pulling on the free end (Fig. 4).

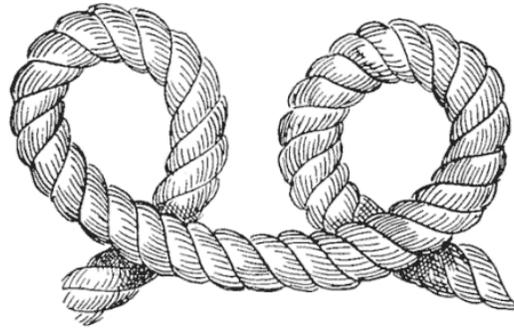


FIG. 5.—Cuckolds' necks.

All knots are begun by "loops" or rings commonly known to mariners as "Cuckolds' Necks" (Fig. 5).



FIG. 6.—Clinch.

These may be either overhand or underhand, and when a seizing or fastening of twine is placed around the two parts where they cross a useful rope ring known as a "clinch" is formed (Fig. 6).

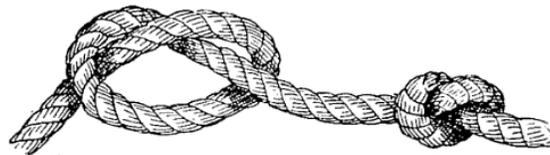


FIG. 7

FIG. 8

FIGS. 7 and 8.—Overhand knots.

If the loose end of the rope is passed over the standing part and through the "cuckold's-neck," the simplest of all knots, known as the "Overhand Knot," is made (Fig. 7). This drawn tight appears as in Fig. 8, and while so simple this knot is important, as it is frequently used in fastening the ends of yarns and strands in splicing, whipping, and seizing.

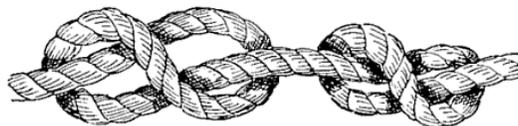


FIG. 9

FIG. 10

FIGS. 9 and 10.—Figure-eight knots.

The "Figure-Eight Knot" is almost as simple as the overhand and is plainly shown in Figs. 9 and 10.

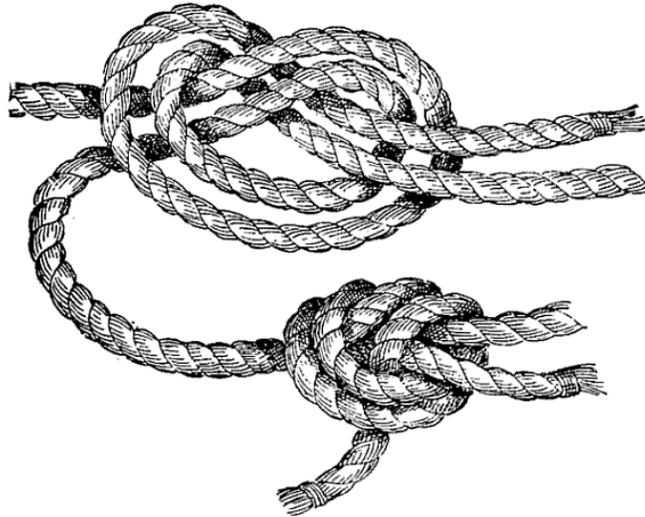


FIG. 16.—Open-hand knots.

A better way to join two ropes of unequal diameter is to use the "Open-hand Knot." This knot is shown in Fig. 16, and is very quickly and easily made; it never slips or gives, but is rather large and clumsy, and if too great a strain is put on the rope it is more likely to break at the knot than at any other spot.

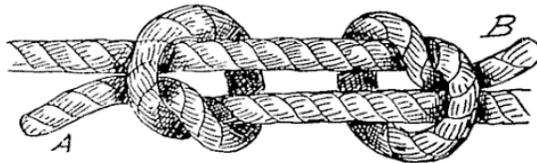


FIG. 17.—Fisherman's knot (making).

The "Fisherman's Knot," shown in Fig. 17, is a good knot and is formed by two simple overhand knots slipped over each rope, and when drawn taut appears as in Fig. 18.

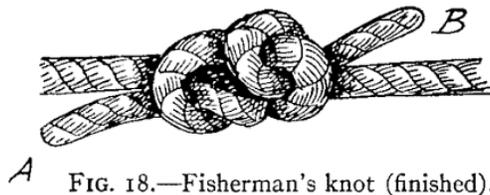


FIG. 18.—Fisherman's knot (finished).

This is an important and valuable knot for anglers, as the two lines may be drawn apart by taking hold of the ends, *A*, *B*, and a third line for a sinker, or extra hook, may be inserted between them. In joining gut lines the knot should be left slightly open and the space between wrapped with silk. This is probably the strongest known method of fastening fine lines.



FIG. 19.—Ordinary knot (finished).

The "Ordinary Knot," for fastening heavy ropes, is shown in Fig. 19.

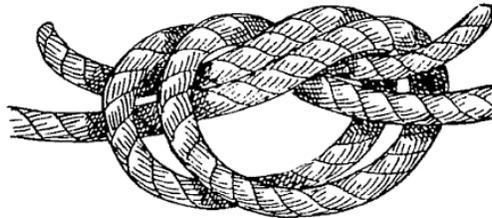


FIG. 20.—Ordinary knot (tying).

It is made by forming a simple knot and then interlacing the other rope or "following around," as shown in Fig. 20. This knot is very strong, will not slip, is easy to make, and does not strain the fibres of the rope. Moreover, ropes joined with this knot will pay out, or hang, in a straight line.



FIG. 21.—Ordinary knot (seized).

By whipping the ends to the standing parts it becomes a neat and handsome knot (Fig. 21).



FIG. 22.—Weaver's knot (complete).

The "Weaver's Knot" (Fig. 22) is more useful in joining small lines, or twine, than for rope, and for thread it is without doubt the best knot known.

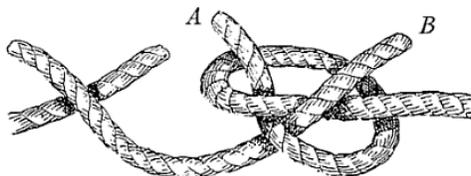


FIG. 23.—Weaver's knot (tying).

The ends are crossed as in Fig. 23. The end *A* is then looped back over the end *B*, and the end *B* is slipped through loop *C* and drawn tight.



FIG. 24.—Double figure-eight knot (complete).

Another useful and handsome knot is illustrated in Fig. 24. This is a variation of the figure-eight knot, already described, and is used where there is too much rope, or where a simple knot is desired to prevent the rope running through an eye, ring, or tackle-block.

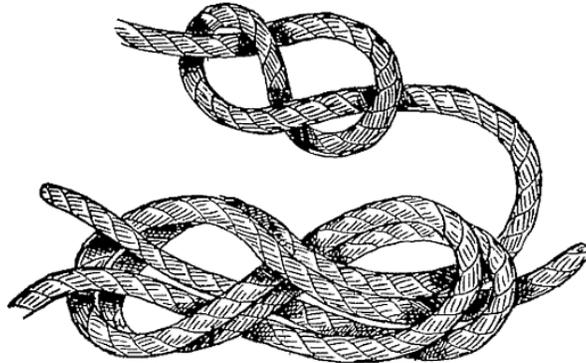


FIG. 25.—Double figure-eight knot (tying).

It is made by forming a regular figure eight and then "following round" with the other rope as in Fig. 25. It is then drawn taut and the ends seized to the standing part if desired.

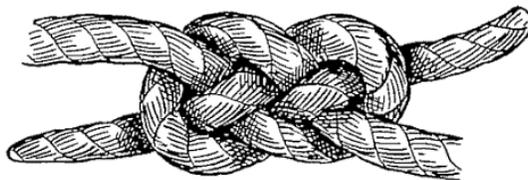


FIG. 26.—Garrick bend (finished).

Sometimes we have occasion to join two heavy or stiff ropes or hawsers, and for this purpose the "Garrick Bend" (Fig. 26) is preeminently the best of all knots. To make this knot, form a bight by laying the end of a rope on top of and across the standing part.

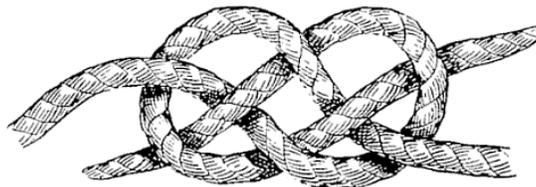


FIG. 27.—Garrick bend (tying).

Next take the end of the other rope and pass it through this bight, first down, then up, over the cross and down through the bight again, so that it comes out on the opposite side from the other end, thus bringing one end on top and the other below, as illustrated in Fig. 27. If the lines are very stiff or heavy the knot may be secured by seizing the ends to the standing parts.

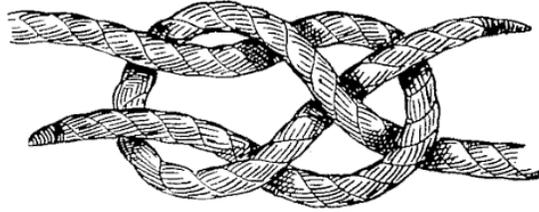


FIG. 28.—Simple hitch (hawser).

A much simpler and a far poorer knot is sometimes used in fastening two heavy ropes together. This is a simple hitch within a loop, as illustrated in Fig. 28, but while it has the advantage of being quickly and easily tied it is so inferior to the Garrick bend that I advise all to adopt the latter in its place.



FIG. 29.—Half-hitch and seizing.

When two heavy lines are to be fastened for any considerable time, a good method is to use the "Half-hitch and Seizing," shown in Fig. 29. This is a secure and easy method of fastening ropes together and it allows the rope to be handled more easily, and to pass around a winch or to be coiled much more readily, than when other knots are used.

CHAPTER III

TIES AND HITCHES

All the knots I have so far described are used mainly for fastening the two ends of a rope, or of two ropes, together. Of quite a different class are the knots used in making a rope fast to a stationary or solid object, and are known as "hitches" or "ties."

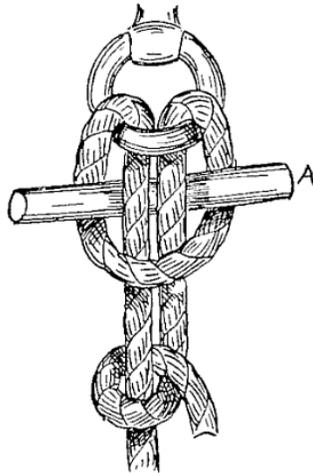


FIG. 30.—Lark's head with toggle (*A*).

One of the easiest of this class to make and one which is very useful in fastening a boat or other object where it may be necessary to release it quickly is the "Lark's Head" (Fig. 30). To make this tie, pass a bight of your rope through the ring, or other object, to which you are making fast and then pass a marline-spike, a billet of wood, or any similar object through the sides of the bight and under or behind the standing part, as shown in *A*, Fig. 30.



FIG. 31.—Lark's head with toggle (*A*) withdrawn.

The end of the rope may then be laid over and under the standing part and back over itself. This knot may be instantly released by merely pulling out the toggle.

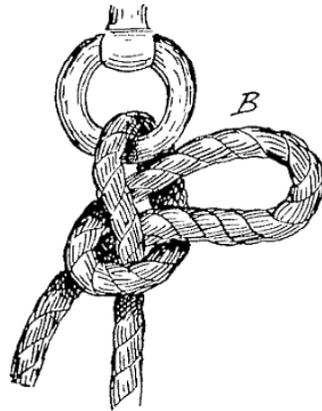


FIG. 32.—Slippery hitch (complete).

Almost as quickly made and unfastened is the "Slippery Hitch" (Fig. 32).



FIG. 33 —Slippery hitch (tying).

To make this, run the end of the rope through the ring or eye to which it is being fastened, then back over the standing part and pull a loop, or bight, back through the "cuckold's neck" thus formed (Fig. 33). To untie, merely pull on the free end.



Fig. 34.

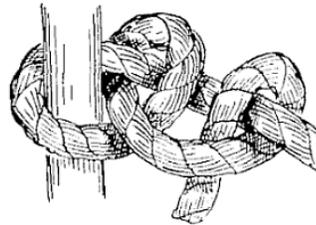


Fig. 35.

FIGS. 34 and 35.—Half-hitches.

Two half-hitches, either around a post or timber or around the standing part of the rope, make an ideal and quickly tied fastening (Figs. 34 and 35). To make these, pass the end around the post,

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