

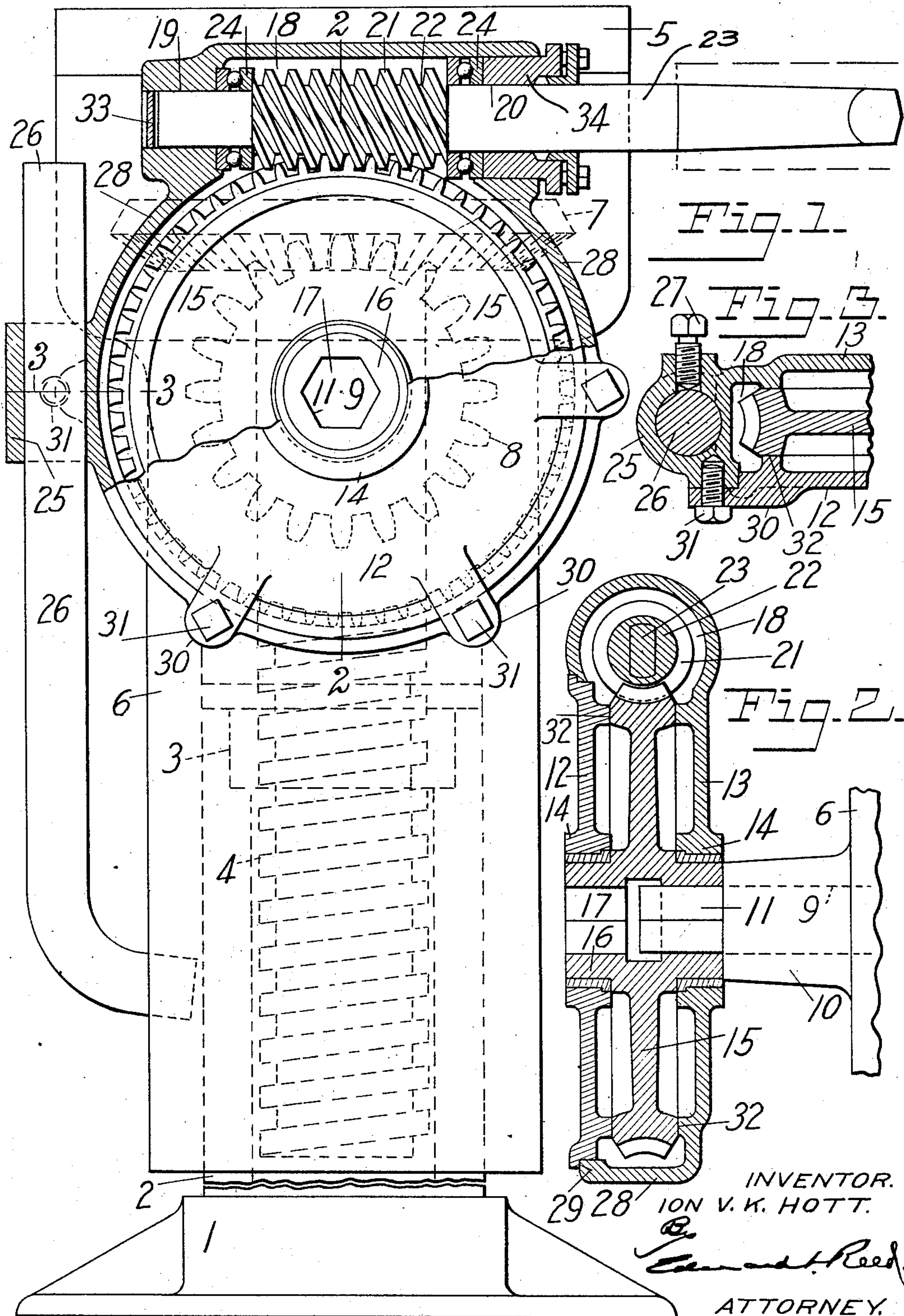
Oct. 7, 1930.

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1,777,437

DETACHABLE GEAR UNIT

Filed April 20, 1927



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DETACHABLE GEAR UNIT

Application filed April 20, 1927. Serial No. 185,319.

This invention relates to a detachable gear unit and is designed more particularly for the purpose of enabling a motor to be applied to and to operate a lifting jack.

5 One object of the invention is to provide a mechanism of this kind which, as a unit, may be attached to and detached from the operating mechanism of a lifting jack, and which will have means for connecting a
10 motor therewith, thus enabling a hand operated jack to be quickly and easily converted into a power operated jack, with the necessary reduction of the speed of the motor as applied to the lifting element of the jack.

15 A further object of the invention is to provide such a mechanism which will be very simple in its construction, of a strong durable character and which can be mounted on the jack in different positions with relation thereto.

Other objects of the invention will appear as the device is described in detail.

25 In the accompanying drawings Fig. 1 is a side elevation, partly in section, of a gear unit embodying my invention, showing the same applied to a lifting jack; Fig. 2 is a section taken on the line 2—2 of Fig. 1; and Fig. 3 is a section taken on the line 3—3 of Fig. 1.

30 In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a lifting jack of a well known type but it will be understood that this embodiment has been chosen
35 for the purpose of illustration only and that the device itself may take various forms and that it may be applied to jacks or other devices of various kinds.

40 The jack shown in the present drawings comprises a base 1 having mounted thereon a hollow upright standard 2 provided near its upper end with a nut 3 in which is mounted a screw threaded lifting element 4. Mounted on the upper end of the lifting
45 element is a load engaging member 5 and depending therefrom is a housing 6 which embraces the standard 2 and serves to guide the lifting element in its movement. Secured to the screw near the top thereof, is a
50 beveled gear 7 with which meshes a second

beveled gear 8 which is rigidly secured to a shaft 9 journaled in a bearing 10 carried by the housing 6. A jack of this type is usually actuated by an operating lever which is connected with the shaft 9 through suitable
55 pawl and ratchet mechanism. For this purpose the outer end portion of the shaft 9 is usually hexagonal, as shown at 11, to receive the ratchet wheel.

60 In applying a motor to a lifting jack of this type it is necessary that the speed of the motor be materially reduced as applied to the jack operating mechanism and for this purpose it is necessary to interpose between
65 the motor and the jack suitable reducing gearing. In carrying out the present invention I have assembled the reducing gearing and its supporting structure as a unit and have provided the same with means where-
70 by it may be connected with and supported by a part of the operating mechanism for the jack, preferably the squared end of the operating shaft 9, the operating mechanism
75 being connected with one of the gears, and another of the gears having means, such as a spindle, for connecting it with a motor. Thus the gear unit may be applied to the jack by removing the ratchet wheel and substituting therefor the gear unit and then applying
80 a motor to the gear unit. The gear unit is also of such a character that it can be connected with the operating mechanism of the jack in different positions with relation thereto, thus enabling the motor to be located on
85 either side of the jack.

90 In the particular embodiment of the invention here illustrated the gear unit comprises a supporting structure which is preferably in the form of a housing comprising side walls 12 and 13 each of which has a cen-
95 tral bearing 14. Arranged within this housing is a gear, here shown as a worm gear 15, having a hub 16, the end portions of which constitute trunnions and are journaled in the bearings 14 of the housing. Both ends of the
100 hub 16 are provided with hexagonal openings or sockets 17 each of which is adapted to receive the hexagonal end of the jack operating shaft and to thus connect the worm gear with that shaft and to support the gear and

the housing on the shaft. The housing has at one side thereof and preferably arranged substantially tangentially thereof, a supplemental compartment 18 provided at its respective ends with bearings 19 and 20. Mounted within this supplemental compartment of the housing is a second gear, here shown as a worm 21, which meshes with the worm wheel 15. This worm is carried by a shaft 22, the end portions of which are journaled in the bearings 19 and 20 and one end of which extends beyond its bearings and constitutes a spindle 23 by means of which a motor may be connected with the worm. The worm may be rotated in either direction, to raise or lower the load on the jack, and I have therefore interposed thrust bearings 24 between the ends of the worm and the respective bearings 19 and 20, so that when the worm is rotated in either direction one or the other of these bearings will take the thrust exerted thereon. Preferably the gear unit is provided with means to hold the same against rotation as a whole and, as here shown the housing is provided at one side with a vertical socket 25 adapted to receive a rod 26 and having a set screw 27 by means of which the rod may be secured in adjusted positions therein. This rod has one end bent or offset so that it will engage the housing of the jack and resist the torsional strain on the gear unit, thus preventing the housing of the gear unit from rotating with the shaft and relieving the worm shaft of strain. By securing the rod in the socket the offset portion thereof may be caused to engage either above or below the worm, according to the direction of movement of the latter. When the gear unit is applied to a jack of the type here shown it is preferable that the rod shall engage the housing of the jack but obviously it would function in the same manner if caused to engage any relatively stationary structure.

The housing may be constructed in various ways. In the present instance, the side walls 12 and 13 are disk-like in shape and the member 13 has an annular flange 28, the outer edge of which is seated in an annular recess 29 in the edge of the side member 12. Both members are provided with ears or lugs 30 to receive screws 31 by means of which the two members are connected one to the other. This flange serves to rigidly connect the side members and retain them in proper relation to form the main compartment of the casing, in which the worm gear 15 is mounted. If desired, the two side members may be provided with forwardly extending annular ribs 32 to engage the worm wheel near the periphery thereof and guide the same. The housing thus formed is fluid tight and may be filled with oil or other lubricant so that the gears will run in an oil bath. The bearing 19 is preferably sealed by a closure 33 and the bear-

ing 20 is provided with a stuffing box 34 so as to prevent the escape of oil from the housing.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a detachable gear unit for converting a hand operated lifting jack into a power operated lifting jack, a supporting structure, a gear rotatably mounted on said structure and having means for detachably connecting the same with the operating shaft of a lifting jack and for supporting said structure on said shaft, a second gear mounted on said structure and operatively connected with the first mentioned gear, means for detachably connecting said second gear with a motor, said supporting structure having a socket at one side thereof, and a rod mounted in said socket and arranged to engage a relatively fixed part to hold said structure against rotation.

2. In a detachable gear unit for converting a hand operated lifting jack into a power operated lifting jack, a supporting structure, a gear rotatably mounted on said structure and having means for detachably connecting the same with said operating shaft of a lifting jack, said shaft constituting the sole support for said gear and said structure, a second gear mounted on said structure and operatively connected with the first mentioned gear, means for detachably connecting said second gear with a motor, and a device connected with said structure and movable therewith to engage a relatively fixed part to limit the rotation of said structure.

3. In a detachable gear unit for converting a hand operated lifting jack into a power operated lifting jack, a supporting structure, a gear rotatably mounted on said structure and having means for detachably connecting the same with the operating shaft of a lifting jack, said shaft constituting the sole support for said gear and said structure, a second gear mounted on said structure and operatively connected with the first mentioned gear, means for detachably connecting said second gear with a motor, and a rod connected with said structure and adapted to engage a relatively fixed part to hold said structure against rotation.

4. In a detachable gear unit for converting a hand operated lifting jack into a power operated lifting jack, a supporting structure, a gear rotatably mounted on said structure and having means for detachably connecting the same with the operating shaft of a lifting jack, said shaft constituting the sole support for said gear and said structure, a second gear mounted on said structure and op-

eratively connected with the first mentioned gear, means for detachably connecting said second gear with a motor, a rod connected with said structure and adapted to engage a relatively fixed part to hold said structure against rotation, and means for securing said rod in adjusted positions with relation to said structure.

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5. In a detachable gear unit for converting a hand operated lifting jack into a power operated lifting jack, a supporting structure, a gear rotatably mounted on said structure and having means for detachably connecting the same with the operating shaft of a lifting jack, said shaft constituting the sole support for said gear and said structure, a second gear mounted on said structure and operatively connected with the first mentioned gear, means for detachably connecting said second gear with a motor, a rod, and means for mounting said rod on said structure in either an upwardly or downwardly extending position whereby it may be caused to engage a relatively fixed part and hold said structure against rotation in either direction.

In testimony whereof, I affix my signature hereto.

ION VON KERT HOTT.

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