United States Patent

Higgins

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[54] **LINE CLAMP**

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[73] Assignee: **Line & Rope Clamps, Inc.**

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[52] **U.S. Cl.**.....**24/126 A,** 339/273, 287/79

[51] **Int. Cl.**.....**F16g 11/04**

[58] **Field of Search**.....24/126 A; 339/273, 267, 270; 287/79

[56] **References Cited**

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[57] **ABSTRACT**

A line end clamp for boat lines or the like, said clamp comprising a relatively rigid block with a pair of spaced substantially parallel bores extending therethrough for receiving a line, a hole passing transversely through one of the bores and off set therewith, and a clamping pin removably mounted in the hole for occupying a portion of the bore for retentatively compressing and clamping the line. The hole is provided with a pair of longitudinal slots, one of which is located in the line-receiving area of the associated bore such that the clamping pin may be keyed to either slot depending upon the type of rope being clamped.

8 Claims, 4 Drawing Figures

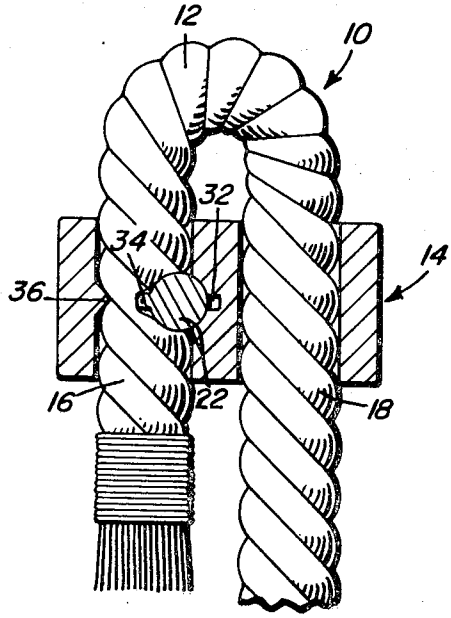


Fig. 1

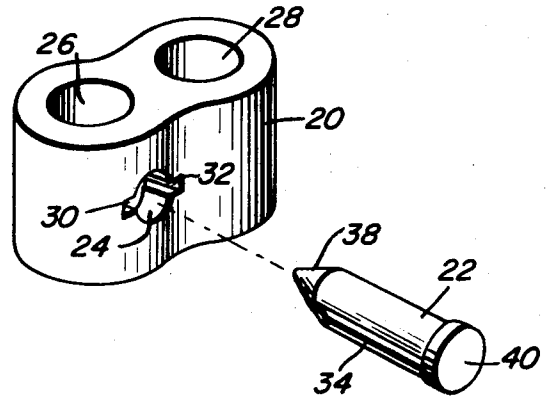


Fig. 2

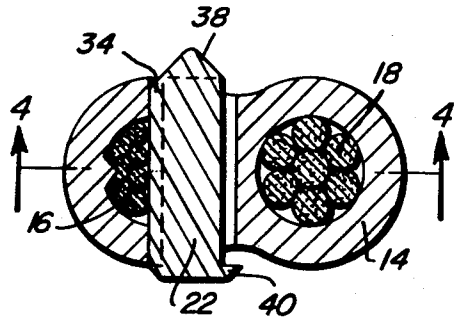


Fig. 3

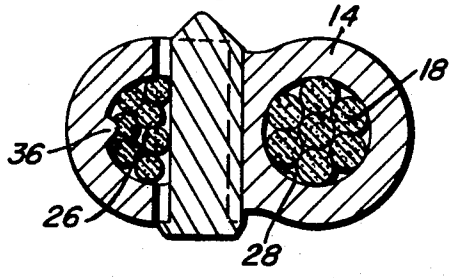
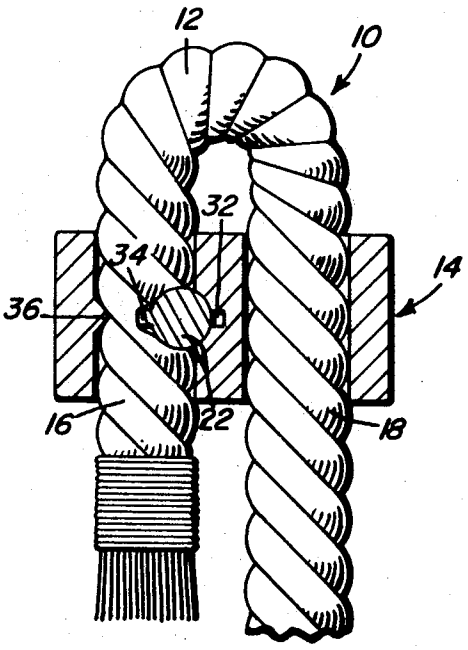


Fig. 4



LINE CLAMP

The present invention relates to a holder for a rope or line and, more particularly, to a rigid clamping block having a plurality of spaced parallel open-ended bores which accommodate coacting portions of the end of the line or rope, and an intervening hole communicating with one of the bores to accommodate a removable clamping pin which retentatively and compressably engages the rope or line.

The invention is expressly constructed and adapted for use when one is called upon to manually bend, loop and form an adjustable loop-like tie down eye at a free end of a bendable line, for example, the type of line which lends itself to use as a boat tie line, tent staking rope, tarpaulin hold-down rope, or the like. The essence of the concept has to do with a rigid clamping block which has a pair of spaced parallel open-ended bores through which component first and second loop-forming portions of the line are adapted to be threaded and passed. The clamp is provided with a median portion thereof and at a locale between the first and second bores with a pin-receiving hole. This hole is disposed in a plane which is substantially perpendicular to the axis of the associated bore and is adapted to receive a clamping pin with a longitudinal key on one side thereof. The hole is offset from the associated bore, such that one side of the median portion of the hole communicates with a median portion of the bore. The clamping pin extends through the hole and provides a cam-like surface portion which is adapted to compressably bind itself against a cooperating portion of the aforementioned second portion of line or rope.

The pin's key may be oriented to engage the rope, thereby increasing the amount of compression when using softer, more compressible rope materials. On the other hand, when the ropes or lines are made of harder, less compressible materials, the key may be selectively oriented in an alternate slot or key way such that it does not engage the rope, thereby decreasing the defective diameter of the pin.

It is an object of the present invention to provide a versatile line clamp construction comprised of only two pieces and providing means for effectively clamping ropes or lines of various hardness and compression characteristics.

Another object of the present invention is to provide a novel line clamping device which includes a keyed clamping pin which may be oriented in alternate positions to achieve different clamping forces corresponding to the type of rope being clamped.

It is a further object of the present invention to provide a unique line clamping device which includes a relatively rigid clamping block with a double-slotted hole therein adapted to receive a clamping pin with a key selectively positioned in either one of the two slots depending upon the type of rope or line being clamped.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is an exploded perspective view of the line clamping device of the present invention.

FIG. 2 is a cross-sectional view of the line clamping device illustrated in FIG. 1, with the clamping pin in a first line compressing position.

FIG. 3 is a sectional view similar to FIG. 2 but with the line clamping pin in a second line compressing position.

FIG. 4 is a sectional view taken along section 4—4 of FIG. 2.

Referring now, more particularly, to the drawings, a rope or line is generally indicated by the numeral 10 and is provided with an end portion with a return bend 12 which defines an eye-like loop which is adapted to fit over a post, stake, piling or similar stationary object depending upon the purpose for which the line is intended. The line is adapted to pass through the line clamping device of the present invention, which is generally indicated by the numeral 14 and includes means for retentatively clamping the end portion of the line, as indicated at 16, and permitting adjustment or sliding movement of a second portion of line, as indicated at 18.

Referring more particularly to FIG. 1, it will be appreciated that the line clamping device of the present invention includes a generally rectangular rigid block 20 adapted to receive a generally cylindrical clamping pin 22 in a pin receiving hole 24. Preferably, the block and clamping pin are made from nylon or plastic. However, other materials such as steel, iron or brass may be utilized, as decided upon by the manufacturer. The block 20 is further provided with a pair of spaced parallel line-receiving bores 26 and 28 extending therethrough. The pin receiving hole 24 extends transversely of line-receiving bore 26 and has a median portion which intervenes, or overlaps, the bore, such that it is in communication therewith. The pin-receiving hole 24 is offset from the axis of bore 26, such that the hole only partially overlaps the bore, thereby leaving a cross-sectional opening through which the line or rope may pass after the clamping pin has been inserted.

Referring to FIGS. 2–4, the construction of the line clamping device of the present invention may be seen in more detail. It will be appreciated that clamping pin 22 and pin-receiving hole 24 are of approximately the same width or diameter, such that the pin is held firmly in place in an interference type fit. Since a substantial median portion of the pin-receiving hole overlaps line receiving bore 26, it is apparent that the line or rope will be displaced upon insertion of the clamping pin. Preferably, the line-receiving bores are approximately the same diameter as the rope or line being clamped. As such, insertion of the clamping pin is effective to compressibly displace the line or rope within the region common to both the line-receiving bore and the pin-receiving hole. This compressible clamping action significantly distorts the configuration of the line, as best illustrated in FIG. 4, to produce a high strength clamp against the rope to prevent its movement relative to the clamping block.

The amount of the compressive clamping forces may be varied by varying the effective cross-section of the line-receiving opening in the region of the clamping pin. This is achieved by providing the pin-receiving hole with a pair of slots 30 and 32 on opposite sides of the hole. Clamping pin 22 is provided with a corresponding key 34 which extends longitudinally along

its outer surfaces. Slot or keyway **30** lies in the area or region of hole **24** which overlaps and communicates with line-receiving bore **26**. On the other hand, keyway **32** is remote from the line-receiving bore and does not lie within the path which the rope or line would normally follow. Thus, the key or flange **34** associated with clamping pin **22** is effective to reduce the size of the opening, thereby effecting the compression forces acting upon the line being clamped.

It will be appreciated that ropes and lines may be made from different materials which have different hardness and compression characteristics. For example, a ⅜ inch nylon line may be much softer than a dacron line of approximately the same dimension. Furthermore, the stranding or manner in which the rope is woven together may effect the hardness characteristics. The multiple-slot and key arrangement provides a means for compensating for such characteristics. For example, FIG. **2** illustrates the clamping pin in a first position with a key **34** extending through slot **30** to provide maximum compression of the rope or line in the area of the key. On the other hand, if a relatively hard rope is being clamped, the key may be selectively positioned in slot or keyway **32**, as illustrated in FIG. **3**. This is effective to increase the opening through which the rope passes.

It will also be appreciated that the line-receiving bore **26** may be provided with a tooth **36** which extends inwardly and is effective to grab or grasp a portion of the rope in an area oppositely disposed of the clamping pin. Preferably, clamping pin **22** is provided with a conically shaped tip or head portion **38** which aids in the insertion of the pin in hole **22**. The opposite end of the pin is provided with a circular shaped flange portion **40** of increased diameter and aids in removal of the pin.

From the foregoing description it will be appreciated that the line clamping device of the present invention is comprised of only two parts, yet, provides a unique, versatile means of selectively clamping lines for ropes of various hardness and compression characteristics. The clamping block and associated pin may be made of molded plastic or nylon which are relatively inexpensive to manufacture. It should be noted that it is not intended that the invention be limited to the exact slot and key configuration illustrated in the drawings. If desired, additional keyways may be provided to provide a plurality of pin positions each providing a different line-receiving opening of different cross-sectional area.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A line clamping device comprising a relatively rigid clamping block, a pair of open-ended line-receiving holes extending through said block and being of approximately the same width as the line to be clamped, a pin-receiving hole in said block transversely overlapping and communicating with one of said line-receiving holes, and a clamping pin removably, retentatively positioned in said pin-receiving hole and significantly reducing a cross-sectional opening of said one line-receiving hole, said pin-receiving hole including at least two longitudinal keyways, one of which is in transverse overlapping relation with said one line-receiving hole, said clamping pin having a longitudinal key selectively positioned in one of said keyways, thereby determining the effective cross-sectional area of the opening in said one line-receiving hole.

2. The structure set forth in claim **1** wherein said two keyways are oppositely disposed of each other, the other of said keyways being remote from said one line-receiving hole.

3. The structure set forth in claim **2** wherein said pin-receiving hole is substantially perpendicular to said one line-receiving hole.

4. The structure set forth in claim **3** wherein each of said holes and said clamping pin are generally cylindrical in configuration.

5. A line clamping device comprising a relatively rigid clamping block, a pair of spaced generally parallel line-receiving holes extending through said block, a pin-receiving hole in said block communicating with one of said line-receiving holes and substantially perpendicular thereto, said pin-receiving hole having a center line substantially offset from that of said one line-receiving hole, said pin-receiving hole having at least two keyways at different positions relative to said one line-receiving hole, and a clamping pin removably mounted in said pin-receiving hole, said clamping pin having an outwardly directed key portion alternately received by one of said keyways.

6. The structure set forth in claim **5** wherein said line-receiving hole is provided with an inwardly protruding tooth adapted to retentatively engage the line when said clamping pin is inserted.

7. The structure set forth in claim **6** wherein said tooth is oppositely disposed one of said keyways to coactively compress the line when said key is inserted in said one keyway.

8. The structure set forth in claim **7** wherein said pin-receiving hole is generally cylindrical in configuration with two of said keyways being diametrically opposite each other.

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