

April 7, 1925.

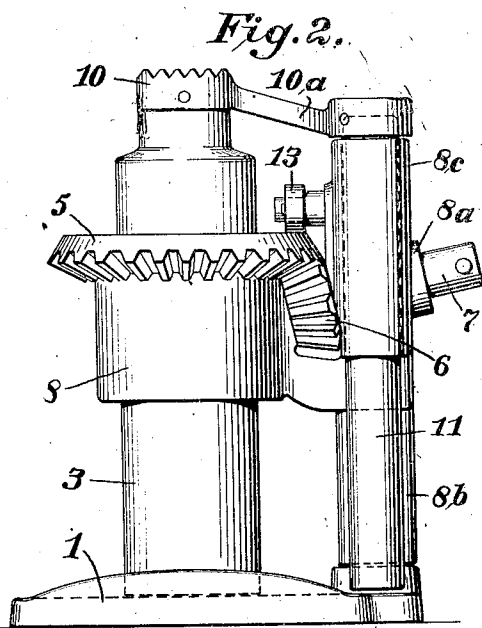
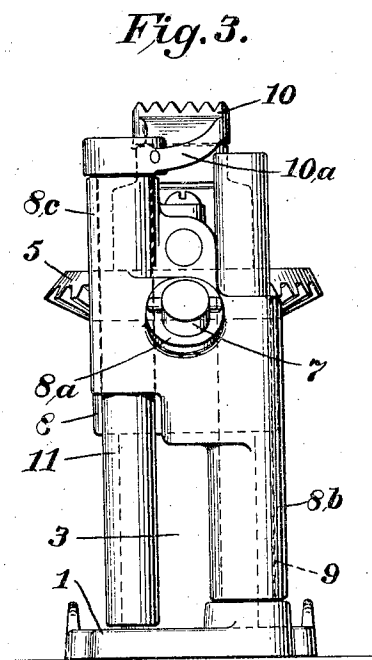
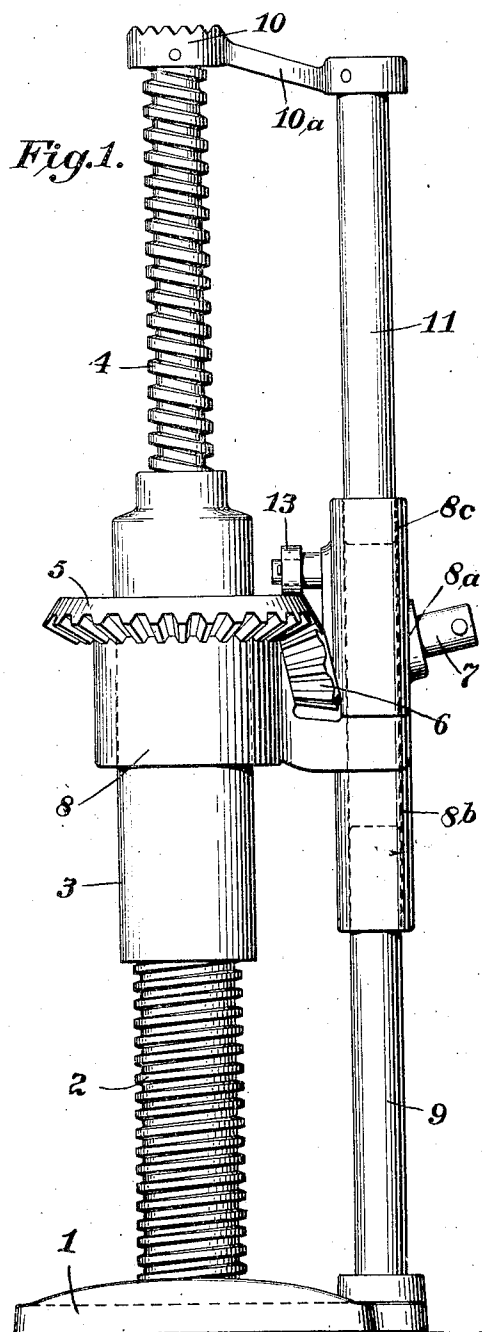
1,532,702

G. LANE

LIFTING JACK

Filed Nov. 10, 1924

2 Sheets-Sheet 1



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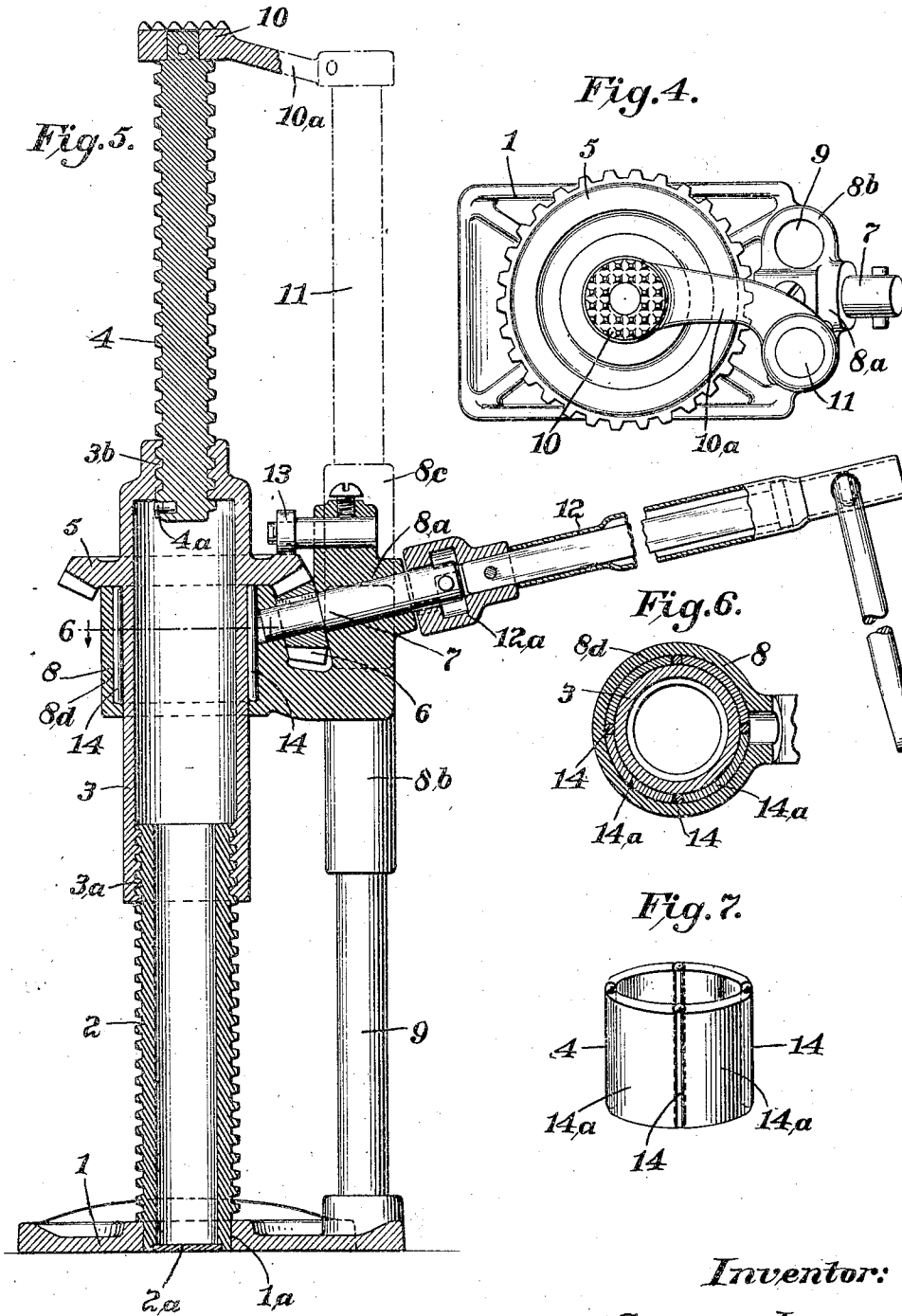
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UNITED STATES PATENT OFFICE.

GEORGE LANE, OF POUGHKEEPSIE, NEW YORK, ASSIGNOR TO LANE BROTHERS COMPANY, OF POUGHKEEPSIE, NEW YORK, A JOINT STOCK ASSOCIATION OF NEW YORK.

LIFTING JACK.

Application filed November 10, 1924. Serial No. 748,951.

To all whom it may concern:

Be it known that I, GEORGE LANE, a citizen of the United States, and a resident of Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Lifting Jacks, of which the following is a specification.

My present invention relates to improvements in lifting jacks of the telescopic screw type.

The increasing use of "balloon" tires on moderate price automobiles makes a demand (especially from the makers) for a low priced and efficient jack that will cover the required range of lift.

The range of lift for a balloon tire jack must be excessive, as compared with the usual recent standards. To be more specific, the extended height should be at least $2\frac{1}{4}$ times the collapsed measurement.

The increasingly low rear construction of cars makes almost obligatory these features: (a) ability to place the jack from the back of the car; (b) lifting should be on the head of the jack and not from some lower point (because spring and axle construction interfere with using a tall jack; it cannot be brought into place to get a bearing on a low lifting toe); and (c) also because of low construction and general congestion around the rear there is not much room for a pump handle action, for which reason a rotating handle is coming more into favor.

The said invention aims to provide a jack which will meet all these requirements, and one which will be strong and durable in use, and capable of being easily and quickly operated, and the invention comprises the novel construction and arrangement and combination of parts hereinafter described, and defined by the appended claims.

An embodiment of my invention is illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of the jack in extended position.

Fig. 2 is a similar view in collapsed condition.

Fig. 3 is a view similar to Fig. 1, but looking at right angles thereto.

Fig. 4 is a plan view, and

Fig. 5 is a section on line 5—5 of Fig. 4.

Figs. 6 and 7 are detail views, Fig. 6 being a section on line 6—6, Fig. 5.

Referring by reference characters to these drawings, the numeral 1 designates the base or foot of the jack to which is secured a hollow standard or post member 2 having a screw threaded exterior. Preferably the standard is applied to the base by making its lower end cylindrical and inserting it in a corresponding opening in the base with a drive fit, as indicated at 1^a, the open end of the standard being closed by a disc or plug 2^a.

3 designates a tubular shell or sleeve member which is provided at its lower end with a nut portion 3^a having internal threads corresponding to and engaging the exterior threads of member 2. The sleeve member 3 is provided at its upper end with a nut portion 3^b, the threads of which are reversed relative to the threads of post 2, and which correspond to and engage the exterior threads of an upper screw member 4, the exterior diameter of which is less than the internal diameter of post 2, whereby the former can lower or telescope into the latter to collapse the jack. The threads are preferably of the "Acme" type.

It will be readily apparent that if the upper screw 4 is held against rotary movement while sleeve 3 is rotated, said sleeve 3 will be screwed up or down on the post 2, according to direction of rotation, while screw 4 will be correspondingly moved relative to sleeve 3, giving to screw 4 a doubly accelerated movement.

It will also be observed that in the extended position the jack is more than two and a quarter times as high as when collapsed, the additional amount being secured by the sleeve 3, and all of the parts fitting within each other in collapsed position.

It is apparent that means must be provided for rotating the sleeve 3 while permitting vertical movement thereof.

This I accomplish by bevel gear 5 fast on sleeve 3 and preferably made integral therewith, said gear 5 meshing with bevel gear 6 fast on rotary shaft member 7 journaled in bracket 8^a of member 8, which has a cylindrical passage through which nut carrying member 3 passes and in which it

is free to rotate. Member 8 is held against rotary movement by the tubular guide member or portion 8^b depending from bracket 8^a and slidably engaging the guide post 9 rigidly carried by the base 1. Thus member 8 is held against rotation, but permitted to travel up or down, according to the direction of rotation of the sleeve.

For holding the upper screw against rotary movement I provide the step or saddle 10 with a laterally extending arm 10^a pinned to the upper end of a depending rod 11 which slidably engages a socket member 8^c of the bracket 8^a. Preferably socket members 8^b and 8^c are placed on each side of and adjacent to the operating shaft, in which position they cannot interfere with the placement of the jack close to vertical surfaces, as for example, the brake drums or housings.

The shaft 7 is adapted to be engaged by the socket 12^a of a suitable operating handle 12, the connection being preferably of the bayonet joint type, whereby the jack may be placed in position and removed by the handle, thus dispensing with the necessity of crawling or reaching under the car.

As the guide posts and rockets are disposed on opposite sides of the operating shaft and equi-distant therefrom, the jack is balanced relative to the handle and tendency to rotate on the handle as a pivot (when lifted thereby) is avoided.

A roller 13 carried by the bracket 8 bears on the upper surface of gear 5 directly above the gear 6, and resists any tilting tendency, due to the driving action of gear 6 whereby any binding of the screws is prevented.

Screw member 4 is provided with means such as a transverse pin or key 4^a to prevent its being screwed entirely out of nut member 3^b, which limits the range of elevation of the jack. Preferably the arm 10^a is made sloping, which prevents its being used as a lifting head, requiring the operator to use the saddle 10 for the contact part which insures the lifting strain being brought on the screw parts in axial alignment therewith, preventing side strain and binding.

We prefer to provide an anti-friction bearing between the member 8 and sleeve 3 and to this end provide the bore of said member 8 through which the sleeve passes, with a cylindrical recess 8^d, within which are located anti-friction rollers 14 held spaced apart by segmental shaped spacers 14^a.

Having thus described my invention, what I claim is:

1. A lifting jack comprising screws of opposite pitch fitting one within the other, a shell enclosing the two screws and provided with nuts at its ends to engage the screws, a gear fast to the shell, a support

journaleed on the shell, a rotary shaft mounted in the support, a gear thereon engaging the first named gear, and means connected from the base for preventing rotation of the support.

2. A lifting jack comprising screws of opposite pitch fitting one within the other, a shell enclosing the two screws and provided with nuts at its ends to engage the screws, a gear fast to the shell, a support journaled on the shell, a rotary shaft mounted in the support and carrying a gear engaging the gear on the shell, and means comprised within the jack structure permitting longitudinal motion of said support along the axial line of screws while restraining rotation of the support about the screw axes.

3. A lifting jack comprising screws of opposite pitch fitting one within the other, a shell enclosing the two screws and provided with nuts at its ends to engage the screws, a gear fast to the shell, a support journaled on the shell, a rotary shaft mounted in the support and carrying a gear engaging the gear on the shell, and means included in the jack structure and external to both screws for restraining axial rotation of both said shaft support and the smaller screw.

4. A lifting jack comprising screws of opposite pitch fitting one within the other, a shell enclosing the two screws and provided with nuts at its ends to engage the screws, a gear fast to the shell, a support journaled on the shell, a rotary shaft mounted in the support and carrying a gear meshing with the gear on the shell and a stud extending upwardly from the base and slidably engaged by said support.

5. A lifting jack comprising screws of opposite pitch fitting one within the other, a shell enclosing the two screws and provided with nuts at its ends to engage the screws, a gear fast to the shell, a support journaled on the shell, a rotary shaft mounted in the support and carrying a gear meshing with the gear on the shell and a stud extending upwardly from the base and slidably engaged by said support, a rod at one side of and parallel to the smaller screw, the said rod and screw being rigidly connected at their upper ends, the depending end of said rod being slidably engaged by said supporting member.

6. A lifting jack comprising a base, a lower vertical tubular screw carried thereby, an upper screw of opposite pitch adapted to telescope within the lower screw, a shell embracing the two screws and provided with nut portions at its upper and lower ends engaging said screws respectively, a gear fast to the shell, a support journaled on the shell, a laterally extending shaft journaled in the support and carrying a gear meshing

with the gear on the shell, said support carrying a pair of vertical guides, a rigid post extending upward from the base and engaging one of said guides, and a second post having its upper end rigidly connected to the upper end of the upper screw and engaging the other guide.

7. A lifting jack comprising a base, a lower vertical tubular screw carried thereby, an upper screw of opposite pitch adapted to telescope within the lower screw, a shell embracing the two screws and provided with nut portions at its upper and lower ends engaging said screws respectively, a gear fast to the shell, a support journaled on the shell, a laterally extending shaft journaled in the support and carrying a gear meshing with the gear on the shell, said support carrying a pair of vertical guides, a rigid post extending upward from the base and engaging one of said guides, and a second post having its upper end rigidly connected

to the upper end of the upper screw and engaging the other guide, said posts and said guides being arranged at equal distances on opposite sides of said laterally extending shaft whereby the weight of the jack is balanced.

8. A lifting jack comprising a base, a hollow screw carried thereby, an upper screw of opposite pitch adapted to telescope within the hollow screw, a shell encircling the two screws and provided with nut portions engaging the same, a gear fast on the shell, a support journaled on the shell, a rotary shaft mounted in the support and carrying a gear meshing with the gear on the shell, a saddle on the upper end of the upper screw having a laterally extending downwardly inclined arm, and a guide rod depending from said arm and slidably engaging said support.

In testimony whereof I affix my signature.
GEORGE LANE.