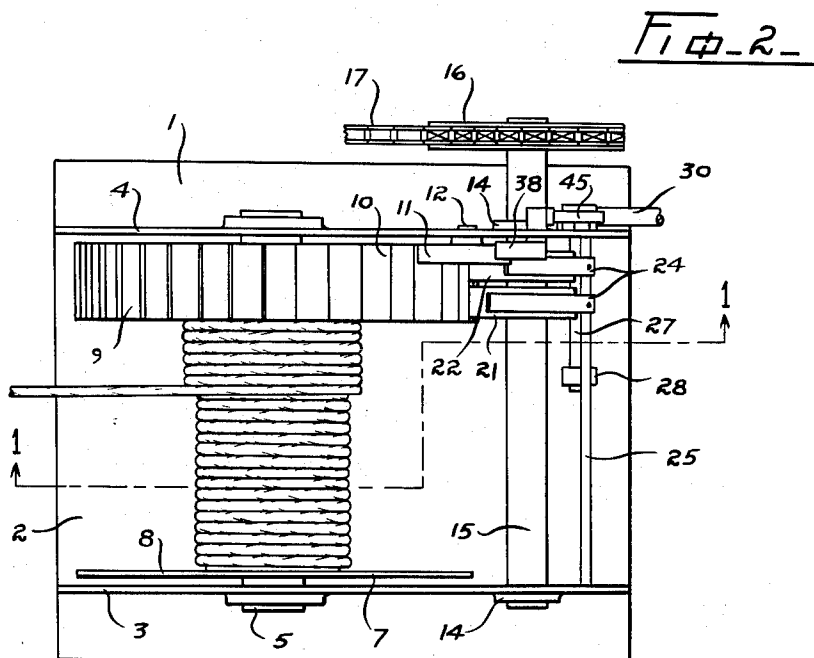
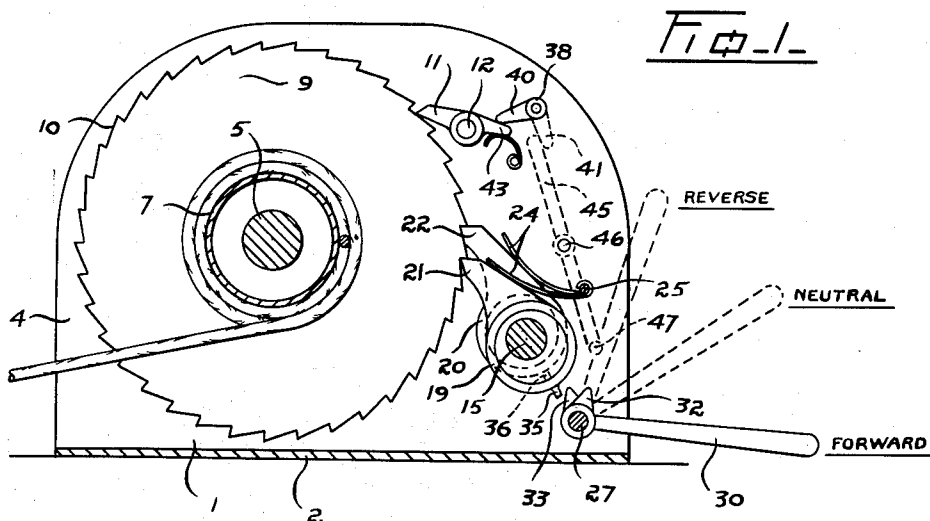


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POWER DRIVEN WINCH

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POWER DRIVEN WINCH

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My invention relates to improvements in power driven winches.

A particular object of the invention is to provide a winch capable of being connected to a power driven shaft having rotation in one direction only.

Many trucks and trailers are equipped with a power take off shaft which may or may not be reversible or even provided with a satisfactory clutch by which it may be set in motion or otherwise. The invention here described is particularly suited for such situations and is provided with a single operating lever conveniently situated close to the winding drum, whereby the winch can be instantly set to wind in or slacken off a load, or hold it in any position while the primary drive shaft of the winch continues to rotate.

Referring to the accompanying drawings:

Figure 1 is a longitudinal sectional view of the invention taken on the line 1—1 of Figure 2.

Figure 2 is a plan view of the invention.

In the drawings like characters of reference indicate corresponding parts in each figure.

The numeral 1 indicates a frame having a base 2 supporting spaced side walls 3 and 4, between which a drum shaft 5 is horizontally supported. Rotatably mounted upon the shaft 5 is a winding drum 7 having a flange 8 and a ratchet wheel 9 provided with teeth 10. The wheel 9 is engaged normally by a spring loaded pawl 11 which is rockingly mounted upon a pin 12 extending from the side wall 4.

Rotatably journaled in bearings 14 in the side walls 3 and 4 is a shaft 15 having secured thereto a sprocket 16 which is adapted to be constantly driven by an endless chain 17 from a suitable source of power, not shown. The driven shaft 15 is fitted with two eccentrics 19 and 20 which are secured to said shaft one hundred and eighty degrees apart and these eccentrics rockingly carry two driving pawls respectively numbered 21 and 22, both of which are spring loaded with leaf springs 24 carried by a transverse member 25 to normally keep the driving pawls in contact with the ratchet teeth 10. The pawl 22 is longer than the pawl 21 by an amount equal to half the length of a tooth 10.

A horizontal shaft 27 is carried between the side wall 4 and a bearing 28 on the base 2 of the winch frame and is fitted with an operating lever 30 which is mounted on the outside of the wall 4. The shaft 27 is fitted with two dogs 32 and 33 which may be selectively moved by the lever 30 to engage lugs 35 and 36 respectively on the lower ends of the driving pawls 21 and 22 to swing said pawls rearwardly away from engagement with the ratchet wheel 9.

A bell crank 38 is rockingly mounted on the wall 4 and is provided with one leg 40 on the inner side of the wall and a downwardly turned leg 41, shown in dotted line on the outside of the wall. The leg 40 is adapted to rest normally on the shank 43 of the spring loaded pawl 11 and the leg 41 is normally engaged by the upper end of a rocking lever 45 which is pivotally mount-

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ed as at 46 on the outside of the wall 4, as is shown in dotted line in Figure 1. The lever is provided with a pin 47 at its lower end which is adapted to be engaged by the operating lever 30 when said lever is swung to its uppermost or "Reverse" position, as shown in Figure 1. The eccentrics 19 and 20 each have a stroke of half the length of a tooth 10 of the ratchet wheel 9, consequently when the driven shaft 15 is rotating it will take one revolution of said shaft to rotate the drum to the extent of one ratchet tooth. When the shaft is running and the operating lever 30 is in the full line or "Forward" position shown in Figure 1, neither of the lugs 35 or 36 will be engaged by their respective dogs, so that half one rotation of the shaft will cause the pawl 21 to move the ratchet wheel one half tooth and the second half rotation will cause the pawl 22 to engage the same tooth and raise it the second half of its length. The locking pawl 11 will obviously drop onto the next lower tooth to hold the wheel against return movement.

If, when raising a load, the operating lever 30 is raised to the intermediate or neutral position, the dog 33 will be moved into a position relative to the lug 36 to prevent the pawl from seating onto the ratchet wheel below the end of a tooth 10, so that no advancement of the wheel takes place. When the lever 30 is raised to its uppermost or "Reverse" position both pawls 21 and 22 will be affected by the dogs 32 and 33 which have been moved by the raising of the lever to its uppermost position into the normal path of the lugs 35 and 36. The obstruction to the free movement of the pawls causes each one of said pawls 21 and 22 to withdraw alternately in an arcuate path having the end of its lug 35 or 36 as a fulcrum as each of the said pawls reaches its lowermost position. The point of each pawl on withdrawing from the tooth will be freely carried upwards by the eccentric movement until it is above the abutment of the tooth 10 and will be then urged into its periphery ready to slide up and engage the face of the tooth next above before the complementary pawl 21 or 22 is entirely carried out of tooth engagement as above recited. This movement is continued with the lowermost pawl pulling away from the next tooth above as the uppermost pawl moves downwardly, holding the ratchet wheel against free rotation in a clockwise direction. During the above described movement of the lever 30 said lever would have come into engagement with the pin 47 of the rocking lever 45 to move it slightly in a clockwise direction and cause the bell crank 38 to rock and raise the spring loaded pawl 11 from its position of engagement upon a tooth 10 of the ratchet wheel 9, so that said wheel will be free to rotate in a clockwise direction step by step as the pawls 21 and 22 move downwardly in contact with the teeth of said ratchet wheel. It will be understood that the normal pull on the cable is relied upon to rotate the drum 7 in a reverse or clockwise direction when the pawls 21 and 22 are withdrawn from operative engagement with the ratchet wheel 9.

What I claim as my invention is:

1. A winch comprising a freely rotatable drum having a ratchet wheel with teeth connected therewith, a pawl normally engaging the ratchet wheel to hold it against reversal, a driven shaft mounted for constant rotation in one direction, a pair of eccentrics mounted upon said shaft, a driving pawl swingingly mounted upon each eccentric and normally engaging said ratchet wheel to rotate said wheel one tooth in one direction as the eccentric shaft is rotated one revolution, and manually operable means to alternately free the pawls from the teeth of the ratchet wheel whereby said ratchet wheel may turn in a reverse direction while the shaft continues to rotate in the one direction.

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2. A winch as claimed in claim 1 and manually operable means for disengaging one of the driving pawls from the ratchet wheel teeth at the start of its driving stroke.

3. A winch as claimed in claim 1 and manually operable means for disengaging both of the driving pawls from the ratchet wheel teeth at the start of their driving strokes.

4. A winch comprising a freely rotatable drum having a ratchet wheel with teeth connected therewith, a driven shaft mounted for constant rotation in one direction, a pair of eccentrics mounted upon said shaft, a driving pawl swingingly mounted upon each eccentric and normally engaging said ratchet wheel to rotate said wheel one tooth in one direction as the eccentric shaft is rotated one revolution, and spring loaded means normally holding the ratchet wheel against rotation in a reverse direction, and manually operable means for disengaging one of the driving pawls from the ratchet wheel teeth.

5. A winch comprising a freely rotatable drum having a ratchet wheel with teeth connected therewith, a driven shaft mounted parallel to said drum and adapted for constant rotation in one direction, a pair of eccentrics mounted upon said shaft, a driving pawl swingingly mounted upon each eccentric, spring means normally urging said pawls into engagement with said teeth to rotate said wheel, a holding pawl normally engaging said teeth, manually operable means for selectively disengaging the driving pawls from the teeth, and means operable by the manually operable means for disengaging the holding pawl to release the ratchet to rotate in step by step movement against the driving pawls as the driven shaft continues to rotate in its normal direction.

6. A winch comprising a freely rotatable drum having a ratchet wheel with teeth connected therewith, a driven shaft mounted parallel to said drum and adapted for constant rotation in one direction, a pair of eccentrics mounted upon said shaft, a driving pawl swingingly mounted upon each eccentric, spring means normally urging said pawls into engagement with said teeth to rotate said wheel, a holding pawl resiliently engaging said teeth, an operative shaft having a pair of dogs aligned

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with the pawls, each of said pawls having a lug, said operative shaft being adapted to be rocked to selectively dispose the dogs in the path of the lugs to rock the pawls out of engagement with the teeth, and means operable in response to movement of the operative shaft for disengaging the holding pawl while the driven shaft continues to rotate in its one direction.

7. A winch as claimed in claim 6, said pawls having a stroke equal to half the length of a ratchet tooth and one of said pawls exceeding the other in length by half the length of a ratchet tooth.

8. A winch comprising a freely rotatable drum having a ratchet wheel with teeth connected therewith, a driven shaft, a holding pawl adapted to engage the teeth of the ratchet wheel, a pair of eccentrics on the driven shaft and a driving pawl in each eccentric adapted to engage the teeth of the ratchet wheel, a single operating lever having means for selectively engaging the pawls to disengage them from the ratchet wheel teeth, and means engageable by the lever for disengaging the holding pawl from engagement with the ratchet wheel teeth, said lever being selectively movable to three positions, one position leaving the pawls to engage the wheel in a direction to raise a load, a second position being to cause one driving pawl to disengage the ratchet wheel whereby movement less than the length of a ratchet wheel tooth is imparted to the wheel and a third position whereby the means for selectively engaging the pawls will cause the driving pawls to disengage the ratchet wheel before reaching an end of their stroke and to cause each pawl to release a tooth when reaching the opposite end of the stroke, thereby releasing the ratchet wheel to rotate to lower a load, said load raising, load holding and load lowering being effected while the driven shaft is rotating in one direction.

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