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2,411,038

POWER UNIT

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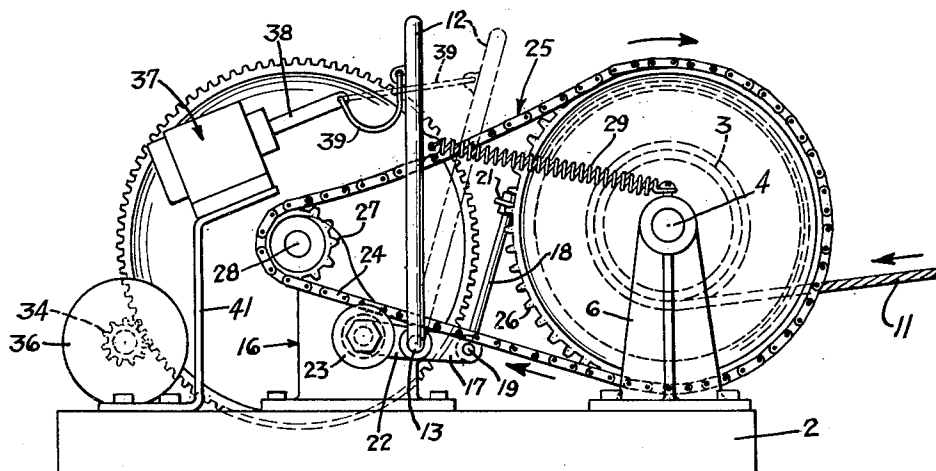


FIG. 1

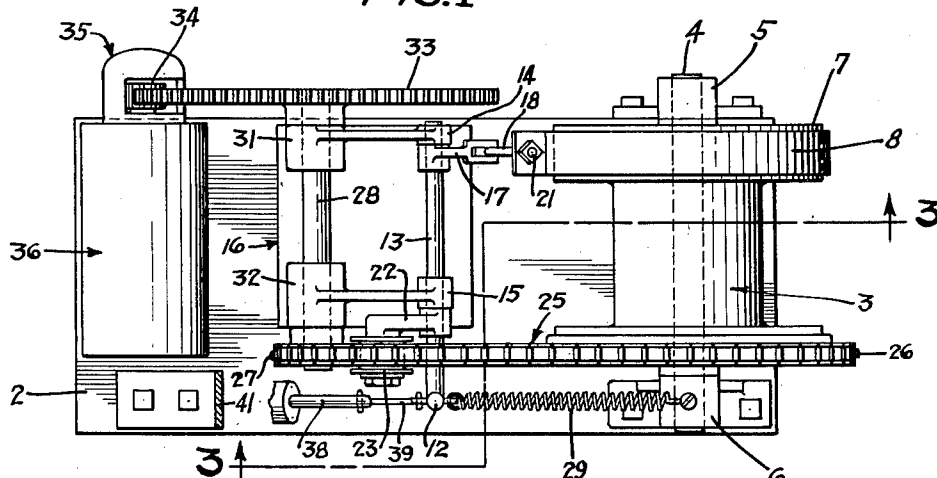


FIG. 2

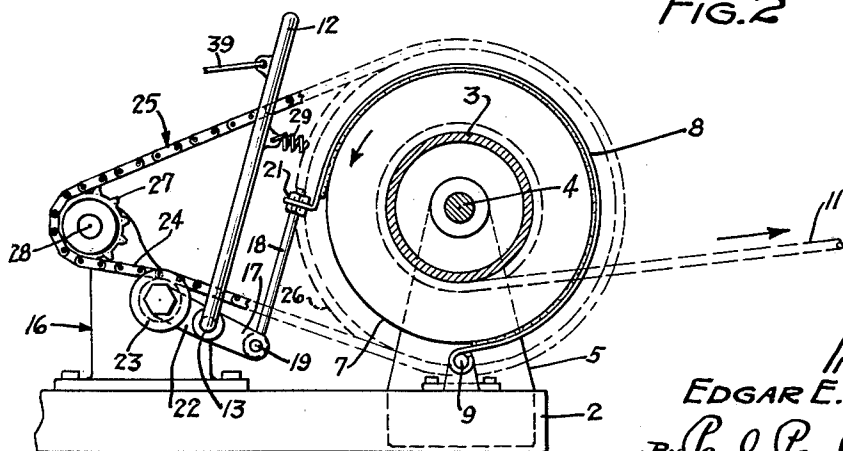


FIG. 3

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POWER UNIT

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3 Claims. (Cl. 254—186)

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This invention relates to new and useful improvements in power units and more particularly to a portable power unit.

An object of the present invention is to provide a portable power unit which is highly efficient and compact, and which has a wide range of use.

A further object is to provide a small compact power unit utilizing a conventional automobile starter motor as its source of power, which may be electrically connected to a conventional automobile storage battery whereby the power unit may be mounted on a small truck or other vehicle and derive its power directly from the usual storage battery thereof, said starter motor comprising the usual Bendix drive for operatively connecting the motor to the power transmitting means between the motor and the hoisting drum.

A further object is to provide a small compact power unit comprising a hoisting drum provided with a brake drum at one end having a brake band partially encircling the brake drum, and a starter motor being mounted on the support and having a driving connection with the hoisting drum, said driving connection including an endless belt or chain, and a rock shaft being mounted on the support and having an arm secured thereto on one end of which is connected to the brake band, and a second arm being secured to the rock shaft and having a roller mounted at its outer end having a running connection with a run of the chain or belt whereby the tension therein will actuate the rock shaft and automatically release the brake band, when the chain is rotating in a direction to lift a load.

Other objects of the invention reside in the unique construction of the brake and its operating means; in the arrangement of the rock shaft and brake band whereby the brake is automatically released each time the hoisting drum is rotated in a direction to lift a load, and whereby when the drive chain is slack, the brake is automatically set; in the provision of electrical means for swinging the brake lever into brake releasing position; and, in the general arrangement of the various parts of the mechanism whereby they cooperate to partially provide a highly efficient power unit which is small and compact in size, and which readily lends itself for use on trucks, road working machinery, including snow plows, and the like, for lifting or lowering the ground engaging tools thereof, and which power unit may also be used in numerous other places requiring the use of a powerful hoisting drum.

Other objects of the invention will appear from

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the following description and the accompanying drawing and will be pointed out in the annexed claims.

In the accompanying drawing there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown, as various changes may be made within the scope of the claims which follow.

In the drawing:

Figure 1 is a side elevation of my improved power unit showing the lower run of the drive chain rotated in a direction to wind the cable onto the drum and whereby the brake band is automatically released;

Figure 2 is a plan view of Figure 1 with some of the parts omitted; and

Figure 3 is a detail sectional view substantially on the line 3—3 of Figure 2, showing the brake band in braking engagement with the drum to control the unwinding of the cable.

The novel power unit herein disclosed is shown comprising a suitable base or support 2 which may be of any particular form and construction applicable for the purpose.

A suitable hoisting drum 3 is mounted on the base 2 at one end thereof and has a shaft 4 which may be rotatably mounted in suitable bearing pedestals 5 and 6 secured to the base 2. The hoisting drum 3 is shown provided at one end with a brake drum 7 which is partially encircled by a conventional brake band 8 having one end anchored to a fixed support such as a pin 9 secured to the base 2. A suitable cable 11 is coiled about the hoisting drum 3 in the usual manner, as shown in Figures 1 and 3.

A brake lever 12 is secured to one end of a rock shaft 13, shown mounted in bearings 14 and 15 which, for convenience, may be integrally cast with an upright bracket 16 secured to the base 2. To simplify construction, the rock shaft 13 may be integrally formed with the brake lever 12, as indicated in the drawing.

An arm 17 is secured to the rock shaft 13 and has one end of a connecting rod 18 pivotally connected thereto by a pin 19. The opposite end of the connecting rod 18 is secured to the free end of the brake band 8 as shown at 21.

Adjacent to the opposite end of the rock shaft 13 there is mounted an arm 22 which is disposed in opposed relation to the arm 17. The arm 22 is shown carrying a suitable roller 23 which engages the lower run 24 of a chain or belt 25 having running connections with a sprocket wheel 26

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secured to the hoisting drum 3, and a sprocket pinion 27 secured to one end of a countershaft 28. A suitable spring 29 is shown having one end connected to the brake lever 12 and its opposite end to a fixed support such as the bracket 6. The spring 29 constantly urges the brake lever 12 in a direction to set the brake band 8.

The countershaft 28 is shown mounted in suitable bearings 31 and 32 which may be integrally formed with the bearing bracket 16. A spur gear 33 is secured to the countershaft 28 and constantly meshes with a pinion 34 of a conventional Bendix drive, indicated by the numeral 35 in Figure 2. The Bendix pinion 34 is operatively connected to the usual drive shaft of a conventional automobile starter motor, generally designated by the numeral 36 in Figures 1 and 2. The starter motor 36 and Bendix drive 35 are well known in the art, and it is therefore deemed unnecessary to herein illustrate the same in detail.

Means is preferably provided for electrically releasing the brake band 8, when desired, and may consist of a suitable solenoid-actuated device, generally designated by the numeral 37. This device is shown having a reciprocally mounted armature or member 38 projecting from one end thereof. The armature 38 has one end of a flexible connection 39 secured thereto whose opposite end is connected to the brake lever 12 as shown. The solenoid actuated drive 37 may be mounted upon a suitable bracket 41 secured to the base 2, and is provided with a suitable electric control circuit, not shown, having a connection with a suitable source of electric power such as the conventional storage battery of a truck or an automobile, or with some other source of low voltage current supply.

The novel power unit herein disclosed has been found particularly useful on small trucks wherein it may be utilized in connection with hoisting apparatus. It has also been found extremely practical on numerous types of road working equipment because of its simplicity and compactness, and also because it may be operated directly from the usual storage battery of the truck or vehicle at low cost.

While I have herein referred to the motor as being a conventional automobile starter motor, in some instances it may be found desirable to use some other form of low voltage motor suitable for the purpose. Also, if the hoist is to be permanently located in a fixed position in a building, a conventional motor may be employed whereby it may be connected in the usual power or lighting circuits of the building.

The roller 23 secured to the arm 22 of the rock shaft 13 is so related to the lower run 24 of the chain 25, that when the chain is rotated in the direction indicated by the arrows in Figure 1, as when winding the cable 11 onto the hoisting drum 3, the tension in the lower run 24 of the chain will cause the chain to swing the arm 22 downwardly thereby to rotate the rock shaft 13 in a direction to release the brake band 8 from the brake drum 7. When the cable 11 is being unwound from the hoisting drum 3 the lower run 24 of the chain may be slack, as indicated in Figure 3, whereby the spring 29 connected to the upper end of the brake lever 12 may swing the brake lever 12 into the position shown in Figure 1, thereby to automatically set the brake band and retard or interrupt rotation of the hoisting drum 3.

If desired, the brake may be instantly released

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at any time by actuation of the solenoid 37, as will be readily understood.

It will be apparent to those skilled in the art that I have accomplished at least the principal objects of my invention, and it will also be apparent to those skilled in the art that the embodiments herein described may be variously changed and modified without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiments are illustrative only, and that my invention is not limited thereto.

I claim as my invention:

1. A power unit comprising a support, a hoisting drum mounted thereon and provided with a brake drum, a brake band partially encircling the brake drum and having one end anchored to a fixed support, a counter shaft, a flexible endless member for transmitting power from the counter shaft to the brake drum, an automobile starter motor for driving the counter shaft, a rock shaft having an arm secured thereto, one end of which is connected to the free end of the brake band, a second arm secured to the rock shaft and having a roller mounted at the free end thereof, the roller on said second arm having a running connection with a run of the flexible drive member whereby when said run is taut, said second arm is actuated to rotate the rock shaft whereby the brake band is automatically released from the brake drum, and spring means constantly urging the roller into contact with the run of said drive member and whereby when said run is slack, the spring means will automatically set the brake.

2. A power unit comprising a support, a hoisting drum mounted thereon and provided with a brake drum, a brake band partially encircling the brake drum and having one end anchored to a fixed support, a counter shaft, an endless drive member for transmitting power from the counter shaft to the brake drum, an automobile starter motor for driving the counter shaft, a rock shaft, a brake lever mounted on the rock shaft, an arm secured to the rock shaft and having one end operatively connected to the free end of the brake band, a second arm secured to the rock shaft in opposed relation to the first mentioned arm, a roller mounted at the outer end of said second arm and having a running connection with a run of the endless drive member whereby when said run is taut, said second arm is actuated to rotate the rock shaft and thereby effect the release of the brake band from the brake drum, and spring means constantly urging the brake lever in a direction to set the brake, said brake lever providing means whereby an operator may manually manipulate the brake to control the rotation of the winding drum.

3. A power unit comprising a support, a hoisting drum mounted thereon and provided with a brake drum, a brake band partially encircling the brake drum and having one end anchored to a fixed support, a counter shaft, a chain drive for transmitting power from the counter shaft to the hoisting drum, an automobile starter motor for driving the counter shaft, a rock shaft, a brake lever fixedly mounted on the rock shaft, an arm secured to the rock shaft and having a connection with the brake band, a second arm secured to the rock shaft, a roller mounted at the outer end of said second arm and having a running connection with a run of the drive chain whereby when said chain run is taut, the roller

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is actuated to partially rotate the rock shaft whereby the brake band is expanded to release the hoisting drum, a spring constantly urging the roller into contact with the run of said drive element whereby when said run is slack the spring will rotate the rock shaft in the opposite direction and thereby automatically set the brake,

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said brake lever providing means whereby an operator may manually manipulate the brake to control the rotation of the winding drum, and electric means associated with the brake lever for electrically moving said lever into brake releasing position.

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