Feb. 8, 1938. W. B. RUNYAN ET AL. 2,107,715

JACK

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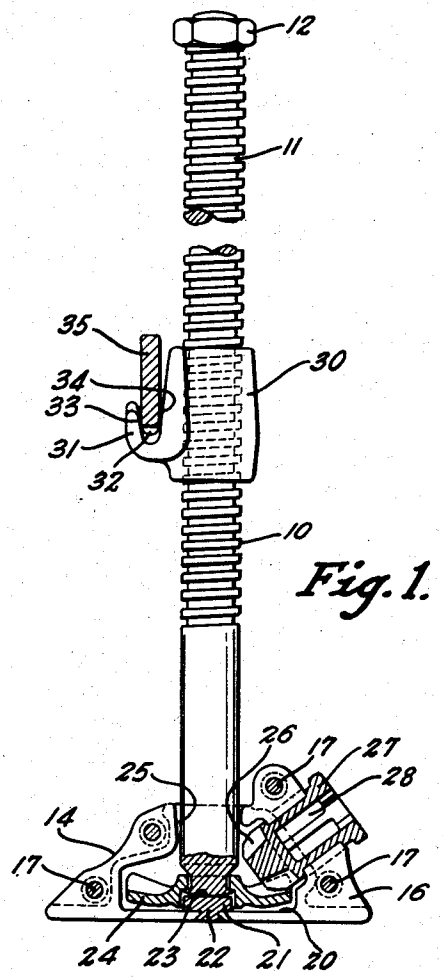


Fig. 1.

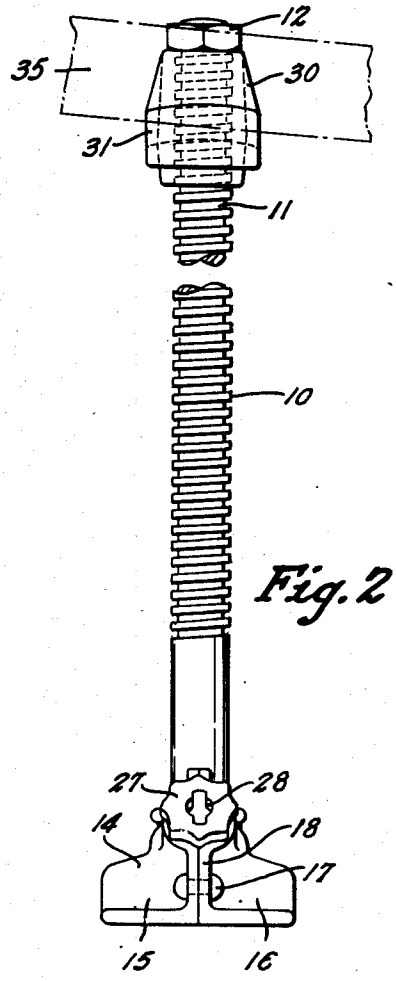


Fig. 2

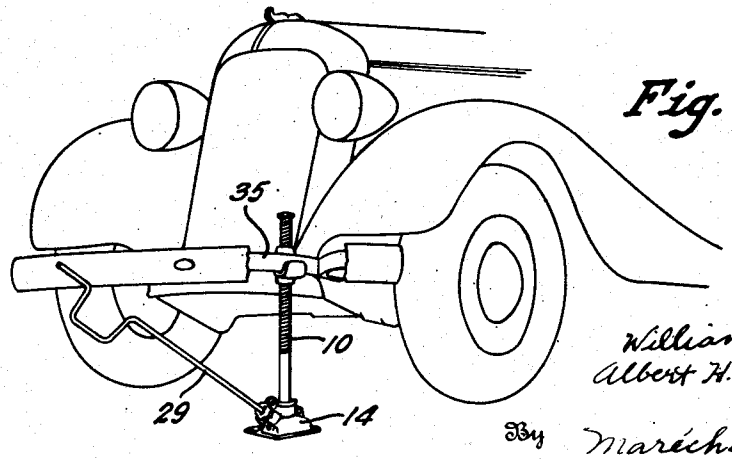


Fig. 3.

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JACK

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4 Claims. (Cl. 254—103)

This invention relates to lifting jacks and more particularly to jacks adapted for a comparatively wide range of lifting movement and for engagement with a part of the bumper of an automobile.

One object of the invention is the provision of a bumper engaging jack adapted for convenient operation and of quite simple and cheap construction.

Another object is the provision of a lifting jack having an elongated screw on which a bumper engaging nut is axially movable, the nut having a projection providing a socket or recess in which the lower part of a bumper or bumper bracket is adapted for fit with a wedging engagement, preventing relative endwise movement of the nut with respect to the bumper.

A further object of the invention is the provision of a bumper engaging jack in which the lower end of a rotatable screw is supported on a thrust bearing member provided in the supporting base, the connection between the lower end of the screw and the base being such that some axial tilting movement of the screw with respect to the base is permitted.

Other objects and advantages of the invention will be apparent from the following description, the appended claims and the accompanying drawing, in which—

Fig. 1 is a side elevation of a lifting jack embodying the present invention, the base and operating gearing being shown in section;

Fig. 2 is a front elevation of the lifting jack; and

Fig. 3 is a perspective view showing the jack engaged with a portion of the bumper of an automobile.

Referring more particularly to the drawing by reference numerals, 10 represents an elongated screw, of a height such that it extends considerably above the height of the ordinary bumper with which the present day automobiles are supplied. The upper portion of the screw is threaded throughout a considerable length as indicated at 11, the top of the screw preferably having a nut 12 or the like fixed thereon and affording a means which can be readily grasped by the hand for turning the screw before the load is engaged.

The lower end of the screw 10 is supported in a ground engaging base 14. As shown, the base 14 is made in two halves or sections 15 and 16, each half being a malleable casting or the like. The two halves are secured together by bolts or rivets 17 which extend through the adjacent flanges 18. The bottom portion of the base 14 provides a horizontal surface 20 which holds a steel bearing member or plate 21. The plate 21 has a downwardly extending projection 22, enlarged at its lower end, and held in position in an opening formed partly in the base section 15 and partly in section 16. The top of the bearing member 21 is engaged by the lower reduced end 23 of the screw, this end being preferably rounded as shown in Fig. 1 and resting on the hardened steel surface of the bearing member 21 so that the screw can be readily turned and tilted. The reduced lower end 23 of the screw is of rectangular or other non-circular cross section and is loosely received in a correspondingly shaped opening in the gear 24 which is provided within the gear chamber of the jack base. The fit between the end 23 of the screw and the receiving opening in the gear 24 is such that the two parts rotate together but can tilt axially with respect to each other. The tilting of the screw, however, is limited to a movement of several degrees by the top portion of the base, which has an opening 25 normally spaced from the screw, but which is so arranged that the inclination of the axis of screw 10 is limited to the desired amount. The fit between screw end 23 and the opening in gear 24 is preferably such as to allow a greater tilt of the screw axis than that permitted by the fit of screw 10 in opening 25, so that the horizontal component of the thrust is taken by the top of the base or housing, and binding between screw end 23 and gear 24 is prevented.

The gear 24 has a central lower recess fitting over and surrounding the upper portion of the bearing member 21 and preventing any substantial tilting of the gear 24 or transverse displacement of the shaft axis within the base. The loosely fitting connection between the lower reduced end portion 23 of the screw and the gear 24 is preferably such that the lower end of the screw cannot be withdrawn from the base, the end 23 having a portion which is extended outwardly beneath the gear, as by peening the lower end of the screw or the like, so as to allow relative tilting, but preventing removal of the screw.

The gear 24 is provided with gear teeth which are engaged by teeth 26 on the operating member 27, the latter being rotatably supported for movement about an axis extending outwardly and upwardly at a substantial angle. The operating member is provided with a suitable socket 28 which may be engaged by the end of an operating crank or handle 29 shown in Fig. 3.

The operating crank or handle is of sufficient length so that its crank portion can be conveniently operated by a person standing in a straight or slightly bent position. Operating member 27 engages the upper side of the gear 24 and thus prevents any substantial axial movement of the latter within the base.

It will now be apparent that when the operating crank is rotated by the operator, a rotational movement of the screw 10 is produced, and the lifting nut 30, which is in threaded engagement with the screw, is thus caused to move axially along the screw if the nut is held against rotational movements. The nut 30 is interiorly threaded and is preferably an integral one-piece casting having a projecting lug portion 31 providing a socket or recess 32 in which the bottom portion of the bumper may be engaged. The side 33 of the lug and the side 34 of the nut are inclined with respect to each other so as to provide a recess or socket of wedge shape, adapted for wedging engagement with the lower side of the bumper 35 of an automobile, the lower end of the recess being substantially smaller in transverse extent than the width of the engaged portion of the bumper so that the wedging interengagement of the bumper and the lifting nut is such as to prevent relative movement of the nut along the bumper. The lower portion of the socket or recess, as shown in Fig. 2, is curved downwardly and outwardly on both sides so that a bumper portion can be engaged when in a horizontal position or when inclined at some substantial angle to the horizontal, and the wedging connection betwen the bumper and the lifting nut will be maintained, and the latter prevented from moving or slipping along on the bumper.

It will now be apparent that the jack is of very simple and cheap construction, embodying comparatively few parts and capable of being very readily assembled. The jack may be very conveniently used, as it is unnecesary for the operator to stoop or crawl under the car, since the lifting nut is adapted for engagement directly with a portion of the bumper, such as the bumper bracket which projects from the automobile frame at the front end or at the rear of the car. To apply the jack to the load, the nut 30 can be turned on the screw to bring it to a suitable position a little below the height of the bumper bracket. The nut 12 fixed at the top of the screw 10 can then be turned by hand to raise the nut 30 and bring the wedging surfaces 33 and 34 into engagement with the bumper bracket, after which the handle 30 is inserted in the operating member, and then rotated to raise the bumper far enough so that the adjacent wheel is elevated clear of the ground.

In applying the jack in position, preparatory to raising a portion of the car, it is unnecessary to position the screw 10 to extend exactly vertically, since the screw can be readily turned even though it is inclined several degrees away from a perfectly upright position, the loose engagement between the screw and the gear 24 permitting the proper intermeshing of the teeth of the operating member 27 with the teeth of the gear 24. This loose engagement between the lower end of the screw and the gear 24 also permits some substantial amount of change of the position of the screw axis, as the lifting movement progresses. The load can, therefore, be raised to a considerably large extent, as the screw 10 is provided with a comparatively long threaded portion, permitting the lifting of one side of either the front or back of the automobile far enough to raise the wheel, and give the lift required for a car equipped with balloon tires.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. An automobile jack adapted for engagement with the bumper of an automobile, comprising an elongated screw, a ground engaging base at the lower end of said screw having a bearing portion rotatably supporting said screw, gear means in said base rotatable with said screw but capable of axial tilting movement with respect thereto, operating means engaging said gear means and supported by said base for rotational movements about an axis inclined angularly outwardly and upwardly, and a lifting nut threaded on said screw above the top of said base and having a projecting load supporting socket adapted for wedging engagement with the bumper.

2. An automobile jack adapted for engagement with the bumper of an automobile comprising an elongated screw, a member fixed to the top of said screw and adapted to be turned by the hand of the operator to rotate the screw, a ground engaging base at the lower end of said screw having a bearing portion rotatably supporting said screw, gear means in said base rotatable with said screw and centered by said bearing portion, said gear means and screw having a connection preventing substantial relative axial movements but providing for axial tilting of the screw, said base having a portion normally spaced from said screw but limiting tilting movement of the screw, operating means engaging said gear means and supported by said base for rotatable movements about an axis inclined upwardly and outwardly, and a lifting nut threaded on said screw above the top of said base and having a projecting load supporting socket adapted to receive the bumper of an automobile.

3. An automobile jack adapted for engagement with the bumper of an automobile comprising an elongated screw, a ground engaging base at the lower end of said screw formed of similar side halves secured together, a thrust plate having a downwardly extending projection held between said sections, a gear in said base rotatably mounted on said thrust plate, said screw having its lower end movably received in said gear and held thereto against axial movement, said base having an upper portion extending above said gear and surrounding the lower end of said screw but normally free of operating engagement therewith, operating means engaging said gear and rotatably supported by said base for rotational movements about an axis inclined outwardly and upwardly, and a lifting nut threaded on said screw above the top of the base and having a projecting load supporting socket adapted to receive the lower side of the bumper bracket of an automobile.

4. An automobile jack adapted for engagement with the bumper of an automobile, comprising an elongated screw, a comparatively short ground engaging base at the lower end of said screw having a bearing portion rotatably supporting said screw, the upper portion of the base

having an opening spaced from the sides of a lower portion of said screw, gear means in said base rotatable with said screw and centered by said bearing portion and capable of axial tilting movement with respect to said screw, operating means engaging said gear means and supported by said base for rotational movements about an axis inclined angularly outwardly and upwardly, and a lifting nut threaded on said screw above the top of said base and having a load engaging projection for engagement with the bumper.

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