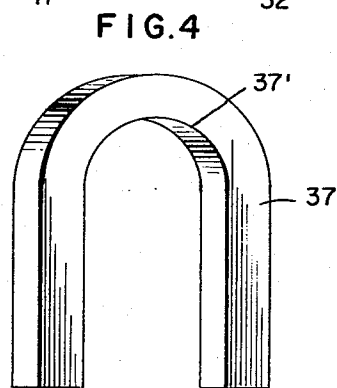
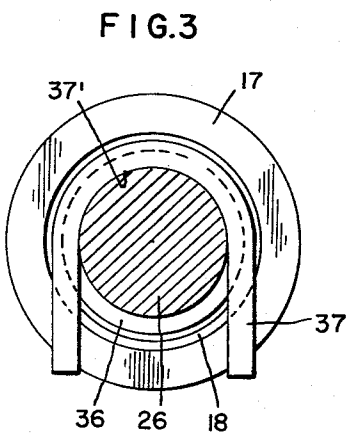
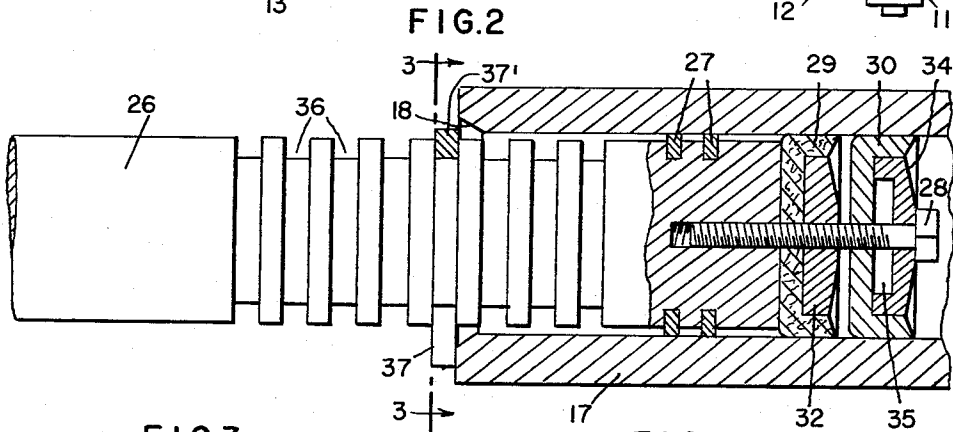
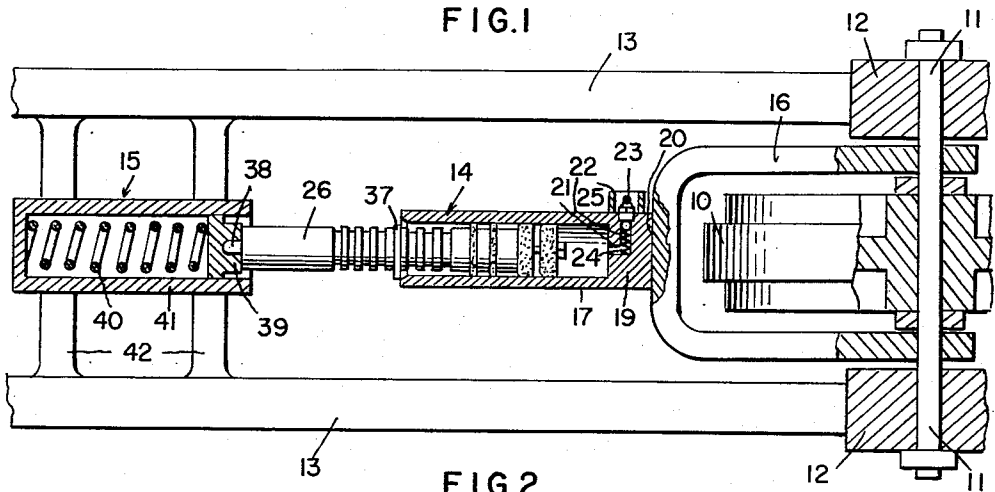


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J. C. HELSEL, SR
TRACK TENSION ADJUSTER

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TRACK TENSION ADJUSTER

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5 Claims. (Cl. 305—10)

This invention relates to a tension adjuster for an endless link track, particularly adapted for attachment to a conventional bulldozer and is a continuation-in-part of application, Serial No. 583,548, filed by me, May 8, 1956, now Patent Number 2,887,342 issued May 19, 1959.

The track tension adjuster of my copending application has proven highly successful under actual working conditions and is capable of withstanding the tremendous pressures exerted thereon in some operations by the lubricant used to counter-pressure one end of the adjuster's floating piston. However, it has been found that after use of the adjuster over an extended period of time the piston cups, which engage the lubricant cylinder wall to positively seal the latter and prevent leakage of the lubricant from the cylinder, tend to wear under these forces, with resultant loss of effectiveness.

It is, therefore, an object of this invention to relieve the pressure exerted on the piston cups of the track tension adjuster's piston and cylinder assembly by the lubricant, thereby prolonging the life thereof indefinitely.

Another object is to provide a track tension adjuster including a piston rod floatingly mounted in a lubricant cylinder, the piston rod including an adjustable locking member carried by the piston rod and engageable with the lubricant cylinder for positively limiting the extent of penetration of the rod into the cylinder under spring pressure.

A further object is to provide a track tension adjuster of the character described in which the locking member requires no extraneous fastening means for securing it into position and may be readily attached to, and removed from, the piston rod in a minimum of time and with a minimum of effort.

Other objects of the invention will be manifest from the following description of the present preferred form of invention, taken in connection with the accompanying drawing, wherein:

FIG. 1 is a longitudinal sectional view taken through a conventional bulldozer equipped with the device of the present invention;

FIG. 2 is an enlarged elevational view of the piston and cylinder assembly of the present invention, portions thereof being shown in section to disclose details of construction;

FIG. 3 is a sectional view taken along the lines 3—3 of FIG. 2 looking in the direction of the arrows, and showing to advantage the locking member forming a part of the present invention; and

FIG. 4 is a perspective view of the lock per se forming a part of the present invention.

Referring now in greater detail to the drawing, there is illustrated in FIG. 1 a portion of a conventional bulldozer which includes an idler wheel 10 which is adapted to engage an endless link track (not shown). Idler wheel 10 is rotatably mounted on an axle 11, the terminals of which are journaled in front idler boxings 12. Boxings 12 are slidably mounted in a conventional manner on spaced frame members 13.

The tension adjuster of the present invention generally includes a piston and cylinder assembly designated 14, one end of which is connected to a spring unit 15. The opposite end of piston and cylinder assembly 14 is secured to a horseshoe bracket 16, the terminals of which bracket are secured in any suitable manner to slidable idler boxings 12.

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Assembly 14 includes a cylinder 17, one end of which is open and beveled at 18 to facilitate insertion of the piston therein, the other end of the cylinder designated 19 being enclosed and welded or secured in any other suitable manner at 20 to the cross member of horseshoe bracket 16. End 19 is provided with a horizontal duct 21 leading from cylinder 17, which duct communicates with a vertical duct 22. A conventional grease fitting 23 is mounted in end 19 and communicates with vertical duct 22. A safety check valve 24 including a ball and coil spring is mounted in vertical duct 22 to prevent fitting 23 from being blown out under pressure exerted thereon by lubricant within the cylinder. A cylindrical grease fitting guard is indicated at 25. Assembly 14 also includes a piston rod 26, the inner end of which is constructed in accordance with my copending application, Serial No. 583,548, and includes a pair of spaced peripheral grooves adapted for the reception of compression piston rings 27. Attached to one end of piston rod 26 by means of a screw 28 are a pair of piston cups 29 and 30 of any suitable flexible construction. The flange portion of cup 29 is tapered as indicated at 31. Piston cup 29 is held in proper position by a follow plate 32, the outer face of which is tapered at an angle of approximately 15°, as indicated at 33. Piston cup 30 is held in proper position by a follow plate 34, the inside of which is counter-bored as indicated at 35. By means of this structure, when screw 28 is drawn up, the face of piston cup 30 adjacent follow plate 32 is forced by counter-bored follow plate 34 against tapered face 33 of follow plate 32. This causes piston cup 30 to expand into tighter engagement with the inside wall of cylinder 17. Cup 30, in turn, exerts an outward force on tapered portion 31 of piston cup 29 to urge the latter into tighter engagement with the inner wall cylinder 17. This effects a positive seal against any pressure and also serves as a pressure point for the lubricating grease to collect and force the piston to travel toward the open end of cylinder 17. The sealing action of piston cups 29 and 30 is backed up by compression piston rings 27.

Intermediate its length, piston 26 is provided with a plurality of spaced annular grooves 36 which are cut into the periphery of the piston. Grooves 36 are adapted for the selective reception of a lock 37 of horseshoe or U-shape configuration. Lock 37 is preferably of metal construction, of a thickness to permit it to be readily inserted into grooves 36 of piston 26, and is wider than the depth of grooves 36 so that a portion thereof extends beyond the periphery of piston 26, as shown to advantage in FIGS. 2 and 3. That portion of lock 37 which extends beyond the peripheral limits of piston 26 abuts the terminal of cylinder 17 adjacent its open end to positively limit the extent of penetration of piston 26 into cylinder 17 under urging of spring unit 15. Consequently, piston cups 29 and 30 are not subjected to pressures exerted by the lubricant which would otherwise result. It should also be noted that the distance between the terminals of horseshoe-shaped lock 37 is slightly less than the diameter of the grooved portions of piston 26 so that when the lock 37 is slipped into place, the outer terminals thereof are flexed slightly to insure a tight fit of the lock in the groove. Also, the upper arcuate portion of lock 37, indicated at 37', complements the contour of the grooved portion of the cylinder to effect contiguous engagement of said arcuate portion with the piston periphery in the manner illustrated in FIG. 3.

The free end of piston 26 is provided with a protuberance or knob 38 adapted to be received in a complementary opening of a spring block 39 which forms a part of spring unit 15. Affixed to spring block 39 is a heavy compression spring 40, the spring block and spring

being locked within a housing 41 secured to frame members 13 by braces 42.

In use, idler wheel 10 is normally held in position by the force of compression spring 40 and piston and cylinder assembly 14 acting through horseshoe bracket 16. In the event that the link track becomes loose from wear, floating piston 26 may be moved longitudinally in cylinder 17 to effect movement of idler 10 in a direction to take up the slack in the link track. Movement of piston 26 is effected by injecting grease, under pressure through grease fitting 23 and through ducts 22 and 21 into cylinder 17. The pressure of the grease against the piston head forces the latter to move in the above-described manner to effect the desired tautness of the link track. For introducing the grease into the cylinder an ordinary grease-gun, furnished, as a rule, by the bulldozer manufacturer for lubricating the moving parts thereof is used. After the desired tension has been placed on the link track, horseshoe lock 37 is fitted into the annular groove 36 closest to the open terminal of cylinder 17. As lock 37 is inserted into the groove, the outer terminals thereof flex slightly to insure a tight fit and thereby prevent accidental disengagement of the lock from the piston. After the lock is in place, relative movement of piston 26 with respect to cylinder 17 in either direction is prevented with consequent relief of pressure on piston cups 29 and 30.

When the bulldozer or other vehicle on which the device of the present invention is installed initiates operation, spring 40 serves to maintain the proper tension thereon by automatically responding to changes in the terrain over which the vehicle travels, thereby eliminating excessive stress on the link track. For example, when too much tension is placed on the link track, a force is exerted through idler 10, horseshoe bracket 16 and piston and cylinder assembly 14 to spring block 39. Block 39, in turn, moves longitudinally of housing 41 to compress spring 40 and thereby reduce the force on the link track.

When lock 37 is to be removed upon readjustment of the link track, removal thereof from groove 36 is readily effected by striking the lower terminals thereof with a hammer or the like. The lock may then be inserted in the selected groove 36 after piston 26 has been relocated in the cylinder 17.

With the device of the present invention, a novel locking arrangement for the piston and cylinder assembly is provided without the use of undesirable extraneous securing means, such as nuts and bolts, which are subject to wear and rust, and complicate and prolong adjustment of the assembly.

While the present invention has been shown and described in its preferred form, it is nevertheless understood that various changes may be made therein, within the scope of the claims hereto appended.

What I claim is:

1. In combination with a vehicle having a link track, an adjuster assembly for the track mounted on a fixed part of the vehicle and including a stationary part and a movable part with a piston floatingly mounted between said parts, the assembly including a further part engaged with the movable part and adapted to be urged by the latter into engagement with the track, pressure means mounted in each of said stationary and movable parts for engagement with the piston, to exert a predetermined force on said last part, and locking means carried by said piston and engageable with said movable part for limiting the extent of penetration of said piston into said movable part, said locking means including annular grooves formed in the outer periphery of said piston, and a horseshoe shaped member adapted for selective engagement with the annular grooves, a portion of said horseshoe shaped member abutting one end of said movable part.

2. In combination with a vehicle having a link track engageable with an idler wheel, an adjuster assembly for the track carried by the vehicle including a piston float-

ingly mounted on the vehicle body, one end of the piston being operatively connected to a spring-loaded cylinder fixedly mounted on the vehicle, a lubricant cylinder engaged with said idler wheel in which cylinder the opposite end of the piston is mounted, for holding the piston in a predetermined state of balance, and an adjustable locking assembly carried by said piston and engageable with the lubricant cylinder for positively limiting the extent of penetration of the piston into the lubricant cylinder under spring pressure, said adjustable locking assembly including a plurality of peripheral annular grooves formed in an intermediate portion of said piston and a U-shaped member adapted for selective engagement with the annular grooves of said piston, a portion of said U-shaped member extending beyond the peripheral limit of said piston into abutting engagement with said cylinder.

3. In combination with a vehicle having a link track engageable with an idler wheel, an adjuster assembly for the track mounted on a fixed part of the vehicle and including a piston having annular peripheral grooves floatingly mounted on the vehicle, a lubricant cylinder engaged with said idler wheel, in which cylinder one end of the piston is mounted, and a locking member beyond said lubricant cylinder adapted for selective engagement with the annular grooves of the piston, a portion of said locking member abutting one end of said lubricant cylinder, to positively limit the extent of penetration of said piston into the lubricant cylinder.

4. A track tension adjuster for a link track vehicle, including a piston having annular peripheral grooves floatingly mounted on the vehicle, one end of the piston being operatively connected in a spring-loaded cylinder mounted on a fixed part of said vehicle, a lubricant cylinder in which the opposite end of the piston is mounted, for holding the piston in a predetermined state of balance, said cylinder being fixed to and adapted for actuating a movable part of the vehicle operatively connected to the link track for exerting tension on the latter, a plurality of sealing members carried by the opposite end of the piston for preventing leakage of the lubricant, said sealing members including flexible cups having flanged portions, one of which cups is adapted to receive a follow plate having a beveled face engageable with the said other cup, the sealing members further including adjustable means connecting said cups and follow plate to the terminal of the piston and for urging the one cup into engagement with the beveled face of said follow plate and with the flanged portion of the other cup to effect expansion of the flanged portions of both cups into sealing engagement with the cylinder wall, and a horseshoe-shaped lock adapted for selective engagement with the annular grooves of said piston, said lock being engageable with the lubricant cylinder for positively limiting the extent of penetration of the piston into the lubricant cylinder under spring pressure.

5. In combination with a vehicle having a link track engageable with an idler wheel, an adjuster assembly mounted on a fixed part of the vehicle and engageable with the idler wheel, said adjuster assembly including a lubricant cylinder engaged with said idler wheel, a piston, one end of said piston being mounted in said lubricant cylinder, a plurality of peripheral annular grooves formed in an intermediate portion of said piston, and a U-shaped member adapted for selective engagement with the annular grooves of said piston, a portion of said U-shaped member extending beyond the peripheral limit of said piston into abutting engagement with said cylinder.

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