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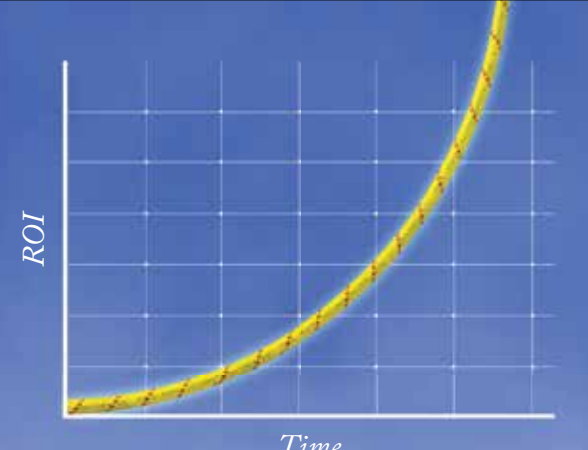
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securing said cover to the gear box are shown as well.

In a preferred embodiment, the first end of the barrel includes right-hand threads within the first end of the barrel, while the second end of the barrel includes left-hand threads. Threadably coupled to these threaded members are two shafts, with the first shaft **25** having right-hand threads at one end, and the second shaft **26** having left-hand threads at one end. The first shaft is threaded coupled to the end of the barrel having the right-hand threads, and the second shaft is threadably coupled into the end of the barrel having the left-hand threads.

It is known that unwanted rotation between a mated pair of threadably coupled components (one having internal and the other having external threads) can be arrested by driving an additional internally threaded component to bear against the first internally threaded component. A simple example of this is that a nut located at a predetermined location along a threaded shaft can be locked into that position by driving a second nut into it from either axial direction. Double-nutting as this is sometimes called, is often employed in environments having moderate vibration such as in transport or shipping.

Threaded load tighteners similar to nuts or threaded washers, often having an eccentric perimeter or lobe or tab extending radially away from its internally threaded hole, are they used in the same manner as doubled nuts to lock turnbuckles and load binders against unwanted rotation after the device has taken up a tensile, axial load. It is similarly contemplated within the scope of the invention to include load tighteners threaded onto the threaded sections of shafts **25** and **26**.

The other ends of the first and second shafts have end effectors, which is a term including any of various means for connecting chain, cable, strap or similar material, or

attachment points of ponderous objects to the shaft for operation in tension. In the embodiment shown in figure 14, the shaft ends not threadably inserted into the barrel terminate with eyes **28**. A link **36** and hook **39** are attached to each eye bolt for attaching to chain, cable, or attachment points on machinery to be secured, such as lifting rings or tow points on vehicle frames.

Other end effectors are designed to withstand and transmit compression forces into the shafts. An embodiment according to this aspect of the invention and adapted for jacking or lifting a load is shown in an exploded view in figure 15. The aforementioned cover **37** and four screws **38** securing said cover to the gear box **33** are seen here, as are the drive gear **32** and barrel gear **30** driven by it. The barrel gear is affixed to the barrel by a roll pin **40**.

The barrel **22** of this embodiment has a first end having external threads **50** and second end opposite the first having a lifting pad **51** which in a best mode is knurled, grooved, cross-cut, or waffled to provide a positive, non-slip contact with the load to be raised. Although in this embodiment the lifting pad is integral to the barrel and may be a single forged part for strength, other preferred embodiments contemplated within the scope of the invention include those having the lifting pad as a separate component swivelably coupled to the barrel end or threadably coupled to the barrel for fine height adjustment and mate-up of the lifting pad to the load. The rotational coupling between the barrel and the lifting pad allows barrel rotation during lifting or lowering without deleteriously forcing the lifting pad to rotate at its contact interface with the load in its lifting or lowering motion.

more patents continued on next page