

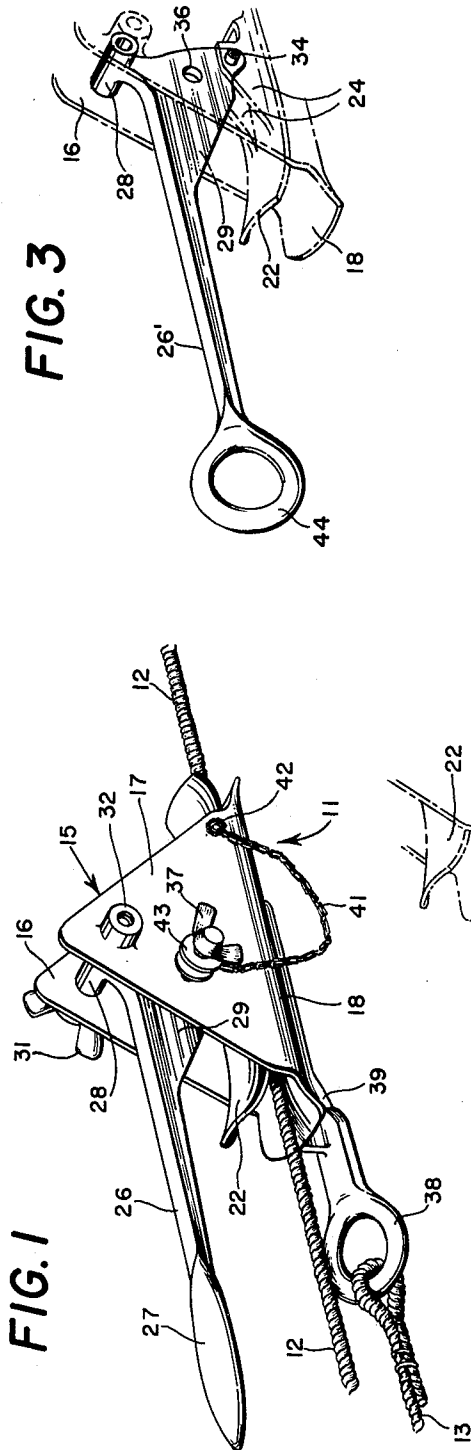
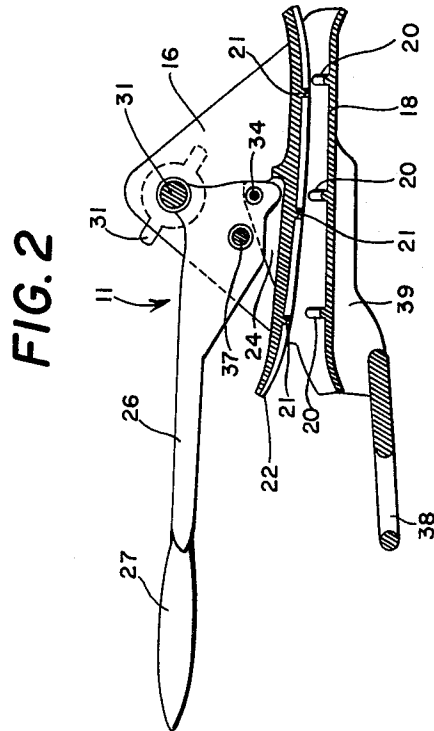
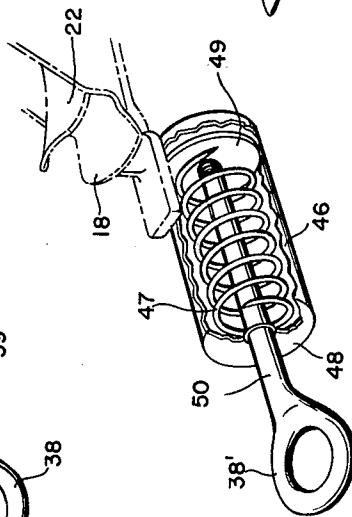
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SAFETY LINE CLAMP

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SAFETY LINE CLAMP

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The invention of this application relates to safety line clamps and is particularly concerned with such clamps which are easily portable and conveniently operated.

It is an object of the present invention to provide a clamp of the character described which is positive in operation.

Another object of the present invention is to provide a clamp of the character described which is durable and yet inexpensive to produce.

A further object of the present invention is to provide a clamp of the character described which incorporates means for indicating its proper use.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings in which:

FIGURE 1 is a perspective view of a safety line clamp according to the invention engaged on a supporting line;

FIGURE 2 is a longitudinal sectional view through the clamp illustrated in FIGURE 1;

FIGURE 3 is a fragmentary view illustrating a possible modification of the structure shown in FIGURES 1 and 2; and

FIGURE 4 is a fragmentary view showing another such modification.

Referring to FIGURE 1 the safety line clamp, designated generally as 11, is shown engaged on a safety line 12, with a supporting line 13 secured thereto. The clamp 11 comprises a frame 15 which has parallel sides 16 and 17 extending outwardly substantially normal to the plane of the base 18 of the frame. The base is of substantial length and is provided on its inner face with a plurality of longitudinally spaced, transverse ridges or beads 20 adapted to cooperate with similar ridges 21 on a movable shoe 22 firmly to grip a safety line such as shown at 12 located between the base 18 and the shoe 22.

The shoe 22 is curved outwardly longitudinally and curved inwardly transversely and has extending from its outer face a pair of transversely spaced lugs 24 which are provided with transversely aligned mounting holes. As shown in FIGURES 1 and 2 the shoe is carried by a lever 26.

The lever 26 is provided with a handle 27 on its outer, free end. At its other end there is provided a mounting bushing 28 and, adjacent thereto, a laterally extending, integral, rigid web 29. The bushing 28 has a tubular bore and is secured in place for pivotal movement of the lever between the sides 16 and 17 of the frame 15 by a bolt or thumbscrew 31 passing therethrough and threadedly engaged in a nipple 32 carried by the frame side 17.

Adjacent its outer end, which projects between the lugs 24 of the shoe 22, is a hole or orifice which registers with the above-mentioned aligned holes through the lugs 24 of the shoe 22. The latter is pivotally attached to the web 29 by a bolt or pin 34 which passes through the said holes through the lugs 24 and through the orifice in the web 29. A second orifice 36 is also provided in the web 29. This orifice is aligned with holes in the frame sides 16 and 17 when the shoe 22 is in line-clamping position so that a bolt or thumbscrew 37 may be passed through the three holes to lock the clamp. The end of the thumbscrew 37 threadedly engages in a nipple (not shown) on the exterior face of the frame side 16.

An eye 38 carried by a finger or bar 39, which may be formed integrally with the outer portion of the base 18

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or may be securely fastened thereto as by welding, is provided for attachment of a supporting line such as shown at 13. Preferably, the lever 26 and the eye 38 extend in the same direction from the clamp.

The operation of a clamp according to the present invention is very simple and convenient. Each worker requiring connection to a safety line is provided with a clamp having a supporting line 13 securely fastened to the eye 38 and running to a suitable safety belt or harness to which it is also securely fastened. When the worker is in position to start work the clamp is attached to the safety line 12 which passes between the base 18 and the shoe 22 by moving the lever 26 toward the eye 38, thus gripping the line 12 at the desired point between the ridges 20 and 21 on the base and the shoe, respectively. When the lever has reached a position where the safety line 12 is firmly held the hole 36 is in position for insertion of the thumbscrew 37 therethrough and through the registering holes in frame sides 16 and 17. After insertion of the thumbscrew 37, it is secured in position by screwing it into the threaded nipple (not shown) on the outer face of frame side 16. The clamp cannot thereafter be unfastened from the line 12 without removal of the thumbscrew.

A clamp according to the present invention may be secured to the proper desired point on a safety line such as the one designated 12 by passing the end of the line through the clamp between the shoe 22 and the base 18. If, however, the end of the safety line is inaccessible, the bolt 31 may be removed so that the lever 26 and shoe 22 can be removed from the clamp and the safety line placed between the clamp sides 16 and 17. The shoe 22 may then be replaced and the bolt 31 may be reinserted through the sides 16 and 17 and the bushing 28. As will be seen in FIGURE 1, a chain 41 may be provided for preventing loss of the thumbscrew 37, the chain being attached at one end to a ring 42 on the frame 15 and attached at its other end to a washer 43 rotatably secured on the bolt or thumbscrew 37 adjacent the head thereof. It is preferred to also provide a similar chain (not shown) for the bolt 31 to prevent its loss.

In FIGURE 3 the lever 26' is essentially like the lever 26 of FIGURES 1 and 2 except that the outer end thereof is formed as an eye 44 to which a supporting line may be secured. In this modification it is not necessary to have an eye attached to the frame 15. The operation of this modification form of clamp is the same as that of the embodiment previously described.

FIGURE 4 illustrates another embodiment in which the eye 38' is resiliently mounted. As shown, a cylinder 46 is secured to the outer face of the frame base 18. Within the cylinder 46 there is provided a compression spring 47 which bears against the outer end 48 of the cylinder and against a disc 49 removably secured at one end of a rod 50. The rod 50 passes through the end 48 of the cylinder 46 and is formed at its outer end as the eye 38'. The cylinder end 48 is secured in place by any suitable means such as welding or brazing. As will be evident, the construction shown in FIGURE 4 provides a cushioning or shock absorbing action in the event that a worker falls and the supporting line attached to the eye 38' is suddenly subjected to the stress of the falling body. In other respects, the operation of the safety clamp would be the same as that previously described. Shock absorbing means such as that shown may be used with either of the embodiments illustrated, only an obvious modification being necessary to allow its use with the embodiment shown in FIGURE 3.

Safety line clamps in accordance with the invention are preferably formed of metal for strength and durability. Ordinary steel may be used, but since the devices are exposed to the weather it may be preferred to form them

of stainless steel to minimize rusting and/or corrosion. It is also possible to use other high strength alloys of suitable characteristics. In fabricating the device the clamp frame 15 and the shoe 22 may be readily made by stamping while the levers 26 and/or 26' can be conveniently formed as forgings or castings. The nipples and the finger 39 can be attached easily to the frame 15 by welding.

It will be apparent that safety line clamps in accordance with the invention are easily and conveniently used and that they are efficient in operation. The pivotal action of the shoe 22 permits the obtaining of a good grip on a safety line such as a rope or cable passing through the clamp and this grip is increased by the ridges 20 and 21. As mentioned above, the shoe 22 is curved outwardly longitudinally. The ends of the frame base 18 are also curved outwardly and slightly flared. Thus the safety line 12 is not subjected to cutting stresses at the ends of the clamp. It will also be noted that once the clamp is applied to a supporting line and the bolt or thumbscrew 37 is screwed in place through the orifice 36 of the web 29, the lever 26 or 26' cannot be moved to release the line even if the lever is bent. This is a valuable safety feature. The thumbscrew 37 also serves as an indicator that the clamp is firmly secured to a safety line since it cannot be put in place unless the shoe 22 has been brought close enough to the frame base 18 so that the line is tightly gripped. Thus, if the shank of the thumbscrew 37 is brightly colored a safety inspector can tell from a distance whether the clamp is properly secured.

The safety line clamp of the present invention now makes it possible for iron workers, other construction workers, window washers, and other workers needing the protection of safety lines to easily and positively connect their supporting lines and safety belts to safety lines. The convenience of not having to tie a stopper hitch on a wet or frozen rope is an important advantage of the present invention.

While in the foregoing description and in the drawings specific embodiments of the invention have been described and illustrated, it will be understood that various modifications and changes in structure can be made without departing from the invention. For example, the shape of the frame sides 16 and 17 has been made generally triangular to reduce the weight of the clamp. It would not, however, be outside the invention to make such sides semicircular or square. Consequently, it is intended that the invention should not be considered as limited except as it may be restricted by the accompanying claims.

I claim:

1. A safety line clamp comprising a frame, said frame comprising an elongated base having a pair of rigidly attached sides projecting outwardly therefrom in spaced relation, said sides extending longitudinally adjacent said base for a major portion of the length of said base whereby to serve as a guide; a lever, one end of which is pivotally supported between said sides and the other end of which projects longitudinally beyond said base and is formed for convenient manual gripping, having a web between said sides adjacent said one end of said lever; an elongated shoe pivotally carried by said web; means for attaching a supporting line to said clamp; said shoe being movable by said lever toward and away from said base and being guided by said sides for a major portion of its length whereby a safety line passing longitudinally through said frame may be securely gripped for a substantial distance; and safety means interengaging said frame and said lever whereby to hold said shoe in line clamping position against accidental release.

2. A safety line clamp as set forth in claim 1 in which said first-mentioned means has a resilient connection to said frame.

3. A safety line clamp as set forth in claim 1 in which said first-mentioned means is integral with said frame.

4. A safety line clamp as set forth in claim 1 in which said first-mentioned means is integral with said lever.

5. A safety line clamp as set forth in claim 1 in which said shoe and said base are provided with cooperating line-gripping ridges.

6. A safety line clamp as set forth in claim 1 in which said lever and shoe are removable from said frame.

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