

June 10, 1930.

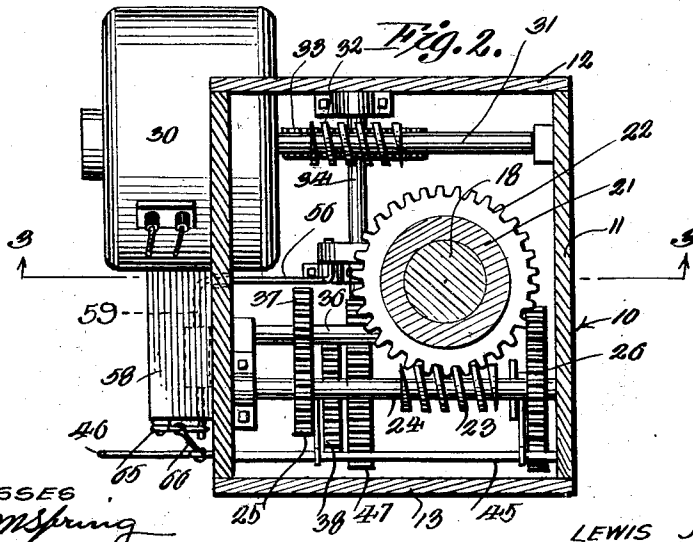
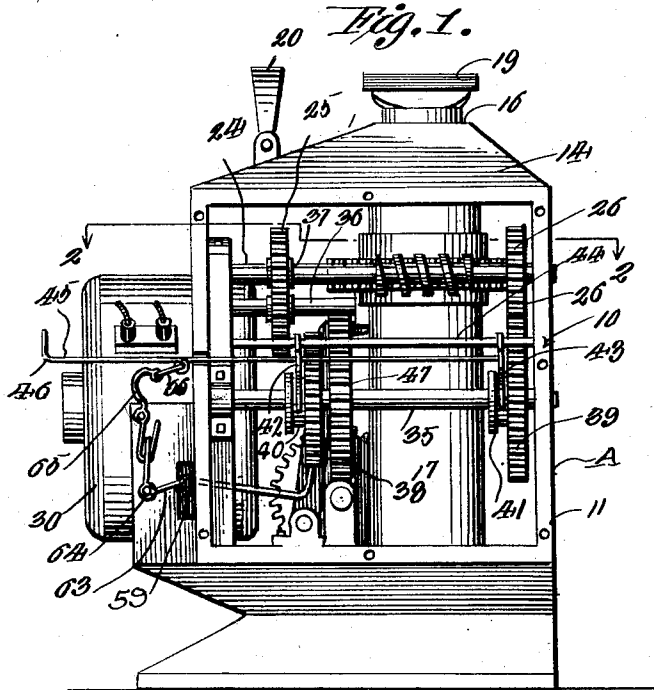
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1,763,144

JACK

Filed Jan. 10, 1927

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WITNESSES

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Fig. 3.

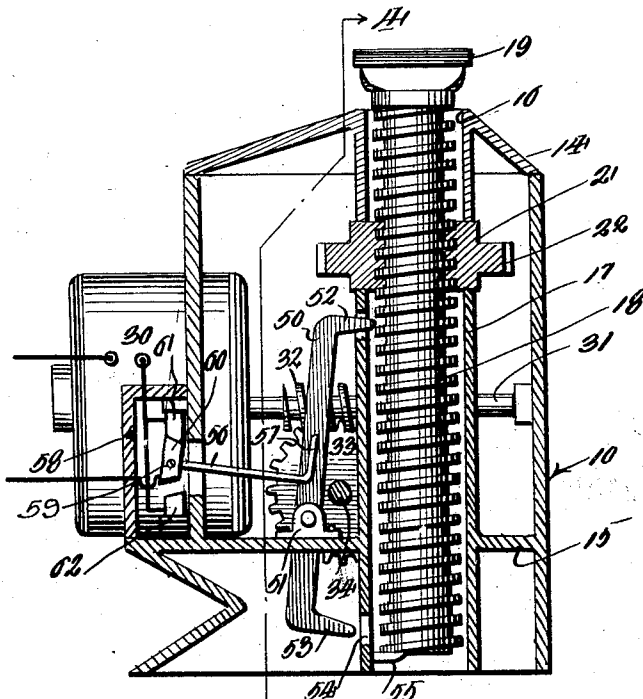
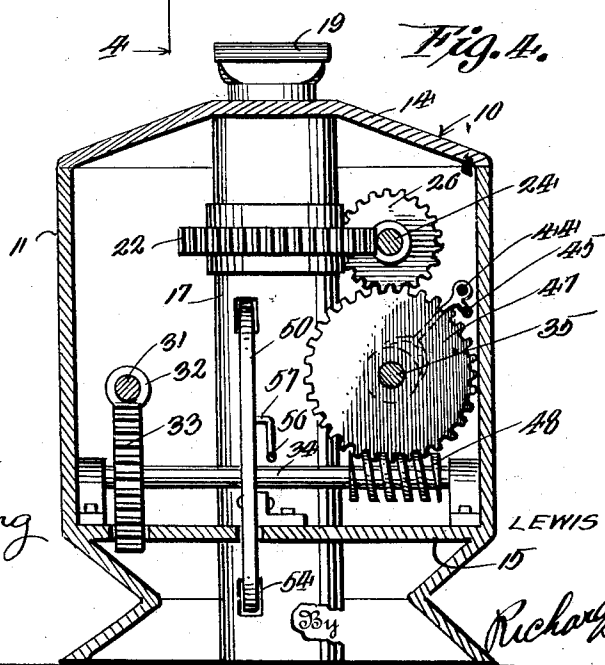


Fig. 4.



WITNESSES
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JACK

Application filed January 10, 1927. Serial No. 160,258.

This invention relates to pushing and pulling implements, and more particularly to a jack which is designed for automobile garage use, but which is susceptible for other purposes.

One of the primary objects of the present invention is to provide a vehicle jack operated by an electric motor, thereby eliminating the difficulties consistent with the use of hand operated jacks.

Another prime object of the invention is to provide automatic means for stopping the operation of the jack when the lifting screw has reached the limit of its travel in either direction, thereby assuring against breakage of parts.

Another salient feature of the invention is the provision of novel means for reversing the direction of movement of the lifting screw, without reversing the direction of rotation of the drive motor.

A further object of the invention is the provision of means for automatically throwing the jack out of gear when the lifting screw has reached the limit of its travel in either direction and for automatically operating a switch for cutting off the flow of current through the motor.

A still further object of the invention is to provide an improved vehicle jack of the above character, which will be durable and efficient in use, one that is simple and easy to manufacture, and one which can be placed upon the market at a reasonable cost.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of the improved jack, showing the cover plate of the jack removed to illustrate the interior mechanism of the jack.

Figure 2 is a horizontal section through the jack taken on the line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is a vertical section through the jack taken on the line 3—3 of Figure 2, looking in the direction of the arrows, illustrating

the gear shifting mechanism and the switch to open and close the circuit of the motor,

Figure 4, is a vertical section taken on the line 4—4 of Figure 3 looking in the direction of the arrows.

Referring to the drawings in detail, wherein particular reference characters designate corresponding parts throughout the several views, the letter A generally indicates an improved jack, which comprises a casing 10 for housing the various operating parts of the same.

The housing 10 can be of any size or configuration, best suited for the purpose intended, and as shown, includes side walls 11, the rear wall 12, the front wall 13 and the top and bottom walls 14 and 15. The wall 13 is preferably made removable, so that the interior mechanism will be exposed so as to permit oiling and to allow repairs to be made.

The top and bottom walls 14 and 15 are provided with aligned openings 16 and a vertical sleeve 17 is fitted in and secured to the walls of the openings. This sleeve slidably supports the lifting screw 18 of the jack, and the top of the screw can be provided with any preferred type of lifting head 19. The top wall portion can also be provided with any suitable type of handle 20 to permit convenient lifting of the jack.

The sleeve 17 at a point intermediate its ends, is preferably divided or slit and a feed nut 21 is inserted in the slit portion, which nut receives the lifting screw 18. This feed nut 21 is freely rotatable in the sleeve 17, but is held against raising and lowering movement in the sleeve 17 by contact therewith. Formed on the periphery of the feed nut is a worm wheel 22 which meshes with a worm 23 formed on or secured to a horizontally disposed drive shaft 24 rotatably mounted in the casing. This drive shaft 24 also has keyed thereto on opposite sides of the worm 22, spur gear wheels 25 and 26, the purpose of which will be later described.

An electric motor 30 of the desired rating is connected with the housing 10 in any desired way and the armature shaft 31 of the motor is extended into the casing. A worm

32 is connected with the shaft 31 in any desired way and has connected therewith a worm wheel 33, which is keyed or otherwise secured to a cross shaft 34 extending toward and underneath the drive shaft 24. Mounted directly below the shaft 24 and in parallel relation thereto is a driven shaft 35 and mounted between the drive shaft 24 and the driven shaft 35 is a stub shaft 36. This stub shaft 36 has rotatably mounted thereon an idle spur gear 37. This idle spur gear 37 meshes at all times with the spur gear 25 which is keyed to the shaft 24.

Feathered upon the driven shaft 35 are drive spur gears 38 and 39, and these gears are provided respectively with grooved collars 40 and 41. The grooved collars 40 and 41 receive rider yokes, 42 and 43, respectively, which are slidably mounted upon a guide rod 44 rigidly secured in the casing. The rider yokes 42 and 43 are connected together by an operating rod 45 which extends exteriorly of the casing. This rod 45 can be provided with a manipulating handle 46 whereby the gears 38 and 39 can be shifted by hand. It is to be noted that when the gear 39 is in driving relation with the gear 26, that the gear 38 is out of meshing engagement with the idle gear 37. The shaft 35 has keyed directly thereto a worm wheel 47 which meshes constantly with a worm 48 on the shaft 34. It is obvious that when the motor 30 is in operation, the shaft 35 will be driven therefrom through the mediums of the worm 32, worm wheel 33, shaft 34, worm 48, and worm wheel 47. The operation of the shaft 35 will drive the shaft 24 in one direction through the medium of the spur gear 39 and the spur gear 26. In order to drive the shaft 24 in the opposite direction, it is necessary that the gears 39 and 38 be shifted so that the gear 39 will be moved out of meshing engagement with the gear 26, and the gear 38 be in meshing engagement with the idle gear 37 which will drive the gear 25. By rotating the shaft 24 in the opposite direction, it can be seen that the lifting screw 18 can be either raised or lowered, as desired.

In order to prevent injury to the various operating parts of the jack when the lifting screw has reached the limit of its travel in either direction, automatic means is provided for stopping the motor and for moving the gears 38 and 39 to a neutral position. This embodies a trip lever 50 which is rockably mounted in the casing adjacent its lower end upon a suitable bracket 51 secured to the bottom plate 15 of the casing. This trip lever is provided at its opposite end with trip fingers 52 and 53, which are adapted to ride into the sleeve 17 at different times through openings 54 formed in the said sleeve. These tripping fingers are preferably provided with cam faces for facilitating the rocking thereof by the trip lug 55 which is secured

to or formed on the lower end of the lifting screw 18. As shown in Figure 3 of the drawings, the upper trip finger 52 is disposed within the sleeve and upon raising of the lifting screw 18 by the feed nut 21 to the limit of its travel, the trip lug 55 will engage the finger 52 causing the rocking of the trip lever and the moving of the finger 53 into the lower opening 54 of the lever and in the path of the trip lug 55 upon downward movement of the lift screw. The movement of the trip lever 50 is utilized for operating the switch for the motor and shifting the gear to a neutral position. This means consists of a rod 56 having an upwardly bent right-angled end 57 which is secured to the lever 50 above its pivot point. This rod extends through the side wall of the casing into a switch box 58 and the rod is angled horizontally as at 59, so as to extend through the box. This portion of the rod has secured thereto the switch block or bridge piece 60 which is secured to one wire of the motor. The block can be mounted for sliding movement in the switch box 58 in any desired way. At the limit of the travel of the block or bridge piece 60 are arranged the contacts 61 and 62 which are connected respectively to the other wire of the motor. The angled portion 59 of the rod 56 extends through the switch box 58 and has connected thereto, one arm of a bell crank 63 which is rockably mounted at its angle, as at 64, to the switch box. The other arm of the bell crank is connected to a double ended lever 65 which is also rockably mounted at a point equidistant its ends to the said box. This double ended lever 65 can be connected by a link 66 with the operating rod 45.

By this arrangement, it can be seen that when the lifting screw 18 reaches its limit of travel, that the lever 50 will rock which will cause the moving of the bridge or block 60 to a neutral position between the contacts 61 and 62, consequently cutting off the motor. The movement of the rod 56 will also actuate the rod 45 through the medium of the bell crank 63 and the double ended lever 65. This action of the rod will move the gears 38 and 39 to a neutral position out of meshing engagement with the idle wheel 37 and the gear 26. When it is desired to start back, the rod 45 can be manually operated for throwing either one of the gears 38 or 39, as the case may be, into meshing engagement with this gear and this movement of the rod will also operate the rod 56 causing the bridge piece 60 to be moved either into contact with the contacts 61 or 62 which will again start the motor in operation.

From the foregoing description, it will be seen that I have provided a novel jack which is automatically operated and which is of a substantial and durable character.

Changes in details may be made without

departing from the spirit or the scope of the invention, but what I claim as new, is:

5 In a device of the class described, a rotatable feed nut, a screw operated by said nut, an electric motor, a control switch for the motor, a driven shaft operated from the motor, a drive shaft for the feed nut, a pair of drive gears keyed to the drive shaft, an idle gear meshing with one of said drive gears, a 10 pair of gears feathered upon the driven shaft, a shift rod for the feathered gears, the feathered gears being arranged for movement into and out of engagement with the idle gear and the drive gear, a trip lever rockably mounted adjacent to one end defining a relatively long 15 arm and a relatively short arm, trip fingers on the opposite ends of the arms, a trip lug on the screw for engaging one trip finger or the other at the limit of the travel of the screw 20 for operating the trip lever, and means operatively connecting the long arm of the trip lever to the control switch and shift rod, as and for the purpose specified.

In testimony whereof I affix my signature.

25 LEWIS J. FULLER.

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