United States Patent

Able

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[54] DETACHABLE HANDLE EXTENSION FOR CHAIN TIGHTENER

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[52] **U.S. Cl.**.....**74/544,** 16/114 R, 81/177 A

[51] **Int. Cl.**.....**G05g 1/04**

[58] **Field of Search**.....74/544, 543, 524, 523, 520, 74/519; 16/114 R, 116; 81/177 A; 254/DIG. 3; 287/103 R

[56] **References Cited**

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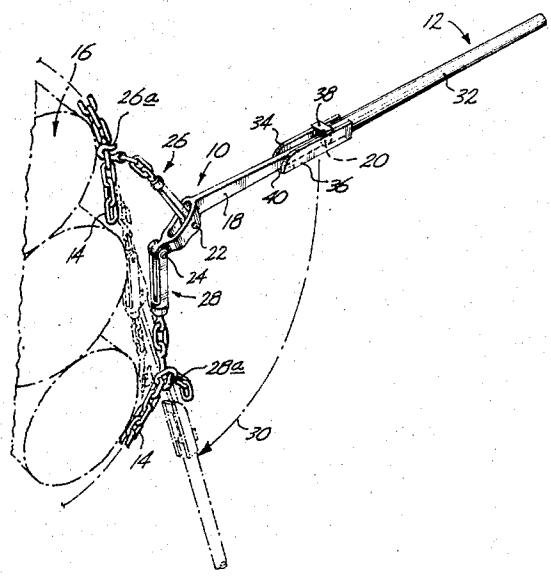
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[57] **ABSTRACT**

An extension adapted to be mounted removably on the handle of a chain tightener or the like, where the handle includes a lateral projection disposed outwardly from its inner end. The extension includes an elongated lever, a pair of bearings rigidly joined to the lever adapted to engage opposite sides of the handle at points spaced along its length, and a catch rigidly joined to the lever adapted releasably to engage the projection on the inner side thereof to prevent axial separation of the extension and handle.

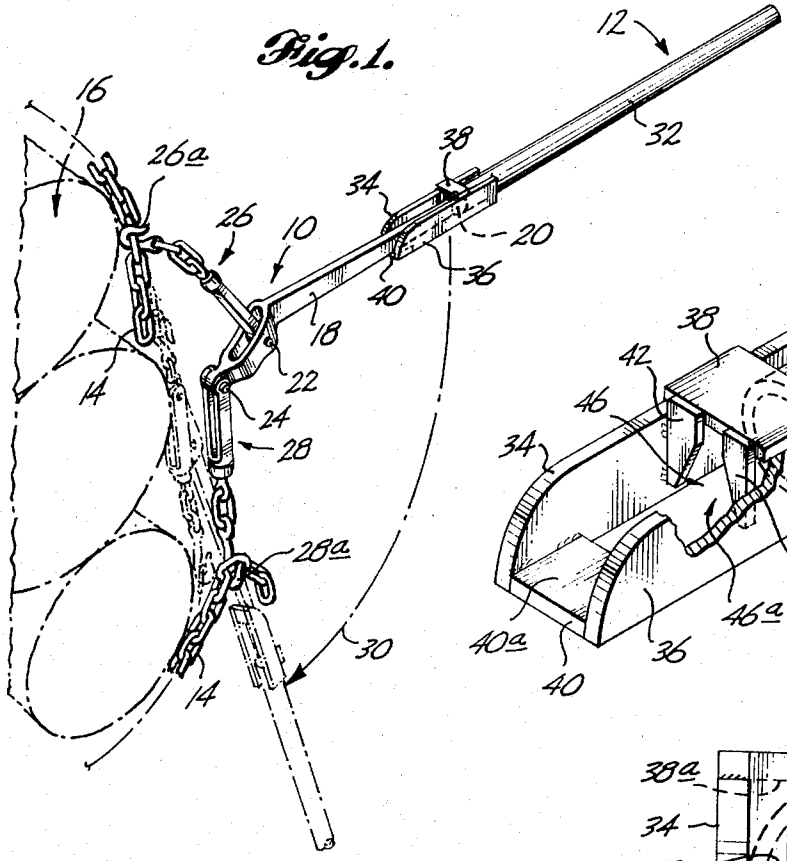
7 Claims, 4 Drawing Figures



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Fig. 1.



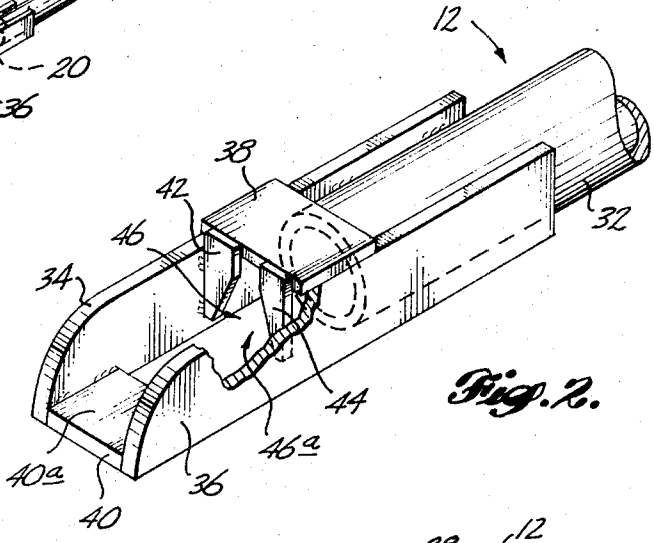


Fig. 2.

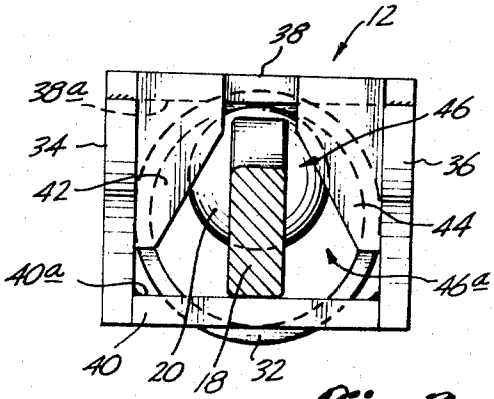


Fig. 3.

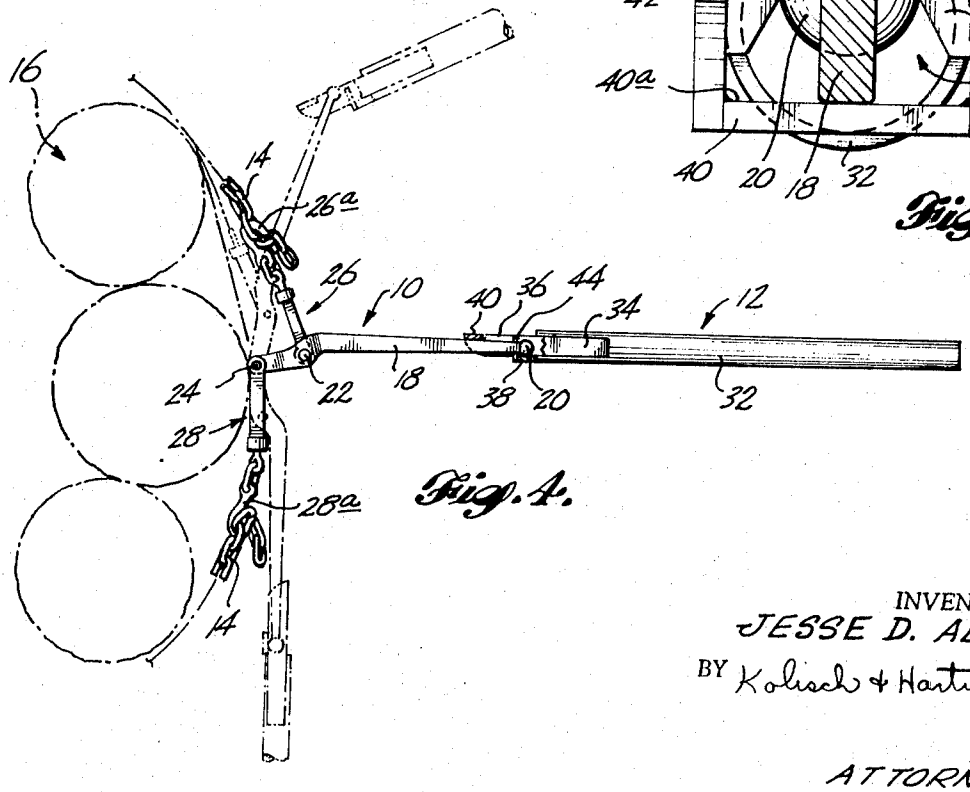


Fig. 4.

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DETACHABLE HANDLE EXTENSION FOR CHAIN TIGHTENER

BACKGROUND OF THE INVENTION

This invention pertains to an extension adapted to be mounted removably upon the handle of a chain tightener and the like.

The typical chain tightener is a hand-operated device used to snug-up and tighten a chain around a load, such as a bundle of logs. Such a tightener typically includes an actuating handle, and a pair of chain-grasping hook mechanisms pivoted to the handle at one end thereof and at points spaced along the length of the handle. As is well understood, such a device normally operates with a toggle-type action, with substantial forces building up in parts in the device as the pivot connections provided for the hook mechanisms move through what might be thought of as an over-center position relative to the line along which forces are transmitted to the device through these mechanisms.

The handles in most chain tighteners of the type generally described above are frequently relatively short, and as a consequence are quite difficult to operate because they offer poor leverage. To overcome this drawback in the past, users have attempted to improve the leverage situation by attaching something to a handle which, so to speak, increases its effective length. Typically, what has been attached to accomplish this has been a length of pipe or the like, which is freely slipped over the handle.

While this practice takes care of the leverage deficiency in tighteners, it creates an extremely hazardous situation which has, in the past, resulted in severe injury, and even death, to numerous persons. The principal danger with this practice is that during a tightening operation an extension of this type will slip axially off a tightener's handle, with the latter then flying up and striking the face of the operator. This event, in fact, accounts for most of the serious injuries and deaths resulting from the use of the practice. A further danger is that, during releasing of a tightener, the extension may be thrown in the air as the tightener's handle flies up from a position locking the tightener in place.

SUMMARY OF THE INVENTION

A general object of the present invention is to provide a novel extension adapted to be mounted removably on the handle of a chain tightener and the like which takes care of the problems mentioned above in a practical and satisfactory manner.

More specifically, an object of the invention is to provide such an extension which adequately takes care of the leverage deficiency characterizing conventional chain tighteners and the like, while at the same time avoiding the introduction of hazards such as those mentioned above.

According to a preferred embodiment of the invention, the proposed extension comprises an elongated lever, and a pair of bearings joined rigidly adjacent one end of the lever, with such bearings spaced apart from one another both longitudinally and transversely with respect to the longitudinal axis of the lever. Such bearings are adapted to engage opposite sides of a handle (on which the extension is mounted) at points spaced along the handle's length. Also joined to the lever, adjacent the end thereof where the bearings are located, is a novel catch which is adapted to seat against the inner side of the usual bulge formed adjacent the outer end of a chain tightener's handle. Such engagement of the catch and bulge prevents axial separation of the extension and handle.

Still another object of the invention is to provide an extension of the type just outlined, which is relatively simple and compact and economical in construction.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and advantages attained by the invention will become more fully apparent as the description which follows is read in conjunction with the accompanying drawings, wherein:

FIG. 1 is a fragmentary perspective view illustrating an extension constructed according to the invention mounted on the handle of a conventional chain tightener, with the extension, and parts in the tightener, shown in two different positions;

FIG. 2 is a fragmentary perspective view, on a larger scale than FIG. 1, illustrating an end of the extension in FIG. 1, with the extension removed from the tightener's handle;

FIG. 3 is an enlarged end view looking axially toward the end of the extension illustrated in FIG. 2, with the extension mounted on the tightener's handle; and

FIG. 4 is a fragmentary side elevation, on about the same scale as FIG. 1, illustrating several positions which may be occupied by the extension and handle during a releasing operation of the chain tightener.

DETAILED DESCRIPTION OF THE INVENTION

Turning now to the drawings, and referring first to FIG. 1, indicated generally at **10** is a conventional chain tightener, on the handle of which is mounted removably an extension **12** constructed according to the invention. Tightener **10** is of the type commonly used to bind-up or tighten a length of chain, such as chain **14**, around a load, such as log bundle **16** shown fragmentarily and in dash-dot outline in the figure. The tightener comprises the usual handle **18** having the configuration illustrated, and including adjacent its outer end a bulge **20**. Such a bulge is conventional, and is found on the handles of substantially all commercially available chain tighteners. Bulge **20** is referred to herein also as a lateral projection. Pivoted to the handle at **22**, **24** are conventional chain-grasping hook mechanisms **26**, **28** respectively, including hooks **26***a*, **28***a*, respectively.

In solid outline in FIG. 1, the tightener is shown in the position which it would occupy before a tightening operation with respect to chain **14**, but after its hooks **26***a*, **28***a* have been attached to links adjacent the ends of the chain. To bind-up or tighten chain **14**, handle **18** is swung downwardly as indicated by arrow **30** to place the parts in the tightener in their dash-dot outline positions in the figure. During this operation, and as will be appreciated by those skilled in the art, pivot connections **22**, **24** move through what might be thought of as an over-center position with respect to the line along which forces are transmitted to the handle through mechanisms **26**, **28**. On such occurring, the tightener becomes self-locked in its dash-dot outline position. As will also be appreciated by those skilled in the art, substantial forces build up in the parts in the tightener, particularly as connections **22**, **24** approach and move through the over-center position described, and considerable effort is required to operate handle **18** to accomplish the latter. In many instances, too great an effort is required, and an operator is unable to complete a tightening operation.

Referring to FIGS. **1**, **2**, and **3**, extension **12**, constructed as contemplated herein, safely overcomes the leverage deficiency in tightener **10**. Extension **12** includes an elongated tube, or lever, **32** preferably formed of steel. In the embodiment illustrated, tube **32** is approximately twice as long as that portion of handle **18** which extends between bulge **20** and pivot connection **22**. Joined, as by welding, to the near end of tube **32** in the figures are spaced apart substantially parallel side plates **34**, **36** having the shapes illustrated. As can be seen, plates **34**, **36** extend axially beyond the near end of the tube. Joined, as by welding, to, and extending transversely between, plates **34**, **36** are plates, or bearings, **38**, **40**. Plate **38** is disposed closely adjacent the near end of tube **32**, and adjacent the top edges of plates **34**, **36**. The lower face, **38***a* (see FIG. **3**), of plate **38** is referred to herein as a handle-engaging portion. Plate **40** is disposed axially outwardly of plate **38** from the near end of tube **32**, and is adjacent the bottom edges of plates **34**, **36**. The top face **40***a* of plate **40** in the figures constitutes a handle-engaging portion herein.

Anchored, as by welding, to the confronting faces of side plates **34**, **36**, also referred to as retaining numbers, and to plate **38**, intermediate faces **38***a*, **40***a* are plates, also referred

to as projections, or fingers, **42, 44** defining a notch, or catch, **46**. Plates **42, 44** occupy substantially the same plane which is spaced outwardly from the near end of tube **32** in the figures, and which is substantially normal to the longitudinal axis of the tube. With extension **12** oriented as shown in FIGS. **1, 2,** and **3**, notch **46** is oriented with its open side at **46***a* facing downwardly in the figures. Preferably, the confronting edges of plates **42, 44** are angled as shown, whereby the notch converges progressing thereinto from its open side.

While the assembly comprising plates **34, 36, 38, 40, 42, 44** has been shown as being made up of separate parts, it is appreciated that this assembly might instead take the form of a unitary casting of similar configuration suitably joined to tube **32**.

Explaining how extension **12** may be used during a tightening operation, the extension may be fitted onto the outer end of handle **18** as illustrated in FIG. **1**. With the extension so mounted, the handle extends over and engages plate **40**, and through notch **46**. Bulge **20** is disposed between plates **42, 44** and the near end of tube **32**, and seats against those faces of plates **42, 44** which confront the end of tube **32**. In addition, the bulge engages face **38***a* of plate **38**.

The tightener may then be operated by swinging downwardly on tube **32**, with force transmitted to handle **18** by virtue of engagement thereof by plates **38, 40**. Because of the length of tube **32**, a considerable improvement in leverage is attained, whereby it is a relatively easy matter to actuate the tightener to bind-up chain **14**. During this operation, there is no danger of handle **18** flying or pulling free from the extension, since axial retraction of the extension and handle is prevented by virtue of plates **42, 44** engaging the inner side of bulge **20**. Further, plates **34, 36** along opposite sides of the handle prevent lateral escape of the handle from the extension. With the chain properly tightened, extension **12** may readily be removed from handle **18** without disturbing the locked condition of the tightener.

Referring to FIG. **4**, the extension may be mounted as shown therein to actuate the tightener handle during a loosening operation. In particular, in this situation, the extension is mounted on the handle in what might be thought of as a position inverted from that in which it is mounted during a tightening operation. This position is clearly illustrated in the figure.

With the extension so mounted, tube **32** may be swung upwardly to swing handle **18**, with force transmitted to the handle, again through engagement thereof by plates **38, 40**. Axial retraction of the extension from the handle is, of course, prevented due to engagement of plates **42, 44** and bulge **20**. After shifting of pivot connections **22, 24** through the over-center position mentioned earlier, tension in chain **14** tends automatically to complete the operation, with handle **18** tending to swing upwardly independently of any force supplied thereto through the extension. As this occurs, at some point during swinging of the handle it swings away from a position engaging plates **38, 40** (as illustrated in dash-double-dot outline at the top of FIG. **4**), with the outer end of the handle extending freely upwardly through the region bounded by tube **32**, plates **34, 36** and plate **40**. Because of this action, there is no appreciable tendency for such swinging of the handle to throw the extension in the air. As a consequence, it is a relatively easy matter for an operator to hold onto and control the extension.

Thus, the extension proposed by the invention offers a novel and satisfactory solution to the problem of simplifying and making safe the operation of a chain tightener and the like. The extension may readily be mounted removably on the handle of such a device at times when required, and when mounted and used, it greatly improves the leverage situation. Very importantly, when mounted and operated with such a device, the extension positively and completely avoids the hazards discussed earlier.

It will be apparent that relatively simple and economical construction characterizes the proposed extension. Further, it will be appreciated that the extension is readily adaptable for use with a wide variety of sizes and types of chain tighteners and like devices. The exact sizes of parts in the extension may, of course, be adjusted to take care of particular situations.

While an embodiment of the invention has been described herein, it is appreciated that variations and modifications may be made without departing from the spirit of the invention.

It is claimed and desired to secure by Letters Patent:

1. An extension adapted to be mounted removably on the handle of a chain tightener and the like, where said handle includes a lateral projection disposed outwardly of its inner end, said extension comprising

an elongated lever,

a pair of bearings rigidly joined to said lever adjacent one end thereof, and spaced apart from one another both longitudinally and transversely with respect to the longitudinal axis of said lever, said bearings being adapted to engage opposite sides of said handle at points spaced along its length with the extension mounted on the handle, and

a catch rigidly joined to said lever adjacent its said one end adapted, with said extension mounted on said handle and said bearings engaging the same, releasably to engage said projection on the inner side thereof, and through such engagement to prevent axial separation of the extension and handle, said catch comprising means defining a notch disposed in a plane extending transversely of the longitudinal axis of said lever, with said notch having an open side oriented and constructed freely to admit said handle into said notch with relative angular movement in one direction between the extension and handle to seat said bearings against the latter, and to release the handle from the notch with relative angular movement in the opposite direction between the extension and handle.

2. The extension of claim **1**, wherein each bearing includes a handle-engaging portion, and said means defining said notch is disposed longitudinally intermediate said portions.

3. An extension adapted to be mounted removably on the handle of a chain tightener and the like, where said handle includes a lateral projection disposed outwardly of its inner end, said extension comprising

an elongated lever,

a pair of bearings rigidly joined to said lever adjacent one end thereof, and spaced apart from one another both longitudinally and transversely with respect to the longitudinal axis of said lever, said bearings being adapted to engage opposite sides of said handle at points spaced along its length with the extension mounted on the handle, and

a pair of laterally spaced, substantially coplaner fingers joined to said lever adjacent its said one end adapted to straddle said handle with the extension mounted on the handle releasably to engage said projection on the inner side thereof and through such engagement to prevent axial separation of the extension and handle, said fingers defining an open-sided notch disposed in a plane extending transversely of the longitudinal axis of said lever, with the open side of said notch being oriented and constructed freely to admit said handle into said notch with relative angular movement in one direction between the extension and handle to seat said bearings against the latter, and to release the handle from the notch with relative angular movement in the opposite direction between the extension and handle.

4. An extension adapted to be mounted removably on the handle of a chain tightener and the like, where said handle includes a lateral projection disposed outwardly of its inner end, said extension comprising

an elongated lever,

a pair of bearings rigidly joined to said lever adjacent one end thereof and spaced apart from one another both longitudinally and transversely with respect to the longitudinal axis of said lever, said bearings being adapted to engage opposite sides of said handle at points spaced along its length with the extension mounted on the handle, and

a catch rigidly joined to said lever adjacent its said one end comprising a pair of laterally spaced projections defining a notch therebetween, said projections being adapted, with the extension mounted on the handle and the bearings engaging the same, to straddle the handle releasably to engage the projection on the handle on the inner side thereof and through such engagement to prevent axial separation of the extension and handle.

5. The extension of claim 4, wherein said notch has an open side, said open side being oriented and constructed freely to admit said handle into said notch with relative angular movement in one direction between the extension and handle to seat said bearings against the latter, and to release the handle from the notch with relative angular movement in the opposite direction between the extension and handle.

6. The extension of claim 4, wherein said projections comprise a pair of substantially coplaner fingers disposed in a plane extending transversely of the longitudinal axis of the lever.

7. An extension adapted to be mounted removably on the handle of a chain tightener and the like, where said handle includes a lateral projection disposed outwardly of its inner end,

said extension comprising

an elongated lever,

a pair of bearings rigidly joined to said lever adjacent one end thereof, and spaced apart form one another both longitudinally and transversely with respect to the longitudinal axis of said lever, said bearings being adapted to engage opposite sides of said handle at points spaced along its length with the extension mounted on the handle,

a catch rigidly joined to said lever adjacent its said one end adapted, with said extension mounted on said handle and said bearings engaging the same, releasably to engage said projection on the inner side thereof, and through such engagement to prevent axial separation of the extension and handle, and

a pair of elongated, laterally spaced retainer members extending substantially parallel to the longitudinal axis of the lever, disposed on opposite sides of and extending between said bearings, said retainer members being operable to prevent lateral escape of the handle from the extension.

* * * * *