Aug. 28, 1934. C. B. CURTISS 1,971,551

ADJUSTABLE TIGHTENING IDLER

Filed April 20, 1931 2 Sheets-Sheet 1

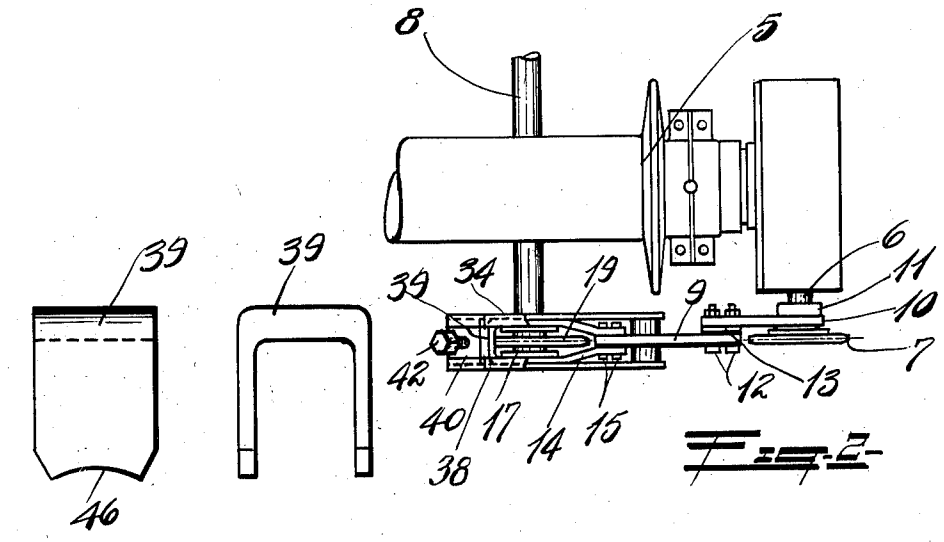


Fig. 2.

Fig. 3. Fig. 4.

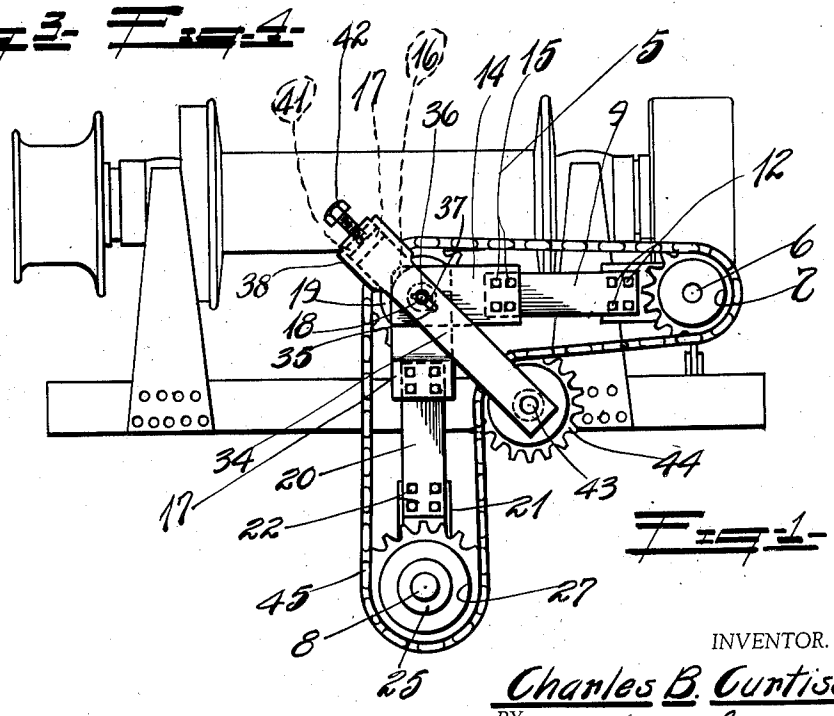


Fig. 1.

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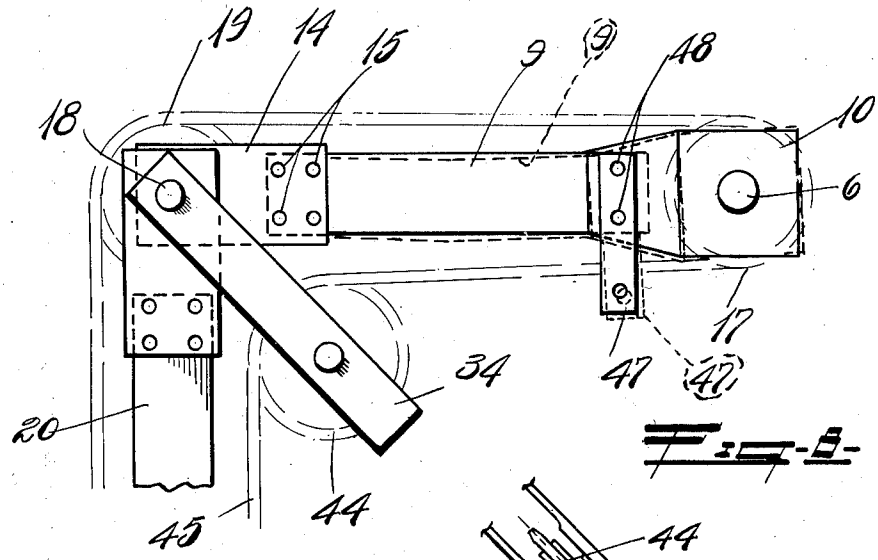
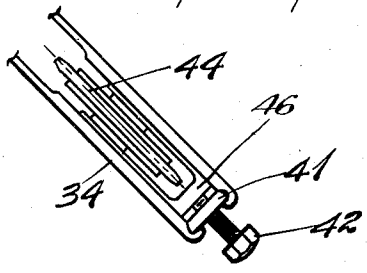


Fig. 8.



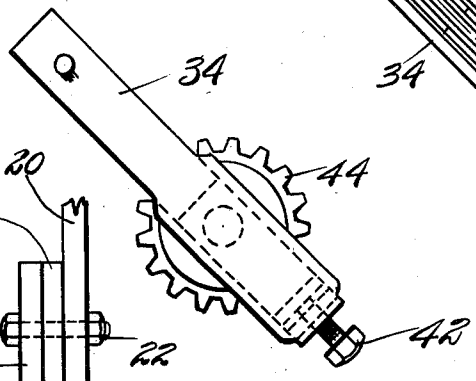


Fig. 6.

Fig. 5.

Fig. 7.

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UNITED STATES PATENT OFFICE

1,971,551

ADJUSTABLE TIGHTENING IDLER

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Application April 20, 1931, Serial No. 531,476

5 Claims. (Cl. 64—5)

This invention relates to adjustable tightening idlers, and more particularly to a mechanism adapted for connecting winches or similar devices to power take-offs.

One object of the invention is to design a mechanism which provides a connecting means between two spaced apart shafts, and to provide adjustable means associated therewith, so that the driving chain or belt may be properly tensioned.

A further object is to provide a driving connection so designed that it will relieve both driving and driven shafts of all operating load at the points of connection except the desired torque.

Another object is to provide a chain or belt connection suitable for a right angle drive, which operates either in an acute, or in an obtuse angle, so that interfering obstacles, such as truck mechanism or parts, can be readily avoided, and which also relieves the hoisting mechanism of the chain pull.

A further object is to provide means on the spreader bar for actuating a mechanism by chain pull (in either direction).

A further object still is to provide a substantial and inexpensive mechanism which can be readily manufactured and assembled, and which can be quickly and easily attached.

The above and other objects will appear as the specification progresses, reference being had to the accompanying drawings, in which I have shown the preferred embodiment of my invention, and in which like reference numerals indicate like parts throughout the several views thereof.

In the drawings.

Fig. 1 is a front view illustrating one design of my improved connecting mechanism, and showing it connecting a winch to a power take-off extension shaft.

Fig. 2 is a fragmentary top plan view thereof, with the driving chain omitted.

Fig. 3 is a side view of the idler yoke.

Fig. 4 is an edge view thereof.

Fig. 5 is a view of the idler side plates and sprocket assembly, showing the adjusting means on the lower end.

Fig. 6 is a fragmentary plan view thereof.

Fig. 7 is a part sectional edge view of the lower end of the connecting bar, showing the bearing support for the power take-off extension shaft.

Fig. 8 is a fragmentary side view of my adjustable tightening idler showing a typical method of actuating a mechanism by chain pull in either direction with my floating idler.

For explanatory purposes I have shown the mechanism as connecting a winch to a power take-off extension shaft, such as used on automotive vehicles, either design shown being satisfactory for right angle drive; I find, however, that one operates better in an acute angle, while the other operates more satisfactorily in an obtuse angle, the principle employed is, however, exactly the same, the only difference being that one is adjusted from the top, while the other is adjusted from the bottom.

Referring now particularly to the drawings, the numeral 5 indicates a winch mechanism which is provided with the usual worm shaft 6 on which a sprocket 7 is secured, this winch being adapted for mounting on an automotive vehicle, (not shown), and is driven from the power take-off extension shaft 8 in a manner to be presently described.

The chain connection proper comprises a horizontally disposed spreader bar 9, one end of which comprises a plate 10 which is connected to and forms a part of an antifriction bearing 11 which is mounted on the worm shaft, the opposite end of the plate being rigidly bolted to the member 9 by means of bolts 12, and a filler plate 13 is interposed between said plate and member.

Offset bearing plates 14 are secured to the other end of the bar 9 by means of bolts 15 or the like, the upper end of said plates being rounded as shown at 16, and for a purpose to be presently described. Vertically disposed offset bearing plates 17 are positioned in facial contact with the plates 14, and these plates 14 and 17 are suitably bored to receive a shaft 18 on which a sprocket assembly 19 is revolubly mounted.

The connecting bar 20 is substantially similar to the spreader bar 9, and a bearing housing 21 is secured to the lower end thereof by means of bolts 22, a filler member 23 being interposed between the members 20 and 21 as usual. A conventional bearing member 24 is mounted in the housing 21 and a driving sprocket hub 25 is journaled therein, said hub being formed with a flange 26 to which the sprocket 27 is secured by means of rivets 28. The opposite end of the hub is threaded, and a bearing nut 30 is threaded thereon, a housing cap 31 fitting over said nut and a cork washer 32 forms a leak-proof connection thereat, a similar washer 33 being interposed between the hub flange and the bearing member.

Angularly disposed idler plates 34 straddle the connecting and spreader bars respectively, and are slotted as at 35 to receive the end of the

sprocket shaft 18, washers 36 being provided on the outer ends of the shaft, and pins 37 serve to hold the washers in position, flanges 38 being provided on the edges of the idler plates, and form a channel in which the idler yoke 39 is slidably mounted, the upper ends 40 of the plates being also turned inwardly, and these ends are welded to a block 41 which is provided with a centrally disposed threaded opening, in which the adjusting bolt 42 is threaded, the end thereof engaging the head of the idler yoke. An idler shaft 43 is mounted in the lower end of these idler bars, and an idler sprocket assembly 44 is revolubly mounted thereon, a conventional chain 45 being trained over these sprockets 7, 27 and 44, so that the winch mechanism is driven thereby.

The lower ends of the idler yoke are rounded as at 46 to engage and fit the rounded shoulder of the offset plates 14, and when it is desired to tighten the chain 45, the adjusting bolt 42 is manipulated, this forces the idler plates 34 upwardly, the slots 35 compensating for this movement, and the chain 45 is tightened accordingly.

In Figs. 5 and 6 of the drawings I have shown the adjusting means on the lower end of the idler plates, the idler pulley 44 being journaled in the slide 46, and this slide and sprocket assembly is slidably mounted in the side plates, so that as the bolt is manipulated, the sprocket will be forced upwardly to tighten the drive chain.

In Fig. 8 of the drawings I have shown a typical method of actuating a mechanism by the forces of compression set up in the frame when said frame is under compression, this comprises an actuating arm 47 which is secured to the plate 10 by means of spaced apart bolts 48, the upper bolt hole having a predetermined clearance therein, the lower hole being a close fit, and when the winch is operating under load the spreader bar will be under compression, and the actuating arm 47 will be shifted as indicated in dotted lines in Fig. 8 of the drawings, so that any mechanism connected thereto will be affected by this movement.

Inasmuch as practically all the trouble experienced with roller chain drives for winches has been traceable to loose chains causing a hammer blow on the hardened roller, cracking it and requiring replacement, it will be obvious that I have perfected a simple, efficient and substantial connecting mechanism, which can be adjusted to keep the chain taut at all times, which balances the chain load, and which relieves the power take-off and winch case of the chain pull.

What I claim is:—

1. A connecting mechanism for connecting a winch to a power take-off extension shaft and including a spreader bar, a driven sprocket mounted thereon, a connecting bar pivotally connected to said spreader bar and in which said extension shaft is journaled, a drive sprocket on said shaft, a chain connecting said sprocket members, and an adjustable idler frame pivotally supported on said spreader bar and connecting bar and provided with a sprocket on the lower end thereof for tensioning said chain.

2. A connecting mechanism for connecting a driving shaft to a driven shaft and including a spacing bar, a gear journaled thereon, a gear on the winch, a leg connected to said bar and in which the driving shaft is journaled, a gear mounted on said shaft, an idler frame mounted on said leg and bar, a gear journaled thereon, flexible driving means connecting said gears, and adjustable means on said idler frame for tensioning said driving means.

3. A connecting mechanism for connecting a winch to a power take-off extension shaft and including a jointed frame, one end of said frame being pivotally connected to the drive shaft of the winch, the opposite end being provided with a bearing in which the extension shaft is journaled, a sprocket assembly mounted on said frame, an idler frame, an idler sprocket revolubly mounted thereon, an idler yoke, sprockets on the extension shaft and winch drive shaft respectively, flexible driving means trained over said sprockets for transmitting power to the winch, and adjustable means engaging said idler yoke for shifting the idler sprocket to tension said driving means.

4. A chain connection for connecting a winch to a power take-off extension shaft, and including a frame comprising a spreader bar and a connecting bar pivotally connected together, one end of said spreader bar being pivotally connected to the drive shaft of the winch, a bearing on the end of the connecting bar and in which the extension shaft is journaled, a sprocket mounted on said frame, a slotted idler frame, an idler sprocket journaled thereon, an idler yoke slidably mounted in the frame and engaging the spreader bar, sprockets on the extension shaft and winch shaft respectively, flexible driving means trained over the sprockets, and adjusting means engaging said yoke for adjusting the idler sprocket to tension said driving means.

5. A connecting mechanism for connecting a driving shaft to a driven shaft and including a frame, one end of which is pivotally connected to the driven shaft, the opposite end being provided with a bearing in which the driving shaft is journaled, sprockets on the driving and driven shafts respectively, flexible driving means connecting said sprockets, and an actuating arm mounted on said frame and adapted to be shifted by the forces of compression therein when the frame is under compression.

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