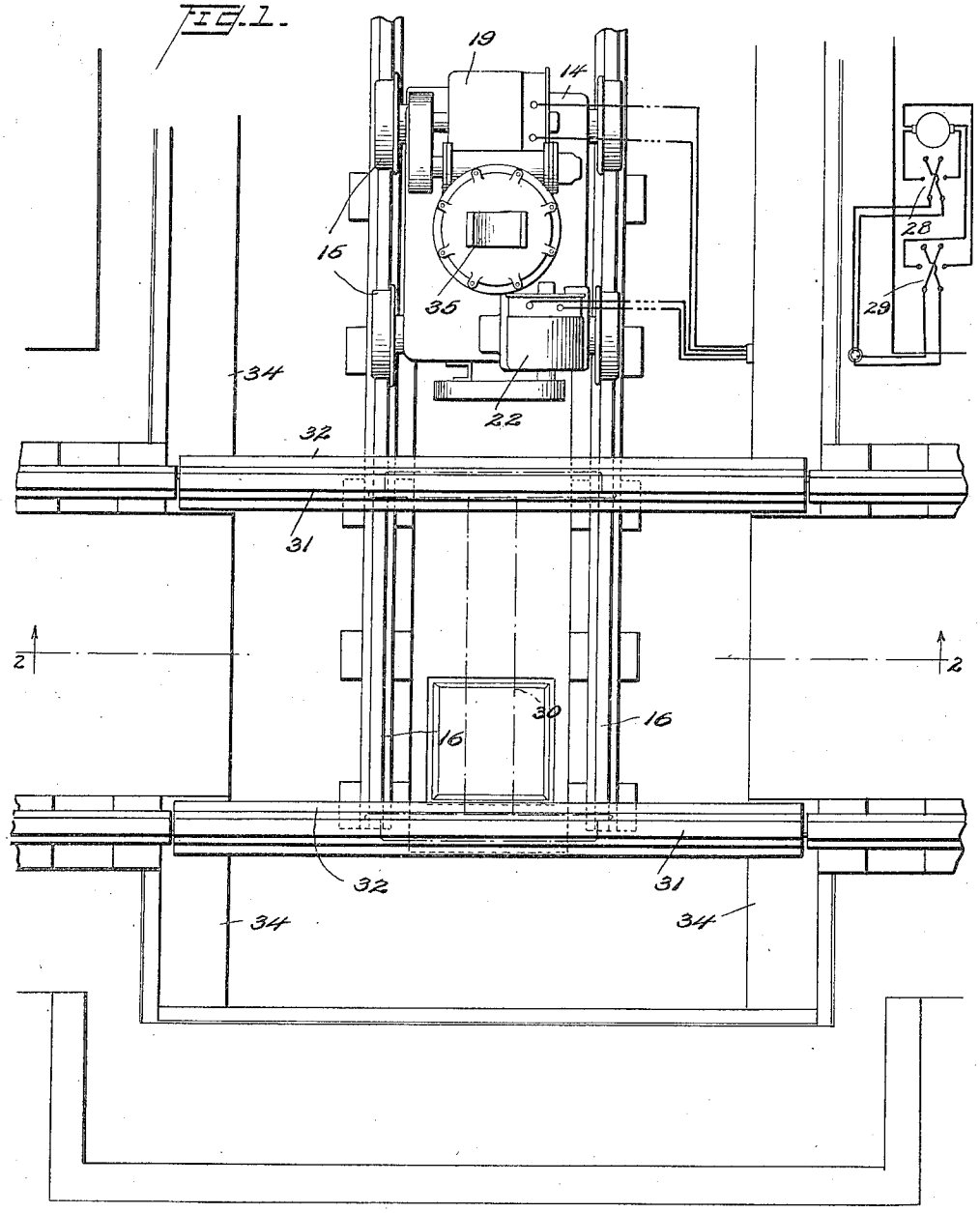
Oct. 9, 1923. 1,470,180

R. N. MILLER

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FIG. 1.




Inventor

Robert N. Miller,

By Watson, Cole, Morse & Grindle,

Attorney

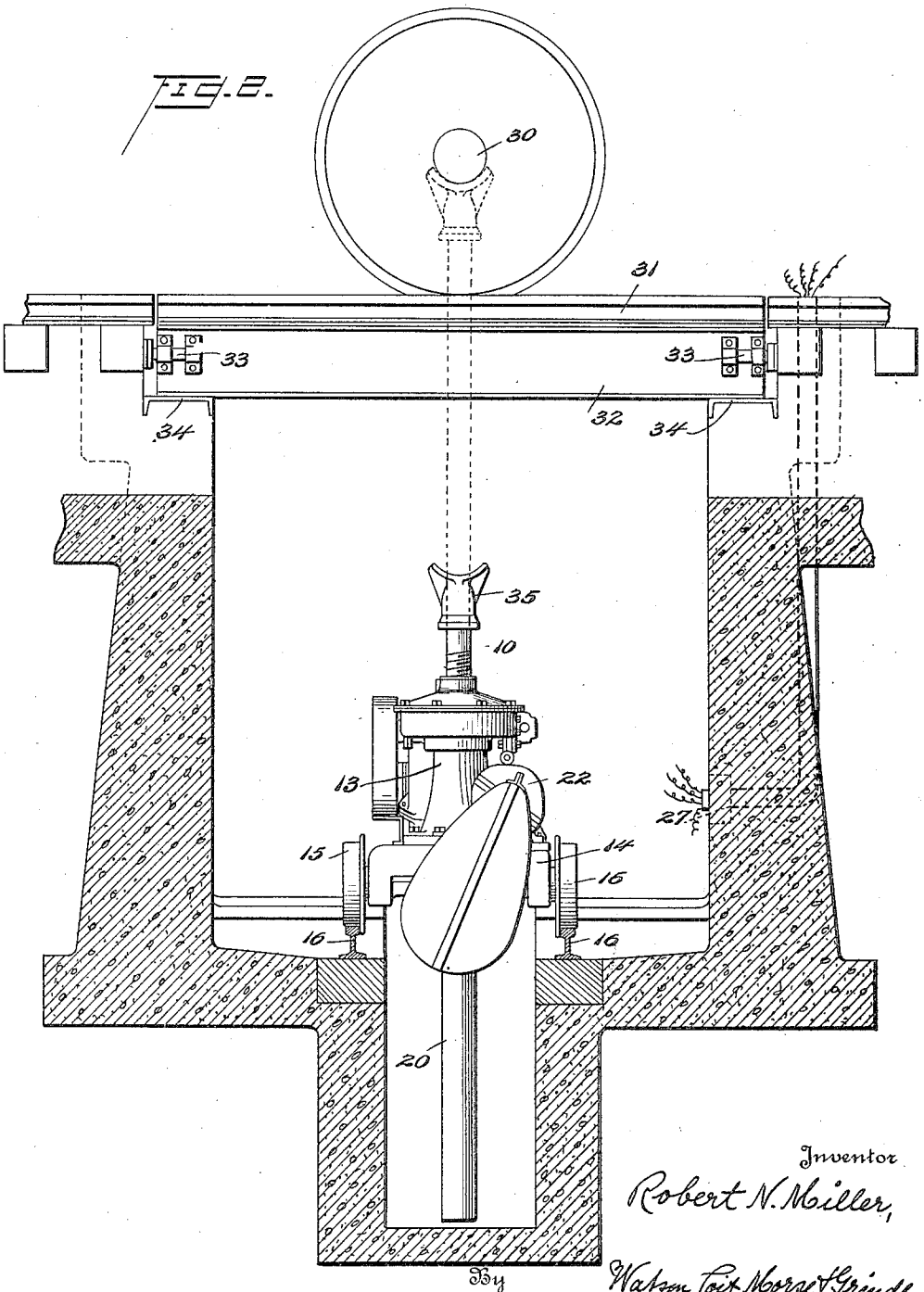
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R. N. MILLER

JACK

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FIG. 2.




Inventor
Robert N. Miller,
By Watson, Cole, Morse & Grindle,
Attorney

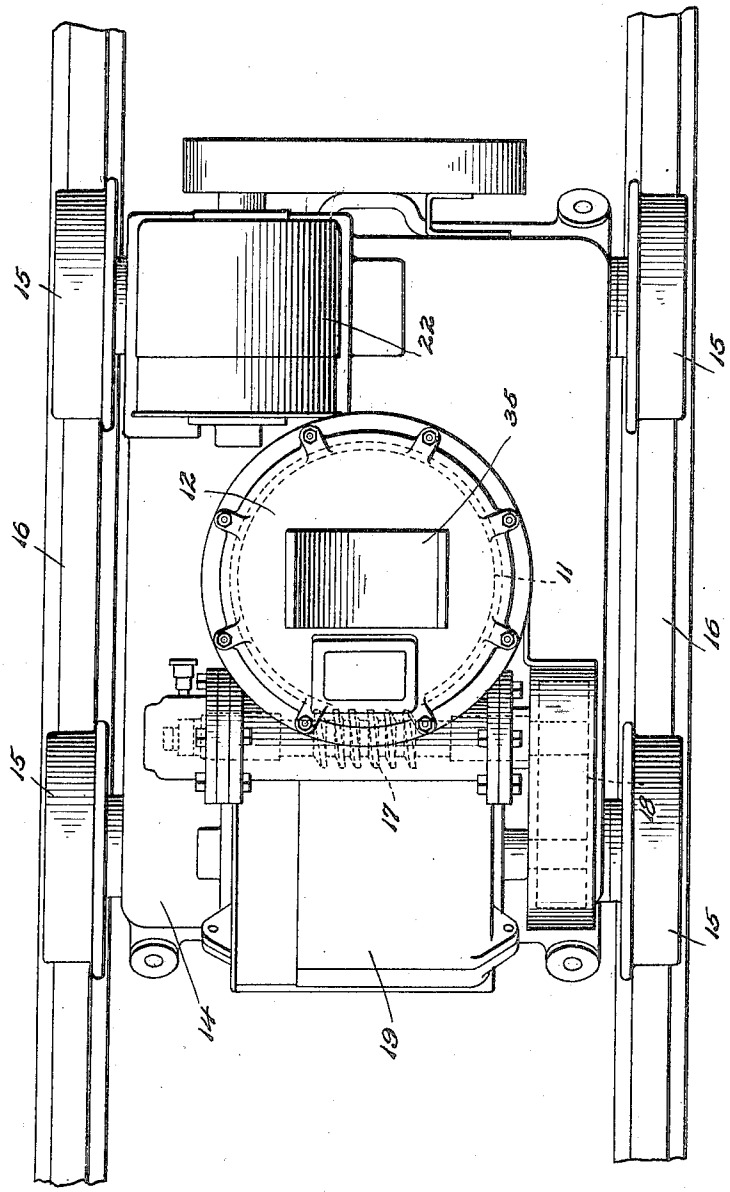
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R. N. MILLER

JACK

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FIG. 3.




Inventor

Robert N. Miller,

By Watson, Cole, Morse & Grinde

Attorney

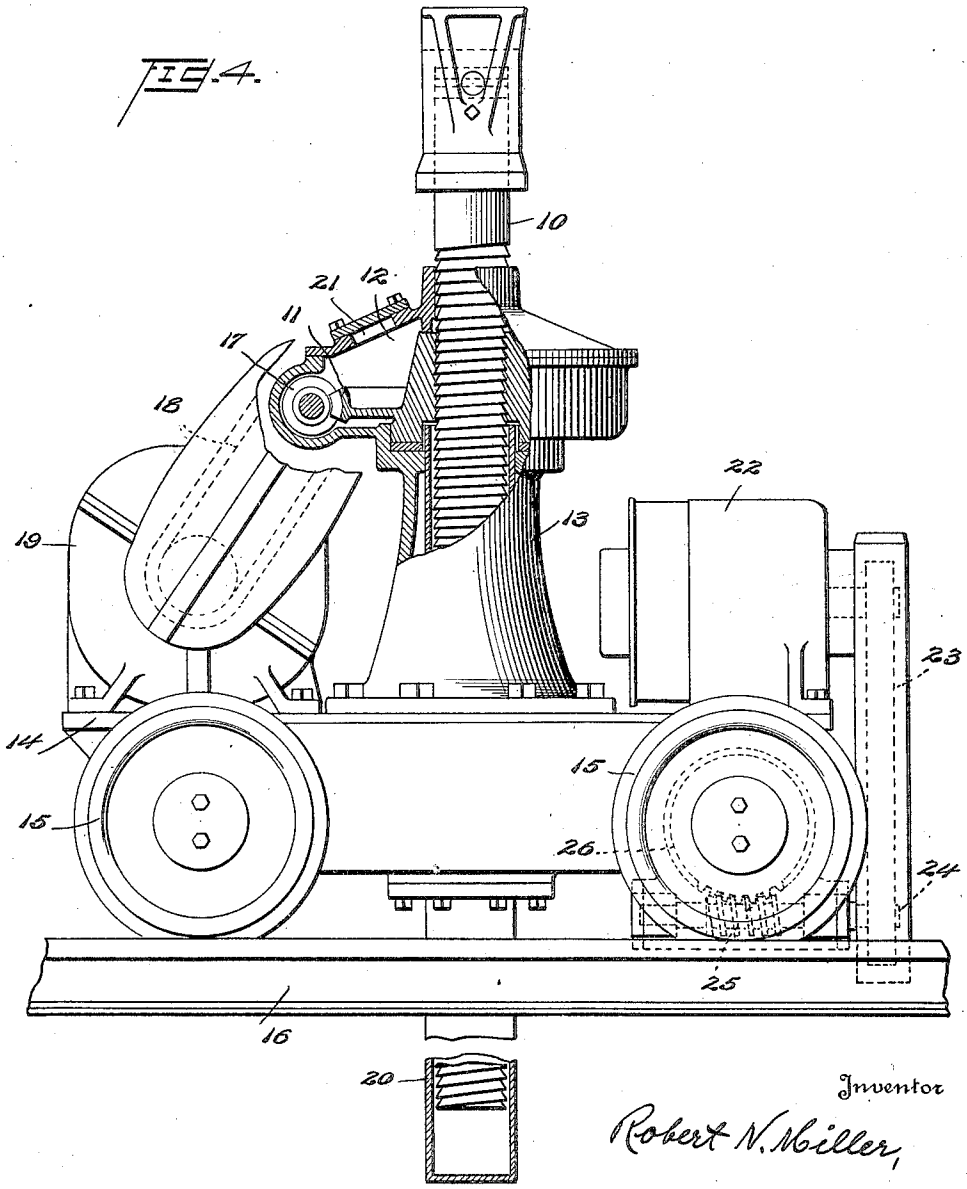
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R. N. MILLER

JACK

Filed May 20, 1921 4 Sheets-Sheet 4

FIG. 4.




Inventor

Robert N. Miller,

By Watson, Cole, Morse & Grindle

Attorney

Patented Oct. 9, 1923. 1,470,180

# UNITED STATES PATENT OFFICE.

ROBERT N. MILLER, OF ALTOONA, PENNSYLVANIA.

## JACK.

Application filed May 20, 1921. Serial No. 471,135.

*To all whom it may concern:*

Be it known that I, ROBERT N. MILLER, a citizen of the United States, and residing at Altoona, Blair County, State of Pennsylvania, have invented certain new and useful Improvements in Jacks, of which the following is a specification.

The present invention relates to jacks and particularly to power jacks adapted to be used in removing, for the purpose of repair or replacement, the wheels and axles of railway cars and locomotives.

It is often necessary, in making repairs, to remove a pair of wheels with their connecting axle from a car or locomotive, and for this purpose railroad machine shops and locomotive round houses have been provided with trackways which bridge across pits sunk below the floor level into which the workmen descend to perform the necessary operations and into which the wheels are lowered. With the present types of locomotive, and steel freight and passenger cars of great weight, the size and mass of the wheels have been increased to such an extent that it is a difficult undertaking to remove an axle with two steel wheels, one fixed on each end thereof, and an operation hazardous to the workmen positioned in the pit.

It is the object of the present invention to provide a jack to be used particularly in such operations which jack is permanently located in the pit beneath a trackway and is operable from the ground surface to lower an axle and its associated wheels into the pit and to then convey the same along a trackway to one side of the car or locomotive to a position where it is accessible from above so that it may be lifted by means of a crane. The jack screw elevating gear is positioned on a wheeled platform and means is provided for propelling the platform along the trackway at the bottom of the pit, which means is controlled from the ground level. As the elevating gear is also controlled from the ground level it is unnecessary for a workman to descend into the pit to operate the jack and to thereby become exposed to great danger due to slipping of the jack or falling of the wheels or other portions of the car or locomotive above his head. The jack operates quickly and enables the repair to be made in a minimum of time as well as being instrumental in preventing injury to the personnel of the repair force.

An important feature of the invention resides in the complete enclosure of the moving parts of the elevating gear within a fluid tight casing which is normally filled with oil, the elevating screw and gear wheel operating the same running in oil at all times. Other features of the invention reside in the arrangement of the parts of the apparatus whereby a quick acting jack is provided as well as one which is sturdy, and in which the parts are positioned in such a manner that the jack is well balanced. One form of the invention is illustrated in the accompanying drawings in which:

Figure 1 is a plan view of a portion of the floor of a round house or repair shop showing a trackway for rolling stock, a pit under the trackway, and the improved jack in the pit;

Figure 2 is a section on line 2—2 of Figure 1 showing the jack positioned beneath the axle of a car or locomotive;

Figure 3 is a plan view of the jack on a larger scale; and

Figure 4 is a side view of the same partly broken away to show the elevating mechanism.

Referring particularly to Figures 3 and 4, it will be seen that the jack comprises an elevating screw 10 which is externally threaded and extends through a threaded central aperture in a worm wheel 11 which is rotatably supported within a chamber 12 of a pedestal 13 mounted upon a platform 14, the pedestal being preferably of cast iron. The platform in turn is supported on wheels 15 which run on rails 16 extending longitudinally of the pit. A worm 17 is also positioned within the fluid tight chamber 12 and this worm meshes with worm wheel 11 to rotate the same about the axis of the screw 10 to raise or lower the latter. Worm 17 is connected by a chain or belt 18 to an electric motor 19 rigidly secured to the truck frame and by reversibly operating this motor the screw may be raised or lowered as desired.

The screw 10 projects downwardly axially through the supporting pedestal 13 and ex-

tends downwardly through an aperture in the truck frame for a considerable distance, as shown in Figure 2, the screw being enclosed within a fluid tight casing 20 which opens at its upper end into the chamber 12. Oil or grease may be introduced through aperture 21 into chamber 12 from where it will find its way into and will fill the casing 20 so that in the operation of the jack, the screw 10, worm wheel 11, and worm 17 continually run in oil or grease, thereby reducing the wear and frictional losses to a minimum.

Mounted upon the end of the truck frame opposite that upon which the motor 19 is positioned is a second motor 22, the shaft of which is connected by a belt or chain 23 with short shaft 24 extending longitudinally of the truck frame. The shaft 24 has a worm 25 thereon which is in mesh with a worm wheel 26 rigid with the adjacent axle of the machine. The motor 22 may be driven in either direction and the jack thereby propelled in either direction along the trackway. Chains 18 and 23 are both enclosed within protective casings to prevent injury or displacement thereof and to keep out dust and grit.

In Figures 1 and 2 the leads from the electric motors are diagrammatically illustrated. In actual practice they will pass through an extensible cable to an outlet box 27 in the side wall of the pit and thence pass upwardly to the floor level. Individual reversing switches for controlling the motors are shown in Figure 1, the switch diagrammatically illustrated at 28 controlling the circuit through the motor for elevating the screw and the switch illustrated diagrammatically at 29 controlling the circuit through the propelling motor.

The operator standing at the edge of the pit, or in any suitable position to observe the position of the jack, may completely control its operation by means of these two switches. By operating switch 29 he may move the jack until the screw is exactly under the middle point of the axle and by operating the switch 29 he may then raise the screw until its upper end engages the axle, as shown in dotted lines in Figure 2. To remove an axle, the car or locomotive is moved until that particular axle is directly over the center line of the trackway below, that is, into the position occupied by the axle 30 in Figure 2. The jack is then elevated into dotted line position (Figure 2) the elevation continuing until the wheels are lifted a slight distance from the tracks. The pair of wheels is then freed from the rail sections 31 which are short and extend only from wall to wall of the pit, removed from under the wheels. These rail sections and the beams 32 upon which they are supported are normally held against lateral movement by bolts 33, the ends of beams 32 merely resting on plates 34 so as to be easily displaced when the weight of the wheels is taken off, by either sliding them laterally on their supporting plates so as not to obstruct the path of the descending axle, or completely removing them from the vicinity of the pit by a crane, as desired.

The motor 19 may then be operated to lower the screw and the axle balanced on its top into such position that the upper edges of the flanges of the wheels are below the beams 32. The propelling motor 22 may then be operated to move the jack and axle laterally along the trackway 17 from a position beneath the car or locomotive to a position where the axle is accessible from above. The screw may then be elevated if desired and rails placed under the wheels or the wheels may be lifted from the jack by means of a crane. For convenience in inspecting and manipulating the wheels the cap 35 of the screw is pivoted thereon so that the axle may be swung in a horizontal plane.

From the above description the nature of the invention will be apparent to those skilled in the art and it will be obvious that changes in the design and arrangement of the parts may be made without departing therefrom.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. In a jack of the class described, in combination, a wheeled platform having a central vertical aperture therethrough, a tubular casing secured to the platform and extending vertically downwardly therefrom, said casing being coaxial with the aperture in the platform and having its lower end closed, a substantially cylindrical pedestal mounted on the top of the platform and arranged coaxially with said aperture and casing, said pedestal having an annular bearing, an internally threaded wheel rotatably mounted on said shoulder, means mounted on the platform for rotating said gear wheel in either direction, and a vertical screw having threaded engagement with said gear and normally extending into said casing, the screw being adapted to be raised or lowered by rotation of said gear, for the purpose set forth.

2. In a jack of the class described, in combination, a wheeled platform having a central vertical aperture therethrough, a substantially cylindrical pedestal mounted on the top of the platform and arranged coaxially with the aperture, said pedestal having an annular bearing, an internally threaded wheel rotatably mounted on said shoulder, means mounted on the platform for rotating the wheel in either direction, a vertical screw having threaded engagement with said wheel and normally extend-

ing through the aperture in the platform and below the same, and a cylindrical tube extending through said aperture and secured to the platform, which tube extends downwardly and upwardly from the platform enclosing and constituting an oil chamber for the screw, the lower end of the tube being closed and its open upper end lying within the pedestal and closely adjacent the rotatable wheel.

In testimony whereof I hereunto affix my signature.

ROBERT N. MILLER.