United States Patent [19]

Jenkins

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[54] **LOCK ASSEMBLY FOR HOLDING EXTENSIBLE OUTRIGGER LEG IN RETRACTED POSITION**

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[52] **U.S. Cl.** ..... **287/58 CT**, 287/126

[51] **Int. Cl.** **F16b 7/10**

[58] **Field of Search** ..... 287/126, 58 CT, 53 H; 248/414, 337, 188.5; 279/102; 212/145; 280/150.5; 16/30; 285/304; 292/DIG. 73

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[57] **ABSTRACT**

An extensible outrigger for vehicles having a power-actuated inner member shiftable within an outer member to a ground-engaging position is provided with a lock to releasably hold the inner member during over-the-road travel and storage. The lock includes a flexible plate secured to the inner member near the outer end of the latter and a compressible pad carried by the plate between the latter and the inner member. The arrangement is such as to not only provide a wedging action but a holding effect because of the compressibility of the pad. Undue wear is avoided by location of the lock so as to become effective only as the retracted position of the outrigger is approached.

2 Claims, 4 Drawing Figures

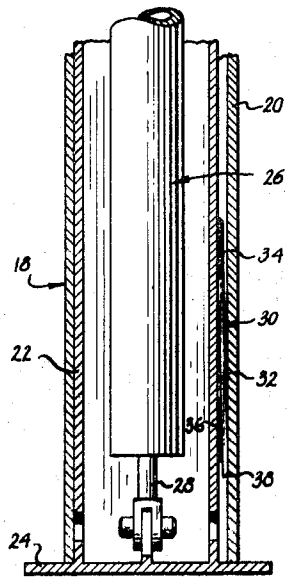


Fig. 1.

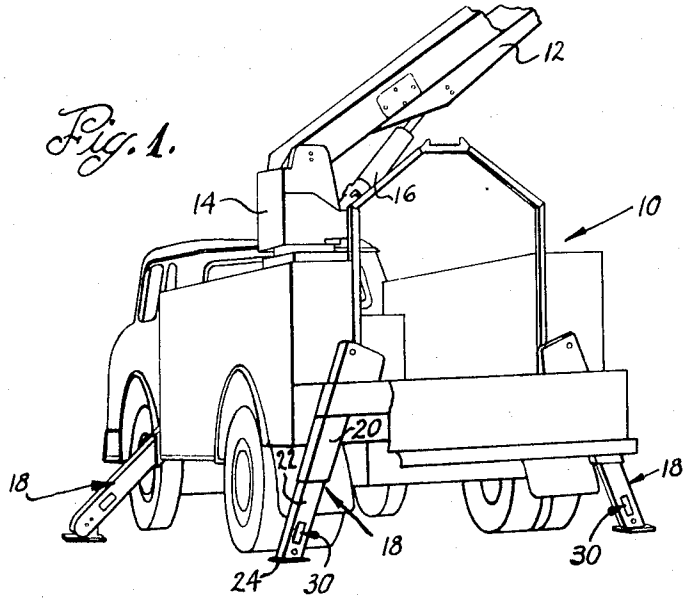


Fig. 2.

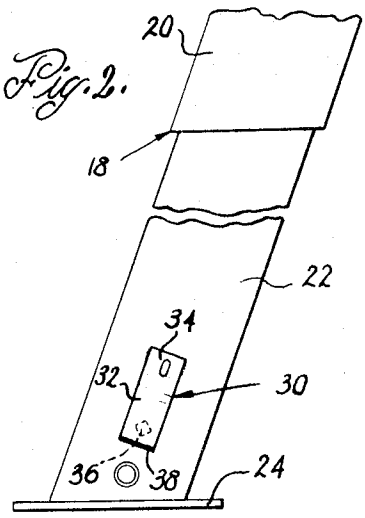


Fig. 3.

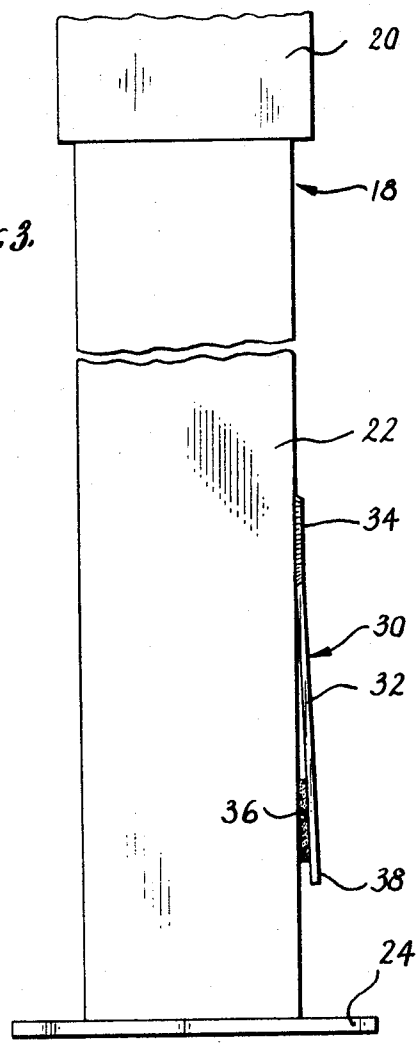
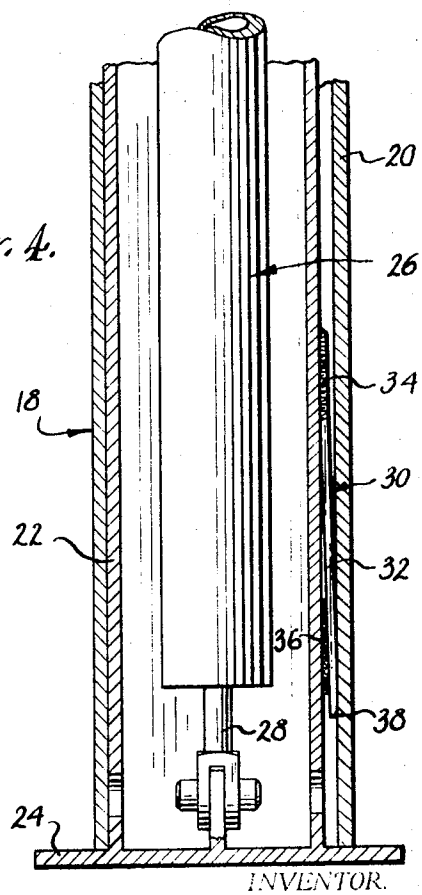


Fig. 4.



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LOCK ASSEMBLY FOR HOLDING EXTENSIBLE OUTRIGGER LEG IN RETRACTED POSITION

It is an important object of my present invention to provide a vehicle outrigger assembly having a simple and inexpensive lock for releasably holding a pair of relatively telescoped members in a retracted position during over-the-road travel and storage notwithstanding malfunctions in the power structure which has, as one of its normal functions, maintenance of the relatively telescoped members in preselected positions.

Another important object of the present invention is to provide auxiliary holding means capable of supporting the weight of the ground-engaging leg of a vehicle outrigger during retraction, notwithstanding fluid leakage in the hydraulic piston and cylinder assembly which actuates the leg and has the primary function of holding the leg extended or retracted.

A further object of my instant invention is to provide a lock for use in connection with an outrigger of the aforementioned nature operable on the basis of a frictional wedge between the leg and its tubular housing as well as by the compression of a pad between the relatively reciprocable members during retraction such as to become automatically operable without need for separate releasable components requiring actuation as is commonplace in conventional locks.

In the drawing:

FIG. 1 is a rear perspective view of a vehicle provided with a lock assembly for holding the extensible outrigger legs thereof in retracted positions;

FIG. 2 is an enlarged, fragmentary side elevational view of one of the outriggers shown in FIG. 1 illustrating the lock assembly mounted on the extended leg;

FIG. 3 is a fragmentary, edge elevational view of the outrigger shown in FIG. 2 still further enlarged; and

FIG. 4 is a fragmentary, longitudinal cross-sectional view through the outrigger shown in FIGS. 2 and 3.

A vehicle broadly designated by the numeral 10 in FIG. 1 is especially adapted for maintenance of power lines or similar operations wherein an extensible boom 12 is needed for lifting workmen or materials. Boom 12 is mounted on vehicle 10 by means of a turret for horizontal swinging movement, there being a piston and cylinder assembly 16 interposed between boom 12 and turret 14 for effecting vertical swinging of boom 12.

During use of the boom 12 it is especially necessary, both for safety and efficiency of operation, to provide a sturdy, non-tippable base, and in view of the spring-like suspension system associated with vehicle 10 and its inherent, relatively high center of gravity, it is necessary to provide front and rear extensible outrigger assemblies which are denoted broadly by the numeral 18.

Since all of the assemblies 18 are substantially identical in construction, only one of the assemblies 18 need be described in detail. Accordingly, a rear outrigger assembly 18 in FIG. 2 includes an elongated, outer, tubular housing member 20 which is secured to vehicle 10 adjacent its upper end and reciprocably receives therewithin an elongated, tubular, inner leg member 22 having an angularly offset foot 24 at its outermost end. A double-acting fluid pressure piston and cylinder unit 26 housed within leg 22 has the piston rod 28 thereof coupled with foot 24, while the upper end of unit 26 (not shown) is coupled with suitable mounting structure on the vehicle 10.

Hydraulic check valves (not shown) are often used to lock the unit 26 in position when the leg 22 is extended or retracted. However, a particular problem is sometimes encountered when leg 22 is retracted and the pressure in the lower end of unit 26 is low, inasmuch as leakage sometimes occurs through the check valve and allows leg 22 to drift down and out while outrigger 18 is in storage or being transported over the road.

Therefore, to solve this problem the outrigger assembly 18 is provided with structure for releasably holing the leg 22 against reciprocation in the nature of a locking device 30 which includes an elongated spring plate 32 welded or otherwise fastened at one end 34 thereof to the leg 22. While the particular location of device 30 anywhere on leg 22 does not affect its effectiveness for locking purposes, in its preferred arrangement device 30 is disposed adjacent the outermost end of leg 22 in order to eliminate unnecessary wear as will hereinafter become clear. Locking device 30 further includes a compressible pad element 36 secured to plate 32 at the opposite end 38 of the latter between end 38 and leg 22. It may, therefore, be seen by viewing FIG. 3 that pad 36 is spaced away from plate end 34, causing the plate 32 to converge toward leg 22 as end 34 is approached, all of which imparts a generally wedge-shaped configuration to the locking device 30.

In operation, the legs 22 of outriggers 18 may be extended into their ground-engaging positions by actuating the piston and cylinder units 26 until the vehicle 10 is completely stabilized. Thereafter, the boom 12 may be utilized to lift workmen and materials to any desired height or position. Upon completion of the job at a particular site, the legs 22 may then be retracted into the housings 20 by again actuating units 26 to place the assemblies 18 in condition for over-the-road travel. During such retraction, as each leg moves within its housing 20 approaching its retracted position, the plate 32, intermediate ends 34 and 38 thereof, comes in contact with one of the lowermost edges of housing 20. As retraction of leg 22 continues, plate 32 begins to flex toward leg 22 and thereby compress pad 36 as locking device 30 becomes clamped between leg 22 and housing 20. By the time leg 22 is in its completely retracted position, as shown in FIG. 4, locking device 30 has become tightly wedged between housing 20 and leg 22. Therefore, device 30 has essentially locked leg 22 in its retracted position, permitting the latter to be removed thereform only upon the application of substantial power through piston and cylinder unit 26.

It will be appreciated that the special design of locking device 30 and the location adjacent the lowermost end of leg 22 substantially minimize the amount of wear to which plate 32 is subjected. Moreover, such an arrangement decreases the burden upon the hydraulic power system for each outrigger 18 and enables the system to operate unencumbered by any frictional resistance for a substantial stretch of leg 22. In addition, the relative simple, low cost construction of locking device 30 greatly enhances the value of the latter as a means of solving the heretofore inherent problems of holding each leg 22 in its retracted position during over-the-road travel.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In combination with an extensible assembly having an elongated, outer, tubular member and an elongated, inner member having one end telescoped within a first end of the outer member and the opposite end projecting therefrom, structure for releasably holding the

inner member fully telescoped within the outer member and against reciprocation comprising:

an independently functional, elongated, yieldable leaf spring component mounted on said inner member adjacent said opposite end thereof and adapted to move completely out of contact with said outer tubular member as said inner member reciprocates from its fully retracted position, said component being further disposed to resist flexure toward said inner member in response to the application of an external force on said component directed toward said inner member by said outer member,

said component being fixed at one end thereof to said inner member and diverging progressively radially outwardly away from said inner member in a direction away from said first end; and

an independently functional, mechanically and structurally distinct, compressible pad on said leaf spring component adjacent the opposite end thereof and on the side facing said inner member for resisting compression toward said inner member the opposite side of said component being smooth so as to provide a good bearing surface whereby, upon the application of such external force to the component directed toward said inner member when the inner member is moved to its retracted position relative to the outer member, said pad and said component cooperate to prevent unintentional movement of the inner member out of said retracted position by combining their individual resistances to such force.

2. The invention as claimed in claim **1**, wherein said component is oriented to cause the external force of said outer member to be applied along said component progressively closer to the opposite end thereof as said inner member approaches its retracted position, thereby effecting a progressively stronger holding action as said position is approached.

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