

[54] CONNECTOR

[76] Inventor: **Creath W. Linville**, 3601 N. Fifth Ave., Apt. 211, Phoenix, Ariz. 85013

[22] Filed: **Mar. 9, 1972**

[21] Appl. No.: **233,161**

[52] U.S. Cl. **24/261 C, 24/260**

[51] Int. Cl. **A44b 21/00**

[58] Field of Search **24/261, 261 C, 236, 24/237, 260, 734**

[56] **References Cited**

UNITED STATES PATENTS

415,770 11/1889 Ferguson 24/260

700,208	5/1902	Lafo et al.	24/261 C
266,007	10/1882	Badger	24/260
1,127,676	2/1915	Ramm	24/261 C

Primary Examiner—Paul R. Gilliam

Attorney—H. Gordon Shields

[57]

ABSTRACT

A connector includes a loop and a locking member disposed generally perpendicular to the plane of the loop with a portion of the locking member disposed within and biased against the loop.

4 Claims, 5 Drawing Figures

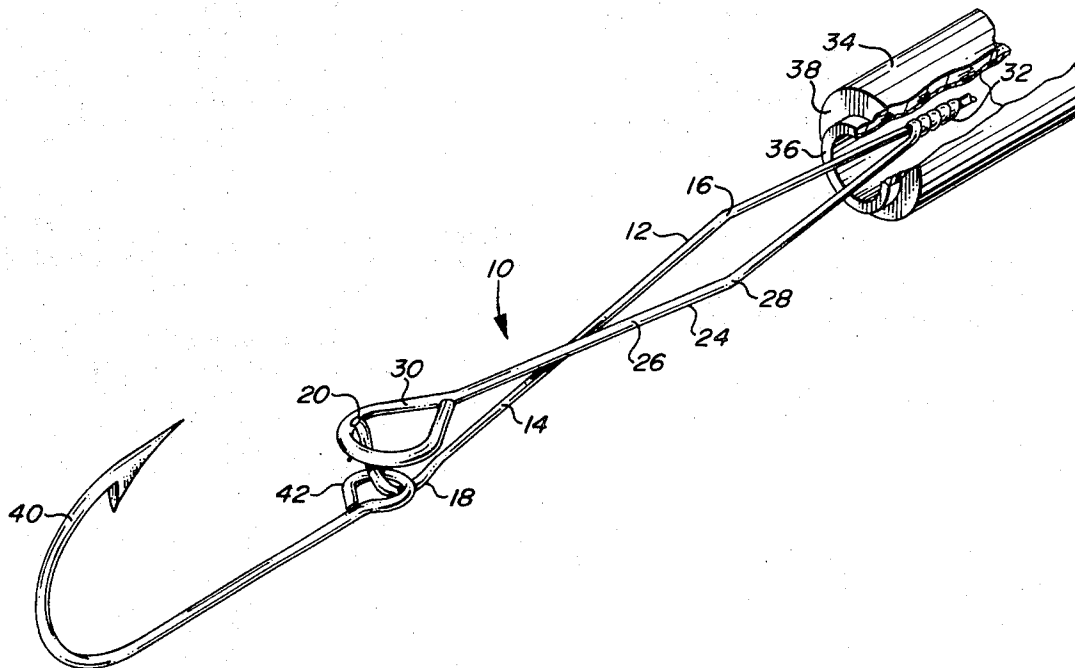


FIG. 1

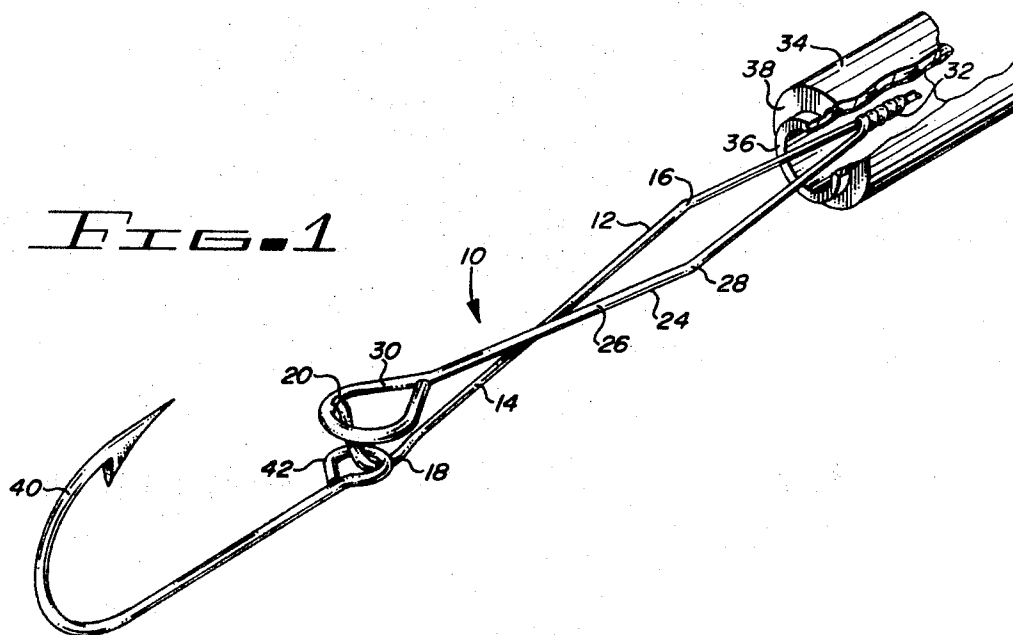


FIG. 2

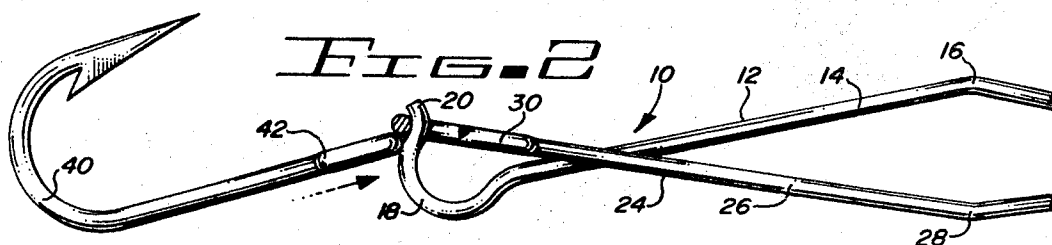


FIG. 3

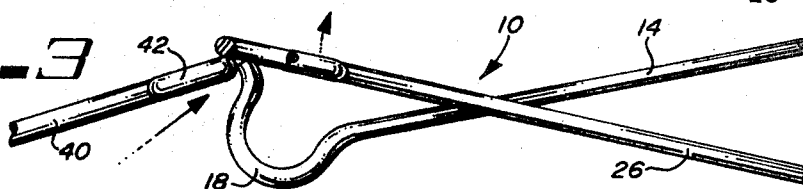


FIG. 4

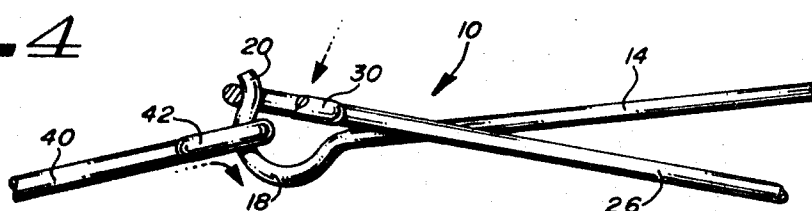
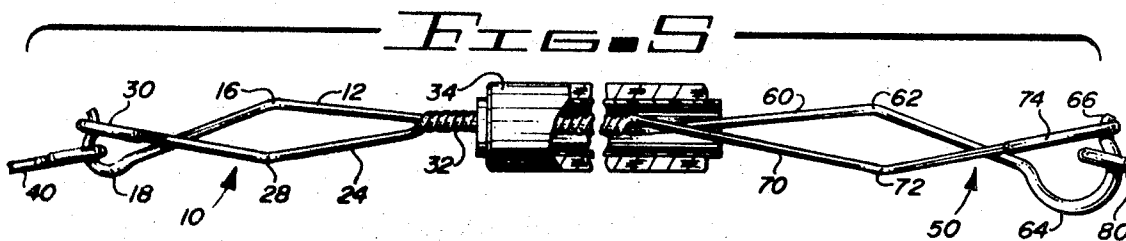


FIG. 5



1 CONNECTOR

BACKGROUND OF THE INVENTION

1. Field of the Invention:

This invention pertains to connectors and more particularly to connectors for apparatus having a loop portion which is to be connected to a structure or structural member through the intermediary of connector apparatus. The present connector apparatus pertains to non-rigid connections where a tension force may be applied to the apparatus or structures being connected.

2. Description of the Prior Art:

Prior art connectors of the type to which the present invention pertains are generally characterized by including a loop and a member which closes the loop to complete the connection. One of the members includes a spring bias, such as a length of springy material in varied configuration, or a clasp member which includes a spring bias. The prior art connectors are also characterized by the inability of the connectors to be operated with ease in the absence of light. Prior art connectors generally require the complete attention of an operator and the ability of the operator to observe the connecting apparatus while engaging or disengaging the connector apparatus from a structure or structural member. Such connection is typically extremely difficult to make without visual reference to the apparatus and the structure to be connected, and/or it requires a substantial degree of manual dexterity to accomplish the desired connection.

SUMMARY OF THE INVENTION

The present invention comprises apparatus in which a connection is both engaged and disengaged by a force acting in the same direction. The connector includes a loop and a spring biased locking member disposed generally perpendicular to the plane of the loop which extends into and against the loop. The structure to be connected is oriented generally parallel to the plane of the loop and engages the locking member which, upon sufficient force, moves out of engagement with the loop until the structure is penetrated by the locking member. At such time as the structure is penetrated by the locking member, the force is then released and the locking member springs into engagement with the loop. To release the structure, a force is applied along the same direction until the locking member is once again disengaged from the loop and continued force of the structure against the locking member moves the structure out of engagement with the locking member and the structure is then free and disengaged. The locking member once again springs back into engagement with the loop.

If desired, this engagement may be accomplished by manually biasing the locking member away from the loop and removing the structure from the locking member.

Among the objects of the present invention are the following:

- to provide a new and useful connector;
- to provide new and useful connector apparatus in which a member is spring biased against a loop;
- to provide new and useful connector apparatus in which engagement and disengagement may readily be accomplished without visual reference;

2

to provide new and useful connector apparatus in which a force is applied in the same direction to both engage and disengage the connector; and
to provide new and useful apparatus for making non-rigid connections.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is an isometric view of the connector apparatus of the present invention secured to a fish hook.

FIGS. 2, 3, and 4 are sequential views showing the operation of the connector apparatus of the present invention.

FIG. 5 is a view of apparatus of embodying the present invention in a double configuration.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 comprises a view illustrating the connector apparatus of the present invention in a particular use environment in which a fish hook is secured to the connector apparatus. Connector 10 includes a pair of arms 12 and 24 disposed adjacent each other and cooperating to form an interlocking hook and eye. The arm 12 includes an elongated portion 14 having a bend 16 therein. The bend 16 occurs preferably about midway along the elongated portion 14 of the arm. At one end of the arm is a curved hook portion 18. The hook 18 terminates in a reverse portion 20 which curves generally away from the curved hook portion 18.

Arm 24 includes an elongated portion 26 which also has a bend therein. The elongated portion 26 of arm 24 is generally about the same length as the elongated portion 14 of arm 12. Bend 28 is located opposite bend 16. Bends 16 and 28 are of about the same angular disposition, but opposite each other such that the arms 12 and 24, rather than being generally parallel to each other, are generally opposite each other in direction while being of approximately the same dimensions. The bends are disposed such as to make the arms diverge from each other from a common source and then converge and pass each other and continue to diverge.

Arm 26 terminates in an eye or loop 30 which is closed on itself. Hook 18 of arm 14 extends into the loop 30 with the reversed portion 20 of the hook juxtaposed against the inside of the loop 30. Hook 18, with its reversed portion 20, is substantially perpendicular to the plane of loop 30, and comprises a locking member for the connector.

Arm 14 and arm 24 are secured together at a common source or joint 32 at opposite ends of the arms from the hook and loop portions 18 and 30, respectively. Joint 32 is illustrated as comprising a portion of both elongated portions 14 and 26, with the elongated portion 26 wrapped around a portion of elongated portion 14. Any appropriate configuration may be used. A sleeve 34, of tubular configuration, is shown disposed over joint 32 and over portions of arms 12 and 24.

From joint 24, arms 14 and 24 diverge to bends 16 and 28, respectively, and then converge and pass each other and terminate by the interlocking of hook 18 with loop 30.

Arms 12 and 24 are fabricated of a springy material and have sufficient bias so that loop 30 and hook 18 are urged towards each other and are held together or are locked in place by reverse portion 20.

Fish hook 40 includes an eye portion 42 which is shown secured to connector 10. Hook 18 extends

through eye 42 and is disposed against loop 30 by reverse portion 20, thus securing or locking the fish hook to the connector.

Sleeve 34 includes an inner tubular member 36, the inside diameter of which is less than the distance between bends 16 and 28 of arms 12 and 24, respectively. Accordingly, moving sleeve 34 towards bends 16 and 28 on the arms biases the arms together and moves hook 18 away from, or out of engagement with, loop 30. This allows a device to be connected to or disconnected from connector 10. The sleeve 34 includes an outer buoyant member 38, such as cork, and is particularly adapted for surface fishing. The sleeve, and particularly the outer member, may be fabricated of any appropriate material. If desired, it may be omitted.

FIGS. 2, 3, and 4 are sequential views showing the connector being secured to a device, such as fish hook 40. Fish hook 40, with eye 42, is disposed with the eye adjacent the intersection of loop 30 and hook 18 of connector 10. Specifically, eye 42 is located beneath loop 30 of arm 24 and against a portion of hook 18 of arm 12. As elongated portions 14 and 26 of arms 12 and 24 are urged towards each other in the area of bends 16 and 28, loop 30 and hook 18 are biased away from each other, as indicated in FIG. 3. With sufficient flexing of the arms, hook 18 is disengaged from loop 30 a distance adequate to allow the eye 42 of fish hook 40 to be placed on hook 18. When hook 18 has been inserted through eye 42, the pressure or bias on arm 12 and 24 is released and the arms then spring back together with the reversed portion 20 of hook 18 disposed on loop 30. The resiliency or springiness of arms 12 and 24 is such as to maintain the interlocked disposition of hook 18 and loop 30.

If it is not convenient to apply a biasing force at or near bends 16 and 28 to bias the hook 18 and loop 30 away from each other, a connection may nevertheless be accomplished in substantially the same manner by a cam action. Apparatus, such as fish hook 40, may be secured to connector 10 by aligning eye 42 substantially parallel to loop 30, beneath the plane of the loop and adjacent hook 18. In FIGS. 2 and 3, the planes of loop 30 and eye 42 are shown slightly off from a parallel orientation, with the plane of eye 42 located at a slight acute angle below loop 30. When relative force or motion is applied to fish hook 40 and eye 42 in a direction generally towards the hook 40 and eye 42 in a direction generally towards the hook and the eye, as shown by the arrows, the camming action between the outer extremity 42 against hook 18 and loop 30 is sufficient to urge loop 30 up and hook 18 down and thus away from each other. Continued force in the same direction will allow eye 42 to slip on or over hook 18 to secure the connection. At such time as the eye 42 extends over the hook 18, or vice versa, as when hook 18 is inserted within eye 42, camming action between the loop and the hook is removed and the inherent resiliency of elongated portions 14 and 26 of the arms urges the hook and the loop back together, as shown in FIG. 4. The connection is thus accomplished and the fish hook is accordingly secured to the connector.

Disconnection may be accomplished in the same manner as the initial connection. By biasing together the elongated portions 14 and 26 of the connector, as by urging the bends 16 and 28 towards each other, hook 18 is disconnected from loop 30 and a device, such as fish hook 40, may then be withdrawn from

hook 18. In the alternative, continued force or relative motion as was applied to connect fish hook 40 onto hook 18 may be applied to disconnect the apparatus. The interior of eye 42 is used in the same manner as the exterior portion was initially used (see FIGS. 2 and 3) to cam hook 18 away from loop 30. When the cam action at the exterior juncture of the loop and the hook accomplishes the desired separation, the eye 42 of the fish hook 40 moves past or away from hook 18 of the connector and the engagement therewith is broken.

By thus orienting the planes of loop 30 and any eye or loop, such as loop 42 of fish hook 40, of a device to be connected or disconnected from connector 10, generally parallel to each other, the application of a steady force in a single direction may be used to both connect and disconnect the apparatus. Connection with disconnection is thus accomplished by feel only and without the necessity of resorting to visual reference.

FIG. 5 discloses a pair of connectors 10 and 50 secured together as by joint 32. Connector 10 includes a pair of arms 12 and 24 and it is secured to a device such as fish hook 40. Connector 50 comprises a pair of arms 60 and 70 which extend from joint 32 and which terminate respectively in a hook portion 64 and a loop portion 74. Hook 64 includes a reversed portion 66 which is disposed within and against loop 74. The inherent resiliency or springiness of the arms 60 and 70 provides a substantial bias to hold or secure the hook 64 against the loop 74. Eye 80 of an appropriate device is secured to connector 50, as shown, by the extension of hook 64 through the eye 80. Sleeve 34 extends about joint 32 and over adjacent portions of both arms 60 and 70 of connector 50. The interior or inside diameter of sleeve 32 is less than the distance between arms 12 and 24 and 60 and 70 of the connectors 10 and 50, respectively, at bends 16 and 28, and 62 and 72, respectively. Thus if the sleeve is moved to the left, as shown in FIG. 5, or onto arms 12 and 24 and towards bends 16 and 28, the arms 12 and 24 will be urged towards each other sufficiently to disengage hook 18 and loop 30. As the hook and the loop are disengaged, a device, for example fish hook 40, may be removed from, or added to, as the case may be, connector 10. The same action may occur if sleeve 34 is moved towards arms 60 and 70 of connector 50. The bends 62 and 72 of the arms will be biased towards each other such that hook 64 will be separated from loop 74 in order to either remove or install eye 80 and the connector 50.

While the principles of the invention have been made clear in illustrative embodiments and in an illustrative environment, there will be immediately obvious to those skilled in the art modifications or variations of structure, materials, and components used in the practice of the invention, and otherwise, which are particularly adapted for specific environments and/or uses, without departing from those principles. The appended claims are intended to cover and embrace any and all such modifications or variations, within the limits only of the true spirit and scope of the invention. This specification and the appended claims have been prepared in accordance with the applicable patent laws and the rules promulgated under the authority thereof.

What is claimed is:

1. Connector apparatus comprising in combination: a first elongated tension member having a first end and a second end;

5

a second elongated tension member having a first end and a second and connected to first elongated member at the first ends of each of said members; a bend in said first elongated member; a bend in said second elongated member substantially opposite the bend in first elongated member; said first and said second elongated members diverging away from each other from their first ends toward the bend in each of said members and then converging from said bend and passing adjacent each other; said first member terminating in a loop on the second end of said first member; said second member terminating in a hook at the second end of said second member, said hook including a reverse portion which curves away from the hook; and said reverse portion of said hook of said second member being disposed against the loop of said first member.

2. A connector apparatus comprising, in combination:

a loop tension member having a first arm member extending from said loop member;

a bend in said first arm member;

a hook member including a reverse portion disposed within and against said loop member, said reverse portion comprising a reverse curve juxtaposed against the loop member;

a second arm tension member connected to said hook member and extending from said hook member adjacent the first arm member;

a bend in said second arm member adjacent the bend in said first arm member, said bends being of sub-

6

stantially the same extent and oppositely extending so as to cause said first arm member and said second arm member to converge from said loop member and said hook member and then to diverge towards said bend and then to converge after said bends; and said first member and said second member secured together at said point of convergence.

3. Connector apparatus comprising, in combination:

a loop;

an elongated member extending from said loop and including a band therein remote from said loop;

a hook terminating in a reverse portion disposed within and against said loop;

means for biasing said hook against said loop, said means including

an arm extending from said hook and adjacent said elongated member,

a bend in said arm adjacent the bend in said elongated member and of substantially the same angular displacement but extending oppositely from the bend in said elongated member, and said elongated member and said arm converging from said bends and secured together to form a joint at the convergence remotely from said hook and said loop and from said bends.

4. The apparatus of claim 3 which includes means for biasing the hook away from said loop comprising a sleeve disposed on said arm and said elongated member at the joint and movable on the arm and the elongated member adjacent the bends to bias the arm and the elongated member together and to bias the hook away from the loop.

* * * * *

35

40

45

50

55

60

65

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,760,468 Dated September 25, 1973

Inventor(s) Creath Q. Linville

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet item [76] "Creath W. Linville"
should read -- Creath Q. Linville --.

Signed and sealed this 26th day of February 1974.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents