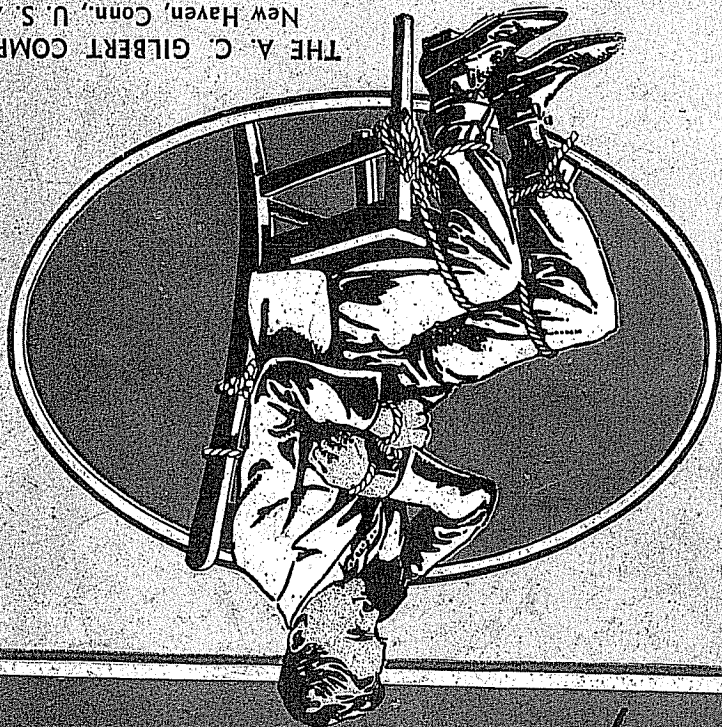




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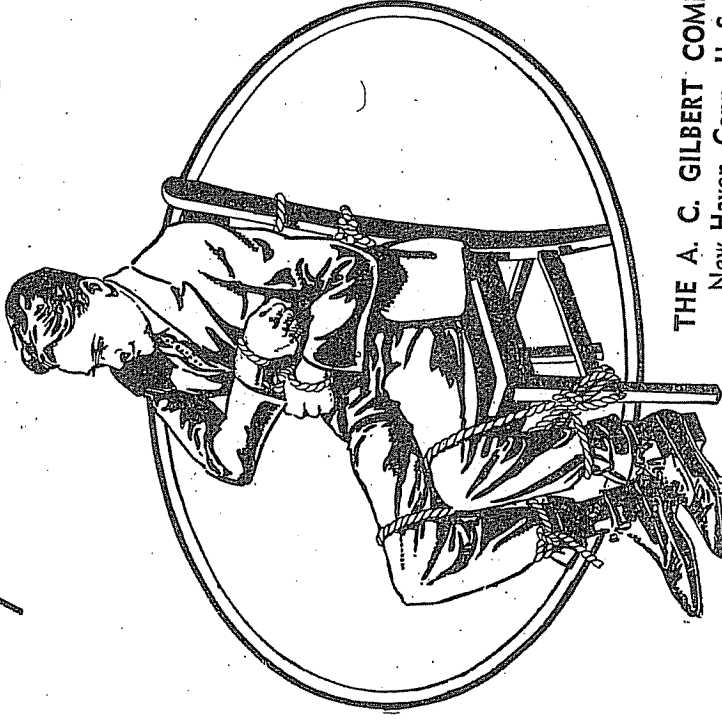
GILBERT
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KNOTS & SPLICES
WITH ROPE TYING TRICKS
OF FAMOUS MAGICIANS

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Gilbert Knots and Splices

with

Rope-Tying Tricks

EXPLAINS METHODS OF KNOT
TYING AND REVEALS ROPE
TRICKS MADE FAMOUS BY
GREAT ARTISTS

BY

ALFRED C. GILBERT

YALE UNIVERSITY, 1909

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PART I.

KNOTS

The history of knotting dates back to the early inhabitants of the earth, when some kind of knot was used to join animal tissues and plant fibers together. These took the place in those days of the several types of cordage which are used and with which we are familiar at the present time.

Up to 1847 no really scientific study had been made or produced on the theory of knots. In the above year, the first scientific work appeared. This was prepared by a German, named Listing, who is credited with being the founder of the Theory of Knotting. His book was most original and was not entirely devoted to the subject, but his treatment of knots, as far as he went into the subject, was based upon the elementary notion of twisting one thread around another. Later works appeared on the subject of Knotting, the best known of them being written by a Scotchman, named Tait, who dug deep into the theory of the formation of knots and compiled a splendid volume.

In a scientific sense, a knot is an endless physical line, which cannot be deformed into a circle. A clearer definition is stated as follows: "An interlacement of the parts of one or more slender flexible bodies, as cordage, forming a lump or knob."

A very great number of knots have been invented from the mind and by the skill of man. These knots are in daily use and upon their strength and correct formation depend the lives of hundreds, yes thousands, of workmen employed in the building trade; also seamen and those employed in other pursuits. There are a very large number of knots, and these are classed under the heads of simple, fancy, bends, hitches, etc. It is not intended to deal in this Manual with any but the most common and useful knots. We have particularly selected those knots that are in almost daily use and serve the average layman to the best advantage. Except in a very few instances a description of how these knots are tied has been omitted, for it was deemed advisable to show only the photograph, which clearly outlines the course of the rope in the formation of the knot. The description in most texts on knot-tying is rather vague and complicated; so it was the opinion of the writer that a study of the photograph and

practice in forming the knot to resemble the one shown would lead to a quicker grasp of the manipulation of all ropes and cordage.

The value of a knot lies in the ease with which it may be formed and untied and its reliability when a strain is placed upon it. Therefore, you will be repaid for the time spent in learning to make the knots and hitches shown in this book; especially in the time and material you will be able to save. You will also avoid breaking your finger-nails and teeth in attempting to untie the knot or knots which you tied incorrectly. It is not always the number of turns in a knot that adds to its security; but, on the contrary, it is the effectiveness of the nip, by which is meant the pressure on the rope where it is bent around or held by something, or where there is simply a sharp bend or turn in a rope. This should be borne in mind when studying the formation of the knots described and when using the knot in actual work.

In distinguishing between varieties of cordage, it is well to bear in mind that those having a circumference of an inch or more are usually known by the general name of rope; those of smaller dimensions, twisted, are called cords, twines, and lines; those of the very smallest dimensions are termed thread or doubled yarn. When the size of a rope is mentioned, it signifies the circumference of the rope. For example, by three-inch rope we mean rope with a circumference of three inches, not three inches in diameter, as many people might think.

Rope is made from many substances, but particularly from vegetable fibers. Where strength, suppleness, flexibility, and durability are required in a rope, the common hemp is the most satisfactory material and is, therefore, used extensively. There are many kinds of hemp used in rope-making. The Manila hemp, because of its tenacity, is used principally for the manufacture of heavy cordage. Various other kinds of hemp, used commonly in rope-making, come from South America, New Zealand, and the East Indies. Ropes and twine of cotton are manufactured in large quantities for use in driving bands for machinery. A number of rope-makers, because it is cheap, use jute—a glossy fiber obtained from plants of the East Indies. This lacks strength and durability, and is used chiefly in making sacks, burlap, and the cheaper varieties of twines. Coir or coconut fiber is largely used in the making of drift-nets, life-buoy lines, etc., because of its being light and buoyant.

Rope is composed of a certain number of strands, usually three or more, which are formed of several yarns. The prepared fiber twisted to

the right forms the yarns and the yarns laid up left-handed form the strands. Three strands twisted together right-handed form a "hawser-laid" rope. Three "hawser-laid" ropes twisted to the left form a cable or a "cable-laid" rope. A "shroud-laid" rope consists of four strands twisted around a central strand or core.

The object of twisting fibers together is that by mutual friction they may be held together when a strain is applied to the rope. Twisting diminishes the strength of a rope; therefore, it is of considerable importance to get the proper degree of twist and to lay up the yarns carefully so that an even strain will be brought to bear on every part, for if they are twisted too hard the cord will break. The twist in each successive operation of rope-making is in a different direction from the preceding one. This alternation of direction serves to keep the fibers parallel to a great extent and thus utilizes the combined strength of the fibers to as great a degree as possible. The degree of twist given to a rope is such that the rope is from three-fourths to two-thirds the length of the yarn composing it. Therefore, the lighter the twist the greater, in proportion, is the strength. A three-stranded rope will bear a greater strain in comparison with its size than any other of the same material. Investigations have proved that "shroud-laid" and "cable-laid" ropes are about one-fifth weaker.

Years ago it was a very common practice in rope-making to tar the rope with a special tar, called Archangel tar, to prevent decay; but it has been found that untarred rope, especially that made from Manila hemp, which withstands the influence of water very well, if in constant service, is about one-third more durable than when tarred, and will also keep longer in storage. Tarring diminishes the strength of a rope and should only be resorted to where the rope is to be constantly exposed to water.

FIGURE 1. The most common and the simplest knot made is the Overhand Knot. It is the most useful of all knots, and forms a part of the majority of other knots. It is used to prevent the strands of a rope from unlaying. For this purpose it must be drawn taut. It may serve as a stopper knot in the middle of a rope, to prevent the slipping of the rope one way or the other. When used as a stopper knot in a ring bolt, the knot must be made on each side of the ring; but it must be larger than the diameter of the ring to prevent its being pulled through the ring.



Fig. 1

This knot is never used on board a vessel, as it may catch in the halliard blocks and before the sail can be lowered or raised the vessel may capsize. On board ship, instead of using this knot, the ends of the rope are whipped, that is, the ends are tied with twine.

This knot is never used at the end of a reef point, for it may cause the tearing of the sail.



Fig. 2a

FIGURE 2a. The Double, Treble, or Fourfold Knot is a modification of the Overhand Knot and is made by continuing the method of passing the end of the rope over the standing part and through the loop or bight before drawing taut. This knot is used on the thongs of a whip; about a dock; to prevent the strands of a rope unlaying, and has much the same use as the Overhand Knot.



Fig. 2b

FIGURE 2b. Shows the knot drawn taut.



Fig. 3

FIGURE 3. This knot is known commonly as the Figure-of-Eight Knot. It is used for much the same purposes as the above knots. A distinct advantage lies in the use of this knot because of the rapidity with which it may be tied. This knot is often used where a Bowline Knot (see Fig. 17) should be used, especially by those who are unacquainted with the tying of knots. This is sometimes called a Flemish Knot.

FIGURE 4a. Sailor's Knot, sometimes called a Square or Flat Knot, is a commonly used knot, especially when tying the ends of a reef earing, when shortening a sail, and for joining the ends of two ropes. This knot can be made and undone with great rapidity. It is a perfect knot when made correctly. If you will observe the photograph you will note that the two ends at the right are passed under the standing part and the two ends at the left over the standing part. This knot is easily spoiled by passing one end over and one end under the standing part of the rope. It is important that the ropes be of the same size, for if made with ropes of different sizes the knot slips and will not



Fig. 4a

draw taut. A little practice will enable you to make this knot perfectly. In tying a life-preserver about the waist this knot is always used.

FIGURE 4b.

This is termed a Reef Knot, and has the same uses as the Sailor's Knot.

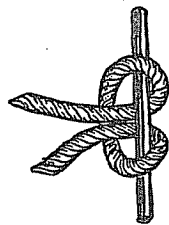


Fig. 4b

FIGURE 5. Shows the Reef Knot half made.

FIGURE 6. In making the Sailor's or

Reef Knot, if the ends of the rope are not passed over and under the standing part of the rope correctly, a granny, lubber's, or calf knot results. It is a very hard and fast rule on board a sailing vessel

never to tie this knot, for when a strain is placed upon it, it slips and becomes useless. This knot is used very often on the stage in the trick called "Herman's Knotted Handkerchiefs."



Fig. 6

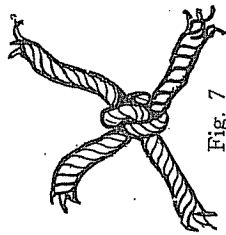


Fig. 7

FIGURE 7. Shows the Granny Knot drawn taut.

FIGURE 8. The Overhand Rosette Knot or Bow is a modification of the Sailor's Knot. This knot is used often to join the ends of

two ropes; but should not be used where the strain on the rope is great, for the rope is apt to break at the knot.

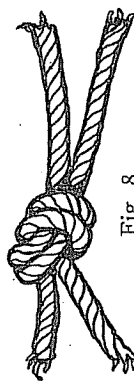


Fig. 8

FIGURES 9 and 10. Fig. 9 shows the Weaver's Knot half made. Fig. 10 shows the knot completed. It is used for joining the ends of ropes. It derives its name from the fact that when the ends of the thread on a loom break, the weaver ties them together rapidly, using this knot; and the loom is set in motion again. This knot is also termed

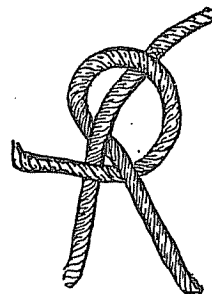


Fig. 9

a Net Knot or Thumb Knot. Weavers call this a thumb knot because it is made over the thumb. Fishermen call it a net knot because they use it to tie two nets together, or two fish trawls, or in any place where a quick bend is needed or for repairing the meshes. In repairing the net of a tennis court, this knot will be found very satisfactory.

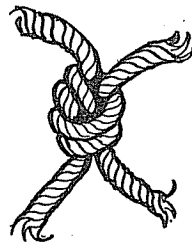


Fig. 11

FIGURE 11. Shows an Overhand Knot joining two ropes. It may be made in a similar manner to the Single Overhand Knot.

FIGURE 12. This is called a Flemish Knot. In reality it is the Figure-of-Eight Knot (see Fig. 3) made with two ropes. It is used for joining two ropes and for much the same purposes as those mentioned above. The advantage of this knot lies in the fact that

it does not slip no matter how great the strain and it does not draw up so tight that it is difficult to untie it. Where speed in untying is required this type of knot should always be used.



Fig. 13

FIGURE 13. The Fisherman's Knot derives its name from the fact that it is used, particularly on fishing vessels, for joining the lines, which are usually made of silkworm gut or cotton. By hauling it taut one knot jams against the other and holds firmly.

FIGURE 14. The Running Knot is one of the simplest of eye knots. The loop or bight is termed the eye of the knot.

Eye knots are used for making a vessel fast to its mooring. If you



Fig. 14

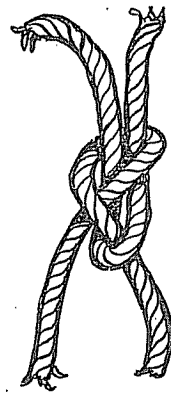


Fig. 10



Fig. 12

are in the vicinity of a dock or pier, you will notice that the majority of fastenings to the dock post are accomplished by means of eye knots. An Overhand Eye Knot is made with the ends of the rope around the standing part of the rope, forming an eye.

FIGURE 15. The Fisherman's Eye Knot or Water Knot, used for bending two lines together, will, if properly made, never pull out. The line will break first. When drawn taut the lower knot jams against the upper and holds securely.

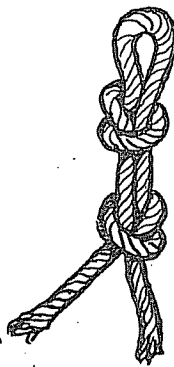


Fig. 15

FIGURE 16. Overhand Eye Knot is very similar to the Rosette Knot or Bow (Fig. 8), except that it is made with a single rope. This knot will not bear a great strain. When drawn taut it is advisable to put a toggle into the center of the knot, so that it may be untied quickly and easily.

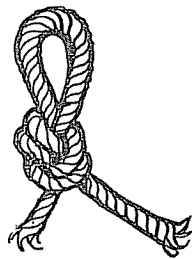


Fig. 16

FIGURE 17. The Bowline Knot is one of the most useful knots made. It is used in any place where an eye is needed; and it is impossible for this knot to slip. When hoisting a man aloft, this knot is always used, the bight serving as a chair. On board a vessel it is customary to have this knot already made in a rope, left forward and aft, in case a person falls overboard. The rope is thrown out; the person crawls into the bight and is lifted in a sitting posture up the side of the ship.



Fig. 17

FIGURE 18. This is a Bowline Knot, tied with two parts of rope and passed through the single bight. Often this is termed a Bowline on a Bight, from the fact that it passes through the loop. Invariably this knot is used where a great strain is to be borne and to join hawsers together. For towing of a vessel or barge with a tug, two ropes may be joined together by making a bowline in the end of



Fig. 18

one of them. The second rope is passed through this bowline and another bowline tied with its own end. This knot is a modification of the Bowline Knot shown in Fig. 17.

FIGURES 19 and 20. Show a Running Knot with two ends—loose and fastened. This type of knot (Fig. 19) is used for tying a boat up to a pier. It is nearly always used around a marine slip, that is, a drydock or ways, where a boat is hauled up for repairs. We find this style of knot used because of the ease with which it is unfastened. Fig. 20 is a modification of this knot, as you will note from the photograph. It is tied where greater security is desired.

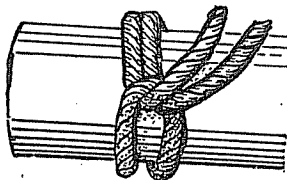


Fig. 19

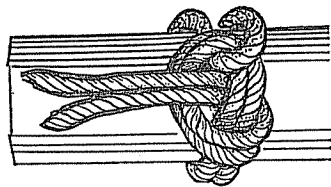


Fig. 20

FIGURE 21. Two Half Hitches are a most useful type of knot for varied purposes, because of their security. These will not pull apart under any circumstances. A distinct advantage in the half hitch lies in the speed with which it may be made. On board a ship these hitches are used when tying up to a dock. The following method of securing the boat is used. Throw three round turns with the rope over the top of the capstan and tie two half hitches; then secure the other end of the rope to the post on dock, employing either of the Running Knots shown in Figs. 19 and 20. Surgeons use this knot for dislocations of joints, particularly those of the thumb.

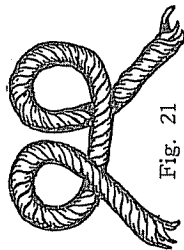


Fig. 21

FIGURE 22. This is nothing more than two half hitches thrown over a post or pole. This method of knotting is used in rigging up a scaffolding or hauling timbers to any height, and from its use in this manner derives the name by which it is con-

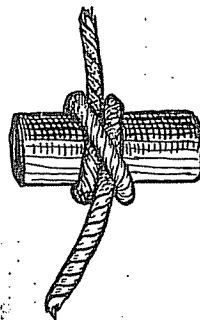


Fig. 22

monly called—Builder's Knot. Two half hitches tied to the front axle of one car and to the rear axle of another will serve as an excellent method of tying when towing a disabled car. A modification of the Builder's Knot is termed a Clove Hitch, and is so termed when the Builder's Knot is made for the purpose of securing a line of small diameter to one of much larger diameter.

FIGURE 23. The Timber Hitch, as this knot is commonly called, is used for unloading lumber from a boat or any other type of carrier. Several pieces of timber may be carried in the bight and the hitch may be cast off quickly. The greater the strain on the rope, the more securely is the timber held.



Fig. 23

FIGURE 24. A Killick Hitch is an adaptation of the Timber Hitch, being made with a single half hitch thrown over the timber or killick after the Timber Hitch is tied and hauled taut. A killick is a term used chiefly by seamen for an anchor, usually a large stone. The hitch is used in bending a mooring rope to a killick. Along rocky coasts where there would be danger of a pointed anchor being caught in the crevices of a rock, a killick or large stone is thrown out which holds the boat fast. A killick is never used for mooring a large vessel.

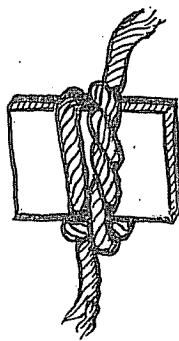


Fig. 24

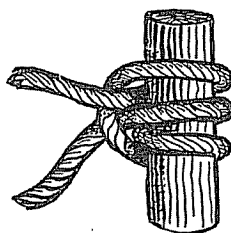


Fig. 25

FIGURE 25. Rolling Hitch. Often this hitch goes by the name of the Magnus Hitch. A common use for the Rolling Hitch is bending one line around the standing part of another, where the strain is drawing lengthwise of the rope. There is a very slight tendency to slip. This hitch is chiefly used on board ship for putting a tackle on a chain to which an anchor is attached. Invariably it is the method used to bend a line to a chain.

FIGURE 26. The Fisherman's Bend, a very well-known form of knot, is made with two round turns around a spar or spar boom and

two half hitches around the standing part of the rope, one hitch above the other. This is used for bending a sail to a spar; tying a gasket around a sail; and when

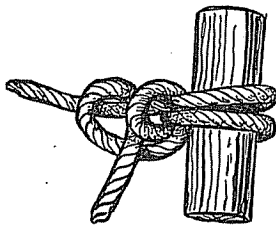


Fig. 26

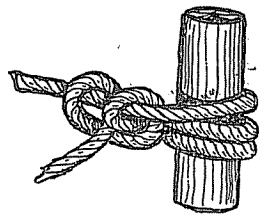


Fig. 27

FIGURE 27. This is a modification of the Fisherman's Bend and the Rolling Hitch. It is made

simply by taking three turns around a spar; making two half hitches around the standing part of the rope; and then hauling taut.

FIGURE 28. The Racking Hitch has several uses, the most important being when hooking a block onto a rope. In nautical terms this hitch is called a Cat's-paw. It is commonly used by sailors; its value lying in the ease with which it is tied and untied. When untied, the bights are simply slipped off the hook and the knot falls apart.

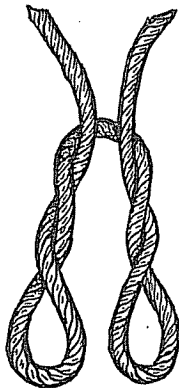


Fig. 28

FIGURE 29. The Slippery Hitch is a form of knot very often used on small-sized boats, such as cat-boats, in making the mainsheet fast. This type of hitch is never used aboard a big sailing vessel.

FIGURE 30. The Sheet Bend is commonly used in bending two lines together and when drawn taut is very secure. This bend is employed when joining ropes of different sizes. Where the rope is

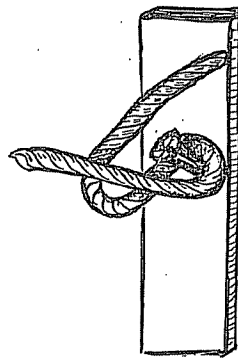


Fig. 29

too thick to tie a knot in it, the rope itself is doubled and this bend formed, which takes the place of the knot.

Salmon fishermen use this bend in joining their nets or in bending warps (a long piece of rope) onto their nets for the purpose of attaching the net to the boat. This is because of the strong tides and heavy strain on the nets due to the weight of the fish.

FIGURE 31. The Blackwall Hitch. You will often hear it called a Wall Hitch. It is a temporary method of securing a rope to a hook and when hauled taut it jams the end of the loop against the back of the hook and holds it firmly. It is not used where great strain is placed on the rope. In its stead a Cat's-paw or Racking Hitch would be used to bear the severe strain.



Fig. 30

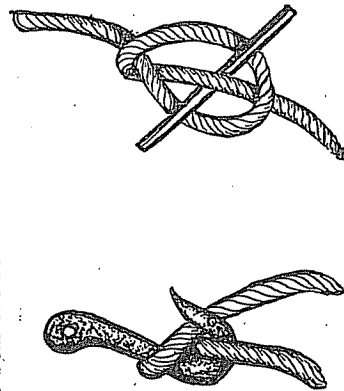


Fig. 32

Fig. 31

FIGURE 32. Marlinespike Hitch is used for serving a rope or racking off lanyards on a boat. When putting on a cross, seizing and using a marlinespike, the hitch is always used. When two ropes, two wires, two stakes, spars, etc., are put together, using a cross seize, a Marlinespike Hitch is always used.

FIGURE 33. Stationer's Knot. This is a very useful knot for tying up parcels, because of the ease and rapidity with which it may be tied and untied. In nearly every store this type of knot is used by the clerks in tying up bundles.

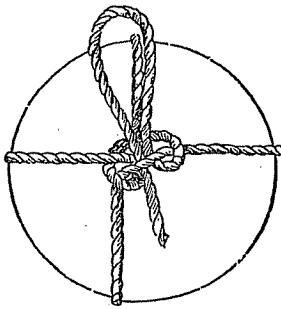


Fig. 33