Dec. 10, 1929. F. F. CRITESER 1,739,353

POWER UNIT

Filed Oct. 20, 1927 2 Sheets-Sheet 1

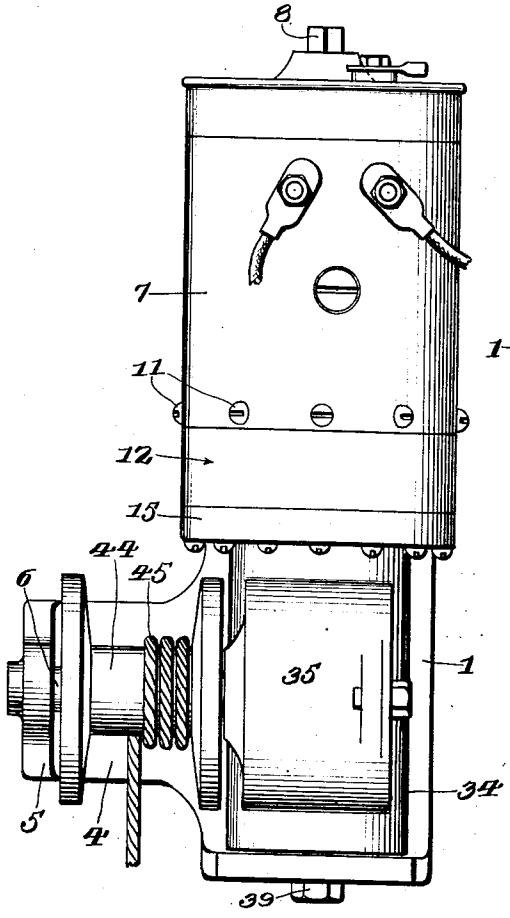


Fig. 1.

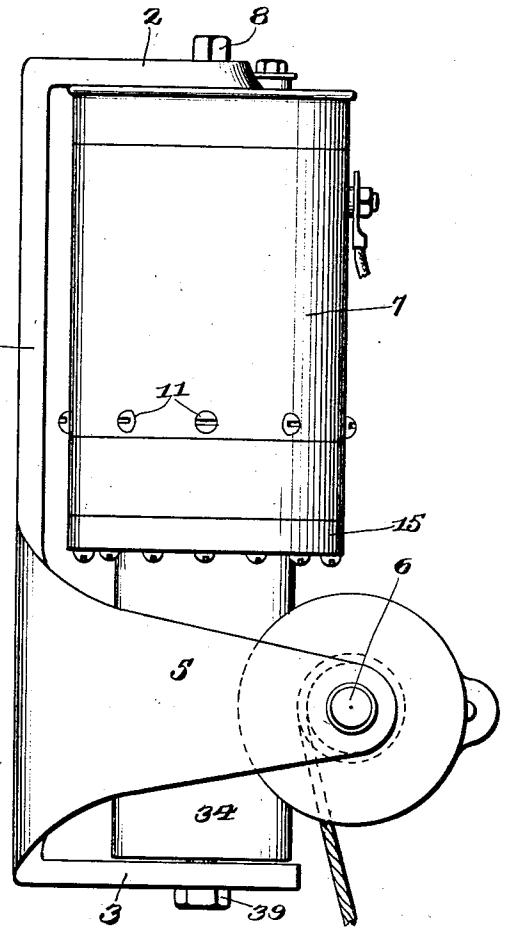


Fig. 2.

INVENTOR.
F. F. Criteser,
BY
Geo. P. Kimmel.
ATTORNEY.

Dec. 10, 1929. F. F. CRITESER 1,739,353

POWER UNIT

Filed Oct. 20, 1927 2 Sheets-Sheet 2

Fig. 3.

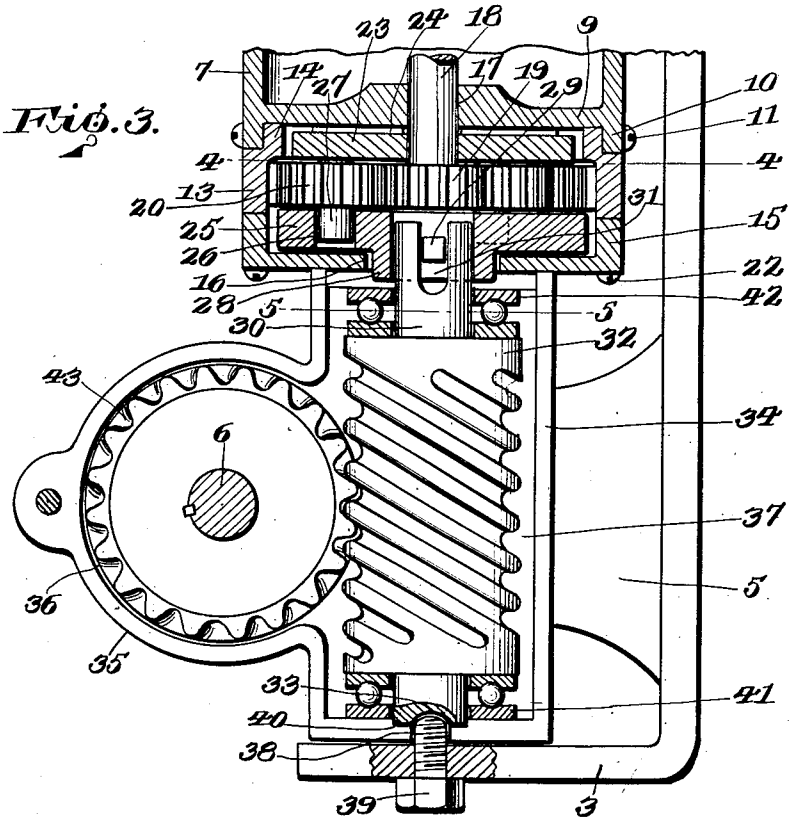


Fig. 4.

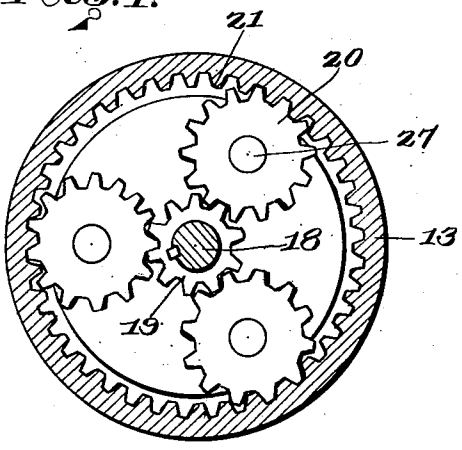
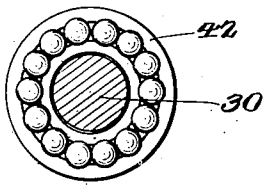


Fig. 5.



INVENTOR.
F.F. Criteser,
BY
Geo. P. Kimmel.
ATTORNEY.

Patented Dec. 10, 1929 1,739,353

UNITED STATES PATENT OFFICE

FRED F. CRITESER, OF ROSEBURG, OREGON

POWER UNIT

Application filed October 20, 1927. Serial No. 227,606.

This invention relates to a power unit, and has for its object to provide, in a manner as hereinafter set forth, a thoroughly efficient power unit of low voltage for use as a hoist, such as are used on cranes in garages and machine shops and also to operate dump beds on various kinds of trucks, as well as for other purposes where a great amount of power is desired in a compact power unit.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a power unit which is simple in its construction and arrangement, strong, durable, compact, thoroughly efficient in its use, conveniently operated, readily assembled, and comparatively inexpensive to set up.

With the foregoing and other objects in view the invention consists of the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawing, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which fall within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:

Figure 1 is a front elevation of a power unit in accordance with this invention.

Figure 2 is a side elevation thereof.

Figure 3 is a fragmentary view in vertical section.

Figure 4 is a section on line 4—4 Figure 3.

Figure 5 is a section on line 5—5 Figure 3.

The power unit includes a supporting frame formed of a vertically disposed body portion 1 of substantial width, height and thickness. Formed integral with the upper end of the body portion 1 is a right angularly disposed arm 2 and opposing the arm 2, as well as being of greater length than the length thereof is an arm 3 which is disposed at right angles to and is formed integral with the lower end of the body portion 1. One side of the body portion 1, at a point between its transverse median and its lower end is provided with a laterally extending arm 4, disposed at right angles with respect to the arms 2, 3 and having its outer end formed with a right angular extension 5 forming a bearing for the outer end of a shaft 6 to be presently referred to.

Opposing the body portion 1 and arranged between the arms 2, 3 is a motor 7 suspended from and connected with the arm 2, as at 8. Preferably the motor 7 is a standard automobile starting motor and includes an armature shaft 18. The lower end of the motor casing is extended from the bottom 9 of the motor, to provide an annular flange 10 through which extends holdfast devices 11 for securing a planetary gear case therewith and said case is referred to generally as at 12.

The planetary gear case 12 includes a body portion 13 which is open at each end and has its upper part inset as at 14 to provide for the body portion 13 to abut against the edge of the flange 10, the inner face of the latter and also the bottom 9. See Figure 3. The gear case 12 further includes a closure section 15 for the lower end of the body portion 13 and said section 15 is cup-shaped and has its bottom formed with a centrally disposed opening 16. The bottom 9 of the housing or casing of the motor 7 is formed with an axially arranged opening 17 for the passage of the armature shaft 18 of the motor 7 into the body portion 13 of the casing 12. The lower end of the shaft 18 has keyed thereto a pinion gear 19 which drives a series of gears 20, three in number, meshing with a ring gear 21 formed on the inner face of the body portion 13 of the planetary gear case. The closure section 15 and body portion 13 of the gear case 12 are secured together by holdfast devices 22 and by this arrangement the triple gears 20 will roll over the ring gear 21 formed on the inner face of the body portion 13.

Mounted on the shaft 17, within the case 12, and above the pinion gear 19 and gears 20, is a plate 23 to which the gears 20 are connected. Spacing means 24 are carried by the plate 23 and which abut against the bottom 9 of the housing or casing of the motor 1.

Arranged below the gears 20, is a collar 25, having its body formed with a series of spaced openings 26, into which extend studs 27 which project from the gears 20 axially thereof.

The foregoing arrangement of elements provide a solid planetary connection between the plate 23 and the collar 25.

The collar 25 is formed with a depending annular flange 28 having its inner face flush with the inner edge of the collar and the latter carries a key 29 for coupling therewith a worm shaft 30, and the latter is bifurcated as at 31, for the passage of the key 29. A worm 32 is fixedly secured to the shaft 30 and is of less length than the length of the latter. The worm 32 has its ends positioned inwardly with respect to the ends of the shaft 30. The lower end of the shaft 30 is formed with a concavity 33.

Connected with the section 15 of the gear case 12, as well as depending therefrom is a cylindrical housing 34 formed with a laterally disposed circular extension 35 providing a chamber 36 which opens into one side of a chamber 37 formed by the housing 34. The bottom of the housing 34 is provided with an axially arranged opening 38 which aligns with the concavity 33. Extending through the arm 3, as well as threadedly engaging therewith is a holding bolt or screw 39, which projects through the opening 38 and extends into the concavity 33. The bottom of the housing 34 has its upper face recessed as at 40 for the reception of the lower end of the shaft 30. The worm 32 is arranged within the chamber 37 and is of materially greater diameter than the shaft 30, and the latter at its upper end projects from the chamber 37 and into the collar 25. Interposed between the lower end of the worm 32 and the bottom of the housing 34 is a thrust bearing 41, which surrounds the lower end of the shaft 30. Mounted on the upper end of the worm 32 and surrounding the shaft 30, as well as being positioned below the flange 28 of the collar 25, is a thrust bearing 42.

Arranged within the chamber 36 and meshing with the worm 32, is a worm gear 43, driven from the worm 32, and keyed to the shaft 6.

Fixed to the shaft 6, exteriorly of the extension 35 is a winding and unwinding drum 44, for a cable 45. The shaft 6 is journaled in the sides of the extension 35. The housing 34 and extension 35 are formed in two sections and connected together by any suitable means.

A power unit, in accordance with this invention, provides a thoroughly efficient hoist for use in connection with cranes in garages and machine shops, and for many other purposes where a great amount of power is desired in a compact power unit, and therefore it is thought the many advantages of a power unit, in accordance with this invention, can be readily understood, and although the preferred embodiment of the invention is as illustrated and described, yet it is to be understood that changes in the details of construction can be had which fall within the scope of the invention as claimed.

What I claim is:

1. A power unit comprising a support, a motor arranged thereon, connected therewith, and including an armature shaft projecting therefrom, a planetary gear mechanism attached to said motor, said armature shaft extending into said mechanism and carrying a driving gear therefor, a shaft having a bifurcated end slidably coupled to and driven from said mechanism and provided with a worm, thrust bearings at each end of said worm, a worm gear meshing with and driven from said worm, a housing common to said worm shaft, worm gear and thrust bearings, a cable winding drum, and a shaft common to said drum and worm gear and mounted in said support and housing, said drum being arranged exteriorly of said housing.

2. A power unit comprising a support including a pair of opposed arms, a motor including an armature shaft projecting therefrom, a planetary gear case and a housing arranged in endwise opposed relation, connected together and positioned between said arms, means for connecting said motor to one of said arms, means for connecting said housing to the other of said arms, said armature shaft extending into said planetary gear case, a planetary gear mechanism within said case, a pinion gear on that end of the armatured shaft within said case and providing a driving means for said mechanism, a shaft arranged within said housing and extending into and slidably coupled to said mechanism and provided with a worm, thrust bearings surrounding the worm shaft and positioned at the ends of said worm, a worm gear arranged within said housing and driven from said worm, a cable winding drum arranged exteriorly of said housing, and a shaft journaled in said support and housing and common to said drum and worm gear.

3. A power unit comprising an electric motor including an armature shaft extending therefrom and provided with a pinion gear, a planetary gear mechanism driven from said pinion gear, a worm gear, operating means for said worm gear driven from said mechanism, said operating means and mechanism having coacting means for slidably coupling the operating means to said mechanism, thrust bearings for said operating means, a cable winding drum, a shaft common to said drum and said worm gear, and supporting means for said motor, mechanism, operating means and the shaft common to the drum and worm gear.

4. A power unit comprising a supporting frame including a body portion terminating at each end in a right angularly disposed arm, said arms opposing and spaced from each other, a motor including a casing and an

armature shaft projecting therefrom, means for connecting one end of the casing to one of said arms, a housing connected at one end to the other of said arms, a planetary gear case connected to the other end of said casing and interposed between the latter and the housing, a planetary gear mechanism within said casing, a shaft within the housing and provided with a worm, said armature shaft extending into said case and having means for driving said mechanism, said mechanism and worm shaft having coacting means for coupling the latter to the former to be driven therefrom, a worm gear within the housing and having its axis disposed at right angles to the axis of the worm shaft and driven from said worm, a drum adjacent said housing, said frame further including a lateral arm extending from said body portion, opposing the drum and having an angular extension forming a bearing, and a shaft common to said drum and worm gear and journaled in said bearing and housing.

5. A power unit comprising a supporting frame including a body portion terminating at each end in a right angularly disposed arm, said arms opposing and spaced from each other, a motor including a casing and an armature shaft projecting therefrom, means for connecting one end of the casing to one of said arms, a housing connected at one end to the other of said arms, a planetary gear case connected to the other end of said casing and interposed between the latter and the housing, a planetary gear mechanism within said casing, a shaft within the housing and provided with a worm, said armature shaft extending into said case and having means for driving said mechanism, said mechanism and worm shaft having coacting means for coupling the latter to the former to be driven therefrom, a worm gear within the housing and having its axis disposed at right angles to the axis of the worm shaft and driven from said worm, a drum adjacent said housing, said frame further including a lateral arm extending from said body portion, opposing the drum and having an angular extension forming a bearing, a shaft common to said drum and worm gear and journaled in said bearing and housing, and thrust bearing surrounding the ends of the worm shaft and positioned against the ends of the worm.

6. A power unit comprising a supporting frame, a motor including a casing and an armature shaft projecting therefrom, means for connecting the outer end of the casing to one end of said frame, a housing connected at one end to the other end of the frame and provided intermediate its ends with a hollow, lateral extension, a planetary gear case connected to the inner end of the casing and interposed between the latter and the other end of the housing, a planetary gear mechanism within said casing, a shaft within the housing and provided with a worm, said armature shaft extending into said case and having means for driving said mechanism, said mechanism and worm shaft having coacting means for slidably connecting the latter to the former to be driven therefrom, a worm gear within the hollow extension and having its axis disposed at right angles to the axis of the worm shaft and driven from said worm, a drum adjacent said hollow extension, said frame including a lateral arm opposing the drum and having an angular extension providing a bearing, and a shaft common to said drum and worm gear and journaled in said bearing and circular extension.

7. A power unit comprising a supporting frame, a motor including a casing and an armature shaft projecting therefrom, means for connecting the outer end of the casing to one end of said frame, a housing connected at one end to the other end of the frame and provided intermediate its ends with a hollow, lateral extension, a planetary gear case connected to the inner end of the casing and interposed between the latter and the other end of the housing, a planetary gear mechanism within said casing, a shaft within the housing and provided with a worm, said armature shaft extending into said case and having means for driving said mechanism, said mechanism and worm shaft having coacting means for slidably connecting the latter to the former to be driven therefrom, a worm gear within the hollow extension and having its axis disposed at right angles to the axis of the worm shaft and driven from said worm, a drum adjacent said hollow extension, said frame including a lateral arm opposing the drum and having an angular extension providing a bearing, a shaft common to said drum and worm gear and journaled in said bearing and circular extension, and thrust bearings within the housing, driving the ends of the worm shaft and positioned against the ends of the worm.

In testimony whereof, I affix my signature hereto.

FRED F. CRITESER.