O. A. NORLUND.

LIFTING JACK.

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1,304,358. Patented May 20, 1919.

Fig. 1.

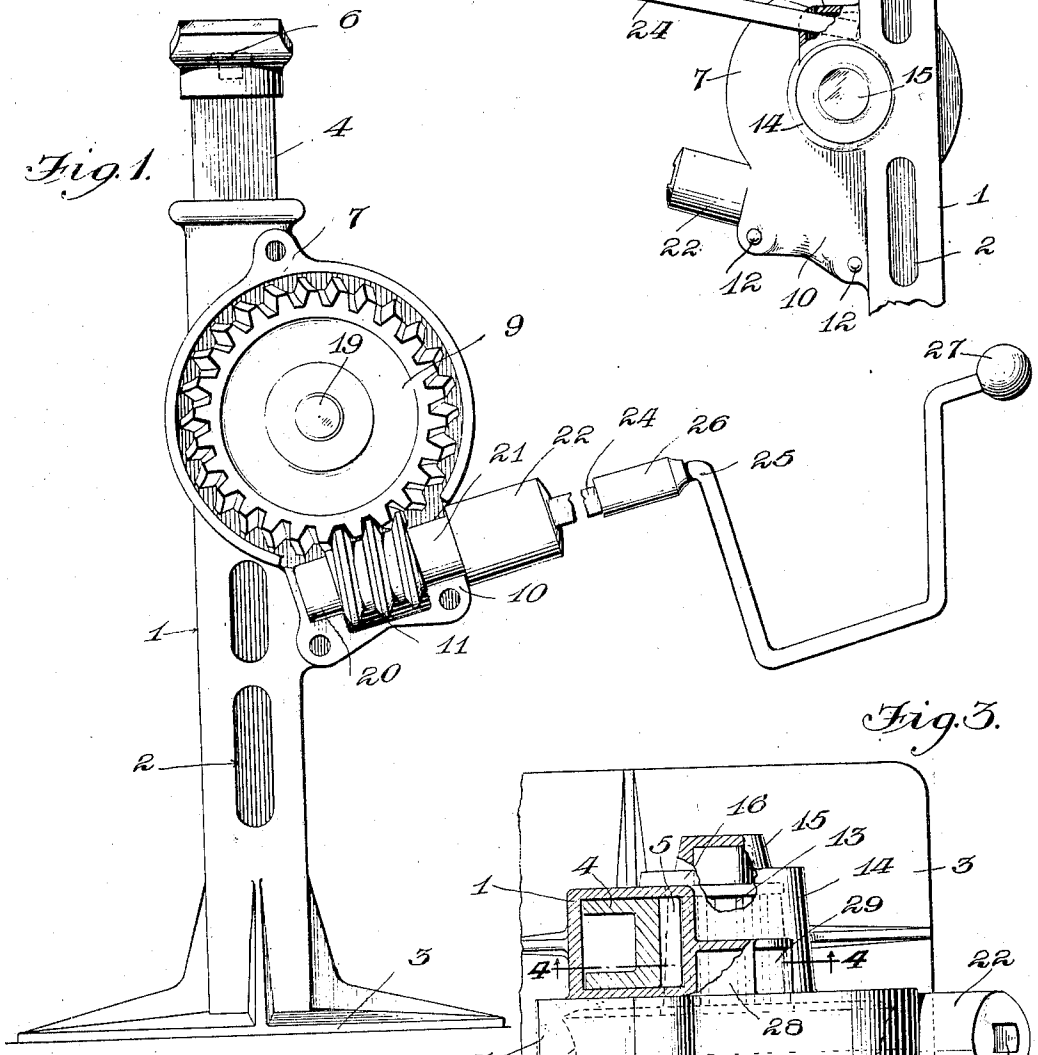
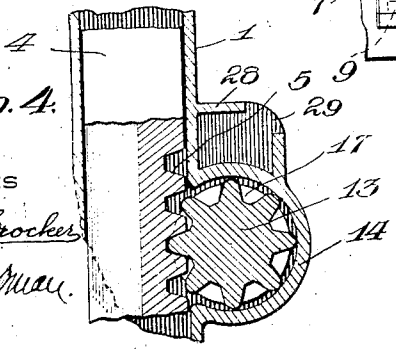


Fig. 2.

Fig. 3.

Fig. 4.



WITNESSES

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LIFTING-JACK.

1,304,358. Specification of Letters Patent. Patented May 20, 1919.

Application filed June 16, 1918. Serial No. 240,655.

To all whom it may concern:

Be it known that I, OLAF A. NORLUND, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Lifting-Jack, of which the following is a specification.

This invention has reference to lifting jacks, and its object is to provide a lifting jack particularly adapted for use in connection with an automobile.

The jack comprises a column in which a rack bar is movable, the rack bar being driven by worm gearing and the latter receiving motion from an elongated removable operating bar in turn receiving motion from a rotatable crank, which latter may be in the form of a socket brace. In order to facilitate the handling of the jack a socket is provided at a relatively high point on the jack structure to receive the extension operating bar so that the jack may be readily placed under an axle or other part of the automobile without the necessity of the one handling the jack reaching under the automobile, the one bar answering both as a manipulating bar for actuating the jack and a handling bar for placing the jack, different sockets being provided for the two purposes.

All the moving parts of the jack liable to be interfered with by accumulations of dirt are covered and the pinion employed to actuate the rack bar is reinforced to permit the employment of smaller teeth in greater number than customary, with the advantage of greater structural strength.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:—

Figure 1 is an elevation of the lifting jack with the face plate covering certain portions of the gearing removed.

Fig. 2 is an elevation of the upper portion of the jack, as seen from the side opposite to that of Fig. 1, the showing of the figure being partly in section and on a smaller scale than Fig. 1.

Fig. 3 is a top plan view of the jack with some portions in cross section and some portions broken away.

Fig. 4 is a section of a portion of the jack on the line 4—4 of Fig. 3.

Referring to the drawing, there is shown a column 1 which may be, although is not necessarily, of rectangular shape in cross section, the column having slots 2 formed through opposite walls at intervals to correspondingly reduce weight of the structure and to expose the interior thereof to view. In order to support the column it is erected on a sufficiently extended base 3, the column 1 and base 3 being usually cast in one piece. Fitted to slide up and down within the column 1 is a rack bar 4 shown as of U-shape in cross section, this lightening the structure, and along one edge the rack bar is formed with teeth 5. At what constitutes the upper end of the rack bar, in use, there is provided a swivel head 6, as is customary.

Cast on the column 1 in offset relation to one face thereof is a casing 7 provided with a removable cover 8. The casing 7 is of a size to house a worm gear 9 and at one side of the casing, preferably the lower side thereof, is an extension 10 of the casing designed to house a worm 11 meshing with the worm gear 9. The cover 8 is shaped to inclose both the worm 9 and worm 11 and is held in place by screws 12 wherever necessary. The worm gear 9 is formed on one face with a gear pinion 13 which may be integral therewith. The pinion is housed within a side extension 14 of the casing 7, this casing being cast in one piece with the column 1 and closed at the end remote from the casing 7. At the closed end the casing 14 has a projection or boss 15 hollowed out to constitute a journal bearing for a pintle 16 at that end of the pinion 13 remote from the worm gear 9. The same end of the pinion 13 has a strengthening web or reinforcement 17 at the end of the teeth of the pinion whereby it is possible without sacrifice of strength to make the teeth smaller and more numerous than would otherwise be the case, this also contributing to the strength of the jack as a whole.

The cover plate 8 is provided with a boss or projection 18 hollowed out to receive a

pintle 19 on the face of the worm gear 9 remote from the pinion 13.

The worm 11 is provided with terminal pintles 20, 21 respectively, having journal bearings in the extension 10 of the casing 7 and the pintle 21 is continued beyond the extension 10 in the form of a socket member 22 provided with an axial socket 23 preferably of square shape in cross section, although not limited to such particular shape. The socket 23 is designed to receive one end of a bar or rod 24 also of square cross section to fit the socket 23 and in order to manipulate the bar 24 there is provided a socket brace 25 having a socket member 26 at one end and a handle 27 at the other end, the brace being similar to or may be the same as the braces of like character employed in automobiles for securing and detaching demountable wheel rims.

Automobile jacks are more commonly used for lifting the axles of automobiles in order to elevate the automobile wheels. It is inconvenient to place an automobile jack in position for use and frequently the clothes of the operator become soiled by contact with wheels or similar parts of the automobile. Again, the usual manipulating means for the jack are of a character requiring the operator to stoop to an extent, causing the manipulation of the jack, especially with heavy automobiles, to be difficult. To avoid these troubles the worm gear arrangement is employed, this making the lifting of heavy automobiles an easy matter and the elongated operating rod 24 greatly facilitates the manipulation because the operator may stand erect or nearly so and a considerable distance away from the jack. Moreover, the worm gear is a self-locking structure and the use of pawls and other holdings devices is avoided.

In order to place the jack in position to elevate an automobile axle or to remove it from such position without the necessity of the operator stooping to any material extent or coming in contact with parts of the automobile, provision is made whereby the rod 24 may be utilized as a carrying handle to place the jack under the axle or to remove it from such position while the operator is freed from the necessity of contacting with any part of the vehicle or stooping under some part of the vehicle. For this purpose a socket or receptacle 28 is formed on the column or post 1, preferably at the junction of the post 1, casing 7 and extension 14, the socket 28 being conveniently cast in one piece with the neighboring parts. The socket 28 is provided with a mouth 29 shaped to loosely receive the bar 24 but to cramp it in the socket when the weight of the jack is borne by said rod 24. By making the mouth 29 of rectangular or similar conformation the bar 24 is cramped to an extent in the socket, and, the jack may be conveniently carried by the bar or rod 24 without liability of slipping therefrom. Moreover, the socket 28 is located near the top of the jack so that there is no tendency of the jack to turn but the jack will hang pendantly from the end of the rod or bar 24 sustaining it. In this way there is no difficulty in holding the jack in an upright position when suspended from the end of the bar or rod 24 and during the operation of placing the jack under the axle of the automobile or removing it therefrom.

All the rotatable gearing is completely housed in the casing and parts associated therewith so that such gearing is well protected from harm and the jack as a whole is compact and self-contained. Moreover, by providing the terminal reinforcement for the pinion 13 the number of teeth on the pinion may be increased with the size of the teeth correspondingly reduced and the teeth on the rack bar may be increased and their size reduced. These features increasing the power of the jack. The various working parts are so completely composed as to protect them from damage and also to thoroughly protect the person using the jack The socket 28 permits the placing of the jack wherever desired under the automobile without requiring any material stooping of the operator and with the assurance that the jack itself will tend to maintain an upright position even when lifted so that its base is not resting on anything.

While the body of the jack has been described as made in the form of a casting or castings, it will be understood that the parts may be forged or stamped.

What is claimed is:

1. A lifting jack for automobiles provided with an upright body containing lifting mechanism, said body having a fixed socket located near its upper end and a rotatable socket connected to the lifting mechanism and located lower than the fixed socket, and a bar or rod interchangeably insertible into the sockets for actuating the lifting mechanism when introduced into the rotatable socket and for transporting the jack as a whole when introduced into the fixed socket.

2. A lifting jack for automobiles provided with lifting mechanism, said jack having a socket connected to the lifting mechanism and another socket in spaced relation to the first socket and in fixed relation to the jack, and a lifting bar or rod introducible into either socket and constituting a manipulating rod for the lifting mechanism when introduced into the first-named socket, and a lifting and transporting bar or rod when introduced into the second-named socket.

3. A lifting jack for automobiles, pro-

vided with a column, a lifting rack bar movable therein, worm gearing engaging the rack bar and provided with a socket, a rod or bar for entering the socket at one end, means for engaging the bar at the other end to turn it to actuate the work gearing, and a socket member at a high point on the column for receiving the operating bar for the worm gearing, whereby the operating bar constitutes a carrying handle for the jack.

4. A lifting jack provided with lifting mechanism including a removable operating bar for the lifting mechanism, and a socket spaced from the lifting mechanism and into which one end of the operating bar is introducible for supporting and moving the jack bodily from place to place.

5. A lifting jack provided with lifting mechanism including a rotatable socket member, an elongated operating bar for the lifting mechanism adapted to the rotatable socket, and another socket separated from the rotatable socket and located at a higher point on the lifting jack to receive one end of the operating bar, whereby the latter may be utilized as a carrying member for the lifting jack independent of the rotatable socket.

6. A lifting jack for automobiles, comprising a base member, a column rising therefrom, a casing on one side of the post near the top thereof and provided with an axial extension across the post with the end of the extension closed, and a socket member at the junction of the casing, axial extension and column, and said casing having an extension on one side in substantially perpendicular relation to the casing, a rack bar in and movable lengthwise of the column, a worm gear in the casing provided with a pinion engaging the rack bar and housed in the axial extension of the casing, a worm housed in the second named extension of the casing in mesh with the worm gear and provided with a socket member exterior to the casing, a removable cover for the casing and second named extension and closing in the worm gear and worm, and an operating rod or bar fitting in the socket at the end of the worm and also fitting the socket at the junction of the casing, the column and the axial extension of the casing, to serve as a handle for transporting the jack.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

OLAF A. NORLUND.

Witnesses:
GLADYS L. OTT,
DAN D. KLINE.

Commissioner