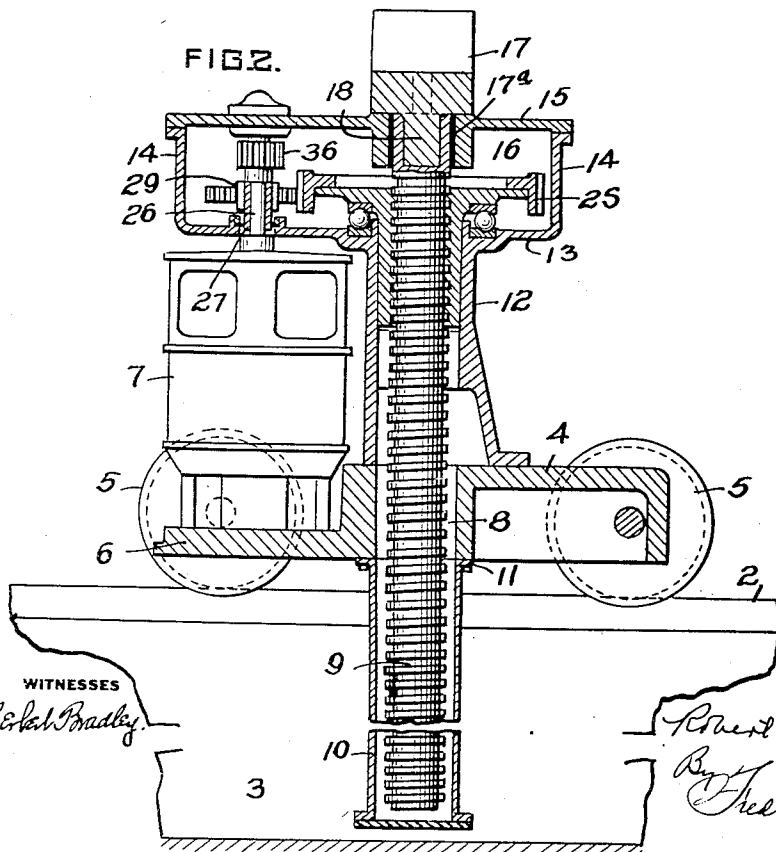
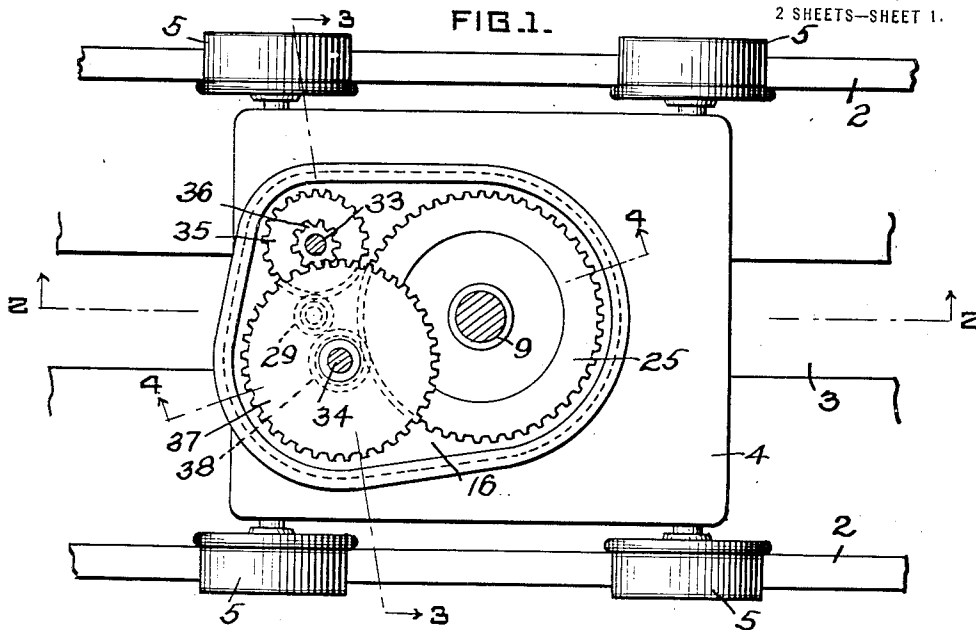


1,387,544.

2 SHEETS—SHEET 1.



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1,387,544.

Patented Aug. 16, 1921.

2 SHEETS—SHEET 2.

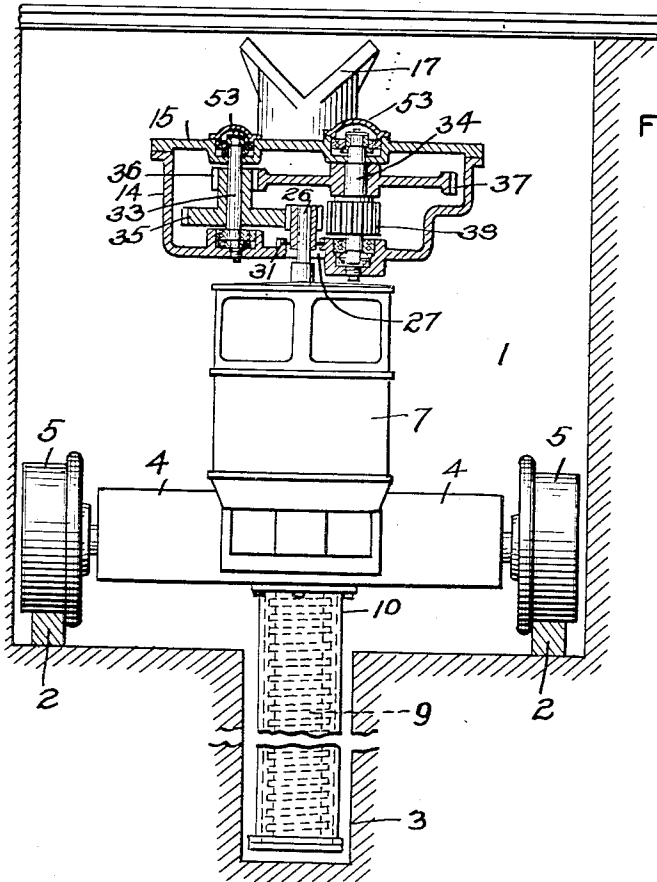


FIG. 3.

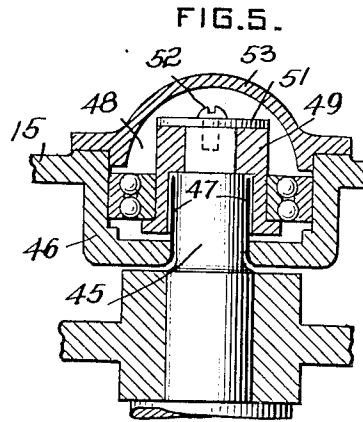


FIG. 5.

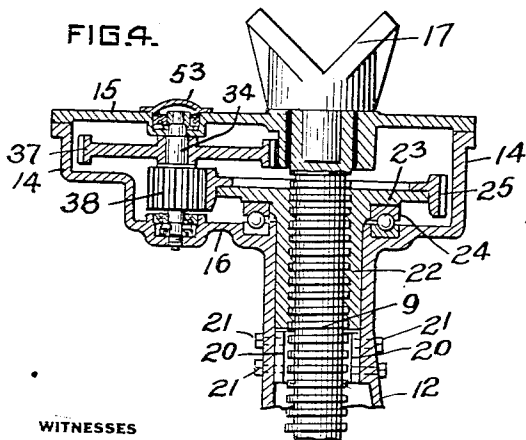


FIG. 4.

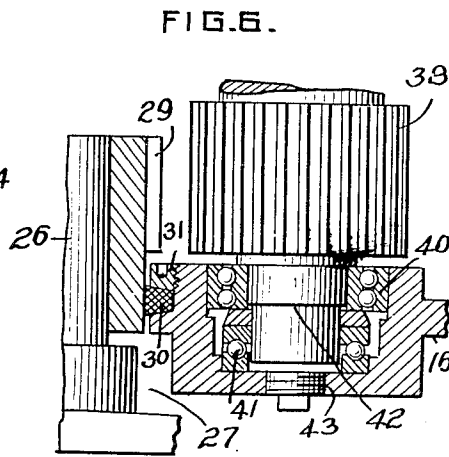


FIG. 6.

WITNESSES

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ROBERT L. HIBBARD, OF PITTSBURGH, PENNSYLVANIA.

DROP-PIT JACK.

1,387,544.

Specification of Letters Patent.

Patented Aug. 16, 1921.

Application filed October 4, 1919. Serial No. 328,372.

To all whom it may concern:

Be it known that I, ROBERT L. HIBBARD, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Drop-Pit Jacks, of which the following is a specification.

This invention relates to drop-pit jacks and more particularly to such jacks for use in pits in locomotive round houses to handle the driving wheels and axles of locomotives. The object of the invention is to provide an electrically operated jack for this purpose which is compact, strong, rapid in operation, and in which the working parts are protected from dirt.

In the accompanying drawings Figure 1 is a plan view of the jack with the top cover removed; Fig. 2 is a longitudinal vertical sectional view taken on the line 2—2, Fig. 1; Fig. 3 is a transverse vertical sectional view taken on the line 3—3, Fig. 1, and showing the track on which the jack carriage runs; Fig. 4 is a vertical sectional view through the upper portion of the jack taken on the line 4—4, Fig. 1; and Figs. 5 and 6 are enlarged detailed views of the bearings of one of the stub shafts.

The jack is constructed to be mounted upon a suitable truck or carriage running on tracks or ways in the pit. In the drawings 1 indicates the pit, 2 the tracks or ways therein, and 3 a slot or channel in the floor of the pit to receive the downwardly projecting end of the jack screw. Running on the track is a truck or carriage comprising the frame 4 carrying journals for the wheels 5 which run upon the tracks 2. The truck frame is a casting of substantially rectangular outline and with a substantially flat top, except at one end where it has a depressed portion 6 upon which is supported an electric motor 7, contained in a suitable casing and placed with its armature shaft vertical. Centrally the truck frame is provided with an opening 8 through which the lifting screw 9 extends. The downwardly projecting end of the screw 9 is housed and protected by a tubular casing 10 closed at its lower end and having its upper end secured to a flange 11 which is attached to the bottom of the truck frame by tap screws or the like. Mounted on the truck frame is a hollow standard or column 12 whose opening is in line with the opening 8 in the truck frame and through which the screw 9 extends. This standard or column

has an enlarged upper portion or head projecting laterally beyond the column and overhanging the motor, and comprising a bottom or floor 13, vertical walls 14 and a cover 15, thus forming a substantially closed chamber 16. The cover 15 is provided with an opening through which the upper end of the screw 9 projects and in which opening is a bronze bushing 17^a to form a relatively tight joint at this point. The lifting head 17, having a V notch to engage the locomotive axle, is provided with a downward projection 18 which fits in a socket in the upper end of said screw. The screw is provided with one or more longitudinal grooves engaged by a key or keys 20 which are held in place by screws 21, and which serve to hold the screw against rotary motion.

Rotatably mounted in the upper end of the hollow column is a bronze nut 22 operatively engaging the screw 9 and which is of material length as shown so as to provide a proper bearing and guide for the screw 9. The upper end of this nut is provided with a flange or web 23 located in the chamber 16, and which is supported from the floor of said chamber by a ball thrust bearing 24. Secured to the flange or web 23 is a steel or similar annular gear member 25, provided on its periphery with teeth, and by means of which rotary movement is imparted to the nut 22.

The armature shaft 26 of motor 7 projects up through an opening 27 in the floor of the chamber 16, and has secured thereto a sleeve 28 whose upper portion forms a pinion 29 while its lower portion is smooth and is surrounded by a compressible gasket 30 in the opening 27, which gasket is held in place by means of an adjustable threaded ring 31, in order to make a substantially oil tight joint at this point.

Mounted in the head of the column 12, on opposite sides of the motor pinion 29, are a pair of short or stub shafts 33 and 34, the former of which carries a spur gear 35 meshing with the motor pinion 29 and also a pinion 36 which meshes with a spur gear 37 carried by shaft 34. The latter shaft also carries a pinion 38 which meshes with the gear 25 of the nut 22. The gearing described constitutes a train of speed reducing gearing connecting the motor shaft with the nut 22, whereby the motor will rotate the nut 22 in either direction to raise and lower the screw 9, as will be obvious.

The lower ends of both shafts 33 and 34 are mounted in special bearings, shown in Fig. 6, the same comprising annular ball bearings 40 surrounding the neck of the shaft and ball thrust bearings 41 underneath a flange or collar 42 secured to the end of the shaft. Underneath each shaft is a cleaning opening 43 closed by a threaded plug to drain out the lubricant when desired, but otherwise the floor of the chamber 16 is perfectly tight so that all of the gearing described can be immersed in a suitable lubricant. The upper ends of these shafts have reduced necks 45 projecting up through an opening formed in a depressed portion 46 of the cover 15, and are surrounded by an upwardly projecting sleeve 47 tightly secured in said opening so as to retain the lubricant in the chamber 48 above the depressed portion 46. Secured to the upper ends of each of the shafts is a sleeve 49 forming the journal and which is surrounded by an annular ball bearing 50, said sleeve preferably being fitted on a square or other non-circular end portion of the shaft and being held against displacement by means of a washer 51 and tap screw 52. The chambers 48 are each closed by means of a removable top 53 secured by tap bolts or the like to the cover 15.

The end construction and bearings for each of the shafts 33 and 34 are substantially alike, differing only in the size and proportion of the parts.

The motor can be entirely incased if desired, and in any event is well housed, and all of the gearing and bearings are inclosed in tightly closed chambers which retain the lubricant so that all parts are thoroughly lubricated, and at the same time protected from dirt. The screw also is housed and protected from dirt by the tubular depending casing 10, and its upper end is projected above the top of the housing only during the time of engaging the locomotive axle and lowering it down so that it can be removed from the locomotive. Consequently there is little opportunity for the screw to become fouled with dirt.

For handling locomotive axles with the drive wheels thereon the truck must be small enough to fit in between the locomotive wheels, which will come down at the two ends of the truck when the axle and wheel are lowered. The electric motor obviously is reversible so that the screw is both lifted and lowered by means of power. The truck can be pushed along the track by hand, or if desired a second electric motor may be mounted on the truck frame and have its armature shaft geared to one of the axles of the truck by any suitable train of gearing.

The jack described is of compact and simple construction, is strong, efficient in operation, and all the working parts are housed

and completely protected against dirt and therefore not subject to material wear. The electric motor is substantially entirely overhung by the enlarged head of the standard 12 and therefore is not liable to receive violent loads.

I claim:

1. In a drop-pit jack, in combination, a truck frame comprising a base and a standard provided with a vertical opening, said standard being provided with an enlarged overhanging chambered head, a nut rotatably mounted in said chamber and journaled in said standard form a closure therefor, a lifting screw engaged by said nut, an electric motor mounted on the base at one side of the standard and having its armature shaft projecting up through the bottom of the overhanging head and into the chamber therein, a pinion on the motor shaft, a pair of vertical stub shafts mounted in said chamber and geared together, one thereof being geared to the motor pinion and the other being geared to the nut.

2. In a drop-pit jack, in combination, a frame comprising a standard and enlarged overhanging chambered head, a non-rotatable lifting screw extending through said standard and head, a nut engaging said screw and provided with a gear, a thrust bearing supporting said nut from the floor of said chambered head, a vertical shaft mounted in bearings in the top and bottom walls of said chamber, both said walls being formed with depressed portions forming lubricant retaining walls for said shaft, a gearing connecting said shaft to the nut gear, a motor whose shaft projects into said chamber parallel to the shaft in said chamber, and spur gearing connecting said shafts.

3. In a drop-pit jack, in combination, a frame provided with a chamber, a non-rotatable lifting screw extending through said chamber, a nut engaging said screw, a motor shaft projecting into said chamber parallel to said screw, a shaft mounted in the top and bottom walls of said chamber parallel to said screw, both said walls being formed with depressed portions forming lubricant retaining walls and centering means for the bearings of said shaft, thrust bearings at the lower end of said last named shaft, and spur gearing connecting said last named shaft to the nut and to the motor shaft.

4. In a drop-pit jack in combination, a frame including a hollow standard provided with an integral enlarged head comprising a bottom with integral unbroken walls rising therefrom and a cover, a nut rotatably mounted in the head and journaled in said standard to form a closure to prevent the escape of lubricant therefrom, a non-rotatable lifting screw extending through the standard and head and surrounded by said 1:

nut, a rotary motor mounted on the frame at one side of the standard and having its shaft projecting up through the bottom of the enlarged head, a pinion on said motor shaft within said head and gearing in said head connecting the pinion on the motor shaft with the nut on the lifting screw.

5. In a drop-pit jack, in combination a frame including a hollow standard provided with an integral enlarged head comprising a bottom with integral unbroken walls rising therefrom and a cover closing the same, a non-rotatable lifting screw in said hollow standard and extending through said chambered head, a nut engaging said screw and mounted on a thrust bearing on the bottom of said head and provided with a sleeve projecting downwardly and guided in said hollow standard, said sleeve neatly fitting the hollow standard so as to prevent the escape of lubricant from the chambered head, a gear on said nut, a motor mounted on the frame at one side of the standard and having its shaft projecting up through the bottom of the overhanging head and into the chamber therein, a pinion on the motor shaft, and gearing mounted in said

chambered head and connecting said pinion and the gear on the nut.

6. In a drop-pit jack, in combination, a frame including a hollow standard and provided with an overhanging chambered head, a non-rotatable lifting screw extending through said standard and head, a nut engaging said screw and provided with a gear, a thrust bearing on said chambered head, a vertical shaft in said head, a bearing on the bottom of the head in which the lower end of said shaft is mounted, the top of said chambered head being provided with a depressed portion forming an oil reservoir, a bearing in said depressed portion for the upper end of said shaft, gears connecting said vertical shaft and nut, a motor having a shaft projecting into said chamber parallel to the shaft therein, and gears connecting said two shafts.

In testimony whereof, I have hereunto set my hand.

ROBERT L. HIBBARD.

Witnesses:

HOWARD L. SNIVELY,
MARY R. LAVELLE.